CITY OF BELLAIRE TEXAS

PLANNING AND ZONING COMMISSION

OCTOBER 11, 2018

Council Conference Room and Council ChamberWorkshop & Regular Session	**5:00 PM**

FIRST FLOOR OF CITY HALL
BELLAIRE, TX 77401

Chairman

Mr. Ross Gordon

Commissioner	Vice Chairman	Commissioner
Mike Baker	Mike Axelrad	John T. Klug
Commissioner	**Commissioner**	**Commissioner**
Jonathan Saikin	Weldon Taylor	Pamela Nelson

<u>Mission Statement:</u>
The City of Bellaire is dedicated to outstanding quality service and facilities to ensure an open, progressive, and secure community.

A. WORKSHOP SESSION

I. Call to Order and Announcement of Quorum

II. Discussion on possible amendments to the City's Code of Ordinances:

i. Regulations on open air porches in residential zoning districts

ii. Requirements for SUP submittals

iii. The requirement of a specific use permit for parking garages throughout the City

iv. Design Standards in commercial districts

v. Bellaire Boulevard Estate Overlay District

vi. Fence Heights for residential structures abutting commercial districts

vii. Regulations and materials used in impervious and pervious surfaces

III. ADJOURNMENT

B. REGULAR SESSION

I. CALL TO ORDER AND ANNOUNCEMENT OF QUORUM

II. APPROVAL OF MINUTES FROM PAST MEETINGS

1. Planning and Zoning Commission - Regular Session - Sep 13, 2018 6:00 PM

III. REMINDER TO CITIZENS DESIRING TO ADDRESS THE COMMISSION

IV. GENERAL PUBLIC COMMENTS

i. 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.

ii. Comments and/or updates from the Commission's City Council Liaison.

V. CURRENT BUSINESS (ITEMS FOR DISCUSSION, CONSIDERATION, AND/OR POSSIBLE ACTION)

i. **Presentation by ChaVonne Sampson on the amendments made to the City's Comprehensive Plan and Code of Ordinances with regard to the property at 4800 Fournace Place.**

ii. Docket # SU-2018-05-Consideration of an application filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for multi-tenant office use in the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 3) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

iii. Docket # SU-2018-06-Consideration of an application filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for the construction of a parking garage adjacent to the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 4) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

iv. Approval of the Commission's Report and Recommendation to City Council regarding a specific use permit at 4800 Fournace Place for multi-tenant office use.

v. Approval of the Commission's Report and Recommendation to City Council regarding a specific use permit at 4800 Fournace Place for the construction of a parking garage.

VI. COMMITTEE REPORTS

VII. CORRESPONDENCE

VIII. REQUESTS FOR NEW BUSINESS, ANNOUNCEMENTS AND COMMENTS

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

ii. **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**

IX. ADJOURNMENT

CITY OF BELLAIRE TEXAS

PLANNING AND ZONING COMMISSION

SEPTEMBER 13, 2018

Council Chamber	Regular Session	6:00 PM

FIRST FLOOR OF CITY HALL
7008 S. RICE AVENUE
BELLAIRE, TX 77401

I. CALL TO ORDER AND ANNOUNCEMENT OF QUORUM

Chairman Gordon called the meeting to order at 6:00 PM, and certified that a quorum was present, consisting of the following members.

Attendee Name	Title	Status	Arrived
Mike Baker	Commissioner	Present	
Jonathan Saikin	Commissioner	Present	
Mike Axelrad	Vice Chairman	Absent	
Ross Gordon	Chairman	Present	
Weldon Taylor	Commissioner	Present	
John T. Klug	Commissioner	Present	
Pamela Nelson	Commissioner	Present	
Zachary Petrov	Assistant City Attorney	Present	
Ashley Parcus	Development Services Coordinator	Present	
ChaVonne Sampson	Director of Development Services	Present	
Trisha S. Pollard	Council Member	Present	

II. APPROVAL OF MINUTES FROM PAST MEETINGS

A. Planning and Zoning Commission - Regular Session - Jul 12, 2018 6:00 PM

Commissioner Nelson stated that the order in which the swearing in of the new commissioners is backwards because it shows it happening before the public comments on the pathways plan. She asked that number 5 and 6 be switched.

RESULT:	**APPROVED AS AMENDED [UNANIMOUS]**
MOVER:	Mike Baker, Commissioner
SECONDER:	Pamela Nelson, Commissioner
AYES:	Baker, Saikin, Gordon, Taylor, Klug, Nelson
ABSENT:	Axelrad

III. REMINDER TO CITIZENS DESIRING TO ADDRESS THE COMMISSION

Chairman Gordon clarified that there were three primary pieces of action on the agenda. The first is two public hearings related to the Chevron property, and the second is the conclusion to the process for the car wash. He added that it is important to note that the general public comments are not intended for those three items. If you would like to speak on the Chevron property you have an opportunity during the public hearing process for the two items. Chairman Gordon stated that at this point in time, the general public comments period is for persons who have indicated the desire to be heard on matters of general interest to the commission and the commission is not permitted to fully discuss, debate, or consider items that are not on the agenda.

IV. GENERAL PUBLIC COMMENTS

A. 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.

Lynn McBee-Ms. McBee stated that she was here to talk to the Planning and Zoning Commission about process. During the July meeting, the last meeting, a public hearing was held which will be deliberated on on the agenda tonight. She stated that her concern about the public hearing was the emergence of a staff meeting now dubbed something like a Development Review Committee, which she stated that she is totally ignorant of. Ms. McBee explained that staff reviewed the meeting and the comments and came up with a traffic impact analysis request and made recommendations about the action, which was in the packet tonight. She stated that she does not know who is a member of this development review committee, or when they met, and that she does not see any minutes concerning that committee. She added that she would appreciate some clarification on that. Ms. McBee felt that the public hearing is intended to allow the citizenry to direct their wishes and that it's your role to consider that; If there have been no comments possible because the materials were missing, then you're missing public input that's vital. She stated that it is simply a matter of principle that you provide all information and staff is subservient to the Planning and Zoning Commission. She added that her general concern about the process is that all staff information including their recommendations should accompany the packet and be made available to the general public before the public hearing. She mentioned that any new recommendations can now not be commented upon because the public hearing was adjourned. She asked that the Commission instruct staff, for future actions, that all information that they care to make about an application should be submitted to the Commission as part of the public hearing packet, and that in this particular case, a second public hearing should be warranted to allow the public to address the new information that was not provided at the first public hearing. Ms. McBee stated that in the future she would suggest that if there are more materials that are going to be requested by the Commission of the staff, that the hearing be continued to a date certain to give fair opportunity to the general public to take advantage of reviewing that additional information.

B. Comments and updates from the Commission's City Council Liaison.

There were no comments from the Commission's City Council Liaison, Trisha Pollard.

V. PUBLIC HEARINGS

Docket # SU-2018-05-Public hearing on an application filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for multi-tenant office use in the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 3) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

A. Presentation of the Public Hearing Process

Ms. Parcus reviewed the public hearing process.

B. Presentation by the Applicant

Danny Sheena, SLS Properties-Mr. Sheena introduced himself and stated that he is one of the owners of SLS properties. He added that he has lived in Houston all of his life, and that he currently lives at 4612 Oleander Street with his wife and kids. Mr. Sheena stated that his partner in this venture is Dr. Ronny Sheena, who also lives in Bellaire, on Marrakech. He then gave some background information about himself, stating that he is an engineer and graduated from the University of Houston many years ago. Mr. Sheena explained that he has a master's degree from UCLA in engineering as well. He informed the Commission that he has been exposed to many real estate deals for his clients and for himself, and that he is very familiar with the Bellaire area, the real estate market, and methods of construction. Mr. Sheena explained that the requests are broken up into two public hearings, the first being a request to use the existing office buildings as multi-tenant office space, and the second is the parking garage. He stated that he would address each one seperately. Mr. Sheena added that there would be more comments and more exhibits for the parking garage than for the multi-tenant office building. He mentioned that he has built properties in Houston for many years, for himself and for his clients, and has been involved in projects for Gerald Heinz all over the country from small buildings to very large buildings.

Mr. Sheena then went on to give some background information regarding the former Chevron buildings. He explained that there is a six story office building that was built in 1965, and then there's a 10 story office building next to it which is like a V-shape, and that was constructed in the '70's a few years later. He stated that it was occupied as an office building for many, many years, and had multiple departments and various divisions in them. Mr. Sheena added that his understanding was that, at times, other companies were leased sub-portions of the office space; therefore the building is already configured for many tenants. He informed the Commission that he owns the property across the freeway, at 5909 and 5959 West Loop South, and has for about a year. It's a multi-tenant office building, very similar to other office buildings in the City of Bellaire. He mentioned that there are several other multi-tenant office buildings located within the City of Bellaire and that is exactly what he would like to do with the property at 4800 Fournace. Mr. Sheena added that his company is very familiar with running, operating, and maintaining office buildings, and stated that the property will operate very similarly to the other office buildings around the city. Mr. Sheena explained that this is simply a request to continue utilizing He thanked the Commission for giving him the time to speak.

C. Staff Findings

Ms. Parcus informed the Commission that the public hearing is on a request filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for multi-tenant office use in the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 3) of the City of Bellaire Zoning Code. She added that the property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area within the City's Comprehensive Plan. Ms. Parcus stated that the application was submitted on August 10, 2018, and that notice of the public hearing was published in the Southwest News on August 28th, and mail outs were sent to 215 properties within 500 feet of the 4800 Fournace on August 31st. Notification signs were posted on the property on August 28th. Ms. Parcus then reviewed the details of the site with regard to the current zoning and adjacent zoning and land uses. She explained that this application is not requesting a re-zone, and that per Section 24-544 C. 3) of the City of Bellaire's Code of Ordinances, "Office buildings" is permitted as a specific use within the City's Technical Research Park District. She informed the Commission that the applicant plans to use the approximately 500,000 square feet of lease-able office space, already existing on the site, to house multi-tenants. Ms. Parcus then mentioned that based on Section 24-514a, general office use requires 3 parking spaces per 1,000 square feet of general floor area. This means that approximately 1,500 parking spaces are required on site in order to accommodate for the 500,000 square feet of office space. She stated that there are currently only 1,400 parking spaces available on site; however, the applicant's request for the construction of a parking garage addresses that issue.

She stated that no action is required during tonight's meeting, and that the item is scheduled for consideration on October 11th.

D. Public Comments

Chairman Gordon explained that because there are two public hearings for the property, any comments relating more to the use of the buildings would need to be made during this hearing and any comments more related to the parking garage will need to be saved for the second.

i. 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.

James Balogh: Mr. Balogh stated that he owns a house at 5017 Mayfair Street, and also resides at 4820 Bellaire Boulevard. He was concerned that there would be a lot of vendors and truck traffic in and out of the site, because there is already an issue with truck and school traffic/buses in the mornings. He added that if the same thing happens on Fournace, then it will be just an L-shaped nightmare. Mr. Balogh also mentioned that the trucks frequently knock down the poles as they turn the corners. He stated that the influx of extra traffic needs to be taken into consideration.

Charles Platt: Mr. Platt stated that he lives at 4924 Beech Street, and has concerns about the specific use permits for the Chevron property for two reasons. He mentioned that environmental is one, and drainage is the other. Mr. Platt added that Chevron has filed two massive environmental reports with the Texas Commission on Environmental Quality in December 2017 and May 2018, and stated that he assumed that the Commission has access to those. He mentioned that he is not an expert, but these reports list numerous chemicals that are outside permissible limits and which have to be remediated, including petroleum hydrocarbons, chlorinated volatile organic compounds and mercury. Mr. Platt stated that there's no action plan yet, as far as he knows, filed with the TCEQ on the contamination, and the buyer has not really addressed it. He added that the buyer says that he will comply with the TCEQ requirements, but has not, in my understanding, submitted the description of the environmental hazards that are required by our ordinance. Mr. Platt felt that it would be advisable to consider hiring a environmental engineer to review the reports and advise the Planning and Zoning Commission. He added that the the buyer should be required to provide more specificity before the Planning and Zoning Commission acts on this matter. Mr. Platt then stated that as far as drainage is concerned, he doesn't know if this project will add to the drainage, but that it is something that needs to be thought about. He added that post-Harvey, we need to retain as much water as we can on properties within the city of Bellaire, and that there is nothing in the proposal that addresses drainage. Mr. Platt explained that this property sits near the top of the Bellaire water shed and drains on either side, and also into Fournace. He stated that this is a major concern and that a lot of the property is covered with concrete pads. Mr. Platt mentioned that he doesn't know what the coverage requirement is, but that it is certainly something we should have a better understanding of before the Planning and Zoning Commission approves these permits.

Michelle Arnold: Ms. Arnold stated that she has lived at 4917 Elm Street since 1994, and apologized that her comments are intertwined. She added that her neighborhood will be negatively impacted if this building goes through as discussed. She stated that it is bad enough that Bellaire taxpayers have had to look at the Chevron office buildings for decades, and now a parking garage for 2,000 cars will further mar the view for Bellaire taxpayers. Ms. Arnold felt that a garage for 2,000 cars will mean terrible traffic for Fournace, safety risks, plus the nuisance of noise from hundreds of car radios and motorcycles. She stated that Bellaire City Council has little control over the town's massage parlors, pawn shops for thieves, and the infamous Bellaire Inn, where rooms are available to rent by the hour, and there will also be no control over the tenants of this building. Ms. Arnold mentioned that Chevron was easy, it was one neighbor with only 900 surface parking spaces. She questioned whether the parking garage construction will stir up any hazardous waste that Chevron might have left behind, and mentioned that another shady side enclave with 20 high end homes and acreage would be nice. Mr. Arnold asked if there is any chance that they can use the surface parking with shade structures that house solar panels which will help reduce the energy costs of this building. She then informed the Commission that they are about to make a big quality of life decision for the town.

Catherine Lewis: Catherine Lewis informed the Commission that she lives at 1112 Colonial, which is about 250 feet from the site. She stated that her main comment was that the total area is in kind of a shabby disrepair, including the sidewalks all around. Ms. Lewis mentioned that the office complex area used to be beautifully maintained when Texaco had a plant there, and then when Chevron took over it went down. She stated that all of that needs to be maintained, and she felt that it should be part of the discussion here. Ms. Lewis then mentioned the drainage issue, and stated that it is a big deal, especially for Mayfair Street, because when you put in a parking garage, if you raise that foundation it'll drain to Mayfair street and Mayfair street already floods. She pointed out that the new storm drainage system that's supposed to go into Mayfair is still not there. Ms. Lewis stated that every year it's on the schedule, and every year it gets delayed. She mentioned that she concurs with an office use, along the lines of what it has been in the past.

Ed Umbricht: Mr. Umbricht stated that he lives at 4900 Mayfair. He mentioned that the TIA that was completed suggests that 2,000 parking spaces will support about 5,700 trips. Mr. Umbricht stated that this means that 5,700 extra cars have to go down Fournace or 610, or take the additional shortcut down Anderson to Elm. He pointed out that the traffic report says there's no net effect to the traffic in the area, but the road is already at a C, and is overburdened in the area. He mentioned that there are three exits to the property currently, but one of them is just too close to the freeway to get in and out. Mr. Umbricht stated that the Chevron property always had police officers at the exit controlling traffic, Texaco did too. He pointed out that this traffic report calls for no traffic controls at all, and that he thinks that it's important to look at. Mr. Umbricht mentioned that the TIA lists Anderson as an emergency exit, and asked that it be closed permanently. He felt that the residents are already boxed in in the neighborhood, with Westpark and the new transit center that's going up on the north side.

Lynn McBee: Ms. McBee stated that the attempt to take a large track such as Chevron and say "we just wanted to fill the office building with multiple kinds of tenants and maybe use the six story building as well, and later we'll talk about a parking garage, and this application has a traffic impact analysis" is based on nothing. She mentioned that the property is not being used right now by whatever mix of tenants will come, so the traffic study, though I'm no expert and I hate these things, doesn't tell me a whole lot. She then asked what types of tenants the building will be used for and what the restrictions will be. Ms. McBee stated that who offices in the building and their needs will determine all the questions we're here to answer tonight, but we can't because we don't know who they'll be. She felt that this is an absurd way to do business in a zoned city, and added that the application makes no attempt to explain the goals of the developer, but really offers as little as he can get away with. Ms. McBee felt that the Commission doesn't have enough information to make a decision on it, and that she doesn't have enough to give an intelligible comment. She mentioned that there is no attempt to even compare the past use of the property in those two buildings and the proposed use of the property, as expected by this new developer; therefore, there is no way to determine if it's going to be better, worse, more, less, etc. Ms. McBee stated that she totally opposes the granting of the specific use for this quote, “multi-tenant building,” of which she knows nothing and the Commission knows nothing. She added that her opposition is based on an incomplete application and lack of information to the public.

E. Response of Applicant

Danny Sheena, SLS Properties-Mr. Sheena explained that this is an office building, and no one ever knows what tenants will be occupying it until a "for lease" sign is put up and interested tenants call about a space. He added that no one in Bellaire comes in up front and is able to tell the City exactly what tenants are going to lease a space. Mr. Sheena pointed out that it is up to the landlord to restrict tenants that are undesirable, and it is not something that he can predict, or anybody can predict in advance. He stated that many people need space for a variety of reasons, doctors, lawyers, accountants, CPAs, dentists, etc. He added that whoever is interested will be screened by the landlord, and the landlord will do a good job to make sure that it's a desirable tenant. Mr. Sheena explained that as far as traffic congestion on the street goes, these buildings were occupied before, and its the same kind of occupancy, just broken up into several different companies. He added that whatever traffic was there before in 2015 and 16 and 14 and 12 will continue to be there. He explained that the building is situated where it's got an exit off of Loop 610 and two exits off of Fournace, and therefore there will not be traffic going into the streets, it is going to be directed where it needs to go. Mr. Sheena added that if there is congestion issues he would be happy to obtain a police officer to direct traffic. Mr. Sheena pointed out that an expert analyzed the situation and determined that there will not be any significant impact with regard to a multi-tenant office use. He added that there are restrictions on the property that he is not able to disclose at this time, because he has not closed on the property. Mr. Sheena stated that they will close on September 26th and that he will be able to give the public and the Commission any information that they would like at the next meeting. He mentioned that the public will understand why there's certain things that cannot be done in the future, but for now, he knows that he wants to keep the multi-tenant office building and he will need to make sure that it's got all the accommodations for it. Mr. Sheena stated that he understands the concerns regarding the environmental issues, but that the city has been in contact with the TCEQ about where the contamination was coming from, and it basically concluded that it is coming from offsite onto the property. He mentioned that it is very deep in the ground, and that Chevron has cleaned the surface contamination. He informed the Commission that there are certain agreements that he has with Chevron as to what will be allowed on the property in the future. He assured the Commission that the TCEQ is monitoring the situation, and he will make sure that there are no issues. Mr. Sheena pointed out that the request before the

Commission is simply whether or not multiple tenants can be allowed to use an existing office building that was fully occupied for many, many years in the past.

F. Questions from the Commission

Commissioner Taylor asked who does have the regulatory, burden if you will, for the environmental issues. He questioned whether it would be the City of Bellaire or the Texas Commission on Enviromental Quality.

Ms. Parcus stated that TCEQ would handle that.

Commissioner Taylor asked for clarification that TCEQ is engaged.

Ms. Parcus confirmed this.

Commissioner Taylor mentioned that based on the parking numbers that were given during the staff report Chevron did not have an adequate amount of parking on the site.

Ms. Parcus confirmed that and explained that the numbers are based on the calculations that staff uses today. She added that she is not sure how it was calculated when Chevron went in, but based on the three per thousand currently used, they would need 1,500 parking spaces on site and right now there's only 1,400 parking spaces on site. Ms. Parcus also explained that the 3 per 1,000 is based on general office and that there is a different requirement for medical office, which is 3.5 per 1,000. She stated that based on that, the requirement of 1,500 could go up even more.

Commissioner Taylor asked the applicant if there is going to be reconstruction in the building that would allow a bigger tenant population than was there for the Chevron organization or if he was anticipating a decrease in the number of tenants.

Mr. Sheena stated that the Chevron property, the building itself, has got multiple cubicles and when you have cubicles you have a lot denser population of tenants. In general office use there's not a lot of cubicles. What you do is you have larger offices. A cubicle is generally, sometimes you get them as five and a half by six and a half. A normal office size is like a 10 by 12 or sometimes even larger. On a normal office you'd have variety of other supporting offices. We expect the density in the same space to be less than it is in Chevron. We believe that the Chevron occupancy was much higher than what we anticipated.

Commissioner Taylor then asked the applicant why he is building the parking garage for 2,000 parking spaces.

Mr. Sheena mentioned that although this is more related to the second hearing he would go ahead and answer the question. He explained that the code say that a minimum of 3 per 1,000 is required for general office use. He stated that he has offices all over the city and his general finding is that if you give them 3 per 1,000, sometimes they will exceed it and it's the peak hours. In an office building you have people that come in late, go out early, it's not everybody goes in and everybody comes out. It's better for a landlord to provide more adequate tenancy for parking than is the minimum required by code. He stated that he feels as though 4 per 1,000 is the right number for him.

Commissioner Taylor mentioned the comment regarding food services, trucks, and truck traffic and asked Mr. Sheena to comment on this.

Mr. Sheena stated that it is an office building. He added that in an office setting you don't typically have the food services that were mentioned. He added that the building does have a cafeteria that services the tenants in the building but that there is an underground ramp that is already existing on site which allows for deliveries to be made without the neighboring residents seeing it.

Chairman Gordon asked staff to clarify what types of uses would be allowed within the office buildings.

Ms. Parcus explained that it would only be general office and medical office, and that retail would not be allowed.

Chairman Gordon asked for clarification that restaurants would not be allowed.

Ms. Parcus confirmed this.

Commissioner Baker asked if the residential lots to the north of the property were also included in the transaction.

Mr. Sheena stated that they are not.

Commissioner Baker asked Mr. Sheena if he has or would consider extending the road that runs along the east west meridian out to the right for additional ingress and egress from the Loop 610 feeder.

Mr. Sheena stated that it is not in the current plans. He added that there would be issues with TxDOT allowing an extra entrance that exists form a freeway they control. Mr. Sheena explained that they have thought about a lot of different scenarios on how to improve the flow of the site, but without knowing exactly what is going to be developed on the other portions of the land it is hard to make those determinations at this point.

Commissioner Baker asked if he could elaborate at all on the possible uses for the rest of the land.

Mr. Sheena stated that he honestly doesn't know today, but added that without the parking garage he wouldn't be able to do anything else. He then reminded the Commission that he has not closed on the property yet.

Commissioner Baker pointed out the structure shown on the top left of the site plan and asked Mr. Sheena to address what it is and how it relates to his proposal.

Mr. Sheena explained that it is a central plant that has the capability of running 10 buildings without ever losing power. He mentioned that the emergency power could be a tremendous help to the city in the future if another natural disaster were to occur.

Commissioner Klug asked what class the office buildings are.

Mr. Sheena stated that both of them are rated as B plus buildings.

Commissioner Klug asked Mr. Sheena about how many other properties he has developed or controlled.

Mr. Sheena explained that he has two directly across the freeway, at 5959 West Loop South. He added that he has one at 2636 South Loop West by Reliant Stadium, which is the biggest building out there, one at 4543 Post Oak Place right there by the Galleria where his brother has a clinic with eight other physicians, one at 2900 Woodridge, that's by 45 and 610, one at 13103 FM 1960, that's 290 and 1960, and one at the corner of Wilcrest and 59 out on the west side. He added that he also has shopping centers by Wilson Road and Beltway and by North Intercontinental, in south Houston by NASA Clear Lake, Dickinson and we've got other land. Mr. Sheena stated that that's only in Houston, and that he has personally done a lot in office buildings but those are the ones that he owns with partners today. He stated that he has done many, many other office buildings for clients of his all over the country. He mentioned that one of his last projects was an 85 story building in Chicago, Illinois that had a 350 foot pyramid on top and was supposed to be the third tallest building in the world. Mr. Sheena stated that he spent probably a year of his life traveling back and forth from Chicago to make sure it happened and then somehow they shortened it at the end and made it a 65 story building. It's called One North Wacker. He stated that there is another building that he did in Detroit called One Detroit Center. It's a 50 story building in downtown Detroit, with an approximately 10 story parking garage. Mr. Sheena added that he has also done small buildings and warehouses.

Commissioner Klug asked Mr. Sheena if he just owns the buildings in Houston or if he manages them as well.

Mr. Sheena explained that he does both.

Commissioner Klug asked for confirmation that his management company would manage and lease the buildings at 4800 Fournace as well.

Mr. Sheena confirmed this.

Commissioner Klug mentioned that there is currently surface parking on the site; he asked if there was any possibility of removing that and returning it to grass or soil for drainage purposes.

Mr. Sheena explained that it would be part of other developments in the future, but that absolutely there will be some green space out there that will accommodate that. He added that he is working with Kirksey Architects and that they absolutely have plans for green space and trees for the rest of the development. He added that he couldn’t tell the Commission right now with certainty as to what exactly it would look like.

Commissioner Klug asked Mr. Sheena if he had an estimate of what the office population would be with his proposal compared to the population under Chevron.

Mr. Sheena stated that it will not be greater than what Chevron had. He added that Chevron occupied the entire building in cubicles, which are much denser than what is anticipated for this proposal.

Commissioner Nelson asked Mr. Sheena if he has any plans to make upgrades to the exterior of the building and/or the surrounding sidewalks that are said to be in disrepair.

Mr. Sheena stated that the building will get a power wash and possibly a paint job. He added that he would not be authorized to do anything to sidewalks that belong to the City, but that he would take care of any sidewalk that he has control over.

Commissioner Nelson mentioned that Mr. Sheena plans to do some landscaping but asked for confirmation that he does not plan to do any actual building.

Mr. Sheena confirmed that no building will be done where the existing buildings are.

Commissioner Nelson understood that continuing the use of the office buildings as multi-tenant would not be impacted by any environmental issues, but mentioned that any kind of new construction, even just changing or replacing a sidewalk could disturb the chemicals that are present.

Mr. Sheena explained that for the purpose of the multi-tenant office building there'll be zero environmental effect or impact on the property. He was confident that even the replacement of a sidewalk would not be impacted as the contamination is approximately 40-50 feet below ground level.

Commissioner Saikin asked Mr. Sheena if any of the other projects that he has worked on are comparable in to this one where you have taken a single tenant or single occupant property and converted it into a multi-tenant space.

Mr. Sheena confirmed that he has, but that the property was not as big as the one at 4800 Fournace. He stated that it was a property that was occupied by Washington Mutual and was located on West Gray. Mr. Sheena added that Chase took the first floor and then the rest of the buildings is split into multi-tenants.

Commissioner Saikin asked what the size was compared to this property.

Mr. Sheena explained that it was approximately 20-30,000 square feet. He added that the building at 4800 Fournace will need a big tenant to occupy a floor or two floors, and that there are people like that they are already in communication with.

Commissioner Saikin asked Mr. Sheena what his timeline is.

Mr. Sheena explained that he will put the spaces up for lease as soon as he closes on the property, and that the parking lot will come after. He added that he currently has enough on site surface parking to begin leasing the spaces without the construction of the parking structure needing to come first.

Commissioner Saikin asked Mr. Sheena if he anticipated that the parking lot will also be shared with the other undeveloped portions of the property.

Mr. Sheena stated that he is not sure yet.

Commissioner Saikin asked if there were any plans to modernize the exterior of the building.

Mr. Sheena reiterated that the only plans are to power wash an possibly paint the building.

Commissioner Saikin questioned whether Mr. Sheena felt that he could attract quality tenants without upgrading the building.

Mr. Sheena was confident that he could and reiterated that he has already been in communication with some companies who are interested in leasing there. He added that his property is better than others due to the fact that the generator can provide secure services that tenants don't have in other properties.

Commissioner Saikin asked how many floors there are in the V-shaped building.

Mr. Sheena stated that there are 10 stories.

Commissioner Klug asked if the excess power capacity from the generator could be switched over to the City of Bellaire if there were an outage.

Mr. Sheena explained that it has excess capacity, but it would be a matter of running the piping from the building to whoever else needs it. He added that there is currently no connection to switch it to the Bellaire grid or residential grid.

Chairman Gordon questioned whether the City has reviewed the TIA that was submitted for the property.

Ms. Parcus explained that it has been sent to the City's Traffic Engineer for review, but that we have not received the comments back yet. She added that the TIA was submitted only one day before the public hearing packet was sent out, and that the Commission will get that information for consideration of the item.

Chairman Gordon was concerned about the process for moving forward without this information and whether the Commission was just setting itself up to have to have an additional public hearing or revisit the topic at a later date if there are comments or revisions. He wondered if the application was in fact complete and is in compliance with all of the City's regulations.

Ms. Parcus explained that this information is typically given to the Commission during consideration of the item, not during the public hearing portion. She added that the application is complete based on the City's regulations for SUP submittals.

Chairman Gordon mentioned that the applications are not clear as to whether the permits cover any of the other land on the property, specifically, the generator that has been discussed. He was concerned about the idea of granting specific use permits for segments of a property.

Ms. Parcus pointed out that the two office buildings are already existing, and that Mr. Sheena is simply asking to continue the use of them. She added that any future development will have to go through the same process before the Commission. Ms. Parcus informed the Commission that she believed that the property is currently 3 lots, and that platting appropriately will be part of the process as well.

Chairman Gordon asked about the landscaping.

Ms. Parcus stated that there is already a significant amount of trees on site, and that the applicant is proposing additional. She added that staff is taking a look at increasing that requirement even more and will have additional information on that at the next meeting.

Chairman Gordon asked the applicant if he plans to subdivide the property in the future.

Mr. Sheena stated that he does have plans to subdivide the property. He added that he will use the existing surface parking until the parking garage is constructed, because it is his understanding that as long as he is not changing the use or constructing anything new he can use the property as it exists today. Mr. Sheena assured the Commission that he is fully aware that he will need to come back to the Commission for any future development projects.

Commissioner Saikin mentioned that City staff had stated that he would need a minimum of 1,500 parking spaces to operate the building.

Mr. Sheena explained that the 1,500 parking spaces would be required when the buildings are fully leased.

Commissioner Saikin asked for confirmation from the City that he would be able to open the building without having a total of 1,500 parking spaces available.

Ms. Parcus explained that the property owner would need to apply for a Certificate of Occupancy for each tenant, and that the necessity for parking would be calculated on a tenant by tenant basis. She added that office spaces could be leased up to the point where they reach the 1,400 parking space requirement.

Commissioner Saikin asked for clarification that the buyer is not suggesting that anything other than what is currently existing on the site is going to be multi-tenant, nor does this give him permission to do so.

Mr. Sheena and City staff confirmed this.

Commissioner Baker asked Mr. Sheena what other types of developments he has considered for the highest and best use of the property as a whole.

Mr. Sheena stated that at this time, he is under confidentiality until he closes on the property as to what can an cannot be developed on the site, but that the existing buildings need to stay.

Chairman Gordon asked if in the future it would be possible for City staff to provide a complete review of the application related to traffic and drainage prior to the public hearing, in order to give the public an adequate amount of time to respond to the information.

Ms. Parcus stated that it is possible, the Commission just needs to establish what it would like for the process and requirements to be. She added that of course that might push the applicant's timeline back, but if that is something that the Commission feels is important staff would be happy to do so.

ChaVonne Sampson, Director of Development Services-Ms. Sampson explained that with applications in the past, the practice of City staff was to wait to hear the concerns of the Commission during the public hearing to determine what issues need to be addressed and what materials need to be submitted to address them. She referenced the re-development of Bellaire High School and reminded the Commission that their TIA had to be redone multiple times. She stated that in that instance the Commission would be back in the same boat.

Ms. Parcus also pointed out that a TIA is not a requirement for the submittal of a specific use permit application, so that is why, as staff, we take a step back and first see what the concerns are. Due to the magnitude of this property, Mr. Sheena was told up front to go ahead and have a TIA prepared, but in other instances, that may not have been the case. She added that he got the TIA to staff as soon as he could, but unfortunately it was not in time to be reviewed prior to the public hearing. Ms. Parcus pointed out that staff made the decision to go ahead and include it in the packet, without the traffic engineer's comments, in order to give the public time to see it and comment on it during the public hearing.

Chairman Gordon mentioned that the TIA that was completed assumed only the proposed development at hand, and did not include any considerations of development of the remainder of the site.

Ms. Parcus confirmed this and stated that any future development would require that a new TIA be done for the property.

Commissioner Nelson mentioned the fact that Mr. Sheena is under confidentiality as to a few things that cannot be done on the property. She asked when during the process the Commission would find out that information and how it will impact the application if the public is not able to comment on it.

Mr. Sheena assured the Commission that it will not impact these applications, only what is able to be done on the rest of the property. He added that he closes on the property on September 26th, and that once that has happened he will be able to give the Commission any and all information that they wish to have.

G. Invitation for Written Comments, if applicable

Chairman Gordon informed the public that written comments on the application will be accepted until 5:00 pm on Wednesday, October 3rd.

H. Closure of the Public Hearing

Motion: a motion was made by Commissioner Saikin and seconded by Commissioner Nelson to close the public hearing.

Vote: the motion carried with a vote of 6-0.

Docket # SU-2018-06-Public hearing on an application filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for the construction of a parking garage adjacent to the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 4) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

A. Presentation by the Applicant

Danny Sheena, SLS Properties-Mr. Sheena explained that the parking garage is permitted use as a specific use under Section 24-544 within the Technical Research Park District of the City of Bellaire Code. He reiterated that in order to support this building, he is proposing the four to one ratio, approximately, and this is based on his experience in operating several office buildings. Mr. Sheena stated that they do not want to be at the minimum required parking, but they also do not want to exceed that even more with a five to one ratio. He then gave some specifics on how the garage would be constructed by stating that typically the first floor is 11 and a half feet, with all other floors being 10. He added that there would also be a guard rail at the very top, bringing the total height to about 45 feet. Mr. Sheena explained that the height of the 10 story building is 150 feet, plus the antennas on top so it is much, much higher than the proposed parking garage. He added that some architects that we talked to suggested constructing a 10-story parking structure, but he did not want that. He mentioned that at the height that is proposed it does use more land, but it's less obstructive for the neighbors. Mr. Sheena informed the Commission that the parking garage will be constructed from pre-cast concrete in order to cut down on time, noise, and the amount of activity that would take place on the site if a different method of construction was used. He explained that with pre-cast, basically, it is poured off-site somewhere and then the pieces get brought to the site and it gets built up like a puzzle. Mr. Sheena informed the Commission that there are currently very dense trees between where the parking garage would be and the residential homes, that would blocking the view. He added that he will also be installing additional trees in any openings that exist. Mr. Sheena then showed a picture of another property of his at which a shopping center was developed close to residential and the fence that he installed there. He stated that it is a three feet by three feet brick walls, and in between them, every 20 or 30 feet depending, concrete panels were added to look like fencing. Mr. Sheena said that he would be willing to do that in this case as well, and that it is very durable. Mr. Sheena then showed what it looks like right now at the Chevron property looking North towards the neighbors on Mayfair. He pointed out that the vegetation is pretty dense with trees already. He reiterated that there are some locations where new trees would need to be filled in, but it would take a lot of looking to actually see the parking garage with all of the screening that he is proposing. Mr. Sheena then explained that the garage would have two entrances and exits, one that will flow down towards the west and will exit Fournace, and one towards the east and also exits on the other side of Fournace, closer to the freeway. He pointed out that there will be no entrance or exit from Anderson Street, and that the only thing that it would ever be used for is emergency personnel, if necessary. Mr. Sheena explained that there will be a fire lane located behind the parking garage because he believes that it is a requirement from the Fire Marshall. He then pointed out where there is already existing landscaping on the property and where he plans to add more. Mr. Sheena informed the Commission that the parking garage is estimated to be about 40 feet away from the property line, which allows enough room for the 25-foot fire lane that's required with the other 15 feet being landscape buffer. He mentioned that the lighting on the parking garage is also regulated by City Code, and that he plans on using specific LED lights that shine straight down and don't illuminate upward to the neighbors.

B. Staff Findings

Ms. Parcus informed the Commission that the public hearing is on a request filed by SLS Properties LLC as applicant for a specific use permit as required by the City of Bellaire Code of Ordinances, Chapter 24 Planning and Zoning, Section 24605 application for specific unit to allow for the construction of a parking garage adjacent to the existing office buildings previously occupied by Chevron USA Inc, as provided for in Section 24-544 C) of the City of Bellaire Zoning Code. She stated that the property is located at 4800 Fournace and is within the Technical Park Zoning District, also known as the North Bellaire Special Development Area in the City's comprehensive plan. Ms. Parcus explained that the application was submitted on August 10th, 2018, and the Notice of the Public Hearing was published in the Southwest News on August 28th, with mailouts sent to 215 properties within 500 feet of the property on August 31st. Notification signs were posted on the property on August 28th. She pointed out that she had already reviewed the site details as well as the adjacent zoning, so she would not go over all of that again. Ms. Parcus stated that per Section 24-544 C) 4 of the City's Code of Ordinances, parking structures and parking lots are permitted as a specific use within the City's Technical Research Park District. She mentioned that the applicant is proposing a 4-story parking garage that will accommodate 2,000 parking spaces, and that a TIA was prepared for the property and was included in the Commission's packet. It has been sent to the city's Traffic Engineer for review and his comments will be included in the materials for consideration of the item. She then discussed landscaping, screening, and buffering, and stated that there is some already existing landscaping on the property and that the City's Development Review Committee has discussed some options for increasing it even more than has been proposed by the applicant. Ms. Parcus explained that staff will go into more detail about this and will recommend conditions during the consideration of the item at the next meeting.

She stated that no action is required during tonight's meeting, as the item is scheduled for consideration on October 11th.

C. Public Comments

i. 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

James Balogh: Mr. Balogh reiterated that he lives at 5019 Mayfair. He added that he is very familiar with the property's excessive amount of "overpowering," because he has five utility poles near his house all of the property's power goes through those poles. Mr. Balogh stated that he now has surge protectors on the whole house. He also mentioned that there are six monitoring wells located a short distance from his house. He explained that he is concerned that if they do start putting more buildings in on the property it will disturb any contaminates that are located in the sub-cellar., I' like to know where the sub ... the cemented in basement is with the nuclear waste. I know they used to have a drilling well in '77 when I bought the property and they were testing tools. And they did stick a neutron-density tool in the hole. Now, if that's cemented in and that's what they're talking about, but that was a research center that did not just geophysical research, but they researched tools and they taught people how to work on the rigs. I'm a geologist and so, I talked to geologists and when you stick a tool, you've got to put the orange cement to it. You've got to file all your permits to the Department of Energy, you name it, and make sure that it's sub-cellar is safe.

Ed Umbricht: Mr. Umbricht stated that he lives at 4900 Mayfair, and tried to divide his comments the best he could. He added that he has owned the house since 1984, so he's seen a lot. Mr. Umbricht mentioned that he appreciates Texaco and Chevron's efforts, and that they've had 24 hour security for as long as he can remember. He stated that he hadn't heard anything or seen anything in the documentation about security going forward, but part of the security is the patrol that is going around. He pointed out that currently when he looks out of his front yard, he can see the 10-story building, but it's pretty far away allowing him to see everything in between; however, if the parking garage is constructed there, then there's plenty of places somebody can hide. If there's no security, then nobody knows whether anybody's hiding or not. He stated that he appreciates the wall, but all it does is give him a wall to look at, and that he personally likes seeing the open space. Mr. Umbricht stated that another concern is with the chain link fence that Chevron had around the property for security; he was curious as to whether or not those fences were coming down. He added that there is so much that the buyer is not allowed to say yet, that we don't know yet, that we're only looking at half of what's there. Mr. Umbricht felt that with a 2,000 car parking garage and multi-tenant occupancy, it will be filling and emptying the parking garage almost three times, which is a little bit more than I think Chevron had.

Brian Wogenstahl Mr. Wogenstahl informed the Commission that he lives at 4910 Mayfair, and that a lot of what he was going to say has been mentioned already, so he would just like to reiterate some things. He added that to him a parking garage, for any building that fronts or abuts to a residential area, is an eyesore. Mr. Wogenstahl stated that in Greenway Plaza, all of their parking is underground and with very little surface, and that he would like to have seen that happen here too. He mentioned that as the applicant showed before, the loading dock is already underground, and that it would be a good idea to try to revisit a parking facility that is underground at this property instead of going up four stories on it. He added that his other main concern is with the entrance/exit from Anderson Street and asked that it be closed permanently. He also reiterated that the street projects that have been scheduled for Mayfair for years keep getting put off by the City, so when a request is made to permanently close that gate, the residents in that area have no confidence that it is really going to happen because their past experience is that when they ask for things or propose things, they never happen.

Lynn McBee: Ms. McBee stated that she would like to reiterate her comments on the prior public hearing of insufficient information. She questioned what the applicant's rush is when he doesn't close on the property until sometime later in the month. Ms. McBee mentioned that omissions from information to a public hearing do not cultivate support. She questioned how the parking garage or the office buildings may be impacted by the Loop 610 improvements that are being constructed now down the southbound and the northbound lanes down to Bellaire Boulevard. She added that there are sidewalks being designed and the lanes are changing and that she doesn't know if that has any impact on this, but it seems to her that it ought to be part of the Commission's consideration for new construction, as well as reuse of buildings. Ms. McBee mentioned that there was a reference made about a sidewalk down Fournace, and she stated that she remembers going to the opening of it. She stated that it was made 10 feet wide at Chevron's cost at the time, on the basis of school safety. She informed the Commission that at that time she was then head of a bicycle safety committee for the City and the 10 foot sidewalk was intended to be a model for the rest of the city 20 years before we talked pathways. She mentioned that it is still there and she thinks that it is in good shape. She stated that the City will need to do some research to determine whether it was ever dedicated to the City. She respectfully requested that the Commission not close the public hearing and allow it to be continued just on the likelihood that additional information be supplied. She added that it would be helpful, since the City doesn't have an open and shut policy that requires the staff to have to submit everything at the public hearing. Her final comment was with regard to Joe Gaither Park, which was an agreement between the City and Chevron. Ms. McBee mentioned that she doesn't know if the written agreement still survives, but that the Development Services Department should find out what would be required to preserve the park.

D. Response of Applicant

Danny Sheena, SLS Properties-Mr. Sheena mentioned the concern with the contamination of the site and explained that there is zero impact on what he is currently requesting. He stated that it affects the 4.75 acres on the freeway side, and it affects the 12.3 acres over there on the right side. He reiterated that there is nothing that will be filed on September 26 that affects this. He stated that there is nothing hidden, and that they will see the documents. Mr. Sheena assured the Commission that there is nothing else for this specific use that they don't know right now to render a decision. He then went on to talk about the security. He stated that he has lived in Bellaire for 20 years and that purse-snatching, robberies, etc. happen all over the city. Mr. Sheena added that he can't assure anybody that it will be better or worse from what's going on currently, because he can't control outsiders or insiders who may come in for whatever reason, but added that Bellaire has one of the best police forces in the country with a very fast response time. He then mentioned that the gate on Anderson could possibly be needed in the future if another natural disaster were to take place. He reiterated that he does not plan on using it for the property and that it would strictly be a matter of necessity in extenuating circumstances. Mr. Sheena then discussed the sidewalks surrounding the site, and stated that he doesn't own the sidewalks, the City does, but if the city wants him to fix the sidewalks, make them ten feet, etc. he will have no problem with that. He then addressed the comment about underground parking and stated that it is not a good idea to put a parking garage underground. He added that it is only something that is done when you are restricted in space. He explained that when you're doing things underground, you have seepage of groundwater. Mr. Sheena then addressed the environmental concerns from Mr. Balogh. He explained that consultants have reviewed it and have determined that the contamination is coming from offsite. Mr. Sheena also informed the Commission that TCEQ has met with the City, or had a conference call, and in writing, put that it is coming in from offsite. He mentioned that the question now is what to do with it. He stated that they believe that it is dormant, and that it is underground about 40 or 50 feet, which will not have any affect on redevelopment. Mr. Sheena explained that specifically, TCEQ stated in a letter to the City of Bellaire that they believe that the issue of environmental will not have any impact on redevelopment of the property.

E. Questions from the Commission

Commissioner Saikin asked for clarification that the parking garage needs a specific use permit in this instance because it is located within the Technical Research Park District, as compared to retail, where it does not require a specific use permit.

Ms. Parcus confirmed this.

Commissioner Saikin mentioned the idea of underground parking, as there is an underground ramp. He asked if underground parking would be feasible at all for this property.

Mr. Sheena stated that it would not. He explained that it is much more expensive to go underground, and that it would not be favorable to do that on this property if there are underground water issues from offsite. He explained that the existing contamination that's underground will remain underground and would be sealed, but sometimes things happen, a seal breaks, etc.

Commissioner Saikin asked if the parking garage is a condition of his decision to purchase the property, and if he has to build the garage in order to operate a multi-tenant office building there.

Mr. Sheena stated that he must have a parking garage to operate the facility. He added that all modern parking garages have covered parking in close proximity to the building. Mr. Sheena stated that without a parking garage, this would not be a Class B+ building, and it would not be similar to other office buildings in Bellaire that have contiguous parking garages adjacent to them.

Commissioner Saikin asked Mr. Sheena if he was opposed to any plans to beautify the parking garage with greenery and other things.

Mr. Sheena stated that he already has plans to do that, especially on the Mayfair side. He stated that he personally has no objections to having greenery or a green wall climbing up the garage, however the issue with that is that you normally end up with splotches in and out. He added that some people just put taller trees adjacent to the garage, but either way, he’s not opposed to having greenery as a buffer between the parking garage and the property line.

Commissioner Saikin asked Mr. Sheena if he could share what his budget is for this garage.

Mr. Sheena explained that precast parking garages generally begin at about $7,500 per parking space.

Commissioner Saikin asked where precast falls within the quality of parking garages.

Mr. Sheena stated that precast parking garages are virtually the number one preference of any architect in the country.

Commissioner Saikin asked if they are more cost effective, nicer aesthetically, what makes them the preference.

Mr. Sheena informed the Commission that there are fewer disturbances for the neighbors, and it's quick to construct. He reiterated that it is constructed offsite, and takes about 6 months from start to finish.

Commissioner Saikin asked Mr. Sheena if he has experience constructing parking garages at his other properties.

Mr. Sheena explained that he has done it for a fifty-one story building in Detroit that was physically built, and that he actually supervised construction of the building as a structural engineer. He stated that he is still a licensed professional engineer in the state of Texas.

Commissioner Nelson asked Mr. Sheena if he is planning to provide 24 hour security for the property.

Mr. Sheena stated that he plans on keeping the security that's already there, as well as adding approximately 200 security cameras onsite.

Commissioner Nelson asked for clarification that he plans to add security cameras and also keep the physical security guards.

Mr. Sheena confirmed this.

Commissioner Nelson asked if the first surface of the parking garage is going to be at surface level.

Mr. Sheena confirmed this.

Commissioner Nelson mentioned that is a lot of concrete and asked what that would do for the drainage.

Mr. Sheena explained that it is already concrete there now, in the same location that the parking garage would go. He explained that he will be taking the existing concrete out and drilling piers. He will then replace the old cement with new cement that comports with the new structure.

Commissioner Nelson asked if he could elevate that first surface of the garage in an effort to make the drainage better than what it is right now.

Mr. Sheena stated that they have not looked into adding space underneath the garage.

Commissioner Klug asked Mr. Sheena if he has had some interface with TCEQ.

Mr. Sheena explained that his consultant has.

Commissioner Klug asked if he could elaborate a little bit more on what's been going on there.

Mr. Sheena stated that they have received a phase one environmental report that is about 1,200 pages. He added that they have evaluated everything that's going on with the site, and what the history of the site is from day one. Mr. Sheena stated that TCEQ has provided information as to what they believe is in the site, and Chevron has been in contact with the TCEQ for many years as to what to do with the problem. He explained that the big problem is generated from the Walmart site. He added that there are a lot of monitoring wells that track what is going on to ensure that it doesn't become worse. Mr. Sheena stated that generally if it doesn't become worse it becomes better, and overtime it dissipates.

Commissioner Klug asked what the cause of the offsite contamination was. He questioned what was where Walmart is now.

Mr. Sheena stated that there were environmental issues of prior owners that had chemicals in warehouses that they just dumped underground.

Commissioner Klug asked if Chevron has done some surface remediation.

Mr. Sheena stated that they have cleaned the surface and that TCEQ has confirmed that the surface is clean. He added that the only thing outstanding is the offsite contamination affecting the property in the ground water that is somewhere between 40-60 feet down.

Commissioner Klug asked Mr. Sheena if TCEQ is going to put any requirement on him to do something before you can finish this project.

Mr. Sheena explained that when he constructs the garage, there are TCEQ requirement for construction, just like there are city codes. He stated that The TCEQ has their own rules and regulations as to what to do whenever you're excavating soil, for example, to drill a pier, etc. Mr. Sheena added that he has consultants that will make sure that all of the TCEQ regulations are followed.

Commissioner Klug asked if anyone inspects the work to ensure compliance.

Mr. Sheena stated that the state inspects it; there are reports that must be sent to the state as to what is being done. He added that he doesn't think that an inspector actually comes out to the property.

Commissioner Baker mentioned the road that runs in between the property and the residential homes and asked Mr. Sheena if he is leaving that road in or removing it.

Mr. Sheena explained that the existing concrete that is there will be taken out to construct the parking garage, and once the garage is built, the 25 foot road will be put back in. He added that the road will move, and that there will be 15 feet of green space between the fire lane that will be 25 feet.

Commissioner Baker mentioned that it looks as though the only trees that are present are on your neighbors' properties.

Mr. Sheena stated that he could be right, and in that instance he will install more trees on his side of the property.

Commissioner Baker asked if the applicant would be tied to the site plan with the granting of the

SUP.

Ms. Parcus explained that if the Commission would like to it could put that as a condition of the SUP.

Commissioner Baker mentioned that the parking garage is proposed to be 45 feet tall, which when compared to most residential homes that are at 35 feet, it is pretty comparable. He asked if there would be any way to lower the first floor of parking by three feet so that visitors would go down to park, essentially having the effect of lowering the overall structure. He also mentioned that extending the parking garage out to the right a little further would allow for him to reduce the height of the parking garage.

Mr. Sheena explained that generally, aesthetically, for an architect, they say to match the garage to the building. He added that they have not advised us to move the garage.

Commissioner Baker stated that he is by no means trying to redesign Mr. Sheena's project; he is just trying to address the concerns voiced by residents and stated that it would be easier to approve a structure that was wider and shorter as opposed to how it is now.

Commissioner Taylor mentioned that the lighting in the parking garage will be set so it's not shining into the residential area, but added that the design of the parking garage also creates a situation where the car lights would potentially shine over into the residential properties.

Mr. Sheena explained that there will be a three and a half foot tall guard rail that will be above the headlights and then the ramps to go up and down are east and west, so they will not shine on the neighbors.

Commissioner Taylor asked staff to include in discussions with the Development Review Committee a conversation about whether or not the gate at Anderson Street is necessary.

Ms. Parcus informed the Commission that in preliminary discussions with the Fire Marshal about the site plan, he was not necessarily concerned about having a fire lane in the back. He added that if they did need the fire lane, the gate would stay closed but would have a knox box on it. If, for any reason, emergency vehicles needed to get back there, they would put in a code to access the site. She stated that the commission can actually put a condition on the SUP stating that that gate stays closed except for emergency purposes.

Chairman Gordon asked if it was an oversight not to include any discussion of past environmental issues or concerns or requirements on the site. He mentioned that the application itself basically says there will be no impact of the project and has no discussion of the past history of the site.

Mr. Sheena explained that there will be no environmental impacts on the parking garage due to the fact that it will be going up, not down into the groundwater. He added that the only thing that is being dug are piers to support the parking garage and there are no issues with the installation of the piers. He added that there is a memo from TCEQ to the City of Bellaire explaining exactly what the situation is, and that there is no issue with redevelopment of the property.

Ms. Parcus informed the Commission that the document that Mr. Sheena spoke about will be included in the Commission's next packet for consideration.

Chairman Gordon agreed that he would like that information included for transparency reasons. He added that no one here is trying to pretend like there's not an environmental issue, whether it's due to the Chevron site or otherwise, and he felt that it is important that the Commission and the public have access to that information.

Chairman Gordon asked City staff if the site plan that has been put forward complies with current City code and criteria, or is that still to be determined in terms of setbacks, etc.

Ms. Parcus reiterated that staff is looking into how the applicant can increase the buffering/landscaping of the site, but as far as everything else goes, yes it is in compliance.

Chairman Gordon asked if it would be possible to have that kind of information included in the packet for a public hearing, in order to determine that all aspects comply and what, if anything, needs to be modified to ensure that nothing that violates city criteria or zoning code regarding offsets or anything like that.

Ms. Parcus stated that it would be possible for staff to include that information in the packet for the public hearing.

F. Invitation for Written Comments, if applicable

Chairman Gordon reiterated that written comments on the application will be accepted until 5:00 pm on Wednesday, October 3rd.

G. Closure of the Public Hearing

Motion: a motion was made by Commissioner Klug and seconded by Commissioner Saikin to close the public hearing.

Vote: the motion carried on a vote of 6-0.

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

A. Docket # SU-2018-04-Consideration of an application filed by Daniel Chang, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for the operation of a drive-through hand car wash and detail facility at 5235 Bellaire Boulevard, as provided for in Section 24-536 B. (2) d)2) of the City of Bellaire Zoning Code. The property is located within the Corridor Mixed-Use (CMU) Zoning District.

Ms. Parcus stated that the public hearing on the item was held on July 12, 2018, and that during the public hearing there were some concerns raised by both the Commission and the public regarding traffic, traffic circulation, car queuing, and noise pollution. She stated that the Commission also required that a TIA be prepared for the property, which had been included in the packet. Ms. Parcus added that City staff had met with the applicant in order to address each of the concerns and have provided additional information for each. She explained that based on table 24-514a.A of the City of Bellaire's code of ordinances, the car wash is required to have one parking spot per bay. Although the applicant is only proposing two bays, each bay will have two lanes, therefore leading to a total of four.

Chairman Gordon asked for clarification on what defined a bay.

Ms. Parcus explained that this issue, along with the number of employees that the car wash would have on hand during its largest shift, had been taken into consideration, and that staff is recommending that a condition be put on the property that three additional parking spaces must be striped. She added that currently there are 5 parking spaces existing, and this would bring the total number of parking up to 8.

Chairman Gordon asked for clarification that there is not a requirement of one parking space per employee.

Ms. Parcus explained that for car washes the requirement is simply one parking space per bay.

Ms. Parcus then stated that concerns were also voiced by residents regarding on-street parking of the Jiu Jitsu business located next door, and that the applicant advised that he would be open to entering a parking agreement with the owner of the Jiu Jitsu business to allow them to use the site for additional parking after hours, if necessary. She added that regarding traffic circulation, there was some concern from residents that the customers from the car wash would utilize the alley as an ingress or egress from the property. She stated that in order to address that concern, the applicant is offering to install a retractable gate running parallel to the alley at the back of the property to prevent the traffic from entering or exiting from that location. Ms. Parcus informed the Commission that the traffic circulation plan was provided by the applicant and shows that both the ingress and egress will be off of this street. She explained that based on Table 24-514a.C of the City's Code of Ordinances states that this type of use must be able to stack or queue three cars per drive-through lane or service window, including the position at the window, meaning that a total of 12 cars must be able to queue on the site. Ms. Parcus stated that staff went to the site to take measurements and found that a total of 16 cars are able to queue on site. She then moved on to the subject of noise pollution and stated that Section 24-511 A of the City's Code of Ordinances states that a commercial use is allowed to create 77 decibels of sound. Ms. Parcus stated that the Development Services Department visited the site at 5235 Bellaire Boulevard as well as that of an already existing car wash located at Sage and San Felipe to conduct a sound meter test, and it was found that the noise created by the car wash was less than that of the traffic traveling on the surrounding streets. She explained that when measured at the boundary between the residential and commercial properties neither site registered higher than a 74 on the sound meter. The applicant also has expressed his willingness to install a wall if necessary on the property to help buffer the noise from the adjacent residential properties. Ms. Parcus then stated that the Development Review Commission held an additional meeting in order to further discuss the issues and concerns that arose during that public hearing, and that she had the following comments from City departments:

Fire Department:

The fire department advised that a knox box would need to be installed on the retractable gate, that will be located on the south side of the property in order for emergency services to gain access to the site if necessary. If another type of buffering is approved, such as the wall that I mentioned, the fire department has no objections as there are other options for accessing the site in an emergency situation.

Police Department:

The police department responded to the concerns from residents regarding the site of development bringing an increase of criminal activity. They stated that there is no evidence to support the idea that a car wash would increase the amount of crime in the surrounding neighborhood. The Chief of Police also mentioned that the proposed gate would create an additional buffer between the residential properties and the car wash.

Public Works:

The Public Works department didn't anticipate any issues with the on-site circulation plan that was provided by the applicant. However, it was recommended that the ingress, egress off of that street by right-in, right-out only and that signage be installed stating such preventing customers from turning left off of or onto Bissonnet from the property. Due to the fact that the ingress and egress of the property are both on Bissonnet Street, City staff would also require the applicant to provide a safe right turning movement during the review process.

She then stated that Section 24-615 of the Code lists five criteria that must be present in order for an SUP to be granted and reviewed each of those. Ms. Parcus informed the Commission that based on the information given, the Development Services Department recommends approval of the applicant's request to operate a drive-through hand car wash and detailing facility at 5235 Bellaire Boulevard with the following conditions:

1. That the retractable gate proposed to be installed parallel to the alley on the south side of the property be replaced by an eight-foot masonry wall in order to both meet screening and buffering requirements as well as to address concerns regarding noise pollution.

2. That landscaping be installed along the Bissonnet frontage in accordance with Section 24-513 of the City of Bellaire code of ordinances.The applicant will be required to work with the Development Services Staff to ensure that the installation of landscaping will not cause any visibility issues.

3. That the applicant install “right-in, right-out” signage and verify that a safe right turning movement is possible into the property off of Bissonnet Street.

Ms. Parcus stated that in addition to those three conditions, staff did think of two others that the Commission may want to include, the first being with the hours of operation, and the second with regard to the striping of the additional three parking spaces.
A motion was then made by Commissioner Klug and seconded by Commissioner Taylor to approve the SUP.
Commissioner Taylor mentioned that residential protection is really paramount in the City and that is reflected within the City’s Code of Ordinances and Comprehensive Plan. He stated that he feels pretty comfortable with approving the proposal with the conditions put into place that will accomplish the appropriate amount of screening. He added that he felt very strongly about the wall versus the gate, and he thought that the staff recommendation supports that. Commissioner Taylor also mentioned that he is in support of the landscaping requirements and the right-in, right-out signage. He asked if a higher fence could be sought by the residents.
Ms. Parcus stated that they would have to go before the Board of Adjustment, but yes.
Commissioner Taylor stated that he thought in the last discussion with the applicant that the hours of operation were going to be 10am to 6pm, seven days a week.
Daniel Chang, Applicant-Mr. Chang stated that it would actually be 9am to 6pm.

Commissioner Taylor felt that a condition on the hours is appropriate. He then asked if the car wash that staff visited was comparable to the property at 5235 Bellaire with regard to the proximity of it to residential property. He asked for specifics as to whether or not they had buffering for their vacuums and/or buffering for their compressors, and if there was there music playing over a loud speaker.

Ms. Parcus stated that no music was on at the time, and that she didn't believe that there was any sort of buffering mechanism for the vacuums or compressors. She added that they were in a similar situation, as residential was right behind them. Ms. Parcus stated that at that location, the front of the residential was actually looking at the car wash, so in that instance, it was actually a little worse than the property in Bellaire. She added that the one difference was probably with the bays at the Houston location. She stated that they were more enclosed, so that could've helped with the sound as far as the vacuums, but even standing on the residential side, the vacuums could not be heard over the ambient noise.

Commissioner Taylor asked the applicant if he was planning to buffer the equipment in any way.

Mr. Chang stated that he wasn't intending to do that, but if need be, he would do it. He added that some sort of housing could be put over the back to dampen the noise.

Commissioner Taylor felt that this is something that the Commission should consider adding as a condition.

Commissioner Taylor asked for clarification from the City's attorney that Section 24-536 does allow for a car wash only facility.

Attorney Petrov confirmed that it is the legal position of the City that it does allow for a car wash facility under "automobile services stations."

Commissioner Baker felt that the wall that was recommended by staff should run the entire length of the southern property border. He asked the applicant if that is what he is prepared to do.

Mr. Chang said that it was not his intention to do so, that he did not want it to be that long. He also mentioned that with a retractable gate he would have the option in the future to use that as an ingress or egress point if it were needed.

Commissioner Taylor explained that that's exactly what the Commission is trying to avoid happening.

Commissioner Baker then asked about people parking in the alley and who would control that.

Ms. Parcus stated that as she understands it, there is currently no one utilizing the alley for parking, and that is only taking place on Ferris Street. She added that if the alley is a public alley then the City cannot keep individuals from parking there.

Commissioner Baker mentioned that he doesn't feel as though there is enough parking for employees, meaning that they are going to park on the street or wherever they can find it, but stated that he is in support of the application with the addition of the wall and the other recommendations from staff.

Commissioner Klug stated that he would be in support of the motion with the recommendations made by staff, with the wall going the entire length of the property, and with some sort of shroud to dampen the noise from the vacuums.

Chairman Gordon asked if the Commission could take a different approach to the idea of shrouding and simply reduce the allowable decibels of noise that can come from the property, say for example from 77 down to 65, just so that there is an obligation of the applicant to maintain that standard.

Ms. Parcus confirmed that would be possible, and that if the City ever got a noise complaint for the property the number that the Commission comes up with would be used to determine whether or not they are in compliance with the conditions of their SUP.

Commissioner Nelson stated that she didn't have any specific questions or comments for the applicant. She mentioned that she is sympathetic to the residential properties that are located behind commercial like this, but she felt that the concerns were being addressed by the conditions that are being added. Commissioner Nelson stated that there is obviously an issue with parking at the Jiu Jitsu business and that maybe the City needs to look into that.

Ms. Parcus explained that the issue is that this is a different property than the rest of the shopping center. She added that at this point, due to the fact that the Jiu Jitsu business was already approved, there is not much that the City can do about it at this point, especially with this application because that's not part of his property.

Commissoner Saikin asked if permitted parking could be put into place for the surrounding streets.

Ms. Parcus explained that in order to get permitted parking the residents would have to sign a petition that would go before the City Council for approval.

Commissioner Saikin asked if those residents have done that.

Ms. Parcus confirmed that they have not done that.

Commissioner Saikin asked whose job it is to approve signage.

Ms. Parcus stated that the Development Services Department does, specifically the City's Code Compliance Officer.

Commissioner Saikin then questioned whether a banner sign would be allowed for this property.

Ms. Sampson stated that a banner sign is considered a temporary sign and is only allowed to be up for a certain amount of time.

Commissioner Saikin mentioned that there has been a banner sign up on the property at the corner of Bissonnet and South Rice since they have been open, and asked that the City look into that.

Commissioner Saikin questioned whether the signage issue should be included as a condition to the request, and stated that he is in agreement with all the other conditions that have been mentioned. He mentioned that he would like to also add a condition that no music can be played on site. Commissioner Saikin then asked Mr. Chang if he has ever put any sort of noise dampening device on the compressors and vacuums at any of his other sites.

Mr. Chang stated that he has not. He added that they really don't make that much noise, but that he's sure that there is something that he can use to encapsulate them with.

Commissioner Nelson again mentioned decreasing the allowable decibel level.

Chairman Gordon stated that the challenge then becomes determining what that number is.

Commissioner Klug questioned whether the noise issue would be addressed by the addition of the masonry wall.

Ms. Parcus agreed that this was the intention of staff in recommending that the retractable gate be replaced with a masonry wall.

Chairman Gordon asked how many vacuums the applicant is planning on having on site.

Mr. Chang informed the Commission that there would be two vacuums.

After further discussion, the Commission determined that the recommended masonry wall would take care of both the buffering and noise requirements for the site.

Chairman Gordon asked what the rear setback of the property is. He stated that it looks like 10 feet on the survey.

Ms. Parcus stated that 10 feet is correct.

Chairman Gordon asked if the wall would be placed at the property line.

Ms. Parcus confirmed that it would have to go on the property line, or at least somewhere within the property. It would not be allowed to be installed in the ROW. She added that staff also looked at requiring additional landscaping on the other side of the wall, but didn't feel that there was adequate room available.

Commissioner Saikin asked for confirmation from staff that the wall is the best buffer.

Ms. Parcus confirmed this, and explained that it takes care of both the noise issue and the buffering requirements at the same time.

A motion was then made by Commissioner Klug and seconded by Commissioner Taylor to amend the previous motion to include the following conditions:

1. That the retractable gate, proposed to be installed parallel to the alley on the south side of the property, be replaced by an 8 foot masonry wall running the entire length of the southern perimeter, in order to meet screening/buffering requirements, as well as to address concerns regarding noise pollution.

2. That landscaping is installed along the Bissonnet frontage, in accordance with Section 24-513 of the City of Bellaire Code of Ordinances. The applicant will be required to work with the Development Services Staff to ensure that the installation of landscaping will not cause any visibility issues.

3. That the applicant installs "Right-in, Right-out" signage, and verifies that a safe-right turning movement is possible into the property off of Bissonnet Street.

4. That the hours of operation be limited to 9:00am-6:00pm, 7 days a week.

5. That the property maintains a total of eight (8) striped parking spaces.

6. That the use of a PA system or speakers on the property be prohibited.

Vote: the motion passed with a vote of 6-0.
Vote on the first motion to approve the SUP: 6-0.

RESULT:	**APPROVED WITH CONDITIONS [UNANIMOUS]**
MOVER:	John T. Klug, Commissioner
SECONDER:	Weldon Taylor, Commissioner
AYES:	Baker, Saikin, Gordon, Taylor, Klug, Nelson
ABSENT:	Axelrad

B. Approval of the Commission's Report and Recommendation to City Council regarding a specific use permit at 5235 Bellaire Boulevard.

Ms. Parcus assured the Commission that the conversation during consideration of the item, along with all of the conditions will be added to the Report.

RESULT:	**ADOPTED AS AMENDED [UNANIMOUS]**
MOVER:	John T. Klug, Commissioner
SECONDER:	Mike Baker, Commissioner
AYES:	Baker, Saikin, Gordon, Taylor, Klug, Nelson
ABSENT:	Axelrad

VII. COMMITTEE REPORTS

There were no committee reports.

VIII. CORRESPONDENCE

There was no correspondence.

IX. REQUESTS FOR NEW BUSINESS, ANNOUNCEMENTS AND COMMENTS

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

Ms. Parcus informed the Commission that the Community Pathways Plan did go before City Council, and that they decided that this is not the time to discuss the plan. She added that the City Council did not take a vote on the item. Ms. Parcus mentioned that training for Chairmen and Vice Chairmen of all Boards and Commissions will be taking place on September 27th, at 6:00 PM. Ms. Parcus added that it is her understanding that invitations to the training would be going out soon, which will give information on how to RSVP to the event. She also reminded the Commission that moving forward, City staff will be communicating with members via their City email addresses only. She urged everyone to make sure that they are still able to log in.

B. 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 Taylor mentioned that when the Commission approved the SUP for Kolter Elementary School there was quite a bit of concern about traffic issues in the area. He asked if there has been or will be follow up by City staff regarding those concerns.

Ms. Parcus explained that actually staff has already followed up on that. She stated that there were some issues that were reported on the first day of school, but HISD and Kolter Elementary have addressed them. She assured the Commission that it is something that is being monitored on a continuous basis.

Commissioner Baker stated that he would like for the Commission to look into amending the R-1 Zoning District to change the way that open air porches are regulated. He added that he would like consideration to be taken to allow open air porches to go beyond the building line by a certain amount.

The Commission decided that holding a workshop to discuss any potential code changes that the Commission should look into would be beneficial. It was decided that the workshop would be held at 5:00PM prior to the next regular meeting on October 11th.

X. ADJOURNMENT

Motion:a motion was made by Commissioner Saikin and seconded by Commissioner Baker to adjourn the meeting.

Vote: the motion carried on a vote of 6-0.

The meeting was adjourned at 9:35 PM.

Planning and Zoning Commission
Council Chamber, First Floor of City Hall
Bellaire, TX 77401-4411

Meeting: 10/11/18 05:00 PM
Department: Development Services
Category: Specific Use Permit
Department Head: ChaVonne Sampson
DOC ID: 2705

SCHEDULED
ACTION ITEM (ID # 2705)

Item Title:

Docket # SU-2018-05-Consideration of an application filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for multi-tenant office use in the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 3) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

Background/Summary:

On September 13, 2018, the Planning and Zoning Commission held a public hearing on a request filed by Danny Sheena of SLS Properties to allow for multi-tenant office use in the existing office buildings located at 4800 Fournace Place. "Office buildings" is permitted as a specific use within the Technical Research Park District.

Development Review Committee:

The City's Development Review Committee held two meetings to discuss the application, one on September 4th and the second on September 25th. During the September 4th meeting, the main concern was whether or not the applicant plans to continue providing after hour security to the site, and whether a traffic signal will be installed or a police officer will be utilized to direct traffic during peak times of the day. The fire lane, proposed to be located directly behind the parking garage, was also discussed. The Fire Marshall advised staff that as long as the emergency vehicles were able to access the site via the street located in between the buildings and the parking garage, then the fire lane was not necessary. Staff has utilized this revision to request that additional landscaping be installed behind the parking garage to increase the buffering between the garage and the residential properties.

TIA:

A TIA was completed for the property and was included in the Commission's public hearing agenda packet. Comments from Jones & Carter, the City's Traffic Engineer were not received until after closure of the public hearing and have therefore been included in the Commission's packet for consideration of the item. The comments were provided to the applicant, who, in turn provided updated information for further review. The updated information was resubmitted to the City's Engineer and those comments are included in the packet as well.

Parking:

According to the applicant, there is approximately 500,000 square feet of lease-able office space located within the existing buildings, which based on Section 24-514a of the City of Bellaire's Code of Ordinances, would require that at least 1,500 parking spaces be available on site. Currently there are only 1,400 parking spaces located on the property; however the application requesting permission to construct a parking garage on the site will alleviate this issue. If the Commission were to grant the specific use permit for multi-tenant office use but deny the request for a parking garage, the applicant must either go before the Board of Adjustment to seek a special exception or only lease out a certain percentage of the space.

The *Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-615, Standards Applicable to all Planned Development Amendments and Specific Use Permits,* details the five criteria that must be met for the issuance of this request:

1. **The proposed planned development amendment or specific use permit is consistent with the purposes, goals, objectives, and standards of the comprehensive plan of the City of Bellaire.**

   The Comprehensive Plan's Future Land Use and Character Map designates this site as the North Bellaire Special Development Area, and describes it as appropriate for "areas already developed as, or envisioned for office and research technology-related uses in a campus-like environment." Landscaping and buffering requirements, as outlined in Goal 2.1 Considerations 1, 3, and 4 are being met by the applicant with the installation of fencing and landscaping on the site.

2. **The design of the proposed development, considered as part of the specific use permit, minimizes adverse effects, including visual impacts of the proposed use on adjacent properties.**

   Adverse effects and visual impacts of the proposed use on the adjacent residential properties will be minimized through the requirement of landscaping, screening and buffering. The proposed traffic circulation plan utilizes the two existing driveways on Fournace Place, and is also proposing an additional ingress/egress point off of the Loop 610 feeder road. There will be no access to the site from Anderson Street.

3. **The proposed development will not have an adverse effect on the value of the adjacent property**.

   While generally the location of commercial businesses near residential properties may have an adverse impact on the value of the adjacent property, considering the fact that the subject property is zoned as a Technical Research Park and that the office buildings that previously housed Chevron U.S.A are already in existence, the proposed continuation of this use would not increase the negative impacts that already exist.

4. **The proposed development will not unduly burden essential public facilities**

and services, including streets, police and fire protection, sanitary sewers, storm sewers, solid waste disposal and schools.

The proposal is simply requesting permission to continue utilizing the already existing office buildings as multi-tenant office space; therefore no additional public services would be needed. The request has been reviewed by the Public Works Department and the Police and Fire Departments, and it has been determined that the development will not unduly burden essential public facilities and services.

5. **The applicant for the development has adequate financial and technical capacity to complete the development as proposed and has met all requirements of this Code, including such conditions as has been imposed as a part of this specific use permit.**

   The applicant has adequate financial and technical capacity to complete the development as proposed, and has met all requirements of this code.

Recommendation:

Finding that the application meets the standards set forth in Section 24-615 for the approval of a Specific Use Permit, the Development Services Department recommends approval of the applicant's request for a specific use permit to allow for multi-tenant office use in the existing buildings previously occupied by Chevron U.S.A, Inc, located at 4800 Fournace Place.

ATTACHMENTS:

- SLS Application Specific Use Multi-Tenant Office (PDF)
- Chevron SLS Deed (PDF)
- Written Comments (PDF)

APPLICATION FOR SPECIFIC USE PERMIT

(4800 Fournace Place, Bellaire TX 77401)

August 10, 2018

SLS Houston Properties, LLC ("SLS") provides this Application for Specific Use Permit to specifically authorize **MULTI-TENANT OFFICE USE** in the existing office buildings previously occupied by Chevron U.S.A., Inc. and located at 4800 Fournace Place, Bellaire TX 77401 ("Property").

The following is the relevant section of the City Ordinance dealing with Special Use Permits.

Section 24-605. – Application for Specific Use Permit.

Any person desiring to petition for a specific use permit to this chapter shall be required to file an application in writing with the Planning and Zoning Official, accompanied by a nonrefundable application fee, in an amount established by the City Council or by City Manager, to defray the actual cost of processing the application. The application shall include the following information:

(1) The name and address of the applicant; and in the event that the applicant is a partnership, the full name and address of the general partner, and in the vent that the applicant is a corporation, the full names and addresses of all officers, a statement as to the state of incorporation, the name and address of the registered agent and the address of the registered office of the corporation;

Applicant Name: SLS Houston Properties, LLC
Address: 2500 West Loop South, Suite 518, Houston TX 77027
Company Ownership: Danny Sheena, Managing Member
4612 Oleander St., Bellaire TX 77401
Dr. Ronnie Sheena, Member
117 Marrakech Ct., Bellaire TX 77401

(2) The Section or Sections of this chapter authorizing the specific use permit;

Section 24-544. – Technical Research Park District (TRPD).

A. *Purpose.* The Technical Research Park District is an area of high quality office use, including technical laboratory, computer center, engineering/operations and research facility uses, which is in close proximity to interstate highway Loop 610 and is characterized by the zoning requirements set forth in this Section.

C. Specific uses.

3) Office buildings.
4) Parking structures and parking lots (private).
5) Central Plant including electrical generating facility (private).
7) Radio, television and microwave antenna or tower.
8) Technical research laboratories.
9) Computer operations.

(3) A legal description and street address of the property which is the subject of the application;

Street Address: 4800 Fournace Place, Bellaire TX 77401

Legal Description: 30.4576 Acres as follows:

Tract I:

All of lot five (5), six (6) and seven (7), block twelve (12), in Westmoreland Farms Amended First Subdivision, according to the map or plat thereof recorded under Volume 3, page 60 in the map records of Harris County, Texas.

Tract II:

Lot five (5), six (6), seven (7), eight (8) and nine(9), block one (1) and lot five (5), six (6), seven (7), eight (8) and nine(9), block two (2) of Twin Oaks, Section Once (1), a subdivision in Harris County, Texas, according to the map or plat recorded in Volume 34, Page 51 of the Map Records of Harris County, Texas.

(4) A statement of ownership accompanied by a certificate from a title insurance company certifying ownership;

Ownership of the Property is currently vested with Chevron U.S.A., Inc. (Exhibit 1). SLS Houston Properties, LLC is under contract to purchase the Property from Chevron. Attached is a written authorization from Chevron to make this Application. (Exhibit 2).

(5) *A written description of the proposed specific use as provided for in this Code;*

The proposed specific use is for multi-tenant office buildings. The buildings were previously occupied by Chevron as a single tenant, but with multiple departments occupying various portions of the office buildings. SLS seeks authorization for multi-tenant office use for those same buildings.

(6) *A written environmental assessment statement describing in general terms the impact of the development for which approval is sought and providing any specific information that the Planning and Zoning Official shall deem necessary; and*

There will be no environmental impact to the Property when used by multi-tenants rather than a single tenant.

(7) *Such other information or documentation as the Planning and Zoning Official, the Planning and Zoning Commission or the City Council may from time to time designate or which may be deemed necessary and appropriate to a full and proper consideration and disposition of the particular application.*

An Application for Specific Use Permit for a parking garage is submitted contemporaneously with this Application.

Thank you in advance for your assistance in this application. Request is respectfully made for an expedited review of this Application. Please do not hesitate to contact me if you have any questions or if you need additional information.

Very truly yours,

Danny M. Sheena

DMS/4800 Fournace/Application Specific Use Multi-Tenant/me

Attachments

First American

Commitment

Commitment For Title Insurance T-7

ISSUED BY

First American 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 FIRST AMERICAN TITLE INSURANCE COMPANY 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.

First American Title Insurance Company

Dennis J. Gilmore
President

Jeffrey S. Robinson
Secretary

EXHIBIT
tabbies
1

First American

Commitment For Title Insurance T-7

ISSUED BY

First American Title Insurance Company

SCHEDULE A

Effective Date: **May 22, 2018** at 8:00 a.m.

GF No. **NCS-816950-SA1**

Commitment No. **NCS-816950-SA1**, issued **June 01, 2018**, at 8:00 a.m.

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: $0.00
PROPOSED INSURED:

(b) TEXAS RESIDENTIAL OWNER'S POLICY OF TITLE INSURANCE
ONE-TO-FOUR FAMILY RESIDENCES (Form T-1R)
Policy Amount: $
PROPOSED INSURED:

(c) LOAN POLICY OF TITLE INSURANCE (Form T-2)
Policy Amount: $
PROPOSED INSURED:
Proposed Borrower:

(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: **Fee Simple**

3. Record title to the land on the Effective Date appears to be vested in:

Chevron U.S.A. Inc., a Pennsylvania corporation (As to Tracts I and II)

4. Legal description of land: TRACT I:

ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II:

LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

Branch :NCP,User :BRCR Comment: Station Id :BGXJ

WD

17
D

SPECIAL WARRANTY DEED

(Cash)

THE STATE OF TEXAS)

W246273
11/25/02 200006909 $17.00

COUNTY OF HARRIS)

KNOW ALL MEN BY THESE PRESENTS:

THAT THE UNDERSIGNED,

TEXACO INC., a Delaware corporation, hereinafter referred to as "Grantor", whether one or more, for in consideration of the sum of TEN DOLLARS ($10.00) cash, and other good and valuable consideration in hand paid by the Grantee herein named, the receipt and sufficiency of which is hereby fully acknowledged and confessed, has GRANTED, SOLD and CONVEYED, and by these presents does GRANT, SELL and CONVEY unto

559-56-1249

CHEVRON U.S.A. INC., a Pennsylvania corporation, herein referred to as "Grantee", whether one or more, the real property described on the attached Exhibit "A" attached hereto and made a part hereof

TOGETHER WITH, all and singular, the rights, benefits, privileges, easements, tenements, hereditaments, appurtenances and interests thereon or in anywise appertaining thereto and with all improvements located thereon (said land, rights, benefits, privileges, easements, tenements, hereditaments, appurtenances, improvements and interests being hereinafter referred to as the "Property").

For the same consideration recited above, Grantor hereby BARGAINS, SELLS and TRANSFERS, without warranty, express or implied, all interest, if any, of Grantor in (i) strips or gores, if any, between the Property and abutting or immediately adjacent properties, and (ii) any land lying in or under the bed of any street, alley, road or right-of-way, opened or proposed, abutting or immediately adjacent to the Property.

This conveyance, however, is made and accepted subject to any and all validly existing encumbrances, conditions and restrictions, relating to the hereinabove described property as now reflected by the records of the County Clerk of Harris County, Texas

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said Grantee, Grantee's heirs, executors, administrators, successors and/or assigns forever; and Grantor does hereby bind Grantor, Grantor's heirs, executors, administrators, successors and/or assigns to WARRANT AND FOREVER DEFEND all and singular the said premises unto the said Grantee Grantee's heirs, executors, administrators, successors and/or assigns, against every person whosoever claiming or to claim the same or any part thereof, by, through, or under Grantor, but not otherwise.

Current ad valorem taxes on said property having been prorated, the payment thereof is assumed by Grantee.

FILE FOR RECORD
8:00 AM
NOV 25 2002
Beverly B. Kaufman
County Clerk, Harris County, Texas

BRMFS1 338776v2

Branch :NCP,User :BRCR Comment: Station Id :BGXJ

This Special Warranty Deed is executed and delivered as of July 1, 2002 and shall be deemed effective as of July 1, 2002.

Texaco Inc., a Delaware corporation

By: Walker C Taylor
Name: Walker C. Taylor
Title: Assistant Secretary

Grantee's Address: Chevron U.S.A. Inc.
c/o ChevronTexaco Business and Real Estate Services
2613 Camino Ramon, Suite 200
San Ramon, CA 94583

559-56-1250

BRMFS1 338776v2

Branch :NCP,User :BRCR Comment: Station Id :BGXJ

STATE OF CALIFORNIA)
) ss.
COUNTY OF Contra Costa)

On October 23, 2002, before me, Cherilyn Robertson, Notary Public, personally appeared Walker C. Taylor, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument, the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

(SEAL)

CHERILYN ROBERTSON
Commission # 1268207
Notary Public - California
Contra Costa County
My Comm. Expires Jun 23, 2004

Signature Cherilyn Robertson

559-55-1253

Branch :NCP,User :BRCR Comment: Station Id :BGXJ

Exhibit A

559-56-2252

BRMFS1 338776v2

559-55-1253

Exhibit A

Property Address	Legal Description	Harris County Appraisal District Account No.
5901 S. Rice Ave.	Lot 5 and Tract 6 Block 12, Westmoreland Farms	0370530120005
4800 Fournace Pl.	Lot 7 and Tract 6A Block 12, Westmoreland Farms	0370530120007
0 Fleetwood	Lots 5 through 9 and Tract A in Block 1, Twin Oaks	0771830010005
0 Fleetwood	Lot 7 Block 2, Twin Oaks	0771830020007
0 Fleetwood	Lots 5,6,8, and 9, Block 2, Twin Oaks	0771830020005
4709 Mayfair St.	Lot 14 Block 2, Twin Oaks	0771830020014
4711 Mayfair St.	Lot 15 Block 2, Twin Oaks	0771830020015
4713 Mayfair St.	Lot 16 Block 2, Twin Oaks	0771830020016
4715 Mayfair St.	Lot 17 Block 2, Twin Oaks	0771830020017
4717 Mayfair St.	Lot 18 Block 2, Twin Oaks	0771830020018
4803 Mayfair St.	Lot 20 Block 2, Twin Oaks	0771830020020
4805 Mayfair St.	Lot 21 Block 2, Twin Oaks	0771830020021
4819 Mayfair St.	Lot 28 Block 2, Twin Oaks	0771830020028
5015 Mayfair St.	Lot 2 Block 3, Loveland Terrace	0772090030002
5013 Mayfair St.	Lot 3 Block 3, Loveland Terrace	0772090030003
5011 Mayfair St.	Lot 4 Block 3, Loveland Terrace	0772090030004
4919 Mayfair St.	Lot 10 Block 3, Loveland Terrace	0772090030010
4905 Mayfair St.	Lot 17 Block 3, Loveland Terrace	0772090030017
10201 Westpark Dr.	Res D2 Block 7 & Res Q4 Block 17 Westchase Sec. 9 Westchase Sec. 1 2nd R/P	1063540000002
3901 Briarpark Dr.	Res D Block 7 & Res Q5 Block 17 Westchase Sec. 9 Westchase Sec. 1 2nd R/P	1063540000010

ANY PROVISION HEREIN WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLOR OR RACE IS INVALID AND UNENFORCEABLE UNDER FEDERAL LAW
THE STATE OF TEXAS
COUNTY OF HARRIS
I hereby certify that this instrument was FILED in File Number Sequence on the date and at the time stamped hereon by me; and was duly RECORDED, in the Official Public Records of Real Property of Harris County, Texas on

NOV 2 5 2002

COUNTY CLERK
HARRIS COUNTY, TEXAS

Chevron

Radu Murgescu
Real Estate Representative, Real Estate & Development

August 9, 2018

Development Services
City of Bellaire
7008 S. Rice Ave
Bellaire, TX 77401

Special Use Permit

Chevron U.S.A. Inc. ("Chevron") is the current owner of the real property located in Bellaire, Harris County, Texas commonly known as 4800 Fournace, Bellaire, Texas 77401 (the "Property").

Chevron has entered into a Purchase and Sale Agreement dated June 11, 2018 with SLS Houston Properties, LLC ("SLS") to sell the Property to SLS on the terms set forth therein.

In connection with SLS's intended use of the Property upon the purchase thereof, Chevron has been advised by SLS that it desires to operate the Property for multi-tenant occupancy and to construct a multi-story garage on the Property and in order to use the Property for such purpose and construct such garage, SLS must apply for a Specific Use Permit with the City of Bellaire.

This will confirm that authority is given by Chevron to SLS to apply for a Specific Use Permit in the form attached hereto as Exhibit A.

Sincerely,
CHEVRON U.S.A. INC.

By: ______________________
Radu Murgescu
Assistant Real Property Officer
Chevron Business and Real Estate Services
A Division of Chevron U.S.A. Inc.

Chevron Business and Real Estate Services
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Road, Room V-1354B, San Ramon, CA 94583
Tel 925 842 6481
RaduMurgescu@chevron.com

EXHIBIT
tabbies
2

Attachment: SLS Application Specific Use Multi-Tenant Office (2705 : Consideration-4800 Fournace-Office Use)

HARRIS COUNTY, TEXAS
J. BLESSING SURVEY, ABSTRACT NO. 162

LEGAL DESCRIPTION

TRACT I
ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II
LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT III
A 0.4477 ACRE TRACT OF LAND LOCATED IN THE J. BLESSING SURVEY, ABSTRACT NO. 162, BEING A PORTION OF FLEETWOOD STREET AS SHOWN ON TWIN OAKS, A SUBDIVISION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 34, PAGE 51 OF THE HARRIS COUNTY MAP RECORDS, AND BEING ALL OF THAT CERTAIN CALLED "TRACT A" CONVEYED TO CHEVRON U.S.A. INC. BY DEED RECORDED IN CLERK'S FILE NO. W246273, SAID 0.4477 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN THE WEST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 610 (BASED ON A VARIABLE WIDTH PUBLIC RIGHT-OF-WAY), SAID POINT BEING THE SOUTHEAST CORNER OF LOT 5, BLOCK 1 OF SAID TWIN OAKS SUBDIVISION;

THENCE NORTH 02°23'37" WEST, ALONG THE EAST LINE OF SAID LOT 5, BLOCK 1, A DISTANCE OF 126.25 FEET TO A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN SAID WEST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 610 FOR THE NROTHEAST CORNER OF SAID LOT 5, SAID POINT BEING THE SOUTHEAST CORNER OF SAID "TRACT A" AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT OF LAND;

THENCE SOUTH 87°38'50" WEST, ALONG THE SOUTH LINE OF SAID "TRACT A", A DISTANCE OF 325.00 FEET TO A POINT LOCATED IN THE WEST LIMIT OF SAID TWIN OAKS SUBDIVISION, SAID POINT BEING THE NORTHWEST CORNER OF LOT 9, BLOCK 1 OF TWIN OAKS, AND THE SOUTHWEST CORNER OF SAID "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE NORTH 02°23'37" WEST, ALONG THE WEST LIMIT OF SAID TWIN OAKS SUBDIVISION AND SAID "TRACT A", A DISTANCE OF 60.00 FEET TO A POINT LOCATED IN THE WEST LIMIT OF TWIN OAKS SUBDIVISION, SAID POINT BEING THE SOUTHWEST CORNER OF LOT 9, BLOCK 2 OF TWIN OAKS, AND THE NORTHWEST CORNER OF "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE NORTH 87°38'50" EAST, ALONG THE NORTH LINE OF SAID "TRACT A", A DISTANCE OF 325.00 FEET TO A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN SAID WEST RIGHT-OF-WAY LINE OF HIGHWAY 610 FOR THE SOUTHEAST CORNER OF LOT 5, BLOCK 2 OF TWIN OAKS, SAID POINT BEING THE NORTHEAST CORNER OF SAID "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE SOUTH 02°23'37" EAST, ALONG SAID WEST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 610, A DISTANCE OF 60.00 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT AND CONTAINING WITHIN THESE CALLS 0.4477 ACRES, OR 19,500 SQUARE FEET OF LAND.

THE LAND SHOWN IN THIS SURVEY IS THE SAME AS THAT DESCRIBED IN FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NUMBER NCS-816950-SA1 WITH AN EFFECTIVE DATE OF SEPTEMBER 12, 2018.

LEGEND

AE	AERIAL EASEMENT
ASPH	ASPHALT
BL	BUILDING LINE
BLDG	BUILDING
BCM	BURIED CABLE MARKER
CI	CURB INLET
CO	CLEAN OUT
CONC.	CONCRETE
COR	CORNER
EBOX	ELECTRICAL BOX
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FNC	FENCE
FND	FOUND
GI	GRATE INLET
GM	GAS METER
GV	GAS VALVE
GT	GREASE TRAP
GW	GUY WIRE
HC	HANDICAP
H.C.C.F.	HARRIS COUNTY CLERK'S FILE
H.C.D.R.	HARRIS COUNTY DEED RECORDS
H.C.M.R.	HARRIS COUNTY MAP RECORDS
HH	UTILITY HAND HOLE
LNSC	LANDSCAPE
LS	LIGHT STANDARD
MH	MANHOLE
MW	MONITORING WELL
NO.	NUMBER
P	OVERHEAD LINES
PP	POWER POLE
PLM	PIPELINE MARKER
PST	POST
PVMT	PAVEMENT
SAN	SANITARY
SDWK	SIDEWALK
STM	STORM SEWER
TSB	TRAFFIC SIGNAL BOX
TSP	TRAFFIC SIGNAL POLE
TMH	TELEPHONE MANHOLE
TPED	TELEPHONE CABLE PEDESTAL
UE	UTILITY EASEMENT
UMH	UTILITY MANHOLE
WM	WATER METER
WV	WATER VALVE

////	ASPHALT LINE
//	FENCE LINE
OO OO	CHAN LINK FENCE
^	HIGH BANK LINE
P	POWER LINE

SCHEDULE 'B' ITEMS

10a ANY COVENANTS, CONDITIONS OR RESTRICTIONS RECORDED IN VOLUME 34, PAGE 51, MAP RECORDS OF HARRIS COUNTY, TEXAS (AS TO TRACT II). AS SHOWN HEREON

The Following Matters Affect Tract I:

10h TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: THE SUPERIOR OIL COMPANY AND HOUSTON NATURAL GAS CORPORATION
RECORDED: IN VOLUME 3174, PAGE 337, OF THE DEED RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: PIPELINE RIGHT OF WAY AGREEMENT
(AS SHOWN HEREON)

10i EASEMENT:
TO: HOUSTON LIGHTING & POWER COMPANY, A TEXAS CORPORATION
RECORDED: JULY 10, 1975 IN COUNTY CLERK'S FILE NO. E481533, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: ELECTRIC DISTRIBUTION LINES
(BLANKET IN NATURE OVER LOT 6, BLOCK 12, WESTMORELAND FARMS, NOT SHOWN HEREON)

10j EASEMENT:
TO: SOUTHWESTERN BELL COMPANY
RECORDED: FEBRUARY 24, 1976 IN COUNTY CLERK'S FILE NO. E685025, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: UNDERGROUND FACILITIES
(AS SHOWN HEREON)

10k EASEMENT:
TO: HOUSTON LIGHTING & POWER COMPANY, A TEXAS CORPORATION
RECORDED: DECEMBER 27, 1982 IN COUNTY CLERK'S FILE NO. H751068, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: EASEMENT FOR ELECTRIC TRANSMISSION AND DISTRIBUTION LINES
(AS SHOWN HEREON)

10l EASEMENT:
TO: THE CITY OF BELLAIRE, TEXAS, A MUNICIPAL CORPORATION
RECORDED: JUNE 25, 1999 IN COUNTY CLERK'S FILE NO. T808327, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: UTILITY EASEMENT
(AS SHOWN HEREON)

10m EASEMENT:
TO: THE CITY OF BELLAIRE, TEXAS, A MUNICIPAL CORPORATION
RECORDED: MARCH 06, 1974 IN COUNTY CLERK'S FILE NO. E097757, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: RIGHT OF WAY
(AS SHOWN HEREON)

10n EASEMENT:
TO: THE CITY OF BELLAIRE, TEXAS, A MUNICIPAL CORPORATION
RECORDED: JANUARY 11, 1983 IN COUNTY CLERK'S FILE NO. H773707, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: PUBLIC HIGHWAY EASEMENT
(AS SHOWN HEREON)

10o TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: TEXACO INC., A DELAWARE CORPORATION AND SOUTHWESTERN BELL TELEPHONE COMPANY
RECORDED: FEBRUARY 01, 2000 IN COUNTY CLERK'S FILE NO. U203300, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: EASEMENT FOR UNDERGROUND TELECOMMUNICATIONS FACILITIES
(AS SHOWN HEREON)

10p TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: TEXACO INC., A DELAWARE CORPORATION AND SOUTHWESTERN BELL TELEPHONE COMPANY
RECORDED: FEBRUARY 01, 2000 IN COUNTY CLERK'S FILE NO. U203301, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: TEMPORARY ACCESS EASEMENT FACILITIES
(AS SHOWN HEREON)

10q TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: TEXACO INC., A DELAWARE CORPORATION AND SOUTHWESTERN BELL TELEPHONE COMPANY
RECORDED: FEBRUARY 01, 2000 IN COUNTY CLERK'S FILE NO. U203301, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: TEMPORARY ACCESS EASEMENT FACILITIES
(AS SHOWN HEREON)

10r THE TERMS, PROVISIONS AND EASEMENT CONTAINED IN THE DOCUMENT ENTITLED "EASEMENT" RECORDED JULY 23, 1975 AS E492165 OF OFFICIAL RECORDS.
(AS SHOWN HEREON)

The Following Matters Affect Tract II:

10s A 30 FOOT BUILDING SETBACK LINE ALONG THE FRONT PROPERTY LINE AS SET FORTH ON THE RECORDED PLAT AND DEDICATION. AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS.
(AS SHOWN HEREON)

10t EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: UTILITY
LOCATION: 10 FOOT ALONG THE REAR PROPERTY LINE
TOGETHER WITH AN UNOBSTRUCTED AERIAL EASEMENT 5' IN WIDTH FROM A PLANE 20' ABOVE THE GROUND UPWARD LOCATED ADJACENT TO AND ADJOINING THE DESCRIBED EASEMENT. AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS. (AS TO LOTS 5, 6, 7, 8 & 9; BLOCK 1)
(AS SHOWN HEREON)

10u EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: UTILITY
LOCATION: 5 FOOT ALONG THE REAR PROPERTY LINE
TOGETHER WITH AN UNOBSTRUCTED AERIAL EASEMENT 5' IN WIDTH FROM A PLANE 20' ABOVE THE GROUND UPWARD LOCATED ADJACENT TO AND ADJOINING THE DESCRIBED. AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS. (AS TO LOTS 5, 6, 7, 8 & 9; BLOCK 2)
(AS SHOWN HEREON)

10v EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: UTILITY
LOCATION: 10 FOOT ALONG THE WESTERN PROPERTY LINE AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS.
(AS SHOWN HEREON)

10w EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: DRAINAGE EASEMENT
LOCATION: 15' ON EACH SIDE OF THE CENTER LINE OF ALL GULLIES, RAVINES AND OTHER NATURAL DRAINAGE COURSES ON THE HEREIN DESCRIBED PROPERTY.
(BLANKET IN NATURE, NO EXISTING PHYSICAL EVIDENCE FOUN, NOT SHOWN HEREON)

10x SUBJECT PROPERTY ABUTS A NON-ACCESS OR A LIMITED-ACCESS ROAD, HIGHWAY OR FREEWAY. THIS COMPANY DOES NOT INSURE THE RIGHT OF INGRESS AND EGRESS TO AND FROM SAID ROAD, HIGHWAY OR FREEWAY, AND ASSUMES NO LIABILITY IN CONNECTION THEREWITH.
(AS SHOWN HEREON)

SURVEYOR'S NOTES

1. THE SURVEYOR HAS NOT ABSTRACTED THE SUBJECT PROPERTY.

2. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT FLOOD AGENCY'S FLOOD INSURANCE RATE MAP NO. 48201C0855L, REVISED JUNE 18, 2007, THE SUBJECT TRACT IS LOCATED IN ZONE "AE", AREAS DETERMINED TO BE INSIDE THE 100-YEAR FLOODPLAIN AND ZONE "X", AREAS OUTSIDE THE 100-YEAR FLOODPLAIN.

3. BEARINGS ON THIS SURVEY ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH CENTRAL ZONE (4204).

4. THERE ARE NO VISIBLE SIGNS OF A CEMETERY ON THIS TRACT.

5. NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS WITHIN RECENT MONTHS.

6. NO OBSERVABLE EVIDENCE OF CHANGES IN STREET RIGHT OF WAY LINES COMPLETED, AND AVAILABLE FROM THE CONTROLLING JURISDICTION AND NO OBSERVABLE EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.

7. NO OBSERVABLE EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

8. PROPERTY HAS PHYSICAL ACCESS TO INTERSTATE HIGHWAY No. 610, FOURNACE PLACE AND SOUTH RICE AVENUE (PUBLIC RIGHTS-OF-WAY).

9. ALL STATEMENTS WITHIN THE CERTIFICATION, AND OTHER REFERENCES LOCATED ELSEWHERE HEREON, RELATED TO: UTILITIES, IMPROVEMENTS, STRUCTURES, BUILDINGS, PARTY WALLS, PARKING, EASEMENTS, SERVITUDES, AND ENCROACHMENTS; ARE BASED SOLELY ON ABOVE GROUND, VISIBLE EVIDENCE, UNLESS ANOTHER SOURCE OF INFORMATION IS SPECIFICALLY REFERENCED HEREON.

ZONING INFORMATION

THE PROPERTY LIES WITHIN THE JURISDICTION OF THE CITY OF BELLAIRE

ZONED: TECHNICAL RESEARCH PROJECT DISTRICT (TRPD)

Taken from City of Bellaire Ordinance Chapter 24, Sec. 24-544.

Lot area: The minimum lot area shall be two (2) acres.

Maximum building height: No building, except those buildings and their appurtenances existing as of November 1, 1983, shall have a height in excess of six (6) stories (excluding cooling towers, roof gables, chimneys, radio and television antennas, vent stacks and similar extensions which may extend for an additional height, the total not to exceed eighty-four (84) feet. A greater height may be permitted in the granting of a specific use amendment for radio, television and microwave antenna or tower.

Maximum floor area to site area: One hundred (100) percent of site area.

Building lines (except those buildings and their appurtenances existing as of November 1, 1983):

1. No building shall be constructed less than fifty (50) feet from the right-of-way line of the abutting Interstate Highway Loop 610 Service Road;

2. All other building lines shall be computed on the basis of a ratio of .84-foot of building height per one foot of distance between said building lines and the nearest point on a lot zoned residential or in residential use that is outside of the district and existing on the date said district is established by ordinance.

Maximum site coverage: Seventy-five (75) percent of site area.

Site plan review required: All specific use applications in this district require site plan review and approval to ensure conformance with the standards for this district and other applicable provisions of the City Code. Applicants shall satisfy all application and submittal requirements for the site plan review itemized in Section 24-524.

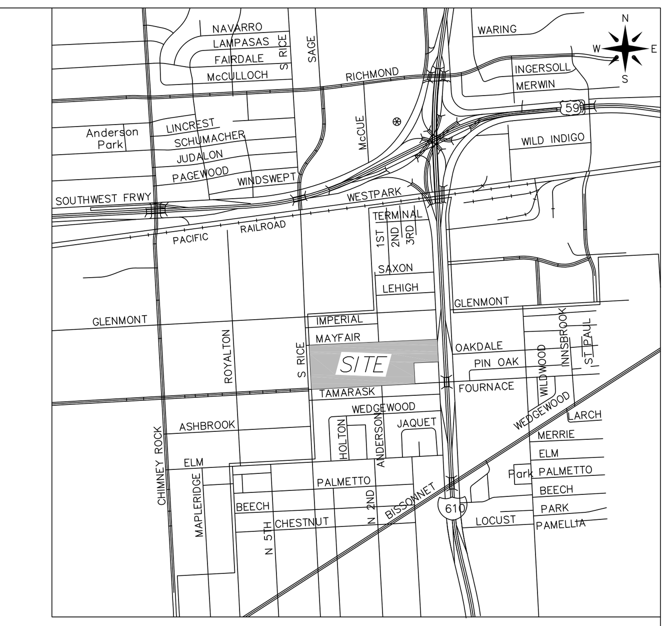
PARKING TABLE

1281 Standard Spaces
33 Handicap Space

1314 Total Parking Spaces

TITLE INFORMATION

THE TITLE DESCRIPTION AND SCHEDULE B ITEMS HEREON ARE FROM FIRST AMERICAN TITLE INSURANCE COMPANY TITLE COMMITMENT UNDER G.F. NO. NCS-816950-SA1 WITH AN EFFECTIVE DATE OF SEPTEMBER 12, 2018.



VICINITY MAP
N.T.S.

0' 40' 80'
SCALE: 1"=40'

SURVEYOR CERTIFICATION

TO: SLS HOUSTON PROPERTIES, LLC.; SLS WEST LOOP, LP.; IBC BANK, its successors and assigns; FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 6(a), 7(a), 7(b)(1), 7(c), 8, 9, 13, 14, 16, 17 AND 19 OF TABLE A THEREOF.

THE FIELD WORK WAS COMPLETED ON 09/13/2018.

Paul Coyne
PAUL A. COYNE
REGISTERED PROFESSIONAL LAND SURVEYOR
NO. 6374

DATE: 09/19/2018

STATE OF TEXAS
REGISTERED
PAUL A. COYNE
6374
PROFESSIONAL
LAND SURVEYOR

SHEET 1 OF 3

REVISIONS		
REV.	DESCRIPTION	DATE

ALTA/NSPS SURVEY OF
TRACT I
ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

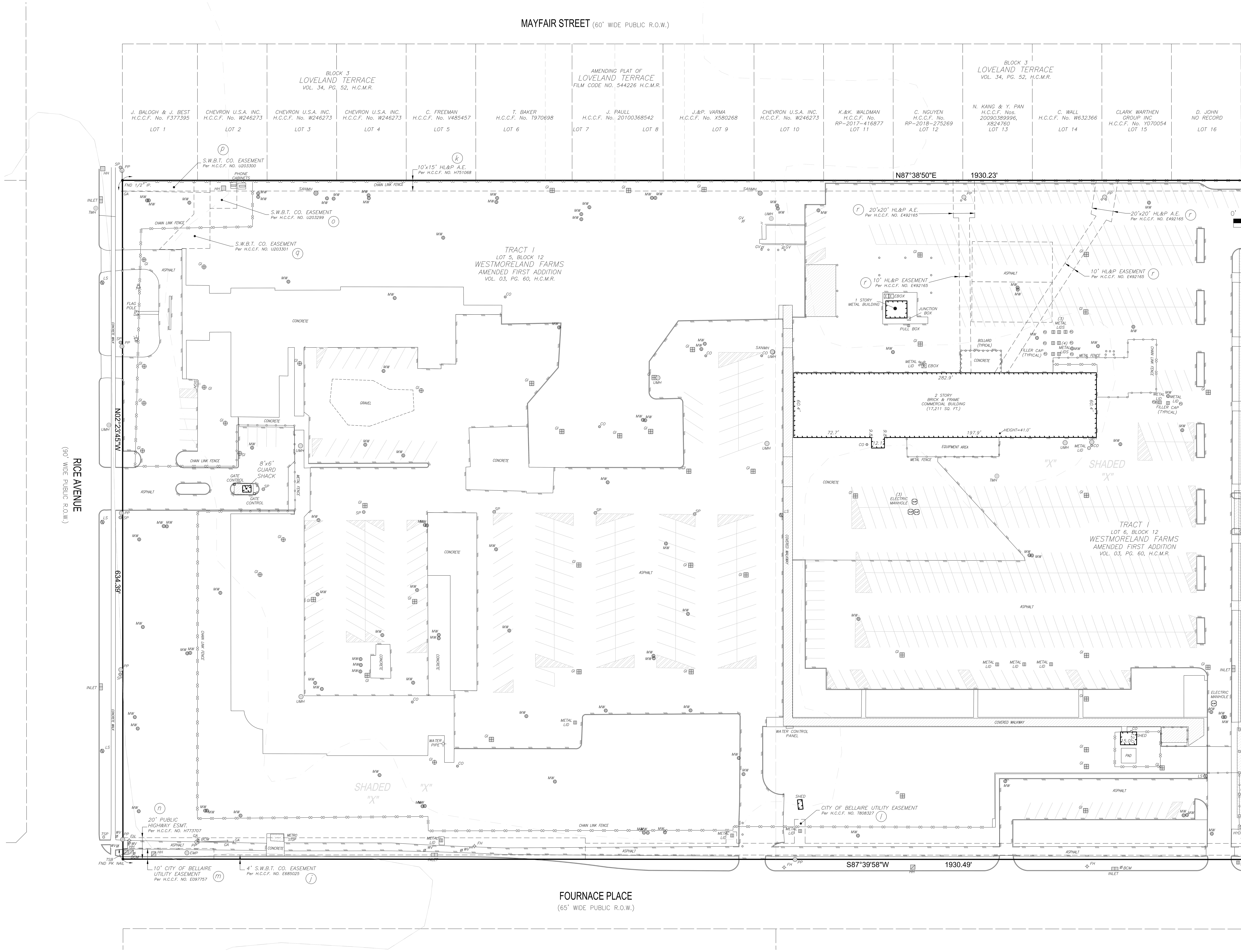
TRACT II
LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

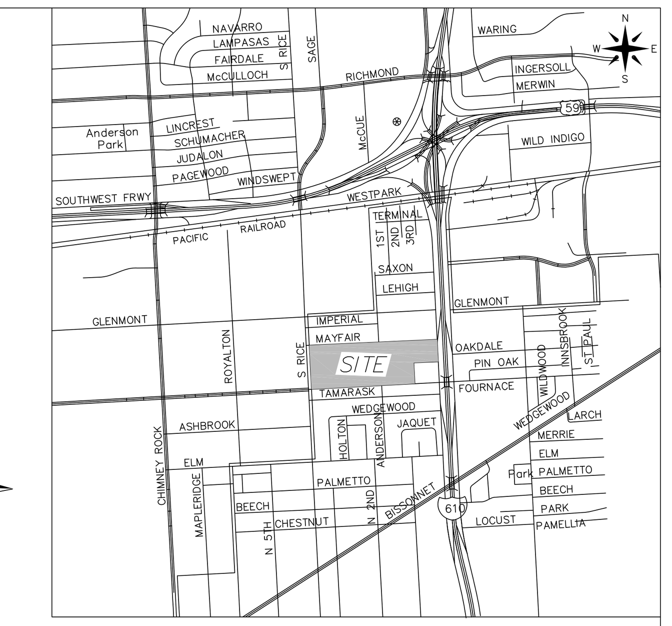
TRACT III
A 0.4477 ACRE TRACT OF LAND LOCATED IN THE J. BLESSING SURVEY, ABSTRACT NO. 162, BEING A PORTION OF FLEETWOOD STREET AS SHOWN ON TWIN OAKS, A SUBDIVISION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 34, PAGE 51 OF THE HARRIS COUNTY MAP RECORDS, AND BEING ALL OF THAT CERTAIN CALLED "TRACT A" CONVEYED TO CHEVRON U.S.A. INC. BY DEED RECORDED IN CLERK'S FILE NO. W246273

ADDRESS: 4800 FOURNACE PLACE, BELLAIRE TX 77401
PROJECT NAME: CHEVRON CAMPUS
CLIENT: SLS PROPERTIES, LLC.

TETRA
2109 Lexington Street
Houston, Texas 77098
(P) 713-462-6100 (F) 713-432-1003
E-Mail: Survey@TSATX.com
www.TSATX.com
License No. 10127500

JOB NO.: 18-0196
SCALE: 1"=40'
DATE: 09/19/2018
DRAWN BY: JP
CHECKED BY: PAC
APPROVED BY:





VICINITY MAP
N.T.S.

0' 40' 80'

SCALE: 1"=40'

LEGEND

AE	AERIAL EASEMENT
ASPH	ASPHALT
BL	BUILDING LINE
BLDG	BUILDING
BCM	BURIED CABLE MARKER
CI	CURB INLET
CO	CLEAN OUT
CONC.	CONCRETE
COR	CORNER
EBOX	ELECTRICAL BOX
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FNC	FENCE
FND	FOUND
GI	GRATE INLET
GM	GAS METER
GV	GAS VALVE
GT	GREASE TRAP
GW	GUY WIRE
HC	HANDICAP
H.C.C.F.	HARRIS COUNTY CLERK'S FILE
H.C.D.R.	HARRIS COUNTY DEED RECORDS
H.C.M.R.	HARRIS COUNTY MAP RECORDS
HH	UTILITY HAND HOLE
LNSC	LANDSCAPE
LS	LIGHT STANDARD
MH	MANHOLE
MW	MONITORING WELL
NO.	NUMBER
P	OVERHEAD LINES
PP	POWER POLE
PLM	PIPELINE MARKER
PST	POST
PVMT	PAVEMENT
SAN	SANITARY
SDWK	SIDEWALK
STM	STORM SEWER
TSB	TRAFFIC SIGNAL BOX
TSP	TRAFFIC SIGNAL POLE
TMH	TELEPHONE MANHOLE
TPED	TELEPHONE CABLE PEDESTAL
UE	UTILITY EASEMENT
UMH	UTILITY MANHOLE
WM	WATER METER
WV	WATER VALVE

ASPHALT LINE
FENCE LINE
CHAN LINK FENCE
HIGH BANK LINE
POWER LINE

SHEET 2 OF 3

REVISIONS	
REV.	DESCRIPTION

ALTA/NSPS SURVEY OF

TRACT I

ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II

LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT III

A 0.4477 ACRE TRACT OF LAND LOCATED IN THE J. BLESSING SURVEY, ABSTRACT NO. 162, BEING A PORTION OF FLEETWOOD STREET AS SHOWN ON TWIN OAKS, A SUBDIVISION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 34, PAGE 51 OF THE HARRIS COUNTY MAP RECORDS, AND BEING ALL OF THAT CERTAIN CALLED "TRACT A" CONVEYED TO CHEVRON U.S.A. INC. BY DEED RECORDED IN CLERK'S FILE NO. W246273

ADDRESS: 4800 FOURNACE PLACE, BELLAIRE TX 77401

PROJECT NAME: CHEVRON CAMPUS

CLIENT: SLS PROPERTIES, LLC.

TETRA
2109 Lexington Street
Houston, Texas 77098
(P) 713-462-6100 (F) 713-432-1003
E-Mail: Survey@TSATX.com
www.TSATX.com
License No. 10127500

JOB NO.:18–0196
SCALE:1"=40'
DATE: 09/19/2018
DRAWN BY: JP
CHECKED BY: PAC
APPROVED BY


MAYFAIR STREET (60' WIDE PUBLIC R.O.W.)
ANDERSON STREET (60' WIDE PUBLIC R.O.W.)
BLOCK 2
TWIN OAKS
VOL. 34, PG. 51, H.C.M.R.
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 17
R. GIR H.C.C.F. No. U385701 LOT 18
CITY OF BELLAIRE H.C.C.F. No. R181066 LOT 19
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 28
T. LANGHAM H.C.C.F. No. 20080560109 LOT 27
CM QUADRUPLE SERIES LLC. H.C.C.F. No. RP-2017-411613 LOT 26
S. GUEVARA, ETAL H.C.C.F. No. E837194 LOT 25
K.&M. ARIZA H.C.C.F. No. Z025636 LOT 24
C.&G. FAIRCHILD H.C.C.F. No. Y587020 LOT 23
J.&K. TRIBON H.C.C.F. No. E619466 LOT 22
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 21
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 20
A.&S. BOOTS H.C.C.F. No. 20120347496 LOT 19
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 18
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 17
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 16
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 15
CHEVRON U.S.A. INC. H.C.C.F. No. W246273 LOT 14
N87°38'50"E 1930.23'
N87°38'50"E 325.00'
S02°23'37"E 5.00'
4' SUPERIOR OIL CO. & HOUSTON NATURAL GAS CORP. EASEMENT Per VOL. 3174, PG. 377, H.C.D.R.
TRACT I
LOT 7, BLOCK 12
WESTMORELAND FARMS
AMENDED FIRST ADDITION
VOL. 03, PG. 60, H.C.M.R.
CALLED 30.0101 ACRES
CHEVRON USA INC.
H.C.C.F. NO. W246273
TRACT II
BLOCK 2
TWIN OAKS
VOL. 34, PG. 51, H.C.M.R.
S87°38'50"W 325.00'
N87°38'50"E 325.00'
CALLED 0.4477 ACRES
CITY OF BELLAIRE
H.C.C.F. NO. W246273
FLEETWOOD STREET
TRACT III
TWIN OAKS
VOL. 34, PG. 51, H.C.M.R.
N02°23'37"W 60.00'
S02°23'37"E
126.25'
60.00'
312.50'
TRACT II
BLOCK 1
TWIN OAKS
VOL. 34, PG. 51, H.C.M.R.
S87°38'50"W 325.00'
SCALE: 1"=40'
10 STORY BRICK & FRAME COMMERCIAL BUILDING (57,459 SQ. FT.)
6 STORY CONCRETE & FRAME COMMERCIAL BUILDING (11,979 SQ. FT.)
SHADED "X"
"AE"
LOT 8, BLOCK 12
WESTMORELAND FARMS
AMENDED FIRST ADDITION
VOL. 03, PG. 60, H.C.M.R.
WULFE WEST LOOP PARTNERS LP.
H.C.C.F. No. RP-2017-35843
S02°26'42"E 317.53'
11'x7' GUARD SHACK
INTERSTATE HIGHWAY 610 (VARIABLE WIDTH PUBLIC R.O.W.)
CITY OF BELLAIRE UTILITY EASEMENT Per H.C.C.F. No. 7808327
4' S.W.B.T. CO. EASEMENT Per H.C.C.F. No. E685025
S87°39'58"W 1930.49'
FOURNACE PLACE (65' WIDE PUBLIC R.O.W.)
SHEET 3 OF 3
ADDRESS: 4800 FOURNACE PLACE, BELLAIRE TX 77401
PROJECT NAME: CHEVRON CAMPUS
CLIENT: SLS PROPERTIES, LLC.
TETRA
www.TSATX.com
JOB NO.:18-0196
SCALE:1"=40'
DATE: 09/19/2018
DRAWN BY: JP
CHECKED BY: PAC
APPROVED BY:

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED

THE STATE OF TEXAS	§	
	§	KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF HARRIS	§	

THAT THE UNDERSIGNED, **CHEVRON U.S.A. INC.**, a Pennsylvania corporation ("Grantor"), for and in consideration of the sum of TEN DOLLARS ($10.00) cash, and other good and valuable consideration paid to Grantor by **SLS WEST LOOP, LP**, a Texas limited partnership ("Grantee"), the receipt and sufficiency of which are hereby fully acknowledged and confessed, has GRANTED, BARGAINED, SOLD and CONVEYED, and by these presents does hereby GRANT, BARGAIN, SELL and CONVEY unto Grantee, whose address is 2500 West Loop South, Suite 518, Houston Texas 77027, all that certain real property in Harris County, Texas being more particularly described in Exhibit "A" attached hereto and made part hereof for all purposes (the "Land"), together with any and all improvements located on the Land (the "Improvements") and all of Grantor's right, title and interest in and to all easements, hereditaments, appurtenances, development rights, and other benefits, if any, pertaining to or affecting the Land (collectively, the "Property").

This conveyance is made and accepted subject to those certain matters set forth on Exhibit "B" attached hereto and made a part hereof for all purposes (the "Permitted Exceptions").

TO HAVE AND TO HOLD the Property, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said Grantee, its successors and assigns, forever; and Grantor does hereby bind Grantor and Grantor's successors and assigns to WARRANT AND FOREVER DEFEND all and singular the Land unto Grantee, and Grantee's successors and assigns, against every person whomsoever claiming or to claim the same or any part thereof, by, through or under Grantor, but not otherwise, subject only to the Permitted Exceptions.

This Special Warranty Deed is being executed and delivered in accordance with the terms of that certain Purchase and Sale Agreement (the "Purchase Agreement") dated as of June 11, 2018 by and between Grantor and Grantee.

GRANTEE AGREES THAT THE PROPERTY HAS BEEN SOLD TO AND ACCEPTED BY GRANTEE "AS IS" AND "WHERE IS," WITH ALL FAULTS, IF ANY, INCLUDING, WITHOUT LIMITATION, THE ENVIRONMENTAL CONDITION (AS DEFINED IN THE PURCHASE AGREEMENT) OF THE PROPERTY, AND EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN THE PURCHASE AGREEMENT, GRANTOR DOES HEREBY DISCLAIM ANY AND ALL WARRANTIES, AND MAKES NO REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED OF ANY KIND TO

~~When Recorded Return To:~~
First American Title Insurance Company
National Commercial Services
18500 Von Karman Avenue, Suite 600
Irvine, CA 92612
File No: NCS -816950-SA1

GRANTEE INCLUDING, WITHOUT LIMITATION, WARRANTIES RELATING TO (A) THE PHYSICAL CONDITION OF THE LAND, IMPROVEMENTS, IF ANY, AND ANY PERSONAL PROPERTY, (B) THE SUITABILITY, HABITABILITY, MERCHANTABILITY, OR DESIGN OF THE PROPERTY FOR A PARTICULAR PURPOSE, (C) THE ENVIRONMENTAL CONDITION OF THE PROPERTY AND THE PRESENCE OR ABSENCE OF OR CONTAMINATION (AS DEFINED IN THE PURCHASE AGREEMENT) BY HAZARDOUS MATERIALS (AS DEFINED IN THE PURCHASE AGREEMENT), (D) ACCESS TO THE PROPERTY, (E) THE COMPLIANCE OF THE PROPERTY WITH LAWS AND REGULATIONS, INCLUDING WITHOUT LIMITATION, ENVIRONMENTAL LAW (AS DEFINED IN THE PURCHASE AGREEMENT) AND (F) THE SOIL CONDITIONS, DRAINAGE, FLOODING CHARACTERISTICS, UTILITIES OR OTHER CONDITIONS EXISTING IN, ON , OR UNDER THE PROPERTY. GRANTEE ACKNOWLEDGES THAT GRANTOR MAKES NO, AND EXPRESSLY DISCLAIMS ANY, WARRANTIES OR REPRESENTATIONS CONCERNING THE ACCURACY OR COMPLETENESS OF ANY OF THE PROPERTY DOCUMENTS (AS DEFINED IN THE PURCHASE AGREEMENT) DELIVERED TO GRANTEE IN ACCORDANCE WITH THE PURCHASE AGREEMENT.

BY ACCEPTING TITLE TO THE PROPERTY, GRANTEE, FOR ITSELF AND ALL MEMBERS OF THE GRANTEE GROUP (AS DEFINED IN THE PURCHASE AGREEMENT) RELEASES ALL MEMBERS OF THE GRANTOR GROUP FROM ANY CLAIM MADE OR ANY LOSS SUSTAINED BY ANY MEMBER OF THE GRANTEE GROUP RELATED IN ANY MANNER TO THE PROPERTY, INCLUDING WITHOUT LIMITATION, ALL CLAIMS MADE AND LOSSES INCURRED RELATED TO THE ENVIRONMENTAL CONDITION OF THE PROPERTY. GRANTEE RECOGNIZES THAT THERE IS A RISK THAT, AFTER CLOSING, GRANTEE MAY SUFFER A LOSS OR CLAIM WHICH ARE IN SOME WAY CAUSED BY THE MATTERS WHICH ARE THE SUBJECT OF THIS RELEASE AND GRANTEE AGREES, FOR ITSELF AND ALL MEMBERS OF THE GRANTEE, THAT ALL MEMBERS OF GRANTEE GROUP ASSUME THIS RISK AND THAT THIS RELEASE SHALL APPLY TO ANY AND ALL SUCH UNKNOWN OR UNANTICIPATED LOSS OR CLAIM. IN THE EVENT THIS RELEASE IS JUDICIALLY DETERMINED TO EXCEED THAT PERMITTED BY APPLICABLE LAW, THEN SUCH RELEASE SHALL BE CONSTRUED SO AS TO PRESERVE THE MAXIMUM RELEASE PERMITTED THEREBY.

GRANTEE, FOR ITSELF AND ALL MEMBERS OF THE GRANTEE GROUP, SHALL INDEMNIFY, DEFEND, SAVE AND HOLD HARMLESS ALL MEMBERS OF THE GRANTOR GROUP FROM ANY CLAIM MADE OR ANY LOSS INCURRED (INCLUDING REASONABLE ATTORNEY FEES) ARISING FROM OR IN CONNECTION WITH GRANTEE'S OWNERSHIP, USE OR OCCUPANCY OF THE PROPERTY FROM AND AFTER THE CLOSING DATE. SUCH CLAIM OR LOSS SHALL INCLUDE, BUT IS NOT LIMITED TO, ANY CLAIMS OR ANY LOSSES AS TO STRICT LIABILITY CLAIMS, INCLUDING THOSE UNDER THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT. IN THE EVENT THIS INDEMNITY IS JUDICIALLY DETERMINED TO EXCEED THAT PERMITTED BY APPLICABLE LAW, THEN SUCH INDEMNITY SHALL BE CONSTRUED AS TO PRESERVE THE MAXIMUM INDEMNITY PERMITTED THEREBY.

IN PARTICULAR, GRANTEE SHALL INDEMNIFY AND DEFEND GRANTOR AND THE GRANTOR GROUP FROM AND AGAINST ANY AND ALL CLAIMS MADE AND ANY AND ALL LOSSES INCURRED ARISING OUT OF AN ENVIRONMENTAL CONDITION OF THE PROPERTY, EXCEPT TO THE EXTENT ARISING OUT OF GROUNDWATER CONTAMINATION AT OR FROM THE PROPERTY THAT EXISTED AS OF THE EFFECTIVE DATE HEREOF; PROVIDED HOWEVER SUCH EXCEPTION SHALL NOT APPLY TO ANY CLAIM OR LOSS ARISING OUT OF SOIL VAPOR CAUSED BY OR ALLEGED TO BE CAUSED BY GROUNDWATER CONTAMINATION. FURTHERMORE, ALL FUTURE ASSIGNEES AND SUCCESSORS OF GRANTEE SHALL INDEMNIFY AND DEFEND GRANTOR AND THE GRANTOR GROUP FROM AND AGAINST ANY AND ALL CLAIMS MADE AND ANY AND ALL LOSSES INCURRED ARISING OUT OF AN ENVIRONMENTAL CONDITION OF THE PROPERTY EXCEPT TO THE EXTENT ARISING OUT OF GROUNDWATER CONTAMINATION AT OR FROM THE PROPERTY THAT EXISTED AS OF THE EFFECTIVE DATE HEREOF; PROVIDED HOWEVER SUCH EXCEPTION SHALL NOT APPLY TO ANY CLAIM OR LOSS ARISING OUT OF SOIL VAPOR CAUSED BY OR ALLEGED TO BE CAUSED BY GROUNDWATER CONTAMINATION.

IT IS EXPRESSLY RECOGNIZED BY GRANTEE THAT THE GROUNDWATER MAY CURRENTLY CONTAIN HAZARDOUS MATERIALS OR MAY COME TO CONTAIN HAZARDOUS MATERIAL IN THE FUTURE. GRANTEE AND ALL FUTURE ASSIGNEES AND SUCCESSORS OF GRANTEE SHALL INDEMNIFY AND DEFEND GRANTOR AND THE GRANTOR GROUP FROM ANY AND ALL CLAIMS MADE AND ANY AND ALL LOSSES INCURRED (INCLUDING EXPENSES ASSOCIATED WITH INVESTIGATION OF CLAIMS, TESTING AND ASSESSMENT), WHETHER BASED ON ANY THEORY OF NEGLIGENCE, TORT, BREACH OF CONTRACT, BREACH OF WARRANTY, STRICT LIABILITY, REGULATORY LIABILITY OR STATUTORY LIABILITY, REGARDLESS OF THE SOLE, JOINT OR CONCURRENT NEGLIGENCE, BREACH OF CONTRACT, BREACH OF WARRANTY, STRICT LIABILITY, REGULATORY LIABILITY, STATUTORY LIABILITY, OR OTHER FAULT OR RESPONSIBILITY OF GRANTOR OR ANY OTHER PERSON OR PARTY, IN ANY WAY ARISING FROM, RESULTING FROM OR RELATED TO GROUNDWATER EXTRACTED OR COLLECTED (EXCEPT BY GRANTOR) AFTER THE EFFECTIVE DATE FROM ANY WELL, SUMP, DRAIN, OR LIKE DEVICE ON THE PROPERTY, WHETHER SUCH WELL, SUMP, DRAIN, OR LIKE DEVICE WAS IN PLACE BEFORE OR AFTER THE EFFECTIVE DATE.

Any conveyance, transfer or assignment of all or part of the Property by Grantee, its successors or assigns, in which the grantee, transferee or assignee fails to expressly assume the obligations of Grantee set forth above shall be deemed null and void. Grantee further agrees to cause the disclaimer, release and indemnity provisions set forth above to be included in all subsequent sales or transfers of any interest in the Property, and to cause all grantees or transferees of the Property to expressly acknowledge and assume all such obligations.

Grantor hereby adopts, establishes, and imposes upon the Property the following restrictions and covenants (the "Protective Covenants") and declares the Protective Covenants applicable to the Property, including any and all portions thereof:

1. Any and all use, development, or redevelopment of the Property, including any and all soil, waste and/or debris management and surface water and/or groundwater management required or necessary under applicable laws or regulation or because of excavation, demolition, or soil disturbance related to the use, operations, development, excavation, grading, construction, or demolition at, in, on, or below the Property shall be conducted in compliance with the Site Management Plan attached as Exhibit "B" to that certain Environmental Easement and Notice of Remediation Agreement of even date herewith, by and between Grantee and Grantor, filed or to be filed in the Official Public Records of Real Property of Harris County, Texas.

2. The groundwater at, in, or under the Property shall not be used for any beneficial purpose or in any manner that may result in potential exposure to the groundwater, including (1) drinking water or other potable uses, (2) the irrigation or watering of landscapes, or (3) agricultural uses. Notwithstanding the foregoing, groundwater at, in, or under the Property may continue to be used to supply the cooling tower on the Property as of the Effective Date, provided that (a) the cooling tower is only used in connection with buildings currently existing on the Property as of the Effective Date and in same manner as before and (b) the supply well for the cooling tower is closed and properly abandoned in compliance with all applicable legal requirements immediately upon decommissioning or removal of the cooling tower.

3. Any new buildings constructed at the Property shall incorporate effective vapor intrusion (VI)-resistant construction methods, which shall include (at a minimum) the installation of a passive vapor-resistant barrier of appropriate chemical-resistant composition and minimum 60-millimeter thickness, unless any regulatory agency requires implementation of a more active engineering control at the Property.

4. In addition to any restrictions on use imposed by any federal, state, or local government authority, including any zoning requirements, the Property shall not be used for any use other than the following: (A) commercial uses, (B) above-grade recreational uses (including public access), and (C) restricted residential uses limited to zero-lot line multi-family dwellings or attached townhomes (either owner occupied or leased) that do not have below-grade or first-story residential space other than open-air parking. Prohibited uses include, but are not limited to, detached or single-family dwellings, dwellings with below grade or first-story residential uses (other than open-air parking), day care centers, children's homes, nursing homes, schools (including preschools, elementary schools, and secondary schools), hospitals and other similar uses. For purposes of clarity, other similar uses of hospitals does not include outpatient health clinics and doctors' offices. For purposes of the foregoing, "zero-lot line" means all or nearly all of the land designated for use by the occupants of a residential dwelling is comprised by the physical structure of the residential building and "open-air parking" means at least one side of the parking structure is unenclosed (e.g., an open-air gate).

5. Soil at the Property as of the Effective Date shall not be used to grow food for human consumption. Edible gardens shall not be located on the Property unless they are in raised beds at least 24-inches above ground surface that do not contain soil sourced from the Property and roots do not contact native soil.

6. No portion of the Property shall be used as a permitted hazardous waste treatment, storage, or disposal facility.

The foregoing Protective Covenants shall run with the title to the Property and shall be binding upon all persons having or acquiring any right, title, or interest therein, or any part thereof, and shall inure to the benefit of and be enforceable by Grantor, its successors and assigns, excluding Grantee and any future record fee title owner of the Property and its/their successors and assigns as the owner or owners of all or any portion of the Property, whether acquired by sale, assignment, inheritance, operation of law, trustee's sale, foreclosure, or otherwise (a "Property Owner"). The Protective Covenants may be terminated or amended by the written consent of Grantor.

Property Owner, by Property Owner's acceptance of a deed or conveyance of the Property or any portion thereof, covenants and agrees, as a covenant running with the title to the Property binding upon Property Owner, and Property Owner's heirs, successors and assigns as owners of any portion of the Property and inuring to the benefit of Grantor, that neither Property Owner nor any of Property Owner's heirs, successors, assigns, tenants, lessees, occupants, licensees, or invitees or any other person holding or using the Property or any portion thereof will use or be permitted to use any portion of the Property or conduct or be permitted to conduct any operation on any portion of the Property in a manner that violates the foregoing Protective Covenants.

Ad valorem taxes and special assessments, if any, against the Property for the year 2018 have been prorated between Grantor and Grantee as of the date of this Special Warranty Deed and Grantee expressly assumes liability for payment of taxes and assessments for the current year and subsequent years.

[SIGNATURE PAGES TO FOLLOW]

SIGNATURE PAGE OF GRANTOR

Executed to be effective as of the 26 day of September 2018 (the "Effective Date").

GRANTOR:

CHEVRON U.S.A. INC., a Pennsylvania corporation

By: [signature]
Name: DAVID S. COOK
Title: Vice President
CHEVRON BUSINESS AND REAL ESTATE SERVICES
A CHEVRON U.S.A. INC. DIVISION

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document, to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

ACKNOWLEDGMENT

STATE OF CALIFORNIA)
)
COUNTY OF Contra Costa

On September 24, 2018, before me, Heather H. Prewitt, Notary Public, personally appeared DAVID S. COOK, who proved to me on the basis of satisfactory evidence, to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

[signature] (SEAL)
Notary Public Signature

HEATHER H. PREWITT
Commission # 2099198
Notary Public - California
Contra Costa County
My Comm. Expires Feb 6, 2019

SIGNATURE PAGE OF GRANTEE

Agreed to and Accepted by Grantee as of the Effective Date.

GRANTEE:

SLS WEST LOOP, LP

By: SLS West Loop General, LLC, a Texas limited liability company, its general partner

By: ______________________
Name: Danny M. Sheena
Title: Manager

THE STATE OF TEXAS §
§
COUNTY OF HARRIS §

The foregoing instrument was acknowledged before me this 26 day of September 2018 by Danny M. Sheena, the Manager of SLS WEST LOOP GENERAL, LLC, a Texas limited liability company, as general partner of SLS WEST LOOP, LP, a Texas limited partnership, on behalf of said limited liability company and said limited partnership.

____
Notary Public/State of Texas

CRISTINA D. ALVARADO
Notary Public, State of Texas
Comm. Expires 07-08-2022
Notary ID 124202647

EXHIBIT "A"
TO SPECIAL WARRANTY DEED

[Legal Description]

TRACT I:

ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II:

LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT III:

A 0.4477 ACRE TRACT OF LAND LOCATED IN THE J. BLESSING SURVEY, ABSTRACT NO. 162, BEING A PORTION OF FLEETWOOD STREET AS SHOWN ON TWIN OAKS, A SUBDIVISION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 34, PAGE 51 OF THE HARRIS COUNTY MAP RECORDS, AND BEING ALL OF THAT CERTAIN CALLED "TRACT A" CONVEYED TO CHEVRON U.S.A. INC. BY DEED RECORDED IN CLERK'S FILE NO. W246273 IN THE OFFICE OF THE COUNTY CLERK OF HARRIS COUNTY, TEXAS SAID 0.4477 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN THE WEST RIGHT-OF-WAY LINE OF HIGHWAY 610 (BASED ON A VARIABLE WIDTH PUBLIC RIGHT-OF-WAY), SAID POINT BEING THE SOUTHEAST CORNER OF LOT 5, BLOCK 1 OF SAID TWIN OAKS SUBDIVISION;

THENCE NORTH 02°23'37" WEST, ALONG THE EAST LINE OF SAID LOT 5, BLOCK 1, A DISTANCE OF 126.25 FEET TO A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN SAID WEST RIGHT-OF-WAY LINE OF HIGHWAY 610 FOR THE NORTHEAST CORNER OF SAID LOT 5, SAID POINT BEING THE SOUTHEAST CORNER OF SAID "TRACT A" AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT OF LAND;

THENCE SOUTH 87°38'50" WEST, ALONG THE SOUTH LINE OF SAID "TRACT A", A DISTANCE OF 325.00 FEET TO A POINT LOCATED IN THE WEST LIMIT OF SAID TWIN OAKS SUBDIVISION, SAID POINT BEING THE NORTHWEST CORNER OF LOT 9, BLOCK 1 OF TWIN OAKS, AND THE SOUTHWEST CORNER OF SAID "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE NORTH 02°23'37" WEST, ALONG THE WEST LIMIT OF SAID TWIN OAKS SUBDIVISION AND SAID "TRACT A", A DISTANCE OF 60.00 FEET TO A POINT LOCATED IN THE WEST LIMIT OF TWIN OAKS SUBDIVISION, SAID POINT BEING THE SOUTHWEST

CORNER OF LOT 9, BLOCK 2 OF TWIN OAKS, AND THE NORTHWEST CORNER OF "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE NORTH 87°38'50" EAST, ALONG THE NORTH LINE OF SAID "TRACT A", A DISTANCE OF 325.00 FEET TO A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN SAID WEST RIGHT-OF-WAY LINE OF HIGHWAY 610 FOR THE SOUTHEAST CORNER OF LOT 5, BLOCK 2 OF TWIN OAKS, SAID POINT BEING THE NORTHEAST CORNER OF SAID "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE SOUTH 02°23'37" EAST, ALONG SAID WEST RIGHT-OF-WAY LINE OF HIGHWAY 610, A DISTANCE OF 60.00 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT III AND CONTAINING WITHIN THESE CALLS 0.4477 ACRES, OR 19,500 SQUARE FEET OF LAND.

EXHIBIT "B"
TO SPECIAL WARRANTY DEED

[Permitted Exceptions]

1. Any covenants, conditions or restrictions indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status, or national origin are hereby deleted to the extent such covenants, conditions or restrictions violate 42 USC 3604 {c}. Recorded in Volume 34, Page 51, Map Records of Harris County, Texas (As to Tract II Only).

2. Any portion of Property lying within the boundaries of a public or private roadway whether dedicated or not.

3. All leases, grants, exceptions or reservations of coal, lignite, oil, gas and other minerals, together with all rights, privileges, and immunities relating thereto, appearing in the Public Records.

4. The following matters disclosed by an ALTA/ACSM survey made by Tetra on September 13, 2018, designated Job No. 18-0196:

   (a) Numerous monitoring wells located over various portions of the property.

   (b) An encroachment of concrete and covered bus stop onto the property from the street right of way of Fourance Place, to undisclosed amounts.

   (c) Underground storage tanks located on the property as evidenced by numerous metal lids and filler caps.

   (d) An encroachment of a block wall onto the land adjoining the property to the south, to undisclosed amounts.

   (e) An encroachment of a curb and asphalt pavement onto the land adjoining the property to the south, to undisclosed amounts.

   (f) An encroachment of a fence onto the land adjoining the property to the southeast, to undisclosed amounts.

   (g) An encroachment of a rolling gate onto the land adjoining the property to the east, to undisclosed amounts.

5. Terms, Conditions, and Stipulations in the Agreement by and between:
   Parties: The Superior Oil Company and Houston Natural Gas Corporation
   Recorded: in Volume 3174, Page 337, of the Deed records, of Harris County, Texas.
   Type: Pipeline Right of Way Agreement
   (As to Tract I Only)

6. Easement:
To: Houston Lighting & Power Company, a Texas corporation
Recorded: July 10, 1975 in County Clerk's File No. E481533, of the Official Public Records, of Harris County, Texas.
Purpose: Electric distribution lines
(As to Tract I Only)

7. Easement:
To: Southwestern Bell Company
Recorded: February 24, 1976 in County Clerk's File No. E685025, of the Official Public Records, of Harris County, Texas.
Purpose: Underground Facilities
(As to Tract I Only)

8. Easement:
To: Houston Lighting & Power Company, a Texas corporation
Recorded: December 27, 1982 in County Clerk's File No. H751068, of the Official Public Records, of Harris County, Texas.
Purpose: Easement for electric transmission and distribution lines
(As to Tract I Only)

9. Easement:
To: The City of Bellaire, Texas, a Municipal Corporation
Recorded: June 25, 1999 in County Clerk's File No. T808327, of the Official Public Records, of Harris County, Texas.
Purpose: Utility Easement
(As to Tract I Only)

10. Easement:
To: The City of Bellaire, Texas, a Municipal Corporation
Recorded: March 06, 1974 in County Clerk's File No. E097757, of the Official Public Records, of Harris County, Texas.
Purpose: Right of Way
(As to Tract I Only)

11. Easement:
To: The City of Bellaire, Texas, a Municipal Corporation
Recorded: January 11, 1983 in County Clerk's File No. H773707, of the Official Public Records, of Harris County, Texas.
Purpose: Public Highway Easement
(As to Tract I Only)

12. Terms, Conditions, and Stipulations in the Agreement by and between:
Parties: Texaco Inc., a Delaware corporation and Southwestern Bell Telephone Company
Recorded: February 01, 2000 in County Clerk's File No. U203299, of the Official Public records, of Harris County, Texas.
Type: Easement for Telecommunications
(As to Tract I Only)

13. Terms, Conditions, and Stipulations in the Agreement by and between:
Parties: Texaco Inc., a Delaware corporation and Southwestern Bell Telephone Company
Recorded: February 01, 2000 in County Clerk's File No. U203300, of the Official Public records, of Harris County, Texas.
Type: Easement for Underground Telecommunications Facilities
(As to Tract I Only)

14. Terms, Conditions, and Stipulations in the Agreement by and between:
Parties: Texaco Inc., a Delaware corporation and Southwestern Bell Telephone Company
Recorded: February 01, 2000 in County Clerk's File No. U203301, of the Official Public records, of Harris County, Texas.
Type: Temporary Access Easement Facilities
(As to Tract I Only)

15. The terms, provisions and easement contained in the document entitled "Easement" recorded July 23, 1975 under Clerk's File No. E492165 of Official Records of Harris County, Texas
(As to Tract I only).

16. A 30 foot building setback line along the front property line as set forth on the recorded plat and dedication as shown on recorded plat filed for record under Volume 34, Page 51, Plat Records of Harris County, Texas (As to Tract II only).

17. Easement as shown on the recorded plat and dedication:

Purpose: Utility
Location: 10 foot along the rear property line

Together with an unobstructed aerial easement 5' in width from a plane 20' above the ground upward located adjacent to and adjoining the described easement.

As shown on recorded plat filed for record under Volume 34, Page 51, Plat Records of Harris County, Texas. (As to Lots 5, 6, 7, 8 & 9; Block 1)

18. Easement as shown on the recorded plat and dedication:
Purpose: Utility
Location: 5 foot along the rear property line

Together with an unobstructed aerial easement 5' in width from a plane 20' above the ground upward located adjacent to and adjoining the described.

As shown on recorded plat filed for record under Volume 34, Page 51, Plat Records of Harris County, Texas. (As to Lots 5, 6, 7, 8 & 9; Block 2)

19. Easement as shown on the recorded plat and dedication:
Purpose: Utility
Location: 10 foot along the western property line

As shown on recorded plat filed for record under Volume 34, Page 51, Plat Records of Harris County, Texas.

20. Easement as shown on the recorded plat and dedication:
Purpose: Drainage Easement
Location: 15' on each side of the center line of all gullies, ravines and other natural drainage courses on the herein described property.

21. Access to and from Highway 610 Loop.

22. Any claim that the title to the Property is subject to a trust or lien created under The Perishable Agricultural Commodities Act, 1930 (7 U.S.C. §§499a, et seq.) or the Packers and Stockyards Act (7 U.S.C. §§181 et seq.) or under similar state laws. (Affects all the Tracts).

RP-2018-442527

Pages 14

09/27/2018 09:08 AM

e-Filed & e-Recorded in the

Official Public Records of

HARRIS COUNTY

STAN STANART

COUNTY CLERK

Fees $64.00

RECORDERS MEMORANDUM
This instrument was received and recorded electronically
and any blackouts, additions or changes were present
at the time the instrument was filed and recorded.

Any provision herein which restricts the sale, rental, or
use of the described real property because of color or
race is invalid and unenforceable under federal law.
THE STATE OF TEXAS
COUNTY OF HARRIS
I hereby certify that this instrument was FILED in
File Number Sequence on the date and at the time stamped
hereon by me; and was duly RECORDED in the Official
Public Records of Real Property of Harris County, Texas.

COUNTY COURT OF HARRIS COUNTY, TEXAS

Stan Stanart

COUNTY CLERK
HARRIS COUNTY, TEXAS

RP-2018-442527

Attachment: Chevron SLS Deed (2705 : Consideration-4800 Fournace-Office Use)

Dear Danny,

Thanks for stopping by and shared the plan with me. As I mentioned I was out of town but I was able to see your presentation online. I don't have any concerns with the project. In fact I appreciate you taking the initiative of building a parking garage because it will ease the parking for future tenants, clients and customers. I also appreciate you offering the parking garage for the neighbors in case if a potential flood In the area.

I would like to stay in touch and be able to see the graphics as you are close to built the garage to see where the wall will be built in reference to our back yard. As I mentioned that will be beneficial for us and see the type of trees the landscaper architect is planning for the screening of the parking garage.

Good luck on the development and again, I'm in favor of the multi-tenant development.

Sincerely,

Sent from my iPhone
Mario Ariza
713-408-9031

To the Planning & Zoning Commission:

I attended the recent public hearing on the use of the Chevron building and the proposed parking garage. Unfortunately, I was unable to stay long enough to hear the presentation on the parking garage. I stand with neighbors who feel the planned parking garage will be too close to the residential lots. A structure as large as a parking garage would have to be significantly farther than 40' from the property line to prevent a negative impact to the adjacent residences. I think it will deprive the residential neighbors of access to natural light, may flood the neighbors with unnatural lighting at night from the parking garage, may create a sound nuisance from cars entering and exiting the parking garage, and may present privacy issues. I don't live on that end of the Chevron property, but I believe I may soon be faced with the same situation on the west end of the Chevron property.

I live at 5009 Mayfair, which is adjacent to the Chevron property near South Rice. Today I happened to meet Mr. Sheena as he was walking the fenceline behind my house. Mr. Sheena said they are about to erect an 8' wood fence in place of the existing cyclone fence. I asked about the planned use of the Chevron property on my end, and he said it was up in the air, but there were many possibilities. He did share that Chevron has restricted the deed so that single family homes cannot be built on that site. (Single family homes were exactly what the neighborhood was hoping would be built.) I told him I'd heard a rumor that the JCC was interested in the property. He indicated that the JCC might be interested, but there are other interests as well, including retail. I asked if he anticipated a parking garage being built on my end of the Chevron property and he said possibly, but assured me that it would be 40 feet away from the fenceline and they would plant trees in between the fence and the garage. He also noted that a parking garage would provide a vision block between me and whatever business is planned for the front of the property.

While I appreciate a nice fence and trees, I don't think they will make up for the intrusion of a parking garage. (I am not addressing his comment of possible retail use of the property, though I would certainly object to that.) Some neighbors have noted that this parking garage is contrary to the comprehensive plan. I agree that a parking garage built only 40 feet from the fenceline does not provide "adequate separation and buffering along the northern boundary", nor does it utilize a sufficient "height-setback plane" that would preserve the openness and residential privacy of the neighboring homes.

Please respect the comprehensive plan and do not approve a parking garage without additional safeguards for the neighboring homes.

Respectfully,

Cynthia Freeman
5009 Mayfair Street
Bellaire, TX 77401
713-376-7342

We believe that the developer, who recently purchased the Chevron building on Fournace. should adhere to standards set forth in the 2017 Comprehensive Plan for the North Bellaire Special Development Area. This includes the location of the proposed 4-story parking garage (which is too tall and too close to backyards of homes fronting Mayfair St.) and the proposed main property entrance on Fournace instead of on the 610 feeder.

As a Bellaire resident, we request that the Developer of the property on 4800 Fournace strictly comply with all standards included in the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

It would be nice if the developer replaced existing parking lots with green space to reduce the risk of flooding, permanently close the back gate of the property by the park on the corner of Anderson and Mayfair and fix all the sidewalk surrounding their property. Also recent mowing by the new owner of the property along S. Rice and Fournace is a mess (leaving all clipping on the side walk and street).

Ruth-Ann and Neil Sivers
5009 Imperial Street
713-298-6724

Dear Ms. Parcus,
My name is Tina Cohen. M is at 5011 Evergreen. I have this property for 20 years. I fully support the development of the Chevron property. I support having multiple tenants in the office building and I support the construction of a parking garage. I also support development of that entire property. It would be nice to have this property developed rather than having a vacant lot.

Sincerely,
Tina Cohen
713-591-1159

Hello and thank you in advance for your time.

I'm writing to request your assistance in ensuring the redevelopment of the property at 4800 Fournace be mindful of the residential area adjacent and comply with the standards in the 2017 Comprehensive Plan for the North Bellaire Special Development Area (the "NoBe").

I am excited to see changes come to the property and I support the developer reducing the parking footprint with a garage. Locating the garage such that it does not tower above the homes on Mayfair should be feasible.

Thank you.

Allison Piper
281-788-8450

Dear Sir,

As a Bellaire resident, I request that the Developer of the property on 4800 Fournace comply with all standards included in the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

We live in that little pocket of Bellaire, and would love to see the developer replace some of the existing parking lots with green space to improve the environment and also to reduce the risk of flooding. ALSO very importantly, if the developer permanently closes the back gate of the property by the little Joe Gaither Park where children from the neighborhood play, it would be provide us parents with a safer living space for our families.

I hope you will consider my request while making any decisions on the further.

Thank you and with regards,

Parul Rohatgi
(Resident - Bellaire)

As residents of Bellaire on Tamarisk Street, my wife and I want the city to ensure that the developer who recently purchased the Chevron building on Fournace adhere to standards set forth in the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

Specifically,

- Building a 4-story parking garage so close to the property line right against the backyards of the homes on Mayfair. It should be reduced in height and moved away from the property line.

- Because of the increased number of vehicles entering and leaving the property, they need to have entrances on both 610 and S Rice. During the afternoon rush hour, we already have people using Tamarisk as a cut-thru to the southbound on-ramp of 610 in order to avoid the light (and traffic) at Fournace and 610. When the office building is occupied, traffic on Tamarisk will increase significantly. Although it would be inconvenient for residents of Tamarisk, I would support making Tamarisk a dead-end at the 610 feeder to eliminate it as a short-cut to the on-ramp. Most of the east-west streets north of the Chevron property are already dead-end streets.

Sincerely,

Donald and Judith Peterson
dnpeter08@gmail.com
4807 Tamarisk St
Bellaire

As a Bellaire resident, I request that the Developer of the property on 4800 Fournace be required to strictly comply with all standards included in the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

In addition, I request that the Developer be required to replace existing parking lots with green space to reduce the risk of flooding.

In addition, I request that the Developer be required to permanently close the back gate of the property by the park.

Last, I request that the Developer be required to repair the sidewalk on Fournace, at a width not to exceed its present width.

Thank you for your attention to this matter.

Best regards,
Stacie Williams

As a Bellaire resident, I request that the Developer of the property on 4800 Fournace strictly comply with all standards included in the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

Thank you.

Best regards,
Maureen Brunetti
1113 Sheffield Street
Bellaire, TX 77401

RE: PROPOSED PARKING GARAGE LOCATION ON FORMER CHEVRON PROPERTY

Dear Ms. Parcus,

As residents of Bellaire and recent homeowners of a Mayfair St. property backing up to the former Chevron property on Fournace St., we are deeply concerned about the proposed location of a new 4-story parking garage. Not only would this ugly monstrosity greatly reduce property values and exacerbate the likelihood of flooding in our homes, it has come to our attention that this proposed location IS NOT IN COMPLIANCE WITH THE 2017 COMPREHENSIVE PLAN for the North Bellaire Special Development Area.

- Specifically, the plan calls for the lowest development intensities, together with adequate separation and buffering, should occur along the northern boundary of the area, closest to single-family homes that front on Mayfair Street.
- Additionally, the most intensive uses in the Special Development Area, and their associated vehicular access points, should be located along or near the Loop 610 frontage.
- Finally, a "height-setback plane" should govern the allowable height of potential multistory buildings near single-family homes to maintain openness and protect residential privacy.

To meet the Comprehensive Plan's standards, the proposed garage should either front on Fournace Street or the 610 feeder, preferably on that corner so that it is as far away as possible from homes on Mayfair. Likewise, in order to comply with the Comprehensive Plan, the primary entrance(s) to the parking garage and office park property MUST be on the feeder, and NOT on Fournace, which would cause major congestion in the area. Opening the back gate (facing Mayfair by the little park) to allow access would be disastrous for our too-narrow street. (As it is, drivers in cars heading towards one another must pull over to allow one car to drive by whenever there are others cars parked on the street.) It would be ideal if that back gate could be permanently removed, the street turned into green space, and the park extended, essentially doubling its size. Finally, we hope the City would encourage the developer to fix the sidewalk along Fournace, replace as much existing cement with green space, and plant quickly maturing trees all along the back fence, thereby reducing the chance of flooding (not to mention giving more privacy and a more aesthetic view to homeowners on Mayfair).

Thank you for helping to ensure that the Developer is aware of the 2017 Comprehensive Plan and complies with the very clear standards set therein.

Sincerely,

Karen and Ken Waldman
4917 Mayfair Street
Bellaire, TX 77401
(713-515-1805, 713-670-6626)

Hi Ms Parcus
I am the original homeowner and a resident at 4903 Mayfair st, Bellaire, Texas 77401. I am very concerned about the proposed parking garage that is not in compliance with the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

I would like to highlight the points where the plan fail to meet the 2017 Comprehensive Plan standards:

1. The Comprehensive Plan states: The lowest development intensities, together with adequate separation and buffering, should occur along the northern boundary of the area, closest to the single-family homes that front on Mayfair Street.The garage should front on Fournace St. to meet this requirement. Putting a four-story parking garage with a driveway four feet await from the fence is not "lowest intensity." Also note that the line of trees is on residents' side of fence (easement), not the commercial property, and may be adversely affected by the driveway; other mature trees that guard the view would be taken down. Additional width of green space, at least 100ft, and more trees should buffer the single-family homes from business traffic.
2. The Comprehensive Plan states: Specifically, the most intensive uses in the Special Development Area, and their associated vehicular access points, should be located along or near the Loop 610 frontage. To the contrary, the SLS plan shows only one narrow entrance along the 610 frontage and two on Fournace St. Two major entrances, or one wide multi-lane driveway, should be on the feeder road to comply with the Comprehensive Plan. The developers have to deal with TxDot as required, not shirk from following the Plan. Fournace is a narrow street with cramped entrances that back up traffic.
3. The Comprehensive Plan states: A "height-setback plane" (greater setback of upper portions of buildings) should govern the allowable height of potential multistory buildings near single-family homes to maintain openness and protect residential privacy. This restriction can only mean that a four-story building cannot be allowed to loom over the back yards on Mayfair. Precedent of parking garages on First Street and on the other side of the freeway is two to three levels, some with basements, separated by a street and trees.

I approve of revitalization of the building along with the majority of residents of North Bellaire. — implosion would be a negative environmental impact. Neighbors previously desired continued use of the property as a quiet office park, since contamination issues would preclude residential use and restaurants. The 6-ft sidewalk along Fournace does belong to property owner. It was put in place and paid for by Chevron, per Lynn McBee. It is now full of potholes. Sheena promised to maintain it, so please ask him to put sidewalk replacement in his plan.His plan shows extensive green space on the property where currently there are parking lots and old foundations. Please ask for actual restoration to green space in his plan. This affects runoff onto city streets, especially Mayfair St, and sometimes floods homes. I have spoken with Neil Verma who fully supports the Comprehensive Plan. It is now the guide for future redevelopment of this property, and now is the opportunity to follow its vision for a better Bellaire. You can find this section, amended April 3, 2017, in pages 41- 43 of the posted Comprehensive Plan.

Cheers

Dr. Roopa Gir
President, iEducate
(713) 504-1827
www.iEducateUSA.org

Dear Ms. Parcus

My name is Biykem Bozkurt. My family and I reside at 4503 Merrie Lane, Bellaire TX 77401. We have lived in Bellaire for the last 17 years. We understand that an application was made for the existing former Chevron property at 4800 Fournace. I am glad that this property is finally being renovated and the area beautified.

This is good not only for the City of Bellaire but also the other communities that surround Bellaire.

Thank you for your support,

Biykem Bozkurt
4503 Merrie Lane
Bellaire TX 77401

Dear Ms. Parcus.

Our names are Thomas Lin and May Sim. We reside at 4621 Laurel and we have lived in Bellaire for the past 15 years raising our family.

We understand that an application was made to build a modern multilevel garage with covered parking on the former Chevron property at 4800 Fournace Place. We also understand that an application was made to lease the existing property to multiple tenants. We are glad that this property is finally being developed and that it will repurpose the old Chevron buildings instead of tearing them down.

We hope that other parts of the Chevron property will also be developed soon. This is good not only for the City of Bellaire but also the other communities that surround Bellaire. It would be nice to see other businesses benefitting our neighborhood on this property as well.

.

Thank you for your consideration,

Thomas and May

Dear Ms. Parcus,

We are writing in regards to the SLS plan to build a parking garage, we believe the garage at 40’ from the property line is too close and tall (at four storeys) relative to the single family homes off of Mayfair. We see no precedent in Bellaire and fear property valuations will suffer as a consequence.

Looking at the 2017 comprehensive plan it clearly cites the need for a buffer and I’m sure residents, including ourselves, expected that would be other single family homes, then maybe townhomes, then potentially small commercial buildings but I understand that Chevron has placed a deed restriction which prohibits any dwelling on the property due to contamination. This is obviously very disappointing for all. As currently envisaged only trees are envisaged and they at best are 20’ tall versus the 40’ height of the parking garage.

The parking garage could be better placed off of 610 and or could incorporate a design which camouflages the structure and stops people from looking into owners homes / pools to provide privacy. Based on the design submitted it doesn’t provide much if any detail to address these issues.

I also understand from SLS that there is potential to increase the size of Joe Gaither park if access via Anderson to the Chevron property is permanently closed, together with the City’s portion of the defunct road and the Chevron lot adjoining it, there is potential to greatly expand the quality of living for residents.

Please feel free to reach out if you have any questions, we look forward to the property having new owners and vision which will bring in much needed tax revenue for the city and jobs for local residents.

Kind Regards,

Heather & Giles Dunn (4916 Mayfair St)

Ms. Ashley Parcus.

I am a resident of Bellaire for 30 years.
I live in 4915 Valerie.
I support the Chevron building to be leased for many tenants.
I also support the parking garage to be built.
It will also benefit me, my family and other Bellaire residents if the rest of the property will be developed.
I fully support such development.

Thanks
Hanan Tuchshnieder
4915 Valerie St
Bellaire TX 77401
(713) 545-1586

Date: September 27, 2018
Subject: 4800 Fournace Property - Proposed Redevelopment by SLS Houston Properties

Dear Ms. Parcus:

My family and I live at 4520 Teas St. We have lived in Bellaire for close to 20 years.

I reviewed the Application for Specific Use Permit for Multi Tenant Office Use submitted by SLS Houston Properties, LLC (SLS) and for the construction by SLS of a 4 story parking garage for property located at 4800 Fournace Place, Bellaire, Texas.

My family and I fully support the proposed re- development by SLS of the 4800 Fournace property.

As long time Bellaire residents, we saw the Chevron buildings fenced off, isolated and inactive, but with huge potential for commercial and residential purposes. We are pleased that someone wants to take steps to improve this property.

I understand that the office buildings have substantial electrical generators that can supply power when there is power outage (which seems to happen more often these days). This is a huge benefit to anyone operating a business and for our community.

My family and I would also love to see the rest of the property get fully re-developed.

We have watched local redevelopments such as Blvd Place, the River Oaks District and others in West University Place with many restaurants, retail stores and other new businesses. We would love to see similar developments on this property. It would be nice to have an additional local destination that we can frequent and enjoy close by.

Please consider favorably such Application, such construction and such redevelopment.

Sincerely,

Neal M. Kaminsky
(713 320-3385

Ms. Parcus,

I am 20 years living in Bellaire with my family. We live in 4802 Maple St.
My wife is a real estate agent and knows the value of properties in Bellaire.
I and my family support the applications of the office buildings and construction of the parking garage.
I would love to lease space in the building for myself. I now have an office around the Galleria area, but having an office close to my home would be much better.
I and my family also hope that the rest of the property will be developed so that we can have more restaurants and quality shops in our City.
Why go outside Bellaire to eat and shop when we can support our own.
Also, development of the property will increase the tax dollars that the City receives. We can do city improvements with the additional tax dollars.

Thank you.

Yuval and Tsili Ran
(713) 397-1179

I am distressed to learn that SLS Properties is petitioning to place a large, four-story parking garage, bordering houses on Mayfair Street. It would not only be an eye-sore but also an invasion of privacy for my neighborhood, which borders the property.

If this garage were built, visitors parking there would have a view into the backyards of the houses bordering the property and into the rest of our neighborhood. Consider families with children, enjoying Joe Gaither Park, on view from the parking garage: a loss of privacy and ambiance.

By the way, notice that the windows of the office building on Fournace do not have a straight view into the neighborhood to the south.

The garage would be better placed abutting the gas station and in the open space on Loop 610 as is suggested int he 2017 Comprehensive Plan. Better still, do away with the idea of a four-story parking garage, and use surface parking only.

Concerned,
Sally Brashear
1116 Anderson Street
Bellaire, TX 77401

October 3, 2018

Brian and Karen Dickson
4603 Cedar Oaks Lane
Bellaire, Texas 77401

ATTENTION:
Ashley Parcus
Development Services
City of Bellaire
7008 South Rice Avenue
Bellaire, TX 77401

Subject: 4800 Fournace Place Development Project

Dear Miss Parcus,

My name is Brian Dickson. I have been a resident of the City of Bellaire for nearly 20 years.

During this lengthy period of time, I have observed many positive and significant changes within our community which include: improvements in both Commercial and Residential Real Property.

<u>Examples of observed Real Property Improvements include (but are not limited to):</u>

Bellaire Residents' approval of a $11,000,000 bond to design and construct a new City Hall, Police Station, Municipal Court, and Civic Center

Bellaire's Road and Drainage System Improvements

Multi-Story Commercial Development Projects with Elevated Parking (to include HEB's first multi-level grocery store in Houston – notably located with the City of Bellaire):

---> https://www.bizjournals.com/houston/news/2018/04/10/multilevel-h-e-b-in-bellaire-hits-the-market.html

Residential Improvements (far too many to list)

Also, as observed in the past, it appears that the City of Bellaire is endeavoring to posture itself strategically as to continually evolve given the competitive nature of neighboring community commercial and residential improvement projects and developments (such as those occurring in River Oaks, West University Place, Boulevard Place, etc.).

Furthermore, it has recently come to my attention that the previously vacated Chevron Complex (at / or about “4800 Fourance Place”) has been recently purchased with intentions to re-develop this property in a manner similar to the aforementioned communities.

I believe that re-development efforts, along with any construction requirements, of “4800 Fournace Place” should be approved and should allow for both commercial and residential utilization. Specifically, I believe that approval should allow for multi-tenant offices, parking facilities (to include vertical parking garages), restaurants, retail sales (i.e. retail stores), and multi-family dwellings (again, similar to the aforementioned communities).

I also believe that such developmental efforts would be greatly beneficial to the City of Bellaire (to include but not be limited to: governmental and business entities, residents, and visitors) as to support quality of life issues, direct and indirect revenue, and would also allow for an increased source of taxable income for use by, including but not limited to, the City of Bellaire, City of Houston, and Harris County.

This is especially fortuitous news for the City of Bellaire as within the past decade, the City of Bellaire and its residents have been deeply impacted by multiple significant and catastrophic events (such as Hurricane Ike and Hurricane Harvey) which resulted in the devastation of a vast amount of real property. Furthermore, in addition, rising costs of day-to-day operations have further negatively impacted both governmental and commercial entities within the City of Bellaire.

Therefore, due to the aforementioned events, conditions, and evolving changes, I believe that re-development efforts of “4800 Fournace Place” would greatly benefit the City of Bellaire.

In closing, as a resident of the City of Bellaire for nearly 20 years, I strongly recommend approval of any and all permits required for the aforementioned project.

Thank you for your consideration in this matter.

Sincerely,

//SIGNED//
Brian H. Dickson

John & Ruth Posey
5013 Evergreen Street
Bellaire, Texas 77401-5014

2 October 2018

Ms. Ashley Parcus
Development Services Coordinator
Development Services
7008 South Rive Avenue
Bellaire, Texas 77401

RE: Development at 4800 Fournace

Dear Ms. Parcus

Our names are John A. Posey, Jr. and Riuth. A. Posey. We reside at 5013 Evergreen Street. We have lived in Bellaire for the past 19 years with our family.

I understand that an application was made to build a modern multilevel parking garage with covered parking on the existing former Chevron property.

I am glad that this property is finally being developed and that it will renovate the old Chevron buildings instead of tearing them down. I hope that other parts of the Chevron property will also be developed soon.

This is good not only for the City of Bellaire but also the other communities that surround Bellaire. It would be nice to see other businesses benefitting our neighborhood on this property as well.

Thank you for your support,

John Posey Jr

John A. Posey, Jr.

Ruth A. Posey

Ruth A. Posey

September 27, 2018

Dear Ms. Parcus

My name is Igor Cherches, I reside at 4501 Verone. I have lived in Bellaire for the past 20 years.

I understand that an application was made to build a modern multilevel garage with covered parking on the former Chevron property at 4800 Fournace Place. I also understand that an application was made to lease the existing property to multiple tenants. I am glad that this property is finally being developed and that it will repurpose the old Chevron buildings instead of tearing them down.

I hope that other parts of the Chevron property will also be developed soon. This is good not only for the City of Bellaire but also the other communities that surround Bellaire. It would be nice to see other businesses benefitting our neighborhood on this property as well.

Thank you for your consideration,

Igor M. Cherches, M. D.

Bellaire Pediatric Dentistry, P.A.

"Oral healthcare for the growing and developing child"

Joel J. Vela, D.D.S. **Diplomate, American Board of Pediatric Dentistry**

October 2, 2018

Ashley Parcus
Development Services Coordinator
City of Bellaire
7008 South Rice Avenue
Bellaire, TX 77401

Dear Ashley,

I have maintained my private practice in the Frost Bank Building since 1999 and have welcomed the influx of healthcare businesses to my building and the community over the last several years. As a business person in Bellaire, I welcome the arrival of new businesses to the community and do as much as possible to frequent and refer to other Bellaire businesses.

I recently learned of an application to change the use of the former Chevron property, located on Fournace Place, from single tenant to multi-tenant usage. I believe this property has been vacant for some time. I even recall the idea being floated at one time to move Bellaire High School to this site. Changing this property from single to multi-tenant use would perhaps provide an opportunity to lease the existing property to multiple tenants which in turn, would benefit not only Bellaire, but the surrounding communities as well. Understandably, a multi-level garage would be necessary to accommodate tenants and clientele. I believe landscaping has also been proposed that would enhance the physical appearance of the property.

I support the conversion of this property from single- to multi-tenant usage as an alternative to its demolition.

Respectfully submitted,

Joel J. Vela, D.D.S.

6750 West Loop South • Suite 795 • Bellaire, Texas 77401 • Phone: 713-661-1100 • Fax: 71

James and Valerie Harrison
5128 Huisache Street, Bellaire, TX 77401

September 29, 2018

Planning and Zoning Commission
City of Bellaire Texas
Bellaire, TX 77401

RE: Applications filed by SLS Properties LLC (1) to Allow for Multi-tenant Office Use in the Existing Office Buildings on the Former Chevron Property, and (2) to Allow for the Construction of a Parking Garage Adjacent to the Existing Office Buildings

I am a resident of the City of Bellaire. My home is located at 5123 Huisache Street. I am a native Bellairian having grown up on the 4500 block of Elm street. I have lived in Bellaire for approximately thirty years, with the past nine years at my current address. My son is a senior at Bellaire High School. I have many strong ties to the community and I want what is best for Bellaire.

Danny Sheena and Ronnie Sheena, the principals of SLS Properties LLC, also live in Bellaire and want what is best for Bellaire. I have personally known Ronnie and his wife Helene for approximately a decade. They have raised three outstanding daughters in Bellaire and have been active members of the community. They are convicted to develop the property at 4800 Fournace in a manner that is appropriate for the community in which they reside and which they love, and in a manner that is sensitive to their Bellaire neighbors.

I am writing to support SLS Properties LLC's specific use permit requests for (1) the use of the existing office building on the former Chevron property as a multi-tenant office building, and (2) the construction of an adjacent parking structure. I also support the future development of the remainder of the property.

SLS Properties LLC's proposed use of the existing building as multi-tenant and the related construction of a parking structure should be approved because they fulfill the goals of the Comprehensive Plan and Council Priorities.

The Comprehensive Plan states that is should guide city officials and staff in making decisions:

> *The plan is ultimately a guidance document for City officials and staff who must make decisions on a daily basis that will determine the future direction, financial health, and "look and feel" of the community.*

A section of the Comprehensive Plan entitled *North Bellaire Special Development Area* is devoted to this particular property, encouraging redevelopment. Furthermore, beginning on page 5.7, the Comprehensive Plan has a section entitled, *Commercial Development in General*, in which it "encourages revitalization of older buildings," which supports the applicant's proposed refurbishment of the existing office building on the former Chevron site, and "easy access to parking," which supports the applicants desire to build an appropriate parking structure.

One of City Council's "focus areas" as identified in *Council Priorities*, as revised June 18, 2018, is Commercial Redevelopment. The Statement for this focus area reads as follows:

> *The City Council of the City of Bellaire, Texas, is dedicated to proactively seeking ways to enhance economic viability of the Bellaire business community in concert with the Comprehensive Plan.*

The specific Council Priorities under this focus area are as follows:

- Draft and adopt ordinances to facilitate the implementation of the Comprehensive Plan.
- Encourage new business development; facilitate business expansion and provide a diverse basis of business opportunities.
- Continue proactive dialogue with the business community.
- Remain sensitive to and address commercial and institutional impact on adjacent residential areas.

Certainly adherence to these priorities support the re-development of the 4800 Fournace property, and the applicant's request to turn the office building into a viable, productive building by making it a multi-tenant building supported by an appropriate parking structure. To borrow words from Statement and from the second focus area above, this development should be ***proactively encouraged*** and ***facilitated***.

As a tax paying citizen, I also support the redevelopment effort. Approximately 55% of all general fund revenues come from personal property taxes, which is a much higher concentration than most cities in Texas. In addition, approximately 68% of all debt service fund revenues come from personal property taxes. New development and redevelopment of commercial property in Bellaire increases the amount of commercial property taxes paid, thereby reducing the burden on residents, and will likely generate increased sales taxes, further diluting the residential property tax burden. Not only is this good for residents in general, it behooves the City to look for opportunities to increase alternative revenue sources such as increased commercial property taxes and increased sales taxes. This is especially true on the heels of Hurricane Harvey, where aggregate residential property values took a hit while aggregate commercial property values increased. Many residents are still reeling from the effects of the Hurricane. The City was sensitive to their plight in not raising taxes and not increasing utility rates for the upcoming fiscal year. Alternative revenue sources such as new commercial property taxes generated from redevelopment and increased sales taxes surely are welcome.

Sincerely,

James H. Harrison

Copy: ChaVonne Sampson, Director of Development Services, City of Bellaire
Ashley Parcus, Development Services Coordinator, Development Services, City of Bellaire

September 25, 2018

Ms. Ashley Parcus
Development Services
City of Bellaire

Dear Ms. Parcus,

I am writing about some of our concerns about the permit application for the formerly Chevron property. My husband and I have resided for 23 years at 808 Holton Street which is located very near the holdings under review.

We were disappointed when Chevron announced it was selling the property because the company was an extremely good neighbor. We realize that the city cannot approve what company buys assets within its borders but we were certainly hoping for a group that would preserve the integrity of the buildings and green space or view it as an opportunity to develop upscale shopping or housing that would contribute to the quality of life in the area and home values. We are familiar with SLS Properties LLC and one of the buildings it operates on Westheimer. It appears that the company's niche is to buy older, distressed properties then lease the assets with minimal upgrades or maintenance. While this is a profitable business model, it is not the goal one wants for a neighbor.

However, our greatest concern is the plan for overflow cars to travel down Fournace to Anderson Street and onto Elm Street. This would be harmful for safety reasons to the residents who live along these corridors. Speed bumps have already been added to both streets to deal with the current high levels of traffic to no avail. We still have many people who cut through the neighborhood from Fournace and also from South Rice. Unfortunately, the speed bumps do not deter many from traveling too fast, and during peak travel times, Elm Street is like a major thoroughfare. The signs specifying no trucks are ignored and the regulation is not enforced.

We have two dogs that are walked daily. We have almost been hit several times due to heavy traffic on Elm and dodged traffic on Anderson Street since it does not have sidewalks. It is also dangerous for small children to play in the front yard due to both traffic concerns and the threat of potential predators who enter the neighborhood. Certainly all of Bellaire is concerned about crime, but when cars outside of your neighborhood flood your streets daily, the area is at greater risk for thievery and other criminal acts.

Bellaire is a city within a city, but foremost, it is a community of homes. We ask that every consideration be made to favor the homeowner’s perspective as this process moves forward.

Kind regards,

Janice and Tom White

P&Z Commissioners

The proposed parking garage is **not in compliance with the 2017 Comprehensive Plan** for the North Bellaire Special Development Area. Three aspects fail to meet plan standards:

1. The Comprehensive Plan states: The *lowest development intensities*, together with adequate separation and buffering, should occur *along the northern boundary* of the area, closest to the single-family homes that front on Mayfair Street.
   The garage should front on Fournace St. to meet this requirement. Putting a four-story parking garage with a driveway four feet await from the fence is not "lowest intensity." Also note that the line of trees is on residents' side of fence (easement), not the commercial property, and may be adversely affected by the driveway; other mature trees that guard the view would be taken down. Additional width of green space, at least 100ft, and more trees should buffer the single-family homes from business traffic.
2. The Comprehensive Plan states: Specifically, the most intensive uses in the Special Development Area, and their associated vehicular access points, should be located *along or near the Loop 610 frontage.*
   To the contrary, the SLS plan shows only one narrow entrance along the 610 frontage and two on Fournace St. Two major entrances, or one wide multi-lane driveway, should be on the feeder road to comply with the Comprehensive Plan. The developers have to deal with TxDot as required, not shirk from following the Plan. Fournace is a narrow street with cramped entrances that back up traffic.
3. The Comprehensive Plan states: A "height-setback plane" (greater setback of upper portions of buildings) should govern the *allowable height of potential multistory buildings near single-family homes* to maintain openness and protect residential privacy.
   This restriction can only mean that a four-story building cannot be allowed to loom over the back yards on Mayfair. Precedent of parking garages on First Street and on the other side of the freeway is two to three levels, some with basements, separated by a street (how wide is that?) or more than 50 feet of green space with mature trees.

I approve of revitalization of the building — implosion would be a negative environmental impact. Neighbors previously desired continued use of the property as a quiet office park, since contamination issues would preclude residential use and restaurants.

The 6-ft sidewalk along Fournace does belong to property owner. It was put in place and paid for by Chevron, per Lynn McBee. Now it is full of potholes. Sheena verbally promised to maintain it, so please ask him to put sidewalk replacement in his plan.

His plat shows extensive green space on the property where currently there are parking lots and old foundations. Please ask for actual restoration to green space in his plan. Never forget that this affects runoff onto city streets, especially Mayfair St., and sometimes floods homes.

Since only two of you were on the board in 2017 when the Comprehensive Plan was amended for the North Bellaire Special Development Area, it is easy to understand why it did not come up in your earlier discussion. It is now the guide for future redevelopment of this property, and now is the opportunity to follow its vision for a better Bellaire. You can find this section, amended April 3, 2017, in pages 41-43 of the posted Comprehensive Plan.

Thank you.

Catherine Lewis
1112 Colonial St

October 3, 2018

Dear members of The City of Bellaire Planning & Zoning Commission,

My family and I have been residents of the City of Bellaire since 2009 and I appreciate all you have done for the city. It's a great place to live and the city's services and relevant departments are fantastic. I am writing you to provide comments regarding the future use of the Chevron property at 4800 Fournace Place. I believe that the proposed parking garage should not be permitted for several reasons.

First, the proposed location of the parking garage is not in compliance with the 2017 Comprehensive Plan for the North Bellaire Special Development Area (see this: https://www.bellairetx.gov/DocumentCenter/View/19623/NBSDA-adopted-April-3-2017?bidId=) because it fails to meet its standards, as such:

- The Comprehensive Plan states that the lowest development intensities, together with adequate separation and buffering, should occur along the northern boundary of the area, closest to the single-family homes that front on Mayfair Street. If any sort of new construction takes place for a garage or other structure, the garage should be next to Fournace to meet this requirement. Also note that the line of trees behind the existing houses on Mayfair is on the residents' side of the fence (easement), not the commercial property, and will be adversely affected.

- The Comprehensive Plan states that the most intensive uses in the Special Development Area, and their associated vehicular access points, should be located along or near the Loop 610 frontage. To the contrary, the SLS Properties plan shows only one narrow entrance along the 610 frontage and two on Fournace. Two major entrances, or one wide multi-lane driveway, should be on the feeder road to comply with the Comprehensive Plan. The developers work with TxDot as required, and not shirk from following the Comprehensive Plan. Fournace is a narrow street with cramped entrances that can cause a back up of traffic.

- The Comprehensive Plan states that a "height-setback plane" (greater setback of upper portions of buildings) should govern the allowable height of potential multistory buildings near single-family homes to maintain openness and protect residential privacy. This restriction can only mean that any sort of four-story building or garage cannot be allowed to loom over the backyards on Mayfair. Note the precedent of parking garages on First Street and on the other side of Loop 610 is two to three levels, some with basements, separated by a street or more than 50 feet of green space with mature trees.

Also, many neighbors and I are puzzled why SLS Properties LLC would want to erect a parking garage at all because according to the new owner, there will be fewer tenants and employees in the main office building than when Chevron operated the property. It seems logical that the developers should use the existing surface lots for parking. Plus, the parking garage would be very far from the building entrance – why would an employee want to walk that far to the main building from a garage located behind Mayfair Street?

Also, imagine if you lived on Mayfair Street – would you want a parking garage right behind your house? The answer is no. Please do not issue a permit to SLS Properties for locating and building a garage behind Mayfair or anywhere on the old Chevron property. It does not seem logical, practical and it is outside of the 2017 Comprehensive Plan for the North Bellaire Special Development Area.

The key question is whether or not erecting a parking garage or making any changes in the future to the old Chevron property will create or destroy value for the area and the hundreds of long-time residents living near Fournace Place. I think the City of Bellaire needs to create value for its homeowners rather than destroy it when looking at future plans and permits for the 4800 Fournace property. I respectfully request that you take these points into account.

Sincerely,

Henry Means

4905 Imperial Street

Bellaire, TX 77401

Debi Mishael
4813 Tamarisk Lane
Bellaire, TX 77401

9/27/18

Ashley Parcus
Development Services Coordinator
City of Bellaire
7008 South Rice Avenue
Bellaire, TX 77401

Dear Ms. Parcus.

My name is Debi Mishael and I live at 4813 Tamarisk Lane in Bellaire. My husband and I have lived in Bellaire for the past 13 years in this same location with our family.

I understand that an application was made to build a modern multilevel parking garage with covered parking on the Chevron property. I am glad that this property is being developed and that it will repurpose the old Chevron buildings instead of tearing them down.

This is good not only for the City of Bellaire but also the other communities that surround Bellaire. It would be nice to see other businesses benefitting our neighborhood on this property.

As a homeowner, I am obviously concerned about property values and neighborhood safety. A professional building is a good option for this location. Retail stores would concern me at this location as would more industrial or warehouse type businesses.

I think it is the best interest of the city to ensure a safe and productive use of this land that enhances the neighborhoods and provides services to the population.

Sincerely,

Debi Mishael

Planning and Zoning Commission
Council Chamber, First Floor of City Hall
Bellaire, TX 77401-4411

Meeting: 10/11/18 05:00 PM
Department: Development Services
Category: Specific Use Permit
Department Head: ChaVonne Sampson
DOC ID: 2708

SCHEDULED
ACTION ITEM (ID # 2708)

Item Title:

Docket # SU-2018-06-Consideration of an application filed by SLS Properties, LLC, as applicant, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for the construction of a parking garage adjacent to the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 4) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

Background/Summary:

On September 13, 2018, the Planning and Zoning Commission held a public hearing on a request filed by Danny Sheena of SLS Properties to allow for the construction of a 4-story parking garage adjacent to the existing office buildings located at 4800 Fournace Place. "Parking structures and parking lots" are permitted as a specific use within the Technical Research Park District.

During the public hearing, concerns were raised by the Commission regarding the fact that the Traffic Impact Analysis (TIA) had not yet been reviewed by the appropriate parties, and that the applicant wasn't at liberty to disclose information regarding any environmental concerns of the property. The TIA has since been reviewed and information regarding the environmental concerns has been received and was provided to the Commission.

Traffic Impact Analysis:

A TIA was completed for the property and was included in the Commission's public hearing agenda packet. Comments from the City's Traffic Engineer were not received until after closure of the public hearing and were therefore included in the Commission's packet for consideration of the item. The comments were provided to the applicant, who, in turn provided updated information for further review. The updated information was resubmitted to the City's Engineer and those comments are included in the packet as well.

Parking:

According to the applicant, there is approximately 500,000 square feet of lease-able office space located within the existing buildings, which based on Section 24-514a of the City of Bellaire's Code of Ordinances, would require that at least 1,500 parking spaces be available on site. The proposal provides a 2,000 car parking garage, which is based on the market standard of 4 per 1,000 square feet.

Landscaping, Screening, and Buffering:

Section 24-544 of the City's Code of Ordinances states that screening is required and shall comply with Table 24-513.A. The street trees that already exist along the Fournace frontage are in compliance with the requirement, and additionally the applicant is proposing to install a significant amount of trees and shrubbery within the site, and along the Loop 610 frontage. Based on a conversation with the City's Fire Marshal, the fire lane that was originally proposed to be installed behind the parking garage is not necessary and could be replaced with additional landscaping. As part of staff's recommendation, a condition is being added to require that the applicant install trees in place of the fire lane. Additional screening will also be present between the residential properties and the parking garage in the form of a masonry wall/fence. Based on the regulations set forth in the Technical Research Park Zoning District, as well as the City's Comprehensive Plan, a height-setback plane should govern the allowable height of potential multi-story buildings near single-family homes to maintain openness and protect residential privacy. Based on this regulation, the parking garage will be required to have a setback of 53.57 feet from the residential boundary. City staff will ensure that this requirement has been met during the plan review process.

Development Review Committee:

The City’s Development Review Committee held two meetings to discuss the application, one on September 4th and the second on September 25th. During the September 4th meeting, the main concern was whether or not the applicant plans to continue providing after hour security to the site, and whether a traffic signal will be installed or a police officer will be utilized to direct traffic during peak times of the day. The fire lane, proposed to be located directly behind the parking garage, was also discussed. The Fire Marshall advised staff that as long as the emergency vehicles were able to access the site via the street located in between the buildings and the parking garage, then the fire lane was not necessary.

During the follow-up meeting on September 25th, the discussion revolved around the TIA, specifically with regard to the proposed ingress/egress site that would potentially be opened up off of Loop 610 and whether or not the applicant had received approval from TxDOT to open that drive back up. The Fire Marshal also mentioned that stand pipes will need to be installed in the parking garage and suggested that it be sprinkled as well.

The *Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-615, Standards Applicable to all Planned Development Amendments and Specific Use Permits,* details the five criteria that must be met for the issuance of this request:

1. **The proposed planned development amendment or specific use permit is consistent with the purposes, goals, objectives, and standards of the comprehensive plan of the City of Bellaire.**

   The Comprehensive Plan’s Future Land Use and Character Map designates this site as the North Bellaire Special Development Area, and describes it as appropriate for "areas already developed as, or envisioned for office and research technology-related uses in a campus-like environment," which are not dominated by surface parking. Landscaping and buffering requirements, as outlined in Goal 2.1 Considerations 1, 3, and 4 are being met by the applicant with the installation of fencing and landscaping on the site. Goal 2.1 Consideration 4 also urges new developments to "use maximum lot coverage standards to limit the extent of parking areas on non-residential sites within or adjacent to residential neighborhoods," as well as to "take advantage of major construction and building expansion projects to explore the potential relocation or reconfiguration of parking arrangements..."

2. The design of the proposed development, considered as part of the specific use permit, minimizes adverse effects, including visual impacts of the proposed use on adjacent properties.

Adverse effects and visual impacts of the proposed use on the adjacent residential properties will be minimized through the requirement of the height-steback plane, landscaping, screening and buffering. The proposed traffic circulation plan utilizes the two currently existing driveways on Fournace Place, and is also proposing to open up the additional ingress/egress point off of the Loop 610 feeder road. There will be no access to the site from Anderson Street.

3. The proposed development will not have an adverse effect on the value of the adjacent property.

While generally the location of commercial businesses near residential properties may have an adverse impact on the value of the adjacent property, considering the fact that the subject property is zoned as a Technical Research Park and previously housed office buildings for Chevron U.S.A, the proposed use would not increase the negative impacts that already exist.

4. The proposed development will not unduly burden essential public facilities and services, including streets, police and fire protection, sanitary sewers, storm sewers, solid waste disposal and schools.

The proposal has been reviewed by the Public Works Department and the Police and Fire Departments, and it has been determined that the development will not unduly burden essential public facilities and services. The applicant must also meet all requirements of the Texas Commission on Environmental Quality (TCEQ).

5. The applicant for the development has adequate financial and technical capacity to complete the development as proposed and has met all requirements of this Code, including such conditions as has been imposed as a part of this specific use permit.

The applicant has adequate financial and technical capacity to complete the development as proposed, and has met all requirements of this code.

Recommendation:

Finding that the application meets the standards set forth in Section 24-615 for the approval of a Specific Use Permit, the Development Services Department recommends approval of the applicant's request for a specific use permit to allow for the construction of a parking garage adjacent to the existing office buildings located at 4800 Fournace Place, with the following conditions:

1. That trees be installed, in accordance with Section 24-513, in place of the proposed fire lane on the north side of the property, between the parking garage and the residential homes on Mayfair.

2. That the ingress/egress point off of Anderson Street be permanently closed.

3. That the parking garage be constructed in accordance with the design standards set forth in Section 24-513a.

ATTACHMENTS:

- SLS Application Specific Use Parking Garage (PDF)
- 4800 Fournace Place TIA Review 092418 (PDF)
- 100118-4800 Fournace Office Traffic Analysis v1.1 (PDF)
- 100118 4800 Fournace Place Office TIA Review Response (PDF)
- 4800 Fournace Place TIA Review 100218 (PDF)
- TxDot Plans (PDF)
- TCEQ Memo (PDF)

APPLICATION FOR SPECIFIC USE PERMIT

(4800 Fournace Place, Bellaire TX 77401)

August 10, 2018

SLS Houston Properties, LLC ("SLS") provides this Application for Specific Use Permit to specifically authorize construction of a **PARKING GARAGE** adjacent to the existing office buildings previously occupied by Chevron U.S.A., Inc. and located at 4800 Fournace Place, Bellaire TX 77401 ("Property").

The following is the relevant section of the City Ordinance dealing with Special Use Permits.

Section 24-605. – Application for Specific Use Permit.

Any person desiring to petition for a specific use permit to this chapter shall be required to file an application in writing with the Planning and Zoning Official, accompanied by a nonrefundable application fee, in an amount established by the City Council or by City Manager, to defray the actual cost of processing the application. The application shall include the following information:

(1) *The name and address of the applicant; and in the event that the applicant is a partnership, the full name and address of the general partner, and in the vent that the applicant is a corporation, the full names and addresses of all officers, a statement as to the state of incorporation, the name and address of the registered agent and the address of the registered office of the corporation;*

Applicant Name: SLS Houston Properties, LLC
Address: 2500 West Loop South, Suite 518, Houston TX 77027
Company Ownership: Danny Sheena, Managing Member
4612 Oleander St., Bellaire TX 77401
Dr. Ronnie Sheena, Member
117 Marrakech Ct., Bellaire TX 77401

(2) *The Section or Sections of this chapter authorizing the specific use permit;*

Section 24-544. – Technical Research Park District (TRPD).

A. *Purpose.* The Technical Research Park District is an area of high quality office use, including technical laboratory, computer center, engineering/operations and research facility uses, which is in close proximity to interstate highway Loop 610 and is characterized by the zoning requirements set forth in this Section.

C. *Specific uses.*

3) Office buildings.
4) Parking structures and parking lots (private).
5) Central Plant including electrical generating facility (private).
7) Radio, television and microwave antenna or tower.
8) Technical research laboratories.
9) Computer operations.

D. *Standard regulations.*

1) Size and area.
   a) Lot area: The minimum lot area shall be two (2) acres.
   b) Maximum building height: No building, except those buildings in their appurtenances existing as of November 1, 1983, shall have a height in excess of six (6) stories (excluding cooling towers, roof gables, chimneys, radio and television antennas, vent stacks and similar extensions which may extend for an additional height, the total not to exceed eighty-four (84) feet.
   c) Maximum floor area to site area: One hundred (100) percent of site area.
   d) Building lines (except those buildings and their appurtenances existing as of November 1, 1983):
      1. No building shall be constructed less than fifty (50) feet from the right-of-way line of the abutting interstate Highway Loop 610 Service Road;
      2. All other building lines shall be computed on the basis of a ratio of .84-foot of building height per one foot of distance between said building lines and the nearest point on a lot zoned residential or in residential use that is outside of the district and existing on the date said district is established by ordinance.
   f) Site plan review required: All specific use applications in this district require site plan review and approval to ensure conformance with the standards for this district and other applicable provisions of the City Code.
3) Screening. Shall comply with Section 24-513.
4) Outdoor lighting. All outdoor lighting shall be located, screened or shielded so that adjacent residential lots or structures are not directly illuminated.

(3) *A legal description and street address of the property which is the subject of the application;*

Street Address: 4800 Fournace Place, Bellaire TX 77401

Legal Description: 30.4576 Acres as follows:

Tract I:

All of lot five (5), six (6) and seven (7), block twelve (12), in Westmoreland Farms Amended First Subdivision, according to the map or plat thereof recorded under Volume 3, page 60 in the map records of Harris County, Texas.

Tract II:

Lot five (5), six (6), seven (7), eight (8) and nine(9), block one (1) and lot five (5), six (6), seven (7), eight (8) and nine(9), block two (2) of Twin Oaks, Section Once (1), a subdivision in Harris County, Texas, according to the map or plat recorded in Volume 34, Page 51 of the Map Records of Harris County, Texas.

(4) *A statement of ownership accompanied by a certificate from a title insurance company certifying ownership;*

Ownership of the Property is currently vested with Chevron U.S.A., Inc. (Exhibit 1). SLS Houston Properties, LLC is under contract to purchase the Property from Chevron. Attached is a written authorization from Chevron to make this Application. (Exhibit 2).

(5) *A written description of the proposed specific use as provided for in this Code;*

The proposed specific use is for a parking garage to be constructed adjacent to the existing office buildings. The parking garage will have 4 suspended levels and will have approximately 2,000 parking spaces. The first suspended level will be at elevation 11'-6". The second, third and fourth suspended levels will be at 10'-0" each above the first suspended level. There will be a 3-6" concrete security barrier along perimeter of the fourth suspended parking level. The total parking garage height will be 45'-0". The parking garage will be a minimum of 40' South of the North Property line. Approximately 3.0 acres of land will be used to construct the new parking garage.

The current taller office building is 10 stories and has a height of approximately 150 feet plus the antennas. The current smaller office building is 6 stories and has a height of approximately 85 feet. The total land that includes the office buildings, the central plant and the newly constructed parking garage is approximately 13.5 acres. The parking garage will be used by the multiple tenants who will occupy the office buildings. Unfortunately, the City of Bellaire has experience severe flooding in recent years. The parking garage will also be used, free of charge, by Bellaire residents including who seek to park their vehicles in elevated areas during flood events.

(6) A written environmental assessment statement describing in general terms the impact of the development for which approval is sought and providing any specific information that the Planning and Zoning Official shall deem necessary; and

There will be no environmental impact to the Property following construction of the parking garage. During construction, piers and a foundation will be constructed to structurally support the parking garage. Construction of the piers, foundation and parking garage will be performed in accordance with the City of Bellaire Code and TCEQ requirements. The above ground structural components will most likely be pre-cast concrete that is manufactured outside of the Property and installed by a crane in pieces like a puzzle. Trees will be placed around the parking garage, including along the North garage portion that is adjacent to the Mayfair Street residents. An architectural 8' fence will be placed along the North boundary of the parking garage. All vehicles will enter and exit the parking garage from Fournace (Exhibit 3A). Furthermore, all outdoor lighting will be located, screened or shielded so that adjacent residents are not directly illuminated. Please see the attached Site Plan (Exhibit 3) and 3D modeling (Exhibit 4).

(7) Such other information or documentation as the Planning and Zoning Official, the Planning and Zoning Commission or the City Council may from time to time designate or which may be deemed necessary and appropriate to a full and proper consideration and disposition of the particular application.

See attached Site Plan (Exhibit 3) and 3D modeling (Exhibit 4) of the proposed parking garage.

Thank you in advance for your assistance in this application. Request is respectfully made for an expedited review of this Application. Please do not hesitate to contact me if you have any questions or if you need additional information.

Very truly yours,

Danny M. Sheena

DMS/4800 Fournace/Application Specific Use Parking Garage/me

Attachments

First American

Commitment

Commitment For Title Insurance T-7

ISSUED BY

First American 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 FIRST AMERICAN TITLE INSURANCE COMPANY 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.

First American Title Insurance Company

Dennis J Gilmore
President

Jeffrey S. Robinson

Jeffrey S Robinson
Secretary

EXHIBIT
1

First American

SCHEDULE A

Commitment For Title Insurance T-7

ISSUED BY

First American Title Insurance Company

Effective Date: **May 22, 2018** at 8:00 a.m. GF No. **NCS-816950-SA1**

Commitment No. **NCS-816950-SA1**, issued **June 01, 2018**, at 8:00 a.m.

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: $0.00
PROPOSED INSURED:

(b) TEXAS RESIDENTIAL OWNER'S POLICY OF TITLE INSURANCE ONE-TO-FOUR FAMILY RESIDENCES (Form T-1R)
Policy Amount: $
PROPOSED INSURED:

(c) LOAN POLICY OF TITLE INSURANCE (Form T-2)
Policy Amount: $
PROPOSED INSURED:
Proposed Borrower:

(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: **Fee Simple**

3. Record title to the land on the Effective Date appears to be vested in:

Chevron U.S.A. Inc., a Pennsylvania corporation (As to Tracts I and II)

4. Legal description of land: TRACT I:

ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II:

LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

Branch :NCP,User :BRCR Comment: Station Id :BGXJ

WD

17
D

SPECIAL WARRANTY DEED

(Cash)

W246273
11/25/02 200006909 $17.00

THE STATE OF TEXAS)

COUNTY OF HARRIS)

559-56-1249

KNOW ALL MEN BY THESE PRESENTS:

THAT THE UNDERSIGNED,

TEXACO INC., a Delaware corporation, hereinafter referred to as "Grantor", whether one or more, for in consideration of the sum of TEN DOLLARS ($10.00) cash, and other good and valuable consideration in hand paid by the Grantee herein named, the receipt and sufficiency of which is hereby fully acknowledged and confessed, has GRANTED, SOLD and CONVEYED, and by these presents does GRANT, SELL and CONVEY unto

CHEVRON U.S.A. INC., a Pennsylvania corporation, herein referred to as "Grantee", whether one or more, the real property described on the attached Exhibit "A" attached hereto and made a part hereof

TOGETHER WITH, all and singular, the rights, benefits, privileges, easements, tenements, hereditaments, appurtenances and interests thereon or in anywise appertaining thereto and with all improvements located thereon (said land, rights, benefits, privileges, easements, tenements, hereditaments, appurtenances, improvements and interests being hereinafter referred to as the "Property").

For the same consideration recited above, Grantor hereby BARGAINS, SELLS and TRANSFERS, without warranty, express or implied, all interest, if any, of Grantor in (i) strips or gores, if any, between the Property and abutting or immediately adjacent properties, and (ii) any land lying in or under the bed of any street, alley, road or right-of-way, opened or proposed, abutting or immediately adjacent to the Property.

This conveyance, however, is made and accepted subject to any and all validly existing encumbrances, conditions and restrictions, relating to the hereinabove described property as now reflected by the records of the County Clerk of Harris County, Texas

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging unto the said Grantee, Grantee's heirs, executors, administrators, successors and/or assigns forever; and Grantor does hereby bind Grantor, Grantor's heirs, executors, administrators, successors and/or assigns to WARRANT AND FOREVER DEFEND all and singular the said premises unto the said Grantee Grantee's heirs, executors, administrators, successors and/or assigns, against every person whosoever claiming or to claim the same or any part thereof, by, through, or under Grantor, but not otherwise.

Current ad valorem taxes on said property having been prorated, the payment thereof is assumed by Grantee.

FILE FOR RECORD
8:00 AM

NOV 25 2002

BRMFS1 338776v2

Beverly B. Kaufman
County Clerk, Harris County, Texas

This Special Warranty Deed is executed and delivered as of July 1, 2002 and shall be deemed effective as of July 1, 2002.

Texaco Inc., a Delaware corporation

By: Walker C Taylor

Name: Walker C. Taylor

Title: ~~Assistant Secretary~~

Grantee's Address: Chevron U.S.A. Inc.
c/o ChevronTexaco Business and Real Estate Services
2613 Camino Ramon, Suite 200
San Ramon, CA 94583

/CR

559-56-1250

BRMFS1 338776v2

STATE OF CALIFORNIA)
) ss.
COUNTY OF Contra Costa)

On October 23, 2002, before me, Cherilyn Robertson, Notary Public, personally appeared Walker C. Taylor, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument, the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

(SEAL)

CHERILYN ROBERTSON
Commission # 1268207
Notary Public - California
Contra Costa County
My Comm. Expires Jun 23, 2004

Signature Cherilyn Robertson

559-55-1251

Exhibit A

559-56-1252

BRMFS1 338776v2

Branch :NCP,User :BRCR Comment: Station Id :BGXJ

Exhibit A

Property Address	Legal Description	Harris County Appraisal District Account No.
5901 S. Rice Ave.	Lot 5 and Tract 6 Block 12, Westmoreland Farms	0370530120005
4800 Fournace Pl.	Lot 7 and Tract 6A Block 12, Westmoreland Farms	0370530120007
0 Fleetwood	Lots 5 through 9 and Tract A in Block 1, Twin Oaks	0771830010005
0 Fleetwood	Lot 7 Block 2, Twin Oaks	0771830020007
0 Fleetwood	Lots 5,6,8, and 9, Block 2, Twin Oaks	0771830020005
4709 Mayfair St.	Lot 14 Block 2, Twin Oaks	0771830020014
4711 Mayfair St.	Lot 15 Block 2, Twin Oaks	0771830020015
4713 Mayfair St.	Lot 16 Block 2, Twin Oaks	0771830020016
4715 Mayfair St.	Lot 17 Block 2, Twin Oaks	0771830020017
4717 Mayfair St.	Lot 18 Block 2, Twin Oaks	0771830020018
4803 Mayfair St.	Lot 20 Block 2, Twin Oaks	0771830020020
4805 Mayfair St.	Lot 21 Block 2, Twin Oaks	0771830020021
4819 Mayfair St.	Lot 28 Block 2, Twin Oaks	0771830020028
5015 Mayfair St.	Lot 2 Block 3, Loveland Terrace	0772090030002
5013 Mayfair St.	Lot 3 Block 3, Loveland Terrace	0772090030003
5011 Mayfair St.	Lot 4 Block 3, Loveland Terrace	0772090030004
4919 Mayfair St.	Lot 10 Block 3, Loveland Terrace	0772090030010
4905 Mayfair St.	Lot 17 Block 3, Loveland Terrace	0772090030017
10201 Westpark Dr.	Res D2 Block 7 & Res Q4 Block 17 Westchase Sec. 9 Westchase Sec. 1 2nd R/P	1063540000002
3901 Briarpark Dr.	Res D Block 7 & Res Q5 Block 17 Westchase Sec. 9 Westchase Sec. 1 2nd R/P	1063540000010

559-55-1253

ANY PROVISION HEREIN WHICH RESTRICTS THE SALE, RENTAL, OR USE OF THE DESCRIBED REAL PROPERTY BECAUSE OF COLOR OR RACE IS INVALID AND UNENFORCEABLE UNDER FEDERAL LAW
THE STATE OF TEXAS
COUNTY OF HARRIS
I hereby certify that this instrument was FILED in File Number Sequence on the date and at the time stamped hereon by me; and was duly RECORDED, in the Official Public Records of Real Property of Harris County, Texas on

NOV 25 2002

Beverly B. Kaufman
COUNTY CLERK
HARRIS COUNTY, TEXAS

Chevron

Radu Murgescu
Real Estate Representative, Real Estate & Development

August 9, 2018

Development Services
City of Bellaire
7008 S. Rice Ave
Bellaire, TX 77401

Special Use Permit

Chevron U.S.A. Inc. ("Chevron") is the current owner of the real property located in Bellaire, Harris County, Texas commonly known as 4800 Fournace, Bellaire, Texas 77401 (the "Property").

Chevron has entered into a Purchase and Sale Agreement dated June 11, 2018 with SLS Houston Properties, LLC ("SLS") to sell the Property to SLS on the terms set forth therein.

In connection with SLS's intended use of the Property upon the purchase thereof, Chevron has been advised by SLS that it desires to operate the Property for multi-tenant occupancy and to construct a multi-story garage on the Property and in order to use the Property for such purpose and construct such garage, SLS must apply for a Specific Use Permit with the City of Bellaire.

This will confirm that authority is given by Chevron to SLS to apply for a Specific Use Permit in the form attached hereto as Exhibit A.

Sincerely,
CHEVRON U.S.A. INC.

By: ______________________
Radu Murgescu
Assistant Real Property Officer
Chevron Business and Real Estate Services
A Division of Chevron U.S.A. Inc.

Chevron Business and Real Estate Services
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Road, Room V-1354B, San Ramon, CA 94583
Tel 925 842 6481
RaduMurgescu@chevron.com

tabbies
EXHIBIT
2

Attachment: SLS Application Specific Use Parking Garage (2708 : Consideration-4800 Fournace-Parking Garage)

EXHIBIT
3
tabbies

Kirkse
ARCHITECTURE

Access

Garage Option

SLS Propertie

4800 Fournace Mixed U

0 100 200

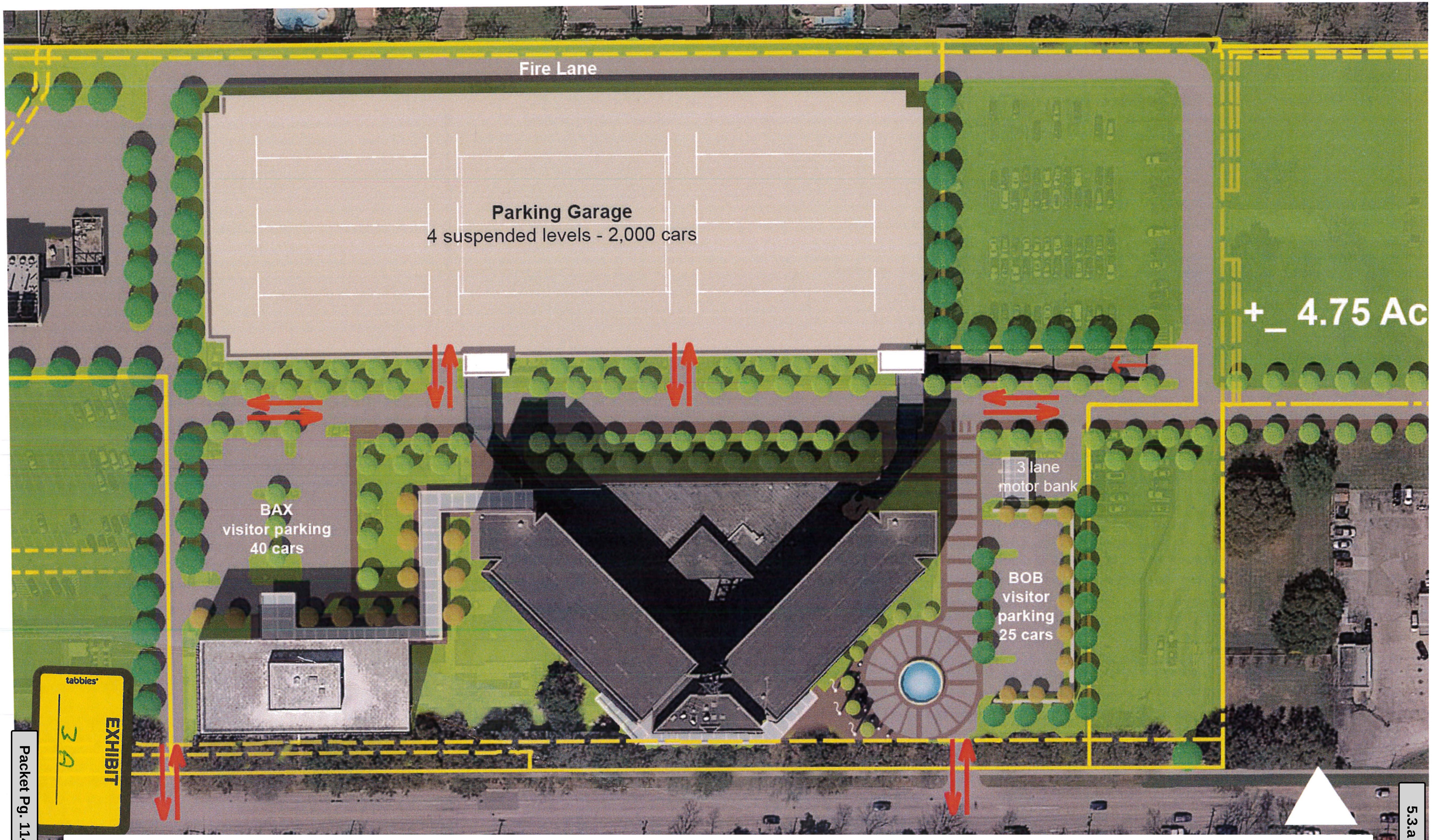

Fire Lane
Parking Garage
4 suspended levels - 2,000 cars
+_ 4.75 Ac
3 lane
motor bank
BAX
visitor parking
40 cars
BOB
visitor
parking
25 cars
EXHIBIT
3A

EXHIBIT
4

HARRIS COUNTY, TEXAS
J. BLESSING SURVEY, ABSTRACT NO. 162

LEGAL DESCRIPTION

TRACT I
ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II
LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT III
A 0.4477 ACRE TRACT OF LAND LOCATED IN THE J. BLESSING SURVEY, ABSTRACT NO. 162, BEING A PORTION OF FLEETWOOD STREET AS SHOWN ON TWIN OAKS, A SUBDIVISION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 34, PAGE 51 OF THE HARRIS COUNTY MAP RECORDS, AND BEING ALL OF THAT CERTAIN CALLED "TRACT A" CONVEYED TO CHEVRON U.S.A. INC. BY DEED RECORDED IN CLERK'S FILE NO. W246273, SAID 0.4477 ACRES BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN THE WEST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 610 (BASED ON A VARIABLE WIDTH PUBLIC RIGHT-OF-WAY), SAID POINT BEING THE SOUTHEAST CORNER OF LOT 5, BLOCK 1 OF SAID TWIN OAKS SUBDIVISION;

THENCE NORTH 02°23'37" WEST, ALONG THE EAST LINE OF SAID LOT 5, BLOCK 1, A DISTANCE OF 126.25 FEET TO A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN SAID WEST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 610 FOR THE NROTHEAST CORNER OF SAID LOT 5, SAID POINT BEING THE SOUTHEAST CORNER OF SAID "TRACT A" AND THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT OF LAND;

THENCE SOUTH 87°38'50" WEST, ALONG THE SOUTH LINE OF SAID "TRACT A", A DISTANCE OF 325.00 FEET TO A POINT LOCATED IN THE WEST LIMIT OF SAID TWIN OAKS SUBDIVISION, SAID POINT BEING THE NORTHWEST CORNER OF LOT 9, BLOCK 1 OF TWIN OAKS, AND THE SOUTHWEST CORNER OF SAID "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE NORTH 02°23'37" WEST, ALONG THE WEST LIMIT OF SAID TWIN OAKS SUBDIVISION AND SAID "TRACT A", A DISTANCE OF 60.00 FEET TO A POINT LOCATED IN THE WEST LIMIT OF TWIN OAKS SUBDIVISION, SAID POINT BEING THE SOUTHWEST CORNER OF LOT 9, BLOCK 2 OF TWIN OAKS, AND THE NORTHWEST CORNER OF "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE NORTH 87°38'50" EAST, ALONG THE NORTH LINE OF SAID "TRACT A", A DISTANCE OF 325.00 FEET TO A TEXAS DEPARTMENT OF TRANSPORTATION MONUMENT FOUND IN SAID WEST RIGHT-OF-WAY LINE OF HIGHWAY 610 FOR THE SOUTHEAST CORNER OF LOT 5, BLOCK 2 OF TWIN OAKS, SAID POINT BEING THE NORTHEAST CORNER OF SAID "TRACT A" AND THE HEREIN DESCRIBED TRACT OF LAND;

THENCE SOUTH 02°23'37" EAST, ALONG SAID WEST RIGHT-OF-WAY LINE OF INTERSTATE HIGHWAY 610, A DISTANCE OF 60.00 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT AND CONTAINING WITHIN THESE CALLS 0.4477 ACRES, OR 19,500 SQUARE FEET OF LAND.

THE LAND SHOWN IN THIS SURVEY IS THE SAME AS THAT DESCRIBED IN FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT NUMBER NCS-816950-SA1 WITH AN EFFECTIVE DATE OF SEPTEMBER 12, 2018.

LEGEND

AE	AERIAL EASEMENT
ASPH	ASPHALT
BL	BUILDING LINE
BLDG	BUILDING
BCM	BURIED CABLE MARKER
CI	CURB INLET
CO	CLEAN OUT
CONC.	CONCRETE
COR	CORNER
EBOX	ELECTRICAL BOX
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FNC	FENCE
FND	FOUND
GI	GRATE INLET
GM	GAS METER
GV	GAS VALVE
GT	GREASE TRAP
GW	GUY WIRE
HC	HANDICAP
H.C.C.F.	HARRIS COUNTY CLERK'S FILE
H.C.D.R.	HARRIS COUNTY DEED RECORDS
H.C.M.R.	HARRIS COUNTY MAP RECORDS
HH	UTILITY HAND HOLE
LNSC	LANDSCAPE
LS	LIGHT STANDARD
MH	MANHOLE
MW	MONITORING WELL
NO.	NUMBER
P	OVERHEAD LINES
PP	POWER POLE
PLM	PIPELINE MARKER
PST	POST
PVMT	PAVEMENT
SAN	SANITARY
SDWK	SIDEWALK
STM	STORM SEWER
TSB	TRAFFIC SIGNAL BOX
TSP	TRAFFIC SIGNAL POLE
TMH	TELEPHONE MANHOLE
TPED	TELEPHONE CABLE PEDESTAL
UE	UTILITY EASEMENT
UMH	UTILITY MANHOLE
WM	WATER METER
WV	WATER VALVE

——————//// ——————	ASPHALT LINE
—————— // ——————	FENCE LINE
————OO————OO————	CHAN LINK FENCE
——————Λ——————	HIGH BANK LINE
——————P——————	POWER LINE

SCHEDULE 'B' ITEMS

(10a) ANY COVENANTS, CONDITIONS OR RESTRICTIONS RECORDED IN VOLUME 34, PAGE 51, MAP RECORDS OF HARRIS COUNTY, TEXAS (AS TO TRACT II). AS SHOWN HEREON

The Following Matters Affect Tract I:

(10h) TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: THE SUPERIOR OIL COMPANY AND HOUSTON NATURAL GAS CORPORATION
RECORDED: IN VOLUME 3174, PAGE 337, OF THE DEED RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: PIPELINE RIGHT OF WAY AGREEMENT
(AS SHOWN HEREON)

(10i) EASEMENT:
TO: HOUSTON LIGHTING & POWER COMPANY, A TEXAS CORPORATION
RECORDED: JULY 10, 1975 IN COUNTY CLERK'S FILE NO. E481533, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: ELECTRIC DISTRIBUTION LINES
(BLANKET IN NATURE OVER LOT 6, BLOCK 12, WESTMORELAND FARMS, NOT SHOWN HEREON)

(10j) EASEMENT:
TO: SOUTHWESTERN BELL COMPANY
RECORDED: FEBRUARY 24, 1976 IN COUNTY CLERK'S FILE NO. E685025, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: UNDERGROUND FACILITIES
(AS SHOWN HEREON)

(10k) EASEMENT:
TO: HOUSTON LIGHTING & POWER COMPANY, A TEXAS CORPORATION
RECORDED: DECEMBER 27, 1982 IN COUNTY CLERK'S FILE NO. H751068, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: EASEMENT FOR ELECTRIC TRANSMISSION AND DISTRIBUTION LINES
(AS SHOWN HEREON)

(10l) EASEMENT:
TO: THE CITY OF BELLAIRE, TEXAS, A MUNICIPAL CORPORATION
RECORDED: JUNE 25, 1999 IN COUNTY CLERK'S FILE NO. T808327, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: UTILITY EASEMENT
(AS SHOWN HEREON)

(10m) EASEMENT:
TO: THE CITY OF BELLAIRE, TEXAS, A MUNICIPAL CORPORATION
RECORDED: MARCH 06, 1974 IN COUNTY CLERK'S FILE NO. E097757, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: RIGHT OF WAY
(AS SHOWN HEREON)

(10n) EASEMENT:
TO: THE CITY OF BELLAIRE, TEXAS, A MUNICIPAL CORPORATION
RECORDED: JANUARY 11, 1983 IN COUNTY CLERK'S FILE NO. H773707, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
PURPOSE: PUBLIC HIGHWAY EASEMENT
(AS SHOWN HEREON)

(10o) TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: TEXACO INC., A DELAWARE CORPORATION AND SOUTHWESTERN BELL TELEPHONE COMPANY
RECORDED: FEBRUARY 01, 2000 IN COUNTY CLERK'S FILE NO. U203300, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: EASEMENT FOR UNDERGROUND TELECOMMUNICATIONS FACILITIES
(AS SHOWN HEREON)

(10p) TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: TEXACO INC., A DELAWARE CORPORATION AND SOUTHWESTERN BELL TELEPHONE COMPANY
RECORDED: FEBRUARY 01, 2000 IN COUNTY CLERK'S FILE NO. U203301, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: TEMPORARY ACCESS EASEMENT FACILITIES
(AS SHOWN HEREON)

(10q) TERMS, CONDITIONS, AND STIPULATIONS IN THE AGREEMENT BY AND BETWEEN:
PARTIES: TEXACO INC., A DELAWARE CORPORATION AND SOUTHWESTERN BELL TELEPHONE COMPANY
RECORDED: FEBRUARY 01, 2000 IN COUNTY CLERK'S FILE NO. U203301, OF THE OFFICIAL PUBLIC RECORDS, OF HARRIS COUNTY, TEXAS.
TYPE: TEMPORARY ACCESS EASEMENT FACILITIES
(AS SHOWN HEREON)

(10r) THE TERMS, PROVISIONS AND EASEMENT CONTAINED IN THE DOCUMENT ENTITLED "EASEMENT" RECORDED JULY 23, 1975 AS E492165 OF OFFICIAL RECORDS.
(AS SHOWN HEREON)

The Following Matters Affect Tract II:

(10s) A 30 FOOT BUILDING SETBACK LINE ALONG THE FRONT PROPERTY LINE AS SET FORTH ON THE RECORDED PLAT AND DEDICATION. AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS.
(AS SHOWN HEREON)

(10t) EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: UTILITY
LOCATION: 10 FOOT ALONG THE REAR PROPERTY LINE
TOGETHER WITH AN UNOBSTRUCTED AERIAL EASEMENT 5' IN WIDTH FROM A PLANE 20' ABOVE THE GROUND UPWARD LOCATED ADJACENT TO AND ADJOINING THE DESCRIBED EASEMENT. AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS. (AS TO LOTS 5, 6, 7, 8 & 9; BLOCK 1)
(AS SHOWN HEREON)

(10u) EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: UTILITY
LOCATION: 5 FOOT ALONG THE REAR PROPERTY LINE
TOGETHER WITH AN UNOBSTRUCTED AERIAL EASEMENT 5' IN WIDTH FROM A PLANE 20' ABOVE THE GROUND UPWARD LOCATED ADJACENT TO AND ADJOINING THE DESCRIBED. AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS. (AS TO LOTS 5, 6, 7, 8 & 9; BLOCK 2)
(AS SHOWN HEREON)

(10v) EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: UTILITY
LOCATION: 10 FOOT ALONG THE WESTERN PROPERTY LINE AS SHOWN ON RECORDED PLAT FILED FOR RECORD UNDER VOLUME 34, PAGE 51, PLAT RECORDS OF HARRIS COUNTY, TEXAS.
(AS SHOWN HEREON)

(10w) EASEMENT AS SHOWN ON THE RECORDED PLAT AND DEDICATION:
PURPOSE: DRAINAGE EASEMENT
LOCATION: 15' ON EACH SIDE OF THE CENTER LINE OF ALL GULLIES, RAVINES AND OTHER NATURAL DRAINAGE COURSES ON THE HEREIN DESCRIBED PROPERTY.
(BLANKET IN NATURE, NO EXISTING PHYSICAL EVIDENCE FOUN, NOT SHOWN HEREON)

(10x) SUBJECT PROPERTY ABUTS A NON-ACCESS OR A LIMITED-ACCESS ROAD, HIGHWAY OR FREEWAY. THIS COMPANY DOES NOT INSURE THE RIGHT OF INGRESS AND EGRESS TO AND FROM SAID ROAD, HIGHWAY OR FREEWAY, AND ASSUMES NO LIABILITY IN CONNECTION THEREWITH.
(AS SHOWN HEREON)

SURVEYOR'S NOTES

1. THE SURVEYOR HAS NOT ABSTRACTED THE SUBJECT PROPERTY.

2. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT FLOOD AGENCY'S FLOOD INSURANCE RATE MAP NO. 48201C0855L, REVISED JUNE 18, 2007, THE SUBJECT TRACT IS LOCATED IN ZONE "AE", AREAS DETERMINED TO BE INSIDE THE 100-YEAR FLOODPLAIN AND ZONE "X", AREAS OUTSIDE THE 100-YEAR FLOODPLAIN.

3. BEARINGS ON THIS SURVEY ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, NAD83, SOUTH CENTRAL ZONE (4204).

4. THERE ARE NO VISIBLE SIGNS OF A CEMETERY ON THIS TRACT.

5. NO OBSERVABLE EVIDENCE OF EARTH MOVING WORK, BUILDING CONSTRUCTION OR BUILDING ADDITIONS WITHIN RECENT MONTHS.

6. NO OBSERVABLE EVIDENCE OF CHANGES IN STREET RIGHT OF WAY LINES COMPLETED, AND AVAILABLE FROM THE CONTROLLING JURISDICTION AND NO OBSERVABLE EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS.

7. NO OBSERVABLE EVIDENCE OF SITE USE AS A SOLID WASTE DUMP, SUMP OR SANITARY LANDFILL.

8. PROPERTY HAS PHYSICAL ACCESS TO INTERSTATE HIGHWAY No. 610, FOURNACE PLACE AND SOUTH RICE AVENUE (PUBLIC RIGHTS-OF-WAY).

9. ALL STATEMENTS WITHIN THE CERTIFICATION, AND OTHER REFERENCES LOCATED ELSEWHERE HEREON, RELATED TO: UTILITIES, IMPROVEMENTS, STRUCTURES, BUILDINGS, PARTY WALLS, PARKING, EASEMENTS, SERVITUDES, AND ENCROACHMENTS; ARE BASED SOLELY ON ABOVE GROUND, VISIBLE EVIDENCE, UNLESS ANOTHER SOURCE OF INFORMATION IS SPECIFICALLY REFERENCED HEREON.

ZONING INFORMATION

THE PROPERTY LIES WITHIN THE JURISDICTION OF THE CITY OF BELLAIRE

ZONED: TECHNICAL RESEARCH PROJECT DISTRICT (TRPD)

Taken from City of Bellaire Ordinance Chapter 24, Sec. 24-544.

Lot area: The minimum lot area shall be two (2) acres.

Maximum building height: No building, except those buildings and their appurtenances existing as of November 1, 1983, shall have a height in excess of six (6) stories (excluding cooling towers, roof gables, chimneys, radio and television antennas, vent stacks and similar extensions which may extend for an additional height, the total not to exceed eighty-four (84) feet. A greater height may be permitted in the granting of a specific use amendment for radio, television and microwave antenna or tower.

Maximum floor area to site area: One hundred (100) percent of site area.

Building lines (except those buildings and their appurtenances existing as of November 1, 1983):

1. No building shall be constructed less than fifty (50) feet from the right-of-way line of the abutting Interstate Highway Loop 610 Service Road;

2. All other building lines shall be computed on the basis of a ratio of .84-foot of building height per one foot of distance between said building lines and the nearest point on a lot zoned residential or in residential use that is outside of the district and existing on the date said district is established by ordinance.

Maximum site coverage: Seventy-five (75) percent of site area.

Site plan review required: All specific use applications in this district require site plan review and approval to ensure conformance with the standards for this district and other applicable provisions of the City Code. Applicants shall satisfy all application and submittal requirements for the site plan review itemized in Section 24-524.

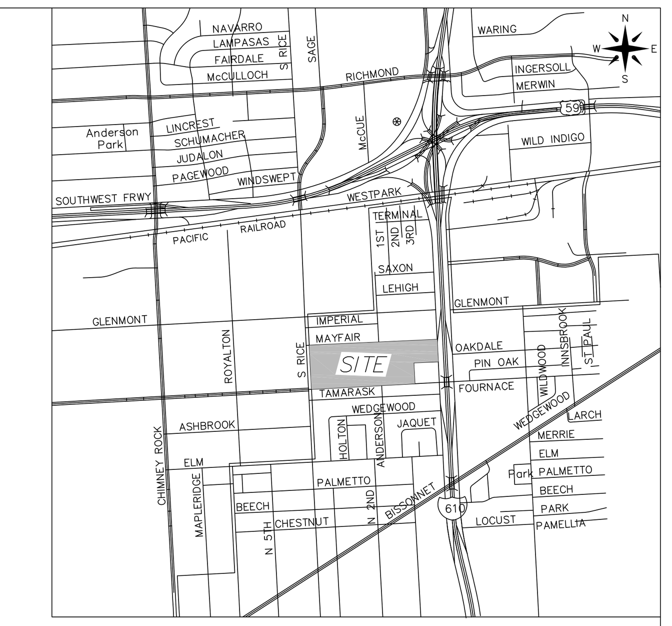
PARKING TABLE

1281 Standard Spaces
33 Handicap Space

1314 Total Parking Spaces

TITLE INFORMATION

THE TITLE DESCRIPTION AND SCHEDULE B ITEMS HEREON ARE FROM FIRST AMERICAN TITLE INSURANCE COMPANY TITLE COMMITMENT UNDER G.F. NO. NCS-816950-SA1 WITH AN EFFECTIVE DATE OF SEPTEMBER 12, 2018.



VICINITY MAP
N.T.S.

0' 40' 80'
SCALE: 1"=40'

SURVEYOR CERTIFICATION

TO: SLS HOUSTON PROPERTIES, LLC.; SLS WEST LOOP, LP.; IBC BANK, its successors and assigns; FIRST AMERICAN TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 6(a), 7(a), 7(b)(1), 7(c), 8, 9, 13, 14, 16, 17 AND 19 OF TABLE A THEREOF.

THE FIELD WORK WAS COMPLETED ON 09/13/2018.

Paul Coyne
PAUL A. COYNE
REGISTERED PROFESSIONAL LAND SURVEYOR
NO. 6374

DATE: 09/19/2018

STATE OF TEXAS
REGISTERED
PAUL A. COYNE
6374
PROFESSIONAL
LAND SURVEYOR

SHEET 1 OF 3

REVISIONS		
REV.	DESCRIPTION	DATE

ALTA/NSPS SURVEY OF
TRACT I
ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT II
LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK ONE (1) AND LOT FIVE (5), SIX (6), SEVEN (7), EIGHT (8) AND NINE (9), BLOCK TWO (2) OF TWIN OAKS, SECTION ONE (1), A SUBDIVISION IN HARRIS COUNTY, TEXAS, ACCORDING TO THE MAP OR PLAT RECORDED IN VOLUME 34, PAGE 51 OF THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

TRACT III
A 0.4477 ACRE TRACT OF LAND LOCATED IN THE J. BLESSING SURVEY, ABSTRACT NO. 162, BEING A PORTION OF FLEETWOOD STREET AS SHOWN ON TWIN OAKS, A SUBDIVISION IN HARRIS COUNTY, TEXAS ACCORDING TO THE MAP OR PLAT THEREOF RECORDED IN VOLUME 34, PAGE 51 OF THE HARRIS COUNTY MAP RECORDS, AND BEING ALL OF THAT CERTAIN CALLED "TRACT A" CONVEYED TO CHEVRON U.S.A. INC. BY DEED RECORDED IN CLERK'S FILE NO. W246273

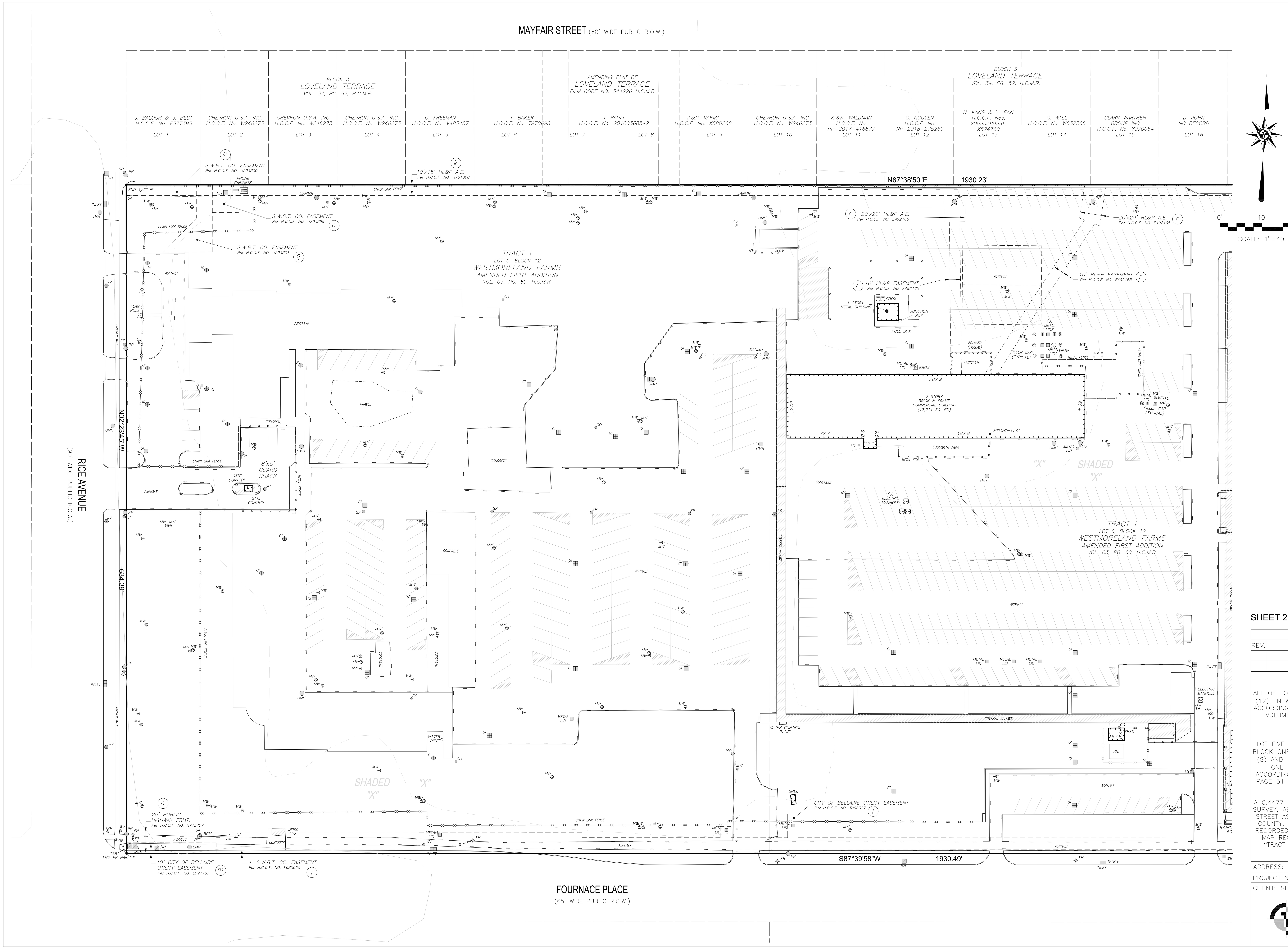
ADDRESS: 4800 FOURNACE PLACE, BELLAIRE TX 77401

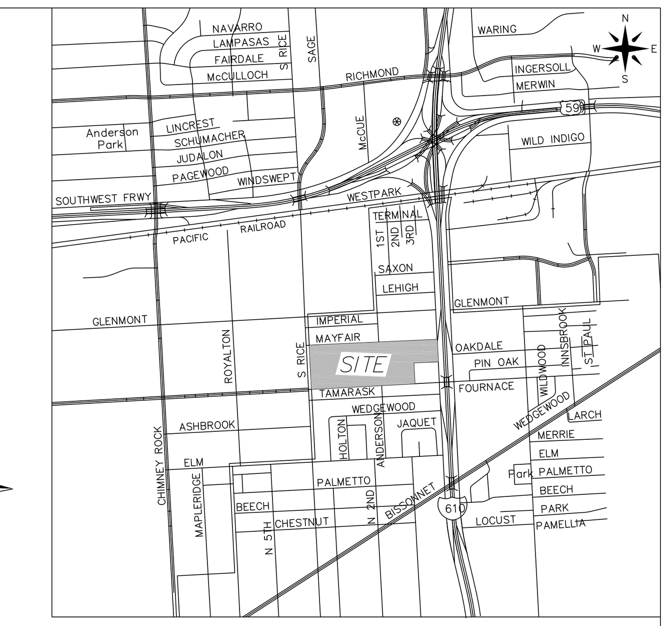
PROJECT NAME: CHEVRON CAMPUS

CLIENT: SLS PROPERTIES, LLC.

TETRA
2109 Lexington Street
Houston, Texas 77098
(P) 713-462-6100 (F) 713-432-1003
E-Mail: Survey@TSATX.com
www.TSATX.com
License No. 10127500

JOB NO.: 18-0196
SCALE: 1"=40'
DATE: 09/19/2018
DRAWN BY: JP
CHECKED BY: PAC
APPROVED BY:





VICINITY MAP
N.T.S.

LEGEND

AE	AERIAL EASEMENT
ASPH	ASPHALT
BL	BUILDING LINE
BLDG	BUILDING
BCM	BURIED CABLE MARKER
CI	CURB INLET
CO	CLEAN OUT
CONC.	CONCRETE
COR	CORNER
EBOX	ELECTRICAL BOX
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FNC	FENCE
FND	FOUND
GI	GRATE INLET
GM	GAS METER
GV	GAS VALVE
GT	GREASE TRAP
GW	GUY WIRE
HC	HANDICAP
H.C.C.F.	HARRIS COUNTY CLERK'S FILE
H.C.D.R.	HARRIS COUNTY DEED RECORDS
H.C.M.R.	HARRIS COUNTY MAP RECORDS
HH	UTILITY HAND HOLE
LNSC	LANDSCAPE
LS	LIGHT STANDARD
MH	MANHOLE
MW	MONITORING WELL
NO.	NUMBER
P	OVERHEAD LINES
PP	POWER POLE
PLM	PIPELINE MARKER
PST	POST
PVMT	PAVEMENT
SAN	SANITARY
SDWK	SIDEWALK
STM	STORM SEWER
TSB	TRAFFIC SIGNAL BOX
TSP	TRAFFIC SIGNAL POLE
TMH	TELEPHONE MANHOLE
TPED	TELEPHONE CABLE PEDESTAL
UE	UTILITY EASEMENT
UMH	UTILITY MANHOLE
WM	WATER METER
WV	WATER VALVE

ASPHALT LINE
FENCE LINE
CHAIN LINK FENCE
HIGH BANK LINE
POWER LINE

SHEET 2 OF 3

REVISIONS	
REV.	DESCRIPTION

ALTA/NSPS SURVEY OF
TRACT I
ALL OF LOT FIVE (5), SIX (6) AND SEVEN (7), BLOCK TWELVE (12), IN WESTMORELAND FARMS AMENDED FIRST SUBDIVISION, ACCORDING TO THE MAP OR PLAT THEREOF RECORDED UNDER VOLUME 3, PAGE 60 IN THE MAP RECORDS OF HARRIS COUNTY, TEXAS.

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ADDRESS: 4800 FOURNACE PLACE, BELLAIRE TX 77401
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License No. 10127500

JOB NO.: 18-0196
SCALE: 1"=40'
DATE: 09/19/2018
DRAWN BY: JP
CHECKED BY: PAC
APPROVED BY:

SHEET 3 OF 3

ADDRESS: 4800 FOURNACE PLACE, BELLAIRE TX 77401
PROJECT NAME: CHEVRON CAMPUS
CLIENT: SLS PROPERTIES, LLC.

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APPROVED BY:

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS

MEMO

TO: Ashley Parcus, City of Bellaire
FROM: Colby W. Wright, P.E., PTOE, Jones & Carter, Inc.
DATE: September 24, 2018
RE: 4800 Fournace Place - Traffic Impact Analysis

Jones|Cater has reviewed the Traffic Impact Analysis (TIA) for the 4800 Fournace Place Office and Parking Garage Redevelopment dated September 3, 2018.

The proposed project would add a four-level parking garage to the existing two office buildings on the site with capacity of 2,000 vehicles, replacing the existing surface parking. Per the Institute of Transportation Engineers, Trip Generation Handbook, 10th Edition, the office building and garage development is estimated to generate 5,758 trips for the typical weekday including 564 trips in the weekday AM peak hour and 597 trips in the weekday PM peak hour.

Jones|Carter offers the following comments on the Traffic Impact Analysis:

1. The traffic count data was collected in August 2018 when the IH 610 southbound exit ramp to Fournace Place was closed which likely affected the traffic volumes. A review of a 2016 traffic count on Fournace Place (attached) appears to show that the volumes on Fournace Place are 30-40% lower than in 2016. Please review and apply an adjustment factor to the traffic data collected as appropriate.
2. Please include a narrative and/or schematic to describe the ultimate configuration of the IH 610 entrance/exit ramps near the site and any effect on access to the site.
3. The proposed East Access Driveway does not appear to meet Texas Department of Transportation (TxDOT) minimum driveway spacing criteria. Please evaluate the need for a southbound right turn lane on the IH 610 Southbound Frontage Road at the proposed East Access Driveway in accordance with TxDOT criteria. Please provide TxDOT approval of proposed driveway location and need for a right turn lane.
4. The intersection volumes at Fournace Place at Anderson appear to be the same in the AM and PM peak hours in Exhibits A5, A6 and A9-A14. Please review and update as necessary.

Please provide updated report based on the above comments for further review.

Texas Department of Transportation

TCDS Help Refresh MS2

Traffic Count Database System (TCDS)

Home HPMS TSMS TCLS TTDS PMS PMDS RSMS NMDS PMMS RTTV

Back Login +Locate +Locate All

Auto-Locate ON

Volume Count Report

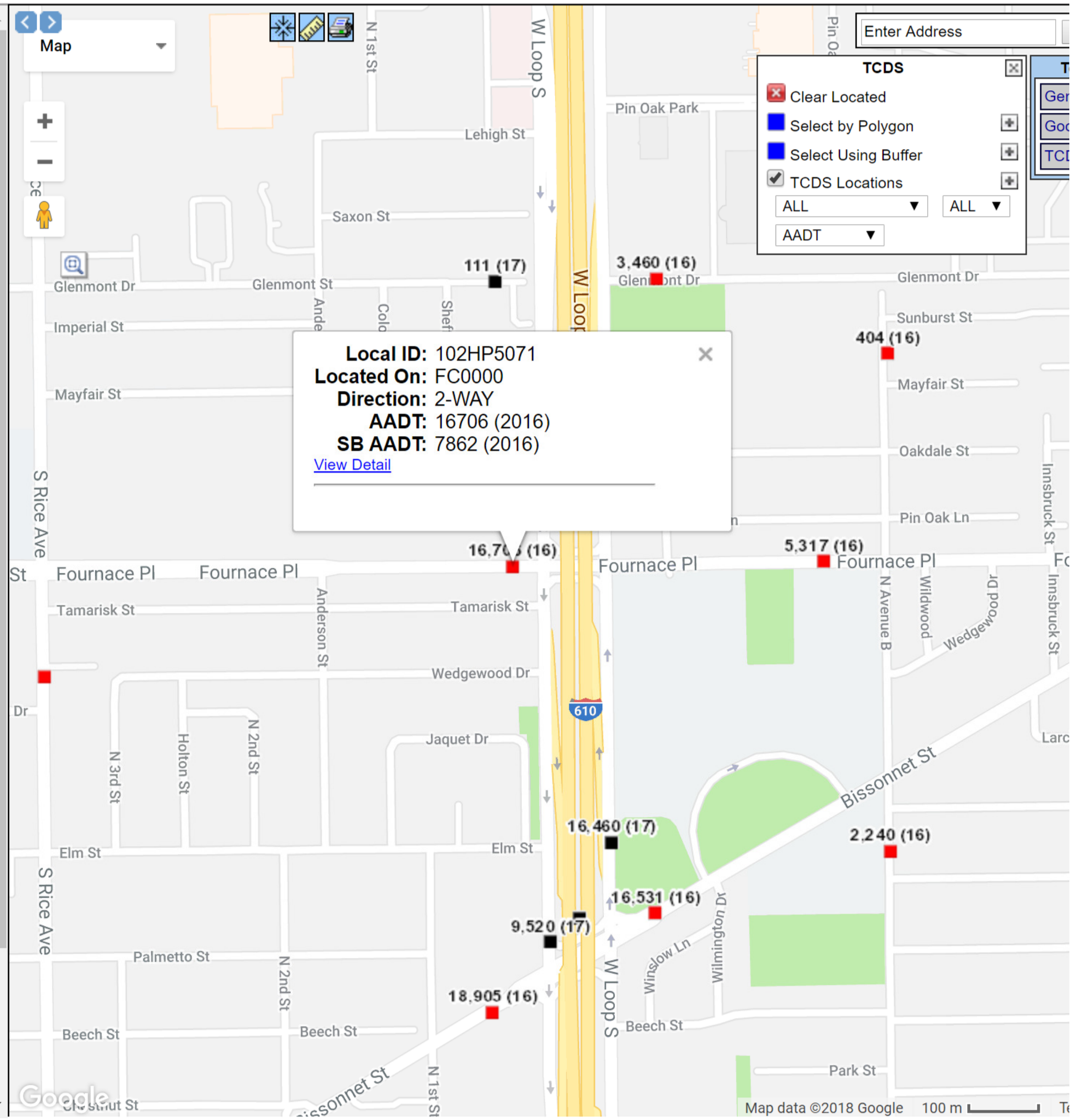
LOCATION INFO	
Location ID	102HP5071
Type	SPOT
Fnct'l Class	4
Located On	FC0000
Loc On Alias	257705
Direction	2-WAY
County	Harris
Community	Bellaire
MPO ID	15
HPMS ID	
Agency	Texas DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Wed 2/24/2016
End Date	Thu 2/25/2016
Start Time	6:00:00 AM
End Time	6:00:00 AM
Direction	
Notes	
Station	
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	19	21	21	11	72
1:00-2:00	11	11	10	6	38
2:00-3:00	7	6	8	12	33
3:00-4:00	9	9	15	14	47
4:00-5:00	9	22	23	29	83
5:00-6:00	43	61	103	151	358
6:00-7:00	173	227	229	237	866
7:00-8:00	307	300	337	404	1,348
8:00-9:00	331	274	248	243	1,096
9:00-10:00	212	195	193	193	793
10:00-11:00	189	171	186	185	731
11:00-12:00	222	240	201	195	858
12:00-13:00	245	242	235	268	990
13:00-14:00	273	310	288	268	1,139
14:00-15:00	233	260	251	262	1,006
15:00-16:00	267	291	328	307	1,193
16:00-17:00	320	337	307	366	1,330
17:00-18:00	304	375	351	360	1,390
18:00-19:00	354	282	276	260	1,172
19:00-20:00	246	205	184	160	795
20:00-21:00	131	91	86	74	382
21:00-22:00	102	80	77	74	333
22:00-23:00	63	52	50	33	198
23:00-24:00	30	25	36	15	106
Total					16,357
AADT					16,706
AM Peak					07:15-08:15 1,372
PM Peak					17:15-18:15 1,440

Count Navigation: |<< < > >>| Count Type: VOLUME



4800 Fournace Place
Office and Parking Garage Redevelopment
Traffic Impact Analysis

Interstate 610 at Fournace Place
Bellaire, Texas

Prepared for
SLS Properties

Prepared by
Voigt Associates, Inc.

September 2018

Voigt Associates, Inc. Project 36401
Version 1.1

4800 Fournace Place Office and Parking Garage Redevelopment

IH-610 at Fournace Place
Bellaire, Texas

Traffic Impact Analysis

Prepared for
SLS Properties

Voigt Associates, Inc.
Texas Registered Firm F-5333

Prepared by

Voigt Associates, Inc.
Project 36401
September 2018
v1.1

Executive Summary

This report presents a summary of the analysis and findings of a Traffic Impact Analysis (TIA) performed by Voigt Associates, Inc. for the proposed 4800 Fournace Office redevelopment project to be located at the former Chevron office building on Fournace Place west of IH-610 in Bellaire, Texas. Chevron departed the facility in 2017 and it has been vacant for about a year. The proposed project will add a four-level parking garage to the existing two office buildings on the site with capacity for 2,000 vehicles, replacing the existing surface parking. This traffic study was requested by city staff as part of an application by SLS Properties for a Specific Use Permit (SUP) for the addition of the parking garage.

Per the Institute of Transportation Engineers *Trip Generation Handbook, 10th Edition*, the office building and garage development is estimated to generate:

- 5,758 trips for the typical weekday;
- 564 trips in the weekday AM peak hour (485 entering, 79 exiting); and
- 597 trips in the weekday PM peak hour (95 entering, 501 exiting).

The current land use at the proposed site is two unoccupied office buildings totaling 571,718 square feet. The exiting office buildings will be joined on the site by a new 2000-vehicle parking garage. Exhibit A1 shows the Site Location Map, Exhibit A2 presents the proposed site layout, and Exhibit A3 shows the proposed site layout superimposed on an aerial view. All referenced exhibits are found in Appendix A.

This analysis includes the three site driveways (two on Fournace Place and one to the IH-610 Southbound Frontage Road) and three other public intersections: 1) IH-610 diamond interchange at Fournace Place; 2) Fournace Place at Anderson Street; and 3) Fournace Place/Gulfton Street at South Rice Avenue. Other existing driveways are slated to be consolidated into the three driveways analyzed in this study, although those existing access driveways will be reserved for future use. Exhibit A4 shows the study area and intersection traffic control. *This analysis is limited to the office buildings and parking garage portions of the overall tract – subsequent development will likely require additional traffic study to determine mitigation, if any, based on future land use.*

The analysis was completed for three primary scenarios:

1. existing 2018 conditions,
2. projected conditions in the 2020 build-out year without the office and garage development; and
3. projected conditions in the 2020 build-out year with the office and garage development fully occupied.

The offices are estimated to be fully reoccupied in the year 2020, depending on market conditions, with the new parking garage in service at that time.

The scope of this study included collection of traffic volumes within the study area for weekday AM and PM peak hours; determination of an estimate of the number of trips that may be generated by the proposed development; trip distribution and assignment of the new trips to and from the existing roadway network; Level of Service analysis to determine the incremental impacts of the proposed development on the surrounding roadway network for the study horizon; and preparing recommendations for transportation improvements or mitigation measures resulting from trips to and from the site.

As an overall conclusion, the traffic operations impact of the development shall be mitigated with the recommendations which follow:

- *This analysis is limited to the office buildings and new parking garage portions of the overall tract – subsequent development will likely require additional traffic study to determine mitigation, if any, based on future land use.*

- Developer/applicant site engineers should ensure that sight distance triangles are preserved for turning movements from all site driveways which consider any landscaping, berms, or signing planned. As necessary, unobstructed visibility should be achieved with setbacks or limited height vegetation and landscaping.

- If driveways to public streets are modified, the design of site access driveways should be completed using an appropriate design vehicle to represent the largest common vehicle to access the site (likely a small 18-wheeler (WB-62) or larger single unit truck, or SU-40).

- All site driveways should be stop-controlled to public streets.

- The level of service analysis indicates that all study intersections, including the signalized intersections at IH-610 at Fournace Place and Fournace Place at South Rice Avenue will continue to operate at acceptable levels of service (at LOS D or better) with the office buildings re-occupied and new garage in service in the weekday AM peak hour.

  During the PM peak hour, with the non-construction influence traffic volumes, the intersection of the IH-610 Southbound Frontage Road at Fournace Place will reduce from LOS D to LOS E (from 47.4 seconds/vehicle to 59.1 seconds/vehicle). With the existing gas/service station on the northwest corner of the IH-610 at Fournace Place intersection, there is no physical room to expand capacity at this interchange on the southbound frontage road. Signal timing adjustments would be the key parameter to adjust to maintain as high of a level of service as possible.

Fournace Place at South Rice Avenue will continue to operate at acceptable levels of service (at LOS C or better) with the office buildings re-occupied and new garage in service in the weekday AM and PM peak hours.

The intersection of Fournace Place at Anderson Street will remain LOS C or better with development traffic.

No off-site mitigation will be necessary other than typical signal timing changes as traffic volumes change over time.

- The reconstruction of the IH-610 southbound frontage road and Fournace Place exit ramp appears to be in the same location as pre-construction per exhibits in Appendix F. This would keep the existing condition, with about 400’ from the hard gore to the “east” site access driveway and about 110’ from the painted gore and double white line to the “east” access driveway. These distances do not meet current TxDOT guidelines for spacing between ramps and driveways (305’ for 40 miles per hour), but the driveway would appear to be grandfathered for the existing land use since its location preceded the publish date of TxDOT Access Management Manual guidelines.

- No physical changes in traffic control devices, additional capacity (left, right, or through lanes), or signal timing modifications is evident at other study intersections in the near term or because of the development. This does not imply that changes in signal timing parameters should not be considered once the development is complete, or that the city should not continue to monitor conditions in the area with or without the development, but it simply states that no modifications to the physical aspects of existing stop or signalized control should be required.

Table of Contents

List of Tables

List of Exhibits

(All Exhibits located in Appendix A)

I. Introduction

This report presents a summary of the analysis and findings of a Traffic Impact Analysis (TIA) performed by Voigt Associates, Inc. for the proposed 4800 Fournace Office redevelopment project to be located at the former Chevron office building on Fournace Place west of IH-610 in Bellaire, Texas. Chevron departed the facility in 2017 and it has been vacant for about a year. The proposed project will add a four-level parking garage to the existing two office buildings on the site with capacity for 2,000 vehicles, replacing the existing surface parking. This traffic study was requested by city staff as part of an application by SLS Properties for a Specific Use Permit (SUP) for the addition of the parking garage.

Per the Institute of Transportation Engineers *Trip Generation Handbook, 10th Edition*, the office building and garage development is estimated to generate:

- 5,758 trips for the typical weekday;
- 564 trips in the weekday AM peak hour (485 entering, 79 exiting); and
- 597 trips in the weekday PM peak hour (95 entering, 501 exiting).

The current land use at the proposed site is two unoccupied office buildings totaling 571,718 square feet (per the Harris County Appraisal District). The exiting office buildings will be joined on the site by a new 2000-vehicle parking garage. Exhibit A1 shows the Site Location Map, Exhibit A2 presents the proposed site layout, and Exhibit A3 shows the proposed site layout superimposed on an aerial view. All referenced exhibits are found in Appendix A.

This analysis includes the three site driveways (two on Fournace Place and one to the IH-610 Southbound Frontage Road) and three other public intersections: 1) IH-610 diamond interchange at Fournace Place; 2) Fournace Place at Anderson Street; and 3) Fournace Place/Gulfton Street at South Rice Avenue. Other existing driveways are slated to be consolidated into the three driveways analyzed in this study, although those existing access driveways will be reserved for future use. Exhibit A4 shows the study area and intersection traffic control. *This analysis is limited to the office buildings and parking garage portions of the overall tract – subsequent development will likely require additional traffic study to determine mitigation, if any, based on future land use.*

The analysis was completed for three primary scenarios:

4. existing 2018 conditions,
5. projected conditions in the 2020 build-out year without the office and garage development; and
6. projected conditions in the 2020 build-out year with the office and garage development fully occupied.

The offices are estimated to be fully reoccupied in the year 2020, depending on market conditions, with the new parking garage in service at that time.

The scope of this study included:

1. Defining the study limits and selection of required analysis periods;
2. Collection of traffic volumes within the study area for weekday AM and PM peak hours;
3. Determination of the background traffic volumes considering historic traffic volume growth rates and known developments in the study area;
4. Determination of an estimate of the number of trips that may be generated by the proposed development;
5. Trip distribution and assignment of the new trips to and from the existing roadway network;
6. Level of Service analysis to determine the incremental impacts of the proposed development on the surrounding roadway network for the study horizon; and
7. Preparing recommendations for transportation improvements or mitigation measures resulting from trips to and from the site.

A. Description of Site Location and Definition of Study Limits

The current land use at the proposed site is unoccupied office buildings and a series of surface parking lots. The site is located north of Fournace Place between IH-610 and South Rice Avenue. The overall 30-acre tract currently has several driveways: three on South Rice Avenue, five access driveways to Fournace Place, and one to the IH-610 Southbound Frontage Road. The study area and intersections deemed critical to the analysis (and determined in conjunction with city planning staff) were:

- IH-610 at Fournace Place (diamond interchange);
- Fournace Place at Anderson Street;
- Fournace Place at South Rice Avenue.

The analysis also include the three primary site intersections that will be used to service the office building and associated parking garage: 1) the “east driveway” on IH-610 about 320’ north of Fournace Place (relocating the existing driveway 480’ north of Fournace Place); 2) the “southeast driveway” on Fournace Place, 570’ west of IH-610 (320’ west of the gas station driveway), and the “southwest driveway”, 660’ west of the southeast site driveway.

Exhibit A4, located in Appendix A, presents a map of the study area and notation of the traffic control status (signal or stop controlled) of each intersection included in the study.

Based on site visits, there appear to be no other *significant* imminent developments noted in the study area. Future development may occur on the overall 30-acre tract, on the 4.75-acre portion along the frontage road and on the 12.3-acre portion along South Rice Avenue, but the land use and timing are unknown as of the date of this report.

The area around the site is largely developed, with single-family homes both north and south of the tract and more retail/commercial development along South Rice Avenue. The Cunningham Elementary School is located on the northwest corner of South Rice Avenue at Gulfton Street (the west extension of Fournace Place). Traffic generated by other potential developments in the area are assumed to be captured in the 2% per year annual growth rate used to project background traffic growth in the 2020 future scenario.

B. Description of the Proposed Development

The office development consists of two buildings with a total of 571,718 square feet of space. The new parking garage will provide parking spaces for 2,000 vehicles. Access to the parking garage will primarily be from three access points as described in Section I.A above.

C. Selection of Analysis Periods

The selection of critical analysis periods was based on the proposed land use and the typical peak hours of operation for the development and surrounding roadway network. Because Fournace Place and South Rice Avenue both generally experience the typical weekday morning and afternoon peak periods, those two-critical weekday AM and PM peak hours were selected for analysis.

To better understand the peaking characteristics on these roads, vehicle turning movement counts were completed and examined to determine the weekday peak periods. While traffic was fairly consistent over the peak periods, the weekday AM and PM peak hours were determined to be 7:30 A.M. to 8:30 A.M. and 4:30 P.M. to 5:30 P.M., respectively.

II. Existing Conditions

To obtain an understanding of the existing traffic conditions within the study area, the current conditions near the site and within the study area were documented. This section presents a thorough review of available data and existing conditions at the site and includes discussion on site visits, area land uses, intersection layouts, roadway features, and traffic counts.

A. Site visits

Several site visits were made in advance of the preparation of this report. AM and PM weekday peak operations were observed during late-August 2018. During these site visits, traffic operations were observed and noted, including the apparent efficiency intersection operations, including unsignalized intersections, and the adequacy of existing lane uses.

Exhibits A3 and A4 (in Appendix A) show the approximate locations of existing intersections and driveways near the site.

The IH-610 Southbound Frontage Road was under construction as of the date of this report. The construction has closed the IH-610 southbound exit to Fournace and several lanes of the frontage road are closed between Westpark Drive to about 400' north of Fournace Place.

B. Study Area Land Use

The subject tract has two unoccupied office buildings on the tract, with surface parking and utility plan buildings. North of the site is single-family residential homes along the east-west streets of Mayfair Street and Imperial Street, with mixed-used residential along Glenmont. Anderson Street is a north-south roadway north of the site, but is gated at the site property line, and will continue to be gated as an emergency access only when the parking garage is constructed.

South of the site, south of Fournace Place, are additional single-family homes. Anderson Street runs north-south between Elm Street and Fournace Place and has two speed humps south of Wedgewood as traffic calming devices to discourage through trips.

Along South Rice Avenue, the land use is generally retail, commercial or institutional land use – mostly on smaller parcels. Houston ISD's Cunningham Elementary School is located on the northwest corner of Gulfton Street at South Rice Avenue.

C. Existing/Proposed Site Access

The three primary site intersections that will be used to service the office building and associated parking garage include:

1. the "east driveway", and existing access driveway on IH-610 about 480' north of Fournace Place;
2. the "southeast driveway" on Fournace Place, 570' west of IH-610 (320' west of the gas station driveway), and
3. the "southwest driveway", 660' west of the southeast site driveway.

The driveway geometry is conceptual at this time

D. Posted Speeds

The posted speed on Fournace Place 35 miles per hour. The speed limit on the IH-610 Southbound Frontage Road is currently 40 miles per hour. No specific speed studies were completed as part of this analysis, but vehicles were operating near the posted speed limit during site visits. The posted speed limits appear appropriate given the functional classification of both roadways and their relationship to the overall area transportation network.

E. Intersection Layouts, Lane Usage and Roadway Configuration

There were seven intersections included in the traffic study, including the three primary site driveways. Each of the intersections and their associated analysis nodes are:

1. IH-610 Northbound Frontage Road at Fournace Place;
2. IH-610 Southbound Frontage Road at Fournace Place;
3. Fournace Place at "southeast" access driveway;
4. Fournace Place at Anderson Street;
5. Fournace Place at "southwest" access driveway;
6. Fournace Place/Gulfton Street at South Rice Avenue; and
10. IH-610 Southbound Frontage Road at "east" access driveway.

Unless impacted by new trips generated by the proposed development and addressed in the study recommendations, detail regarding turn bay storage lengths and other geometric features for each intersection may be found in Appendix D within the simulation output.

A description of each of the major study roadways is as follows:

- Fournace Place is an east-west, four-lane undivided asphalt roadway along the site frontage with curb and gutter drainage. There are sidewalks on both sides Fournace Place west of Anderson Street, but only on the north side of Fournace Place east of Anderson Street. Fournace Place is signalized at IH-610 on the east side of the study area and at South Rice Avenue on the west side of the study area.

- Anderson Street is a two-lane local roadway south of Fournace Place. The northbound approach of Anderson Street is stop-controlled to Fournace Place.

- The IH-610 Southbound Frontage Road is a four-lane roadway north of Fournace Place. The Northbound Frontage Road is a three-lane facility south of Fournace Place.

F. Traffic Control Devices

The traffic control status of the study area intersections are as follows (number represent model node numbers) with the proposed site access locations shown in bold text:

1. IH-610 Northbound Frontage Road at Fournace Place (signalized);
2. IH-610 Southbound Frontage Road at Fournace Place (signalized);
3. Fournace Place at "southeast" access driveway (one-way stop controlled);
4. Fournace Place at Anderson Street (one-way stop controlled);
5. Fournace Place at "southwest" access driveway (one-way stop controlled);
6. Fournace Place/Gulfton Street at South Rice Avenue (signalized); and

10. IH-610 Southbound Frontage Road at "east" access driveway (one-way stop controlled).

No changes to the traffic control at existing intersections would be anticipated because of the proposed office and garage development.

G. Right of Way

The right of way on Fournace Place and on IH-610 are likely adequate for the functional classification and existing traffic operations characteristics on the facilities near the site. No additional right of way should be needed to accommodate anticipated near- to medium-term future traffic demands. No additional right-of-way would appear to be required as part of the development to accommodate mitigation to maintain acceptable operations level of service.

H. Lane Widths

Lane widths were measured during site visits and from review of existing aerial photographs. The lane widths are documented in the traffic simulation output in Appendix D. Most lane widths were measured as 10 feet or greater, with lane widths on Fournace Place measured as about 11 feet wide.

I. Peak-Hour Traffic Counts

Manual turning movement counts were conducted for two-hour peak periods in the Weekday A.M. (6:30-8:30 A.M.) and Weekday P.M. (4:30-6:30 P.M.) study periods. Counts were taken at the following intersections on Tuesday, August 28, 2018:

- IH-610 Northbound Frontage Road at Fournace Place;
- IH-610 Southbound Frontage Road at Fournace Place;
- Fournace Place at Anderson Street; and
- Fournace Place/Gulfton Street at South Rice Avenue.

The results of these counts are presented in Appendix B. Each approach was counted individually and the highest four 15-minute intervals for each time period were identified as the peak hour for the intersection. The peak hours identified for analysis for the weekday morning and afternoon were 7:30-8:30 A.M. and 4:30-5:30 P.M., respectively. Exhibits A5 and A6 in Appendix A show the peak hour counts in graphical format. The peak hour factors (PHF) in the study area along Fournace Place were typical (0.91 to 0.96) during the weekday peak hours. The peak hour factors can be seen on the turning movement count reports in Appendix B for each of the intersections counted. Selected peak hour traffic volumes observed are summarized in Table 1.

Table 1. Traffic Volumes in the Study Area.

Location	AM Peak Hour	PM Peak Hour
IH-610 Frontage Road		
Northbound, South of Fournace	1370	970
Southbound, North of Fournace	1120	1210
Fournace Place		
Eastbound, West of Anderson Street	780	530
Westbound, East of Anderson Street	260	440
Anderson Street		
Northbound, South of Fournace Place	20	15
Southbound, South of Fournace Place	30	20

The turning movement counts were processed to determine the traffic volumes and peak hour factors (PHF) for each peak hour at each intersection. As the study progressed, peak hours were defined (see Section I.C) for the overall study peak hours and turning movements and peak hour factors calculated for each intersection for the study peak hours. These peak hour factors are shown on the turning movement count sheets and vary depending on the peak hour of interest. The calculated PHF's for each intersection were used in the analysis, with site driveway intersections using 0.92 for weekday AM and PM peak hours.

Because the IH-610 southbound frontage road is currently under construction, we obtained counts taken before construction began (in May of 2017). These counts are attached in Appendix B and show that the southbound frontage road approach counts have lowered by about 30-40% since the Fournace exit ramp was closed. We adjusted the counts taken in August 2018 upwards to account for the exit ramp closure, and used those going forward in the 2020 analyses (with and without development).

J. Transit & Pedestrian Facilities

There are existing sidewalks on Fournace Place on both sides of the street west of Anderson Street and only on the north side of the street east of Anderson Street. There are also sidewalks along the IH-610 frontage and South Rice Avenue frontage of the site.

Fixed transit service provided along IH-610 and Fournace Place (METRO's Route 9 – Gulfton/Holman) and on South Rice Avenue (METRO's Route 49 – Chimney Rock/S Post Oak) near the site. However, no reductions in trip generation were taken for those trips which might be assumed to take transit rather than personal vehicles to the development.

K. Existing Level of Service of Roadway Sections and Intersections

This traffic impact analysis employed the macroscopic traffic simulation model Synchro, as well as the microscopic model SimTraffic, both part of the Synchro Pro 10 Simulation Suite. Synchro was used to input the roadway network geometry and traffic control parameters. Most simulations were undertaken with Synchro, but some using SimTraffic to verify the Synchro findings.

In some cases, microscopic traffic simulation models have advantages when simulating networks of mixed traffic control (signalized and unsignalized intersections adjacent in a network). Some of these advantages include much more robust simulation of actuated signal operations, more realistic gap acceptance simulation at unsignalized intersections, and more realistic arrival and departure sequences through arterial networks. All simulations in this study represent the peak 15-minute time periods within any peak hour. In general, the simulation results for the weekday peak periods could be generalized to represent almost an hour of traffic volumes since the volumes are relatively flat over the weekday peaks for intersections on public roadways. Traffic signal timing at IH-610 at Fournace Place and Fournace Place at South Rice Avenue was optimized for each simulation scenario in this analysis.

The reconstruction of the IH-610 southbound frontage road and Fournace Place exit ramp appears to be in the same location as pre-construction per exhibits in Appendix F. This would keep the existing condition, with about 400' from the hard gore to the "east" site access driveway and about 110' from the painted gore and double white line to the "east" access driveway. These distances do not meet current TxDOT guidelines for spacing between ramps and driveways (305' for 40 miles per hour), but the driveway would appear to be grandfathered for the existing land use since its location preceded the publish date of TxDOT Access Management Manual guidelines.

For each of the critical peak hours identified for the development and adjacent roadway network, existing LOS were determined using the traffic counts taken in August 2018. Table 2 presents the per-vehicle delay thresholds that define each level of service.

Table 2. LOS Thresholds for Signalized and Unsignalized Intersections.

Level of Service (LOS)	Signalized Intersections Control Delay Per Vehicle (seconds/vehicle)	Unsignalized Intersections Control Delay Per Vehicle (seconds/vehicle)
A	≤10	0-10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

An explanation of the concept of level of service is that it is like grades in school – A is the most desirable, F the least desirable. Level of service (LOS) for signalized intersections is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. LOS is directly related to the control delay value. The LOS thresholds are different for signalized intersections as compared to unsignalized intersections, primarily because drivers expect different levels of performance from distinct types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than a stop-controlled intersection. Thus, a higher level of control delay is acceptable at a signalized intersection for the same level of service. At a two-way stop-controlled intersection, LOS is defined for each minor movement, but not for the intersection as a whole. Typically, the assessment of operations at signalized and all-way stop intersections is made using overall intersection delay and LOS. For two-way, or one-way, stop controlled intersections, the assessment is based on the higher-delay controlled approach.

Table 3 summarizes the existing intersection LOS for each of the study intersections during each critical peak hour. The delays reported within this report represent the average vehicle delay in the peak 15-minute time period within each peak hour, not the average delay over the entire peak hour as a whole.

Table 3. Existing Level of Service (2018) for Study Intersections

Intersection/Scenario	AM Peak Hour		PM Peak Hour	
	Critical Delay (s/v)	Critical LOS	Critical Delay (s/v)	Critical LOS
1. IH 610 Northbound Frontage Road at Fournace Place				
2018 Existing	32.8	C	29.5	C
2018 Existing - adjusted for construction	35.6	D	34.2	C
2. IH 610 Southbound Frontage Road at Fournace Place				
2018 Existing	27.4	C	24.1	C
2018 Existing - adjusted for construction	37.1	D	39.5	D
4. Fournace Place at Anderson Street				
2018 Existing	13.5	B	13.1	B
2018 Existing - adjusted for construction	14.2	B	14.4	B
6. Fournace Place/Gulfton Street at South Rice Avenue				
2018 Existing	18.8	B	18.1	B
2018 Existing - adjusted for construction	20.0	B	20.4	C

As shown in Table 3, the existing study intersections included in the study area currently experience Level of Service C or better, generally with LOS D or better indicating acceptable service for urban and suburban environments. Simulation output for these intersections is included in Appendix D for all simulations completed.

L. Photographs Documenting the Existing Site Conditions

Photographs of the existing site driveway access locations as well as the approaches to the critical intersections in the study area may be viewed in Appendix E.

III. Projected Traffic

If given the expected type of land use, its respective location within a roadway corridor, as well as some idea of access locations, a general estimation of new traffic demand for a proposed land use on a roadway (or particular intersection) can be made. This process is usually completed with the assistance of the 10th Edition of Trip Generation. The traffic projected using techniques outlined in Trip Generation must be viewed exclusively as traffic demand estimates, with some variation expected after full build-out and occupancy of the proposed development.

A. Traffic Projection Details.

The existing turning movement counts collected in August 2018 quantified the traffic volumes currently using the roadway facilities in the study area. No other *significant* developments in the immediate area were believed to influence traffic in the base condition build-out year (2020). Section III.C, below, includes detail on the projection of base volumes for the build-out year.

B. Site Traffic

Traffic generated by the proposed site for the weekday peak hours was estimated using the ITE Trip Generation Manual. Details of the trip generation exercise for the development are shown in Appendix C in Table C1. Whether the proposed land use trip generation can be given via a regression curve or a simple rate is stated in this table. ITE Land Use 710, General Office Building, was used to estimate new trips generated by the site.

The site is expected to generate about 564 trips (485 trips to and 79 trips from the site) during the weekday A.M. peak hour, and about 597 trips (95 trips to and 501 trips from) during the weekday P.M. peak hour.

Once trips were generated for the peak hours of the study, the trip distribution and assignment portion of the analysis was completed. Initially, a generalized form of the gravity model was used to estimate site trip distribution by examining the existing turning movements and travel times in the network to determine the potential gravity-type trip distribution pattern. Detailed tables were published in Appendix C of the report documenting the trip distributions and projected turning movements at each intersection in the study network for each origin and destination pair. The tables in Appendix C include:

- Table C1. Trip Generation Calculations;
- Table C2. Trip Distribution;
- Table C3. Existing (2018) Peak Hour Turning Movement Counts;
- Table C4. Projected 2020 Peak Hour Turning Movements, Without Development;
- Table C5. Projected Peak Hour Trips; and
- Table C6. Projected 2020 Turning Movements with development.

The trip distribution and assignment exercise was accomplished manually using a spreadsheet solution. Exhibits A7 and A8 present the trip distribution percentages used for this study for weekday AM & PM peak hours. Exhibits A9 and A10 show the new trips as turning movements for AM & PM peak hours. Exhibits A11-A14 show the projected turning movements in graphical from for the Tables C4 and C7 listed above.

All trips were estimated to originate from seven origins:

1. From IH-610 Southbound Frontage Road, North of Site;
2. From IH-610 Northbound Frontage Road, South of Fournace Place;
3. From Fournace Place, East of IH-610 Northbound Frontage Road;
4. From Anderson Street, South of Fournace Place;
5. From Gulfton Street/Fournace Place, West of South Rice Avenue;
6. From South Rice Avenue, North of Fournace Place; and
7. From South Rice Avenue, South of Fournace Place.

and depart to seven destinations:

1. To IH-610 Northbound Frontage Road, North of Fournace Place;
2. To IH-610 Southbound Frontage Road, South of Fournace Place;
3. To Fournace Place, East of IH-610 Northbound Frontage Road;
4. To Anderson Street, South of Fournace Place;
5. To Gulfton Street/Fournace Place, West of South Rice Avenue;
6. To South Rice Avenue, North of Fournace Place; and
7. To South Rice Avenue, South of Fournace Place.

Table C2, in Appendix C, presents the trip distribution and assignment exercise for the development. This table shows the origins and destinations, trip distribution percentages to each origin and destination pair and the assumed routing for each. The trip distribution percentages are shown below in Table 4.

Table 4. Trip Distribution.

Origin/Destination	Distribution
From IH-610 SBFR, North of Site	37.0%
From IH-610 NBFR, South of Fournace	33.0%
From Fournace, East of IH-610 NBFR	5.0%
From Anderson, South of Fournace	1.0%
From Gulfton/Fournace, West of S Rice	8.0%
From South Rice Ave, North of Fournace	8.0%
From South Rice Ave, South of Fournace	8.0%

To give an idea of the percentage weights of potential origins and destinations, turning movement counts are used to evaluate traffic movements entering and leaving the study area. These raw percentage weights are then shown in the Trip Distribution portion of Table C2 in Appendix C. These weights are examined and considered, then a trip distribution percentage finalized based on 1) the raw weight, and 2) engineering judgment of surrounding operational conditions on roadway facilities included in the study (including operational conditions, perceived travel times by origin-destination pair, and number of turns on the route).

C. Background Traffic

By projecting the existing traffic into future years using an assumed annual growth rate, the future natural traffic growth (in vehicles) can be estimated. The background traffic growth rate is assumed to account for all smaller developments in the study area as well as area growth beyond study area. This growth rate was determined through analysis of historical trends in the region, and the dynamics of growth and development in the area.

The Houston Regional Traffic Count Map, located at: http://ttihouston.tamu.edu/hgac/trafficcountmap/ was examined for traffic counts in the area surrounding the site. A review of historic traffic volumes within the study area show mixed traffic growth trends, likely influenced over time by the transitional nature of land use in the area, but generally an upward trend exists. A growth rate of between 1% and 2% could be deemed appropriate for use in the subject analysis. A growth rate of 2% was deemed appropriate for use.

D. Pass-By, Diverted Trips and Internal Capture

Because the development is a destination type development no adjustments for pass-by or internal capture were made.

E. Total Traffic Estimates

Once the trip generation and trip distribution exercises were complete for weekday AM & PM peak hours, the estimated ultimate traffic was determined for the proposed development. These site generated volumes and how they are distributed through the roadway network are shown in Appendix C.

- Table C2. Trip Distribution
- Table C5. Projected Peak Hour Trips

F. Future Traffic Conditions

Future traffic conditions for the year 2020 (site full occupancy) were then calculated based on the background traffic growth rate of 2% per annum and the ultimate traffic generation estimates for the site. Table 5 summarizes the projected intersection LOS for each of the study intersections for 2020 future conditions <u>without</u> the development – these scenarios were defined as the base traffic condition to compare conditions with occupancy of the proposed development. As shown in Table 5 below all intersections in the study area in the 2020 future year will experience Level of Service D or better.

Table 5. Projected Level of Service (2020) without Office.

Intersection/Scenario	AM Peak Hour		PM Peak Hour	
	Critical Delay (s/v)	Critical LOS	Critical Delay (s/v)	Critical LOS
1. IH 610 Northbound Frontage Road at Fournace Place				
2018 Existing	32.8	C	29.5	C
2018 Existing - adjusted for construction	35.6	D	34.2	C
2020 Projected w/o development	42.1	D	35.2	D
2. IH 610 Southbound Frontage Road at Fournace Place				
2018 Existing	27.4	C	24.1	C
2018 Existing - adjusted for construction	37.1	D	39.5	D
2020 Projected w/o development	42.7	D	47.4	D
4. Fournace Place at Anderson Street				
2018 Existing	13.5	B	13.1	B
2018 Existing - adjusted for construction	14.2	B	14.4	B
2020 Projected w/o development	14.6	B	14.8	B
6. Fournace Place/Gulfton Street at South Rice Avenue				
2018 Existing	18.8	B	18.1	B
2018 Existing - adjusted for construction	20.0	B	20.4	C
2020 Projected w/o development	21.0	C	21.5	C

IV. Traffic Analysis

The analysis of future traffic conditions was undertaken for the year 2020 (which was the estimated year that the site was assumed to be re-occupied). Highway Capacity Manual-based output has been included for completeness as required in Appendix D.

A. Simulation of Future Traffic Conditions

The projected capacity and level of service (for both background traffic and total traffic) for the study year of 2020 is presented in Table 6 for the following cases:

- 2020 Projected Future Traffic Volume Condition without development traffic but with 2%/year background growth rate; and
- 2020 Projected Future Traffic Volume Condition with development traffic with 2%/year background growth rate.

Table 6 is a summary of the projected Level of Service, as defined by the average vehicle delay either 1) for all vehicles at signalized or all-way stop intersections; or 2) for the highest-delay approach at unsignalized two-way (or one-way) stop controlled intersection. The traffic simulation output is included in Appendix D for review and identification of particular contributors to any intersections or intersection movements of interest.

As shown in Table 6 below all intersections in the study area in the 2020 future year will experience Level of Service D or better. The entirety of the results of traffic modeling and simulation is shown in detail in the numerous tables in Appendix D.

Table 6. Projected Level of Service for the Study Corridor, 2020.

Intersection/Scenario	AM Peak Hour		PM Peak Hour	
	Critical Delay (s/v)	Critical LOS	Critical Delay (s/v)	Critical LOS
1. IH 610 Northbound Frontage Road at Fournace Place				
2020 Projected w/o development	42.1	D	35.2	D
2020 Projected w/development	46.7	D	35.7	D
2. IH 610 Southbound Frontage Road at Fournace Place				
2020 Projected w/o development	42.7	D	47.4	D
2020 Projected w/development	42.1	D	59.1	E
3. Fournace Place at Southeast Site Access Driveway				
2020 Projected w/development	22.4	C	36.3	E
4. Fournace Place at Anderson Street				
2020 Projected w/o development	14.6	B	14.8	B
2020 Projected w/development	16.3	C	17.5	C
5. Fournace Place at Southwest Site Access Driveway				
2020 Projected w/development	26.5	D	69.5	F
6. Fournace Place/Gulfton Street at South Rice Avenue				
2020 Projected w/o development	21.0	C	21.5	C
2020 Projected w/development	23.4	C	23.7	C
10. IH 610 Southbound Frontage Road at East Site Access				
2020 Projected w/development	15.0	C	22.3	C

B. Warrant Analysis Results

No analyses for all-way stop control or traffic signal control were completed as part of this analysis. The study intersections with public roadways currently have appropriate levels of traffic control. The recommended level of traffic control for the site driveways to Fournace Place and to the IH-610 Southbound Frontage Road are to be stop-controlled on approach.

C. Site Circulation and Parking Requirements

With the addition of 2,000 parking spaces with the new garage, parking ratios should be compliant with guidelines with respect to number of spaces required. There adequate opportunity to circulate among driveways onsite. Developer/applicant site engineers should review on-site circulation and determine what traffic control is required on the site given the final site plan. Texas MUTCD compliant signing and markings should be employed on the site as needed.

D. Impacts to Nearby Neighborhoods

The proposed development of the subject tract should have negligible impacts on local traffic, particularly with respect to neighborhood traffic. The great majority of traffic destined for the site will access and egress from Fournace Place or directly via the IH-610 Southbound Frontage Road.

Anderson Street north of the site is gated at the subject tract's property line for emergency access only. There is no plan to allow access to or from the new parking garage through the neighborhood to the north.

Anderson Street to the south leads to Elm Street which is an alternative route to the IH-610 Southbound Frontage Road to the east or to South Rice Avenue to the west. There is no travel time advantage to use Anderson Street to go south of the site considering that if the driver goes to Elm Street (across two speed humps and two stop-controlled intersections) and then goes east to the frontage road, they must still pass two signalized intersections (Bissonnet Street and Bellaire Boulevard) before being able to enter IH-610 southbound south of Bellaire Boulevard. In comparison, even with some congestion at IH-610 at Fournace Place, the lower travel time route is to stay on Fournace and entering IH-610 just south of Fournace Place. The mitigation to discourage non-residential trips along Anderson Street to the south of the site is already in place.

E. Sight Distance

From site visits, it appears that adequate sight distance is available from the two site driveways on Fournace Place and for the site driveway on the IH-610 Southbound Frontage Road given the operational speeds on both facilities. Trees and shrubs should not be allowed to block vehicular sight distance on the approach to public streets from any driveway approach. In addition, site engineers should ensure that interior driveways have adequate sight distance for given traffic control conditions.

V. Conclusions and Recommendations

This section of the report summarizes the overall impact of the development and includes discussion about recommended site access, traffic control, and other improvements or operations issues that should be addressed as the development moves forward. As an overall conclusion, the traffic operations impact of the development shall be mitigated with the recommendations which follow:

- *This analysis is limited to the office buildings and new parking garage portions of the overall tract – subsequent development will likely require additional traffic study to determine mitigation, if any, based on future land use.*

- Developer/applicant site engineers should ensure that sight distance triangles are preserved for turning movements from all site driveways which consider any landscaping, berms, or signing planned. As necessary, unobstructed visibility should be achieved with setbacks or limited height vegetation and landscaping.

- If driveways to public streets are modified, the design of site access driveways should be completed using an appropriate design vehicle to represent the largest common vehicle to access the site (likely a small 18-wheeler (WB-62) or larger single unit truck, or SU-40).

- All site driveways should be stop-controlled to public streets.

- The level of service analysis indicates that all study intersections, including the signalized intersections at IH-610 at Fournace Place and Fournace Place at South Rice Avenue will continue to operate at acceptable levels of service (at LOS D or better) with the office buildings re-occupied and new garage in service in the weekday AM peak hour.

  During the PM peak hour, with the non-construction influence traffic volumes, the intersection of the IH-610 Southbound Frontage Road at Fournace Place will reduce from LOS D to LOS E (from 47.4 seconds/vehicle to 59.1 seconds/vehicle). With the existing gas/service station on the northwest corner of the IH-610 at Fournace Place intersection, there is no physical room to expand capacity at this interchange on the southbound frontage road. Signal timing adjustments would be the key parameter to adjust to maintain as high of a level of service as possible.

  Fournace Place at South Rice Avenue will continue to operate at acceptable levels of service (at LOS C or better) with the office buildings re-occupied and new garage in service in the weekday AM and PM peak hours.

  The intersection of Fournace Place at Anderson Street will remain LOS C or better with development traffic.

  No off-site mitigation will be necessary other than typical signal timing changes as traffic volumes change over time.

- The reconstruction of the IH-610 southbound frontage road and Fournace Place exit ramp appears to be in the same location as pre-construction per exhibits in Appendix F. This would keep the existing condition, with about 400' from the hard gore to the "east" site access driveway and about 110' from the painted gore and double white line to the "east" access driveway. These distances do not meet current TxDOT guidelines for spacing between ramps and driveways (305' for 40 miles per hour), but the driveway would appear to be grandfathered for the existing land use since its location preceded the publish date of TxDOT Access Management Manual guidelines.

- No physical changes in traffic control devices, additional capacity (left, right, or through lanes), or signal timing modifications is evident at other study intersections in the near term or because of the development. This does not imply that changes in signal timing parameters should not be considered once the development is complete, or that the city should not continue to monitor conditions in the area with or without the development, but it simply states that no modifications to the physical aspects of existing stop or signalized control should be required.

VI. Appendix

The following appendices are included this report:

Appendix A. Exhibits

Appendix B. Traffic Count Data
(24-Hour Counts and Manual Turning Movement Counts)

Appendix C. Trip Generation & Distribution
(Assignment Details and Projected Turning Movement Counts)

Appendix D. Simulation/Analysis Results (including all reports and simulation files on compact disc)

Appendix E. Site, Roadway & Intersection Photographs

APPENDIX A – EXHIBITS

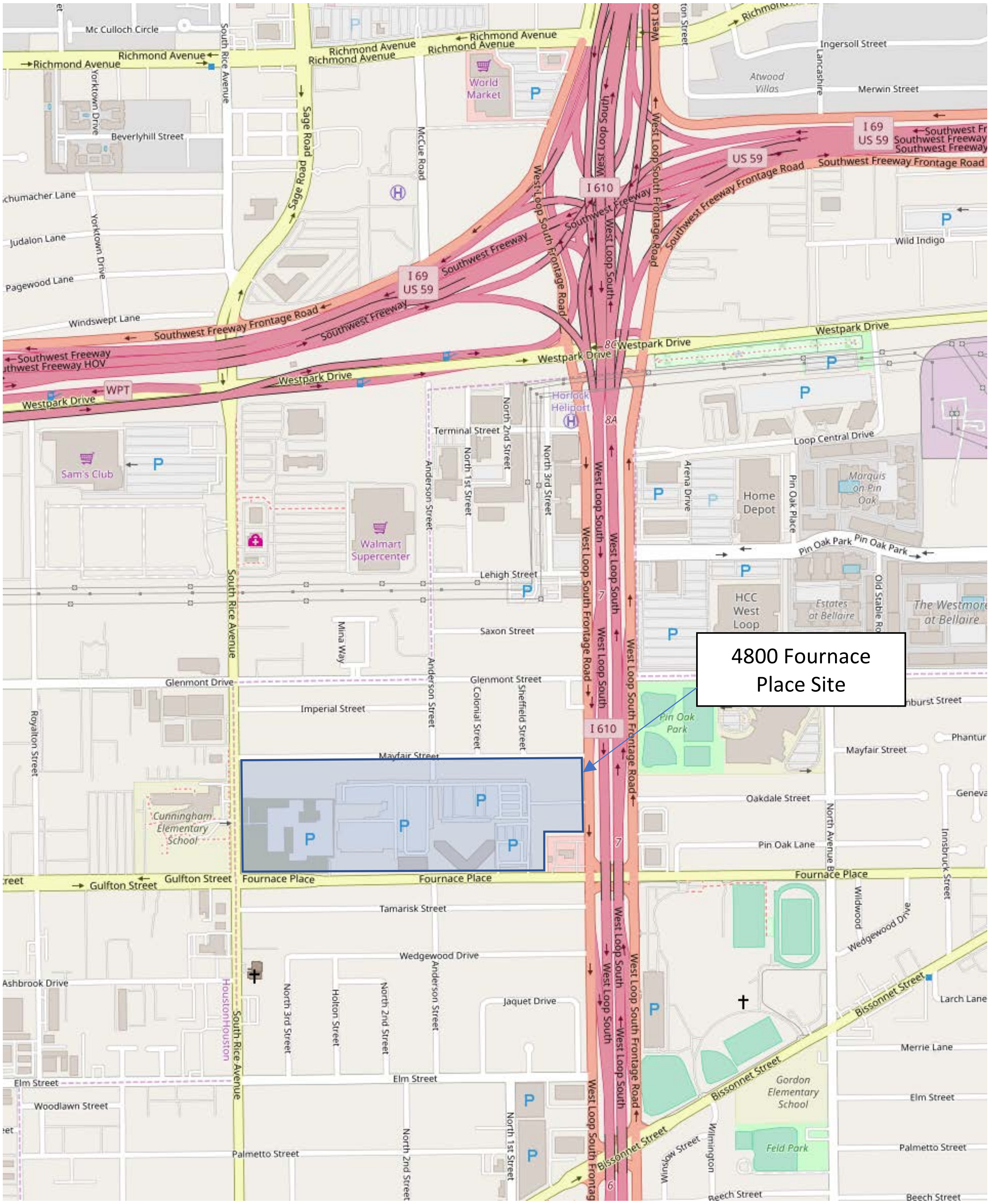


Exhibit A1. Site Location Map.

Exhibit A2. Proposed Site Layout and Access

Exhibit A3. Site Layout on Aerial Background.

Exhibit A4. Study Area and Intersection Traffic Control Status.

Exhibit A5
Total Turning Movements

2018 AM Peak Hour
Existing Conditions

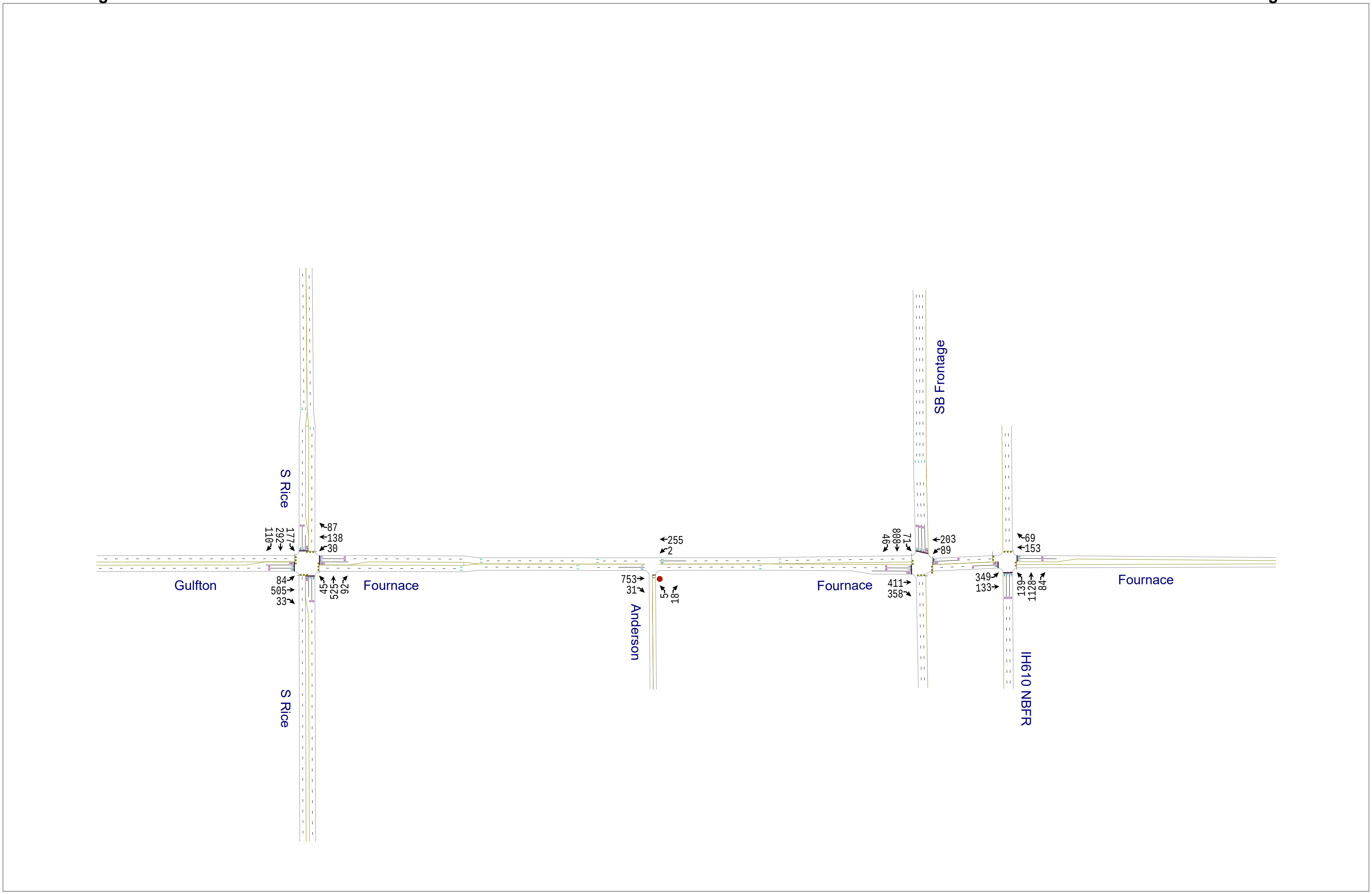


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Exhibit A5-A
Total Turning Movements

2018 AM Peak Hour
Adjusted Volumes for Non-Construction Conditions

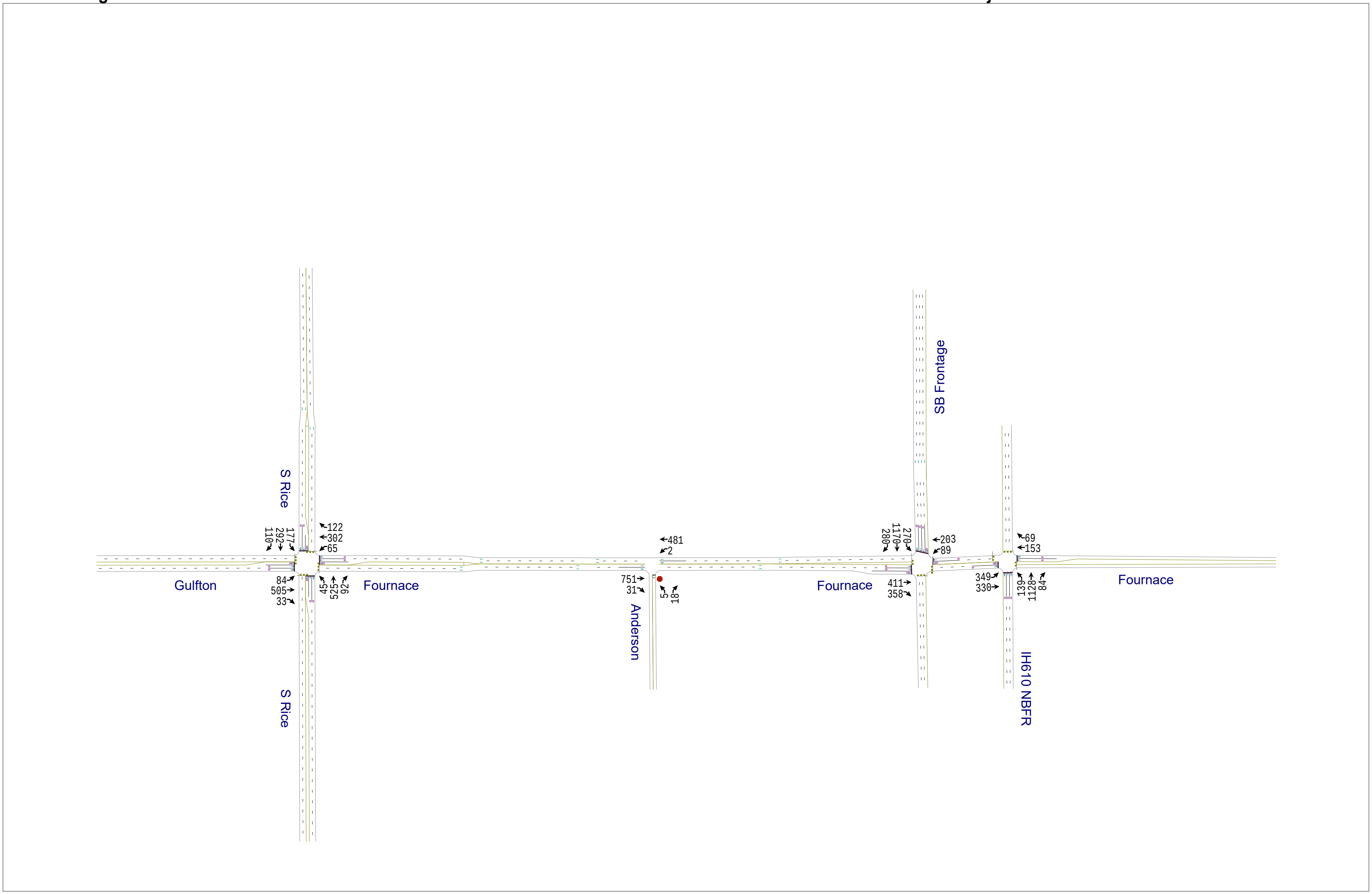

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Exhibit A6
Total Turning Movements

2018 PM Peak Hour
Existing Conditions

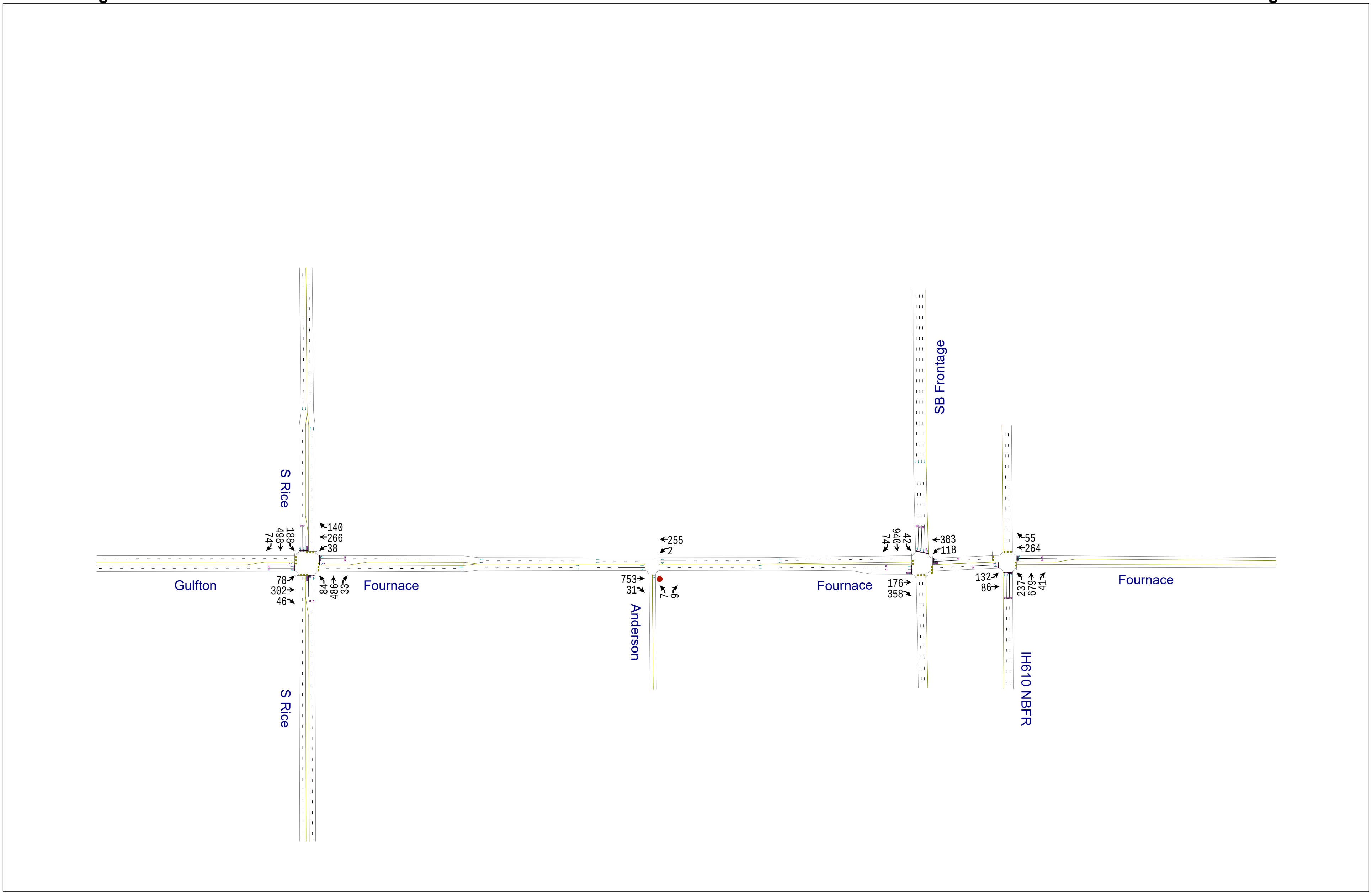

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Exhibit A6-A
Total Turning Movements

2018 PM Peak Hour
Adjusted Volumes for Non-Construction Conditions

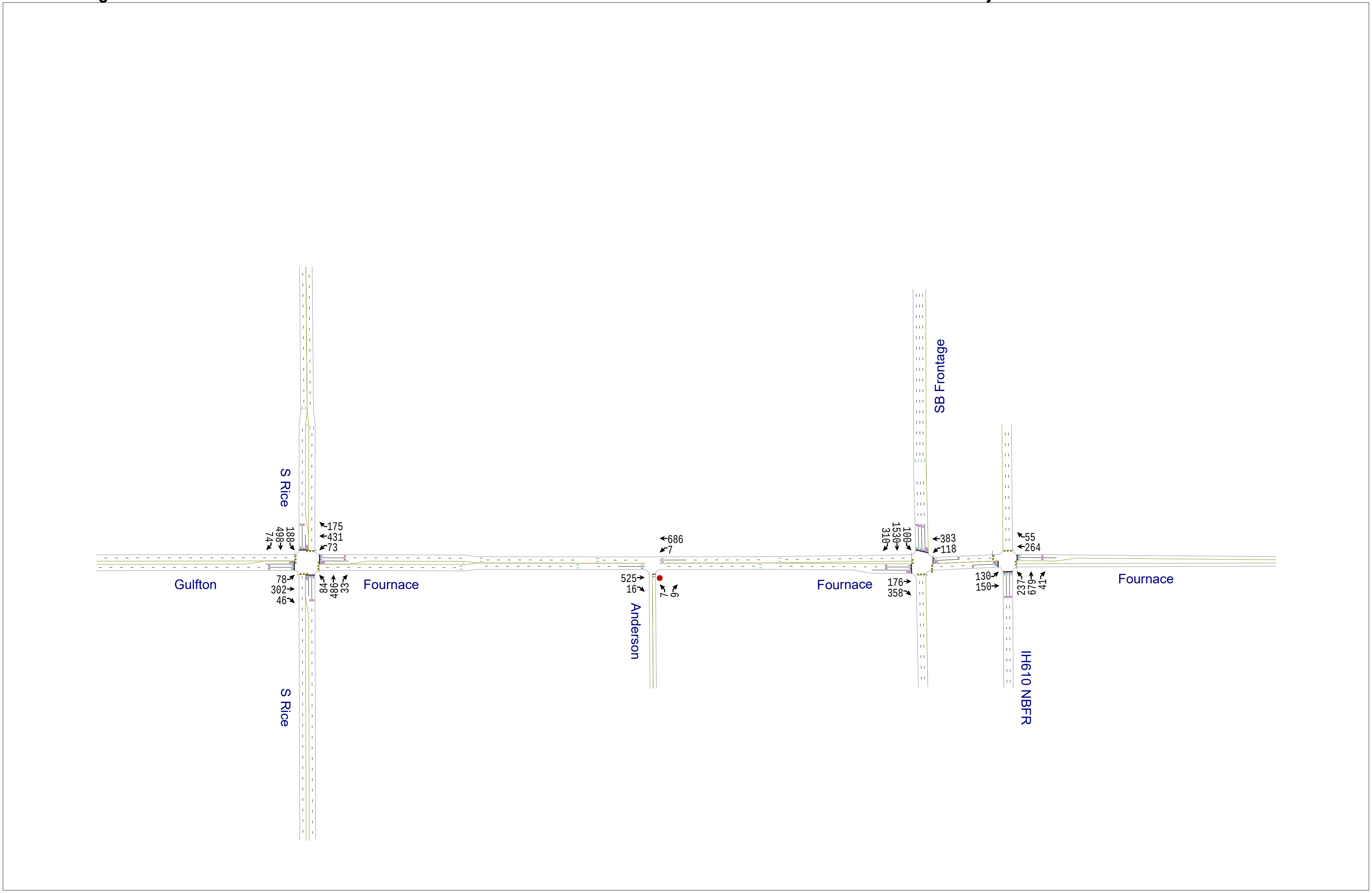

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Exhibit A7. Trip Distribution – Weekday AM Peak Origins/Destinations.

Exhibit A8. Trip Distribution – Weekday PM Peak Origins/Destinations.

Exhibit A9
Total Turning Movements

AM Peak Hour
New Trips as Turning Movements

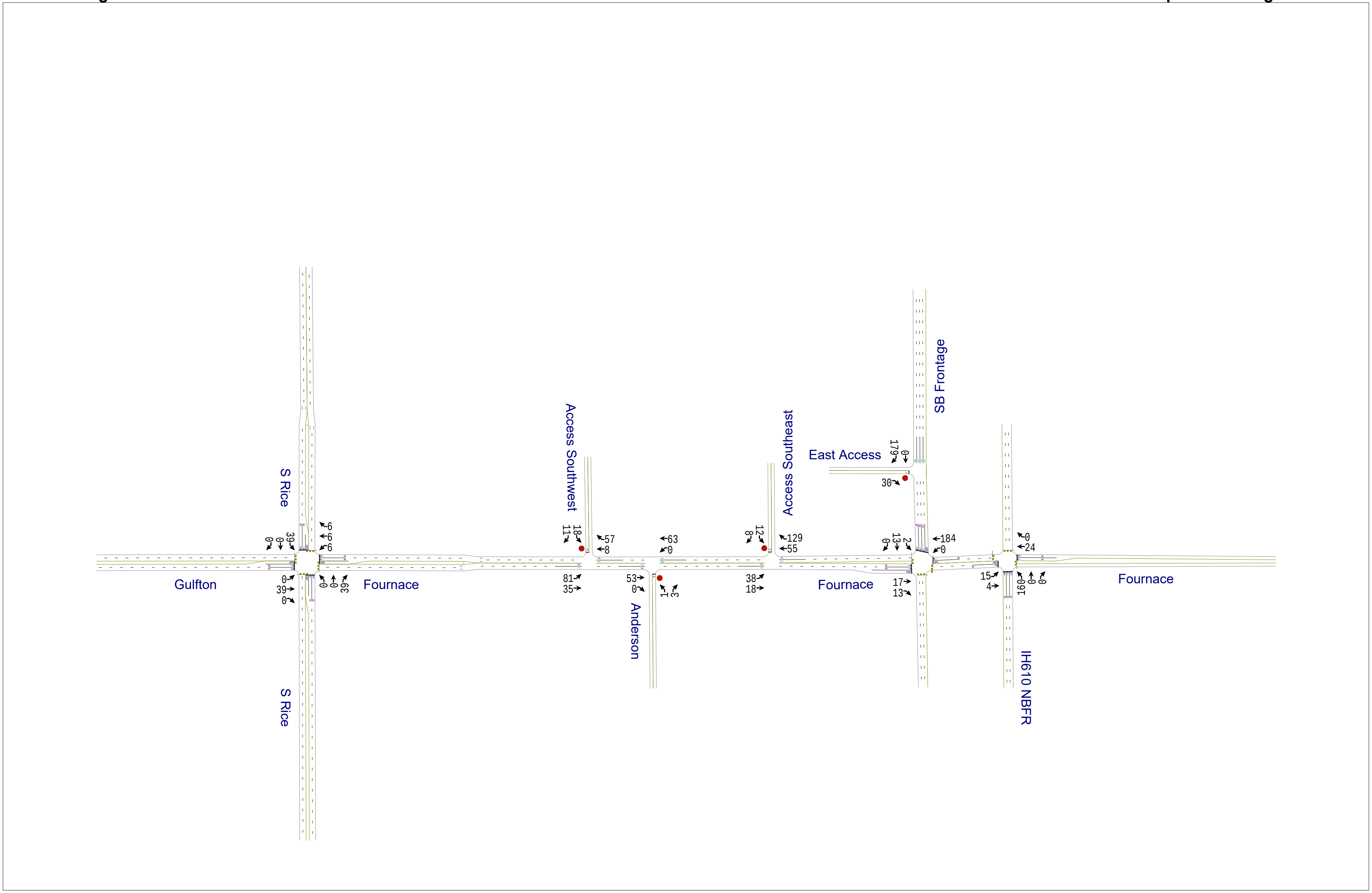

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Exhibit A10
Total Turning Movements

PM Peak Hour
New Trips as Turning Movements

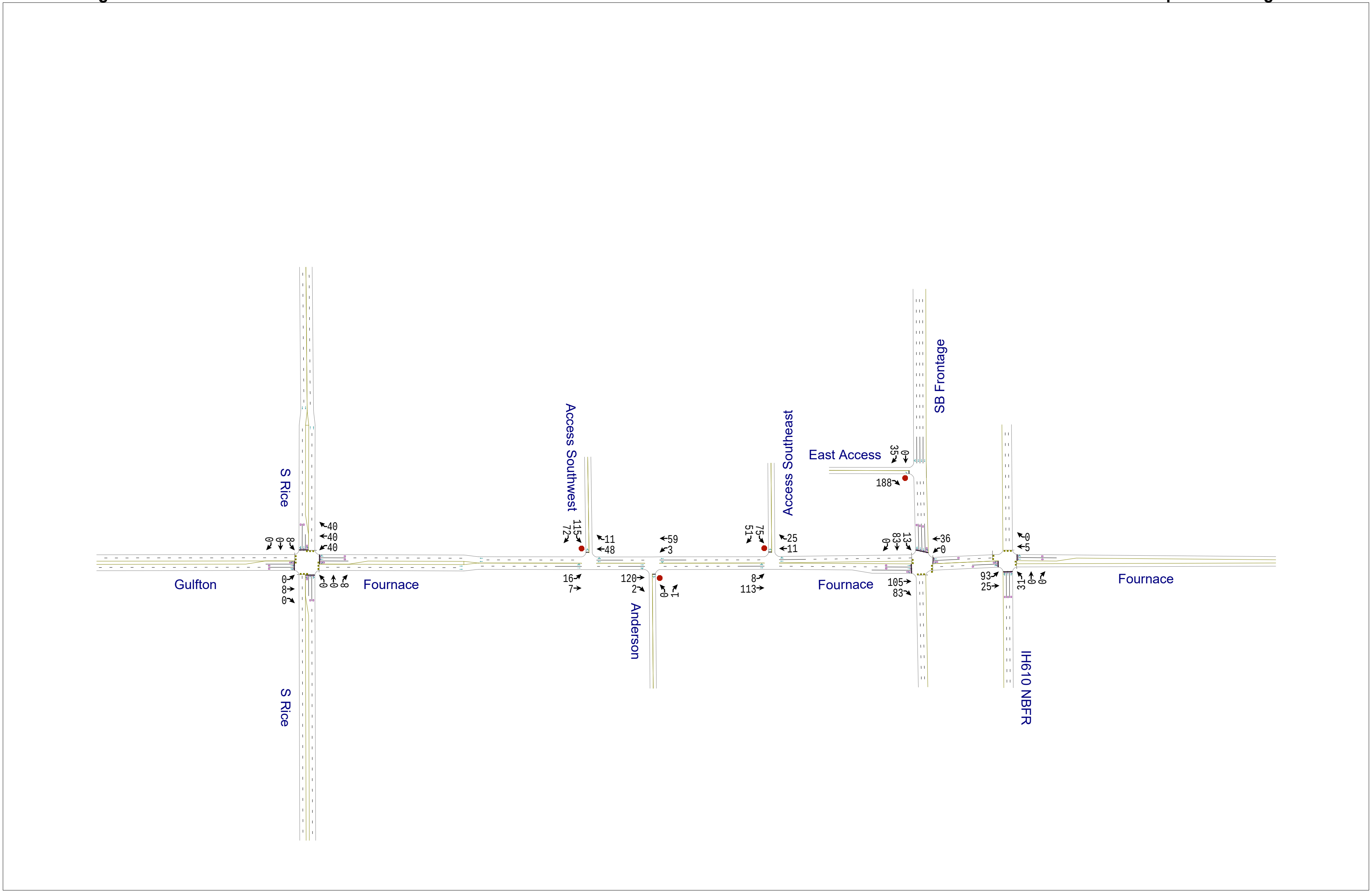

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Exhibit A11
Total Turning Movements

2020 AM Peak Hour
Projected w/o Development

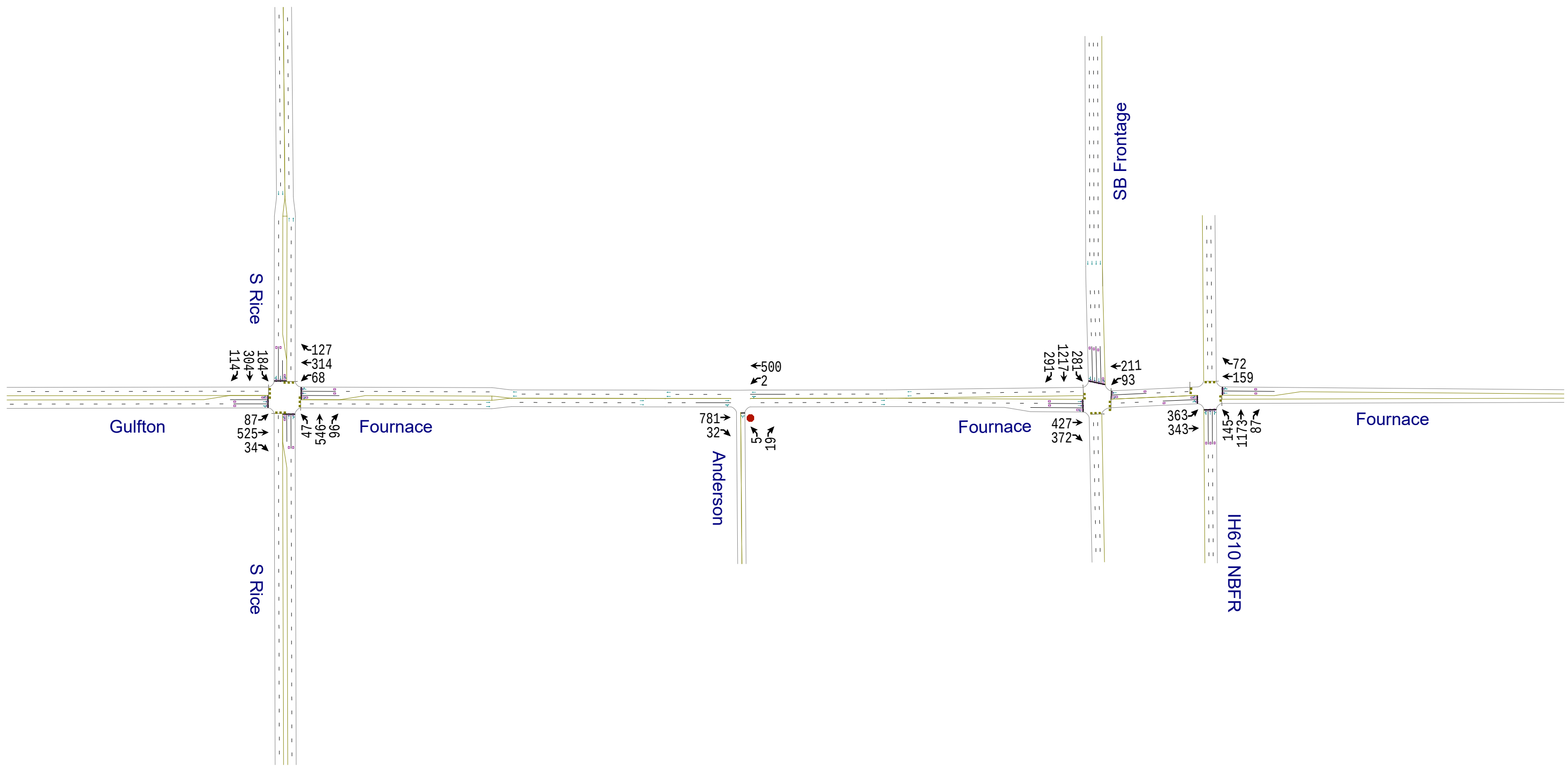

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Exhibit A12
Total Turning Movements

2020 PM Peak Hour
Projected w/o Development

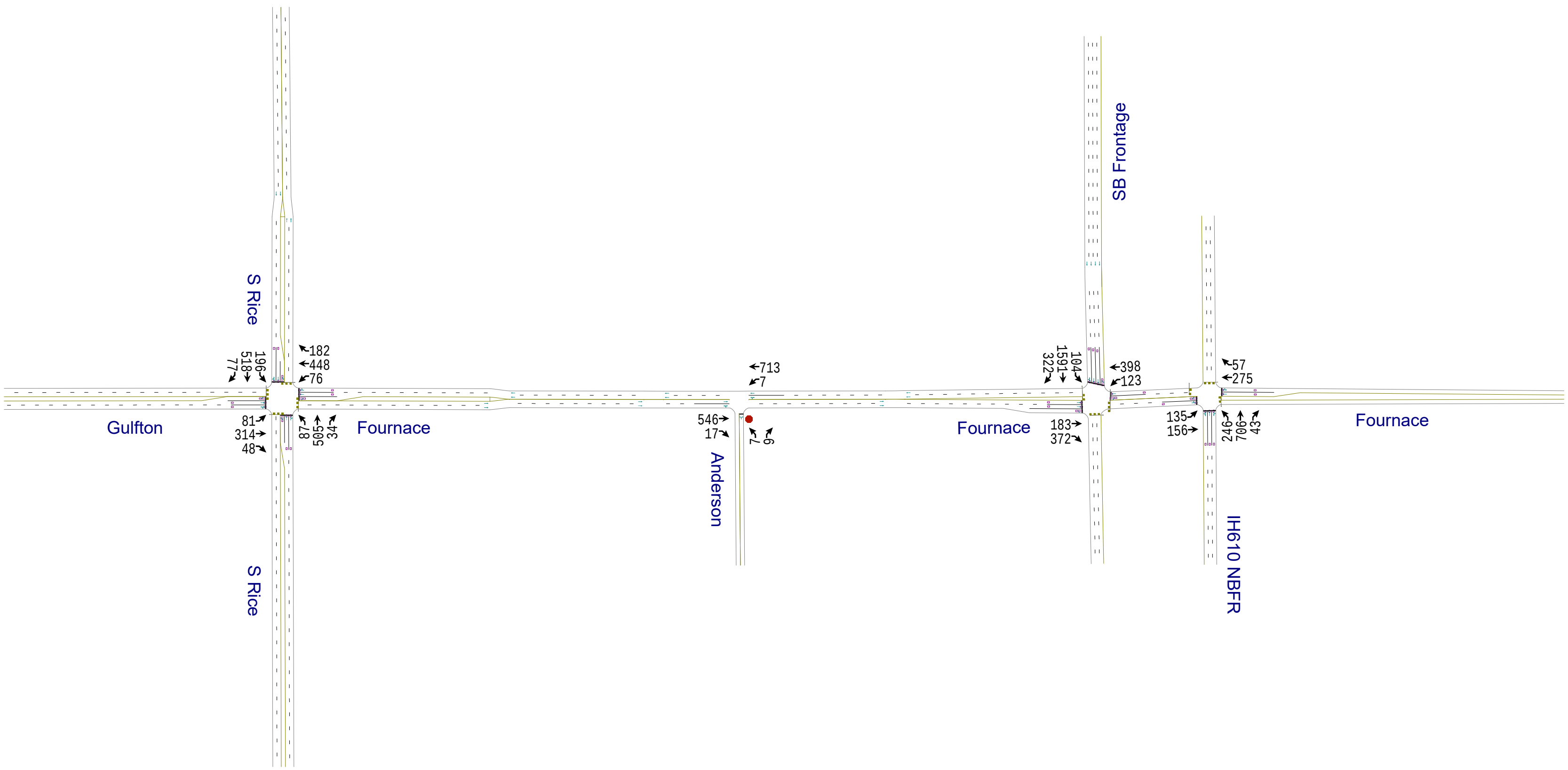

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Exhibit A13
Total Turning Movements

2020 AM Peak Hour
Projected w/Development

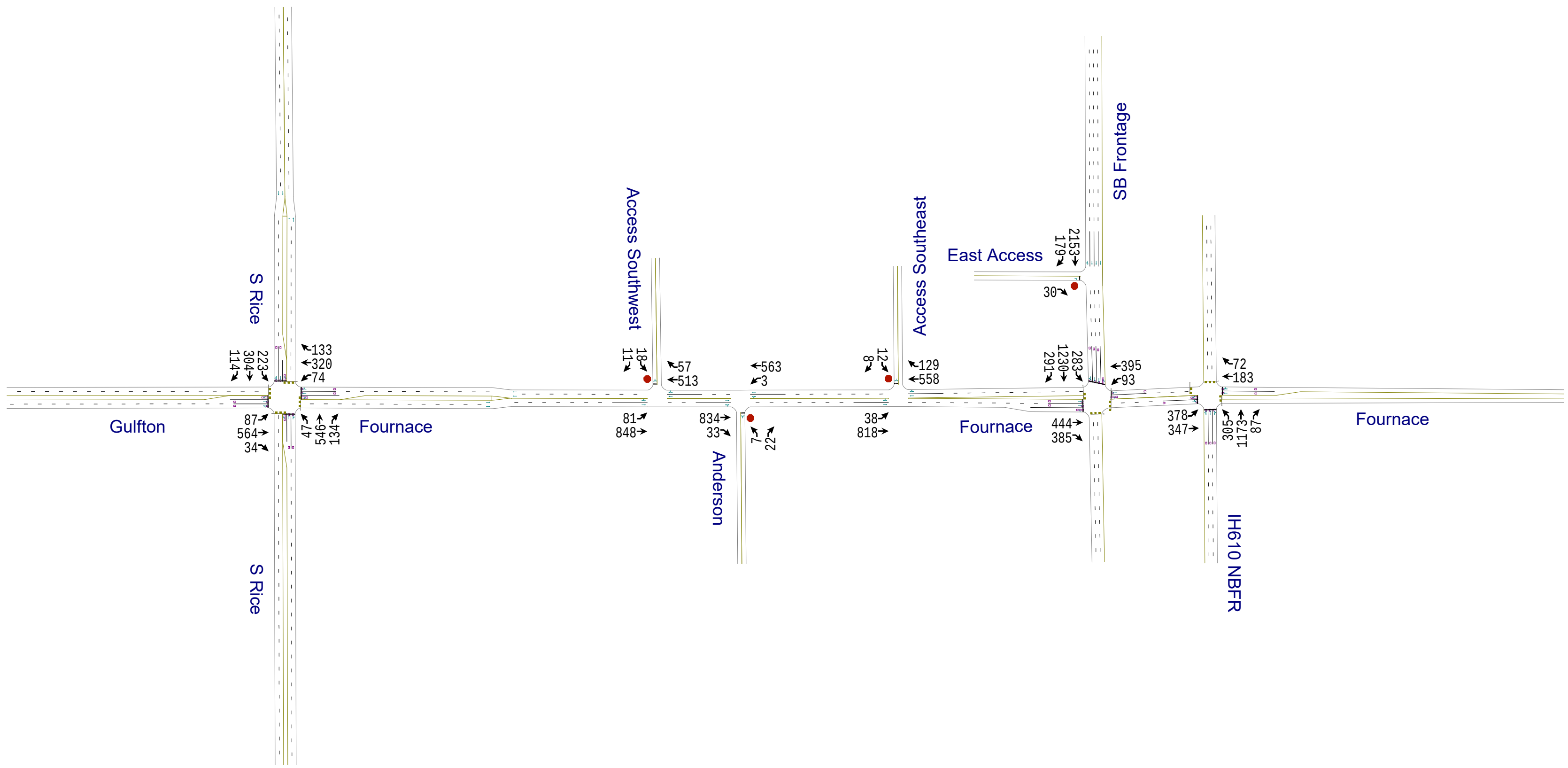

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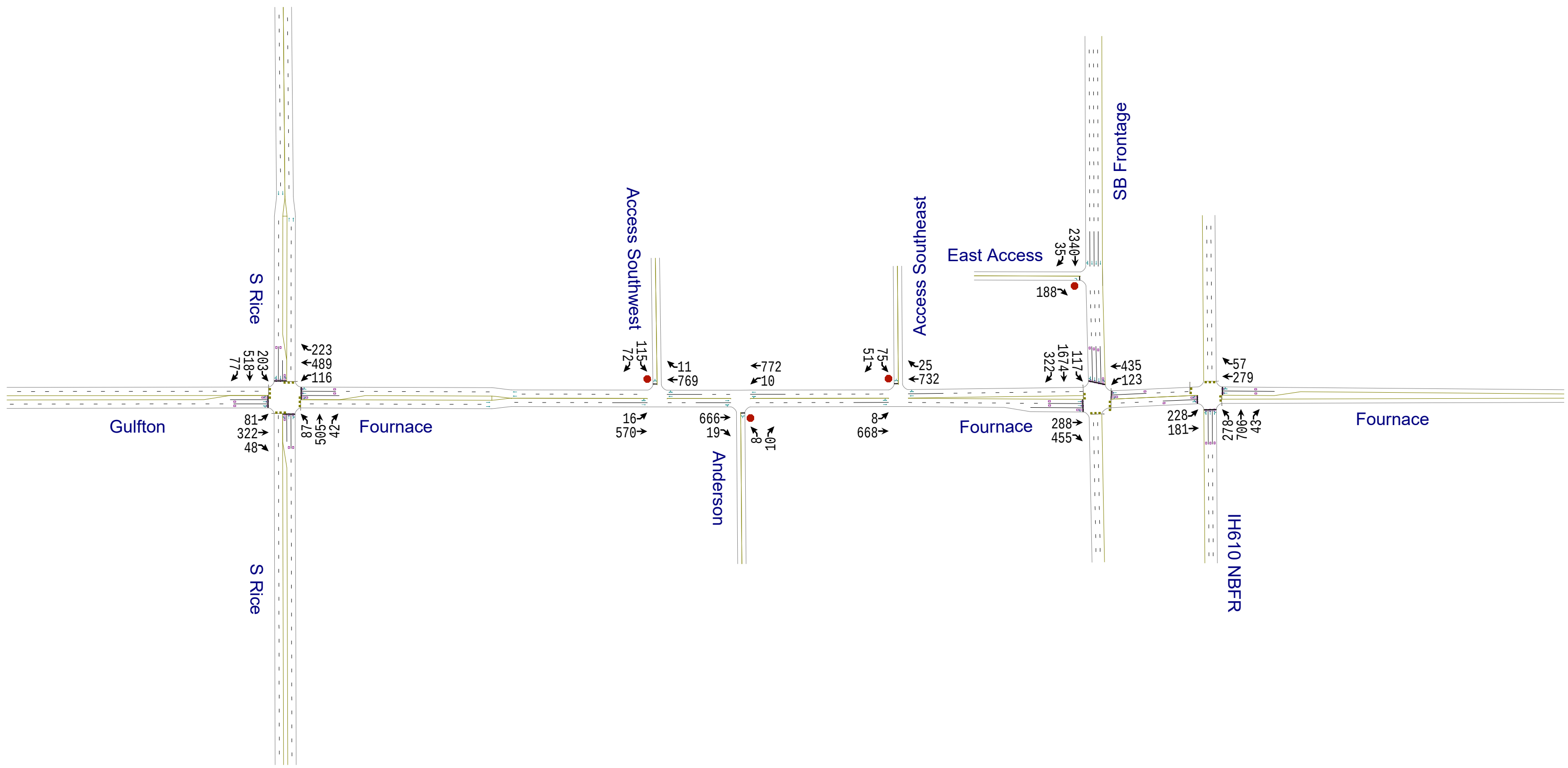
Exhibit A14
Total Turning Movements

2020 PM Peak Hour
Projected w/Development



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APPENDIX B – TRAFFIC DATA

Manual Turning Movement Count
IH-610 Northbound Frontage Road at Fournace Place, Bellaire,Texas
Tuesday, August 28, 2018

Time Begin	Eastbound Fournace Place				Westbound Fournace Place				Northbound IH-610 Frontage Road				Southbound <<NO APPROACH>>				15-min Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
6:30	16	17	0	0	0	6	1	0	24	77	10	0					151
6:45	23	17	0	0	0	11	5	0	45	111	2	1					215
7:00	29	14	0	0	0	27	7	0	44	139	13	3					276
7:15	59	27	0	0	0	46	9	0	38	152	30	7					368
7:30	76	40	0	0	0	44	12	0	35	315	15	5					542
7:45	99	32	0	0	0	44	23	0	28	260	21	6					513
8:00	90	32	0	0	0	37	27	0	24	275	12	3					500
8:15	84	29	0	0	0	28	7	0	52	278	36	1					515

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Peak Hour Total	Eastbound Fournace Place				Westbound Fournace Place				Northbound IH-610 Frontage Road				Southbound <<NO APPROACH>>				Hour Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
7:30-8:30	349	133	0	0	0	153	69	0	139	1128	84	15	0	0	0	0	2070
PHF:	0.95																

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	0

Time Begin	Eastbound Fournace Place				Westbound Fournace Place				Northbound IH-610 Frontage Road				Southbound <<NO APPROACH>>				15-min Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
16:30	28	21	0	0	0	60	11	0	65	160	12	6					363
16:45	30	22	0	0	0	49	12	0	78	142	8	4					345
17:00	44	23	0	0	0	81	22	0	32	199	12	3					416
17:15	30	20	0	0	0	74	10	0	62	178	9	3					386
17:30	33	20	0	0	0	44	10	0	57	171	10	6					351
17:45	41	17	0	0	0	43	16	0	64	195	6	7					389
18:00	37	13	0	0	0	62	8	0	60	128	7	3					318
18:15	15	14	0	0	0	36	5	0	54	118	3	6					251

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Peak Hour Total	Eastbound Fournace Place				Westbound Fournace Place				Northbound IH-610 Frontage Road				Southbound <<NO APPROACH>>				Hour Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
16:30-17:30	132	86	0	0	0	264	55	0	237	679	41	16	0	0	0	0	1510
PHF:	0.91																

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	0

Manual Turning Movement Count

IH-610 Southbound Frontage Road at Fournace Place, Bellaire,Texas
Tuesday, August 28, 2018

Time Begin	Eastbound Fournace Place				Westbound Fournace Place				Northbound <<NO APPROACH>>				Southbound IH-610 Frontage Road				15-min Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
6:30	0	25	93	0	5	25	0	0					8	156	5	5	317
6:45	0	31	84	0	5	51	0	0					9	192	9	9	381
7:00	0	37	87	0	20	51	0	0					6	214	7	28	422
7:15	0	70	94	0	35	49	0	0					16	209	9	31	482
7:30	0	93	91	0	26	53	0	0					23	216	13	27	515
7:45	0	107	90	0	24	48	0	0					24	202	11	61	506
8:00	0	111	99	0	20	41	0	0					11	198	10	68	490
8:15	0	100	78	0	19	61	0	0					13	192	12	36	475

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	0	0	2
0	0	0	0

Peak Hour Total	Eastbound Fournace Place				Westbound Fournace Place				Northbound <<NO APPROACH>>				Southbound IH-610 Frontage Road				Hour Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
7:30-8:30	0	411	358	0	89	203	0	0	0	0	0	0	71	808	46	192	1986
PHF:	0.96																

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	2

Time Begin	Eastbound Fournace Place				Westbound Fournace Place				Northbound <<NO APPROACH>>				Southbound IH-610 Frontage Road				15-min Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
16:30	0	44	86	0	27	98	0	0					5	233	22	35	504
16:45	0	38	87	0	29	98	0	0					14	223	15	35	504
17:00	0	57	94	0	30	83	0	0					10	252	21	33	547
17:15	0	37	91	0	32	104	0	0					13	232	16	52	525
17:30	0	42	72	0	19	82	0	0					11	204	14	57	444
17:45	0	46	87	0	27	80	0	0					12	212	14	33	478
18:00	0	41	76	0	32	90	0	0					9	243	13	47	504
18:15	0	26	46	0	18	72	0	0					3	190	15	17	370

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	0
0	0	0	0
0	0	0	2
0	0	0	0
0	0	0	1
0	0	0	1
0	0	0	0
0	0	0	1

Peak Hour Total	Eastbound Fournace Place				Westbound Fournace Place				Northbound <<NO APPROACH>>				Southbound IH-610 Frontage Road				Hour Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
16:30-17:30	0	176	358	0	118	383	0	0	0	0	0	0	42	940	74	155	2080
PHF:	0.95																

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	0	2

Manual Turning Movement Count

Fournace Place at Anderson Street, Bellaire,Texas

Tuesday, August 28, 2018

Time Begin	Eastbound Fournace Place Left	Thru	Right	U	Westbound Fournace Place Left	Thru	Right	U	Northbound Anderson Street Left	Thru	Right	U	Southbound <<NO APPROACH>> Left	Thru	Right	U	15-min Vehicle Total
6:30		117	1	0	2	33			1		0						154
6:45		113	0	0	2	52			0		0						167
7:00		122	0	0	2	52			1		0						177
7:15		165	6	0	0	58			3		0						232
7:30		176	9	0	1	71			1		4						262
7:45		214	10	0	0	62			1		3						290
8:00		206	6	0	0	50			3		4						269
8:15		157	6	0	1	72			0		7						243

Peds (Crossing Approach) EB	WB	NB	SB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
0	1	0	0
0	0	0	0

Peak Hour Total	Eastbound Fournace Place Left	Thru	Right	U	Westbound Fournace Place Left	Thru	Right	U	Northbound Anderson Street Left	Thru	Right	U	Southbound <<NO APPROACH>> Left	Thru	Right	U	Hour Vehicle Total
7:30-8:30	0	753	31	0	2	255	0	0	5	0	18	0	0	0	0	0	1064
PHF:	0.92																

Peds (Crossing Approach) EB	WB	NB	SB
0	1	0	0

Time Begin	Eastbound Fournace Place Left	Thru	Right	U	Westbound Fournace Place Left	Thru	Right	U	Northbound Anderson Street Left	Thru	Right	U	Southbound <<NO APPROACH>> Left	Thru	Right	U	15-min Vehicle Total
16:30		138	1	0	2	110			1		0						227
16:45		108	7	0	3	111			2		4						235
17:00		143	5	0	2	104			2		1						257
17:15		122	3	0	0	112			2		4						243
17:30		115	4	0	5	98			0		0						222
17:45		114	6	0	4	94			1		0						219
18:00		114	7	0	4	97			4		1						227
18:15		67	3	0	4	78			0		4						156

Peds (Crossing Approach) EB	WB	NB	SB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Peak Hour Total	Eastbound Fournace Place Left	Thru	Right	U	Westbound Fournace Place Left	Thru	Right	U	Northbound Anderson Street Left	Thru	Right	U	Southbound <<NO APPROACH>> Left	Thru	Right	U	Hour Vehicle Total
16:30-17:30	0	511	16	0	7	437	0	0	7	0	9	0	0	0	0	0	962
PHF:	0.94																

Peds (Crossing Approach) EB	WB	NB	SB
0	0	0	0

Manual Turning Movement Count

Fournace Place at South Rice Avenue, Bellaire,Texas

Tuesday, August 28, 2018

Time Begin	Eastbound Fournace Place				Westbound Fournace Place				Northbound South Rice Avenue				Southbound South Rice Avenue				15-min Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
6:30	3	87	2	0	2	16	17	0	12	31	11	0	17	31	4	0	233
6:45	13	81	5	0	5	27	19	0	10	47	11	0	19	28	7	0	272
7:00	24	65	5	0	4	24	23	0	13	72	18	0	40	60	37	0	385
7:15	34	119	10	0	8	36	22	0	11	79	13	0	37	57	52	0	478
7:30	23	123	3	0	1	41	18	0	10	141	17	0	45	69	65	0	556
7:45	24	152	11	0	7	41	20	0	13	123	24	0	48	78	16	0	557
8:00	19	123	7	0	11	20	22	0	10	146	29	0	53	75	16	0	531
8:15	18	107	12	0	11	36	27	0	12	115	22	0	31	70	13	0	474

Peds (Crossing Approach)			
EB	WB	NB	SB
0	0	2	0
0	0	0	0
2	0	5	0
2	0	2	0
0	0	7	0
4	0	1	0
0	1	1	0
0	1	0	0

Peak Hour Total	Eastbound Fournace Place				Westbound Fournace Place				Northbound South Rice Avenue				Southbound South Rice Avenue				Hour Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
7:30-8:30	84	505	33	0	30	138	87	0	45	525	92	0	177	292	110	0	2118
PHF:	0.95																

Peds (Crossing Approach)			
EB	WB	NB	SB
4	2	9	0

Time Begin	Eastbound Fournace Place				Westbound Fournace Place				Northbound South Rice Avenue				Southbound South Rice Avenue				15-min Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
16:30	18	69	7	0	5	69	33	0	22	122	13	0	57	135	18	0	520
16:45	24	71	10	0	13	63	45	0	18	102	9	0	36	106	20	0	517
17:00	13	85	14	0	7	61	23	0	23	129	8	0	51	140	23	0	577
17:15	23	77	15	0	13	73	39	0	21	133	3	0	44	117	13	0	571
17:30	14	60	12	0	6	56	32	0	17	162	12	0	48	147	21	0	587
17:45	28	69	6	0	8	56	33	0	15	92	5	0	46	123	17	0	498
18:00	15	62	5	0	7	52	39	0	10	111	12	0	49	131	27	0	520
18:15	23	34	10	1	12	48	25	0	7	75	6	0	29	82	15	0	366

Peds (Crossing Approach)			
EB	WB	NB	SB
0	1	0	3
0	0	0	0
1	5	4	0
0	1	0	0
0	0	1	0
0	0	0	1
0	0	0	0
0	0	1	0

Peak Hour Total	Eastbound Fournace Place				Westbound Fournace Place				Northbound South Rice Avenue				Southbound South Rice Avenue				Hour Vehicle Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
16:30-17:30	78	302	46	0	38	266	140	0	84	486	33	0	188	498	74	0	2185
PHF:	0.95																

Peds (Crossing Approach)			
EB	WB	NB	SB
1	7	4	3

Texas A&M Transportation Institute
701 N. Post Oak, Suite 430
Houston, TX 77024

Manual Turning Movement Count **All Vehicles**

North-South Facility: IH 610
East-West Facility: Fournace
Weather: Clear (AM, PM)
Date: May 26, 2017 (AM) , May 25, 2017 (PM)

Time Begin	Northbound IH 610				Southbound IH 610				Eastbound Fournace			Westbound Fournace			Total
	U-turn	Left	Thru	Right	U-turn	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:15 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:45 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	3	29	23	2	-	-	-	-	15	52	-	-	18	2	144
7:15 AM	2	34	34	6	-	-	-	-	21	63	-	-	15	6	181
7:30 AM	4	30	52	7	-	-	-	-	26	90	-	-	28	6	243
7:45 AM	6	27	57	12	-	-	-	-	33	109	-	-	21	11	276
8:00 AM	3	30	59	12	-	-	-	-	31	47	-	-	22	4	208
8:15 AM	10	27	43	23	-	-	-	-	24	60	-	-	16	6	209
8:30 AM	6	18	50	16	-	-	-	-	29	53	-	-	13	5	190
8:45 AM	7	20	68	3	-	-	-	-	24	39	-	-	14	3	178
4:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:15 PM	5	45	96	5	-	-	-	-	24	36	-	-	59	7	277
4:30 PM	6	40	73	4	-	-	-	-	34	49	-	-	50	12	268
4:45 PM	5	38	60	5	-	-	-	-	24	30	-	-	45	13	220
5:00 PM	5	34	69	3	-	-	-	-	31	28	-	-	58	19	247
5:15 PM	6	42	88	4	-	-	-	-	12	42	-	-	56	8	258
5:30 PM	2	54	55	3	-	-	-	-	25	43	-	-	60	3	245
5:45 PM	2	32	68	5	-	-	-	-	19	49	-	-	48	7	230
6:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:15 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:45 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Special Hours	Northbound				Southbound									
	U-turn	Left	Thru	Right	U-turn	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7-8 AM	15	120	166	27	-	-	-	-	95	314	-	-	82	25
5-6 PM	15	162	280	15	-	-	-	-	87	162	-	-	222	37

Notes:

Texas A&M Transportation Institute
701 N. Post Oak, Suite 430
Houston, TX 77024

Manual Turning Movement Count **All Vehicles**

North-South Facility: IH 610
East-West Facility: Fournace
Weather: Clear (AM, PM)
Date: May 26, 2017 (AM) , May 25, 2017 (PM)

Time Begin	Northbound IH 610				Southbound IH 610				Eastbound Fournace			Westbound Fournace			Total
	U-turn	Left	Thru	Right	U-turn	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
6:00 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:15 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:45 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	-	-	-	-	63	41	240	67	-	26	65	13	35	-	550
7:15 AM	-	-	-	-	60	52	264	65	-	38	86	10	39	-	614
7:30 AM	-	-	-	-	75	83	282	73	-	41	71	18	41	-	684
7:45 AM	-	-	-	-	92	94	312	73	-	37	59	7	38	-	712
8:00 AM	-	-	-	-	88	38	317	67	-	41	58	16	35	-	660
8:15 AM	-	-	-	-	93	47	257	47	-	39	65	11	37	-	596
8:30 AM	-	-	-	-	90	39	302	45	-	42	70	11	23	-	622
8:45 AM	-	-	-	-	109	34	259	51	-	29	52	7	24	-	565
4:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:15 PM	-	-	-	-	74	22	366	106	-	38	77	33	71	-	787
4:30 PM	-	-	-	-	92	37	364	74	-	46	77	29	61	-	780
4:45 PM	-	-	-	-	57	19	375	85	-	35	82	24	59	-	736
5:00 PM	-	-	-	-	88	13	389	69	-	46	81	35	57	-	778
5:15 PM	-	-	-	-	71	29	395	90	-	25	80	26	72	-	788
5:30 PM	-	-	-	-	75	28	381	81	-	40	74	27	87	-	793
5:45 PM	-	-	-	-	84	30	370	69	-	38	77	21	59	-	748
6:00 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:15 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:30 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6:45 PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Special Hours	Northbound				Southbound									
	U-turn	Left	Thru	Right	U-turn	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7-8 AM	-	-	-	-	290	270	1098	278	-	142	281	48	153	-
5-6 PM	-	-	-	-	318	100	1535	309	-	149	312	109	275	-

Notes:

APPENDIX C – TRIP GENERATION / DISTRIBUTION ANALYSIS DETAILS

Table C1. Trip Generation Calculations

Trip Rates

Development Description	ITE Trip Generation Land Use Number	Trip Generation Land Use	Independent Variable	Value	Use Rate	Use Curve	Weekday 24-Hr Trip Rate*	Weekday Percent Entering	Weekday Percent Exiting	Weekday AM Peak Hour of Adjacent Roadway Trip Rate*	Weekday AM Peak Hour of Adjacent Roadway Percent Entering	Weekday AM Peak Hour of Adjacent Roadway Percent Exiting	Weekday PM Peak Hour of Adjacent Roadway Trip Rate*	Weekday PM Peak Hour of Adjacent Roadway Percent Entering	Weekday PM Peak Hour of Adjacent Roadway Percent Exiting
4800 Fournace Mixed Use	710	General Office Building	1KSF	571,718	Y	Y	1.40	50%	50%	1.16	86%	14%	1.15	16%	84%

Trip End Calculations

Development Description	ITE Trip Generation Land Use Number	Trip Generation Land Use	Independent Variable	Value	Use Rate	Use Curve	Weekday 24-Hr Trip Ends	Weekday Trips Entering	Weekday Trips Exiting	Weekday AM Peak Hour of Adjacent Roadway Peak Hour Trips	Weekday AM Peak Hour of Adjacent Roadway Trips Entering	Weekday AM Peak Hour of Adjacent Roadway Trips Exiting	Weekday PM Peak Hour of Adjacent Roadway Peak Hour Trips	Weekday PM Peak Hour of Adjacent Roadway Trips Entering	Weekday PM Peak Hour of Adjacent Roadway Trips Exiting
4800 Fournace Mixed Use	710	General Office Building	1KSF	571,718	Y	Y	5,757	2,879	2,879	564	485	79	597	95	501

Trip End Totals

	Weekday 24-Hr Trip Ends	Weekday Trips Entering	Weekday Trips Exiting	Weekday AM Peak Hour of Adjacent Roadway Peak Hour Trips	Weekday AM Peak Hour of Adjacent Roadway Trips Entering	Weekday AM Peak Hour of Adjacent Roadway Trips Exiting	Weekday PM Peak Hour of Adjacent Roadway Peak Hour Trips	Weekday PM Peak Hour of Adjacent Roadway Trips Entering	Weekday PM Peak Hour of Adjacent Roadway Trips Exiting
Trip Totals	5,757	2,879	2,879	564	485	79	597	95	501

*trip rates shown for information only, fitted curves used for trip generation

Trip Adjustment Factors

Adjustment Factor	Time Period	Factor
Internal Capture Rates:	Weekday	0.0%
	Weekday AM Peak Hour of Adjacent Roadway	0.0%
	Weekday PM Peak Hour of Adjacent Roadway	0.0%
Pass-By Trips:	Weekday	0.0%
	Weekday AM Peak Hour of Adjacent Roadway	0.0%
	Weekday PM Peak Hour of Adjacent Roadway	0.0%

Trip Totals

Trip Type	Weekday AM Peak Hour of Adjacent Roadway Total Trips	Weekday AM Peak Hour of Adjacent Roadway Trips* Entering	Weekday AM Peak Hour of Adjacent Roadway Trips* Exiting	Weekday PM Peak Hour of Adjacent Roadway Total Trips	Weekday PM Peak Hour of Adjacent Roadway Trips* Entering	Weekday PM Peak Hour of Adjacent Roadway Trips* Exiting
Total Trips, Pre-Capture/Pass-By:	564	485	79	597	95	501
Total Trips, Captured Within Development:	-	-	-	-	-	-
Total Trips, New & Pass-By	564	485	79	597	95	501
Total Trips, Pass-By, Existing on Roadway Network:	-	-	-	-	-	-
Total Trips, New on Roadway Network:	564	485	79	597	95	501

*trip estimates subject to roundoff error

Table C2. Trip Distribution

GLOBAL ORIGINS/DESTINATIONS

Origins-Peak Hour Volume	AM	PM	Destinations-Peak Hour Volume	AM	PM
From IH-610 SBFR, North of Site	1117	1211	To IH-610 NBFR, North of Site	1546	866
From IH-610 NBFR, South of Fournace	1366	973	To IH-610 SBFR, South of Fournace	1255	1416
From Fournace, East of IH-610 NBFR	222	319	To Fournace, East of IH-610 NBFR	217	127
From Anderson, South of Fournace	23	16	To Anderson, South of Fournace	33	23
From Gulfton/Fournace, West of S Rice	622	426	To Gulfton/Fournace, West of S Rice	293	424
From South Rice Ave, North of Fournace	579	760	To South Rice Ave, North of Fournace	696	704
From South Rice Ave, South of Fournace	662	603	To South Rice Ave, South of Fournace	355	582

TRIP DISTRIBUTION (NEW TRIPS)

FROM (ENTERING DEVELOPMENT)	Existing Total Volume AM Peak	Manually Estimated Trip Distribution (%)	Volume Based Trip Distribution Percentage	AM Peak Development Volume*	Existing Total Volume PM Peak	Manually Estimated Trip Distribution (%)	Volume Based Trip Distribution Percentage	PM Peak Development Volume*
From IH-610 SBFR, North of Site	1117	37.0%	24.3%	179	1211	37.0%	28.1%	35
From IH-610 NBFR, South of Fournace	1366	33.0%	29.8%	160	973	33.0%	22.6%	31
From Fournace, East of IH-610 NBFR	222	5.0%	4.8%	24	319	5.0%	7.4%	5
From Anderson, South of Fournace	23	1.0%	0.5%	5	16	1.0%	0.4%	1
From Gulfton/Fournace, West of S Rice	622	8.0%	13.5%	39	426	8.0%	9.9%	8
From South Rice Ave, North of Fournace	579	8.0%	12.6%	39	760	8.0%	17.6%	8
From South Rice Ave, South of Fournace	662	8.0%	14.4%	39	603	8.0%	14.0%	8
Total	4591	100.0%	100.0%	485	4308	100.0%	100.0%	95
TO (EXITING DEVELOPMENT)	Existing Total Volume AM Peak	Manually Estimated Trip Distribution (%)	Volume Based Trip Distribution Percentage	AM Peak Development Volume*	Existing Total Volume PM Peak	Manually Estimated Trip Distribution (%)	Volume Based Trip Distribution Percentage	PM Peak Development Volume*
To IH-610 NBFR, North of Site	1546	37.0%	35.2%	29	866	37.0%	20.9%	185
To IH-610 SBFR, South of Fournace	1255	33.0%	28.6%	26	1416	33.0%	34.2%	165
To Fournace, East of IH-610 NBFR	217	5.0%	4.9%	4	127	5.0%	3.1%	25
To Anderson, South of Fournace	33	1.0%	0.8%	1	23	1.0%	0.6%	5
To Gulfton/Fournace, West of S Rice	293	8.0%	6.7%	6	424	8.0%	10.2%	40
To South Rice Ave, North of Fournace	696	8.0%	15.8%	6	704	8.0%	17.0%	40
To South Rice Ave, South of Fournace	355	8.0%	8.1%	6	582	8.0%	14.1%	40
Total	4395	100.0%	100.0%	79	4142	100.0%	100.0%	501

*Development volumes and sum totals rounded to whole vehicles

TRIP DISTRIBUTION DETAILS - NEW TRIPS

FROM (ENTERING DEVELOPMENT)	ROUTE (ENTERING DEVELOPMENT)									AM PEAK HOUR Vehicles	PM PEAK HOUR Vehicles	AM PEAK HOUR Percent of Entering Vehicles	PM PEAK HOUR Percent of Entering Vehicles
	AM Percent Dist.	PM Percent Dist.	Int01: IH610 NBFR at Fournace	Int02: IH610 SBFR at Fournace	Int03: Fournace at Southeast Access	Int04: Fournace at Anderson	Int05: Fournace at Southwest Access	Int6: Fournace at S Rice Avenue	Int10: IH610 SBFR at East Access				
From IH-610 SBFR, North of Site													
via East Access Drive	100.0%	100.0%							SBR	179	35	37.00%	37.00%
via Southeast Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southwest Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
From IH-610 NBFR, South of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	70.0%	70.0%	NBL	WBT	WBR					112	22	23.10%	23.10%
via Southwest Access Drive	30.0%	30.0%	NBL	WBT	WBT	WBT	WBR			48	9	9.90%	9.90%
From Fournace, East of IH-610 NBFR													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	70.0%	70.0%	WBT	WBT	WBR					17	3	3.50%	3.50%
via Southwest Access Drive	30.0%	30.0%	WBT	WBT	WBT	WBT	WBR			7	1	1.50%	1.50%
From Anderson, South of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	70.0%	70.0%			EBL	NBR				3	1	0.70%	0.70%
via Southwest Access Drive	30.0%	30.0%				NBL	WBR			1	0	0.30%	0.30%
From Gulfton/Fournace, West of S Rice													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	30.0%	30.0%			EBL	EBT	EBT	EBT		12	2	2.40%	2.40%
via Southwest Access Drive	70.0%	70.0%					EBL	EBT		27	5	5.60%	5.60%
From South Rice Ave, North of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	30.0%	30.0%			EBL	EBT	EBT	SBL		12	2	2.40%	2.40%
via Southwest Access Drive	70.0%	70.0%					EBL	SBL		27	5	5.60%	5.60%
From South Rice Ave, South of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	30.0%	30.0%			EBL	EBT	EBT	NBR		12	2	2.40%	2.40%
via Southwest Access Drive	70.0%	70.0%					EBL	NBR		27	5	5.60%	5.60%

TO (EXITING DEVELOPMENT)	ROUTE (EXITING DEVELOPMENT)									AM PEAK HOUR Vehicles	PM PEAK HOUR Vehicles	AM PEAK HOUR Percent of Exiting Vehicles	PM PEAK HOUR Percent of Exiting Vehicles
	AM Percent Dist.	PM Percent Dist.	Int01: IH610 NBFR at Fournace	Int02: IH610 SBFR at Fournace	Int03: Fournace at Southeast Access	Int04: Fournace at Anderson	Int05: Fournace at Southwest Access	Int6: Fournace at S Rice Avenue	Int10: IH610 SBFR at East Access				
To IH-610 NBFR, North of Site													
via East Access Drive	50.0%	50.0%		SBU					EBR	15	93	18.50%	18.50%
via Southeast Access Drive	20.0%	20.0%	EBL	EBT	SBL					6	37	7.40%	7.40%
via Southwest Access Drive	30.0%	30.0%	EBL	EBT	EBT	EBT	SBL			9	56	11.10%	11.10%
To IH-610 SBFR, South of Fournace													
via East Access Drive	50.0%	50.0%		SBT					EBR	13	83	16.50%	16.50%
via Southeast Access Drive	20.0%	20.0%		EBR	SBL					5	33	6.60%	6.60%
via Southwest Access Drive	30.0%	30.0%		EBR	EBT	EBT	SBL			8	50	9.90%	9.90%
To Fournace, East of IH-610 NBFR													
via East Access Drive	50.0%	50.0%	EBT	SBL					EBR	2	13	2.50%	2.50%
via Southeast Access Drive	20.0%	20.0%	EBT	EBT	SBL					1	5	1.00%	1.00%
via Southwest Access Drive	30.0%	30.0%	EBT	EBT	EBT	EBT	SBL			1	8	1.50%	1.50%
To Anderson, South of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	60.0%	60.0%			SBR	WBL				0	3	0.60%	0.60%
via Southwest Access Drive	40.0%	40.0%				EBR	SBL			0	2	0.40%	0.40%
To Gulfton/Fournace, West of S Rice													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	40.0%	40.0%			SBR	WBT	WBT	WBT		3	16	3.20%	3.20%
via Southwest Access Drive	60.0%	60.0%					SBR	WBT		4	24	4.80%	4.80%
To South Rice Ave, North of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	40.0%	40.0%			SBR	WBT	WBT	WBR		3	16	3.20%	3.20%
via Southwest Access Drive	60.0%	60.0%					SBR	WBR		4	24	4.80%	4.80%
To South Rice Ave, South of Fournace													
via East Access Drive	0.0%	0.0%								0	0	0.00%	0.00%
via Southeast Access Drive	40.0%	40.0%			SBR	WBT	WBT	WBL		3	16	3.20%	3.20%
via Southwest Access Drive	60.0%	60.0%					SBR	WBL		4	24	4.80%	4.80%

Table C3. Existing (2018) Peak Hour Turning Movement Counts

1. IH 610 Northbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Frontage Road				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	349	133	0	0	0	153	69	0	139	1128	84	15	0	0	0	0
PM Peak (16:30-17:30p)	132	86	0	0	0	264	55	0	237	679	41	16	0	0	0	0

2. IH 610 Southbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	411	358	0	89	203	0	0	0	0	0	0	71	808	46	192
PM Peak (16:30-17:30p)	0	176	358	0	118	383	0	0	0	0	0	0	42	940	74	155

3. Fournace Place at Southeast Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southeast Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)		771				257							0		0	
PM Peak (16:30-17:30p)		520				444							0		0	

4. Fournace Place at Anderson Street

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Anderson Street				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	753	31	0	2	255	0	0	5	0	18	0	0	0	0	0
PM Peak (16:30-17:30p)	0	511	16	0	7	437	0	0	7	0	9	0	0	0	0	0

5. Fournace Place at Southwest Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southwest Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)		784				260							0		0	
PM Peak (16:30-17:30p)		527				444							0		0	

6. Fournace Place/Gulfton Street at South Rice Avenue

	Eastbound				Westbound				Northbound				Southbound			
	Gulfton Street				Fournace Place				South Rice Avenue				South Rice Avenue			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	84	505	33	0	30	138	87	0	45	525	92	0	177	292	110	0
PM Peak (16:30-17:30p)	78	302	46	0	38	266	140	0	84	486	33	0	188	498	74	0

10. IH 610 Southbound Frontage Road at East Site Access

	Eastbound				Westbound				Northbound				Southbound			
	East Site Access Driveway				<<NO APPROACH>>				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)														1117		
PM Peak (16:30-17:30p)														1211		

Table C3-ADJ. Adjusted for Construction - (2018) Peak Hour Turning Movement Counts
Adjusted Values Highlighted in Yellow

1. IH 610 Northbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Frontage Road				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	349	330	0	0	0	153	69	0	139	1128	84	15	0	0	0	0
PM Peak (16:30-17:30p)	130	150	0	0	0	264	55	0	237	679	41	16	0	0	0	0

2. IH 610 Southbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	411	358	0	89	203	0	0	0	0	0	0	270	1170	280	350
PM Peak (16:30-17:30p)	0	176	358	0	118	383	0	0	0	0	0	0	100	1530	310	310

3. Fournace Place at Southeast Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southeast Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)		769				483							0		0	
PM Peak (16:30-17:30p)		534				693							0		0	

4. Fournace Place at Anderson Street

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Anderson Street				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	751	31	0	2	481	0	0	5	0	18	0	0	0	0	0
PM Peak (16:30-17:30p)	0	525	16	0	7	686	0	0	7	0	9	0	0	0	0	0

5. Fournace Place at Southwest Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southwest Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)		782				486							0		0	
PM Peak (16:30-17:30p)		541				693							0		0	

6. Fournace Place/Gulfton Street at South Rice Avenue

	Eastbound				Westbound				Northbound				Southbound			
	Gulfton Street				Fournace Place				South Rice Avenue				South Rice Avenue			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	84	505	33	0	65	302	122	0	45	525	92	0	177	292	110	0
PM Peak (16:30-17:30p)	78	302	46	0	73	431	175	0	84	486	33	0	188	498	74	0

10. IH 610 Southbound Frontage Road at East Site Access

	Eastbound				Westbound				Northbound				Southbound			
	East Site Access Driveway				<<NO APPROACH>>				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)														2070		
PM Peak (16:30-17:30p)														2250		

Table C4. Projected 2020 Peak Hour Turning Movement Counts (without development)

1. IH 610 Northbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Frontage Road				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	363	343	0	0	0	159	72	0	145	1173	87	16	0	0	0	0
PM Peak (16:30-17:30p)	135	156	0	0	0	275	57	0	246	706	43	17	0	0	0	0

2. IH 610 Southbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	427	372	0	93	211	0	0	0	0	0	0	281	1217	291	364
PM Peak (16:30-17:30p)	0	183	372	0	123	398	0	0	0	0	0	0	104	1591	322	322

3. Fournace Place at Southeast Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southeast Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	800	0	0	0	502	0	0	0	0	0	0	0	0	0	0
PM Peak (16:30-17:30p)	0	555	0	0	0	721	0	0	0	0	0	0	0	0	0	0

4. Fournace Place at Anderson Street

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Anderson Street				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	781	32	0	2	500	0	0	5	0	19	0	0	0	0	0
PM Peak (16:30-17:30p)	0	546	17	0	7	713	0	0	7	0	9	0	0	0	0	0

5. Fournace Place at Southwest Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southwest Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	813	0	0	0	505	0	0	0	0	0	0	0	0	0	0
PM Peak (16:30-17:30p)	0	563	0	0	0	721	0	0	0	0	0	0	0	0	0	0

6. Fournace Place/Gulfton Street at South Rice Avenue

	Eastbound				Westbound				Northbound				Southbound			
	Gulfton Street				Fournace Place				South Rice Avenue				South Rice Avenue			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	87	525	34	0	68	314	127	0	47	546	96	0	184	304	114	0
PM Peak (16:30-17:30p)	81	314	48	0	76	448	182	0	87	505	34	0	196	518	77	0

10. IH 610 Southbound Frontage Road at East Site Access

	Eastbound				Westbound				Northbound				Southbound			
	East Site Access Driveway				<<NO APPROACH>>				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	0	0	0	0	0	0	0	0	0	0	0	0	2153	0	0
PM Peak (16:30-17:30p)	0	0	0	0	0	0	0	0	0	0	0	0	0	2340	0	0

Table C5. Projected Peak Hour New Site Trips

1. IH 610 Northbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Frontage Road				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	15	4	0	0	0	24	0	0	160	0	0	0	0	0	0	0
PM Peak (16:30-17:30p)	93	25	0	0	0	5	0	0	31	0	0	0	0	0	0	0

2. IH 610 Southbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	17	13	0	0	184	0	0	0	0	0	0	2	13	0	15
PM Peak (16:30-17:30p)	0	105	83	0	0	36	0	0	0	0	0	0	13	83	0	93

3. Fournace Place at Southeast Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southeast Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	38	18	0	0	0	55	129	0	0	0	0	0	12	0	8	0
PM Peak (16:30-17:30p)	8	113	0	0	0	11	25	0	0	0	0	0	75	0	51	0

4. Fournace Place at Anderson Street

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Anderson Street				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	53	0	0	0	63	0	0	1	0	3	0	0	0	0	0
PM Peak (16:30-17:30p)	0	120	2	0	3	59	0	0	0	0	1	0	0	0	0	0

5. Fournace Place at Southwest Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southwest Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	81	35	0	0	0	8	57	0	0	0	0	0	18	0	11	0
PM Peak (16:30-17:30p)	16	7	0	0	0	48	11	0	0	0	0	0	115	0	72	0

6. Fournace Place/Gulfton Street at South Rice Avenue

	Eastbound				Westbound				Northbound				Southbound			
	Gulfton Street				Fournace Place				South Rice Avenue				South Rice Avenue			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	39	0	0	6	6	6	0	0	0	39	0	39	0	0	0
PM Peak (16:30-17:30p)	0	8	0	0	40	40	40	0	0	0	8	0	8	0	0	0

10. IH 610 Southbound Frontage Road at East Site Access

	Eastbound				Westbound				Northbound				Southbound			
	East Site Access Driveway				<<NO APPROACH>>				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	0	30	0	0	0	0	0	0	0	0	0	0	0	179	0
PM Peak (16:30-17:30p)	0	0	188	0	0	0	0	0	0	0	0	0	0	0	35	0

Table C6. Projected 2020 Peak Hour Turning Movement Counts (w/development)

1. IH 610 Northbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Frontage Road				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	378	347	0	0	0	183	72	0	305	1173	87	16	0	0	0	0
PM Peak (16:30-17:30p)	228	181	0	0	0	279	57	0	278	706	43	17	0	0	0	0

2. IH 610 Southbound Frontage Road at Fournace Place

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	444	385	0	93	395	0	0	0	0	0	0	283	1230	291	379
PM Peak (16:30-17:30p)	0	288	455	0	123	435	0	0	0	0	0	0	117	1674	322	415

3. Fournace Place at Southeast Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southeast Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	38	818	0	0	0	558	129	0	0	0	0	0	12	0	8	0
PM Peak (16:30-17:30p)	8	668	0	0	0	732	25	0	0	0	0	0	75	0	51	0

4. Fournace Place at Anderson Street

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				Anderson Street				<<NO APPROACH>>			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	834	33	0	3	563	0	0	7	0	22	0	0	0	0	0
PM Peak (16:30-17:30p)	0	666	19	0	10	772	0	0	8	0	10	0	0	0	0	0

5. Fournace Place at Southwest Site Access Driveway

	Eastbound				Westbound				Northbound				Southbound			
	Fournace Place				Fournace Place				<<NO APPROACH>>				Southwest Site Access Driveway			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	81	848	0	0	0	513	57	0	0	0	0	0	18	0	11	0
PM Peak (16:30-17:30p)	16	570	0	0	0	769	11	0	0	0	0	0	115	0	72	0

6. Fournace Place/Gulfton Street at South Rice Avenue

	Eastbound				Westbound				Northbound				Southbound			
	Gulfton Street				Fournace Place				South Rice Avenue				South Rice Avenue			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	87	564	34	0	74	320	133	0	47	546	134	0	223	304	114	0
PM Peak (16:30-17:30p)	81	322	48	0	116	489	223	0	87	505	42	0	203	518	77	0

10. IH 610 Southbound Frontage Road at East Site Access

	Eastbound				Westbound				Northbound				Southbound			
	East Site Access Driveway				<<NO APPROACH>>				<<NO APPROACH>>				Frontage Road			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U
AM Peak (7:30-8:30a)	0	0	30	0	0	0	0	0	0	0	0	0	0	2153	179	0
PM Peak (16:30-17:30p)	0	0	188	0	0	0	0	0	0	0	0	0	0	2340	35	0

APPENDIX D – TRAFFIC SIMULATION OUTPUT ANALYSIS RESULTS

Lanes, Volumes, Timings
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	133	0	0	153	69	139	1128	84	0	0	0
Future Volume (vph)	349	133	0	0	153	69	139	1128	84	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.953			0.991				
Flt Protected	0.950	0.977						0.995				
Satd. Flow (prot)	1681	1729	0	0	3373	0	0	5014	0	0	0	0
Flt Permitted	0.140	0.103						0.995				
Satd. Flow (perm)	248	182	0	0	3373	0	0	5014	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					69			11				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	367	140	0	0	161	73	146	1187	88	0	0	0
Shared Lane Traffic (%)	34%											
Lane Group Flow (vph)	242	265	0	0	234	0	0	1421	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lanes, Volumes, Timings
1: IH610 NBFR & Fournace

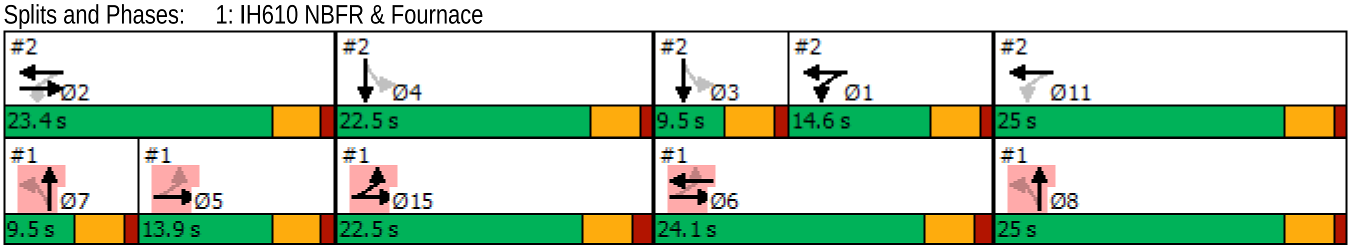
2018 PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	22.5				24.1							
Total Split (%)	23.7%				25.4%							
Maximum Green (s)	17.5				19.1							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	45.2	45.2			19.1			30.0				
Actuated g/C Ratio	0.48	0.48			0.20			0.32				
v/c Ratio	0.64	0.72			0.32			0.89				
Control Delay	21.1	25.8			23.9			39.0				
Queue Delay	0.1	0.0			0.0			0.0				
Total Delay	21.2	25.8			23.9			39.0				
LOS	C	C			C			D				
Approach Delay		23.6			23.9			39.0				
Approach LOS		C			C			D				

Intersection Summary

Area Type: Other
Cycle Length: 95
Actuated Cycle Length: 94.7
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 33.8 — Intersection LOS: C
Intersection Capacity Utilization 58.4% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.6	23.4	9.5	22.5	13.9	9.5	25.0	25.0
Total Split (%)	15%	25%	10%	24%	15%	10%	26%	26%
Maximum Green (s)	10.1	18.9	5.0	18.0	9.4	5.0	20.5	20.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	22.5		24.1		14.6	23.4	9.5	22.5	13.9	9.5	25.0	25.0
Total Split (%)	23.7%		25.4%		15%	25%	10%	24%	15%	10%	26%	26%
Maximum Green (s)	17.5		19.1		10.1	18.9	5.0	18.0	9.4	5.0	20.5	20.5
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	17.5		19.1		10.1	18.9	5.0	18.0	9.4	5.0	20.5	20.5
90th %ile Term Code	Max		Max		Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	17.5		19.1		10.1	18.9	5.0	18.0	9.4	5.0	20.5	20.5
70th %ile Term Code	Max		Max		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	17.5		19.1		10.1	18.9	5.0	18.0	9.4	5.0	20.5	20.5
50th %ile Term Code	Max		Max		Max	Max	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	17.5		19.1		10.1	18.9	5.0	18.0	9.4	5.0	20.5	20.5
30th %ile Term Code	Hold		Max		Hold	Hold	Max	Max	Max	Max	Max	Hold
10th %ile Green (s)	15.9		19.1		10.1	18.9	5.0	16.4	9.4	5.0	20.5	20.5
10th %ile Term Code	Hold		Max		Hold	Hold	Max	Gap	Max	Max	Max	Hold

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 94.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 95
30th %ile Actuated Cycle: 95
10th %ile Actuated Cycle: 93.4

Queues
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	242	265	234	1421
v/c Ratio	0.64	0.72	0.32	0.89
Control Delay	21.1	25.8	23.9	39.0
Queue Delay	0.1	0.0	0.0	0.0
Total Delay	21.2	25.8	23.9	39.0
Queue Length 50th (ft)	127	145	44	295
Queue Length 95th (ft)	226	#261	78	#369
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	383	373	735	1595
Starvation Cap Reductn	6	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.71	0.32	0.89

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	133	0	0	153	69	139	1128	84	0	0	0
Future Volume (vph)	349	133	0	0	153	69	139	1128	84	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.95			0.99				
Flt Protected	0.95	0.98			1.00			0.99				
Satd. Flow (prot)	1681	1729			3374			5012				
Flt Permitted	0.14	0.10			1.00			0.99				
Satd. Flow (perm)	248	183			3374			5012				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	367	140	0	0	161	73	146	1187	88	0	0	0
RTOR Reduction (vph)	0	0	0	0	55	0	0	8	0	0	0	0
Lane Group Flow (vph)	242	265	0	0	179	0	0	1413	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	45.7	45.7			19.1			30.0				
Effective Green, g (s)	45.7	45.7			19.1			30.0				
Actuated g/C Ratio	0.48	0.48			0.20			0.32				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	379	369			680			1587				
v/s Ratio Prot	0.12	c0.13			0.05							
v/s Ratio Perm	0.19	c0.22						0.28				
v/c Ratio	0.64	0.72			0.26			0.89				
Uniform Delay, d1	32.2	19.4			31.9			30.8				
Progression Factor	0.65	0.58			1.00			1.00				
Incremental Delay, d2	3.0	5.6			0.2			6.7				
Delay (s)	23.9	16.8			32.1			37.5				
Level of Service	C	B			C			D				
Approach Delay (s)		20.2			32.1			37.5			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	27.5
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lanes, Volumes, Timings
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions

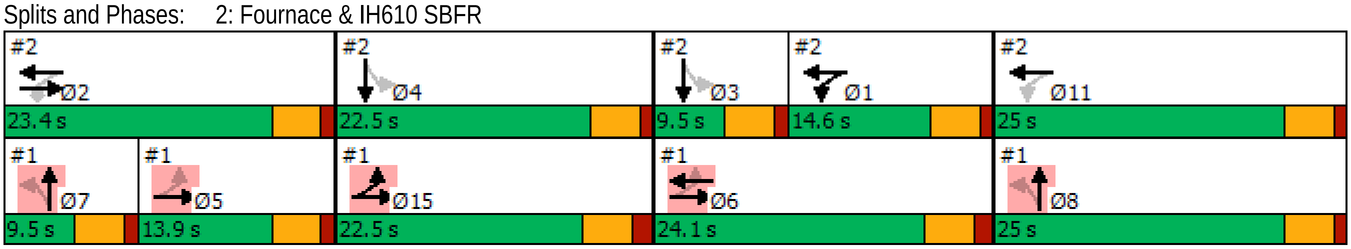
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	411	358	89	203	0	0	0	0	71	808	46
Future Volume (vph)	0	411	358	89	203	0	0	0	0	71	808	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.992	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	5045	0
Flt Permitted				0.503						0.950		
Satd. Flow (perm)	0	3539	1583	937	1863	0	0	0	0	1770	5045	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			373								9	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	428	373	93	211	0	0	0	0	74	842	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	428	373	93	211	0	0	0	0	74	890	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		23.4	23.4	14.6								
Total Split (%)		24.6%	24.6%	15.4%								
Maximum Green (s)		18.9	18.9	10.1								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		18.9	18.9	54.0	58.5					27.2	27.2	
Actuated g/C Ratio		0.20	0.20	0.57	0.62					0.29	0.29	
v/c Ratio		0.61	0.61	0.15	0.18					0.15	0.61	
Control Delay		38.7	8.3	2.4	2.8					26.1	31.0	
Queue Delay		0.1	0.0	0.0	1.0					0.0	0.0	
Total Delay		38.9	8.3	2.4	3.8					26.1	31.0	
LOS		D	A	A	A					C	C	
Approach Delay		24.7			3.4						30.6	
Approach LOS		C			A						C	

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 94.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 24.3	Intersection LOS: C
Intersection Capacity Utilization 58.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	22.5	13.9	24.1	9.5	25.0	25.0	22.5
Total Split (%)	10%	24%	15%	25%	10%	26%	26%	24%
Maximum Green (s)	5.0	18.0	9.4	19.1	5.0	20.5	20.5	17.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	23.4	23.4	14.6				9.5	22.5	13.9	24.1	9.5	25.0
Total Split (%)	24.6%	24.6%	15.4%				10%	24%	15%	25%	10%	26%
Maximum Green (s)	18.9	18.9	10.1				5.0	18.0	9.4	19.1	5.0	20.5
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	18.9	18.9	10.1				5.0	18.0	9.4	19.1	5.0	20.5
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
70th %ile Green (s)	18.9	18.9	10.1				5.0	18.0	9.4	19.1	5.0	20.5
70th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
50th %ile Green (s)	18.9	18.9	10.1				5.0	18.0	9.4	19.1	5.0	20.5
50th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
30th %ile Green (s)	18.9	18.9	10.1				5.0	18.0	9.4	19.1	5.0	20.5
30th %ile Term Code	Hold	Hold	Hold				Max	Max	Max	Max	Max	Max
10th %ile Green (s)	18.9	18.9	10.1				5.0	16.4	9.4	19.1	5.0	20.5
10th %ile Term Code	Hold	Hold	Hold				Max	Gap	Max	Max	Max	Max

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 94.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 95
30th %ile Actuated Cycle: 95
10th %ile Actuated Cycle: 93.4

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	25.0	22.5
Total Split (%)	26%	24%
Maximum Green (s)	20.5	17.5
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	20.5	17.5
90th %ile Term Code	Hold	Max
70th %ile Green (s)	20.5	17.5
70th %ile Term Code	Hold	Max
50th %ile Green (s)	20.5	17.5
50th %ile Term Code	Hold	Max
30th %ile Green (s)	20.5	17.5
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	20.5	15.9
10th %ile Term Code	Hold	Hold

Intersection Summary

Queues
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	428	373	93	211	74	890
v/c Ratio	0.61	0.61	0.15	0.18	0.15	0.61
Control Delay	38.7	8.3	2.4	2.8	26.1	31.0
Queue Delay	0.1	0.0	0.0	1.0	0.0	0.0
Total Delay	38.9	8.3	2.4	3.8	26.1	31.0
Queue Length 50th (ft)	124	0	3	7	33	167
Queue Length 95th (ft)	175	77	m3	m7	68	211
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	706	614	623	1151	497	1423
Starvation Cap Reductn	0	0	0	711	0	0
Spillback Cap Reductn	22	0	0	0	34	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.61	0.15	0.48	0.16	0.63

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	411	358	89	203	0	0	0	0	71	808	46
Future Volume (vph)	0	411	358	89	203	0	0	0	0	71	808	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	5044	
Flt Permitted		1.00	1.00	0.50	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	936	1863					1770	5044	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	428	373	93	211	0	0	0	0	74	842	48
RTOR Reduction (vph)	0	0	299	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	428	74	93	211	0	0	0	0	74	884	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		18.9	18.9	54.0	58.5					27.2	27.2	
Effective Green, g (s)		18.9	18.9	54.0	58.5					27.2	27.2	
Actuated g/C Ratio		0.20	0.20	0.57	0.62					0.29	0.29	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		706	315	622	1150					508	1448	
v/s Ratio Prot		c0.12		0.02	c0.11						c0.18	
v/s Ratio Perm			0.05	0.07						0.04		
v/c Ratio		0.61	0.24	0.15	0.18					0.15	0.61	
Uniform Delay, d1		34.5	31.8	9.2	7.8					25.1	29.2	
Progression Factor		1.00	1.00	0.26	0.31					1.00	1.00	
Incremental Delay, d2		1.5	0.4	0.1	0.1					0.1	0.8	
Delay (s)		36.0	32.2	2.5	2.5					25.2	29.9	
Level of Service		D	C	A	A					C	C	
Approach Delay (s)		34.2			2.5			0.0			29.6	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	27.5
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	753	31	2	255	5	18
Future Volume (vph)	753	31	2	255	5	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.994				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	3518	0	0	3539	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	3518	0	0	3539	1645	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	818	34	2	277	5	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	852	0	0	279	25	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 31.8%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
4: Anderson & Fournace

2018 PM Peak Hour
Existing Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	753	31	2	255	5	18
Future Volume (Veh/h)	753	31	2	255	5	18
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)	818	34	2	277	5	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			852		978	426
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			771		902	329
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	97
cM capacity (veh/h)			809		267	642

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	545	307	94	185	25
Volume Left	0	0	2	0	5
Volume Right	0	34	0	0	20
cSH	1700	1700	809	1700	501
Volume to Capacity	0.32	0.18	0.00	0.11	0.05
Queue Length 95th (ft)	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.2	0.0	12.6
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		12.6
Approach LOS					B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	753	31	2	255	5	18
Future Vol, veh/h	753	31	2	255	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	818	34	2	277	5	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	852	0	978	426
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	143	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	783	-	248	577
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	869	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	783	-	247	577
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	869	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	447	-	-	783	-
HCM Lane V/C Ratio	0.056	-	-	0.003	-
HCM Control Delay (s)	13.5	-	-	9.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	753	31	2	255	5	18
Future Vol, veh/h	753	31	2	255	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	818	34	2	277	5	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	852	0	978	426
Stage 1	-	-	-	-	835	-
Stage 2	-	-	-	-	143	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	783	-	248	577
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	869	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	783	-	247	577
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	869	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.5
HCM LOS			B

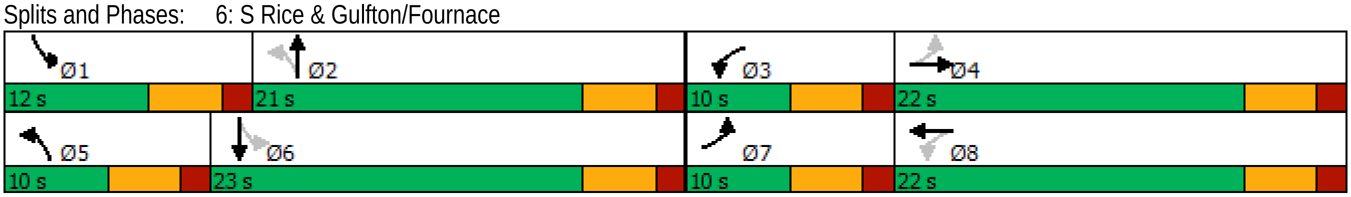
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	447	-	-	783	-
HCM Lane V/C Ratio	0.056	-	-	0.003	-
HCM Control Delay (s)	13.5	-	-	9.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (vph)	84	505	33	30	138	87	45	525	92	177	292	110
Future Volume (vph)	84	505	33	30	138	87	45	525	92	177	292	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.991			0.942			0.978			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3507	0	1770	3334	0	1770	3461	0	1770	3394	0
Flt Permitted	0.528			0.387			0.505			0.235		
Satd. Flow (perm)	984	3507	0	721	3334	0	941	3461	0	438	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			92			29			83	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	532	35	32	145	92	47	553	97	186	307	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	567	0	32	237	0	47	650	0	186	423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		10.0	21.0		12.0	23.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		15.4%	32.3%		18.5%	35.4%	
Maximum Green (s)	5.0	17.0		5.0	17.0		5.0	16.0		7.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.4	15.8		15.5	11.9		18.4	14.8		22.5	20.2	
Actuated g/C Ratio	0.33	0.30		0.29	0.22		0.34	0.28		0.42	0.38	
v/c Ratio	0.22	0.54		0.10	0.29		0.12	0.66		0.51	0.32	
Control Delay	13.9	19.7		12.7	13.5		11.1	22.5		16.3	12.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.9	19.7		12.7	13.5		11.1	22.5		16.3	12.4	
LOS	B	B		B	B		B	C		B	B	
Approach Delay		19.0			13.4			21.8			13.6	
Approach LOS		B			B			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 53.5	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 17.7	Intersection LOS: B
Intersection Capacity Utilization 63.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: S Rice & Gulfton/Fournace



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	10.0	21.0	12.0	23.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	15.4%	32.3%	18.5%	35.4%
Maximum Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
90th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
70th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
70th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
50th %ile Green (s)	5.0	17.8	0.0	7.8	0.0	15.9	7.0	27.9
50th %ile Term Code	Max	Hold	Skip	Gap	Skip	Gap	Max	Hold
30th %ile Green (s)	5.0	16.8	0.0	6.8	0.0	14.0	7.0	26.0
30th %ile Term Code	Max	Hold	Skip	Gap	Skip	Gap	Max	Hold
10th %ile Green (s)	0.0	9.2	0.0	9.2	0.0	9.9	0.0	9.9
10th %ile Term Code	Skip	Gap	Skip	Hold	Skip	Gap	Skip	Hold

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 53.5
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 55.7
30th %ile Actuated Cycle: 52.8
10th %ile Actuated Cycle: 29.1

Queues
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	88	567	32	237	47	650	186	423
v/c Ratio	0.22	0.54	0.10	0.29	0.12	0.66	0.51	0.32
Control Delay	13.9	19.7	12.7	13.5	11.1	22.5	16.3	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	19.7	12.7	13.5	11.1	22.5	16.3	12.4
Queue Length 50th (ft)	21	77	7	23	7	93	31	30
Queue Length 95th (ft)	45	150	21	48	27	174	#86	93
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	401	1232	315	1216	408	1149	374	1517
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	0.22	0.46	0.10	0.19	0.12	0.57	0.50	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	505	33	30	138	87	45	525	92	177	292	110
Future Volume (vph)	84	505	33	30	138	87	45	525	92	177	292	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.94		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3506		1770	3333		1770	3460		1770	3394	
Flt Permitted	0.53	1.00		0.39	1.00		0.51	1.00		0.24	1.00	
Satd. Flow (perm)	983	3506		721	3333		941	3460		438	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	532	35	32	145	92	47	553	97	186	307	116
RTOR Reduction (vph)	0	7	0	0	71	0	0	21	0	0	55	0
Lane Group Flow (vph)	88	560	0	32	166	0	47	629	0	186	368	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.4	15.8		15.4	13.8		18.3	16.7		25.3	20.2	
Effective Green, g (s)	19.4	15.8		15.4	13.8		18.3	16.7		25.3	20.2	
Actuated g/C Ratio	0.33	0.27		0.26	0.23		0.31	0.28		0.43	0.34	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	369	935		215	776		313	976		301	1158	
v/s Ratio Prot	c0.01	c0.16		0.00	0.05		0.00	0.18		c0.05	0.11	
v/s Ratio Perm	0.06			0.03			0.04			c0.21		
v/c Ratio	0.24	0.60		0.15	0.21		0.15	0.64		0.62	0.32	
Uniform Delay, d1	14.1	18.9		16.5	18.3		14.5	18.6		11.7	14.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0		0.3	0.1		0.2	1.5		3.7	0.2	
Delay (s)	14.5	20.0		16.8	18.5		14.7	20.1		15.4	14.6	
Level of Service	B	B		B	B		B	C		B	B	
Approach Delay (s)		19.2			18.3			19.8			14.8	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	59.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	505	33	30	138	87	45	525	92	177	292	110
Future Volume (veh/h)	84	505	33	30	138	87	45	525	92	177	292	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	88	532	35	32	145	92	47	553	97	186	307	116
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	407	753	49	268	404	241	422	736	129	388	770	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.04	0.19	0.19	0.05	0.24	0.24	0.11	0.30	0.30
Ln Grp Delay, s/veh	15.2	20.7	20.7	16.2	18.7	19.0	13.4	22.2	22.4	13.9	14.6	14.7
Ln Grp LOS	B	C	C	B	B	B	B	C	C	B	B	B
Approach Vol, veh/h		655			269			697			609	
Approach Delay, s/veh		20.0			18.5			21.7			14.4	
Approach LOS		B			B			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	10.5	17.6	6.8	16.5	7.4	20.6	8.6	14.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	5.9	10.8	2.7	9.5	3.0	7.1	4.0	5.2
Green Ext Time (g_e), s	0.1	1.8	0.0	2.0	0.0	1.8	0.0	0.9
Prob of Phs Call (p_c)	0.93	1.00	0.37	1.00	0.49	1.00	0.72	1.00
Prob of Max Out (p_x)	1.00	0.99	1.00	0.57	1.00	0.18	1.00	0.05
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3013		3372		2530		2132
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		527		221		937		1275
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	186	0	32	0	47	0	88	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	3.9	0.0	0.7	0.0	1.0	0.0	2.0	0.0
Cycle Q Clear Time (g_c), s	3.9	0.0	0.7	0.0	1.0	0.0	2.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	778	0	841	0	960	0	1139	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	12.6	0.0	9.7	0.0	12.6	0.0	9.7	0.0
Perm LT Serve Time (g_u), s	3.8	0.0	4.0	0.0	10.6	0.0	6.5	0.0
Perm LT Q Serve Time (g_ps), s	2.8	0.0	0.2	0.0	0.1	0.0	0.3	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	388	0	268	0	422	0	407	0
V/C Ratio (X)	0.48	0.00	0.12	0.00	0.11	0.00	0.22	0.00
Avail Cap (c_a), veh/h	439	0	378	0	511	0	456	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	13.0	0.0	16.1	0.0	13.3	0.0	15.0	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.2	0.0	0.1	0.0	0.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	13.9	0.0	16.2	0.0	13.4	0.0	15.2	0.0
1st-Term Q (Q1), veh/ln	1.9	0.0	0.4	0.0	0.5	0.0	1.0	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.0	0.0	0.4	0.0	0.5	0.0	1.0	0.0
%ile Storage Ratio (RQ%)	0.83	0.00	0.09	0.00	0.15	0.00	0.23	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	324	0	279	0	213	0	119
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	8.7	0.0	7.5	0.0	4.9	0.0	3.0
Cycle Q Clear Time (g_c), s	0.0	8.7	0.0	7.5	0.0	4.9	0.0	3.0
Lane Grp Cap (c), veh/h	0	432	0	395	0	539	0	335
V/C Ratio (X)	0.00	0.75	0.00	0.71	0.00	0.40	0.00	0.35
Avail Cap (c_a), veh/h	0	551	0	586	0	620	0	586
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	18.0	0.0	18.4	0.0	14.1	0.0	18.1
Incr Delay (d2), s/veh	0.0	4.3	0.0	2.3	0.0	0.5	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	22.2	0.0	20.7	0.0	14.6	0.0	18.7
1st-Term Q (Q1), veh/ln	0.0	4.2	0.0	3.6	0.0	2.4	0.0	1.5

2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.3	0.0	0.1	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.7	0.0	3.9	0.0	2.4	0.0	1.5
%ile Storage Ratio (RQ%)	0.00	0.12	0.00	0.13	0.00	0.13	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	326	0	288	0	210	0	118
Grp Sat Flow (s), veh/h/ln	0	1770	0	1824	0	1697	0	1638
Q Serve Time (g_s), s	0.0	8.8	0.0	7.5	0.0	5.1	0.0	3.2
Cycle Q Clear Time (g_c), s	0.0	8.8	0.0	7.5	0.0	5.1	0.0	3.2
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.30	0.00	0.12	0.00	0.55	0.00	0.78
Lane Grp Cap (c), veh/h	0	432	0	407	0	517	0	310
V/C Ratio (X)	0.00	0.75	0.00	0.71	0.00	0.41	0.00	0.38
Avail Cap (c_a), veh/h	0	551	0	603	0	595	0	542
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	18.0	0.0	18.4	0.0	14.2	0.0	18.2
Incr Delay (d2), s/veh	0.0	4.4	0.0	2.3	0.0	0.5	0.0	0.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	22.4	0.0	20.7	0.0	14.7	0.0	19.0
1st-Term Q (Q1), veh/ln	0.0	4.3	0.0	3.8	0.0	2.3	0.0	1.4
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.3	0.0	0.1	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.8	0.0	4.0	0.0	2.4	0.0	1.5
%ile Storage Ratio (RQ%)	0.00	0.12	0.00	0.14	0.00	0.13	0.00	0.07
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		18.8						
HCM 2010 LOS		B						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	84	505	33	30	138	87	45	525	92	177	292	110
Future Volume (veh/h)	84	505	33	30	138	87	45	525	92	177	292	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	532	35	32	145	92	47	553	97	186	307	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	409	754	50	270	404	241	424	738	129	390	771	286
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.04	0.19	0.19	0.05	0.24	0.24	0.11	0.30	0.30
Unsig. Movement Delay												
Ln Grp Delay, s/veh	15.2	20.7	20.6	16.2	18.7	18.9	13.4	22.1	22.2	13.9	14.6	14.7
Ln Grp LOS	B	C	C	B	B	B	B	C	C	B	B	B
Approach Vol, veh/h		655			269			697			609	
Approach Delay, s/veh		19.9			18.5			21.6			14.4	
Approach LOS		B			B			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	10.5	17.5	6.8	16.4	7.4	20.6	8.6	14.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	5.9	10.7	2.7	9.4	3.0	7.0	4.0	5.2
Green Ext Time (g_e), s	0.1	1.8	0.0	2.0	0.0	1.8	0.0	0.9
Prob of Phs Call (p_c)	0.93	1.00	0.37	1.00	0.49	1.00	0.71	1.00
Prob of Max Out (p_x)	1.00	0.98	1.00	0.57	1.00	0.18	1.00	0.05
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3023		3385		2538		2139
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		529		222		940		1278
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	186	0	32	0	47	0	88	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	3.9	0.0	0.7	0.0	1.0	0.0	2.0	0.0
Cycle Q Clear Time (g_c), s	3.9	0.0	0.7	0.0	1.0	0.0	2.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	782	0	844	0	964	0	1143	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	12.6	0.0	9.7	0.0	12.5	0.0	9.7	0.0
Perm LT Serve Time (g_u), s	3.8	0.0	4.0	0.0	10.6	0.0	6.5	0.0
Perm LT Q Serve Time (g_ps), s	2.7	0.0	0.2	0.0	0.1	0.0	0.3	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	390	0	270	0	424	0	409	0
V/C Ratio (X)	0.48	0.00	0.12	0.00	0.11	0.00	0.22	0.00
Avail Cap (c_a), veh/h	441	0	380	0	512	0	458	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	13.0	0.0	16.0	0.0	13.3	0.0	14.9	0.0
Incr Delay (d2), s/veh	0.9	0.0	0.2	0.0	0.1	0.0	0.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	13.9	0.0	16.2	0.0	13.4	0.0	15.2	0.0
1st-Term Q (Q1), veh/ln	1.3	0.0	0.3	0.0	0.3	0.0	0.7	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.4	0.0	0.3	0.0	0.3	0.0	0.7	0.0
%ile Storage Ratio (RQ%)	0.58	0.00	0.06	0.00	0.11	0.00	0.17	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	324	0	279	0	213	0	119
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	8.7	0.0	7.4	0.0	4.9	0.0	3.0
Cycle Q Clear Time (g_c), s	0.0	8.7	0.0	7.4	0.0	4.9	0.0	3.0
Lane Grp Cap (c), veh/h	0	434	0	396	0	540	0	336
V/C Ratio (X)	0.00	0.75	0.00	0.70	0.00	0.39	0.00	0.35
Avail Cap (c_a), veh/h	0	554	0	589	0	624	0	589
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	17.9	0.0	18.4	0.0	14.1	0.0	18.1
Incr Delay (d2), s/veh	0.0	4.1	0.0	2.3	0.0	0.5	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	22.1	0.0	20.7	0.0	14.6	0.0	18.7
1st-Term Q (Q1), veh/ln	0.0	3.0	0.0	2.6	0.0	1.6	0.0	1.1
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.3	0.0	0.1	0.0	0.1

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.5	0.0	2.9	0.0	1.7	0.0	1.1
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.10	0.00	0.09	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	326	0	288	0	210	0	118
Grp Sat Flow (s), veh/h/ln	0	1775	0	1830	0	1701	0	1640
Q Serve Time (g_s), s	0.0	8.7	0.0	7.4	0.0	5.0	0.0	3.2
Cycle Q Clear Time (g_c), s	0.0	8.7	0.0	7.4	0.0	5.0	0.0	3.2
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.30	0.00	0.12	0.00	0.55	0.00	0.78
Lane Grp Cap (c), veh/h	0	433	0	408	0	517	0	310
V/C Ratio (X)	0.00	0.75	0.00	0.71	0.00	0.41	0.00	0.38
Avail Cap (c_a), veh/h	0	554	0	607	0	597	0	544
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	17.9	0.0	18.4	0.0	14.2	0.0	18.2
Incr Delay (d2), s/veh	0.0	4.3	0.0	2.3	0.0	0.5	0.0	0.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	22.2	0.0	20.6	0.0	14.7	0.0	18.9
1st-Term Q (Q1), veh/ln	0.0	3.1	0.0	2.7	0.0	1.6	0.0	1.1
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.3	0.0	0.1	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.6	0.0	3.0	0.0	1.7	0.0	1.1
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.10	0.00	0.09	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B

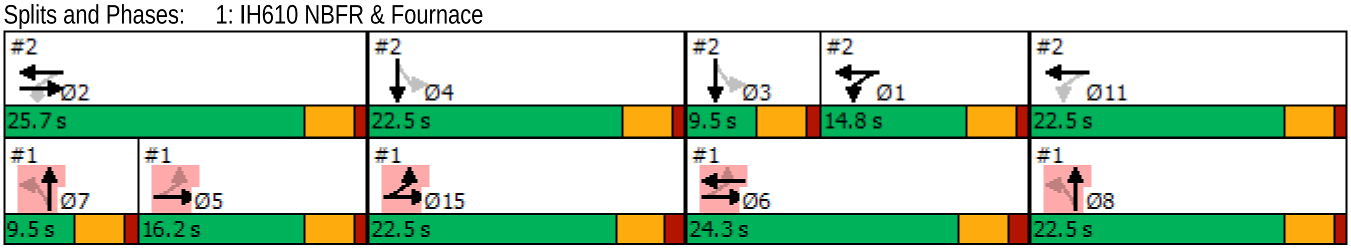
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	86	0	0	264	55	237	679	41	0	0	0
Future Volume (vph)	132	86	0	0	264	55	237	679	41	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.974			0.994				
Flt Protected	0.950	0.987						0.988				
Satd. Flow (prot)	1681	1747	0	0	3447	0	0	4994	0	0	0	0
Flt Permitted	0.135	0.539						0.988				
Satd. Flow (perm)	239	954	0	0	3447	0	0	4994	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					23			7				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	145	95	0	0	290	60	260	746	45	0	0	0
Shared Lane Traffic (%)	24%											
Lane Group Flow (vph)	110	130	0	0	350	0	0	1051	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	22.5				24.3							
Total Split (%)	23.7%				25.6%							
Maximum Green (s)	17.5				19.3							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	46.6	46.6			19.3			27.5				
Actuated g/C Ratio	0.50	0.50			0.21			0.29				
v/c Ratio	0.28	0.21			0.48			0.71				
Control Delay	13.7	6.7			33.3			32.7				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	13.7	6.7			33.3			32.7				
LOS	B	A			C			C				
Approach Delay		9.9			33.3			32.7				
Approach LOS		A			C			C				

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 93.6	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 29.5	Intersection LOS: C
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.8	25.7	9.5	22.5	16.2	9.5	22.5	22.5
Total Split (%)	16%	27%	10%	24%	17%	10%	24%	24%
Maximum Green (s)	10.3	21.2	5.0	18.0	11.7	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	22.5		24.3		14.8	25.7	9.5	22.5	16.2	9.5	22.5	22.5
Total Split (%)	23.7%		25.6%		16%	27%	10%	24%	17%	10%	24%	24%
Maximum Green (s)	17.5		19.3		10.3	21.2	5.0	18.0	11.7	5.0	18.0	18.0
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	17.5		19.3		10.3	21.2	5.0	18.0	11.7	5.0	18.0	18.0
90th %ile Term Code	Hold		Max		Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	17.5		19.3		10.3	21.2	5.0	18.0	11.7	5.0	18.0	18.0
70th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	17.5		19.3		10.3	20.9	5.0	18.0	11.4	5.0	18.0	18.0
50th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Gap	Max	Max	Hold
30th %ile Green (s)	17.5		19.3		10.3	19.0	5.0	18.0	9.5	5.0	18.0	18.0
30th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Gap	Max	Max	Hold
10th %ile Green (s)	17.5		19.3		10.3	16.6	5.0	18.0	7.1	5.0	18.0	18.0
10th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Gap	Max	Max	Hold

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 93.6
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 94.7
30th %ile Actuated Cycle: 92.8
10th %ile Actuated Cycle: 90.4

Queues
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	110	130	350	1051
v/c Ratio	0.28	0.21	0.48	0.71
Control Delay	13.7	6.7	33.3	32.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.7	6.7	33.3	32.7
Queue Length 50th (ft)	1	1	91	205
Queue Length 95th (ft)	88	2	136	256
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	388	638	729	1473
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.20	0.48	0.71

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	86	0	0	264	55	237	679	41	0	0	0
Future Volume (vph)	132	86	0	0	264	55	237	679	41	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	0.99			1.00			0.99				
Satd. Flow (prot)	1681	1746			3448			4991				
Flt Permitted	0.14	0.54			1.00			0.99				
Satd. Flow (perm)	239	953			3448			4991				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	145	95	0	0	290	60	260	746	45	0	0	0
RTOR Reduction (vph)	0	0	0	0	18	0	0	5	0	0	0	0
Lane Group Flow (vph)	110	130	0	0	332	0	0	1046	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	47.1	47.1			19.3			27.5				
Effective Green, g (s)	47.1	47.1			19.3			27.5				
Actuated g/C Ratio	0.50	0.50			0.21			0.29				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	389	627			710			1466				
v/s Ratio Prot	c0.05	0.04			c0.10							
v/s Ratio Perm	c0.09	0.07						0.21				
v/c Ratio	0.28	0.21			0.47			0.71				
Uniform Delay, d1	29.4	12.9			32.6			29.5				
Progression Factor	0.88	0.65			1.00			1.00				
Incremental Delay, d2	0.4	0.2			0.5			1.7				
Delay (s)	26.2	8.6			33.1			31.2				
Level of Service	C	A			C			C				
Approach Delay (s)		16.7			33.1			31.2			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	93.6	Sum of lost time (s)	27.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lanes, Volumes, Timings
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions

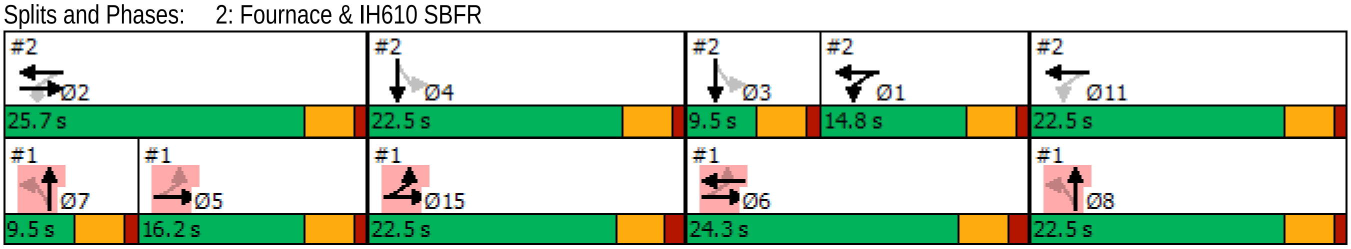
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	176	358	118	383	0	0	0	0	42	940	74
Future Volume (vph)	0	176	358	118	383	0	0	0	0	42	940	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.989	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	5029	0
Flt Permitted				0.635						0.950		
Satd. Flow (perm)	0	3539	1583	1183	1863	0	0	0	0	1770	5029	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			377								13	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	185	377	124	403	0	0	0	0	44	989	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	377	124	403	0	0	0	0	44	1067	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		25.7	25.7	14.8								
Total Split (%)		27.1%	27.1%	15.6%								
Maximum Green (s)		21.2	21.2	10.3								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		19.8	19.8	52.6	57.1					27.5	27.5	
Actuated g/C Ratio		0.21	0.21	0.56	0.61					0.29	0.29	
v/c Ratio		0.25	0.60	0.17	0.35					0.08	0.72	
Control Delay		31.5	7.8	1.4	3.1					25.1	32.6	
Queue Delay		0.0	0.0	0.0	1.5					0.0	0.0	
Total Delay		31.5	7.8	1.4	4.7					25.1	32.6	
LOS		C	A	A	A					C	C	
Approach Delay		15.6			3.9						32.3	
Approach LOS		B			A						C	

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 93.6	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 21.3	Intersection LOS: C
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	22.5	16.2	24.3	9.5	22.5	22.5	22.5
Total Split (%)	10%	24%	17%	26%	10%	24%	24%	24%
Maximum Green (s)	5.0	18.0	11.7	19.3	5.0	18.0	18.0	17.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								
Intersection Summary								

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	25.7	25.7	14.8				9.5	22.5	16.2	24.3	9.5	22.5
Total Split (%)	27.1%	27.1%	15.6%				10%	24%	17%	26%	10%	24%
Maximum Green (s)	21.2	21.2	10.3				5.0	18.0	11.7	19.3	5.0	18.0
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	21.2	21.2	10.3				5.0	18.0	11.7	19.3	5.0	18.0
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
70th %ile Green (s)	21.2	21.2	10.3				5.0	18.0	11.7	19.3	5.0	18.0
70th %ile Term Code	Hold	Hold	Max				Max	Max	Max	Hold	Max	Max
50th %ile Green (s)	20.9	20.9	10.3				5.0	18.0	11.4	19.3	5.0	18.0
50th %ile Term Code	Hold	Hold	Max				Max	Max	Gap	Hold	Max	Max
30th %ile Green (s)	19.0	19.0	10.3				5.0	18.0	9.5	19.3	5.0	18.0
30th %ile Term Code	Hold	Hold	Max				Max	Max	Gap	Hold	Max	Max
10th %ile Green (s)	16.6	16.6	10.3				5.0	18.0	7.1	19.3	5.0	18.0
10th %ile Term Code	Hold	Hold	Max				Max	Max	Gap	Hold	Max	Max

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 93.6
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 94.7
30th %ile Actuated Cycle: 92.8
10th %ile Actuated Cycle: 90.4

Phasings
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	22.5	22.5
Total Split (%)	24%	24%
Maximum Green (s)	18.0	17.5
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	18.0	17.5
90th %ile Term Code	Hold	Hold
70th %ile Green (s)	18.0	17.5
70th %ile Term Code	Hold	Hold
50th %ile Green (s)	18.0	17.5
50th %ile Term Code	Hold	Hold
30th %ile Green (s)	18.0	17.5
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	18.0	17.5
10th %ile Term Code	Hold	Hold

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	185	377	124	403	44	1067
v/c Ratio	0.25	0.60	0.17	0.35	0.08	0.72
Control Delay	31.5	7.8	1.4	3.1	25.1	32.6
Queue Delay	0.0	0.0	0.0	1.5	0.0	0.0
Total Delay	31.5	7.8	1.4	4.7	25.1	32.6
Queue Length 50th (ft)	48	0	1	3	19	208
Queue Length 95th (ft)	78	74	m1	3	45	259
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	801	650	729	1165	520	1487
Starvation Cap Reductn	0	0	0	562	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.58	0.17	0.67	0.08	0.72

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	176	358	118	383	0	0	0	0	42	940	74
Future Volume (vph)	0	176	358	118	383	0	0	0	0	42	940	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	5030	
Flt Permitted		1.00	1.00	0.64	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1183	1863					1770	5030	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	185	377	124	403	0	0	0	0	44	989	78
RTOR Reduction (vph)	0	0	297	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	185	80	124	403	0	0	0	0	44	1058	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		19.8	19.8	52.6	57.1					27.5	27.5	
Effective Green, g (s)		19.8	19.8	52.6	57.1					27.5	27.5	
Actuated g/C Ratio		0.21	0.21	0.56	0.61					0.29	0.29	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		748	334	729	1136					520	1477	
v/s Ratio Prot		0.05		0.02	c0.22						c0.21	
v/s Ratio Perm			0.05	0.08						0.02		
v/c Ratio		0.25	0.24	0.17	0.35					0.08	0.72	
Uniform Delay, d1		30.7	30.6	9.7	9.1					23.9	29.6	
Progression Factor		1.00	1.00	0.12	0.26					1.00	1.00	
Incremental Delay, d2		0.2	0.4	0.1	0.2					0.1	1.7	
Delay (s)		30.9	31.0	1.3	2.5					24.0	31.2	
Level of Service		C	C	A	A					C	C	
Approach Delay (s)		31.0			2.2			0.0			31.0	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	93.6	Sum of lost time (s)	27.5
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	511	16	7	437	7	9
Future Volume (vph)	511	16	7	437	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.995				0.921	
Flt Protected				0.999	0.980	
Satd. Flow (prot)	3522	0	0	3536	1681	0
Flt Permitted				0.999	0.980	
Satd. Flow (perm)	3522	0	0	3536	1681	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	544	17	7	465	7	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	561	0	0	472	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 27.0%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	511	16	7	437	7	9
Future Volume (Veh/h)	511	16	7	437	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	544	17	7	465	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked						
vC, conflicting volume			561		799	280
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			561		799	280
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1006		321	717

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	363	198	162	310	17
Volume Left	0	0	7	0	7
Volume Right	0	17	0	0	10
cSH	1700	1700	1006	1700	475
Volume to Capacity	0.21	0.12	0.01	0.18	0.04
Queue Length 95th (ft)	0	0	1	0	3
Control Delay (s)	0.0	0.0	0.4	0.0	12.9
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		12.9
Approach LOS					B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	511	16	7	437	7	9
Future Vol, veh/h	511	16	7	437	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	544	17	7	465	7	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	561	0	800	281
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1006	-	322	716
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1006	-	319	716
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	464	-	-	1006	-
HCM Lane V/C Ratio	0.037	-	-	0.007	-
HCM Control Delay (s)	13.1	-	-	8.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↰↑	Y	
Traffic Vol, veh/h	511	16	7	437	7	9
Future Vol, veh/h	511	16	7	437	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	544	17	7	465	7	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	561	0	800	281
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1006	-	322	716
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1006	-	319	716
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.1
HCM LOS			B

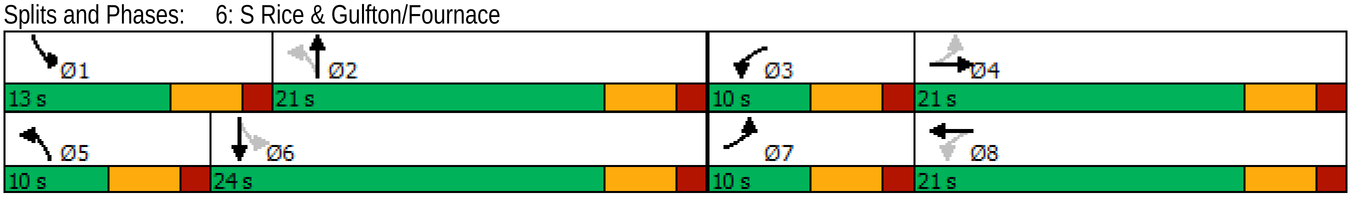
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	464	-	-	1006	-
HCM Lane V/C Ratio	0.037	-	-	0.007	-
HCM Control Delay (s)	13.1	-	-	8.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	302	46	38	266	140	84	486	33	188	498	74
Future Volume (vph)	78	302	46	38	266	140	84	486	33	188	498	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.980			0.948			0.990			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3355	0	1770	3504	0	1770	3472	0
Flt Permitted	0.429			0.534			0.394			0.311		
Satd. Flow (perm)	799	3468	0	995	3355	0	734	3504	0	579	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			138			10			26	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	318	48	40	280	147	88	512	35	198	524	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	366	0	40	427	0	88	547	0	198	602	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		13.0	24.0	
Total Split (%)	15.4%	32.3%		15.4%	32.3%		15.4%	32.3%		20.0%	36.9%	
Maximum Green (s)	5.0	16.0		5.0	16.0		5.0	16.0		8.0	19.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	14.7	13.1		13.8	11.3		17.6	13.9		21.9	16.1	
Actuated g/C Ratio	0.29	0.26		0.27	0.22		0.35	0.27		0.43	0.32	
v/c Ratio	0.24	0.40		0.11	0.50		0.24	0.57		0.45	0.54	
Control Delay	15.0	18.3		13.4	15.7		11.5	20.6		13.1	17.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.0	18.3		13.4	15.7		11.5	20.6		13.1	17.6	
LOS	B	B		B	B		B	C		B	B	
Approach Delay		17.7			15.5			19.4			16.5	
Approach LOS		B			B			B			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 50.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 57.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: S Rice & Gulfton/Fournace



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	13.0	24.0
Total Split (%)	15.4%	32.3%	15.4%	32.3%	15.4%	32.3%	20.0%	36.9%
Maximum Green (s)	5.0	16.0	5.0	16.0	5.0	16.0	8.0	19.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	15.7	5.0	15.7	5.0	16.0	8.0	19.0
90th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Max
70th %ile Green (s)	5.0	13.1	5.0	13.1	5.0	16.0	8.0	19.0
70th %ile Term Code	Max	Hold	Max	Gap	Max	Max	Max	Hold
50th %ile Green (s)	5.0	20.5	0.0	10.5	5.0	14.8	8.0	17.8
50th %ile Term Code	Max	Hold	Skip	Gap	Max	Gap	Max	Hold
30th %ile Green (s)	0.0	8.8	0.0	8.8	5.0	12.0	8.0	15.0
30th %ile Term Code	Skip	Hold	Skip	Gap	Max	Gap	Max	Hold
10th %ile Green (s)	0.0	7.1	0.0	7.1	0.0	8.6	0.0	8.6
10th %ile Term Code	Skip	Gap	Skip	Hold	Skip	Gap	Skip	Hold

Intersection Summary
Cycle Length: 65
Actuated Cycle Length: 50.9
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 64.7
70th %ile Actuated Cycle: 62.1
50th %ile Actuated Cycle: 58.3
30th %ile Actuated Cycle: 43.8
10th %ile Actuated Cycle: 25.7

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	366	40	427	88	547	198	602
v/c Ratio	0.24	0.40	0.11	0.50	0.24	0.57	0.45	0.54
Control Delay	15.0	18.3	13.4	15.7	11.5	20.6	13.1	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	18.3	13.4	15.7	11.5	20.6	13.1	17.6
Queue Length 50th (ft)	19	44	9	48	16	86	38	87
Queue Length 95th (ft)	44	95	26	87	42	147	85	148
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	337	1294	355	1274	367	1245	459	1472
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	0.24	0.28	0.11	0.34	0.24	0.44	0.43	0.41

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	302	46	38	266	140	84	486	33	188	498	74
Future Volume (vph)	78	302	46	38	266	140	84	486	33	188	498	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.95		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3470		1770	3356		1770	3505		1770	3470	
Flt Permitted	0.43	1.00		0.53	1.00		0.39	1.00		0.31	1.00	
Satd. Flow (perm)	800	3470		994	3356		735	3505		580	3470	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	318	48	40	280	147	88	512	35	198	524	78
RTOR Reduction (vph)	0	18	0	0	107	0	0	7	0	0	18	0
Lane Group Flow (vph)	82	348	0	40	320	0	88	540	0	198	584	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.6	13.1		13.8	12.2		17.5	13.9		21.9	16.1	
Effective Green, g (s)	15.6	13.1		13.8	12.2		17.5	13.9		21.9	16.1	
Actuated g/C Ratio	0.29	0.24		0.25	0.22		0.32	0.26		0.40	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	835		274	752		304	895		360	1026	
v/s Ratio Prot	c0.01	c0.10		0.00	0.10		0.02	0.15		c0.06	c0.17	
v/s Ratio Perm	0.07			0.03			0.07			0.16		
v/c Ratio	0.30	0.42		0.15	0.43		0.29	0.60		0.55	0.57	
Uniform Delay, d1	14.5	17.4		15.5	18.1		13.2	17.8		11.2	16.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.3		0.2	0.4		0.5	1.2		1.8	0.7	
Delay (s)	15.2	17.8		15.7	18.5		13.7	19.0		13.0	16.9	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		17.3			18.2			18.2			16.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	302	46	38	266	140	84	486	33	188	498	74
Future Volume (veh/h)	78	302	46	38	266	140	84	486	33	188	498	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	82	318	48	40	280	147	88	512	35	198	524	78
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	336	665	99	348	431	220	365	734	50	421	819	121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.04	0.19	0.19	0.07	0.22	0.22	0.12	0.26	0.26
Ln Grp Delay, s/veh	15.0	17.8	17.9	15.1	20.5	21.0	13.7	20.0	20.0	13.7	17.5	17.5
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		448			467			635			800	
Approach Delay, s/veh		17.3			20.3			19.1			16.5	
Approach LOS		B			C			B			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	10.8	15.8	7.1	15.6	8.5	18.1	8.4	14.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	8.0	16.0	5.0	16.0	5.0	19.0	5.0	16.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	6.1	8.9	2.9	6.5	3.8	9.4	3.8	7.8
Green Ext Time (g_e), s	0.1	1.8	0.0	1.4	0.0	2.5	0.0	1.6
Prob of Phs Call (p_c)	0.93	1.00	0.42	1.00	0.70	1.00	0.67	1.00
Prob of Max Out (p_x)	1.00	0.62	1.00	0.22	1.00	0.38	1.00	0.41
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3363		3089		3093		2269
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		229		462		459		1159
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	198	0	40	0	88	0	82	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	4.1	0.0	0.9	0.0	1.8	0.0	1.8	0.0
Cycle Q Clear Time (g_c), s	4.1	0.0	0.9	0.0	1.8	0.0	1.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	856	0	1012	0	814	0	957	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	10.8	0.0	9.4	0.0	10.8	0.0	9.4	0.0
Perm LT Serve Time (g_u), s	3.8	0.0	6.1	0.0	5.6	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	2.1	0.0	0.1	0.0	0.6	0.0	0.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	421	0	348	0	365	0	336	0
V/C Ratio (X)	0.47	0.00	0.11	0.00	0.24	0.00	0.24	0.00
Avail Cap (c_a), veh/h	500	0	452	0	419	0	395	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	12.9	0.0	15.0	0.0	13.4	0.0	14.6	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.1	0.0	0.3	0.0	0.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	13.7	0.0	15.1	0.0	13.7	0.0	15.0	0.0
1st-Term Q (Q1), veh/ln	2.0	0.0	0.4	0.0	0.9	0.0	0.8	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.1	0.0	0.4	0.0	0.9	0.0	0.9	0.0
%ile Storage Ratio (RQ%)	0.88	0.00	0.10	0.00	0.29	0.00	0.20	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	269	0	181	0	299	0	217
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	6.9	0.0	4.4	0.0	7.4	0.0	5.6
Cycle Q Clear Time (g_c), s	0.0	6.9	0.0	4.4	0.0	7.4	0.0	5.6
Lane Grp Cap (c), veh/h	0	386	0	381	0	469	0	336
V/C Ratio (X)	0.00	0.70	0.00	0.47	0.00	0.64	0.00	0.65
Avail Cap (c_a), veh/h	0	575	0	575	0	682	0	575
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	17.8	0.0	16.9	0.0	16.0	0.0	18.4
Incr Delay (d2), s/veh	0.0	2.3	0.0	0.9	0.0	1.4	0.0	2.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.0	0.0	17.8	0.0	17.5	0.0	20.5
1st-Term Q (Q1), veh/ln	0.0	3.4	0.0	2.1	0.0	3.6	0.0	2.7

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.6	0.0	2.2	0.0	3.8	0.0	2.9
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.07	0.00	0.20	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	278	0	185	0	303	0	210
Grp Sat Flow (s), veh/h/ln	0	1822	0	1781	0	1782	0	1658
Q Serve Time (g_s), s	0.0	6.9	0.0	4.5	0.0	7.4	0.0	5.8
Cycle Q Clear Time (g_c), s	0.0	6.9	0.0	4.5	0.0	7.4	0.0	5.8
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.26	0.00	0.26	0.00	0.70
Lane Grp Cap (c), veh/h	0	398	0	384	0	472	0	315
V/C Ratio (X)	0.00	0.70	0.00	0.48	0.00	0.64	0.00	0.67
Avail Cap (c_a), veh/h	0	592	0	578	0	687	0	538
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	17.8	0.0	16.9	0.0	16.0	0.0	18.5
Incr Delay (d2), s/veh	0.0	2.2	0.0	0.9	0.0	1.5	0.0	2.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.0	0.0	17.9	0.0	17.5	0.0	21.0
1st-Term Q (Q1), veh/ln	0.0	3.5	0.0	2.2	0.0	3.6	0.0	2.6
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.7	0.0	2.3	0.0	3.8	0.0	2.8
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.08	0.00	0.20	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		18.1						
HCM 2010 LOS		B						

HCM 6th Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	302	46	38	266	140	84	486	33	188	498	74
Future Volume (veh/h)	78	302	46	38	266	140	84	486	33	188	498	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	318	48	40	280	147	88	512	35	198	524	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	338	668	100	349	432	220	366	736	50	422	820	122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.04	0.19	0.19	0.07	0.22	0.22	0.12	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	14.9	17.8	17.8	15.1	20.5	20.9	13.7	20.0	20.0	13.7	17.5	17.5
Ln Grp LOS	B	B	B	B	C	C	B	B	B	B	B	B
Approach Vol, veh/h		448			467			635			800	
Approach Delay, s/veh		17.3			20.2			19.1			16.5	
Approach LOS		B			C			B			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	10.8	15.7	7.1	15.6	8.5	18.0	8.4	14.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	8.0	16.0	5.0	16.0	5.0	19.0	5.0	16.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	6.1	8.9	2.9	6.5	3.8	9.4	3.8	7.8
Green Ext Time (g_e), s	0.1	1.8	0.0	1.4	0.0	2.5	0.0	1.6
Prob of Phs Call (p_c)	0.93	1.00	0.42	1.00	0.70	1.00	0.67	1.00
Prob of Max Out (p_x)	1.00	0.62	1.00	0.22	1.00	0.38	1.00	0.41
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3376		3100		3104		2276
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		230		463		460		1162
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	198	0	40	0	88	0	82	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	4.1	0.0	0.9	0.0	1.8	0.0	1.8	0.0
Cycle Q Clear Time (g_c), s	4.1	0.0	0.9	0.0	1.8	0.0	1.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	860	0	1016	0	817	0	961	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	10.7	0.0	9.3	0.0	10.7	0.0	9.3	0.0
Perm LT Serve Time (g_u), s	3.8	0.0	6.1	0.0	5.6	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	2.1	0.0	0.1	0.0	0.6	0.0	0.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	422	0	349	0	366	0	338	0
V/C Ratio (X)	0.47	0.00	0.11	0.00	0.24	0.00	0.24	0.00
Avail Cap (c_a), veh/h	503	0	454	0	421	0	397	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	12.9	0.0	14.9	0.0	13.4	0.0	14.6	0.0
Incr Delay (d2), s/veh	0.8	0.0	0.1	0.0	0.3	0.0	0.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	13.7	0.0	15.1	0.0	13.7	0.0	14.9	0.0
1st-Term Q (Q1), veh/ln	1.3	0.0	0.3	0.0	0.6	0.0	0.6	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.4	0.0	0.3	0.0	0.6	0.0	0.6	0.0
%ile Storage Ratio (RQ%)	0.60	0.00	0.07	0.00	0.20	0.00	0.15	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	269	0	181	0	299	0	217
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	6.9	0.0	4.4	0.0	7.3	0.0	5.5
Cycle Q Clear Time (g_c), s	0.0	6.9	0.0	4.4	0.0	7.3	0.0	5.5
Lane Grp Cap (c), veh/h	0	387	0	383	0	470	0	337
V/C Ratio (X)	0.00	0.69	0.00	0.47	0.00	0.64	0.00	0.64
Avail Cap (c_a), veh/h	0	578	0	578	0	686	0	578
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	17.7	0.0	16.9	0.0	16.0	0.0	18.4
Incr Delay (d2), s/veh	0.0	2.2	0.0	0.9	0.0	1.4	0.0	2.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.0	0.0	17.8	0.0	17.5	0.0	20.5
1st-Term Q (Q1), veh/ln	0.0	2.4	0.0	1.5	0.0	2.5	0.0	2.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.2

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.6	0.0	1.6	0.0	2.7	0.0	2.2
%ile Storage Ratio (RQ%)	0.00	0.07	0.00	0.06	0.00	0.14	0.00	0.10
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	278	0	185	0	303	0	210
Grp Sat Flow (s), veh/h/ln	0	1829	0	1787	0	1787	0	1661
Q Serve Time (g_s), s	0.0	6.9	0.0	4.5	0.0	7.4	0.0	5.8
Cycle Q Clear Time (g_c), s	0.0	6.9	0.0	4.5	0.0	7.4	0.0	5.8
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.26	0.00	0.26	0.00	0.70
Lane Grp Cap (c), veh/h	0	399	0	385	0	472	0	315
V/C Ratio (X)	0.00	0.70	0.00	0.48	0.00	0.64	0.00	0.67
Avail Cap (c_a), veh/h	0	595	0	581	0	690	0	540
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	17.7	0.0	16.9	0.0	16.0	0.0	18.5
Incr Delay (d2), s/veh	0.0	2.2	0.0	0.9	0.0	1.5	0.0	2.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	20.0	0.0	17.8	0.0	17.5	0.0	20.9
1st-Term Q (Q1), veh/ln	0.0	2.5	0.0	1.6	0.0	2.5	0.0	1.9
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	2.7	0.0	1.7	0.0	2.7	0.0	2.1
%ile Storage Ratio (RQ%)	0.00	0.07	0.00	0.06	0.00	0.15	0.00	0.10
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

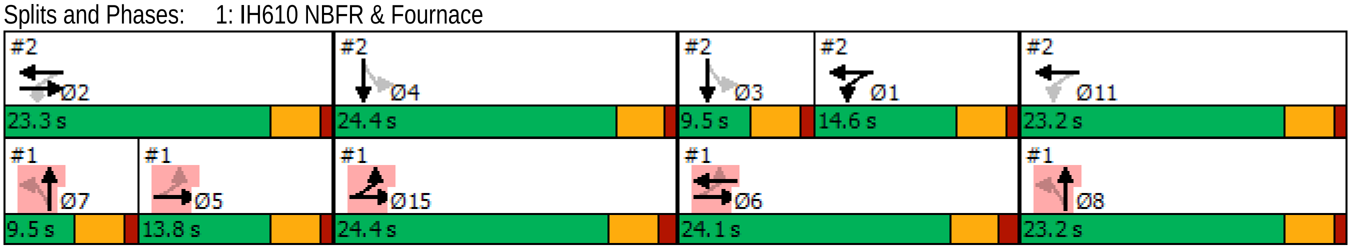
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	330	0	0	153	69	139	1128	84	0	0	0
Future Volume (vph)	349	330	0	0	153	69	139	1128	84	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.953			0.991				
Flt Protected	0.950	0.995						0.995				
Satd. Flow (prot)	1681	1761	0	0	3373	0	0	5014	0	0	0	0
Flt Permitted	0.141	0.545						0.995				
Satd. Flow (perm)	250	964	0	0	3373	0	0	5014	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					69			11				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	367	347	0	0	161	73	146	1187	88	0	0	0
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	330	384	0	0	234	0	0	1421	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	24.4				24.1							
Total Split (%)	25.7%				25.4%							
Maximum Green (s)	19.4				19.1							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	47.3	47.3			19.1			28.2				
Actuated g/C Ratio	0.50	0.50			0.20			0.30				
v/c Ratio	0.79	0.60			0.32			0.95				
Control Delay	24.5	10.5			24.0			47.2				
Queue Delay	1.6	0.2			0.0			0.0				
Total Delay	26.2	10.7			24.0			47.2				
LOS	C	B			C			D				
Approach Delay		17.8			24.0			47.2				
Approach LOS		B			C			D				

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 95	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.6	23.3	9.5	24.4	13.8	9.5	23.2	23.2
Total Split (%)	15%	25%	10%	26%	15%	10%	24%	24%
Maximum Green (s)	10.1	18.8	5.0	19.9	9.3	5.0	18.7	18.7
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	24.4		24.1		14.6	23.3	9.5	24.4	13.8	9.5	23.2	23.2
Total Split (%)	25.7%		25.4%		15%	25%	10%	26%	15%	10%	24%	24%
Maximum Green (s)	19.4		19.1		10.1	18.8	5.0	19.9	9.3	5.0	18.7	18.7
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	19.4		19.1		10.1	18.8	5.0	19.9	9.3	5.0	18.7	18.7
90th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	19.4		19.1		10.1	18.8	5.0	19.9	9.3	5.0	18.7	18.7
70th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	19.4		19.1		10.1	18.8	5.0	19.9	9.3	5.0	18.7	18.7
50th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	19.4		19.0		10.0	18.8	5.0	19.9	9.3	5.0	18.7	18.7
30th %ile Term Code	Hold		Hold		Min	Hold	Max	Max	Max	Max	Max	Hold
10th %ile Green (s)	19.4		19.0		10.0	18.8	5.0	19.9	9.3	5.0	18.7	18.7
10th %ile Term Code	Hold		Hold		Min	Hold	Max	Max	Max	Max	Max	Hold

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 95
30th %ile Actuated Cycle: 94.9
10th %ile Actuated Cycle: 94.9

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	330	384	234	1421
v/c Ratio	0.79	0.60	0.32	0.95
Control Delay	24.5	10.5	24.0	47.2
Queue Delay	1.6	0.2	0.0	0.0
Total Delay	26.2	10.7	24.0	47.2
Queue Length 50th (ft)	122	98	44	304
Queue Length 95th (ft)	#280	167	78	#404
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	416	642	733	1496
Starvation Cap Reductn	21	25	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.84	0.62	0.32	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	330	0	0	153	69	139	1128	84	0	0	0
Future Volume (vph)	349	330	0	0	153	69	139	1128	84	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.95			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1681	1761			3374			5012				
Flt Permitted	0.14	0.55			1.00			0.99				
Satd. Flow (perm)	249	965			3374			5012				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	367	347	0	0	161	73	146	1187	88	0	0	0
RTOR Reduction (vph)	0	0	0	0	55	0	0	8	0	0	0	0
Lane Group Flow (vph)	330	384	0	0	179	0	0	1413	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	47.8	47.8			19.1			28.2				
Effective Green, g (s)	47.8	47.8			19.1			28.2				
Actuated g/C Ratio	0.50	0.50			0.20			0.30				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	417	648			678			1487				
v/s Ratio Prot	c0.16	0.12			0.05							
v/s Ratio Perm	c0.24	0.18						0.28				
v/c Ratio	0.79	0.59			0.26			0.95				
Uniform Delay, d1	32.3	16.7			32.0			32.7				
Progression Factor	0.44	0.52			1.00			1.00				
Incremental Delay, d2	8.3	1.2			0.2			13.4				
Delay (s)	22.6	9.9			32.2			46.1				
Level of Service	C	A			C			D				
Approach Delay (s)		15.8			32.2			46.1			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lanes, Volumes, Timings
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions (Adjusted For Construction)

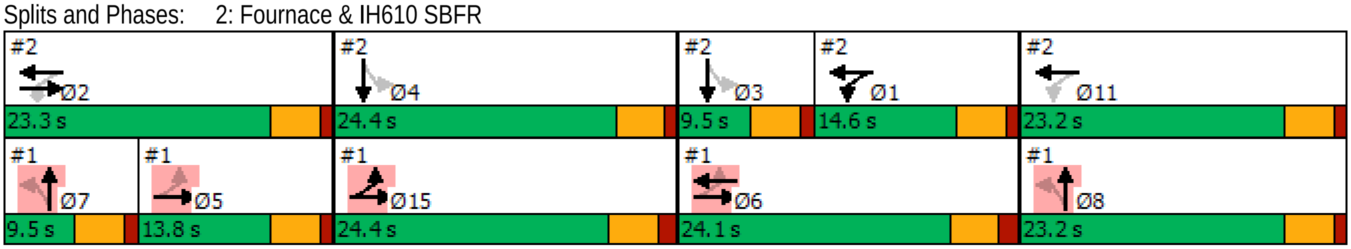
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	411	358	89	203	0	0	0	0	270	1170	280
Future Volume (vph)	0	411	358	89	203	0	0	0	0	270	1170	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.971	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	4938	0
Flt Permitted				0.503						0.950		
Satd. Flow (perm)	0	3539	1583	937	1863	0	0	0	0	1770	4938	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			373								61	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	428	373	93	211	0	0	0	0	281	1219	292
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	428	373	93	211	0	0	0	0	281	1511	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		23.3	23.3	14.6								
Total Split (%)		24.5%	24.5%	15.4%								
Maximum Green (s)		18.8	18.8	10.1								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		18.8	18.8	52.1	56.6					29.4	29.4	
Actuated g/C Ratio		0.20	0.20	0.55	0.60					0.31	0.31	
v/c Ratio		0.61	0.61	0.15	0.19					0.51	0.96	
Control Delay		39.0	8.4	2.5	2.9					30.9	47.0	
Queue Delay		0.2	0.0	0.0	1.5					0.2	0.0	
Total Delay		39.2	8.4	2.5	4.4					31.1	47.0	
LOS		D	A	A	A					C	D	
Approach Delay		24.9			3.8						44.5	
Approach LOS		C			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 95	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	24.4	13.8	24.1	9.5	23.2	23.2	24.4
Total Split (%)	10%	26%	15%	25%	10%	24%	24%	26%
Maximum Green (s)	5.0	19.9	9.3	19.1	5.0	18.7	18.7	19.4
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	23.3	23.3	14.6				9.5	24.4	13.8	24.1	9.5	23.2
Total Split (%)	24.5%	24.5%	15.4%				10%	26%	15%	25%	10%	24%
Maximum Green (s)	18.8	18.8	10.1				5.0	19.9	9.3	19.1	5.0	18.7
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	18.8	18.8	10.1				5.0	19.9	9.3	19.1	5.0	18.7
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
70th %ile Green (s)	18.8	18.8	10.1				5.0	19.9	9.3	19.1	5.0	18.7
70th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
50th %ile Green (s)	18.8	18.8	10.1				5.0	19.9	9.3	19.1	5.0	18.7
50th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
30th %ile Green (s)	18.8	18.8	10.0				5.0	19.9	9.3	19.0	5.0	18.7
30th %ile Term Code	Hold	Hold	Min				Max	Max	Max	Hold	Max	Max
10th %ile Green (s)	18.8	18.8	10.0				5.0	19.9	9.3	19.0	5.0	18.7
10th %ile Term Code	Hold	Hold	Min				Max	Max	Max	Hold	Max	Max

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 95
30th %ile Actuated Cycle: 94.9
10th %ile Actuated Cycle: 94.9

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	23.2	24.4
Total Split (%)	24%	26%
Maximum Green (s)	18.7	19.4
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	18.7	19.4
90th %ile Term Code	Hold	Max
70th %ile Green (s)	18.7	19.4
70th %ile Term Code	Hold	Max
50th %ile Green (s)	18.7	19.4
50th %ile Term Code	Hold	Max
30th %ile Green (s)	18.7	19.4
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	18.7	19.4
10th %ile Term Code	Hold	Hold

Intersection Summary

Queues
2: Fournace & IH610 SBFR

2018 PM Peak Hour
Existing Conditions (Adjusted For Construction)

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	428	373	93	211	281	1511
v/c Ratio	0.61	0.61	0.15	0.19	0.51	0.96
Control Delay	39.0	8.4	2.5	2.9	30.9	47.0
Queue Delay	0.2	0.0	0.0	1.5	0.2	0.0
Total Delay	39.2	8.4	2.5	4.4	31.1	47.0
Queue Length 50th (ft)	124	0	3	8	138	315
Queue Length 95th (ft)	175	77	m3	m7	218	#421
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	700	612	602	1074	547	1570
Starvation Cap Reductn	0	0	0	681	0	0
Spillback Cap Reductn	25	0	0	0	28	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.61	0.15	0.54	0.54	0.96

Intersection Summary

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑					↰	↑↑↱	
Traffic Volume (vph)	0	411	358	89	203	0	0	0	0	270	1170	280
Future Volume (vph)	0	411	358	89	203	0	0	0	0	270	1170	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	4938	
Flt Permitted		1.00	1.00	0.50	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	936	1863					1770	4938	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	428	373	93	211	0	0	0	0	281	1219	292
RTOR Reduction (vph)	0	0	299	0	0	0	0	0	0	0	42	0
Lane Group Flow (vph)	0	428	74	93	211	0	0	0	0	281	1469	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		18.8	18.8	52.1	56.6					29.4	29.4	
Effective Green, g (s)		18.8	18.8	52.1	56.6					29.4	29.4	
Actuated g/C Ratio		0.20	0.20	0.55	0.60					0.31	0.31	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		700	313	601	1109					547	1528	
v/s Ratio Prot		c0.12		0.02	c0.11						c0.30	
v/s Ratio Perm			0.05	0.07						0.16		
v/c Ratio		0.61	0.24	0.15	0.19					0.51	0.96	
Uniform Delay, d1		34.8	32.1	10.2	8.8					26.9	32.2	
Progression Factor		1.00	1.00	0.25	0.30					1.00	1.00	
Incremental Delay, d2		1.6	0.4	0.1	0.1					0.8	14.8	
Delay (s)		36.4	32.4	2.6	2.7					27.7	47.0	
Level of Service		D	C	A	A					C	D	
Approach Delay (s)		34.5			2.6			0.0			44.0	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	751	31	2	481	5	18
Future Volume (vph)	751	31	2	481	5	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.994				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	3518	0	0	3539	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	3518	0	0	3539	1645	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	816	34	2	523	5	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	850	0	0	525	25	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 31.7%	ICU Level of Service A
Analysis Period (min) 15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	751	31	2	481	5	18
Future Volume (Veh/h)	751	31	2	481	5	18
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)	816	34	2	523	5	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked			0.96		0.96	0.96
vC, conflicting volume			850		1098	425
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			767		1025	326
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	97
cM capacity (veh/h)			811		222	645

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	544	306	176	349	25
Volume Left	0	0	2	0	5
Volume Right	0	34	0	0	20
cSH	1700	1700	811	1700	467
Volume to Capacity	0.32	0.18	0.00	0.21	0.05
Queue Length 95th (ft)	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.1	0.0	13.1
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		13.1
Approach LOS					B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↰↑	Y	
Traffic Vol, veh/h	751	31	2	481	5	18
Future Vol, veh/h	751	31	2	481	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	816	34	2	523	5	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	850	0	1099	425
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	784	-	207	578
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	784	-	206	578
Mov Cap-2 Maneuver	-	-	-	-	206	-
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	754	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	415	-	-	784	-
HCM Lane V/C Ratio	0.06	-	-	0.003	-
HCM Control Delay (s)	14.2	-	-	9.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↰↑	Y	
Traffic Vol, veh/h	751	31	2	481	5	18
Future Vol, veh/h	751	31	2	481	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	816	34	2	523	5	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	850	0	1099	425
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	784	-	207	578
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	784	-	206	578
Mov Cap-2 Maneuver	-	-	-	-	206	-
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	754	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	415	-	-	784	-
HCM Lane V/C Ratio	0.06	-	-	0.003	-
HCM Control Delay (s)	14.2	-	-	9.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

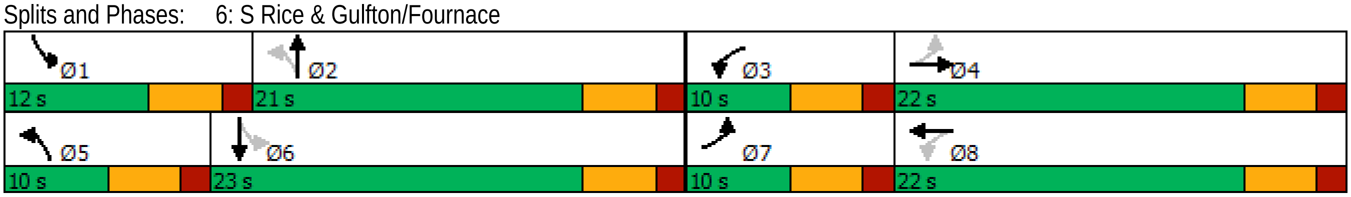
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	505	33	65	302	122	45	525	92	177	292	110
Future Volume (vph)	84	505	33	65	302	122	45	525	92	177	292	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.991			0.957			0.978			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3507	0	1770	3387	0	1770	3461	0	1770	3394	0
Flt Permitted	0.411			0.362			0.505			0.236		
Satd. Flow (perm)	766	3507	0	674	3387	0	941	3461	0	440	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			90			29			83	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	532	35	68	318	128	47	553	97	186	307	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	567	0	68	446	0	47	650	0	186	423	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		10.0	21.0		12.0	23.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		15.4%	32.3%		18.5%	35.4%	
Maximum Green (s)	5.0	17.0		5.0	17.0		5.0	16.0		7.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.7	16.1		17.7	14.2		18.6	15.0		22.0	18.4	
Actuated g/C Ratio	0.33	0.29		0.32	0.25		0.33	0.27		0.39	0.33	
v/c Ratio	0.25	0.56		0.21	0.48		0.12	0.69		0.53	0.36	
Control Delay	14.0	21.0		13.6	17.6		11.8	24.2		18.0	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.0	21.0		13.6	17.6		11.8	24.2		18.0	14.5	
LOS	B	C		B	B		B	C		B	B	
Approach Delay		20.1			17.1			23.3			15.6	
Approach LOS		C			B			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 55.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 19.3 — Intersection LOS: B
Intersection Capacity Utilization 63.1% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: S Rice & Gulfton/Fournace



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	10.0	21.0	12.0	23.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	15.4%	32.3%	18.5%	35.4%
Maximum Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
90th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
70th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
70th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
50th %ile Green (s)	5.0	16.0	5.0	16.0	5.0	16.0	7.0	18.0
50th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Hold
30th %ile Green (s)	5.0	20.0	0.0	10.0	0.0	14.5	7.0	26.5
30th %ile Term Code	Max	Hold	Skip	Gap	Skip	Gap	Max	Hold
10th %ile Green (s)	0.0	9.2	0.0	9.2	0.0	9.9	0.0	9.9
10th %ile Term Code	Skip	Gap	Skip	Hold	Skip	Gap	Skip	Hold

Intersection Summary
Cycle Length: 65
Actuated Cycle Length: 55.9
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 64
30th %ile Actuated Cycle: 56.5
10th %ile Actuated Cycle: 29.1

Queues
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted For Construction)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	88	567	68	446	47	650	186	423
v/c Ratio	0.25	0.56	0.21	0.48	0.12	0.69	0.53	0.36
Control Delay	14.0	21.0	13.6	17.6	11.8	24.2	18.0	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	21.0	13.6	17.6	11.8	24.2	18.0	14.5
Queue Length 50th (ft)	21	101	16	61	10	116	43	55
Queue Length 95th (ft)	45	150	37	100	27	174	#86	93
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	355	1217	321	1193	393	1110	356	1356
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	0.25	0.47	0.21	0.37	0.12	0.59	0.52	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

HCM Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted For Construction)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	505	33	65	302	122	45	525	92	177	292	110
Future Volume (vph)	84	505	33	65	302	122	45	525	92	177	292	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3506		1770	3387		1770	3460		1770	3394	
Flt Permitted	0.41	1.00		0.36	1.00		0.51	1.00		0.24	1.00	
Satd. Flow (perm)	766	3506		673	3387		941	3460		440	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	532	35	68	318	128	47	553	97	186	307	116
RTOR Reduction (vph)	0	7	0	0	67	0	0	21	0	0	57	0
Lane Group Flow (vph)	88	560	0	68	379	0	47	629	0	186	366	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.7	16.1		17.7	15.1		18.6	16.0		23.4	18.4	
Effective Green, g (s)	19.7	16.1		17.7	15.1		18.6	16.0		23.4	18.4	
Actuated g/C Ratio	0.33	0.27		0.30	0.25		0.31	0.27		0.39	0.31	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	313	945		247	856		329	927		283	1046	
v/s Ratio Prot	c0.02	c0.16		0.01	0.11		0.01	0.18		c0.05	0.11	
v/s Ratio Perm	0.08			0.07			0.04			c0.20		
v/c Ratio	0.28	0.59		0.28	0.44		0.14	0.68		0.66	0.35	
Uniform Delay, d1	14.2	18.9		15.4	18.8		14.5	19.5		13.0	16.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.0		0.6	0.4		0.2	2.0		5.4	0.2	
Delay (s)	14.7	19.9		16.0	19.1		14.7	21.5		18.4	16.2	
Level of Service	B	B		B	B		B	C		B	B	
Approach Delay (s)		19.2			18.7			21.1			16.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	505	33	65	302	122	45	525	92	177	292	110
Future Volume (veh/h)	84	505	33	65	302	122	45	525	92	177	292	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	88	532	35	68	318	128	47	553	97	186	307	116
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	342	740	49	301	523	206	411	724	127	378	760	281
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.06	0.21	0.21	0.05	0.24	0.24	0.11	0.30	0.30
Ln Grp Delay, s/veh	15.4	21.8	21.8	15.7	20.7	20.9	14.1	24.0	24.2	14.7	15.4	15.5
Ln Grp LOS	B	C	C	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		655			514			697			609	
Approach Delay, s/veh		21.0			20.1			23.4			15.2	
Approach LOS		C			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	10.7	17.9	8.2	16.8	7.5	21.1	8.6	16.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	6.1	11.2	3.6	9.8	3.0	7.3	4.0	8.4
Green Ext Time (g_e), s	0.0	1.7	0.0	1.9	0.0	1.8	0.0	1.7
Prob of Phs Call (p_c)	0.94	1.00	0.64	1.00	0.50	1.00	0.73	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.62	1.00	0.19	1.00	0.37
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3013		3372		2530		2481
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		527		221		937		979
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	186	0	68	0	47	0	88	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	4.1	0.0	1.6	0.0	1.0	0.0	2.0	0.0
Cycle Q Clear Time (g_c), s	4.1	0.0	1.6	0.0	1.0	0.0	2.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	778	0	841	0	960	0	940	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	13.1	0.0	11.3	0.0	12.9	0.0	11.3	0.0
Perm LT Serve Time (g_u), s	3.7	0.0	3.9	0.0	10.8	0.0	4.9	0.0
Perm LT Q Serve Time (g_ps), s	2.9	0.0	0.6	0.0	0.1	0.0	0.7	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	378	0	301	0	411	0	342	0
V/C Ratio (X)	0.49	0.00	0.23	0.00	0.11	0.00	0.26	0.00
Avail Cap (c_a), veh/h	420	0	362	0	494	0	387	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	13.7	0.0	15.4	0.0	14.0	0.0	15.1	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.4	0.0	0.1	0.0	0.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	14.7	0.0	15.7	0.0	14.1	0.0	15.4	0.0
1st-Term Q (Q1), veh/ln	1.9	0.0	0.7	0.0	0.5	0.0	1.0	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.0	0.0	0.8	0.0	0.5	0.0	1.0	0.0
%ile Storage Ratio (RQ%)	0.85	0.00	0.18	0.00	0.17	0.00	0.23	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	324	0	279	0	213	0	225
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	9.1	0.0	7.8	0.0	5.1	0.0	6.2
Cycle Q Clear Time (g_c), s	0.0	9.1	0.0	7.8	0.0	5.1	0.0	6.2
Lane Grp Cap (c), veh/h	0	425	0	389	0	531	0	373
V/C Ratio (X)	0.00	0.76	0.00	0.72	0.00	0.40	0.00	0.60
Avail Cap (c_a), veh/h	0	529	0	562	0	595	0	562
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	18.9	0.0	19.3	0.0	14.9	0.0	19.1
Incr Delay (d2), s/veh	0.0	5.1	0.0	2.5	0.0	0.5	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.0	0.0	21.8	0.0	15.4	0.0	20.7
1st-Term Q (Q1), veh/ln	0.0	4.4	0.0	3.8	0.0	2.5	0.0	3.0

2nd-Term Q (Q2), veh/ln	0.0	0.6	0.0	0.3	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.0	0.0	4.1	0.0	2.6	0.0	3.2
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.14	0.00	0.14	0.00	0.15
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	326	0	288	0	210	0	221
Grp Sat Flow (s), veh/h/ln	0	1770	0	1824	0	1697	0	1690
Q Serve Time (g_s), s	0.0	9.2	0.0	7.8	0.0	5.3	0.0	6.4
Cycle Q Clear Time (g_c), s	0.0	9.2	0.0	7.8	0.0	5.3	0.0	6.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.30	0.00	0.12	0.00	0.55	0.00	0.58
Lane Grp Cap (c), veh/h	0	425	0	400	0	510	0	356
V/C Ratio (X)	0.00	0.77	0.00	0.72	0.00	0.41	0.00	0.62
Avail Cap (c_a), veh/h	0	529	0	579	0	571	0	537
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	18.9	0.0	19.4	0.0	15.0	0.0	19.2
Incr Delay (d2), s/veh	0.0	5.3	0.0	2.4	0.0	0.5	0.0	1.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.2	0.0	21.8	0.0	15.5	0.0	20.9
1st-Term Q (Q1), veh/ln	0.0	4.4	0.0	3.9	0.0	2.5	0.0	2.9
2nd-Term Q (Q2), veh/ln	0.0	0.6	0.0	0.3	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.1	0.0	4.2	0.0	2.5	0.0	3.1
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.14	0.00	0.14	0.00	0.14
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		20.1						
HCM 2010 LOS		C						

HCM 6th Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted For Construction)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	505	33	65	302	122	45	525	92	177	292	110
Future Volume (veh/h)	84	505	33	65	302	122	45	525	92	177	292	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	532	35	68	318	128	47	553	97	186	307	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	343	742	49	303	524	207	412	725	127	379	761	282
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.06	0.21	0.21	0.05	0.24	0.24	0.11	0.30	0.30
Unsig. Movement Delay												
Ln Grp Delay, s/veh	15.4	21.8	21.7	15.7	20.6	20.9	14.1	23.8	24.0	14.6	15.4	15.5
Ln Grp LOS	B	C	C	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		655			514			697			609	
Approach Delay, s/veh		20.9			20.1			23.3			15.2	
Approach LOS		C			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	10.7	17.8	8.2	16.7	7.5	21.0	8.6	16.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	6.0	11.1	3.5	9.8	3.0	7.3	4.0	8.3
Green Ext Time (g_e), s	0.0	1.7	0.0	1.9	0.0	1.8	0.0	1.7
Prob of Phs Call (p_c)	0.94	1.00	0.64	1.00	0.50	1.00	0.73	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.61	1.00	0.19	1.00	0.37
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3023		3385		2538		2489
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		529		222		940		982
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	186	0	68	0	47	0	88	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	4.0	0.0	1.5	0.0	1.0	0.0	2.0	0.0
Cycle Q Clear Time (g_c), s	4.0	0.0	1.5	0.0	1.0	0.0	2.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	782	0	844	0	964	0	944	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	13.0	0.0	11.2	0.0	12.8	0.0	11.2	0.0
Perm LT Serve Time (g_u), s	3.7	0.0	3.9	0.0	10.7	0.0	4.9	0.0
Perm LT Q Serve Time (g_ps), s	2.9	0.0	0.6	0.0	0.1	0.0	0.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	379	0	303	0	412	0	343	0
V/C Ratio (X)	0.49	0.00	0.22	0.00	0.11	0.00	0.26	0.00
Avail Cap (c_a), veh/h	422	0	363	0	496	0	389	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	13.6	0.0	15.3	0.0	14.0	0.0	15.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.4	0.0	0.1	0.0	0.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	14.6	0.0	15.7	0.0	14.1	0.0	15.4	0.0
1st-Term Q (Q1), veh/ln	1.3	0.0	0.5	0.0	0.4	0.0	0.7	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.5	0.0	0.6	0.0	0.4	0.0	0.7	0.0
%ile Storage Ratio (RQ%)	0.61	0.00	0.13	0.00	0.12	0.00	0.17	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	324	0	279	0	213	0	225
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	9.1	0.0	7.8	0.0	5.1	0.0	6.1
Cycle Q Clear Time (g_c), s	0.0	9.1	0.0	7.8	0.0	5.1	0.0	6.1
Lane Grp Cap (c), veh/h	0	426	0	390	0	533	0	374
V/C Ratio (X)	0.00	0.76	0.00	0.72	0.00	0.40	0.00	0.60
Avail Cap (c_a), veh/h	0	532	0	566	0	599	0	566
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	18.9	0.0	19.3	0.0	14.9	0.0	19.1
Incr Delay (d2), s/veh	0.0	5.0	0.0	2.5	0.0	0.5	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	23.8	0.0	21.8	0.0	15.4	0.0	20.6
1st-Term Q (Q1), veh/ln	0.0	3.2	0.0	2.8	0.0	1.8	0.0	2.2
2nd-Term Q (Q2), veh/ln	0.0	0.6	0.0	0.3	0.0	0.1	0.0	0.2

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.8	0.0	3.1	0.0	1.8	0.0	2.4
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.10	0.00	0.10	0.00	0.11
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	326	0	288	0	210	0	221
Grp Sat Flow (s), veh/h/ln	0	1775	0	1830	0	1701	0	1694
Q Serve Time (g_s), s	0.0	9.1	0.0	7.8	0.0	5.3	0.0	6.3
Cycle Q Clear Time (g_c), s	0.0	9.1	0.0	7.8	0.0	5.3	0.0	6.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.30	0.00	0.12	0.00	0.55	0.00	0.58
Lane Grp Cap (c), veh/h	0	426	0	401	0	510	0	357
V/C Ratio (X)	0.00	0.76	0.00	0.72	0.00	0.41	0.00	0.62
Avail Cap (c_a), veh/h	0	532	0	583	0	573	0	539
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	18.9	0.0	19.3	0.0	14.9	0.0	19.1
Incr Delay (d2), s/veh	0.0	5.1	0.0	2.4	0.0	0.5	0.0	1.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.0	0.0	21.7	0.0	15.5	0.0	20.9
1st-Term Q (Q1), veh/ln	0.0	3.3	0.0	2.9	0.0	1.8	0.0	2.2
2nd-Term Q (Q2), veh/ln	0.0	0.6	0.0	0.3	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.9	0.0	3.2	0.0	1.8	0.0	2.4
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.11	0.00	0.10	0.00	0.11
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

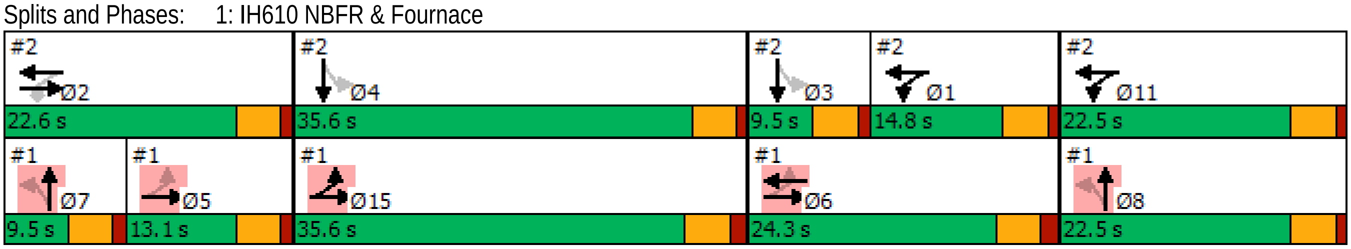
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	150	0	0	264	55	237	679	41	0	0	0
Future Volume (vph)	130	150	0	0	264	55	237	679	41	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.974			0.994				
Flt Protected	0.950	0.996						0.988				
Satd. Flow (prot)	1681	1763	0	0	3447	0	0	4994	0	0	0	0
Flt Permitted	0.145							0.988				
Satd. Flow (perm)	257	1770	0	0	3447	0	0	4994	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					20			6				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	143	165	0	0	290	60	260	746	45	0	0	0
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	129	179	0	0	350	0	0	1051	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	35.6				24.3							
Total Split (%)	33.9%				23.1%							
Maximum Green (s)	30.6				19.3							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	57.7	67.7			19.3			27.5				
Actuated g/C Ratio	0.55	0.65			0.18			0.26				
v/c Ratio	0.23	0.16			0.54			0.80				
Control Delay	9.5	3.2			39.9			41.3				
Queue Delay	0.0	1.1			0.1			0.0				
Total Delay	9.5	4.3			40.1			41.3				
LOS	A	A			D			D				
Approach Delay		6.5			40.1			41.3				
Approach LOS		A			D			D				

Intersection Summary	
Area Type: Other	
Cycle Length: 105	
Actuated Cycle Length: 104.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 34.8	Intersection LOS: C
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.8	22.6	9.5	35.6	13.1	9.5	22.5	22.5
Total Split (%)	14%	22%	9%	34%	12%	9%	21%	21%
Maximum Green (s)	10.3	18.1	5.0	31.1	8.6	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.6		24.3		14.8	22.6	9.5	35.6	13.1	9.5	22.5	22.5
Total Split (%)	33.9%		23.1%		14%	22%	9%	34%	12%	9%	21%	21%
Maximum Green (s)	30.6		19.3		10.3	18.1	5.0	31.1	8.6	5.0	18.0	18.0
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	30.6		19.3		10.3	18.1	5.0	31.1	8.6	5.0	18.0	18.0
90th %ile Term Code	Hold		Max		Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	30.6		19.3		10.3	18.1	5.0	31.1	8.6	5.0	18.0	18.0
70th %ile Term Code	Hold		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	30.6		19.3		10.3	18.1	5.0	31.1	8.6	5.0	18.0	18.0
50th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	30.6		19.3		10.3	18.1	5.0	31.1	8.6	5.0	18.0	18.0
30th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold
10th %ile Green (s)	30.6		19.3		10.3	16.7	5.0	31.1	7.2	5.0	18.0	18.0
10th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Gap	Max	Max	Hold

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 104.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 105
10th %ile Actuated Cycle: 103.6

Queues
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted for Construction)

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	129	179	350	1051
v/c Ratio	0.23	0.16	0.54	0.80
Control Delay	9.5	3.2	39.9	41.3
Queue Delay	0.0	1.1	0.1	0.0
Total Delay	9.5	4.3	40.1	41.3
Queue Length 50th (ft)	2	2	106	240
Queue Length 95th (ft)	88	3	153	294
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	557	1132	651	1316
Starvation Cap Reductn	0	747	0	0
Spillback Cap Reductn	0	0	27	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.46	0.56	0.80

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted for Construction)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	150	0	0	264	55	237	679	41	0	0	0
Future Volume (vph)	130	150	0	0	264	55	237	679	41	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1681	1763			3448			4991				
Flt Permitted	0.14	1.00			1.00			0.99				
Satd. Flow (perm)	256	1770			3448			4991				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	143	165	0	0	290	60	260	746	45	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	4	0	0	0	0
Lane Group Flow (vph)	129	179	0	0	334	0	0	1047	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	58.2	58.2			19.3			27.5				
Effective Green, g (s)	58.2	58.2			19.3			27.5				
Actuated g/C Ratio	0.56	0.56			0.18			0.26				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	558	981			635			1310				
v/s Ratio Prot	c0.07	0.05			c0.10							
v/s Ratio Perm	c0.06	0.05						0.21				
v/c Ratio	0.23	0.18			0.53			0.80				
Uniform Delay, d1	25.0	11.5			38.6			36.0				
Progression Factor	0.72	0.40			1.00			1.00				
Incremental Delay, d2	0.2	0.1			0.8			3.5				
Delay (s)	18.2	4.6			39.4			39.5				
Level of Service	B	A			D			D				
Approach Delay (s)		10.3			39.4			39.5			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	27.5
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

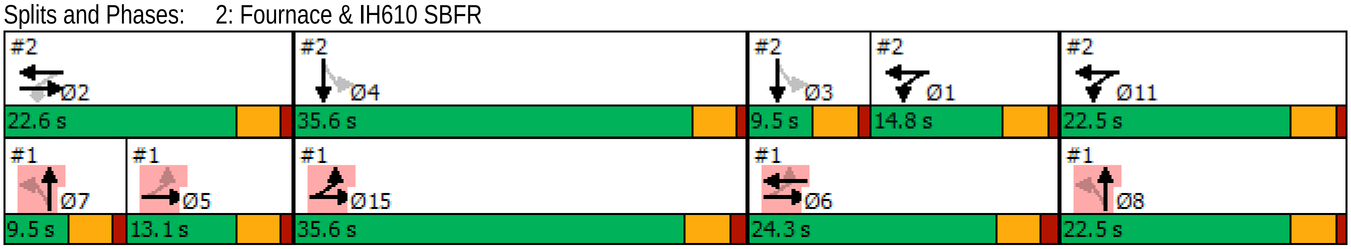
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	176	358	118	383	0	0	0	0	100	1530	310
Future Volume (vph)	0	176	358	118	383	0	0	0	0	100	1530	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.975	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	4958	0
Flt Permitted				0.618						0.950		
Satd. Flow (perm)	0	3539	1583	1151	1863	0	0	0	0	1770	4958	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			332								47	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	185	377	124	403	0	0	0	0	105	1611	326
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	185	377	124	403	0	0	0	0	105	1937	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1 11	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø1	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations									
Traffic Volume (vph)									
Future Volume (vph)									
Ideal Flow (vphpl)									
Storage Length (ft)									
Storage Lanes									
Taper Length (ft)									
Lane Util. Factor									
Frt									
Flt Protected									
Satd. Flow (prot)									
Flt Permitted									
Satd. Flow (perm)									
Right Turn on Red									
Satd. Flow (RTOR)									
Link Speed (mph)									
Link Distance (ft)									
Travel Time (s)									
Peak Hour Factor									
Adj. Flow (vph)									
Shared Lane Traffic (%)									
Lane Group Flow (vph)									
Enter Blocked Intersection									
Lane Alignment									
Median Width(ft)									
Link Offset(ft)									
Crosswalk Width(ft)									
Two way Left Turn Lane									
Headway Factor									
Turning Speed (mph)									
Number of Detectors									
Detector Template									
Leading Detector (ft)									
Trailing Detector (ft)									
Detector 1 Position(ft)									
Detector 1 Size(ft)									
Detector 1 Type									
Detector 1 Channel									
Detector 1 Extend (s)									
Detector 1 Queue (s)									
Detector 1 Delay (s)									
Detector 2 Position(ft)									
Detector 2 Size(ft)									
Detector 2 Type									
Detector 2 Channel									
Detector 2 Extend (s)									
Turn Type									
Protected Phases	1	3	4	5	6	7	8	11	15
Permitted Phases									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1 11	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0									
Minimum Split (s)		22.5	22.5									
Total Split (s)		22.6	22.6									
Total Split (%)		21.5%	21.5%									
Maximum Green (s)		18.1	18.1									
Yellow Time (s)		3.5	3.5									
All-Red Time (s)		1.0	1.0									
Lost Time Adjust (s)		0.0	0.0									
Total Lost Time (s)		4.5	4.5									
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0									
Recall Mode		None	None									
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		17.8	17.8	50.6	55.1					40.6	40.6	
Actuated g/C Ratio		0.17	0.17	0.48	0.53					0.39	0.39	
v/c Ratio		0.31	0.69	0.17	0.41					0.15	0.99	
Control Delay		39.6	14.5	1.6	3.6					21.8	50.6	
Queue Delay		0.0	0.0	0.0	2.8					0.0	0.0	
Total Delay		39.6	14.5	1.6	6.4					21.8	50.6	
LOS		D	B	A	A					C	D	
Approach Delay		22.7			5.3						49.1	
Approach LOS		C			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 105	
Actuated Cycle Length: 104.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 37.0	Intersection LOS: D
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Lane Group	Ø1	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase									
Switch Phase									
Minimum Initial (s)	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	14.8	9.5	35.6	13.1	24.3	9.5	22.5	22.5	35.6
Total Split (%)	14%	9%	34%	12%	23%	9%	21%	21%	34%
Maximum Green (s)	10.3	5.0	31.1	8.6	19.3	5.0	18.0	18.0	30.6
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)									
Total Lost Time (s)									
Lead/Lag	Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	None
Walk Time (s)			7.0		7.0		7.0		
Flash Dont Walk (s)			11.0		11.0		11.0		
Pedestrian Calls (#/hr)			0		0		0		
Act Effct Green (s)									
Actuated g/C Ratio									
v/c Ratio									
Control Delay									
Queue Delay									
Total Delay									
LOS									
Approach Delay									
Approach LOS									

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø1	Ø3	Ø4	Ø5	Ø6	Ø7
Protected Phases	2		1 11	1 11 2		4 3	1	3	4	5	6	7
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0					10.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5					14.5	9.5	22.5	9.5	23.0	9.5
Total Split (s)	22.6	22.6					14.8	9.5	35.6	13.1	24.3	9.5
Total Split (%)	21.5%	21.5%					14%	9%	34%	12%	23%	9%
Maximum Green (s)	18.1	18.1					10.3	5.0	31.1	8.6	19.3	5.0
Yellow Time (s)	3.5	3.5					3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0					1.0	1.0	1.0	1.0	1.5	1.0
Lead/Lag							Lag	Lead		Lag		Lead
Lead-Lag Optimize?							Yes	Yes		Yes		Yes
Vehicle Extension (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0					3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0					0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None					None	None	None	None	None	None
Walk Time (s)	7.0	7.0							7.0		7.0	
Flash Dont Walk (s)	11.0	11.0							11.0		11.0	
Pedestrian Calls (#/hr)	0	0							0		0	
90th %ile Green (s)	18.1	18.1					10.3	5.0	31.1	8.6	19.3	5.0
90th %ile Term Code	Max	Max					Max	Max	Max	Max	Max	Max
70th %ile Green (s)	18.1	18.1					10.3	5.0	31.1	8.6	19.3	5.0
70th %ile Term Code	Max	Max					Max	Max	Max	Max	Hold	Max
50th %ile Green (s)	18.1	18.1					10.3	5.0	31.1	8.6	19.3	5.0
50th %ile Term Code	Hold	Hold					Max	Max	Max	Max	Hold	Max
30th %ile Green (s)	18.1	18.1					10.3	5.0	31.1	8.6	19.3	5.0
30th %ile Term Code	Hold	Hold					Max	Max	Max	Max	Hold	Max
10th %ile Green (s)	16.7	16.7					10.3	5.0	31.1	7.2	19.3	5.0
10th %ile Term Code	Hold	Hold					Max	Max	Max	Gap	Hold	Max

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 104.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 105
10th %ile Actuated Cycle: 103.6

Lane Group	Ø8	Ø11	Ø15
Protected Phases	8	11	15
Permitted Phases			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	10.0
Total Split (s)	22.5	22.5	35.6
Total Split (%)	21%	21%	34%
Maximum Green (s)	18.0	18.0	30.6
Yellow Time (s)	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.5
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	None	None	None
Walk Time (s)	7.0		
Flash Dont Walk (s)	11.0		
Pedestrian Calls (#/hr)	0		
90th %ile Green (s)	18.0	18.0	30.6
90th %ile Term Code	Max	Max	Hold
70th %ile Green (s)	18.0	18.0	30.6
70th %ile Term Code	Max	Hold	Hold
50th %ile Green (s)	18.0	18.0	30.6
50th %ile Term Code	Max	Hold	Hold
30th %ile Green (s)	18.0	18.0	30.6
30th %ile Term Code	Max	Hold	Hold
10th %ile Green (s)	18.0	18.0	30.6
10th %ile Term Code	Max	Hold	Hold

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	185	377	124	403	105	1937
v/c Ratio	0.31	0.69	0.17	0.41	0.15	0.99
Control Delay	39.6	14.5	1.6	3.6	21.8	50.6
Queue Delay	0.0	0.0	0.0	2.8	0.0	0.0
Total Delay	39.6	14.5	1.6	6.4	21.8	50.6
Queue Length 50th (ft)	57	26	1	4	45	459
Queue Length 95th (ft)	91	125	m1	m4	83	#586
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	612	548	750	985	686	1950
Starvation Cap Reductn	0	0	0	456	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.69	0.17	0.76	0.15	0.99

Intersection Summary

\# 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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	176	358	118	383	0	0	0	0	100	1530	310
Future Volume (vph)	0	176	358	118	383	0	0	0	0	100	1530	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	4957	
Flt Permitted		1.00	1.00	0.62	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1152	1863					1770	4957	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	185	377	124	403	0	0	0	0	105	1611	326
RTOR Reduction (vph)	0	0	276	0	0	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	185	101	124	403	0	0	0	0	105	1908	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1 11	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		17.8	17.8	50.6	55.1					40.6	40.6	
Effective Green, g (s)		17.8	17.8	50.6	55.1					40.6	40.6	
Actuated g/C Ratio		0.17	0.17	0.48	0.53					0.39	0.39	
Clearance Time (s)		4.5	4.5									
Vehicle Extension (s)		3.0	3.0									
Lane Grp Cap (vph)		601	269	750	980					686	1922	
v/s Ratio Prot		0.05		0.05	c0.22						c0.38	
v/s Ratio Perm			0.06	0.03						0.06		
v/c Ratio		0.31	0.38	0.17	0.41					0.15	0.99	
Uniform Delay, d1		38.1	38.5	15.0	15.0					20.9	31.9	
Progression Factor		1.00	1.00	0.09	0.17					1.00	1.00	
Incremental Delay, d2		0.3	0.9	0.1	0.2					0.1	18.7	
Delay (s)		38.3	39.4	1.5	2.8					21.0	50.6	
Level of Service		D	D	A	A					C	D	
Approach Delay (s)		39.1			2.5			0.0			49.1	
Approach LOS		D			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	27.5
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	525	16	7	686	7	9
Future Volume (vph)	525	16	7	686	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.996				0.921	
Flt Protected					0.980	
Satd. Flow (prot)	3525	0	0	3539	1681	0
Flt Permitted					0.980	
Satd. Flow (perm)	3525	0	0	3539	1681	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	559	17	7	730	7	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	576	0	0	737	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.9% ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Anderson & Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted for Construction)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	525	16	7	686	7	9
Future Volume (Veh/h)	525	16	7	686	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	559	17	7	730	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked						
vC, conflicting volume			576		946	288
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			576		946	288
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			993		258	709

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	373	203	250	487	17
Volume Left	0	0	7	0	7
Volume Right	0	17	0	0	10
cSH	1700	1700	993	1700	412
Volume to Capacity	0.22	0.12	0.01	0.29	0.04
Queue Length 95th (ft)	0	0	1	0	3
Control Delay (s)	0.0	0.0	0.3	0.0	14.1
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		14.1
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	525	16	7	686	7	9
Future Vol, veh/h	525	16	7	686	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	559	17	7	730	7	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	947	288
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	379	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	993	-	259	709
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	993	-	256	709
Mov Cap-2 Maneuver	-	-	-	-	256	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	400	-	-	993	-
HCM Lane V/C Ratio	0.043	-	-	0.007	-
HCM Control Delay (s)	14.4	-	-	8.7	0.1
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	525	16	7	686	7	9
Future Vol, veh/h	525	16	7	686	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	559	17	7	730	7	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	576	0	947	288
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	379	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	993	-	259	709
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	993	-	256	709
Mov Cap-2 Maneuver	-	-	-	-	256	-
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	400	-	-	993	-
HCM Lane V/C Ratio	0.043	-	-	0.007	-
HCM Control Delay (s)	14.4	-	-	8.7	0.1
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Lanes, Volumes, Timings
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted for Construction)

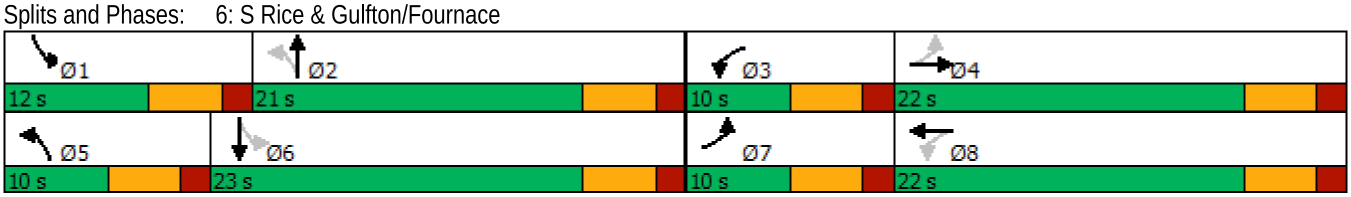
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	302	46	73	431	175	84	486	33	188	498	74
Future Volume (vph)	78	302	46	73	431	175	84	486	33	188	498	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.980			0.957			0.990			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3387	0	1770	3504	0	1770	3472	0
Flt Permitted	0.269			0.534			0.340			0.308		
Satd. Flow (perm)	501	3468	0	995	3387	0	633	3504	0	574	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			91			10			25	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	318	48	77	454	184	88	512	35	198	524	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	366	0	77	638	0	88	547	0	198	602	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		10.0	21.0		12.0	23.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		15.4%	32.3%		18.5%	35.4%	
Maximum Green (s)	5.0	17.0		5.0	17.0		5.0	16.0		7.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	19.6	17.0		18.6	15.0		17.8	14.3		20.7	15.7	
Actuated g/C Ratio	0.35	0.30		0.33	0.27		0.32	0.25		0.37	0.28	
v/c Ratio	0.27	0.34		0.19	0.66		0.28	0.61		0.54	0.61	
Control Delay	14.3	17.6		13.1	20.9		14.0	23.5		17.9	21.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.3	17.6		13.1	20.9		14.0	23.5		17.9	21.5	
LOS	B	B		B	C		B	C		B	C	
Approach Delay		17.0			20.1			22.2			20.6	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 56.1
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 20.2 Intersection LOS: C
Intersection Capacity Utilization 63.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: S Rice & Gulfton/Fournace



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	10.0	21.0	12.0	23.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	15.4%	32.3%	18.5%	35.4%
Maximum Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
90th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
70th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
50th %ile Green (s)	5.0	16.5	5.0	16.5	5.0	15.7	7.0	17.7
50th %ile Term Code	Max	Hold	Max	Gap	Max	Gap	Max	Hold
30th %ile Green (s)	5.0	23.9	0.0	13.9	5.0	12.6	7.0	14.6
30th %ile Term Code	Max	Hold	Skip	Gap	Max	Gap	Max	Hold
10th %ile Green (s)	0.0	9.0	0.0	9.0	0.0	8.9	0.0	8.9
10th %ile Term Code	Skip	Hold	Skip	Gap	Skip	Gap	Skip	Hold

Intersection Summary
Cycle Length: 65
Actuated Cycle Length: 56.1
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 64.2
30th %ile Actuated Cycle: 58.5
10th %ile Actuated Cycle: 27.9

Queues
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted for Construction)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	366	77	638	88	547	198	602
v/c Ratio	0.27	0.34	0.19	0.66	0.28	0.61	0.54	0.61
Control Delay	14.3	17.6	13.1	20.9	14.0	23.5	17.9	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	17.6	13.1	20.9	14.0	23.5	17.9	21.5
Queue Length 50th (ft)	19	57	18	100	20	98	47	102
Queue Length 95th (ft)	43	93	41	153	44	147	88	153
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	300	1268	406	1203	313	1120	377	1256
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	0.27	0.29	0.19	0.53	0.28	0.49	0.53	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	302	46	73	431	175	84	486	33	188	498	74
Future Volume (vph)	78	302	46	73	431	175	84	486	33	188	498	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3470		1770	3386		1770	3505		1770	3470	
Flt Permitted	0.27	1.00		0.53	1.00		0.34	1.00		0.31	1.00	
Satd. Flow (perm)	501	3470		994	3386		634	3505		574	3470	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	82	318	48	77	454	184	88	512	35	198	524	78
RTOR Reduction (vph)	0	18	0	0	66	0	0	8	0	0	18	0
Lane Group Flow (vph)	82	348	0	77	572	0	88	539	0	198	584	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.6	17.0		18.6	16.0		17.9	14.3		20.7	15.7	
Effective Green, g (s)	20.6	17.0		18.6	16.0		17.9	14.3		20.7	15.7	
Actuated g/C Ratio	0.35	0.29		0.32	0.27		0.30	0.24		0.35	0.27	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	1001		348	919		262	850		303	924	
v/s Ratio Prot	c0.02	0.10		0.01	c0.17		0.02	0.15		c0.06	0.17	
v/s Ratio Perm	0.09			0.06			0.08			c0.17		
v/c Ratio	0.33	0.35		0.22	0.62		0.34	0.63		0.65	0.63	
Uniform Delay, d1	13.4	16.6		14.4	18.8		15.1	20.0		14.2	19.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.2		0.3	1.3		0.8	1.6		5.0	1.4	
Delay (s)	14.1	16.8		14.7	20.1		15.9	21.5		19.2	20.5	
Level of Service	B	B		B	C		B	C		B	C	
Approach Delay (s)		16.3			19.5			20.7			20.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	78	302	46	73	431	175	84	486	33	188	498	74
Future Volume (veh/h)	78	302	46	73	431	175	84	486	33	188	498	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	82	318	48	77	454	184	88	512	35	198	524	78
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	303	758	113	403	600	241	338	704	48	395	797	118
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.25	0.25	0.06	0.24	0.24	0.07	0.21	0.21	0.12	0.26	0.26
Ln Grp Delay, s/veh	15.1	18.0	18.0	14.2	23.5	24.1	15.7	23.2	23.2	15.7	19.8	19.9
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		448			715			635			800	
Approach Delay, s/veh		17.4			22.8			22.2			18.8	
Approach LOS		B			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.3	16.4	8.4	18.4	8.7	19.1	8.6	18.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	6.6	9.8	3.7	6.8	4.1	10.3	3.8	11.4
Green Ext Time (g_e), s	0.0	1.7	0.0	1.4	0.0	2.2	0.0	1.9
Prob of Phs Call (p_c)	0.95	1.00	0.69	1.00	0.74	1.00	0.71	1.00
Prob of Max Out (p_x)	1.00	0.77	1.00	0.17	1.00	0.57	1.00	0.93
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3363		3089		3093		2466
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		229		462		459		991
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	198	0	77	0	88	0	82	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	4.6	0.0	1.7	0.0	2.1	0.0	1.8	0.0
Cycle Q Clear Time (g_c), s	4.6	0.0	1.7	0.0	2.1	0.0	1.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	856	0	1012	0	814	0	787	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	11.4	0.0	13.3	0.0	11.4	0.0	13.3	0.0
Perm LT Serve Time (g_u), s	3.7	0.0	8.6	0.0	5.8	0.0	3.9	0.0
Perm LT Q Serve Time (g_ps), s	2.3	0.0	0.4	0.0	0.7	0.0	1.1	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	395	0	403	0	338	0	303	0
V/C Ratio (X)	0.50	0.00	0.19	0.00	0.26	0.00	0.27	0.00
Avail Cap (c_a), veh/h	417	0	454	0	380	0	350	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	14.7	0.0	13.9	0.0	15.3	0.0	14.6	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.0	0.4	0.0	0.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.7	0.0	14.2	0.0	15.7	0.0	15.1	0.0
1st-Term Q (Q1), veh/ln	2.2	0.0	0.8	0.0	1.0	0.0	0.9	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.3	0.0	0.8	0.0	1.0	0.0	0.9	0.0
%ile Storage Ratio (RQ%)	0.98	0.00	0.19	0.00	0.33	0.00	0.21	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	269	0	181	0	299	0	325
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	7.7	0.0	4.7	0.0	8.2	0.0	9.3
Cycle Q Clear Time (g_c), s	0.0	7.7	0.0	4.7	0.0	8.2	0.0	9.3
Lane Grp Cap (c), veh/h	0	371	0	434	0	456	0	430
V/C Ratio (X)	0.00	0.73	0.00	0.42	0.00	0.66	0.00	0.75
Avail Cap (c_a), veh/h	0	519	0	551	0	583	0	551
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.1	0.0	17.3	0.0	18.1	0.0	19.1
Incr Delay (d2), s/veh	0.0	3.1	0.0	0.6	0.0	1.7	0.0	4.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	23.2	0.0	18.0	0.0	19.8	0.0	23.5
1st-Term Q (Q1), veh/ln	0.0	3.7	0.0	2.3	0.0	4.0	0.0	4.5

2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.1	0.0	0.2	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.1	0.0	2.3	0.0	4.2	0.0	5.0
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.08	0.00	0.23	0.00	0.23
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	278	0	185	0	303	0	313
Grp Sat Flow (s), veh/h/ln	0	1822	0	1781	0	1782	0	1688
Q Serve Time (g_s), s	0.0	7.8	0.0	4.8	0.0	8.3	0.0	9.4
Cycle Q Clear Time (g_c), s	0.0	7.8	0.0	4.8	0.0	8.3	0.0	9.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.26	0.00	0.26	0.00	0.59
Lane Grp Cap (c), veh/h	0	382	0	437	0	459	0	411
V/C Ratio (X)	0.00	0.73	0.00	0.42	0.00	0.66	0.00	0.76
Avail Cap (c_a), veh/h	0	534	0	555	0	588	0	526
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.1	0.0	17.4	0.0	18.1	0.0	19.2
Incr Delay (d2), s/veh	0.0	3.1	0.0	0.7	0.0	1.8	0.0	4.9
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	23.2	0.0	18.0	0.0	19.9	0.0	24.1
1st-Term Q (Q1), veh/ln	0.0	3.9	0.0	2.3	0.0	4.0	0.0	4.4
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.1	0.0	0.2	0.0	0.6
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.2	0.0	2.4	0.0	4.3	0.0	4.9
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.08	0.00	0.23	0.00	0.23
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		20.5						
HCM 2010 LOS		C						

HCM 6th Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2018 PM Peak Hour
Existing Conditions (Adjusted for Construction)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	302	46	73	431	175	84	486	33	188	498	74
Future Volume (veh/h)	78	302	46	73	431	175	84	486	33	188	498	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	318	48	77	454	184	88	512	35	198	524	78
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	305	760	114	405	601	242	339	706	48	396	798	118
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.25	0.25	0.06	0.24	0.24	0.07	0.21	0.21	0.12	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	15.0	17.9	18.0	14.1	23.4	24.0	15.7	23.1	23.1	15.7	19.8	19.9
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		448			715			635			800	
Approach Delay, s/veh		17.4			22.7			22.0			18.8	
Approach LOS		B			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.3	16.4	8.4	18.4	8.7	19.0	8.6	18.2
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	6.6	9.7	3.7	6.8	4.0	10.3	3.8	11.4
Green Ext Time (g_e), s	0.0	1.7	0.0	1.4	0.0	2.2	0.0	1.9
Prob of Phs Call (p_c)	0.95	1.00	0.69	1.00	0.74	1.00	0.71	1.00
Prob of Max Out (p_x)	1.00	0.76	1.00	0.17	1.00	0.57	1.00	0.92
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3376		3100		3104		2474
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		230		463		460		994
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	198	0	77	0	88	0	82	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	4.6	0.0	1.7	0.0	2.0	0.0	1.8	0.0
Cycle Q Clear Time (g_c), s	4.6	0.0	1.7	0.0	2.0	0.0	1.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	860	0	1016	0	817	0	790	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	11.4	0.0	13.2	0.0	11.4	0.0	13.2	0.0
Perm LT Serve Time (g_u), s	3.7	0.0	8.6	0.0	5.8	0.0	3.9	0.0
Perm LT Q Serve Time (g_ps), s	2.3	0.0	0.4	0.0	0.7	0.0	1.1	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	396	0	405	0	339	0	305	0
V/C Ratio (X)	0.50	0.00	0.19	0.00	0.26	0.00	0.27	0.00
Avail Cap (c_a), veh/h	419	0	456	0	382	0	352	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	14.7	0.0	13.9	0.0	15.3	0.0	14.6	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.2	0.0	0.4	0.0	0.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.7	0.0	14.1	0.0	15.7	0.0	15.0	0.0
1st-Term Q (Q1), veh/ln	1.6	0.0	0.6	0.0	0.7	0.0	0.6	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.7	0.0	0.6	0.0	0.8	0.0	0.7	0.0
%ile Storage Ratio (RQ%)	0.71	0.00	0.14	0.00	0.24	0.00	0.15	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	269	0	181	0	299	0	325
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	7.7	0.0	4.7	0.0	8.2	0.0	9.2
Cycle Q Clear Time (g_c), s	0.0	7.7	0.0	4.7	0.0	8.2	0.0	9.2
Lane Grp Cap (c), veh/h	0	372	0	436	0	457	0	432
V/C Ratio (X)	0.00	0.72	0.00	0.42	0.00	0.65	0.00	0.75
Avail Cap (c_a), veh/h	0	522	0	554	0	587	0	554
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.1	0.0	17.3	0.0	18.1	0.0	19.1
Incr Delay (d2), s/veh	0.0	3.0	0.0	0.6	0.0	1.7	0.0	4.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	23.1	0.0	17.9	0.0	19.8	0.0	23.4
1st-Term Q (Q1), veh/ln	0.0	2.8	0.0	1.7	0.0	2.9	0.0	3.3
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.1	0.0	0.2	0.0	0.5

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.1	0.0	1.8	0.0	3.1	0.0	3.8
%ile Storage Ratio (RQ%)	0.00	0.08	0.00	0.06	0.00	0.17	0.00	0.18
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	278	0	185	0	303	0	313
Grp Sat Flow (s), veh/h/ln	0	1829	0	1787	0	1787	0	1691
Q Serve Time (g_s), s	0.0	7.7	0.0	4.8	0.0	8.3	0.0	9.4
Cycle Q Clear Time (g_c), s	0.0	7.7	0.0	4.8	0.0	8.3	0.0	9.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.13	0.00	0.26	0.00	0.26	0.00	0.59
Lane Grp Cap (c), veh/h	0	383	0	438	0	460	0	411
V/C Ratio (X)	0.00	0.73	0.00	0.42	0.00	0.66	0.00	0.76
Avail Cap (c_a), veh/h	0	537	0	558	0	590	0	528
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.1	0.0	17.3	0.0	18.1	0.0	19.2
Incr Delay (d2), s/veh	0.0	3.0	0.0	0.6	0.0	1.8	0.0	4.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	23.1	0.0	18.0	0.0	19.9	0.0	24.0
1st-Term Q (Q1), veh/ln	0.0	2.9	0.0	1.7	0.0	3.0	0.0	3.2
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.1	0.0	0.2	0.0	0.6
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.2	0.0	1.8	0.0	3.2	0.0	3.8
%ile Storage Ratio (RQ%)	0.00	0.08	0.00	0.06	0.00	0.17	0.00	0.17
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 6th Ctrl Delay		20.4						
HCM 6th LOS		C						

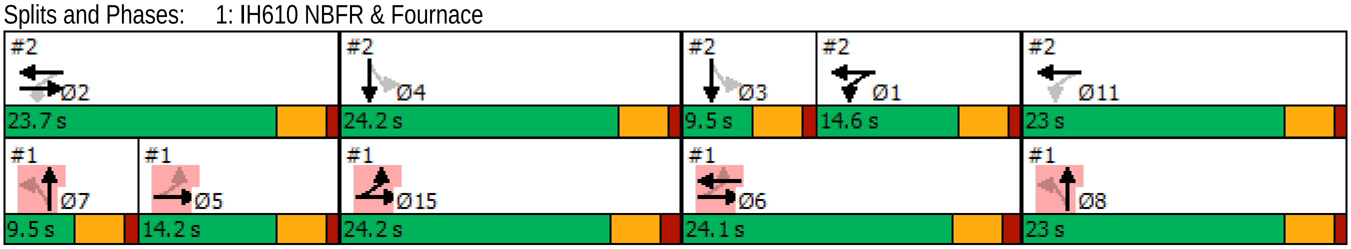
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	363	343	0	0	159	72	145	1173	87	0	0	0
Future Volume (vph)	363	343	0	0	159	72	145	1173	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.953			0.991				
Flt Protected	0.950	0.995						0.995				
Satd. Flow (prot)	1681	1761	0	0	3373	0	0	5014	0	0	0	0
Flt Permitted	0.139	0.531						0.995				
Satd. Flow (perm)	246	940	0	0	3373	0	0	5014	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					69			11				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	382	361	0	0	167	76	153	1235	92	0	0	0
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	344	399	0	0	243	0	0	1480	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	24.2				24.1							
Total Split (%)	25.5%				25.4%							
Maximum Green (s)	19.2				19.1							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	47.5	47.5			19.1			28.0				
Actuated g/C Ratio	0.50	0.50			0.20			0.29				
v/c Ratio	0.83	0.63			0.33			1.00				
Control Delay	28.2	11.3			24.4			56.5				
Queue Delay	2.2	0.2			0.0			0.0				
Total Delay	30.4	11.5			24.4			56.5				
LOS	C	B			C			E				
Approach Delay		20.2			24.4			56.5				
Approach LOS		C			C			E				

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 95	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 42.4	Intersection LOS: D
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.6	23.7	9.5	24.2	14.2	9.5	23.0	23.0
Total Split (%)	15%	25%	10%	25%	15%	10%	24%	24%
Maximum Green (s)	10.1	19.2	5.0	19.7	9.7	5.0	18.5	18.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	24.2		24.1		14.6	23.7	9.5	24.2	14.2	9.5	23.0	23.0
Total Split (%)	25.5%		25.4%		15%	25%	10%	25%	15%	10%	24%	24%
Maximum Green (s)	19.2		19.1		10.1	19.2	5.0	19.7	9.7	5.0	18.5	18.5
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	19.2		19.1		10.1	19.2	5.0	19.7	9.7	5.0	18.5	18.5
90th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	19.2		19.1		10.1	19.2	5.0	19.7	9.7	5.0	18.5	18.5
70th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	19.2		19.1		10.1	19.2	5.0	19.7	9.7	5.0	18.5	18.5
50th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	19.2		19.0		10.0	19.2	5.0	19.7	9.7	5.0	18.5	18.5
30th %ile Term Code	Hold		Hold		Min	Hold	Max	Max	Max	Max	Max	Hold
10th %ile Green (s)	19.2		19.0		10.0	19.2	5.0	19.7	9.7	5.0	18.5	18.5
10th %ile Term Code	Hold		Hold		Min	Hold	Max	Max	Max	Max	Max	Hold

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 95
30th %ile Actuated Cycle: 94.9
10th %ile Actuated Cycle: 94.9

Queues
1: IH610 NBFR & Fournace

2020 AM Peak Hour
Projected w/o Development

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	344	399	243	1480
v/c Ratio	0.83	0.63	0.33	1.00
Control Delay	28.2	11.3	24.4	56.5
Queue Delay	2.2	0.2	0.0	0.0
Total Delay	30.4	11.5	24.4	56.5
Queue Length 50th (ft)	127	104	46	323
Queue Length 95th (ft)	#305	178	82	#435
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	413	635	733	1486
Starvation Cap Reductn	19	23	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	0.65	0.33	1.00

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2020 AM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	363	343	0	0	159	72	145	1173	87	0	0	0
Future Volume (vph)	363	343	0	0	159	72	145	1173	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.95			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1681	1761			3373			5012				
Flt Permitted	0.14	0.53			1.00			0.99				
Satd. Flow (perm)	246	939			3373			5012				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	382	361	0	0	167	76	153	1235	92	0	0	0
RTOR Reduction (vph)	0	0	0	0	55	0	0	8	0	0	0	0
Lane Group Flow (vph)	344	399	0	0	188	0	0	1472	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	48.0	48.0			19.1			28.0				
Effective Green, g (s)	48.0	48.0			19.1			28.0				
Actuated g/C Ratio	0.51	0.51			0.20			0.29				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	414	640			678			1477				
v/s Ratio Prot	c0.17	0.13			0.06							
v/s Ratio Perm	c0.25	0.19						0.29				
v/c Ratio	0.83	0.62			0.28			1.00				
Uniform Delay, d1	32.8	17.0			32.1			33.5				
Progression Factor	0.45	0.53			1.00			1.00				
Incremental Delay, d2	11.1	1.6			0.2			22.5				
Delay (s)	25.9	10.6			32.3			55.9				
Level of Service	C	B			C			E				
Approach Delay (s)		17.7			32.3			55.9			0.0	
Approach LOS		B			C			E			A	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lanes, Volumes, Timings
2: Fournace & IH610 SBFR

2020 AM Peak Hour
Projected w/o Development

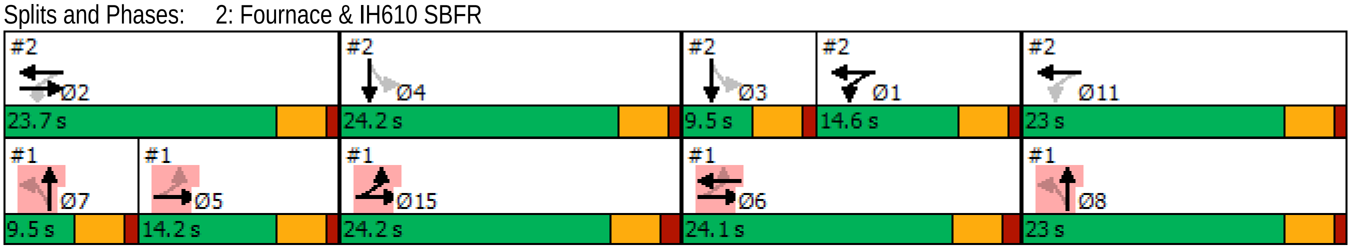
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	427	372	93	211	0	0	0	0	281	1217	291
Future Volume (vph)	0	427	372	93	211	0	0	0	0	281	1217	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.971	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	4938	0
Flt Permitted				0.494						0.950		
Satd. Flow (perm)	0	3539	1583	920	1863	0	0	0	0	1770	4938	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			388								61	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	445	388	97	220	0	0	0	0	293	1268	303
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	445	388	97	220	0	0	0	0	293	1571	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		23.7	23.7	14.6								
Total Split (%)		24.9%	24.9%	15.4%								
Maximum Green (s)		19.2	19.2	10.1								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		19.2	19.2	52.3	56.8					29.2	29.2	
Actuated g/C Ratio		0.20	0.20	0.55	0.60					0.31	0.31	
v/c Ratio		0.62	0.62	0.16	0.20					0.54	1.01	
Control Delay		39.0	8.3	2.5	2.9					31.7	56.8	
Queue Delay		0.2	0.0	0.0	1.6					0.3	0.0	
Total Delay		39.2	8.3	2.5	4.5					32.0	56.8	
LOS		D	A	A	A					C	E	
Approach Delay		24.8			3.9						52.9	
Approach LOS		C			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 95	
Actuated Cycle Length: 95	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 40.0	Intersection LOS: D
Intersection Capacity Utilization 93.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	24.2	14.2	24.1	9.5	23.0	23.0	24.2
Total Split (%)	10%	25%	15%	25%	10%	24%	24%	25%
Maximum Green (s)	5.0	19.7	9.7	19.1	5.0	18.5	18.5	19.2
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Phasings
2: Fournace & IH610 SBFR

2020 AM Peak Hour
Projected w/o Development

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	23.7	23.7	14.6				9.5	24.2	14.2	24.1	9.5	23.0
Total Split (%)	24.9%	24.9%	15.4%				10%	25%	15%	25%	10%	24%
Maximum Green (s)	19.2	19.2	10.1				5.0	19.7	9.7	19.1	5.0	18.5
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	19.2	19.2	10.1				5.0	19.7	9.7	19.1	5.0	18.5
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
70th %ile Green (s)	19.2	19.2	10.1				5.0	19.7	9.7	19.1	5.0	18.5
70th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
50th %ile Green (s)	19.2	19.2	10.1				5.0	19.7	9.7	19.1	5.0	18.5
50th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
30th %ile Green (s)	19.2	19.2	10.0				5.0	19.7	9.7	19.0	5.0	18.5
30th %ile Term Code	Hold	Hold	Min				Max	Max	Max	Hold	Max	Max
10th %ile Green (s)	19.2	19.2	10.0				5.0	19.7	9.7	19.0	5.0	18.5
10th %ile Term Code	Hold	Hold	Min				Max	Max	Max	Hold	Max	Max

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 95
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 95
30th %ile Actuated Cycle: 94.9
10th %ile Actuated Cycle: 94.9

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	23.0	24.2
Total Split (%)	24%	25%
Maximum Green (s)	18.5	19.2
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	18.5	19.2
90th %ile Term Code	Hold	Max
70th %ile Green (s)	18.5	19.2
70th %ile Term Code	Hold	Max
50th %ile Green (s)	18.5	19.2
50th %ile Term Code	Hold	Max
30th %ile Green (s)	18.5	19.2
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	18.5	19.2
10th %ile Term Code	Hold	Hold

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	445	388	97	220	293	1571
v/c Ratio	0.62	0.62	0.16	0.20	0.54	1.01
Control Delay	39.0	8.3	2.5	2.9	31.7	56.8
Queue Delay	0.2	0.0	0.0	1.6	0.3	0.0
Total Delay	39.2	8.3	2.5	4.5	32.0	56.8
Queue Length 50th (ft)	130	0	3	8	146	~339
Queue Length 95th (ft)	181	78	m3	m7	228	#452
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	715	629	596	1078	544	1560
Starvation Cap Reductn	0	0	0	685	0	0
Spillback Cap Reductn	27	0	0	0	35	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.62	0.16	0.56	0.58	1.01

Intersection Summary

~ 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.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	427	372	93	211	0	0	0	0	281	1217	291
Future Volume (vph)	0	427	372	93	211	0	0	0	0	281	1217	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	4938	
Flt Permitted		1.00	1.00	0.49	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	921	1863					1770	4938	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	445	388	97	220	0	0	0	0	293	1268	303
RTOR Reduction (vph)	0	0	310	0	0	0	0	0	0	0	42	0
Lane Group Flow (vph)	0	445	78	97	220	0	0	0	0	293	1529	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		19.2	19.2	52.3	56.8					29.2	29.2	
Effective Green, g (s)		19.2	19.2	52.3	56.8					29.2	29.2	
Actuated g/C Ratio		0.20	0.20	0.55	0.60					0.31	0.31	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		715	319	597	1113					544	1517	
v/s Ratio Prot		c0.13		0.02	c0.12						c0.31	
v/s Ratio Perm			0.05	0.07						0.17		
v/c Ratio		0.62	0.25	0.16	0.20					0.54	1.01	
Uniform Delay, d1		34.6	31.8	10.2	8.7					27.3	32.9	
Progression Factor		1.00	1.00	0.24	0.29					1.00	1.00	
Incremental Delay, d2		1.7	0.4	0.1	0.1					1.0	25.0	
Delay (s)		36.3	32.2	2.5	2.6					28.3	57.9	
Level of Service		D	C	A	A					C	E	
Approach Delay (s)		34.4			2.6			0.0			53.3	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lanes, Volumes, Timings
4: Anderson & Fournace

2020 AM Peak Hour
Projected w/o Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	781	32	2	500	5	19
Future Volume (vph)	781	32	2	500	5	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.994				0.891	
Flt Protected					0.990	
Satd. Flow (prot)	3518	0	0	3539	1643	0
Flt Permitted					0.990	
Satd. Flow (perm)	3518	0	0	3539	1643	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	849	35	2	543	5	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	884	0	0	545	26	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 32.6%	ICU Level of Service A
Analysis Period (min) 15	

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

HCM Unsignalized Intersection Capacity Analysis
4: Anderson & Fournace

2020 AM Peak Hour
Projected w/o Development

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	781	32	2	500	5	19
Future Volume (Veh/h)	781	32	2	500	5	19
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)	849	35	2	543	5	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			884		1142	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			743		1018	272
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	97
cM capacity (veh/h)			806		218	681

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	566	318	183	362	26
Volume Left	0	0	2	0	5
Volume Right	0	35	0	0	21
cSH	1700	1700	806	1700	484
Volume to Capacity	0.33	0.19	0.00	0.21	0.05
Queue Length 95th (ft)	0	0	0	0	4
Control Delay (s)	0.0	0.0	0.1	0.0	12.9
Lane LOS			A		B
Approach Delay (s)	0.0		0.0		12.9
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	781	32	2	500	5	19
Future Vol, veh/h	781	32	2	500	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	849	35	2	543	5	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	884	0	1143	442
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	276	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	761	-	194	563
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	746	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	761	-	193	563
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	402	-	-	761	-
HCM Lane V/C Ratio	0.065	-	-	0.003	-
HCM Control Delay (s)	14.6	-	-	9.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	781	32	2	500	5	19
Future Vol, veh/h	781	32	2	500	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	849	35	2	543	5	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	884	0	1143	442
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	276	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	761	-	194	563
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	746	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	761	-	193	563
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

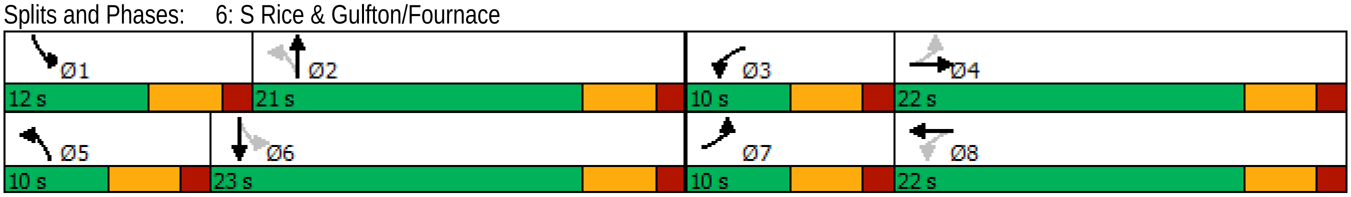
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	402	-	-	761	-
HCM Lane V/C Ratio	0.065	-	-	0.003	-
HCM Control Delay (s)	14.6	-	-	9.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	525	34	68	314	127	47	546	96	184	304	114
Future Volume (vph)	87	525	34	68	314	127	47	546	96	184	304	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.991			0.957			0.978			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3507	0	1770	3387	0	1770	3461	0	1770	3394	0
Flt Permitted	0.378			0.322			0.497			0.201		
Satd. Flow (perm)	704	3507	0	600	3387	0	926	3461	0	374	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			91			29			82	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	553	36	72	331	134	49	575	101	194	320	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	589	0	72	465	0	49	676	0	194	440	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		10.0	21.0		12.0	23.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		15.4%	32.3%		18.5%	35.4%	
Maximum Green (s)	5.0	17.0		5.0	17.0		5.0	16.0		7.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.7	16.0		17.7	13.9		19.9	14.8		25.3	21.5	
Actuated g/C Ratio	0.32	0.27		0.30	0.24		0.34	0.25		0.43	0.37	
v/c Ratio	0.29	0.61		0.25	0.53		0.13	0.76		0.59	0.34	
Control Delay	14.7	22.5		14.3	18.6		11.9	27.2		21.1	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.7	22.5		14.3	18.6		11.9	27.2		21.1	14.5	
LOS	B	C		B	B		B	C		C	B	
Approach Delay		21.4			18.0			26.2			16.5	
Approach LOS		C			B			C			B	

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 58.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 20.8	Intersection LOS: C
Intersection Capacity Utilization 64.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: S Rice & Gulfton/Fournace



Phasings
6: S Rice & Gulfton/Fournace

2020 AM Peak Hour
Projected w/o Development

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	10.0	21.0	12.0	23.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	15.4%	32.3%	18.5%	35.4%
Maximum Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
70th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
50th %ile Green (s)	5.0	16.5	5.0	16.5	5.0	16.0	7.0	18.0
50th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Hold
30th %ile Green (s)	5.0	20.3	0.0	10.3	0.0	15.2	7.0	27.2
30th %ile Term Code	Max	Hold	Skip	Gap	Skip	Gap	Max	Hold
10th %ile Green (s)	0.0	9.5	0.0	9.5	0.0	10.4	6.4	21.8
10th %ile Term Code	Skip	Gap	Skip	Hold	Skip	Gap	Gap	Hold

Intersection Summary
Cycle Length: 65
Actuated Cycle Length: 58.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 64.5
30th %ile Actuated Cycle: 57.5
10th %ile Actuated Cycle: 41.3

Queues
6: S Rice & Gulfton/Fournace

2020 AM Peak Hour
Projected w/o Development

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	589	72	465	49	676	194	440
v/c Ratio	0.29	0.61	0.25	0.53	0.13	0.76	0.59	0.34
Control Delay	14.7	22.5	14.3	18.6	11.9	27.2	21.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	22.5	14.3	18.6	11.9	27.2	21.1	14.5
Queue Length 50th (ft)	22	106	17	64	11	124	46	59
Queue Length 95th (ft)	47	156	39	105	28	#189	#107	97
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	318	1094	283	1075	388	993	333	1296
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	0.29	0.54	0.25	0.43	0.13	0.68	0.58	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 AM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	525	34	68	314	127	47	546	96	184	304	114
Future Volume (vph)	87	525	34	68	314	127	47	546	96	184	304	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3507		1770	3386		1770	3460		1770	3394	
Flt Permitted	0.38	1.00		0.32	1.00		0.50	1.00		0.20	1.00	
Satd. Flow (perm)	703	3507		600	3386		925	3460		374	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	553	36	72	331	134	49	575	101	194	320	120
RTOR Reduction (vph)	0	7	0	0	69	0	0	21	0	0	54	0
Lane Group Flow (vph)	92	582	0	72	396	0	49	655	0	194	386	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.7	16.0		17.7	15.0		19.9	17.2		28.5	21.5	
Effective Green, g (s)	19.7	16.0		17.7	15.0		19.9	17.2		28.5	21.5	
Actuated g/C Ratio	0.31	0.25		0.28	0.24		0.32	0.27		0.45	0.34	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	282	892		219	807		328	946		324	1160	
v/s Ratio Prot	c0.02	c0.17		0.01	0.12		0.01	c0.19		c0.07	0.11	
v/s Ratio Perm	0.08			0.08			0.04			0.20		
v/c Ratio	0.33	0.65		0.33	0.49		0.15	0.69		0.60	0.33	
Uniform Delay, d1	15.8	21.0		17.1	20.7		15.1	20.5		11.8	15.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.7		0.9	0.5		0.2	2.2		3.0	0.2	
Delay (s)	16.4	22.7		17.9	21.1		15.3	22.7		14.7	15.5	
Level of Service	B	C		B	C		B	C		B	B	
Approach Delay (s)		21.8			20.7			22.2			15.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	62.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	525	34	68	314	127	47	546	96	184	304	114
Future Volume (veh/h)	87	525	34	68	314	127	47	546	96	184	304	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	92	553	36	72	331	134	49	575	101	194	320	120
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	337	753	49	296	533	212	407	733	128	374	774	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.06	0.22	0.22	0.05	0.24	0.24	0.11	0.31	0.31
Ln Grp Delay, s/veh	15.8	23.1	23.1	16.1	21.2	21.5	14.4	26.0	26.2	15.0	15.7	15.8
Ln Grp LOS	B	C	C	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		681			537			725			634	
Approach Delay, s/veh		22.1			20.6			25.3			15.5	
Approach LOS		C			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.0	18.4	8.3	17.3	7.6	21.8	8.8	16.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	6.3	11.9	3.7	10.4	3.1	7.6	4.2	8.8
Green Ext Time (g_e), s	0.0	1.5	0.0	1.9	0.0	1.8	0.0	1.7
Prob of Phs Call (p_c)	0.95	1.00	0.67	1.00	0.53	1.00	0.76	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.72	1.00	0.22	1.00	0.44
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3012		3374		2535		2475
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		528		219		933		984
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	194	0	72	0	49	0	92	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	4.3	0.0	1.7	0.0	1.1	0.0	2.2	0.0
Cycle Q Clear Time (g_c), s	4.3	0.0	1.7	0.0	1.1	0.0	2.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	760	0	824	0	945	0	924	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	13.8	0.0	11.8	0.0	13.4	0.0	11.8	0.0
Perm LT Serve Time (g_u), s	3.5	0.0	3.9	0.0	11.2	0.0	5.0	0.0
Perm LT Q Serve Time (g_ps), s	3.5	0.0	0.8	0.0	0.1	0.0	0.8	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	374	0	296	0	407	0	337	0
V/C Ratio (X)	0.52	0.00	0.24	0.00	0.12	0.00	0.27	0.00
Avail Cap (c_a), veh/h	405	0	350	0	483	0	376	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	13.9	0.0	15.7	0.0	14.3	0.0	15.4	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.4	0.0	0.1	0.0	0.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.0	0.0	16.1	0.0	14.4	0.0	15.8	0.0
1st-Term Q (Q1), veh/ln	2.1	0.0	0.8	0.0	0.5	0.0	1.0	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.2	0.0	0.9	0.0	0.5	0.0	1.1	0.0
%ile Storage Ratio (RQ%)	0.94	0.00	0.20	0.00	0.17	0.00	0.25	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	337	0	290	0	222	0	235
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	9.8	0.0	8.4	0.0	5.5	0.0	6.6
Cycle Q Clear Time (g_c), s	0.0	9.8	0.0	8.4	0.0	5.5	0.0	6.6
Lane Grp Cap (c), veh/h	0	431	0	395	0	540	0	381
V/C Ratio (X)	0.00	0.78	0.00	0.73	0.00	0.41	0.00	0.62
Avail Cap (c_a), veh/h	0	514	0	546	0	578	0	546
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	19.5	0.0	19.9	0.0	15.2	0.0	19.6
Incr Delay (d2), s/veh	0.0	6.5	0.0	3.2	0.0	0.5	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.0	0.0	23.1	0.0	15.7	0.0	21.2
1st-Term Q (Q1), veh/ln	0.0	4.8	0.0	4.0	0.0	2.6	0.0	3.2

2nd-Term Q (Q2), veh/ln	0.0	0.8	0.0	0.4	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.6	0.0	4.4	0.0	2.7	0.0	3.4
%ile Storage Ratio (RQ%)	0.00	0.14	0.00	0.15	0.00	0.15	0.00	0.16
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	339	0	299	0	218	0	230
Grp Sat Flow (s), veh/h/ln	0	1770	0	1824	0	1698	0	1689
Q Serve Time (g_s), s	0.0	9.9	0.0	8.4	0.0	5.6	0.0	6.8
Cycle Q Clear Time (g_c), s	0.0	9.9	0.0	8.4	0.0	5.6	0.0	6.8
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.30	0.00	0.12	0.00	0.55	0.00	0.58
Lane Grp Cap (c), veh/h	0	431	0	407	0	518	0	363
V/C Ratio (X)	0.00	0.79	0.00	0.74	0.00	0.42	0.00	0.63
Avail Cap (c_a), veh/h	0	514	0	563	0	555	0	521
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	19.5	0.0	19.9	0.0	15.3	0.0	19.6
Incr Delay (d2), s/veh	0.0	6.7	0.0	3.2	0.0	0.5	0.0	1.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.2	0.0	23.1	0.0	15.8	0.0	21.5
1st-Term Q (Q1), veh/ln	0.0	4.8	0.0	4.2	0.0	2.6	0.0	3.1
2nd-Term Q (Q2), veh/ln	0.0	0.8	0.0	0.4	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.6	0.0	4.6	0.0	2.7	0.0	3.3
%ile Storage Ratio (RQ%)	0.00	0.14	0.00	0.16	0.00	0.14	0.00	0.15
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		21.1						
HCM 2010 LOS		C						

HCM 6th Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 AM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	525	34	68	314	127	47	546	96	184	304	114
Future Volume (veh/h)	87	525	34	68	314	127	47	546	96	184	304	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	553	36	72	331	134	49	575	101	194	320	120
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	338	755	49	298	533	212	409	735	129	375	775	285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.22	0.22	0.06	0.21	0.21	0.05	0.24	0.24	0.11	0.30	0.30
Unsig. Movement Delay												
Ln Grp Delay, s/veh	15.8	23.0	22.9	16.1	21.1	21.4	14.4	25.8	26.0	15.0	15.7	15.8
Ln Grp LOS	B	C	C	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		681			537			725			634	
Approach Delay, s/veh		22.0			20.6			25.1			15.5	
Approach LOS		C			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.0	18.4	8.3	17.2	7.6	21.7	8.8	16.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	6.3	11.8	3.7	10.4	3.1	7.6	4.1	8.8
Green Ext Time (g_e), s	0.0	1.6	0.0	1.9	0.0	1.8	0.0	1.7
Prob of Phs Call (p_c)	0.95	1.00	0.67	1.00	0.53	1.00	0.75	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.71	1.00	0.22	1.00	0.43
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3022		3387		2543		2483
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		529		220		936		987
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	194	0	72	0	49	0	92	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	4.3	0.0	1.7	0.0	1.1	0.0	2.1	0.0
Cycle Q Clear Time (g_c), s	4.3	0.0	1.7	0.0	1.1	0.0	2.1	0.0
Perm LT Sat Flow (s_l), veh/h/ln	763	0	827	0	949	0	928	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	13.7	0.0	11.8	0.0	13.4	0.0	11.8	0.0
Perm LT Serve Time (g_u), s	3.6	0.0	3.9	0.0	11.1	0.0	5.0	0.0
Perm LT Q Serve Time (g_ps), s	3.5	0.0	0.8	0.0	0.1	0.0	0.7	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	375	0	298	0	409	0	338	0
V/C Ratio (X)	0.52	0.00	0.24	0.00	0.12	0.00	0.27	0.00
Avail Cap (c_a), veh/h	407	0	352	0	485	0	378	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	13.9	0.0	15.7	0.0	14.2	0.0	15.3	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.4	0.0	0.1	0.0	0.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.0	0.0	16.1	0.0	14.4	0.0	15.8	0.0
1st-Term Q (Q1), veh/ln	1.4	0.0	0.6	0.0	0.4	0.0	0.8	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.6	0.0	0.6	0.0	0.4	0.0	0.8	0.0
%ile Storage Ratio (RQ%)	0.66	0.00	0.15	0.00	0.13	0.00	0.18	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	337	0	290	0	222	0	235
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	9.7	0.0	8.3	0.0	5.4	0.0	6.6
Cycle Q Clear Time (g_c), s	0.0	9.7	0.0	8.3	0.0	5.4	0.0	6.6
Lane Grp Cap (c), veh/h	0	432	0	396	0	541	0	382
V/C Ratio (X)	0.00	0.78	0.00	0.73	0.00	0.41	0.00	0.62
Avail Cap (c_a), veh/h	0	517	0	550	0	582	0	550
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	19.4	0.0	19.8	0.0	15.2	0.0	19.5
Incr Delay (d2), s/veh	0.0	6.3	0.0	3.1	0.0	0.5	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.8	0.0	23.0	0.0	15.7	0.0	21.1
1st-Term Q (Q1), veh/ln	0.0	3.5	0.0	3.0	0.0	1.9	0.0	2.4
2nd-Term Q (Q2), veh/ln	0.0	0.8	0.0	0.3	0.0	0.1	0.0	0.2

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.3	0.0	3.4	0.0	2.0	0.0	2.6
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.11	0.00	0.11	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	339	0	299	0	218	0	230
Grp Sat Flow (s), veh/h/ln	0	1775	0	1831	0	1702	0	1693
Q Serve Time (g_s), s	0.0	9.8	0.0	8.4	0.0	5.6	0.0	6.8
Cycle Q Clear Time (g_c), s	0.0	9.8	0.0	8.4	0.0	5.6	0.0	6.8
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.30	0.00	0.12	0.00	0.55	0.00	0.58
Lane Grp Cap (c), veh/h	0	432	0	408	0	519	0	364
V/C Ratio (X)	0.00	0.78	0.00	0.73	0.00	0.42	0.00	0.63
Avail Cap (c_a), veh/h	0	517	0	566	0	557	0	524
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	19.4	0.0	19.8	0.0	15.2	0.0	19.6
Incr Delay (d2), s/veh	0.0	6.5	0.0	3.1	0.0	0.5	0.0	1.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.0	0.0	22.9	0.0	15.8	0.0	21.4
1st-Term Q (Q1), veh/ln	0.0	3.5	0.0	3.1	0.0	1.9	0.0	2.4
2nd-Term Q (Q2), veh/ln	0.0	0.8	0.0	0.4	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.3	0.0	3.5	0.0	2.0	0.0	2.5
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.12	0.00	0.11	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 6th Ctrl Delay		21.0						
HCM 6th LOS		C						

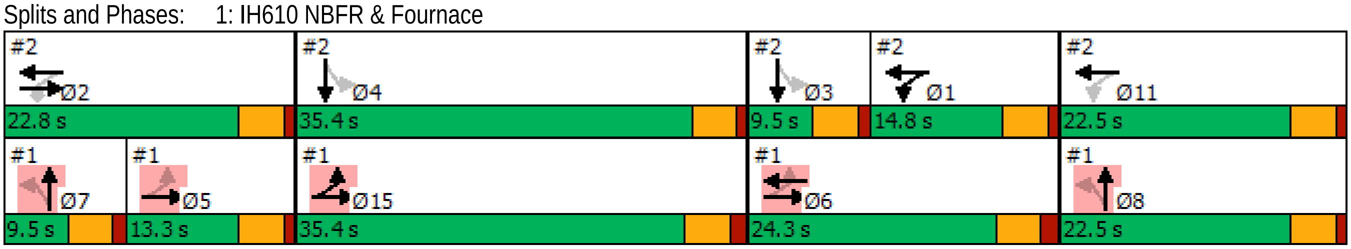
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	156	0	0	275	57	246	706	43	0	0	0
Future Volume (vph)	135	156	0	0	275	57	246	706	43	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.974			0.994				
Flt Protected	0.950	0.996						0.988				
Satd. Flow (prot)	1681	1763	0	0	3447	0	0	4994	0	0	0	0
Flt Permitted	0.144							0.988				
Satd. Flow (perm)	255	1770	0	0	3447	0	0	4994	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					21			6				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	148	171	0	0	302	63	270	776	47	0	0	0
Shared Lane Traffic (%)	10%											
Lane Group Flow (vph)	133	186	0	0	365	0	0	1093	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	35.4				24.3							
Total Split (%)	33.7%				23.1%							
Maximum Green (s)	30.4				19.3							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	57.7	67.7			19.3			27.5				
Actuated g/C Ratio	0.55	0.65			0.18			0.26				
v/c Ratio	0.24	0.16			0.56			0.83				
Control Delay	9.6	3.2			40.4			42.8				
Queue Delay	0.0	1.3			0.2			0.0				
Total Delay	9.6	4.5			40.5			42.8				
LOS	A	A			D			D				
Approach Delay		6.7			40.5			42.8				
Approach LOS		A			D			D				

Intersection Summary	
Area Type: Other	
Cycle Length: 105	
Actuated Cycle Length: 104.7	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 35.8	Intersection LOS: D
Intersection Capacity Utilization 96.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.8	22.8	9.5	35.4	13.3	9.5	22.5	22.5
Total Split (%)	14%	22%	9%	34%	13%	9%	21%	21%
Maximum Green (s)	10.3	18.3	5.0	30.9	8.8	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.4		24.3		14.8	22.8	9.5	35.4	13.3	9.5	22.5	22.5
Total Split (%)	33.7%		23.1%		14%	22%	9%	34%	13%	9%	21%	21%
Maximum Green (s)	30.4		19.3		10.3	18.3	5.0	30.9	8.8	5.0	18.0	18.0
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	30.4		19.3		10.3	18.3	5.0	30.9	8.8	5.0	18.0	18.0
90th %ile Term Code	Hold		Max		Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	30.4		19.3		10.3	18.3	5.0	30.9	8.8	5.0	18.0	18.0
70th %ile Term Code	Hold		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	30.4		19.3		10.3	18.3	5.0	30.9	8.8	5.0	18.0	18.0
50th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	30.4		19.3		10.3	18.2	5.0	30.9	8.7	5.0	18.0	18.0
30th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Gap	Max	Max	Hold
10th %ile Green (s)	30.4		19.3		10.3	16.8	5.0	30.9	7.3	5.0	18.0	18.0
10th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Gap	Max	Max	Hold

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 104.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 104.9
10th %ile Actuated Cycle: 103.5

Queues
1: IH610 NBFR & Fournace

2020 PM Peak Hour
Projected w/o Development

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	133	186	365	1093
v/c Ratio	0.24	0.16	0.56	0.83
Control Delay	9.6	3.2	40.4	42.8
Queue Delay	0.0	1.3	0.2	0.0
Total Delay	9.6	4.5	40.5	42.8
Queue Length 50th (ft)	2	2	111	252
Queue Length 95th (ft)	91	3	160	308
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	554	1116	652	1316
Starvation Cap Reductn	0	742	0	0
Spillback Cap Reductn	0	0	30	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.50	0.59	0.83

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2020 PM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	156	0	0	275	57	246	706	43	0	0	0
Future Volume (vph)	135	156	0	0	275	57	246	706	43	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	1.00			1.00			0.99				
Satd. Flow (prot)	1681	1763			3448			4991				
Flt Permitted	0.14	1.00			1.00			0.99				
Satd. Flow (perm)	255	1770			3448			4991				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	148	171	0	0	302	63	270	776	47	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	0	0	4	0	0	0	0
Lane Group Flow (vph)	133	186	0	0	348	0	0	1089	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	58.2	58.2			19.3			27.5				
Effective Green, g (s)	58.2	58.2			19.3			27.5				
Actuated g/C Ratio	0.56	0.56			0.18			0.26				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	555	981			635			1310				
v/s Ratio Prot	c0.07	0.06			c0.10							
v/s Ratio Perm	c0.06	0.05						0.22				
v/c Ratio	0.24	0.19			0.55			0.83				
Uniform Delay, d1	25.1	11.5			38.7			36.4				
Progression Factor	0.71	0.39			1.00			1.00				
Incremental Delay, d2	0.2	0.1			1.0			4.6				
Delay (s)	18.1	4.6			39.7			41.0				
Level of Service	B	A			D			D				
Approach Delay (s)		10.2			39.7			41.0			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	27.5
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

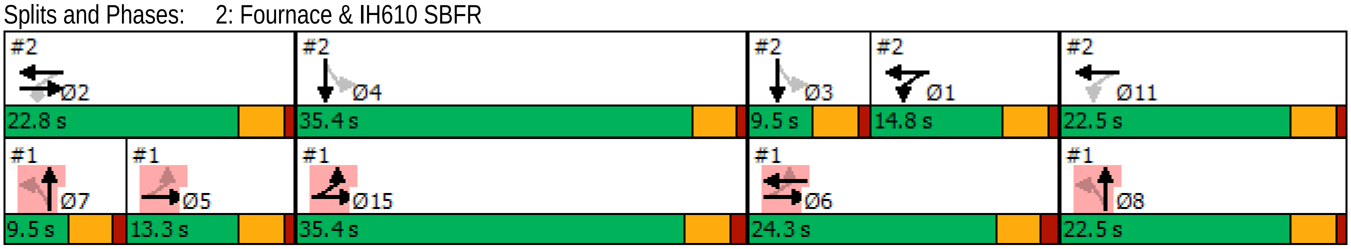
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	183	372	123	398	0	0	0	0	104	1591	322
Future Volume (vph)	0	183	372	123	398	0	0	0	0	104	1591	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.975	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	4958	0
Flt Permitted				0.630						0.950		
Satd. Flow (perm)	0	3539	1583	1174	1863	0	0	0	0	1770	4958	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			336								47	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	193	392	129	419	0	0	0	0	109	1675	339
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	193	392	129	419	0	0	0	0	109	2014	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		22.8	22.8	14.8								
Total Split (%)		21.7%	21.7%	14.1%								
Maximum Green (s)		18.3	18.3	10.3								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		18.0	18.0	50.8	55.3					40.4	40.4	
Actuated g/C Ratio		0.17	0.17	0.49	0.53					0.39	0.39	
v/c Ratio		0.32	0.71	0.21	0.43					0.16	1.04	
Control Delay		39.6	15.6	1.5	3.7					22.0	62.4	
Queue Delay		0.0	0.0	0.0	3.4					0.0	0.0	
Total Delay		39.6	15.6	1.5	7.1					22.0	62.4	
LOS		D	B	A	A					C	E	
Approach Delay		23.5			5.7						60.3	
Approach LOS		C			A						E	

Intersection Summary	
Area Type: Other	
Cycle Length: 105	
Actuated Cycle Length: 104.7	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 44.5	Intersection LOS: D
Intersection Capacity Utilization 96.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	35.4	13.3	24.3	9.5	22.5	22.5	35.4
Total Split (%)	9%	34%	13%	23%	9%	21%	21%	34%
Maximum Green (s)	5.0	30.9	8.8	19.3	5.0	18.0	18.0	30.4
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								
Intersection Summary								

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	22.8	22.8	14.8				9.5	35.4	13.3	24.3	9.5	22.5
Total Split (%)	21.7%	21.7%	14.1%				9%	34%	13%	23%	9%	21%
Maximum Green (s)	18.3	18.3	10.3				5.0	30.9	8.8	19.3	5.0	18.0
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	18.3	18.3	10.3				5.0	30.9	8.8	19.3	5.0	18.0
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
70th %ile Green (s)	18.3	18.3	10.3				5.0	30.9	8.8	19.3	5.0	18.0
70th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
50th %ile Green (s)	18.3	18.3	10.3				5.0	30.9	8.8	19.3	5.0	18.0
50th %ile Term Code	Hold	Hold	Max				Max	Max	Max	Hold	Max	Max
30th %ile Green (s)	18.2	18.2	10.3				5.0	30.9	8.7	19.3	5.0	18.0
30th %ile Term Code	Hold	Hold	Max				Max	Max	Gap	Hold	Max	Max
10th %ile Green (s)	16.8	16.8	10.3				5.0	30.9	7.3	19.3	5.0	18.0
10th %ile Term Code	Hold	Hold	Max				Max	Max	Gap	Hold	Max	Max

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 104.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 104.9
10th %ile Actuated Cycle: 103.5

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	22.5	35.4
Total Split (%)	21%	34%
Maximum Green (s)	18.0	30.4
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	18.0	30.4
90th %ile Term Code	Max	Hold
70th %ile Green (s)	18.0	30.4
70th %ile Term Code	Hold	Hold
50th %ile Green (s)	18.0	30.4
50th %ile Term Code	Hold	Hold
30th %ile Green (s)	18.0	30.4
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	18.0	30.4
10th %ile Term Code	Hold	Hold

Intersection Summary

Queues
2: Fournace & IH610 SBFR

2020 PM Peak Hour
Projected w/o Development

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	193	392	129	419	109	2014
v/c Ratio	0.32	0.71	0.21	0.43	0.16	1.04
Control Delay	39.6	15.6	1.5	3.7	22.0	62.4
Queue Delay	0.0	0.0	0.0	3.4	0.0	0.0
Total Delay	39.6	15.6	1.5	7.1	22.0	62.4
Queue Length 50th (ft)	60	33	1	4	47	~530
Queue Length 95th (ft)	94	138	m1	m4	86	#628
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	618	554	627	989	683	1942
Starvation Cap Reductn	0	0	0	461	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.71	0.21	0.79	0.16	1.04

Intersection Summary

~ 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.

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	183	372	123	398	0	0	0	0	104	1591	322
Future Volume (vph)	0	183	372	123	398	0	0	0	0	104	1591	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	4957	
Flt Permitted		1.00	1.00	0.63	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1174	1863					1770	4957	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	193	392	129	419	0	0	0	0	109	1675	339
RTOR Reduction (vph)	0	0	278	0	0	0	0	0	0	0	29	0
Lane Group Flow (vph)	0	193	114	129	419	0	0	0	0	109	1985	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		18.0	18.0	50.8	55.3					40.4	40.4	
Effective Green, g (s)		18.0	18.0	50.8	55.3					40.4	40.4	
Actuated g/C Ratio		0.17	0.17	0.49	0.53					0.39	0.39	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		608	272	628	983					682	1912	
v/s Ratio Prot		0.05		0.02	c0.22						c0.40	
v/s Ratio Perm			0.07	0.08						0.06		
v/c Ratio		0.32	0.42	0.21	0.43					0.16	1.04	
Uniform Delay, d1		38.0	38.7	15.0	15.0					21.0	32.2	
Progression Factor		1.00	1.00	0.07	0.18					1.00	1.00	
Incremental Delay, d2		0.3	1.0	0.1	0.2					0.1	31.3	
Delay (s)		38.3	39.7	1.2	2.9					21.2	63.4	
Level of Service		D	D	A	A					C	E	
Approach Delay (s)		39.2			2.5			0.0			61.3	
Approach LOS		D			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	27.5
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	546	17	7	713	7	9
Future Volume (vph)	546	17	7	713	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.995				0.921	
Flt Protected					0.980	
Satd. Flow (prot)	3522	0	0	3539	1681	0
Flt Permitted					0.980	
Satd. Flow (perm)	3522	0	0	3539	1681	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	581	18	7	759	7	10
Shared Lane Traffic (%)						
Lane Group Flow (vph)	599	0	0	766	17	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 34.6% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Anderson & Fournace

2020 PM Peak Hour
Projected w/o Development

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	546	17	7	713	7	9
Future Volume (Veh/h)	546	17	7	713	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	581	18	7	759	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked						
vC, conflicting volume			599		984	300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			599		984	300
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			974		244	697

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	387	212	260	506	17
Volume Left	0	0	7	0	7
Volume Right	0	18	0	0	10
cSH	1700	1700	974	1700	395
Volume to Capacity	0.23	0.12	0.01	0.30	0.04
Queue Length 95th (ft)	0	0	1	0	3
Control Delay (s)	0.0	0.0	0.3	0.0	14.5
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		14.5
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	546	17	7	713	7	9
Future Vol, veh/h	546	17	7	713	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	581	18	7	759	7	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	984	300
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	394	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	974	-	246	696
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	974	-	243	696
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	383	-	-	974	-
HCM Lane V/C Ratio	0.044	-	-	0.008	-
HCM Control Delay (s)	14.8	-	-	8.7	0.1
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	546	17	7	713	7	9
Future Vol, veh/h	546	17	7	713	7	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	581	18	7	759	7	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	984	300
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	394	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	974	-	246	696
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	974	-	243	696
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	650	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.8
HCM LOS			B

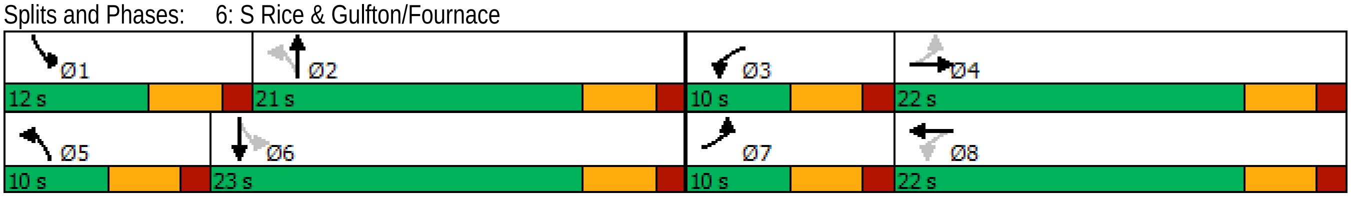
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	383	-	-	974	-
HCM Lane V/C Ratio	0.044	-	-	0.008	-
HCM Control Delay (s)	14.8	-	-	8.7	0.1
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱		↰	↑↱	
Traffic Volume (vph)	81	314	48	76	448	182	87	505	34	196	518	77
Future Volume (vph)	81	314	48	76	448	182	87	505	34	196	518	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.980			0.957			0.990			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3387	0	1770	3504	0	1770	3472	0
Flt Permitted	0.270			0.497			0.386			0.264		
Satd. Flow (perm)	503	3468	0	926	3387	0	719	3504	0	492	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			92			10			25	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	331	51	80	472	192	92	532	36	206	545	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	382	0	80	664	0	92	568	0	206	626	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		10.0	21.0		12.0	23.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		15.4%	32.3%		18.5%	35.4%	
Maximum Green (s)	5.0	17.0		5.0	17.0		5.0	16.0		7.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.6	14.8		18.6	14.8		19.2	14.0		24.0	18.8	
Actuated g/C Ratio	0.32	0.25		0.32	0.25		0.33	0.24		0.41	0.32	
v/c Ratio	0.32	0.43		0.22	0.72		0.28	0.68		0.58	0.56	
Control Delay	15.2	19.7		13.4	23.0		13.9	25.5		20.2	20.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.2	19.7		13.4	23.0		13.9	25.5		20.2	20.7	
LOS	B	B		B	C		B	C		C	C	
Approach Delay		18.9			22.0			23.9			20.6	
Approach LOS		B			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 58.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 21.5	Intersection LOS: C
Intersection Capacity Utilization 65.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: S Rice & Gulfton/Fournace



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	10.0	21.0	12.0	23.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	15.4%	32.3%	18.5%	35.4%
Maximum Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
90th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
70th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
50th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
50th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	5.0	14.4	5.0	14.4	5.0	13.0	7.0	15.0
30th %ile Term Code	Max	Hold	Max	Gap	Max	Gap	Max	Hold
10th %ile Green (s)	0.0	9.3	0.0	9.3	0.0	9.2	6.4	20.6
10th %ile Term Code	Skip	Hold	Skip	Gap	Skip	Gap	Gap	Hold

Intersection Summary
Cycle Length: 65
Actuated Cycle Length: 58.9
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 65
30th %ile Actuated Cycle: 59.4
10th %ile Actuated Cycle: 39.9

Queues
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/o Development

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	85	382	80	664	92	568	206	626
v/c Ratio	0.32	0.43	0.22	0.72	0.28	0.68	0.58	0.56
Control Delay	15.2	19.7	13.4	23.0	13.9	25.5	20.2	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	19.7	13.4	23.0	13.9	25.5	20.2	20.7
Queue Length 50th (ft)	20	61	19	106	21	104	50	109
Queue Length 95th (ft)	44	96	42	161	45	153	#100	160
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	269	1056	366	1078	326	994	358	1162
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	0.32	0.36	0.22	0.62	0.28	0.57	0.58	0.54

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	314	48	76	448	182	87	505	34	196	518	77
Future Volume (vph)	81	314	48	76	448	182	87	505	34	196	518	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3468		1770	3386		1770	3506		1770	3471	
Flt Permitted	0.27	1.00		0.50	1.00		0.39	1.00		0.26	1.00	
Satd. Flow (perm)	503	3468		925	3386		719	3506		492	3471	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	331	51	80	472	192	92	532	36	206	545	81
RTOR Reduction (vph)	0	20	0	0	70	0	0	7	0	0	17	0
Lane Group Flow (vph)	85	362	0	80	594	0	92	561	0	206	609	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.5	14.8		18.5	14.8		19.1	15.4		25.9	18.8	
Effective Green, g (s)	18.5	14.8		18.5	14.8		19.1	15.4		25.9	18.8	
Actuated g/C Ratio	0.30	0.24		0.30	0.24		0.31	0.25		0.42	0.31	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	229	841		331	821		288	885		357	1069	
v/s Ratio Prot	c0.02	0.10		0.01	c0.18		0.02	0.16		c0.07	0.18	
v/s Ratio Perm	0.09			0.06			0.08			c0.18		
v/c Ratio	0.37	0.43		0.24	0.72		0.32	0.63		0.58	0.57	
Uniform Delay, d1	15.9	19.5		15.5	21.2		15.2	20.3		12.0	17.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.4		0.4	3.2		0.6	1.5		2.3	0.7	
Delay (s)	16.9	19.9		15.9	24.4		15.8	21.8		14.3	18.4	
Level of Service	B	B		B	C		B	C		B	B	
Approach Delay (s)		19.4			23.5			20.9			17.4	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	314	48	76	448	182	87	505	34	196	518	77
Future Volume (veh/h)	81	314	48	76	448	182	87	505	34	196	518	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	85	331	51	80	472	192	92	532	36	206	545	81
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	296	767	117	398	608	246	332	716	48	393	815	121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.25	0.25	0.06	0.25	0.25	0.07	0.21	0.21	0.12	0.26	0.26
Ln Grp Delay, s/veh	15.5	18.4	18.4	14.5	25.3	26.0	16.1	24.6	24.6	16.2	20.7	20.8
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	C	C
Approach Vol, veh/h		467			744			660			832	
Approach Delay, s/veh		17.9			24.4			23.5			19.6	
Approach LOS		B			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.7	16.9	8.6	19.0	8.8	19.8	8.7	18.9
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	6.9	10.3	3.8	7.1	4.2	10.9	3.9	12.1
Green Ext Time (g_e), s	0.0	1.6	0.0	1.5	0.0	2.1	0.0	1.8
Prob of Phs Call (p_c)	0.96	1.00	0.71	1.00	0.76	1.00	0.73	1.00
Prob of Max Out (p_x)	1.00	0.88	1.00	0.21	1.00	0.66	1.00	1.00
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3365		3079		3093		2462
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		227		470		458		995
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	206	0	80	0	92	0	85	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	4.9	0.0	1.8	0.0	2.2	0.0	1.9	0.0
Cycle Q Clear Time (g_c), s	4.9	0.0	1.8	0.0	2.2	0.0	1.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	840	0	997	0	796	0	768	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	11.9	0.0	13.9	0.0	11.9	0.0	13.9	0.0
Perm LT Serve Time (g_u), s	3.6	0.0	8.8	0.0	5.9	0.0	3.8	0.0
Perm LT Q Serve Time (g_ps), s	2.7	0.0	0.4	0.0	0.8	0.0	1.3	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	393	0	398	0	332	0	296	0
V/C Ratio (X)	0.52	0.00	0.20	0.00	0.28	0.00	0.29	0.00
Avail Cap (c_a), veh/h	404	0	443	0	370	0	338	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.0	0.0	14.2	0.0	15.7	0.0	15.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	0.2	0.0	0.4	0.0	0.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	16.2	0.0	14.5	0.0	16.1	0.0	15.5	0.0
1st-Term Q (Q1), veh/ln	2.3	0.0	0.9	0.0	1.0	0.0	0.9	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.5	0.0	0.9	0.0	1.1	0.0	1.0	0.0
%ile Storage Ratio (RQ%)	1.05	0.00	0.21	0.00	0.35	0.00	0.23	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	279	0	189	0	311	0	338
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	8.3	0.0	5.0	0.0	8.8	0.0	10.0
Cycle Q Clear Time (g_c), s	0.0	8.3	0.0	5.0	0.0	8.8	0.0	10.0
Lane Grp Cap (c), veh/h	0	376	0	441	0	466	0	437
V/C Ratio (X)	0.00	0.74	0.00	0.43	0.00	0.67	0.00	0.77
Avail Cap (c_a), veh/h	0	504	0	536	0	567	0	536
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.7	0.0	17.7	0.0	18.5	0.0	19.7
Incr Delay (d2), s/veh	0.0	4.0	0.0	0.7	0.0	2.2	0.0	5.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.6	0.0	18.4	0.0	20.7	0.0	25.3
1st-Term Q (Q1), veh/ln	0.0	4.0	0.0	2.5	0.0	4.3	0.0	4.9

2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.1	0.0	0.3	0.0	0.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.5	0.0	2.5	0.0	4.6	0.0	5.6
%ile Storage Ratio (RQ%)	0.00	0.11	0.00	0.09	0.00	0.25	0.00	0.26
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	289	0	193	0	315	0	326
Grp Sat Flow (s), veh/h/ln	0	1823	0	1780	0	1782	0	1687
Q Serve Time (g_s), s	0.0	8.3	0.0	5.1	0.0	8.9	0.0	10.1
Cycle Q Clear Time (g_c), s	0.0	8.3	0.0	5.1	0.0	8.9	0.0	10.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.12	0.00	0.26	0.00	0.26	0.00	0.59
Lane Grp Cap (c), veh/h	0	388	0	443	0	469	0	417
V/C Ratio (X)	0.00	0.74	0.00	0.44	0.00	0.67	0.00	0.78
Avail Cap (c_a), veh/h	0	519	0	539	0	571	0	511
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.7	0.0	17.8	0.0	18.5	0.0	19.7
Incr Delay (d2), s/veh	0.0	4.0	0.0	0.7	0.0	2.3	0.0	6.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.6	0.0	18.4	0.0	20.8	0.0	26.0
1st-Term Q (Q1), veh/ln	0.0	4.2	0.0	2.5	0.0	4.4	0.0	4.7
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.1	0.0	0.3	0.0	0.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.6	0.0	2.6	0.0	4.7	0.0	5.4
%ile Storage Ratio (RQ%)	0.00	0.12	0.00	0.09	0.00	0.25	0.00	0.25
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		21.6						
HCM 2010 LOS		C						

HCM 6th Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/o Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	314	48	76	448	182	87	505	34	196	518	77
Future Volume (veh/h)	81	314	48	76	448	182	87	505	34	196	518	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	85	331	51	80	472	192	92	532	36	206	545	81
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	297	769	117	400	610	246	334	718	48	394	816	121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.25	0.25	0.06	0.25	0.25	0.07	0.21	0.21	0.12	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	15.5	18.3	18.4	14.4	25.1	25.8	16.1	24.5	24.5	16.1	20.6	20.7
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	C	C
Approach Vol, veh/h		467			744			660			832	
Approach Delay, s/veh		17.8			24.3			23.3			19.5	
Approach LOS		B			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	11.6	16.9	8.6	18.9	8.8	19.7	8.7	18.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	6.9	10.3	3.8	7.1	4.2	10.8	3.9	12.1
Green Ext Time (g_e), s	0.0	1.6	0.0	1.5	0.0	2.2	0.0	1.8
Prob of Phs Call (p_c)	0.96	1.00	0.71	1.00	0.76	1.00	0.73	1.00
Prob of Max Out (p_x)	1.00	0.87	1.00	0.21	1.00	0.65	1.00	1.00
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3378		3091		3105		2470
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		228		472		460		998
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	206	0	80	0	92	0	85	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	4.9	0.0	1.8	0.0	2.2	0.0	1.9	0.0
Cycle Q Clear Time (g_c), s	4.9	0.0	1.8	0.0	2.2	0.0	1.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	843	0	1001	0	799	0	772	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	11.9	0.0	13.8	0.0	11.9	0.0	13.8	0.0
Perm LT Serve Time (g_u), s	3.6	0.0	8.8	0.0	5.9	0.0	3.8	0.0
Perm LT Q Serve Time (g_ps), s	2.7	0.0	0.4	0.0	0.8	0.0	1.2	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	394	0	400	0	334	0	297	0
V/C Ratio (X)	0.52	0.00	0.20	0.00	0.28	0.00	0.29	0.00
Avail Cap (c_a), veh/h	406	0	445	0	372	0	339	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.0	0.0	14.2	0.0	15.7	0.0	14.9	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.2	0.0	0.4	0.0	0.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	16.1	0.0	14.4	0.0	16.1	0.0	15.5	0.0
1st-Term Q (Q1), veh/ln	1.7	0.0	0.6	0.0	0.8	0.0	0.7	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.8	0.0	0.7	0.0	0.8	0.0	0.7	0.0
%ile Storage Ratio (RQ%)	0.77	0.00	0.15	0.00	0.26	0.00	0.17	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	279	0	189	0	311	0	339
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	8.2	0.0	5.0	0.0	8.8	0.0	9.9
Cycle Q Clear Time (g_c), s	0.0	8.2	0.0	5.0	0.0	8.8	0.0	9.9
Lane Grp Cap (c), veh/h	0	377	0	442	0	467	0	439
V/C Ratio (X)	0.00	0.74	0.00	0.43	0.00	0.67	0.00	0.77
Avail Cap (c_a), veh/h	0	507	0	539	0	571	0	539
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.6	0.0	17.7	0.0	18.5	0.0	19.6
Incr Delay (d2), s/veh	0.0	3.9	0.0	0.7	0.0	2.2	0.0	5.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.5	0.0	18.3	0.0	20.6	0.0	25.1
1st-Term Q (Q1), veh/ln	0.0	3.0	0.0	1.8	0.0	3.2	0.0	3.6
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.1	0.0	0.3	0.0	0.7

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.4	0.0	1.9	0.0	3.4	0.0	4.3
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.06	0.00	0.19	0.00	0.20
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	289	0	193	0	315	0	325
Grp Sat Flow (s), veh/h/ln	0	1829	0	1785	0	1788	0	1691
Q Serve Time (g_s), s	0.0	8.3	0.0	5.1	0.0	8.8	0.0	10.1
Cycle Q Clear Time (g_c), s	0.0	8.3	0.0	5.1	0.0	8.8	0.0	10.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.12	0.00	0.26	0.00	0.26	0.00	0.59
Lane Grp Cap (c), veh/h	0	389	0	444	0	470	0	417
V/C Ratio (X)	0.00	0.74	0.00	0.43	0.00	0.67	0.00	0.78
Avail Cap (c_a), veh/h	0	522	0	542	0	574	0	513
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.6	0.0	17.7	0.0	18.5	0.0	19.7
Incr Delay (d2), s/veh	0.0	3.9	0.0	0.7	0.0	2.2	0.0	6.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	24.5	0.0	18.4	0.0	20.7	0.0	25.8
1st-Term Q (Q1), veh/ln	0.0	3.1	0.0	1.9	0.0	3.2	0.0	3.5
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.1	0.0	0.3	0.0	0.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.6	0.0	1.9	0.0	3.5	0.0	4.2
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	0.07	0.00	0.19	0.00	0.19
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 6th Ctrl Delay		21.5						
HCM 6th LOS		C						

Lanes, Volumes, Timings
1: IH610 NBFR & Fournace

2020 AM Peak Hour
Projected w/Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	347	0	0	183	72	305	1173	87	0	0	0
Future Volume (vph)	378	347	0	0	183	72	305	1173	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.958			0.992				
Flt Protected	0.950	0.995						0.990				
Satd. Flow (prot)	1681	1761	0	0	3391	0	0	4994	0	0	0	0
Flt Permitted	0.138	0.483						0.990				
Satd. Flow (perm)	244	855	0	0	3391	0	0	4994	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					48			9				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	398	365	0	0	193	76	321	1235	92	0	0	0
Shared Lane Traffic (%)	11%											
Lane Group Flow (vph)	354	409	0	0	269	0	0	1648	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

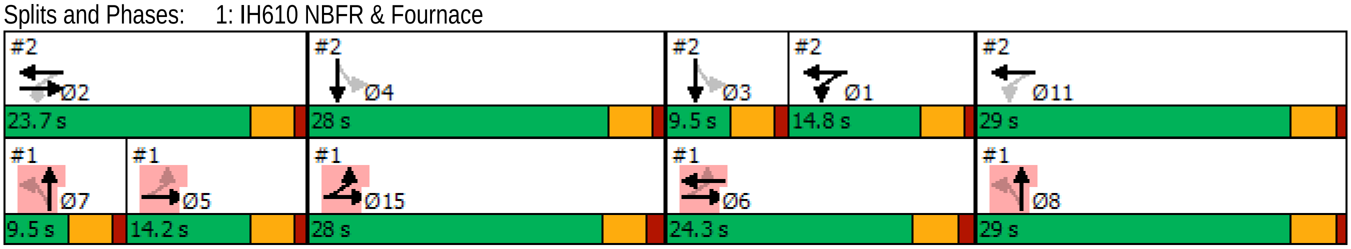
Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	28.0				24.3							
Total Split (%)	26.7%				23.1%							
Maximum Green (s)	23.0				19.3							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	51.5	51.5			19.3			34.0				
Actuated g/C Ratio	0.49	0.49			0.18			0.32				
v/c Ratio	0.82	0.66			0.41			1.02				
Control Delay	25.1	12.9			32.9			61.8				
Queue Delay	11.6	0.3			0.0			0.0				
Total Delay	36.7	13.2			32.9			61.8				
LOS	D	B			C			E				
Approach Delay		24.1			32.9			61.8				
Approach LOS		C			C			E				

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 105
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 48.2 Intersection LOS: D
Intersection Capacity Utilization 98.3% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.8	23.7	9.5	28.0	14.2	9.5	29.0	29.0
Total Split (%)	14%	23%	9%	27%	14%	9%	28%	28%
Maximum Green (s)	10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								
Intersection Summary								

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	28.0		24.3		14.8	23.7	9.5	28.0	14.2	9.5	29.0	29.0
Total Split (%)	26.7%		23.1%		14%	23%	9%	27%	14%	9%	28%	28%
Maximum Green (s)	23.0		19.3		10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	23.0		19.3		10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
90th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	23.0		19.3		10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
70th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	23.0		19.3		10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
50th %ile Term Code	Max		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	23.0		19.3		10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
30th %ile Term Code	Hold		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
10th %ile Green (s)	23.0		19.3		10.3	19.2	5.0	23.5	9.7	5.0	24.5	24.5
10th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 105
10th %ile Actuated Cycle: 105

Queues
1: IH610 NBFR & Fournace

2020 AM Peak Hour
Projected w/Development

Lane Group	EBL	EBT	WBT	NBT
Lane Group Flow (vph)	354	409	269	1648
v/c Ratio	0.82	0.66	0.41	1.02
Control Delay	25.1	12.9	32.9	61.8
Queue Delay	11.6	0.3	0.0	0.0
Total Delay	36.7	13.2	32.9	61.8
Queue Length 50th (ft)	157	134	68	~414
Queue Length 95th (ft)	#335	248	109	#526
Internal Link Dist (ft)		207	951	395
Turn Bay Length (ft)				
Base Capacity (vph)	434	617	662	1623
Starvation Cap Reductn	63	27	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.95	0.69	0.41	1.02

Intersection Summary

~ 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.

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2020 AM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	347	0	0	183	72	305	1173	87	0	0	0
Future Volume (vph)	378	347	0	0	183	72	305	1173	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.96			0.99				
Flt Protected	0.95	0.99			1.00			0.99				
Satd. Flow (prot)	1681	1760			3389			4994				
Flt Permitted	0.14	0.48			1.00			0.99				
Satd. Flow (perm)	244	855			3389			4994				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	398	365	0	0	193	76	321	1235	92	0	0	0
RTOR Reduction (vph)	0	0	0	0	39	0	0	6	0	0	0	0
Lane Group Flow (vph)	354	409	0	0	230	0	0	1642	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	52.0	52.0			19.3			34.0				
Effective Green, g (s)	52.0	52.0			19.3			34.0				
Actuated g/C Ratio	0.50	0.50			0.18			0.32				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	435	621			622			1617				
v/s Ratio Prot	c0.18	0.14			0.07							
v/s Ratio Perm	c0.22	0.18						0.33				
v/c Ratio	0.81	0.66			0.37			1.02				
Uniform Delay, d1	35.4	19.9			37.5			35.5				
Progression Factor	0.40	0.51			1.00			1.00				
Incremental Delay, d2	8.7	1.9			0.4			26.3				
Delay (s)	23.0	12.1			37.9			61.8				
Level of Service	C	B			D			E				
Approach Delay (s)		17.1			37.9			61.8			0.0	
Approach LOS		B			D			E			A	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

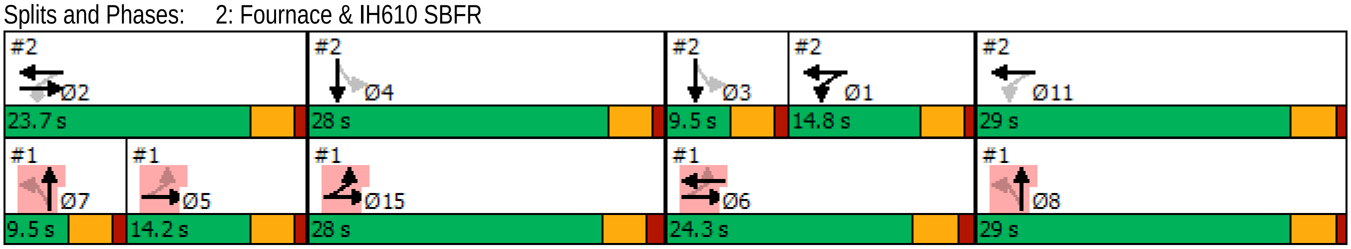
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	444	385	93	395	0	0	0	0	283	1230	291
Future Volume (vph)	0	444	385	93	395	0	0	0	0	283	1230	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.971	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	4938	0
Flt Permitted				0.486						0.950		
Satd. Flow (perm)	0	3539	1583	905	1863	0	0	0	0	1770	4938	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			401								55	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	463	401	97	411	0	0	0	0	295	1281	303
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	463	401	97	411	0	0	0	0	295	1584	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		23.7	23.7	14.8								
Total Split (%)		22.6%	22.6%	14.1%								
Maximum Green (s)		19.2	19.2	10.3								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		19.2	19.2	58.5	63.0					33.0	33.0	
Actuated g/C Ratio		0.18	0.18	0.56	0.60					0.31	0.31	
v/c Ratio		0.72	0.65	0.16	0.37					0.53	1.00	
Control Delay		47.4	9.4	1.4	2.5					33.8	57.1	
Queue Delay		0.2	0.0	0.0	2.6					0.3	0.0	
Total Delay		47.5	9.4	1.4	5.0					34.1	57.1	
LOS		D	A	A	A					C	E	
Approach Delay		29.8			4.3						53.5	
Approach LOS		C			A						D	

Intersection Summary	
Area Type: Other	
Cycle Length: 105	
Actuated Cycle Length: 105	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 39.5	Intersection LOS: D
Intersection Capacity Utilization 98.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Fournace & IH610 SBFR



Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	28.0	14.2	24.3	9.5	29.0	29.0	28.0
Total Split (%)	9%	27%	14%	23%	9%	28%	28%	27%
Maximum Green (s)	5.0	23.5	9.7	19.3	5.0	24.5	24.5	23.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	23.7	23.7	14.8				9.5	28.0	14.2	24.3	9.5	29.0
Total Split (%)	22.6%	22.6%	14.1%				9%	27%	14%	23%	9%	28%
Maximum Green (s)	19.2	19.2	10.3				5.0	23.5	9.7	19.3	5.0	24.5
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	19.2	19.2	10.3				5.0	23.5	9.7	19.3	5.0	24.5
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
70th %ile Green (s)	19.2	19.2	10.3				5.0	23.5	9.7	19.3	5.0	24.5
70th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
50th %ile Green (s)	19.2	19.2	10.3				5.0	23.5	9.7	19.3	5.0	24.5
50th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
30th %ile Green (s)	19.2	19.2	10.3				5.0	23.5	9.7	19.3	5.0	24.5
30th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
10th %ile Green (s)	19.2	19.2	10.3				5.0	23.5	9.7	19.3	5.0	24.5
10th %ile Term Code	Hold	Hold	Max				Max	Max	Max	Hold	Max	Max

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 105
10th %ile Actuated Cycle: 105

Phasings
2: Fournace & IH610 SBFR

2020 AM Peak Hour
Projected w/Development

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	29.0	28.0
Total Split (%)	28%	27%
Maximum Green (s)	24.5	23.0
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	24.5	23.0
90th %ile Term Code	Hold	Max
70th %ile Green (s)	24.5	23.0
70th %ile Term Code	Hold	Max
50th %ile Green (s)	24.5	23.0
50th %ile Term Code	Hold	Max
30th %ile Green (s)	24.5	23.0
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	24.5	23.0
10th %ile Term Code	Hold	Hold

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	463	401	97	411	295	1584
v/c Ratio	0.72	0.65	0.16	0.37	0.53	1.00
Control Delay	47.4	9.4	1.4	2.5	33.8	57.1
Queue Delay	0.2	0.0	0.0	2.6	0.3	0.0
Total Delay	47.5	9.4	1.4	5.0	34.1	57.1
Queue Length 50th (ft)	155	0	2	7	162	376
Queue Length 95th (ft)	212	87	m2	m6	248	#493
Internal Link Dist (ft)	513			207		267
Turn Bay Length (ft)		150				
Base Capacity (vph)	647	617	589	1117	556	1589
Starvation Cap Reductn	0	0	0	567	0	0
Spillback Cap Reductn	11	0	0	0	39	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.65	0.16	0.75	0.57	1.00

Intersection Summary

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.

HCM Signalized Intersection Capacity Analysis
2: Fournace & IH610 SBFR

2020 AM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	444	385	93	395	0	0	0	0	283	1230	291
Future Volume (vph)	0	444	385	93	395	0	0	0	0	283	1230	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	4939	
Flt Permitted		1.00	1.00	0.49	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	905	1863					1770	4939	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	462	401	97	411	0	0	0	0	295	1281	303
RTOR Reduction (vph)	0	0	328	0	0	0	0	0	0	0	38	0
Lane Group Flow (vph)	0	463	73	97	411	0	0	0	0	295	1546	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		19.2	19.2	58.5	63.0					33.0	33.0	
Effective Green, g (s)		19.2	19.2	58.5	63.0					33.0	33.0	
Actuated g/C Ratio		0.18	0.18	0.56	0.60					0.31	0.31	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		647	289	589	1117					556	1552	
v/s Ratio Prot		c0.13		0.02	c0.22						c0.31	
v/s Ratio Perm			0.05	0.08						0.17		
v/c Ratio		0.72	0.25	0.16	0.37					0.53	1.00	
Uniform Delay, d1		40.3	36.8	10.9	10.8					29.6	35.9	
Progression Factor		1.00	1.00	0.11	0.17					1.00	1.00	
Incremental Delay, d2		3.8	0.5	0.1	0.1					1.0	21.8	
Delay (s)		44.1	37.2	1.3	2.0					30.6	57.7	
Level of Service		D	D	A	A					C	E	
Approach Delay (s)		40.9			1.9			0.0			53.5	
Approach LOS		D			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	818	558	129	12	8
Future Volume (vph)	38	818	558	129	12	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.972		0.945	
Flt Protected		0.998			0.971	
Satd. Flow (prot)	0	3532	3440	0	1709	0
Flt Permitted		0.998			0.971	
Satd. Flow (perm)	0	3532	3440	0	1709	0
Link Speed (mph)		35	35		30	
Link Distance (ft)		440	593		378	
Travel Time (s)		8.6	11.6		8.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	889	607	140	13	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	930	747	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	38	818	558	129	12	8
Future Volume (Veh/h)	38	818	558	129	12	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)	41	889	607	140	13	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			593			
pX, platoon unblocked						
vC, conflicting volume	747				1204	374
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747				1204	374
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				92	99
cM capacity (veh/h)	857				168	624

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	337	593	405	342	22
Volume Left	41	0	0	0	13
Volume Right	0	0	0	140	9
cSH	857	1700	1700	1700	240
Volume to Capacity	0.05	0.35	0.24	0.20	0.09
Queue Length 95th (ft)	4	0	0	0	7
Control Delay (s)	1.6	0.0	0.0	0.0	21.5
Lane LOS	A				C
Approach Delay (s)	0.6		0.0		21.5
Approach LOS					C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	818	558	129	12	8
Future Vol, veh/h	38	818	558	129	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	889	607	140	13	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	747	0	-	0	1204	374
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	527	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	857	-	-	-	177	623
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	557	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	857	-	-	-	160	623
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	557	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	22.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	857	-	-	-	228
HCM Lane V/C Ratio	0.048	-	-	-	0.095
HCM Control Delay (s)	9.4	0.4	-	-	22.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	38	818	558	129	12	8
Future Vol, veh/h	38	818	558	129	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	889	607	140	13	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	747	0	-	0	1204	374
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	527	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	857	-	-	-	177	623
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	557	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	857	-	-	-	160	623
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	557	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	22.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	857	-	-	-	228
HCM Lane V/C Ratio	0.048	-	-	-	0.095
HCM Control Delay (s)	9.4	0.4	-	-	22.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	834	33	3	563	7	22
Future Volume (vph)	834	33	3	563	7	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.994				0.899	
Flt Protected					0.988	
Satd. Flow (prot)	3518	0	0	3539	1655	0
Flt Permitted					0.988	
Satd. Flow (perm)	3518	0	0	3539	1655	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	907	36	3	612	8	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	943	0	0	615	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.1% ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Anderson & Fournace

2020 AM Peak Hour
Projected w/Development

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	834	33	3	563	7	22
Future Volume (Veh/h)	834	33	3	563	7	22
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)	907	36	3	612	8	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			943		1237	472
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			822		1133	323
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	96
cM capacity (veh/h)			759		185	636

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	605	338	207	408	32
Volume Left	0	0	3	0	8
Volume Right	0	36	0	0	24
cSH	1700	1700	759	1700	395
Volume to Capacity	0.36	0.20	0.00	0.24	0.08
Queue Length 95th (ft)	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.2	0.0	14.9
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		14.9
Approach LOS					B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	0.4					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	834	33	3	563	7	22
Future Vol, veh/h	834	33	3	563	7	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	907	36	3	612	8	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	943	0	1237	472
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	723	-	168	538
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	723	-	167	538
Mov Cap-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	715	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	350	-	-	723	-
HCM Lane V/C Ratio	0.09	-	-	0.005	-
HCM Control Delay (s)	16.3	-	-	10	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection						
Int Delay, s/veh	0.4					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	834	33	3	563	7	22
Future Vol, veh/h	834	33	3	563	7	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	907	36	3	612	8	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	943	0	1237	472
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	723	-	168	538
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	723	-	167	538
Mov Cap-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	715	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	350	-	-	723	-
HCM Lane V/C Ratio	0.09	-	-	0.005	-
HCM Control Delay (s)	16.3	-	-	10	0
HCM Lane LOS	C	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	81	848	513	57	18	11
Future Volume (vph)	81	848	513	57	18	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.985		0.949	
Flt Protected		0.996			0.970	
Satd. Flow (prot)	0	3525	3486	0	1715	0
Flt Permitted		0.996			0.970	
Satd. Flow (perm)	0	3525	3486	0	1715	0
Link Speed (mph)		35	35		30	
Link Distance (ft)		440	250		402	
Travel Time (s)		8.6	4.9		9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	922	558	62	20	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1010	620	0	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 55.1% ICU Level of Service B

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
5: Fournace & Access Southwest

2020 AM Peak Hour
Projected w/Development

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	81	848	513	57	18	11
Future Volume (Veh/h)	81	848	513	57	18	11
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)	88	922	558	62	20	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1061	1283			
pX, platoon unblocked					0.89	
vC, conflicting volume	620				1226	310
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	620				1000	310
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				90	98
cM capacity (veh/h)	956				193	686

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	395	615	372	248	32
Volume Left	88	0	0	0	20
Volume Right	0	0	0	62	12
cSH	956	1700	1700	1700	264
Volume to Capacity	0.09	0.36	0.22	0.15	0.12
Queue Length 95th (ft)	8	0	0	0	10
Control Delay (s)	2.8	0.0	0.0	0.0	20.5
Lane LOS	A				C
Approach Delay (s)	1.1		0.0		20.5
Approach LOS					C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	848	513	57	18	11
Future Vol, veh/h	81	848	513	57	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	88	922	558	62	20	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	620	0	-	0	1226	310
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	637	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	956	-	-	-	171	686
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	956	-	-	-	139	686
Mov Cap-2 Maneuver	-	-	-	-	139	-
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	489	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	26.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	956	-	-	-	199
HCM Lane V/C Ratio	0.092	-	-	-	0.158
HCM Control Delay (s)	9.1	0.7	-	-	26.5
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

Intersection						
Int Delay, s/veh	1.4					
Movement	**EBL**	**EBT**	**WBT**	**WBR**	**SBL**	**SBR**
Lane Configurations						
Traffic Vol, veh/h	81	848	513	57	18	11
Future Vol, veh/h	81	848	513	57	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	88	922	558	62	20	12

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	620	0	-	0	1226	310
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	637	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	956	-	-	-	171	686
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	956	-	-	-	139	686
Mov Cap-2 Maneuver	-	-	-	-	139	-
Stage 1	-	-	-	-	419	-
Stage 2	-	-	-	-	489	-
Approach	**EB**		**WB**		**SB**	
HCM Control Delay, s	1.4		0		26.5	
HCM LOS					D	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	956	-	-	-	199
HCM Lane V/C Ratio	0.092	-	-	-	0.158
HCM Control Delay (s)	9.1	0.7	-	-	26.5
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.3	-	-	-	0.6

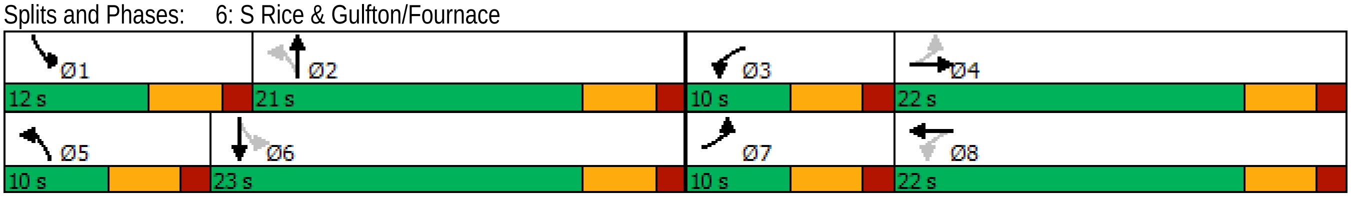
Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	564	34	74	320	133	47	546	134	223	304	114
Future Volume (vph)	87	564	34	74	320	133	47	546	134	223	304	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.991			0.956			0.970			0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3507	0	1770	3383	0	1770	3433	0	1770	3394	0
Flt Permitted	0.390			0.263			0.497			0.183		
Satd. Flow (perm)	726	3507	0	490	3383	0	926	3433	0	341	3394	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			95			44			82	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	594	36	78	337	140	49	575	141	235	320	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	630	0	78	477	0	49	716	0	235	440	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		10.0	21.0		12.0	23.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		15.4%	32.3%		18.5%	35.4%	
Maximum Green (s)	5.0	17.0		5.0	17.0		5.0	16.0		7.0	18.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	18.9	15.2		18.9	15.2		20.2	15.0		25.7	21.8	
Actuated g/C Ratio	0.31	0.25		0.31	0.25		0.33	0.25		0.43	0.36	
v/c Ratio	0.29	0.71		0.30	0.52		0.13	0.81		0.75	0.34	
Control Delay	14.6	25.8		15.1	18.2		12.1	29.6		31.4	14.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.6	25.8		15.1	18.2		12.1	29.6		31.4	14.8	
LOS	B	C		B	B		B	C		C	B	
Approach Delay		24.4			17.7			28.4			20.6	
Approach LOS		C			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 60.3	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 6: S Rice & Gulfton/Fournace



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	10.0	21.0	12.0	23.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	15.4%	32.3%	18.5%	35.4%
Maximum Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
70th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
50th %ile Green (s)	5.0	17.0	5.0	17.0	5.0	16.0	7.0	18.0
50th %ile Term Code	Max	Max	Max	Hold	Max	Max	Max	Hold
30th %ile Green (s)	5.0	15.3	5.0	15.3	0.0	16.0	7.0	28.0
30th %ile Term Code	Max	Gap	Max	Hold	Skip	Max	Max	Hold
10th %ile Green (s)	0.0	10.1	0.0	10.1	0.0	11.0	7.0	23.0
10th %ile Term Code	Skip	Gap	Skip	Hold	Skip	Gap	Max	Hold

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 60.3
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 65
30th %ile Actuated Cycle: 63.3
10th %ile Actuated Cycle: 43.1

Queues
6: S Rice & Gulfton/Fournace

2020 AM Peak Hour
Projected w/Development

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	630	78	477	49	716	235	440
v/c Ratio	0.29	0.71	0.30	0.52	0.13	0.81	0.75	0.34
Control Delay	14.6	25.8	15.1	18.2	12.1	29.6	31.4	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	25.8	15.1	18.2	12.1	29.6	31.4	14.8
Queue Length 50th (ft)	22	115	18	66	11	132	58	60
Queue Length 95th (ft)	47	168	41	107	28	#216	#162	97
Internal Link Dist (ft)		715		541		971		467
Turn Bay Length (ft)	110		110		80		60	
Base Capacity (vph)	317	1021	263	1046	381	967	315	1279
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	0.29	0.62	0.30	0.46	0.13	0.74	0.75	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	564	34	74	320	133	47	546	134	223	304	114
Future Volume (vph)	87	564	34	74	320	133	47	546	134	223	304	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3509		1770	3383		1770	3435		1770	3394	
Flt Permitted	0.39	1.00		0.26	1.00		0.50	1.00		0.18	1.00	
Satd. Flow (perm)	727	3509		490	3383		925	3435		342	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	594	36	78	337	140	49	575	141	235	320	120
RTOR Reduction (vph)	0	7	0	0	72	0	0	32	0	0	54	0
Lane Group Flow (vph)	92	623	0	78	405	0	49	684	0	235	386	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.9	15.2		18.9	15.2		20.2	17.4		29.0	21.8	
Effective Green, g (s)	18.9	15.2		18.9	15.2		20.2	17.4		29.0	21.8	
Actuated g/C Ratio	0.30	0.24		0.30	0.24		0.32	0.27		0.46	0.34	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	277	839		220	809		331	941		318	1165	
v/s Ratio Prot	0.02	c0.18		c0.02	0.12		0.01	0.20		c0.08	0.11	
v/s Ratio Perm	0.08			0.08			0.04			c0.25		
v/c Ratio	0.33	0.74		0.35	0.50		0.15	0.73		0.74	0.33	
Uniform Delay, d1	16.6	22.3		16.7	20.9		15.2	20.9		12.4	15.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	3.6		1.0	0.5		0.2	2.8		8.7	0.2	
Delay (s)	17.3	25.9		17.7	21.4		15.4	23.7		21.1	15.6	
Level of Service	B	C		B	C		B	C		C	B	
Approach Delay (s)		24.8			20.8			23.2			17.5	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis | 2020 AM Peak Hour
6: S Rice & Gulfton/Fournace | Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	564	34	74	320	133	47	546	134	223	304	114
Future Volume (veh/h)	87	564	34	74	320	133	47	546	134	223	304	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	92	594	36	78	337	140	49	575	141	235	320	120
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	330	775	47	283	549	224	415	698	171	376	812	299
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.23	0.23	0.06	0.22	0.22	0.05	0.25	0.25	0.12	0.32	0.32
Ln Grp Delay, s/veh	16.5	26.2	26.2	16.9	21.9	22.2	15.1	30.8	31.3	17.6	15.8	15.9
Ln Grp LOS	B	C	C	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		722			555			765			675	
Approach Delay, s/veh		25.0			21.3			30.0			16.5	
Approach LOS		C			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	12.0	19.4	8.6	18.3	7.7	23.7	8.9	18.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	7.4	13.3	3.9	11.6	3.2	7.9	4.3	9.4
Green Ext Time (g_e), s	0.0	1.2	0.0	1.8	0.0	1.8	0.0	1.7
Prob of Phs Call (p_c)	0.98	1.00	0.72	1.00	0.55	1.00	0.77	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.94	1.00	0.24	1.00	0.52
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		2821		3391		2535		2454
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		690		205		933		1001
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	235	0	78	0	49	0	92	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	5.4	0.0	1.9	0.0	1.2	0.0	2.3	0.0
Cycle Q Clear Time (g_c), s	5.4	0.0	1.9	0.0	1.2	0.0	2.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	732	0	793	0	945	0	914	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	15.7	0.0	13.0	0.0	14.4	0.0	13.0	0.0
Perm LT Serve Time (g_u), s	3.2	0.0	3.8	0.0	12.8	0.0	5.7	0.0
Perm LT Q Serve Time (g_ps), s	3.2	0.0	1.0	0.0	0.1	0.0	0.8	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	376	0	283	0	415	0	330	0
V/C Ratio (X)	0.63	0.00	0.28	0.00	0.12	0.00	0.28	0.00
Avail Cap (c_a), veh/h	376	0	326	0	483	0	364	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	14.4	0.0	16.4	0.0	15.0	0.0	16.0	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.5	0.0	0.1	0.0	0.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	17.6	0.0	16.9	0.0	15.1	0.0	16.5	0.0
1st-Term Q (Q1), veh/ln	2.6	0.0	0.9	0.0	0.6	0.0	1.1	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.9	0.0	1.0	0.0	0.6	0.0	1.1	0.0
%ile Storage Ratio (RQ%)	1.25	0.00	0.22	0.00	0.18	0.00	0.26	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	360	0	310	0	222	0	241
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	11.2	0.0	9.5	0.0	5.7	0.0	7.2
Cycle Q Clear Time (g_c), s	0.0	11.2	0.0	9.5	0.0	5.7	0.0	7.2
Lane Grp Cap (c), veh/h	0	438	0	404	0	567	0	396
V/C Ratio (X)	0.00	0.82	0.00	0.77	0.00	0.39	0.00	0.61
Avail Cap (c_a), veh/h	0	485	0	515	0	567	0	515
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.8	0.0	21.1	0.0	15.4	0.0	20.4
Incr Delay (d2), s/veh	0.0	10.1	0.0	5.2	0.0	0.4	0.0	1.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	30.8	0.0	26.2	0.0	15.8	0.0	21.9
1st-Term Q (Q1), veh/ln	0.0	5.4	0.0	4.6	0.0	2.8	0.0	3.5

2nd-Term Q (Q2), veh/ln	0.0	1.2	0.0	0.6	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.6	0.0	5.2	0.0	2.8	0.0	3.7
%ile Storage Ratio (RQ%)	0.00	0.17	0.00	0.18	0.00	0.15	0.00	0.17
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	356	0	320	0	218	0	236
Grp Sat Flow (s), veh/h/ln	0	1741	0	1827	0	1698	0	1686
Q Serve Time (g_s), s	0.0	11.3	0.0	9.6	0.0	5.9	0.0	7.4
Cycle Q Clear Time (g_c), s	0.0	11.3	0.0	9.6	0.0	5.9	0.0	7.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.40	0.00	0.11	0.00	0.55	0.00	0.59
Lane Grp Cap (c), veh/h	0	431	0	417	0	544	0	377
V/C Ratio (X)	0.00	0.83	0.00	0.77	0.00	0.40	0.00	0.63
Avail Cap (c_a), veh/h	0	477	0	532	0	544	0	491
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.8	0.0	21.1	0.0	15.5	0.0	20.5
Incr Delay (d2), s/veh	0.0	10.5	0.0	5.1	0.0	0.5	0.0	1.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	31.3	0.0	26.2	0.0	15.9	0.0	22.2
1st-Term Q (Q1), veh/ln	0.0	5.4	0.0	4.8	0.0	2.7	0.0	3.4
2nd-Term Q (Q2), veh/ln	0.0	1.3	0.0	0.6	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.7	0.0	5.4	0.0	2.8	0.0	3.6
%ile Storage Ratio (RQ%)	0.00	0.17	0.00	0.18	0.00	0.15	0.00	0.17
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		23.5						
HCM 2010 LOS		C						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	564	34	74	320	133	47	546	134	223	304	114
Future Volume (veh/h)	87	564	34	74	320	133	47	546	134	223	304	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	594	36	78	337	140	49	575	141	235	320	120
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	331	777	47	285	550	224	416	700	171	378	814	300
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.23	0.23	0.06	0.22	0.22	0.05	0.25	0.25	0.12	0.32	0.32
Unsig. Movement Delay												
Ln Grp Delay, s/veh	16.5	26.1	26.0	16.9	21.9	22.1	15.1	30.6	31.1	17.5	15.8	15.9
Ln Grp LOS	B	C	C	B	C	C	B	C	C	B	B	B
Approach Vol, veh/h		722			555			765			675	
Approach Delay, s/veh		24.8			21.3			29.8			16.4	
Approach LOS		C			C			C			B	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	12.0	19.4	8.6	18.3	7.7	23.7	8.9	18.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	5.0	18.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.2	3.8	5.1	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	7.4	13.2	3.9	11.5	3.2	7.8	4.3	9.3
Green Ext Time (g_e), s	0.0	1.2	0.0	1.8	0.0	1.8	0.0	1.7
Prob of Phs Call (p_c)	0.98	1.00	0.72	1.00	0.55	1.00	0.77	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.93	1.00	0.24	1.00	0.52
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		2831		3404		2543		2462
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		692		206		936		1004
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	235	0	78	0	49	0	92	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	5.4	0.0	1.9	0.0	1.2	0.0	2.3	0.0
Cycle Q Clear Time (g_c), s	5.4	0.0	1.9	0.0	1.2	0.0	2.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	735	0	796	0	949	0	917	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	15.7	0.0	13.0	0.0	14.4	0.0	13.0	0.0
Perm LT Serve Time (g_u), s	3.2	0.0	3.8	0.0	12.8	0.0	5.7	0.0
Perm LT Q Serve Time (g_ps), s	3.2	0.0	1.0	0.0	0.1	0.0	0.8	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	378	0	285	0	416	0	331	0
V/C Ratio (X)	0.62	0.00	0.27	0.00	0.12	0.00	0.28	0.00
Avail Cap (c_a), veh/h	378	0	328	0	485	0	366	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	14.4	0.0	16.4	0.0	15.0	0.0	16.0	0.0
Incr Delay (d2), s/veh	3.2	0.0	0.5	0.0	0.1	0.0	0.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	17.5	0.0	16.9	0.0	15.1	0.0	16.5	0.0
1st-Term Q (Q1), veh/ln	1.8	0.0	0.7	0.0	0.4	0.0	0.8	0.0
2nd-Term Q (Q2), veh/ln	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.2	0.0	0.7	0.0	0.4	0.0	0.9	0.0
%ile Storage Ratio (RQ%)	0.91	0.00	0.17	0.00	0.14	0.00	0.20	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	360	0	310	0	222	0	241
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	11.2	0.0	9.5	0.0	5.6	0.0	7.1
Cycle Q Clear Time (g_c), s	0.0	11.2	0.0	9.5	0.0	5.6	0.0	7.1
Lane Grp Cap (c), veh/h	0	439	0	405	0	569	0	397
V/C Ratio (X)	0.00	0.82	0.00	0.76	0.00	0.39	0.00	0.61
Avail Cap (c_a), veh/h	0	488	0	518	0	569	0	518
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.7	0.0	21.0	0.0	15.4	0.0	20.4
Incr Delay (d2), s/veh	0.0	9.9	0.0	5.1	0.0	0.4	0.0	1.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	30.6	0.0	26.1	0.0	15.8	0.0	21.9
1st-Term Q (Q1), veh/ln	0.0	4.1	0.0	3.5	0.0	2.0	0.0	2.6
2nd-Term Q (Q2), veh/ln	0.0	1.2	0.0	0.6	0.0	0.1	0.0	0.2

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.3	0.0	4.1	0.0	2.1	0.0	2.8
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.14	0.00	0.11	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	356	0	320	0	218	0	236
Grp Sat Flow (s), veh/h/ln	0	1746	0	1833	0	1702	0	1690
Q Serve Time (g_s), s	0.0	11.2	0.0	9.5	0.0	5.8	0.0	7.3
Cycle Q Clear Time (g_c), s	0.0	11.2	0.0	9.5	0.0	5.8	0.0	7.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.40	0.00	0.11	0.00	0.55	0.00	0.59
Lane Grp Cap (c), veh/h	0	431	0	418	0	545	0	377
V/C Ratio (X)	0.00	0.82	0.00	0.77	0.00	0.40	0.00	0.62
Avail Cap (c_a), veh/h	0	479	0	535	0	545	0	493
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	20.7	0.0	21.0	0.0	15.4	0.0	20.4
Incr Delay (d2), s/veh	0.0	10.3	0.0	5.0	0.0	0.5	0.0	1.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	31.1	0.0	26.0	0.0	15.9	0.0	22.1
1st-Term Q (Q1), veh/ln	0.0	4.1	0.0	3.6	0.0	2.0	0.0	2.6
2nd-Term Q (Q2), veh/ln	0.0	1.2	0.0	0.6	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.3	0.0	4.2	0.0	2.0	0.0	2.8
%ile Storage Ratio (RQ%)	0.00	0.13	0.00	0.14	0.00	0.11	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	30	0	0	2153	179
Future Volume (vph)	0	30	0	0	2153	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.86	0.86
Frt		0.865			0.988	
Flt Protected						
Satd. Flow (prot)	0	1611	0	0	6331	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	0	6331	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	367			347	687	
Travel Time (s)	8.3			5.9	11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	33	0	0	2340	195
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	33	0	0	2535	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 44.2% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
10: IH610 SBFR/SB Frontage & East Access

2020 AM Peak Hour
Projected w/Development

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	30	0	0	2153	179
Future Volume (Veh/h)	0	30	0	0	2153	179
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	33	0	0	2340	195
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				347		
pX, platoon unblocked						
vC, conflicting volume	2438	682	2535			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2438	682	2535			
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)	26	392	174			

Direction, Lane #	EB 1	SB 1	SB 2	SB 3	SB 4
Volume Total	33	669	669	669	529
Volume Left	0	0	0	0	0
Volume Right	33	0	0	0	195
cSH	392	1700	1700	1700	1700
Volume to Capacity	0.08	0.39	0.39	0.39	0.31
Queue Length 95th (ft)	7	0	0	0	0
Control Delay (s)	15.0	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	15.0	0.0			
Approach LOS	C				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

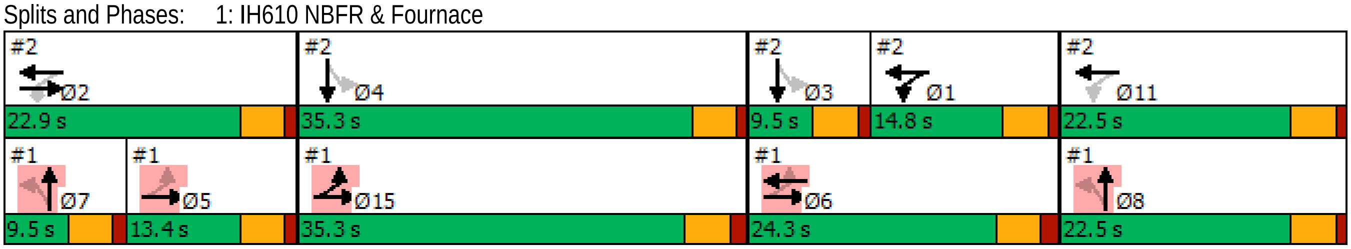
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	181	0	0	279	57	278	706	43	0	0	0
Future Volume (vph)	228	181	0	0	279	57	278	706	43	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	150		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.91	0.91	0.91	1.00	1.00	1.00
Frt					0.974			0.994				
Flt Protected	0.950	0.990						0.987				
Satd. Flow (prot)	1681	1752	0	0	3447	0	0	4989	0	0	0	0
Flt Permitted	0.142	0.539						0.987				
Satd. Flow (perm)	251	954	0	0	3447	0	0	4989	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					20			6				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		287			1031			475			520	
Travel Time (s)		5.6			20.1			9.3			10.1	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	251	199	0	0	307	63	305	776	47	0	0	0
Shared Lane Traffic (%)	19%											
Lane Group Flow (vph)	203	247	0	0	370	0	0	1128	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					

Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	1	2	3	4	5	7	8	11
Permitted Phases								

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	15	15 5 6			6		8 7	8 7				
Switch Phase												
Minimum Initial (s)	5.0				5.0							
Minimum Split (s)	10.0				23.0							
Total Split (s)	35.3				24.3							
Total Split (%)	33.6%				23.1%							
Maximum Green (s)	30.3				19.3							
Yellow Time (s)	3.5				3.5							
All-Red Time (s)	1.5				1.5							
Lost Time Adjust (s)	0.0				0.0							
Total Lost Time (s)	5.0				5.0							
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0				3.0							
Recall Mode	None				None							
Walk Time (s)					7.0							
Flash Dont Walk (s)					11.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	58.0	58.0			19.3			27.5				
Actuated g/C Ratio	0.55	0.55			0.18			0.26				
v/c Ratio	0.37	0.33			0.57			0.86				
Control Delay	12.7	8.7			40.8			44.7				
Queue Delay	1.4	0.4			0.2			0.0				
Total Delay	14.1	9.1			41.0			44.7				
LOS	B	A			D			D				
Approach Delay		11.4			41.0			44.7				
Approach LOS		B			D			D				

Intersection Summary	
Area Type: Other	
Cycle Length: 105	
Actuated Cycle Length: 105	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.09	
Intersection Signal Delay: 36.3	Intersection LOS: D
Intersection Capacity Utilization 103.6%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 1: IH610 NBFR & Fournace



Lane Group	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Detector Phase								
Switch Phase								
Minimum Initial (s)	10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	14.8	22.9	9.5	35.3	13.4	9.5	22.5	22.5
Total Split (%)	14%	22%	9%	34%	13%	9%	21%	21%
Maximum Green (s)	10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lag		Lead		Lag	Lead		
Lead-Lag Optimize?	Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0			7.0	
Flash Dont Walk (s)		11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0		0			0	
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								
Intersection Summary								

Lane Group	EBL	EBT	WBT	NBT	Ø1	Ø2	Ø3	Ø4	Ø5	Ø7	Ø8	Ø11
Protected Phases	15	15 5 6	6	8 7	1	2	3	4	5	7	8	11
Permitted Phases	15 5 6											
Minimum Initial (s)	5.0		5.0		10.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0		23.0		14.5	22.5	9.5	22.5	9.5	9.5	22.5	9.5
Total Split (s)	35.3		24.3		14.8	22.9	9.5	35.3	13.4	9.5	22.5	22.5
Total Split (%)	33.6%		23.1%		14%	22%	9%	34%	13%	9%	21%	21%
Maximum Green (s)	30.3		19.3		10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5		1.5		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag		Lead		Lag	Lead		
Lead-Lag Optimize?					Yes		Yes		Yes	Yes		
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None		None		None	None	None	None	None	None	None	None
Walk Time (s)			7.0			7.0		7.0			7.0	
Flash Dont Walk (s)			11.0			11.0		11.0			11.0	
Pedestrian Calls (#/hr)			0			0		0			0	
90th %ile Green (s)	30.3		19.3		10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
90th %ile Term Code	Hold		Max		Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	30.3		19.3		10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
70th %ile Term Code	Hold		Max		Max	Max	Max	Max	Max	Max	Max	Hold
50th %ile Green (s)	30.3		19.3		10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
50th %ile Term Code	Hold		Hold		Max	Max	Max	Max	Max	Max	Max	Hold
30th %ile Green (s)	30.3		19.3		10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
30th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold
10th %ile Green (s)	30.3		19.3		10.3	18.4	5.0	30.8	8.9	5.0	18.0	18.0
10th %ile Term Code	Hold		Hold		Max	Hold	Max	Max	Max	Max	Max	Hold

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 105
10th %ile Actuated Cycle: 105

HCM Signalized Intersection Capacity Analysis
1: IH610 NBFR & Fournace

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	181	0	0	279	57	278	706	43	0	0	0
Future Volume (vph)	228	181	0	0	279	57	278	706	43	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0			4.5				
Lane Util. Factor	0.95	0.95			0.95			0.91				
Frt	1.00	1.00			0.97			0.99				
Flt Protected	0.95	0.99			1.00			0.99				
Satd. Flow (prot)	1681	1753			3449			4986				
Flt Permitted	0.14	0.54			1.00			0.99				
Satd. Flow (perm)	251	955			3449			4986				
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	251	199	0	0	307	63	305	776	47	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	4	0	0	0	0
Lane Group Flow (vph)	203	247	0	0	354	0	0	1124	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	15	15 5 6			6			8 7				
Permitted Phases	15 5 6						8 7					
Actuated Green, G (s)	58.5	58.5			19.3			27.5				
Effective Green, g (s)	58.5	58.5			19.3			27.5				
Actuated g/C Ratio	0.56	0.56			0.18			0.26				
Clearance Time (s)	5.0				5.0							
Vehicle Extension (s)	3.0				3.0							
Lane Grp Cap (vph)	552	762			633			1305				
v/s Ratio Prot	c0.11	0.09			c0.10							
v/s Ratio Perm	c0.10	0.09						0.23				
v/c Ratio	0.37	0.32			0.56			0.86				
Uniform Delay, d1	26.2	12.6			39.0			36.9				
Progression Factor	0.70	0.77			1.00			1.00				
Incremental Delay, d2	0.4	0.2			1.1			6.0				
Delay (s)	18.8	9.9			40.1			43.0				
Level of Service	B	A			D			D				
Approach Delay (s)		13.9			40.1			43.0			0.0	
Approach LOS		B			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lanes, Volumes, Timings
2: Fournace & IH610 SBFR

2020 PM Peak Hour
Projected w/Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	455	123	435	0	0	0	0	117	1674	322
Future Volume (vph)	0	288	455	123	435	0	0	0	0	117	1674	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91
Frt			0.850								0.976	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1583	1770	1863	0	0	0	0	1770	4963	0
Flt Permitted				0.567						0.950		
Satd. Flow (perm)	0	3539	1583	1056	1863	0	0	0	0	1770	4963	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			335								44	
Link Speed (mph)		35			35			35			40	
Link Distance (ft)		593			287			471			347	
Travel Time (s)		11.6			5.6			9.2			5.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	303	479	129	458	0	0	0	0	123	1762	339
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	303	479	129	458	0	0	0	0	123	2101	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1	1	2					1	2	
Detector Template		Thru	Right	Left	Thru					Left	Thru	
Leading Detector (ft)		100	20	20	100					20	100	
Trailing Detector (ft)		0	0	0	0					0	0	
Detector 1 Position(ft)		0	0	0	0					0	0	
Detector 1 Size(ft)		6	20	20	6					20	6	
Detector 1 Type		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		

Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Lane Configurations								
Traffic Volume (vph)								
Future Volume (vph)								
Ideal Flow (vphpl)								
Storage Length (ft)								
Storage Lanes								
Taper Length (ft)								
Lane Util. Factor								
Frt								
Flt Protected								
Satd. Flow (prot)								
Flt Permitted								
Satd. Flow (perm)								
Right Turn on Red								
Satd. Flow (RTOR)								
Link Speed (mph)								
Link Distance (ft)								
Travel Time (s)								
Peak Hour Factor								
Adj. Flow (vph)								
Shared Lane Traffic (%)								
Lane Group Flow (vph)								
Enter Blocked Intersection								
Lane Alignment								
Median Width(ft)								
Link Offset(ft)								
Crosswalk Width(ft)								
Two way Left Turn Lane								
Headway Factor								
Turning Speed (mph)								
Number of Detectors								
Detector Template								
Leading Detector (ft)								
Trailing Detector (ft)								
Detector 1 Position(ft)								
Detector 1 Size(ft)								
Detector 1 Type								
Detector 1 Channel								
Detector 1 Extend (s)								
Detector 1 Queue (s)								
Detector 1 Delay (s)								
Detector 2 Position(ft)								
Detector 2 Size(ft)								
Detector 2 Type								
Detector 2 Channel								
Detector 2 Extend (s)								
Turn Type								
Protected Phases	3	4	5	6	7	8	11	15
Permitted Phases								

Lanes, Volumes, Timings
2: Fournace & IH610 SBFR

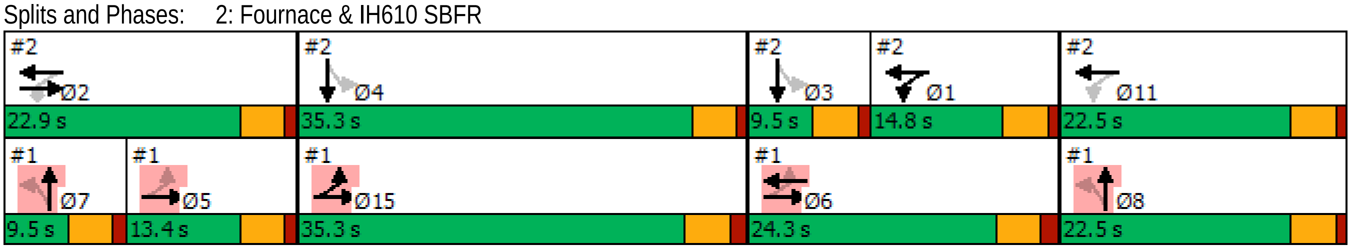
2020 PM Peak Hour
Projected w/Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		2	2	1	1 11 2					4 3	4 3	
Switch Phase												
Minimum Initial (s)		10.0	10.0	10.0								
Minimum Split (s)		22.5	22.5	14.5								
Total Split (s)		22.9	22.9	14.8								
Total Split (%)		21.8%	21.8%	14.1%								
Maximum Green (s)		18.4	18.4	10.3								
Yellow Time (s)		3.5	3.5	3.5								
All-Red Time (s)		1.0	1.0	1.0								
Lost Time Adjust (s)		0.0	0.0	0.0								
Total Lost Time (s)		4.5	4.5	4.5								
Lead/Lag				Lag								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)		3.0	3.0	3.0								
Recall Mode		None	None	None								
Walk Time (s)		7.0	7.0									
Flash Dont Walk (s)		11.0	11.0									
Pedestrian Calls (#/hr)		0	0									
Act Effct Green (s)		18.4	18.4	51.2	55.7					40.3	40.3	
Actuated g/C Ratio		0.18	0.18	0.49	0.53					0.38	0.38	
v/c Ratio		0.49	0.87	0.22	0.46					0.18	1.09	
Control Delay		42.1	30.2	1.5	3.7					22.4	80.2	
Queue Delay		0.0	0.0	0.0	4.0					0.0	0.0	
Total Delay		42.1	30.2	1.5	7.7					22.4	80.2	
LOS		D	C	A	A					C	F	
Approach Delay		34.8			6.3						77.0	
Approach LOS		C			A						E	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 105
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 56.3 Intersection LOS: E
Intersection Capacity Utilization 103.6% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 2: Fournace & IH610 SBFR



Lane Group	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø11	Ø15
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	9.5	23.0	9.5	22.5	9.5	10.0
Total Split (s)	9.5	35.3	13.4	24.3	9.5	22.5	22.5	35.3
Total Split (%)	9%	34%	13%	23%	9%	21%	21%	34%
Maximum Green (s)	5.0	30.8	8.9	19.3	5.0	18.0	18.0	30.3
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.5	1.0	1.0	1.0	1.5
Lost Time Adjust (s)								
Total Lost Time (s)								
Lead/Lag	Lead		Lag		Lead			
Lead-Lag Optimize?	Yes		Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None
Walk Time (s)		7.0		7.0		7.0		
Flash Dont Walk (s)		11.0		11.0		11.0		
Pedestrian Calls (#/hr)		0		0		0		
Act Effct Green (s)								
Actuated g/C Ratio								
v/c Ratio								
Control Delay								
Queue Delay								
Total Delay								
LOS								
Approach Delay								
Approach LOS								

Intersection Summary

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
Protected Phases	2		1	1 11 2		4 3	3	4	5	6	7	8
Permitted Phases		2	1 11 2		4 3							
Minimum Initial (s)	10.0	10.0	10.0				5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	14.5				9.5	22.5	9.5	23.0	9.5	22.5
Total Split (s)	22.9	22.9	14.8				9.5	35.3	13.4	24.3	9.5	22.5
Total Split (%)	21.8%	21.8%	14.1%				9%	34%	13%	23%	9%	21%
Maximum Green (s)	18.4	18.4	10.3				5.0	30.8	8.9	19.3	5.0	18.0
Yellow Time (s)	3.5	3.5	3.5				3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0				1.0	1.0	1.0	1.5	1.0	1.0
Lead/Lag			Lag				Lead		Lag		Lead	
Lead-Lag Optimize?			Yes				Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0				3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None				None	None	None	None	None	None
Walk Time (s)	7.0	7.0						7.0		7.0		7.0
Flash Dont Walk (s)	11.0	11.0						11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0						0		0		0
90th %ile Green (s)	18.4	18.4	10.3				5.0	30.8	8.9	19.3	5.0	18.0
90th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
70th %ile Green (s)	18.4	18.4	10.3				5.0	30.8	8.9	19.3	5.0	18.0
70th %ile Term Code	Max	Max	Max				Max	Max	Max	Max	Max	Max
50th %ile Green (s)	18.4	18.4	10.3				5.0	30.8	8.9	19.3	5.0	18.0
50th %ile Term Code	Max	Max	Max				Max	Max	Max	Hold	Max	Max
30th %ile Green (s)	18.4	18.4	10.3				5.0	30.8	8.9	19.3	5.0	18.0
30th %ile Term Code	Hold	Hold	Max				Max	Max	Max	Hold	Max	Max
10th %ile Green (s)	18.4	18.4	10.3				5.0	30.8	8.9	19.3	5.0	18.0
10th %ile Term Code	Hold	Hold	Max				Max	Max	Max	Hold	Max	Max

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 105
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 105
70th %ile Actuated Cycle: 105
50th %ile Actuated Cycle: 105
30th %ile Actuated Cycle: 105
10th %ile Actuated Cycle: 105

Lane Group	Ø11	Ø15
Protected Phases	11	15
Permitted Phases		
Minimum Initial (s)	5.0	5.0
Minimum Split (s)	9.5	10.0
Total Split (s)	22.5	35.3
Total Split (%)	21%	34%
Maximum Green (s)	18.0	30.3
Yellow Time (s)	3.5	3.5
All-Red Time (s)	1.0	1.5
Lead/Lag		
Lead-Lag Optimize?		
Vehicle Extension (s)	3.0	3.0
Minimum Gap (s)	3.0	3.0
Time Before Reduce (s)	0.0	0.0
Time To Reduce (s)	0.0	0.0
Recall Mode	None	None
Walk Time (s)		
Flash Dont Walk (s)		
Pedestrian Calls (#/hr)		
90th %ile Green (s)	18.0	30.3
90th %ile Term Code	Max	Hold
70th %ile Green (s)	18.0	30.3
70th %ile Term Code	Hold	Hold
50th %ile Green (s)	18.0	30.3
50th %ile Term Code	Hold	Hold
30th %ile Green (s)	18.0	30.3
30th %ile Term Code	Hold	Hold
10th %ile Green (s)	18.0	30.3
10th %ile Term Code	Hold	Hold

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Fournace & IH610 SBFR

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	288	455	123	435	0	0	0	0	117	1674	322
Future Volume (vph)	0	288	455	123	435	0	0	0	0	117	1674	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5	4.5	4.5					4.5	4.5	
Lane Util. Factor		0.95	1.00	1.00	1.00					1.00	0.91	
Frt		1.00	0.85	1.00	1.00					1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	1863					1770	4962	
Flt Permitted		1.00	1.00	0.57	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1056	1863					1770	4962	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	303	479	129	458	0	0	0	0	123	1762	339
RTOR Reduction (vph)	0	0	276	0	0	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	303	203	129	458	0	0	0	0	123	2074	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		2		1	1 11 2						4 3	
Permitted Phases			2	1 11 2						4 3		
Actuated Green, G (s)		18.4	18.4	51.2	55.7					40.3	40.3	
Effective Green, g (s)		18.4	18.4	51.2	55.7					40.3	40.3	
Actuated g/C Ratio		0.18	0.18	0.49	0.53					0.38	0.38	
Clearance Time (s)		4.5	4.5	4.5								
Vehicle Extension (s)		3.0	3.0	3.0								
Lane Grp Cap (vph)		620	277	584	988					679	1904	
v/s Ratio Prot		0.09		0.02	c0.25						c0.42	
v/s Ratio Perm			c0.13	0.09						0.07		
v/c Ratio		0.49	0.73	0.22	0.46					0.18	1.09	
Uniform Delay, d1		39.1	41.0	14.9	15.3					21.4	32.4	
Progression Factor		1.00	1.00	0.07	0.17					1.00	1.00	
Incremental Delay, d2		0.6	9.6	0.1	0.2					0.1	49.5	
Delay (s)		39.7	50.5	1.2	2.8					21.6	81.9	
Level of Service		D	D	A	A					C	F	
Approach Delay (s)		46.3			2.4			0.0			78.5	
Approach LOS		D			A			A			E	

Intersection Summary			
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	27.5
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 methodology does not support clustered intersections.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	668	732	25	75	51
Future Volume (vph)	8	668	732	25	75	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.995		0.946	
Flt Protected		0.999			0.971	
Satd. Flow (prot)	0	3536	3522	0	1711	0
Flt Permitted		0.999			0.971	
Satd. Flow (perm)	0	3536	3522	0	1711	0
Link Speed (mph)		35	35		30	
Link Distance (ft)		440	593		378	
Travel Time (s)		8.6	11.6		8.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	726	796	27	82	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	735	823	0	137	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.0% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
3: Fournace & Access Southeast

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	668	732	25	75	51
Future Volume (Veh/h)	8	668	732	25	75	51
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)	9	726	796	27	82	55
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			593			
pX, platoon unblocked						
vC, conflicting volume	823				1190	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	823				1190	412
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				54	91
cM capacity (veh/h)	803				178	589

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	251	484	531	292	137
Volume Left	9	0	0	0	82
Volume Right	0	0	0	27	55
cSH	803	1700	1700	1700	248
Volume to Capacity	0.01	0.28	0.31	0.17	0.55
Queue Length 95th (ft)	1	0	0	0	76
Control Delay (s)	0.5	0.0	0.0	0.0	36.2
Lane LOS	A				E
Approach Delay (s)	0.2		0.0		36.2
Approach LOS					E

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	668	732	25	75	51
Future Vol, veh/h	8	668	732	25	75	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	726	796	27	82	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	823	0	-	0	1191	412
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	803	-	-	-	180	589
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	803	-	-	-	177	589
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	36.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	803	-	-	-	247
HCM Lane V/C Ratio	0.011	-	-	-	0.554
HCM Control Delay (s)	9.5	0.1	-	-	36.3
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	3.1

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	668	732	25	75	51
Future Vol, veh/h	8	668	732	25	75	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	726	796	27	82	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	823	0	-	0	1191	412
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	803	-	-	-	180	589
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	803	-	-	-	177	589
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	36.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	803	-	-	-	247
HCM Lane V/C Ratio	0.011	-	-	-	0.554
HCM Control Delay (s)	9.5	0.1	-	-	36.3
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0	-	-	-	3.1

Lanes, Volumes, Timings
4: Anderson & Fournace

2020 PM Peak Hour
Projected w/Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	666	19	10	772	8	10
Future Volume (vph)	666	19	10	772	8	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.996				0.926	
Flt Protected				0.999	0.978	
Satd. Flow (prot)	3525	0	0	3536	1687	0
Flt Permitted				0.999	0.978	
Satd. Flow (perm)	3525	0	0	3536	1687	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	250			440	473	
Travel Time (s)	4.9			8.6	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	709	20	11	821	9	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	729	0	0	832	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 38.4% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
4: Anderson & Fournace

2020 PM Peak Hour
Projected w/Development

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	666	19	10	772	8	10
Future Volume (Veh/h)	666	19	10	772	8	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	709	20	11	821	9	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	1311			1033		
pX, platoon unblocked						
vC, conflicting volume			729		1152	364
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			729		1152	364
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	98
cM capacity (veh/h)			871		189	632

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	473	256	285	547	20
Volume Left	0	0	11	0	9
Volume Right	0	20	0	0	11
cSH	1700	1700	871	1700	307
Volume to Capacity	0.28	0.15	0.01	0.32	0.07
Queue Length 95th (ft)	0	0	1	0	5
Control Delay (s)	0.0	0.0	0.5	0.0	17.5
Lane LOS			A		C
Approach Delay (s)	0.0		0.2		17.5
Approach LOS					C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	666	19	10	772	8	10
Future Vol, veh/h	666	19	10	772	8	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	709	20	11	821	9	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	729	0	1152	365
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	871	-	191	632
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	871	-	187	632
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	307	-	-	871	-
HCM Lane V/C Ratio	0.062	-	-	0.012	-
HCM Control Delay (s)	17.5	-	-	9.2	0.1
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.3					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	666	19	10	772	8	10
Future Vol, veh/h	666	19	10	772	8	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	709	20	11	821	9	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	729	0	1152	365
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	871	-	191	632
Stage 1	-	-	-	-	444	-
Stage 2	-	-	-	-	621	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	871	-	187	632
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	307	-	-	871	-
HCM Lane V/C Ratio	0.062	-	-	0.012	-
HCM Control Delay (s)	17.5	-	-	9.2	0.1
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	16	570	769	11	115	72
Future Volume (vph)	16	570	769	11	115	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt			0.998		0.948	
Flt Protected		0.999			0.970	
Satd. Flow (prot)	0	3536	3532	0	1713	0
Flt Permitted		0.999			0.970	
Satd. Flow (perm)	0	3536	3532	0	1713	0
Link Speed (mph)		35	35		30	
Link Distance (ft)		440	250		402	
Travel Time (s)		8.6	4.9		9.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	620	836	12	125	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	637	848	0	203	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 44.7% ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
5: Fournace & Access Southwest

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	16	570	769	11	115	72
Future Volume (Veh/h)	16	570	769	11	115	72
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)	17	620	836	12	125	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		1061	1283			
pX, platoon unblocked						
vC, conflicting volume	848				1186	424
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	848				1186	424
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				30	87
cM capacity (veh/h)	785				178	579

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	224	413	557	291	203
Volume Left	17	0	0	0	125
Volume Right	0	0	0	12	78
cSH	785	1700	1700	1700	242
Volume to Capacity	0.02	0.24	0.33	0.17	0.84
Queue Length 95th (ft)	2	0	0	0	166
Control Delay (s)	1.0	0.0	0.0	0.0	66.9
Lane LOS	A				F
Approach Delay (s)	0.3		0.0		66.9
Approach LOS					F

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection						
Int Delay, s/veh	8.6					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	570	769	11	115	72
Future Vol, veh/h	16	570	769	11	115	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	620	836	12	125	78

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	848	0	-	0	1186	424
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	344	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	785	-	-	-	181	579
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	785	-	-	-	175	579
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	689	-

Approach	EB		WB		SB	
HCM Control Delay, s	0.5		0		69.5	
HCM LOS					F	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	785	-	-	-	239
HCM Lane V/C Ratio	0.022	-	-	-	0.85
HCM Control Delay (s)	9.7	0.2	-	-	69.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	6.8

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	570	769	11	115	72
Future Vol, veh/h	16	570	769	11	115	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	620	836	12	125	78

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	848	0	-	0	1186	424
Stage 1	-	-	-	-	842	-
Stage 2	-	-	-	-	344	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	785	-	-	-	181	579
Stage 1	-	-	-	-	383	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	785	-	-	-	175	579
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	689	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	69.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	785	-	-	-	239
HCM Lane V/C Ratio	0.022	-	-	-	0.85
HCM Control Delay (s)	9.7	0.2	-	-	69.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	6.8

Lanes, Volumes, Timings
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/Development

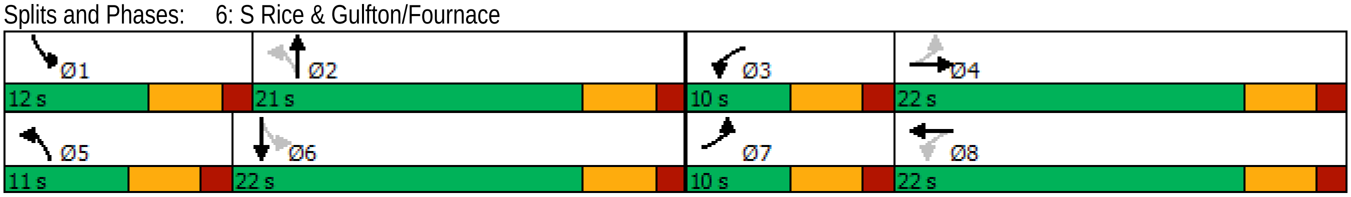
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	322	48	116	489	223	87	505	42	203	518	77
Future Volume (vph)	81	322	48	116	489	223	87	505	42	203	518	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		150	110		150	80		150	60		150
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.980			0.953			0.989			0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3373	0	1770	3500	0	1770	3472	0
Flt Permitted	0.258			0.488			0.357			0.269		
Satd. Flow (perm)	481	3468	0	909	3373	0	665	3500	0	501	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			110			12			24	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		795			621			1051			547	
Travel Time (s)		15.5			12.1			20.5			10.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	339	51	122	515	235	92	532	44	214	545	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	390	0	122	750	0	92	576	0	214	626	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	4.0		5.0	4.0		5.0	4.0	
Minimum Split (s)	10.0	21.0		10.0	21.0		10.0	21.0		10.0	21.0	
Total Split (s)	10.0	22.0		10.0	22.0		11.0	21.0		12.0	22.0	
Total Split (%)	15.4%	33.8%		15.4%	33.8%		16.9%	32.3%		18.5%	33.8%	
Maximum Green (s)	5.0	17.0		5.0	17.0		6.0	16.0		7.0	17.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Min		None	Min		None	None		None	None	
Walk Time (s)		5.0			5.0			5.0			5.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	19.2	15.5		19.2	15.5		20.2	14.2		23.5	18.3	
Actuated g/C Ratio	0.32	0.26		0.32	0.26		0.34	0.24		0.39	0.31	
v/c Ratio	0.32	0.43		0.33	0.79		0.27	0.68		0.61	0.58	
Control Delay	15.3	19.7		15.0	25.3		13.7	25.8		22.1	21.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.3	19.7		15.0	25.3		13.7	25.8		22.1	21.9	
LOS	B	B		B	C		B	C		C	C	
Approach Delay		18.9			23.9			24.2			22.0	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 59.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 68.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: S Rice & Gulfton/Fournace



Phasings
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/Development

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Minimum Initial (s)	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	22.0	10.0	22.0	11.0	21.0	12.0	22.0
Total Split (%)	15.4%	33.8%	15.4%	33.8%	16.9%	32.3%	18.5%	33.8%
Maximum Green (s)	5.0	17.0	5.0	17.0	6.0	16.0	7.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None	None	None
Walk Time (s)		5.0		5.0		5.0		5.0
Flash Dont Walk (s)		11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)		0		0		0		0
90th %ile Green (s)	5.0	17.0	5.0	17.0	6.0	16.0	7.0	17.0
90th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	5.0	17.0	5.0	17.0	6.0	16.0	7.0	17.0
70th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
50th %ile Green (s)	5.0	17.0	5.0	17.0	6.0	16.0	7.0	17.0
50th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max
30th %ile Green (s)	5.0	16.2	5.0	16.2	6.0	14.0	7.0	15.0
30th %ile Term Code	Max	Hold	Max	Gap	Max	Hold	Max	Gap
10th %ile Green (s)	0.0	10.4	0.0	10.4	0.0	9.4	6.7	21.1
10th %ile Term Code	Skip	Hold	Skip	Gap	Skip	Gap	Gap	Hold

Intersection Summary
Cycle Length: 65
Actuated Cycle Length: 59.7
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 65
50th %ile Actuated Cycle: 65
30th %ile Actuated Cycle: 62.2
10th %ile Actuated Cycle: 41.5

HCM Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	81	322	48	116	489	223	87	505	42	203	518	77
Future Volume (vph)	81	322	48	116	489	223	87	505	42	203	518	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.95		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3470		1770	3373		1770	3499		1770	3471	
Flt Permitted	0.26	1.00		0.49	1.00		0.36	1.00		0.27	1.00	
Satd. Flow (perm)	481	3470		910	3373		664	3499		502	3471	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	339	51	122	515	235	92	532	44	214	545	81
RTOR Reduction (vph)	0	19	0	0	83	0	0	9	0	0	17	0
Lane Group Flow (vph)	85	371	0	122	668	0	92	567	0	214	609	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.2	15.5		19.2	15.5		20.2	15.7		25.4	18.3	
Effective Green, g (s)	19.2	15.5		19.2	15.5		20.2	15.7		25.4	18.3	
Actuated g/C Ratio	0.31	0.25		0.31	0.25		0.33	0.25		0.41	0.30	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	225	867		333	843		296	886		350	1024	
v/s Ratio Prot	c0.02	0.11		0.02	c0.20		0.02	0.16		c0.07	0.18	
v/s Ratio Perm	0.09			0.09			0.08			c0.18		
v/c Ratio	0.38	0.43		0.37	0.79		0.31	0.64		0.61	0.59	
Uniform Delay, d1	16.1	19.5		15.9	21.7		14.9	20.6		12.8	18.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.3		0.7	5.1		0.6	1.5		3.1	0.9	
Delay (s)	17.2	19.9		16.6	26.9		15.5	22.2		16.0	19.6	
Level of Service	B	B		B	C		B	C		B	B	
Approach Delay (s)		19.4			25.4			21.2			18.7	
Approach LOS		B			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	322	48	116	489	223	87	505	42	203	518	77
Future Volume (veh/h)	81	322	48	116	489	223	87	505	42	203	518	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	85	339	51	122	515	235	92	532	44	214	545	81
Adj No. of Lanes	1	2	0	1	2	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	277	782	117	412	622	283	326	701	58	386	820	121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.25	0.25	0.07	0.26	0.26	0.07	0.21	0.21	0.12	0.27	0.27
Ln Grp Delay, s/veh	16.2	19.0	19.0	14.9	30.2	31.2	16.9	26.7	26.7	17.4	22.0	22.1
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	C	C
Approach Vol, veh/h		475			872			668			840	
Approach Delay, s/veh		18.5			28.5			25.3			20.9	
Approach LOS		B			C			C			C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	12.0	17.4	9.3	19.8	8.9	20.5	8.7	20.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	6.0	17.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+l1), s	7.3	10.9	4.9	7.4	4.3	11.2	4.0	14.1
Green Ext Time (g_e), s	0.0	1.5	0.0	1.5	0.0	1.8	0.0	1.3
Prob of Phs Call (p_c)	0.97	1.00	0.86	1.00	0.78	1.00	0.75	1.00
Prob of Max Out (p_x)	1.00	1.00	1.00	0.24	1.00	0.88	1.00	1.00
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1774		1774		1774		1774	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3311		3090		3093		2367
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		273		461		458		1076
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	(Pr/Pm)		(Pr/Pm)		(Pr/Pm)		(Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	214	0	122	0	92	0	85	0
Grp Sat Flow (s), veh/h/ln	1774	0	1774	0	1774	0	1774	0
Q Serve Time (g_s), s	5.3	0.0	2.9	0.0	2.3	0.0	2.0	0.0
Cycle Q Clear Time (g_c), s	5.3	0.0	2.9	0.0	2.3	0.0	2.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	834	0	990	0	796	0	709	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	12.5	0.0	14.8	0.0	12.4	0.0	14.8	0.0
Perm LT Serve Time (g_u), s	3.5	0.0	9.4	0.0	6.3	0.0	3.3	0.0
Perm LT Q Serve Time (g_ps), s	3.1	0.0	0.8	0.0	0.8	0.0	1.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	386	0	412	0	326	0	277	0
V/C Ratio (X)	0.55	0.00	0.30	0.00	0.28	0.00	0.31	0.00
Avail Cap (c_a), veh/h	386	0	433	0	390	0	315	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.7	0.0	14.5	0.0	16.4	0.0	15.6	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.4	0.0	0.5	0.0	0.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	17.4	0.0	14.9	0.0	16.9	0.0	16.2	0.0
1st-Term Q (Q1), veh/ln	2.6	0.0	1.4	0.0	1.1	0.0	1.0	0.0
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.7	0.0	1.5	0.0	1.1	0.0	1.0	0.0
%ile Storage Ratio (RQ%)	1.16	0.00	0.34	0.00	0.36	0.00	0.23	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	284	0	193	0	311	0	385
Grp Sat Flow (s), veh/h/ln	0	1770	0	1770	0	1770	0	1770
Q Serve Time (g_s), s	0.0	8.8	0.0	5.3	0.0	9.2	0.0	12.0
Cycle Q Clear Time (g_c), s	0.0	8.8	0.0	5.3	0.0	9.2	0.0	12.0
Lane Grp Cap (c), veh/h	0	375	0	448	0	469	0	465
V/C Ratio (X)	0.00	0.76	0.00	0.43	0.00	0.66	0.00	0.83
Avail Cap (c_a), veh/h	0	484	0	514	0	514	0	514
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	21.6	0.0	18.3	0.0	19.2	0.0	20.3
Incr Delay (d2), s/veh	0.0	5.0	0.0	0.7	0.0	2.8	0.0	9.9
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.7	0.0	19.0	0.0	22.0	0.0	30.2
1st-Term Q (Q1), veh/ln	0.0	4.3	0.0	2.6	0.0	4.4	0.0	5.8

2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.1	0.0	0.4	0.0	1.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.8	0.0	2.7	0.0	4.8	0.0	7.1
%ile Storage Ratio (RQ%)	0.00	0.12	0.00	0.09	0.00	0.26	0.00	0.33
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	292	0	197	0	315	0	365
Grp Sat Flow (s), veh/h/ln	0	1815	0	1781	0	1782	0	1673
Q Serve Time (g_s), s	0.0	8.9	0.0	5.4	0.0	9.2	0.0	12.1
Cycle Q Clear Time (g_c), s	0.0	8.9	0.0	5.4	0.0	9.2	0.0	12.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.15	0.00	0.26	0.00	0.26	0.00	0.64
Lane Grp Cap (c), veh/h	0	384	0	451	0	472	0	439
V/C Ratio (X)	0.00	0.76	0.00	0.44	0.00	0.67	0.00	0.83
Avail Cap (c_a), veh/h	0	496	0	518	0	518	0	486
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	21.7	0.0	18.4	0.0	19.2	0.0	20.3
Incr Delay (d2), s/veh	0.0	5.1	0.0	0.7	0.0	2.9	0.0	10.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.7	0.0	19.0	0.0	22.1	0.0	31.2
1st-Term Q (Q1), veh/ln	0.0	4.4	0.0	2.7	0.0	4.5	0.0	5.5
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.1	0.0	0.4	0.0	1.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.9	0.0	2.8	0.0	4.9	0.0	6.8
%ile Storage Ratio (RQ%)	0.00	0.12	0.00	0.09	0.00	0.26	0.00	0.32
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Intersection Summary								
HCM 2010 Ctrl Delay		23.8						
HCM 2010 LOS		C						

HCM 6th Signalized Intersection Capacity Analysis
6: S Rice & Gulfton/Fournace

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	322	48	116	489	223	87	505	42	203	518	77
Future Volume (veh/h)	81	322	48	116	489	223	87	505	42	203	518	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	85	339	51	122	515	235	92	532	44	214	545	81
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	278	784	117	414	623	283	328	703	58	387	822	122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.25	0.25	0.07	0.26	0.26	0.07	0.21	0.21	0.12	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	16.2	18.9	19.0	14.9	30.0	30.9	16.9	26.5	26.6	17.4	21.9	22.0
Ln Grp LOS	B	B	B	B	C	C	B	C	C	B	C	C
Approach Vol, veh/h		475			872			668			840	
Approach Delay, s/veh		18.5			28.3			25.2			20.8	
Approach LOS		B			C			C			C	

Timer:	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Case No	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phs Duration (G+Y+Rc), s	12.0	17.3	9.3	19.8	8.9	20.5	8.7	20.3
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green (Gmax), s	7.0	16.0	5.0	17.0	6.0	17.0	5.0	17.0
Max Allow Headway (MAH), s	3.8	5.1	3.8	5.2	3.8	5.2	3.8	5.2
Max Q Clear (g_c+I1), s	7.3	10.8	4.9	7.4	4.3	11.2	4.0	14.0
Green Ext Time (g_e), s	0.0	1.5	0.0	1.5	0.0	1.9	0.0	1.3
Prob of Phs Call (p_c)	0.97	1.00	0.86	1.00	0.78	1.00	0.75	1.00
Prob of Max Out (p_x)	1.00	0.99	1.00	0.23	1.00	0.87	1.00	1.00
Left-Turn Movement Data								
Assigned Mvmt	1		3		5		7	
Mvmt Sat Flow, veh/h	1781		1781		1781		1781	
Through Movement Data								
Assigned Mvmt		2		4		6		8
Mvmt Sat Flow, veh/h		3324		3102		3105		2374
Right-Turn Movement Data								
Assigned Mvmt		12		14		16		18
Mvmt Sat Flow, veh/h		274		462		460		1079
Left Lane Group Data								
Assigned Mvmt	1	0	3	0	5	0	7	0
Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	

Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	214	0	122	0	92	0	85	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	5.3	0.0	2.9	0.0	2.3	0.0	2.0	0.0
Cycle Q Clear Time (g_c), s	5.3	0.0	2.9	0.0	2.3	0.0	2.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	837	0	994	0	799	0	712	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	12.5	0.0	14.8	0.0	12.3	0.0	14.8	0.0
Perm LT Serve Time (g_u), s	3.5	0.0	9.4	0.0	6.3	0.0	3.3	0.0
Perm LT Q Serve Time (g_ps), s	3.1	0.0	0.8	0.0	0.8	0.0	1.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	387	0	414	0	328	0	278	0
V/C Ratio (X)	0.55	0.00	0.29	0.00	0.28	0.00	0.31	0.00
Avail Cap (c_a), veh/h	387	0	435	0	392	0	316	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	15.7	0.0	14.5	0.0	16.4	0.0	15.6	0.0
Incr Delay (d2), s/veh	1.7	0.0	0.4	0.0	0.5	0.0	0.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	17.4	0.0	14.9	0.0	16.9	0.0	16.2	0.0
1st-Term Q (Q1), veh/ln	1.9	0.0	1.0	0.0	0.8	0.0	0.7	0.0
2nd-Term Q (Q2), veh/ln	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.0	0.0	1.1	0.0	0.9	0.0	0.8	0.0
%ile Storage Ratio (RQ%)	0.87	0.00	0.25	0.00	0.28	0.00	0.17	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T		T		T		T
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	284	0	193	0	311	0	385
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	8.8	0.0	5.3	0.0	9.1	0.0	11.9
Cycle Q Clear Time (g_c), s	0.0	8.8	0.0	5.3	0.0	9.1	0.0	11.9
Lane Grp Cap (c), veh/h	0	376	0	449	0	471	0	466
V/C Ratio (X)	0.00	0.76	0.00	0.43	0.00	0.66	0.00	0.83
Avail Cap (c_a), veh/h	0	487	0	517	0	517	0	517
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	21.6	0.0	18.3	0.0	19.1	0.0	20.3
Incr Delay (d2), s/veh	0.0	4.9	0.0	0.7	0.0	2.8	0.0	9.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.5	0.0	18.9	0.0	21.9	0.0	30.0
1st-Term Q (Q1), veh/ln	0.0	3.3	0.0	2.0	0.0	3.3	0.0	4.4
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.1	0.0	0.4	0.0	1.3

3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.8	0.0	2.0	0.0	3.7	0.0	5.6
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.07	0.00	0.20	0.00	0.26
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data								
Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		T+R		T+R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	292	0	197	0	315	0	365
Grp Sat Flow (s), veh/h/ln	0	1821	0	1787	0	1788	0	1676
Q Serve Time (g_s), s	0.0	8.8	0.0	5.4	0.0	9.2	0.0	12.0
Cycle Q Clear Time (g_c), s	0.0	8.8	0.0	5.4	0.0	9.2	0.0	12.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.15	0.00	0.26	0.00	0.26	0.00	0.64
Lane Grp Cap (c), veh/h	0	385	0	452	0	473	0	440
V/C Ratio (X)	0.00	0.76	0.00	0.44	0.00	0.66	0.00	0.83
Avail Cap (c_a), veh/h	0	499	0	520	0	520	0	488
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	21.6	0.0	18.3	0.0	19.2	0.0	20.3
Incr Delay (d2), s/veh	0.0	4.9	0.0	0.7	0.0	2.8	0.0	10.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.6	0.0	19.0	0.0	22.0	0.0	30.9
1st-Term Q (Q1), veh/ln	0.0	3.4	0.0	2.0	0.0	3.4	0.0	4.1
2nd-Term Q (Q2), veh/ln	0.0	0.5	0.0	0.1	0.0	0.4	0.0	1.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.9	0.0	2.1	0.0	3.7	0.0	5.4
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	0.07	0.00	0.20	0.00	0.25
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		23.7
HCM 6th LOS		C

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	188	0	0	2340	35
Future Volume (vph)	0	188	0	0	2340	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	0.86	0.86
Frt		0.865			0.998	
Flt Protected						
Satd. Flow (prot)	0	1611	0	0	6395	0
Flt Permitted						
Satd. Flow (perm)	0	1611	0	0	6395	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	367			347	687	
Travel Time (s)	8.3			5.9	11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	204	0	0	2543	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	204	0	0	2581	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
10: IH610 SBFR/SB Frontage & East Access

2020 PM Peak Hour
Projected w/Development

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	188	0	0	2340	35
Future Volume (Veh/h)	0	188	0	0	2340	35
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	204	0	0	2543	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				347		
pX, platoon unblocked						
vC, conflicting volume	2562	655	2581			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2562	655	2581			
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	50	100			
cM capacity (veh/h)	21	409	167			

Direction, Lane #	EB 1	SB 1	SB 2	SB 3	SB 4
Volume Total	204	727	727	727	401
Volume Left	0	0	0	0	0
Volume Right	204	0	0	0	38
cSH	409	1700	1700	1700	1700
Volume to Capacity	0.50	0.43	0.43	0.43	0.24
Queue Length 95th (ft)	68	0	0	0	0
Control Delay (s)	22.3	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	22.3	0.0			
Approach LOS	C				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E – SITE, ROADWAY & INTERSECTION PHOTOGRAPHS

Photograph Date: 8/28/2018

Photograph 1. IH-610 Southbound Frontage Road, North of Fournace Place.
Existing site access driveway to right (closed as of this date).

Photograph Date: 8/28/2018

Photograph 2. Fournace Place, Looking West, East of IH-610.

Photograph Date: 8/28/2018

Photograph 3. Fournace Place, Looking West, East of "Southeast" Access Driveway

Photograph Date: 8/28/2018

Photograph 4. Fournace Place, Looking West, East of Anderson Street.

Photograph Date: 8/28/2018

Photograph 5. Anderson Street, Looking North, South of Fournace Place.

Photograph Date: 8/28/2018

Photograph 6. Fournace Place, Looking West, East of “Southwest” Access Driveway

Photograph Date: 8/28/2018

Photograph 7. Fournace Place, Looking West, East of South Rice Avenue.

Photograph Date: 8/28/2018

Photograph 8. Fournace Place, Looking East, West of “Southwest” Access Driveway.

Photograph Date: 8/28/2018

Photograph 9. Fournace Place, Looking East, West of Anderson Street.

Photograph Date: 8/28/2018

Photograph 10. Fournace Place, Looking East, West of “Southeast” Access Driveway (to left)

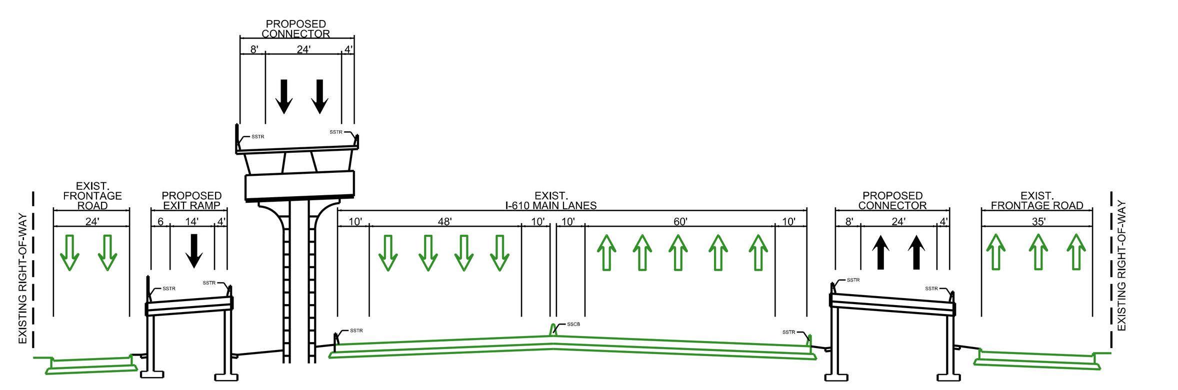
Photograph Date: 8/28/2018

Photograph 11. Fournace Place, Looking East, West of IH-610.

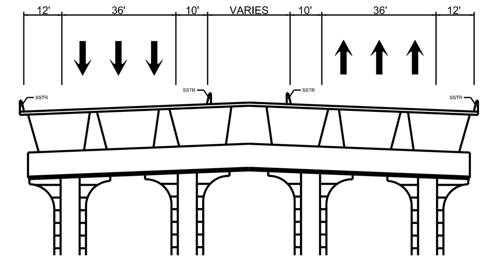
APPENDIX F – IH-610 FOURNACE ROAD EXIT CONFIGURATION

I-610/I-69 INTERCHANGE PLAN

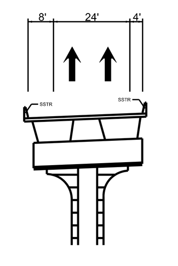
HOUSTON DISTRICT
PROJECT DEVELOPMENT



PROPOSED TYPICAL SECTION A - A
I-610 WITH PROPOSED CONNECTORS



PROPOSED TYPICAL SECTION B - B
I-610 MAIN LANE BRIDGE



PROPOSED TYPICAL SECTION C - C
PROPOSED DIRECT CONNECTORS

PRELIMINARY
SUBJECT TO CHANGE

SCHEMATIC LAYOUT

I-610/I-69 INTERCHANGE

COUNTY: HARRIS
LIMITS FROM: WEST LOOP
LIMITS TO: SOUTHWEST FRWY
CSJ: 0271-17-XXX
DATE: 03/03/2016
APPROVED: / /

NOT A BIDDING DOCUMENT

P.E.

TBPE NO.

LEGEND

DESCRIPTION	SYMBOLOGY	WEIGHT	COLOR CODE
PROPOSED MAIN LANES		2	BLACK -0
PROPOSED TOLL LANES		2	PURPLE -60
PROPOSED FRONTAGE ROADS		5	BLUE -1
PROPOSED RAMPS		2	BLUE -1
PROPOSED DIRECT CONNECTOR		2	ORANGE -6
PROPOSED EMBANKMENT		2	RED -3
PROPOSED RETAINING WALL		6	RED -3
PROPOSED BRIDGE BENTS		2	RED -3
PROPOSED NOISE WALL		5	MAGENTA -37
PROPOSED SIDEWALKS		2	MAGENTA -200
PROPOSED STRIPING		1	ORANGE -6
PROPOSED LANE INDICATOR		1	BLACK -0
PROPOSED RIGHT-OF-WAY		5	BLACK -0
CONTROL OF ACCESS		2	RED -3
PLANIMETRIC		1	GREEN -2
EXISTING RIGHT-OF-WAY		1	BLACK -0
EXISTING ROADWAY		2	GREEN -2
EXISTING ROADWAY TO BE REMOVED		1	BLACK -0
EXISTING LANE INDICATOR		1	BLACK -0
TRAFFIC VOLUMES (DHV) 2015/2035		1	BLACK -0

COLORFILL LEGEND

MAIN LANE WIDENING
MAIN LANE BRIDGE
FRONTAGE ROAD
DIRECT CONNECTOR
PROPOSED RAMP

SCALE

0 100 200 300 400

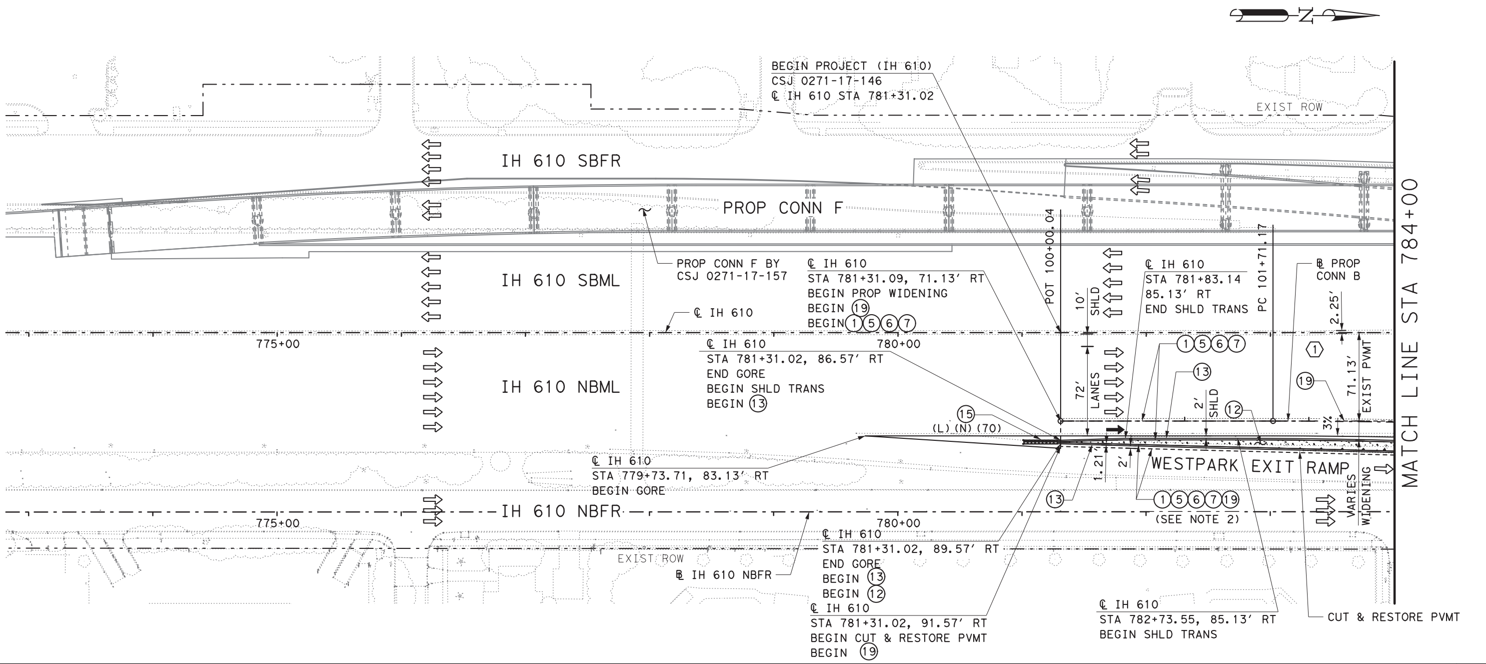
DESIGN CRITERIA

FUNCTIONAL CLASSIFICATION: URBAN FREEWAY
MAIN LANE DESIGN CRITERIA: FREEWAY
MAIN LANE DESIGN SPEED: 60 MPH
FRONTAGE ROAD DESIGN CRITERIA: COLLECTOR
FRONTAGE ROAD DESIGN SPEED: 45 MPH
CONNECTOR/RAMP DESIGN SPEED: 45 MPH

ROADWAY: I-610/I-69
COUNTY: HARRIS
LIMITS FROM: WEST LOOP
LIMITS TO: SOUTHWEST FRWY

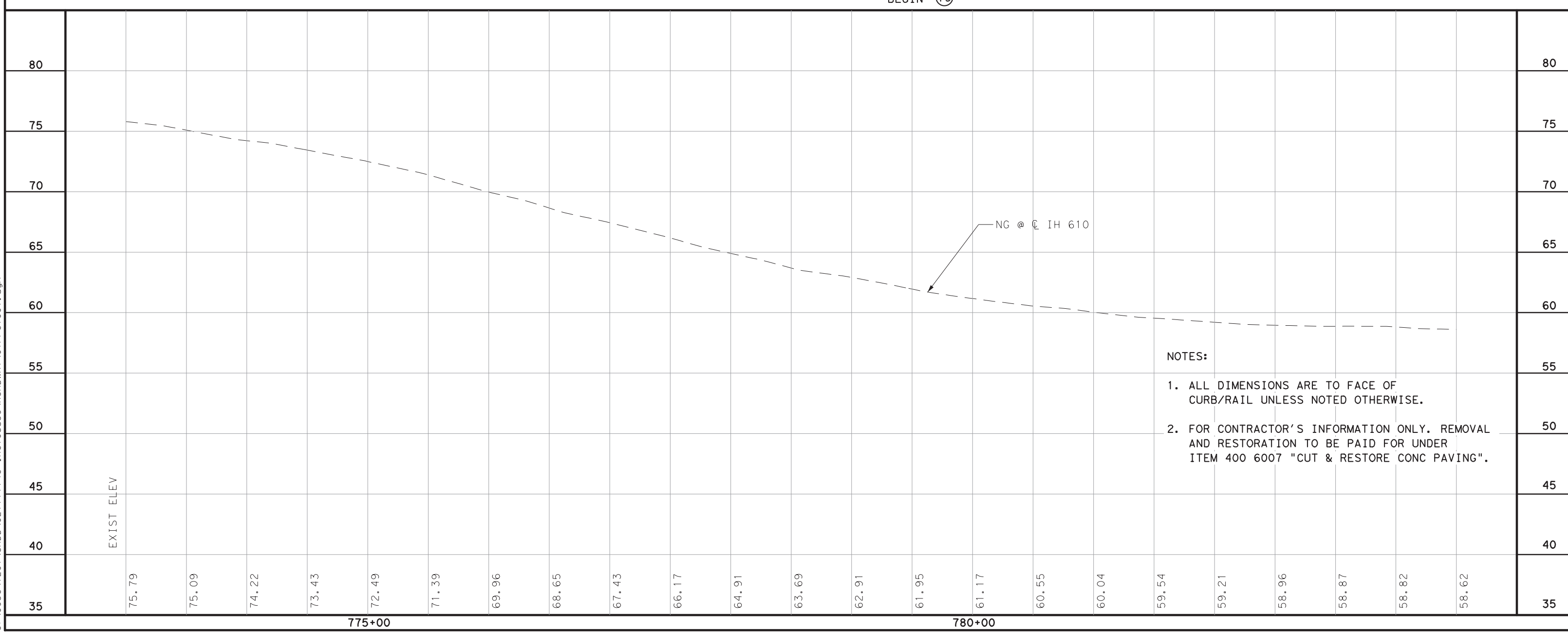
1 / 2

Attachment: 100118-4800 Fournace Office Traffic Analysis v1.1 (2708 : Consideration-4800 Fournace-Parking Garage)



LEGEND

1 15" CONC PVMT
2 11" CONC PVMT
3 1" THIN OVERLA… …URE-F (TOM-F)
4 13" CONC PVMT
5 1" ASPHALT STA… …) BASE
6 6" CEMENT TREA… …SE
7 6" LIME TREATE… …RADE
8 13" FAST TRACK… …PVMT
9 6" MONO CURB
10 4" CONC SIDEWA…
11 PEDESTRIAN RAM…
12 RIPRAP (4")
13 36" SSTR
14 PERM 42" SSCB
15 CRASH CUSHION… …ATOR
16 MSE RETAINING…
17 RIPRAP (MOWSTR…
18 SOUND WALL
19 SAWCUT
20 BLOCK SODDING
21 ONE COARSE SUR… …REATMENT (OCST)
22 WIDE FLANGE PA… …TERMINAL
23 10" CONC PVMT
24 PERM CONC TRAF… …RRIER (CTB)
25 1" THIN OVERLA… …URE-C (TOM-C)
26 6" CONC PVMT (…
27 6" COMPACTED S… …E
28 OVERHEAD GUIDE… …STRUCTURE
29 HIGH MAST LIGH…
X TYPICAL SECTIO… …ER
XXX HORIZONTAL CUR… …BER
PROP DIRECTION… …AFFIC
EXIST DIRECTIO… …RAFFIC



NOTES:

1. ALL DIMENSIONS ARE TO FACE OF CURB/RAIL UNLESS NOTED OTHERWISE.
2. FOR CONTRACTOR'S INFORMATION ONLY. REMOVAL AND RESTORATION TO BE PAID FOR UNDER ITEM 400 6007 "CUT & RESTORE CONC PAVING".

0' 25' 100'
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1… VERT

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LJA Enginee… Inc.
FRN-F-1386

Tex… …partment of T… …portation
© 2017

IH 61… …69
IH 610 N… LANES
PLAN &… …FILE
STA 773+00 … 784+00

CSJ 0271-17-146 SHEET 1 OF 3

FED. RD. DIV. NO.	STATE			HIGHWAY NO.
6	TEXAS			IH610
STATE DISTRICT	COUNTY	CONTROL NO.	JOB NO.	SHEET NO.
HOU	HARRIS	027…	161, ETC	3089

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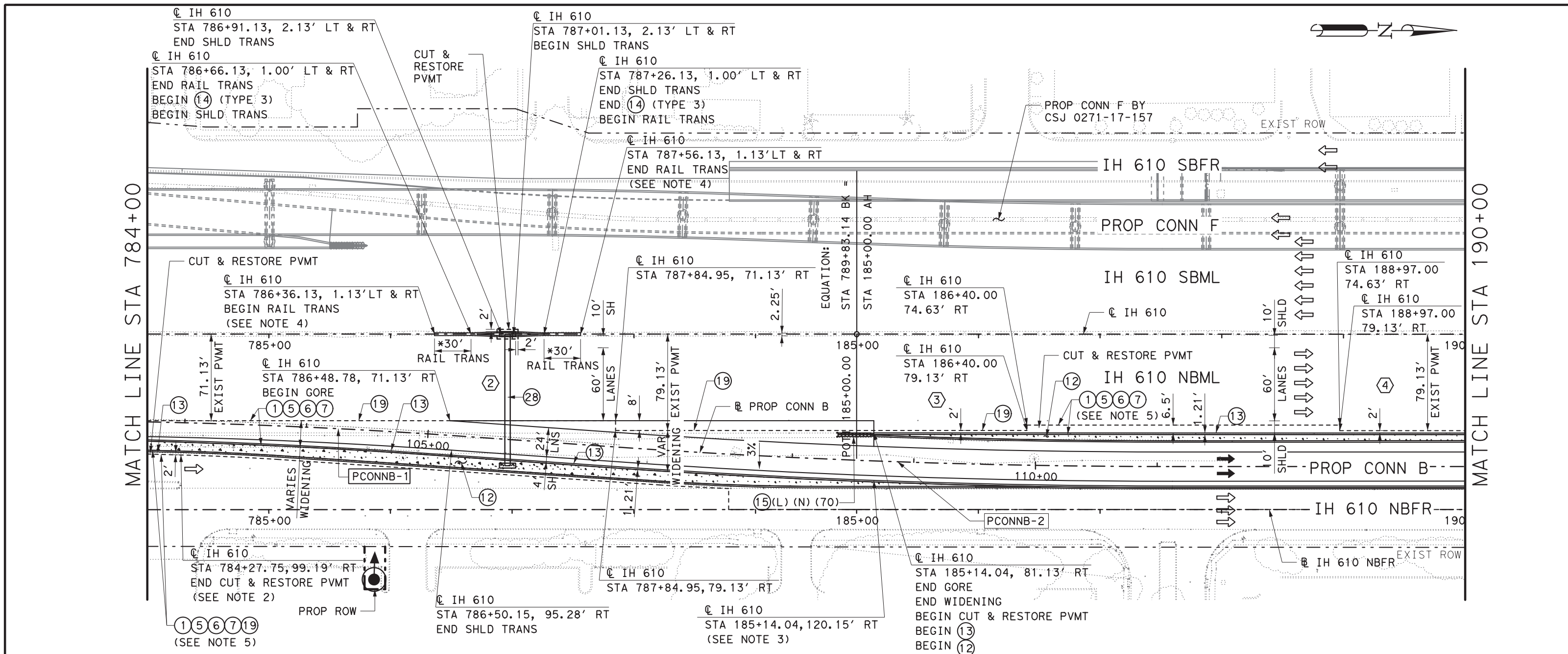

LEGEND

1	15" CONC PVMT
2	11" CONC PVMT
3	1" THIN OVERLA[...]URE-F (TOM-F)
4	13" CONC PVMT
5	1" ASPHALT STA[...] BASE
6	6" CEMENT TREA[...]SE
7	6" LIME TREATE[...]RADE
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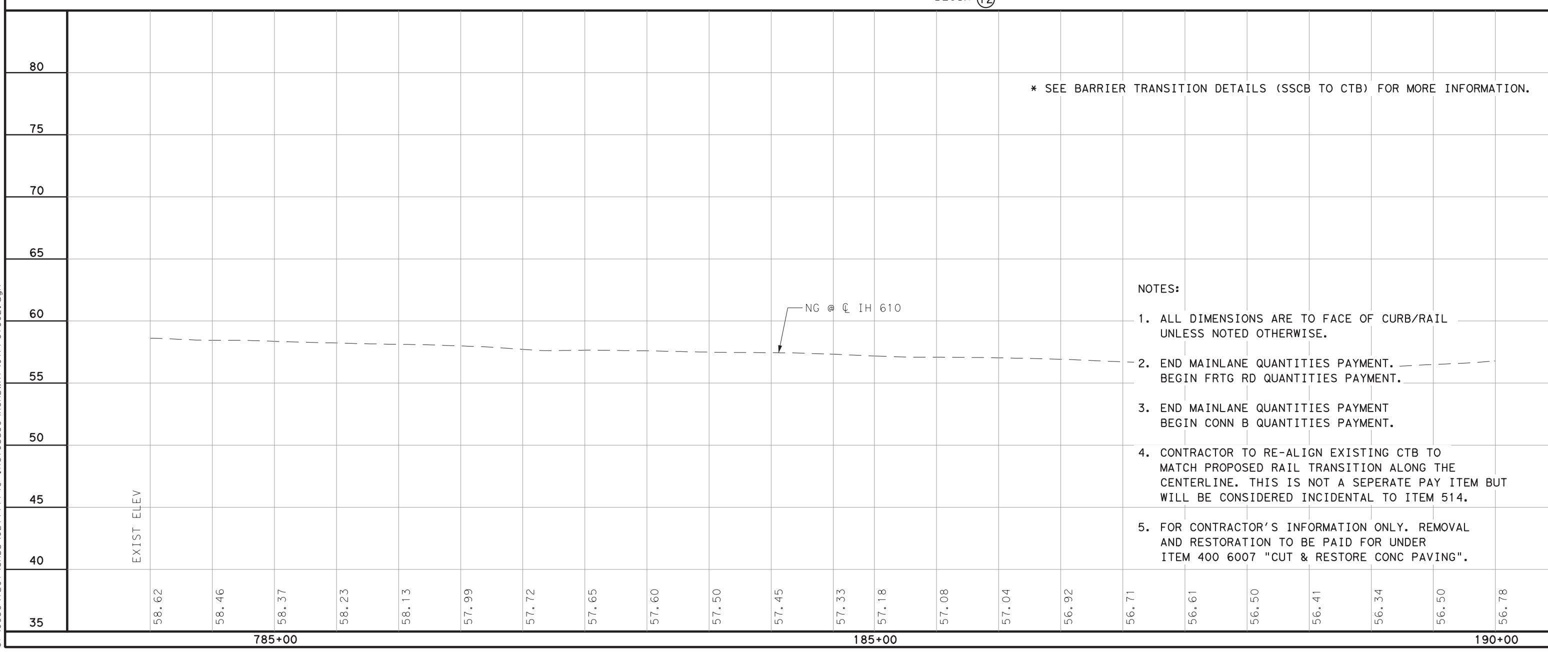
10	4" CONC SIDEWA[...]
11	PEDESTRIAN RAM[...]
12	RIPRAP (4")
13	36" SSTR
14	PERM 42" SSCB
15	CRASH CUSHION [...]ATOR
16	MSE RETAINING [...]
17	RIPRAP (MOWSTR[...]
18	SOUND WALL
19	SAWCUT
20	BLOCK SODDING
21	ONE COARSE SUR[...]REATMENT (OCST)
22	WIDE FLANGE PA[...] TERMINAL
23	10" CONC PVMT
24	PERM CONC TRAF[...]RRIER (CTB)
25	1" THIN OVERLA[...]URE-C (TOM-C)
26	6" CONC PVMT ([...]
27	6" COMPACTED S[...]E
28	OVERHEAD GUIDE[...]STRUCTURE
29	HIGH MAST LIGH[...]
X	TYPICAL SECTIO[...]ER
XXX	HORIZONTAL CUR[...]BER
←	PROP DIRECTION[...]RAFFIC
⇦	EXIST DIRECTIO[...]RAFFIC



NOTES:

1. ALL DIMENSIONS ARE TO FACE OF CURB/RAIL UNLESS NOTED OTHERWISE.
2. END MAINLANE QUANTITIES PAYMENT. BEGIN FRTG RD QUANTITIES PAYMENT.
3. END MAINLANE QUANTITIES PAYMENT BEGIN CONN B QUANTITIES PAYMENT.
4. CONTRACTOR TO RE-ALIGN EXISTING CTB TO MATCH PROPOSED RAIL TRANSITION ALONG THE CENTERLINE. THIS IS NOT A SEPERATE PAY ITEM BUT WILL BE CONSIDERED INCIDENTAL TO ITEM 514.
5. FOR CONTRACTOR'S INFORMATION ONLY. REMOVAL AND RESTORATION TO BE PAID FOR UNDER ITEM 400 6007 "CUT & RESTORE CONC PAVING".

STATE OF TEXAS
CHRIS[...]IE
10[...]
PROFESSIONAL ENGINEER
4/1[...]

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1[...] VERT

REV. NO.	DATE	[...]ION	BY

LJA Enginee[...] Inc.
FRN-F-1386

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IH 61[...]69
IH 610 N[...] LANES
PLAN & [...]FILE
STA 784+00 [...] 190+00

CSJ 0271-17-146 SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	[...]	[...] NO.	HIGHWAY NO.
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STATE DISTRICT	COUNTY	CONTROL NO.	JOB NO.	SHEET NO.
HOU	HARRIS	027[...]	161,ETC	3090

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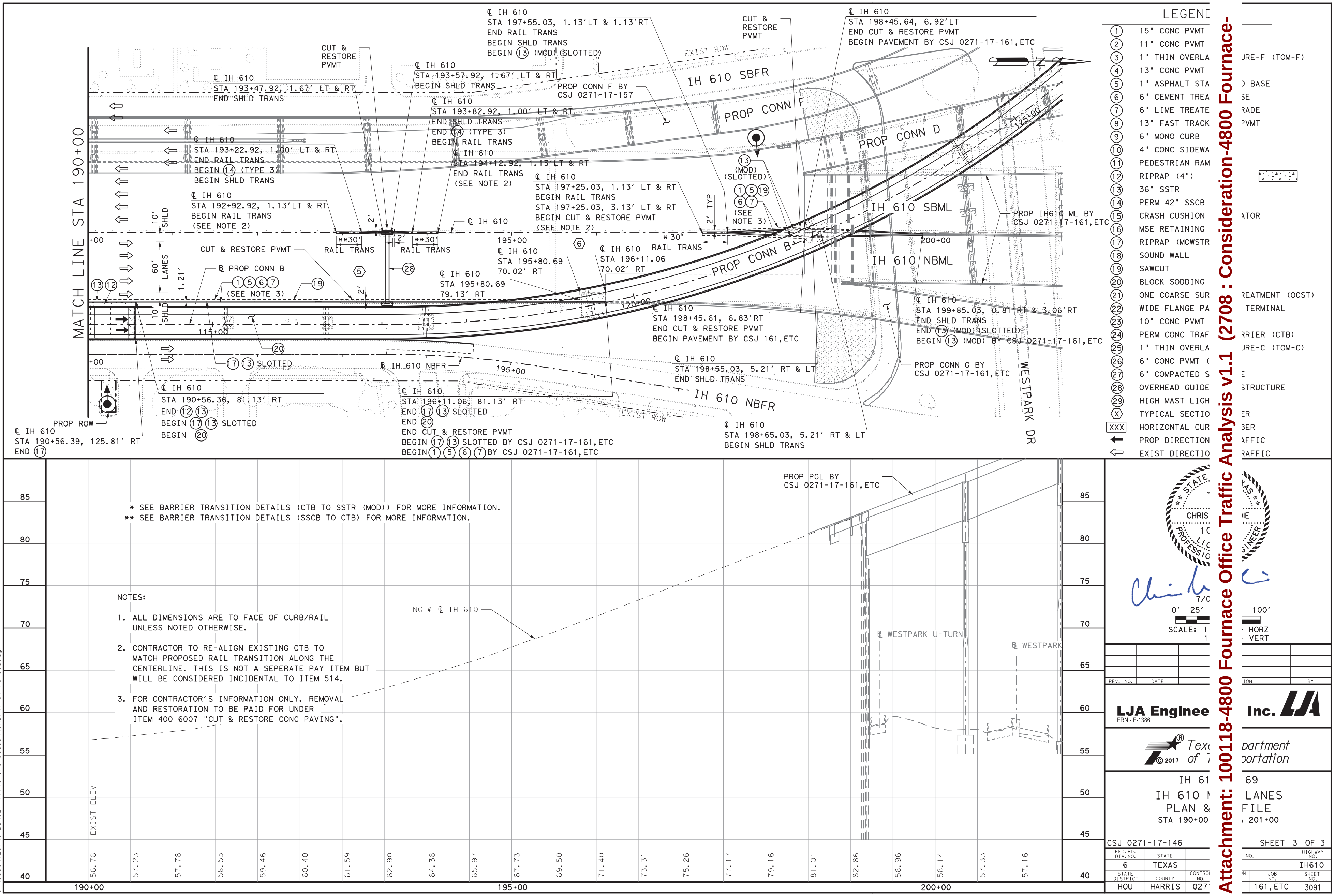
MATCH LINE STA 190+00
IH 610 SBFR
PROP CONN F
PROP CONN D
PROP CONN B
IH 610 SBML
IH 610 NBML
IH 610 NBFR
WESTPARK DR
EXIST ROW
PROP ROW
℄ IH 610 STA 197+55.03, 1.13' LT & 1.13' RT END RAIL TRANS BEGIN SHLD TRANS BEGIN 13 (MOD) (SLOTTED)
CUT & RESTORE PVMT
℄ IH 610 STA 193+57.92, 1.67' LT & RT BEGIN SHLD TRANS
℄ IH 610 STA 193+47.92, 1.67' LT & RT END SHLD TRANS
PROP CONN F BY CSJ 0271-17-157
℄ IH 610 STA 193+82.92, 1.00' LT & RT END SHLD TRANS END 14 (TYPE 3) BEGIN RAIL TRANS
℄ IH 610 STA 193+22.92, 1.00' LT & RT END RAIL TRANS BEGIN 14 (TYPE 3) BEGIN SHLD TRANS
℄ IH 610 STA 194+12.92, 1.13' LT & RT END RAIL TRANS (SEE NOTE 2)
℄ IH 610 STA 197+25.03, 1.13' LT & RT BEGIN RAIL TRANS STA 197+25.03, 3.13' LT & RT BEGIN CUT & RESTORE PVMT (SEE NOTE 2)
℄ IH 610 STA 192+92.92, 1.13' LT & RT BEGIN RAIL TRANS (SEE NOTE 2)
℄ IH 610 STA 198+45.64, 6.92' LT END CUT & RESTORE PVMT BEGIN PAVEMENT BY CSJ 0271-17-161, ETC
13 (MOD) (SLOTTED)
1 5 19 6 7 (SEE NOTE 3)
2' TYP
PROP IH610 ML BY CSJ 0271-17-161, ETC
10' SHLD
60' LANES
1.21'
10' SHLD
**30' RAIL TRANS
**30' RAIL TRANS
*30' RAIL TRANS
CUT & RESTORE PVMT
℄ PROP CONN B
1 5 6 7 (SEE NOTE 3)
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℄ IH 610
195+00
℄ IH 610 STA 195+80.69 70.02' RT
℄ IH 610 STA 195+80.69 79.13' RT
℄ IH 610 STA 196+11.06 70.02' RT
200+00
120+00
115+00
125+00
℄ IH 610 STA 198+45.61, 6.83' RT END CUT & RESTORE PVMT BEGIN PAVEMENT BY CSJ 161, ETC
℄ IH 610 STA 199+85.03, 0.81' RT & 3.06' RT END SHLD TRANS END 13 (MOD) (SLOTTED) BEGIN 13 (MOD) BY CSJ 0271-17-161, ETC
PROP CONN G BY CSJ 0271-17-161, ETC
℄ IH 610 STA 198+55.03, 5.21' RT & LT END SHLD TRANS
℄ IH 610 STA 198+65.03, 5.21' RT & LT BEGIN SHLD TRANS
13 12
20
17 13 SLOTTED
℄ IH 610 NBFR
℄ IH 610 STA 190+56.36, 81.13' RT END 12 13 BEGIN 17 13 SLOTTED BEGIN 20
℄ IH 610 STA 190+56.39, 125.81' RT END 17
℄ IH 610 STA 196+11.06, 81.13' RT END 17 13 SLOTTED END 20 END CUT & RESTORE PVMT BEGIN 17 13 SLOTTED BY CSJ 0271-17-161, ETC BEGIN 1 5 6 7 BY CSJ 0271-17-161, ETC
LEGEND
1 15" CONC PVMT
2 11" CONC PVMT
3 1" THIN OVERLA… URE-F (TOM-F)
4 13" CONC PVMT
5 1" ASPHALT STA… BASE
6 6" CEMENT TREA…
7 6" LIME TREATE… RADE
8 13" FAST TRACK… PVMT
9 6" MONO CURB
10 4" CONC SIDEWA…
11 PEDESTRIAN RAM…
12 RIPRAP (4")
13 36" SSTR
14 PERM 42" SSCB
15 CRASH CUSHION… ATOR
16 MSE RETAINING…
17 RIPRAP (MOWSTR…
18 SOUND WALL
19 SAWCUT
20 BLOCK SODDING
21 ONE COARSE SUR… REATMENT (OCST)
22 WIDE FLANGE PA… TERMINAL
23 10" CONC PVMT
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26 6" CONC PVMT
27 6" COMPACTED S…
28 OVERHEAD GUIDE… STRUCTURE
29 HIGH MAST LIGH…
X TYPICAL SECTIO…
XXX HORIZONTAL CUR…
PROP DIRECTION… AFFIC
EXIST DIRECTIO… RAFFIC
* SEE BARRIER TRANSITION DETAILS (CTB TO SSTR (MOD)) FOR MORE INFORMATION.
** SEE BARRIER TRANSITION DETAILS (SSCB TO CTB) FOR MORE INFORMATION.
NOTES:
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3. FOR CONTRACTOR'S INFORMATION ONLY. REMOVAL AND RESTORATION TO BE PAID FOR UNDER ITEM 400 6007 "CUT & RESTORE CONC PAVING".
PROP PGL BY CSJ 0271-17-161, ETC
NG @ ℄ IH 610
℄ WESTPARK U-TURN
℄ WESTPARK
EXIST ELEV
85
80
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56.78
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59.46
60.40
61.59
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LJA Engineering, Inc.
FRN-F-1386
Texas Department of Transportation
©2017
IH 61… 69
IH 610 … LANES
PLAN & … FILE
STA 190+00 … 201+00
CSJ 0271-17-146
SHEET 3 OF 3
FED. RD. DIV. NO. 6
STATE TEXAS
HIGHWAY NO. IH610
STATE DISTRICT HOU
COUNTY HARRIS
CONTROL NO. 027…
JOB NO. 161, ETC
SHEET NO. 3091
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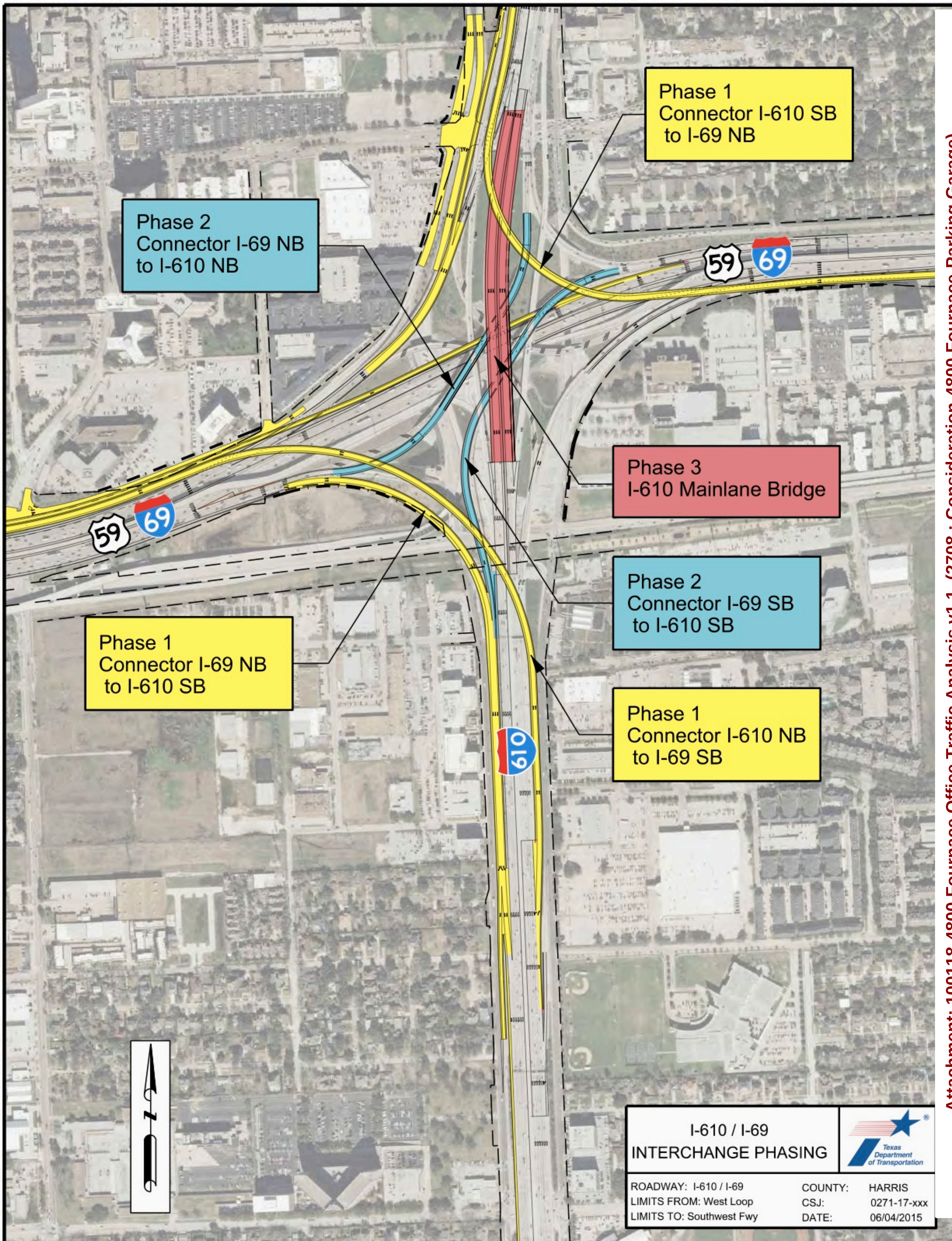

Phase 1
Connector I-610 SB
to I-69 NB
Phase 2
Connector I-69 NB
to I-610 NB
Phase 3
I-610 Mainlane Bridge
Phase 2
Connector I-69 SB
to I-610 SB
Phase 1
Connector I-69 NB
to I-610 SB
Phase 1
Connector I-610 NB
to I-69 SB
59
69
610
N
I-610 / I-69
INTERCHANGE PHASING
Texas Department of Transportation
ROADWAY: I-610 / I-69
LIMITS FROM: West Loop
LIMITS TO: Southwest Fwy
COUNTY: HARRIS
CSJ: 0271-17-xxx
DATE: 06/04/2015

Voigt Associates, Inc.
Professional Traffic Engineers
Texas Registered Firm F-5333

2611 Garnet Court
Pearland, Texas 77584
832.264.0429
tony@voigtassociates.com

October 1, 2018

Ms. Ashley Parcus
Development Services Coordinator
City of Bellaire, Development Services
7008 South Rice Avenue
Bellaire, Texas 77401

RE: 4800 Fournace Place Office TIA, Addendum #1
Response to Initial Traffic Impact Analysis Review Comments: September 24, 2018

Dear Ms. Parcus,
Thanks for your review of the 4800 Fournace Traffic Impact Analysis through Mr. Colby Wright, P.E., PTOE of Jones & Carter. Per your request, we have prepared this addendum for review and present the revised report attached.

Comments:
1. The traffic count data was collected in August 2018 when the IH 610 southbound exit ramp to Fournace Place was closed which likely affected the traffic volumes. A review of a 2016 traffic count on Fournace Place (attached) appears to show that the volumes on Fournace Place are 30-40% lower than in 2016. Please review and apply an adjustment factor to the traffic data collected as appropriate.

We were able to review the TxDOT counts provided by Mr. Wright, as well as secure turning movement counts at the IH-610 at Fournace Place interchange conducted by the Texas A&M Transportation Institute in May of 2017. The counts showed that the existing southbound frontage road counts were about 30-40% lower than the counts conducted in August 2018. The other interchange approaches were similar or higher in August 2018 as compared to May 2017. In the revised analysis we used the TTI volumes on the southbound frontage road approach and carried them through the study area (westbound to South Rice and Gulfton Street). See Table C3-ADJ in Appendix C for the adjusted values. Values in Table C3 were the basis for the build-out year analysis in 2020, grown at 2%/year. Simulation for 2020 conditions with and without the office development was re-run and the results presented in Section IV have been updated

2. Please include a narrative and/or schematic to describe the ultimate configuration of the IH 610 entrance/exit ramps near the site and any effect on access to the site.

See Section II.K for a discussion on the reconstruction of the IH-610 Southbound Fournace Place Exit Ramp and Appendix F for schematics of the plans showing the exit ramp in the same approximate location as before construction began.

3. The proposed East Access Driveway does not appear to meet Texas Department of Transportation (TxDOT) minimum driveway spacing criteria. Please evaluate the need for a southbound right turn lane on the IH 610 Southbound Frontage Road at the proposed East

Voigt Associates, Inc.
Professional Traffic Engineers

Access Driveway in accordance with TxDOT criteria. Please provide TxDOT approval of proposed driveway location and need for a right turn lane.

The revised site plan no longer proposes to move the site driveway on the IH-610 southbound frontage road (see Exhibit A2). As the land use will be consistent with what has been on this tract for many years, TxDOT approval for the garage construction should not be required. However, the property owner has been advised that any additional future development on the overall tract would be subject to TxDOT review of the impacts of the development and that the frontage road driveway may require modification or mitigation. Mr. Wright and I spoke on the phone about this comment and agreed to defer TxDOT approval until the point where a land use change is proposed, but the developer is now aware of this future requirement.

4. The intersection volumes at Fournace Place at Anderson appear to be the same in the AM and PM peak hours in Exhibits A5, A6 and A9-A14. Please review and update as necessary.

These exhibits have been updated in the revised report.

Please note that none of these minor comments or corrections changed the conclusions or findings of the analysis.

If you need additional information or have any questions about the analysis or the results of this report, please feel free to contact me at 832-264-0429.

Sincerely,

Anthony Voigt, P.E., PTOE
Principal

JONES & CARTER, INC.
ENGINEERS • PLANNERS • SURVEYORS

MEMO

TO: Ashley Parcus, City of Bellaire
FROM: Colby W. Wright, P.E., PTOE, Jones & Carter, Inc.
DATE: October 2, 2018
RE: 4800 Fournace Place - Traffic Impact Analysis

Jones|Cater has reviewed the Traffic Impact Analysis (TIA) for the 4800 Fournace Place Office and Parking Garage Redevelopment dated October 1, 2018.

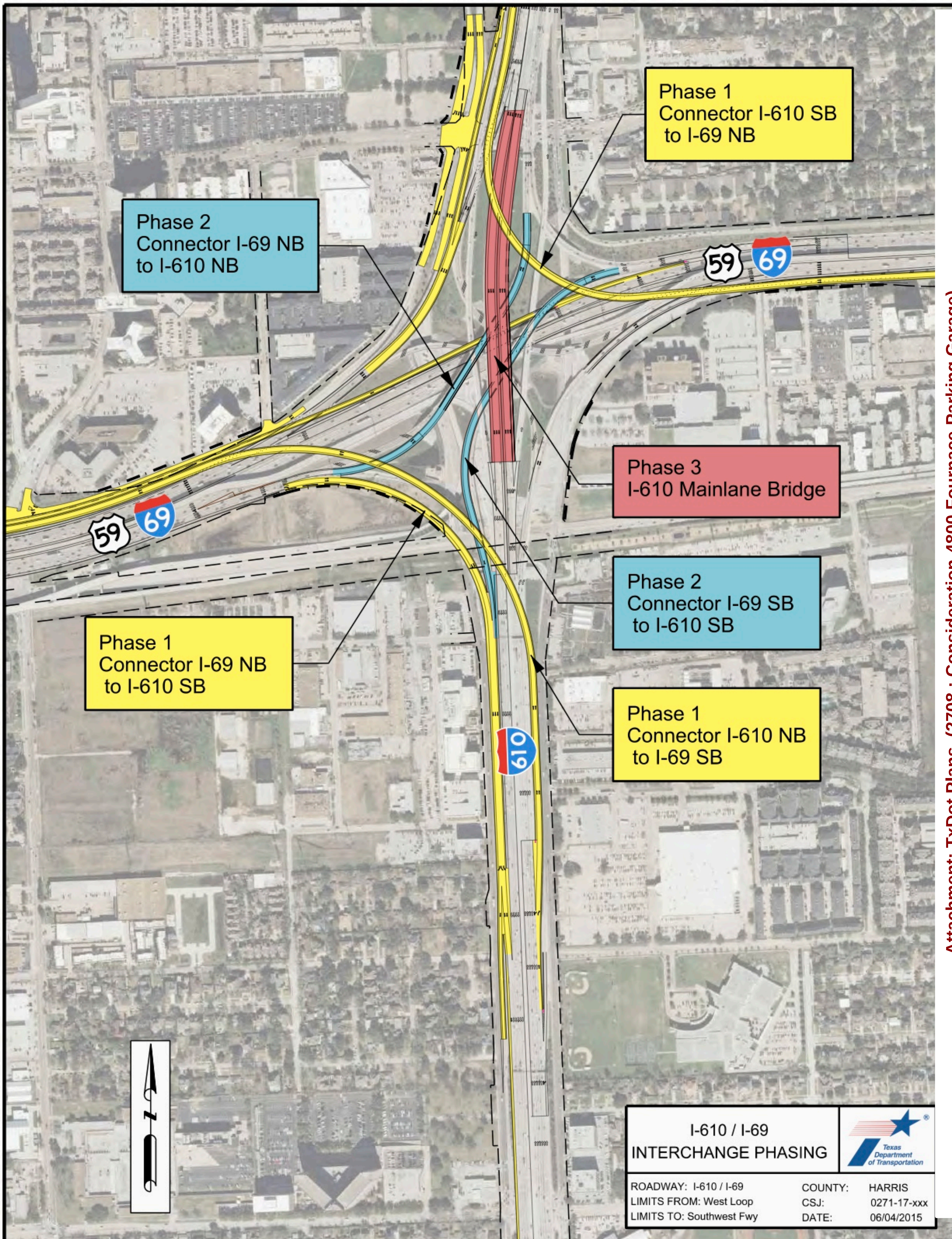
The proposed project would add a four-level parking garage to the existing two office buildings on the site with capacity of 2,000 vehicles, replacing the existing surface parking. Per the Institute of Transportation Engineers, Trip Generation Handbook, 10th Edition, the office building and garage development is estimated to generate 5,758 trips for the typical weekday including 564 trips in the weekday AM peak hour and 597 trips in the weekday PM peak hour.

The TIA projects the following intersections/movements will operate at LOS E or F:

- IH 610 Southbound Frontage Road at Fournace Place – LOS E in the PM Peak Hour
- Fournace Place at Southeast Site Access Driveway – LOS E in the PM Peak Hour
- Fournace Place at Southwest Site Access Driveway – LOS F in the PM Peak Hour

The Texas Department of Transportation (TxDOT) has jurisdiction over access to the IH 610 Southbound Frontage Road. Any review and/or approvals necessary for existing/proposed driveways to the IH 610 Southbound Frontage Road shall be the responsibility of the site owner/developer to obtain from TxDOT.

Jones|Carter has no further comments and offers no objections to further permitting of the project.



Phase 1
Connector I-610 SB
to I-69 NB
Phase 2
Connector I-69 NB
to I-610 NB
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Phase 3
I-610 Mainlane Bridge
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Phase 2
Connector I-69 SB
to I-610 SB
Phase 1
Connector I-69 NB
to I-610 SB
Phase 1
Connector I-610 NB
to I-69 SB
610
I-610 / I-69
INTERCHANGE PHASING
Texas Department of Transportation
ROADWAY: I-610 / I-69
LIMITS FROM: West Loop
LIMITS TO: Southwest Fwy
COUNTY: HARRIS
CSJ: 0271-17-xxx
DATE: 06/04/2015

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Document Control Sheet

Sheet Title:	VCP - RLM
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Record Series:	VCP
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Secondary ID:	
Doc Type:	Documents Outgoing
Security:	Public
Date:	6/6/2018
Title:	Inter-Agency Comm
Tertiary ID	

VCP: 845
OUT DATE: 6/6/18
DOC.NAME: INTER-AGENCY COMM
PROJ. MGR: J BELL

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

Date: June 11, 2018

To: File

RECEIVED
JUN 20 2018
TCEQ
CENTRAL FILE ROOM

Thru: Iryna Kushnirsky, Team Leader IK 6-15-18
VCP-CA Section

From: Joe Bell, P.G., Project Manager JNB 6-15-18
VCP-CA Section

Subject: Teleconference Summary, Anderson Greenwood & Co. (AGCO) Site located at 5425 South Rice Avenue, Houston, Harris County, Texas; Voluntary Cleanup Program (VCP) No. 845

Date: June 6, 2018/ 11:00 am to 12:00 pm / Bldg. D, Room 208 / TCEQ Central Office, Austin

Attendees: Merrie Smith, VCP-CA Section Manger, Remediation Division, TCEQ

Iryna Kushnirsky, Team Leader, VCP-CA Section Manager, Remediation Division, TCEQ

Joe Bell, Project Manager (AGCO), TCEQ

Ruth Winsor, Project Manager (Chevron), TCEQ

Paul Hofmann, City Manager, City of Bellaire

James Andrews, City Engineer, City of Bellaire

Michael Leach (sp), Public Works, City of Bellaire

Sheron Sampson (sp), Director of Development Services, City of Bellaire

Meeting Purpose:

- Discuss if human health risks are posed by AGCO and Chevron sites
- Status update on cleanup activities for the AGCO and Chevron releases
- Discuss any development issues for the Chevron site

Major conclusions/points of discussion/concerns:

- Mr. Hofmann opened with a statement that the City of Bellaire was attempting to get a better understanding of the items listed in the meeting purpose in order to address their own concerns, as well as that of the public. In addition, the city was concerned about the contaminant impact, if any, upon the redevelopment of the Chevron facility.

Attachment: TCEQ Memo (2708 : Consideration-4800 Fournace-Parking Garage)

- TCEQ discussed risk at the site, stating that evaluations to date have not identified any risk to the public, either through the presence of shallow groundwater contamination in the area, drinking water supply, or other exposure pathways. Specifics regarding what contemplates "complete exposure pathways", risk to the Evangeline Aquifer, and groundwater-to-outdoor air exposure potential at the AGCO facility were discussed.
- TCEQ addressed the City of Bellaire's concern about potential impact to the Feld Park public water supply well. TCEQ noted that its screened interval at approximately 1,500 feet was well below any known water well installed in the area and that fact helped to protect the well from contamination. In addition, TCEQ noted that the well was located a good distance to the southeast of known contamination and that Chevron's dewatering systems appears to be exerting a radial influence, which would conceptually preclude further contaminant migration to the south. Lastly, TCEQ noted that sampling of the water from the treatment system, to which the Feld Park well contributes, indicated only trace levels of contaminants associated with treatment activities and that no site contaminants were detected.
- TCEQ discussed project status and complexities regarding assessment and remediation, inclusive of permitting issues (without blame on either party), incomplete assessment in order to construct a comprehensive response action, and an apparent off-site source(s).
- TCEQ noted that AGCO, as expressed to TCEQ by its representatives, is addressing a recent City of Houston requirement for a $195,000 impact fee in order to start up their groundwater remediation system.
- TCEQ stated that it was important to evaluate the effectiveness of the groundwater remediation system's capture zone and radius of influence, though not in those specific terms, in order to construct a remedy for off-site affected property.
- Regarding redevelopment of the Chevron facility, discussion was brief. TCEQ noted that it did not perceive any delay in redevelopment posed by the contaminants, but that Chevron was still in the assessment phase and that their Affected Property Assessment Report was under review.
- City of Bellaire officials stated that they found the conference call very helpful, expressed their thanks, and looked forward to additional information about the groundwater contamination.

Planning and Zoning Commission
Council Chamber, First Floor of City Hall
Bellaire, TX 77401-4411

Meeting: 10/11/18 05:00 PM
Department: Development Services
Category: Report
Department Head: ChaVonne Sampson
DOC ID: 2712

SCHEDULED
ACTION ITEM (ID # 2712)

Item Title:

Approval of the Commission's Report and Recommendation to City Council regarding a specific use permit at 4800 Fournace Place for multi-tenant office use.

Background/Summary:

A draft Report and Recommendation has been included in the packet and should be amended as necessary, based on the events of the evening.

ATTACHMENTS:

- 4800 Fournace-Office-Use (PDF)

City of Bellaire
DEVELOPMENT SERVICES

October 11, 2018

To: Mayor and City Council
From: Ross Gordon, Chairman, Planning & Zoning Commission
CC: ChaVonne Sampson, Director of Community Development
Subject: Report and Recommendation on an application for a Specific Use Permit for multi-tenant office use at 4800 Fournace Place.

On Thursday, September 13, 2018, the Planning & Zoning Commission held a public hearing for the purpose of reviewing an application filed by Danny Sheena with SLS Properties, for a Specific Use Permit as required by the City of Bellaire Code of Ordinances, Chapter 24, Planning and Zoning, Section 24-605, Application for Specific Use Permit, to allow for multi-tenant office use in the existing office buildings previously occupied by Chevron U.S.A, Inc, as provided for in section 24-544 C. 3) of the City of Bellaire Zoning Code. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

Notifications regarding the public hearing were mailed out to all addresses within 500 feet of the property. Any and all persons desiring to be heard in connection with the Specific Use Permit Application were invited to speak before the Commission.

Six (6) members of the public spoke on the application with concerns regarding an increase in traffic and contamination of the site.

During the public hearing, many concerns were voiced from the Commission regarding what types of office uses would be allowed, anticipated office population, condition of the current site, completion of the application and the fact that the TIA had not yet been reviewed by the City's Traffic Engineer, and environmental impacts.

Twenty-seven (27) additional written comments were received by staff following closure of the public hearing, and were included in the Commission's packet.

CONSIDERATION

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7008 South Rice Avenue, Bellaire, Texas 77401-4411
P 713.662.8222 | F 713.662.8212
www.bellairetx.gov

City of Bellaire

DEVELOPMENT SERVICES

RECOMMENDATION

On October 11, 2018, after due consideration and discussion, the Commission found that the application was ____________ with the criteria and standards set forth in Section 24-615 of the City of Bellaire Code of Ordinances, and voted ___________to recommend __________of the Specific Use Permit at 4800 Fournace to City Council.

VOTE OF THE COMMISSION

Members present and voting FOR this recommendation to City Council:

Members present and voting AGAINST this recommendation to City Council:

Members absent:

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Planning and Zoning Commission
Council Chamber, First Floor of City Hall
Bellaire, TX 77401-4411

Meeting: 10/11/18 05:00 PM
Department: Development Services
Category: Report
Department Head: ChaVonne Sampson
DOC ID: 2713

SCHEDULED
ACTION ITEM (ID # 2713)

Item Title:

Approval of the Commission's Report and Recommendation to City Council regarding a specific use permit at 4800 Fournace Place for the construction of a parking garage.

Background/Summary:

A draft Report and Recommendation has been included in the packet and should be amended as necessary, based on the events of the evening.

ATTACHMENTS:

- 4800 Fournace-Parking Garage (PDF)

City of Bellaire

DEVELOPMENT SERVICES

October 11, 2018

To: Mayor and City Council
From: Ross Gordon, Chairman, Planning & Zoning Commission
CC: ChaVonne Sampson, Director of Community Development
Subject: Report and Recommendation on an application for a Specific Use Permit for the construction of a parking garage at 4800 Fournace Place.

On Thursday, September 13, 2018, the Planning & Zoning Commission held a public hearing for the purpose of reviewing an application filed by Danny Sheena with SLS Properties, on a request for a Specific Use Permit (SUP) to allow for the construction of a parking garage adjacent to the existing office buildings previously occupied by Chevron U.S.A, Inc., as provided for in Section 24-544 C. 4) of the City of Bellaire Code of Ordinances. The property is located at 4800 Fournace Place, and is within the Technical Research Park Zoning District, also known as the North Bellaire Special Development Area.

Notifications regarding the public hearing were mailed out to all addresses within 500 feet of the property. Any and all persons desiring to be heard in connection with the Specific Use Permit Application were invited to speak before the Commission.

Six (6) members of the public spoke on the application citing concerns regarding an increase in traffic, the closeness of the parking garage to residential homes and park, drainage, contamination of the site, and security of the site.

During the public hearing, many concerns were voiced from the Commission regarding contamination of the site, appropriate buffering for the adjacent residential properties, security of the site, and drainage.

Twenty seven (27) additional written comments were received by staff following closure of the public hearing, and were included in the Commission's packet.

CONSIDERATION

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City of Bellaire

DEVELOPMENT SERVICES

RECOMMENDATION

On October 11, 2018, after due consideration and discussion, the Commission found that the application was ____________ with the criteria and standards set forth in Section 24-615 of the City of Bellaire Code of Ordinances, and voted ___________to recommend __________of the Specific Use Permit at 4800 Fournace to City Council, with the following conditions:

1.

2.

3.

VOTE OF THE COMMISSION

Members present and voting FOR this recommendation to City Council:

Members present and voting AGAINST this recommendation to City Council:

Members absent:

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