

Bryan Moyers, Councilmember
David Brundage, Councilmember
Holly Gray-Moore, Mayor Pro-Tem



Carl E. Gierisch, Jr., Mayor

Brian Darby, Councilmember
Hogan Page, Councilmember
David Thompson, Councilmember

ROANOKE CITY COUNCIL AGENDA REGULAR MEETING

**JANUARY 25, 2022
7:00 PM
500 S. OAK STREET
ROANOKE, TX 76262-6732**

A. CALL CITY COUNCIL TO ORDER

Invocation and Pledge of Allegiance

B. ANNOUNCEMENTS

C. PUBLIC INPUT

This item is available for citizens to address the City Council on any issues that are not the subject of a public hearing. No action by law may be taken on the topic. The presiding officer reserves the right to impose a time limit on this portion of the agenda. In order to provide the highest quality cable broadcast, all speakers need to speak at the podium.

D. PRESENTATION

1. Dr. Ryder Warren will give an update regarding Northwest Independent School District .
2. Human Resources Coordinator Melanie Curl will present Employee Recognitions for 2021.

E. CONSENT AGENDA

All items listed below are considered routine and will be enacted with one motion. There will be no separate discussion of items unless a Councilmember



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or citizen so requests, in which event the item will be removed and considered separately.

1. Consider approval of the minutes from the regular City Council meeting held on January 11, 2022.
2. Consider approval of the minutes from the City Council Workshop meeting held on January 13, 2022.
3. Consider approval of Resolution No. 2022-100R authorizing continued participation with the Atmos Cities Steering Committee; and authorizing the payment of five cents per capita to the Atmos Cities Steering Committee to fund regulatory and related activities related to Atmos Energy Corporation.
4. Consider approval to award bid to McClendon Construction Co., Inc. for the downtown street reconstruction of Travis Street and the remaining portion of Austin Street located between Pine and Walnut, for the amount not to exceed \$1,083,150.05.
5. Consider the approval of a government obligation contract between Republic First National Corporation and the City of Roanoke, Texas for the leasing of a wastewater Vactor truck equipment for the sum of \$74,424 annually.

F. OLD BUSINESS

1. Public hearing to consider amending the Comprehensive Zoning Ordinance of the City of Roanoke, Texas, on approximately 18.504- acres of land located in the M.E.P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County, Texas, by changing the zoning on the approximately 18.504- acres of land from Single Family-7 District (SF-7) and Retail District (R) to Planned Development District with multi-family and single family detached uses. (Ordinance No. 2021-123)
2. Consideration and action of Ordinance No. 2021-123, amending the Comprehensive Zoning Ordinance, for approximately 18.504 acres of land located in the M.E. P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County , TX, by changing the zoning from Single-Family-7 District (SF-7) and Retail District (R) to Planned Development District with Multi-Family and Single Family Attached uses.



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G. NEW BUSINESS

1. Consideration and action on approval of Ordinance No. 2022-105 proposing the creation of the Roanoke Crime Control and Prevention District.
2. Consideration and action on approval of Resolution No. 2022-101R appointing a temporary board of directors to the proposed Roanoke Crime Control and prevention District.

H. EXECUTIVE SESSION

The City Council will hold a closed Executive Session meeting pursuant to the provisions of Chapter 551 of the Texas Government Code, in accordance with the authority contained in:

Section 551.072

Deliberations regarding the purchase, exchange, lease, or value of real property.

Section 551.087

To deliberate commercial or financial information the City has received from a business prospect, and to deliberate the offer of a financial or other incentive to a business prospect.

RECONVENE INTO REGULAR SESSION

The City Council will reconvene into Regular Session, pursuant to the provisions of Chapter 551 of the Texas Government Code, to take any action necessary regarding:

Section 551.072

Deliberations regarding the purchase, exchange, lease, or value of real property.

Section 551.087

To deliberate commercial or financial information the City has received from a business prospect, and to deliberate the offer of a financial or other incentive to a business prospect.

The City Council reserves the right to adjourn into Executive Session during the course of this meeting to discuss any item on the posted agenda as authorized by Chapter 551 of the Texas Government Code.



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I. ADJOURNMENT

CERTIFICATION

I certify that the above notice was posted at City Hall, 500 South Oak Street, Roanoke, Texas, on Friday, January 21, 2022, by 5:00 pm, in accordance with Chapter 551, Texas Government Code.

A handwritten signature in blue ink, reading "April S. Hill".

April S. Hill, City Secretary

*Any person planning to attend this meeting that may require auxiliary aids or services should request accommodations two (2) days prior to the meeting by calling (817) 491-8152. **BRILLE IS NOT AVAILABLE.**

📶 A public wireless network is now available in the Council Chambers for use during meetings. It is available from 7am to 11pm Monday thru Friday. The name of the network is: City Hall Guests



CITY COUNCIL AGENDA ITEM

TO: Mayor and City Council

SUBJECT: 01/11/2022 CC Minutes

MEETING DATE: January 25, 2022

DEPARTMENT: City Secretary

ITEM SUMMARY:

Consider approval of the minutes from the regular City Council meeting held on January 11, 2022.

INFORMATION:**STAFF RECOMMENDATION:****SPECIAL CONSIDERATION:****FINANCIAL CONSIDERATION:****ATTACHMENTS:**

1. CCMin 01-11-2022

Bryan Moyers, Council Member
David Brundage, Council Member
Holly Gray-Moore, Mayor Pro-Tem



Carl E. Gierisch, Jr., Mayor

Brian Darby, Council Member
Hogan Page, Council Member
David Thompson, Council Member

**MINUTES
ROANOKE CITY COUNCIL
REGULAR MEETING
JANUARY 11, 2022
CITY HALL COUNCIL CHAMBERS
500 S. OAK STREET
7:00 P.M.**

PRESENT: Mayor Carl E. "Scooter" Gierisch, Jr.; Mayor Pro Tem Holly Gray-Moore; Council Members: Brian Darby, David Brundage, Hogan Page, David Thompson, and Bryan Moyers; City Manager Scott Campbell, City Secretary April S. Hill, and City Attorney Jeff Moore.

DEPT. STAFF: Assistant City Manager Cody Petree, Fire Chief Chris Addington, Chief of Police Jeriahme Miller, Director of Fiscal and Administrative Services Vicki Rodriguez, Public Works Director Shawn Wilkinson, Parks and Recreation Director Ronnie Angel, and City Planner Kelly Carlson.

A. CALL CITY COUNCIL TO ORDER

City Council called to order at 7:00 p.m.
Invocation and Pledge of Allegiance given by Mayor Gierisch.

B. ANNOUNCEMENTS

1. Mayor Gierisch swore in Corporal Ryan Otero to his new position of Sergeant.

C. PUBLIC INPUT

Shannon Richardson, 1055 Glen Garden Drive, expressed his concerns and possible code violations regarding the Gierisch Brothers Motor Co, Ltd.

D. CONSENT AGENDA

All items listed below are considered routine and will be enacted with one motion. There will be no separate discussion of items unless a Councilmember or citizen so requests, in which event the item will be removed and considered separately.

1. Consider approval of the minutes from the regular City Council meeting held on December 14, 2021.

Motion made by Holly Gray-Moore second by David Thompson to approve



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Consent Item 1.
Motion carried unanimously.

E. NEW BUSINESS

1. Motion made by Holly Gray-Moore second by Hogan Page to appoint a temporary board of directors to the Roanoke Crime Control and Prevention District, as nominated by Mayor and City Council.

1. Angie Grimm
2. Sean Turner
3. Werner Rindfleisch
4. Krystle Joyner
5. John Thompson
6. Victor Molaschi
7. Jim Harper

Motion carried unanimously.

2. Public hearing to consider amending Chapter 12, Section 12.931 of the Code of Ordinances by authorizing the use of "Limited Service Hotels" to have four (4) floors of rooms or less. (Ordinance No. 2022-100)

Public hearing started at 7:21 p.m.

Kathleen Reynolds, 506 Dallas Drive, stated she is concerned with a hotel being built on Dallas Drive and would like the hotel minimized as much as possible. Ms. Reynolds expressed her concerns regarding the current traffic issues and what impact this will have, with the added traffic.

Public hearing ended at 7:24 p.m.

3. Motion made by Brian Darby second by Bryan Moyers to approve Ordinance No. 2022-100 amending the Comprehensive Zoning Ordinance, by amending Chapter 12, Article VII, Section 12.931- Hotels (a).(7) to allow 4 floors or less for a limited service hotel.

Motion carried 5-1-0. Councilmember David Brundage was opposed.

4. Public hearing to consider amending the Comprehensive Zoning Ordinance of the City of Roanoke, Texas, on approximately 0.231 acres of land located in the John Bacon Survey, Abstract No. 1565 and the M.E.P. & P.R.R. Company Survey, Abstract No. 923, City of Roanoke, Denton County, Texas, by changing the zoning on the approximately 0.231 acres of land from Single Family-7 (SF-7) District to Retail (R) District; prescribing the permissible uses. (Ordinance No. 2022-101).

Public hearing started at 7:39 p.m.



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Laura Hovis, 507 Dallas Drive, asked if there is a way to stop this. Ms. Hovis further stated there is already an issue with traffic and she is opposed to a hotel being built on Dallas Drive.

Kathleen Reynolds, 506 Dallas Drive, stated the traffic congestion is already an issue, please do not build a hotel at the end of Dallas Drive, unless you intend to make all of Dallas Drive commercial and allow everyone to sell out as commercial.

Donna Griggs, 503 Dallas Drive, stated they came to Roanoke because it was like being in a country/rural setting, but all of that has changed. Ms. Griggs stated the traffic makes it difficult to get out of their neighborhood and is opposed to a hotel on Dallas Drive.

Jerry Boyle, 614 Dallas Drive owner, stated he is only asking to rezone the small lot in the center of his large commercial property, which surrounds it.

Public hearing ended at 7:48 p.m.

5. Motion made by Brian Darby second by Holly Gray-Moore to approve Ordinance No. 2022-101, amending the Comprehensive Zoning Ordinance by changing the zoning from Single-Family-7 District (SF-7) to Retail District (R), for an approximate 0.231 acre of land, having an address of 614 Dallas Drive, and situated in the M.E. P. & P.R.R. Survey, Abstract No. 923, City of Roanoke, Denton County, TX.

Motion carried 5-1-0. Councilmember David Thompson was opposed.

6. Motion made by Holly Gray-Moore second by David Thompson to approve a façade grant application from Laura Hanley, 115 N. Oak St. Roanoke, TX.

Motion carried unanimously.

7. Staff Presentation/Discussion Regarding Potential Art and History Trail.

City Manager Scott Campbell gave an overview of some conceptual ideas of the Art and History Trail program, which would be a long-term project.

Roanoke Visitor Center Museum Manager Stacey Lotz addressed the Mayor and City Council stating they will present an idea of “how we as a city can build upon, what you as a Council have already started.” Ms. Lotz further stated by “creating an Art and History Trail, it will connect art, nature, and people, to encourage creative experiences in human interaction. In addition, it expounds upon the importance of culture within our community.”

Roanoke Visitor Center Museum Curator of Collections Kelly Thomerson gave a PowerPoint presentation of possible ideas to make the Art and History Trail program successful.



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Mr. Campbell stated staff has spoken internally about the program and would like feedback from the Mayor and City Council, in starting the program with a mural on the backside of the building located at Oak Street and Main Street.

Mayor Gierisch suggested an idea, since the City of Roanoke was founded on the Railroad, maybe acquiring and placing an old locomotive in the space between that building and the water tower would be an idea.

Mr. Campbell stated at some time in the future an ordinance could be approved to appoint an official arts board for this program.

Mayor Gierisch stated that anything that captures Roanoke's rich history is a great idea.

Mayor Pro Tem Holly Gray-Moore state that she is in favor of this program, but has concerns in what murals would be placed where. Mayor Pro Tem Gray-Moore further stated that we would need to make sure there is an appropriate approval process in place. Concerning placing a mural on the building at Oak Street and Main Street, Mayor Pro Tem Gray-Moore suggested placing a memorial there for Police and Fire.

Councilmember Brian Darby asked is there any data (about drawing more to the city) available from other cities who have this program.

Mr. Campbell stated we can research this.

The Mayor and City Council thanked everyone for their hard work in putting this together.

F. EXECUTIVE SESSION

The City Council will hold a closed Executive Session meeting pursuant to the provisions of Chapter 551 of the Texas Government Code, in accordance with the authority contained in:

CITY COUNCIL CONVENED INTO CLOSED SESSION AT 8:11 P.M.

Section 551.074

To discuss and consider personnel matters and all matters incident and related thereto.

Section 551.087

To deliberate commercial or financial information the City has received from a business prospect, and to deliberate the offer of a financial or other incentive to a business prospect.

RECONVENE INTO REGULAR SESSION

The City Council will reconvene into Regular Session, pursuant to the provisions of Chapter 551 of the Texas Government Code, to take any action necessary regarding:

CITY COUNCIL RECONVENED INTO REGULAR SESSION AT 8:41 P.M.



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OF THE ROANOKE CITY COUNCIL

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1. **Sections 551.074 of the TEXAS GOVERNMENT CODE** To discuss and consider personnel matters and all matters incident and related thereto.
No action taken.

2. **Sections 551.087 of the TEXAS GOVERNMENT CODE** To deliberate commercial or financial information the City has received from a business prospect, and to deliberate the offer of a financial or other incentive to a business prospect.
No action taken.

G. ADJOURNMENT

Motion made by Holly Gray-Moore second by Brian Darby to adjourn the meeting at 8:41 p.m.
Motion carried unanimously.

Carl E. "Scooter" Gierisch, Jr., Mayor

April S. Hill, City Secretary



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: 01/13/2022 CC Workshop Minutes

MEETING DATE: January 25, 2022

DEPARTMENT: City Secretary

ITEM SUMMARY:

Consider approval of the minutes from the City Council Workshop meeting held on January 13, 2022.

INFORMATION:

STAFF RECOMMENDATION:

SPECIAL CONSIDERATION:

FINANCIAL CONSIDERATION:

ATTACHMENTS:

1. CCMin 01-13-2022 - Workshop

Bryan Moyers, Council Member
David Brundage, Council Member
Holly Gray-Moore, Mayor Pro-Tem



Carl E. Gierisch, Jr., Mayor

Brian Darby, Council Member
Hogan Page, Council Member
David Thompson, Council Member

**MINUTES
ROANOKE CITY COUNCIL
WORKSHOP MEETING
JANUARY 13, 2022
CITY HALL COUNCIL CHAMBERS
500 S. OAK STREET
7:00 P.M.**

PRESENT: Mayor Carl E. "Scooter" Gierisch, Jr.; Mayor Pro Tem Holly Gray-Moore; Council Members: Brian Darby, Hogan Page, David Thompson, and Bryan Moyers; City Manager Scott Campbell, and City Secretary April S. Hill.

DEPT. STAFF: Assistant City Manager Cody Petree.

ABSENT: Councilmember David Brundage.

A. CALL CITY COUNCIL TO ORDER

City Council called to order at 7:00 p.m.

B. PUBLIC INPUT

No one wished to speak.

C. NEW BUSINESS

1. Discussion regarding proposed Ordinance No. 2021-123, amending the Comprehensive Zoning Ordinance, for approximately 18.504 acres of land located in the M.E. P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County, TX, by changing the zoning from Single-Family-7 District (SF-7) and Retail District (R) to Planned Development District with Multi-Family and Single Family Attached uses.

City Manager Scott Campbell stated there is a lot of information contained within the packet. Mr. Campbell explained there are a couple of fundamental issues the city has been discussing with the developer, 1) how does this compare with the future land use plan (is it the best use of the property), and 2) the overall number of units.

Kenneth Fambro, thanked the Mayor and City Council for the opportunity to speak on this matter. Mr. Fambro gave a PowerPoint presentation of the proposed project. Mr. Fambro explained during this process, they went before the Planning



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and Zoning Commission and took their comments and reevaluated the overall project and a lot of time has went into creating an actual site plan, researching density, traffic, etc. In the process of reevaluating this project, they implemented an age restricted (55+) development, steering away from traditional multi-family units.

Assistant City Manager Cody Petree stated townhomes require rear garage and alleyway.

Mr. Fambro stated efforts have been made to

Mayor Gierisch stated there is concern with drainage on the hill, which has been an issue for quite some time. Mayor Gierisch asked if retention would be adequate to correct the issue of drainage.

Mr. Fambro stated the intent is to include two (2) retention ponds to address drainage issues.

Mayor Gierisch asked if the streets would be curbed and guttered, to help carry water away from properties, with underground drainage.

Councilmember Bryan Moyers asked if it is a 5'(ft.) retaining wall.

Mr. Fambro stated it was a 5'(ft.) retaining wall.

Mayor Pro Tem Gray-Moore asked the developer what the future plans are on improving Walnut Street and Lois Street, concerning traffic. Mayor Pro Tem Gray-Moore further stated that area could not currently handle the increased traffic.

Mr. Fambro stated they would realign Lois Street to allow a better flow of traffic and push traffic to service road as opposed to Lois Street.

Mayor Pro Tem Gray-Moore asked staff where we are at for future street improvements for Walnut Street and Lois Street.

Mr. Campbell stated there is a list of streets that are coming up for improvements, so it is several years out for those specific streets.

Mr. Fambro...

Mayor Pro Tem Gray-Moore asked if traffic counts for that area were conducted, and if so, when what it done.

Mr. Petree stated those roads had a count of approximately 2500 tripe per day and were graded an "F".



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Mayor Pro Tem Gray-Moore stated she would like to see a traffic count that was conducted when it is at its peak.

Mr. Fambro stated the traffic count was conducted during peak traffic.

Mr. Campbell stated that one thing to take into consideration of the economic impact is move up the street improvements to coincide with the project.

Mayor Gierisch stated the city has discussed with the county to possibly get on a bond package and take that cost off the city's CIP, which would help.

Mr. Campbell stated the county has asked for a list of possible streets to include on the bond package.

Councilmember David Thompson asked how traffic would get in and out of the area, taking traffic pattern and direction issues into consideration.

Mr. Fambro stated anything built in that area will add to the traffic issues.

Councilmember Brian Darby asked if the project is making the traffic better or worse.

Mr. Fambro stated there would be more traffic going through that area.

Councilmember Darby asked the developer what they are providing to the city, as a whole, that will address the traffic issue.

Mr. Fambro asked for clarification.

Councilmember Darby asked what the developer would do within the project to help ease an increase of traffic.

Mr. Fambro stated that they are not sure how they would help with improvements, when it is a Texas Department of Transportation (TxDOT) road.

Rick Simmons, Westlake, founder of firm, stated improvements would need to be made and looking at the three (3) uses of the plan; the highest traffic will come from the multi-family portion of the project.

Mayor Pro Tem Holly Gray-Moore stated she likes the concept of the project, but has an issue with the multi-family as it has too high of density.

Mr. Campbell stated the project consists of Tract 1; 265 units of multi-family, Tract 2; 131 units of age restricted (55+), and Tract 3; 45 townhomes.



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Mayor Pro Tem Gray-Moore stated the developer should contribute some participation on road improvements.

Mr. Campbell state the staff report shows the different density of the different tracts.

Mr. Fambro stated they look at the tracts differently, with one being tradition multi-family and the other being age restricted. The higher density is to meet the price point.

Mayor Pro Tem Gray-Moore asked Victor Molaschi (Planning and Zoning Commission member) what was the biggest issues seen by the Planning and Zoning Commission.

Victor Molaschi stated the Planning and Zoning Commission biggest issues is the number of parking spaces in relation of the actual number of car owners living there, narrow roads and fire access, and multi-family.

Mr. Campbell asked if there a ballpark of what the developer could do to lower the number of units and still meet their price point.

Mr. Fambro stated that if they participated in street improvements, it would be difficult to lower the number of units.

Mayor Pro Tem Gray-Moore stated that if they meet all of the zoning requirements, then there would be no need to participate in the street improvements.

Mr. Simmons gave an overview of the history of their developments. Watermere in Southlake is a senior housing and multi-family and the traffic is lower due to the senior residents using the streets at different hours, such as peak hours.

Mayor Pro Tem Gray-Moore stated she agrees the city needs more senior living in the area, however the density is too high and will not support a higher density.

After much discussion, Mr. Fambro asked if they could defer to a later meeting.

Mr. Campbell stated that this was a workshop to discuss this matter, so it would be more appropriate to defer at the January 25, 2021.

Mayor Gierisch stated that by the January 25, 2021 we would need to know a set date on which they wish to defer.

D. ADJOURNMENT



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Motion made by Holly Gray-Moore second by Brian Darby to adjourn the meeting
at 8:02 p.m.
Motion carried unanimously.

Carl E. "Scooter" Gierisch, Jr., Mayor

April S. Hill, City Secretary



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: RES NO 2022-100R - Atmos Steering Committee Assessment

MEETING DATE: January 25, 2022

DEPARTMENT: City Secretary

ITEM SUMMARY:

Consider approval of Resolution No. 2022-100R authorizing continued participation with the Atmos Cities Steering Committee; and authorizing the payment of five cents per capita to the Atmos Cities Steering Committee to fund regulatory and related activities related to Atmos Energy Corporation.

INFORMATION:

Purpose of the Resolution:

Most municipalities have retained original jurisdiction over gas utility rates and services within municipal limits. The Atmos Cities Steering Committee ("ACSC") is composed of 178 municipalities in the service area of Atmos Energy Corporation, Mid-Tex Division that have retained original jurisdiction. Atmos is a monopoly provider of natural gas. Because Atmos has no competitors, regulation of the rates that it charges its customers is the only way that cities can ensure that natural gas rates are fair. Working as a coalition to review the rates charged by Atmos allows cities to accomplish more collectively than each city could do acting alone. Cities have more than 100 years experience in regulating natural gas rates in Texas.

ACSC is the largest coalition of cities served by Atmos Mid-Tex. There are 178 ACSC member cities, which represent more than 60 percent of the total load served by Atmos-Mid Tex. ACSC protects the authority of municipalities over the monopoly natural gas provider and defends the interests of residential and small commercial customers within the cities. Although many of the activities undertaken by ACSC are connected to rate cases (and therefore expenses are reimbursed by the utility), ACSC also undertakes additional activities on behalf of municipalities for which it needs funding support from its members.

The ACSC Membership Assessment Supports Important Activities:

ACSC is actively involved in rate cases, appeals, rulemakings, and legislative efforts



AGENDA ITEM

impacting the rates charged by Atmos within the City. These activities will continue throughout the calendar year. It is possible that additional efforts will be necessary on new issues that arise during the year, and it is important that ACSC be able to fund its participation on behalf of its member cities. A per capita assessment has historically been used, and is a fair method for the members to bear the burdens associated with the benefits received from that membership.

Explanation of Resolution Paragraphs:

- I. This paragraph authorizes the continuation of the City's membership in ACSC.
- II. This paragraph authorizes payment of the City's assessment to the ACSC in the amount of five cents (\$0.05) per capita.
- III. This paragraph requires notification that the City has adopted the Resolution.

Payment of Assessment

The assessment payment check should be made out to "*Atmos Cities Steering Committee*" and mailed to Brandi Stigler, Atmos Cities Steering Committee, c/o Arlington City Attorney's Office, Mail Stop 63-0300, 101 S. Mesquite St., Suite 300, Arlington, Texas 76010.

STAFF RECOMMENDATION:

Approve Resolution No. 2022-100R

SPECIAL CONSIDERATION:

FINANCIAL CONSIDERATION:

ATTACHMENTS:

1. Action Needed Memo-2022 ACSC Renewal Assessment
2. RES NO 2022-100R - Authorize payment to Atmos Cities Steering Committee - ACSC 2022 Assessment Model Resolution
3. 2022 ACSC Invoice-Roanoke
4. ACSC Newsletter December 2021
5. 2021 MASTER ACSC List of Cities 179 Total (2021.12.29)

MEMORANDUM

TO: Atmos Cities Steering Committee

FROM: Jennifer Richie, Chair, Atmos Cities Steering Committee

DATE: January, 2022

RE: **Action Needed - 2022 Atmos Cities Steering Committee Membership Assessment Invoice**

On December 9, 2021, the Atmos Cities Steering Committee (“ACSC”) held a quarterly meeting with representatives from Atmos Energy. During the meeting, the group held a discussion of upcoming natural gas issues and approved the assessment for ACSC membership. Using the population-based assessment protocol previously adopted by ACSC, the assessment for 2022 is a per capita fee of \$0.05. This is the same amount as was adopted for 2019-2021.

ACSC protects the authority of municipalities over the monopoly natural gas provider and defends the interests of the residential and small commercial customers within the cities. Cities are the only consumer advocates that work to keep natural gas rates reasonable. The work undertaken by ACSC has saved ratepayers millions of dollars in unreasonable charges. In order to continue to be an effective voice at the Railroad Commission, at the Legislature, and in the courts, ACSC must have your support. Please take action to pay the membership assessment as soon as possible. Payment of the membership assessment fee shall be deemed to be in agreement with the terms of the ACSC participation agreement.

Although ACSC does not require that your city take action by resolution to approve the assessment, some members have requested a model resolution authorizing payment of the 2022 membership assessment. To assist you in the assessment process, we have provided the following documents for your use:

- ACSC December 2021 Newsletter
- Model resolution approving the 2022 assessment (optional, provided for those cities that have requested a resolution to authorize payment)
- Model staff report supporting the resolution
- List of Atmos Cities Steering Committee members
- 2022 Assessment invoice
- 2021 Assessment invoice and statement (only included if not yet paid)
- Blank member contact form to update the distribution lists

Please forward the membership assessment fee and, if applicable, the signed resolution to Brandi Stigler, Atmos Cities Steering Committee, c/o City Attorney’s Office, Mail Stop 63-0300, 101 S. Mesquite St., Suite 300, Arlington, Texas 76010. Checks should be made payable to: *Atmos Cities Steering Committee*.

If you have any questions, please contact ACSC Chair Person, Jennifer Richie (254/750-5688). ACSC’s counsel, Thomas Brocato (tbrocato@lglawfirm.com) at 512/322-5857 is also available to assist you.

RESOLUTION NO. 2022-100R

A RESOLUTION AUTHORIZING CONTINUED PARTICIPATION WITH THE ATMOS CITIES STEERING COMMITTEE; AND AUTHORIZING THE PAYMENT OF FIVE CENTS PER CAPITA TO THE ATMOS CITIES STEERING COMMITTEE TO FUND REGULATORY AND RELATED ACTIVITIES RELATED TO ATMOS ENERGY CORPORATION

WHEREAS, the City of Roanoke is a regulatory authority under the Gas Utility Regulatory Act (GURA) and has exclusive original jurisdiction over the rates and services of Atmos Energy Corporation, Mid-Tex Division (Atmos) within the municipal boundaries of the city; and

WHEREAS, the Atmos Cities Steering Committee (ACSC) has historically intervened in Atmos rate proceedings and gas utility related rulemakings to protect the interests of municipalities and gas customers residing within municipal boundaries; and

WHEREAS, ACSC is participating in Railroad Commission dockets and projects, as well as court proceedings and legislative activities, affecting gas utility rates; and

WHEREAS, the City is a member of ACSC; and

WHEREAS, in order for ACSC to continue its participation in these activities which affects the provision of gas utility service and the rates to be charged, it must assess its members for such costs; NOW THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS:

I.

That the City is authorized to continue its membership with the Atmos Cities Steering Committee to protect the interests of the City of Roanoke and protect the interests of the customers of Atmos Energy Corporation, Mid-Tex Division residing and conducting business within the City limits.

II.

The City is further authorized to pay its 2022 assessment to the ACSC in the amount of five cents (\$0.05) per capita.

III.

A copy of this Resolution and approved assessment fee payable to “*Atmos Cities Steering Committee*” shall be sent to:

Brandi Stigler
Atmos Cities Steering Committee
c/o Arlington City Attorney’s Office, Mail Stop 63-0300
101 S. Mesquite St., Suite 300
Arlington, Texas 76010

PRESENTED AND PASSED on this the 25th day of January, 2022, by a vote of _____ ayes and _____ nays at a regular meeting of the City Council of the City of Roanoke, Texas.

Signature
Carl E. Gierisch, Jr., Mayor

ATTEST:

Signature
April S. Hill, City Secretary

APPROVED AS TO FORM:
City Attorney

BY _____
Jeff Moore

City of Arlington, c/o Atmos Cities Steering Committee
 Attn: Brandi Stigler
 101 S. Mesquite St., Ste 300
 MS #63-0300
 Arlington, TX 76010

Invoice

Date	Invoice #
1/4/2022	22-128

Bill To
City of Roanoke

Item	Population	Per Capita	Amount
2022 Membership Assessment	9,753	0.05	487.65
Please make check payable to: Atmos Cities Steering Committee and mail to Atmos Cities Steering Committee, Attn: Brandi Stigler, Arlington City Attorney's Office, 101 S. Mesquite St., Ste 300, MS #63-0300, Arlington, Texas 76010		Total	\$487.65

December 2021



Railroad Commission Considers Gas Curtailments

In response to this year's devastating power outages—and with an eye toward maintaining natural gas supplies for critical electricity generation — the Texas Railroad Commission has proposed changes to long-standing rules governing emergency natural gas curtailments.

The proposed new rules would replace a 1970s-era rule known as “Order 489” relating to gas deliveries during “curtailment events,” i.e., when gas utilities lack sufficient supply to serve all customers. Railroad staff proposed the rules on November 8, are accepting stakeholder comments through January 7, and they would take effect on April 1.

In specific terms, the proposed rules would amend a section of the Texas Administrative Code (16 TAC § 7.455) relating to curtailment standards. The proposed rules likewise repeal a section of the Texas Administrative Code (16 TAC § 7.305) relating to the agency's existing curtailment program. The new rules broadly parallel emergency guidelines that the Railroad Commission issued in February in response to Winter Storm Uri.

The proposed rules enumerate different categories of gas service by order of priority, with the lowest priority service being the first in line for curtailments during shortage situations. The highest priority categories include: 1) firm deliveries of natural gas to human needs customers and firm deliveries of natural gas to local distribution systems that serve human needs customers; 2) firm deliveries of natural gas to electric generation facilities; and 3) firm deliveries of natural gas to industrial and commercial users of the minimum amount required to prevent physical harm to plant facilities, plant personnel, or the public.

The rules enumerate other priority categories, make a distinction between “firm” and “interruptible” deliveries, and establish that “firm” gas service has a higher priority than “interruptible” gas service. However, the proposed rules do not define “firm deliveries,” and they define “interruptible deliveries” only as “subject to interruption or curtailment under mutually agreed upon contracts and/or tariffs.” The proposed rule also appears to allow a utility to provide “interruptible deliveries” to human needs customers.

The rules require gas utilities to file a curtailment plan with the Railroad Commission within 90 days of the effective date of the rules. Utilities also must maintain curtailment emergency contact information with the commission.

Stakeholder comments in the rulemaking are due by January 7. To view the proposed rules visit the RRC website at <https://www.rrc.texas.gov/general-counsel/rules/proposed-rules/> under the “Chapter 7. Gas Services” section.

Railroad Commission Approves Securitizing \$3.4 Billion in Gas Costs

The Texas Railroad Commission has authorized the use of \$3.4 billion in long-term debt to pay for natural gas consumed during Winter Storm Uri.

The regulatory decision means that ratepayers will end up paying over many years—potentially up to 30—for fuel consumed during a single month. The Railroad Commission approved the debt financing arrangement on November 10.

Atmos, CenterPoint, Texas Gas Service, and eight other gas utilities applied for financial recovery under the debt financing deal, which utilities have promoted as a method to help gas utility customers avoid rate shock. Under ordinary circumstances, the cost of natural gas consumed by utility customers would have flowed directly into monthly bills. During Winter Storm Uri, however, gas prices spiked to intolerable levels, so gas utilities instead set aside those costs as “regulatory assets” to deal with later. The bond financing approved on November 10 will allow the utilities to receive reimbursements for those expenses.

The downside for ratepayers is that they will have to pay off the bonds over many years—and with interest. The size of the resulting bill charges remains unclear. A separate state agency known as the Texas Public Finance Authority will issue the bonds.

Ninety Days to Issue Financing Order

“The Railroad Commission has 90 days to issue a financing order which instructs the Texas Public Finance Authority to issue bonds,” an official with Texas Gas Service, a gas utility, said in an email distributed to the media. “After that, the Texas Public Finance Authority has 180 days to issue the bonds. As this process unfolds, the length of time for recovery and the rate charged to customers will be determined.”

Under the agency decision, Atmos Energy can receive reimbursements for approximately \$2 billion in fuel costs, CenterPoint can receive approximately \$1.1 billion, and TGS can receive \$197.3 million. Other utilities eligible for recovery include Bluebonnet, Corix, EPCOR, SiEnergy, UniGas, TGS West Texas Service Area, and CoServ.

Settlement Agreement

Under a settlement with the Atmos Cities Steering Committee and others, Atmos agreed to reduce its regulatory asset by more than \$9 million. Similarly, CenterPoint agreed to reduce its regulatory asset by \$39.7 million.

The bond financing process (known as securitization) received earlier authorization by the Texas Legislature under House Bill 1520. Utilities promoted the bond financing technique to lawmakers as a way to spread out the pain from

the massive price spikes, with one utility explaining in testimony that it paid 22 times more than usual for gas during the weather emergency. Others reported that the commodity cost of natural gas spiked to levels 150 times greater than typical. “It would be like you're going to fill up your gas tank during the storm . . . and instead of paying \$50-ish to fill up your tank, the register there reads . . . \$6,000 to \$7,000,” one former utility official said in a media interview.

By law, gas distribution utilities such as Atmos, CenterPoint, and TGS cannot profit from the sale of the gas commodity, but instead pass those costs directly to end users without markups. However, some gas suppliers made massive profits from the price surge, according to reports.

UTILITY

STIPULATED MAXIMUM
REGULATORY ASSET
AMOUNT

Atmos	\$2,021,888,534
Bluebonnet	\$1,962,731
CenterPoint	\$1,099,929,626
Corix	\$294,407
EPCOR	\$11,296,221
SiEnergy	\$18,795,497
TGS	\$197,342,375
UniGas	\$32,431,370
TGS WTSA	\$59,663,320
CoServ	\$67,224,791



PUC, Railroad Commission Adopt Parallel Rules related to Critical Facility Designation

Rules governing how natural gas facilities receive critical designations as a means to protect the power grid received approval November 30 by twin regulatory agencies.

Those agencies, the Public Utility Commission and the Texas Railroad Commission, regulate the electric and gas industries respectively. Together, the new rules pertain to the identification of “critical load” natural gas facilities such as wells, gas-processing plants and pipelines. Facing a statutory deadline, the agencies adopted the guidelines during parallel meetings held within a few hours of each other.

The rules are important because failures by the gas industry have been identified as a major contributing factor to the winter emergency that left four million Texans without power last February. Beyond providing home heating service, natural gas suppliers also fuel electric generators. The rules are intended to give electric utilities more visibility regarding which gas facilities play critical roles for grid reliability, and this, in turn, will allow electric utilities to make better decisions regarding which they should prioritize for service during emergencies.

RAILROAD COMMISSION ACTS

On the Railroad Commission side, the agency’s three commissioners adopted a new rule, 16 TAC §3.65, as well as amendments to 16 TAC §3.107 regarding critical infrastructure designations. These changes implement provisions from Senate Bill 3 and House Bill 3648 from the 87th Legislative Session.

The Railroad Commission’s new rules incorporate many of the suggestions made by stakeholders, including suggestions made by the Atmos Cities Steering Committee, a city coalition. For instance, the Railroad Commission accepted ACSC comments on the over-broad definition of critical loads. (The city coalition had argued that if the rules designate too many facilities as critical, then electric utilities would waste resources and make inefficient decisions trying to protect them from disconnection.) The Commission staff also referenced the ACSC in a comments summary accompanying the new rules.

Key changes included in the adopted version of the rules, as opposed to the previous draft include:

- Adopts the PUC definition of energy emergency.
- Stipulates that certain categories of major gas providers must receive a critical designation, without a possibility of opting out.
- Customers not designated as critical may file an application for critical status noting their role in the supply chain that makes them critical.
- Those facilities requesting an opt-out exception must provide evidence as to why the exception is appropriate.

Also of note, the preamble clarifies that “critical” designations apply only to reporting requirements, and not, *per se*, to weatherization requirements. However, the preamble discusses how such “critical” definitions may be the basis for future weatherization requirements, which the Commission will release later.

The distinction is important because under the new rules certain facilities can opt-out of the reporting requirements by paying a \$150 fee. It remains to be determined whether such payment also will allow for opt-out of the yet-to-be-determined weatherization requirements.

PUBLIC UTILITY COMMISSION ACTS

The PUC, meanwhile, adopted amendments to implement new PURA §38.074, also added by HB 3648 and SB 3. The new rules require a critical natural gas facility, or a “critical customer” as described under §3.65, to provide critical customer information to the utility from which it receives electric delivery service. They also require the utility to incorporate this information into its load-shed and power restoration planning.

“This is a fundamental reason that the Texas power grid will be more resilient this winter than last winter,” PUC Chairman Peter Lake said. “For the first time ever, both of those industries will know where the key pieces are and how to keep both sides of that equation functioning in an extreme winter event.”

Almost nowhere else in the United States do two separate agencies regulate local gas and electric industries. However, PUC staffers said they worked closely with their Railroad Commission counterparts to devise rules that will work seamlessly across both industries. For instance, natural gas facilities under the new rules will have the ability to submit a single form with all the information transmission and distribution utilities need to identify critical gas units. The grid operator will have access to this information through a single portal.

“As everyone knows, one of the failings from the state's perspective from February was the lack of coordination between the electric and gas industries,” PUC general counsel David Smeltzer said. “We got clear direction from the Legislature that can't happen again, and one of the aspects of that was electricity not going to the gas people ... It's kind of a cycle.”

GAS NOT “PRIMARY CULPRIT” ACCORDING TO RAILROAD COMMISSION CHAIR

Ultimately the policy changes stem from public outcry following to the February power emergency — an emergency that the Federal Energy Regulatory Commission and the North American Electric Reliability Corp. have characterized as “the largest controlled firm load shed event in US history.”

During the Railroad Commission meeting, Chairman Wayne Christian pushed back against published reports that the state's natural gas industry and lax regulation by his agency largely were to blame for the widespread blackouts. “While no form of energy performed perfectly during Winter Storm Uri, the insistence that natural gas producers are the primary culprit behind the February blackouts is pure hyperbole,” he said.

According to reports, gas-fired generation offline hit a peak of about 18 gigawatts, as compared with about 52.3 GW of all types of generation offline at peak. ERCOT's winter 2020-21 Seasonal Assessment of Resource Adequacy lists 55.7 GW of gas-fired generation capacity.

Railroad Commissioner Jim Wright said that Texas has sufficient natural gas storage capacity to supply about 8 million homes for a month. He said the Railroad Commission encourages gas-fired generators to “fully utilize this capacity for this coming winter” but that agency “has no authority to require operators to release gas at a specific time or, for that matter, at all.”

To view the adopted Railroad Commission rules, go to visit the RRC website at <https://www.rrc.texas.gov/general-counsel/rules/proposed-rules/> and search under “Chapter 3: Oil and Gas.” To view the PUC rules, go to PUC interchange at interchange.puc.texas.gov, and search under Docket no. 52345.

RRM Update

You may recall that Atmos has a statutory right to an annual increase in rates based on additional plant investment via a process known as the Gas Reliability Infrastructure Program (GRIP). By contrast, the Rate Review Mechanism (RRM) is a negotiated substitute for GRIP that only exists through the exercise of the Cities' original jurisdiction over rates and services.

As we have previously reported, Atmos submitted its 2021 RRM tariff filings for its Mid-Tex division in April. The case has settled and has received approval from city councils.

Under Atmos Mid-Tex's settlement, rates will increase by \$22.78 million within the area of Atmos Cites Steering Committee member cities. This represents a more than 27% reduction from the \$31.4 million initially proposed by Atmos Mid-Tex. The settlement also includes a two-month delay in the effective date, which ACSC's consultants have determined will result in an additional \$3.8 million in one-time savings. Atmos Mid-Tex claims that in 2020 it replaced 199 miles of steel pipe, 168 miles of cast iron pipe, and more than 34,700 steel service lines

Also, recall that ordinances adopted by city councils define and control the RRM process. That is, RRM tariffs reflected in city ordinances are essentially contractual commitments agreed to by both Atmos and the municipalities. The money-saving concession to change the implantation date is only possible

because of Atmos' concession, and that delay should have relieved some pressure on city councils for action during the ongoing stressful pandemic.

Looking forward

According to a recent financial filing, the company anticipates an additional RRM filing during April 2022 for its Mid-Tex Division.



Texas' Underground Storage Facilities Adding to Natural Gas Reserves

Gas suppliers during October added approximately 100 billion cubic feet in natural gas to underground storage reserves in the state, according to information from the Texas Railroad Commission.

Agency officials say the increased gas reserves should help Texas avoid energy supply disruptions during the upcoming winter season. Researchers have blamed such disruptions—among other factors—for the rolling blackouts this year.

“Natural gas storage is a great way to avoid and mitigate any potential supply disruptions,” said Railroad Commission chief engineer Ted Wooten in an October 27 release.

Natural gas utilities and electric power generators both can benefit from stored gas. Conversely, a disruption in the supply of natural gas can undermine operations at electric plants, thereby contributing to power outages. Such disruptions were partially to blame for last February’s outages, according to a recent University of Texas report.

By law, operators of the underground facilities—including both depleted oil and gas reservoirs and mined salt caverns—must report storage information to the Railroad Commission. The agency in turn reports underground gas storage statistics on its website.

“The more gas we have in reserve, the better prepared we are,” said Mr. Wooten.



Atmos Quarterly Financial Reports

Atmos Energy—a company that serves 3 million distribution customers across eight states—released its earnings report for the 2021 fiscal year that included summaries of its company-wide earnings, recaps of its annual earnings data, summaries of its long-term capital spending plans, and its data specific to Texas. Atmos released this information in a public statement after market closing on November 10 and during a conference call with financial analysts on November 11.

Earnings Summary

In a November financial release, Atmos Energy reported consolidated net income of \$665.6 million for the fiscal year ending September 30, 2021, including \$48.7 million for the fourth fiscal quarter.

The Dallas-based energy company also reported fiscal year-to-date capital spending of nearly \$2 billion, including approximately \$1 billion to repair and replace transmission and distribution pipelines, \$240 million in service line replacement, and \$45 million to enhance storage and compression capabilities.

According to its November filing, Atmos receives 90% of its expense recoveries within six months of making rate filings due to the use of interim rate mechanisms such as the Gas Reliability Infrastructure Program (GRIP).

Atmos expects capital expenditures in the range of \$2.4 billion to \$2.5 billion during the upcoming fiscal year. The company reports that approximately 88% of its capital spending corresponds to safety and reliability investments.

Atmos projects that average monthly customer bills will increase from \$58 in 2021 to \$75 in 2026—or by approximately 30%. It reported adding 51,000 new customers during the 2021 fiscal year.

ADDITIONAL COMPANY-WIDE HIGHLIGHTS

- Distribution operating income increased by \$90.3 million to \$618.5 million for FY 2021, compared with \$528.2 million for the prior fiscal year. The increase reflects a \$150.6 million increase in rates and customer growth.
- Pipeline and storage operating income decreased by \$9.4 million to \$286.5 million for FY 2021, as compared with \$295.9 million for the prior fiscal year. The year-to-year decrease is primarily attributable to a \$17.1 million increase in system maintenance costs, a \$17 million increase in depreciation and property tax expenses due to increased capital investments, and other factors. However, a \$56.2 million income increase from GRIP filings approved in FY 2020 and FY 2021 partially offset the increases in expenses.
- The company's equity capitalization ratio as of September 30, 2021 was 51.9%. This compares with 60% as of September 30, 2020. This higher capitalization ratio was largely due to a \$2.2 billion debt issuance in March 2021 to

finance gas costs incurred during Winter Storm Uri. Excluding the \$2.2 billion of incremental financing, the company's equity capitalization ratio would have been 60.1% as of September 30, 2021.

- The company reported replacing approximately 1,100 miles of distribution and transmission pipe during FY 2021. This represents approximately 1.4% of all such pipe on its system. The company remains on track to replace all cast iron pipe by the end of the calendar year.
- The company replaced 38,000 steel service lines during FY 2021. This represents a 4.8% reduction in such lines.

CAPITAL SPENDING THROUGH 2026

The company predicts that it will make \$13 billion to \$14 billion in capital investments through 2026, 80% of which it will allocate to improving safety. This new spending includes \$10 billion on the Atmos distribution system, and it will finance the replacement of 4,000 to 5,000 miles of distribution system pipe—or 6–8% of the total of such pipe on the system. The company also plans to replace 100,000 to 150,000 steel service lines.

Atmos will allocate an additional \$4 billion in capital expenditures to its transmission system. This includes replacing 800–1,200 miles of Atmos Pipeline Texas transmission pipe through 2026.

2021 ACSC Meetings

December 9

2021 Officers

Chair—Jennifer Richie (Waco)
Vice Chair—Meg Jakubik (Bedford)
Secretary—Adrienne Lothery (Colleville)

For more questions or concerns regarding any ACSC matter or communication, please contact the following representative, who will be happy to provide assistance:



Thomas L. Brocato
(512) 322-5857
tbrocato@lglawfirm.com

Jamie Mauldin
(512) 322-5890
jmauldin@lglawfirm.com

ACSC Cities (179 Members)

- | | | |
|----------------------------|---------------------------|---------------------------|
| 1. Abilene | 61. Fairview | 121. Northlake |
| 2. Addison | 62. Farmers Branch | 122. Oak Leaf |
| 3. Albany | 63. Farmersville | 123. Ovilla |
| 4. Allen | 64. Fate | 124. Palestine |
| 5. Alvarado | 65. Flower Mound | 125. Pantego |
| 6. Angus | 66. Forest Hill | 126. Paris |
| 7. Anna | 67. Forney | 127. Parker |
| 8. Argyle | 68. Fort Worth | 128. Pecan Hill |
| 9. Arlington | 69. Frisco | 129. Petrolia |
| 10. Aubrey | 70. Frost | 130. Plano |
| 11. Azle | 71. Gainesville | 131. Ponder |
| 12. Bedford | 72. Garland | 132. Pottsboro |
| 13. Bellmead | 73. Garrett | 133. Prosper |
| 14. Benbrook | 74. Georgetown | 134. Quitman |
| 15. Beverly Hills | 75. Glenn Heights | 135. Red Oak |
| 16. Blossom | 76. Grand Prairie | 136. Reno (Parker County) |
| 17. Blue Ridge | 77. Grapevine | 137. Rhome |
| 18. Bowie | 78. Groesbeck | 138. Richardson |
| 19. Boyd | 79. Gunter | 139. Richland |
| 20. Bridgeport | 80. Haltom City | 140. Richland Hills |
| 21. Brownwood | 81. Harker Heights | 141. River Oaks |
| 22. Bryan | 82. Haskell | 142. Roanoke |
| 23. Buffalo | 83. Haslet | 143. Robinson |
| 24. Burkburnett | 84. Hewitt | 144. Rockwall |
| 25. Burleson | 85. Highland Park | 145. Roscoe |
| 26. Caddo Mills | 86. Highland Village | 146. Rowlett |
| 27. Canton | 87. Honey Grove | 147. Royse City |
| 28. Carrollton | 88. Hurst | 148. Sachse |
| 29. Cedar Hill | 89. Hutto | 149. Saginaw |
| 30. Celeste | 90. Iowa Park | 150. Sansom Park |
| 31. Celina | 91. Irving | 151. Seagoville |
| 32. Centerville | 92. Justin | 152. Sherman |
| 33. Cisco | 93. Kaufman | 153. Snyder |
| 34. Clarksville | 94. Keene | 154. Southlake |
| 35. Cleburne | 95. Keller | 155. Springtown |
| 36. Clyde | 96. Kemp | 156. Stamford |
| 37. College Station | 97. Kennedale | 157. Stephenville |
| 38. Colleyville | 98. Kerens | 158. Sulphur Springs |
| 39. Colorado City | 99. Kerrville | 159. Sweetwater |
| 40. Comanche | 100. Killeen | 160. Temple |
| 41. Commerce | 101. Krum | 161. Terrell |
| 42. Coolidge | 102. Lakeside | 162. The Colony |
| 43. Coppell | 103. Lake Dallas | 163. Trophy Club |
| 44. Corinth | 104. Lake Worth | 164. Tyler |
| 45. Crandall | 105. Lancaster | 165. University Park |
| 46. Cross Roads | 106. Lavon | 166. Venus |
| 47. Crowley | 107. Lewisville | 167. Vernon |
| 48. Dalworthington Gardens | 108. Little Elm | 168. Waco |
| 49. Denison | 109. Lorena | 169. Watauga |
| 50. Denton | 110. Madisonville | 170. Waxahachie |
| 51. DeSoto | 111. Malakoff | 171. Westlake |
| 52. Draper | 112. Mansfield | 172. Westover Hills |
| 53. Duncanville | 113. McKinney | 173. Westworth Village |
| 54. Early | 114. Melissa | 174. Whitesboro |
| 55. Eastland | 115. Mesquite | 175. White Settlement |
| 56. Edgecliff Village | 116. Midlothian | 176. Wichita Falls |
| 57. Emory | 117. Murphy | 177. Wilmer |
| 58. Ennis | 118. Newark | 178. Woodway |
| 59. Euless | 119. Nocona | 179. Wylie |
| 60. Everman | 120. North Richland Hills | |



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: Travis Street and Austin Street Reconstruction

MEETING DATE: January 25, 2022

DEPARTMENT: Public Works

ITEM SUMMARY:

Consider approval to award bid to McClendon Construction Co., Inc. for the downtown street reconstruction of Travis Street and the remaining portion of Austin Street located between Pine and Walnut, for the amount not to exceed \$1,083,150.05.

INFORMATION:

The approval of the street reconstruction project will include the reconstruction of the final portion of Austin between Pine and Walnut and the reconstruction of Travis Street. The project will include concrete streets and curb/gutter drainage improvements.

STAFF RECOMMENDATION:

Staff recommends approval

SPECIAL CONSIDERATION:

FINANCIAL CONSIDERATION:

The total financial impact is one million eighty-three thousand one hundred fifty dollars and five cents. (\$1,083,150.05)

ATTACHMENTS:

1. 15024-0004-00 ROA
2. Roanoke Downtown Street Reconstruction - Austin Street-Travis Street - Bid Tab

January 20, 2022

City of Roanoke, Texas
Attn: Mr. Shawn Wilkinson, Public Works Director
265 Marshall Creek Road
Roanoke, Texas 76262

Re: Downtown Street Reconstruction – Austin Street & Travis Street
Recommendation of Award

Dear Mr. Wilkinson:

Jones|Carter assisted the City in receiving bids for the above referenced project in your City Hall large conference room on December 14, 2021 at 11:00 A.M. Bids were publicly opened and read aloud at that time.

Eight (8) contractors submitted bids for this work. A Bid Tabulation Summary is enclosed for your review. McClendon Construction Co., Inc. submitted the lowest combination of Base Bid plus Alternate Bid in the amount of \$1,083,150.05.

While we have not worked with McClendon Construction, we made contact with their provided references and determined that their experience in the local area on similar projects makes them an acceptable contractor for this project.

In accordance with our findings, we recommend the referenced contract be awarded to McClendon Construction Co., Inc. based on their bid in the amount of \$1,083,150.05. Please advise should you have any questions or require further information regarding this matter.

Sincerely,



David Leslie, PE
Senior Project Manager

Enclosure: As Stated

K:\15024\15024-0004-00 Downtown Street Reconstructon - Austin S\Project Management\Correspondence\15024-0004-00 ROA.doc

BID TABULATION

OWNER: City of Roanoke				BID NO. 1		BID NO. 2		BID NO. 3		BID NO. 4		BID NO. 5	
PROJECT: Roanoke Downtown Street Reconstruction - Austin Street - Travis Street				McClendon Construction Co, Inc		HQS Construction, LLC		XIT Paving & Construction, Inc.		Rebcon, In.		Stabile & Winn, Inc.	
DATE: December 14, 2021				PO Box 999		PO Box 250771		3934 S. Hwy 287		1868 W. Northwest Hwy		PO Box 79380	
ENGINEER: Jones Carter				Burleson, TX 76097		Plano, TX 75025		Waxahachie, TX 75165		Dallas, TX 75220		Saginaw, TX 76179	
JOB NO. : 15024-0004-00				Time: 11:00AM									
ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
BASE BID													
Roadway Improvements													
101	Mobilization	LS	1	\$38,550.00	\$38,550.00	\$48,500.00	\$48,500.00	\$53,000.00	\$53,000.00	\$45,000.00	\$45,000.00	\$50,000.00	\$50,000.00
102	Right-of-Way Preparation	STA	9	\$2,900.00	\$26,100.00	\$1,000.00	\$9,000.00	\$5,500.00	\$49,500.00	\$7,500.00	\$67,500.00	\$3,000.00	\$27,000.00
103	Traffic Control, Temporary Signs, and Barricades	LS	1	\$17,500.00	\$17,500.00	\$27,000.00	\$27,000.00	\$55,000.00	\$55,000.00	\$29,000.00	\$29,000.00	\$20,000.00	\$20,000.00
104	Temporary Erosion Control	LS	1	\$10,950.00	\$10,950.00	\$3,000.00	\$3,000.00	\$7,500.00	\$7,500.00	\$22,000.00	\$22,000.00	\$1,500.00	\$1,500.00
105	Construction Layout	LS	1	\$9,500.00	\$9,500.00	\$8,500.00	\$8,500.00	\$25,000.00	\$25,000.00	\$10,000.00	\$10,000.00	\$15,000.00	\$15,000.00
106	Unclassified Street Evacuation	CY	1,115	\$65.00	\$72,475.00	\$25.00	\$27,875.00	\$40.00	\$44,600.00	\$38.00	\$42,370.00	\$35.00	\$39,025.00
107	Sawcut, Remove & Dispose of Existing Pavement (All Depths and Types)	SY	3,260	\$17.00	\$55,420.00	\$22.50	\$73,350.00	\$11.00	\$35,860.00	\$11.00	\$35,860.00	\$9.00	\$29,340.00
108	Subgrade Lime Treatment (Roadway) (6" Thick)	SY	3,283	\$7.50	\$24,622.50	\$10.00	\$32,830.00	\$10.00	\$32,830.00	\$7.00	\$22,981.00	\$6.00	\$19,698.00
109	Hydrated Lime (Slurry)	TON	54	\$215.00	\$11,610.00	\$180.00	\$9,720.00	\$220.00	\$11,880.00	\$189.00	\$10,206.00	\$210.00	\$11,340.00
110	Concrete Pavement (w/ Monolithic Curb)(Reinforced)(6" Thick)	SY	2,981	\$58.50	\$174,388.50	\$72.00	\$214,632.00	\$64.80	\$193,168.80	\$91.00	\$271,271.00	\$83.70	\$249,509.70
111	Reinforced Concrete Driveway (6" Thick)	SY	633	\$88.00	\$55,704.00	\$72.00	\$45,576.00	\$74.00	\$46,842.00	\$94.00	\$59,502.00	\$78.75	\$49,848.75
112	Temporary Flex Base (6" Thick)	SY	664	\$5.00	\$3,320.00	\$6.00	\$3,984.00	\$22.00	\$14,608.00	\$47.00	\$31,208.00	\$15.60	\$10,358.40
113	Sidewalk (Concrete) (Reinforced) (4" Thick)	SY	850	\$73.00	\$62,050.00	\$60.00	\$51,000.00	\$64.00	\$54,400.00	\$75.00	\$63,750.00	\$72.00	\$61,200.00
114	Colored Stamped Concrete Crosswalk	SY	140	\$160.00	\$22,400.00	\$130.00	\$18,200.00	\$254.00	\$35,560.00	\$165.00	\$23,100.00	\$187.00	\$26,180.00
115	Barrier Free Ramp	SY	12	\$250.00	\$3,000.00	\$320.00	\$3,840.00	\$208.00	\$2,496.00	\$225.00	\$2,700.00	\$150.00	\$1,800.00
116	Concrete Sidewalk Steps (Travis Sta. 6+30 Right)	LS	1	\$500.00	\$500.00	\$2,000.00	\$2,000.00	\$1,710.00	\$1,710.00	\$1,500.00	\$1,500.00	\$500.00	\$500.00
117	Topsoil (6" Thick)	SY	2,289	\$5.00	\$11,445.00	\$5.00	\$11,445.00	\$7.00	\$16,023.00	\$9.00	\$20,601.00	\$4.50	\$10,300.50
118	Slab Sodding	SY	2,289	\$5.50	\$12,589.50	\$8.00	\$18,312.00	\$9.50	\$21,745.50	\$9.00	\$20,601.00	\$5.50	\$12,589.50
Roadway Improvements Subtotal				\$612,124.50		\$608,764.00		\$701,723.30		\$779,150.00		\$635,189.85	
Drainage Improvements													
201	Curb Inlets (10')	EA	4	\$6,650.00	\$26,600.00	\$8,000.00	\$32,000.00	\$6,845.00	\$27,380.00	\$7,000.00	\$28,000.00	\$6,100.00	\$24,400.00
202	Curb Inlets (15')	EA	1	\$9,000.00	\$9,000.00	\$12,000.00	\$12,000.00	\$8,920.00	\$8,920.00	\$9,500.00	\$9,500.00	\$10,100.00	\$10,100.00
203	Type 2 Curb Inlet (15')	EA	1	\$17,050.00	\$17,050.00	\$14,000.00	\$14,000.00	\$15,775.00	\$15,775.00	\$18,300.00	\$18,300.00	\$21,000.00	\$21,000.00
204	Grate Inlet (2'X2')	EA	7	\$3,500.00	\$24,500.00	\$5,000.00	\$35,000.00	\$4,656.00	\$32,592.00	\$3,850.00	\$26,950.00	\$6,500.00	\$45,500.00
205	4' Manhole	EA	2	\$6,850.00	\$13,700.00	\$7,000.00	\$14,000.00	\$2,312.00	\$4,624.00	\$7,325.00	\$14,650.00	\$7,300.00	\$14,600.00
206	Cast In Place Manhole Around Existing RCP	EA	2	\$7,550.00	\$15,100.00	\$5,000.00	\$10,000.00	\$7,565.00	\$15,130.00	\$8,057.50	\$16,115.00	\$9,400.00	\$18,800.00
207	Connect to Existing Storm Sewer Pipe	EA	1	\$870.00	\$870.00	\$1,500.00	\$1,500.00	\$1,665.00	\$1,665.00	\$957.00	\$957.00	\$825.00	\$825.00
208	Culvert Pipe (8" PVC) with Cast in Place and Treatments	LS	1	\$4,950.00	\$4,950.00	\$2,500.00	\$2,500.00	\$3,390.00	\$3,390.00	\$8,250.00	\$8,250.00	\$8,800.00	\$8,800.00
209	Storm Drain Pipe (12" RCP)	LF	378	\$115.00	\$43,470.00	\$80.00	\$30,240.00	\$78.00	\$29,484.00	\$115.00	\$43,470.00	\$115.00	\$43,470.00
210	Storm Drain Pipe (18" RCP)	LF	51	\$130.00	\$6,630.00	\$85.00	\$4,335.00	\$107.00	\$5,457.00	\$131.00	\$6,681.00	\$131.00	\$6,681.00

OWNER: City of Roanoke				BID NO. 1 McClendon Construction Co, Inc PO Box 999 Burleson, TX 76097		BID NO. 2 HQS Construction, LLC PO Box 250771 Plano, TX 75025		BID NO. 3 XIT Paving & Construction, Inc. 3934 S. Hwy 287 Waxahachie, TX 75165		BID NO. 4 Rebcon, In. 1868 W. Northwest Hwy Dallas, TX 75220		BID NO. 5 Stabile & Winn, Inc. PO Box 79380 Saginaw, TX 76179	
PROJECT: Roanoke Downtown Street Reconstruction - Austin Street - Travis Street													
DATE: December 14, 2021Time: 11:00AM													
ENGINEER: Jones Carter													
JOB NO. : 15024-0004-00													
ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
211	Storm Drain Pipe (21" RCP)	LF	326	\$140.00	\$45,640.00	\$90.00	\$29,340.00	\$108.00	\$35,208.00	\$143.00	\$46,618.00	\$147.00	\$47,922.00
212	Storm Drain Pipe (24" RCP)	LF	47	\$154.00	\$7,238.00	\$95.00	\$4,465.00	\$140.00	\$6,580.00	\$159.00	\$7,473.00	\$156.00	\$7,332.00
213	Trent Safety System for Storm Drain	LF	802	\$2.50	\$2,005.00	\$2.00	\$1,604.00	\$1.75	\$1,403.50	\$3.00	\$2,406.00	\$2.00	\$1,604.00
Drainage Improvements Subtotal				\$216,753.00		\$190,984.00		\$187,608.50		\$229,370.00		\$251,034.00	
Water Improvements													
301	Water Main Pipe (8" PVC C-900, DR-18)	LF	783	\$85.35	\$66,829.05	\$60.00	\$46,980.00	\$54.00	\$42,282.00	\$83.00	\$64,989.00	\$95.00	\$74,385.00
302	Water Meter Relocation	EA	6	\$1,250.00	\$7,500.00	\$1,000.00	\$6,000.00	\$835.00	\$5,010.00	\$1,364.00	\$8,184.00	\$280.00	\$1,680.00
303	New Water Meter Installation	EA	5	\$1,250.00	\$6,250.00	\$1,500.00	\$7,500.00	\$792.00	\$3,960.00	\$1,364.00	\$6,820.00	\$280.00	\$1,400.00
304	Connection to Existing Water Main	EA	6	\$1,550.00	\$9,300.00	\$2,500.00	\$15,000.00	\$2,090.00	\$12,540.00	\$1,700.00	\$10,200.00	\$2,200.00	\$13,200.00
305	Water Service (Short) (1")	EA	9	\$1,900.00	\$17,100.00	\$1,500.00	\$13,500.00	\$1,185.00	\$10,665.00	\$1,900.00	\$17,100.00	\$1,900.00	\$17,100.00
306	Water Service (Long) (1")	EA	4	\$2,000.00	\$8,000.00	\$2,000.00	\$8,000.00	\$1,915.00	\$7,660.00	\$2,050.00	\$8,200.00	\$2,300.00	\$9,200.00
307	Gate Valve (8")	EA	3	\$2,550.00	\$7,650.00	\$2,000.00	\$6,000.00	\$2,156.00	\$6,468.00	\$2,700.00	\$8,100.00	\$2,350.00	\$7,050.00
308	Abandon Existing Water Main	LF	802	\$16.00	\$12,832.00	\$20.00	\$16,040.00	\$12.00	\$9,624.00	\$18.00	\$14,436.00	\$6.00	\$4,812.00
309	Trench Safety System for Water Main	LF	783	\$1.00	\$783.00	\$2.00	\$1,566.00	\$1.25	\$978.75	\$1.00	\$783.00	\$1.00	\$783.00
Water Improvements Subtotal				\$136,244.05		\$120,586.00		\$99,187.75		\$138,812.00		\$129,610.00	
Miscellaneous Items													
401	Install Speed Limit Sign (w/ Decorative Post)(Type F)(MUTCD R2-1-25)	EA	6	\$1,200.00	\$7,200.00	\$1,000.00	\$6,000.00	\$1,475.00	\$8,850.00	\$1,298.00	\$7,788.00	\$1,900.00	\$11,400.00
402	Remove, Salvage and Install Existing Signs and Post on New Foundation	EA	5	\$1,750.00	\$8,750.00	\$500.00	\$2,500.00	\$2,156.00	\$10,780.00	\$1,900.00	\$9,500.00	\$2,600.00	\$13,000.00
403	Remove and Replace Mailbox	EA	8	\$450.00	\$3,600.00	\$500.00	\$4,000.00	\$235.00	\$1,880.00	\$550.00	\$4,400.00	\$485.00	\$3,880.00
404	Remove and Replace Quintuple Mailbox	EA	1	\$450.00	\$450.00	\$850.00	\$850.00	\$610.00	\$610.00	\$2,700.00	\$2,700.00	\$1,000.00	\$1,000.00
405	Concrete Retaining Wall Extension	LF	22	\$250.00	\$5,500.00	\$7,250.00	\$159,500.00	\$455.00	\$10,010.00	\$395.00	\$8,690.00	\$260.00	\$5,720.00
406	Project Sign	EA	2	\$700.00	\$1,400.00	\$800.00	\$1,600.00	\$690.00	\$1,380.00	\$850.00	\$1,700.00	\$550.00	\$1,100.00
407	Bollard Assembly	EA	5	\$1,250.00	\$6,250.00	\$1,000.00	\$5,000.00	\$1,070.00	\$5,350.00	\$1,750.00	\$8,750.00	\$850.00	\$4,250.00
408	Sprinkler System Protection and Repair	LS	1	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00
409	Audio Video Route Survey	LS	1	\$1,500.00	\$1,500.00	\$1,000.00	\$1,000.00	\$2,500.00	\$2,500.00	\$1,500.00	\$1,500.00	\$250.00	\$250.00
410	Miscellaneous Improvements	LS	1	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00
Miscellaneous Items Subtotal				\$104,650.00		\$250,450.00		\$111,360.00		\$115,028.00		\$110,600.00	
BASE BID TOTAL				\$1,069,771.55		\$1,170,784.00		\$1,099,879.55		\$1,262,360.00		\$1,126,433.85	
LOW BID RANKING W/ BASE				1		4		2		8		3	

OWNER: City of Roanoke				BID NO. 1 McClendon Construction Co, Inc PO Box 999 Burleson, TX 76097		BID NO. 2 HQS Construction, LLC PO Box 250771 Plano, TX 75025		BID NO. 3 XIT Paving & Construction, Inc. 3934 S. Hwy 287 Waxahachie, TX 75165		BID NO. 4 Rebcon, In. 1868 W. Northwest Hwy Dallas, TX 75220		BID NO. 5 Stabile & Winn, Inc. PO Box 79380 Saginaw, TX 76179	
PROJECT: Roanoke Downtown Street Reconstruction - Austin Street - Travis Street													
DATE: December 14, 2021Time: 11:00AM													
ENGINEER: Jones Carter													
JOB NO. : 15024-0004-00													
ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
ALTERNATE BID													
Paving													
501	Painted Pavement Marker (Handicap Symbol)	EA	1	\$750.00	\$750.00	\$800.00	\$800.00	\$825.00	\$825.00	\$825.00	\$825.00	\$550.00	\$550.00
Roadway Improvements Subtotal				\$750.00		\$800.00		\$825.00		\$825.00		\$550.00	
Drainage Items													
601	Curb Inlet (10')	EA	5	\$6,050.00	\$30,250.00	\$7,500.00	\$37,500.00	\$5,889.00	\$29,445.00	\$6,600.00	\$33,000.00	\$10,240.00	\$51,200.00
204	Grate Inlet (2'x2')	EA	-5	\$3,500.00	\$17,500.00	\$5,000.00	\$25,000.00	\$4,656.00	\$23,280.00	\$3,500.00	\$17,500.00	\$6,500.00	\$32,500.00
205	Storm Drain Pipe (18" RCP)	LF	-1	\$119.00	\$119.00	\$80.00	\$80.00	\$78.00	\$78.00	\$104.00	\$104.00	\$115.00	\$115.00
206	Trench Safety System for Storm Drain Pipe	LF	-1	\$2.50	\$2.50	\$2.00	\$2.00	\$1.75	\$1.75	\$2.50	\$2.50	\$2.00	\$2.00
Drainage Improvements Subtotal				\$12,628.50		\$12,418.00		\$6,085.25		\$15,393.50		\$18,583.00	
ALTERNATE BID TOTAL				\$13,378.50		\$13,218.00		\$6,910.25		\$16,218.50		\$19,133.00	
TOTAL (BASE BID + ALTERNATE BID)				\$1,083,150.05		\$1,184,002.00		\$1,106,789.80		\$1,278,578.50		\$1,145,566.85	
LOW BID RANKING W/ ALTERNATE				1		4		2		8		3	

OWNER: City of Roanoke				BID NO. 6 Nu-Way Construction, L.L.C. PO Box 270416 Flower Mound, TX 75027		BID NO. 7 Reliable Paving Inc. 1903 Peyco Dr. N. Arlington, TX 76001		BID NO. 8 2L Construction, LLC PO Box 397 Rhome, TX 76078	
PROJECT: Roanoke Downtown Street Reconstruction - Austin Street - Travis Street									
DATE: December 14, 2021Time: 11:00AM									
ENGINEER: Jones Carter									
JOB NO. : 15024-0004-00									
ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
BASE BID									
Roadway Improvements									
101	Mobilization	LS	1	\$75,000.00	\$75,000.00	\$60,000.00	\$60,000.00	\$140,000.00	\$140,000.00
102	Right-of-Way Preparation	STA	9	\$1,000.00	\$9,000.00	\$2,100.00	\$18,900.00	\$2,500.00	\$22,500.00
103	Traffic Control, Temporary Signs, and Barricades	LS	1	\$10,000.00	\$10,000.00	\$26,000.00	\$26,000.00	\$20,000.00	\$20,000.00
104	Temporary Erosion Control	LS	1	\$10,000.00	\$10,000.00	\$13,000.00	\$13,000.00	\$5,000.00	\$5,000.00
105	Construction Layout	LS	1	\$15,000.00	\$15,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00
106	Unclassified Street Evacuation	CY	1,115	\$30.00	\$33,450.00	\$50.00	\$55,750.00	\$35.00	\$39,025.00
107	Sawcut, Remove & Dispose of Existing Pavement (All Depths and Types)	SY	3,260	\$50.00	\$163,000.00	\$10.00	\$32,600.00	\$12.00	\$39,120.00
108	Subgrade Lime Treatment (Roadway) (6" Thick)	SY	3,283	\$7.50	\$24,622.50	\$13.00	\$42,679.00	\$18.00	\$59,094.00
109	Hydrated Lime (Slurry)	TON	54	\$240.00	\$12,960.00	\$250.00	\$13,500.00	\$200.00	\$10,800.00
110	Concrete Pavement (w/ Monolithic Curb)(Reinforced)(6" Thick)	SY	2,981	\$60.00	\$178,860.00	\$81.00	\$241,461.00	\$80.00	\$238,480.00
111	Reinforced Concrete Driveway (6" Thick)	SY	633	\$54.00	\$34,182.00	\$92.00	\$58,236.00	\$70.00	\$44,310.00
112	Temporary Flex Base (6" Thick)	SY	664	\$10.54	\$6,998.56	\$30.00	\$19,920.00	\$40.00	\$26,560.00
113	Sidewalk (Concrete) (Reinforced) (4" Thick)	SY	850	\$45.00	\$38,250.00	\$70.00	\$59,500.00	\$50.00	\$42,500.00
114	Colored Stamped Concrete Crosswalk	SY	140	\$180.00	\$25,200.00	\$250.00	\$35,000.00	\$150.00	\$21,000.00
115	Barrier Free Ramp	SY	12	\$3,000.00	\$36,000.00	\$250.00	\$3,000.00	\$350.00	\$4,200.00
116	Concrete Sidewalk Steps (Travis Sta. 6+30 Right)	LS	1	\$2,500.00	\$2,500.00	\$1,500.00	\$1,500.00	\$1,600.00	\$1,600.00
117	Topsoil (6" Thick)	SY	2,289	\$8.75	\$20,028.75	\$6.00	\$13,734.00	\$10.00	\$22,890.00
118	Slab Sodding	SY	2,289	\$5.50	\$12,589.50	\$11.00	\$25,179.00	\$5.00	\$11,445.00
Roadway Improvements Subtotal				\$707,641.31		\$739,959.00		\$768,524.00	
Drainage Improvements									
201	Curb Inlets (10')	EA	4	\$9,500.00	\$38,000.00	\$7,000.00	\$28,000.00	\$6,500.00	\$26,000.00
202	Curb Inlets (15')	EA	1	\$12,000.00	\$12,000.00	\$9,500.00	\$9,500.00	\$8,200.00	\$8,200.00
203	Type 2 Curb Inlet (15')	EA	1	\$12,000.00	\$12,000.00	\$18,000.00	\$18,000.00	\$15,000.00	\$15,000.00
204	Grate Inlet (2'X2')	EA	7	\$3,500.00	\$24,500.00	\$3,800.00	\$26,600.00	\$1,600.00	\$11,200.00
205	4' Manhole	EA	2	\$8,000.00	\$16,000.00	\$7,300.00	\$14,600.00	\$7,500.00	\$15,000.00
206	Cast In Place Manhole Around Existing RCP	EA	2	\$8,000.00	\$16,000.00	\$8,000.00	\$16,000.00	\$10,000.00	\$20,000.00
207	Connect to Existing Storm Sewer Pipe	EA	1	\$3,000.00	\$3,000.00	\$950.00	\$950.00	\$2,000.00	\$2,000.00
208	Culvert Pipe (8" PVC) with Cast in Place and Treatments	LS	1	\$5,000.00	\$5,000.00	\$8,200.00	\$8,200.00	\$850.00	\$850.00
209	Storm Drain Pipe (12" RCP)	LF	378	\$80.00	\$30,240.00	\$115.00	\$43,470.00	\$65.00	\$24,570.00
210	Storm Drain Pipe (18" RCP)	LF	51	\$100.00	\$5,100.00	\$130.00	\$6,630.00	\$90.00	\$4,590.00

OWNER: City of Roanoke				BID NO. 6 Nu-Way Construction, L.L.C. PO Box 270416 Flower Mound, TX 75027		BID NO. 7 Reliable Paving Inc. 1903 Peyco Dr. N. Arlington, TX 76001		BID NO. 8 2L Construction, LLC PO Box 397 Rhome, TX 76078	
PROJECT: Roanoke Downtown Street Reconstruction - Austin Street - Travis Street									
DATE: December 14, 2021Time: 11:00AM									
ENGINEER: Jones Carter									
JOB NO. : 15024-0004-00									
ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
211	Storm Drain Pipe (21" RCP)	LF	326	\$120.00	\$39,120.00	\$140.00	\$45,640.00	\$115.00	\$37,490.00
212	Storm Drain Pipe (24" RCP)	LF	47	\$160.00	\$7,520.00	\$160.00	\$7,520.00	\$140.00	\$6,580.00
213	Trent Safety System for Storm Drain	LF	802	\$3.00	\$2,406.00	\$3.00	\$2,406.00	\$5.00	\$4,010.00
Drainage Improvements Subtotal				\$210,886.00		\$227,516.00		\$175,490.00	
Water Improvements									
301	Water Main Pipe (8" PVC C-900, DR-18)	LF	783	\$80.00	\$62,640.00	\$83.00	\$64,989.00	\$65.00	\$50,895.00
302	Water Meter Relocation	EA	6	\$2,000.00	\$12,000.00	\$1,370.00	\$8,220.00	\$2,000.00	\$12,000.00
303	New Water Meter Installation	EA	5	\$2,000.00	\$10,000.00	\$1,370.00	\$6,850.00	\$2,500.00	\$12,500.00
304	Connection to Existing Water Main	EA	6	\$2,500.00	\$15,000.00	\$1,700.00	\$10,200.00	\$7,500.00	\$45,000.00
305	Water Service (Short) (1")	EA	9	\$1,500.00	\$13,500.00	\$1,900.00	\$17,100.00	\$2,500.00	\$22,500.00
306	Water Service (Long) (1")	EA	4	\$3,000.00	\$12,000.00	\$2,000.00	\$8,000.00	\$3,000.00	\$12,000.00
307	Gate Valve (8")	EA	3	\$2,500.00	\$7,500.00	\$2,700.00	\$8,100.00	\$4,000.00	\$12,000.00
308	Abandon Existing Water Main	LF	802	\$30.00	\$24,060.00	\$17.00	\$13,634.00	\$10.00	\$8,020.00
309	Trench Safety System for Water Main	LF	783	\$3.00	\$2,349.00	\$1.50	\$1,174.50	\$6.00	\$4,698.00
Water Improvements Subtotal				\$159,049.00		\$138,267.50		\$179,613.00	
Miscellaneous Items									
401	Install Speed Limit Sign (w/ Decorative Post)(Type F)(MUTCD R2-1-25)	EA	6	\$3,000.00	\$18,000.00	\$1,000.00	\$6,000.00	\$1,500.00	\$9,000.00
402	Remove, Salvage and Install Existing Signs and Post on New Foundation	EA	5	\$250.00	\$1,250.00	\$900.00	\$4,500.00	\$2,000.00	\$10,000.00
403	Remove and Replace Mailbox	EA	8	\$1,200.00	\$9,600.00	\$310.00	\$2,480.00	\$300.00	\$2,400.00
404	Remove and Replace Quintuple Mailbox	EA	1	\$2,500.00	\$2,500.00	\$620.00	\$620.00	\$1,200.00	\$1,200.00
405	Concrete Retaining Wall Extension	LF	22	\$200.00	\$4,400.00	\$100.00	\$2,200.00	\$300.00	\$6,600.00
406	Project Sign	EA	2	\$400.00	\$800.00	\$500.00	\$1,000.00	\$1,000.00	\$2,000.00
407	Bollard Assembly	EA	5	\$1,500.00	\$7,500.00	\$440.00	\$2,200.00	\$1,500.00	\$7,500.00
408	Sprinkler System Protection and Repair	LS	1	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00
409	Audio Video Route Survey	LS	1	\$1,000.00	\$1,000.00	\$1,600.00	\$1,600.00	\$3,000.00	\$3,000.00
410	Miscellaneous Improvements	LS	1	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00	\$50,000.00
Miscellaneous Items Subtotal				\$115,050.00		\$90,600.00		\$111,700.00	
BASE BID TOTAL				\$1,192,626.31		\$1,196,342.50		\$1,235,327.00	
LOW BID RANKING W/ BASE				5		6		7	

OWNER: City of Roanoke				BID NO. 6 Nu-Way Construction, L.L.C. PO Box 270416 Flower Mound, TX 75027		BID NO. 7 Reliable Paving Inc. 1903 Peyco Dr. N. Arlington, TX 76001		BID NO. 8 2L Construction, LLC PO Box 397 Rhome, TX 76078	
PROJECT: Roanoke Downtown Street Reconstruction - Austin Street - Travis Street									
DATE: December 14, 2021Time: 11:00AM									
ENGINEER: Jones Carter									
JOB NO. : 15024-0004-00									
ITEM NO.	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
ALTERNATE BID									
Paving									
501	Painted Pavement Marker (Handicap Symbol)	EA	1	\$500.00	\$500.00	\$1,100.00	\$1,100.00	\$900.00	\$900.00
Roadway Improvements Subtotal				\$500.00		\$1,100.00		\$900.00	
Drainage Items									
601	Curb Inlet (10')	EA	5	\$5,000.00	\$25,000.00	\$6,600.00	\$33,000.00	\$4,000.00	\$20,000.00
204	Grate Inlet (2'x2')	EA	-5	\$3,500.00	\$17,500.00	\$3,800.00	\$19,000.00	\$1,600.00	\$8,000.00
205	Storm Drain Pipe (18" RCP)	LF	-1	\$80.00	\$80.00	\$115.00	\$115.00	\$65.00	\$65.00
206	Trench Safety System for Storm Drain Pipe	LF	-1	\$3.00	\$3.00	\$2.50	\$2.50	\$5.00	\$5.00
Drainage Improvements Subtotal				\$7,417.00		\$13,882.50		\$11,930.00	
ALTERNATE BID TOTAL				\$7,917.00		\$14,982.50		\$12,830.00	
TOTAL (BASE BID + ALTERNATE BID)				\$1,200,543.31		\$1,211,325.00		\$1,248,157.00	
LOW BID RANKING W/ ALTERNATE				5		6		7	



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: Consider the approval of a government obligation contract for the leasing of a wastewater Vactor truck equipment.

MEETING DATE: January 25, 2022

DEPARTMENT: Public Works

ITEM SUMMARY:

Consider the approval of a government obligation contract between Republic First National Corporation and the City of Roanoke, Texas for the leasing of a wastewater Vactor truck equipment for the sum of \$74,424 annually.

INFORMATION:

As approved in the FY 2021-2022 budget, the City of Roanoke will enter into a lease agreement for a Vactor wastewater truck. The lease agreement includes one (1) Vactor wastewater truck, a bumper to bumper service and maintenance program and an equipment loan program for the annual sum of \$74,424.

STAFF RECOMMENDATION:

Staff recommends approval

SPECIAL CONSIDERATION:

FINANCIAL CONSIDERATION:

Seventy-four thousand four hundred and twenty-four dollars (\$74,424) annually.

ATTACHMENTS:

1. City of Roanoke Texas - GOC - 3380743 Flushing Truck

DOCUMENTATION INSTRUCTIONS

The instructions listed below should be followed when completing the enclosed documentation. **Please sign in blue ink and print on single sided paper only.** Documentation completed improperly will delay funding. If you have any questions regarding the Conditions to Funding, instructions or the documentation, please call us at 800-700-7878.

I. Attached Documentation

1. **Government Obligation Contract**
 - ◆ An authorized individual that is with the Obligor should sign on the first space provided. **All original signatures are required for funding.**
2. **Exhibit A – Description of Equipment**
 - ◆ Review equipment description. Complete serial number/VIN if applicable.
 - ◆ List the location where the equipment will be located after delivery/installation.
3. **Exhibit B – Payment Schedule**
 - ◆ Sign and print name and title
4. **Exhibit C - Acceptance of Obligation**
 - ◆ Sign and print name and title
5. **Exhibit D - Obligor Resolution**
 - ◆ Type in the date of the meeting in which the purchase was approved.
 - ◆ Print or type the name and title of the individual(s) who is authorized to execute the Contract.
 - ◆ The secretary, chairman or other authorized board member of the Obligor must sign the Resolution where indicated.
 - ◆ A second authorized individual that is with the Obligor should attest the Resolution where indicated.
6. **Exhibit E - Officer's Certificate**
 - ◆ Sign and print name and title
 - ◆ Please list the Source of Funds for the Contract Payments.
7. **Exhibit F - Payment Request & Equipment Acceptance Form**
 - ◆ Do Not Return until you need to request funds from the Vendor Payable Account.
8. **Exhibit G - Signature Card**
 - ◆ Sign and print name and title
 - ◆ An additional individual may sign as an authorized individual, if desired.
9. **Exhibit H - Obligor Acknowledgement**
 - ◆ Complete information as indicated.
10. **Exhibit I - Bank Qualified Certificate**
 - ◆ Sign and print name and title
11. **Notice of Assignment**
 - ◆ Sign and print name and title.
12. **Insurance Requirements**
 - ◆ Complete insurance company contact information where indicated.
13. **Debit Authorization – (Preferred)**
 - ◆ Complete form and attach a voided check
14. **8038G IRS Form**
 - ◆ Please read 8038 Review Form
 - ◆ In Box 2, type Employer Identification Number
 - ◆ Sign and print name and title

II. Condition to Funding

If, for any reason: (i) the required documentation is not returned by May 12, 2022, is incomplete, or has unresolved issues relating thereto, or (ii) on, or prior to the return of the documentation, there is a change of circumstance, including but not limited to changes in the federal corporate income tax rate or reducing/capping the tax-exempt interest benefit, which adversely affects the expectations, rights or security of the Obligee or its assignees; then Obligee or its assignees reserve the right to withdraw/void its offer to fund this transaction in its entirety. *Neither KS StateBank nor Baystone Government Finance is acting as an advisor to the municipal entity/obligated person and neither owes a fiduciary duty pursuant to Section 15B of the Exchange Act of 1934.*

All documentation should be returned to:
 Republic First National Corporation
 2525 West State Road 114
 Rochester, Indiana 46975

GOVERNMENT OBLIGATION CONTRACT

Obligor

City of Roanoke, Texas
500 South Oak Street
Roanoke, Texas 76262

Obligee

Republic First National Corporation
2525 West State Road 114
Rochester, Indiana 46975

Dated as of January 12, 2022

This Government Obligation Contract dated as of the date listed above is between Obligor and Obligor listed directly above. Obligor desires to finance the purchase of the Equipment described in Exhibit A to Obligor and Obligor desires to have Obligor finance the purchase of the Equipment subject to the terms and conditions of this Contract which are set forth below.

I. Definitions

Section 1.01 Definitions. The following terms will have the meanings indicated below unless the context clearly requires otherwise:

"Additional Schedule" refers to the proper execution of additional schedules to Exhibit A and Exhibit B, as well as other exhibits or documents that may be required by the Obligor all of which relate to the financing of additional Equipment.

"Budget Year" means the Obligor's fiscal year.

"Commencement Date" is the date when Obligor's obligation to pay Contract Payments begins.

"Contract" means this Government Obligation Contract and all Exhibits attached hereto, all addenda, modifications, schedules, refinancings, guarantees and all documents relied upon by Obligor prior to execution of this Contract.

"Contract Payments" means the payments Obligor is required to make under this Contract as set forth on Exhibit B.

"Contract Term" means the Original Term and all Renewal Terms.

"Exhibit" includes the Exhibits attached hereto, and any "Additional Schedule", whether now existing or subsequently created.

"Equipment" means all of the items of Equipment listed on Exhibit A and any Additional Schedule, whether now existing or subsequently created, and all replacements, restorations, modifications and improvements.

"Government" as used in the title hereof means a State or a political subdivision of the State within the meaning of Section 103(a) of the Internal Revenue Code of 1986, as amended ("Code"), or a constituted authority or district authorized to issue obligations on behalf of the State or political subdivision of the State within the meaning of Treasury Regulation 1.103-1(b), or a qualified volunteer fire company within the meaning of section 150(e)(1) of the Code.

"Obligee" means the entity originally listed above as Obligor or any of its assignees.

"Obligor" means the entity listed above as Obligor and which is financing the Equipment through Obligor under the provisions of this Contract.

"Original Term" means the period from the Commencement Date until the end of the Budget Year of Obligor.

"Partial Prepayment Date" means the first Contract Payment date that occurs on or after the earlier of (a) the twenty-four month (24) anniversary of the Commencement Date or (b) the date on which Obligor has accepted all the Equipment and all amounts have been disbursed from the Vendor Payable Account to pay for the Equipment.

"Purchase Price" means the total cost of the Equipment, including all delivery charges, installation charges, legal fees, financing costs, recording and filing fees and other costs necessary to vest full, clear legal title to the Equipment in Obligor, subject to the security interest granted to and retained by Obligor as set forth in this Contract, and otherwise incurred in connection with the financing of this Equipment.

"Renewal Term" means the annual term which begins at the end of the Original Term and which is simultaneous with Obligor's Budget Year and each succeeding Budget Year for the number of Budget Years necessary to comprise the Contract Term.

"State" means the state which Obligor is located.

"Surplus Amount" means any amount on deposit in the Vendor Payable Account on the Partial Prepayment Date.

"Vendor Payable Account" means the separate account of that name established pursuant to Section X of this Contract.

II. Obligor Warranties

Section 2.01 Obligor represents, warrants and covenants as follows for the benefit of Obligor or its assignees:

- (a) Obligor is an "issuer of tax exempt obligations" because Obligor is the State or a political subdivision of the State within the meaning of Section 103(a) of the Internal Revenue Code of 1986, as amended, (the "Code") or because Obligor is a constituted authority or district authorized to issue obligations on behalf of the State or political subdivision of the State within the meaning of Treasury Regulation 1.103-1(b), or a qualified volunteer fire company within the meaning of section 150(e)(1) of the Code.
- (b) Obligor has complied with any requirement for a referendum and/or competitive bidding.
- (c) Obligor has complied with all statutory laws and regulations that may be applicable to the execution of this Contract, including the Act; Obligor, and its officer executing this Contract, are authorized under the Constitution and laws of the State to enter into this Contract and have used and followed all proper procedures of its governing body in executing and delivering this Contract. The officer of Obligor executing this Contract has the authority to execute and deliver this Contract. This Contract constitutes a legal, valid, binding and enforceable obligation of the Obligor in accordance with its terms. Obligor is a municipality, county, school district, conservation and reclamation district, hospital organization, or other political subdivision of the State of Texas so as to constitute a "governmental agency" under Section 271.005 of the Texas Local Government Code, as amended ("Act").
- (d) The Equipment listed in Exhibit A constitutes "personal property" under the Act in that it is personal property in the nature of appliances, equipment, or furnishings, or an interest in such type of personal property. The Equipment may be movable or fixed personal property, however the Equipment cannot constitute a permanent, immovable improvement. The Obligor may include materials and labor incidental to the Equipment as part of the Equipment in Exhibit A.
- (e) Obligor shall use the Equipment only for essential, traditional government purposes.
- (f) Should the IRS disallow the tax-exempt status of the interest portion of the Contract Payments as a result of the failure of the Obligor to use the Equipment for governmental purposes, or should the Obligor cease to be an issuer of tax exempt obligations, or should the obligation of Obligor created under this Contract cease to be a tax exempt obligation for any reason, then Obligor shall be required to pay additional sums to the Obligor or its assignees so as to bring the after tax yield on this Contract to the same level as the Obligor or its assignees would attain if the transaction continued to be tax-exempt.
- (g) In the event that the Internal Revenue Code of 1986, as currently amended (the "Code"), should be further amended or replaced: (i) to reduce corporate and/or individual income tax rates or (ii) to reduce or eliminate the extent to which the interest portion of the Contract Payments is excludable from gross income, then, at the written request of Obligor or its assigns, Obligor shall pay to Obligor or its assigns with each Contract Payment payable after the effective date of such amendment or replacement such additional amount as necessary to bring the after tax yield on each such Contract Payment to the same effective rate that Obligor or its assigns would have received had there occurred no such amendment to or replacement of the Code. Notwithstanding any other provision of this Agreement, Obligor shall have the right to exercise its option to purchase the Equipment pursuant to Section 3.04 hereof on the effective date of any such amendment or replacement.
- (h) Obligor will submit to the Secretary of the Treasury an information reporting statement as required by the Code.
- (i) Upon request by Obligor, Obligor will provide Obligor with current financial statements, reports, budgets or other relevant fiscal information.
- (j) Obligor shall retain the Equipment free of any hazardous substances as defined in the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. 9601 et. seq. as amended and supplemented.
- (k) Obligor hereby warrants the General Fund of the Obligor is the primary source of funds or a backup source of funds from which the Contract Payments will be made.
- (l) Obligor hereby pledges from legally available funds an amount sufficient to provide for the payment of the Contract Payments due under this Contract and such legally available funds have been pledged irrevocably for such payment.
- (m) The official of Obligor responsible for budget preparation will include in the budget request for each Budget Year the Contract Payments to become due in such Budget Year from legally available funds.
- (n) Obligor is unaware of any pending or threatened litigation before any state or federal court which would affect (1) the authority of the Obligor to enter into this Contract or (2) the authority of the Obligor to pledge the legally available funds to the payment of the Contract Payments due under this Contract. If Obligor should become aware of such pending or threatened litigation, Obligor shall notify Obligor immediately.
- (o) The meeting at which this Contract was adopted was open to the public, and the public notice of the time, place and purpose of said meeting was given, all as required by Chapter 551, Texas Government Code, as amended.
- (p) Obligor shall comply with any procurement laws applicable to the Obligor under the laws of this State.

- (q) Obligor presently intends to continue this Contract for the Original Term and all Renewal Terms as set forth on Exhibit B hereto. The official of Obligor responsible for budget preparation will include in the budget request for each Budget Year the Contract Payments to become due in such Budget Year, and will use all reasonable and lawful means available to secure the appropriation of money for such Budget Year sufficient to pay the Contract Payments coming due therein. Obligor reasonably believes that moneys can and will lawfully be appropriated and made available for this purpose.
- (r) Obligor has selected both the Equipment and the vendor(s) from whom the Equipment is to be purchased upon its own judgment and without reliance on any manufacturer, merchant, vendor or distributor, or agent thereof, of such equipment to the public.
- (s) Obligor owns the Equipment and any additional collateral free and clear of any liens, and Obligor has not and will not, during the Contract Term, create, permit, incur or assume any levies, liens or encumbrances of any kind with respect to the Equipment or any additional collateral except those created by this Contract.
- (t) Obligor warrants, as applicable, the purchase of any telecommunications and video surveillance services or equipment financed hereunder complies with 2 CFR § 200.216 and 2 CFR § 200.471.

Section 2.02 Escrow Agreement. In the event both Obligor and Obligor mutually agree to utilize an Escrow Account, then immediately following the execution and delivery of this Contract, Obligor and Obligor agree to execute and deliver and to cause Escrow Agent to execute and deliver the Escrow Agreement. This Contract shall take effect only upon execution and delivery of the Escrow Agreement by the parties thereto. Obligor shall deposit or cause to be deposited with the Escrow Agent for credit to the Equipment Acquisition Fund the sum of N/A, which shall be held, invested and disbursed in accordance with the Escrow Agreement.

III. Acquisition of Equipment, Contract Payments and the Purchase Option Price

Section 3.01 Acquisition and Acceptance. Obligor shall be solely responsible for the ordering of the Equipment and for the delivery and installation of the Equipment. The Payment Request and Equipment Acceptance Form must be signed by the same authorized individual(s) who signed the Signature Card, Exhibit G. By making a Contract Payment after its receipt of the Equipment pursuant to this Contract, Obligor shall be deemed to have accepted the Equipment on the date of such Contract Payment for purposes of this Contract. All Contract Payments paid prior to delivery of the Payment Request and Equipment Acceptance Form shall be credited to Contract Payments as they become due as shown on the Contract Payment Schedule attached as Exhibit B hereto.

Section 3.02 Contract Payments. Obligor shall pay Contract Payments from the legally available funds, as referenced in Section 4.01 below, exclusively to Obligor or its assignees in lawful, legally available money of the United States of America. The Contract Payments shall be sent to the location specified by the Obligor or its assignees. The Contract Payments, payable without notice or demand, are due as set forth on Exhibit B. Obligor shall have the option to charge interest at the highest lawful rate on any Contract Payment received later than the due date for the number of days that the Contract Payment(s) were late, plus any additional accrual on the outstanding balance for the number of days that the Contract Payment(s) were late. Obligor shall also have the option, on monthly payments only, to charge a late fee of up to 10% of the monthly Contract Payment that is past due. Furthermore, Obligor agrees to pay any fees associated with the use of a payment system other than check, wire transfer, or ACH. Once all amounts due Obligor hereunder have been received, Obligor will release any and all of its rights, title and interest in the Equipment.

SECTION 3.03 CONTRACT PAYMENTS UNCONDITIONAL. THE OBLIGATIONS OF OBLIGOR TO MAKE CONTRACT PAYMENTS AND TO PERFORM AND OBSERVE THE OTHER COVENANTS CONTAINED IN THIS CONTRACT SHALL BE ABSOLUTE AND UNCONDITIONAL IN ALL EVENTS WITHOUT ABATEMENT, DIMINUTION, DEDUCTION, SET-OFF, OR SUBJECT TO DEFENSE OR COUNTERCLAIM.

Section 3.04 Purchase Option Price. Upon thirty (30) days written notice, Obligor shall have the option to pay, in addition to the Contract Payment, the corresponding Purchase Option Price which is listed on the same line on Exhibit B. This option is only available to the Obligor on the Contract Payment date and no partial prepayments are allowed. If Obligor chooses this option and pays the Purchase Option Price to Obligor then Obligor will transfer any and all of its rights, title and interest in the Equipment to Obligor.

Section 3.05 Contract Term. The Contract Term shall be the Original Term and all Renewal Terms until all the Contract Payments are paid as set forth on Exhibit B except as provided under Section 9.01 below.

Section 3.06 Disclaimer of Warranties. OBLIGOR MAKES NO WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, AS TO THE VALUE, DESIGN, CONDITION, MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE OR ANY OTHER WARRANTY WITH RESPECT TO THE EQUIPMENT. OBLIGOR IS NOT A MANUFACTURER, SELLER, VENDOR OR DISTRIBUTOR, OR AGENT THEREOF, OF SUCH EQUIPMENT; NOR IS OBLIGOR A MERCHANT OR IN THE BUSINESS OF DISTRIBUTING SUCH EQUIPMENT TO THE PUBLIC. OBLIGOR SHALL NOT BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGE ARISING OUT OF THE INSTALLATION, OPERATION, POSSESSION, STORAGE OR USE OF THE EQUIPMENT BY OBLIGOR.

IV. Appropriation of Money

Section 4.01 Appropriation. Obligor shall be obligated to appropriate from legally available funds sufficient money in each Budget Year to make all the Contract Payments for the Original Term and each successive Renewal Term as each Contract Payment comes due. Obligor hereby pledges such revenues, funds, or taxes which constitute legally available funds, within the limits prescribed by law, that is sufficient to provide timely payment of the Contract Payments when due. Such legally available funds shall be made payable from all or any part of any revenues, funds, or taxes available to Obligor for its public purposes in accordance with Section 271.005 of the Texas Local Government Code. If Obligor fails to make an appropriation of money to make any Contract Payment, then an Event of Default will be deemed to have occurred as set forth under Section IX below. This Contract represents a binding and enforceable promise to pay in accordance with the terms herein by the Obligor.

V. Insurance, Damage, Insufficiency of Proceeds

Section 5.01 Insurance. Obligor shall maintain both property insurance and liability insurance at its own expense with respect to the Equipment. Obligor shall be solely responsible for selecting the insurer(s) and for making all premium payments and ensuring that all policies are continuously kept in effect during the period when Obligor is required to make Contract Payments. Obligor shall provide Obligor with a certificate of insurance which lists the Obligor and/or assigns as a loss payee and an additional insured on the policies with respect to the Equipment.

- (a) Obligor shall insure the Equipment against any loss or damage by fire and all other risks covered by the standard extended coverage endorsement then in use in the State and any other risks reasonably required by Obligor in an amount at least equal to the then applicable Purchase Option Price of the Equipment. Alternatively, Obligor may insure the Equipment under a blanket insurance policy or policies.
- (b) The liability insurance shall insure Obligor from liability and property damage in any form and amount satisfactory to Obligor.
- (c) Obligor may self-insure against the casualty risks and liability risks described above. If Obligor chooses this option, Obligor must furnish Obligor with a certificate and/or other documents which evidences such coverage.
- (d) All insurance policies issued or affected by this Section shall be so written or endorsed such that the Obligor and its assignees are named additional insureds and loss payees and that all losses are payable to Obligor and Obligor or its assignees as their interests may appear. Each policy issued or affected by this Section shall contain a provision that the insurance company shall not cancel or materially modify the policy without first giving thirty (30) days advance notice to Obligor or its assignees. Obligor shall furnish to Obligor certificates evidencing such coverage throughout the Contract Term.

Section 5.02 Damage to or Destruction of Equipment. Obligor assumes the risk of loss or damage to the Equipment. If the Equipment or any portion thereof is lost, stolen, damaged, or destroyed by fire or other casualty, Obligor will immediately report all such losses to all possible insurers and take the proper procedures to obtain all insurance proceeds. At the option of Obligor, Obligor shall either (1) apply the Net Proceeds to replace, repair or restore the Equipment or (2) apply the Net Proceeds to the applicable Purchase Option Price. For purposes of this Section and Section 5.03, the term Net Proceeds shall mean the amount of insurance proceeds collected from all applicable insurance policies after deducting all expenses incurred in the collection thereof.

Section 5.03 Insufficiency of Net Proceeds. If there are no Net Proceeds for whatever reason or if the Net Proceeds are insufficient to pay in full the cost of any replacement, repair, restoration, modification or improvement of the Equipment, then Obligor shall, at the option of Obligor, either (1) complete such replacement, repair, restoration, modification or improvement and pay any costs thereof in excess of the amount of the Net Proceeds or (2) apply the Net Proceeds to the Purchase Option Price and pay the deficiency, if any, to the Obligor.

Section 5.04 Obligor Negligence. Obligor assumes all risks and liabilities, whether or not covered by insurance, for loss or damage to the Equipment and for injury to or death of any person or damage to any property whether such injury or death be with respect to agents or employees of Obligor or of third parties, and whether such property damage be to Obligor's property or the property of others (including, without limitation, liabilities for loss or damage related to the release or threatened release of hazardous substances under the Comprehensive Environmental Response, Compensation and Liability Act, the Resource Conservation and Recovery Act or similar or successor law or any State or local equivalent now existing or hereinafter enacted which in any manner arise out of or are incident to any possession, use, operation, condition or storage of any Equipment by Obligor), which is proximately caused by the negligent conduct of Obligor, its officers, employees and agents.

Section 5.05 Reimbursement. Obligor hereby assumes responsibility for and agrees to reimburse Obligor for all liabilities, obligations, losses, damages, penalties, claims, actions, costs and expenses (including reasonable attorneys' fees) of whatsoever kind and nature, imposed on, incurred by or asserted against Obligor that in any way relate to or arise out of a claim, suit or proceeding, based in whole or in part upon the negligent conduct of Obligor, its officers, employees and agents, or arose out of installation, operation, possession, storage or use of any item of the Equipment, to the maximum extent permitted by law.

VI. Title and Security Interest

Section 6.01 Title. Title to the Equipment shall vest in Obligor when Obligor acquires and accepts the Equipment. Title to the Equipment will automatically transfer to the Obligor in the event Obligor defaults under Section 9.01. In such event, Obligor shall execute and deliver to Obligor such documents as Obligor may request to evidence the passage of legal title to the Equipment to Obligor.

Section 6.02 Security Interest. To secure the payment of all Obligor's obligations under this Contract, as well as all other obligations, debts and liabilities, plus interest thereon, whether now existing or subsequently created, Obligor hereby grants to Obligor a security interest under the Uniform Commercial Code constituting a first lien on the Equipment described more fully on

Exhibit A. Furthermore, Obligor agrees that any other collateral securing any other obligation(s) to Oblige, whether offered prior to or subsequent hereto, also secures this obligation. Obligor hereby also pledges such revenues, funds, or taxes which constitute legally available funds in accordance with 271.005 of the Texas Local Government Code, within the limits prescribed by law, that is sufficient to provide timely payment of the Contract Payments when due. The security interest established by this section includes not only all additions, attachments, repairs and replacements to the Equipment but also all proceeds therefrom. Obligor authorizes Oblige to prepare and record any Financing Statement required under the Uniform Commercial Code to perfect the security interest created hereunder. Obligor agrees that any Equipment listed on Exhibit A is and will remain personal property and will not be considered a fixture even if attached to real property.

VII. Assignment

Section 7.01 Assignment by Oblige. All of Oblige's rights, title and/or interest in and to this Contract may be assigned and reassigned in whole or in part to one or more assignees or sub-assignees by Oblige at any time without the consent of Obligor. No such assignment shall be effective as against Obligor until the assignor shall have filed with Obligor written notice of assignment identifying the assignee. Obligor shall pay all Contract Payments due hereunder relating to such Equipment to or at the direction of Oblige or the assignee named in the notice of assignment. Obligor shall keep a complete and accurate record of all such assignments.

Section 7.02 Assignment by Obligor. None of Obligor's right, title and interest under this Contract and in the Equipment may be assigned by Obligor unless Oblige approves of such assignment in writing before such assignment occurs and only after Obligor first obtains an opinion from nationally recognized counsel stating that such assignment will not jeopardize the tax-exempt status of the obligation.

VIII. Maintenance of Equipment

Section 8.01 Equipment. Obligor shall keep the Equipment in good repair and working order, and as required by manufacturer's and warranty specifications. If Equipment consists of copiers, Obligor is required to enter into a copier maintenance/service agreement. Oblige shall have no obligation to inspect, test, service, maintain, repair or make improvements or additions to the Equipment under any circumstances. Obligor will be liable for all damage to the Equipment, other than normal wear and tear, caused by Obligor, its employees or its agents. Obligor shall pay for and obtain all permits, licenses and taxes related to the ownership, installation, operation, possession, storage or use of the Equipment. If the Equipment includes any titled vehicle(s), then Obligor is responsible for obtaining such title(s) from the State and also for ensuring that Oblige is listed as First Lienholder on all of the title(s). Obligor shall not use the Equipment to haul, convey or transport hazardous waste as defined in the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et. seq. Obligor agrees that Oblige or its Assignee may execute any additional documents including financing statements, affidavits, notices, and similar instruments, for and on behalf of Obligor which Oblige deems necessary or appropriate to protect Oblige's interest in the Equipment and in this Contract. Obligor shall allow Oblige to examine and inspect the Equipment at all reasonable times.

IX. Default

Section 9.01 Events of Default defined. The following events shall constitute an "Event of Default" under this Contract:

- (a) Failure by Obligor to pay any Contract Payment listed on Exhibit B for fifteen (15) days after such payment is due according to the Payment Date listed on Exhibit B.
- (b) Failure to pay any other payment required to be paid under this Contract at the time specified herein and a continuation of said failure for a period of fifteen (15) days after written notice by Oblige that such payment must be made. If Obligor continues to fail to pay any payment after such period, then Oblige may, but will not be obligated to, make such payments and charge Obligor for all costs incurred plus interest at the highest lawful rate.
- (c) Failure by Obligor to observe and perform any warranty, covenant, condition, promise or duty under this Contract for a period of thirty (30) days after written notice specifying such failure is given to Obligor by Oblige, unless Oblige agrees in writing to an extension of time. Oblige will not unreasonably withhold its consent to an extension of time if corrective action is instituted by Obligor. Subsection (c) does not apply to Contract Payments and other payments discussed above.
- (d) Any statement, material omission, representation or warranty made by Obligor in or pursuant to this Contract which proves to be false, incorrect or misleading on the date when made regardless of Obligor's intent and which materially adversely affects the rights or security of Oblige under this Contract.
- (e) Any provision of this Contract which ceases to be valid for whatever reason and the loss of such provision would materially adversely affect the rights or security of Oblige.
- (f) Obligor admits in writing its inability to pay its obligations.
- (g) Obligor defaults on one or more of its other obligations.
- (h) Obligor becomes insolvent, is unable to pay its debts as they become due, makes an assignment for the benefit of creditors, applies for or consents to the appointment of a receiver, trustee, conservator, custodian, or liquidator of Obligor, or all or substantially all of its assets, or a petition for relief is filed by Obligor under federal bankruptcy, insolvency or similar laws, or is filed against Obligor and is not dismissed within thirty (30) days thereafter.

Section 9.02 Remedies on Default. Whenever any Event of Default exists, Oblige shall have the right to take one or any combination of the following remedial steps:

- (a) With or without terminating this Contract, Oblige may declare all Contract Payments and other amounts payable by Obligor hereunder to the end of the Contract Term to be immediately due and payable.
- (b) With or without terminating this Contract, Oblige may require Obligor at Obligor's expense to redeliver any or all of the Equipment and any additional collateral to Oblige to a location specified by Oblige. Such delivery shall take place within fifteen (15) days after the Event of Default occurs. If Obligor fails to deliver the Equipment and any additional collateral, Oblige may enter the premises where the Equipment and any additional collateral is located and take possession of the Equipment and any additional collateral and charge Obligor for costs incurred. Notwithstanding that Oblige has taken possession of the Equipment and any additional collateral, Obligor shall still be obligated to pay the remaining Contract Payments due up until the end of the Contract Term. Obligor will be liable for any damage to the Equipment and any additional collateral caused by Obligor or its employees or agents.
- (c) Oblige may take whatever action at law or in equity that may appear necessary or desirable to enforce its rights. Obligor shall be responsible to Oblige for all costs incurred by Oblige in the enforcement of its rights under this Contract including, but not limited to, reasonable attorney fees.

Section 9.03 No Remedy Exclusive. No remedy herein conferred upon or reserved to Oblige is intended to be exclusive and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Contract now or hereafter existing at law or in equity. No delay or omission to exercise any right or power accruing upon any default shall impair any such right or shall be construed to be a waiver thereof.

Section 9.04 Return of Equipment and Storage.

- (a) **Surrender:** The Obligor shall, at its own expense, surrender the Equipment, any additional collateral and all required documentation to evidence transfer of title from Obligor to the Oblige in the event of a default by delivering the Equipment and any additional collateral to the Oblige to a location accessible by common carrier and designated by Oblige. In the case that any of the Equipment and any additional collateral consists of software, Obligor shall destroy all intangible items constituting such software and shall deliver to Oblige all tangible items constituting such software. At Oblige's request, Obligor shall also certify in a form acceptable to Oblige that Obligor has complied with the above software return provisions and that they will immediately cease using the software and that they shall permit Oblige and/or the vendor of the software to inspect Obligor's locations to verify compliance with the terms hereto.
- (b) **Delivery:** The Equipment and any additional collateral shall be delivered to the location designated by the Oblige by a common carrier unless the Oblige agrees in writing that a common carrier is not needed. When the Equipment and any additional collateral is delivered into the custody of a common carrier, the Obligor shall arrange for the shipping of the item and its insurance in transit in accordance with the Oblige's instructions and at the Obligor's sole expense. Obligor at its expense shall completely sever and disconnect the Equipment and any additional collateral or its component parts from the Obligor's property all without liability to the Oblige. Obligor shall pack or crate the Equipment and any additional collateral and all of the component parts of the Equipment and any additional collateral carefully and in accordance with any recommendations of the manufacturer. The Obligor shall deliver to the Oblige the plans, specifications, operation manuals or other warranties and documents furnished by the manufacturer or vendor on the Equipment and any additional collateral and such other documents in the Obligor's possession relating to the maintenance and methods of operation of such Equipment and any additional collateral.
- (c) **Condition:** When the Equipment is surrendered to the Oblige it shall be in the condition and repair required to be maintained under this Contract. It will also meet all legal regulatory conditions necessary for the Oblige to sell or lease it to a third party and be free of all liens. If Oblige reasonably determines that the Equipment or an item of the Equipment, once it is returned, is not in the condition required hereby, Oblige may cause the repair, service, upgrade, modification or overhaul of the Equipment or an item of the Equipment to achieve such condition and upon demand, Obligor shall promptly reimburse Oblige for all amounts reasonably expended in connection with the foregoing.
- (d) **Storage:** Upon written request by the Oblige, the Obligor shall provide free storage for the Equipment and any additional collateral for a period not to exceed 60 days after the expiration of the Contract Term before returning it to the Oblige. The Obligor shall arrange for the insurance described to continue in full force and effect with respect to such item during its storage period and the Oblige shall reimburse the Obligor on demand for the incremental premium cost of providing such insurance.

X. Vendor Payable Account

Section 10.01 Establishment of Vendor Payable Account. On the date that the Oblige executed this Contract, which is on or after the date that the Obligor executes this Contract, Oblige agrees to (i) make available to Obligor an amount sufficient to pay the total Purchase Price for the Equipment by establishing a separate, non-interest bearing account (the "Vendor Payable Account"), as agent for Obligor's account, with a financial institution that Oblige selects that is acceptable to Obligor (including Oblige or any of its affiliates) and (ii) to deposit an amount equal to such Purchase Price as reflected on Exhibit B in the Vendor Payable Account. Obligor hereby further agrees to make the representations, warranties and covenants relating to the Vendor Payable Account as set forth in Exhibit C attached hereto. Upon Obligor's delivery to Oblige of a Payment Request and Equipment Acceptance Form in the form set forth in Exhibit F attached hereto, Obligor authorizes Oblige to withdraw funds from the Vendor Payable Account from time to time to pay the Purchase Price, or a portion thereof, for each item of Equipment as it is delivered to Obligor. The Payment Request and Equipment Acceptance Form must be signed by an authorized individual acting on behalf of Obligor. The authorized individual or individuals designated by the Obligor must sign the Signature Card which will be kept in the possession of the Oblige.

Section 10.02 Down Payment. Prior to the disbursement of any funds from the Vendor Payable Account, the Obligor must either (1) deposit all the down payment funds that the Obligor has committed towards the purchase of the Equipment into the Vendor Payable Account or (2) Obligor must provide written verification to the satisfaction of the Obligees that all the down payment funds Obligor has committed towards the purchase of the Equipment have already been spent or are simultaneously being spent with the funds requested from the initial Payment Request and Equipment Acceptance Form. For purposes of this Section, the down payment funds committed towards the Equipment from the Obligor are the down payment funds that were represented to the Obligees at the time this transaction was submitted for credit approval by the Obligor to the Obligees.

Section 10.03 Disbursement upon Default. If an event of default occurs prior to the Partial Prepayment Date, the amount then on deposit in the Vendor Payable Account shall be retained by the Obligees and Obligor will have no interest therein.

Section 10.04 Surplus Amount. Any Surplus Amount then on deposit in the Vendor Payable Account on the Partial Prepayment Date shall be applied to pay on such Partial Prepayment Date a portion of the Purchase Option Price then applicable.

Section 10.05 Recalculation of Contract Payments. Upon payment of a portion of the Purchase Option Price as provided in Section 10.04 above, each Contract Payment thereafter shall be reduced by an amount calculated by Obligees based upon a fraction the numerator of which is the Surplus Amount and the denominator of which is the Purchase Option Price on such Partial Prepayment Date. Within 15 days after such Partial Prepayment Date, Obligees shall provide to Obligor a revised Exhibit B to this Contract, which shall take into account such payment of a portion of the Purchase Option Price thereafter and shall be and become thereafter Exhibit B to this Contract. Notwithstanding any other provision of this Section 10, this Contract shall remain in full force and effect with respect to all or the portion of the Equipment accepted by Obligor as provided in this Contract, and the portion of the principal component of Contract Payments remaining unpaid after the Partial Prepayment Date plus accrued interest thereon shall remain payable in accordance with the terms of this Contract, including revised Exhibit B hereto which shall be binding and conclusive upon Obligees and Obligor.

XI. Miscellaneous

Section 11.01 Notices. All notices shall be sufficiently given and shall be deemed given when delivered or mailed by registered mail, postage prepaid, to the parties at their respective places of business as first set forth herein or as the parties shall designate hereafter in writing.

Section 11.02 Binding Effect. Obligor acknowledges this Contract is not binding upon the Obligees or its assignees unless the Conditions to Funding listed on the Documentation Instructions have been met to Obligees's satisfaction, and Obligees has executed the Contract. Thereafter, this Contract shall inure to the benefit of and shall be binding upon Obligees and Obligor and their respective successors and assigns.

Section 11.03 Severability. In the event any provision of this Contract shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision hereof.

Section 11.04 Amendments, Addenda, Changes or Modifications. This Contract may be amended, added to, changed or modified by written agreement duly executed by Obligees and Obligor. Furthermore, Obligees reserves the right to directly charge or amortize into the remaining balance due from Obligor, a reasonable fee, to be determined at that time, as compensation to Obligees for the additional administrative expense resulting from such amendment, addenda, change or modification requested by Obligor.

Section 11.05 Execution in Counterparts. This Contract may be simultaneously executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

Section 11.06 Captions. The captions or headings in this Contract do not define, limit or describe the scope or intent of any provisions or sections of this Contract.

Section 11.07 Master Contract. This Contract can be utilized as a Master Contract. This means that the Obligees and the Obligor may agree to the financing of additional Equipment under this Contract at some point in the future by executing one or more Additional Schedules to Exhibit A and Exhibit B, as well as other exhibits or documents that may be required by Obligees. Additional Schedules will be consecutively numbered on each of the exhibits which make up the Additional Schedule and all the terms and conditions of the Contract shall govern each Additional Schedule.

Section 11.08 Entire Writing. This Contract constitutes the entire writing between Obligees and Obligor. No waiver, consent, modification or change of terms of this Contract shall bind either party unless in writing and signed by both parties, and then such waiver, consent, modification or change shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements, representations, conditions, or warranties, express or implied, which are not specified herein regarding this Contract, the Equipment or any additional collateral, financed hereunder. Any terms and conditions of any purchase order or other documents submitted by Obligor in connection with this Contract which are in addition to or inconsistent with the terms and conditions of this Contract will not be binding on Obligees and will not apply to this Contract.

Section 11.09 Participation in Israel Boycott. In accordance with Texas Government Code §2271.002, Obligees certifies that Obligees does not participate in, and agrees not to participate in during the term of the Contract, a boycott of Israel.

Obligees and Obligor have caused this Contract to be executed in their names by their duly authorized representatives listed below.

City of Roanoke, Texas

Republic First National Corporation

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

Signature

Britney Middleton, Assistant Secretary

Printed Name and Title

EXHIBIT A

DESCRIPTION OF EQUIPMENT

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

Below is a detailed description of all the items of Equipment including quantity, model number and serial number where applicable:

One (1) Vactor Truck

Physical Address of Equipment after Delivery : 265 Marshall Creek Rd., Roanoke, TX 76262

EXHIBIT B

PAYMENT SCHEDULE

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

Date of First Payment: March 1, 2022
 Original Balance: \$481,012.87
 Total Number of Payments: Sixty-One (61)
 Number of Payments Per Year: Twelve (12)

Pmt No.	Due Date	Total Payment	Service Payment	Contract Payment	Applied to Interest	Applied to Principal	*Purchase Option Price
1	1-Mar-22	\$6,202.00	\$1,000.00	\$5,202.00	\$2,040.97	\$3,161.03	Not Available
2	1-Apr-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,215.30	\$3,986.70	Not Available
3	1-May-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,205.16	\$3,996.84	Not Available
4	1-Jun-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,195.00	\$4,007.00	\$480,104.69
5	1-Jul-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,184.80	\$4,017.20	\$475,762.88
6	1-Aug-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,174.59	\$4,027.41	\$471,413.29
7	1-Sep-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,164.35	\$4,037.65	\$467,055.91
8	1-Oct-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,154.08	\$4,047.92	\$462,690.72
9	1-Nov-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,143.78	\$4,058.22	\$458,317.71
10	1-Dec-22	\$6,202.00	\$1,000.00	\$5,202.00	\$1,133.46	\$4,068.54	\$453,936.86
11	1-Jan-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,123.11	\$4,078.89	\$449,548.16
12	1-Feb-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,112.74	\$4,089.26	\$445,151.60
13	1-Mar-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,102.34	\$4,099.66	\$440,747.16
14	1-Apr-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,091.91	\$4,110.09	\$436,334.83
15	1-May-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,081.46	\$4,120.54	\$431,914.60
16	1-Jun-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,070.98	\$4,131.02	\$427,486.45
17	1-Jul-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,060.47	\$4,141.53	\$423,050.36
18	1-Aug-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,049.94	\$4,152.06	\$418,606.33
19	1-Sep-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,039.38	\$4,162.62	\$414,154.33
20	1-Oct-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,028.79	\$4,173.21	\$409,694.36
21	1-Nov-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,018.18	\$4,183.82	\$405,226.40
22	1-Dec-23	\$6,202.00	\$1,000.00	\$5,202.00	\$1,007.54	\$4,194.46	\$400,750.43
23	1-Jan-24	\$6,202.00	\$1,000.00	\$5,202.00	\$996.87	\$4,205.13	\$396,266.44
24	1-Feb-24	\$6,202.00	\$1,000.00	\$5,202.00	\$986.18	\$4,215.82	\$391,774.42
25	1-Mar-24	\$6,202.00	\$1,000.00	\$5,202.00	\$975.46	\$4,226.54	\$387,274.35
26	1-Apr-24	\$6,202.00	\$1,000.00	\$5,202.00	\$964.71	\$4,237.29	\$382,766.22
27	1-May-24	\$6,202.00	\$1,000.00	\$5,202.00	\$953.93	\$4,248.07	\$378,250.01
28	1-Jun-24	\$6,202.00	\$1,000.00	\$5,202.00	\$943.13	\$4,258.87	\$373,725.71
29	1-Jul-24	\$6,202.00	\$1,000.00	\$5,202.00	\$932.30	\$4,269.70	\$369,193.30
30	1-Aug-24	\$6,202.00	\$1,000.00	\$5,202.00	\$921.44	\$4,280.56	\$364,652.77
31	1-Sep-24	\$6,202.00	\$1,000.00	\$5,202.00	\$910.55	\$4,291.45	\$360,104.11
32	1-Oct-24	\$6,202.00	\$1,000.00	\$5,202.00	\$899.64	\$4,302.36	\$355,547.30
33	1-Nov-24	\$6,202.00	\$1,000.00	\$5,202.00	\$888.69	\$4,313.31	\$350,982.32
34	1-Dec-24	\$6,202.00	\$1,000.00	\$5,202.00	\$877.72	\$4,324.28	\$346,409.16
35	1-Jan-25	\$6,202.00	\$1,000.00	\$5,202.00	\$866.73	\$4,335.27	\$341,827.81
36	1-Feb-25	\$6,202.00	\$1,000.00	\$5,202.00	\$855.70	\$4,346.30	\$337,238.25
37	1-Mar-25	\$6,202.00	\$1,000.00	\$5,202.00	\$844.65	\$4,357.35	\$332,640.47
38	1-Apr-25	\$6,202.00	\$1,000.00	\$5,202.00	\$833.56	\$4,368.44	\$328,034.45
39	1-May-25	\$6,202.00	\$1,000.00	\$5,202.00	\$822.45	\$4,379.55	\$323,420.18
40	1-Jun-25	\$6,202.00	\$1,000.00	\$5,202.00	\$811.32	\$4,390.68	\$318,797.64
41	1-Jul-25	\$6,202.00	\$1,000.00	\$5,202.00	\$800.15	\$4,401.85	\$314,166.82
42	1-Aug-25	\$6,202.00	\$1,000.00	\$5,202.00	\$788.95	\$4,413.05	\$309,527.70
43	1-Sep-25	\$6,202.00	\$1,000.00	\$5,202.00	\$777.73	\$4,424.27	\$304,880.27
44	1-Oct-25	\$6,202.00	\$1,000.00	\$5,202.00	\$766.48	\$4,435.52	\$300,224.51
45	1-Nov-25	\$6,202.00	\$1,000.00	\$5,202.00	\$755.20	\$4,446.80	\$295,560.41

EXHIBIT B - CONTINUED

PAYMENT SCHEDULE

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

Pmt No.	Due Date	Total Payment	Service Payment	Contract Payment	Applied to Interest	Applied to Principal	*Purchase Option Price
46	1-Dec-25	\$6,202.00	\$1,000.00	\$5,202.00	\$743.89	\$4,458.11	\$290,887.96
47	1-Jan-26	\$6,202.00	\$1,000.00	\$5,202.00	\$732.55	\$4,469.45	\$286,207.13
48	1-Feb-26	\$6,202.00	\$1,000.00	\$5,202.00	\$721.18	\$4,480.82	\$281,517.92
49	1-Mar-26	\$6,202.00	\$1,000.00	\$5,202.00	\$709.79	\$4,492.21	\$276,820.31
50	1-Apr-26	\$6,202.00	\$1,000.00	\$5,202.00	\$698.36	\$4,503.64	\$272,114.28
51	1-May-26	\$6,202.00	\$1,000.00	\$5,202.00	\$686.91	\$4,515.09	\$267,399.82
52	1-Jun-26	\$6,202.00	\$1,000.00	\$5,202.00	\$675.43	\$4,526.57	\$262,676.91
53	1-Jul-26	\$6,202.00	\$1,000.00	\$5,202.00	\$663.91	\$4,538.09	\$257,945.54
54	1-Aug-26	\$6,202.00	\$1,000.00	\$5,202.00	\$652.37	\$4,549.63	\$253,205.69
55	1-Sep-26	\$6,202.00	\$1,000.00	\$5,202.00	\$640.80	\$4,561.20	\$248,457.35
56	1-Oct-26	\$6,202.00	\$1,000.00	\$5,202.00	\$629.20	\$4,572.80	\$243,700.50
57	1-Nov-26	\$6,202.00	\$1,000.00	\$5,202.00	\$617.57	\$4,584.43	\$238,935.13
58	1-Dec-26	\$6,202.00	\$1,000.00	\$5,202.00	\$605.91	\$4,596.09	\$234,161.22
59	1-Jan-27	\$6,202.00	\$1,000.00	\$5,202.00	\$594.22	\$4,607.78	\$229,378.76
60	1-Feb-27	\$6,202.00	\$1,000.00	\$5,202.00	\$582.50	\$4,619.50	\$224,587.73
61	1-Mar-27	\$224,990.11	\$0.00	\$224,990.11	\$570.78	\$224,419.33	\$0.00

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

*Assumes all Contract Payments due to date are paid

EXHIBIT C**ACCEPTANCE OF OBLIGATION
TO COMMENCE CONTRACT PAYMENTS UNDER EXHIBIT B**

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

I, the undersigned, hereby certify that I am a duly qualified representative of Obligor and that I have been given the authority by the governing body of Obligor to sign this Acceptance of Obligation to commence Contract Payments with respect to the above referenced Contract. I hereby certify that:

1. The Equipment described on Exhibit A has not been delivered, installed or available for use as of the Commencement date of this Contract.
2. Obligor acknowledges that Obligee has agreed to deposit into a Vendor Payable Account an amount sufficient to pay the total purchase price (the "Purchase Price") for the Equipment so identified in such Exhibit A;
3. The principal amount of the Contract Payments in the Exhibit B accurately reflects the Purchase Price;
4. Obligor agrees to execute a Payment Request and Equipment Acceptance Form authorizing payment of the Purchase Price, or a portion thereof, for each withdrawal of funds from the Vendor Payable Account.

Notwithstanding that the Equipment has not been delivered to or accepted by Obligor on the date of execution of the Contract, Obligor hereby warrants that:

- (a) Obligor's obligation to commence Contract Payments as set forth in Exhibit B is absolute and unconditional as of the Commencement Date and on each date set forth in Exhibit B thereafter, subject to the terms and conditions of the Contract;
- (b) immediately upon delivery and acceptance of all the Equipment, Obligor will notify Obligee of Obligor's final acceptance of the Equipment by delivering to Obligee the "Payment Request and Equipment Acceptance Form" in the form set forth in Exhibit F attached to the Contract;
- (c) in the event that any Surplus Amount is on deposit in the Vendor Payable Account when an event of default under the Contract occurs, then those amounts shall be applied as provided in Section 10 of the Contract;
- (d) regardless of whether Obligor delivers a final Payment Request and Equipment Acceptance Form, all Contract Payments paid prior to delivery of all the Equipment shall be credited to Contract Payments as they become due under the Contract as set forth in Exhibit B.

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

EXHIBIT D
OBLIGOR RESOLUTION

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

At a duly called meeting of the Governing Body of the Obligor (as defined in the Contract) held on _____ the following resolution was introduced and adopted:

BE IT RESOLVED by the Governing Body of Obligor as follows:

1. **Determination of Need.** The Governing Body of Obligor has determined that a true and very real need exists for the acquisition of the Equipment described on Exhibit A of the Government Obligation Contract dated as of January 12, 2022, between City of Roanoke, Texas (Obligee) and Republic First National Corporation (Obligee).
2. **Personal Property Finance Act.** The Governing Body of Obligor will enter into the Contract, together with all related documents, as authorized by the Public Property Finance Act, Subchapter A, Chapter 271, Local Government Code (the "PPFA").
3. **Pledge of Taxes.** For each year in which Contract Payments are due pursuant to the Contract, there shall be levied, as authorized by the PPFA, an ad valorem tax within the limits prescribed by law that is sufficient (together with other funds lawfully available to Obligor and applied for such purpose) to provide for the timely payment of Contract Payments when due.
4. **Approval and Authorization.** The Governing Body of Obligor has determined that the Contract, substantially in the form presented to this meeting, is in the best interests of the Obligor for the acquisition of such Equipment, and the Governing Body hereby approves the entering into of the Contract by the Obligor and hereby designates and authorizes the following person(s) to execute and deliver the Contract on Obligor's behalf with such changes thereto as such person(s) deem(s) appropriate, and any related documents, including any Escrow Agreement, necessary to the consummation of the transaction contemplated by the Contract.

Authorized Individual(s): Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services
(Typed or Printed Name and Title of individual(s) authorized to execute the Contract)

5. **Adoption of Resolution.** The signatures below from the designated individuals from the Governing Body of the Obligor evidence the adoption by the Governing Body of this Resolution.

Signature: _____
(Signature of Secretary, Board Chairman or other member of the Governing Body)

Printed Name & Title: Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services
(Printed Name and Title of individual who signed directly above)

Attested By: _____
(Signature of one additional person who can witness the passage of this Resolution)

Printed Name & Title: Scott Campbell, City Manager
(Printed Name of individual who signed directly above)

EXHIBIT E

OFFICER'S CERTIFICATE

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

I, the undersigned, hereby certify that I am a duly qualified representative of Obligor and that I have been given the authority by the governing body of Obligor to sign this Officer's Certificate with respect to the above referenced Contract. I hereby certify that:

1. Obligor has appropriated and/or taken other lawful actions necessary to provide moneys sufficient to pay all Contract Payments required to be paid under the Contract during the current Budget Year of Obligor, and such moneys will be applied in payment of all Contract Payments due and payable during such current Budget Year.
2. Obligor has obtained insurance coverage as required under the Contract from an insurer qualified to do business in the State.
3. No event or condition that constitutes or would constitute an Event of Default exists as of the date hereof.
4. The governing body of Obligor has approved the authorization, execution and delivery of this Contract on its behalf by the authorized representative of Obligor who signed the Contract.
5. Please list the Source of Funds (Fund Item in Budget) for the Contract Payments that come due under Exhibit B of this Contract.

Source of Funds : General Fund

By signing below, Obligor hereby authorizes the General Fund of the Obligor as a backup source of funds from which the Contract Payments can be made.

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

EXHIBIT F

PAYMENT REQUEST AND EQUIPMENT ACCEPTANCE FORM

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

In accordance with Section 10.01, by executing this Payment Request and Equipment Acceptance Form the Obligor hereby represents that the Payee or Payees listed below who are requesting payment have delivered the Equipment or a portion of the Equipment or performed the services to the satisfaction of the Obligor and that the amounts requested below by the Payee or Payees are proportionate with the value of the Equipment delivered or services rendered by the Payee or Payees. The Obligor hereby represents and warrants for all purposes that:

1. Pursuant to the invoice attached hereto, the amount to be disbursed is \$ _____ and this amount is consistent with the Contract between Obligor and vendor.
2. Payment is to be made to: Payee: _____

3. The undersigned certifies that the following documents are attached to this Payment Request and Equipment Acceptance Form when there is a request for a release of funds from the Vendor Payable Account to pay for a portion, or all, of the Equipment: (1) Invoice from the vendor, (2) copy of the Contract between Obligor and vendor (if requested by the Obligee), (3) Insurance Certificate (if applicable), (4) front and back copy of the original MSO/Title listing KS StateBank and/or its assigns as the first lien holder (if applicable). By executing this Payment Request and Equipment Acceptance Form and attaching the documents as required above, the Obligor shall be deemed to have accepted this portion of the Equipment for all purposes under the Contract, including, without limitation, the obligation of Obligor to make the Contract Payments with respect thereto in a proportionate amount of the total Contract Payment.
4. No amount listed in this exhibit was included in any such exhibit previously submitted.
5. Each disbursement hereby requested has been incurred and is a proper charge against the Vendor Payable Account. No amount hereby requested to be disbursed will be paid to Obligor as reimbursement for any expenditure paid by Obligor more than 60 days prior to the date of execution and delivery of the Contract.
6. The Equipment referenced in the attached has been delivered, installed, inspected and tested as necessary and in accordance with Obligor's specifications and accepted for all purposes.
7. That Obligor is or will be the title owner to the Equipment referenced in the attached, and that in the event that any third party makes a claim to such title that Obligor will take all measures necessary to secure title including, without limitation, the appropriation of additional funds to secure title to such Equipment, or a portion thereof, and keep the Contract in full force and effect. Furthermore, Obligor has obtained insurance coverage as required under the Contract from an insurer qualified to do business in the State.
8. Obligor has appropriated and/or taken other lawful actions necessary to provide moneys sufficient to pay all Contract Payments required to be paid under the Contract during the current Budget Year of Obligor, and such moneys will be applied in payment of all Contract Payments due and payable during such current Budget Year.
9. No event or condition that constitutes or would constitute an Event of Default exists as of the date hereof.

I, the undersigned, hereby certify that I am a duly qualified representative of Obligor and that I have been given the authority by the governing body of Obligor to sign this Payment Request and Equipment Acceptance Form.

Please forward this document and any correspondence relating to vendor payment to:

Email: britney@rfnonline.com
or
Fax: 800-865-8517

Please call 800-700-7878 if you have any questions.

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

EXHIBIT G

SIGNATURE CARD

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

The below signatures will be used for purposes of verifying the signature on a Payment Request and Equipment Acceptance Form prior to making payments from the Equipment Acquisition Fund or Vendor Payable Account. By signing below, the undersigned represents and warrants that s/he has received all appropriate authority from City of Roanoke, Texas.

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

Signature of additional authorized individual (optional) of Obligor

Signature

Scott Campbell, City Manager

Printed Name and Title

EXHIBIT H

OBLIGOR ACKNOWLEDGEMENT

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

Obligor hereby acknowledges that it has ordered or caused to be ordered the equipment that is the subject of the above-mentioned Contract.

Please complete the below information, attach another page if necessary

Vendor Name: Kinloch Equipment & Supply, Inc.

Equipment: One (1) Vactor Truck

Cost of Equipment: \$481,012.87

Vendor Name: _____

Equipment: _____

Cost of Equipment: _____

Vendor Name: _____

Equipment: _____

Cost of Equipment: _____

Vendor Name: _____

Equipment: _____

Cost of Equipment: _____

Vendor Name: _____

Equipment: _____

Cost of Equipment: _____

Obligor will immediately notify Obligee if any of the information listed above is changed.

EXHIBIT I

BANK QUALIFIED CERTIFICATE

RE: Government Obligation Contract dated as of January 12, 2022, between Republic First National Corporation (Obligee) and City of Roanoke, Texas (Obligor)

Whereas, Obligor hereby represents that it is a “Bank Qualified” Issuer for the calendar year in which this Contract is executed by making the following designations with respect to Section 265 of the Internal Revenue Code of 1986, as amended (the “Code”). (A “Bank Qualified Issuer” is an issuer that issues less than ten million (\$10,000,000) dollars of tax-exempt obligations other than “private activity bonds” as defined in Section 141 of the Code, excluding certain “qualified 501(c)(3) bonds” as defined in Section 145 of the Code, during the calendar year).

Now, therefor, Obligor hereby designates this Contract as follows:

1. **Designation as Qualified Tax-Exempt Obligation.** Pursuant to Section 265(b)(3)(B)(i) of the Code, the Obligor hereby specifically designates the Contract as a “qualified tax-exempt obligation” for purposes of Section 265(b)(3) of the Code. In compliance with Section 265(b)(3)(D) of the Code, the Obligor hereby represents that the Obligor will not designate more than \$10,000,000 of obligations issued by the Obligor in the calendar year during which the Contract is executed and delivered as such “qualified tax-exempt obligations”.
2. **Issuance Limitation.** In compliance with the requirements of Section 265(b)(3)(C) of the Code, the Obligor hereby represents that the Obligor (including all subordinate entities of the Obligor within the meaning of Section 265(b)(3)(E) of the Code) reasonably anticipates not to issue in the calendar year during which the Contract is executed and delivered, obligations bearing interest exempt from federal income taxation under Section 103 of the Code (other than “private activity bonds” as defined in Section 141 of the Code and excluding certain “qualified 501(c)(3) bonds” as defined in Section 145 of the Code) in an amount greater than \$10,000,000.

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

NOTICE OF ASSIGNMENT

JANUARY 12, 2022

Republic First National Corporation (Obligee/Assignor) hereby gives notice of an Assignment between Obligee/Assignor and KS StateBank (Assignee) of the Government Obligation Contract (Contract) between Obligee/Assignor and City of Roanoke, Texas, dated as of January 12, 2022.

All Contract Payments coming due pursuant to the Contract shall be made to:

KS StateBank
P.O. Box 69
Manhattan, Kansas 66505-0069

Republic First National Corporation, Obligee/Assignor

Signature

Britney Middleton, Assistant Secretary

Printed Name and Title

ACKNOWLEDGEMENT OF AND CONSENT TO ASSIGNMENT

City of Roanoke, Texas (Obligor) as party to a Government Obligation Contract dated as of January 12, 2022 between Obligor and Republic First National Corporation (Obligee), hereby acknowledges receipt of a Notice of Assignment dated January 12, 2022 whereby Obligee gave notice of its assignment to KS StateBank of its right to receive all Contract Payments due from Obligor under the Contract and hereby consents to that Assignment. Pursuant to the Notice of Assignment from Obligee, Obligor agrees to deliver all Contract Payments coming due under the Contract to:

KS StateBank
P.O. Box 69
Manhattan, Kansas 66505-0069

City of Roanoke, Texas

Signature

Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services

Printed Name and Title

INSURANCE REQUIREMENTS

Pursuant to Article V of the Government Obligation Contract, you have agreed to provide us evidence of insurance covering the Equipment.

A Certificate of Insurance listing the information stated below should be sent to us no later than the date on which the equipment is delivered.

Insured:

City of Roanoke, Texas
500 South Oak Street
Roanoke, Texas 76262

Certificate Holder:

KS StateBank
1010 Westloop, P.O. Box 69
Manhattan, Kansas 66505-0069

1. Equipment Description

- ◆ One (1) Vactor Truck
- ◆ Please include all applicable VIN's, serial numbers, etc.

2. Deductible

- ◆ The deductible amounts on the insurance policy should not exceed \$25,000.00.

3. Physical Damage

- ◆ All risk coverage to guarantee proceeds of at least \$481,012.87.

4. Liability

- ◆ Minimum Combined Single Limit of \$1,000,000.00 on bodily injury and property damage.

5. Additional Insured and Loss Payee

- ◆ KS StateBank AOIA (and/or Its Assigns) MUST be listed as additional insured and loss payee.

Please forward certificate as soon as possible to: Email: britney@rfnonline.com
or
Fax: 800-865-8517

Please complete the information below and return this form along with the Contract.

City of Roanoke, Texas

Insurance Company: _____

Agent's Name: _____

Telephone #: _____

Fax #: _____

Address: _____

City, State Zip: _____

Email: _____

PREFERRED

*As an additional payment option for Obligor, we are now providing the option of ACH (Automatic Clearing House). By completing this form, Obligor is authorizing Oblgee to withdraw said payment amount on said date.

DEBIT AUTHORIZATION

I hereby authorize KS StateBank Government Finance Department to initiate debit entries for the Payment Amount (including, but not limited to, any late fees, rate changes, escrow modifications, etc.). I acknowledge that KS StateBank Government Finance Department may reinitiate returned entries up to two additional times, to the account indicated below at the financial institution named below and to debit the same to such account for:

Contract Number 3380743	Payment Amount \$6,202.00	Frequency of Payments Monthly
Beginning _____ Month Year	Day of Month Debits will be made according to Exhibit B of the Contract	

I acknowledge that the origination of ACH transactions to this account must comply with the provisions of U.S. law.

Financial Institution Name		Branch	
Address	City	State	Zip
Routing Number		Account Number	

Type of Account

☐ Checking

☐ Savings

If the account does not have sufficient funds, KS StateBank Government Finance Department may attempt, but shall have no obligation to continue to attempt to deduct the payment from the account. If the account has insufficient funds when KS StateBank Government Finance Department attempts to deduct a payment, KS StateBank Government Finance Department may terminate the automatic deduction of payments upon notice to borrower and me. Until such time as payment is made, borrower shall be responsible to make such payments, and all other payments that may be due to KS StateBank Government Finance Department regarding the above-referenced loan.

This authority is to remain in full force and effect until KS StateBank has received written notification from any authorized signer of the account of its termination in such time and manner as to afford KS StateBank a reasonable opportunity to act on it.

Obligor Name on Contract City of Roanoke, Texas	
Signature	Printed Name and Title Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services
Tax ID Number 75-1129779	Date

PLEASE ATTACH COPY OF A VOIDED CHECK TO THIS FORM!

USA Patriot Act

USA Patriot Act requires identity verification for all new accounts. This means that we may require information from you to allow us to make a proper identification.

INVOICE

DATE SENT: 01-19-2022

BILL TO:

CITY OF ROANOKE, TEXAS
ATTN: ACCOUNTS PAYABLE
500 SOUTH OAK STREET
ROANOKE, TEXAS 76262

REMIT TO:

KS STATEBANK
GOVERNMENT FINANCE DEPARTMENT
PO BOX 69
MANHATTAN, KS 66505-0069
FOR INQUIRIES: 800-700-7878

ACCOUNT NUMBER	PAYMENT DATE	PAYMENT DUE DATE	TOTAL AMOUNT DUE
3380743	03-01-2022	03-01-2022	\$6,202.00

DESCRIPTION	AMOUNT
GOVERNMENT OBLIGATION CONTRACT DATED AS OF JANUARY 12, 2022	PAYMENT AMOUNT: \$5,202.00
	SERVICING AMOUNT: \$1,000.00
ONE (1) VACTOR TRUCK	
<i>Additional interest will be assessed on any payment received after the due date.</i>	
	\$6,202.00
	TOTAL DUE

INVOICE

DATE SENT: 01-19-2022

BILL TO:

CITY OF ROANOKE, TEXAS
ATTN: ACCOUNTS PAYABLE
500 SOUTH OAK STREET
ROANOKE, TEXAS 76262

REMIT TO:

KS STATEBANK
GOVERNMENT FINANCE DEPARTMENT
PO BOX 69
MANHATTAN, KS 66505-0069
FOR INQUIRIES: 800-700-7878

ACCOUNT NUMBER	PAYMENT DATE	PAYMENT DUE DATE	TOTAL AMOUNT DUE
3380743	04-01-2022	04-01-2022	\$6,202.00

DESCRIPTION	AMOUNT
GOVERNMENT OBLIGATION CONTRACT DATED AS OF JANUARY 12, 2022	PAYMENT AMOUNT: \$5,202.00
	SERVICING AMOUNT: \$1,000.00
ONE (1) VACTOR TRUCK	
<i>Additional interest will be assessed on any payment received after the due date.</i>	
	\$6,202.00
	TOTAL DUE

8038 REVIEW FORM

The 8038 form attached hereto is an important part of the documentation package and must be properly filled out and submitted to the Department of the Treasury in order for you to receive the lower tax-exempt rate. Unless you instruct us otherwise, we have engaged a Paid Preparer to assist in the filling out of this form. The Paid Preparer has filled out the relevant portions of this form based on the current understanding of what is required by the Department of the Treasury. The responses on this 8038 form are based on the dates and amounts which you have requested (structure of the transaction) and which are on the Payment Schedule.

1. Please review our responses for accuracy. If anything is inaccurate, please contact our office so that we can make proper revisions.
2. If the information provided to you on this form is accurate, please sign where indicated and return with the document package.
3. If there are any changes to the structure of the transaction that occur prior to funding which require a change to the 8038 form, we will make such changes and provide notification to you.
4. We will return to you a copy of the 8038 form that was mailed to the Department of the Treasury.

Important Note:

The IRS is now requesting information regarding tax-exempt issuers' and borrowers' written policies and procedures designed to monitor post-issuance compliance with the federal tax rules applicable to tax-exempt obligations (boxes 43 and 44). Do not check items 43 and 44 on the 8038 form unless you have established written procedures in accordance with the instructions referenced directly below. If you choose to "check" items 43 and/or 44, please be prepared to provide copies of such written procedures to the Paid Preparer or any representatives of the IRS upon request. Written procedures should contain certain key characteristics, including making provisions for:

- Due diligence review at regular intervals;
- Identifying the official or employee responsible for review;
- Training of the responsible official/employee;
- Retention of adequate records to substantiate compliance (e.g., records relating to expenditure of proceeds);
- Procedures reasonably expected to timely identify noncompliance; and
- Procedures ensuring that the issuer will take steps to timely correct noncompliance.

For additional guidance on this 8038 form, you can refer to the Documentation Instructions located on the following government website: <http://www.irs.gov/app/picklist/list/formsInstructions.html>, or contact your local IRS office.

Information Return for Tax-Exempt Governmental Obligations

► Under Internal Revenue Code section 149(e)
► See separate instructions.
Caution: If the issue price is under \$100,000, use Form 8038-GC.

OMB No. 1545-0720

Part I Reporting Authority		If Amended Return, check here ► ☐	
1 Issuer's name City of Roanoke, Texas		2 Issuer's employer identification number (EIN) 75-1129779	
3a Name of person (other than issuer) with whom the IRS may communicate about this return (see instructions)		3b Telephone number of other person shown on 3a	
4 Number and street (or P.O. box if mail is not delivered to street address) 500 South Oak Street	Room/suite	5 Report number (For IRS Use Only) 3	
6 City, town, or post office, state, and ZIP code Roanoke, Texas 76262		7 Date of issue 01/12/2022	
8 Name of issue Government Obligation Contract		9 CUSIP number None	
10a Name and title of officer or other employee of the issuer whom the IRS may call for more information (see instructions) Ms. Vicki Rodriguez, Director of Fiscal and Administrative Services		10b Telephone number of officer or other employee shown on 10a (817) 491-6075	

Part II Type of Issue (enter the issue price). See the instructions and attach schedule.			
11 Education	11		
12 Health and hospital	12		
13 Transportation	13		
14 Public safety	14		
15 Environment (including sewage bonds)	15		
16 Housing	16		
17 Utilities	17		
18 Other. Describe ► One (1) Vector Truck	18	491,478	76
19 If obligations are TANs or RANs, check only box 19a	►	☐	
If obligations are BANs, check only box 19b	►	☐	
20 If obligations are in the form of a lease or installment sale, check box	►	☐	

Part III Description of Obligations. Complete for the entire issue for which this form is being filed.					
	(a) Final maturity date	(b) issue price	(c) Stated redemption price at maturity	(d) Weighted average maturity	(e) Yield
21	03/01/2027	\$ 491,478.76	\$ 481,012.87	3.766 years	3.071 %

Part IV Uses of Proceeds of Bond Issue (including underwriters' discount)							
22	Proceeds used for accrued interest				22		
23	Issue price of entire issue (enter amount from line 21, column (b))				23	491,478	76
24	Proceeds used for bond issuance costs (including underwriters' discount)				24	10,465	89
25	Proceeds used for credit enhancement				25		
26	Proceeds allocated to reasonably required reserve or replacement fund				26		
27	Proceeds used to refund prior tax-exempt bonds. Complete Part V.				27		
28	Proceeds used to refund prior taxable bonds. Complete Part V.				28		
29	Total (add lines 24 through 28)				29	10,465	89
30	Nonrefunding proceeds of the issue (subtract line 29 from line 23 and enter amount here)				30	481,012	87

Part V Description of Refunded Bonds. Complete this part only for refunding bonds.			
31	Enter the remaining weighted average maturity of the tax-exempt bonds to be refunded	►	years
32	Enter the remaining weighted average maturity of the taxable bonds to be refunded	►	years
33	Enter the last date on which the refunded tax-exempt bonds will be called (MM/DD/YYYY)	►	
34	Enter the date(s) the refunded bonds were issued ► (MM/DD/YYYY)		

For Paperwork Reduction Act Notice, see separate instructions.

Cat. No. 63773S

Form **8038-G** (Rev. 9-2011)

Part VI Miscellaneous

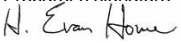
35 Enter the amount of the state volume cap allocated to the issue under section 141(b)(5)	35		
36a Enter the amount of gross proceeds invested or to be invested in a guaranteed investment contract (GIC) (see instructions)	36a		
b Enter the final maturity date of the GIC ► (MM/DD/YYYY) _____			
c Enter the name of the GIC provider ► _____			
37 Pooled financings: Enter the amount of the proceeds of this issue that are to be used to make loans to other governmental units	37		
38a If this issue is a loan made from the proceeds of another tax-exempt issue, check box ► ☐ and enter the following information:			
b Enter the date of the master pool bond ► (MM/DD/YYYY) _____			
c Enter the EIN of the issuer of the master pool bond ► _____			
d Enter the name of the issuer of the master pool bond ► _____			
39 If the issuer has designated the issue under section 265(b)(3)(B)(i)(III) (small issuer exception), check box			☒
40 If the issuer has elected to pay a penalty in lieu of arbitrage rebate, check box			☐
41a If the issuer has identified a hedge, check here ► ☐ and enter the following information:			
b Name of hedge provider ► _____			
c Type of hedge ► _____			
d Term of hedge ► _____			
42 If the issuer has superintegrated the hedge, check box			☐
43 If the issuer has established written procedures to ensure that all nonqualified bonds of this issue are remediated according to the requirements under the Code and Regulations (see instructions), check box			☐
44 If the issuer has established written procedures to monitor the requirements of section 148, check box			☐
45a If some portion of the proceeds was used to reimburse expenditures, check here ► ☐ and enter the amount of reimbursement. ► _____			
b Enter the date the official intent was adopted ► (MM/DD/YYYY) _____			

Signature and Consent

Under penalties of perjury, I declare that I have examined this return and accompanying schedules and statements, and to the best of my knowledge and belief, they are true, correct, and complete. I further declare that I consent to the IRS's disclosure of the issuer's return information, as necessary to process this return, to the person that I have authorized above.

 _____
  Vicki Rodriguez, CFGO, Director of Fiscal and Administrative Services
 Signature of issuer's authorized representative Date Type or print name and title

Paid Preparer Use Only

Print/Type preparer's name H. Evan Howe	Preparer's signature  HEvanHowe KS StateBank 2022.01.20 08:46:06-06'00'	Date 01/19/2022	Check ☐ if self-employed	PTIN P01438994
Firm's Name ► Baystone Financial LLC		Firm's EIN ► 48-1223987		
Firm's Address ► 10601 Mission Road, Suite 200, Leawood, KS 66206		Phone no. (800) 752-3562		

Form **8038-G** (Rev. 9-2011))



CITY COUNCIL AGENDA ITEM

TO: Mayor and City Council

SUBJECT: PH Notice ORD NO 2021-123 - PD 18.504 Acres

MEETING DATE: January 25, 2022

DEPARTMENT: City Secretary

ITEM SUMMARY:

Public hearing to consider amending the Comprehensive Zoning Ordinance of the City of Roanoke, Texas, on approximately 18.504- acres of land located in the M.E.P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County, Texas, by changing the zoning on the approximately 18.504- acres of land from Single Family-7 District (SF-7) and Retail District (R) to Planned Development District with multi-family and single family detached uses. (Ordinance No. 2021-123)

This item was moved from the October 26, 2021 City Council meeting.

INFORMATION:

STAFF RECOMMENDATION:

This is a continuation of this public hearing. See progression below.

At the October 18th Planning and Zoning Commission meeting, this item was tabled until the December 6, 2021 Planning and Zoning meeting.

It is recommended by the City Attorney to table this item until the December 14, 2021 City Council meeting. A suggested motion to move this item to the December meeting is listed below.

Motion:

Motion to continue the public hearing and action item at the December 14, 2021 City Council meeting at 7:00 p.m.

At the December 14, 2021, this item was tabled until the January 25, 2022 CC meeting.

SPECIAL CONSIDERATION:

FINANCIAL CONSIDERATION:



CITY COUNCIL AGENDA ITEM

ATTACHMENTS:

1. PH Notice - ORD NO 2021-123 - Rezone - SF-7 and R to PD - 18.504 Acres - 09282021-Republish



City of Roanoke Notice of Public Hearing Zoning Amendment

NOTICE OF PUBLIC HEARING ZONING AMENDMENT

THIS WAS MOVED TO THE DECEMBER 6, 2021 P&Z MEETING

Planning and Zoning Commission

THE ROANOKE PLANNING AND ZONING COMMISSION WILL HOLD A PUBLIC HEARING ON MONDAY, OCTOBER 18, 2021, TO CONSIDER AMENDING THE COMPREHENSIVE ZONING ORDINANCE OF THE CITY OF ROANOKE, TEXAS, ON APPROXIMATELY 18.504- ACRES OF LAND LOCATED IN THE M.E.P. & P.R.R. CO. SURVEY, ABSTRACT NO. 923, CITY OF ROANOKE, DENTON COUNTY, TEXAS, BY CHANGING THE ZONING ON THE APPROXIMATELY 18.504- ACRES OF LAND FROM SINGLE FAMILY-7 DISTRICT (SF-7) AND RETAIL DISTRICT (R) TO PLANNED DEVELOPMENT DISTRICT WITH MULTI-FAMILY AND SINGLE FAMILY DETACHED USES. THE PUBLIC HEARING WILL BE HELD AT 7:00 P.M. AT THE ROANOKE CITY HALL LOCATED AT 500 S OAK STREET, ROANOKE, TEXAS.

THIS WAS MOVED TO THE DEC.14, 2021 CITY COUNCIL MEETING

City Council

THE ROANOKE CITY COUNCIL WILL HOLD A PUBLIC HEARING ON TUESDAY, OCTOBER 26, 2021, TO CONSIDER AMENDING THE COMPREHENSIVE ZONING ORDINANCE OF THE CITY OF ROANOKE, TEXAS, ON APPROXIMATELY 18.504- ACRES OF LAND LOCATED IN THE M.E.P. & P.R.R. CO. SURVEY, ABSTRACT NO. 923, CITY OF ROANOKE, DENTON COUNTY, TEXAS, BY CHANGING THE ZONING ON THE APPROXIMATELY 18.504- ACRES OF LAND FROM SINGLE FAMILY-7 DISTRICT (SF-7) AND RETAIL DISTRICT (R) TO PLANNED DEVELOPMENT DISTRICT WITH MULTI-FAMILY AND SINGLE FAMILY DETACHED USES. THE PUBLIC HEARING WILL BE HELD AT 7:00 P.M. AT THE ROANOKE CITY HALL LOCATED AT 500 S OAK STREET, ROANOKE, TEXAS.

CERTIFICATION

I certify that the above notice was posted at City Hall, 500 South Oak Street, Roanoke, Texas, on Friday, October 1, 2021, by 5:00 p.m.

April S. Hill, City Secretary

*Any person planning to attend this meeting that may require auxiliary aids or services should request accommodations two (2) days prior to the meeting by calling (817) 491-8152. **BRILLE IS NOT AVAILABLE.**

📶 A public wireless network is now available in the Council Chambers for use during meetings. It is available from 7am to 11pm Monday thru Friday. The name of the network is: City Hall Guests



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: ORD NO 2021-123

MEETING DATE: January 25, 2022

DEPARTMENT: Planning

ITEM SUMMARY:

Consideration and action of Ordinance No. 2021-123, amending the Comprehensive Zoning Ordinance, for approximately 18.504 acres of land located in the M.E. P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County, TX, by changing the zoning from Single-Family-7 District (SF-7) and Retail District (R) to Planned Development District with Multi-Family and Single Family Attached uses. This item was moved from the December 11, 2021 City Council meeting.

INFORMATION:

Planning Analysis:

The applicant has initiated a re-zoning request for approximately 18.5 acres of what is currently retail and single-family residential (SF-7) at the corner of Hwy 114 Bypass and Lois St.

DIVISION 2. - PD, PLANNED DEVELOPMENT OVERLAY DISTRICT

Sec. 12.620. - General Purpose and Description

(a) The City Council of the City of Roanoke, Texas, after public hearing and proper notice to all parties affected and after recommendation from the Planning and Zoning Commission, may authorize the creation of a Planned Development (PD) overlay district.

(b) The Planned Development (PD) district is an overlay zoning district which accommodates planned associations of uses developed as integral land use units such as office parks, retail/commercial or service centers, shopping centers, residential developments having a mixture of housing options, or any appropriate combination of uses which may be planned, developed or operated as integral land use units either by a single owner or a combination of owners. A Planned Development district may be used to permit new or innovative concepts in land utilization not permitted by other zoning districts in this chapter, to ensure the compatibility



AGENDA ITEM

of land uses, and to allow for the adjustment of changing demands to meet the current needs of the community by meeting one or more of the following purposes:

- (1) To provide for a superior design of lots/tracts or buildings;
- (2) To provide for increased recreation and open space opportunities for public use and enjoyment;
- (3) To provide amenities or features that would be of special benefit to the property users or to the overall community;
- (4) To protect or preserve natural amenities and environmental assets such as trees, creeks, ponds, floodplains, slopes, viewscales, or wildlife habitats;
- (5) To protect or preserve existing historical buildings, structures, features or places;
- (6) To provide an appropriate balance between the intensity of development and the ability to provide adequate supporting public facilities and services; and
- (7) To meet or exceed the standards of this chapter.

(c) While greater flexibility is given to allow special conditions or restrictions that would not otherwise allow the development to occur, procedures are established herein to ensure against misuse of increased flexibility.

[SHARE LINK](#)
[SECTION D](#)
[SECTIONS](#)
[VERSIONS](#)

Sec. 12.622. - Planned Development Requirements.

(a)

Any development requirements for a particular PD district that deviate from those of the base zoning district(s) shall be set forth in the amending ordinance granting the PD district. These shall include, but may not be limited to: allowed or additional uses, lot/tract area, lot/tract width, lot/tract depth, yard depths and widths, building height and size, building exterior construction, lot/tract coverage, floor area ratio, parking, access, screening, landscaping, accessory buildings, signs, lighting, project phasing or scheduling, property management associations, and other requirements as the City Council and Planning and Zoning Commission may deem appropriate.

Future Land Use:

The Future Land Use Plan shows this area to be designated as single-family residential. This plan, which was included as part of our 2020 Comprehensive Plan, includes Table 4-1, which shows the distribution of future land uses throughout the



AGENDA ITEM

planning area. This table provides 69.8 acres to be distributed to multi-family development, roughly 1.6% of Roanoke's planned area. With the recent re-zoning of the 14 acres off Cannon Parkway in PD 96-117, Roanoke currently sits at approximately 79.4 acres designated for multi-family development, exceeding the projected amount in the Future Land Use Plan. With the growing interest in multi-family development as an investment and an increasing need for housing in the area, staff regularly receive inquiries about re-zoning existing property to high density residential. If it is the City's intent to re-examine its goals in regards to the amount of multi-family housing or high density residential to be designated within our boundaries, a new study should be initiated by the City staff to take into consideration factors that influence overall development patterns that have an impact on the entire infrastructure system for the City, such as, densities, existing development, zoning patterns, anticipated land use, availability of land for future expansion, current growth trends in the surrounding area, anticipated projects, existing utilities availability, capacity and impact on local schools.

Traffic Study:

A traffic study was conducted by the applicant to analyze the potential traffic impact of the proposed Multi-Family Development. The study has been reviewed by the City's engineering consultant. The Traffic Study and comments are included and may be reviewed as an attachment to the item.

Proposed mitigation: Mitigation would be to widen and add a dedicated LT Turn lane at Lois and Dorman St. on the northbound approach and this is described in Mitigation Measures on Page 26.

Amenities:

The proposed plan in the PD includes one outdoor swimming pool amenity for the complex.

(e) A swimming pool shall be provided in multi-family developments of fifty (50) or more units, plus one (1) additional pool per one hundred (100) units. See [Chapter 6, article 6.300](#) of this Code, article VII of this Code, the International Residential Code, and the International Property Maintenance Code, as amended, for additional requirements for swimming pools.

Parking:



AGENDA ITEM

The applicant has proposed on-street parking within the PD to meet the required amount of parking. Staff would recommend only non-required parking on-street. All required parking should be located on-site.

Planning and Zoning Commission:

The board recommended approval and recommendations included in the motion to address the onsite parking concerns, density and traffic. "Approve what is presented to City Council, with the recommendation that they focus on traffic, parking, and the amount of multifamily (multiple commissioners concerns with the amount of multifamily)."

STAFF RECOMMENDATION:

Mayor and City Council, as you recall during the workshop, you recommended the developer reach back out to City staff to review the density, traffic and public safety matters. We have a meeting scheduled with the developer for next Thursday, January 27th. However, after reviewing the below language staff's recommendation, it is for the developer to resubmit any proposed changes back to P&Z since the revisions should be significant in our opinion. Therefore, we have asked that the developer withdraw their application verses continuing the public hearing. We will keep everyone apprised of the progress.

Minor revisions/ amendments. It is recognized that final architectural and engineering design may necessitate minor changes in an approved site plan. In such cases, the City Manager, or his/her designee shall have the authority to approve minor modifications to an approved site plan and which shall be submitted as an "amended site plan" which substantially conforms to the previously approved site plan, provided that such modifications do not significantly change traffic circulation, building location(s) on the site, proximity of building(s) to nearby residential areas, increase the size or height of building(s), or any other conditions specifically attached as part of the City Council's approval of the site plan. Submission materials and requirements for approval of an



AGENDA ITEM

amended site plan shall be as determined by the City Manager or his/her designee. If the City Manager or his/her designee refuses to approve an amended site plan, then the applicant shall re-submit the amended site plan as a "revised site plan" as described in Subsection (2) below, whereupon the revised site plan shall be scheduled for consideration by the Planning and Zoning Commission and City Council.

Major revisions. In the event of revisions that are more extensive in nature and do not conform to the description for minor amendments above, a "revised site plan" must be resubmitted, reviewed by the City Manager or his/her designee and reconsidered by the Planning and Zoning Commission and the City Council in accordance with the site plan review and approval procedures set forth in this Section.

SPECIAL CONSIDERATION:

N/A

FINANCIAL CONSIDERATION:

N/A

ATTACHMENTS:

1. Roanoke North Signed Zoning Application_ERN (9.29.21)
2. ORD NO 2021-123 - Rezone - SF-7 and R to PD - 18.5 acre tract - 12032021
3. Roanoke North Concept Plan without Contours_11.09.21
4. Colored Elevations (1)_ERN
5. For-Sale Townhome Colored Elevation (8.23.21)
6. Landscape Plans_11.09.21
7. Tract Exhibit Roanoke North
8. Roanoke North Residential Development TIA #2 (10-6-21)
9. Roanoke North Trip Generation - Previous Configuration
10. Street Classification Exhibit_11.09.21
11. Comparision Table_revised
12. Development Standards_revised



CITY OF ROANOKE
500 S. OAK STREET
ROANOKE, TEXAS 76262
(817) 491-2411 FAX (817) 491-2242

ZONING APPLICATION

Applicant/Agent Name IHS Real Estate Holdings, LLC		Home Phone (817) 742-1851	Mobile Phone
Address 3110 W. Southlake Blvd., Suite 120		City / State Southlake	Zip 76092
Property Owner(s) RONOLANDCO, LLC		Home Phone	Work Phone
Address, City, State, Zip 361 W. Bryon Nelson Blvd., Ste. 104 Roanoke, Texas 76262			
Present Zoning Classification SF-7 & Retail	Requested Zoning Classification PD	Acreage/Lot of Requested Zoning Classification 18.5 Acres	

Are any Deed restrictions in place that would prevent this property being used in the manner herein proposed?

☐ Yes ☒ No

If yes, list restrictions _____

Proposed use Mixed use development including single-family and multi-family uses.

Justification for requested zoning change: Please see letter of intent.

I authorize the City of Roanoke to place one change of zoning sign on the subject property to remain in place for the duration of the zoning change process.

[Signature] 7.30.2021
Applicant Signature and Date

Attach two (2) copies of the Metes & Bounds description of the property and a survey map (11x17) of the property. One electronic copy in a pdf format. Fees for Zoning Request is \$250.00 plus \$10.00 per acre. Fees are subject to change if amended by Ordinance.

Authorization:

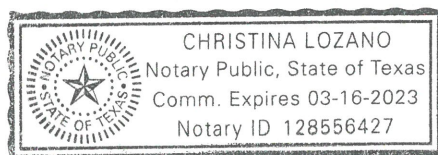
I/We RONOLANDCO, LLC owner(s) of the above described property do hereby authorize IHS Real Estate Holdings, LLC to act on my/our behalf in making and representing this zoning change application.

[Signature] 7.30.2021
Signature of owner Date

State of Texas Tarrant
County of _____

Sworn to and subscribed before me on the 2nd day of August, 2021, by Kenneth W. Fambro, II
(year) (name of owner).

Notary Seal



[Signature]
Notary Public's Signature

08/23/2019



CITY OF ROANOKE
500 S. OAK STREET
ROANOKE, TEXAS 76262
(817) 491-2411 FAX (817) 491-2242

ZONING APPLICATION

Applicant/Agent Name IHS Real Estate Holdings, LLC		Home Phone (817) 742-1851	Mobile Phone
Address 3110 W. Southlake Blvd., Suite 120		City / State Southlake	Zip 76092
Property Owner(s) Billy R. Bowen		Home Phone	Work Phone
Address, City, State, Zip 1008 Walnut Street, Roanoke, Texas 76262			
Present Zoning Classification SF-7 & Retail	Requested Zoning Classification PD	Acreage/Lot of Requested Zoning Classification 18.5 Acres	

Are any Deed restrictions in place that would prevent this property being used in the manner herein proposed?

☐ Yes ☒ No

If yes, list restrictions _____

Proposed use Mixed use development including single-family and multi-family uses.

Justification for requested zoning change: Please see letter of intent.

I authorize the City of Roanoke to place one change of zoning sign on the subject property to remain in place for the duration of the zoning change process.

[Signature]
Applicant Signature and Date

Attach two (2) copies of the Metes & Bounds description of the property and a survey map (11x17) of the property. One electronic copy in a pdf format. Fees for Zoning Request is \$250.00 plus \$10.00 per acre. Fees are subject to change if amended by Ordinance.

Authorization:

I/We Billy R. Bowen
IHS Real Estate Holdings, LLC owner(s) of the above described property do hereby authorize _____ to act on my/our behalf in making and representing this zoning change application.

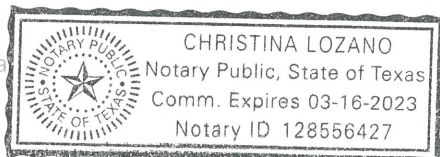
Billy R. Bowen
Signature of owner

8-2-21
Date

State of Texas
County of Tarrant

Sworn to and subscribed before me on the 2nd day of August 2021 by Billy R. Bowen
(year) (name of owner).

Notary Seal



[Signature]
Notary Public's Signature

08/23/2019



CITY OF ROANOKE
500 S. OAK STREET
ROANOKE, TEXAS 76262
(817) 491-2411 FAX (817) 491-2242

ZONING APPLICATION

Applicant/Agent Name IHS Real Estate Holdings, LLC		Home Phone (817) 742-1851	Mobile Phone
Address 3110 W. Southlake Blvd., Suite 120		City / State Southlake	Zip 76092
Property Owner(s) Bobwhite Properties, LP		Home Phone	Work Phone
Address, City, State, Zip A0923A MEP & PRR, TR 2a, OLD CDAD TR #6 (8A); TR 1, OLD DCAD TR #6 (16)			
Present Zoning Classification SF-7 & Retail	Requested Zoning Classification PD	Acreage/Lot of Requested Zoning Classification 18.5 Acres	

Are any Deed restrictions in place that would prevent this property being used in the manner herein proposed?
☐ Yes ☒ No

If yes, list restrictions _____

Proposed use Mixed use development including single-family and multi-family uses.

Justification for requested zoning change: Please see letter of intent.

I authorize the City of Roanoke to place one change of zoning sign on the subject property to remain in place for the duration of the zoning change process.

[Signature] 7-30-21
Applicant Signature and Date

Attach two (2) copies of the Metes & Bounds description of the property and a survey map (11x17) of the property. One electronic copy in a pdf format. Fees for Zoning Request is \$250.00 plus \$10.00 per acre. Fees are subject to change if amended by Ordinance.

Authorization:

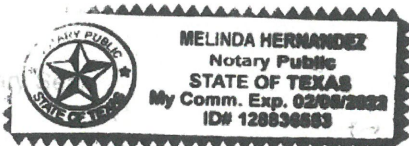
I/We Billie T. Ticknor, for
IHS Bobwhite Properties owner(s) of the above described property do hereby authorize
change application. to act on my/our behalf in making and representing this zoning

State of Texas
County of Tarrant

[Signature]
Signature of owner

7-30-21
Date

Sworn to and subscribed before me on the 30th day of July, 2021 by Billie Ticknor
(year) (name of owner)



[Signature]
Notary Public's Signature

08/23/2019



CITY OF ROANOKE
500 S. OAK STREET
ROANOKE, TEXAS 76262
(817) 491-2411 FAX (817) 491-2242

ZONING APPLICATION

Applicant/Agent Name IHS Real Estate Holdings, LLC		Home Phone (817) 742-1851	Mobile Phone
Address 3110 W. Southlake Blvd., Suite 120		City / State Southlake	Zip 76092
Property Owner(s) Ann French Clark Revocable Trust		Home Phone	Work Phone
Address, City, State, Zip 990 N Walnut Street; 411 Lois Street, Roanoke, Texas 76262			
Present Zoning Classification SF-7 & Retail	Requested Zoning Classification PD	Acreage/Lot of Requested Zoning Classification 18.5 Acres	

Are any Deed restrictions in place that would prevent this property being used in the manner herein proposed?

☐ Yes ☒ No

If yes, list restrictions _____

Proposed use Mixed use development including single-family and multi-family uses.

Justification for requested zoning change: Please see letter of intent.

I authorize the City of Roanoke to place one change of zoning sign on the subject property to remain in place for the duration of the zoning change process.

[Signature] 7/30/2021
Applicant Signature and Date

Attach two (2) copies of the Metes & Bounds description of the property and a survey map (11x17) of the property. One electronic copy in a pdf format. Fees for Zoning Request is \$250.00 plus \$10.00 per acre. Fees are subject to change if amended by Ordinance.

Authorization:

I/We Toni Clark Beckett, Trustee owner(s) of the above described property do hereby authorize IHS Real Estate Holdings, LLC to act on my/our behalf in making and representing this zoning change application.

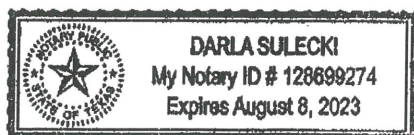
[Signature] 7/30/2021
Signature of owner Date

State of Texas

County of Tarrant

Sworn to and subscribed before me on the 30th day of July 2021, by Revocable Trust of (year) (name of owner).
Ann French Clark,
Toni Clark Beckett,
Trustee

Notary Seal



[Signature]
Notary Public's Signature

08/23/2019

ORDINANCE No. 2021-123

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS, AMENDING THE COMPREHENSIVE ZONING ORDINANCE OF THE CITY OF ROANOKE, TEXAS, FOR AN APPROXIMATELY 18.504-ACRE TRACT OR TRACTS OF LAND LOCATED IN THE M.E.P. & P.R.R. CO. SURVEY, ABSTRACT NO. 923, CITY OF ROANOKE, DENTON COUNTY, TEXAS, AND MORE PARTICULARLY DESCRIBED AND OR DEPICTED IN EXHIBIT "A" WHICH IS ATTACHED HERETO AND INCORPORATED HEREIN FOR ALL PURPOSES, BY CHANGING THE ZONING ON SAID TRACT OR TRACTS FROM SINGLE FAMILY-7 (SF-7) DISTRICT AND RETAIL (R) DISTRICT TO PLANNED DEVELOPMENT DISTRICT 17 (PD-17) WITH MULTI-FAMILY AND SINGLE-FAMILY ATTACHED USES; PRESCRIBING THE PERMISSIBLE USES THEREOF; PROVIDING A PENALTY CLAUSE; PROVIDING A SEVERABILITY CLAUSE; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, after public notice and public hearing as required by law, the Planning and Zoning Commission for the City of Roanoke, Texas, has recommended that the official zoning map of the City of Roanoke, Texas, be amended to reflect that the zoning on the approximately 18.504-acre tract or tracts located in the M.E.P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County, Texas, and being more particularly described and depicted in **Exhibit A** of this Ordinance, which is attached hereto and incorporated herein for all purposes, be changed from Single Family-7 District (SF-7) and Retail District (R) to Planned Development District 17(PD-17) with multi-family and single-family attached uses; and

WHEREAS, the Planning and Zoning Commission of the City of Roanoke, Texas, and the City Council of the City of Roanoke, Texas, in compliance with the laws of the State of Texas, have given the requisite notices by publication and otherwise, and have held due hearings and afforded a full and fair hearing to all property owners generally and to all persons interested, and the City Council of the City of Roanoke, Texas, is of the opinion and finds that said changes should be granted and that the Comprehensive Zoning Ordinance should be amended.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS, THAT:

Section 1. FINDINGS INCORPORATED

The findings set forth above are incorporated into the body of this Ordinance as if fully set forth herein.

Section 2.

The approximately 18.504-acre tract or tracts located in the M.E.P. & P.R.R. Co. Survey, Abstract No. 923, City of Roanoke, Denton County, Texas, and being more particularly described and depicted in **Exhibit A** of this Ordinance, which is attached hereto and incorporated herein for all purposes, be changed from Single Family-7 District (SF-7) and Retail District (R) to Planned Development District 17 (PD-17) with multi-family and single-family attached uses.

Section 3.

The property shall be developed in strict accordance with the allowable land uses for the property being more particularly described and depicted in **Exhibit A** of this Ordinance, which is attached hereto and incorporated herein for all purposes.

Section 4.

The City Secretary is directed to engross and enroll this Ordinance in the Code of Ordinances of the City of Roanoke and to reflect this change of zoning on the official zoning map of the City of Roanoke, Texas.

Section 5. PENALTY CLAUSE

Any person, firm, or corporation violating any of the provisions or terms of this Ordinance shall be guilty of a misdemeanor and upon conviction, shall be fined a sum not to exceed \$2,000.00 for each offense, and each and every violation or day such violation shall continue or exist, shall be deemed a separate offense.

Section 6. SEVERABILITY CLAUSE

It is hereby declared to be the intention of the City Council that the phrases, clauses, sentences, paragraphs and sections of this Ordinance are severable, and if any phrase, clause, sentence, paragraph or section of this Ordinance shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Ordinance, since the same would have been enacted by the City Council without the incorporation of this Ordinance of any such unconstitutional phrase, clause, sentence, paragraph or section.

Section 7. EFFECTIVE DATE

This Ordinance shall become effective immediately upon its passage and publication as required by law.

PASSED, APPROVED AND ADOPTED by the City Council of the City of Roanoke, Texas, on this the 14th day of December, 2021.

APPROVED:

Carl E. Gierisch, Jr., Mayor

ATTEST:

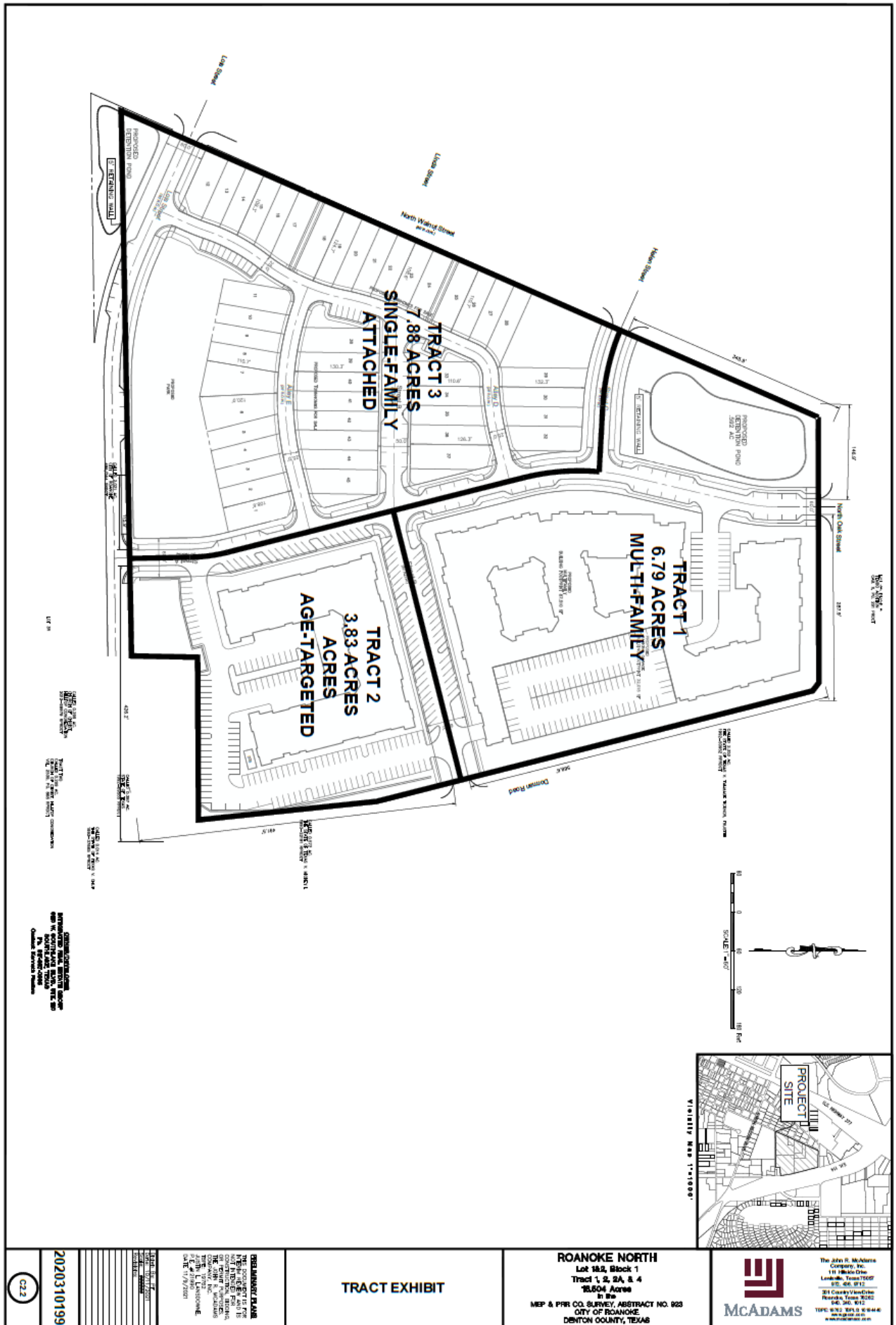
April S. Hill, City Secretary

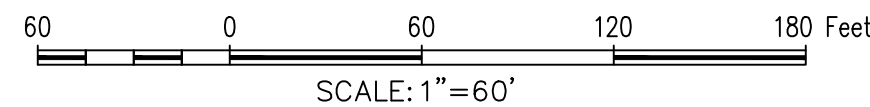
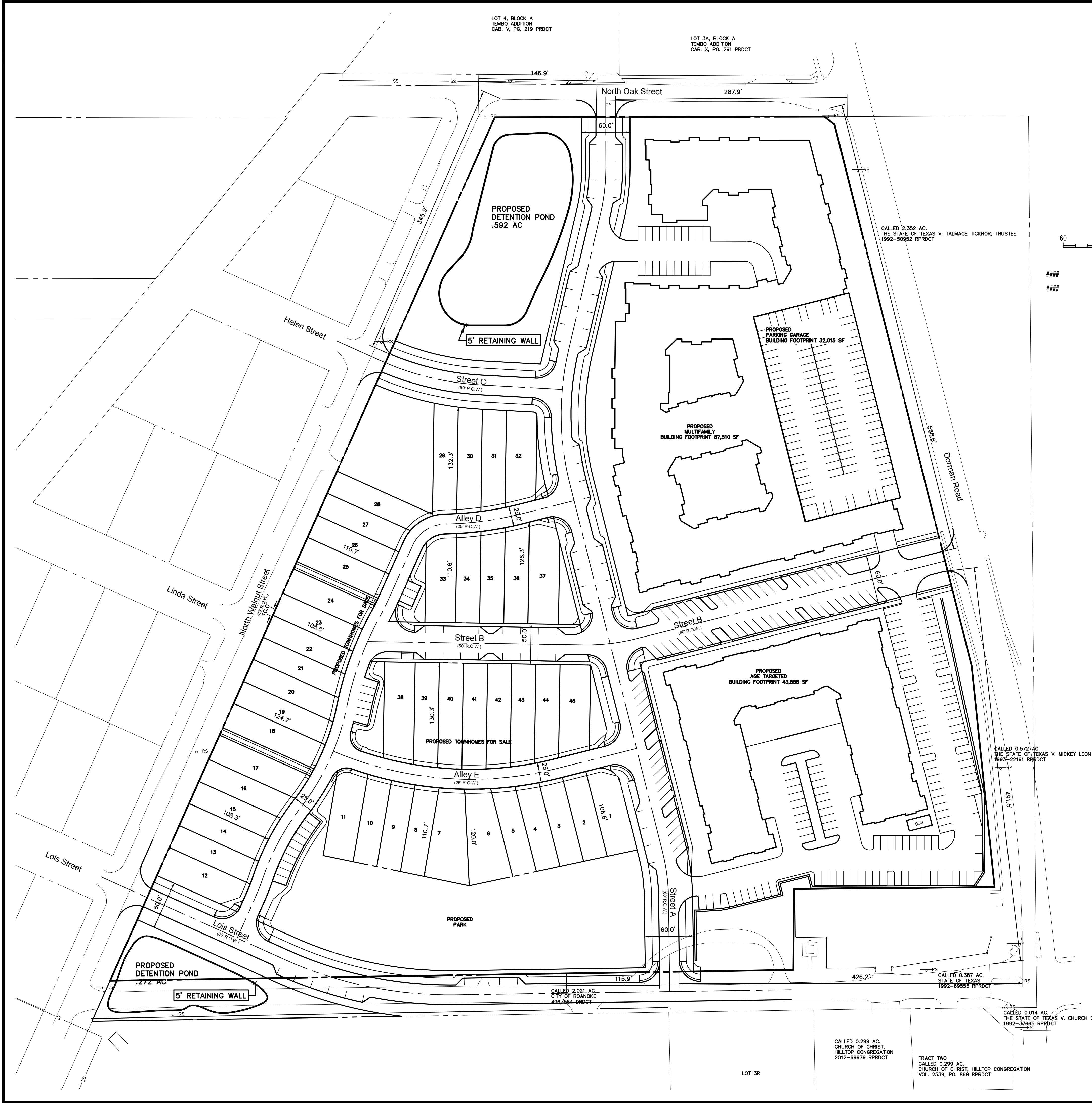
APPROVED AS TO FORM:

Jeff Moore, City Attorney

Exhibit A

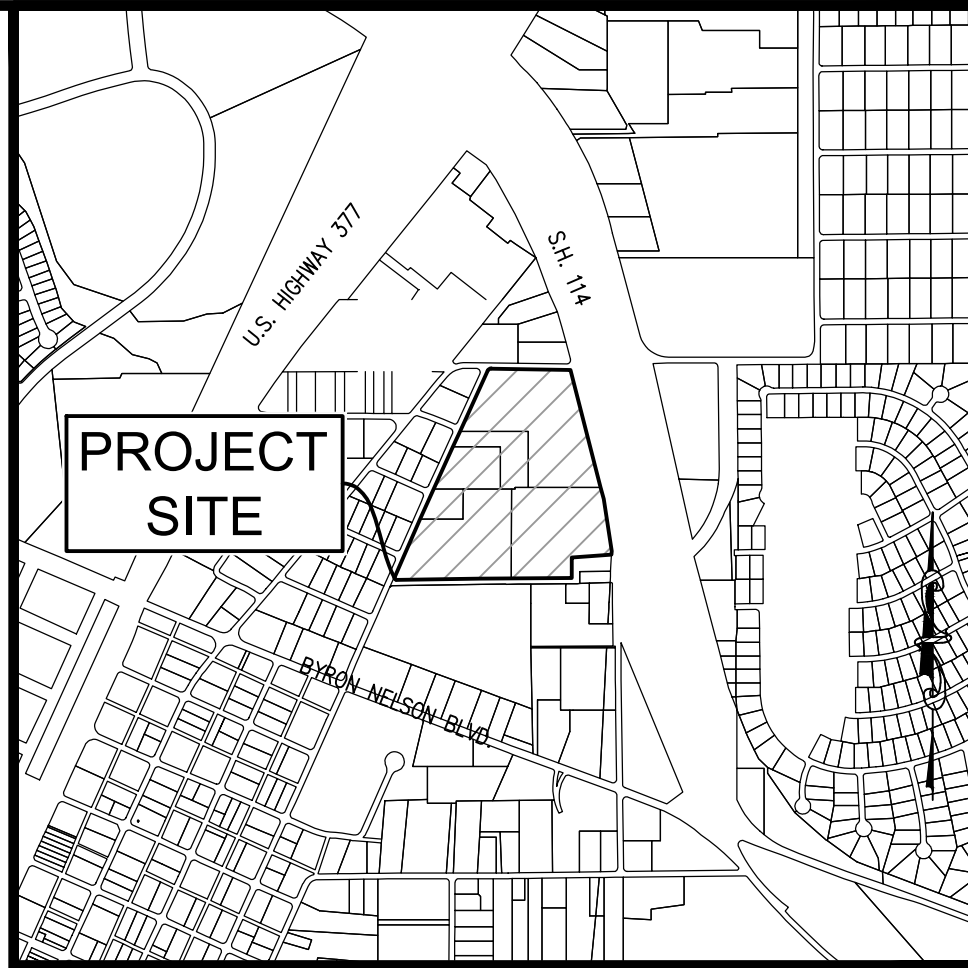
Property Description and Depiction
of the
Approximately 18.504-Acre Tract of Land





###

SITE DATA TABLE			
PHYSICAL ADDRESS		NORTHWEST CORNER OF N WALNUT ST AND LOIS STREET	
GROSS SITE AREA		18.504 ACRES	
EXISTING ZONING		SINGLE FAMILY SF-7 & RETAIL	
PROPOSED ZONING		PLANNED DEVELOPMENT	
CURRENT USE		VACANT AND RESIDENTIAL	
PROPOSED USE		TOWNHOME, MULTI-FAMILY, AND AGE TARGETED	
BUILDING SUMMARY			
NUMBER OF MULTI-FAMILY UNITS		265 UNITS	
NUMBER OF AGE TARGETED UNITS		131 UNITS	
NUMBER OF TOWNHOME FOR SALE UNITS		45 UNITS	
MULTI-FAMILY NUMBER OF STORIES		4 STORIES	
AGE TARGETED NUMBER OF STORIES		4 STORIES	
TOWNHOME NUMBER OF STORIES		2 STORIES	
GROUND FLOOR BUILDING AREA FOR MF		87,510 SQUARE FEET	
GROUND FLOOR BUILDING AREA FOR AT		43,555 SQUARE FEET	
PARKING SUMMARY			
SPACES REQUIRED = (UNITSx1.5)		REQUIRED PARKING	
MULTI-FAMILY	398 SPACES	516	TOTAL
		12	ONSITE
		34	ONSTREET
		470	P. GARAGE
AGE TARGETED	197 SPACES	182	TOTAL
		99	ONSITE
		22	CARPORT
		47	ONSTREET
		14	ATT. GARAGE



Vicinity Map 1"=1000'

The John R. McAdams
Company, Inc.
111 Hillside Drive
Lewisville, Texas 75057
972.435.9712
201 Country View Drive
Rockwall, Texas 75087
940.240.1012
TBPE: 19762 TBPLS: 10194440
www.mcadamsco.com

MCADAMS

ROANOKE NORTH
Lot 1&2, Block 1
Tract 1, 2, 2A, & 4
in the
18,504 Acres
MEP & PRR CO. SURVEY, ABSTRACT NO. 923
CITY OF ROANOKE
DENTON COUNTY, TEXAS

**CONCEPT PLAN WITHOUT
CONTOURS**

PRELIMINARY PLANS
THIS DOCUMENT IS FOR
INTERIM REVIEW AND IS
NOT INTENDED FOR
CONSTRUCTION, BIDDING,
OR PERMIT PURPOSES.
THE JOHN R. MCADAMS
COMPANY, INC.
TBPE: 19762
JUSTIN L. LANSOWNE,
P.E. #121990
DATE 11/9/2021

Drawn By: JT
Date: 10/26/2021
Scale: 1"=60'
Revisions:

2020310199

C2.01b

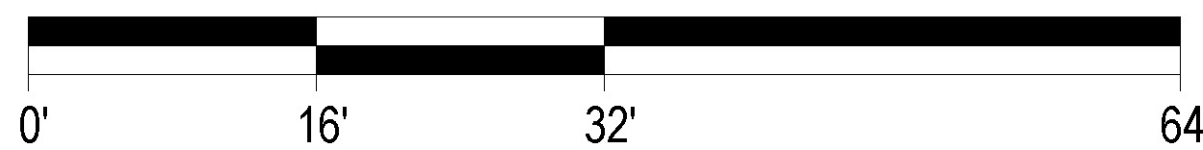
OWNER/DEVELOPER
INTEGRATED REAL ESTATE GROUP
3110 W. SOUTHLAKE BLVD, STE. 120
SOUTHLAKE, TEXAS
Ph. 817-837-0585
Contact: Kenneth Fambro



FRONT ELEVATION

81% MASONRY

SCALE: 3/32" = 1'-0" (24"x36" SHEET)



HUMPHREYS & PARTNERS ARCHITECTS, L.P.
5339 Alpha Rd., Suite 300, Dallas, TX 75240 | 972.701.9636 | www.humphreys.com

INTEGRATED REAL ESTATE GROUP

ELEVATIONS - BLDG I

August 24, 2021

A41X

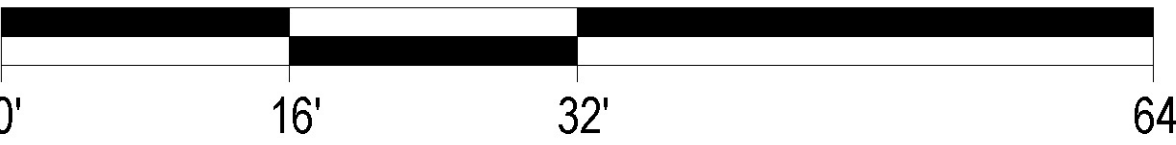
ROANOKE SITE
ROANOKE, TX
HPA# 21239

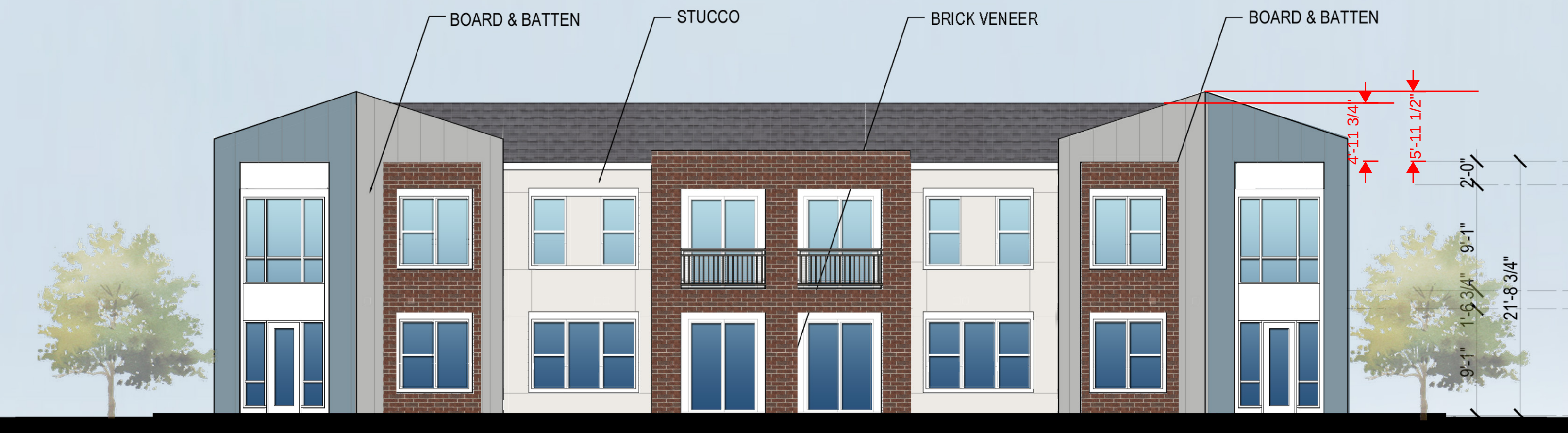


FRONT ELEVATION

85% MASONRY

SCALE: 3/32" = 1'-0" (24"x36" SHEET)





SCALE: 1/8" = 1'-0" (24"x36" SHEET)

0' 8' 16' 32'

HUMPHREYS & PARTNERS ARCHITECTS, L.P.
5339 Alpha Rd., Suite 300, Dallas, TX 75240 | 972.701.9636 | www.humphreys.com

INTEGRATED REAL ESTATE GROUP

ELEVATIONS - TH
August 24, 2021

A43X
ROANOKE SITE
ROANOKE, TX
HPA# 21239

TOWNHOMES
ROANOKE, TEXAS
INTEGRATED REAL ESTATE GROUP

ISSUED FOR
REVIEW ONLY

NOT TO BE USED FOR
REGULATORY APPROVAL,
PERMITTING, OR
CONSTRUCTION

REVISIONS

PROJECT #

21000

DATE

08-23-2021

SHEET NO.

A.490

BUILDING
ELEVATIONS

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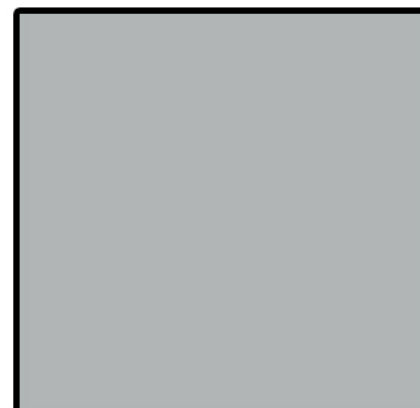
B1
MERIDIAN
BRICK MASONRY



B2
MERIDIAN
BRICK MASONRY



P1
SW 7004
SNOWBOUND



P2
SW 7072
ONLINE



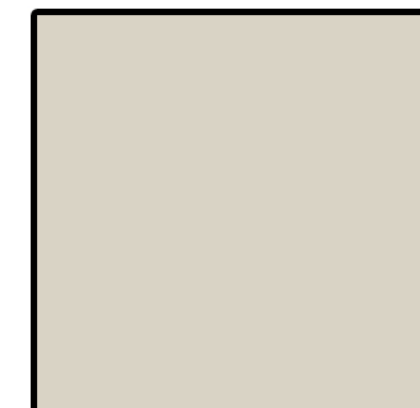
P3
SW 7078
URBANE BRONZE



S1
GOLDEN OAK
STAIN



M1
BLACK
METAL



W1
CLAY
VINYL WINDOW

DEVELOPER:

Integrated Real Estate Group
3110 W Southlake Blvd #120,
Southlake, TX 76092

KEY MAP



PROJECT

ROANOKE IREG

SITE PLAN SUBMITTAL

ROANOKE, TEXAS

ANDDESIGN PROJ.# 8521082

REVISION / ISSUANCE

[illegible]

DESIGNED BY: #####
DRAWN BY: #####
CHECKED BY: #####

VERT: ####
 HORZ: 1"=50'

PLANTING PLAN

SHEET NUMBER

L6-00

SECTION 12.314 (A) USABLE OPEN SPACE REQUIREMENTS FOR NONRESIDENTIAL AND MULTI-FAMILY	
REQUIRED:	PROVIDED:
USABLE OPEN SPACE, EXCEPT AS PROVIDED BELOW, ANY MULTI-FAMILY DEVELOPMENT SHALL PROVIDE USABLE OPEN SPACE WHICH EQUALS OR EXCEEDS FIFTEEN PERCENT (15%) OF THE TOTAL LOT/TRACT AREA. USABLE OPEN SPACE AREAS SHALL BE IN CONFORMANCE WITH SECTIONS 12.274(a) AND 12.274(b). 120,879 sf(15% of Gross area 805,860 sf)	120,879 sf (Refer L6-00 for Usable Open spaces)

SECTION 12.725 MIN. LANDSCAPING REQUIREMENTS FOR NONRESIDENTIAL AND MULTI-FAMILY DEVELOPMENTS	
REQUIRED:	PROVIDED:
(a) FOR ALL NONRESIDENTIAL AND MULTI-FAMILY DEVELOPMENTS, INCLUDING SCHOOLS, CHURCHES, DAY CARE FACILITIES, AND OTHER SIMILAR USES IN A RESIDENTIAL DISTRICT, AT LEAST TWENTY PERCENT (20%) OF THE LOT/TRACT AREA SHALL BE PERVIOUS, PERMANENTLY LANDSCAPED AREA. TOTAL SITE AREA: 18.5 ACRES X .20 = 3.7 ACRES (161,172 SF)	3.7 ACRES/ 161,172 SF
(b) A MINIMUM TWENTY-FIVE FOOT LANDSCAPED STREET BUFFER ADJACENT TO THE RIGHT-OF WAY OF ANY ARTERIAL IS REQUIRED FOR THE FIRST TWO HUNDRED AND FIFTY FEET FROM THE BEGINNING POINT OF THE STREET CORNER RADIUS. BEYOND THE FIRST 250 FEET, THE LANDSCAPED STREET BUFFER MAY EITHER CONTINUE AT 25-FOOT WIDTH, OR IT SHALL TRANSITION DOWN TO A REQUIRED WIDTH OF FIFTEEN FEET ALONG THE REMAINDER OF THE ARTERIAL FRONTAGE.	PROVIDED, SEE PLAN

PARKING LOT LANDSCAPE REQUIREMENTS			
REQUIREMENTS BASED ON ROANOKE, TX MUNICIPLE CODE ARTICLE VII, DIVISION 3, SECTION 12.725 (C)			
ZONE	COMMENTS	REQUIRED	PROVIDED
PARKING ISLAND REQUIREMENTS	THERE SHALL BE A MINIMUM OF ONE (1) LARGE SHADE TREE PLANTED WITHIN THE PARKING AREA FOR EVERY TEN (10) PARKING SPACES FOR PARKING LOT/TRACTS HAVING MORE THAN TWENTY (20) SPACES. WITHIN PARKING LOT/TRACTS , LANDSCAPE AREAS SHOULD BE LOCATED TO DEFINE PARKING AREAS AND TO ASSIST IN CLARIFYING APPROPRIATE CIRCULATION PATTERNS. LANDSCAPE ISLANDS SHALL BE LOCATED AT THE TERMINUS OF ALL PARKING ROWS AND WITHIN BAYS OF PARKING SUCH THAT BAYS DO NOT GENERALLY EXCEED FIFTEEN (15) PARKING SPACES IN LENGTH, AND ALL ISLANDS SHALL CONTAIN AT LEAST ONE (1) TREE (LARGE OR ORNAMENTAL).	221 PARKING SPACES 221 / 12 = 18 ISLANDS (2,916 SF, 18 TREES)	18 ISLANDS (162+SF EACH) 2,916 SF TOTAL 18 TREES
SHADE TREES PER PARKING LOT	THERE SHALL BE A MINIMUM OF 1 LARGE SHADE TREE PLANTING WITHIN THE PARKING SPACES FOR PARKING LOT/TRACTS HAVING MORE THAN 20 SPACES 1 SHADE TREE / 10 PARKING SPACES IN PARKING LOTS WITH MORE THAN 20 SPACES	221 SPACES / 10 = 22 TREES	22 TREES
PARKING LOT STANDARDS			
DIVISION 3, SECTION 12.725 (D); THERE SHALL BE A LANDSCAPED AREA WITH AT LEAST ONE LARGE SHADE TREE WITHIN SIXTY FEET OF EVERY PARKING SPACE.			PROVIDED
PARKING LOT SPACES TO TREE RATIO REQUIREMENTS			
DIVISION 3, SECTION 12.725 (D); THERE SHALL BE A MINIMUM OF ONE LARGE SHADE TREE PLANTED WITH THE PARKING AREA FOR EVERY 10 PARKING SPACES FOR PARKING LOT/ TRACTS HAVING MORE THEN 20 SPACES.			PROVIDED

STREET TREE REQUIREMENTS			
REQUIREMENTS BASED ON ROANOKE, TX MUNICIPAL CODE CHAPTER 12 ARTICLE VII. DIVISION 3 SECTION 12.725 (C)			
ZONE	COMMENTS	REQUIRED	PROVIDED
ARTERIAL FRONTAGE STREET	ONE LARGE SHADE TREE AND 4 SMALL ORNAMENTAL TREES SHALL BE REQUIRED PER FIFTY LINEAR FEET OF STREET BUFFER FRONTAGE	1030 LINEAR FEET/ 50 FT, 21 LARGE TREE, 84 ORNAMENTAL TREES	21 LARGE TREES, 84 ORNAMENTAL TREES

PLANT SCHEDULE

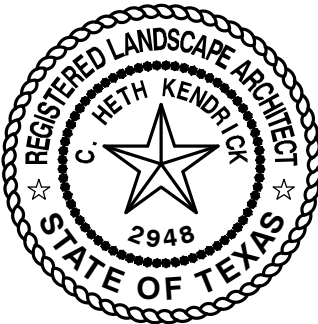
TREES	CODE	BOTANICAL NAME	COMMON NAME	CONT.	SIZE	SPEC SIZE
	GB	Ginkgo biloba	Maidenhair Tree	CONT		8' - 12' HT
	QM	Quercus muehlenbergii	Chinkapin Oak	CONT		8' - 12' HT
	UC	Ulmus crassifolia	Cedar Elm	CONT		8' - 12' HT
ORNAMENTAL TREES	CODE	BOTANICAL NAME	COMMON NAME	CONT.	SIZE	SPEC SIZE
	CCTX	Cercis canadensis texensis MATCHED SPECIMEN, STRONG CENTRAL LEADER	Texas Redbud	CONT.	2" CAL.	10'-12' HT.
	ILDE	Ilex decidua MATCHED SPECIMEN, MULTI-STEM TRUNK	Possumhaw	CONT.	3" CAL.	10'-12' HT.
	SOSE	Sophora secundiflora MATCHED SPECIMEN, MULTI-STEM	Texas Mountain Laurel	CONT.	2" CAL.	8'-10' HT.
GROUND COVERS	CODE	BOTANICAL NAME	COMMON NAME	CONT	SPACING	MIN HT
	SE	SOD Bermuda	Bermuda Sod	1-5 GAL.		

DEVELOPER:

Integrated Real Estate Group
3110 W Southlake Blvd #120,
Southlake, TX 76092

KEY MAP

SEAL



PROJECT

ROANOKE IREG

SITE PLAN SUBMITTAL
ROANOKE, TEXAS

LANDESIGN PROJ.#
8521082

REVISION / ISSUANCE		
NO.	DESCRIPTION	DATE

DESIGNED BY: ####
DRAWN BY: ####
CHECKED BY: ####

SCALE NORTH

VERT: ####
HORZ:

SHEET TITLE
CALCULATION TABLES AND
CONCEPTUAL PLANT
SCHEDULE

SHEET NUMBER

L6-01

Integrated Real Estate Group
3110 W Southlake Blvd #120,
Southlake, TX 76092



1. ALL TREES ARE TO BE NURSERY GROWN. ALL TREES TO BE BALL AND BURLAP (B&B) OR CONTAINER GROWN AS SPECIFIED IN SCHEDULE.
2. COMPLETELY REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, CONTAINERS, STAKING WIRE, OR NYLON TWINE FROM ROOTBALL PRIOR TO PLANTING.
3. INSTALL TOP OF PLANT BALL EVEN WITH OR 1" ABOVE EXISTING GRADE.
4. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
5. SET TREE IN VERTICAL POSITION PRIOR TO PLANTING.
6. ALL STAKING TO BE REMOVED AFTER ONE YEAR.
7. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
8. RESEED UNMULCHED, DISTURBED AREAS.
9. DO NOT COVER ROOT CROWN.

1. ALL TREES ARE TO BE NURSERY GROWN. ALL TREES TO BE BALL AND BURLAP (B&B) OR CONTAINER GROWN AND SPECIFIED IN SCHEDULE.
2. COMPLETELY REMOVE ALL TREES. PLASTIC-COATED BURLAP, CONTAINER STRAPPING WIRE, OR NYLON TWINE TO BE REMOVED PRIOR TO PLANTING.
3. INSTALL TOP OF PLANT BALL EVEN WITH OR 1" ABOVE EXISTING GRADE.
4. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
5. SET TREE IN VERTICAL POSITION POST TO STAKING.
6. ALL STAKING TO BE REMOVED AFTER ONE YEAR.
7. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
8. RESEED UNMULCHED, DISTURBED AREAS.
9. DO NOT COVER ROOT CROWN.

NOTES:

1. ALL TREES ARE TO BE NURSERY GROWN. ALL TREES TO BE BALL AND BURLAP (&&B) OR CONTAINER GROWN. ALL TREES TO BE SPECIFIED IN SCHEDULE.
2. COMPLETELY REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, CONTAINERS, STAKING WIRE, OR NYLON ON SITE FROM ROOTBALL PRIOR TO PLANTING.
3. INSTALL TOP OF PLANT BALL EVEN WITH OR 1" ABOVE EXISTING GRADE.
4. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
5. SET TREE IN VERTICAL POSITION PRIOR TO STAKING.
6. ALL STAKING TO BE REMOVED AFTER ONE YEAR.
7. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
8. RESEED UNMULCHED, DISTURBED AREAS.
9. DO NOT COVER ROOT CROWN.

NTS

NTS

NTS



1. SCARIFY ROOT MASS OF CONTAINERIZED PLANT MATERIAL.
2. INSTALL CONTAINERIZED PLANTS AT FINISHED GRADE.
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
5. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.



PLANT SPACING CHART

SPACING "D"	ROW "A"	PLANTS / S.F.
6" O.C.	5 3/16" O.C.	4.61
8" O.C.	6 15/16" O.C.	2.60
10" O.C.	8 2/3" O.C.	1.66
12" O.C.	10 3/8" O.C.	1.15
15" O.C.	13" O.C.	0.73
18" O.C.	15 9/16" O.C.	0.51
24" O.C.	20 13/16" O.C.	0.29

NOTES:
1. LAYOUT PLANTS IN PREPARED BED AS SHOWN.
2. SPACING AS SPECIFIED, PER SCHEDULE STAGGERED ROWS

NTS

NTS

NTS

NOTE:
1. MIX IN BONE MEAL AT BOTTOM OF BULB WHEN PLANTED

TREE PROTECTION NOTES:

1. REFER TO THE TREE PRESERVATION PLAN FOR TREE LOCATIONS TO BE PRESERVED.
2. REVEAL LOCAL JURISDICTION'S TREE PRESERVATION AND PROTECTION FOR ADDITIONAL INFORMATION REGARDING TREE PROTECTION MEASURES.
3. REMOVE ALL TREE PROTECTION FENCING UPON COMPLETION OF PROJECT.
4. EXISTING TREE SHOW TO REMAIN ARE TO BE PROTECTED DURING CONSTRUCTION. ALL SAFETY FENCE MIN. 4'-0" HEIGHT SHALL BE INSTALLED AT THE DRIP LINE OF ALL TREES OR TREE GROUPS TO REMAIN.
5. DISPOSAL OF ANY WASTE MATERIAL, SUCH AS, BUT NOT LIMITED TO PAINT, ASPHALT, OIL, SAND, CONCRETE, MORTAR, ETC. WITHIN THE CANOPY AREA OF THE EXISTING TREES SHALL NOT BE ALLOWED.
6. NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A NECESSARY NATURE, SHALL BE ALLOWED TO AVOID DAMAGE TO TREES.
7. NO FILL OR EXCAVATION OF ANY NATURE SHALL OCCUR WITHIN THE DRIP LINE OF A TREE TO BE PRESERVED, UNLESS THERE IS A SPECIFIED WELL OR RETAINING WALL SHOWN ON THE GRADING PLAN.
8. NO MATERIAL SHALL BE STORED WITHIN THE DRIPLINE AREA OF A TREE TO BE PRESERVED.

NOTES:

1. NO GRADING, PARKING OR MANEUVERING OF VEHICLES, STORAGE OF MATERIALS, AND/OR ANY OTHER CONSTRUCTION OR LAND DEVELOPMENT ACTIVITY SHALL TAKE PLACE WITHIN THE TREE PROTECTION FENCING AREA.
2. FENCE TO BE MAINTAINED AND REPAIRED AS NEEDED DURING CONSTRUCTION.

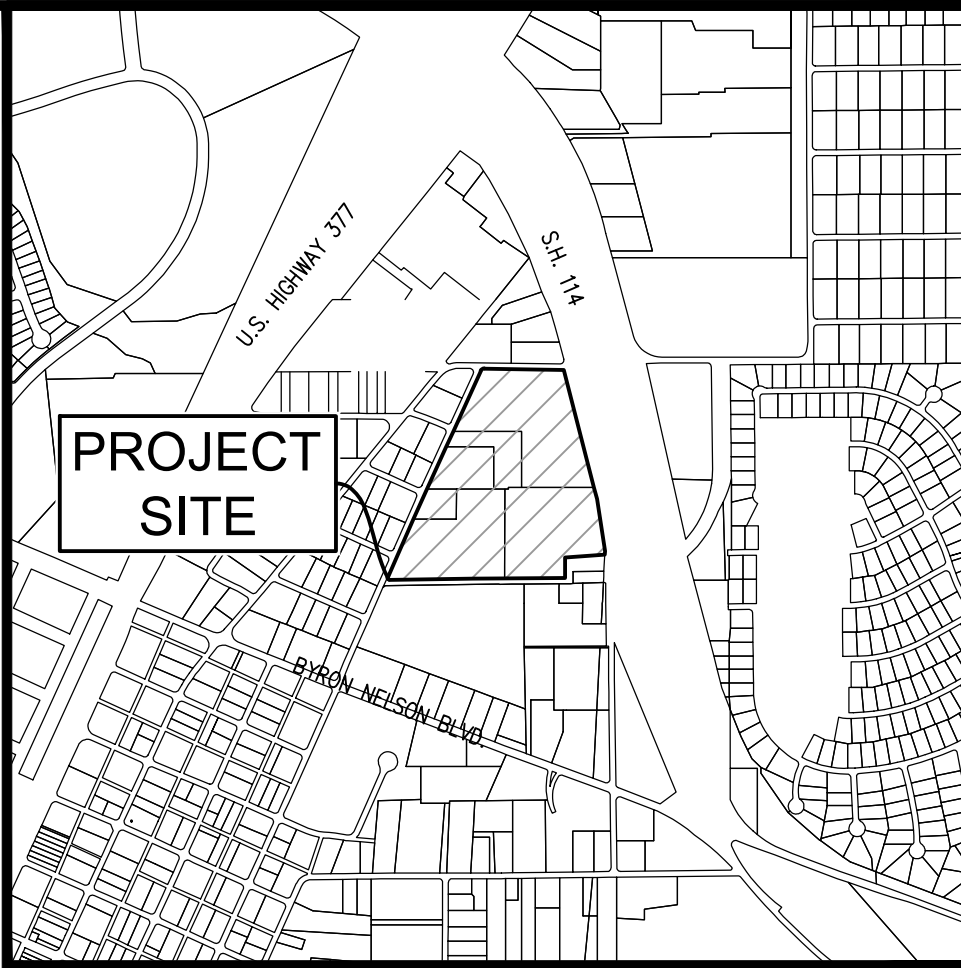
NTS

NTS

LOT 3A, BLOCK A
TEMPO ADDITION
CAB. X, PG. 291 PRDCT

CALLED 2.352 AC.
THE STATE OF TEXAS V. TALMAGE TICKNOR, TRUSTEE
1992-50952 RPRDCT

60 0 60 120 180 Feet
SCALE: 1"=60'



Vicinity Map 1"=1000'

The John R. McAdams
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Rockwall, Texas 75087
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TBPE: 19762 TBPLS: 10194440
www.mcadamsco.com



MCADAMS

ROANOKE NORTH

Lot 1&2, Block 1

Tract 1, 2, 2A, & 4

18,504 Acres

in the

MEP & PRR CO. SURVEY, ABSTRACT NO. 923

CITY OF ROANOKE,
DENTON COUNTY, TEXAS

TRACT EXHIBIT

PRELIMINARY PLANS

THIS DOCUMENT IS FOR
INTERIM REVIEW AND IS
NOT INTENDED FOR
CONSTRUCTION, BIDDING,
OR PERMIT PURPOSES.
THE JOHN R. MCADAMS
COMPANY, INC.
TBPE: 19762
JUSTIN L. LANSOWNE,
P.E. #121990
DATE 11/9/2021

Drawn By: PF
Date: 10/11/2021
Scale: #####
Revisions:

2020310199

C.2.2

ROANOKE NORTH

**TRAFFIC IMPACT ANALYSIS FOR
ROANOKE NORTH RESIDENTIAL DEVELOPMENT
ROANOKE, TEXAS
SUBMITTAL #2**

Prepared for:
Integrated Real Estate Group
3110 W. Southlake Blvd, Ste. 120
Southlake, TX 76092

Prepared by:



LEE ENGINEERING

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TBPE Firm F-450



Digitally signed by
Kelly D. Parma, P.E.,
PTOE
Date: 2021-10-06 16:
36:55

October 2021

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INTRODUCTION

This traffic study was conducted to analyze the potential traffic impacts of the proposed Roanoke North Residential Development located on the northwest corner of the intersection of SH 114 and Lois Street in Roanoke, Texas. A vicinity map of the study area is shown in **Figure 1** and a site plan for the multifamily development is shown in **Figure 2** and in the Appendix. The following elements were included in this study:

Data Collection

- Collected weekday AM and PM peak period turning movement volumes at the following 13 existing study intersections:
 - 1) SH 114 Eastbound Frontage Road (EBFR) and US 377
 - 2) SH 114 Westbound Frontage Road (WBFR) and US 377
 - 3) Oak Street and Dorman Street
 - 4) Oak Street and Commercial Driveway
 - 5) Oak Street and Walnut Street
 - 6) Walnut Street and Helen Street
 - 7) Walnut Street and Lois Street (North)
 - 8) Walnut Street and Lois Street (South)
 - 9) Lois Street and Joan Street
 - 10) Lois Street and Dorman Street
 - 11) US 377 and James Street
 - 12) Walnut Street and Byron Nelson Boulevard
 - 13) Dorman Street and Byron Nelson Boulevard
- Obtained historical traffic volumes near the proposed development for comparison to the existing traffic volumes collected.
- Obtained the proposed site plan, information related to the planned roadway improvements, and other relevant information.

Traffic Analysis

- Assessed the general accessibility of the site.
- Estimated the number of trips that will be generated by the proposed development
- Estimated the directional distribution of traffic approaching / departing the proposed development.
- Assigned the estimated traffic to the study area roadways and intersections.
- Performed capacity analyses for the critical intersections within the study area.
- Performed Roadway link capacity analysis for roadway segments adjacent to the proposed development.
- Performed access management analysis for the proposed site driveways.

Recommendations

- Determined if any roadway improvements are needed to accommodate projected traffic generated by the proposed development.

Documentation

- Prepared a report documenting the study procedures and results.

Figure 1: Vicinity Map of the Study Area



SITE ACCESSIBILITY

Site accessibility describes the ease with which vehicles can get to and from a development. A site's accessibility is affected by the geographical location of the development with respect to other activity areas, the roadway system and physical restraints such as rivers or lakes.

The existing lane configurations for the adjacent roadways are provided in **Figure 3**. A description of the study area roadways includes:

SH 114 Frontage Roads – SH 114 eastbound frontage road and SH 114 westbound frontage road are both east-west, two-lane frontage road east of the proposed facility with a posted speed limit of 60 mph.

US 377 – US 377 is to the west of the proposed development with a posted speed limit of 50 mph. The section between SH 114 eastbound frontage road and Byron Nelson Boulevard is currently under construction and is planned to be a five-lane undivided roadway with a two-way-left-turn lane in the middle with the completion of construction. US 377 is identified as a Type AA Major Arterial in the City of Roanoke Thoroughfare Plan.

Byron Nelson Boulevard – Byron Nelson Boulevard is to the south of the proposed development and is a three-lane undivided roadway with a two-way-left-turn lane in the middle. The posted speed limit on Byron Nelson Boulevard is 40 mph. Byron Nelson Boulevard is identified as a Type AA Major Arterial in the City of Roanoke Thoroughfare Plan.

Walnut Street – Walnut Street is adjacent to the proposed development to the west and is a two-lane undivided roadway. The posted speed limit on Walnut Street is 25 mph. It is identified as a Type C Major Collector in the City of Roanoke Thoroughfare Plan.

Lois Street – Lois Street is adjacent to the proposed development to the south and is a two-lane undivided roadway. The posted speed limit on Walnut Street is 25 mph. It is identified as a Type C Major Collector in the City of Roanoke Thoroughfare Plan.

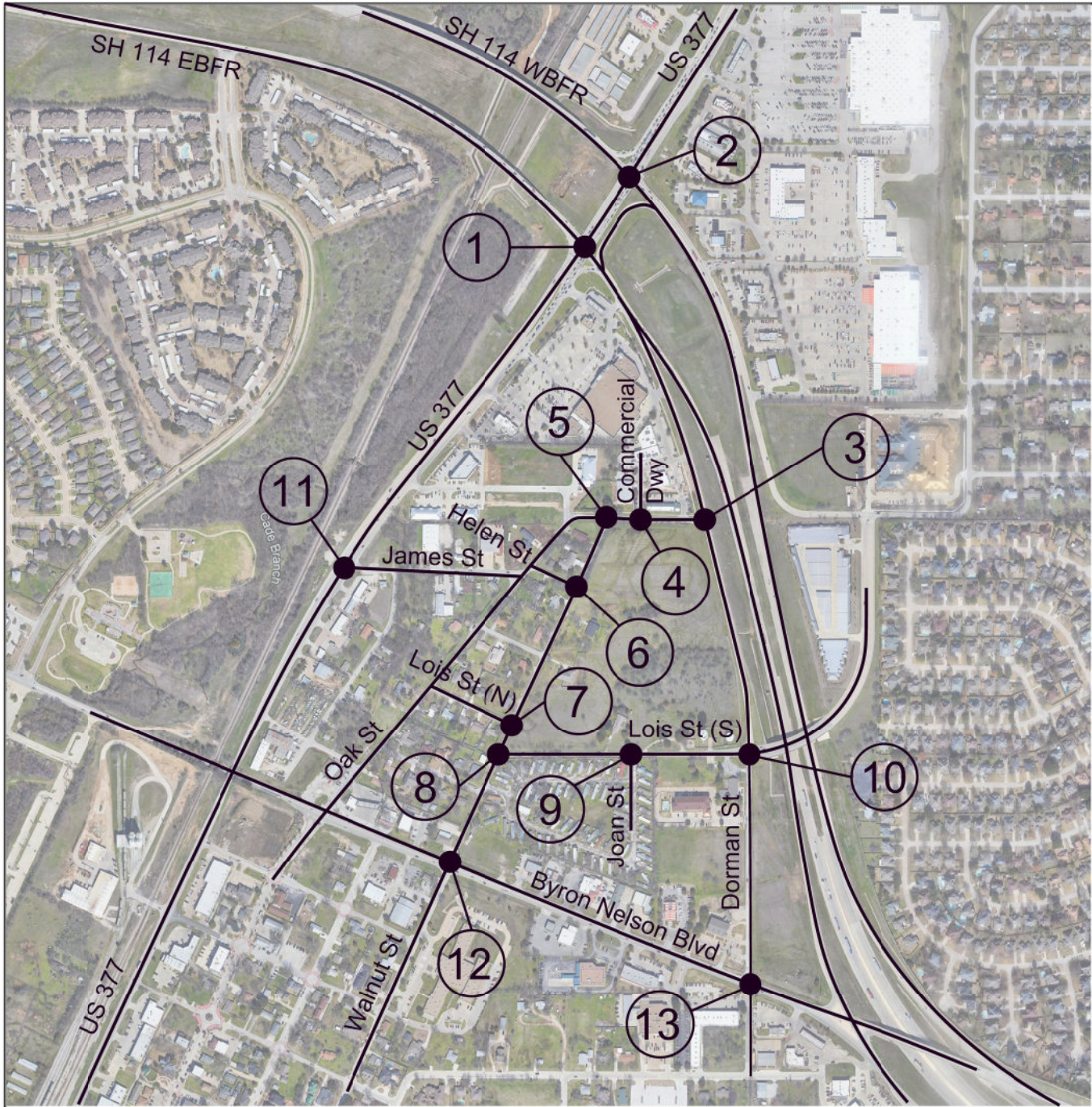
Oak Street – Oak Street is adjacent to the proposed development to the north and is a two-lane undivided roadway. The posted speed limit on Walnut Street is 25 mph. It is identified as a Type C Major Collector in the City of Roanoke Thoroughfare Plan.

James Street – James Street is to the west of the proposed development and is a two-lane undivided roadway. The posted speed limit on Walnut Street is 25 mph. It is identified as a Type C Major Collector in the City of Roanoke Thoroughfare Plan.

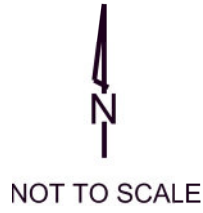
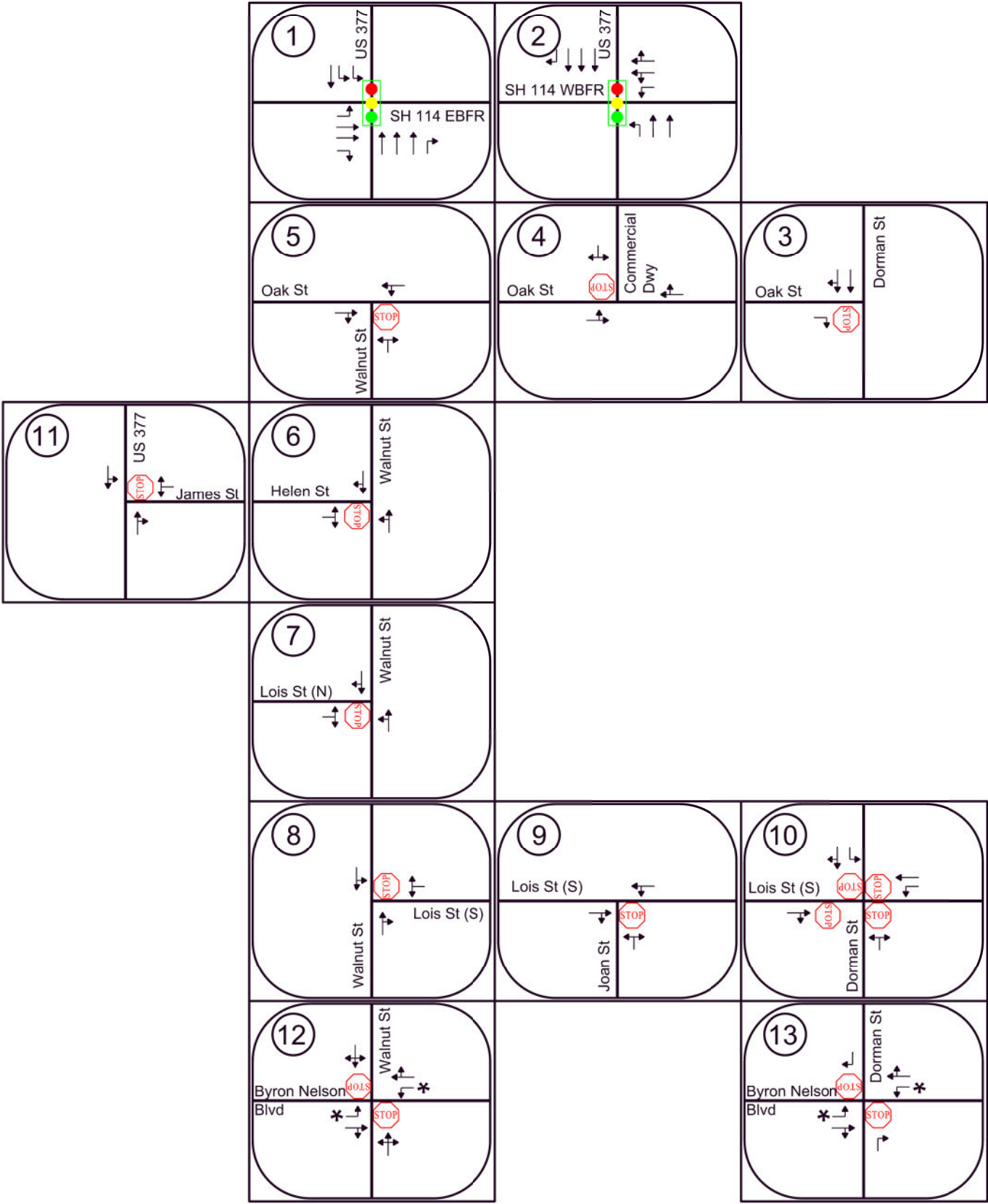
Access to the proposed multifamily development is proposed to be provided by:

- One full-access driveway (Street A) on the south side of Oak Street that will be aligned with the existing commercial driveway and will be located approximately 290 feet west of Dorman Street.
- One right-in-right-out driveway (Street B) on the west side of Dorman Street that will be located approximately 570 feet south of Oak Street.
- One full-access driveway (Street C) on the east side of Walnut Street that will be aligned with the existing Helen Street and will be located approximately 345 feet south of Oak Street.
- One full-access driveway (Alley E) on the north side of Lois Street that will be aligned with the existing Joan Street and will be located approximately 600 feet west of Dorman Street.
- One full-access driveway (Street A) on the north side of Lois Street that will be located approximately 115 feet east of the existing Joan Street and proposed Alley E.

The proposed site access driveway location and lane configurations are shown in **Figure 4**.

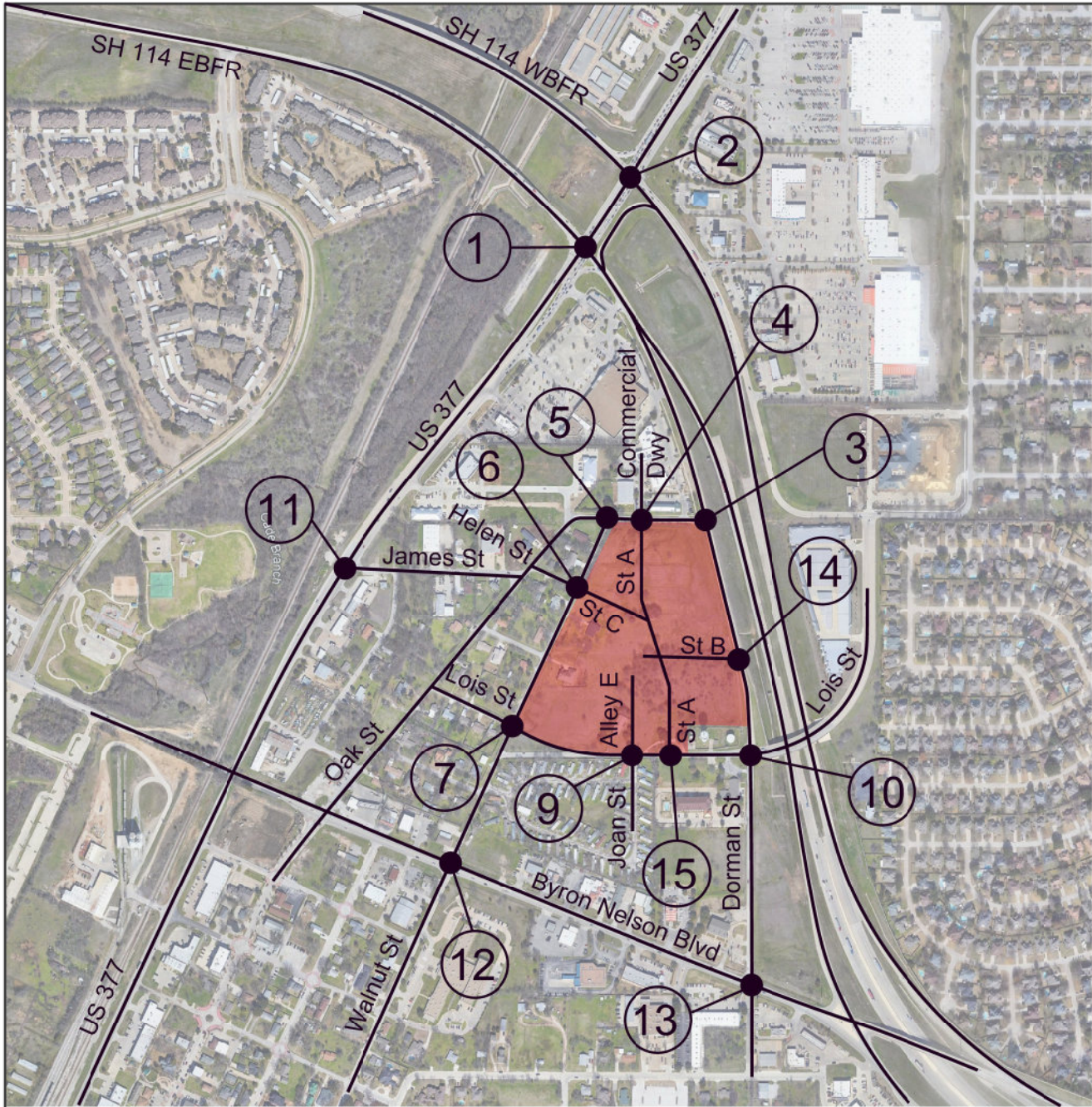


- LEGEND**
- STUDY INTERSECTION
 -  SIGNALIZED INTERSECTION
 -  STOP-CONTROLLED INTERSECTION
 - * Two-Way Left Turn Lane (TWLTL).



Existing Intersection Lane Configurations

Figure 3



LEGEND

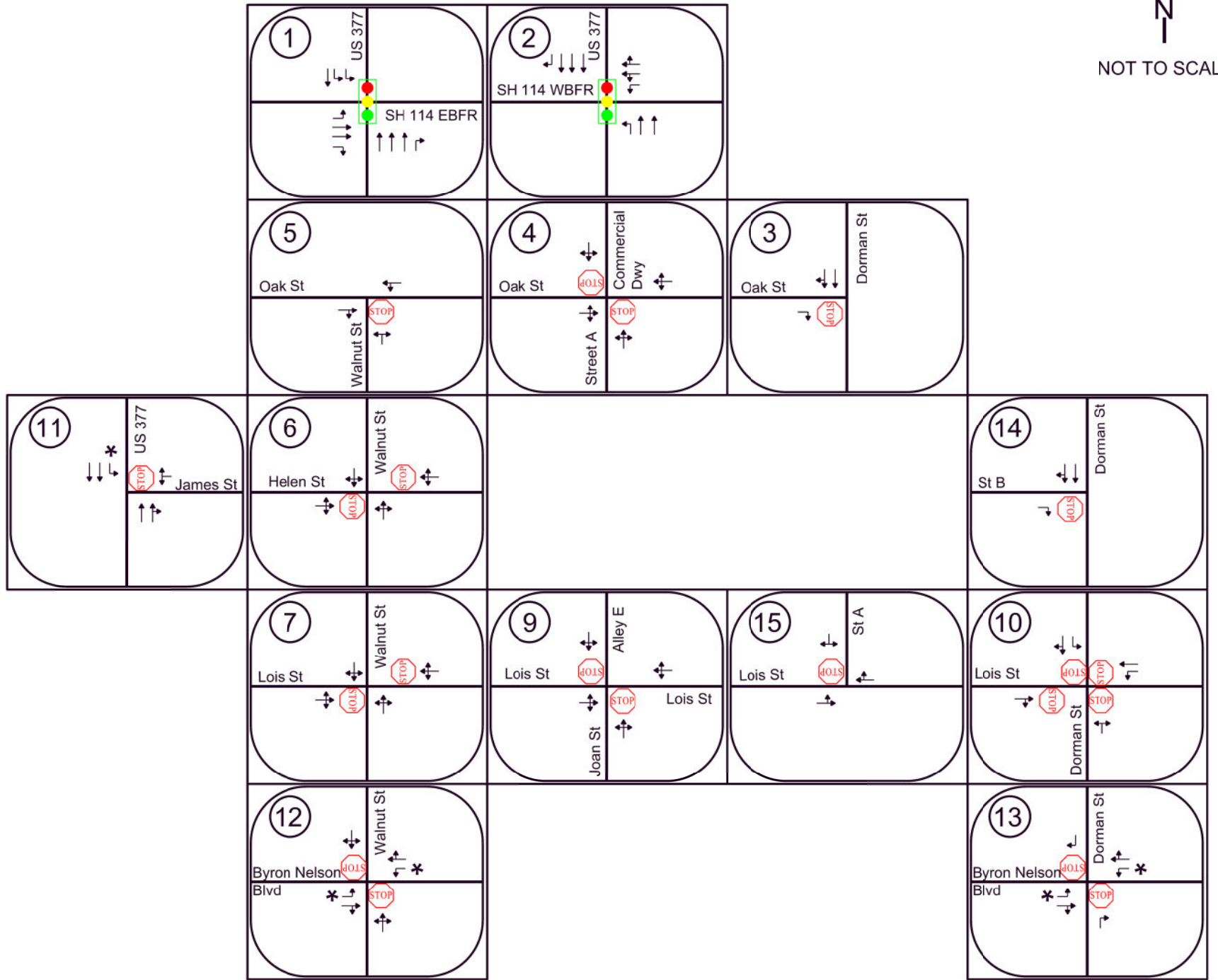
● STUDY INTERSECTION

SIGNALIZED INTERSECTION

STOP-CONTROLLED INTERSECTION

PROPOSED DEVELOPMENT

* Two-Way Left Turn Lane (TWLTL).



Proposed Intersection Lane Configurations

Figure 4

PROPOSED DEVELOPMENT

The proposed Roanoke North Residential Development is planned to consist of a mixture of residential uses including:

- 289 multifamily dwelling units
- 129 senior living dwelling units
- Nine (9) townhome dwelling units
- 41 single-family dwelling units.

Based on discussions with the developer's representative, the Build-Out Year of the proposed development is planned to occur in 2024. The property is currently undeveloped.

The number of trips generated by the proposed development is a function of the type and quantity of land uses within the development. The number of vehicle trips generated by the proposed development was estimated based on the trip generation rates and equations provided in the publication entitled *Trip Generation Manual, 10th Edition*, by the Institute of Transportation Engineers (ITE). Estimates of the number of trips generated by the site were made for the AM and PM peak hours, as well as on a daily basis. The trip generation characteristics for the proposed Roanoke North Residential Development at Build-Out are shown in **Table 1**.

Table 1: Trip Generation Characteristics for Proposed Roanoke North residential development

Land Use		Rates ¹								
Description	ITE Code	Average Weekday			AM Peak Hour			PM Peak Hour		
Multifamily Housing (Mid-Rise)	221	T = 5.45(X) – 1.75			Ln(T) = 0.98*Ln(X) – 0.98			Ln(T) = 0.96Ln*(X) – 0.63		
Senior Adult Housing - Attached	252	T = 4.02(X) - 25.37			T = 0.2(X) - 0.18			T = 0.26(X)		
Townhomes	220	T = 7.56(X) - 40.86			Ln(T) = 0.95*Ln(X) - 0.51			Ln(T) = 0.89*Ln(X) - 0.02		
Single-Family Detached Housing	210	Ln(T) = 0.92*Ln(X) + 2.71			T = 0.71(X) + 4.80			Ln(T) = 0.96*Ln(X) + 0.20		
Land Use		Directional Split ²								
Description	ITE Code	Average Weekday			AM Peak Hour			PM Peak Hour		
Multifamily Housing (Mid-Rise)	221	50 / 50			26 / 74			61 / 39		
Senior Adult Housing - Attached	252	50 / 50			35 / 65			55 / 45		
Townhomes	220	50 / 50			23 / 77			63 / 37		
Single-Family Detached Housing	210	50 / 50			25 / 75			63 / 37		
Land Use		Number of Trips								
Land Use	Variable ³	Average Weekday			AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	289	1,574	787	787	97	25	72	123	75	48
Senior Adult Housing - Attached	129	494	247	247	26	9	17	34	19	15
Townhomes	9	28	14	14	5	1	4	7	4	3
Single-Family Detached Housing	41	458	229	229	34	9	25	43	27	16
TOTAL		2,554	1,277	1,277	162	44	118	207	125	82

¹T = Trips Ends; X = Number of Dwelling Units

²XX / YY = % entering vehicles / % exiting vehicles

³Number of Dwelling Units

TRAFFIC VOLUMES

Existing Traffic Volumes

Peak period turning movement volumes were collected at the existing study area intersections from 7:00-8:00 AM and 4:00-6:00 PM on Tuesday, August 31, 2021. **Figure 5** shows the existing traffic volumes collected for this traffic study. The raw traffic count data is provided in the Appendix.

To account for the COVID-19 pandemic impact on the traffic patterns and to present a more accurate representation of “typical” conditions, available historical traffic volumes (2019) were obtained near the proposed development from TxDOT’s online Traffic Count Database System (TCDS). These 2019 TCDS volumes were summarized, grown to existing (2021) conditions and compared to the existing traffic volume data collected (8/31/21). Based on the comparisons, the following correction factors were applied to the AM peak and PM peak hour volumes collected at the 13 study intersections:

- AM Peak Hour = 1.22
- PM Peak Hour = 1.10

The detailed methodology used in determining these adjustment factors is provided in the Appendix. **Figure 6** shows the Revised Existing (2021) peak hour traffic volumes.

Background Traffic Volumes

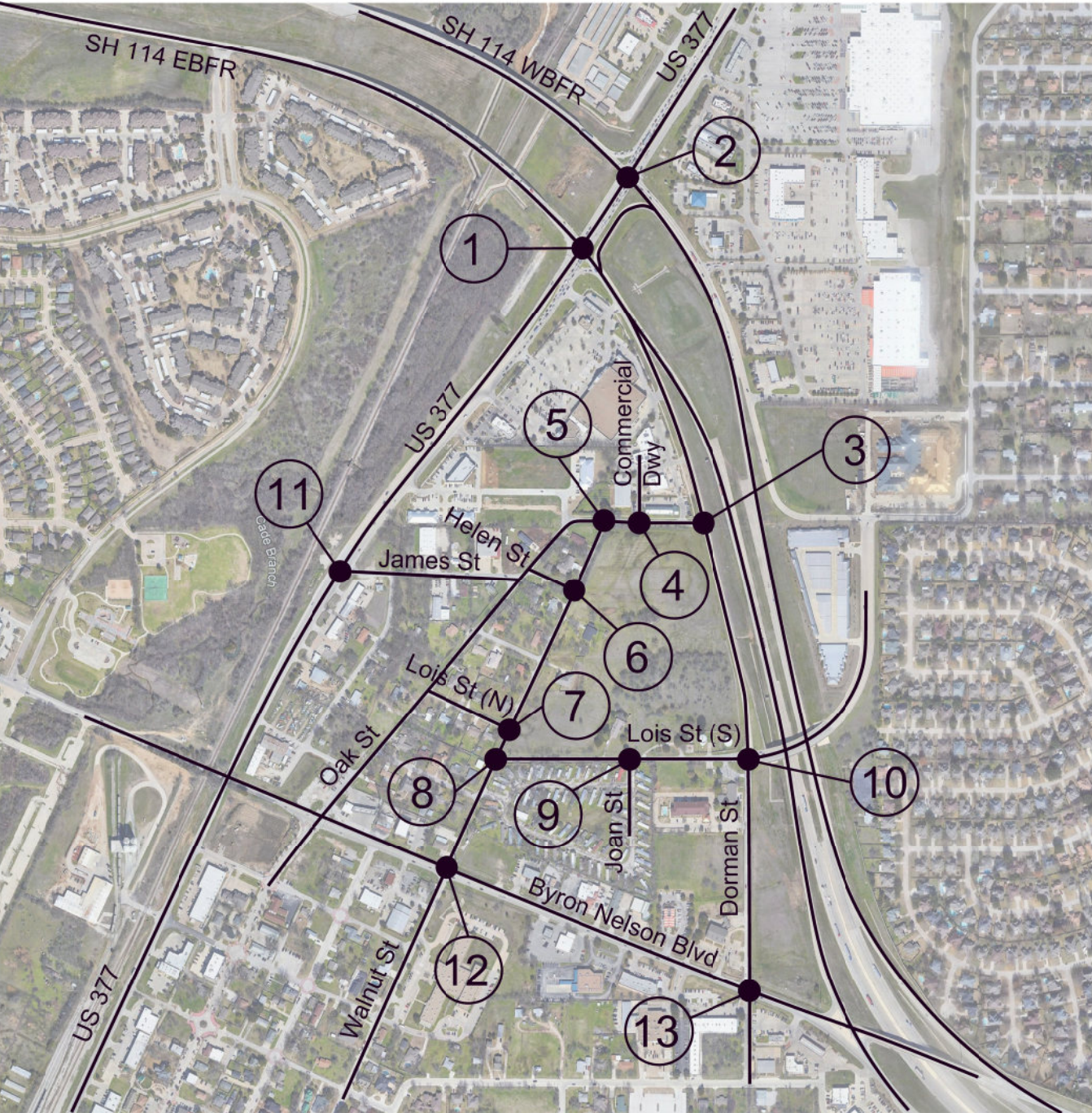
Historical 24-hour traffic volumes in the vicinity of the proposed multifamily development were obtained from TxDOT traffic count maps and are presented in **Table 2**. These volumes were used in estimating the annual growth percentage necessary to grow the existing background traffic volumes to future analysis years.

Table 2: Historical Traffic Count Database System Traffic Counts

YEAR	US 377 (S of SH 114)	Walnut St (Between Lois St and Byron Nelson Blvd)	Dorman St (Between Lois St and Oak St)
2009	13,700	940	--
2010	15,000	--	--
2011	16,800	--	--
2012	17,400	--	--
2013	16,311	--	--
2014	16,763	827	1,207
2015	15,820	--	--
2016	14,763	--	--
2017	17,431	--	898
2018	16,881	--	811
2019	16,963	1,077	1,062
Average Annual Growth Rate ¹	0.2% / 2%	5% / 1%	-3% / --

¹ Growth rate for 5-year period (2014 to 2019) / 10-year period (2009 to 2019)

As shown in Table 2, traffic volumes near the proposed development have fluctuated in the previous 5- and 10-year period. For this analysis, an annual growth rate of five percent (5%) was used for determining traffic conditions under the Build-Out Year (2024). **Figure 7** provides the resulting Build-Out Year (2024) Background peak hour traffic volumes.



LEGEND

● STUDY INTERSECTION

AM (PM) PEAK HOUR VOLUMES

* AM and PM Traffic volumes collected on Tuesday, August 31, 2021.

Initial Existing (2021) Peak Hour Traffic Volumes

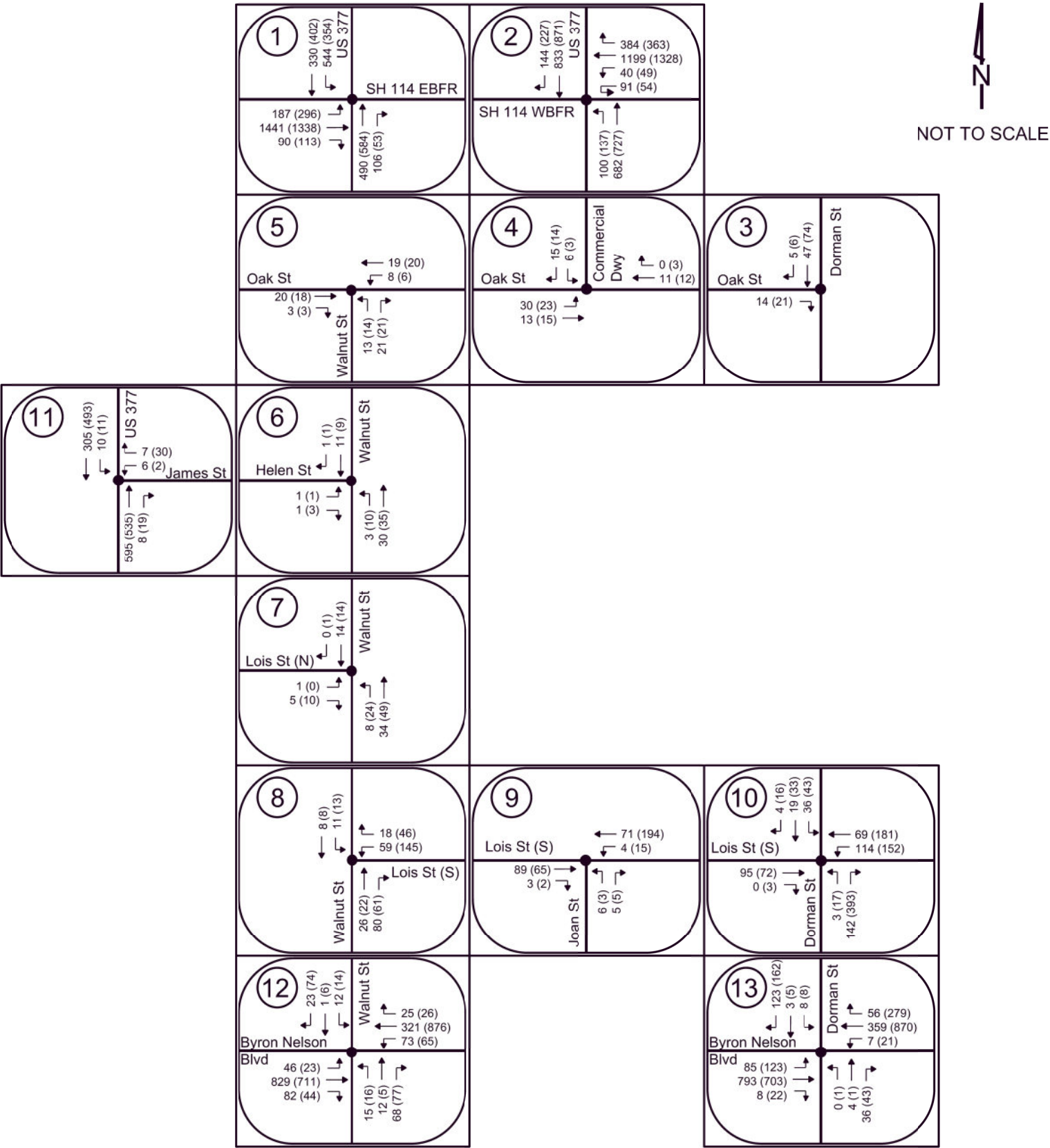
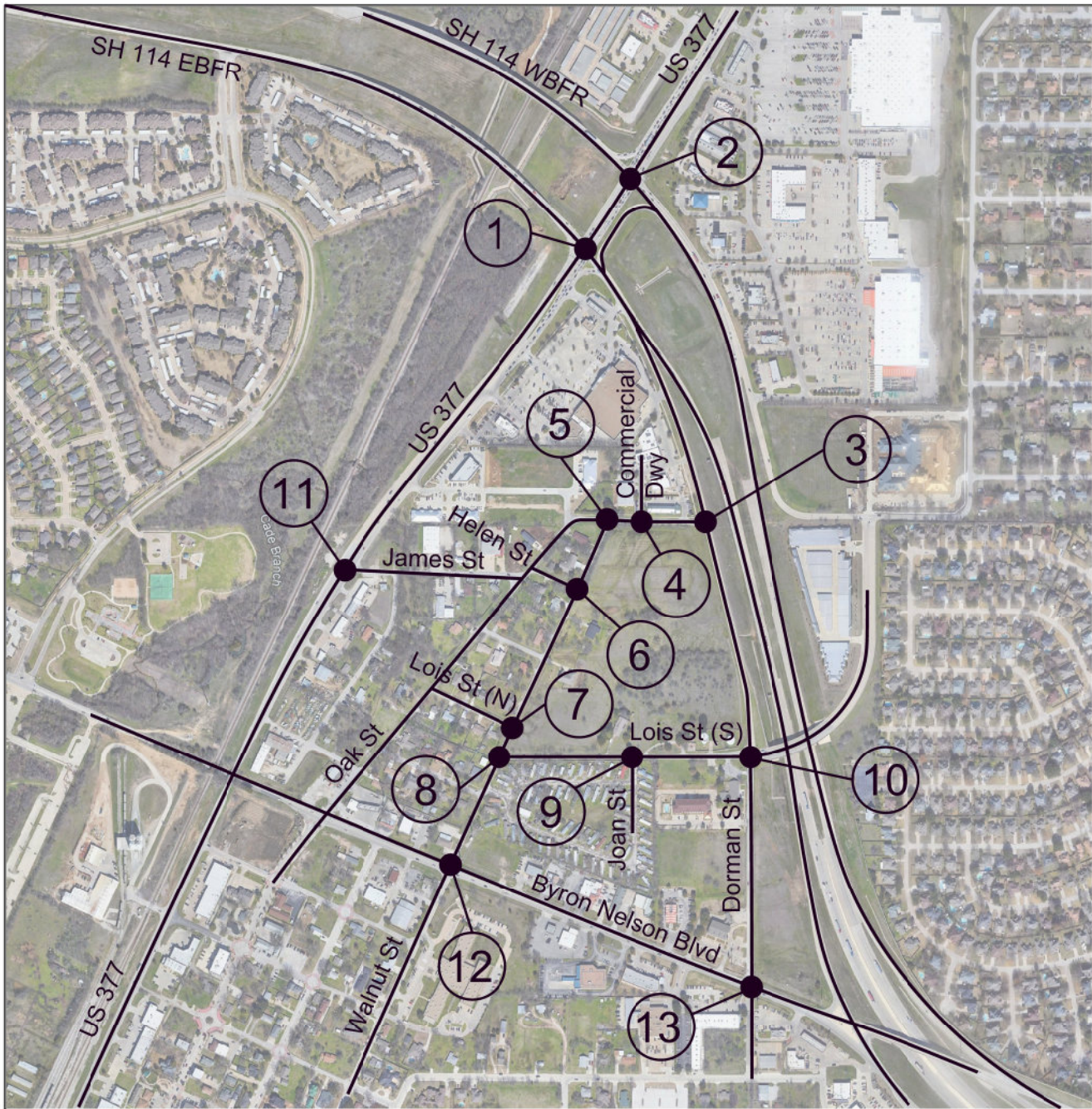


Figure 5



LEGEND

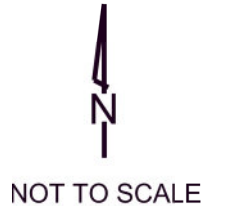
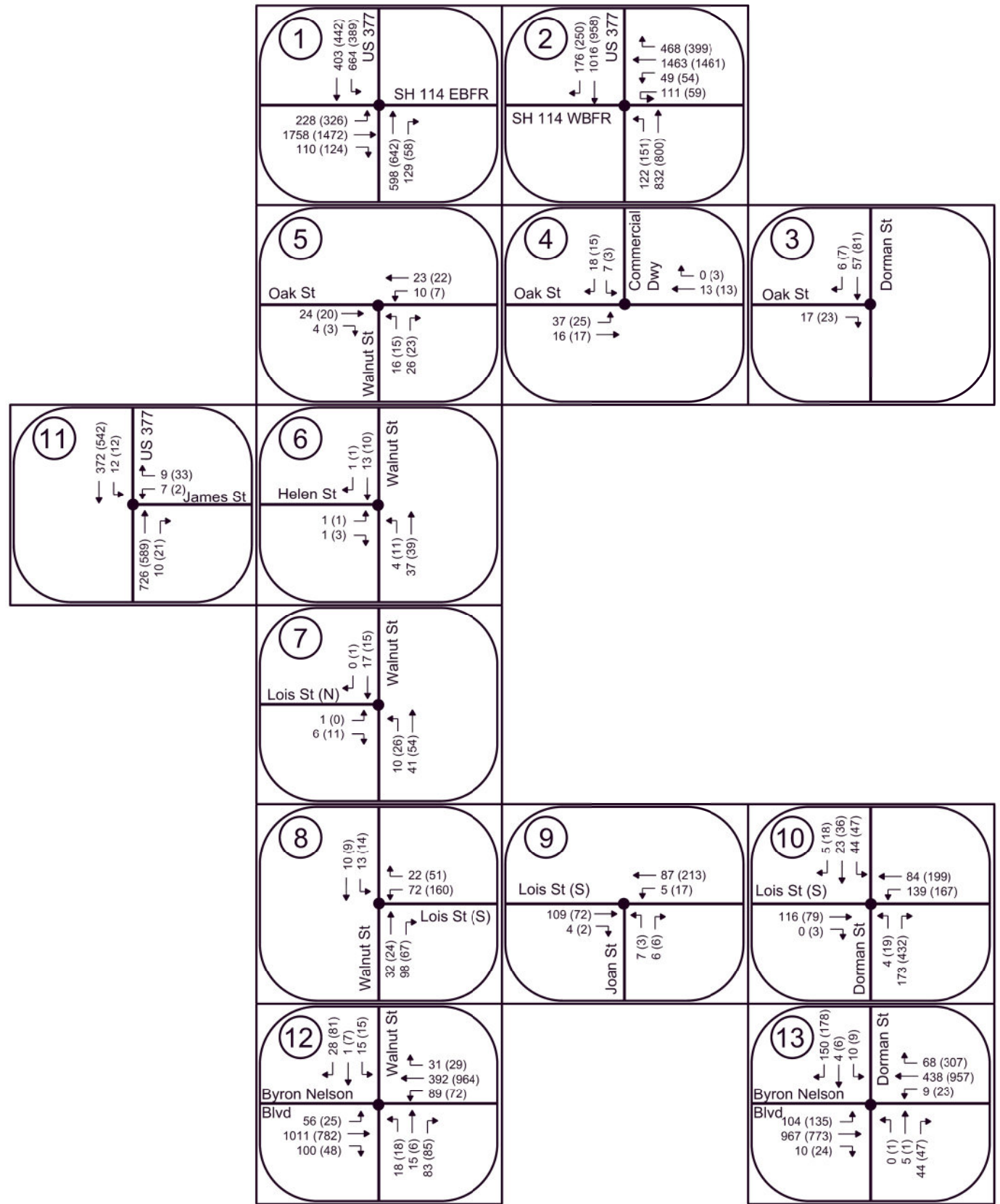
● STUDY INTERSECTION

AM (PM) PEAK HOUR VOLUMES

* The following adjustment factors were applied to the initial existing traffic volumes in Figure 5 in an attempt to reflect "typical" operations:

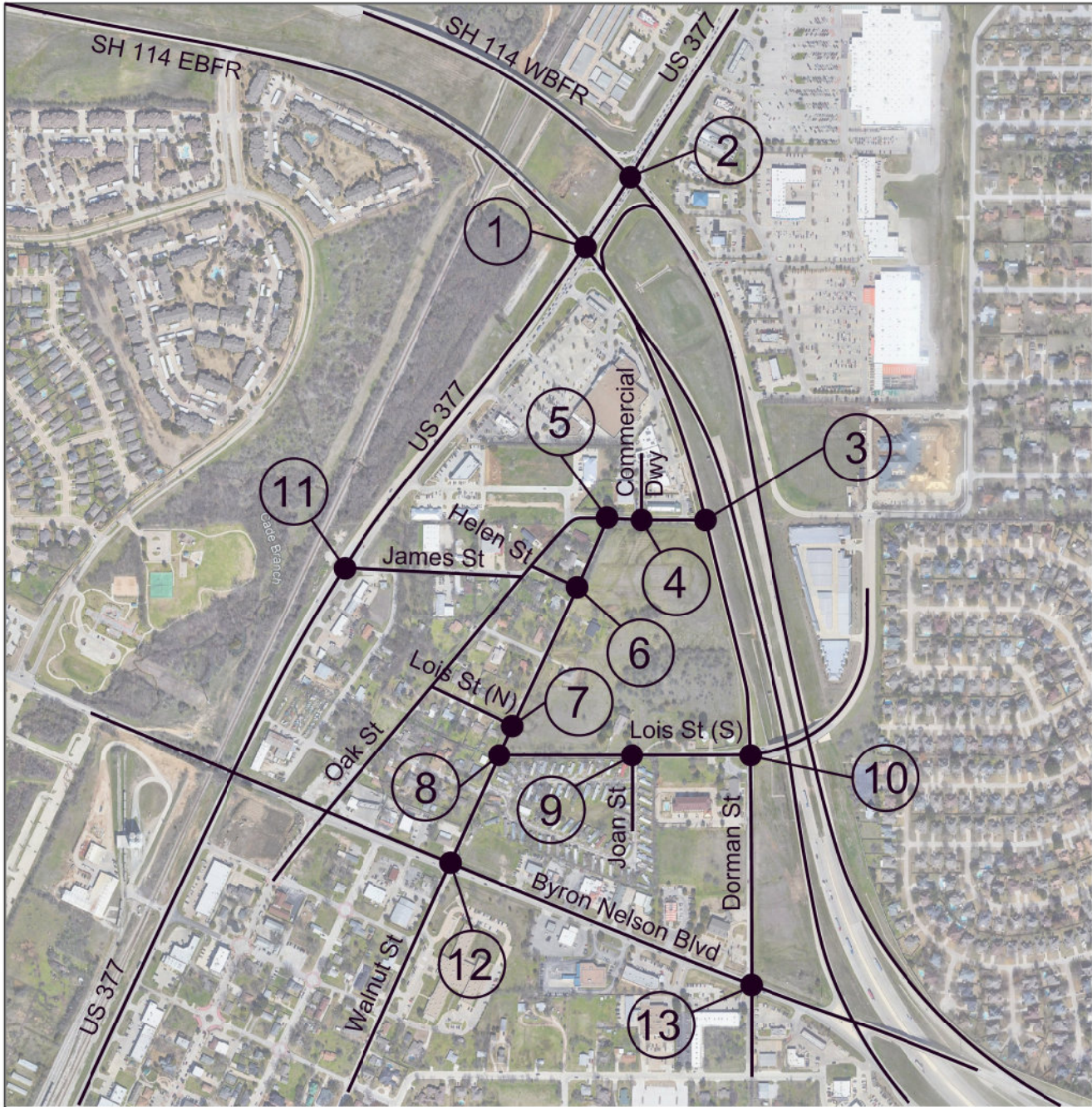
AM Peak Hour = 1.22

PM Peak Hour = 1.10



Revised Existing (2021) Peak Hour Traffic Volumes

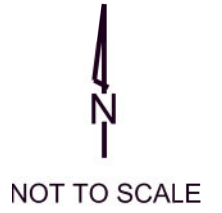
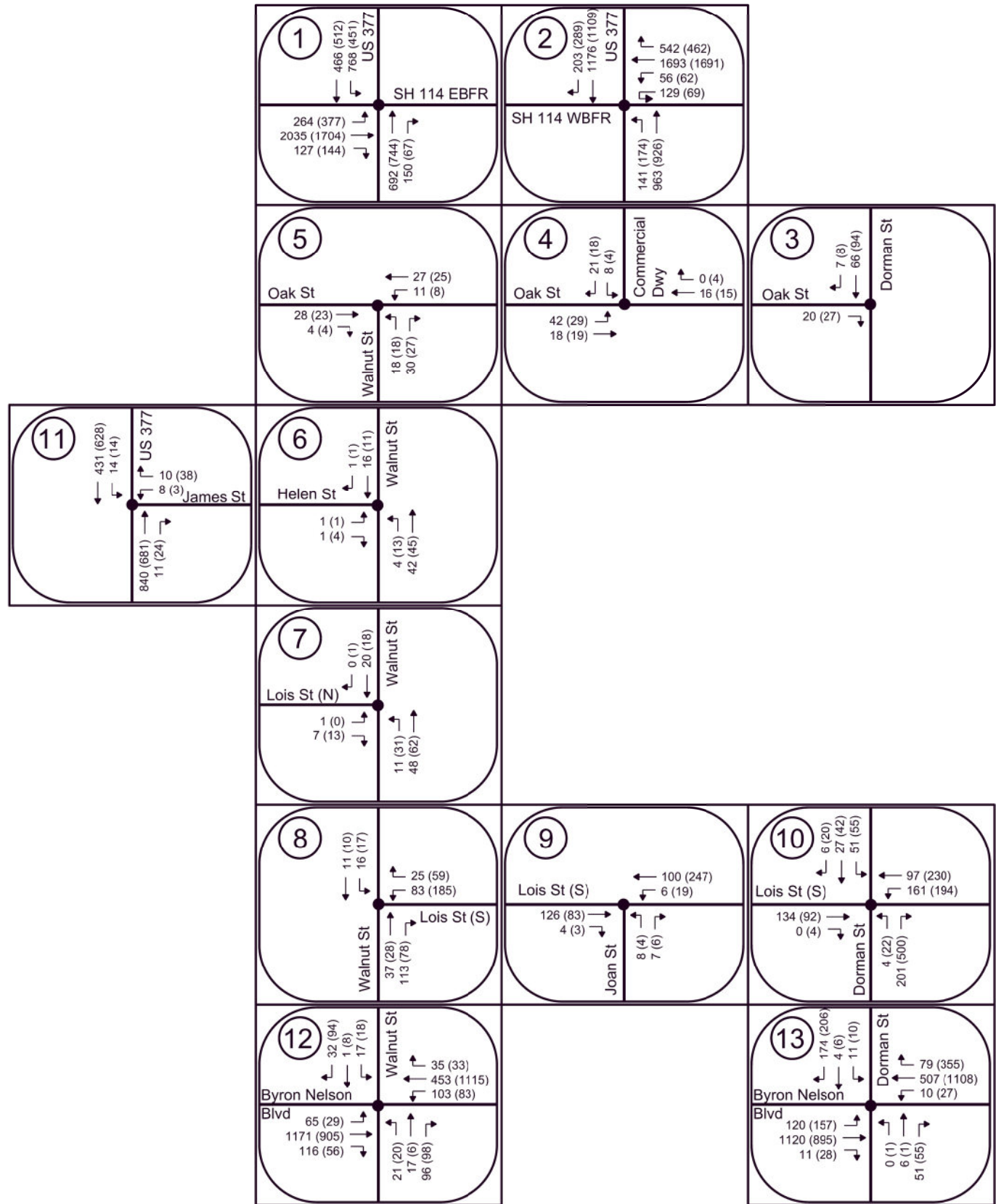
Figure 6



LEGEND

● STUDY INTERSECTION

AM (PM) PEAK HOUR VOLUMES



Build Out Year (2024) Background Peak Hour Traffic Volumes

Figure 7

TRIP DISTRIBUTION AND ASSIGNMENT

Trip Distribution

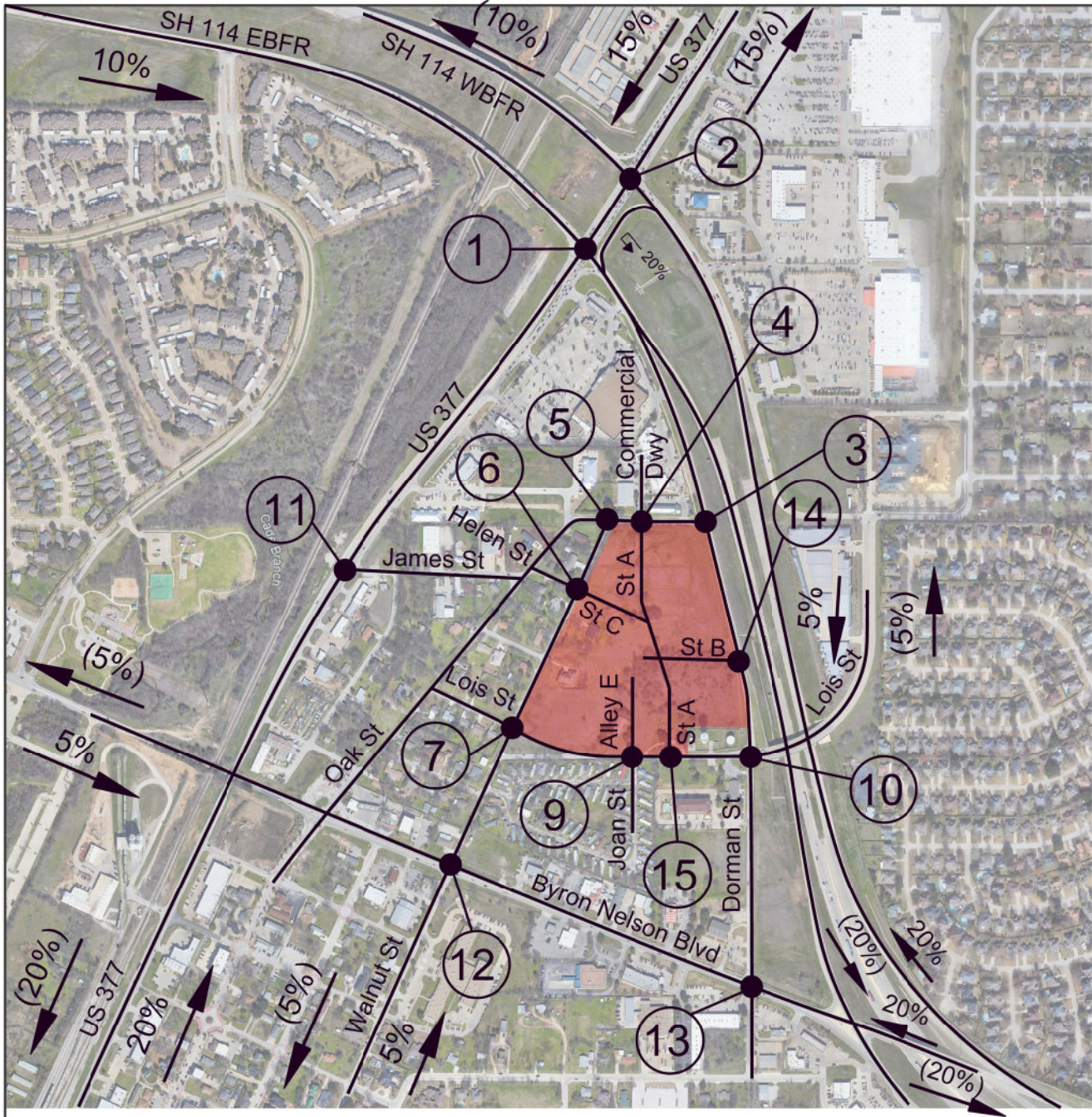
The existing traffic volumes and roadways in the area, along with the proposed site layout, were used to determine the directions from which traffic would approach and depart the proposed Roanoke North Residential Development. The assumed directional distribution is provided in **Figure 8**.

Site Traffic Volumes

Traffic volumes expected to be generated by the proposed Roanoke North Residential Development (Table 1) were assigned to the area roadways and site access points based on the directional distribution identified in Figure 8. The estimated site generated traffic volumes for the weekday AM and PM peak hours are shown in **Figure 9**.

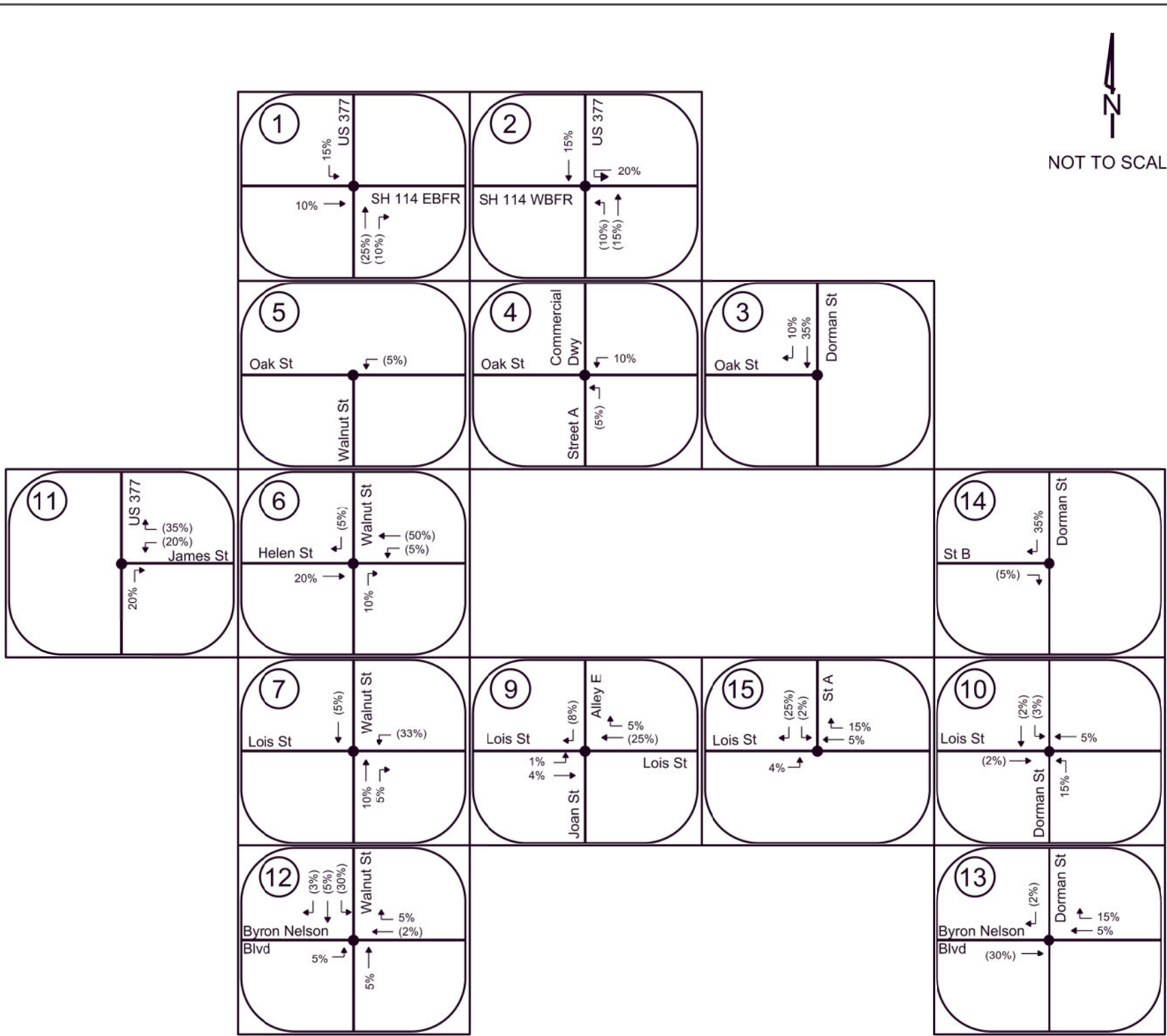
Total Traffic Conditions

Total (background + site) peak hour traffic conditions at Build-Out Year (2024) of the proposed Roanoke North Residential Development were obtained by adding the Build-Out Year (2024) Background traffic volumes (Figure 7) to the site generated traffic volumes (Figure 9) and are shown in **Figure 10**.



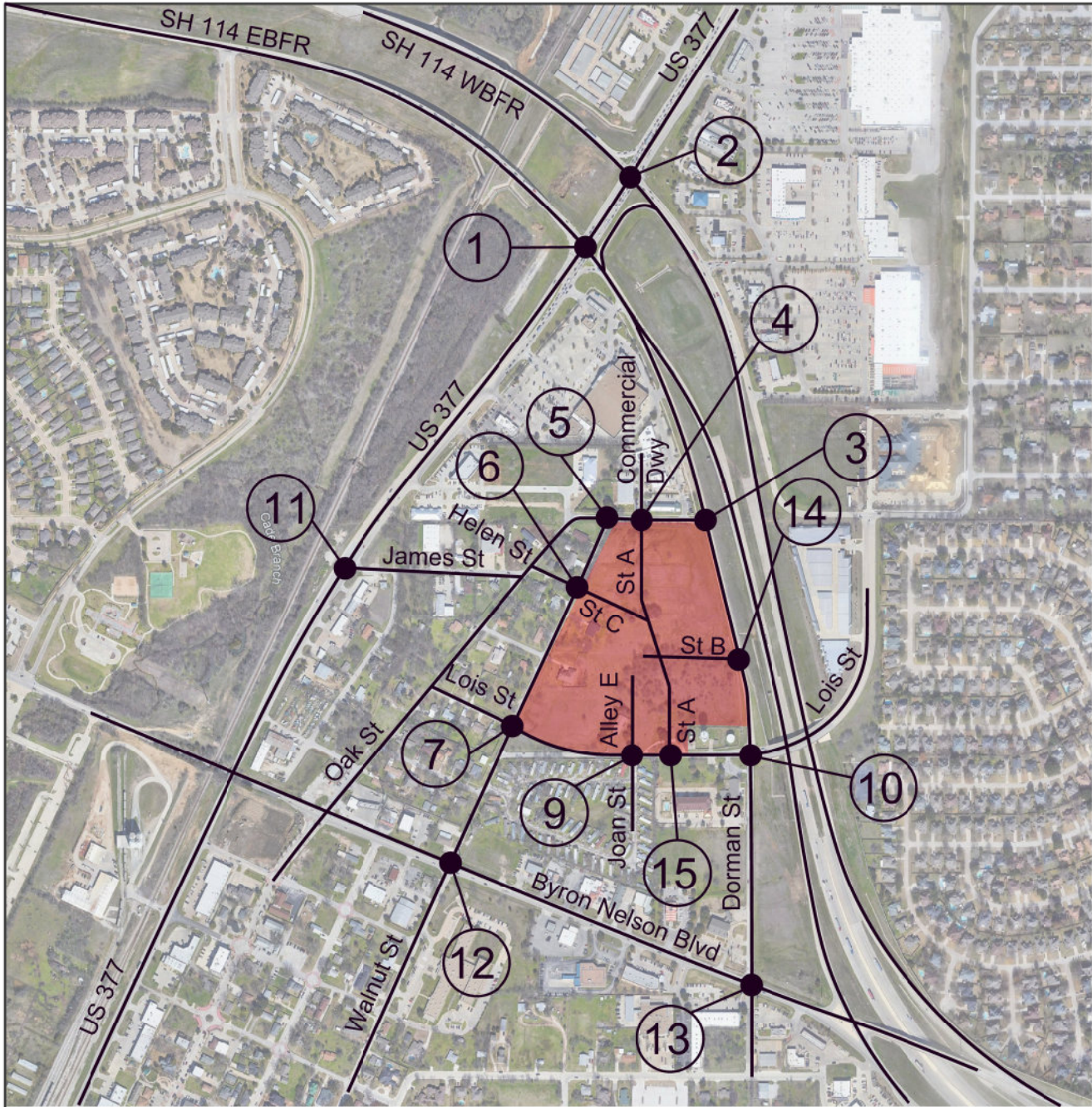
LEGEND

- STUDY INTERSECTION
- INBOUND (OUTBOUND) PERCENTAGE
- PROPOSED DEVELOPMENT



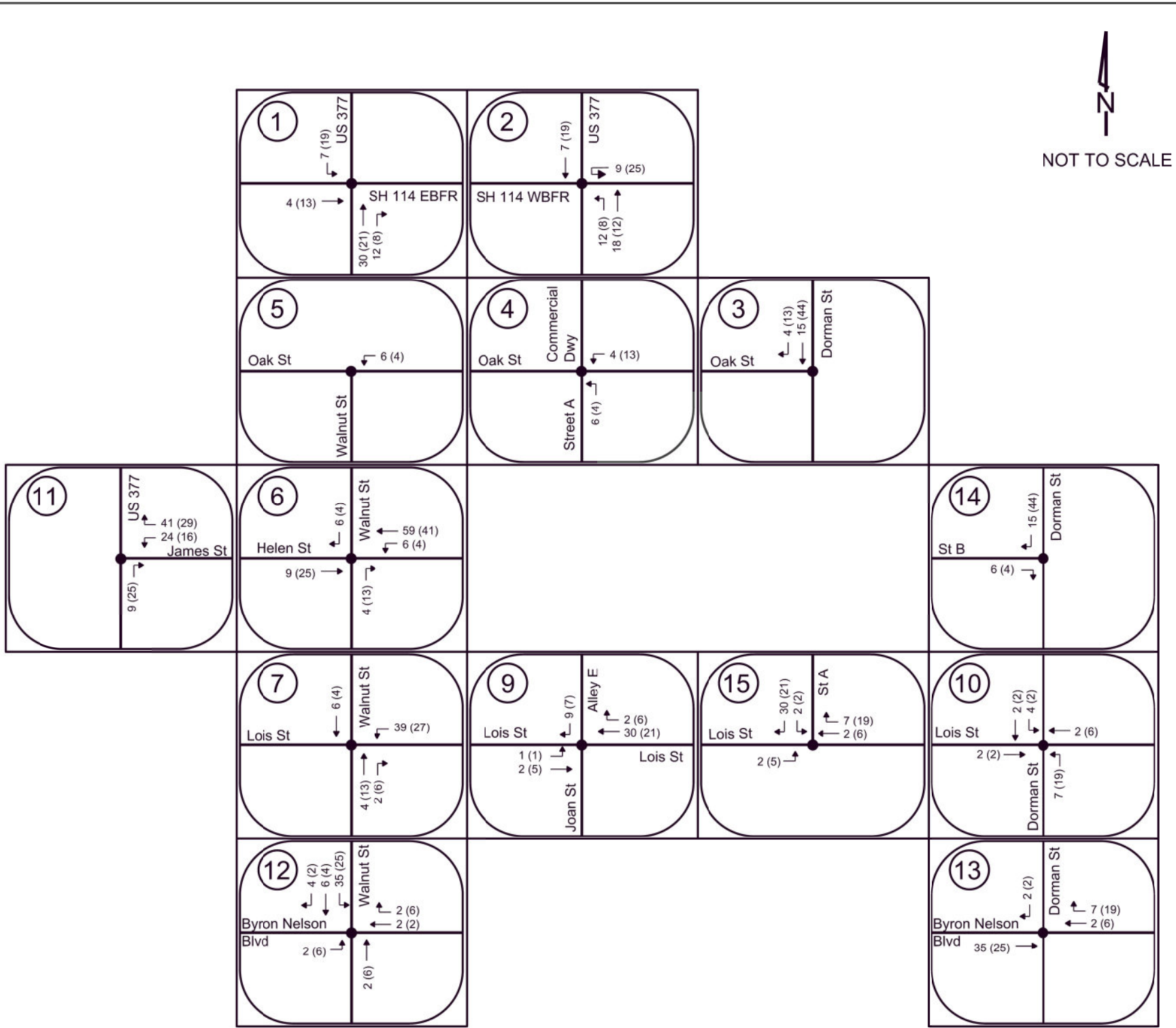
Assumed Directional Distribution

Figure 8



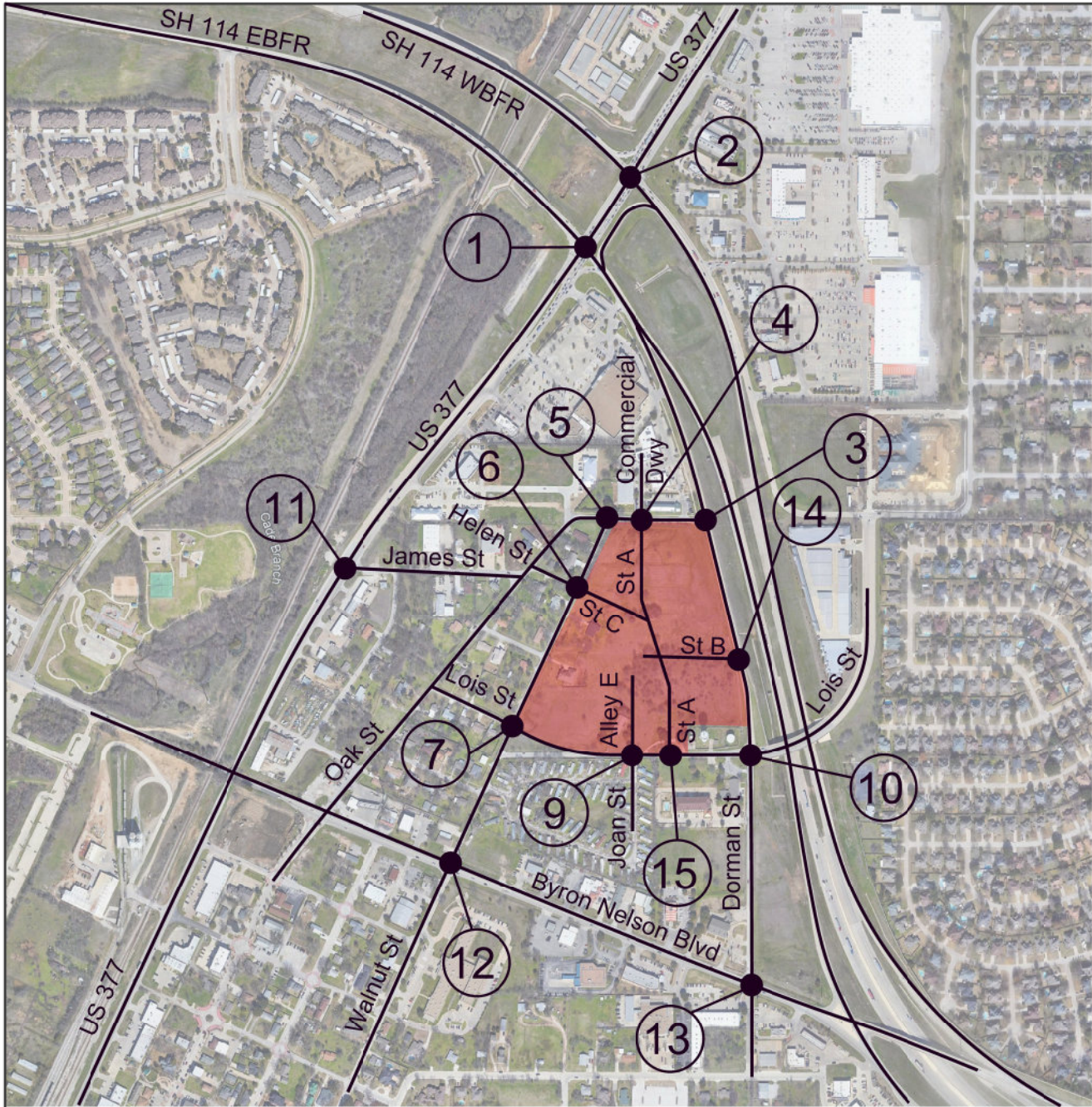
LEGEND

- STUDY INTERSECTION
- AM (PM) PEAK HOUR VOLUMES
- PROPOSED DEVELOPMENT



Site Generated Peak Hour Traffic Volumes

Figure 9

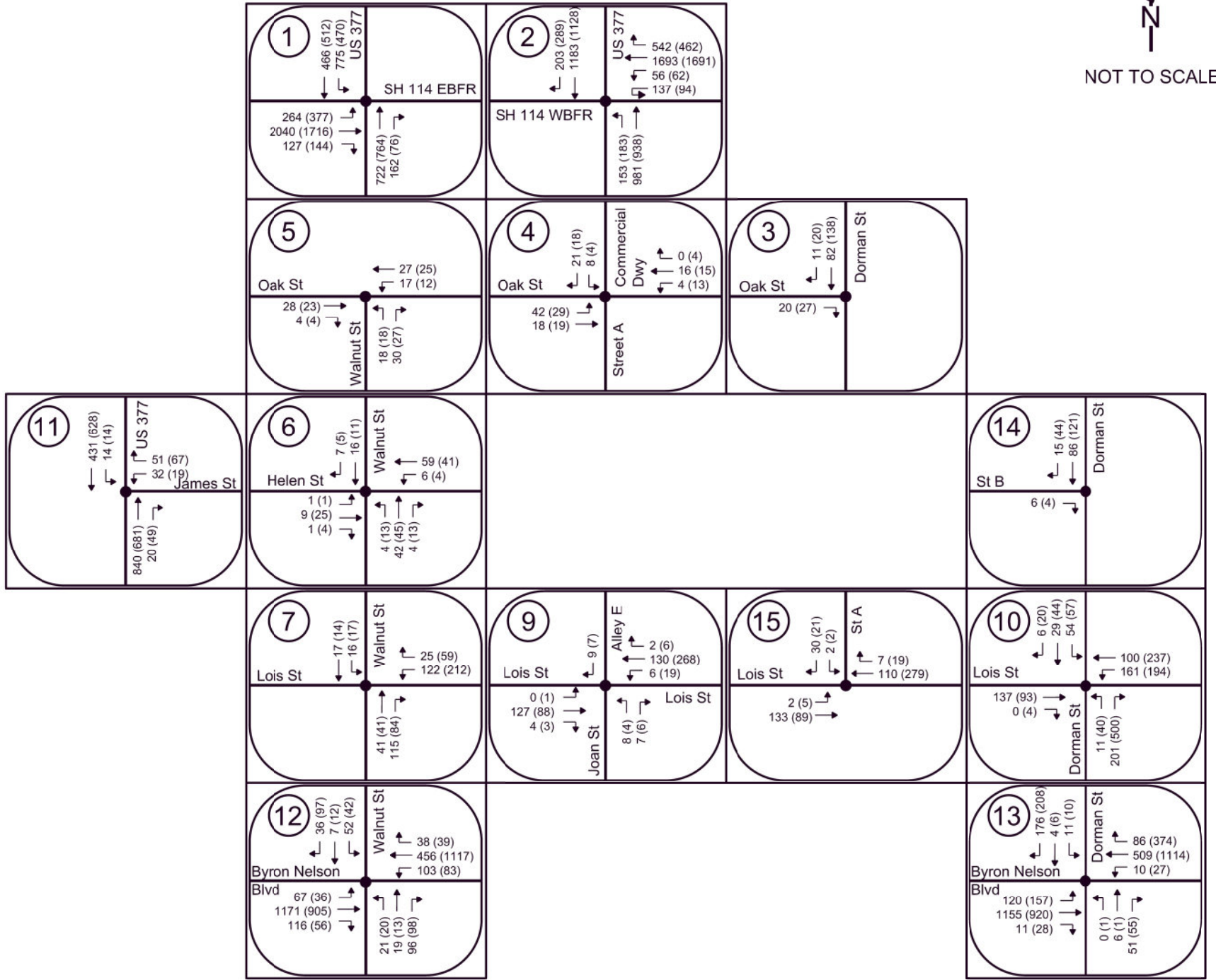


LEGEND

● STUDY INTERSECTION

AM (PM) PEAK HOUR VOLUMES

PROPOSED DEVELOPMENT



Build-Out Year (2024) Total Peak Hour Traffic Volumes

Figure 10

INTERSECTION CAPACITY ANALYSES

The Level of Service (LOS) of an intersection is a qualitative measure of capacity and operating conditions and is directly related to vehicle delay. The LOS criteria for unsignalized and signalized intersections are shown in **Table 3**. LOS is given a letter designation from A to F, with LOS A representing very short delays and LOS F representing very long delays or over-capacity conditions. LOS D is typically considered the minimum acceptable condition for both signalized and unsignalized intersections.

Table 3: Level of Service Criteria for Intersections

Level-of-Service (LOS)	Average Delay (seconds/vehicle)	
	Unsignalized	Signalized
A	≤ 10.0	≤ 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	> 50.0 or Volume exceeds Capacity	> 80.0 or Volume exceeds Capacity

SOURCE: *Highway Capacity Manual (HCM) 6th Edition*, Transportation Research Board, 2016

Capacity analyses were conducted for the study area intersections under the following analysis scenarios:

- Existing (2021) Traffic Conditions
- Build-Out Year (2024) Background Traffic Conditions
- Build-Out Year (2024) Total Traffic Conditions

The intersection capacity analyses were conducted using *Highway Capacity Manual (HCM) 6th Edition* methodologies in *Synchro 10* traffic analysis software package. Printouts of the Synchro analysis results are provided in the Appendix.

Existing Traffic Conditions

The existing lane configurations shown in Figure 3 and the Revised Existing (2021) traffic volumes shown in Figure 6 were used for the existing analyses. **Table 4** presents the capacity analysis results for the study intersections under Existing (2021) conditions. Traffic generated by the proposed development is not included in any of the analysis results presented in Table 4. The shaded cells identify intersections or approaches that currently operate at levels of service below the LOS D threshold.

Table 4: Capacity Analysis Results – Existing Traffic Conditions

1: US 377 and SH 114 Eastbound Frontage Road (Signalized)						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Existing (2021) Conditions	AM	58.0 (E) ¹	52.2 (D)	--	67.7 (E)	62.9 (E)
	PM	38.3 (D)	33.5 (C)	--	63.6 (E)	28.0 (C)
2: US 377 and SH 114 Westbound Frontage Road (Signalized)						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Existing (2021) Conditions	AM	108.8 (F)	--	127.0 (F)	68.7 (E)	111.1 (F)
	PM	67.1 (E)	--	79.7 (E)	42.9 (D)	66.0 (E)
3: Oak Street and Dorman Street (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Existing (2021) Conditions	AM	-- ²	8.6 (A)	--	--	0.0 (A)
	PM	--	8.7 (A)	--	--	0.0 (A)
4: Oak Street and Commercial Driveway (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB Left	WB	NB	SB
Existing (2021) Conditions	AM	--	7.4 (A)	0.0 (A)	--	9.0 (A)
	PM	--	7.3 (A)	0.0 (A)	--	8.6 (A)
5: Oak Street and Walnut Street (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB Left	NB	SB
Existing (2021) Conditions	AM	--	0.0 (A)	7.3 (A)	9.0 (A)	--
	PM	--	0.0 (A)	7.3 (A)	8.9 (A)	--
6: Walnut Street and Helen Street (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB	NB Left	SB
Existing (2021) Conditions	AM	--	8.7 (A)	--	7.3 (A)	0.0 (A)
	PM	--	8.5 (A)	--	7.3 (A)	0.0 (A)
7: Walnut Street and Lois Street (North) (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB	NB Left	SB
Existing (2021) Conditions	AM	--	8.5 (A)	--	7.3 (A)	0.0 (A)
	PM	--	8.4 (A)	--	7.3 (A)	0.0 (A)
8: Walnut Street and Lois Street (South) (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB Left
Existing (2021) Conditions	AM	--	--	9.8 (A)	0.0 (A)	7.6 (A)
	PM	--	--	10.6 (B)	0.0 (A)	7.5 (A)

9: Lois Street and Joan Street (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB Left	NB	SB
Existing (2021) Conditions	AM	--	0.0 (A)	7.5 (A)	9.6 (A)	--
	PM	--	0.0 (A)	7.4 (A)	9.4 (A)	--
10: Lois Street and Dorman Street (All-Way Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB
Existing (2021) Conditions	AM	10.0 (A)	10.1 (B)	10.1 (B)	10.2 (B)	9.3 (A)
	PM	16.5 (C)	11.4 (B)	12.9 (B)	21.8 (C)	10.4 (B)
11: US 377 and James Street (Side-Street Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB	WB	NB	SB Left
Existing (2021) Conditions	AM	--	--	19.2 (C)	0.0 (A)	9.4 (A)
	PM	--	--	13.7 (B)	0.0 (A)	9.0 (A)
12: Walnut Street and Byron Nelson Boulevard (Two-Way Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB Left	WB Left	NB	SB
Existing (2021) Conditions	AM	--	8.4 (A)	12.1 (B)	169.7 (F)	157.0 (F)
	PM	--	10.6 (B)	10.1 (B)	265.6 (F)	213.8 (F)
13: Dorman Street and Byron Nelson Boulevard (Two-Way Stop-Controlled)						
Scenario	Peak Hour	Intersection	EB Left	WB Left	NB	SB
Existing (2021) Conditions	AM	--	8.8 (A)	10.3 (B)	19.5 (C)	13.4 (B)
	PM	--	14.2 (B)	9.6 (A)	15.9 (C)	54.6 (F)

¹ Delay in seconds/vehicle (Level of Service)

² HCM methodology does not provide intersection-wide delay/level of service for Side-Street/Two-Way Stop-Controlled analysis

The analysis results in Table 4 indicate that the following signalized intersections and approaches at the side-street stop-controlled intersections currently operate below LOS D:

- US 377 and SH 114 EBFR (AM peak hour)
- US 377 and SH 114 WBFR (AM & peak hours)
- Walnut Street and Byron Nelson Boulevard – Northbound and Southbound approaches (AM & peak hours)
- Dorman Street and Byron Nelson Boulevard – Southbound approach (PM peak hour)

All other approaches and movements at the unsignalized intersection are currently operating at acceptable levels of service during the AM and PM peak hours under Existing (2021) traffic conditions.

The operation at the US 377 and SH 114 Frontage Road intersections is a result of the high traffic volumes on these roadways, especially on the frontage roads since the SH 114 main lanes end east of US 377, forcing all SH 114 traffic to travel through the US 377 intersections. The operation at the two (2) intersections on Byron Nelson Boulevard are a result of the existing high eastbound and westbound traffic volumes (more than 900 vehicles in a single lane in the peak direction during the AM and PM peak hours).

Build-Out Year (2024) Background and Total Traffic Conditions

The existing lane configurations shown in Figure 3 and the Build-Out Year (2024) Background traffic volumes shown in Figure 7 were used for the Build-Out Year (2024) Background analyses. The proposed lane configurations shown in Figure 4 and the Build-Out Year (2024) Total traffic volumes shown in Figure 10 were used for the Build-Out Year (2024) Traffic analyses. **Table 5** presents the capacity analysis results for the study intersections under Build-Out Year (2024) Background and Total conditions. The shaded cells identify intersections or approaches that are predicted to operate at levels of service below the LOS D threshold.

Table 5: Capacity Analysis Results – Build-Out (2024) Background and Total Traffic Conditions

1: US 377 and SH 114 Eastbound Frontage Road (Signalized)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	94.9 (F) ¹	102.3 (F)	--	109.7 (F)	70.4 (E)
	PM	47.5 (D)	47.7 (D)	--	69.0 (E)	28.9 (C)
Build-Out Year (2024) Total Conditions	AM	96.5 (F)	103.3 (F)	--	111.1 (F)	73.0 (E)
	PM	49.2 (D)	49.8 (D)	--	70.6 (E)	29.4 (C)
2: US 377 and SH 114 Westbound Frontage Road (Signalized)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	156.7 (F)	--	213.3 (F)	79.4 (E)	124.5 (F)
	PM	117.3 (F)	--	174.0 (F)	45.3 (D)	84.0 (F)
Build-Out Year (2024) Total Conditions	AM	156.8 (F)	--	213.3 (F)	78.9 (E)	127.0 (F)
	PM	121.3 (F)	--	177.8 (F)	45.5 (D)	93.0 (F)
3: Oak Street and Dorman Street (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	-- ²	8.6 (A)	--	--	0.0 (A)
	PM	--	8.7 (A)	--	--	0.0 (A)
Build-Out Year (2024) Total Conditions	AM	--	8.7 (A)	--	--	0.0 (A)
	PM	--	8.9 (A)	--	--	0.0 (A)
4: Oak Street and Commercial Driveway (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB Left	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	--	7.4 (A)	0.0 (A)	--	9.1 (A)
	PM	--	7.3 (A)	0.0 (A)	--	8.6 (A)
4: Oak Street and Commercial Driveway / Street A (Two-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB Left	WB Left	NB	SB
Build-Out Year (2024) Total Conditions	AM	--	7.4 (A)	7.3 (A)	0.0 (A)	9.2 (A)
	PM	--	7.3 (A)	7.3 (A)	0.0 (A)	8.7 (A)
5: Oak Street and Walnut Street (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB Left	NB	SB
Build-Out Year (2024) Background Conditions	AM	--	0.0 (A)	7.3 (A)	9.0 (A)	--
	PM	--	0.0 (A)	7.3 (A)	8.9 (A)	--
Build-Out Year (2024) Total Conditions	AM	--	0.0 (A)	7.3 (A)	9.1 (A)	--
	PM	--	0.0 (A)	7.3 (A)	9.0 (A)	--

6: Walnut Street and Helen Street (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB Left	SB
Build-Out Year (2024) Background Conditions	AM	--	8.7 (A)	--	7.3 (A)	0.0 (A)
	PM	--	8.5 (A)	--	7.3 (A)	0.0 (A)
6: Walnut Street and Helen Street / Street C (Two-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB Left	SB Left
Build-Out Year (2024) Total Conditions	AM	--	9.5 (A)	10.0 (B)	7.3 (A)	0.0 (A)
	PM	--	9.7 (A)	10.0 (B)	7.3 (A)	0.0 (A)
7: Walnut Street and Lois Street (N) (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB Left	SB
Build-Out Year (2024) Background Conditions	AM	--	8.5 (A)	--	7.3 (A)	0.0 (A)
	PM	--	8.4 (A)	--	7.3 (A)	0.0 (A)
Scenario	Peak	Intersection	EB	WB	NB Left	SB Left
Build-Out Year (2024) Total Conditions	AM	--	0.0 (A)	10.8 (B)	0.0 (A)	7.6 (A)
	PM	--	0.0 (A)	11.2 (B)	0.0 (A)	7.5 (A)
8: Walnut Street and Lois Street (S) (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB Left
Build-Out Year (2024) Background Conditions	AM	--	--	10.1 (B)	0.0 (A)	7.6 (A)
	PM	--	--	11.1 (B)	0.0 (A)	7.5 (A)
9: Lois Street and Joan Street (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB Left	NB	SB
Build-Out Year (2024) Background Conditions	AM	--	0.0 (A)	7.6 (A)	9.8 (A)	--
	PM	--	0.0 (A)	7.4 (A)	9.8 (A)	--
9: Lois Street and Joan Street / Alley E (Two-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB Left	WB Left	NB	SB
Build-Out Year (2024) Total Conditions	AM	--	0.0 (A)	7.6 (A)	10.3 (B)	9.1 (A)
	PM	--	7.9 (A)	7.5 (A)	10.3 (B)	10.0 (B)
10: Lois Street and Dorman Street (All-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	10.9 (B)	10.9 (B)	10.9 (B)	11.2 (B)	9.8 (A)
	PM	24.7 (C)	12.6 (B)	15.2 (C)	37.7 (E)	11.2 (B)
Build-Out Year (2024) Total Conditions	AM	11.0 (B)	11.1 (B)	11.0 (B)	11.5 (B)	9.9 (A)
	PM	28.3 (D)	12.9 (B)	15.7 (C)	44.8 (E)	11.4 (B)
11: US 377 and James Street (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB Left
Build-Out Year (2024) Background Conditions	AM	--	--	14.8 (C)	0.0 (A)	10.0 (B)
	PM	--	--	11.8 (B)	0.0 (A)	9.4 (A)
Build-Out Year (2024) Total Conditions	AM	--	--	16.6 (C)	0.0 (A)	10.1 (B)
	PM	--	--	13.9 (B)	0.0 (A)	9.5 (A)

12: Walnut Street and Byron Nelson Boulevard (Two-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB Left	WB Left	NB	SB
Build-Out Year (2024) Background Conditions	AM	--	8.7 (A)	14.0 (B)	>300 (F)	>300 (F)
	PM	--	11.5 (B)	10.9 (B)	>300 (F)	>300 (F)
Build-Out Year (2024) Total Conditions	AM	--	8.7 (A)	14.0 (B)	>300 (F)	>300 (F)
	PM	--	11.6 (B)	10.9 (B)	>300 (F)	>300 (F)
13: Dorman Street and Byron Nelson Boulevard (Two-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB Left	WB Left	NB	SB
Build-Out Year (2024) Background Conditions	AM	--	9.2 (A)	11.1 (B)	24.4 (C)	15.4 (C)
	PM	--	17.7 (C)	10.2 (B)	18.6 (C)	151.6 (F)
Build-Out Year (2024) Total Conditions	AM	--	9.3 (A)	11.3 (B)	25.7 (D)	15.6 (C)
	PM	--	18.1 (C)	10.3 (B)	19.2 (C)	164.7 (F)
14: Dorman Street and Street B (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Total Conditions	AM	--	8.6 (A)	--	--	0.0 (A)
	PM	--	8.8 (A)	--	--	0.0 (A)
15: Lois Street and Street A (Side-Street Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB Left	WB	NB	SB
Build-Out Year (2024) Total Conditions	AM	--	7.5 (A)	0.0 (A)	--	9.1 (A)
	PM	--	7.9 (A)	0.0 (A)	--	10.2 (B)

¹ Delay in seconds/vehicle (Level of Service)

² HCM methodology does not provide intersection-wide delay/level of service for Side-Street/Two-Way Stop-Controlled analysis

The analysis results in Table 5 indicate that the following signalized intersections and approaches at the side-street stop-controlled intersections are predicted to operate below LOS D under Build-Out Year (2024) Background conditions, similar to Existing (2021) conditions:

- US 377 and SH 114 EBFR (AM peak hour)
- US 377 and SH 114 WBFR (AM & peak hours)
- Walnut Street and Byron Nelson Boulevard – Northbound and Southbound approaches (AM & peak hours)
- Dorman Street and Byron Nelson Boulevard – Southbound approach (PM peak hour)

With no improvements to the area roadways assumed between Existing (2021) and Build-Out Year (2024) conditions, the reasons for the above operation below LOS D at these intersections remains the same as identified for Existing (2021) conditions.

Under Build-Out Year (2024) Total conditions, with site traffic generated by the proposed Roanoke North Residential Development included, operation at the intersections is predicted to operate similar to Build-Out Year (2024) Background conditions. That is, traffic generated by the proposed development is predicted to have minimal impacts to the study intersections.

All other approaches and movements at the existing and new side-street stop-controlled intersections are predicted to operate at acceptable levels of service (LOS D or better) during the AM and PM peak hours under Build-Out Year (2024) Background and Total conditions.

Mitigation Measures

Potential mitigation measures for the frontage road intersections and the two (2) two-way stop-controlled intersections were identified and evaluated, where applicable. Although the all-way stop-controlled intersection of Lois Street and Dorman Street operate at LOS D or better under all scenarios evaluated, the City has requested mitigation improvements for the northbound approach at this intersection.

Operation at the US 377 and SH 114 Frontage Road intersections will be improved when the SH 114 main lanes are extended to the west side of US 377, eliminating a high number of the eastbound and westbound through traffic volumes on the SH 114 Frontage Roads at this intersection. A Design Schematic (October 2018) has been developed and approved for this improvement (CSJ 0353-09-002).

At the all-way stop-controlled intersection of Lois Street and Dorman Street, delays on the northbound approach can be reduced, resulting in LOS D or better operation (**Table 6**), by widening this approach from a single lane to two lanes to provide an exclusive left turn lane and shared through+right turn lane. For the two (2) two-way stop-controlled intersections on Byron Nelson Boulevard, the operation for the northbound and southbound approaches is a result of the delays experienced by these motorists trying to access Byron Nelson Boulevard with high eastbound and westbound high traffic volumes (>900 vehicles/hour in a single lane in the peak direction during the existing AM and PM peak hours and >1,100 vehicles/hour in a single lane in the peak direction during Build-Out Year (2024) Background conditions). As shown in **Table 6**, changing the traffic control at these intersections on Byron Nelson Boulevard to signalized is predicted to result in LOS D or better operation for these intersections during both the AM and PM peak hours under Build-Out Year (2024) conditions. These improvements would be needed even without traffic generated by the proposed residential development.

Although not included as part of the analysis, additional capacity improvements at the two (2) intersections on Byron Nelson Boulevard (widening of Byron Nelson Boulevard and/or installation of turn lanes) are predicted to result in operation better than that identified in Table 6. Similar to the signalization of these intersections, any capacity improvements would be needed even without traffic generated by the proposed residential development included. It should also be noted that with the signalization of the Dorman Street and Byron Nelson Boulevard, it was assumed that the right-turn only movements on the northbound and southbound approaches on Dorman Street would be modified to allow full access (left turn, through and right turn movements).

Table 6: Capacity Analysis Results – Build-Out Year (2024) Traffic Conditions with Mitigation

10: Lois Street and Dorman Street (All-Way Stop-Controlled)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	10.7 (B)	10.9 (B)	10.9 (B)	10.6 (B)	9.8 (A)
	PM	21.1 (C)	12.4 (B)	14.8 (B)	30.0 (D)	11.1 (B)
Build-Out Year (2024) Total Conditions	AM	10.7 (B)	11.0 (B)	11.0 (B)	10.5 (B)	9.9 (A)
	PM	21.3 (C)	12.5 (B)	15.2 (C)	30.1 (D)	11.3 (B)
12: Walnut Street and Byron Nelson Boulevard (Signalized)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	47.5 (D) ¹	66.0 (E)	11.0 (B)	30.1 (C)	29.0 (C)
	PM	18.5 (B)	16.1 (B)	19.4 (B)	23.5 (C)	23.4 (C)
Build-Out Year (2024) Total Conditions	AM	54.4 (D)	74.5 (E)	12.1 (B)	29.4 (C)	69.5 (E)
	PM	24.2 (C)	19.7 (B)	25.1 (C)	21.4 (C)	49.2 (D)
13: Dorman Street and Byron Nelson Boulevard (Signalized)						
Scenario	Peak Hr	Intersection	EB	WB	NB	SB
Build-Out Year (2024) Background Conditions	AM	16.2 (B)	18.6 (B)	12.6 (B)	13.6 (B)	12.5 (B)
	PM	50.4 (D)	18.9 (B)	77.8 (E)	23.8 (C)	26.8 (C)
Build-Out Year (2024) Total Conditions	AM	17.7 (B)	21.0 (C)	12.8 (B)	13.6 (B)	12.5 (B)
	PM	54.8 (D)	18.9 (B)	86.3 (F)	23.7 (C)	26.6 (C)

¹ Delay in seconds/vehicle (Level of Service)

ROADWAY LINK CAPACITY ANALYSIS

Roadway capacity is defined as the volume of traffic that a roadway can accommodate based on the road's width, traffic control, parking conditions, and several other factors. Capacity values for roadways by area type and functional class are presented in **Table 7**. These numbers were obtained from the North Central Texas Council of Governments (NCTCOG), which has developed planning level analysis numbers in their *DFW Regional Travel Model* that are useful in determining directional hourly capacities under different roadway and area conditions.

Table 7: NCTCOG Roadway Capacity Analysis and Level of Service Guidelines
Hourly Service Volume Per Lane*
(Undivided Roads)

Area Type	Functional Class						
	Freeway	Principal Arterial	Minor Arterial	Collector	Ramp	Frontage Road	HOV
CBD	---	675	650	425	1250	650	---
Outer Business District	---	725	725	450	1375	725	---
Urban Residential	---	775	750	475	1425	750	---
Suburban Residential	---	875	825	525	1600	825	---
Rural	---	925	875	550	1725	875	---

* Service volumes at Level of Service E (the model requires LOS E service volumes)

The roadway level of service (LOS) is determined by the volume on the roadway divided by the total planning level roadway capacity. The LOS classifications used within the model are listed below:

- if Volume/Service Volume Ratio is ≤ 0.45 , then LOS = A or B
- if Volume/Service Volume Ratio is > 0.45 and ≤ 0.65 , then LOS = C
- if Volume/Service Volume Ratio is > 0.65 and ≤ 0.80 , then LOS = D
- if Volume/Service Volume Ratio is > 0.80 and ≤ 1.00 , then LOS = E
- if Volume/Service Volume Ratio is > 1.00 , then LOS = F

The segments on Walnut Street (Collector), Dorman Street (Collector) and Lois Street (Collector) were identified as two-lane undivided roadways in a Rural area for analysis purposes with planning level capacities for each roadway highlighted in Table 7. Roadway capacity analysis was performed for Existing (2021) and Build-Out Year (2024) Background and Total traffic conditions and the results are shown in **Table 8**.

Table 8: Roadway Link Capacity Analysis Results

Analysis Period	Direction	Capacity ¹	Volume ¹		V/C		LOS	
			AM	PM	AM	PM	AM	PM
Walnut Street (South of Helen Street)								
Existing (2021)	NB	550	40	50	0.07	0.09	A/B	A/B
	SB	550	15	13	0.03	0.02	A/B	A/B
Build-Out (2024) – Background	NB	550	47	57	0.09	0.10	A/B	A/B
	SB	550	17	15	0.03	0.03	A/B	A/B
Build-Out (2024) – Total	NB	550	51	70	0.09	0.13	A/B	A/B
	SB	550	23	19	0.04	0.03	A/B	A/B
Dorman Street (North of Street B)								
Existing (2021)	NB	--	--	--	--	--	--	--
	SB	1,100	74	105	0.07	0.10	A/B	A/B
Build-Out (2024) – Background	NB	--	--	--	--	--	--	--
	SB	1,100	86	121	0.08	0.11	A/B	A/B
Build-Out (2024) – Total	NB	--	--	--	--	--	--	--
	SB	1,100	102	165	0.09	0.15	A/B	A/B
Lois Street (West of Joan Street)								
Existing (2021)	WB	550	94	217	0.17	0.39	A/B	A/B
	EB	550	112	74	0.20	0.13	A/B	A/B
Build-Out (2024) – Background	WB	550	109	251	0.20	0.46	A/B	C
	EB	550	130	85	0.24	0.15	A/B	A/B
Build-Out (2024) – Total	WB	550	148	278	0.27	0.51	A/B	C
	EB	550	132	92	0.24	0.17	A/B	A/B

¹ Vehicles/hour

As shown by the results in Table 8, all the roadway segments are currently operating at an acceptable level of service (LOS D or better) under Existing (2021) conditions and are predicted to continue to operate at an acceptable level of service (LOS D or better) under Build-Out Year (2024) Background and Total conditions. Based on these results, all the roadways have significant capacity available. Traffic generated by the Roanoke North Residential Development is predicted to have minimal impact to the operation of the streets adjacent to the development.

ACCESS MANAGEMENT ANALYSIS

As part of this study, access management analyses were performed to consider the need for deceleration lanes and to determine if adequate driveway spacing and intersection sight distance is provided for the proposed site driveways.

Right Turn Deceleration Lane Analysis

Traffic volumes on Oak Street, Dorman Street, Walnut Street and Lois Street at the site roadway connections were analyzed to determine the necessity of right turn deceleration lane. In the absence of City of Roanoke guidelines, guidelines in TxDOT's *Access Management Manual* were used for this analysis and state that for roadways with a posted speed limit less than 45 mph, a right turn deceleration lane should be considered when peak right turn volumes are greater than 60 vehicles per hour. **Table 9** summarizes the projected right turn volumes at the site roadway connections under Build-Out Year (2024) Total traffic conditions.

Table 9: Right Turn Deceleration Lane Analysis Results

Intersection	Scenario	Approach	Speed Limit (mph)	Right Turn Entering Volume (vph) AM (PM)	Threshold (vph)	Exceeds Threshold? AM (PM)
Street A at Oak Street	Build-Out Year (2024) Total	EB	25	0 (0)	60	NO (NO)
Street B at Dorman Street	Build-Out Year (2024) Total	SB	30	15 (44)	60	NO (NO)
Street C at Walnut Street	Build-Out Year (2024) Total	NB	25	4 (13)	60	NO (NO)
Alley E at Lois Street	Build-Out Year (2024) Total	WB	25	2 (6)	60	NO (NO)
Street A at Lois Street	Build-Out Year (2024) Total	WB	25	7 (19)	60	NO (NO)

Based on the projected right turn peak hour traffic volumes and TxDOT guidelines, all of the right turn volumes are not predicted to exceed TxDOT's guidelines at any of the site roadway connections. Therefore, right turn deceleration lanes are not recommended at any of the site roadway connections.

Left Turn Deceleration Lane Analysis

For this analysis, the procedure presented in TxDOT's *Roadway Design Manual* was used for determining whether left turn lanes should be considered on the adjacent streets (Oak Street, Walnut Street and Lois Street) at the site roadway connections. While the posted speed limit on the adjacent streets (Oak Street, Walnut Street and Lois Street) is 25 mph. Table 3-11 in TxDOT's *Roadway Design Manual* does not provide guidelines for roadways with speed limits below 40 mph. It should be noted that if the threshold for a 40 mph-roadway is not met, then the threshold

for a 25-mph roadway would not be met either. For a conservative analysis, **Table 10** summarizes the information presented in Table 3-11 of this manual for a design speed of 40 mph for when left turn lanes should be considered.

Table 10: Guide for Left Turn Lanes on Two-Lane Highways

Opposing Volume (vph)	Advancing Volume (vph)			
	5% Left Turns	10% Left Turns	20% Left Turns	30% Left Turns
40 mph Design Speed				
800	330	240	180	160
600	410	305	225	200
400	510	380	275	245
200	640	470	350	305
100	720	515	390	340

SOURCE: TxDOT Roadway Design Manual (Table 3-11)

Table 11 presents the evaluation results of whether left turn deceleration lanes should be considered for installation on Oak Street at Street A, Walnut Street at Street C and Lois Street at Alley E and Street A under Build-Out Year (2024) Total conditions.

Table 11: Left Turn Deceleration Lane Analysis Results

Peak Hour	Opposing Volume (vph)	Advancing Volume (vph)				Volume > Guideline?
		Percent Left Turns	Left Turns	Volume	Guideline	
Street A at Oak Street						
AM Peak	60	20%	4	20	~390	NO
PM Peak	48	41%	13	32	~340	NO
Street C at Walnut Street						
AM Peak	50	0%	0	23	~720	NO
PM Peak	71	0%	0	16	~720	NO
Alley E at Lois Street						
AM Peak	138	0%	0	131	~690	NO
PM Peak	293	1%	1	92	~580	NO
Street A at Lois Street						
AM Peak	117	1%	2	135	~705	NO
PM Peak	298	5%	5	94	~575	NO

Based on the results presented in Table 11, the traffic volumes at all of the proposed site roadway connections are not predicted to exceed (or even approach) the left turn lane guidelines during either the AM or PM peak hours under Build-Out Year (2024) Total conditions. Additionally, guidance in TxDOT's *Roadway Design Manual* states, "Left-turn lanes on two-lane highways at intersecting crossroads generally are not economically justified. For certain moderate or high-volume two-lane highways with heavy left-turn movements, however, left-turn lanes may be

justified in view of reduced road user crash costs.” The low number of left turns predicted during the AM and PM peak hours from the adjacent road at the site roadway connections (less than 15 entering left turns/hour), these left turn volumes are not considered to be “moderate or high-volume.” Therefore, as a result of the low left turn volumes and the left turn deceleration thresholds not being satisfied, left turn deceleration lanes are not recommended at any of the site roadway locations.

Sight Distance

As part of this traffic analysis, the available and required intersection sight distance for motorists accessing the adjacent roadway from the proposed site roadway connections were analyzed. The sight distance required was estimated using the procedures developed by the American Association of State Highway and Transportation Officials (AASHTO) and published in the 2018 edition of *A Policy on Geometric Design of Highways and Streets*. At this location, the motorist should be able to see if and when adequate gaps exist to perform their desired maneuver. **Table 12** presents the required and available intersection sight distance for vehicles exiting to the adjacent streets (Oak Street, Walnut Street, Lois Street and Dorman Street) for the proposed Roanoke North residential development.

Table 12: Intersection Sight Distance Evaluation

Major Roadway	Oak Street	Walnut Street	Lois Street		Dorman Street
Posted Speed Limit	25 mph	25 mph	25 mph	25 mph	30 mph
Design Vehicle	Passenger Vehicle	Passenger Vehicle	Passenger Vehicle	Passenger Vehicle	Passenger Vehicle
Minor Roadway	Street A	Street C	Alley E	Street A	Street B
Intersection Sight Distance (Turning From Driveway)					
Required	280'	280'	280'	280'	290'
Available Sight Distance to the Left	~380'	>500'	~300'	~300'	>500'
Available > Required to the Left	YES	YES	YES	YES	YES
Available Sight Distance to the Right	~295'	~340'	>500'	>500'	N/A ¹
Available > Required to the Right	YES	YES	YES	YES	N/A ¹

¹Right-out exit only

Based on the conditions that existed in the field at the time of the site visit, the field investigation results of the available sight distance indicate that adequate sight distance is predicted to be provided at all the proposed site roadway connections.

Access Spacing

In *City of Roanoke's Technical Standards (Part B)*, required access point spacing is determined based on Street Type designation in the City of Roanoke Thoroughfare Plan. Section I.B.7

indicates that the minimum driveway spacing (edge to edge offset) should be 200 feet on a Collector or Arterial roadway.

Based on the information presented in the site plan:

- Street A is planned to be located approximately 285 feet west of Dorman Street and approximately 145 feet east of Walnut Street on Oak Street.
- Street C is planned to be located approximately 345 feet south of Oak Street and approximately 700 feet north of Lois Street (after realignment) on Walnut Street.
- Alley E is planned to be located approximately 510 feet east of Walnut Street and approximately 115 feet west of the proposed Street A on Lois Street.
- Street A is planned to be located approximately 115 feet east of Alley E and approximately 425 feet west of the proposed Dorman Street on Lois Street.
- Street B is planned to be located approximately 570 feet south of Oak Street and approximately 490 feet north of Lois Street on Dorman Street.

The proposed site access roadway connections meet the City's access spacing requirements, except the distance between Street A (on Oak Street) and Walnut Street and the distance between the proposed Alley E and Street A (on Lois Street). The location of these site access roadway connections would need to be granted a variance. For Street A on Oak Street, this Street aligns with an existing commercial driveway to the north. Alley E on Lois Street is an alleyway and would not serve the traffic volumes expected at a public roadway, such as Street A. Due to the alignment of Street A on Oak Street and the low volumes at Alley E on Lois Street, these site access roadways should be granted a variance for their proposed locations.

CONCLUSIONS & RECOMMENDATIONS

Based on the analysis of the proposed site plan and characteristics of the proposed Roanoke North Residential Development, the following **conclusions** can be made:

- The proposed development is predicted to generate 2,554 trips on a daily basis with 162 trips during the AM peak hour and 207 trips during the PM peak hour.

Intersection Capacity Analysis

- Under Existing (2021) traffic conditions, the following signalized intersections and approaches at the side-street stop-controlled intersections currently operate below LOS D:
 - US 377 and SH 114 EBFR (AM peak hour)
 - US 377 and SH 114 WBFR (AM & peak hours)
 - Walnut Street and Byron Nelson Boulevard – Northbound and Southbound approaches (AM & peak hours)
 - Dorman Street and Byron Nelson Boulevard – Southbound approach (PM peak hour)

The operation at SH 114 Frontage Road intersections is a result of the high traffic volumes on these roadways, primarily as a result of forcing all SH 114 traffic to travel through the US 377 intersections. The operation at the two (2) intersections on Byron Nelson Boulevard are a result of the existing high eastbound and westbound traffic volumes (more than 900 vehicles in a single lane in the peak direction during the AM and PM peak hours).

All other approaches and movements at the unsignalized intersections are currently operating at acceptable levels of service during the AM and PM peak hours under Existing (2021) traffic conditions.

- Under Build-Out Year (2024) Background conditions, With no improvements to the area roadways assumed between Existing (2021) and Build-Out Year (2024) conditions, the intersections and approaches are predicted to operate similar to Existing (2021) conditions.
- Under Build-Out Year (2024) Total conditions, with site traffic generated by the proposed Roanoke North Residential Development included, operation at the intersections is predicted to operate similar to Build-Out Year (2024) Background conditions. That is, traffic generated by the proposed development is predicted to have minimal impacts to the study intersections.

Roadway Link Capacity Analysis

All of the roadway segments (Walnut Street, Dorman Street and Lois Street) are currently operating at an acceptable level of service (LOS D or better) under Existing (2021) conditions and are predicted to continue to operate at an acceptable level of service (LOS D or better) under Build-Out Year (2024) Background and Total conditions.

Access Management Analysis

- All of the right turn volumes at the site access roadways are not predicted to exceed TxDOT's guidelines and right turn deceleration lanes are not recommended at any of the site roadway connections.
- As a result of the low left turn volumes and the left turn deceleration thresholds (TxDOT) not being satisfied, left turn deceleration lanes are not recommended at any of the site roadway locations.
- Based on the conditions that existed in the field at the time of the site visit, the field investigation results of the available sight distance indicate that adequate sight distance is predicted to be provided at all of the proposed site roadway connections.
- The proposed site access roadway connections meet the City's access spacing requirements, except the distance between Street A (on Oak Street) and Walnut Street and the distance between the proposed Alley E and Street A (on Lois Street).
 - The location of these site access roadway connections would need to be granted a variance.
 - Due to the alignment of Street A on Oak Street and the low volumes at Alley E on Lois Street, these site access roadways should be granted a variance for their proposed locations.

Based on the results of this traffic study, the following **recommendations** are made as a result of the traffic generated by the proposed Roanoke North Residential Development:

- Request and obtain a variance for the location of Street A on Oak Street and the locations of Alley E and Street A on Lois Street.

Based on the results of this traffic study, it is **recommended** that the following potential mitigation measures be considered under Existing (2021) and Build-Out Year (2024) conditions, **regardless of whether the proposed Roanoke North Residential Development is completed:**

- Install traffic signals at the Byron Nelson Boulevard intersections with Walnut Street and Dorman Street.

APPENDIX

PROPOSED SITE PLAN

File: W:\Projects\2020310199_Roanoke North\2020310199_Roanoke North\2020310199-CONCEPT A.dwg
Plotted: 8/3/2021 3:43 PM, by: Tanya, Job: 2020310199-CONCEPT A, Date: 8/3/2021 3:38 PM, by: jfarrag

APPENDIX

LOT 4, BLOCK A
TEMBO ADDITION
CAB. V. PG. 219 PRDCT

LOT 3A, BLOCK A
TEMBO ADDITION
CAB. X, PG. 291 PRDCT

CALLED 2.352 AC.
THE STATE OF TEXAS V. TALMAGE TICKNOR, TRUSTEE
1992-50952 RPRDCT

CALLED 0.572 AC.
THE STATE OF TEXAS V. MICKEY LEON
1993-22191 RPRDCT

CALLED 0.387 AC.
STATE OF TEXAS
1992-69555 RPRDCT

CALLED 0.014 AC.
THE STATE OF TEXAS V. CHURCH C
1992-57665 RPRDCT

CALLED 0.299 AC.
CHURCH OF CHRIST,
HILLTOP CONGREGATION
2012-69579 RPRDCT

TRACT TWO
CALLED 0.299 AC.
CHURCH OF CHRIST, HILLTOP CONGREGATION
VOL. 2339, PG. 568 RPRDCT

LOT 3R

SITE DATA TABLE			
PHYSICAL ADDRESS	NORTHWEST CORNER OF N WALNUT ST AND LOIS STREET		
GROSS SITE AREA	18.504 ACRES		
EXISTING ZONING	SINGLE FAMILY SF-7 & RETAIL		
PROPOSED ZONING	PLANNED DEVELOPMENT		
CURRENT USE	VACANT AND RESIDENTIAL		
PROPOSED USE	RESIDENTIAL AND MULTI-FAMILY AND AGE TARGETED		
BUILDING SUMMARY			
NUMBER OF MULTI-FAMILY UNITS	289 UNITS		
NUMBER OF AGE TARGETED UNITS	129 UNITS		
NUMBER OF FOR-RENT TOWNHOME UNITS	9 UNITS		
NUMBER OF SINGLE FAMILY FOR-SALE TOWNHOMES	41 UNITS		
MULTI-FAMILY NUMBER OF STORIES	4 STORIES		
AGE TARGETED NUMBER OF STORIES	4 STORIES		
TOWNHOME NUMBER OF STORIES	2 STORIES		
GROUND FLOOR BUILDING AREA FOR MF	87,510 SQUARE FEET		
GROUND FLOOR BUILDING AREA FOR AT	43,440 SQUARE FEET		
GROUND FLOOR BUILDING AREA FOR TH	11,695 SQUARE FEET		
PARKING SUMMARY			
SPACES REQUIRED = (UNITSX1.5)	REQUIRED PARKING	PROVIDED PARKING	
MULTI-FAMILY	434 SPACES	524	TOTAL
		20	ONSITE
		34	ONSTREET
		470	P. GARAGE
AGE TARGETED	194 SPACES	196	TOTAL
		100	ONSITE
		26	CARPORT
		52	ONSTREET
		18	ATT. GARAGE
TOWNHOME	14 SPACES	15	TOTAL
		0	ONSITE
		6	ONSTREET
		9	ATT. GARAGE

OWNER/DEVELOPER
INTEGRATED REAL ESTATE GROUP
3110 W. SOUTHLAKE BLVD, STE. 120
SOUTHLAKE, TEXAS
Ph. 817-837-0585
Contact: Kenneth Fambro

C2.01b

INTERSECTION TURNING MOVMENT VOLUMES

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 EBFR @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 1

Turning Movement Data

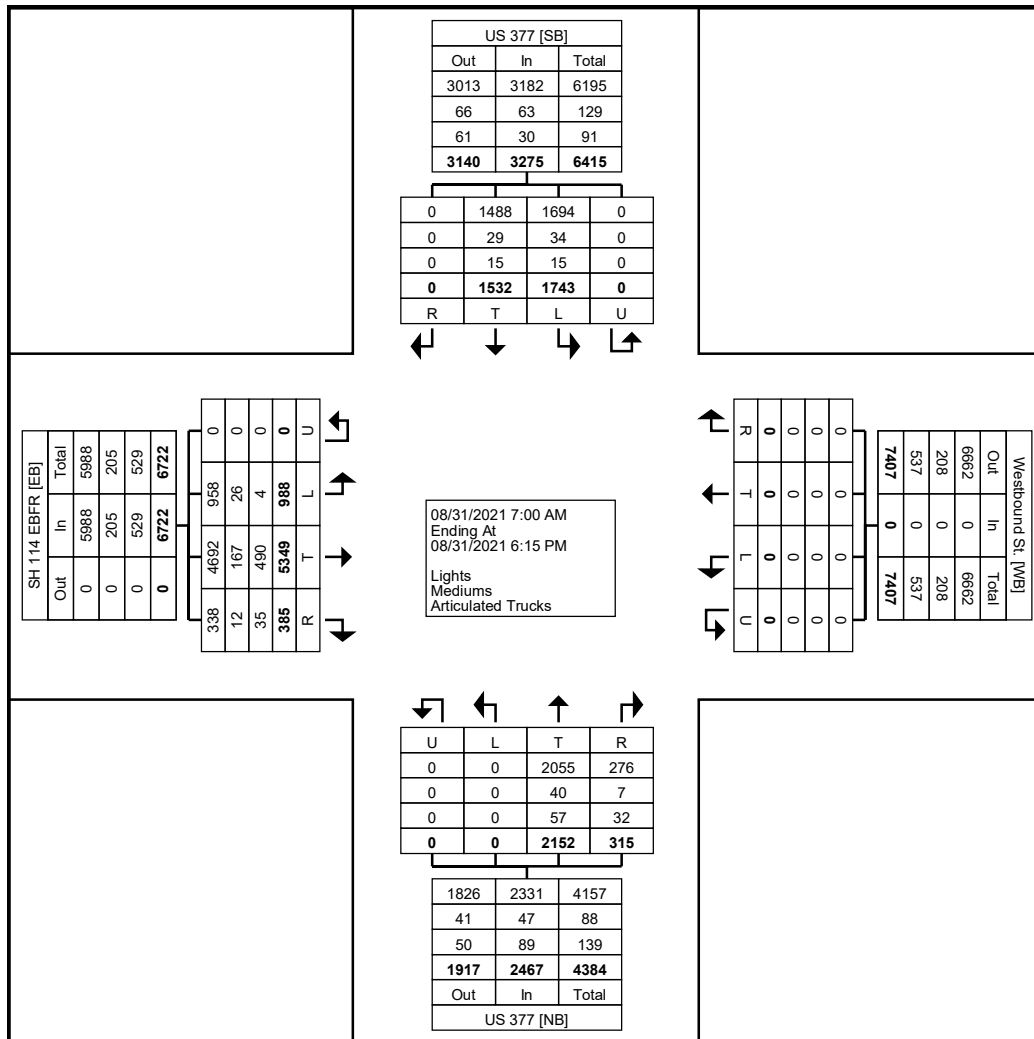
Start Time	US 377 Southbound					Westbound St. Westbound					US 377 Northbound					SH 114 EBFR Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	133	52	0	0	185	0	0	0	0	0	0	105	17	0	122	47	376	25	0	448	755
7:15 AM	139	93	0	0	232	0	0	0	0	0	0	132	26	0	158	41	357	24	0	422	812
7:30 AM	132	77	0	0	209	0	0	0	0	0	0	116	32	0	148	46	375	20	0	441	798
7:45 AM	140	108	0	0	248	0	0	0	0	0	0	137	31	0	168	53	333	21	0	407	823
Hourly Total	544	330	0	0	874	0	0	0	0	0	0	490	106	0	596	187	1441	90	0	1718	3188
8:00 AM	114	82	0	0	196	0	0	0	0	0	0	124	19	0	143	66	333	16	0	415	754
8:15 AM	139	100	0	0	239	0	0	0	0	0	0	132	26	0	158	68	303	21	0	392	789
8:30 AM	102	93	0	0	195	0	0	0	0	0	0	97	23	0	120	55	354	21	0	430	745
8:45 AM	140	92	0	0	232	0	0	0	0	0	0	145	25	0	170	36	287	19	0	342	744
Hourly Total	495	367	0	0	862	0	0	0	0	0	0	498	93	0	591	225	1277	77	0	1579	3032
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	96	101	0	0	197	0	0	0	0	0	0	135	12	0	147	70	332	30	0	432	776
4:15 PM	95	108	0	0	203	0	0	0	0	0	0	142	18	0	160	64	322	22	0	408	771
4:30 PM	88	114	0	0	202	0	0	0	0	0	0	142	14	0	156	79	341	26	0	446	804
4:45 PM	98	106	0	0	204	0	0	0	0	0	0	129	15	0	144	72	320	34	0	426	774
Hourly Total	377	429	0	0	806	0	0	0	0	0	0	548	59	0	607	285	1315	112	0	1712	3125
5:00 PM	105	89	0	0	194	0	0	0	0	0	0	150	14	0	164	71	327	26	0	424	782
5:15 PM	63	93	0	0	156	0	0	0	0	0	0	163	10	0	173	74	350	27	0	451	780
5:30 PM	75	106	0	0	181	0	0	0	0	0	0	164	11	0	175	74	322	27	0	423	779
5:45 PM	84	118	0	0	202	0	0	0	0	0	0	139	22	0	161	72	317	26	0	415	778
Hourly Total	327	406	0	0	733	0	0	0	0	0	0	616	57	0	673	291	1316	106	0	1713	3119
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	1743	1532	0	0	3275	0	0	0	0	0	0	2152	315	0	2467	988	5349	385	0	6722	12464
Approach %	53.2	46.8	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	87.2	12.8	0.0	-	14.7	79.6	5.7	0.0	-	-
Total %	14.0	12.3	0.0	0.0	26.3	0.0	0.0	0.0	0.0	0.0	0.0	17.3	2.5	0.0	19.8	7.9	42.9	3.1	0.0	53.9	-
Lights	1694	1488	0	0	3182	0	0	0	0	0	0	2055	276	0	2331	958	4692	338	0	5988	11501
% Lights	97.2	97.1	-	-	97.2	-	-	-	-	-	-	95.5	87.6	-	94.5	97.0	87.7	87.8	-	89.1	92.3
Mediums	34	29	0	0	63	0	0	0	0	0	0	40	7	0	47	26	167	12	0	205	315
% Mediums	2.0	1.9	-	-	1.9	-	-	-	-	-	-	1.9	2.2	-	1.9	2.6	3.1	3.1	-	3.0	2.5
Articulated Trucks	15	15	0	0	30	0	0	0	0	0	0	57	32	0	89	4	490	35	0	529	648
% Articulated Trucks	0.9	1.0	-	-	0.9	-	-	-	-	-	-	2.6	10.2	-	3.6	0.4	9.2	9.1	-	7.9	5.2

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 EBFR @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 2



Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 EBFR @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 3

Turning Movement Peak Hour Data (7:00 AM)

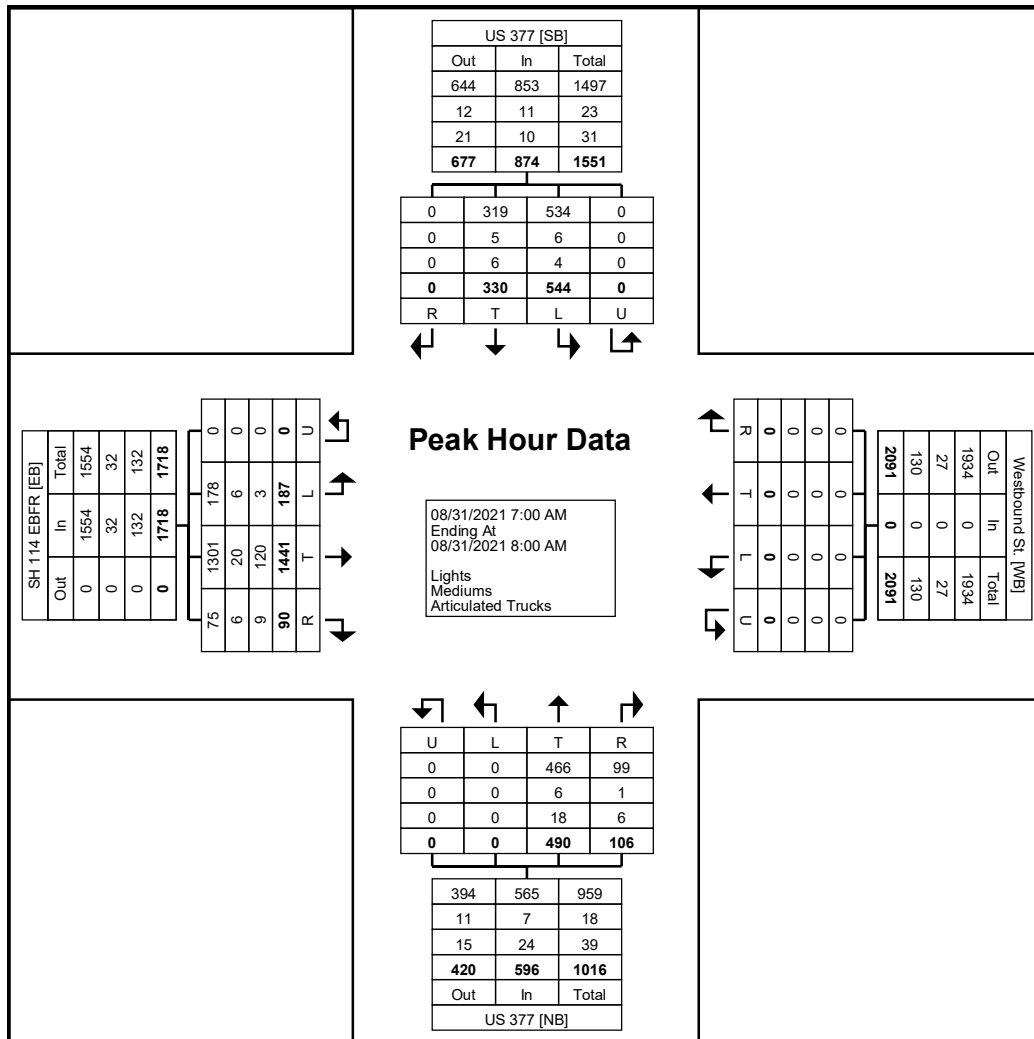
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	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	133	52	0	0	185	0	0	0	0	0	0	105	17	0	122	47	376	25	0	448	755
7:15 AM	139	93	0	0	232	0	0	0	0	0	0	132	26	0	158	41	357	24	0	422	812
7:30 AM	132	77	0	0	209	0	0	0	0	0	0	116	32	0	148	46	375	20	0	441	798
7:45 AM	140	108	0	0	248	0	0	0	0	0	0	137	31	0	168	53	333	21	0	407	823
Total	544	330	0	0	874	0	0	0	0	0	0	490	106	0	596	187	1441	90	0	1718	3188
Approach %	62.2	37.8	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	82.2	17.8	0.0	-	10.9	83.9	5.2	0.0	-	-
Total %	17.1	10.4	0.0	0.0	27.4	0.0	0.0	0.0	0.0	0.0	0.0	15.4	3.3	0.0	18.7	5.9	45.2	2.8	0.0	53.9	-
PHF	0.971	0.764	0.000	0.000	0.881	0.000	0.000	0.000	0.000	0.000	0.000	0.894	0.828	0.000	0.887	0.882	0.958	0.900	0.000	0.959	0.968
Lights	534	319	0	0	853	0	0	0	0	0	0	466	99	0	565	178	1301	75	0	1554	2972
% Lights	98.2	96.7	-	-	97.6	-	-	-	-	-	-	95.1	93.4	-	94.8	95.2	90.3	83.3	-	90.5	93.2
Mediums	6	5	0	0	11	0	0	0	0	0	0	6	1	0	7	6	20	6	0	32	50
% Mediums	1.1	1.5	-	-	1.3	-	-	-	-	-	-	1.2	0.9	-	1.2	3.2	1.4	6.7	-	1.9	1.6
Articulated Trucks	4	6	0	0	10	0	0	0	0	0	0	18	6	0	24	3	120	9	0	132	166
% Articulated Trucks	0.7	1.8	-	-	1.1	-	-	-	-	-	-	3.7	5.7	-	4.0	1.6	8.3	10.0	-	7.7	5.2

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 EBFR @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:00 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 EBFR @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 5

Turning Movement Peak Hour Data (4:30 PM)

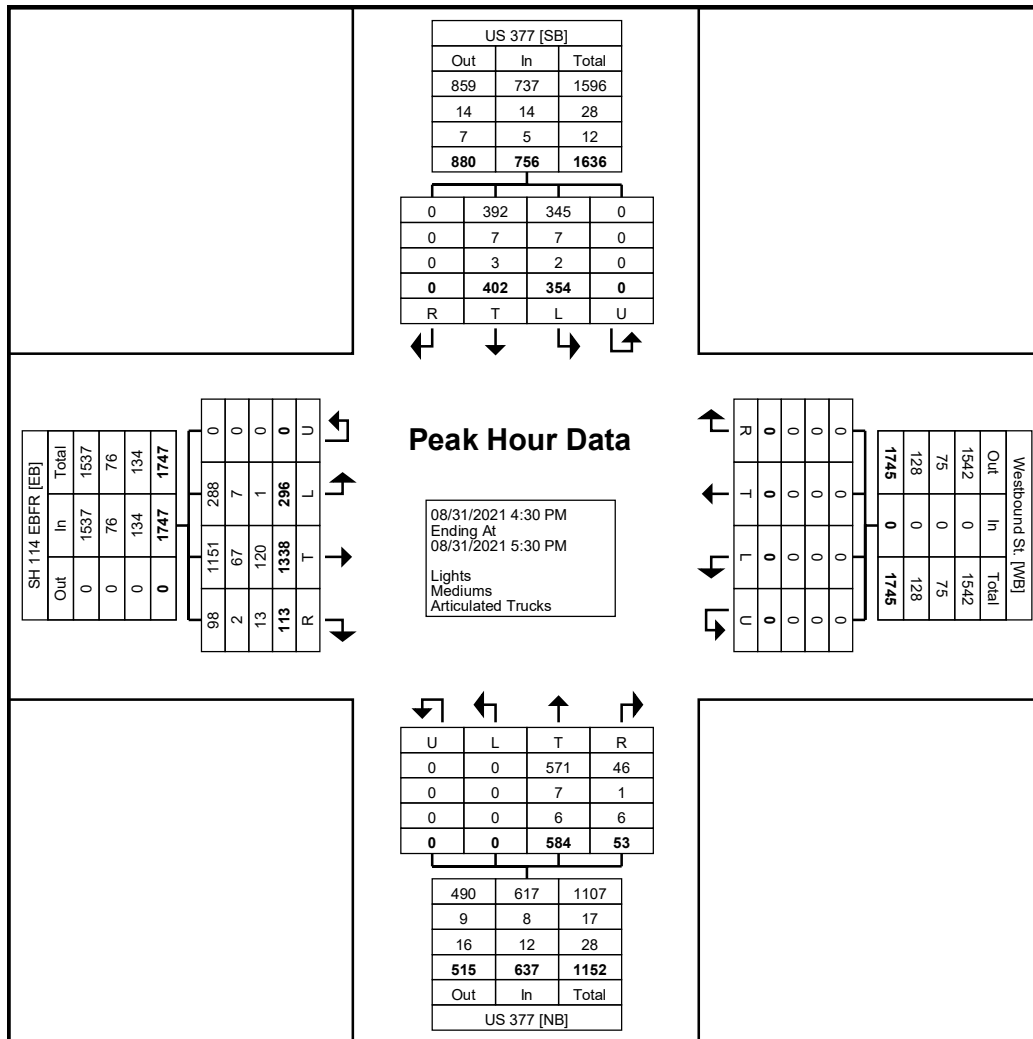
Start Time	US 377 Southbound					Westbound St. Westbound					US 377 Northbound					SH 114 EBFR Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:30 PM	88	114	0	0	202	0	0	0	0	0	0	142	14	0	156	79	341	26	0	446	804
4:45 PM	98	106	0	0	204	0	0	0	0	0	0	129	15	0	144	72	320	34	0	426	774
5:00 PM	105	89	0	0	194	0	0	0	0	0	0	150	14	0	164	71	327	26	0	424	782
5:15 PM	63	93	0	0	156	0	0	0	0	0	0	163	10	0	173	74	350	27	0	451	780
Total	354	402	0	0	756	0	0	0	0	0	0	584	53	0	637	296	1338	113	0	1747	3140
Approach %	46.8	53.2	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	91.7	8.3	0.0	-	16.9	76.6	6.5	0.0	-	-
Total %	11.3	12.8	0.0	0.0	24.1	0.0	0.0	0.0	0.0	0.0	0.0	18.6	1.7	0.0	20.3	9.4	42.6	3.6	0.0	55.6	-
PHF	0.843	0.882	0.000	0.000	0.926	0.000	0.000	0.000	0.000	0.000	0.000	0.896	0.883	0.000	0.921	0.937	0.956	0.831	0.000	0.968	0.976
Lights	345	392	0	0	737	0	0	0	0	0	0	571	46	0	617	288	1151	98	0	1537	2891
% Lights	97.5	97.5	-	-	97.5	-	-	-	-	-	-	97.8	86.8	-	96.9	97.3	86.0	86.7	-	88.0	92.1
Mediums	7	7	0	0	14	0	0	0	0	0	0	7	1	0	8	7	67	2	0	76	98
% Mediums	2.0	1.7	-	-	1.9	-	-	-	-	-	-	1.2	1.9	-	1.3	2.4	5.0	1.8	-	4.4	3.1
Articulated Trucks	2	3	0	0	5	0	0	0	0	0	0	6	6	0	12	1	120	13	0	134	151
% Articulated Trucks	0.6	0.7	-	-	0.7	-	-	-	-	-	-	1.0	11.3	-	1.9	0.3	9.0	11.5	-	7.7	4.8

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 EBFR @
US 377
Site Code:
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Turning Movement Peak Hour Data Plot (4:30 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 WBFR @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Data

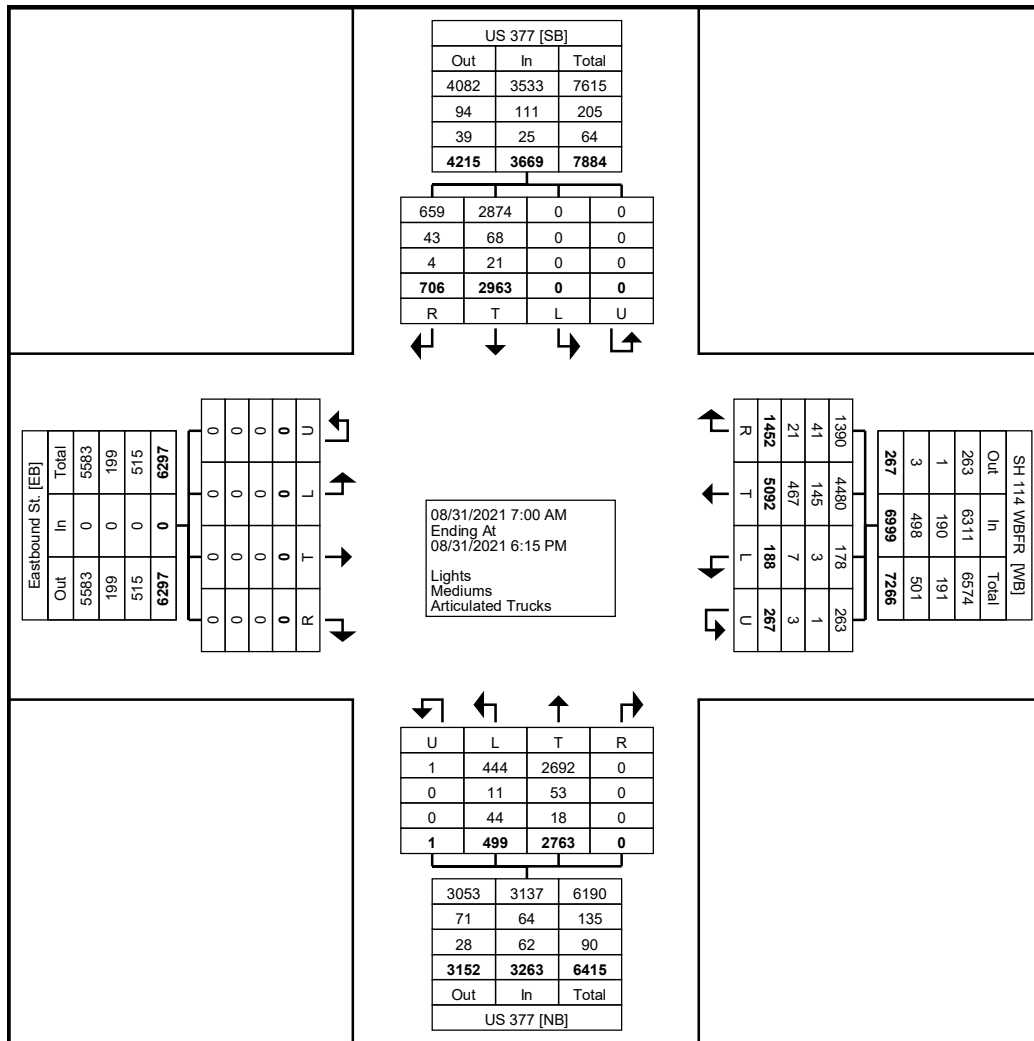
Start Time	US 377 Southbound					SH 114 WBFR Westbound					US 377 Northbound					Eastbound St. Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	172	30	0	202	8	302	92	8	410	19	142	0	0	161	0	0	0	0	0	773
7:15 AM	0	211	25	0	236	10	297	82	16	405	31	152	0	1	184	0	0	0	0	0	825
7:30 AM	0	228	36	0	264	5	322	102	28	457	21	169	0	0	190	0	0	0	0	0	911
7:45 AM	0	197	26	0	223	11	288	107	22	428	22	165	0	0	187	0	0	0	0	0	838
Hourly Total	0	808	117	0	925	34	1209	383	74	1700	93	628	0	1	722	0	0	0	0	0	3347
8:00 AM	0	217	34	0	251	9	305	85	21	420	21	181	0	0	202	0	0	0	0	0	873
8:15 AM	0	191	48	0	239	15	284	90	20	409	36	167	0	0	203	0	0	0	0	0	851
8:30 AM	0	212	54	0	266	11	240	81	22	354	28	146	0	0	174	0	0	0	0	0	794
8:45 AM	0	172	41	0	213	16	261	88	20	385	30	128	0	0	158	0	0	0	0	0	756
Hourly Total	0	792	177	0	969	51	1090	344	83	1568	115	622	0	0	737	0	0	0	0	0	3274
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	209	51	0	260	8	343	93	15	459	38	175	0	0	213	0	0	0	0	0	932
4:15 PM	0	224	71	0	295	9	340	80	10	439	30	178	0	0	208	0	0	0	0	0	942
4:30 PM	0	226	50	0	276	15	341	93	19	468	36	194	0	0	230	0	0	0	0	0	974
4:45 PM	0	212	55	0	267	17	304	97	10	428	33	180	0	0	213	0	0	0	0	0	908
Hourly Total	0	871	227	0	1098	49	1328	363	54	1794	137	727	0	0	864	0	0	0	0	0	3756
5:00 PM	0	138	64	0	202	12	359	85	11	467	28	216	0	0	244	0	0	0	0	0	913
5:15 PM	0	108	40	0	148	16	348	96	15	475	46	195	0	0	241	0	0	0	0	0	864
5:30 PM	0	128	43	0	171	12	377	94	12	495	38	185	0	0	223	0	0	0	0	0	889
5:45 PM	0	118	38	0	156	14	381	87	18	500	42	190	0	0	232	0	0	0	0	0	888
Hourly Total	0	492	185	0	677	54	1465	362	56	1937	154	786	0	0	940	0	0	0	0	0	3554
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	2963	706	0	3669	188	5092	1452	267	6999	499	2763	0	1	3263	0	0	0	0	0	13931
Approach %	0.0	80.8	19.2	0.0	-	2.7	72.8	20.7	3.8	-	15.3	84.7	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-
Total %	0.0	21.3	5.1	0.0	26.3	1.3	36.6	10.4	1.9	50.2	3.6	19.8	0.0	0.0	23.4	0.0	0.0	0.0	0.0	0.0	-
Lights	0	2874	659	0	3533	178	4480	1390	263	6311	444	2692	0	1	3137	0	0	0	0	0	12981
% Lights	-	97.0	93.3	-	96.3	94.7	88.0	95.7	98.5	90.2	89.0	97.4	-	100.0	96.1	-	-	-	-	-	93.2
Mediums	0	68	43	0	111	3	145	41	1	190	11	53	0	0	64	0	0	0	0	0	365
% Mediums	-	2.3	6.1	-	3.0	1.6	2.8	2.8	0.4	2.7	2.2	1.9	-	0.0	2.0	-	-	-	-	-	2.6
Articulated Trucks	0	21	4	0	25	7	467	21	3	498	44	18	0	0	62	0	0	0	0	0	585
% Articulated Trucks	-	0.7	0.6	-	0.7	3.7	9.2	1.4	1.1	7.1	8.8	0.7	-	0.0	1.9	-	-	-	-	-	4.2

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 WBFR @
US 377
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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 WBFR @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (7:30 AM)

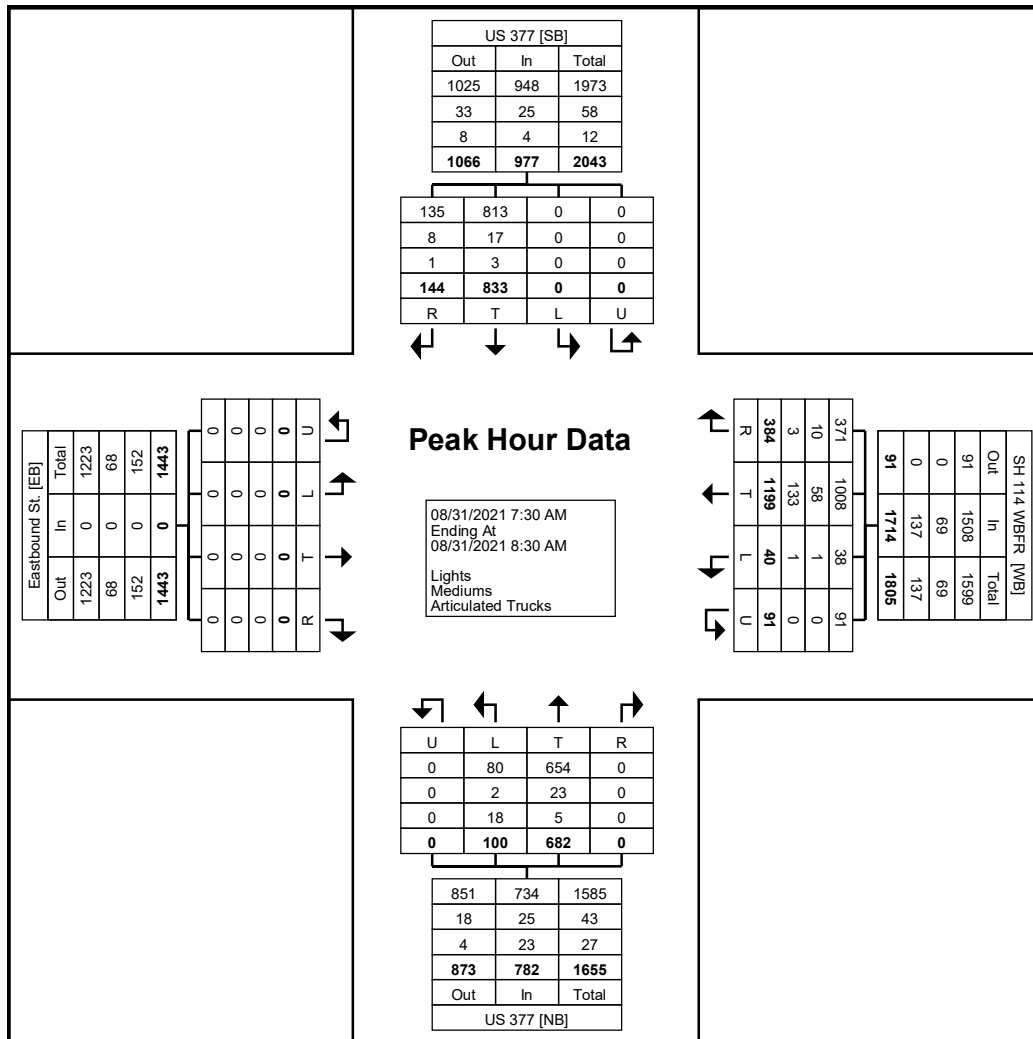
Start Time	US 377 Southbound					SH 114 WBFR Westbound					US 377 Northbound					Eastbound St. Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:30 AM	0	228	36	0	264	5	322	102	28	457	21	169	0	0	190	0	0	0	0	0	911
7:45 AM	0	197	26	0	223	11	288	107	22	428	22	165	0	0	187	0	0	0	0	0	838
8:00 AM	0	217	34	0	251	9	305	85	21	420	21	181	0	0	202	0	0	0	0	0	873
8:15 AM	0	191	48	0	239	15	284	90	20	409	36	167	0	0	203	0	0	0	0	0	851
Total	0	833	144	0	977	40	1199	384	91	1714	100	682	0	0	782	0	0	0	0	0	3473
Approach %	0.0	85.3	14.7	0.0	-	2.3	70.0	22.4	5.3	-	12.8	87.2	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-
Total %	0.0	24.0	4.1	0.0	28.1	1.2	34.5	11.1	2.6	49.4	2.9	19.6	0.0	0.0	22.5	0.0	0.0	0.0	0.0	0.0	-
PHF	0.000	0.913	0.750	0.000	0.925	0.667	0.931	0.897	0.813	0.938	0.694	0.942	0.000	0.000	0.963	0.000	0.000	0.000	0.000	0.000	0.953
Lights	0	813	135	0	948	38	1008	371	91	1508	80	654	0	0	734	0	0	0	0	0	3190
% Lights	-	97.6	93.8	-	97.0	95.0	84.1	96.6	100.0	88.0	80.0	95.9	-	-	93.9	-	-	-	-	-	91.9
Mediums	0	17	8	0	25	1	58	10	0	69	2	23	0	0	25	0	0	0	0	0	119
% Mediums	-	2.0	5.6	-	2.6	2.5	4.8	2.6	0.0	4.0	2.0	3.4	-	-	3.2	-	-	-	-	-	3.4
Articulated Trucks	0	3	1	0	4	1	133	3	0	137	18	5	0	0	23	0	0	0	0	0	164
% Articulated Trucks	-	0.4	0.7	-	0.4	2.5	11.1	0.8	0.0	8.0	18.0	0.7	-	-	2.9	-	-	-	-	-	4.7

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 WBFR @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data Plot (7:30 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 WBFR @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (4:00 PM)

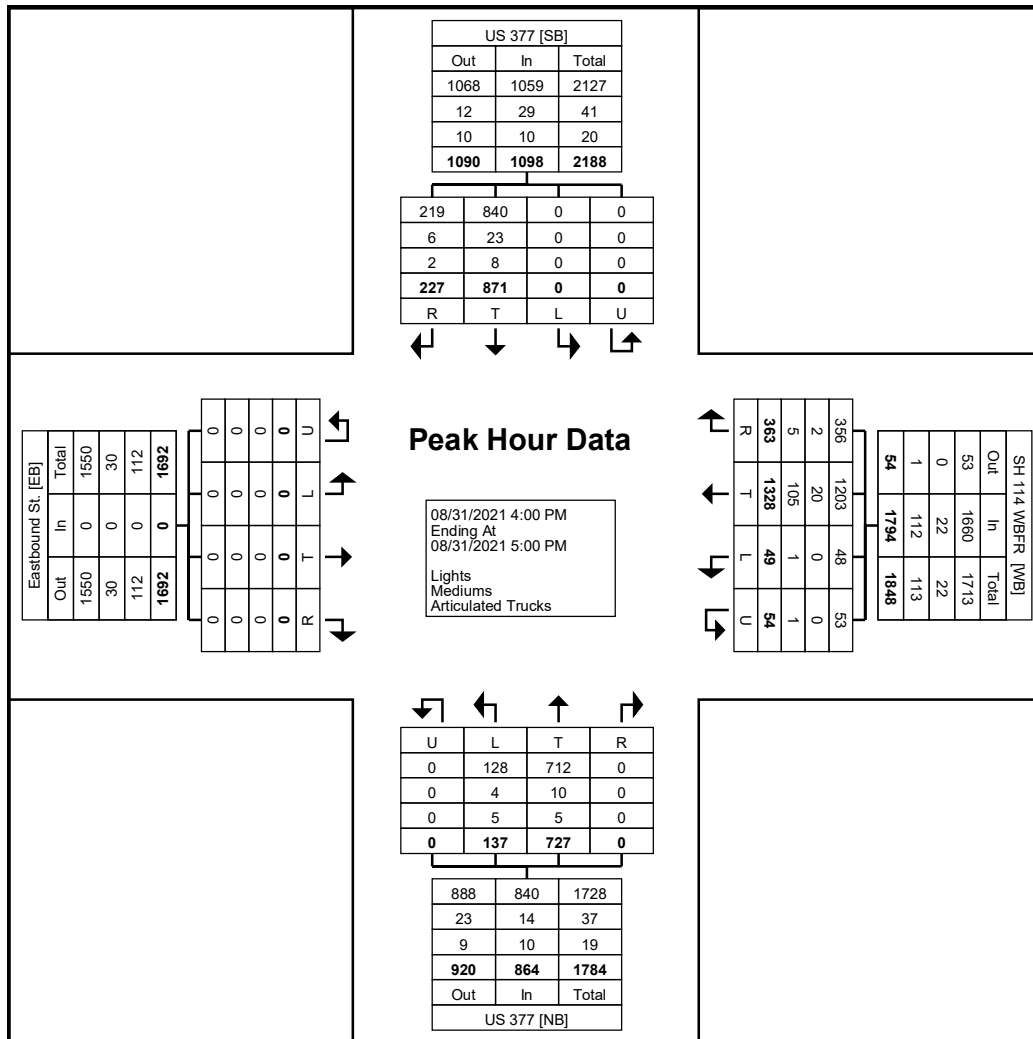
Start Time	US 377 Southbound					SH 114 WBFR Westbound					US 377 Northbound					Eastbound St. Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:00 PM	0	209	51	0	260	8	343	93	15	459	38	175	0	0	213	0	0	0	0	0	932
4:15 PM	0	224	71	0	295	9	340	80	10	439	30	178	0	0	208	0	0	0	0	0	942
4:30 PM	0	226	50	0	276	15	341	93	19	468	36	194	0	0	230	0	0	0	0	0	974
4:45 PM	0	212	55	0	267	17	304	97	10	428	33	180	0	0	213	0	0	0	0	0	908
Total	0	871	227	0	1098	49	1328	363	54	1794	137	727	0	0	864	0	0	0	0	0	3756
Approach %	0.0	79.3	20.7	0.0	-	2.7	74.0	20.2	3.0	-	15.9	84.1	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-
Total %	0.0	23.2	6.0	0.0	29.2	1.3	35.4	9.7	1.4	47.8	3.6	19.4	0.0	0.0	23.0	0.0	0.0	0.0	0.0	0.0	-
PHF	0.000	0.963	0.799	0.000	0.931	0.721	0.968	0.936	0.711	0.958	0.901	0.937	0.000	0.000	0.939	0.000	0.000	0.000	0.000	0.000	0.964
Lights	0	840	219	0	1059	48	1203	356	53	1660	128	712	0	0	840	0	0	0	0	0	3559
% Lights	-	96.4	96.5	-	96.4	98.0	90.6	98.1	98.1	92.5	93.4	97.9	-	-	97.2	-	-	-	-	-	94.8
Mediums	0	23	6	0	29	0	20	2	0	22	4	10	0	0	14	0	0	0	0	0	65
% Mediums	-	2.6	2.6	-	2.6	0.0	1.5	0.6	0.0	1.2	2.9	1.4	-	-	1.6	-	-	-	-	-	1.7
Articulated Trucks	0	8	2	0	10	1	105	5	1	112	5	5	0	0	10	0	0	0	0	0	132
% Articulated Trucks	-	0.9	0.9	-	0.9	2.0	7.9	1.4	1.9	6.2	3.6	0.7	-	-	1.2	-	-	-	-	-	3.5

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: SH 114 WBFR @
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Turning Movement Peak Hour Data Plot (4:00 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

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817.265.8968

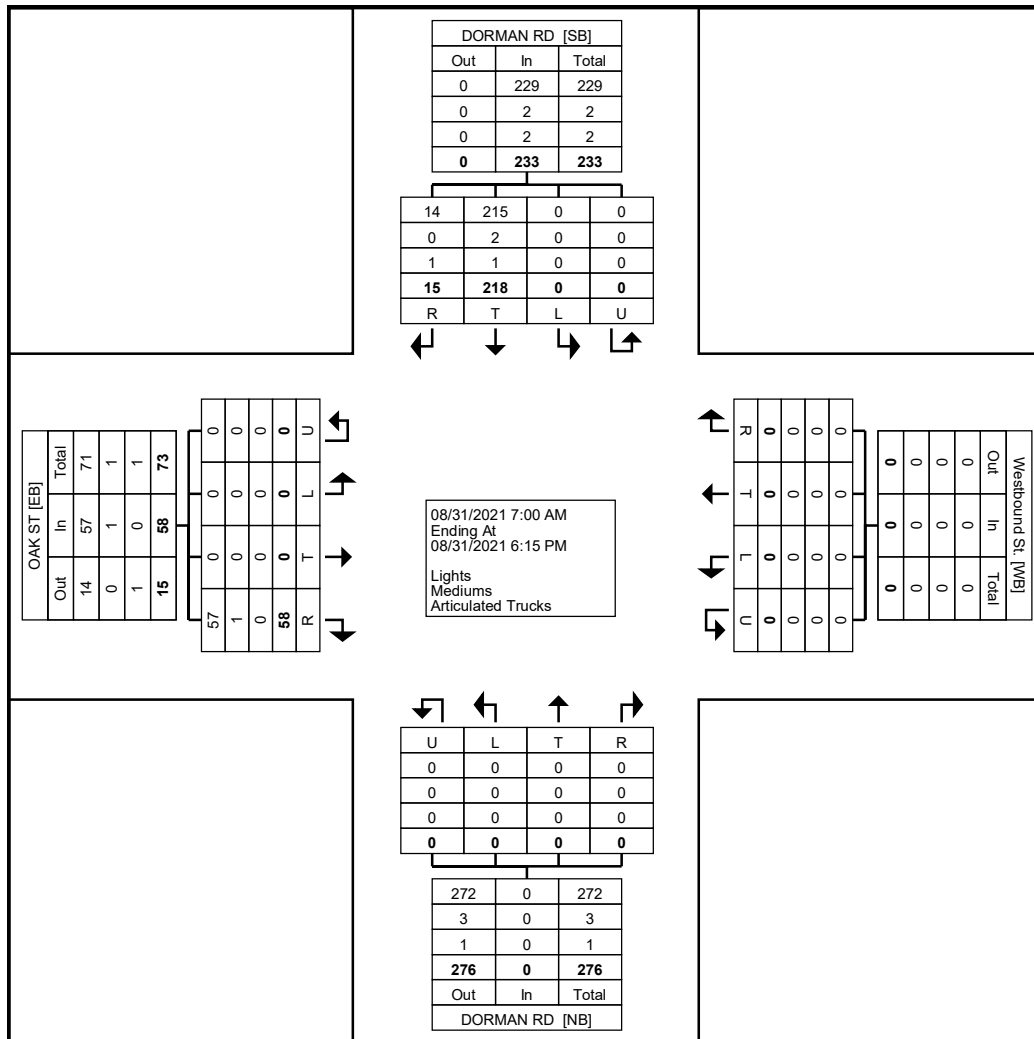
Count Name: DORMAN RD @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 1

Turning Movement Data

Start Time	DORMAN RD Southbound					Westbound St. Westbound					DORMAN RD Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
7:15 AM	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	7
7:30 AM	0	8	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	9
7:45 AM	0	11	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	19
Hourly Total	0	29	1	0	30	0	0	0	0	0	0	0	0	0	0	0	0	9	0	9	39
8:00 AM	0	11	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	14
8:15 AM	0	11	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	16
8:30 AM	0	14	2	0	16	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	17
8:45 AM	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	15
Hourly Total	0	45	4	0	49	0	0	0	0	0	0	0	0	0	0	0	0	13	0	13	62
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	18	2	0	20	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	25
4:15 PM	0	21	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	23
4:30 PM	0	17	2	0	19	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	22
4:45 PM	0	17	1	0	18	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	23
Hourly Total	0	73	5	0	78	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15	93
5:00 PM	0	21	2	0	23	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	29
5:15 PM	0	19	1	0	20	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	27
5:30 PM	0	15	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	19
5:45 PM	0	16	2	0	18	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	22
Hourly Total	0	71	5	0	76	0	0	0	0	0	0	0	0	0	0	0	0	21	0	21	97
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	218	15	0	233	0	0	0	0	0	0	0	0	0	0	0	0	58	0	58	291
Approach %	0.0	93.6	6.4	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	100.0	0.0	-	-
Total %	0.0	74.9	5.2	0.0	80.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.9	0.0	19.9	-
Lights	0	215	14	0	229	0	0	0	0	0	0	0	0	0	0	0	0	57	0	57	286
% Lights	-	98.6	93.3	-	98.3	-	-	-	-	-	-	-	-	-	-	-	-	98.3	-	98.3	98.3
Mediums	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
% Mediums	-	0.9	0.0	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	1.7	-	1.7	1.0
Articulated Trucks	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Articulated Trucks	-	0.5	6.7	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	0.7

Arlington, Texas, United States 76013
817.265.8968

Count Name: DORMAN RD @
OAK ST
Site Code:
Start Date: 08/31/2021
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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: DORMAN RD @
OAK ST
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (7:45 AM)

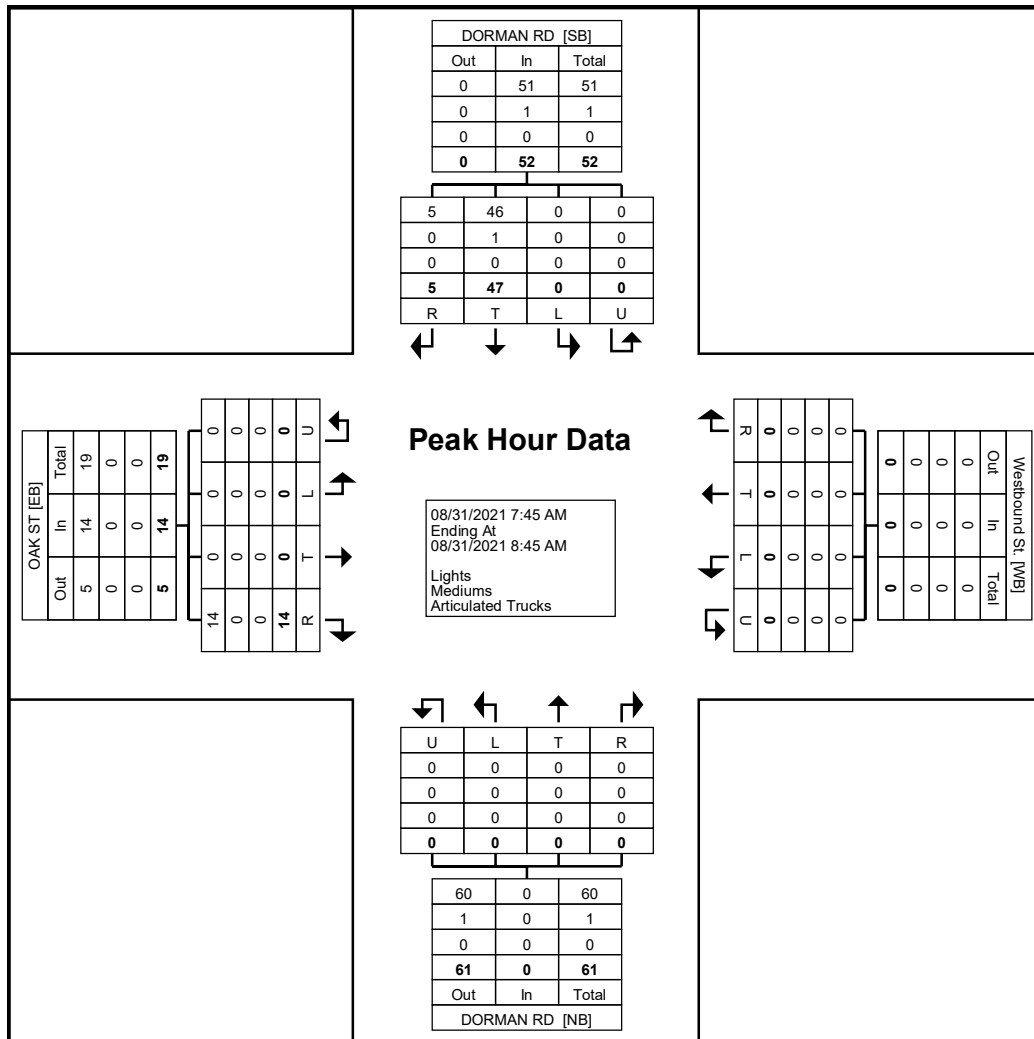
Start Time	DORMAN RD Southbound					Westbound St. Westbound					DORMAN RD Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	0	11	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	19
8:00 AM	0	11	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	14
8:15 AM	0	11	1	0	12	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	16
8:30 AM	0	14	2	0	16	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	17
Total	0	47	5	0	52	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	66
Approach %	0.0	90.4	9.6	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	100.0	0.0	-	-
Total %	0.0	71.2	7.6	0.0	78.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.2	0.0	21.2	-
PHF	0.000	0.839	0.625	0.000	0.813	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.868
Lights	0	46	5	0	51	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	65
% Lights	-	97.9	100.0	-	98.1	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	100.0	98.5
Mediums	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Mediums	-	2.1	0.0	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	1.5
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: DORMAN RD @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:45 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: DORMAN RD @
OAK ST
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (4:30 PM)

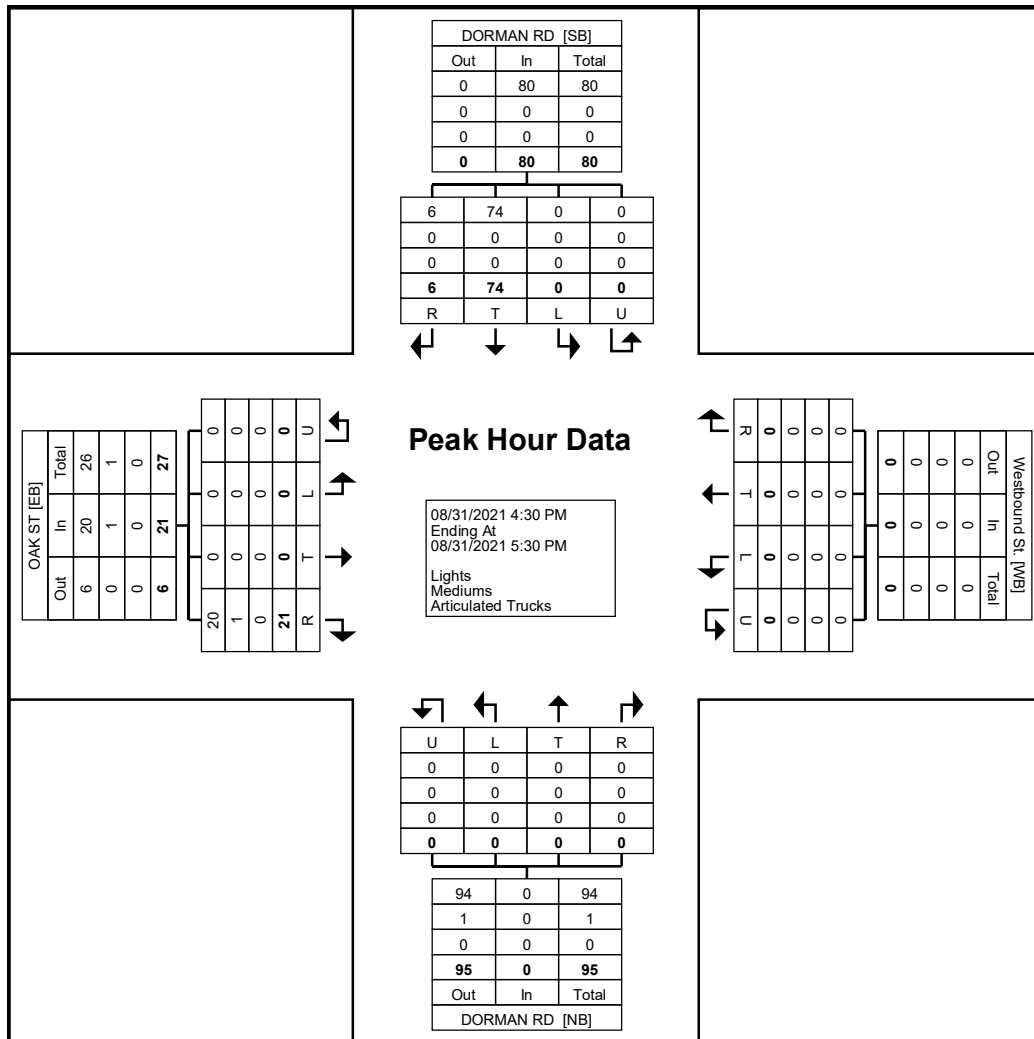
Start Time	DORMAN RD Southbound					Westbound St. Westbound					DORMAN RD Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:30 PM	0	17	2	0	19	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	22
4:45 PM	0	17	1	0	18	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	23
5:00 PM	0	21	2	0	23	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	29
5:15 PM	0	19	1	0	20	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	27
Total	0	74	6	0	80	0	0	0	0	0	0	0	0	0	0	0	0	21	0	21	101
Approach %	0.0	92.5	7.5	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	100.0	0.0	-	-
Total %	0.0	73.3	5.9	0.0	79.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	20.8	-
PHF	0.000	0.881	0.750	0.000	0.870	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.750	0.871
Lights	0	74	6	0	80	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	100
% Lights	-	100.0	100.0	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	95.2	-	95.2	99.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% Mediums	-	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	4.8	-	4.8	1.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: DORMAN RD @
OAK ST
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data Plot (4:30 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: OAK ST @
COMMERCIAL DRWY
Site Code:
Start Date: 08/31/2021
Page No: 1

Turning Movement Data

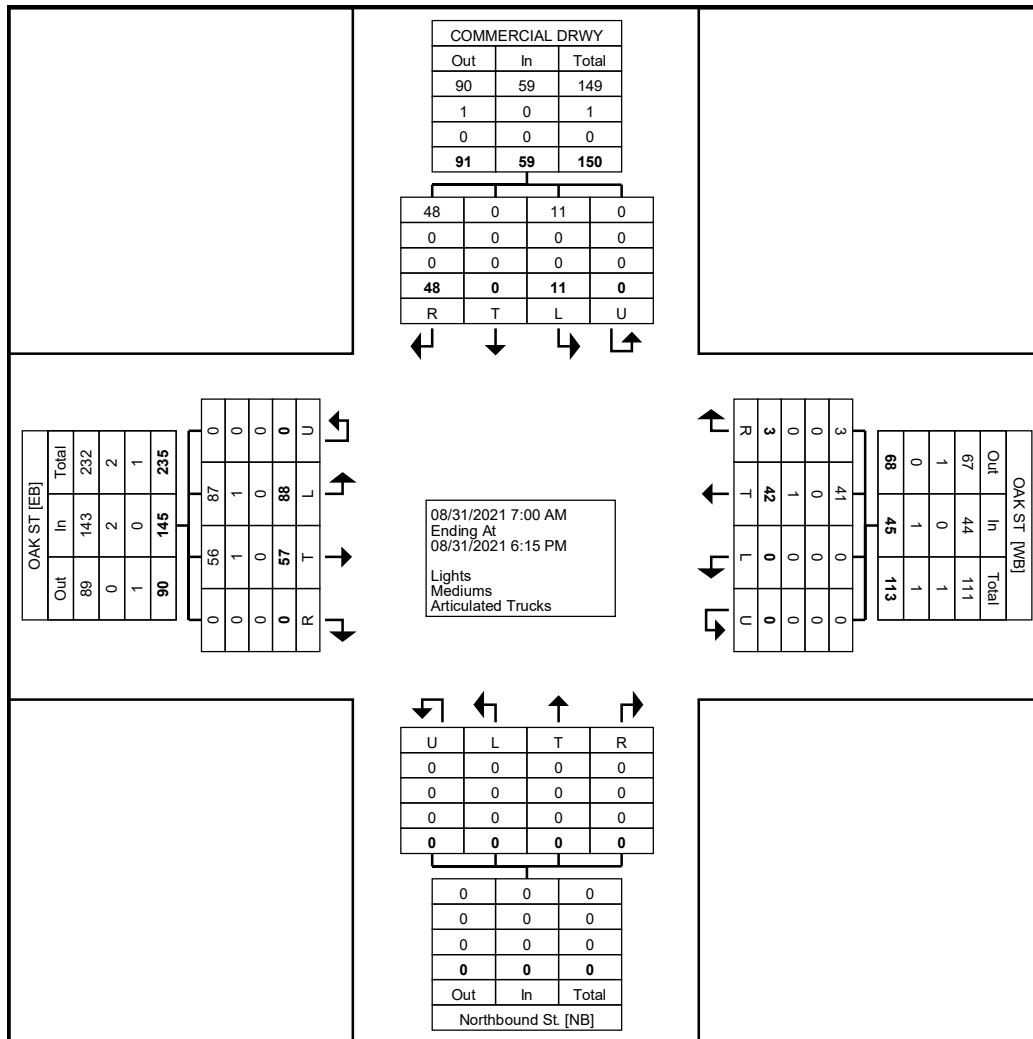
Start Time	COMMERCIAL DRWY Southbound					OAK ST Westbound					Northbound St. Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5	6
7:15 AM	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	6	1	0	0	7	10
7:30 AM	0	0	3	0	3	0	1	0	0	1	0	0	0	0	0	6	3	0	0	9	13
7:45 AM	4	0	8	0	12	0	3	0	0	3	0	0	0	0	0	14	6	0	0	20	35
Hourly Total	4	0	14	0	18	0	5	0	0	5	0	0	0	0	0	29	12	0	0	41	64
8:00 AM	1	0	4	0	5	0	3	0	0	3	0	0	0	0	0	2	1	0	0	3	11
8:15 AM	1	0	1	0	2	0	2	0	0	2	0	0	0	0	0	7	3	0	0	10	14
8:30 AM	0	0	2	0	2	0	3	0	0	3	0	0	0	0	0	7	3	0	0	10	15
8:45 AM	1	0	1	0	2	0	3	0	0	3	0	0	0	0	0	6	7	0	0	13	18
Hourly Total	3	0	8	0	11	0	11	0	0	11	0	0	0	0	0	22	14	0	0	36	58
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	1	0	1	0	2	0	4	0	0	4	0	0	0	0	0	4	3	0	0	7	13
4:15 PM	1	0	2	0	3	0	2	0	0	2	0	0	0	0	0	3	4	0	0	7	12
4:30 PM	2	0	4	0	6	0	3	0	0	3	0	0	0	0	0	7	3	0	0	10	19
4:45 PM	0	0	1	0	1	0	2	3	0	5	0	0	0	0	0	7	5	0	0	12	18
Hourly Total	4	0	8	0	12	0	11	3	0	14	0	0	0	0	0	21	15	0	0	36	62
5:00 PM	0	0	7	0	7	0	5	0	0	5	0	0	0	0	0	6	3	0	0	9	21
5:15 PM	0	0	2	0	2	0	2	0	0	2	0	0	0	0	0	2	5	0	0	7	11
5:30 PM	0	0	5	0	5	0	4	0	0	4	0	0	0	0	0	4	3	0	0	7	16
5:45 PM	0	0	4	0	4	0	4	0	0	4	0	0	0	0	0	4	5	0	0	9	17
Hourly Total	0	0	18	0	18	0	15	0	0	15	0	0	0	0	0	16	16	0	0	32	65
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	11	0	48	0	59	0	42	3	0	45	0	0	0	0	0	88	57	0	0	145	249
Approach %	18.6	0.0	81.4	0.0	-	0.0	93.3	6.7	0.0	-	0.0	0.0	0.0	0.0	-	60.7	39.3	0.0	0.0	-	-
Total %	4.4	0.0	19.3	0.0	23.7	0.0	16.9	1.2	0.0	18.1	0.0	0.0	0.0	0.0	0.0	35.3	22.9	0.0	0.0	58.2	-
Lights	11	0	48	0	59	0	41	3	0	44	0	0	0	0	0	87	56	0	0	143	246
% Lights	100.0	-	100.0	-	100.0	-	97.6	100.0	-	97.8	-	-	-	-	-	98.9	98.2	-	-	98.6	98.8
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
% Mediums	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	1.1	1.8	-	-	1.4	0.8
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Articulated Trucks	0.0	-	0.0	-	0.0	-	2.4	0.0	-	2.2	-	-	-	-	-	0.0	0.0	-	-	0.0	0.4

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: OAK ST @
COMMERCIAL DRWY
Site Code:
Start Date: 08/31/2021
Page No: 2



Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: OAK ST @
COMMERCIAL DRWY
Site Code:
Start Date: 08/31/2021
Page No: 3

Turning Movement Peak Hour Data (7:45 AM)

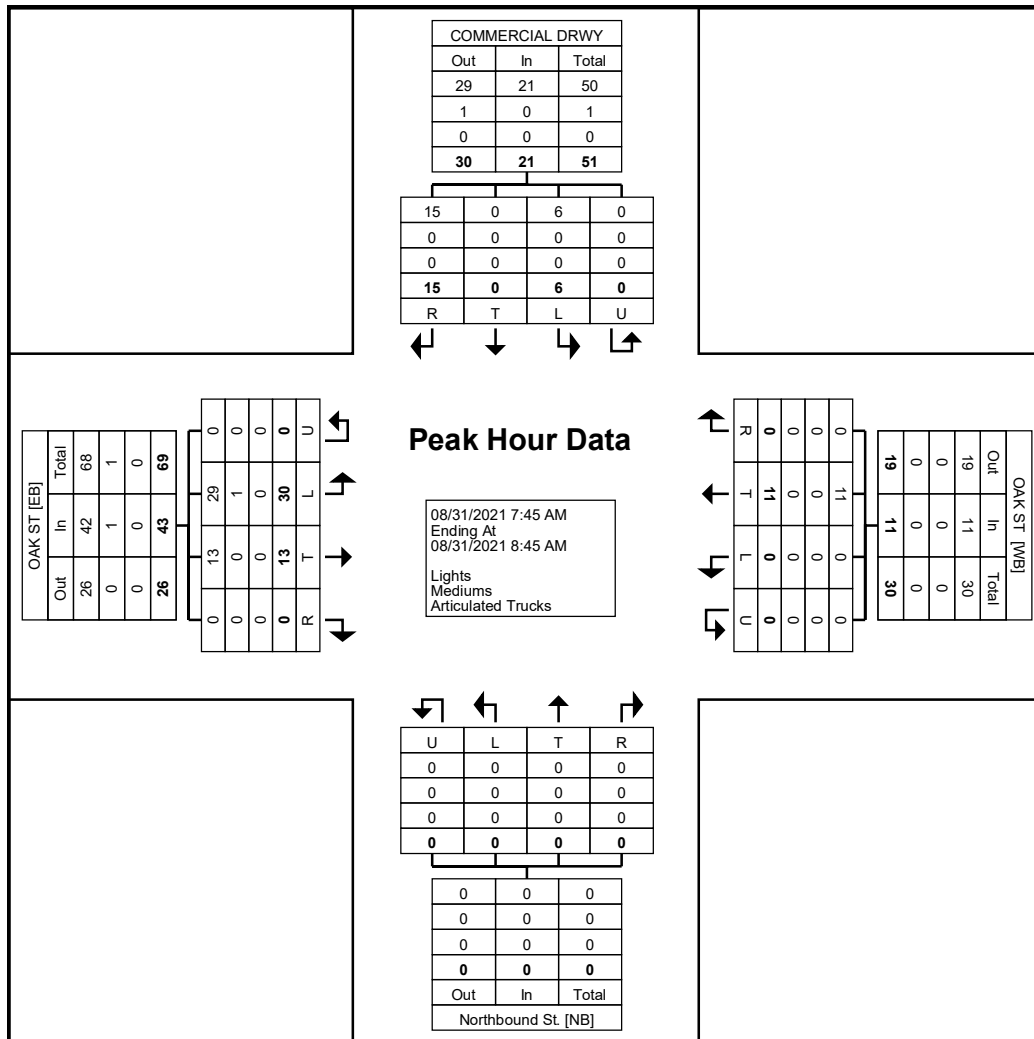
Start Time	COMMERCIAL DRWY Southbound					OAK ST Westbound					Northbound St. Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	4	0	8	0	12	0	3	0	0	3	0	0	0	0	0	14	6	0	0	20	35
8:00 AM	1	0	4	0	5	0	3	0	0	3	0	0	0	0	0	2	1	0	0	3	11
8:15 AM	1	0	1	0	2	0	2	0	0	2	0	0	0	0	0	7	3	0	0	10	14
8:30 AM	0	0	2	0	2	0	3	0	0	3	0	0	0	0	0	7	3	0	0	10	15
Total	6	0	15	0	21	0	11	0	0	11	0	0	0	0	0	30	13	0	0	43	75
Approach %	28.6	0.0	71.4	0.0	-	0.0	100.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	69.8	30.2	0.0	0.0	-	-
Total %	8.0	0.0	20.0	0.0	28.0	0.0	14.7	0.0	0.0	14.7	0.0	0.0	0.0	0.0	0.0	40.0	17.3	0.0	0.0	57.3	-
PHF	0.375	0.000	0.469	0.000	0.438	0.000	0.917	0.000	0.000	0.917	0.000	0.000	0.000	0.000	0.000	0.536	0.542	0.000	0.000	0.538	0.536
Lights	6	0	15	0	21	0	11	0	0	11	0	0	0	0	0	29	13	0	0	42	74
% Lights	100.0	-	100.0	-	100.0	-	100.0	-	-	100.0	-	-	-	-	-	96.7	100.0	-	-	97.7	98.7
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
% Mediums	0.0	-	0.0	-	0.0	-	0.0	-	-	0.0	-	-	-	-	-	3.3	0.0	-	-	2.3	1.3
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	-	0.0	-	0.0	-	0.0	-	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: OAK ST @
COMMERCIAL DRWY
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:45 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: OAK ST @
COMMERCIAL DRWY
Site Code:
Start Date: 08/31/2021
Page No: 5

Turning Movement Peak Hour Data (4:15 PM)

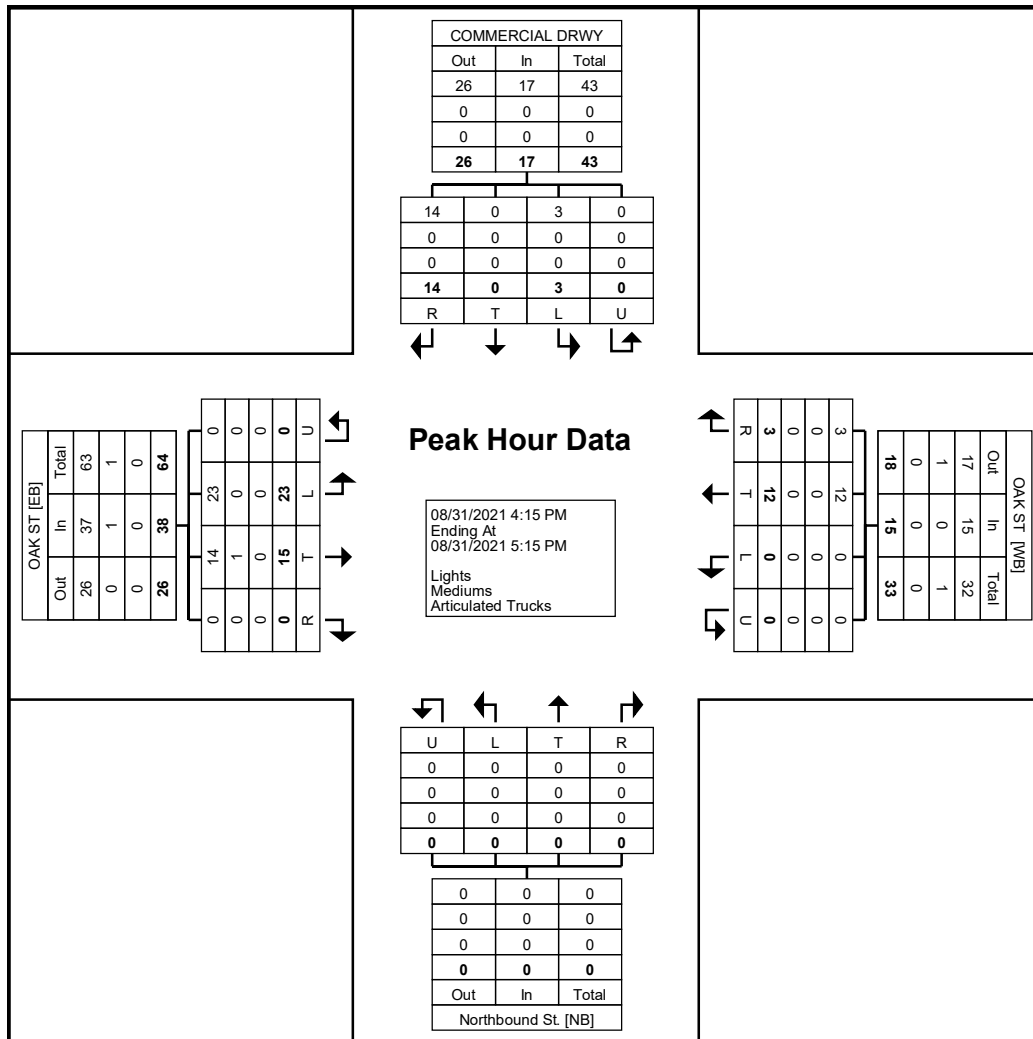
Start Time	COMMERCIAL DRWY Southbound					OAK ST Westbound					Northbound St. Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:15 PM	1	0	2	0	3	0	2	0	0	2	0	0	0	0	0	3	4	0	0	7	12
4:30 PM	2	0	4	0	6	0	3	0	0	3	0	0	0	0	0	7	3	0	0	10	19
4:45 PM	0	0	1	0	1	0	2	3	0	5	0	0	0	0	0	7	5	0	0	12	18
5:00 PM	0	0	7	0	7	0	5	0	0	5	0	0	0	0	0	6	3	0	0	9	21
Total	3	0	14	0	17	0	12	3	0	15	0	0	0	0	0	23	15	0	0	38	70
Approach %	17.6	0.0	82.4	0.0	-	0.0	80.0	20.0	0.0	-	0.0	0.0	0.0	0.0	-	60.5	39.5	0.0	0.0	-	-
Total %	4.3	0.0	20.0	0.0	24.3	0.0	17.1	4.3	0.0	21.4	0.0	0.0	0.0	0.0	0.0	32.9	21.4	0.0	0.0	54.3	-
PHF	0.375	0.000	0.500	0.000	0.607	0.000	0.600	0.250	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.821	0.750	0.000	0.000	0.792	0.833
Lights	3	0	14	0	17	0	12	3	0	15	0	0	0	0	0	23	14	0	0	37	69
% Lights	100.0	-	100.0	-	100.0	-	100.0	100.0	-	100.0	-	-	-	-	-	100.0	93.3	-	-	97.4	98.6
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Mediums	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	6.7	-	-	2.6	1.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: OAK ST @
COMMERCIAL DRWY
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Turning Movement Peak Hour Data Plot (4:15 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 1

Turning Movement Data

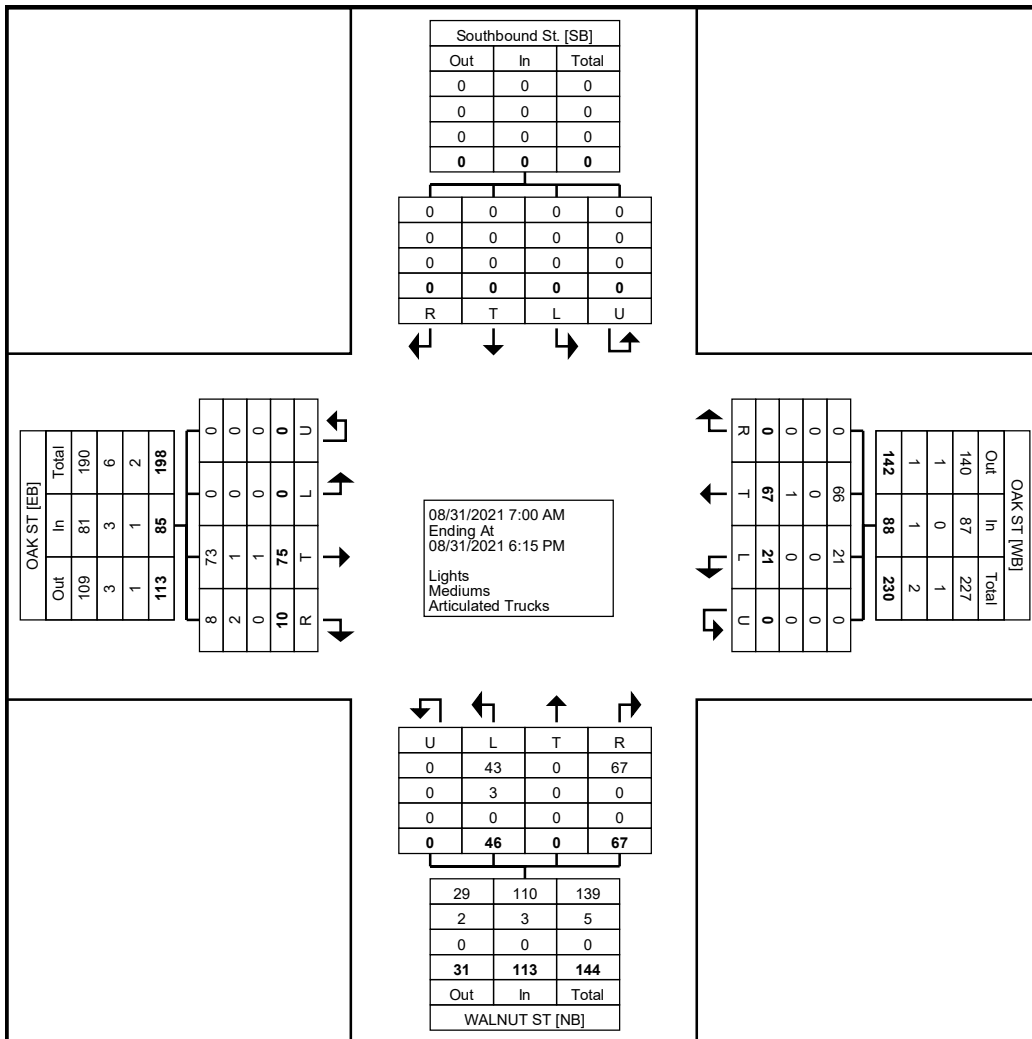
Start Time	Southbound St. Southbound					OAK ST Westbound					WALNUT ST Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	0	0	0	0	0	1	0	0	1	3	0	0	0	3	0	5	0	0	5	9
7:15 AM	0	0	0	0	0	0	3	0	0	3	3	0	5	0	8	0	2	1	0	3	14
7:30 AM	0	0	0	0	0	1	2	0	0	3	3	0	5	0	8	0	5	0	0	5	16
7:45 AM	0	0	0	0	0	4	7	0	0	11	0	0	9	0	9	0	9	2	0	11	31
Hourly Total	0	0	0	0	0	5	13	0	0	18	9	0	19	0	28	0	21	3	0	24	70
8:00 AM	0	0	0	0	0	2	5	0	0	7	5	0	1	0	6	0	2	1	0	3	16
8:15 AM	0	0	0	0	0	1	2	0	0	3	2	0	6	0	8	0	6	0	0	6	17
8:30 AM	0	0	0	0	0	1	5	0	0	6	6	0	5	0	11	0	3	0	0	3	20
8:45 AM	0	0	0	0	0	1	1	0	0	2	2	0	4	0	6	0	8	1	0	9	17
Hourly Total	0	0	0	0	0	5	13	0	0	18	15	0	16	0	31	0	19	2	0	21	70
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	0	0	0	0	1	4	0	0	5	5	0	1	0	6	0	5	0	0	5	16
4:15 PM	0	0	0	0	0	2	2	0	0	4	4	0	5	0	9	0	4	0	0	4	17
4:30 PM	0	0	0	0	0	1	6	0	0	7	3	0	4	0	7	0	3	0	0	3	17
4:45 PM	0	0	0	0	0	0	3	0	0	3	3	0	5	0	8	0	7	1	0	8	19
Hourly Total	0	0	0	0	0	4	15	0	0	19	15	0	15	0	30	0	19	1	0	20	69
5:00 PM	0	0	0	0	0	3	9	0	0	12	4	0	7	0	11	0	4	2	0	6	29
5:15 PM	0	0	0	0	0	1	4	0	0	5	1	0	1	0	2	0	6	2	0	8	15
5:30 PM	0	0	0	0	0	3	5	0	0	8	0	0	4	0	4	0	2	0	0	2	14
5:45 PM	0	0	0	0	0	0	8	0	0	8	2	0	5	0	7	0	4	0	0	4	19
Hourly Total	0	0	0	0	0	7	26	0	0	33	7	0	17	0	24	0	16	4	0	20	77
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	21	67	0	0	88	46	0	67	0	113	0	75	10	0	85	286
Approach %	0.0	0.0	0.0	0.0	-	23.9	76.1	0.0	0.0	-	40.7	0.0	59.3	0.0	-	0.0	88.2	11.8	0.0	-	-
Total %	0.0	0.0	0.0	0.0	0.0	7.3	23.4	0.0	0.0	30.8	16.1	0.0	23.4	0.0	39.5	0.0	26.2	3.5	0.0	29.7	-
Lights	0	0	0	0	0	21	66	0	0	87	43	0	67	0	110	0	73	8	0	81	278
% Lights	-	-	-	-	-	100.0	98.5	-	-	98.9	93.5	-	100.0	-	97.3	-	97.3	80.0	-	95.3	97.2
Mediums	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	1	2	0	3	6
% Mediums	-	-	-	-	-	0.0	0.0	-	-	0.0	6.5	-	0.0	-	2.7	-	1.3	20.0	-	3.5	2.1
Articulated Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Articulated Trucks	-	-	-	-	-	0.0	1.5	-	-	1.1	0.0	-	0.0	-	0.0	-	1.3	0.0	-	1.2	0.7

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 2



Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 3

Turning Movement Peak Hour Data (7:45 AM)

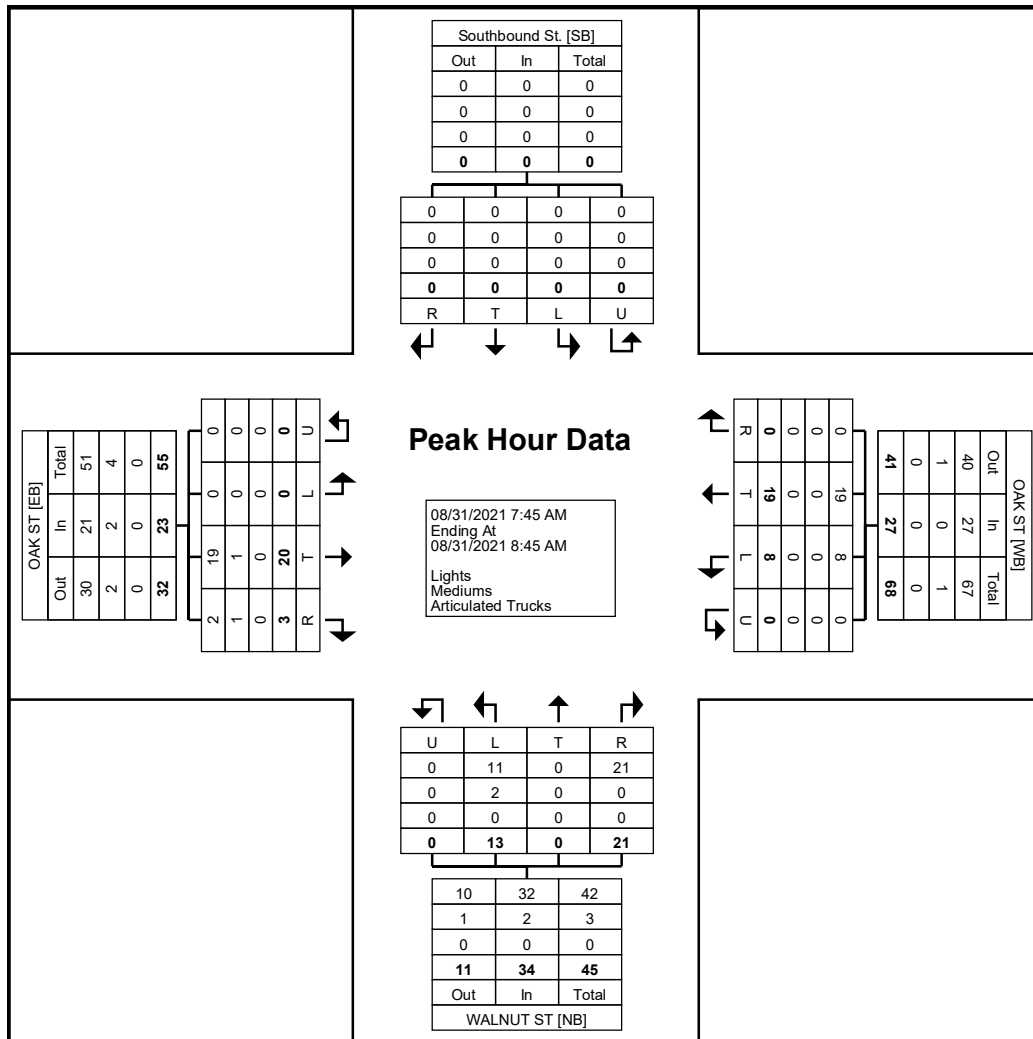
Start Time	Southbound St. Southbound					OAK ST Westbound					WALNUT ST Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	0	0	0	0	0	4	7	0	0	11	0	0	9	0	9	0	9	2	0	11	31
8:00 AM	0	0	0	0	0	2	5	0	0	7	5	0	1	0	6	0	2	1	0	3	16
8:15 AM	0	0	0	0	0	1	2	0	0	3	2	0	6	0	8	0	6	0	0	6	17
8:30 AM	0	0	0	0	0	1	5	0	0	6	6	0	5	0	11	0	3	0	0	3	20
Total	0	0	0	0	0	8	19	0	0	27	13	0	21	0	34	0	20	3	0	23	84
Approach %	0.0	0.0	0.0	0.0	-	29.6	70.4	0.0	0.0	-	38.2	0.0	61.8	0.0	-	0.0	87.0	13.0	0.0	-	-
Total %	0.0	0.0	0.0	0.0	0.0	9.5	22.6	0.0	0.0	32.1	15.5	0.0	25.0	0.0	40.5	0.0	23.8	3.6	0.0	27.4	-
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.679	0.000	0.000	0.614	0.542	0.000	0.583	0.000	0.773	0.000	0.556	0.375	0.000	0.523	0.677
Lights	0	0	0	0	0	8	19	0	0	27	11	0	21	0	32	0	19	2	0	21	80
% Lights	-	-	-	-	-	100.0	100.0	-	-	100.0	84.6	-	100.0	-	94.1	-	95.0	66.7	-	91.3	95.2
Mediums	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	1	1	0	2	4
% Mediums	-	-	-	-	-	0.0	0.0	-	-	0.0	15.4	-	0.0	-	5.9	-	5.0	33.3	-	8.7	4.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:45 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 5

Turning Movement Peak Hour Data (4:15 PM)

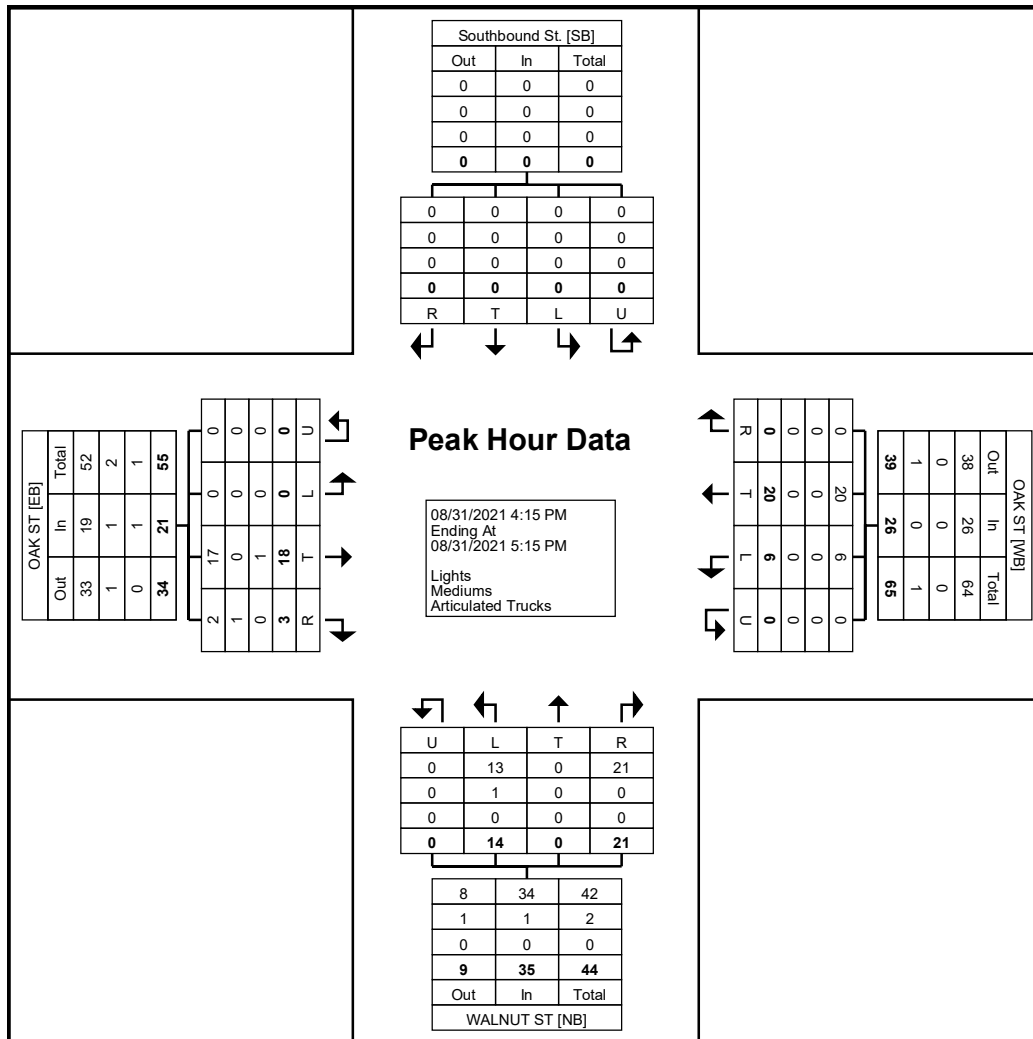
Start Time	Southbound St. Southbound					OAK ST Westbound					WALNUT ST Northbound					OAK ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:15 PM	0	0	0	0	0	2	2	0	0	4	4	0	5	0	9	0	4	0	0	4	17
4:30 PM	0	0	0	0	0	1	6	0	0	7	3	0	4	0	7	0	3	0	0	3	17
4:45 PM	0	0	0	0	0	0	3	0	0	3	3	0	5	0	8	0	7	1	0	8	19
5:00 PM	0	0	0	0	0	3	9	0	0	12	4	0	7	0	11	0	4	2	0	6	29
Total	0	0	0	0	0	6	20	0	0	26	14	0	21	0	35	0	18	3	0	21	82
Approach %	0.0	0.0	0.0	0.0	-	23.1	76.9	0.0	0.0	-	40.0	0.0	60.0	0.0	-	0.0	85.7	14.3	0.0	-	-
Total %	0.0	0.0	0.0	0.0	0.0	7.3	24.4	0.0	0.0	31.7	17.1	0.0	25.6	0.0	42.7	0.0	22.0	3.7	0.0	25.6	-
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.556	0.000	0.000	0.542	0.875	0.000	0.750	0.000	0.795	0.000	0.643	0.375	0.000	0.656	0.707
Lights	0	0	0	0	0	6	20	0	0	26	13	0	21	0	34	0	17	2	0	19	79
% Lights	-	-	-	-	-	100.0	100.0	-	-	100.0	92.9	-	100.0	-	97.1	-	94.4	66.7	-	90.5	96.3
Mediums	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	2
% Mediums	-	-	-	-	-	0.0	0.0	-	-	0.0	7.1	-	0.0	-	2.9	-	0.0	33.3	-	4.8	2.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Articulated Trucks	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	-	5.6	0.0	-	4.8	1.2

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
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Count Name: WALNUT ST @
OAK ST
Site Code:
Start Date: 08/31/2021
Page No: 6



Turning Movement Peak Hour Data Plot (4:15 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
HELEN ST
Site Code:
Start Date: 08/31/2021
Page No: 1

Turning Movement Data

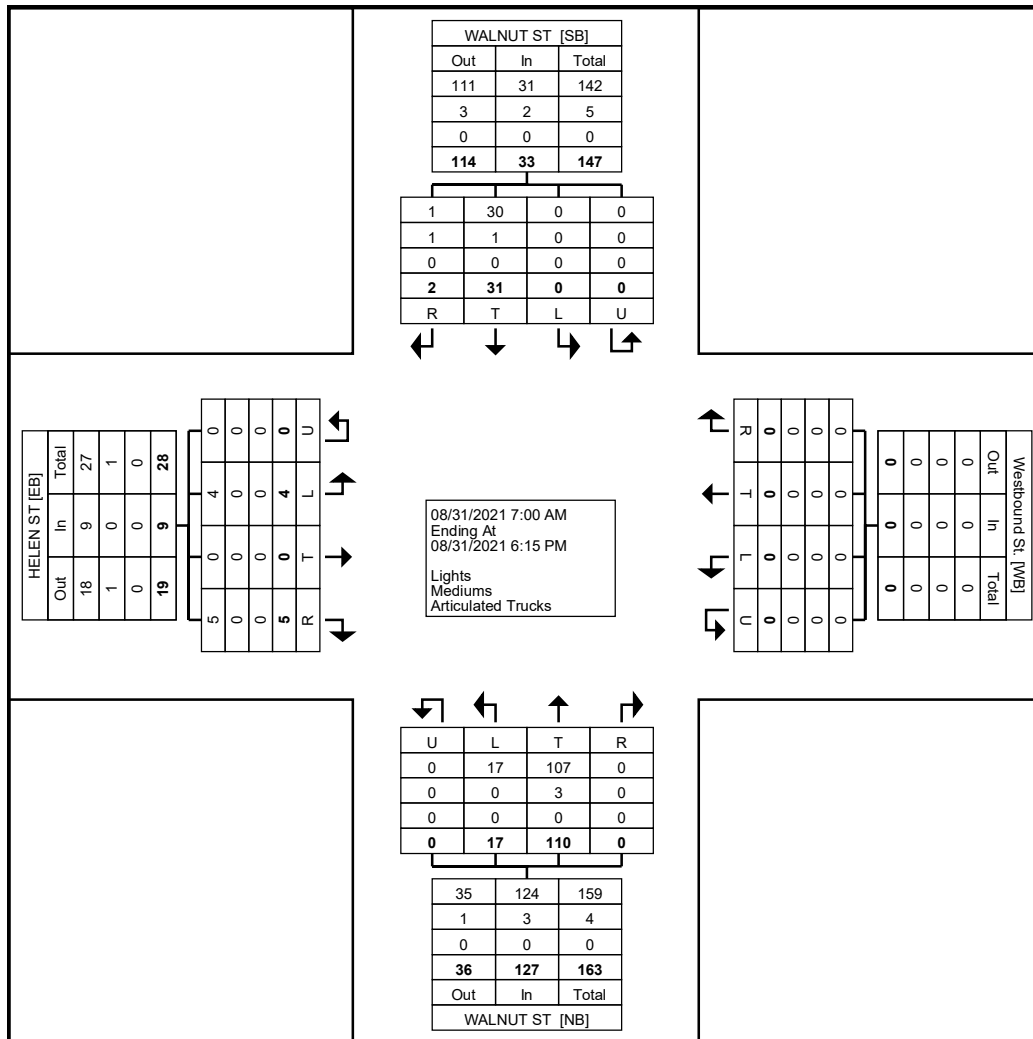
Start Time	WALNUT ST Southbound					Westbound St. Westbound					WALNUT ST Northbound					HELEN ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
7:15 AM	0	2	0	0	2	0	0	0	0	0	1	7	0	0	8	1	0	0	0	1	11
7:30 AM	0	1	0	0	1	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	10
7:45 AM	0	5	1	0	6	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	15
Hourly Total	0	8	1	0	9	0	0	0	0	0	2	27	0	0	29	1	0	0	0	1	39
8:00 AM	0	3	0	0	3	0	0	0	0	0	1	6	0	0	7	0	0	1	0	1	11
8:15 AM	0	1	0	0	1	0	0	0	0	0	0	7	0	0	7	1	0	0	0	1	9
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	11
8:45 AM	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	9
Hourly Total	0	7	0	0	7	0	0	0	0	0	1	30	0	0	31	1	0	1	0	2	40
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	1	0	0	1	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	7
4:15 PM	0	2	0	0	2	0	0	0	0	0	4	10	0	0	14	0	0	1	0	1	17
4:30 PM	0	2	0	0	2	0	0	0	0	0	2	6	0	0	8	1	0	0	0	1	11
4:45 PM	0	0	1	0	1	0	0	0	0	0	4	8	0	0	12	0	0	2	0	2	15
Hourly Total	0	5	1	0	6	0	0	0	0	0	10	30	0	0	40	1	0	3	0	4	50
5:00 PM	0	5	0	0	5	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	16
5:15 PM	0	3	0	0	3	0	0	0	0	0	1	2	0	0	3	1	0	1	0	2	8
5:30 PM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
5:45 PM	0	0	0	0	0	0	0	0	0	0	3	7	0	0	10	0	0	0	0	0	10
Hourly Total	0	11	0	0	11	0	0	0	0	0	4	23	0	0	27	1	0	1	0	2	40
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	31	2	0	33	0	0	0	0	0	17	110	0	0	127	4	0	5	0	9	169
Approach %	0.0	93.9	6.1	0.0	-	0.0	0.0	0.0	0.0	-	13.4	86.6	0.0	0.0	-	44.4	0.0	55.6	0.0	-	-
Total %	0.0	18.3	1.2	0.0	19.5	0.0	0.0	0.0	0.0	0.0	10.1	65.1	0.0	0.0	75.1	2.4	0.0	3.0	0.0	5.3	-
Lights	0	30	1	0	31	0	0	0	0	0	17	107	0	0	124	4	0	5	0	9	164
% Lights	-	96.8	50.0	-	93.9	-	-	-	-	-	100.0	97.3	-	-	97.6	100.0	-	100.0	-	100.0	97.0
Mediums	0	1	1	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
% Mediums	-	3.2	50.0	-	6.1	-	-	-	-	-	0.0	2.7	-	-	2.4	0.0	-	0.0	-	0.0	3.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
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Count Name: WALNUT ST @
HELEN ST
Site Code:
Start Date: 08/31/2021
Page No: 2



Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
HELEN ST
Site Code:
Start Date: 08/31/2021
Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

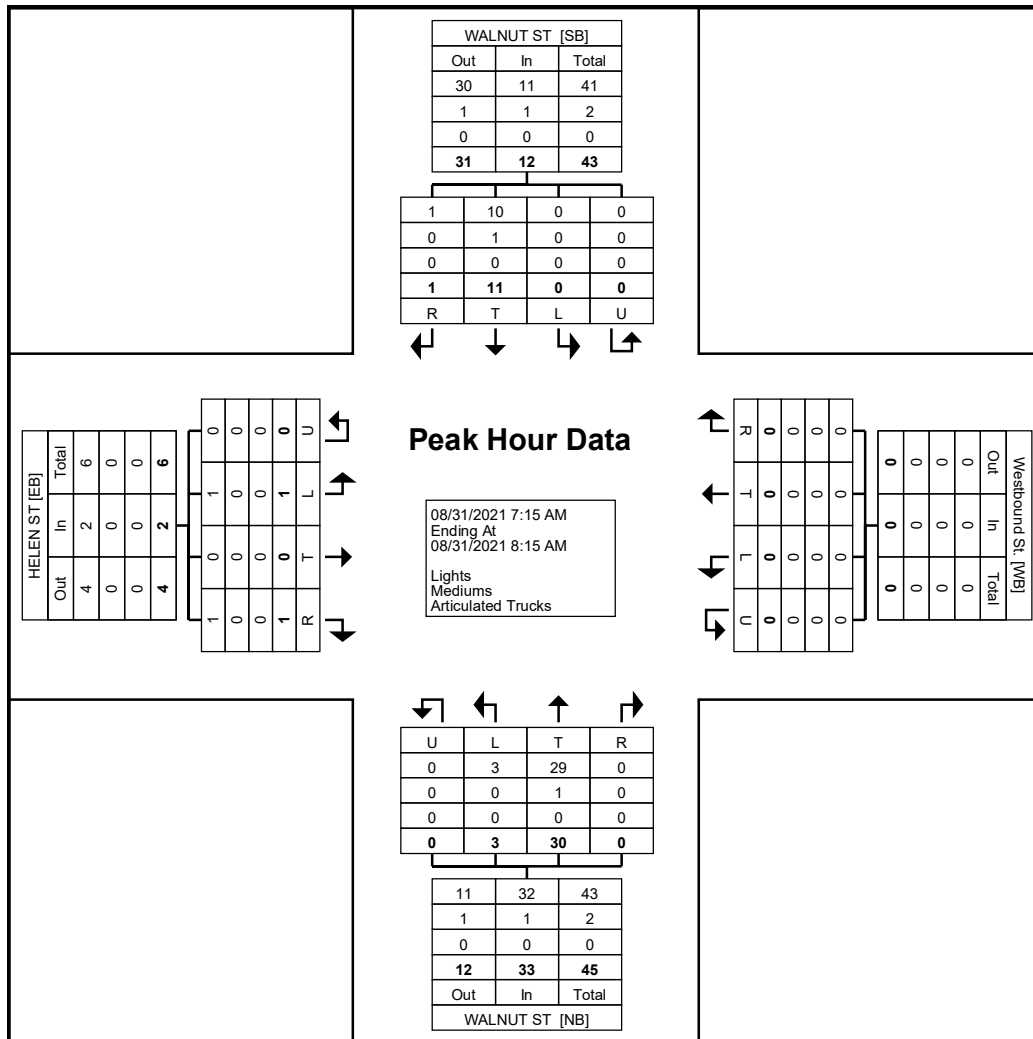
Start Time	WALNUT ST Southbound					Westbound St. Westbound					WALNUT ST Northbound					HELEN ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:15 AM	0	2	0	0	2	0	0	0	0	0	1	7	0	0	8	1	0	0	0	1	11
7:30 AM	0	1	0	0	1	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	10
7:45 AM	0	5	1	0	6	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	15
8:00 AM	0	3	0	0	3	0	0	0	0	0	1	6	0	0	7	0	0	1	0	1	11
Total	0	11	1	0	12	0	0	0	0	0	3	30	0	0	33	1	0	1	0	2	47
Approach %	0.0	91.7	8.3	0.0	-	0.0	0.0	0.0	0.0	-	9.1	90.9	0.0	0.0	-	50.0	0.0	50.0	0.0	-	-
Total %	0.0	23.4	2.1	0.0	25.5	0.0	0.0	0.0	0.0	0.0	6.4	63.8	0.0	0.0	70.2	2.1	0.0	2.1	0.0	4.3	-
PHF	0.000	0.550	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.750	0.833	0.000	0.000	0.917	0.250	0.000	0.250	0.000	0.500	0.783
Lights	0	10	1	0	11	0	0	0	0	0	3	29	0	0	32	1	0	1	0	2	45
% Lights	-	90.9	100.0	-	91.7	-	-	-	-	-	100.0	96.7	-	-	97.0	100.0	-	100.0	-	100.0	95.7
Mediums	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Mediums	-	9.1	0.0	-	8.3	-	-	-	-	-	0.0	3.3	-	-	3.0	0.0	-	0.0	-	0.0	4.3
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
HELEN ST
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:15 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
HELEN ST
Site Code:
Start Date: 08/31/2021
Page No: 5

Turning Movement Peak Hour Data (4:15 PM)

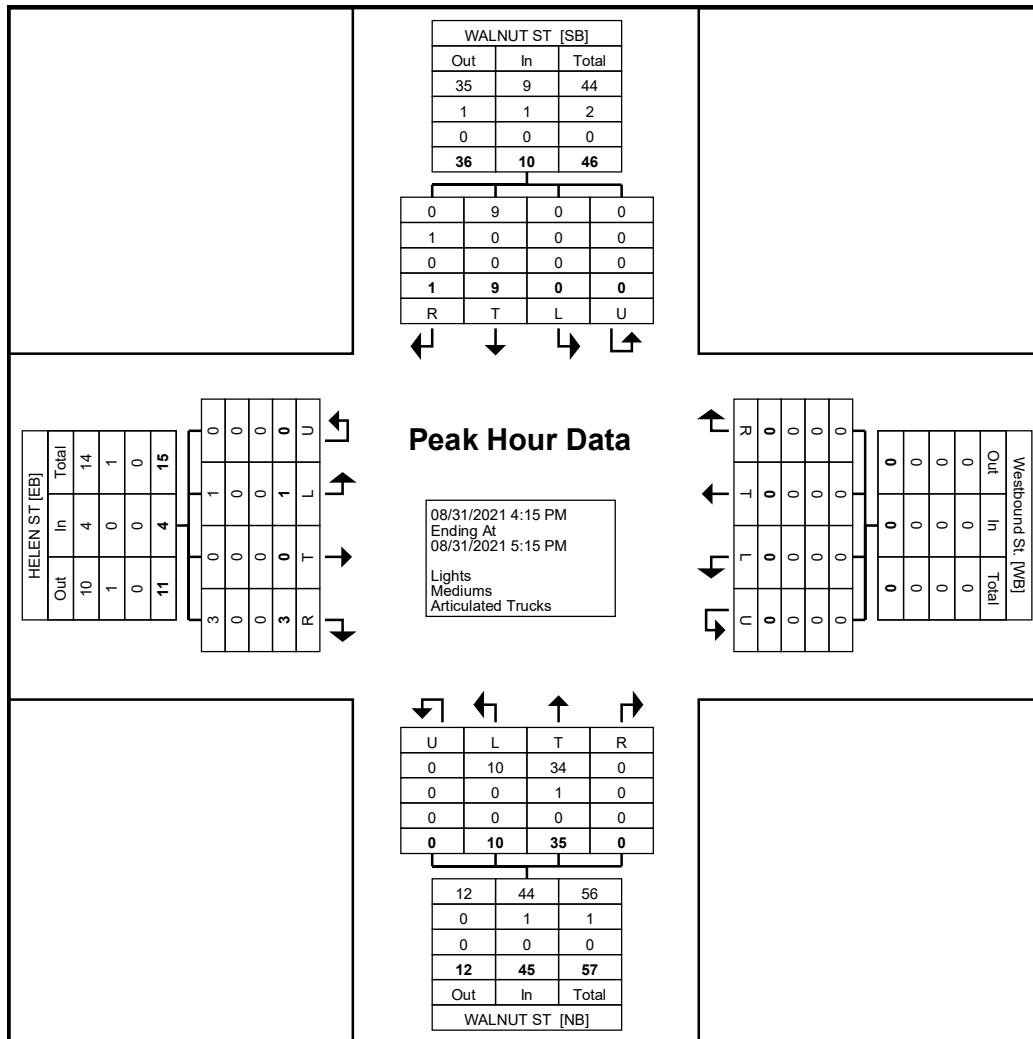
Start Time	WALNUT ST Southbound					Westbound St. Westbound					WALNUT ST Northbound					HELEN ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:15 PM	0	2	0	0	2	0	0	0	0	0	4	10	0	0	14	0	0	1	0	1	17
4:30 PM	0	2	0	0	2	0	0	0	0	0	2	6	0	0	8	1	0	0	0	1	11
4:45 PM	0	0	1	0	1	0	0	0	0	0	4	8	0	0	12	0	0	2	0	2	15
5:00 PM	0	5	0	0	5	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	16
Total	0	9	1	0	10	0	0	0	0	0	10	35	0	0	45	1	0	3	0	4	59
Approach %	0.0	90.0	10.0	0.0	-	0.0	0.0	0.0	0.0	-	22.2	77.8	0.0	0.0	-	25.0	0.0	75.0	0.0	-	-
Total %	0.0	15.3	1.7	0.0	16.9	0.0	0.0	0.0	0.0	0.0	16.9	59.3	0.0	0.0	76.3	1.7	0.0	5.1	0.0	6.8	-
PHF	0.000	0.450	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.625	0.795	0.000	0.000	0.804	0.250	0.000	0.375	0.000	0.500	0.868
Lights	0	9	0	0	9	0	0	0	0	0	10	34	0	0	44	1	0	3	0	4	57
% Lights	-	100.0	0.0	-	90.0	-	-	-	-	-	100.0	97.1	-	-	97.8	100.0	-	100.0	-	100.0	96.6
Mediums	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Mediums	-	0.0	100.0	-	10.0	-	-	-	-	-	0.0	2.9	-	-	2.2	0.0	-	0.0	-	0.0	3.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

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Count Name: WALNUT ST @
HELEN ST
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data Plot (4:15 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST NORTH
Site Code:
Start Date: 08/31/2021
Page No: 1

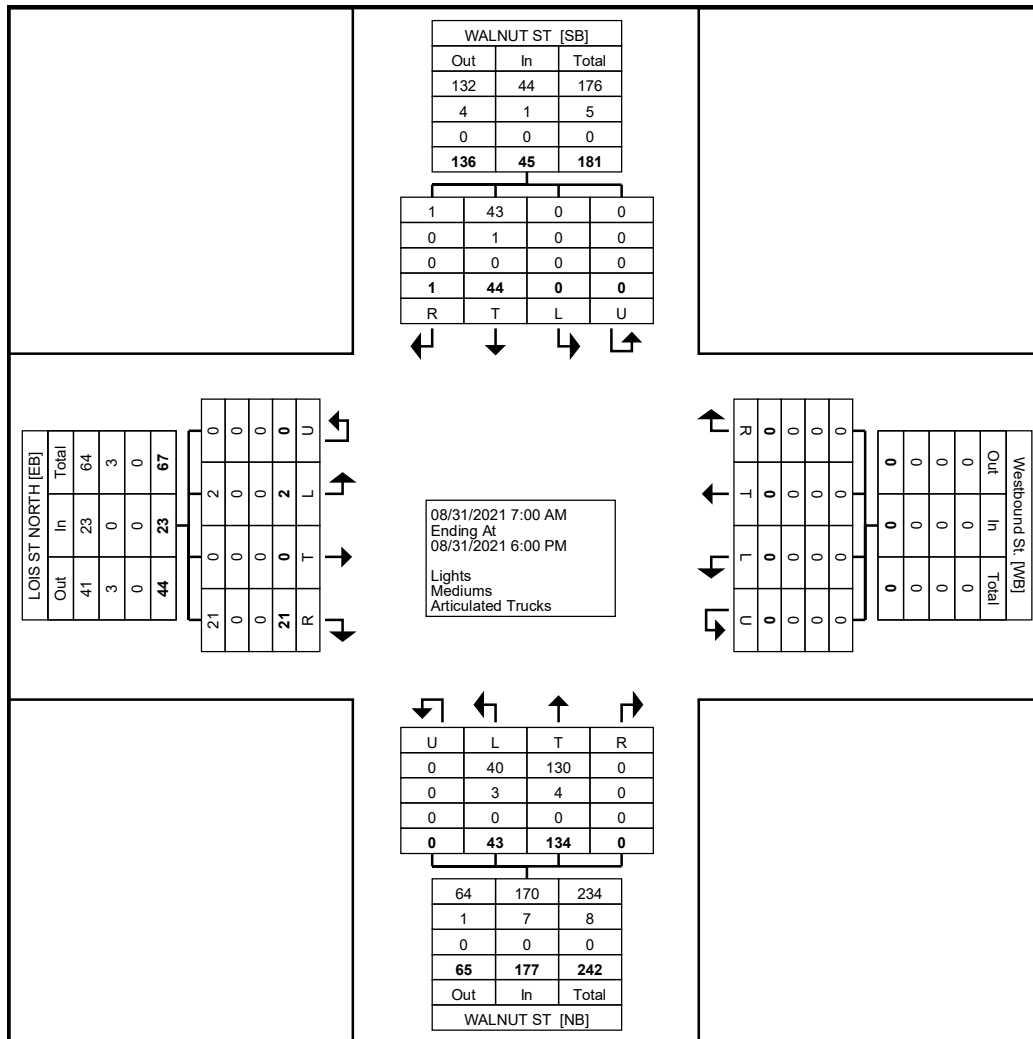
Turning Movement Data

Start Time	WALNUT ST Southbound					Westbound St. Westbound					WALNUT ST Northbound					LOIS ST NORTH Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	4
7:15 AM	0	2	0	0	2	0	0	0	0	0	1	8	0	0	9	0	0	0	0	0	11
7:30 AM	0	2	0	0	2	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	12
7:45 AM	0	4	0	0	4	0	0	0	0	0	2	9	0	0	11	0	0	0	0	0	15
Hourly Total	0	8	0	0	8	0	0	0	0	0	3	30	0	0	33	0	0	1	0	1	42
8:00 AM	0	6	0	0	6	0	0	0	0	0	4	9	0	0	13	0	0	0	0	0	19
8:15 AM	0	3	0	0	3	0	0	0	0	0	1	5	0	0	6	0	0	4	0	4	13
8:30 AM	0	1	0	0	1	0	0	0	0	0	1	11	0	0	12	1	0	1	0	2	15
8:45 AM	0	3	0	0	3	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	10
Hourly Total	0	13	0	0	13	0	0	0	0	0	7	31	0	0	38	1	0	5	0	6	57
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	1	0	0	1	0	0	0	0	0	3	7	0	0	10	0	0	1	0	1	12
4:15 PM	0	2	1	0	3	0	0	0	0	0	6	12	0	0	18	0	0	4	0	4	25
4:30 PM	0	5	0	0	5	0	0	0	0	0	5	11	0	0	16	0	0	3	0	3	24
4:45 PM	0	1	0	0	1	0	0	0	0	0	11	11	0	0	22	0	0	2	0	2	25
Hourly Total	0	9	1	0	10	0	0	0	0	0	25	41	0	0	66	0	0	10	0	10	86
5:00 PM	0	6	0	0	6	0	0	0	0	0	2	15	0	0	17	0	0	1	0	1	24
5:15 PM	0	5	0	0	5	0	0	0	0	0	1	3	0	0	4	0	0	1	0	1	10
5:30 PM	0	3	0	0	3	0	0	0	0	0	2	5	0	0	7	0	0	1	0	1	11
5:45 PM	0	0	0	0	0	0	0	0	0	0	3	9	0	0	12	1	0	2	0	3	15
Hourly Total	0	14	0	0	14	0	0	0	0	0	8	32	0	0	40	1	0	5	0	6	60
Grand Total	0	44	1	0	45	0	0	0	0	0	43	134	0	0	177	2	0	21	0	23	245
Approach %	0.0	97.8	2.2	0.0	-	0.0	0.0	0.0	0.0	-	24.3	75.7	0.0	0.0	-	8.7	0.0	91.3	0.0	-	-
Total %	0.0	18.0	0.4	0.0	18.4	0.0	0.0	0.0	0.0	0.0	17.6	54.7	0.0	0.0	72.2	0.8	0.0	8.6	0.0	9.4	-
Lights	0	43	1	0	44	0	0	0	0	0	40	130	0	0	170	2	0	21	0	23	237
% Lights	-	97.7	100.0	-	97.8	-	-	-	-	-	93.0	97.0	-	-	96.0	100.0	-	100.0	-	100.0	96.7
Mediums	0	1	0	0	1	0	0	0	0	0	3	4	0	0	7	0	0	0	0	0	8
% Mediums	-	2.3	0.0	-	2.2	-	-	-	-	-	7.0	3.0	-	-	4.0	0.0	-	0.0	-	0.0	3.3
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST NORTH
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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST NORTH
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (7:45 AM)

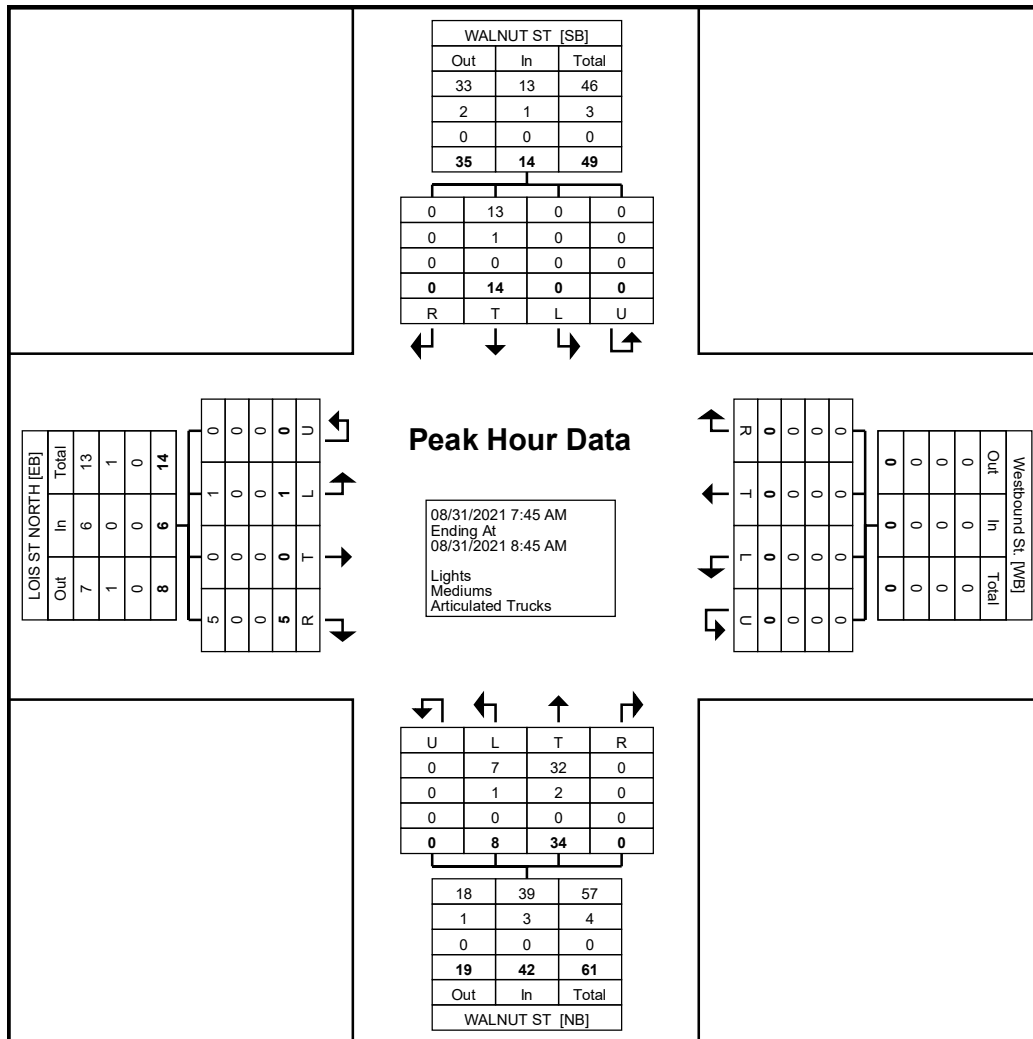
Start Time	WALNUT ST Southbound					Westbound St. Westbound					WALNUT ST Northbound					LOIS ST NORTH Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	0	4	0	0	4	0	0	0	0	0	2	9	0	0	11	0	0	0	0	0	15
8:00 AM	0	6	0	0	6	0	0	0	0	0	4	9	0	0	13	0	0	0	0	0	19
8:15 AM	0	3	0	0	3	0	0	0	0	0	1	5	0	0	6	0	0	4	0	4	13
8:30 AM	0	1	0	0	1	0	0	0	0	0	1	11	0	0	12	1	0	1	0	2	15
Total	0	14	0	0	14	0	0	0	0	0	8	34	0	0	42	1	0	5	0	6	62
Approach %	0.0	100.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	19.0	81.0	0.0	0.0	-	16.7	0.0	83.3	0.0	-	-
Total %	0.0	22.6	0.0	0.0	22.6	0.0	0.0	0.0	0.0	0.0	12.9	54.8	0.0	0.0	67.7	1.6	0.0	8.1	0.0	9.7	-
PHF	0.000	0.583	0.000	0.000	0.583	0.000	0.000	0.000	0.000	0.000	0.500	0.773	0.000	0.000	0.808	0.250	0.000	0.313	0.000	0.375	0.816
Lights	0	13	0	0	13	0	0	0	0	0	7	32	0	0	39	1	0	5	0	6	58
% Lights	-	92.9	-	-	92.9	-	-	-	-	-	87.5	94.1	-	-	92.9	100.0	-	100.0	-	100.0	93.5
Mediums	0	1	0	0	1	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	4
% Mediums	-	7.1	-	-	7.1	-	-	-	-	-	12.5	5.9	-	-	7.1	0.0	-	0.0	-	0.0	6.5
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	-	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST NORTH
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:45 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST NORTH
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (4:15 PM)

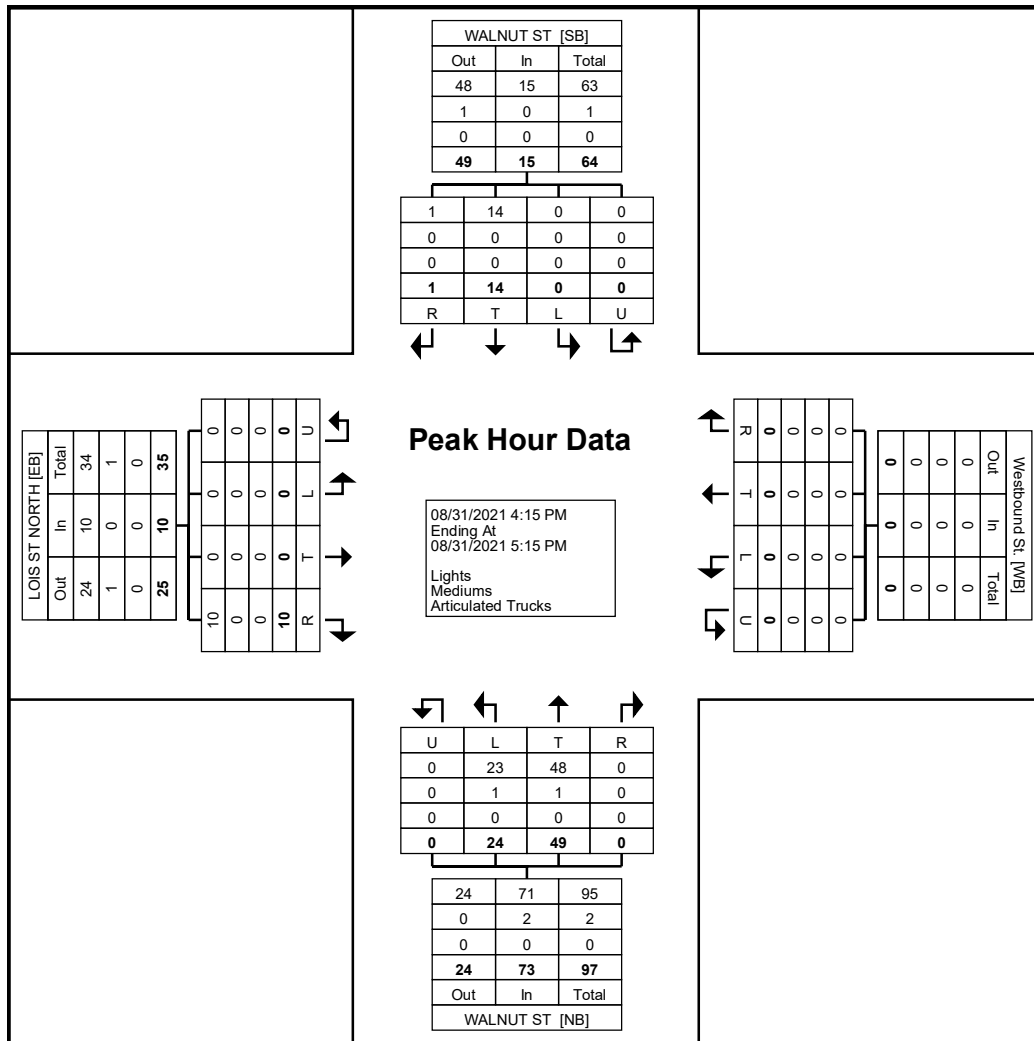
Start Time	WALNUT ST Southbound					Westbound St. Westbound					WALNUT ST Northbound					LOIS ST NORTH Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:15 PM	0	2	1	0	3	0	0	0	0	0	6	12	0	0	18	0	0	4	0	4	25
4:30 PM	0	5	0	0	5	0	0	0	0	0	5	11	0	0	16	0	0	3	0	3	24
4:45 PM	0	1	0	0	1	0	0	0	0	0	11	11	0	0	22	0	0	2	0	2	25
5:00 PM	0	6	0	0	6	0	0	0	0	0	2	15	0	0	17	0	0	1	0	1	24
Total	0	14	1	0	15	0	0	0	0	0	24	49	0	0	73	0	0	10	0	10	98
Approach %	0.0	93.3	6.7	0.0	-	0.0	0.0	0.0	0.0	-	32.9	67.1	0.0	0.0	-	0.0	0.0	100.0	0.0	-	-
Total %	0.0	14.3	1.0	0.0	15.3	0.0	0.0	0.0	0.0	0.0	24.5	50.0	0.0	0.0	74.5	0.0	0.0	10.2	0.0	10.2	-
PHF	0.000	0.583	0.250	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.545	0.817	0.000	0.000	0.830	0.000	0.000	0.625	0.000	0.625	0.980
Lights	0	14	1	0	15	0	0	0	0	0	23	48	0	0	71	0	0	10	0	10	96
% Lights	-	100.0	100.0	-	100.0	-	-	-	-	-	95.8	98.0	-	-	97.3	-	-	100.0	-	100.0	98.0
Mediums	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	2
% Mediums	-	0.0	0.0	-	0.0	-	-	-	-	-	4.2	2.0	-	-	2.7	-	-	0.0	-	0.0	2.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0	0.0	-	-	0.0	-	-	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

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817.265.8968

Count Name: WALNUT ST @
LOIS ST NORTH
Site Code:
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Turning Movement Peak Hour Data Plot (4:15 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST SOUTH
Site Code:
Start Date: 08/31/2021
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Turning Movement Data

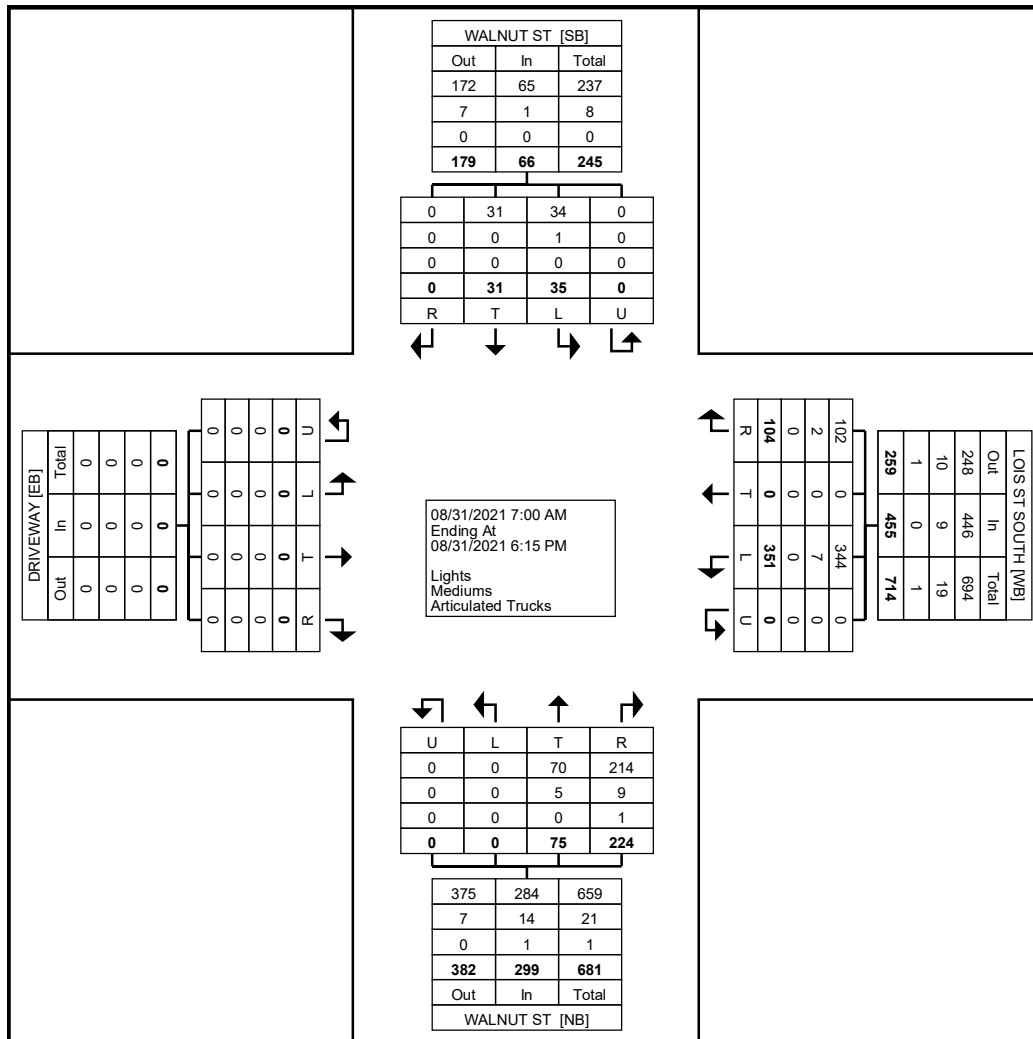
Start Time	WALNUT ST Southbound					LOIS ST SOUTH Westbound					WALNUT ST Northbound					DRIVEWAY Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	1	0	0	0	1	10	0	2	0	12	0	2	5	0	7	0	0	0	0	0	20
7:15 AM	0	2	0	0	2	6	0	3	0	9	0	6	3	0	9	0	0	0	0	0	30
7:30 AM	2	1	0	0	3	7	0	3	0	10	0	6	11	0	17	0	0	0	0	0	20
7:45 AM	2	4	0	0	6	14	0	3	0	17	0	9	21	0	30	0	0	0	0	0	53
Hourly Total	5	7	0	0	12	37	0	11	0	48	0	23	40	0	63	0	0	0	0	0	123
8:00 AM	3	2	0	0	5	15	0	9	0	24	0	4	29	0	33	0	0	0	0	0	62
8:15 AM	5	1	0	0	6	11	0	2	0	13	0	6	24	0	30	0	0	0	0	0	49
8:30 AM	1	1	0	0	2	19	0	4	0	23	0	7	6	0	13	0	0	0	0	0	38
8:45 AM	1	2	0	0	3	16	0	6	0	22	0	1	7	0	8	0	0	0	0	0	33
Hourly Total	10	6	0	0	16	61	0	21	0	82	0	18	66	0	84	0	0	0	0	0	182
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	3	0	0	3	28	0	6	0	34	0	3	19	0	22	0	0	0	0	0	59
4:15 PM	3	3	0	0	6	46	0	15	0	61	0	7	14	0	21	0	0	0	0	0	88
4:30 PM	5	2	0	0	7	45	0	11	0	56	0	3	13	0	16	0	0	0	0	0	79
4:45 PM	5	0	0	0	5	26	0	14	0	40	0	9	15	0	24	0	0	0	0	0	69
Hourly Total	13	8	0	0	21	145	0	46	0	191	0	22	61	0	83	0	0	0	0	0	295
5:00 PM	2	3	0	0	5	30	0	10	0	40	0	4	10	0	14	0	0	0	0	0	59
5:15 PM	3	4	0	0	7	30	0	4	0	34	0	0	20	0	20	0	0	0	0	0	61
5:30 PM	1	3	0	0	4	26	0	3	0	29	0	3	11	0	14	0	0	0	0	0	47
5:45 PM	1	0	0	0	1	22	0	9	0	31	0	5	16	0	21	0	0	0	0	0	53
Hourly Total	7	10	0	0	17	108	0	26	0	134	0	12	57	0	69	0	0	0	0	0	220
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	35	31	0	0	66	351	0	104	0	455	0	75	224	0	299	0	0	0	0	0	820
Approach %	53.0	47.0	0.0	0.0	-	77.1	0.0	22.9	0.0	-	0.0	25.1	74.9	0.0	-	0.0	0.0	0.0	0.0	-	-
Total %	4.3	3.8	0.0	0.0	8.0	42.8	0.0	12.7	0.0	55.5	0.0	9.1	27.3	0.0	36.5	0.0	0.0	0.0	0.0	0.0	-
Lights	34	31	0	0	65	344	0	102	0	446	0	70	214	0	284	0	0	0	0	0	795
% Lights	97.1	100.0	-	-	98.5	98.0	-	98.1	-	98.0	-	93.3	95.5	-	95.0	-	-	-	-	-	97.0
Mediums	1	0	0	0	1	7	0	2	0	9	0	5	9	0	14	0	0	0	0	0	24
% Mediums	2.9	0.0	-	-	1.5	2.0	-	1.9	-	2.0	-	6.7	4.0	-	4.7	-	-	-	-	-	2.9
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	-	0.0	0.4	-	0.3	-	-	-	-	-	0.1

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST SOUTH
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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST SOUTH
Site Code:
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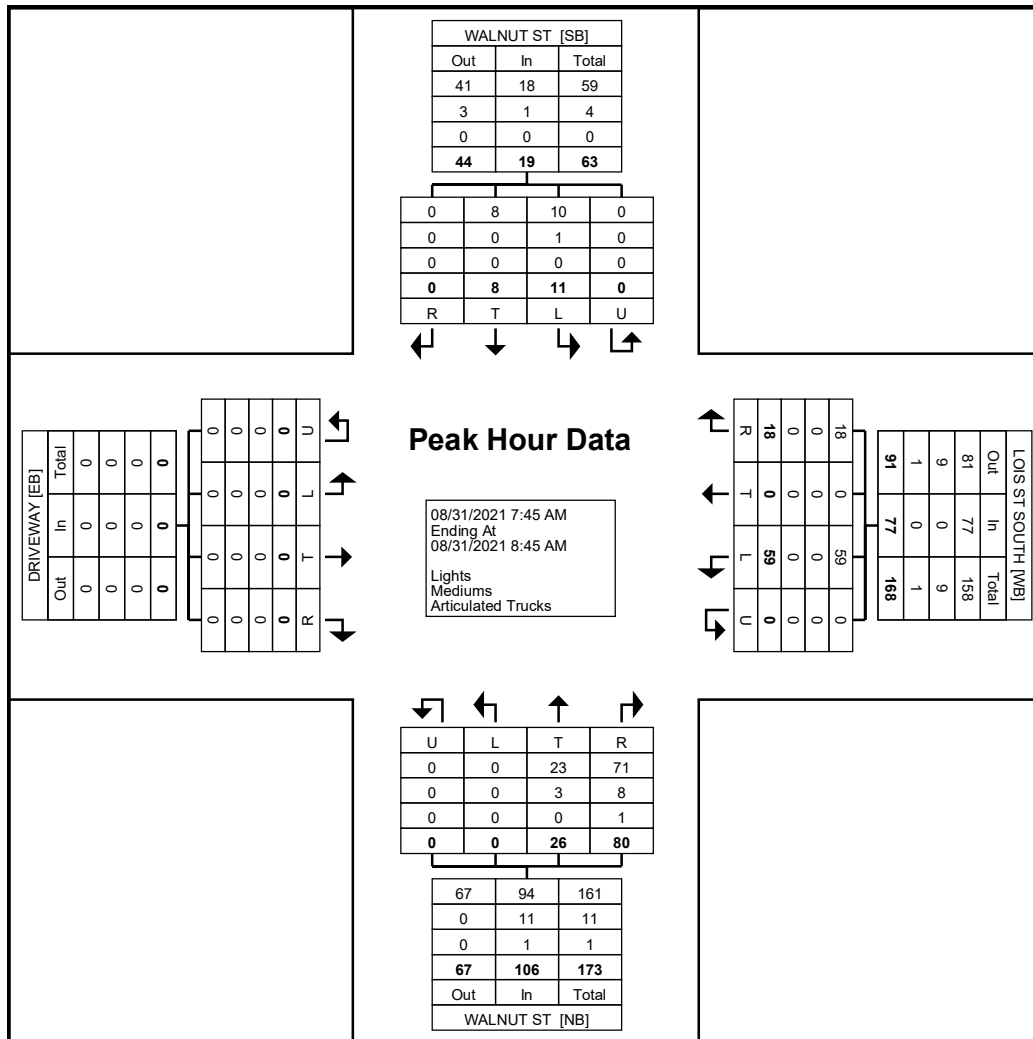
Turning Movement Peak Hour Data (7:45 AM)

Start Time	WALNUT ST Southbound					LOIS ST SOUTH Westbound					WALNUT ST Northbound					DRIVEWAY Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	2	4	0	0	6	14	0	3	0	17	0	9	21	0	30	0	0	0	0	0	53
8:00 AM	3	2	0	0	5	15	0	9	0	24	0	4	29	0	33	0	0	0	0	0	62
8:15 AM	5	1	0	0	6	11	0	2	0	13	0	6	24	0	30	0	0	0	0	0	49
8:30 AM	1	1	0	0	2	19	0	4	0	23	0	7	6	0	13	0	0	0	0	0	38
Total	11	8	0	0	19	59	0	18	0	77	0	26	80	0	106	0	0	0	0	0	202
Approach %	57.9	42.1	0.0	0.0	-	76.6	0.0	23.4	0.0	-	0.0	24.5	75.5	0.0	-	0.0	0.0	0.0	0.0	0.0	-
Total %	5.4	4.0	0.0	0.0	9.4	29.2	0.0	8.9	0.0	38.1	0.0	12.9	39.6	0.0	52.5	0.0	0.0	0.0	0.0	0.0	-
PHF	0.550	0.500	0.000	0.000	0.792	0.776	0.000	0.500	0.000	0.802	0.000	0.722	0.690	0.000	0.803	0.000	0.000	0.000	0.000	0.000	0.815
Lights	10	8	0	0	18	59	0	18	0	77	0	23	71	0	94	0	0	0	0	0	189
% Lights	90.9	100.0	-	-	94.7	100.0	-	100.0	-	100.0	-	88.5	88.8	-	88.7	-	-	-	-	-	93.6
Mediums	1	0	0	0	1	0	0	0	0	0	0	3	8	0	11	0	0	0	0	0	12
% Mediums	9.1	0.0	-	-	5.3	0.0	-	0.0	-	0.0	-	11.5	10.0	-	10.4	-	-	-	-	-	5.9
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	-	0.0	1.3	-	0.9	-	-	-	-	-	0.5

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Count Name: WALNUT ST @
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Turning Movement Peak Hour Data Plot (7:45 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
LOIS ST SOUTH
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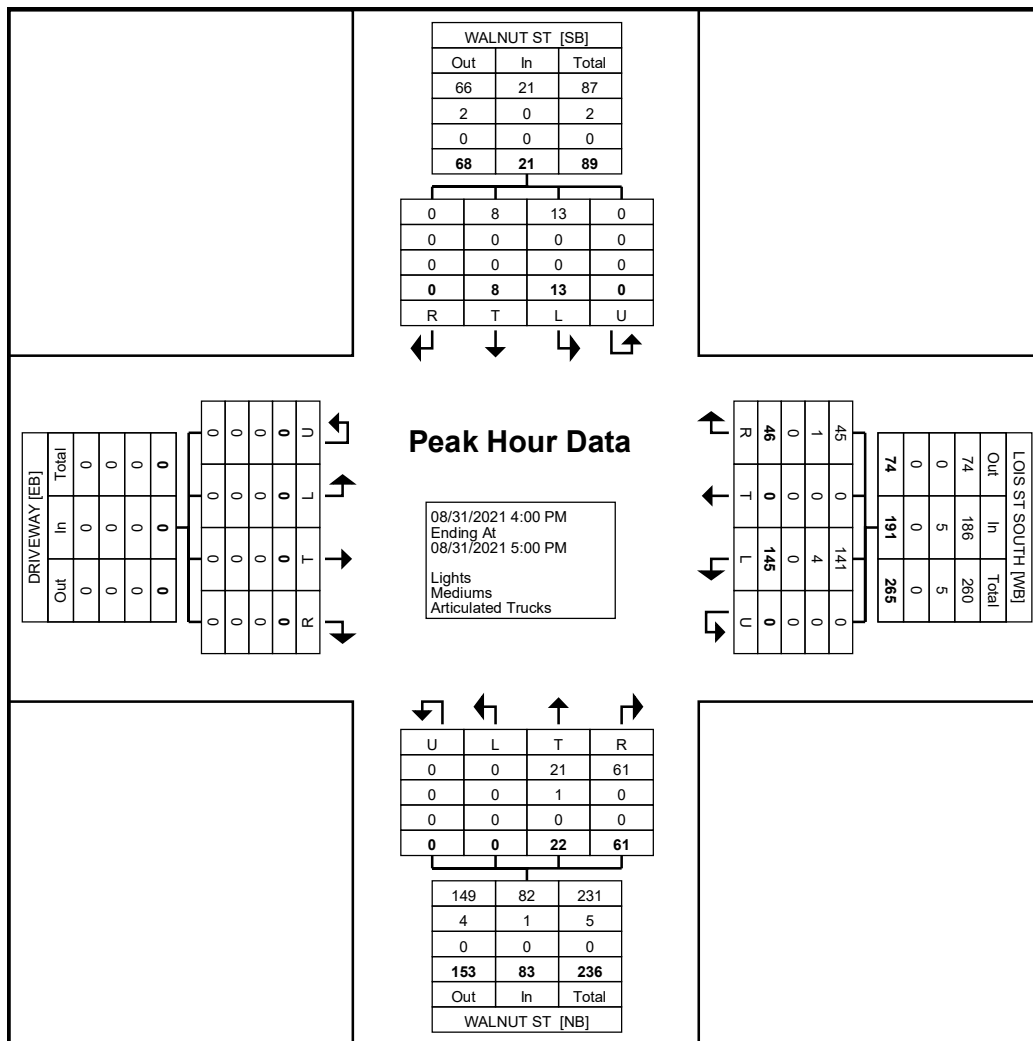
Turning Movement Peak Hour Data (4:00 PM)

Start Time	WALNUT ST Southbound					LOIS ST SOUTH Westbound					WALNUT ST Northbound					DRIVEWAY Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:00 PM	0	3	0	0	3	28	0	6	0	34	0	3	19	0	22	0	0	0	0	0	59
4:15 PM	3	3	0	0	6	46	0	15	0	61	0	7	14	0	21	0	0	0	0	0	88
4:30 PM	5	2	0	0	7	45	0	11	0	56	0	3	13	0	16	0	0	0	0	0	79
4:45 PM	5	0	0	0	5	26	0	14	0	40	0	9	15	0	24	0	0	0	0	0	69
Total	13	8	0	0	21	145	0	46	0	191	0	22	61	0	83	0	0	0	0	0	295
Approach %	61.9	38.1	0.0	0.0	-	75.9	0.0	24.1	0.0	-	0.0	26.5	73.5	0.0	-	0.0	0.0	0.0	0.0	0.0	-
Total %	4.4	2.7	0.0	0.0	7.1	49.2	0.0	15.6	0.0	64.7	0.0	7.5	20.7	0.0	28.1	0.0	0.0	0.0	0.0	0.0	-
PHF	0.650	0.667	0.000	0.000	0.750	0.788	0.000	0.767	0.000	0.783	0.000	0.611	0.803	0.000	0.865	0.000	0.000	0.000	0.000	0.000	0.838
Lights	13	8	0	0	21	141	0	45	0	186	0	21	61	0	82	0	0	0	0	0	289
% Lights	100.0	100.0	-	-	100.0	97.2	-	97.8	-	97.4	-	95.5	100.0	-	98.8	-	-	-	-	-	98.0
Mediums	0	0	0	0	0	4	0	1	0	5	0	1	0	0	1	0	0	0	0	0	6
% Mediums	0.0	0.0	-	-	0.0	2.8	-	2.2	-	2.6	-	4.5	0.0	-	1.2	-	-	-	-	-	2.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	-	-	-	-	-	0.0

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Count Name: WALNUT ST @
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Turning Movement Peak Hour Data Plot (4:00 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: LOIS ST @ JOAN
ST
Site Code:
Start Date: 08/31/2021
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Turning Movement Data

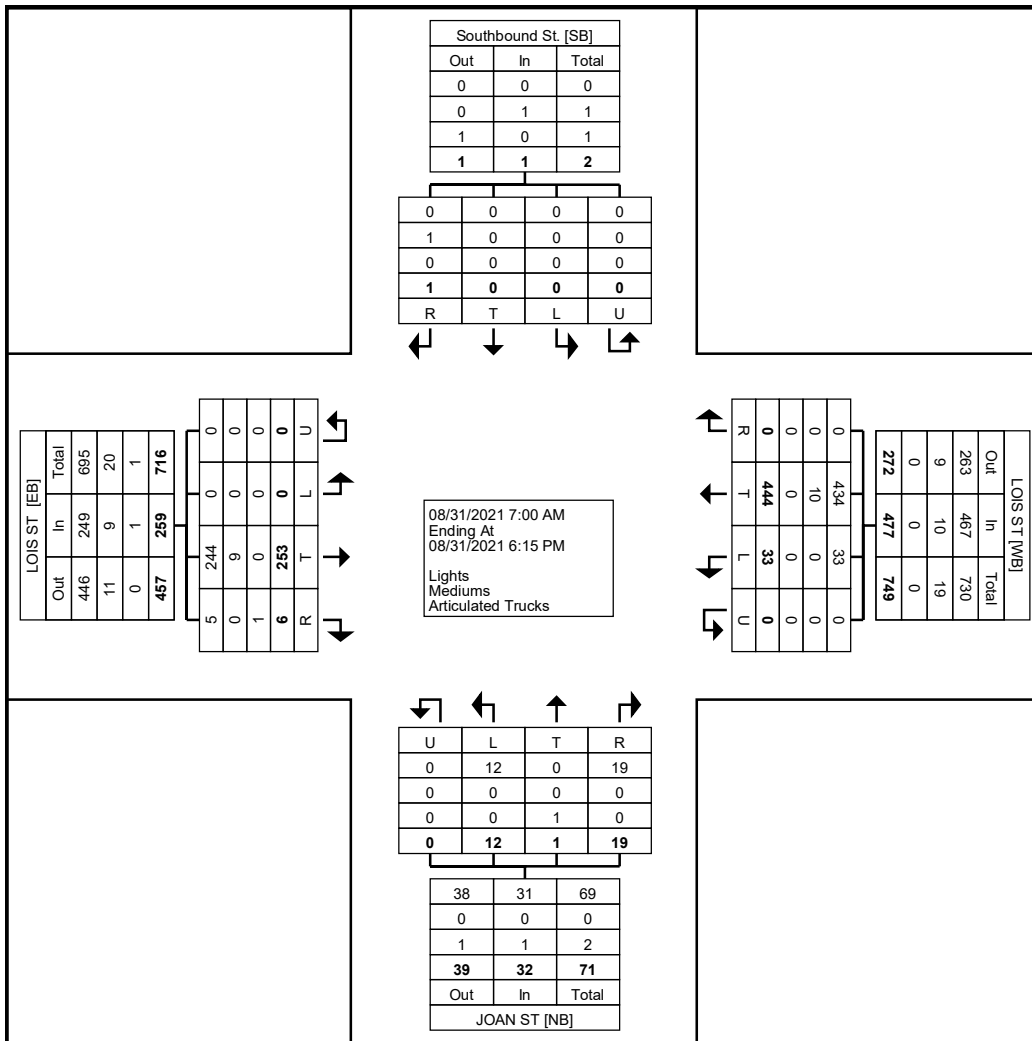
Start Time	Southbound St. Southbound					LOIS ST Westbound					JOAN ST Northbound					LOIS ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	0	0	0	0	0	0	10	0	0	10	2	0	4	0	6	0	5	0	0	5	21
7:15 AM	0	0	0	0	0	4	9	0	0	13	0	0	3	0	3	0	3	0	0	3	19
7:30 AM	0	0	0	0	0	1	11	0	0	12	0	0	1	0	1	0	13	0	0	13	26
7:45 AM	0	0	0	0	0	2	15	0	0	17	3	1	1	0	5	0	21	3	0	24	46
Hourly Total	0	0	0	0	0	7	45	0	0	52	5	1	9	0	15	0	42	3	0	45	112
8:00 AM	0	0	0	0	0	1	23	0	0	24	1	0	2	0	3	0	29	0	0	29	56
8:15 AM	0	0	0	0	0	0	12	0	0	12	1	0	1	0	2	0	31	0	0	31	45
8:30 AM	0	0	0	0	0	1	21	0	0	22	1	0	1	0	2	0	8	0	0	8	32
8:45 AM	0	0	0	0	0	0	21	0	0	21	1	0	1	0	2	0	8	0	0	8	31
Hourly Total	0	0	0	0	0	2	77	0	0	79	4	0	5	0	9	0	76	0	0	76	164
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	3	34	0	0	37	0	0	0	0	0	0	19	0	0	19	56
4:15 PM	0	0	0	0	0	4	60	0	0	64	1	0	1	0	2	0	15	1	0	16	82
4:30 PM	0	0	0	0	0	4	55	0	0	59	1	0	2	0	3	0	19	1	0	20	82
4:45 PM	0	0	1	0	1	0	39	0	0	39	1	0	1	0	2	0	18	0	0	18	60
Hourly Total	0	0	1	0	1	11	188	0	0	199	3	0	4	0	7	0	71	2	0	73	280
5:00 PM	0	0	0	0	0	7	40	0	0	47	0	0	1	0	1	0	13	0	0	13	61
5:15 PM	0	0	0	0	0	0	34	0	0	34	0	0	0	0	0	0	23	1	0	24	58
5:30 PM	0	0	0	0	0	1	29	0	0	30	0	0	0	0	0	0	11	0	0	11	41
5:45 PM	0	0	0	0	0	5	31	0	0	36	0	0	0	0	0	0	17	0	0	17	53
Hourly Total	0	0	0	0	0	13	134	0	0	147	0	0	1	0	1	0	64	1	0	65	213
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	1	33	444	0	0	477	12	1	19	0	32	0	253	6	0	259	769
Approach %	0.0	0.0	100.0	0.0	-	6.9	93.1	0.0	0.0	-	37.5	3.1	59.4	0.0	-	0.0	97.7	2.3	0.0	-	-
Total %	0.0	0.0	0.1	0.0	0.1	4.3	57.7	0.0	0.0	62.0	1.6	0.1	2.5	0.0	4.2	0.0	32.9	0.8	0.0	33.7	-
Lights	0	0	0	0	0	33	434	0	0	467	12	0	19	0	31	0	244	5	0	249	747
% Lights	-	-	0.0	-	0.0	100.0	97.7	-	-	97.9	100.0	0.0	100.0	-	96.9	-	96.4	83.3	-	96.1	97.1
Mediums	0	0	1	0	1	0	10	0	0	10	0	0	0	0	0	0	9	0	0	9	20
% Mediums	-	-	100.0	-	100.0	0.0	2.3	-	-	2.1	0.0	0.0	0.0	-	0.0	-	3.6	0.0	-	3.5	2.6
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	2
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	100.0	0.0	-	3.1	-	0.0	16.7	-	0.4	0.3

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

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817.265.8968

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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: LOIS ST @ JOAN
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Turning Movement Peak Hour Data (7:45 AM)

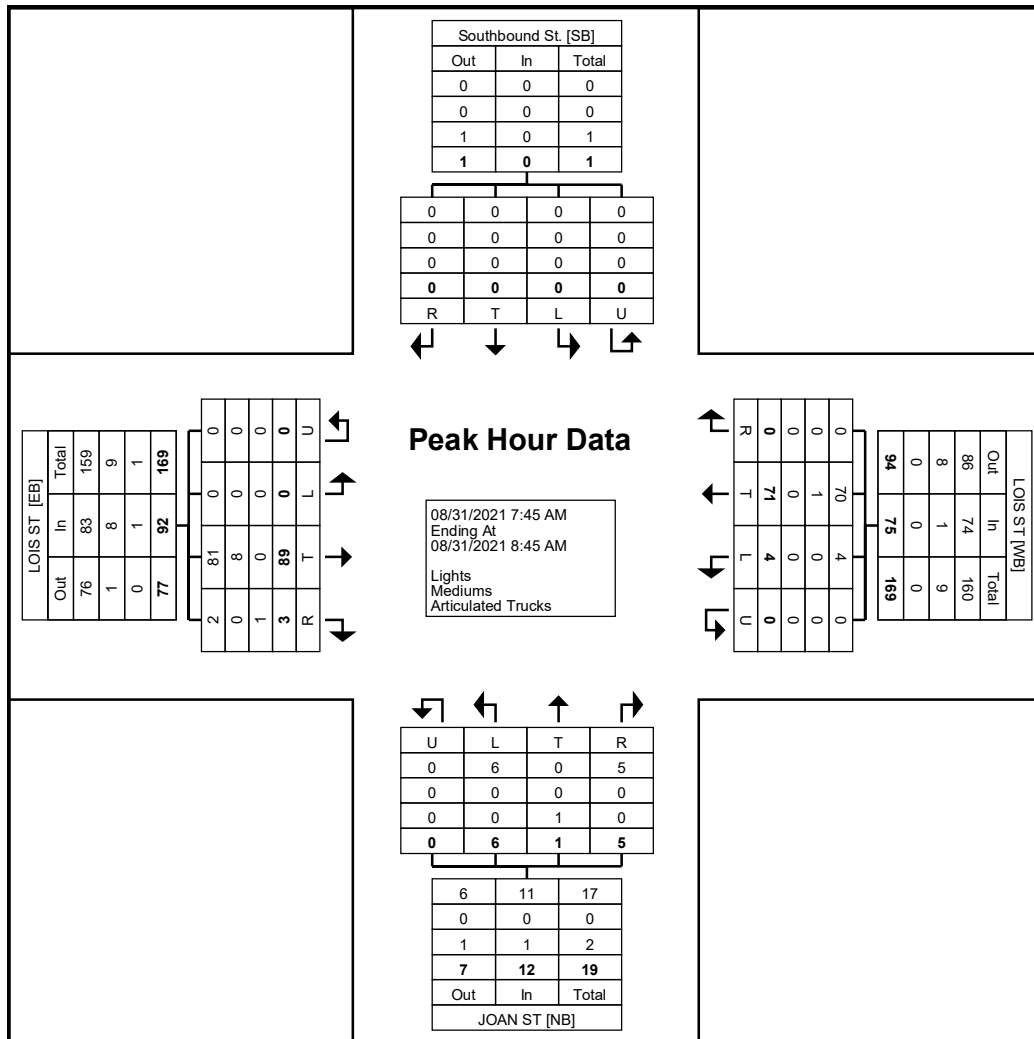
Start Time	Southbound St. Southbound					LOIS ST Westbound					JOAN ST Northbound					LOIS ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	0	0	0	0	0	2	15	0	0	17	3	1	1	0	5	0	21	3	0	24	46
8:00 AM	0	0	0	0	0	1	23	0	0	24	1	0	2	0	3	0	29	0	0	29	56
8:15 AM	0	0	0	0	0	0	12	0	0	12	1	0	1	0	2	0	31	0	0	31	45
8:30 AM	0	0	0	0	0	1	21	0	0	22	1	0	1	0	2	0	8	0	0	8	32
Total	0	0	0	0	0	4	71	0	0	75	6	1	5	0	12	0	89	3	0	92	179
Approach %	0.0	0.0	0.0	0.0	-	5.3	94.7	0.0	0.0	-	50.0	8.3	41.7	0.0	-	0.0	96.7	3.3	0.0	-	-
Total %	0.0	0.0	0.0	0.0	0.0	2.2	39.7	0.0	0.0	41.9	3.4	0.6	2.8	0.0	6.7	0.0	49.7	1.7	0.0	51.4	-
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.772	0.000	0.000	0.781	0.500	0.250	0.625	0.000	0.600	0.000	0.718	0.250	0.000	0.742	0.799
Lights	0	0	0	0	0	4	70	0	0	74	6	0	5	0	11	0	81	2	0	83	168
% Lights	-	-	-	-	-	100.0	98.6	-	-	98.7	100.0	0.0	100.0	-	91.7	-	91.0	66.7	-	90.2	93.9
Mediums	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	8	0	0	8	9
% Mediums	-	-	-	-	-	0.0	1.4	-	-	1.3	0.0	0.0	0.0	-	0.0	-	9.0	0.0	-	8.7	5.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	2
% Articulated Trucks	-	-	-	-	-	0.0	0.0	-	-	0.0	0.0	100.0	0.0	-	8.3	-	0.0	33.3	-	1.1	1.1

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Turning Movement Peak Hour Data Plot (7:45 AM)

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Turning Movement Peak Hour Data (4:15 PM)

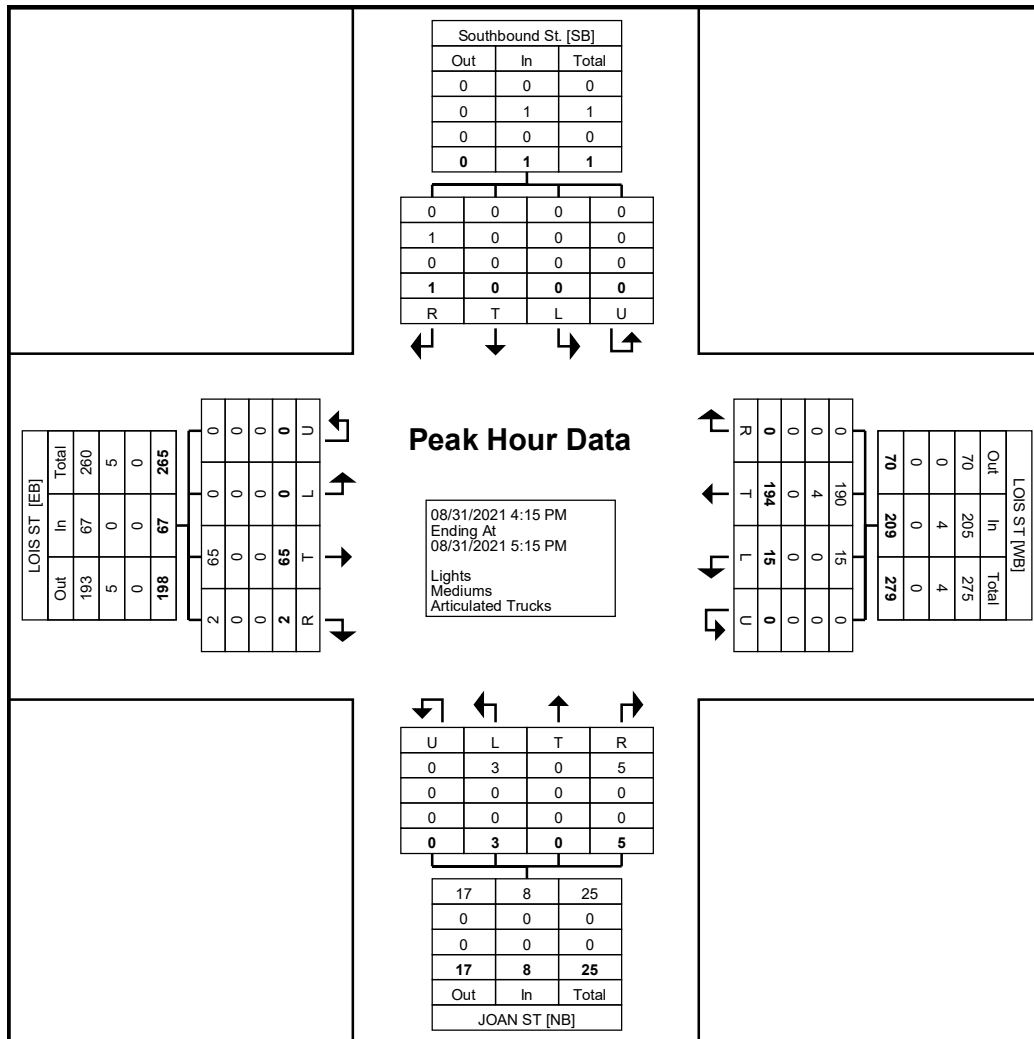
Start Time	Southbound St. Southbound					LOIS ST Westbound					JOAN ST Northbound					LOIS ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:15 PM	0	0	0	0	0	4	60	0	0	64	1	0	1	0	2	0	15	1	0	16	82
4:30 PM	0	0	0	0	0	4	55	0	0	59	1	0	2	0	3	0	19	1	0	20	82
4:45 PM	0	0	1	0	1	0	39	0	0	39	1	0	1	0	2	0	18	0	0	18	60
5:00 PM	0	0	0	0	0	7	40	0	0	47	0	0	1	0	1	0	13	0	0	13	61
Total	0	0	1	0	1	15	194	0	0	209	3	0	5	0	8	0	65	2	0	67	285
Approach %	0.0	0.0	100.0	0.0	-	7.2	92.8	0.0	0.0	-	37.5	0.0	62.5	0.0	-	0.0	97.0	3.0	0.0	-	-
Total %	0.0	0.0	0.4	0.0	0.4	5.3	68.1	0.0	0.0	73.3	1.1	0.0	1.8	0.0	2.8	0.0	22.8	0.7	0.0	23.5	-
PHF	0.000	0.000	0.250	0.000	0.250	0.536	0.808	0.000	0.000	0.816	0.750	0.000	0.625	0.000	0.667	0.000	0.855	0.500	0.000	0.838	0.869
Lights	0	0	0	0	0	15	190	0	0	205	3	0	5	0	8	0	65	2	0	67	280
% Lights	-	-	0.0	-	0.0	100.0	97.9	-	-	98.1	100.0	-	100.0	-	100.0	-	100.0	100.0	-	100.0	98.2
Mediums	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5
% Mediums	-	-	100.0	-	100.0	0.0	2.1	-	-	1.9	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	1.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	-	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0

GRAM Traffic NTX Inc.

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817.265.8968

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Turning Movement Peak Hour Data Plot (4:15 PM)

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817.265.8968

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Turning Movement Data

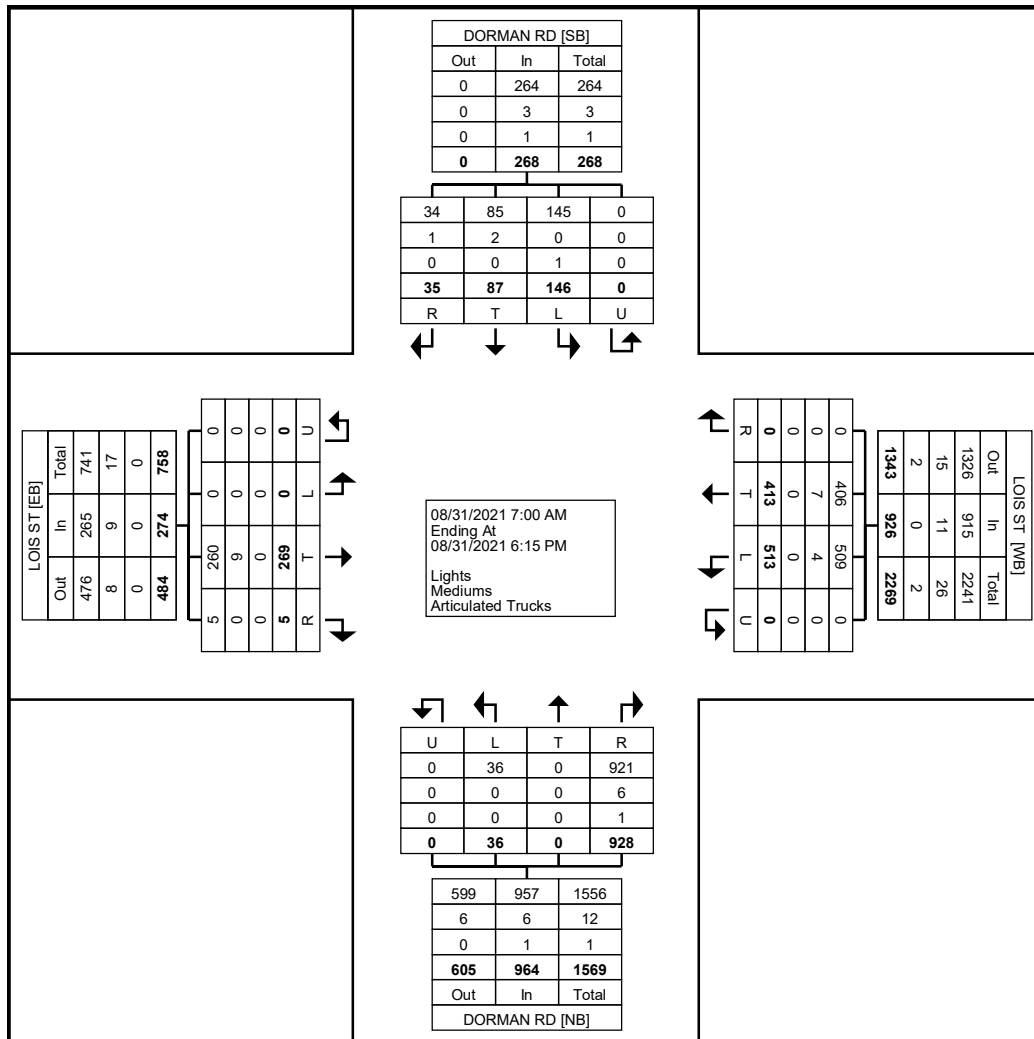
Start Time	DORMAN RD Southbound					LOIS ST Westbound					DORMAN RD Northbound					LOIS ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	2	1	1	0	4	14	11	0	0	25	0	0	16	0	16	0	9	0	0	9	54
7:15 AM	5	1	1	0	7	21	11	0	0	32	1	0	21	0	22	0	5	0	0	5	66
7:30 AM	4	3	0	0	7	32	11	0	0	43	0	0	18	0	18	0	13	0	0	13	81
7:45 AM	12	3	1	0	16	29	13	0	0	42	2	0	43	0	45	0	19	0	0	19	122
Hourly Total	23	8	3	0	34	96	46	0	0	142	3	0	98	0	101	0	46	0	0	46	323
8:00 AM	6	5	2	0	13	30	21	0	0	51	1	0	34	0	35	0	36	0	0	36	135
8:15 AM	10	5	0	0	15	24	12	0	0	36	0	0	46	0	46	0	31	0	0	31	128
8:30 AM	8	6	1	0	15	31	23	0	0	54	0	0	19	0	19	0	9	0	0	9	97
8:45 AM	8	5	1	0	14	23	19	0	0	42	1	0	22	0	23	0	7	0	0	7	86
Hourly Total	32	21	4	0	57	108	75	0	0	183	2	0	121	0	123	0	83	0	0	83	446
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	9	9	3	0	21	52	32	0	0	84	3	0	69	0	72	0	16	0	0	16	193
4:15 PM	9	7	6	0	22	37	55	0	0	92	4	0	96	0	100	0	19	1	0	20	234
4:30 PM	9	8	3	0	20	46	52	0	0	98	3	0	86	0	89	0	19	1	0	20	227
4:45 PM	12	8	1	0	21	45	36	0	0	81	5	0	111	0	116	0	19	1	0	20	238
Hourly Total	39	32	13	0	84	180	175	0	0	355	15	0	362	0	377	0	73	3	0	76	892
5:00 PM	13	10	6	0	29	24	38	0	0	62	5	0	100	0	105	0	15	0	0	15	211
5:15 PM	16	5	5	0	26	25	25	0	0	50	2	0	93	0	95	0	22	1	0	23	194
5:30 PM	12	4	2	0	18	40	27	0	0	67	3	0	76	0	79	0	11	1	0	12	176
5:45 PM	11	7	2	0	20	40	27	0	0	67	6	0	78	0	84	0	19	0	0	19	190
Hourly Total	52	26	15	0	93	129	117	0	0	246	16	0	347	0	363	0	67	2	0	69	771
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	146	87	35	0	268	513	413	0	0	926	36	0	928	0	964	0	269	5	0	274	2432
Approach %	54.5	32.5	13.1	0.0	-	55.4	44.6	0.0	0.0	-	3.7	0.0	96.3	0.0	-	0.0	98.2	1.8	0.0	-	-
Total %	6.0	3.6	1.4	0.0	11.0	21.1	17.0	0.0	0.0	38.1	1.5	0.0	38.2	0.0	39.6	0.0	11.1	0.2	0.0	11.3	-
Lights	145	85	34	0	264	509	406	0	0	915	36	0	921	0	957	0	260	5	0	265	2401
% Lights	99.3	97.7	97.1	-	98.5	99.2	98.3	-	-	98.8	100.0	-	99.2	-	99.3	-	96.7	100.0	-	96.7	98.7
Mediums	0	2	1	0	3	4	7	0	0	11	0	0	6	0	6	0	9	0	0	9	29
% Mediums	0.0	2.3	2.9	-	1.1	0.8	1.7	-	-	1.2	0.0	-	0.6	-	0.6	-	3.3	0.0	-	3.3	1.2
Articulated Trucks	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
% Articulated Trucks	0.7	0.0	0.0	-	0.4	0.0	0.0	-	-	0.0	0.0	-	0.1	-	0.1	-	0.0	0.0	-	0.0	0.1

GRAM Traffic NTX Inc.

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Turning Movement Data Plot

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Count Name: LOIS ST @
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Turning Movement Peak Hour Data (7:45 AM)

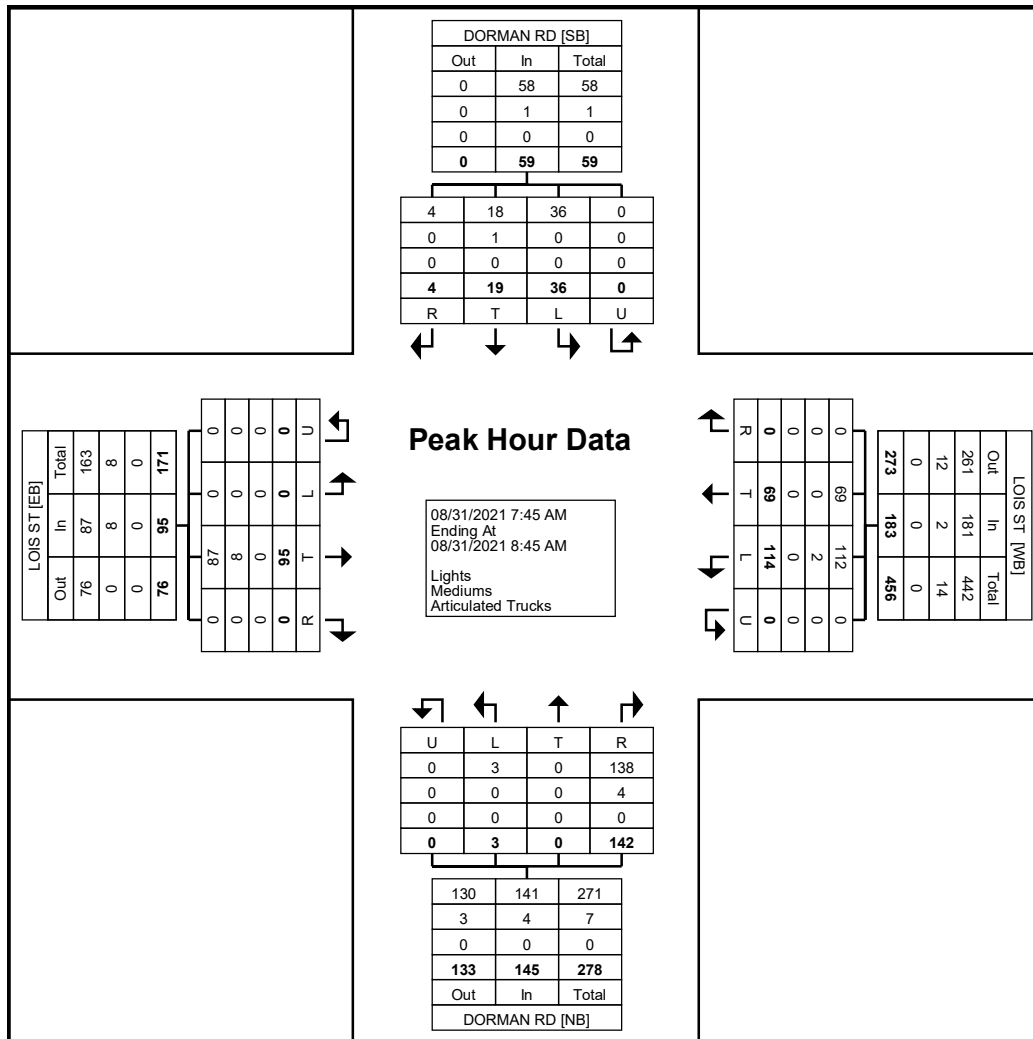
Start Time	DORMAN RD Southbound					LOIS ST Westbound					DORMAN RD Northbound					LOIS ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:45 AM	12	3	1	0	16	29	13	0	0	42	2	0	43	0	45	0	19	0	0	19	122
8:00 AM	6	5	2	0	13	30	21	0	0	51	1	0	34	0	35	0	36	0	0	36	135
8:15 AM	10	5	0	0	15	24	12	0	0	36	0	0	46	0	46	0	31	0	0	31	128
8:30 AM	8	6	1	0	15	31	23	0	0	54	0	0	19	0	19	0	9	0	0	9	97
Total	36	19	4	0	59	114	69	0	0	183	3	0	142	0	145	0	95	0	0	95	482
Approach %	61.0	32.2	6.8	0.0	-	62.3	37.7	0.0	0.0	-	2.1	0.0	97.9	0.0	-	0.0	100.0	0.0	0.0	-	-
Total %	7.5	3.9	0.8	0.0	12.2	23.7	14.3	0.0	0.0	38.0	0.6	0.0	29.5	0.0	30.1	0.0	19.7	0.0	0.0	19.7	-
PHF	0.750	0.792	0.500	0.000	0.922	0.919	0.750	0.000	0.000	0.847	0.375	0.000	0.772	0.000	0.788	0.000	0.660	0.000	0.000	0.660	0.893
Lights	36	18	4	0	58	112	69	0	0	181	3	0	138	0	141	0	87	0	0	87	467
% Lights	100.0	94.7	100.0	-	98.3	98.2	100.0	-	-	98.9	100.0	-	97.2	-	97.2	-	91.6	-	-	91.6	96.9
Mediums	0	1	0	0	1	2	0	0	0	2	0	0	4	0	4	0	8	0	0	8	15
% Mediums	0.0	5.3	0.0	-	1.7	1.8	0.0	-	-	1.1	0.0	-	2.8	-	2.8	-	8.4	-	-	8.4	3.1
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	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

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Turning Movement Peak Hour Data (4:15 PM)

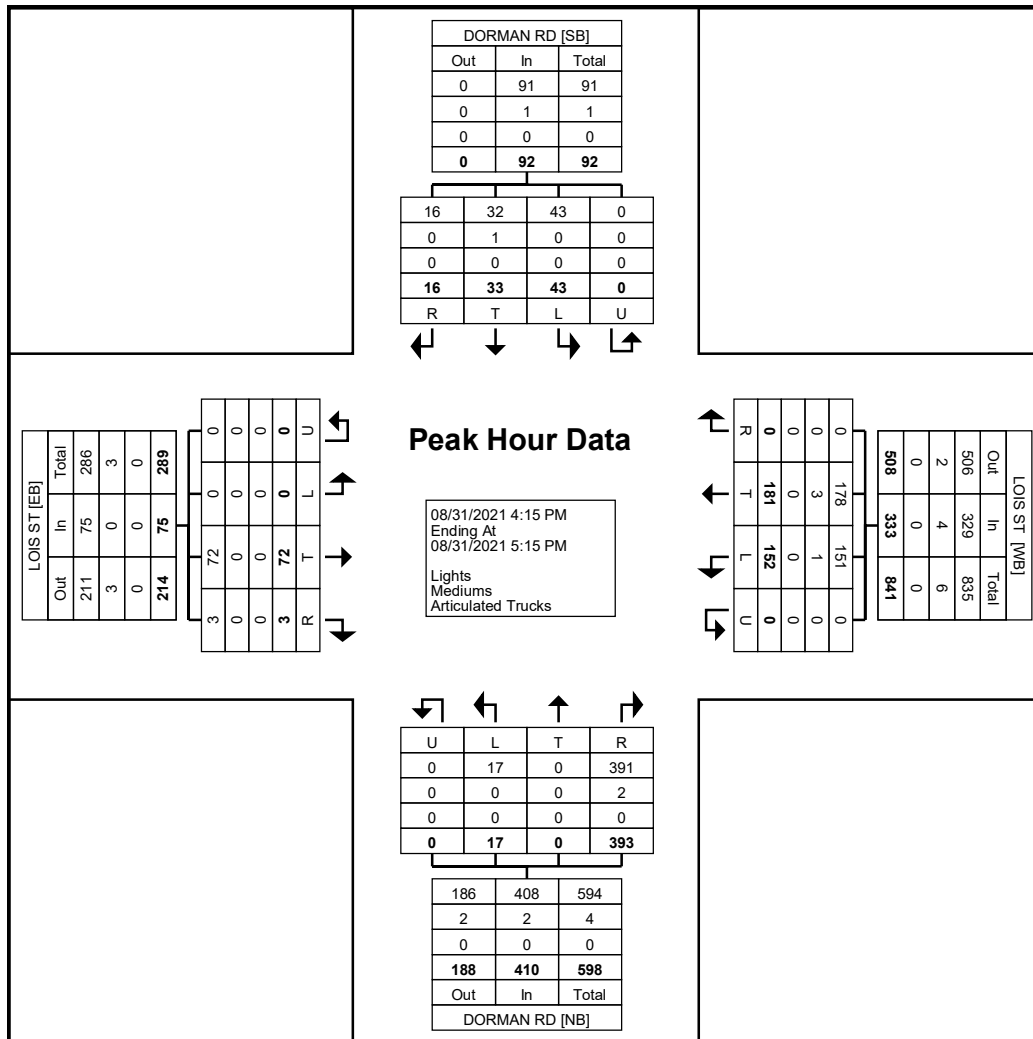
Start Time	DORMAN RD Southbound					LOIS ST Westbound					DORMAN RD Northbound					LOIS ST Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:15 PM	9	7	6	0	22	37	55	0	0	92	4	0	96	0	100	0	19	1	0	20	234
4:30 PM	9	8	3	0	20	46	52	0	0	98	3	0	86	0	89	0	19	1	0	20	227
4:45 PM	12	8	1	0	21	45	36	0	0	81	5	0	111	0	116	0	19	1	0	20	238
5:00 PM	13	10	6	0	29	24	38	0	0	62	5	0	100	0	105	0	15	0	0	15	211
Total	43	33	16	0	92	152	181	0	0	333	17	0	393	0	410	0	72	3	0	75	910
Approach %	46.7	35.9	17.4	0.0	-	45.6	54.4	0.0	0.0	-	4.1	0.0	95.9	0.0	-	0.0	96.0	4.0	0.0	-	-
Total %	4.7	3.6	1.8	0.0	10.1	16.7	19.9	0.0	0.0	36.6	1.9	0.0	43.2	0.0	45.1	0.0	7.9	0.3	0.0	8.2	-
PHF	0.827	0.825	0.667	0.000	0.793	0.826	0.823	0.000	0.000	0.849	0.850	0.000	0.885	0.000	0.884	0.000	0.947	0.750	0.000	0.938	0.956
Lights	43	32	16	0	91	151	178	0	0	329	17	0	391	0	408	0	72	3	0	75	903
% Lights	100.0	97.0	100.0	-	98.9	99.3	98.3	-	-	98.8	100.0	-	99.5	-	99.5	-	100.0	100.0	-	100.0	99.2
Mediums	0	1	0	0	1	1	3	0	0	4	0	0	2	0	2	0	0	0	0	0	7
% Mediums	0.0	3.0	0.0	-	1.1	0.7	1.7	-	-	1.2	0.0	-	0.5	-	0.5	-	0.0	0.0	-	0.0	0.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	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

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: LOIS ST @
DORMAN RD
Site Code:
Start Date: 08/31/2021
Page No: 6



Turning Movement Peak Hour Data Plot (4:15 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: ---JAMES ST @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 1

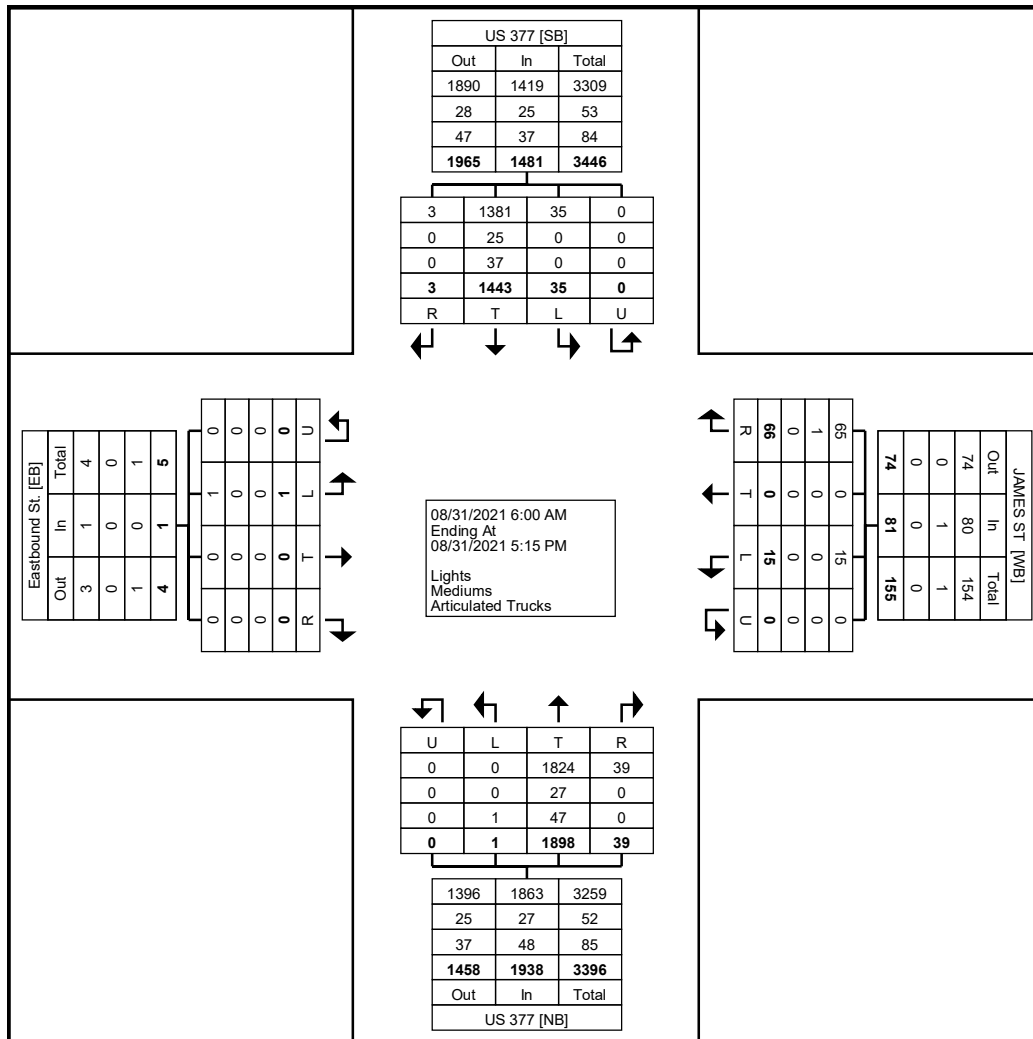
Turning Movement Data

Start Time	US 377 Southbound					JAMES ST Westbound					US 377 Northbound					Eastbound St. Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
6:00 AM	0	35	0	0	35	0	0	0	0	0	0	49	0	0	49	0	0	0	0	0	84
6:15 AM	0	47	1	0	48	0	0	2	0	2	0	52	0	0	52	0	0	0	0	0	102
6:30 AM	0	49	0	0	49	0	0	2	0	2	0	72	0	0	72	0	0	0	0	0	123
6:45 AM	2	91	0	0	93	0	0	1	0	1	0	104	4	0	108	0	0	0	0	0	202
Hourly Total	2	222	1	0	225	0	0	5	0	5	0	277	4	0	281	0	0	0	0	0	511
7:00 AM	3	65	0	0	68	0	0	0	0	0	0	132	2	0	134	0	0	0	0	0	202
7:15 AM	5	74	1	0	80	3	0	2	0	5	0	139	3	0	142	0	0	0	0	0	227
7:30 AM	1	73	1	0	75	2	0	4	0	6	0	170	3	0	173	0	0	0	0	0	254
7:45 AM	1	93	0	0	94	1	0	1	0	2	0	154	0	0	154	0	0	0	0	0	250
Hourly Total	10	305	2	0	317	6	0	7	0	13	0	595	8	0	603	0	0	0	0	0	933
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	2	108	0	0	110	1	0	2	0	3	0	121	3	0	124	0	0	0	0	0	237
3:15 PM	2	107	0	0	109	2	0	5	0	7	1	108	0	0	109	0	0	0	0	0	225
3:30 PM	4	101	0	0	105	1	0	8	0	9	0	130	4	0	134	0	0	0	0	0	248
3:45 PM	4	107	0	0	111	3	0	9	0	12	0	132	1	0	133	1	0	0	0	1	257
Hourly Total	12	423	0	0	435	7	0	24	0	31	1	491	8	0	500	1	0	0	0	1	967
4:00 PM	3	111	0	0	114	1	0	6	0	7	0	107	3	0	110	0	0	0	0	0	231
4:15 PM	0	116	0	0	116	0	0	11	0	11	0	139	6	0	145	0	0	0	0	0	272
4:30 PM	2	141	0	0	143	0	0	7	0	7	0	148	3	0	151	0	0	0	0	0	301
4:45 PM	6	125	0	0	131	1	0	6	0	7	0	141	7	0	148	0	0	0	0	0	286
Hourly Total	11	493	0	0	504	2	0	30	0	32	0	535	19	0	554	0	0	0	0	0	1090
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	35	1443	3	0	1481	15	0	66	0	81	1	1898	39	0	1938	1	0	0	0	1	3501
Approach %	2.4	97.4	0.2	0.0	-	18.5	0.0	81.5	0.0	-	0.1	97.9	2.0	0.0	-	100.0	0.0	0.0	0.0	-	-
Total %	1.0	41.2	0.1	0.0	42.3	0.4	0.0	1.9	0.0	2.3	0.0	54.2	1.1	0.0	55.4	0.0	0.0	0.0	0.0	0.0	-
Lights	35	1381	3	0	1419	15	0	65	0	80	0	1824	39	0	1863	1	0	0	0	1	3363
% Lights	100.0	95.7	100.0	-	95.8	100.0	-	98.5	-	98.8	0.0	96.1	100.0	-	96.1	100.0	-	-	-	100.0	96.1
Mediums	0	25	0	0	25	0	0	1	0	1	0	27	0	0	27	0	0	0	0	0	53
% Mediums	0.0	1.7	0.0	-	1.7	0.0	-	1.5	-	1.2	0.0	1.4	0.0	-	1.4	0.0	-	-	-	0.0	1.5
Articulated Trucks	0	37	0	0	37	0	0	0	0	0	1	47	0	0	48	0	0	0	0	0	85
% Articulated Trucks	0.0	2.6	0.0	-	2.5	0.0	-	0.0	-	0.0	100.0	2.5	0.0	-	2.5	0.0	-	-	-	0.0	2.4

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: ---JAMES ST @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: ---JAMES ST @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (7:00 AM)

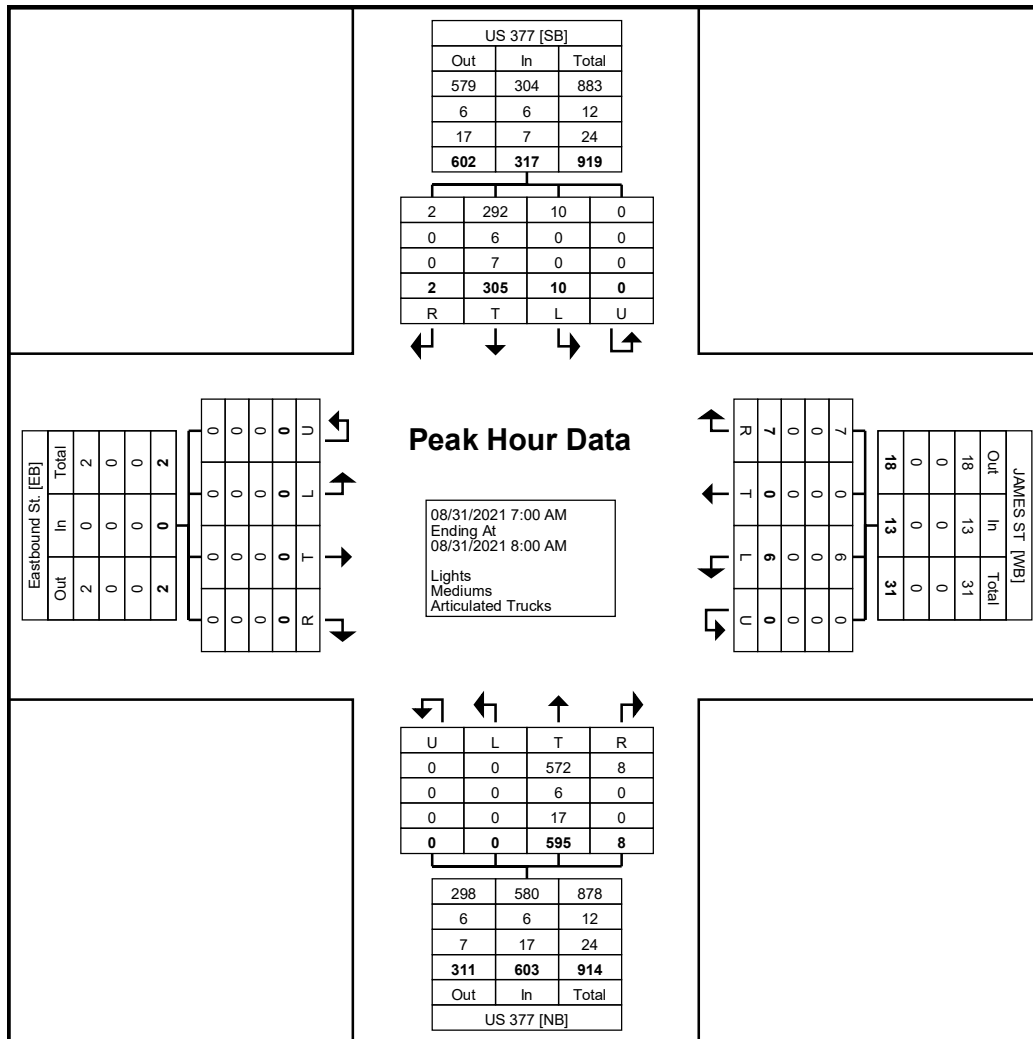
Start Time	US 377 Southbound					JAMES ST Westbound					US 377 Northbound					Eastbound St. Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	3	65	0	0	68	0	0	0	0	0	0	132	2	0	134	0	0	0	0	0	202
7:15 AM	5	74	1	0	80	3	0	2	0	5	0	139	3	0	142	0	0	0	0	0	227
7:30 AM	1	73	1	0	75	2	0	4	0	6	0	170	3	0	173	0	0	0	0	0	254
7:45 AM	1	93	0	0	94	1	0	1	0	2	0	154	0	0	154	0	0	0	0	0	250
Total	10	305	2	0	317	6	0	7	0	13	0	595	8	0	603	0	0	0	0	0	933
Approach %	3.2	96.2	0.6	0.0	-	46.2	0.0	53.8	0.0	-	0.0	98.7	1.3	0.0	-	0.0	0.0	0.0	0.0	0.0	-
Total %	1.1	32.7	0.2	0.0	34.0	0.6	0.0	0.8	0.0	1.4	0.0	63.8	0.9	0.0	64.6	0.0	0.0	0.0	0.0	0.0	-
PHF	0.500	0.820	0.500	0.000	0.843	0.500	0.000	0.438	0.000	0.542	0.000	0.875	0.667	0.000	0.871	0.000	0.000	0.000	0.000	0.000	0.918
Lights	10	292	2	0	304	6	0	7	0	13	0	572	8	0	580	0	0	0	0	0	897
% Lights	100.0	95.7	100.0	-	95.9	100.0	-	100.0	-	100.0	-	96.1	100.0	-	96.2	-	-	-	-	-	96.1
Mediums	0	6	0	0	6	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	12
% Mediums	0.0	2.0	0.0	-	1.9	0.0	-	0.0	-	0.0	-	1.0	0.0	-	1.0	-	-	-	-	-	1.3
Articulated Trucks	0	7	0	0	7	0	0	0	0	0	0	17	0	0	17	0	0	0	0	0	24
% Articulated Trucks	0.0	2.3	0.0	-	2.2	0.0	-	0.0	-	0.0	-	2.9	0.0	-	2.8	-	-	-	-	-	2.6

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: ---JAMES ST @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 4



Turning Movement Peak Hour Data Plot (7:00 AM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: ---JAMES ST @
US 377
Site Code:
Start Date: 08/31/2021
Page No: 5

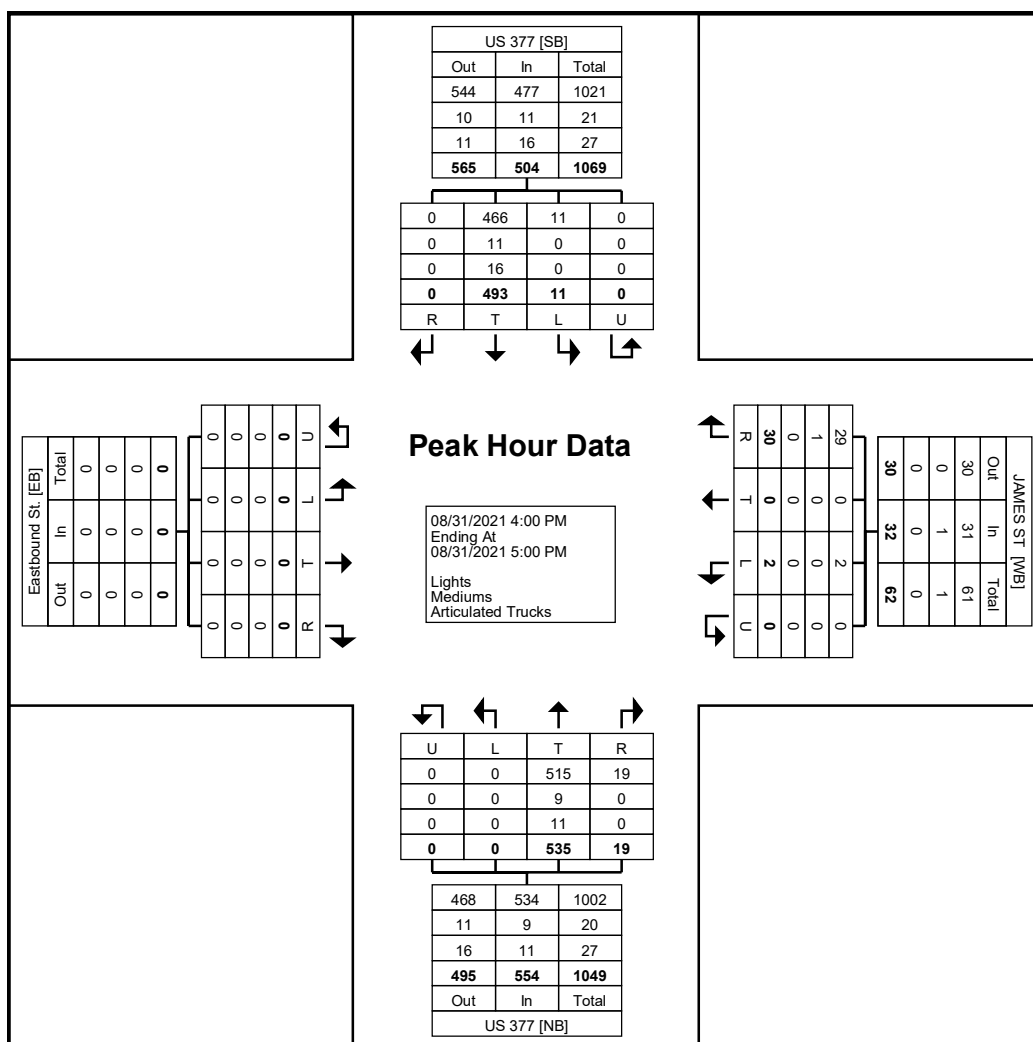
Turning Movement Peak Hour Data (4:00 PM)

Start Time	US 377 Southbound					JAMES ST Westbound					US 377 Northbound					Eastbound St. Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:00 PM	3	111	0	0	114	1	0	6	0	7	0	107	3	0	110	0	0	0	0	0	231
4:15 PM	0	116	0	0	116	0	0	11	0	11	0	139	6	0	145	0	0	0	0	0	272
4:30 PM	2	141	0	0	143	0	0	7	0	7	0	148	3	0	151	0	0	0	0	0	301
4:45 PM	6	125	0	0	131	1	0	6	0	7	0	141	7	0	148	0	0	0	0	0	286
Total	11	493	0	0	504	2	0	30	0	32	0	535	19	0	554	0	0	0	0	0	1090
Approach %	2.2	97.8	0.0	0.0	-	6.3	0.0	93.8	0.0	-	0.0	96.6	3.4	0.0	-	0.0	0.0	0.0	0.0	0.0	-
Total %	1.0	45.2	0.0	0.0	46.2	0.2	0.0	2.8	0.0	2.9	0.0	49.1	1.7	0.0	50.8	0.0	0.0	0.0	0.0	0.0	-
PHF	0.458	0.874	0.000	0.000	0.881	0.500	0.000	0.682	0.000	0.727	0.000	0.904	0.679	0.000	0.917	0.000	0.000	0.000	0.000	0.000	0.905
Lights	11	466	0	0	477	2	0	29	0	31	0	515	19	0	534	0	0	0	0	0	1042
% Lights	100.0	94.5	-	-	94.6	100.0	-	96.7	-	96.9	-	96.3	100.0	-	96.4	-	-	-	-	-	95.6
Mediums	0	11	0	0	11	0	0	1	0	1	0	9	0	0	9	0	0	0	0	0	21
% Mediums	0.0	2.2	-	-	2.2	0.0	-	3.3	-	3.1	-	1.7	0.0	-	1.6	-	-	-	-	-	1.9
Articulated Trucks	0	16	0	0	16	0	0	0	0	0	0	11	0	0	11	0	0	0	0	0	27
% Articulated Trucks	0.0	3.2	-	-	3.2	0.0	-	0.0	-	0.0	-	2.1	0.0	-	2.0	-	-	-	-	-	2.5

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: ---JAMES ST @
US 377
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data Plot (4:00 PM)

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
BYRON NELSON BLVD
Site Code:
Start Date: 08/31/2021
Page No: 1

Turning Movement Data

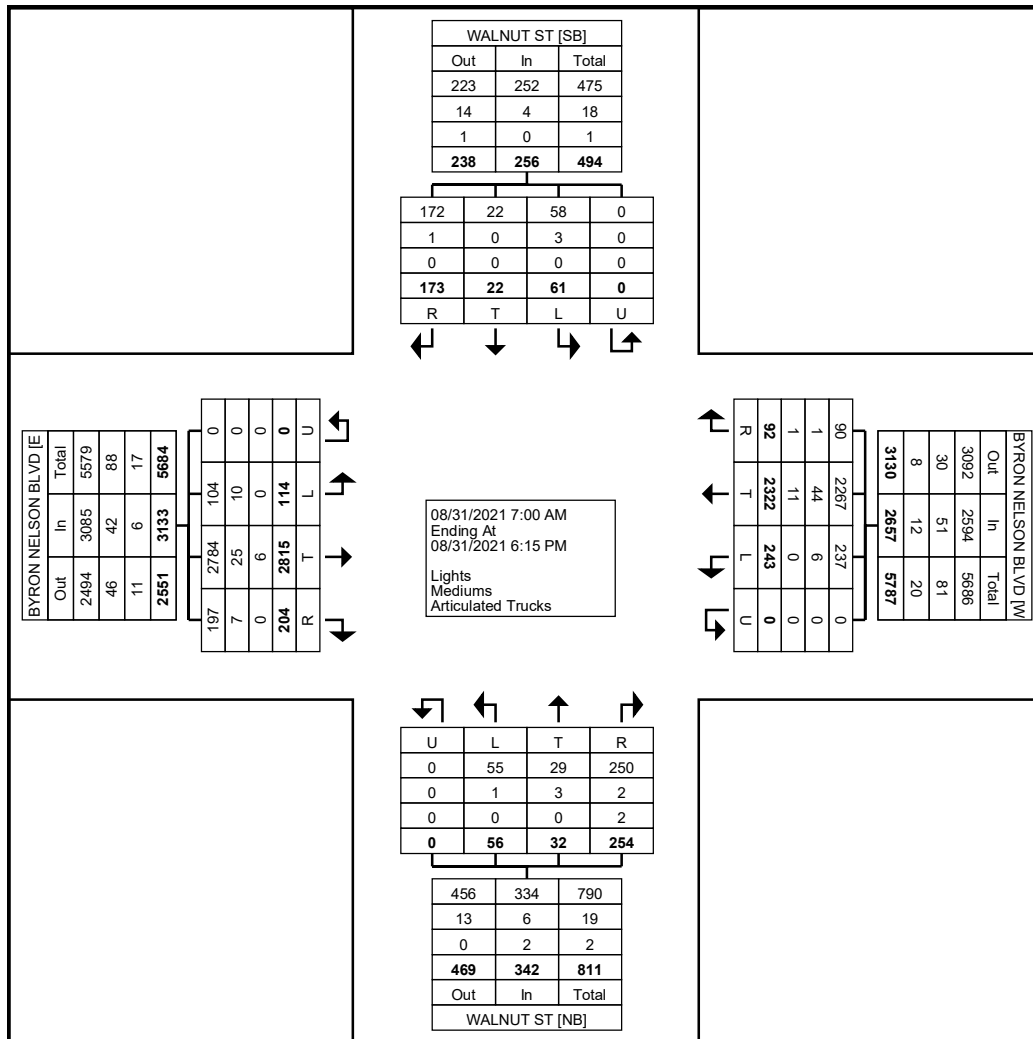
Start Time	WALNUT ST Southbound					BYRON NELSON BLVD Westbound					WALNUT ST Northbound					BYRON NELSON BLVD Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	6	3	2	0	11	4	59	3	0	66	4	0	11	0	15	1	163	3	0	167	259
7:15 AM	6	2	4	0	12	3	64	5	0	72	2	2	7	0	11	1	196	6	0	203	298
7:30 AM	3	0	2	0	5	14	62	5	0	81	3	2	10	0	15	4	218	14	0	236	337
7:45 AM	3	1	9	0	13	20	89	12	0	121	4	3	11	0	18	10	212	21	0	243	395
Hourly Total	18	6	17	0	41	41	274	25	0	340	13	7	39	0	59	16	789	44	0	849	1289
8:00 AM	4	0	6	0	10	23	94	6	0	123	2	3	25	0	30	17	188	25	0	230	393
8:15 AM	2	0	6	0	8	16	76	2	0	94	6	4	22	0	32	15	211	22	0	248	382
8:30 AM	2	5	13	0	20	15	89	2	0	106	2	2	14	0	18	6	158	10	0	174	318
8:45 AM	4	2	7	0	13	11	73	3	0	87	4	2	10	0	16	5	162	8	0	175	291
Hourly Total	12	7	32	0	51	65	332	13	0	410	14	11	71	0	96	43	719	65	0	827	1384
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	6	2	6	0	14	16	164	7	0	187	2	2	21	0	25	11	129	14	0	154	380
4:15 PM	3	0	16	0	19	21	207	10	0	238	4	1	15	0	20	8	143	9	0	160	437
4:30 PM	4	2	21	0	27	17	224	4	0	245	5	3	22	0	30	6	170	11	0	187	489
4:45 PM	4	2	15	0	21	16	214	10	0	240	2	1	16	0	19	8	183	7	0	198	478
Hourly Total	17	6	58	0	81	70	809	31	0	910	13	7	74	0	94	33	625	41	0	699	1784
5:00 PM	3	2	13	0	18	11	226	8	0	245	5	0	16	0	21	2	170	9	0	181	465
5:15 PM	3	0	25	0	28	21	212	4	0	237	4	1	23	0	28	7	188	17	0	212	505
5:30 PM	3	0	16	0	19	13	242	4	0	259	5	3	15	0	23	5	162	12	0	179	480
5:45 PM	5	1	12	0	18	22	227	7	0	256	2	3	16	0	21	8	162	16	0	186	481
Hourly Total	14	3	66	0	83	67	907	23	0	997	16	7	70	0	93	22	682	54	0	758	1931
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	61	22	173	0	256	243	2322	92	0	2657	56	32	254	0	342	114	2815	204	0	3133	6388
Approach %	23.8	8.6	67.6	0.0	-	9.1	87.4	3.5	0.0	-	16.4	9.4	74.3	0.0	-	3.6	89.8	6.5	0.0	-	-
Total %	1.0	0.3	2.7	0.0	4.0	3.8	36.3	1.4	0.0	41.6	0.9	0.5	4.0	0.0	5.4	1.8	44.1	3.2	0.0	49.0	-
Lights	58	22	172	0	252	237	2267	90	0	2594	55	29	250	0	334	104	2784	197	0	3085	6265
% Lights	95.1	100.0	99.4	-	98.4	97.5	97.6	97.8	-	97.6	98.2	90.6	98.4	-	97.7	91.2	98.9	96.6	-	98.5	98.1
Mediums	3	0	1	0	4	6	44	1	0	51	1	3	2	0	6	10	25	7	0	42	103
% Mediums	4.9	0.0	0.6	-	1.6	2.5	1.9	1.1	-	1.9	1.8	9.4	0.8	-	1.8	8.8	0.9	3.4	-	1.3	1.6
Articulated Trucks	0	0	0	0	0	0	11	1	0	12	0	0	2	0	2	0	6	0	0	6	20
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.5	1.1	-	0.5	0.0	0.0	0.8	-	0.6	0.0	0.2	0.0	-	0.2	0.3

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
BYRON NELSON BLVD
Site Code:
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Turning Movement Data Plot

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

Arlington, Texas, United States 76013
817.265.8968

Count Name: WALNUT ST @
BYRON NELSON BLVD
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (7:30 AM)

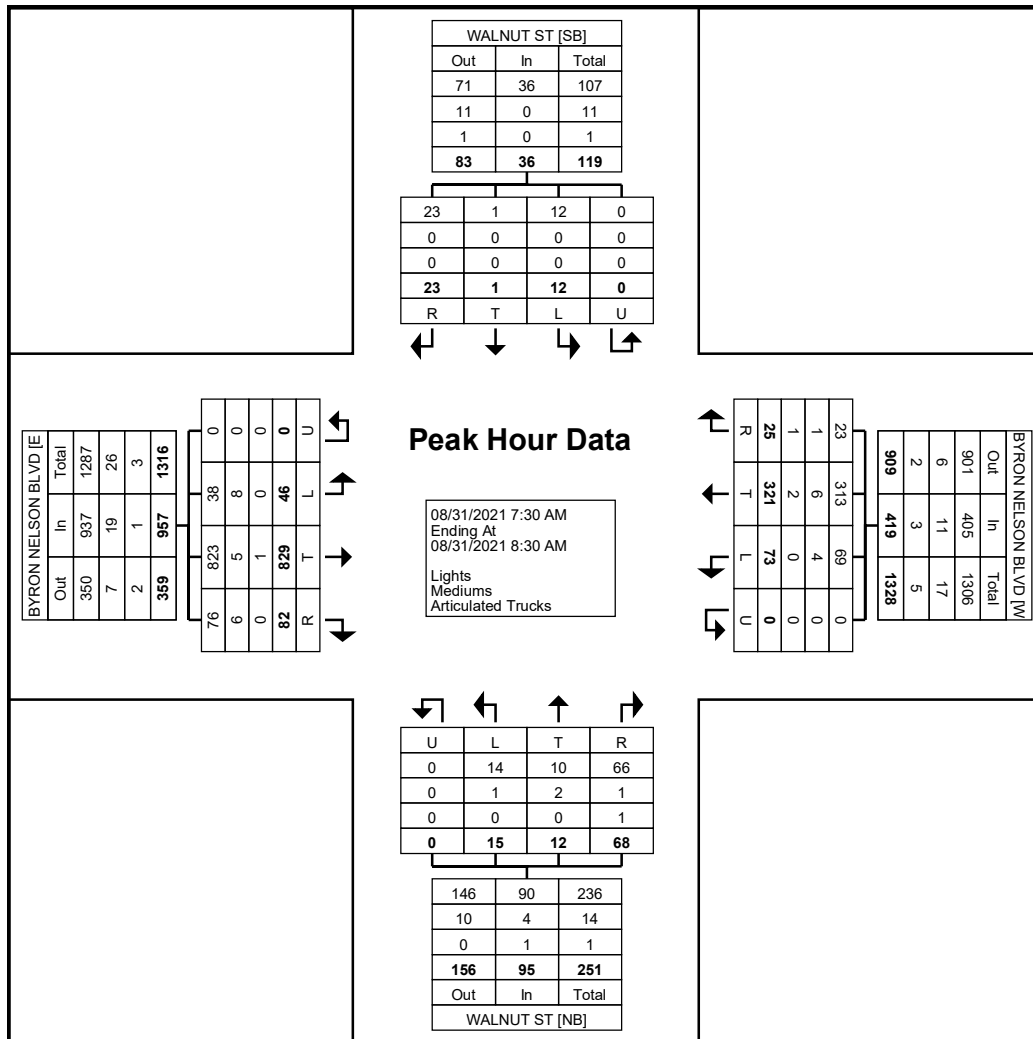
Start Time	WALNUT ST Southbound					BYRON NELSON BLVD Westbound					WALNUT ST Northbound					BYRON NELSON BLVD Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:30 AM	3	0	2	0	5	14	62	5	0	81	3	2	10	0	15	4	218	14	0	236	337
7:45 AM	3	1	9	0	13	20	89	12	0	121	4	3	11	0	18	10	212	21	0	243	395
8:00 AM	4	0	6	0	10	23	94	6	0	123	2	3	25	0	30	17	188	25	0	230	393
8:15 AM	2	0	6	0	8	16	76	2	0	94	6	4	22	0	32	15	211	22	0	248	382
Total	12	1	23	0	36	73	321	25	0	419	15	12	68	0	95	46	829	82	0	957	1507
Approach %	33.3	2.8	63.9	0.0	-	17.4	76.6	6.0	0.0	-	15.8	12.6	71.6	0.0	-	4.8	86.6	8.6	0.0	-	-
Total %	0.8	0.1	1.5	0.0	2.4	4.8	21.3	1.7	0.0	27.8	1.0	0.8	4.5	0.0	6.3	3.1	55.0	5.4	0.0	63.5	-
PHF	0.750	0.250	0.639	0.000	0.692	0.793	0.854	0.521	0.000	0.852	0.625	0.750	0.680	0.000	0.742	0.676	0.951	0.820	0.000	0.965	0.954
Lights	12	1	23	0	36	69	313	23	0	405	14	10	66	0	90	38	823	76	0	937	1468
% Lights	100.0	100.0	100.0	-	100.0	94.5	97.5	92.0	-	96.7	93.3	83.3	97.1	-	94.7	82.6	99.3	92.7	-	97.9	97.4
Mediums	0	0	0	0	0	4	6	1	0	11	1	2	1	0	4	8	5	6	0	19	34
% Mediums	0.0	0.0	0.0	-	0.0	5.5	1.9	4.0	-	2.6	6.7	16.7	1.5	-	4.2	17.4	0.6	7.3	-	2.0	2.3
Articulated Trucks	0	0	0	0	0	0	2	1	0	3	0	0	1	0	1	0	1	0	0	1	5
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.6	4.0	-	0.7	0.0	0.0	1.5	-	1.1	0.0	0.1	0.0	-	0.1	0.3

GRAM Traffic NTX Inc.

1120 W. Lovers Lane

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Turning Movement Peak Hour Data Plot (7:30 AM)

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Count Name: WALNUT ST @
BYRON NELSON BLVD
Site Code:
Start Date: 08/31/2021
Page No: 5

Turning Movement Peak Hour Data (4:30 PM)

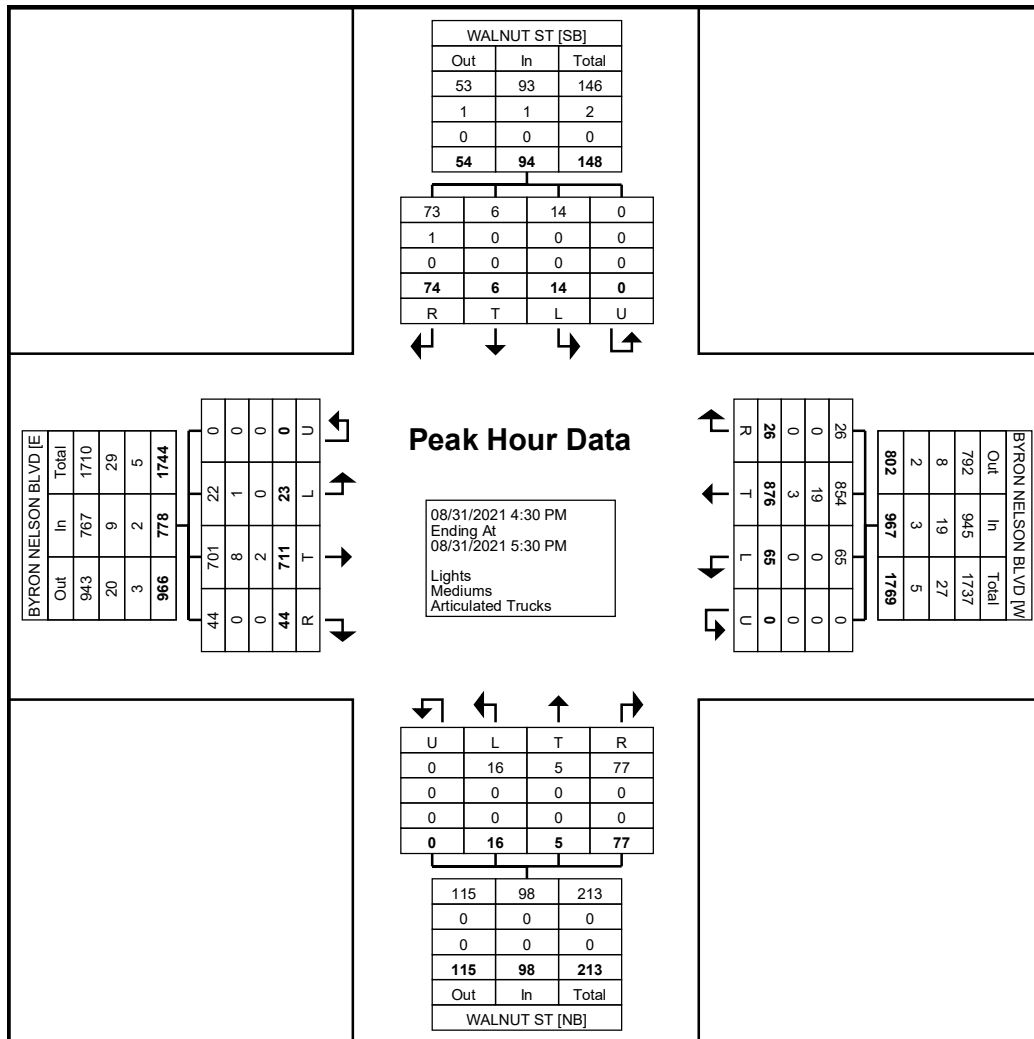
Start Time	WALNUT ST Southbound					BYRON NELSON BLVD Westbound					WALNUT ST Northbound					BYRON NELSON BLVD Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:30 PM	4	2	21	0	27	17	224	4	0	245	5	3	22	0	30	6	170	11	0	187	489
4:45 PM	4	2	15	0	21	16	214	10	0	240	2	1	16	0	19	8	183	7	0	198	478
5:00 PM	3	2	13	0	18	11	226	8	0	245	5	0	16	0	21	2	170	9	0	181	465
5:15 PM	3	0	25	0	28	21	212	4	0	237	4	1	23	0	28	7	188	17	0	212	505
Total	14	6	74	0	94	65	876	26	0	967	16	5	77	0	98	23	711	44	0	778	1937
Approach %	14.9	6.4	78.7	0.0	-	6.7	90.6	2.7	0.0	-	16.3	5.1	78.6	0.0	-	3.0	91.4	5.7	0.0	-	-
Total %	0.7	0.3	3.8	0.0	4.9	3.4	45.2	1.3	0.0	49.9	0.8	0.3	4.0	0.0	5.1	1.2	36.7	2.3	0.0	40.2	-
PHF	0.875	0.750	0.740	0.000	0.839	0.774	0.969	0.650	0.000	0.987	0.800	0.417	0.837	0.000	0.817	0.719	0.945	0.647	0.000	0.917	0.959
Lights	14	6	73	0	93	65	854	26	0	945	16	5	77	0	98	22	701	44	0	767	1903
% Lights	100.0	100.0	98.6	-	98.9	100.0	97.5	100.0	-	97.7	100.0	100.0	100.0	-	100.0	95.7	98.6	100.0	-	98.6	98.2
Mediums	0	0	1	0	1	0	19	0	0	19	0	0	0	0	0	1	8	0	0	9	29
% Mediums	0.0	0.0	1.4	-	1.1	0.0	2.2	0.0	-	2.0	0.0	0.0	0.0	-	0.0	4.3	1.1	0.0	-	1.2	1.5
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.3	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.0	0.3	0.0	-	0.3	0.3

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Turning Movement Peak Hour Data Plot (4:30 PM)

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Count Name: DORMAN ST @
BYRON NELSON BLVD
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Turning Movement Data

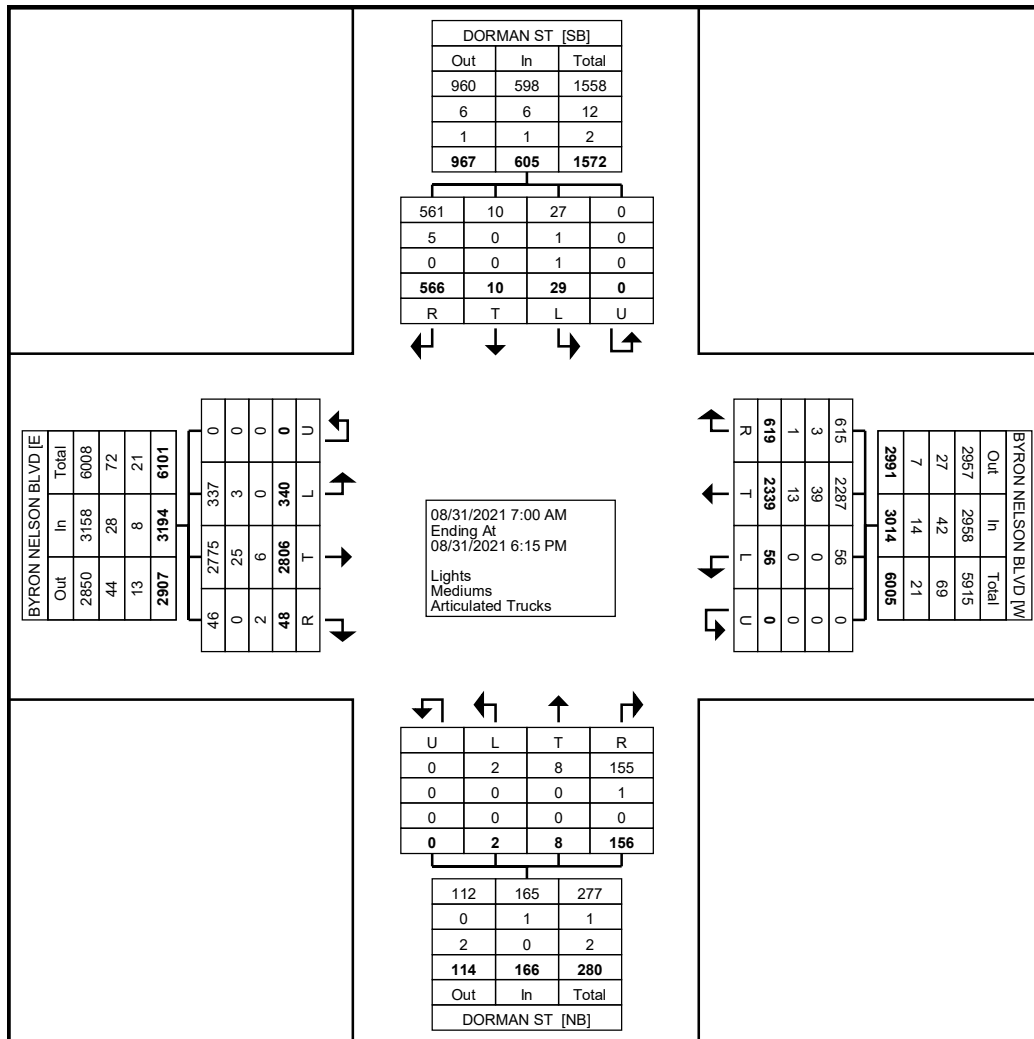
Start Time	DORMAN ST Southbound					BYRON NELSON BLVD Westbound					DORMAN ST Northbound					BYRON NELSON BLVD Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:00 AM	2	0	16	0	18	0	64	6	0	70	0	0	6	0	6	6	171	2	0	179	273
7:15 AM	0	0	18	0	18	2	71	13	0	86	0	1	7	0	8	10	197	2	0	209	321
7:30 AM	4	1	33	0	38	1	69	11	0	81	0	2	8	0	10	10	219	4	0	233	362
7:45 AM	0	0	31	0	31	3	106	17	0	126	0	1	11	0	12	22	181	2	0	205	374
Hourly Total	6	1	98	0	105	6	310	47	0	363	0	4	32	0	36	48	768	10	0	826	1330
8:00 AM	2	1	32	0	35	2	105	12	0	119	0	1	8	0	9	27	192	2	0	221	384
8:15 AM	2	1	27	0	30	1	79	16	0	96	0	0	9	0	9	26	201	0	0	227	362
8:30 AM	3	0	33	0	36	5	77	11	0	93	0	1	10	0	11	11	164	1	0	176	316
8:45 AM	1	0	26	0	27	5	80	4	0	89	0	0	12	0	12	17	166	3	0	186	314
Hourly Total	8	2	118	0	128	13	341	43	0	397	0	2	39	0	41	81	723	6	0	810	1376
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	2	0	59	0	61	4	165	51	0	220	0	0	9	0	9	20	135	1	0	156	446
4:15 PM	2	0	41	0	43	3	209	79	0	291	0	1	8	0	9	23	151	2	0	176	519
4:30 PM	2	1	44	0	47	6	228	71	0	305	0	0	11	0	11	26	176	6	0	208	571
4:45 PM	5	3	50	0	58	7	212	69	0	288	1	0	6	0	7	40	176	6	0	222	575
Hourly Total	11	4	194	0	209	20	814	270	0	1104	1	1	34	0	36	109	638	15	0	762	2111
5:00 PM	1	1	36	0	38	7	221	75	0	303	0	0	14	0	14	28	170	6	0	204	559
5:15 PM	0	0	32	0	32	1	209	64	0	274	0	1	12	0	13	29	181	4	0	214	533
5:30 PM	0	1	43	0	44	5	215	64	0	284	1	0	8	0	9	18	158	5	0	181	518
5:45 PM	3	1	45	0	49	4	229	56	0	289	0	0	17	0	17	27	168	2	0	197	552
Hourly Total	4	3	156	0	163	17	874	259	0	1150	1	1	51	0	53	102	677	17	0	796	2162
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	29	10	566	0	605	56	2339	619	0	3014	2	8	156	0	166	340	2806	48	0	3194	6979
Approach %	4.8	1.7	93.6	0.0	-	1.9	77.6	20.5	0.0	-	1.2	4.8	94.0	0.0	-	10.6	87.9	1.5	0.0	-	-
Total %	0.4	0.1	8.1	0.0	8.7	0.8	33.5	8.9	0.0	43.2	0.0	0.1	2.2	0.0	2.4	4.9	40.2	0.7	0.0	45.8	-
Lights	27	10	561	0	598	56	2287	615	0	2958	2	8	155	0	165	337	2775	46	0	3158	6879
% Lights	93.1	100.0	99.1	-	98.8	100.0	97.8	99.4	-	98.1	100.0	100.0	99.4	-	99.4	99.1	98.9	95.8	-	98.9	98.6
Mediums	1	0	5	0	6	0	39	3	0	42	0	0	1	0	1	3	25	0	0	28	77
% Mediums	3.4	0.0	0.9	-	1.0	0.0	1.7	0.5	-	1.4	0.0	0.0	0.6	-	0.6	0.9	0.9	0.0	-	0.9	1.1
Articulated Trucks	1	0	0	0	1	0	13	1	0	14	0	0	0	0	0	0	6	2	0	8	23
% Articulated Trucks	3.4	0.0	0.0	-	0.2	0.0	0.6	0.2	-	0.5	0.0	0.0	0.0	-	0.0	0.0	0.2	4.2	-	0.3	0.3

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Turning Movement Data Plot

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Count Name: DORMAN ST @
BYRON NELSON BLVD
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (7:30 AM)

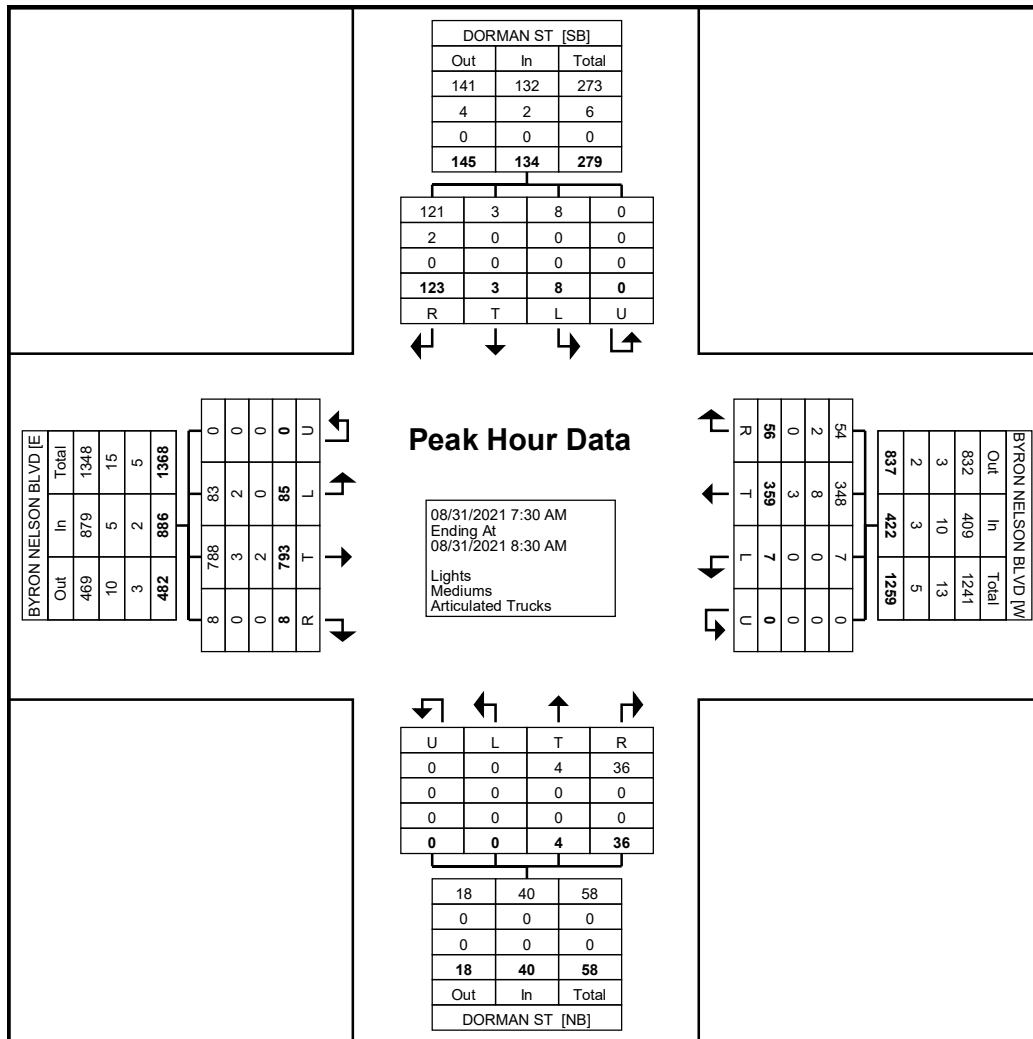
Start Time	DORMAN ST Southbound					BYRON NELSON BLVD Westbound					DORMAN ST Northbound					BYRON NELSON BLVD Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
7:30 AM	4	1	33	0	38	1	69	11	0	81	0	2	8	0	10	10	219	4	0	233	362
7:45 AM	0	0	31	0	31	3	106	17	0	126	0	1	11	0	12	22	181	2	0	205	374
8:00 AM	2	1	32	0	35	2	105	12	0	119	0	1	8	0	9	27	192	2	0	221	384
8:15 AM	2	1	27	0	30	1	79	16	0	96	0	0	9	0	9	26	201	0	0	227	362
Total	8	3	123	0	134	7	359	56	0	422	0	4	36	0	40	85	793	8	0	886	1482
Approach %	6.0	2.2	91.8	0.0	-	1.7	85.1	13.3	0.0	-	0.0	10.0	90.0	0.0	-	9.6	89.5	0.9	0.0	-	-
Total %	0.5	0.2	8.3	0.0	9.0	0.5	24.2	3.8	0.0	28.5	0.0	0.3	2.4	0.0	2.7	5.7	53.5	0.5	0.0	59.8	-
PHF	0.500	0.750	0.932	0.000	0.882	0.583	0.847	0.824	0.000	0.837	0.000	0.500	0.818	0.000	0.833	0.787	0.905	0.500	0.000	0.951	0.965
Lights	8	3	121	0	132	7	348	54	0	409	0	4	36	0	40	83	788	8	0	879	1460
% Lights	100.0	100.0	98.4	-	98.5	100.0	96.9	96.4	-	96.9	-	100.0	100.0	-	100.0	97.6	99.4	100.0	-	99.2	98.5
Mediums	0	0	2	0	2	0	8	2	0	10	0	0	0	0	0	2	3	0	0	5	17
% Mediums	0.0	0.0	1.6	-	1.5	0.0	2.2	3.6	-	2.4	-	0.0	0.0	-	0.0	2.4	0.4	0.0	-	0.6	1.1
Articulated Trucks	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	5
% Articulated Trucks	0.0	0.0	0.0	-	0.0	0.0	0.8	0.0	-	0.7	-	0.0	0.0	-	0.0	0.0	0.3	0.0	-	0.2	0.3

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Turning Movement Peak Hour Data Plot (7:30 AM)

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Count Name: DORMAN ST @
BYRON NELSON BLVD
Site Code:
Start Date: 08/31/2021
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Turning Movement Peak Hour Data (4:30 PM)

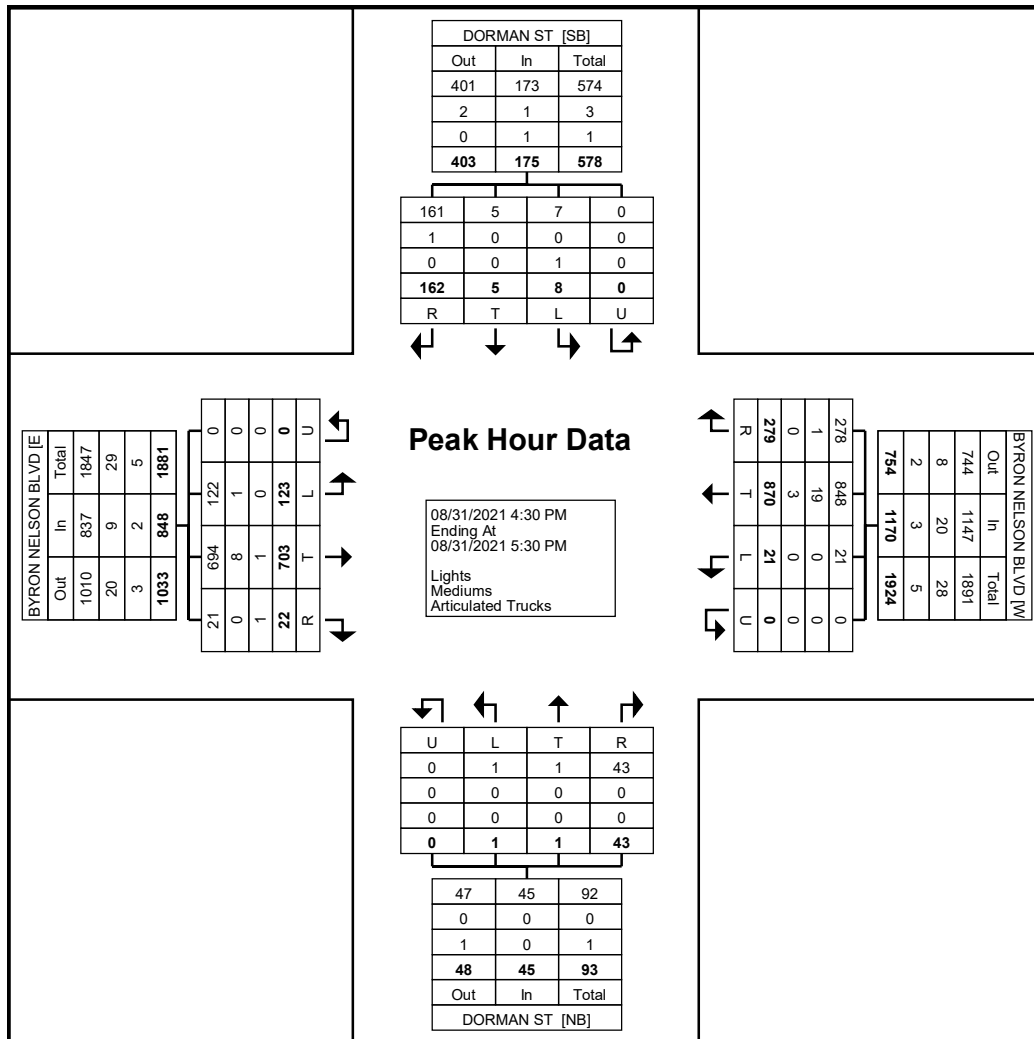
Start Time	DORMAN ST Southbound					BYRON NELSON BLVD Westbound					DORMAN ST Northbound					BYRON NELSON BLVD Eastbound					Int. Total
	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	
4:30 PM	2	1	44	0	47	6	228	71	0	305	0	0	11	0	11	26	176	6	0	208	571
4:45 PM	5	3	50	0	58	7	212	69	0	288	1	0	6	0	7	40	176	6	0	222	575
5:00 PM	1	1	36	0	38	7	221	75	0	303	0	0	14	0	14	28	170	6	0	204	559
5:15 PM	0	0	32	0	32	1	209	64	0	274	0	1	12	0	13	29	181	4	0	214	533
Total	8	5	162	0	175	21	870	279	0	1170	1	1	43	0	45	123	703	22	0	848	2238
Approach %	4.6	2.9	92.6	0.0	-	1.8	74.4	23.8	0.0	-	2.2	2.2	95.6	0.0	-	14.5	82.9	2.6	0.0	-	-
Total %	0.4	0.2	7.2	0.0	7.8	0.9	38.9	12.5	0.0	52.3	0.0	0.0	1.9	0.0	2.0	5.5	31.4	1.0	0.0	37.9	-
PHF	0.400	0.417	0.810	0.000	0.754	0.750	0.954	0.930	0.000	0.959	0.250	0.250	0.768	0.000	0.804	0.769	0.971	0.917	0.000	0.955	0.973
Lights	7	5	161	0	173	21	848	278	0	1147	1	1	43	0	45	122	694	21	0	837	2202
% Lights	87.5	100.0	99.4	-	98.9	100.0	97.5	99.6	-	98.0	100.0	100.0	100.0	-	100.0	99.2	98.7	95.5	-	98.7	98.4
Mediums	0	0	1	0	1	0	19	1	0	20	0	0	0	0	0	1	8	0	0	9	30
% Mediums	0.0	0.0	0.6	-	0.6	0.0	2.2	0.4	-	1.7	0.0	0.0	0.0	-	0.0	0.8	1.1	0.0	-	1.1	1.3
Articulated Trucks	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	0	1	1	0	2	6
% Articulated Trucks	12.5	0.0	0.0	-	0.6	0.0	0.3	0.0	-	0.3	0.0	0.0	0.0	-	0.0	0.0	0.1	4.5	-	0.2	0.3

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Turning Movement Peak Hour Data Plot (4:30 PM)

ADJUSTMENT FACTOR FOR EXISTING (2021) TRAFFIC VOLUMES

ROANOKE NORTH RESIDENTIAL DEVELOPEMNT TIA ADJUSTMENT OF EXISTING (2021) PEAK HOUR TRAFFIC VOLUMES

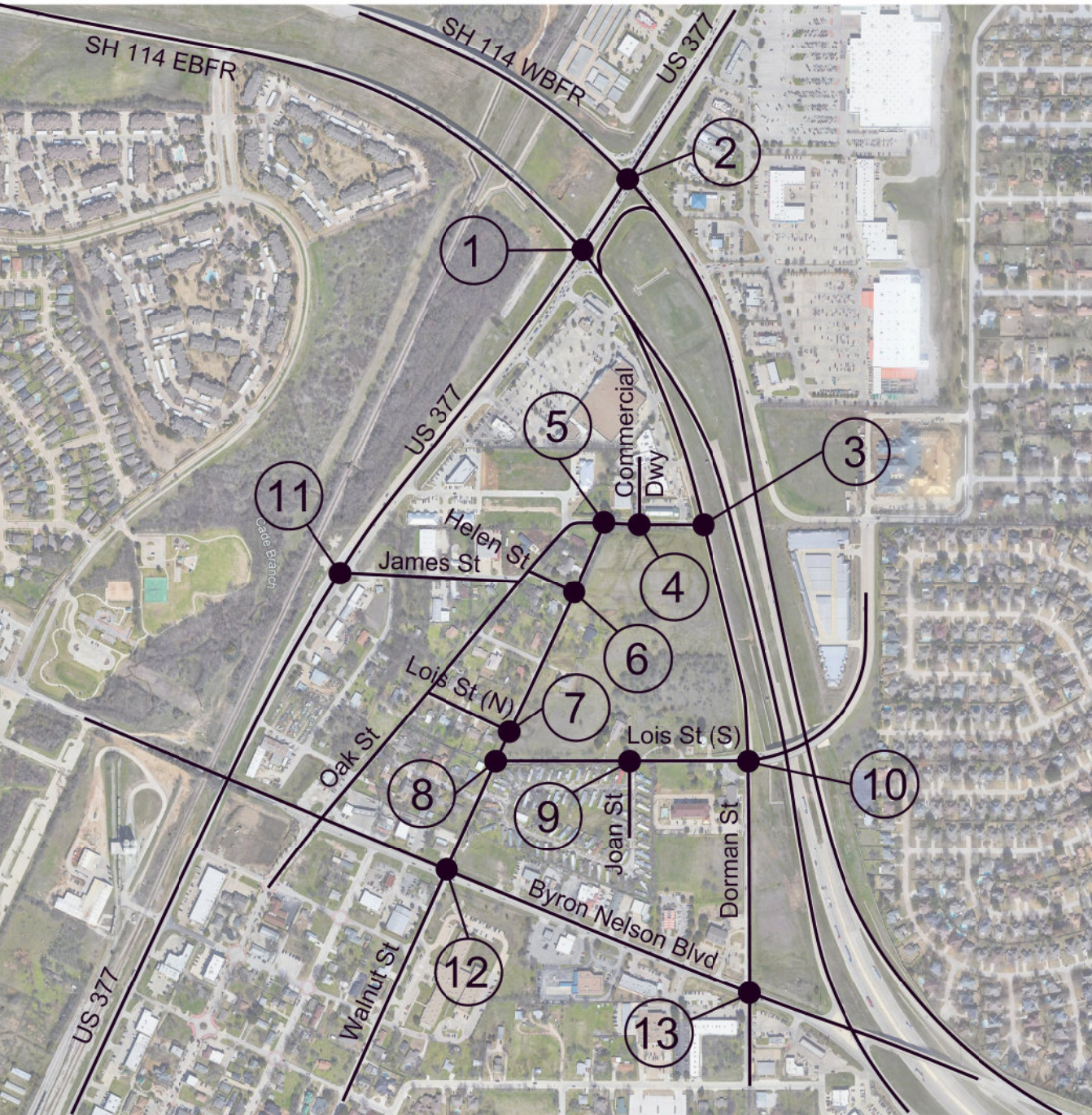
Since traffic volumes under existing conditions could potentially not represent typical conditions due to the COVID-19 pandemic, adjustment factors to apply to the existing traffic volumes collected were determined using the methodology below:

- 1) Existing traffic volumes were collected at the study intersections during the existing AM and PM peak hour traffic volumes (**Figure 5**) on Tuesday, August 31, 2021.
- 2) Hourly traffic volume data collected over a 24-hour period at five (5) locations in the study area were obtained from TxDOT's online Traffic Count Database System (TCDS):
 - US 377 – North of SH 114 WBFR
 - Oak Street – West of Dorman Road
 - Dorman Road – South of Oak Street
 - Walnut Street – North of Byron Nelson Boulevard
 - Walnut Street – South of Byron Nelson Boulevard

This data is provided in **Figures A1 to A5** and summarized in **Table A1**.

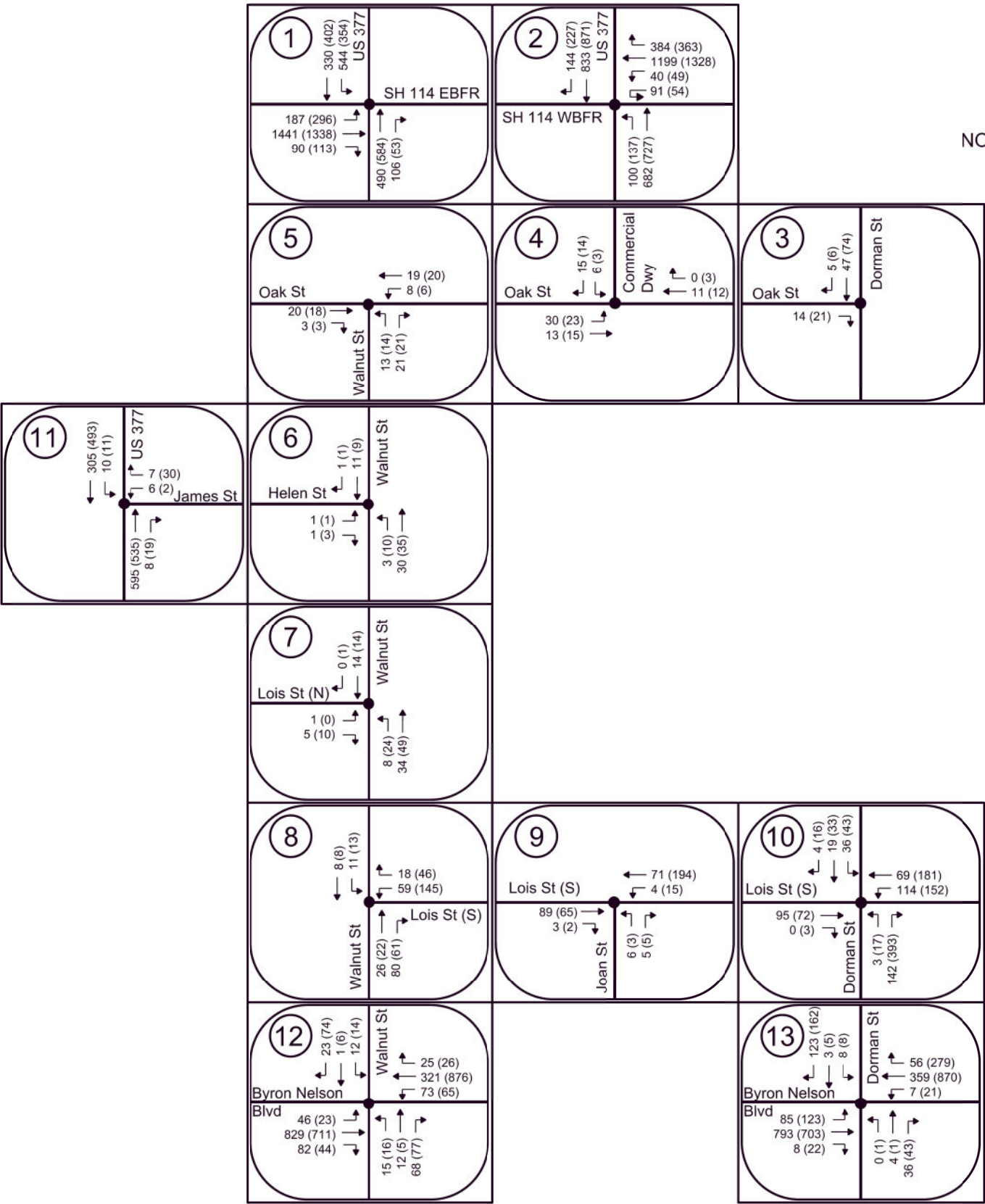
- 3) As described in the TIA, a five (5) percent annual growth rate was assumed. This 5% annual growth rate was applied to the TCDS data to project 2021 TCDS peak hour traffic volumes, which are also summarized in **Table A1**.
- 4) Comparisons between the Projected 2021 TCDS and Existing (8/31/21) traffic volume data are summarized in **Table A1**, which shows the calculated adjustment factors for the AM and PM peak hours based on this information:
 - AM Peak Hour = 1.22
 - PM Peak Hour = 1.10

The revised existing (2021) traffic volumes used in this study are presented in **Figure 6** and represent the application of the adjustment factors to the existing peak hour traffic volumes (Figure 5).



LEGEND
 ● STUDY INTERSECTION
 AM (PM) PEAK HOUR VOLUMES

* AM and PM Traffic volumes collected on Tuesday, August 31, 2021.



Initial Existing (2021) Peak Hour Traffic Volumes

Figure 5

Figure A1: TCDS Data – US 377 (North of SH 114 WBFR)

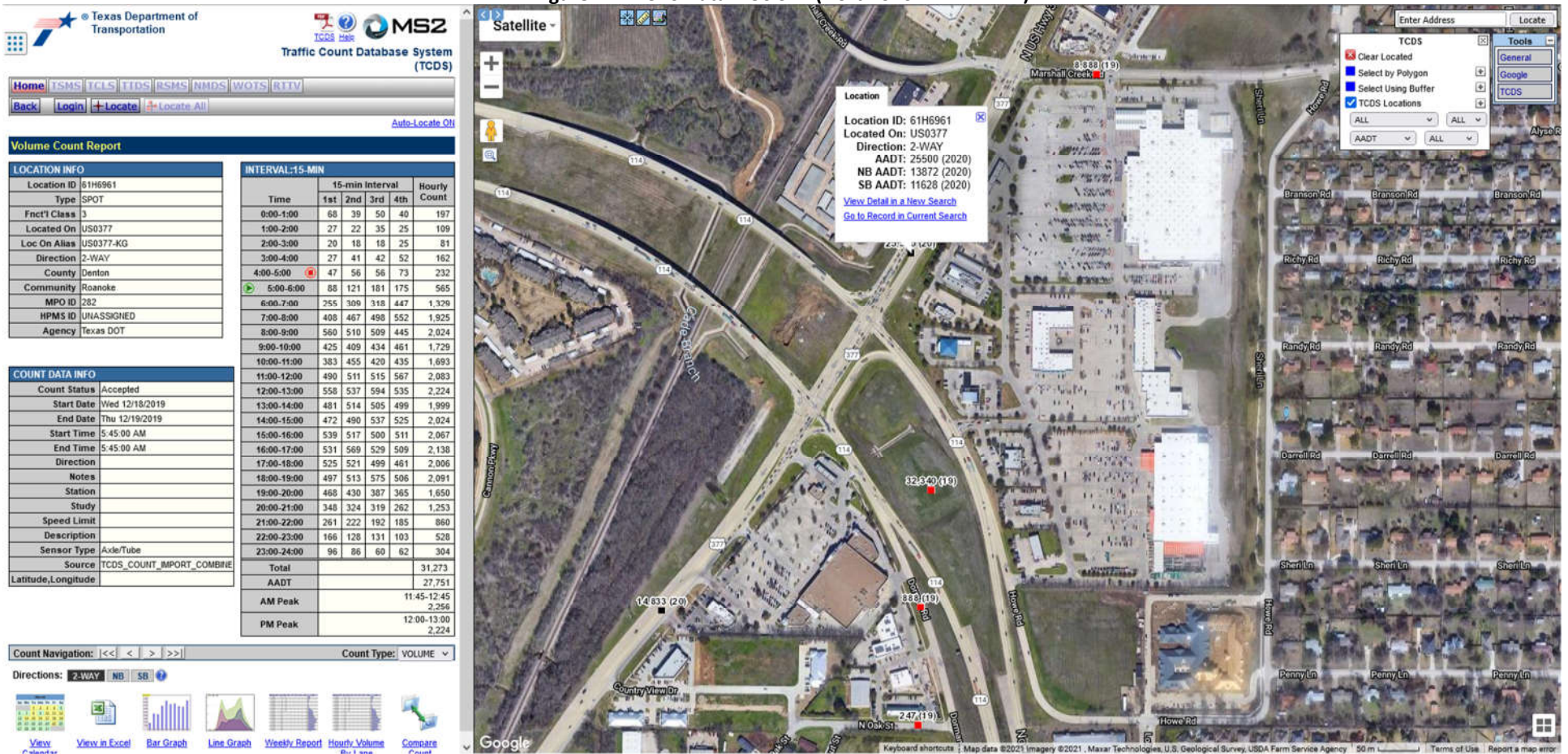
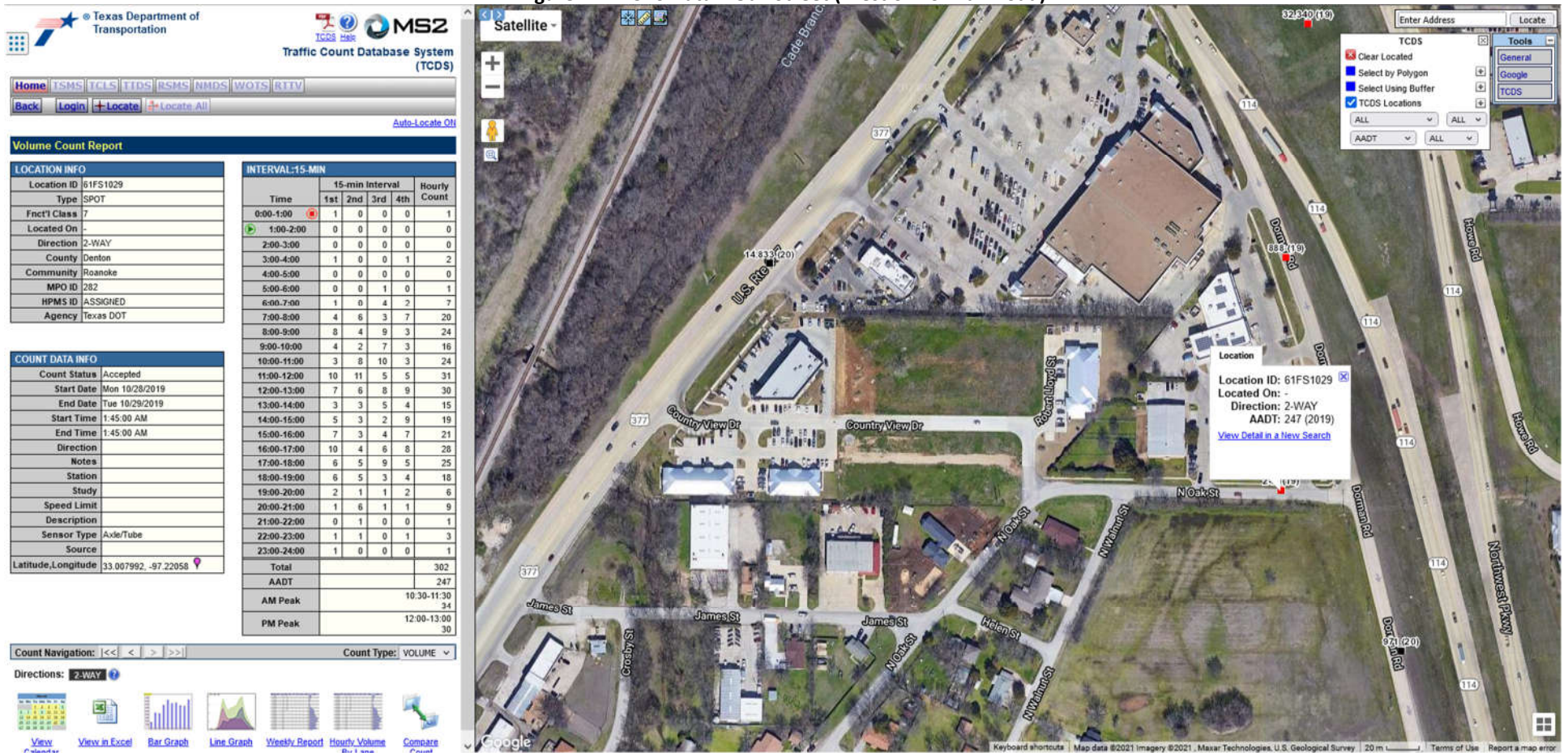


Figure A2: TCDS Data – Oak Street (West of Dorman Road)



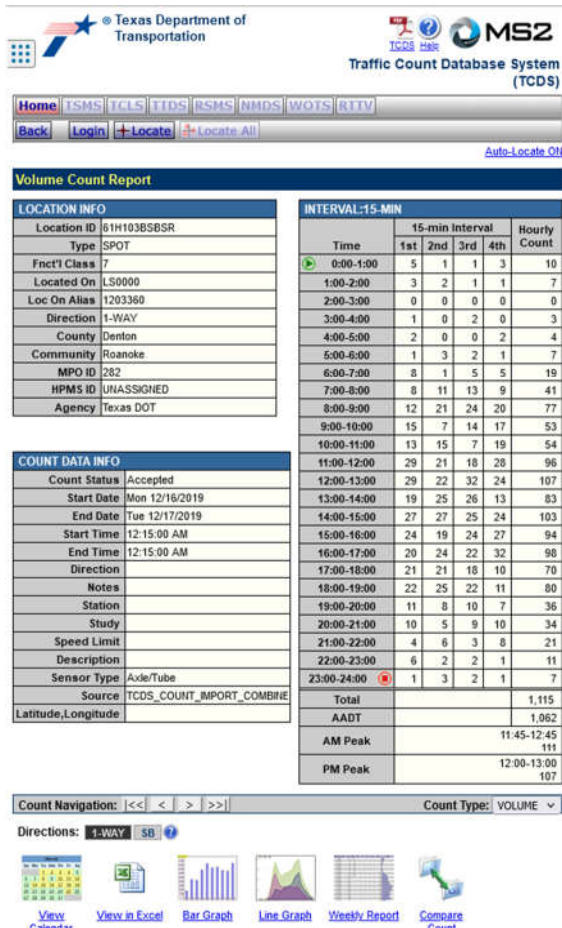


Figure A3: TCDS Data – Dorman Road (South of Oak Street)

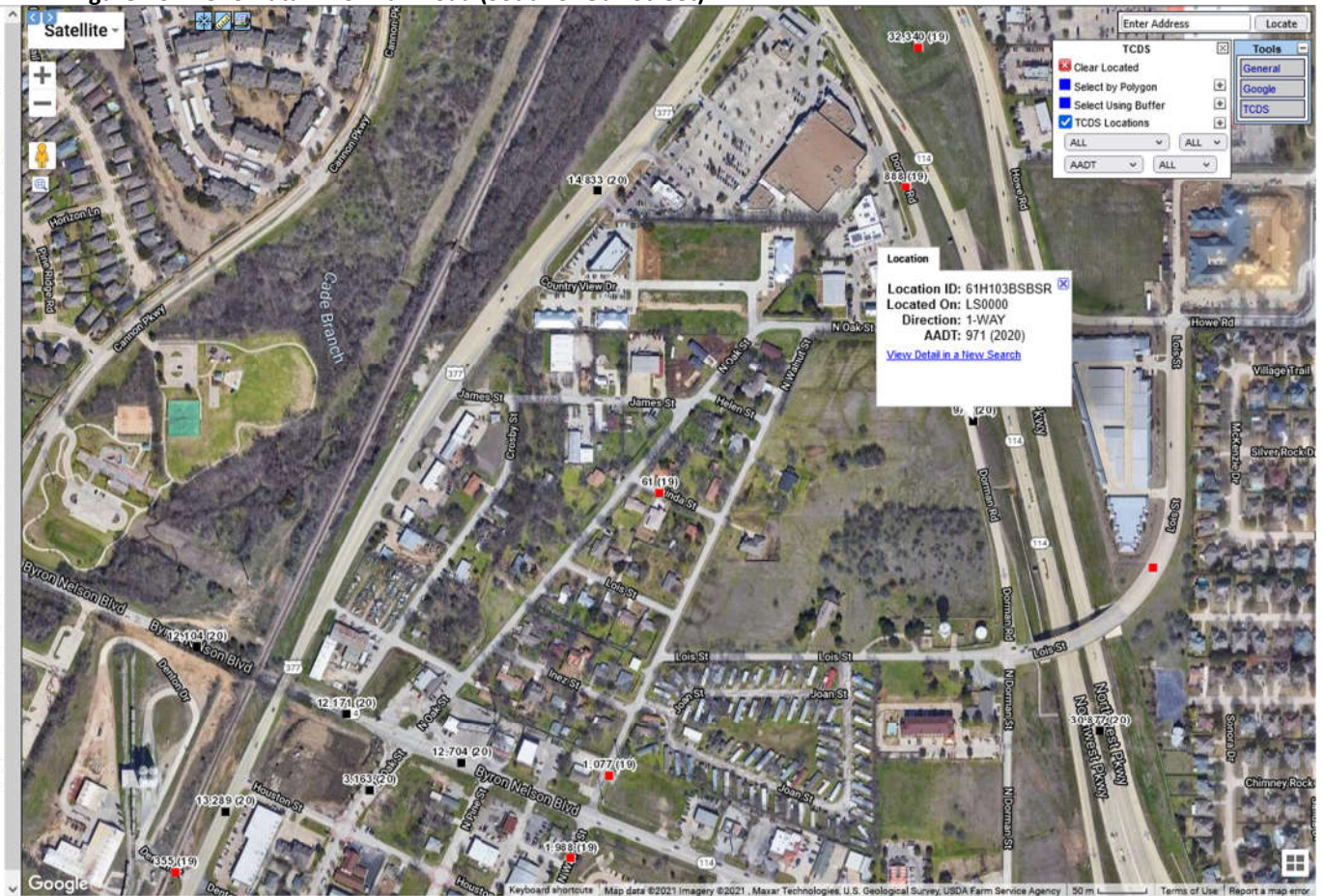


Figure A4: TCDS Data – Walnut Street (North of Byron Nelson Boulevard)

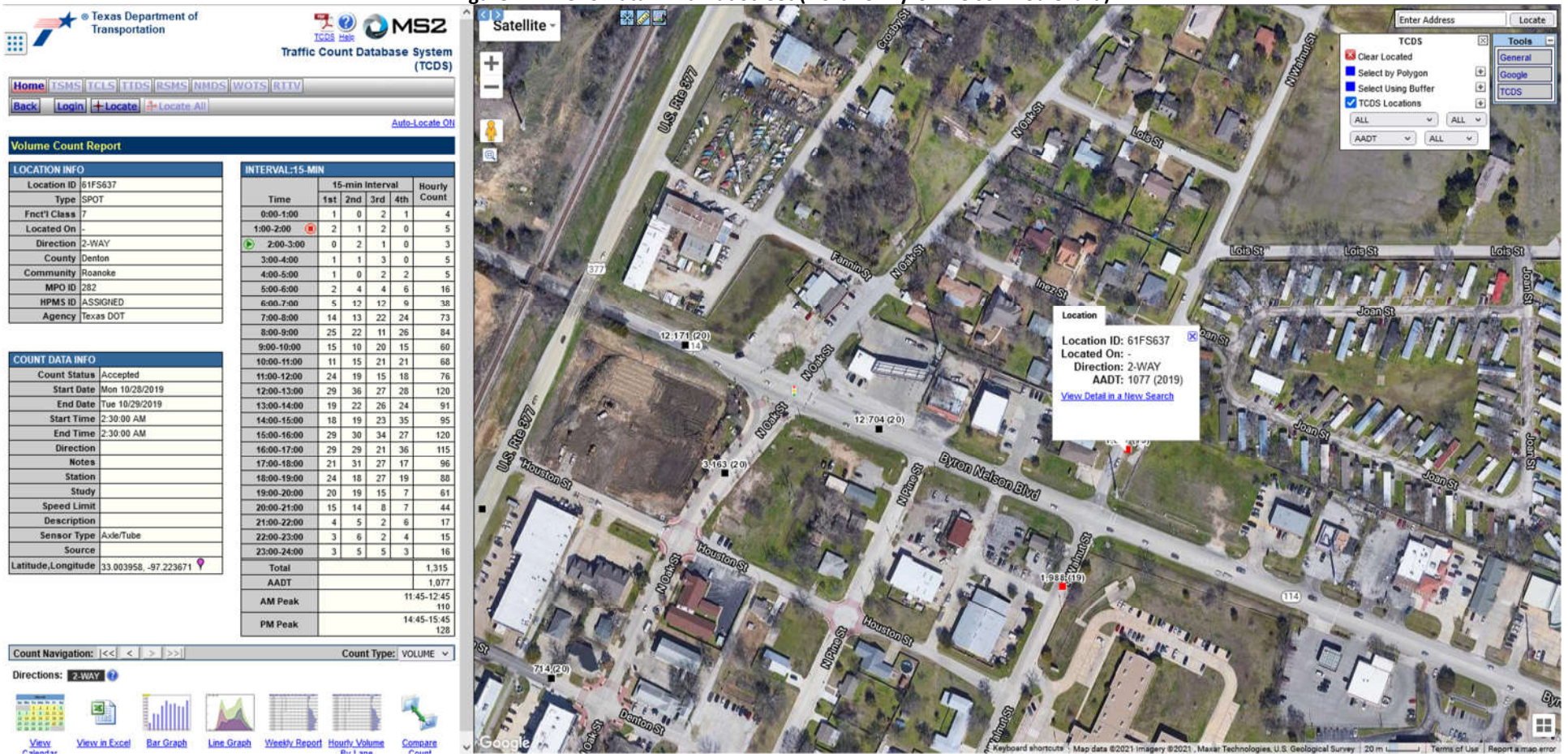


Figure A5: TCDS Data – Walnut Street (South of Byron Nelson Boulevard)

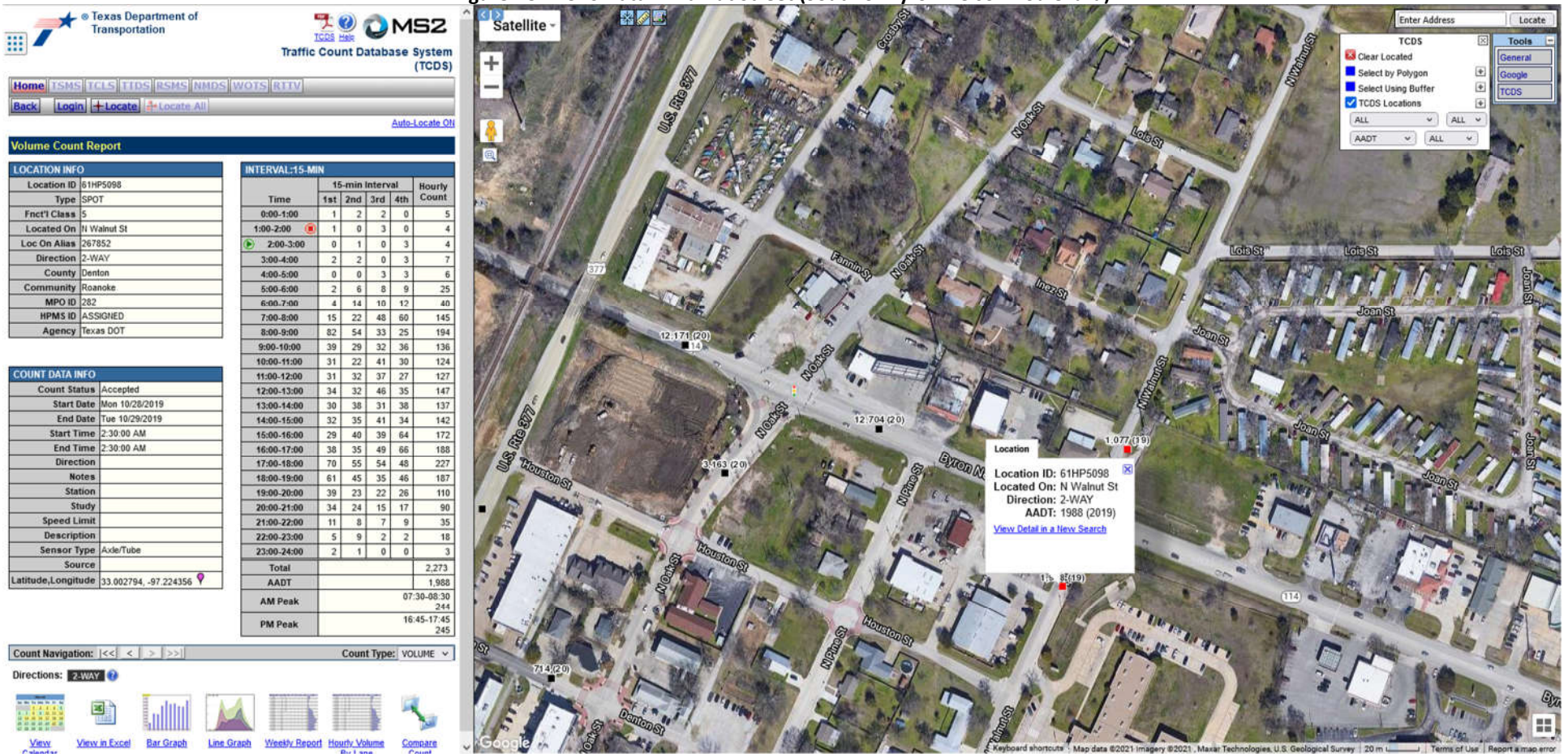
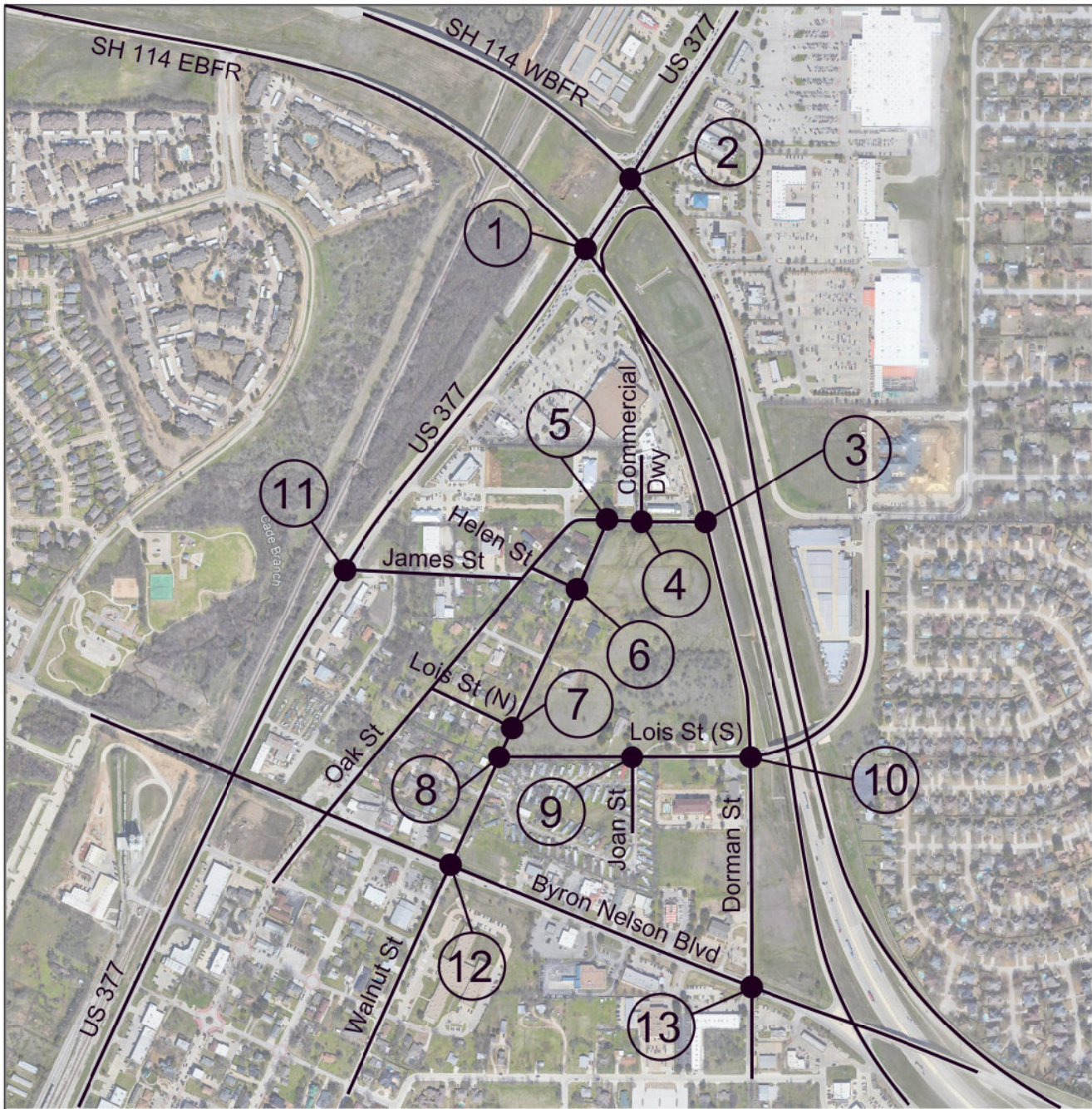


Table A1: COVID Adjustment Factor Calculations

AM PEAK HOUR								
TxDOT TCDS Location	2-WAY VOLUMES							COMPARISON
	TCDS				EXISTING TMCs			Previous Counts (Grown to 2021) : Existing TMC
	DATE	TIME	Volumes	Grown to 2021 (5% annually)	DATE	TIME	EXISTING (2021)	
US 377 - N of SH 114 WBFR	12/18/2019	7:45 - 8:45 AM	2,131	2,344	8/31/2021	7:30 - 8:30 AM	2,043	1.15
Oak St - W of Dorman Rd	10/28/2019	7:45 - 8:45 AM	28	31	8/31/2021	7:45 - 8:45 AM	19	1.63
Dorman Rd - S of Oak St	12/16/2019	8:00 - 9:00 AM	77	85	8/31/2021	7:45 - 8:45 AM	61	1.39
Walnut St - N of Byron Nelson Blvd	10/28/2019	7:30 - 8:30 AM	93	102	8/31/2021	7:30 - 8:30 AM	119	0.86
Walnut St - S of Byron Nelson Blvd	10/28/2019	7:30 - 8:30 AM	244	268	8/31/2021	7:30 - 8:30 AM	251	1.07
AVERAGE							1.22	

PM PEAK HOUR								
TxDOT TCDS Location	2-WAY VOLUMES							COMPARISON
	TCDS				EXISTING TMCs			Previous Counts (Grown to 2021) : Existing TMC
	DATE	TIME	Volumes	Grown to 2021 (5% annually)	DATE	TIME	EXISTING (2021)	
US 377 - N of SH 114 WBFR	12/18/2019	4:00 - 5:00 PM	2,138	2,352	8/31/2021	4:00 - 5:00 PM	2,188	1.07
Oak St - W of Dorman Rd	10/28/2019	4:00 - 5:00 PM	28	31	8/31/2021	4:30 - 5:30 PM	27	1.15
Dorman Rd - S of Oak St	12/16/2019	4:15 - 5:15 PM	99	109	8/31/2021	4:30 - 5:30 PM	95	1.15
Walnut St - N of Byron Nelson Blvd	10/28/2019	4:00 - 5:00 PM	115	127	8/31/2021	4:30 - 5:30 PM	148	0.86
Walnut St - S of Byron Nelson Blvd	10/28/2019	4:45 - 5:45 PM	245	270	8/31/2021	4:30 - 5:30 PM	213	1.27
AVERAGE							1.10	



LEGEND

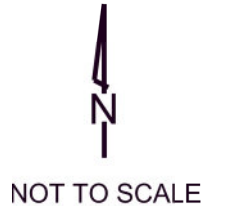
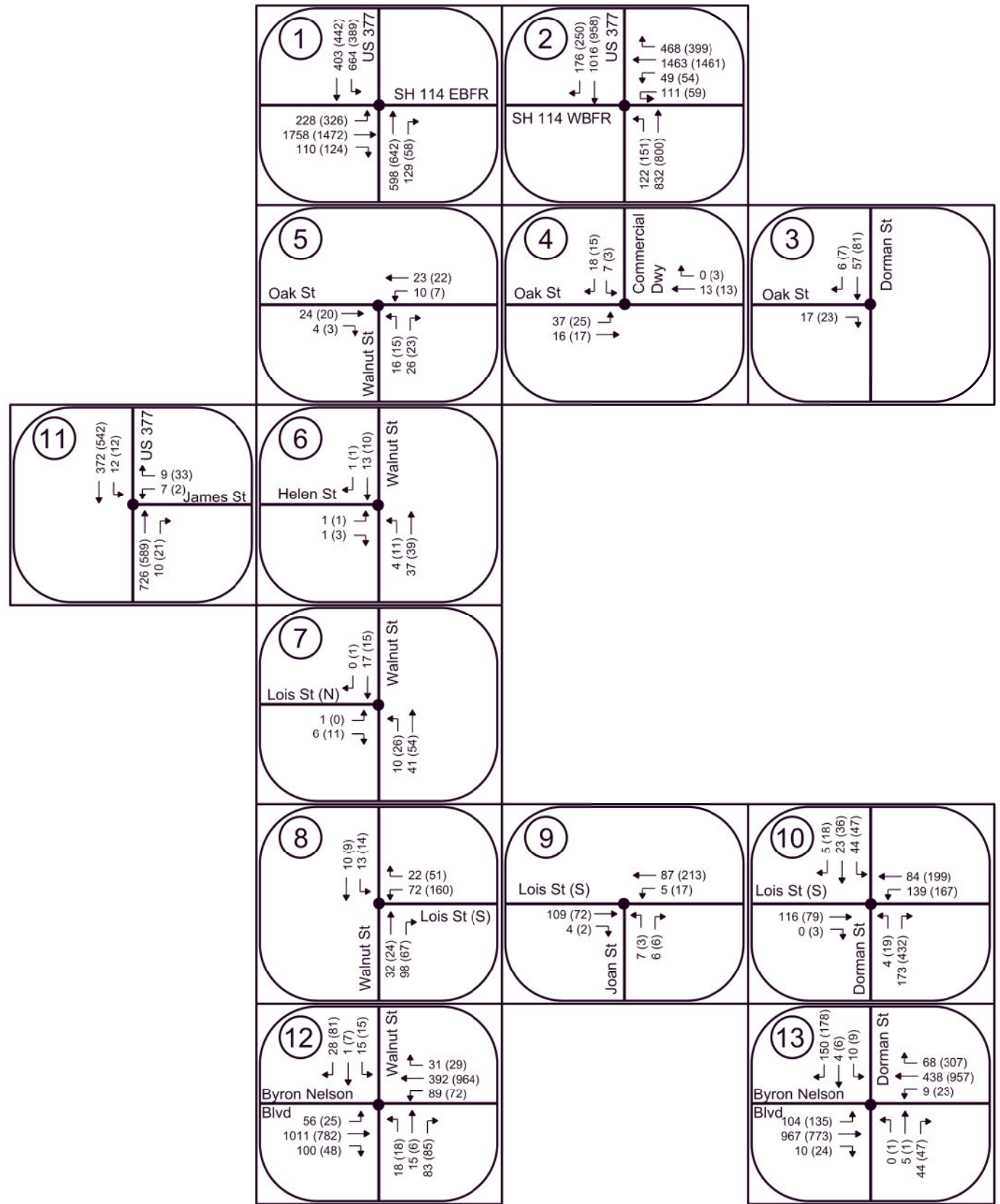
● STUDY INTERSECTION

AM (PM) PEAK HOUR VOLUMES

* The following adjustment factors were applied to the initial existing traffic volumes in Figure 5 in an attempt to reflect "typical" operations:

AM Peak Hour = 1.22

PM Peak Hour = 1.10



EXISTING TRAFFIC SIGNAL TIMING SHEETS

Configuration Phase Sequence

Controller Sequence (MM)1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sequence 1																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.

Sequence 12

Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.

Sequence 13

Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Sequence 14

Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Sequence 15

Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Sequence 16

Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Phases In Use / Exclusive PED (MM)1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases in Use	X	X		X	X	X		X								
Exclusive PED																

Phase Compatibility (MM)1-1-2

Phase	Compatible Phase
1	5
1	6
2	5
2	6
3	7
3	8
4	7
4	8
9	11
9	12
10	11
10	12
13	15
13	16
14	15
14	16

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Overlap	A	B	C	D	E	F	G	H	I	J	L	K	L	M	N	O
Description																

Administration (MM)1-7-1

Enable CU/Cabinet Interlock
CRC No

Request Download
Controller Data No

Controller Database CRC 0000

Enable Automatic Backup to
Datakey No

Backup Prevent (MM)1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing /	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Backup	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Simultaneous Gap (MM)1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MMU Channel) (MM)1-3

Phase / Type Dimming Power Up Auto Flash

APPENDIX

Overlap			Red	Yellow	Green	Dark	Auto	Red	Yellow	Dark	Red	Yellow	Together
1	0					+	X				X		X
2	2	V				+	X				X		
3	0					+	X				X		
4	5	O				+	X				X		
5	0					+	X				X		
6	6	V				+	X				X		X
7	0					+	X				X		X
8	6	O				+	X				X		X
9	0					+	X				X		X
10	0					+	X				X		
11	0					+	X				X		
12	0					+	X				X		X
13	1	O				+	X						
14	2	O				+	X						
15	3	O				+	X						
16	4	O				+	X						

Roanoke - SH 114 at US 377

Configuration Port 1 (SDLC)

SDLC Options (MM)1-4-1

BIU	1	2	3	4	5	6	7	8
Term and Facility Enable	X	X						
Detector Rack Enable	X	X						

Enable TS2/MMU Type Cabinet: Yes
Enable MMU Extended Status: Yes
Enable SDLC Stop Time: No
Enable 3 Critical RFE's Lockup: No

MMU Program (MM)1-4-2

Channel Can Serve with
Channel

Channel 1	Channel 2
1	5
1	6
1	8
1	14
1	15
1	16
2	5
2	6
2	8
2	13
2	14
2	15
2	16
4	5
4	6
4	8
4	15
4	16
5	13
5	14
5	16
6	13
6	14

6	15
6	16
8	13
8	14
13	14
13	15
13	16
14	15
14	16
15	16

Color Check Enable (MM)1-4-3

Enable Color Check: No

MMU Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Secondary To Secondary Addressing (MM)1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term and Facility Enable									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack Enable									

Diagnostics (Test Fixture) Enable: No

Configuration Communications**Ethernet Port Configuration (MM)1-5-1 NTCIP Parameters (MM)1-5-5**

Controller IP:	10.70.10.51	Backup Time:	0
Subnet Mask:	255.255.255.0	UDP Port:	501
Default Gateway IP:	10.70.10.1	Ethernet Priority:	1
Server IP:	10.70.10.1	Port 2 Priority:	4
		Port 3A Priority:	2
		Port 3B Priority:	3

Port Configuration (MM)1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Protocol	Terminal	NTCIP	AB3418
Enable	No	Yes	No
Data Rate	1200	9600	4800
Data Parity Stop	7 N 1	8 N 1	7 0 1
Modem Setup String	None	None	None
User String			
Comm Port Address	0	1	10
System Detector 9-1	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex Half/Full	Half	Full	Full
Flow Control	Yes	No	Yes
AB3418 NTCIP Group Address	0	0	0
AB3418 NTCIP Single Flag Enable	No	No	No
RTS to CTS Delay	0.0	0.0	14.0
RTS Turn Off Delay	0.0	0.0	2.0
Droupout Time	10	10	10
Early RTS	No	No	No
Telemetry Mode	FSK	FSK	FSK
Rail Road	0	0	0
Rail Road Line	0	0	0
ATCS Group	0	0	0
Wayside Device	0	0	0
ATCS Device	0	0	0
Wayside SubNode	0	0	0
ATCS SubNode	0	0	0

ECPIP Parameters (MM)1-5-6

Controller Address: 10
Expanded System Detector Address: 0

Local System Detector
Local System
Detector Number

Configuration Logging/Display

Event Logging (MM)1-6-1

Critical RFE's	Yes	3 Critical RFE's in 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Faults	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preempt	Yes	TSP	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online/Offline	Yes		

Alarm Log	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM)1-7-2

Key Click Enable:	No
Backlight Enable:	Yes
LED Mode:	Auto
Main Status Display Mode:	Advanced
Screen Format:	Advanced
Trans Mode Pop-up Disable:	No

Sign On (MM)8-5

Sign On Message Line 1: Diamond Controllers
Sign On Message Line 2:

Roanoke - SH 114 at US 377

Logic Processor Page 1

Statement Control (MM)1-8-1

LP	Statement Control
1	E
2	E

Logic Processor Page 2

Logic Statements (MM)1-8-2

Statement Number: 1

IF:

	Assignment	#		State
IF	DETECTOR	3	IS	ON

THEN:

	Assignment	#		State
	CALL PHASE	1		ON

ELSE:

	Assignment	#		State
--	------------	---	--	-------

Statement Number: 2

IF:

	Assignment	#		State
IF	DETECTOR	7	IS	ON

THEN:

	Assignment	#		State
	CALL PHASE	5		ON

ELSE:

	Assignment	#		State
--	------------	---	--	-------

Controller Timing Plan (MM)2-1**Plan 3**

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	7	10	5	20	7	10	5	20	5	20	2	2	5	20	2	2
BK Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	1.5	1.5	1.0	1.5	1.5	1.5	1.0	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Vehicle Ext 2	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	30	30	25	60	25	35	25	60	25	40	2	2	25	40	2	2
Max 2	35	30	50	85	30	35	50	85	50	90	4	4	50	90	4	4
Max 3	50	45	0	100	50	45	0	100	0	110	0	0	0	110	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Stp	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
Yellow	3.6	4.7	3.5	5.0	3.6	4.7	3.5	5.0	3.5	5.0	3.5	3.5	3.5	5.0	3.5	3.5
Red Clear	1.4	1.0	1.5	1.7	1.4	1.0	1.5	1.7	1.5	1.7	1.5	1.5	1.5	1.7	1.5	1.5
Red Max	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
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	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
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPT Duc	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
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	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

Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	7	10	5	15	7	10	5	15	1	1	2	5	1	1	2	5
BK Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	1.5	1.5	1.0	1.5	1.5	1.5	1.0	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Vehicle Ext 2	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max 1	15	20	25	35	15	20	25	35	1	1	2	5	1	1	2	5
Max 2	35	30	50	85	30	35	50	85	50	90	4	4	50	90	4	4
Max 3	50	45	0	100	50	45	0	100	0	110	0	0	0	110	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Stp	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
Yellow	3.6	4.7	3.5	5.0	3.6	4.7	3.5	5.0	3.5	5.0	3.5	3.5	3.5	5.0	3.5	3.5
Red Clear	1.4	1.0	1.5	1.7	1.4	1.0	1.5	1.7	1.5	1.7	1.5	1.5	1.5	1.7	1.5	1.5
Red Max	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
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	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
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPT Duc	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
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	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

Controller Overlaps

Overlap	Type	Vehicle Overlaps (MM)2-2			
		Lag Green	Yellow	Red	Advance Green
A	Normal	0.0	0.0	0.0	0.0
B	Normal	0.0	0.0	0.0	0.0
C	Normal	0.0	0.0	0.0	0.0
D	Normal	0.0	0.0	0.0	0.0
E	Normal	0.0	0.0	0.0	0.0
F	Normal	0.0	0.0	0.0	0.0

Overlap	Phase	Included	Protect	Phases		Modifier	Lag X Phase	Lag 2 Phase	Flash Green
				Ped Protect	Not Overlap				
A	1	Yes	No	No	No		No	No	0
A	9	Yes	No	No	No		No	No	0
A	10	Yes	No	No	No		No	No	0
B	1	Yes	No	No	No		No	No	0
B	2	Yes	No	No	No		No	No	0
B	9	Yes	No	No	No		No	No	0
B	10	Yes	No	No	No		No	No	0
C	5	Yes	No	No	No		No	No	0
C	13	Yes	No	No	No		No	No	0
C	14	Yes	No	No	No		No	No	0
D	5	Yes	No	No	No		No	No	0
D	6	Yes	No	No	No		No	No	0
D	13	Yes	No	No	No		No	No	0
D	14	Yes	No	No	No		No	No	0
E	4	Yes	No	No	No		No	No	0
E	12	Yes	No	No	No		No	No	0
F	8	Yes	No	No	No		No	No	0
F	16	Yes	No	No	No		No	No	0

PPLT FYA

Overlap	Protected Phase	Permissive Phase	Flash Arrow Output	Flash Arrow Channel	FYA Delay	FYA Clearance	Special Function Disable
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Guaranteed Minimum Time Data (MM) 2-4
Phase Time Data

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	0	0	7	3.0	0.0	0
B02	0	0	7	3.0	0.0	0
C03	0	0	7	3.0	0.0	0
D04	0	0	7	3.0	0.0	0
E05	0	0	7	3.0	0.0	0
F06	0	0	7	3.0	0.0	0
G07	0	0	7	3.0	0.0	0
H08	0	0	7	3.0	0.0	0
I09	0	0	7	3.0	0.0	0
J10	0	0	7	3.0	0.0	0
K11	0	0	7	3.0	0.0	0
L12	0	0	7	3.0	0.0	0
M13	0	0	7	3.0	0.0	0
N14	0	0	7	3.0	0.0	0
O15	0	0	7	3.0	0.0	0
P16	0	0	7	3.0	0.0	0

Roanoke - SH 114 at US 377

Controller Pedestrian Overlaps

Pedestrian Overlaps (MM) 2-3

Included Phase Ped Overlap

Coordination Options

Coordination Options (MM)3-1

Manual Pattern	Auto	ECPI Coord	No
System Source	TBC	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell/Add Time	5		
Delay Coord Walk to LZ	No	Force Off	Fixed
Offset Reference	Lead	Use Ped Time	No
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Initial Green	Yes
Re-Sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM)3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM)3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Coordination Pattern Data
Pattern Data (MM)3-2

Pattern - 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits in	Seconds
Cycle	180	Std (COS)	111	Offsets in	Seconds
Offset Value	111s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 1)	50	35	0	95	30	55	0	95	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Disp.	-	0	0	0
Split Sum	180s	180s	0s	0s

Misc. Data

Veh. Permissive 1	0	Veh. Permissive 2	0	Veh. Permissive 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern Data

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phases				X				X								
Vehicle Recalls																
Ped Recalls																
Max Recalls																
Phase Omit											X	X			X	X
Special Function Output																

Pattern - 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits in	Seconds
Cycle	180	Std (COS)	121	Offsets in	Seconds
Offset Value	110s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 2)	30	45	0	105	40	35	0	105	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Disp.	-	0	0	0
Split Sum	180s	180s	0s	0s

Misc. Data

Veh. Permissive 1	0	Veh. Permissive 2	0	Veh. Permissive 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern Data

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phases				X				X								
Vehicle Recalls																
Ped Recalls																
Max Recalls																
Phase Omit											X	X			X	X
Special Function Output																

Pattern - 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits in	Seconds
Cycle	90	Std (COS)	131	Offsets in	Seconds
Offset Value	88s	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Splits (Split Pat 3)	24	26	0	40	24	26	0	40	0	0	0	0	0	0	0	0
Preference 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preference 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Disp.	-	0	0	0
Split Sum	90s	90s	0s	0s

Misc. Data

Veh. Permissive 1	0	Veh. Permissive 2	0	Veh. Permissive 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern Data

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coordinated Phases		X				X										
Vehicle Recalls																
Ped Recalls																
Max Recalls																
Phase Omit											X	X			X	X
Special Function Output																

Preemptor

Preempt Plan (MM)4-1

Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Track Clear Vehicle																
Track Clear Overlap																
Enable Trailing																
Dwell Vehicle		X			X											
Dwell Ped																
Dwell Overlap				X												
Cycling Vehicle																
Cycling Ped																
Cycling Overlap																
Exit Phase																
Exit Calls																
Special Function	X															

Enable	Yes	Preempt Override	No	Interlock Enable	No
Detector Lock	No	Delay	0	Inhibit	0
Override Flash	No	Duration	0	CLR > GRN	No
Term Overlap Asap	No	PC Through Yellow	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	Flash Exit Color	Green	Exit Option	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Preempt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	0	25.5	25.5
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	25.5	25.5

	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	5	0.0	90	2.0	4.0

Preempt Active Out On Preempt Active Dwell No

Other Priority Preempt On Non-Priority Preempt No

Inhibit Extension Time 0.0 Ped Priority Return Off

Veh Priority Return Off Queue Delay Off

Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return % Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Track Clear Vehicle																
Track Clear Overlap																
Enable Trailing																
Dwell Vehicle	X					X										
Dwell Ped																
Dwell Overlap		X														
Cycling Vehicle																
Cycling Ped																
Cycling Overlap																
Exit Phase																
Exit Calls																
Special Function					X											

Enable Yes Preempt Override Yes Interlock Enable No

Detector Lock No Delay 0 Inhibit 0

Override Flash No Duration 0 CLR > GRN No

Term Overlap Asap No PC Through Yellow No Terminate Phase No

Ped Dark No Track Clear Rsrv No Dwell Flash Off

Linked Pmt 0 Flash Exit Color Green Exit Option Off

Exit Timing Plan 0 Reservice 0 Fault Type Hard

Ring	1	2	3	4
Free During Preempt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	0	25.5	25.5
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	25.5	25.5
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	5	0.0	90	2.0	4.0

Preempt Active Out On Preempt Active Dwell No

Other Priority Preempt On Non-Priority Preempt No

Inhibit Extension Time 0.0 Ped Priority Return Off

Veh Priority Return Off Queue Delay Off

Conditional Delay Off

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return % Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Plan 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Track Clear Vehicle																
Track Clear Overlap																
Enable Trailing																
Dwell Vehicle				X												
Dwell Ped																
Dwell Overlap					X											
Cycling Vehicle																
Cycling Ped																
Cycling Overlap																
Exit Phase																
Exit Calls																
Special Function																

Enable Yes Preempt Override No Interlock Enable No

Detector Lock No Delay 0 Inhibit 0

Override Flash	No	Duration	0	CLR > GRN	No
Term Overlap Asap	No	PC Through Yellow	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	Flash Exit Color	Green	Exit Option	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Preempt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	0	25.5	25.5
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	25.5	25.5
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	90	25.5	25.5

Preempt Active Out	On	Preempt Active Dwell	No
Other Priority Preempt	On	Non-Priority Preempt	No
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return % Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Plan 6

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Track Clear Vehicle																
Track Clear Overlap																
Enable Trailing																
Dwell Vehicle								X								
Dwell Ped																
Dwell Overlap						X										
Cycling Vehicle																
Cycling Ped																

Cycling Overlap																
Exit Phase																
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Detector Lock	No	Delay	0	Inhibit	0
Override Flash	No	Duration	0	CLR > GRN	No
Term Overlap Asap	No	PC Through Yellow	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	Flash Exit Color	Green	Exit Option	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Preempt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	0	25.5	25.5
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	25.5	25.5
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	90	25.5	25.5

Preempt Active Out	On	Preempt Active Dwell	No
Other Priority Preempt	On	Non-Priority Preempt	No
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return % Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Roanoke - SH 114 at US 377

Time Base Clock/Calendar

Clock/Calendar Options (MM)5-1

Enable Action Plan: 0
Sync Reference Time: 12:00 AM
Sync Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: -6

Time Base Action Plan
Action Plan (MM)5-2

Action Plan - 1

Pattern	254 - FREE	Override System	No
Timing Plan	3	Sequence	18
Veh Det Plan	3	Detector Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Diming Enable	No	Veh Priority Return	No
Ped Priority Return	No	Queue Delay	No
Preempt Cond Delay	No		

AM

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2				X				X								
Veh Recall																
Max Recall																
Max 2				X				X								
Max 3																
CS Inhibit																
Omit																
Special Function																
Auxilliary Function																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15															
LP 16-30															
LP 31-45															
LP 46-60															
LP 61-75															
LP 76-90															
LP 91-100															

Action Plan - 2

Pattern	254 - FREE	Override System	No
Timing Plan	3	Sequence	18
Veh Det Plan	3	Detector Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Diming Enable	No	Veh Priority Return	No
Ped Priority Return	No	Queue Delay	No
Preempt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-------	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----

Ped Recall

Walk 2

Veh Ext 2				X				X								
-----------	--	--	--	---	--	--	--	---	--	--	--	--	--	--	--	--

Veh Recall

Max Recall

Max 2

Max 3				X				X								
-------	--	--	--	---	--	--	--	---	--	--	--	--	--	--	--	--

CS Inhibit

Omit

Special
FunctionAuxilliary
Function

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
--	---	---	---	---	---	---	---	---	---	----	----	----	----	----	----

LP 1-15

LP 16-30

LP 31-45

LP 46-60

LP 61-75

LP 76-90

LP 91-100

Action Plan - 3

Pattern	254 - FREE	Override System	No
Timing Plan	3	Sequence	18
Veh Det Plan	3	Detector Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Diming Enable	No	Veh Priority Return	No
Ped Priority Return	No	Queue Delay	No
Preempt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2				X				X								
Veh Recall																
Max Recall																
Max 2				X				X								
Max 3																
CS Inhibit																
Omit																
Special																
Function																
Auxilliary																
Function																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15															
LP 16-30															
LP 31-45															
LP 46-60															
LP 61-75															
LP 76-90															
LP 91-100															

Action Plan - 4

Pattern	4	Override System	No
Timing Plan	0	Sequence	0
Veh Det Plan	0	Detector Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Diming Enable	No	Veh Priority Return	No
Ped Priority Return	No	Queue Delay	No
Preempt Cond Delay	No		

Phase 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Ped Recall

Walk 2

Veh Ext 2

Veh Recall

Max Recall

Max 2

Max 3

CS Inhibit

Omit

Special

Function

Auxilliary

Function

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

LP 1-15

LP 16-30

LP 31-45

LP 46-60

LP 61-75

LP 76-90

LP 91-100

Action Plan - 100

Pattern	254 - FREE	Override System	No
Timing Plan	3	Sequence	18
Veh Det Plan	3	Detector Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Diming Enable	No	Veh Priority Return	No
Ped Priority Return	No	Queue Delay	No
Preempt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2				X												
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Special Function																
Auxilliary Function																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
LP 1-15																
LP 16-30																
LP 31-45																
LP 46-60																
LP 61-75																
LP 76-90																
LP 91-100																

Roanoke - SH 114 at US 377

Time Base Day Plan/Schedule
Day Plan (MM)5-3

Day Plan - 1

Event	Action Plan	Start Time
1	100	12:00 AM
2	1	6:00 AM
3	3	8:30 AM
4	2	1:30 PM
5	3	7:30 PM
6	100	8:00 PM

Day Plan - 2

Event	Action Plan	Start Time
1	100	12:00 AM
2	3	7:30 AM
3	100	7:00 PM

Schedule (MM)5-4

Schedule Number - 1

Day Plan Number: 1

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	X	X	X	X	X	X	X	X	X	X	X	X

Day of Week	Sun	Mon	Tue	Wed	Thur	Fri	Sat
		X	X	X	X	X	

Day of Month	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan Number: 2

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	X	X	X	X	X	X	X	X	X	X	X	X

Day of Week	Sun	Mon	Tue	Wed	Thur	Fri	Sat
	X						X

Day of Month	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Time Base Exceptions

Exception Day Program (MM)5-5					
Day	Fixed/Float	Month	Day of Week/Month	Week of Month/Year	Day Plan
1	FIXED	1	1	0	3
2	FLOAT	11	5	4	3
3	FIXED	12	25	0	3

Roanoke - SH 114 at US 377

Detectors

Detectors Page 1

Vehicle Detectors Setup (MM)6-1			
Vehicle Plan	Detector Number	Called	Type

Vehicle Detector Setup (MM)6-2 continued			
Detector Number	Type	TS2 Detector	Detector Description
1	N-NTCIP	No	
2	N-NTCIP	No	
3	N-NTCIP	No	
4	N-NTCIP	No	
5	N-NTCIP	No	
6	N-NTCIP	No	
7	N-NTCIP	No	
8	N-NTCIP	No	
9	N-NTCIP	No	
10	N-NTCIP	No	
11	N-NTCIP	No	
12	N-NTCIP	No	
13	N-NTCIP	No	
14	N-NTCIP	No	
15	N-NTCIP	No	
16	N-NTCIP	No	
17	N-NTCIP	No	
18	N-NTCIP	No	
19	N-NTCIP	No	
20	N-NTCIP	No	
21	N-NTCIP	No	
22	N-NTCIP	No	
23	N-NTCIP	No	
24	N-NTCIP	No	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	

32	N-NTCIP	Yes
33	N-NTCIP	Yes
34	N-NTCIP	Yes
35	N-NTCIP	Yes
36	N-NTCIP	Yes
37	N-NTCIP	Yes
38	N-NTCIP	Yes
39	N-NTCIP	Yes
40	N-NTCIP	Yes
41	N-NTCIP	Yes
42	N-NTCIP	Yes
43	N-NTCIP	Yes
44	N-NTCIP	Yes
45	N-NTCIP	Yes
46	N-NTCIP	Yes
47	N-NTCIP	Yes
48	N-NTCIP	Yes
49	N-NTCIP	Yes
50	N-NTCIP	Yes
51	N-NTCIP	Yes
52	N-NTCIP	Yes
53	N-NTCIP	Yes
54	N-NTCIP	Yes
55	N-NTCIP	Yes
56	N-NTCIP	Yes
57	N-NTCIP	Yes
58	N-NTCIP	Yes
59	N-NTCIP	Yes
60	N-NTCIP	Yes
61	N-NTCIP	Yes
62	N-NTCIP	Yes
63	N-NTCIP	Yes
64	N-NTCIP	Yes

Vehicle Detector Setup (MM)6-2 continued

Det Num	Veh Det Plan	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim / Discon. Time	Use Added Initial	Cross Switch Phase	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	3	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
1	2	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
1	3	0	No	No	15.0	Queue	0.0	0	No	0	None	No	No	No
1	4	0	No	No	15.0	Queue	0.0	0	No	0	None	No	No	No
2	1	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

2	2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	3	4	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
2	4	4	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
3	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	2	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	1	No	Yes	15.0	Passage	0.0	0	No	0	None	No	No	No
3	4	1	No	Yes	15.0	Passage	0.0	0	No	0	None	No	No	No
4	1	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	2	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	3	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	1	5	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
5	2	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	1	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	2	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	3	8	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
6	4	8	No	Yes	5.0	Passage	0.0	0	No	0	None	No	No	No
7	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	2	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	3	5	No	Yes	15.0	Passage	0.0	0	No	0	None	No	No	No
7	4	5	No	Yes	15.0	Passage	0.0	0	No	0	None	No	No	No
8	1	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	2	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	3	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	4	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	2	1	No	Yes	0.0	Passage	0.0	0	No	2	None	No	No	No
10	2	1	No	Yes	0.0	Passage	0.0	0	No	2	None	No	No	No
11	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	3	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	4	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	2	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	2	5	No	Yes	0.0	Passage	0.0	0	No	6	None	No	No	No
14	2	5	No	Yes	0.0	Passage	0.0	0	No	6	None	No	No	No
15	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	2	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	2	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	3	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	4	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
17	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
17	2	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
17	3	4	No	No	0.0	Passage	1.0	0	No	0	None	No	No	No

17	4	4	No	No	0.0	Passage	1.0	0	No	0	None	No	No	No
18	1	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
18	2	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
19	3	2	No	No	0.0	Passage	0.0	0	No	0	None	No	No	No
19	4	2	No	No	0.0	Passage	0.0	0	No	0	None	No	No	No
22	3	8	No	No	0.0	Passage	0.0	0	No	0	None	No	No	No
22	4	8	No	No	0.0	Passage	0.0	0	No	0	None	No	No	No
24	3	6	No	No	0.0	Passage	0.0	0	No	0	None	No	No	No
24	4	6	No	No	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Options (MM)6-3

Phase Ped Detector (NTCIP)

Local Ped Detector	Number
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Detectors

Detectors Page 2

Log - Speed Detector Setup (MM)6-4

NTCIP Log ECPI Log Period: Length Unit:
Period: 0 TBAP Inch

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap Length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM)6-5

Plan	Detector	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay
1	1	0	0	0	1	255	0
1	2	0	0	0	1	255	0
1	3	0	0	0	1	255	0
1	4	0	0	0	1	255	0
1	5	0	0	0	1	255	0
1	6	0	0	0	1	255	0
1	7	0	0	0	1	255	0
1	8	0	0	0	1	255	0
1	9	0	0	0	1	255	0
1	10	0	0	0	1	255	0
1	11	0	0	0	1	255	0

1	12	0	0	0	1	255	0
1	13	0	0	0	1	255	0
1	14	0	0	0	1	255	0
1	15	0	0	0	1	255	0
1	16	0	0	0	1	255	0
1	17	0	0	0	1	255	0
1	18	0	0	0	1	255	0
1	19	0	0	0	1	255	0
1	20	0	0	0	1	255	0
1	21	0	0	0	1	255	0
1	22	0	0	0	1	255	0
1	23	0	0	0	1	255	0
1	24	0	0	0	1	255	0
1	25	0	0	0	1	255	0
1	26	0	0	0	1	255	0
1	27	0	0	0	1	255	0
1	28	0	0	0	1	255	0
1	29	0	0	0	1	255	0
1	30	0	0	0	1	255	0
1	31	0	0	0	1	255	0
1	32	0	0	0	1	255	0
1	33	0	0	0	1	255	0
1	34	0	0	0	1	255	0
1	35	0	0	0	1	255	0
1	36	0	0	0	1	255	0
1	37	0	0	0	1	255	0
1	38	0	0	0	1	255	0
1	39	0	0	0	1	255	0
1	40	0	0	0	1	255	0
1	41	0	0	0	1	255	0
1	42	0	0	0	1	255	0
1	43	0	0	0	1	255	0
1	44	0	0	0	1	255	0
1	45	0	0	0	1	255	0
1	46	0	0	0	1	255	0
1	47	0	0	0	1	255	0
1	48	0	0	0	1	255	0
1	49	0	0	0	1	255	0
1	50	0	0	0	1	255	0
1	51	0	0	0	1	255	0
1	52	0	0	0	1	255	0
1	53	0	0	0	1	255	0
1	54	0	0	0	1	255	0
1	55	0	0	0	1	255	0

1	56	0	0	0	1	255	0
1	57	0	0	0	1	255	0
1	58	0	0	0	1	255	0
1	59	0	0	0	1	255	0
1	60	0	0	0	1	255	0
1	61	0	0	0	1	255	0
1	62	0	0	0	1	255	0
1	63	0	0	0	1	255	0
1	64	0	0	0	1	255	0
3	1	0	0	0	1	255	0
3	2	0	0	0	1	255	0
3	3	0	0	0	1	255	0
3	4	0	0	0	1	255	0
3	5	0	0	0	1	255	0
3	6	0	0	0	1	255	0
3	7	0	0	0	1	255	0
3	8	0	0	0	1	255	0
3	9	0	0	0	1	255	0
3	10	0	0	0	1	255	0
3	11	0	0	0	1	255	0
3	12	0	0	0	1	255	0
3	13	0	0	0	1	255	0
3	14	0	0	0	1	255	0
3	15	0	0	0	1	255	0
3	16	0	0	0	1	255	0
3	17	0	0	0	1	255	0
3	18	0	0	0	1	255	0
3	19	0	0	0	1	255	0
3	20	0	0	0	1	255	0
3	21	0	0	0	1	255	0
3	22	0	0	0	1	255	0
3	23	0	0	0	1	255	0
3	24	0	0	0	1	255	0
3	25	0	0	0	1	255	0
3	26	0	0	0	1	255	0
3	27	0	0	0	1	255	0
3	28	0	0	0	1	255	0
3	29	0	0	0	1	255	0
3	30	0	0	0	1	255	0
3	31	0	0	0	1	255	0
3	32	0	0	0	1	255	0
3	33	0	0	0	1	255	0
3	34	0	0	0	1	255	0
3	35	0	0	0	1	255	0

3	36	0	0	0	1	255	0
3	37	0	0	0	1	255	0
3	38	0	0	0	1	255	0
3	39	0	0	0	1	255	0
3	40	0	0	0	1	255	0
3	41	0	0	0	1	255	0
3	42	0	0	0	1	255	0
3	43	0	0	0	1	255	0
3	44	0	0	0	1	255	0
3	45	0	0	0	1	255	0
3	46	0	0	0	1	255	0
3	47	0	0	0	1	255	0
3	48	0	0	0	1	255	0
4	1	0	0	0	1	255	0
4	2	0	0	0	1	255	0
4	3	0	0	0	1	255	0
4	4	0	0	0	1	255	0
4	5	0	0	0	1	255	0
4	6	0	0	0	1	255	0
4	7	0	0	0	1	255	0
4	8	0	0	0	1	255	0
4	9	0	0	0	1	255	0
4	10	0	0	0	1	255	0
4	11	0	0	0	1	255	0
4	12	0	0	0	1	255	0
4	13	0	0	0	1	255	0
4	14	0	0	0	1	255	0
4	15	0	0	0	1	255	0
4	16	0	0	0	1	255	0
4	17	0	0	0	1	255	0
4	18	0	0	0	1	255	0
4	19	0	0	0	1	255	0
4	20	0	0	0	1	255	0
4	21	0	0	0	1	255	0
4	22	0	0	0	1	255	0
4	23	0	0	0	1	255	0
4	24	0	0	0	1	255	0
4	25	0	0	0	1	255	0
4	26	0	0	0	1	255	0
4	27	0	0	0	1	255	0
4	28	0	0	0	1	255	0
4	29	0	0	0	1	255	0
4	30	0	0	0	1	255	0
4	31	0	0	0	1	255	0

4	32	0	0	0	1	255	0
4	33	0	0	0	1	255	0
4	34	0	0	0	1	255	0
4	35	0	0	0	1	255	0
4	36	0	0	0	1	255	0
4	37	0	0	0	1	255	0
4	38	0	0	0	1	255	0
4	39	0	0	0	1	255	0
4	40	0	0	0	1	255	0
4	41	0	0	0	1	255	0
4	42	0	0	0	1	255	0
4	43	0	0	0	1	255	0
4	44	0	0	0	1	255	0
4	45	0	0	0	1	255	0
4	46	0	0	0	1	255	0
4	47	0	0	0	1	255	0
4	48	0	0	0	1	255	0

Pedestrian Detector Diagnostics (MM)6-6

Plan	Detector	Counts	Act	Pres	Multiplier
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SYNCHRO PRINTOUTS

Timings

Existing 2021 AM.syn

1: US 377 & SH 114 EBFR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	228	1758	110	0	0	0	0	598	129	664	403	0
Future Volume (vph)	228	1758	110	0	0	0	0	598	129	664	403	0
Adj. Flow (vph)	235	1812	113	0	0	0	0	616	133	685	415	0
Lane Group Flow (vph)	235	1812	113	0	0	0	0	616	133	685	415	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	1 2	
Permitted Phases	4		4						2			
Detector Phase	4	4	4					2	2	1	1 2	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0					10.0	10.0	7.0		
Minimum Split (s)	26.7	26.7	26.7					15.7	15.7	12.0		
Total Split (s)	91.7	91.7	91.7					35.7	35.7	40.0		
Total Split (%)	54.8%	54.8%	54.8%					21.3%	21.3%	23.9%		
Yellow Time (s)	5.0	5.0	5.0					4.7	4.7	3.6		
All-Red Time (s)	1.7	1.7	1.7					1.0	1.0	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7					5.7	5.7	5.0		
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode	None	None	None					None	None	None		
Act Effect Green (s)	85.1	85.1	85.1					28.1	28.1	34.1	67.9	
Actuated g/C Ratio	0.52	0.52	0.52					0.17	0.17	0.21	0.41	
v/c Ratio	0.26	0.99	0.13					0.71	0.42	0.96	0.54	
Control Delay	23.7	58.3	12.4					69.6	38.7	45.3	5.8	
Queue Delay	0.0	0.0	0.0					4.4	0.0	44.6	12.6	
Total Delay	23.7	58.3	12.4					73.9	38.7	89.9	18.3	
LOS	C	E	B					E	D	F	B	
Approach Delay		52.2						67.7			62.9	
Approach LOS		D						E			E	

Intersection Summary

Cycle Length: 167.4

Actuated Cycle Length: 164.7

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 58.0

Intersection LOS: E

Intersection Capacity Utilization 93.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 1: US 377 & SH 114 EBFR

#1  35.7 s	#1  40 s	#1  91.7 s
#2  40.7 s	#2  35 s	#2  91.7 s

Lee Engineering, LLC

Synchro 11 Report

H:\T1514.07 - TIA Multifamily-SR House Multi Use Development, Roanoke, TX\Synchro\Existing 2021 AM.syn

Timings
1: US 377 & SH 114 EBFR

Existing 2021 AM.syn

Lane Group	Ø5	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	35.0	40.7	91.7
Total Split (%)	21%	24%	55%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Timings
2: US 377 & SH 114 WBFR

Existing 2021 AM.syn

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	49	1463	468	122	832	0	0	1016	176
Future Volume (vph)	0	0	0	49	1463	468	122	832	0	0	1016	176
Adj. Flow (vph)	0	0	0	52	1540	493	128	876	0	0	1069	185
Lane Group Flow (vph)	0	0	0	47	2038	0	128	876	0	0	1069	185
Turn Type				Perm	NA		Prot	NA			NA	Perm
Protected Phases					8		5	5 6			6	
Permitted Phases				8								6
Detector Phase				8	8		5	5 6			6	6
Switch Phase												
Minimum Initial (s)				20.0	20.0		7.0				10.0	10.0
Minimum Split (s)				26.7	26.7		12.0				15.7	15.7
Total Split (s)				91.7	91.7		35.0				40.7	40.7
Total Split (%)				54.8%	54.8%		20.9%				24.3%	24.3%
Yellow Time (s)				5.0	5.0		3.6				4.7	4.7
All-Red Time (s)				1.7	1.7		1.4				1.0	1.0
Lost Time Adjust (s)				0.0	0.0		0.0				0.0	0.0
Total Lost Time (s)				6.7	6.7		5.0				5.7	5.7
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None				None	None
Act Effect Green (s)				85.1	85.1		27.1	67.9			35.0	35.0
Actuated g/C Ratio				0.52	0.52		0.16	0.41			0.21	0.21
v/c Ratio				0.06	1.20		0.44	0.60			0.99	0.43
Control Delay				21.1	129.4		58.1	29.2			88.6	22.4
Queue Delay				0.0	0.0		0.0	40.4			37.9	0.0
Total Delay				21.1	129.4		58.1	69.6			126.5	22.4
LOS				C	F		E	E			F	C
Approach Delay					127.0			68.1			111.1	
Approach LOS					F			E			F	

Intersection Summary

Cycle Length: 167.4

Actuated Cycle Length: 164.7

Natural Cycle: 130

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.20

Intersection Signal Delay: 108.8

Intersection LOS: F

Intersection Capacity Utilization 93.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 2: US 377 & SH 114 WBFR

#1 	#1 	#1
35.7 s	40 s	91.7 s
#2 	#2 	#2
40.7 s	35 s	91.7 s

Lee Engineering, LLC

H:\T1514.07 - TIA Multifamily-SR House Multi Use Development, Roanoke, TX\Synchro\Existing 2021 AM.syn

Synchro 11 Report

Timings
2: US 377 & SH 114 WBFR

Existing 2021 AM.syn

Lane Group	Ø1	Ø2	Ø4
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	4
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	40.0	35.7	91.7
Total Split (%)	24%	21%	55%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	0	0	57	6
Future Vol, veh/h	0	17	0	0	57	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	20	0	0	66	7
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	37	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	1027	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1027	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.6		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1027	-	-			
HCM Lane V/C Ratio	0.019	-	-			
HCM Control Delay (s)	8.6	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	16	13	0	7	18
Future Vol, veh/h	37	16	13	0	7	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	54	54	54	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	30	24	0	13	33

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	24	0	0 192 24
Stage 1	-	-	- 24 -
Stage 2	-	-	- 168 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1591	-	- 797 1052
Stage 1	-	-	- 999 -
Stage 2	-	-	- 862 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1591	-	- 762 1052
Mov Cap-2 Maneuver	-	-	- 762 -
Stage 1	-	-	- 955 -
Stage 2	-	-	- 862 -

Approach	EB	WB	SB
HCM Control Delay, s	5.1	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1591	-	-	-	951
HCM Lane V/C Ratio	0.043	-	-	-	0.049
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection

Int Delay, s/veh 4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	24	4	10	23	16	26
Future Vol, veh/h	24	4	10	23	16	26
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	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	6	15	34	24	38

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	41
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1568
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1568
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	973	-	-	1568	-
HCM Lane V/C Ratio	0.063	-	-	0.009	-
HCM Control Delay (s)	9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	4	37	13	1
Future Vol, veh/h	1	1	4	37	13	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	1	5	47	17	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	75	18	18	0	-	0
Stage 1	18	-	-	-	-	-
Stage 2	57	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	928	1061	1599	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	925	1061	1599	-	-	-
Mov Cap-2 Maneuver	925	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.7	0.7		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1599	-	988	-	-	
HCM Lane V/C Ratio	0.003	-	0.003	-	-	
HCM Control Delay (s)	7.3	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	10	41	17	0
Future Vol, veh/h	1	6	10	41	17	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	7	12	50	21	0

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	95	21	21
Stage 1	21	-	-
Stage 2	74	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	905	1056	1595
Stage 1	1002	-	-
Stage 2	949	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	898	1056	1595
Mov Cap-2 Maneuver	898	-	-
Stage 1	994	-	-
Stage 2	949	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1595	-	1030	-	-
HCM Lane V/C Ratio	0.008	-	0.008	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 6th TWSC
8: Walnut St & Lois St (S)

Existing 2021 AM.syn

Intersection

Int Delay, s/veh 4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	72	22	32	98	13	10
Future Vol, veh/h	72	22	32	98	13	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	88	27	39	120	16	12

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	143	99	0
Stage 1	99	-	-
Stage 2	44	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	850	957	-
Stage 1	925	-	-
Stage 2	978	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	841	957	-
Mov Cap-2 Maneuver	841	-	-
Stage 1	925	-	-
Stage 2	967	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	4.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	866	1420
HCM Lane V/C Ratio	-	-	0.132	0.011
HCM Control Delay (s)	-	-	9.8	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0

Intersection

Int Delay, s/veh 0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	109	4	5	87	7	6
Future Vol, veh/h	109	4	5	87	7	6
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	5	6	109	9	8

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	141
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1442
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1442
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	800	-	-	1442	-
HCM Lane V/C Ratio	0.02	-	-	0.004	-
HCM Control Delay (s)	9.6	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱			↰		↱	↰	
Traffic Vol, veh/h	0	116	0	139	84	0	4	0	173	44	23	5
Future Vol, veh/h	0	116	0	139	84	0	4	0	173	44	23	5
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	130	0	156	94	0	4	0	194	49	26	6
Number of Lanes	0	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.1	10.1	10.2	9.3
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	2%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	100%	0%	82%
Vol Right, %	98%	0%	0%	0%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	116	139	84	44	28
LT Vol	4	0	139	0	44	0
Through Vol	0	116	0	84	0	23
RT Vol	173	0	0	0	0	5
Lane Flow Rate	199	130	156	94	49	31
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.281	0.203	0.256	0.142	0.086	0.049
Departure Headway (Hd)	5.084	5.609	5.912	5.408	6.295	5.664
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	702	633	603	658	565	626
Service Time	3.154	3.696	3.691	3.187	4.084	3.452
HCM Lane V/C Ratio	0.283	0.205	0.259	0.143	0.087	0.05
HCM Control Delay	10.2	10.1	10.7	9.1	9.7	8.7
HCM Lane LOS	B	B	B	A	A	A
HCM 95th-tile Q	1.2	0.8	1	0.5	0.3	0.2

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	9	726	10	12	372
Future Vol, veh/h	7	9	726	10	12	372
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	8	10	789	11	13	404

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1225	795	0
Stage 1	795	-	-
Stage 2	430	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	198	388	-
Stage 1	445	-	-
Stage 2	656	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	194	388	-
Mov Cap-2 Maneuver	194	-	-
Stage 1	445	-	-
Stage 2	643	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.2	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	270	823
HCM Lane V/C Ratio	-	-	0.064	0.016
HCM Control Delay (s)	-	-	19.2	9.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	15.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	56	1011	100	89	392	31	18	15	83	15	1	28
Future Vol, veh/h	56	1011	100	89	392	31	18	15	83	15	1	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	1064	105	94	413	33	19	16	87	16	1	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	446	0	0	1169	0	0	1868	1869	1117	1904	1905	430
Stage 1	-	-	-	-	-	-	1235	1235	-	618	618	-
Stage 2	-	-	-	-	-	-	633	634	-	1286	1287	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1114	-	-	598	-	-	55	72	252	52	69	625
Stage 1	-	-	-	-	-	-	216	249	-	477	481	-
Stage 2	-	-	-	-	-	-	468	473	-	202	235	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1114	-	-	598	-	-	44	57	252	23	55	625
Mov Cap-2 Maneuver	-	-	-	-	-	-	44	57	-	23	55	-
Stage 1	-	-	-	-	-	-	205	236	-	452	405	-
Stage 2	-	-	-	-	-	-	375	399	-	117	223	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	2.1	169.7	157
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	116	1114	-	-	598	-	-	62
HCM Lane V/C Ratio	1.053	0.053	-	-	0.157	-	-	0.747
HCM Control Delay (s)	169.7	8.4	-	-	12.1	-	-	157
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	7.2	0.2	-	-	0.6	-	-	3.3

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	967	10	9	438	68	0	5	44	10	4	150
Future Vol, veh/h	104	967	10	9	438	68	0	5	44	10	4	150
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	107	997	10	9	452	70	0	5	45	10	4	155
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	522	0	0	1007	0	0	-	1756	1002	1746	1726	487
Stage 1	-	-	-	-	-	-	-	1216	-	505	505	-
Stage 2	-	-	-	-	-	-	-	540	-	1241	1221	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1044	-	-	688	-	-	0	85	294	68	89	581
Stage 1	-	-	-	-	-	-	0	254	-	549	540	-
Stage 2	-	-	-	-	-	-	0	521	-	214	252	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1044	-	-	688	-	-	-	75	294	50	79	581
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	75	-	50	79	-
Stage 1	-	-	-	-	-	-	-	228	-	493	533	-
Stage 2	-	-	-	-	-	-	-	514	-	159	226	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.2			19.5			13.4		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	294	1044	-	-	688	-	-	581				
HCM Lane V/C Ratio	0.154	0.103	-	-	0.013	-	-	0.266				
HCM Control Delay (s)	19.5	8.8	-	-	10.3	-	-	13.4				
HCM Lane LOS	C	A	-	-	B	-	-	B				
HCM 95th %tile O(veh)	0.5	0.3	-	-	0	-	-	1.1				

Timings

Existing 2021 PM.syn

1: US 377 & SH 114 EBFR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	326	1472	124	0	0	0	0	642	58	389	442	0
Future Volume (vph)	326	1472	124	0	0	0	0	642	58	389	442	0
Adj. Flow (vph)	333	1502	127	0	0	0	0	655	59	397	451	0
Lane Group Flow (vph)	333	1502	127	0	0	0	0	655	59	397	451	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	1 2	
Permitted Phases	4		4						2			
Detector Phase	4	4	4					2	2	1	1 2	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0					10.0	10.0	7.0		
Minimum Split (s)	26.7	26.7	26.7					15.7	15.7	12.0		
Total Split (s)	106.7	106.7	106.7					50.7	50.7	55.0		
Total Split (%)	50.2%	50.2%	50.2%					23.9%	23.9%	25.9%		
Yellow Time (s)	5.0	5.0	5.0					4.7	4.7	3.6		
All-Red Time (s)	1.7	1.7	1.7					1.0	1.0	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7					5.7	5.7	5.0		
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode	None	None	None					None	None	None		
Act Effect Green (s)	100.4	100.4	100.4					39.1	39.1	25.3	70.1	
Actuated g/C Ratio	0.55	0.55	0.55					0.21	0.21	0.14	0.38	
v/c Ratio	0.34	0.77	0.14					0.60	0.16	0.83	0.63	
Control Delay	25.4	36.9	15.5					67.2	19.5	48.1	9.6	
Queue Delay	0.0	0.0	0.0					0.4	0.0	0.0	0.7	
Total Delay	25.4	36.9	15.5					67.6	19.5	48.1	10.4	
LOS	C	D	B					E	B	D	B	
Approach Delay		33.5						63.6			28.0	
Approach LOS		C						E			C	

Intersection Summary

Cycle Length: 212.4

Actuated Cycle Length: 182.2

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 38.3

Intersection LOS: D

Intersection Capacity Utilization 78.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: US 377 & SH 114 EBFR

#1  50.7 s	#1  55 s	#1  106.7 s
#2  50.7 s	#2  55 s	#2  106.7 s

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Synchro 11 Report

Timings
1: US 377 & SH 114 EBFR

Existing 2021 PM.syn

Lane Group	Ø5	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	55.0	50.7	106.7
Total Split (%)	26%	24%	50%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Timings
2: US 377 & SH 114 WBFR

Existing 2021 PM.syn

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	54	1461	399	151	800	0	0	958	250
Future Volume (vph)	0	0	0	54	1461	399	151	800	0	0	958	250
Adj. Flow (vph)	0	0	0	56	1522	416	157	833	0	0	998	260
Lane Group Flow (vph)	0	0	0	50	1944	0	157	833	0	0	998	260
Turn Type				Perm	NA		Prot	NA			NA	Perm
Protected Phases					8		5	5 6			6	
Permitted Phases				8								6
Detector Phase				8	8		5	5 6			6	6
Switch Phase												
Minimum Initial (s)				20.0	20.0		7.0				10.0	10.0
Minimum Split (s)				26.7	26.7		12.0				15.7	15.7
Total Split (s)				106.7	106.7		55.0				50.7	50.7
Total Split (%)				50.2%	50.2%		25.9%				23.9%	23.9%
Yellow Time (s)				5.0	5.0		3.6				4.7	4.7
All-Red Time (s)				1.7	1.7		1.4				1.0	1.0
Lost Time Adjust (s)				0.0	0.0		0.0				0.0	0.0
Total Lost Time (s)				6.7	6.7		5.0				5.7	5.7
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None				None	None
Act Effect Green (s)				100.4	100.4		22.6	70.1			41.7	41.7
Actuated g/C Ratio				0.55	0.55		0.12	0.38			0.23	0.23
v/c Ratio				0.06	1.07		0.72	0.61			0.86	0.53
Control Delay				21.8	81.2		84.9	34.6			76.2	26.9
Queue Delay				0.0	0.0		0.0	0.4			0.0	0.0
Total Delay				21.8	81.2		84.9	35.0			76.2	26.9
LOS				C	F		F	D			E	C
Approach Delay					79.7			42.9			66.0	
Approach LOS					E			D			E	

Intersection Summary

Cycle Length: 212.4

Actuated Cycle Length: 182.2

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 67.1

Intersection LOS: E

Intersection Capacity Utilization 78.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: US 377 & SH 114 WBFR

#1 	#1 	#1
50.7 s	55 s	106.7 s
#2 	#2 	#2
50.7 s	55 s	106.7 s

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Synchro 11 Report

Timings
2: US 377 & SH 114 WBFR

Existing 2021 PM.syn

Lane Group	Ø1	Ø2	Ø4
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	4
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	55.0	50.7	106.7
Total Split (%)	26%	24%	50%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗			↖↗	
Traffic Vol, veh/h	0	23	0	0	81	7
Future Vol, veh/h	0	23	0	0	81	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	0	0	93	8
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	51	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	1006	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1006	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.7		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1006	-	-			
HCM Lane V/C Ratio	0.026	-	-			
HCM Control Delay (s)	8.7	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Intersection

Int Delay, s/veh 4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	17	13	3	3	15
Future Vol, veh/h	25	17	13	3	3	15
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	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	20	16	4	4	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	20	0	0 98 18
Stage 1	-	-	- 18 -
Stage 2	-	-	- 80 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1596	-	- 901 1061
Stage 1	-	-	- 1005 -
Stage 2	-	-	- 943 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1596	-	- 884 1061
Mov Cap-2 Maneuver	-	-	- 884 -
Stage 1	-	-	- 986 -
Stage 2	-	-	- 943 -

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1596	-	-	-	1027
HCM Lane V/C Ratio	0.019	-	-	-	0.021
HCM Control Delay (s)	7.3	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection

Int Delay, s/veh 4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	20	3	7	22	15	23
Future Vol, veh/h	20	3	7	22	15	23
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	70	70	70	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	4	10	31	21	33

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	33
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1579
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1579
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	988	-	-	1579	-
HCM Lane V/C Ratio	0.055	-	-	0.006	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	3	11	39	10	1
Future Vol, veh/h	1	3	11	39	10	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	3	13	45	11	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	83	12	12	0	-	0
Stage 1	12	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	919	1069	1607	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	912	1069	1607	-	-	-
Mov Cap-2 Maneuver	912	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.5	1.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1607	-	1025	-	-	
HCM Lane V/C Ratio	0.008	-	0.004	-	-	
HCM Control Delay (s)	7.3	0	8.5	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	26	54	15	1
Future Vol, veh/h	0	11	26	54	15	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	27	55	15	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	125	16	16	0	-	0
Stage 1	16	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	870	1063	1602	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	855	1063	1602	-	-	-
Mov Cap-2 Maneuver	855	-	-	-	-	-
Stage 1	990	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	2.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1602	-	1063	-	-	
HCM Lane V/C Ratio	0.017	-	0.011	-	-	
HCM Control Delay (s)	7.3	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0	-	-	

HCM 6th TWSC
8: Walnut St & Lois St (S)

Existing 2021 PM.syn

Intersection						
Int Delay, s/veh	7.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	160	51	24	67	14	9
Future Vol, veh/h	160	51	24	67	14	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	190	61	29	80	17	11
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	114	69	0	0	109	0
Stage 1	69	-	-	-	-	-
Stage 2	45	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	882	994	-	-	1481	-
Stage 1	954	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	871	994	-	-	1481	-
Mov Cap-2 Maneuver	871	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	965	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.6	0		4.5		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	898	1481	-	
HCM Lane V/C Ratio	-	-	0.28	0.011	-	
HCM Control Delay (s)	-	-	10.6	7.5	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	1.1	0	-	

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	72	2	17	213	3	6
Future Vol, veh/h	72	2	17	213	3	6
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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	2	20	245	3	7
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	85	0	369	84
Stage 1	-	-	-	-	84	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1512	-	631	975
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1512	-	622	975
Mov Cap-2 Maneuver	-	-	-	-	622	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	752	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		9.4	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	820	-	-	1512	-	
HCM Lane V/C Ratio	0.013	-	-	0.013	-	
HCM Control Delay (s)	9.4	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile O(veh)	0	-	-	0	-	

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱			↱		↱	↱	
Traffic Vol, veh/h	0	79	3	167	199	0	19	0	432	47	36	18
Future Vol, veh/h	0	79	3	167	199	0	19	0	432	47	36	18
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	82	3	174	207	0	20	0	450	49	38	19
Number of Lanes	0	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	11.4	12.9	21.8	10.4
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	4%	0%	100%	0%	100%	0%
Vol Thru, %	0%	96%	0%	100%	0%	67%
Vol Right, %	96%	4%	0%	0%	0%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	451	82	167	199	47	54
LT Vol	19	0	167	0	47	0
Through Vol	0	79	0	199	0	36
RT Vol	432	3	0	0	0	18
Lane Flow Rate	470	85	174	207	49	56
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.723	0.164	0.332	0.367	0.098	0.101
Departure Headway (Hd)	5.54	6.93	6.879	6.372	7.2	6.451
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	653	515	522	564	496	553
Service Time	3.587	5.005	4.634	4.126	4.97	4.221
HCM Lane V/C Ratio	0.72	0.165	0.333	0.367	0.099	0.101
HCM Control Delay	21.8	11.4	13	12.8	10.8	10
HCM Lane LOS	C	B	B	B	B	A
HCM 95th-tile Q	6.1	0.6	1.4	1.7	0.3	0.3

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	33	589	21	12	542
Future Vol, veh/h	2	33	589	21	12	542
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	36	647	23	13	596
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1281	659	0	0	670	0
Stage 1	659	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	183	464	-	-	920	-
Stage 1	515	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	179	464	-	-	920	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	515	-	-	-	-	-
Stage 2	524	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.7	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	452	920	-	
HCM Lane V/C Ratio	-	-	0.085	0.014	-	
HCM Control Delay (s)	-	-	13.7	9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile O(veh)	-	-	0.3	0	-	

Intersection												
Int Delay, s/veh	24.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	782	48	72	964	29	18	6	85	15	7	81
Future Vol, veh/h	25	782	48	72	964	29	18	6	85	15	7	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	815	50	75	1004	30	19	6	89	16	7	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1034	0	0	865	0	0	2107	2076	840	2109	2086	1019
Stage 1	-	-	-	-	-	-	892	892	-	1169	1169	-
Stage 2	-	-	-	-	-	-	1215	1184	-	940	917	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	672	-	-	778	-	-	37	54	365	37	53	288
Stage 1	-	-	-	-	-	-	337	360	-	235	267	-
Stage 2	-	-	-	-	-	-	222	263	-	316	351	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	672	-	-	778	-	-	21	47	365	23	46	288
Mov Cap-2 Maneuver	-	-	-	-	-	-	21	47	-	23	46	-
Stage 1	-	-	-	-	-	-	324	346	-	226	241	-
Stage 2	-	-	-	-	-	-	138	238	-	226	337	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.7			265.6			213.8		
HCM LOS							F			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	90	672	-	-	778	-	-	95
HCM Lane V/C Ratio	1.262	0.039	-	-	0.096	-	-	1.129
HCM Control Delay (s)	265.6	10.6	-	-	10.1	-	-	213.8
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	8.2	0.1	-	-	0.3	-	-	7.2

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	135	773	24	23	957	307	1	1	47	9	6	178
Future Vol, veh/h	135	773	24	23	957	307	1	1	47	9	6	178
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	139	797	25	24	987	316	1	1	48	9	6	184
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	1303	0	0	822	0	0	2376	2439	810	2305	2293	1145
Stage 1	-	-	-	-	-	-	1088	1088	-	1193	1193	-
Stage 2	-	-	-	-	-	-	1288	1351	-	1112	1100	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	531	-	-	807	-	-	24	32	380	27	39	243
Stage 1	-	-	-	-	-	-	261	292	-	228	260	-
Stage 2	-	-	-	-	-	-	201	219	-	253	288	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	531	-	-	807	-	-	4	23	380	18	28	243
Mov Cap-2 Maneuver	-	-	-	-	-	-	4	23	-	18	28	-
Stage 1	-	-	-	-	-	-	193	215	-	168	252	-
Stage 2	-	-	-	-	-	-	47	212	-	162	213	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	2.1		0.2			15.9			54.6			
HCM LOS						C			F			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	380	531	-	-	807	-	-	243				
HCM Lane V/C Ratio	0.128	0.262	-	-	0.029	-	-	0.755				
HCM Control Delay (s)	15.9	14.2	-	-	9.6	-	-	54.6				
HCM Lane LOS	C	B	-	-	A	-	-	F				
HCM 95th %tile O(veh)	0.4	1	-	-	0.1	-	-	5.4				

Timings

Build Out 2024 Background AM.syn

1: US 377 & SH 114 EBFR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	2035	127	0	0	0	0	692	150	768	466	0
Future Volume (vph)	264	2035	127	0	0	0	0	692	150	768	466	0
Adj. Flow (vph)	272	2098	131	0	0	0	0	713	155	792	480	0
Lane Group Flow (vph)	272	2098	131	0	0	0	0	713	155	792	480	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	1 2	
Permitted Phases	4		4						2			
Detector Phase	4	4	4					2	2	1	1 2	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0					10.0	10.0	7.0		
Minimum Split (s)	26.7	26.7	26.7					15.7	15.7	12.0		
Total Split (s)	91.7	91.7	91.7					35.7	35.7	40.0		
Total Split (%)	54.8%	54.8%	54.8%					21.3%	21.3%	23.9%		
Yellow Time (s)	5.0	5.0	5.0					4.7	4.7	3.6		
All-Red Time (s)	1.7	1.7	1.7					1.0	1.0	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7					5.7	5.7	5.0		
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode	None	None	None					None	None	None		
Act Effect Green (s)	85.0	85.0	85.0					29.5	29.5	35.0	70.2	
Actuated g/C Ratio	0.51	0.51	0.51					0.18	0.18	0.21	0.42	
v/c Ratio	0.30	1.16	0.16					0.79	0.48	1.10	0.61	
Control Delay	25.0	117.9	13.9					73.2	43.7	80.4	7.2	
Queue Delay	0.0	0.0	0.0					50.8	0.0	1.2	44.8	
Total Delay	25.0	117.9	13.9					124.0	43.7	81.6	52.0	
LOS	C	F	B					F	D	F	D	
Approach Delay		102.3						109.7			70.4	
Approach LOS		F						F			E	

Intersection Summary

Cycle Length: 167.4

Actuated Cycle Length: 166.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 94.9

Intersection LOS: F

Intersection Capacity Utilization 106.0%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 1: US 377 & SH 114 EBFR

#1  35.7 s	#1  40 s	#1  91.7 s
#2  40.7 s	#2  35 s	#2  91.7 s

Lee Engineering, LLC

Synchro 11 Report

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Timings
1: US 377 & SH 114 EBFR

Build Out 2024 Background AM.syn

Lane Group	Ø5	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	35.0	40.7	91.7
Total Split (%)	21%	24%	55%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Timings
2: US 377 & SH 114 WBFR

Build Out 2024 Background AM.syn

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	56	1693	542	141	963	0	0	1176	203
Future Volume (vph)	0	0	0	56	1693	542	141	963	0	0	1176	203
Adj. Flow (vph)	0	0	0	59	1782	571	148	1014	0	0	1238	214
Lane Group Flow (vph)	0	0	0	53	2359	0	148	1014	0	0	1238	214
Turn Type				Perm	NA		Prot	NA			NA	Perm
Protected Phases					8		5	5 6			6	
Permitted Phases				8								6
Detector Phase				8	8		5	5 6			6	6
Switch Phase												
Minimum Initial (s)				20.0	20.0		7.0				10.0	10.0
Minimum Split (s)				26.7	26.7		12.0				15.7	15.7
Total Split (s)				91.7	91.7		35.0				40.7	40.7
Total Split (%)				54.8%	54.8%		20.9%				24.3%	24.3%
Yellow Time (s)				5.0	5.0		3.6				4.7	4.7
All-Red Time (s)				1.7	1.7		1.4				1.0	1.0
Lost Time Adjust (s)				0.0	0.0		0.0				0.0	0.0
Total Lost Time (s)				6.7	6.7		5.0				5.7	5.7
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None				None	None
Act Effect Green (s)				85.0	85.0		29.5	70.2			35.0	35.0
Actuated g/C Ratio				0.51	0.51		0.18	0.42			0.21	0.21
v/c Ratio				0.06	1.40		0.47	0.68			1.16	0.52
Control Delay				21.3	217.6		57.8	31.8			138.9	34.3
Queue Delay				0.0	0.0		0.0	50.7			1.1	0.0
Total Delay				21.3	217.6		57.8	82.5			140.0	34.3
LOS				C	F		E	F			F	C
Approach Delay					213.3			79.4			124.5	
Approach LOS					F			E			F	

Intersection Summary

Cycle Length: 167.4

Actuated Cycle Length: 166.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 156.7

Intersection LOS: F

Intersection Capacity Utilization 106.0%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 2: US 377 & SH 114 WBFR

#1  35.7 s	#1  40 s	#1  91.7 s
#2  40.7 s	#2  35 s	#2  91.7 s

Lee Engineering, LLC

Synchro 11 Report

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Lane Group	Ø1	Ø2	Ø4
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	4
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	40.0	35.7	91.7
Total Split (%)	24%	21%	55%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	0	0	66	7
Future Vol, veh/h	0	20	0	0	66	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	0	0	76	8
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	42	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	1019	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1019	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.6		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1019	-	-			
HCM Lane V/C Ratio	0.023	-	-			
HCM Control Delay (s)	8.6	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	18	16	0	8	21
Future Vol, veh/h	42	18	16	0	8	21
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	54	54	54	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	33	30	0	15	39
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	30	0	-	0	219	30
Stage 1	-	-	-	-	30	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1583	-	-	-	769	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1583	-	-	-	731	1044
Mov Cap-2 Maneuver	-	-	-	-	731	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	843	-
Approach	EB	WB		SB		
HCM Control Delay, s	5.2	0		9.1		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1583	-	-	-	934	
HCM Lane V/C Ratio	0.049	-	-	-	0.057	
HCM Control Delay (s)	7.4	0	-	-	9.1	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2	

Intersection						
Int Delay, s/veh	4.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	4	11	27	18	30
Future Vol, veh/h	28	4	11	27	18	30
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	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	6	16	40	26	44
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	47	0	116	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	72	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1560	-	880	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	951	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1560	-	871	1026
Mov Cap-2 Maneuver	-	-	-	-	871	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	941	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.1		9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	962	-	-	1560	-	
HCM Lane V/C Ratio	0.073	-	-	0.01	-	
HCM Control Delay (s)	9	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	4	42	16	1
Future Vol, veh/h	1	1	4	42	16	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	1	5	54	21	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	86	22	22	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	915	1055	1593	-	-	-
Stage 1	1001	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	912	1055	1593	-	-	-
Mov Cap-2 Maneuver	912	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.7	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1593	-	978	-	-	
HCM Lane V/C Ratio	0.003	-	0.003	-	-	
HCM Control Delay (s)	7.3	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	7	11	48	20	0
Future Vol, veh/h	1	7	11	48	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	9	13	59	24	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	109	24	24	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	888	1052	1591	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	881	1052	1591	-	-	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.5	1.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1591	-	1027	-	-	
HCM Lane V/C Ratio	0.008	-	0.009	-	-	
HCM Control Delay (s)	7.3	0	8.5	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	4.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	83	25	37	113	16	11
Future Vol, veh/h	83	25	37	113	16	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	101	30	45	138	20	13
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	167	114	0	0	183	0
Stage 1	114	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	823	939	-	-	1392	-
Stage 1	911	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	811	939	-	-	1392	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	956	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.1	0		4.5		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	837	1392	-	
HCM Lane V/C Ratio	-	-	0.157	0.014	-	
HCM Control Delay (s)	-	-	10.1	7.6	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.6	0	-	

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	126	4	6	100	8	7
Future Vol, veh/h	126	4	6	100	8	7
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	158	5	8	125	10	9
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	163	0	302	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	141	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1416	-	690	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	886	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1416	-	686	884
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	881	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.4		9.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	766	-	-	1416	-	
HCM Lane V/C Ratio	0.024	-	-	0.005	-	
HCM Control Delay (s)	9.8	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱			↱↲		↱	↱	
Traffic Vol, veh/h	0	134	0	161	97	0	4	0	201	51	27	6
Future Vol, veh/h	0	134	0	161	97	0	4	0	201	51	27	6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	151	0	181	109	0	4	0	226	57	30	7
Number of Lanes	0	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.9	10.9	11.2	9.8
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	2%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	100%	0%	82%
Vol Right, %	98%	0%	0%	0%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	134	161	97	51	33
LT Vol	4	0	161	0	51	0
Through Vol	0	134	0	97	0	27
RT Vol	201	0	0	0	0	6
Lane Flow Rate	230	151	181	109	57	37
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.344	0.248	0.311	0.172	0.106	0.062
Departure Headway (Hd)	5.374	5.938	6.195	5.69	6.652	6.016
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	670	605	581	632	540	596
Service Time	3.399	3.965	3.919	3.414	4.383	3.746
HCM Lane V/C Ratio	0.343	0.25	0.312	0.172	0.106	0.062
HCM Control Delay	11.2	10.9	11.7	9.6	10.2	9.1
HCM Lane LOS	B	B	B	A	B	A
HCM 95th-tile Q	1.5	1	1.3	0.6	0.4	0.2

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	840	11	14	431
Future Vol, veh/h	8	10	840	11	14	431
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
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	11	913	12	15	468
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1183	463	0	0	925	0
Stage 1	919	-	-	-	-	-
Stage 2	264	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	182	546	-	-	734	-
Stage 1	349	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	178	546	-	-	734	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	349	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	14.8	0	0.3			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	386	734	-	
HCM Lane V/C Ratio	-	-	0.051	0.021	-	
HCM Control Delay (s)	-	-	14.8	10	-	
HCM Lane LOS	-	-	B	B	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

Intersection												
Int Delay, s/veh	57.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	1171	116	103	453	35	21	17	96	17	1	32
Future Vol, veh/h	65	1171	116	103	453	35	21	17	96	17	1	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	1233	122	108	477	37	22	18	101	18	1	34
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	514	0	0	1355	0	0	2159	2160	1294	2202	2203	496
Stage 1	-	-	-	-	-	-	1430	1430	-	712	712	-
Stage 2	-	-	-	-	-	-	729	730	-	1490	1491	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1052	-	-	508	-	-	34	47	199	32	45	574
Stage 1	-	-	-	-	-	-	167	200	-	423	436	-
Stage 2	-	-	-	-	-	-	414	428	-	154	187	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1052	-	-	508	-	-	25	35	199	~ 8	33	574
Mov Cap-2 Maneuver	-	-	-	-	-	-	25	35	-	~ 8	33	-
Stage 1	-	-	-	-	-	-	156	187	-	396	343	-
Stage 2	-	-	-	-	-	-	306	337	-	64	175	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			2.4			\$ 546.1			\$ 946.6		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	74	1052	-	-	508	-	-	23				
HCM Lane V/C Ratio	1.906	0.065	-	-	0.213	-	-	2.288				
HCM Control Delay (s)	\$ 546.1	8.7	-	-	14	-	-	\$ 946.6				
HCM Lane LOS	F	A	-	-	B	-	-	F				
HCM 95th %tile Q(veh)	12.6	0.2	-	-	0.8	-	-	6.7				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	1120	11	10	507	79	0	6	51	11	4	174
Future Vol, veh/h	120	1120	11	10	507	79	0	6	51	11	4	174
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	124	1155	11	10	523	81	0	6	53	11	4	179
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	604	0	0	1166	0	0	-	2033	1161	2022	1998	564
Stage 1	-	-	-	-	-	-	-	1409	-	584	584	-
Stage 2	-	-	-	-	-	-	-	624	-	1438	1414	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	974	-	-	599	-	-	0	57	238	43	60	525
Stage 1	-	-	-	-	-	-	0	205	-	498	498	-
Stage 2	-	-	-	-	-	-	0	478	-	165	204	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	974	-	-	599	-	-	-	49	238	27	51	525
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	49	-	27	51	-
Stage 1	-	-	-	-	-	-	-	179	-	435	490	-
Stage 2	-	-	-	-	-	-	-	470	-	108	178	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.2			24.4			15.4		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	238	974	-	-	599	-	-	525				
HCM Lane V/C Ratio	0.221	0.127	-	-	0.017	-	-	0.342				
HCM Control Delay (s)	24.4	9.2	-	-	11.1	-	-	15.4				
HCM Lane LOS	C	A	-	-	B	-	-	C				
HCM 95th %tile O(veh)	0.8	0.4	-	-	0.1	-	-	1.5				

Timings

Build Out 2024 Background PM.syn

1: US 377 & SH 114 EBFR

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	377	1704	144	0	0	0	0	744	67	451	512	0
Future Volume (vph)	377	1704	144	0	0	0	0	744	67	451	512	0
Adj. Flow (vph)	385	1739	147	0	0	0	0	759	68	460	522	0
Lane Group Flow (vph)	385	1739	147	0	0	0	0	759	68	460	522	0
Turn Type	Perm	NA	Perm					NA	Perm	Prot	NA	
Protected Phases		4						2		1	1 2	
Permitted Phases	4		4						2			
Detector Phase	4	4	4					2	2	1	1 2	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0					10.0	10.0	7.0		
Minimum Split (s)	26.7	26.7	26.7					15.7	15.7	12.0		
Total Split (s)	106.7	106.7	106.7					50.7	50.7	55.0		
Total Split (%)	50.2%	50.2%	50.2%					23.9%	23.9%	25.9%		
Yellow Time (s)	5.0	5.0	5.0					4.7	4.7	3.6		
All-Red Time (s)	1.7	1.7	1.7					1.0	1.0	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0					0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7					5.7	5.7	5.0		
Lead/Lag								Lead	Lead	Lag		
Lead-Lag Optimize?								Yes	Yes	Yes		
Recall Mode	None	None	None					None	None	None		
Act Effect Green (s)	100.2	100.2	100.2					42.9	42.9	31.0	79.6	
Actuated g/C Ratio	0.52	0.52	0.52					0.22	0.22	0.16	0.42	
v/c Ratio	0.42	0.94	0.17					0.67	0.17	0.83	0.67	
Control Delay	30.6	54.0	18.8					71.3	25.8	46.0	10.6	
Queue Delay	0.0	0.0	0.0					1.5	0.0	0.2	3.0	
Total Delay	30.6	54.0	18.8					72.8	25.8	46.2	13.6	
LOS	C	D	B					E	C	D	B	
Approach Delay		47.7						69.0			28.9	
Approach LOS		D						E			C	

Intersection Summary

Cycle Length: 212.4

Actuated Cycle Length: 191.5

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 47.5

Intersection LOS: D

Intersection Capacity Utilization 88.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: US 377 & SH 114 EBFR

#1  50.7 s	#1  55 s	#1  106.7 s
#2  50.7 s	#2  55 s	#2  106.7 s

Lane Group	Ø5	Ø6	Ø8
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	5	6	8
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	55.0	50.7	106.7
Total Split (%)	26%	24%	50%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Timings
2: US 377 & SH 114 WBFR

Build Out 2024 Background PM.syn

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	62	1691	462	174	926	0	0	1109	289
Future Volume (vph)	0	0	0	62	1691	462	174	926	0	0	1109	289
Adj. Flow (vph)	0	0	0	65	1761	481	181	965	0	0	1155	301
Lane Group Flow (vph)	0	0	0	58	2249	0	181	965	0	0	1155	301
Turn Type				Perm	NA		Prot	NA			NA	Perm
Protected Phases					8		5	5 6			6	
Permitted Phases				8								6
Detector Phase				8	8		5	5 6			6	6
Switch Phase												
Minimum Initial (s)				20.0	20.0		7.0				10.0	10.0
Minimum Split (s)				26.7	26.7		12.0				15.7	15.7
Total Split (s)				106.7	106.7		55.0				50.7	50.7
Total Split (%)				50.2%	50.2%		25.9%				23.9%	23.9%
Yellow Time (s)				5.0	5.0		3.6				4.7	4.7
All-Red Time (s)				1.7	1.7		1.4				1.0	1.0
Lost Time Adjust (s)				0.0	0.0		0.0				0.0	0.0
Total Lost Time (s)				6.7	6.7		5.0				5.7	5.7
Lead/Lag							Lag				Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode				None	None		None				None	None
Act Effect Green (s)				100.2	100.2		28.8	79.6			45.1	45.1
Actuated g/C Ratio				0.52	0.52		0.15	0.42			0.24	0.24
v/c Ratio				0.07	1.30		0.68	0.66			0.96	0.63
Control Delay				24.6	177.8		81.4	37.5			90.3	41.8
Queue Delay				0.0	0.0		0.2	1.0			4.8	0.0
Total Delay				24.6	177.8		81.6	38.5			95.0	41.8
LOS				C	F		F	D			F	D
Approach Delay					174.0			45.3			84.0	
Approach LOS					F			D			F	

Intersection Summary

Cycle Length: 212.4

Actuated Cycle Length: 191.5

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.30

Intersection Signal Delay: 117.3

Intersection LOS: F

Intersection Capacity Utilization 88.8%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: US 377 & SH 114 WBFR

#1  50.7 s	#1  55 s	#1  106.7 s
#2  50.7 s	#2  55 s	#2  106.7 s

Lee Engineering, LLC

Synchro 11 Report

H:\T1514.07 - TIA Multifamily-SR House Multi Use Development, Roanoke, TX\Synchro\Build Out 2024 Background PM.syn

Lane Group	Ø1	Ø2	Ø4
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Adj. Flow (vph)			
Lane Group Flow (vph)			
Turn Type			
Protected Phases	1	2	4
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	7.0	10.0	20.0
Minimum Split (s)	12.0	15.7	26.7
Total Split (s)	55.0	50.7	106.7
Total Split (%)	26%	24%	50%
Yellow Time (s)	3.6	4.7	5.0
All-Red Time (s)	1.4	1.0	1.7
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	
Recall Mode	None	None	None
Act Effect Green (s)			
Actuated g/C Ratio			
v/c Ratio			
Control Delay			
Queue Delay			
Total Delay			
LOS			
Approach Delay			
Approach LOS			
Intersection Summary			

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	27	0	0	94	8
Future Vol, veh/h	0	27	0	0	94	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	0	0	108	9
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	59	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	994	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	994	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.7		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	994	-	-			
HCM Lane V/C Ratio	0.031	-	-			
HCM Control Delay (s)	8.7	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	19	15	4	4	18
Future Vol, veh/h	29	19	15	4	4	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	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	23	18	5	5	22
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	23	0	-	0	114	21
Stage 1	-	-	-	-	21	-
Stage 2	-	-	-	-	93	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1592	-	-	-	882	1056
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1592	-	-	-	863	1056
Mov Cap-2 Maneuver	-	-	-	-	863	-
Stage 1	-	-	-	-	980	-
Stage 2	-	-	-	-	931	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.4	0		8.6		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1592	-	-	-	1015	
HCM Lane V/C Ratio	0.022	-	-	-	0.026	
HCM Control Delay (s)	7.3	0	-	-	8.6	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	

Intersection

Int Delay, s/veh 4.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	23	4	8	25	18	27
Future Vol, veh/h	23	4	8	25	18	27
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	70	70	70	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	6	11	36	26	39

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	39
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	977	-	-	1571	-
HCM Lane V/C Ratio	0.066	-	-	0.007	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	4	13	45	11	1
Future Vol, veh/h	1	4	13	45	11	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	15	52	13	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	96	14	14	0	-	0
Stage 1	14	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	903	1066	1604	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	894	1066	1604	-	-	-
Mov Cap-2 Maneuver	894	-	-	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.5	1.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1604	-	1027	-	-	
HCM Lane V/C Ratio	0.009	-	0.006	-	-	
HCM Control Delay (s)	7.3	0	8.5	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	13	31	62	18	1
Future Vol, veh/h	0	13	31	62	18	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	32	63	18	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	146	19	19	0	-	0
Stage 1	19	-	-	-	-	-
Stage 2	127	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	846	1059	1597	-	-	-
Stage 1	1004	-	-	-	-	-
Stage 2	899	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	828	1059	1597	-	-	-
Mov Cap-2 Maneuver	828	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	899	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.4	2.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1597	-	1059	-	-	
HCM Lane V/C Ratio	0.02	-	0.013	-	-	
HCM Control Delay (s)	7.3	0	8.4	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.1	-	0	-	-	

Intersection						
Int Delay, s/veh	7.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	185	59	28	78	17	10
Future Vol, veh/h	185	59	28	78	17	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	220	70	33	93	20	12
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	132	80	0	0	126	0
Stage 1	80	-	-	-	-	-
Stage 2	52	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	862	980	-	-	1460	-
Stage 1	943	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	850	980	-	-	1460	-
Mov Cap-2 Maneuver	850	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	956	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.1	0	4.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	878	1460	-	
HCM Lane V/C Ratio	-	-	0.331	0.014	-	
HCM Control Delay (s)	-	-	11.1	7.5	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	1.5	0	-	

Intersection

Int Delay, s/veh 0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	83	3	19	247	4	6
Future Vol, veh/h	83	3	19	247	4	6
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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	3	22	284	5	7

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	98
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1495
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1495
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	758	-	-	1495	-
HCM Lane V/C Ratio	0.015	-	-	0.015	-
HCM Control Delay (s)	9.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	24.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱			↱↲		↱	↱	
Traffic Vol, veh/h	0	92	4	194	230	0	22	0	500	55	42	20
Future Vol, veh/h	0	92	4	194	230	0	22	0	500	55	42	20
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	96	4	202	240	0	23	0	521	57	44	21
Number of Lanes	0	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	12.6	15.2	37.7	11.2
HCM LOS	B	C	E	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	4%	0%	100%	0%	100%	0%
Vol Thru, %	0%	96%	0%	100%	0%	68%
Vol Right, %	96%	4%	0%	0%	0%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	522	96	194	230	55	62
LT Vol	22	0	194	0	55	0
Through Vol	0	92	0	230	0	42
RT Vol	500	4	0	0	0	20
Lane Flow Rate	544	100	202	240	57	65
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.882	0.211	0.414	0.457	0.124	0.127
Departure Headway (Hd)	5.838	7.596	7.384	6.874	7.801	7.056
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	614	474	491	527	461	510
Service Time	3.935	5.613	5.084	4.574	5.525	4.779
HCM Lane V/C Ratio	0.886	0.211	0.411	0.455	0.124	0.127
HCM Control Delay	37.7	12.6	15.2	15.2	11.6	10.8
HCM Lane LOS	E	B	C	C	B	B
HCM 95th-tile Q	10.4	0.8	2	2.4	0.4	0.4

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	38	681	24	14	628
Future Vol, veh/h	3	38	681	24	14	628
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	42	748	26	15	690
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1136	387	0	0	774	0
Stage 1	761	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	196	611	-	-	837	-
Stage 1	422	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	192	611	-	-	837	-
Mov Cap-2 Maneuver	315	-	-	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	572	837	-	
HCM Lane V/C Ratio	-	-	0.079	0.018	-	
HCM Control Delay (s)	-	-	11.8	9.4	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

Intersection												
Int Delay, s/veh	100.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	905	56	83	1115	33	20	6	98	18	8	94
Future Vol, veh/h	29	905	56	83	1115	33	20	6	98	18	8	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	943	58	86	1161	34	21	6	102	19	8	98
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1195	0	0	1001	0	0	2435	2399	972	2436	2411	1178
Stage 1	-	-	-	-	-	-	1032	1032	-	1350	1350	-
Stage 2	-	-	-	-	-	-	1403	1367	-	1086	1061	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	584	-	-	692	-	-	22	33	306	22	33	232
Stage 1	-	-	-	-	-	-	281	310	-	186	219	-
Stage 2	-	-	-	-	-	-	173	215	-	262	300	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	584	-	-	692	-	-	~ 8	27	306	~ 11	27	232
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 8	27	-	~ 11	27	-
Stage 1	-	-	-	-	-	-	267	294	-	177	192	-
Stage 2	-	-	-	-	-	-	84	188	-	162	285	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.7			\$ 1175.5			\$ 831.5		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	41	584	-	-	692	-	-	51				
HCM Lane V/C Ratio	3.15	0.052	-	-	0.125	-	-	2.451				
HCM Control Delay (s)	\$ 1175.5	11.5	-	-	10.9	-	-	\$ 831.5				
HCM Lane LOS	F	B	-	-	B	-	-	F				
HCM 95th %tile Q(veh)	14.4	0.2	-	-	0.4	-	-	12.9				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Intersection												
Int Delay, s/veh	13.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	157	895	28	27	1108	355	1	1	55	10	6	206
Future Vol, veh/h	157	895	28	27	1108	355	1	1	55	10	6	206
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	162	923	29	28	1142	366	1	1	57	10	6	212
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1508	0	0	952	0	0	2752	2826	938	2672	2657	1325
Stage 1	-	-	-	-	-	-	1262	1262	-	1381	1381	-
Stage 2	-	-	-	-	-	-	1490	1564	-	1291	1276	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	444	-	-	722	-	-	13	18	321	15	23	~ 190
Stage 1	-	-	-	-	-	-	208	241	-	178	211	-
Stage 2	-	-	-	-	-	-	154	172	-	201	238	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	444	-	-	722	-	-	-	11	321	~ 8	14	~ 190
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	11	-	~ 8	14	-
Stage 1	-	-	-	-	-	-	132	153	-	113	203	-
Stage 2	-	-	-	-	-	-	-	165	-	104	151	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.6			0.2			18.6			151.6		
HCM LOS							C			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	321	444	-	-	722	-	-	190				
HCM Lane V/C Ratio	0.177	0.365	-	-	0.039	-	-	1.118				
HCM Control Delay (s)	18.6	17.7	-	-	10.2	-	-	151.6				
HCM Lane LOS	C	C	-	-	B	-	-	F				
HCM 95th %tile Q(veh)	0.6	1.6	-	-	0.1	-	-	10.4				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s				+: Computation Not Defined				*: All major volume in platoon		

Timings

Build Out 2024 Total AM.syn

1: US 377 & SH 114 EBFR

										
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø5	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	264	2040	127	722	162	775	466			
Future Volume (vph)	264	2040	127	722	162	775	466			
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA			
Protected Phases		4		2		1	1 2	5	6	8
Permitted Phases	4		4		2					
Detector Phase	4	4	4	2	2	1	1 2			
Switch Phase										
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0	7.0		7.0	10.0	20.0
Minimum Split (s)	26.7	26.7	26.7	15.7	15.7	12.0		12.0	15.7	26.7
Total Split (s)	91.7	91.7	91.7	35.7	35.7	40.0		35.0	40.7	91.7
Total Split (%)	54.8%	54.8%	54.8%	21.3%	21.3%	23.9%		21%	24%	55%
Yellow Time (s)	5.0	5.0	5.0	4.7	4.7	3.6		3.6	4.7	5.0
All-Red Time (s)	1.7	1.7	1.7	1.0	1.0	1.4		1.4	1.0	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)	6.7	6.7	6.7	5.7	5.7	5.0				
Lead/Lag				Lead	Lead	Lag		Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None		None	None	None
Act Effect Green (s)	85.0	85.0	85.0	29.5	29.5	35.0	70.2			
Actuated g/C Ratio	0.51	0.51	0.51	0.18	0.18	0.21	0.42			
v/c Ratio	0.30	1.17	0.16	0.83	0.51	1.11	0.61			
Control Delay	25.0	119.0	13.9	75.2	46.5	84.5	7.2			
Queue Delay	0.0	0.0	0.0	50.3	0.0	1.2	44.8			
Total Delay	25.0	119.0	13.9	125.5	46.5	85.6	52.0			
LOS	C	F	B	F	D	F	D			
Approach Delay		103.3		111.1			73.0			
Approach LOS		F		F			E			

Intersection Summary

Cycle Length: 167.4

Actuated Cycle Length: 166.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 96.5

Intersection LOS: F

Intersection Capacity Utilization 107.0%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 1: US 377 & SH 114 EBFR

#1  35.7 s	#1  40 s	#1  91.7 s
#2  40.7 s	#2  35 s	#2  91.7 s

Timings 2: US 377 & SH 114 WBFR

Build Out 2024 Total AM.syn

									
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	Ø1	Ø2	Ø4
Lane Configurations									
Traffic Volume (vph)	56	1693	153	981	1183	203			
Future Volume (vph)	56	1693	153	981	1183	203			
Turn Type	Perm	NA	Prot	NA	NA	Perm			
Protected Phases		8	5	5 6	6		1	2	4
Permitted Phases	8					6			
Detector Phase	8	8	5	5 6	6	6			
Switch Phase									
Minimum Initial (s)	20.0	20.0	7.0		10.0	10.0	7.0	10.0	20.0
Minimum Split (s)	26.7	26.7	12.0		15.7	15.7	12.0	15.7	26.7
Total Split (s)	91.7	91.7	35.0		40.7	40.7	40.0	35.7	91.7
Total Split (%)	54.8%	54.8%	20.9%		24.3%	24.3%	24%	21%	55%
Yellow Time (s)	5.0	5.0	3.6		4.7	4.7	3.6	4.7	5.0
All-Red Time (s)	1.7	1.7	1.4		1.0	1.0	1.4	1.0	1.7
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0			
Total Lost Time (s)	6.7	6.7	5.0		5.7	5.7			
Lead/Lag			Lag		Lead	Lead	Lag	Lead	
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None	None		None	None	None	None	None
Act Effect Green (s)	85.0	85.0	29.5	70.2	35.0	35.0			
Actuated g/C Ratio	0.51	0.51	0.18	0.42	0.21	0.21			
v/c Ratio	0.06	1.40	0.52	0.69	1.17	0.53			
Control Delay	21.3	217.6	58.1	31.4	141.3	37.1			
Queue Delay	0.0	0.0	0.0	50.7	1.1	0.0			
Total Delay	21.3	217.6	58.1	82.1	142.4	37.1			
LOS	C	F	E	F	F	D			
Approach Delay		213.3		78.9	127.0				
Approach LOS		F		E	F				

Intersection Summary

Cycle Length: 167.4

Actuated Cycle Length: 166.9

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.40

Intersection Signal Delay: 156.8

Intersection LOS: F

Intersection Capacity Utilization 107.0%

ICU Level of Service G

Analysis Period (min) 15

Splits and Phases: 2: US 377 & SH 114 WBFR

#1 	#1 	#1 
35.7 s	40 s	91.7 s
#2 	#2 	#2 
40.7 s	35 s	91.7 s

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	0	0	82	11
Future Vol, veh/h	0	20	0	0	82	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	23	0	0	94	13
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	54	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	1002	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1002	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.7		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1002	-	-			
HCM Lane V/C Ratio	0.023	-	-			
HCM Control Delay (s)	8.7	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	18	0	4	16	0	0	0	0	8	0	21
Future Vol, veh/h	42	18	0	4	16	0	0	0	0	8	0	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	78	33	0	7	30	0	0	0	0	15	0	39
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	30	0	0	33	0	0	253	233	33	233	233	30
Stage 1	-	-	-	-	-	-	189	189	-	44	44	-
Stage 2	-	-	-	-	-	-	64	44	-	189	189	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1583	-	-	1579	-	-	700	667	1041	722	667	1044
Stage 1	-	-	-	-	-	-	813	744	-	970	858	-
Stage 2	-	-	-	-	-	-	947	858	-	813	744	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1583	-	-	1579	-	-	645	630	1041	692	630	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	645	630	-	692	630	-
Stage 1	-	-	-	-	-	-	772	707	-	922	854	-
Stage 2	-	-	-	-	-	-	907	854	-	772	707	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	5.2			1.5			0			9.2		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1583	-	-	1579	-	-	916				
HCM Lane V/C Ratio	-	0.049	-	-	0.005	-	-	0.059				
HCM Control Delay (s)	0	7.4	0	-	7.3	0	-	9.2				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.2				

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	4	17	27	18	30
Future Vol, veh/h	28	4	17	27	18	30
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	68	68	68	68	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	6	25	40	26	44
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	47	0	134	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	90	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1560	-	860	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	934	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1560	-	846	1026
Mov Cap-2 Maneuver	-	-	-	-	846	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	919	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	2.8		9.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	950	-	-	1560	-	
HCM Lane V/C Ratio	0.074	-	-	0.016	-	
HCM Control Delay (s)	9.1	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Intersection													
Int Delay, s/veh	5.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Vol, veh/h	1	9	1	6	59	0	4	42	4	0	16	7	
Future Vol, veh/h	1	9	1	6	59	0	4	42	4	0	16	7	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	1	12	1	8	76	0	5	54	5	0	21	9	
Major/Minor	Minor2		Minor1			Major1			Major2				
Conflicting Flow All	131	95	26	99	97	57	30	0	0	59	0	0	
Stage 1	26	26	-	67	67	-	-	-	-	-	-	-	
Stage 2	105	69	-	32	30	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	841	795	1050	883	793	1009	1583	-	-	1545	-	-	
Stage 1	992	874	-	943	839	-	-	-	-	-	-	-	
Stage 2	901	837	-	984	870	-	-	-	-	-	-	-	
Platoon blocked, %								-	-		-	-	
Mov Cap-1 Maneuver	778	793	1050	870	791	1009	1583	-	-	1545	-	-	
Mov Cap-2 Maneuver	778	793	-	870	791	-	-	-	-	-	-	-	
Stage 1	989	874	-	940	836	-	-	-	-	-	-	-	
Stage 2	817	834	-	970	870	-	-	-	-	-	-	-	
Approach	EB		WB			NB			SB				
HCM Control Delay, s	9.5		10			0.6			0				
HCM LOS	A		B										
Minor Lane/Major Mvmt	NBL		NBT	NBR	EBLn1WBLn1		SBL	SBT	SBR				
Capacity (veh/h)	1583		-	-	810	798	1545	-	-				
HCM Lane V/C Ratio	0.003		-	-	0.017	0.104	-	-	-				
HCM Control Delay (s)	7.3		0	-	9.5	10	0	-	-				
HCM Lane LOS	A		A	-	A	B	A	-	-				
HCM 95th %tile O(veh)	0		-	-	0.1	0.3	0	-	-				

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	122	0	25	0	41	115	16	17	0
Future Vol, veh/h	0	0	0	122	0	25	0	41	115	16	17	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	149	0	30	0	50	140	20	21	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	196	251	21	181	181	120	21	0	0	190	0	0
Stage 1	61	61	-	120	120	-	-	-	-	-	-	-
Stage 2	135	190	-	61	61	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	763	652	1056	781	713	931	1595	-	-	1384	-	-
Stage 1	950	844	-	884	796	-	-	-	-	-	-	-
Stage 2	868	743	-	950	844	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	729	642	1056	772	702	931	1595	-	-	1384	-	-
Mov Cap-2 Maneuver	729	642	-	772	702	-	-	-	-	-	-	-
Stage 1	950	831	-	884	796	-	-	-	-	-	-	-
Stage 2	840	743	-	936	831	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0		10.8			0			3.7			
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1595	-	-	-	795	1384	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.225	0.014	-	-				
HCM Control Delay (s)	0	-	-	0	10.8	7.6	0	-				
HCM Lane LOS	A	-	-	A	B	A	A	-				
HCM 95th %tile O(veh)	0	-	-	-	0.9	0	-	-				

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	127	4	6	130	2	8	0	7	0	0	9
Future Vol, veh/h	0	127	4	6	130	2	8	0	7	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	159	5	8	163	3	10	0	9	0	0	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	166	0	0	164	0	0	348	344	162	347	345	165
Stage 1	-	-	-	-	-	-	162	162	-	181	181	-
Stage 2	-	-	-	-	-	-	186	182	-	166	164	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1412	-	-	1414	-	-	607	579	883	607	578	879
Stage 1	-	-	-	-	-	-	840	764	-	821	750	-
Stage 2	-	-	-	-	-	-	816	749	-	836	762	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1412	-	-	1414	-	-	597	576	883	599	575	879
Mov Cap-2 Maneuver	-	-	-	-	-	-	597	576	-	599	575	-
Stage 1	-	-	-	-	-	-	840	764	-	821	746	-
Stage 2	-	-	-	-	-	-	801	745	-	828	762	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			10.3			9.1		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	703	1412	-	-	1414	-	-	879				
HCM Lane V/C Ratio	0.027	-	-	-	0.005	-	-	0.013				
HCM Control Delay (s)	10.3	0	-	-	7.6	0	-	9.1				
HCM Lane LOS	B	A	-	-	A	A	-	A				
HCM 95th %tile O(veh)	0.1	0	-	-	0	-	-	0				

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱			↰		↱	↱	
Traffic Vol, veh/h	0	137	0	161	100	0	11	0	201	54	29	6
Future Vol, veh/h	0	137	0	161	100	0	11	0	201	54	29	6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	154	0	181	112	0	12	0	226	61	33	7
Number of Lanes	0	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	11.1	11	11.5	9.9
HCM LOS	B	B	B	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	5%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	100%	0%	83%
Vol Right, %	95%	0%	0%	0%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	212	137	161	100	54	35
LT Vol	11	0	161	0	54	0
Through Vol	0	137	0	100	0	29
RT Vol	201	0	0	0	0	6
Lane Flow Rate	238	154	181	112	61	39
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.36	0.257	0.314	0.179	0.113	0.066
Departure Headway (Hd)	5.44	6	6.255	5.75	6.699	6.07
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	599	575	625	536	590
Service Time	3.468	4.028	3.98	3.475	4.433	3.804
HCM Lane V/C Ratio	0.36	0.257	0.315	0.179	0.114	0.066
HCM Control Delay	11.5	11.1	11.8	9.7	10.3	9.2
HCM Lane LOS	B	B	B	A	B	A
HCM 95th-tile Q	1.6	1	1.3	0.6	0.4	0.2

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	51	840	20	14	431
Future Vol, veh/h	32	51	840	20	14	431
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
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	35	55	913	22	15	468
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1188	468	0	0	935	0
Stage 1	924	-	-	-	-	-
Stage 2	264	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	181	542	-	-	728	-
Stage 1	347	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	177	542	-	-	728	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	347	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.6	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	399	728	-	
HCM Lane V/C Ratio	-	-	0.226	0.021	-	
HCM Control Delay (s)	-	-	16.6	10.1	-	
HCM Lane LOS	-	-	C	B	-	
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-	

Intersection												
Int Delay, s/veh	214.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	1171	116	103	456	38	21	19	96	52	7	36
Future Vol, veh/h	67	1171	116	103	456	38	21	19	96	52	7	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	1233	122	108	480	40	22	20	101	55	7	38
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	520	0	0	1355	0	0	2175	2172	1294	2213	2213	500
Stage 1	-	-	-	-	-	-	1436	1436	-	716	716	-
Stage 2	-	-	-	-	-	-	739	736	-	1497	1497	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1046	-	-	508	-	-	33	47	199	~ 31	44	571
Stage 1	-	-	-	-	-	-	166	199	-	421	434	-
Stage 2	-	-	-	-	-	-	409	425	-	153	186	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1046	-	-	508	-	-	~ 20	34	199	~ 7	32	571
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 20	34	-	~ 7	32	-
Stage 1	-	-	-	-	-	-	155	185	-	392	342	-
Stage 2	-	-	-	-	-	-	294	334	-	63	173	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			2.4			\$ 688.8			\$ 3916.5		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	65	1046	-	-	508	-	-	12				
HCM Lane V/C Ratio	2.202	0.067	-	-	0.213	-	-	8.333				
HCM Control Delay (s)	\$ 688.8	8.7	-	-	14	-	-	\$ 3916.5				
HCM Lane LOS	F	A	-	-	B	-	-	F				
HCM 95th %tile Q(veh)	13.7	0.2	-	-	0.8	-	-	13.7				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	1155	11	10	509	86	0	6	51	11	4	176
Future Vol, veh/h	120	1155	11	10	509	86	0	6	51	11	4	176
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	124	1191	11	10	525	89	0	6	53	11	4	181
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	614	0	0	1202	0	0	-	2079	1197	2064	2040	570
Stage 1	-	-	-	-	-	-	-	1445	-	590	590	-
Stage 2	-	-	-	-	-	-	-	634	-	1474	1450	-
Critical Hdwy	4.12	-	-	4.12	-	-	-	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	-	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	965	-	-	581	-	-	0	53	226	40	57	521
Stage 1	-	-	-	-	-	-	0	197	-	494	495	-
Stage 2	-	-	-	-	-	-	0	473	-	158	196	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	965	-	-	581	-	-	-	45	226	25	49	521
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	45	-	25	49	-
Stage 1	-	-	-	-	-	-	-	172	-	431	487	-
Stage 2	-	-	-	-	-	-	-	465	-	102	171	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.2			25.7			15.6		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	226	965	-	-	581	-	-	521				
HCM Lane V/C Ratio	0.233	0.128	-	-	0.018	-	-	0.348				
HCM Control Delay (s)	25.7	9.3	-	-	11.3	-	-	15.6				
HCM Lane LOS	D	A	-	-	B	-	-	C				
HCM 95th %tile Q(veh)	0.9	0.4	-	-	0.1	-	-	1.5				

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	6	0	0	86	15
Future Vol, veh/h	0	6	0	0	86	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	0	7	0	0	93	16
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	55	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	1000	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	1000	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.6		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	1000	-	-			
HCM Lane V/C Ratio	0.007	-	-			
HCM Control Delay (s)	8.6	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0	-	-			

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	133	110	7	2	30
Future Vol, veh/h	2	133	110	7	2	30
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	2	145	120	8	2	33

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	128	0	0 273 124
Stage 1	-	-	- 124 -
Stage 2	-	-	- 149 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1458	-	- 716 927
Stage 1	-	-	- 902 -
Stage 2	-	-	- 879 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1458	-	- 715 927
Mov Cap-2 Maneuver	-	-	- 715 -
Stage 1	-	-	- 901 -
Stage 2	-	-	- 879 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1458	-	-	-	910
HCM Lane V/C Ratio	0.001	-	-	-	0.038
HCM Control Delay (s)	7.5	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

Build Out 2024 Total PM.syn

1: US 377 & SH 114 EBFR

										
Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT	Ø5	Ø6	Ø8
Lane Configurations										
Traffic Volume (vph)	377	1716	144	764	76	470	512			
Future Volume (vph)	377	1716	144	764	76	470	512			
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA			
Protected Phases		4		2		1	1 2	5	6	8
Permitted Phases	4		4		2					
Detector Phase	4	4	4	2	2	1	1 2			
Switch Phase										
Minimum Initial (s)	20.0	20.0	20.0	10.0	10.0	7.0		7.0	10.0	20.0
Minimum Split (s)	26.7	26.7	26.7	15.7	15.7	12.0		12.0	15.7	26.7
Total Split (s)	106.7	106.7	106.7	50.7	50.7	55.0		55.0	50.7	106.7
Total Split (%)	50.2%	50.2%	50.2%	23.9%	23.9%	25.9%		26%	24%	50%
Yellow Time (s)	5.0	5.0	5.0	4.7	4.7	3.6		3.6	4.7	5.0
All-Red Time (s)	1.7	1.7	1.7	1.0	1.0	1.4		1.4	1.0	1.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0				
Total Lost Time (s)	6.7	6.7	6.7	5.7	5.7	5.0				
Lead/Lag				Lead	Lead	Lag		Lag	Lead	
Lead-Lag Optimize?				Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None	None		None	None	None
Act Effect Green (s)	100.2	100.2	100.2	42.8	42.8	32.3	80.8			
Actuated g/C Ratio	0.52	0.52	0.52	0.22	0.22	0.17	0.42			
v/c Ratio	0.42	0.95	0.17	0.69	0.20	0.84	0.67			
Control Delay	31.2	56.5	19.2	72.8	30.0	45.9	10.3			
Queue Delay	0.0	0.0	0.0	1.9	0.0	0.3	3.6			
Total Delay	31.2	56.5	19.2	74.6	30.0	46.2	13.9			
LOS	C	E	B	E	C	D	B			
Approach Delay		49.8		70.6			29.4			
Approach LOS		D		E			C			

Intersection Summary

Cycle Length: 212.4

Actuated Cycle Length: 192.7

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 49.2

Intersection LOS: D

Intersection Capacity Utilization 90.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: US 377 & SH 114 EBFR

#1  Ø2	#1  Ø1	#1  Ø4
50.7 s	55 s	106.7 s
#2  Ø6	#2  Ø5	#2  Ø8
50.7 s	55 s	106.7 s

Timings 2: US 377 & SH 114 WBFR

Build Out 2024 Total PM.syn

							Ø1	Ø2	Ø4
Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	Ø1	Ø2	Ø4
Lane Configurations									
Traffic Volume (vph)	62	1691	183	938	1128	289			
Future Volume (vph)	62	1691	183	938	1128	289			
Turn Type	Perm	NA	Prot	NA	NA	Perm			
Protected Phases		8	5	5 6	6		1	2	4
Permitted Phases	8					6			
Detector Phase	8	8	5	5 6	6	6			
Switch Phase									
Minimum Initial (s)	20.0	20.0	7.0		10.0	10.0	7.0	10.0	20.0
Minimum Split (s)	26.7	26.7	12.0		15.7	15.7	12.0	15.7	26.7
Total Split (s)	106.7	106.7	55.0		50.7	50.7	55.0	50.7	106.7
Total Split (%)	50.2%	50.2%	25.9%		23.9%	23.9%	26%	24%	50%
Yellow Time (s)	5.0	5.0	3.6		4.7	4.7	3.6	4.7	5.0
All-Red Time (s)	1.7	1.7	1.4		1.0	1.0	1.4	1.0	1.7
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0			
Total Lost Time (s)	6.7	6.7	5.0		5.7	5.7			
Lead/Lag			Lag		Lead	Lead	Lag	Lead	
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes	
Recall Mode	None	None	None		None	None	None	None	None
Act Effect Green (s)	100.2	100.2	30.0	80.8	45.1	45.1			
Actuated g/C Ratio	0.52	0.52	0.16	0.42	0.23	0.23			
v/c Ratio	0.07	1.31	0.69	0.66	0.99	0.64			
Control Delay	25.1	181.8	81.2	37.1	95.5	44.5			
Queue Delay	0.0	0.0	0.4	1.3	10.0	0.0			
Total Delay	25.1	181.8	81.6	38.4	105.5	44.5			
LOS	C	F	F	D	F	D			
Approach Delay		177.8		45.5	93.0				
Approach LOS		F		D	F				

Intersection Summary

Cycle Length: 212.4

Actuated Cycle Length: 192.7

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 121.3

Intersection LOS: F

Intersection Capacity Utilization 90.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: US 377 & SH 114 WBFR

#1 	#1 	#1
50.7 s	55 s	106.7 s
#2 	#2 	#2
50.7 s	55 s	106.7 s

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	27	0	0	138	20
Future Vol, veh/h	0	27	0	0	138	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	31	0	0	159	23
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	91	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	949	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	949	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.9		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	949	-	-			
HCM Lane V/C Ratio	0.033	-	-			
HCM Control Delay (s)	8.9	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0.1	-	-			

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	19	0	13	15	4	0	0	0	4	0	18
Future Vol, veh/h	29	19	0	13	15	4	0	0	0	4	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	23	0	16	18	5	0	0	0	5	0	22
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	23	0	0	157	148	23	146	146	21
Stage 1	-	-	-	-	-	-	93	93	-	53	53	-
Stage 2	-	-	-	-	-	-	64	55	-	93	93	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1592	-	-	1592	-	-	809	743	1054	823	745	1056
Stage 1	-	-	-	-	-	-	914	818	-	960	851	-
Stage 2	-	-	-	-	-	-	947	849	-	914	818	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1592	-	-	1592	-	-	773	719	1054	803	721	1056
Mov Cap-2 Maneuver	-	-	-	-	-	-	773	719	-	803	721	-
Stage 1	-	-	-	-	-	-	894	800	-	939	842	-
Stage 2	-	-	-	-	-	-	918	841	-	894	800	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	4.4			3			0			8.7		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1592	-	-	1592	-	-	999				
HCM Lane V/C Ratio	-	0.022	-	-	0.01	-	-	0.027				
HCM Control Delay (s)	0	7.3	0	-	7.3	0	-	8.7				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.1				

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	23	4	12	25	18	27
Future Vol, veh/h	23	4	12	25	18	27
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	70	70	70	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	6	17	36	26	39
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	39	0	106	36
Stage 1	-	-	-	-	36	-
Stage 2	-	-	-	-	70	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1571	-	892	1037
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	953	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1571	-	882	1037
Mov Cap-2 Maneuver	-	-	-	-	882	-
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	943	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.4		9	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	969	-	-	1571	-	
HCM Lane V/C Ratio	0.066	-	-	0.011	-	
HCM Control Delay (s)	9	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile O(veh)	0.2	-	-	0	-	

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	25	4	4	41	0	13	45	13	0	11	5
Future Vol, veh/h	1	25	4	4	41	0	13	45	13	0	11	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	29	5	5	47	0	15	52	15	0	13	6
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	129	113	16	123	109	60	19	0	0	67	0	0
Stage 1	16	16	-	90	90	-	-	-	-	-	-	-
Stage 2	113	97	-	33	19	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	844	777	1063	852	781	1005	1597	-	-	1535	-	-
Stage 1	1004	882	-	917	820	-	-	-	-	-	-	-
Stage 2	892	815	-	983	880	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	798	769	1063	818	773	1005	1597	-	-	1535	-	-
Mov Cap-2 Maneuver	798	769	-	818	773	-	-	-	-	-	-	-
Stage 1	994	882	-	908	812	-	-	-	-	-	-	-
Stage 2	832	807	-	947	880	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	9.7		10			1.3			0			
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1597	-	-	799	777	1535	-	-				
HCM Lane V/C Ratio	0.009	-	-	0.043	0.067	-	-	-				
HCM Control Delay (s)	7.3	0	-	9.7	10	0	-	-				
HCM Lane LOS	A	A	-	A	B	A	-	-				
HCM 95th %tile O(veh)	0	-	-	0.1	0.2	0	-	-				

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	212	0	59	0	41	84	17	14	0
Future Vol, veh/h	0	0	0	212	0	59	0	41	84	17	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	216	0	60	0	42	86	17	14	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	163	176	14	133	133	85	14	0	0	128	0	0
Stage 1	48	48	-	85	85	-	-	-	-	-	-	-
Stage 2	115	128	-	48	48	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	802	717	1066	839	758	974	1604	-	-	1458	-	-
Stage 1	965	855	-	923	824	-	-	-	-	-	-	-
Stage 2	890	790	-	965	855	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	746	708	1066	831	749	974	1604	-	-	1458	-	-
Mov Cap-2 Maneuver	746	708	-	831	749	-	-	-	-	-	-	-
Stage 1	965	845	-	923	824	-	-	-	-	-	-	-
Stage 2	835	790	-	953	845	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0		11.2			0			4.1			
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1604	-	-	-	858	1458	-	-				
HCM Lane V/C Ratio	-	-	-	-	0.322	0.012	-	-				
HCM Control Delay (s)	0	-	-	0	11.2	7.5	0	-				
HCM Lane LOS	A	-	-	A	B	A	A	-				
HCM 95th %tile O(veh)	0	-	-	-	1.4	0	-	-				

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	88	3	19	268	6	4	0	6	0	0	7
Future Vol, veh/h	1	88	3	19	268	6	4	0	6	0	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	101	3	22	308	7	5	0	7	0	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	315	0	0	104	0	0	465	464	103	464	462	312
Stage 1	-	-	-	-	-	-	105	105	-	356	356	-
Stage 2	-	-	-	-	-	-	360	359	-	108	106	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1245	-	-	1488	-	-	508	495	952	508	497	728
Stage 1	-	-	-	-	-	-	901	808	-	661	629	-
Stage 2	-	-	-	-	-	-	658	627	-	897	807	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1245	-	-	1488	-	-	495	486	952	497	488	728
Mov Cap-2 Maneuver	-	-	-	-	-	-	495	486	-	497	488	-
Stage 1	-	-	-	-	-	-	900	807	-	660	618	-
Stage 2	-	-	-	-	-	-	639	616	-	890	806	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.5			10.3			10		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	695	1245	-	-	1488	-	-	728				
HCM Lane V/C Ratio	0.017	0.001	-	-	0.015	-	-	0.011				
HCM Control Delay (s)	10.3	7.9	0	-	7.5	0	-	10				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

Intersection	
Intersection Delay, s/veh	28.3
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱			↱		↱	↱	
Traffic Vol, veh/h	0	93	4	194	237	0	40	0	500	57	44	20
Future Vol, veh/h	0	93	4	194	237	0	40	0	500	57	44	20
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	97	4	202	247	0	42	0	521	59	46	21
Number of Lanes	0	1	0	1	1	0	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	12.9	15.7	44.8	11.4
HCM LOS	B	C	E	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	7%	0%	100%	0%	100%	0%
Vol Thru, %	0%	96%	0%	100%	0%	69%
Vol Right, %	93%	4%	0%	0%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	540	97	194	237	57	64
LT Vol	40	0	194	0	57	0
Through Vol	0	93	0	237	0	44
RT Vol	500	4	0	0	0	20
Lane Flow Rate	562	101	202	247	59	67
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.924	0.217	0.421	0.479	0.13	0.133
Departure Headway (Hd)	6.019	7.736	7.491	6.981	7.9	7.161
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	608	466	483	518	455	501
Service Time	4.019	5.759	5.191	4.681	5.631	4.892
HCM Lane V/C Ratio	0.924	0.217	0.418	0.477	0.13	0.134
HCM Control Delay	44.8	12.9	15.5	15.9	11.8	11
HCM Lane LOS	E	B	C	C	B	B
HCM 95th-tile Q	11.8	0.8	2.1	2.6	0.4	0.5

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	67	681	49	14	628
Future Vol, veh/h	19	67	681	49	14	628
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	74	748	54	15	690
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1150	401	0	0	802	0
Stage 1	775	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	192	599	-	-	817	-
Stage 1	415	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	189	599	-	-	817	-
Mov Cap-2 Maneuver	311	-	-	-	-	-
Stage 1	415	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.9	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	497	817	-	
HCM Lane V/C Ratio	-	-	0.19	0.019	-	
HCM Control Delay (s)	-	-	13.9	9.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-	

Intersection												
Int Delay, s/veh	276.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	905	56	83	1117	39	20	13	98	42	12	97
Future Vol, veh/h	36	905	56	83	1117	39	20	13	98	42	12	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	943	58	86	1164	41	21	14	102	44	13	101
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1205	0	0	1001	0	0	2462	2425	972	2463	2434	1185
Stage 1	-	-	-	-	-	-	1048	1048	-	1357	1357	-
Stage 2	-	-	-	-	-	-	1414	1377	-	1106	1077	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	579	-	-	692	-	-	21	32	306	~ 21	32	230
Stage 1	-	-	-	-	-	-	275	305	-	184	217	-
Stage 2	-	-	-	-	-	-	171	212	-	255	295	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	579	-	-	692	-	-	~ 6	26	306	~ 7	26	230
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 6	26	-	~ 7	26	-
Stage 1	-	-	-	-	-	-	257	285	-	172	190	-
Stage 2	-	-	-	-	-	-	78	186	-	151	276	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.7			\$ 1721.1			\$ 3114.7		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	32	579	-	-	692	-	-	22				
HCM Lane V/C Ratio	4.264	0.065	-	-	0.125	-	-	7.15				
HCM Control Delay (s)	\$ 1721.1	11.6	-	-	10.9	-	-	\$ 3114.7				
HCM Lane LOS	F	B	-	-	B	-	-	F				
HCM 95th %tile Q(veh)	16.2	0.2	-	-	0.4	-	-	19.9				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s				+: Computation Not Defined				*: All major volume in platoon		

Intersection												
Int Delay, s/veh	14.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	157	920	28	27	1114	374	1	1	55	10	6	208
Future Vol, veh/h	157	920	28	27	1114	374	1	1	55	10	6	208
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	162	948	29	28	1148	386	1	1	57	10	6	214
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1534	0	0	977	0	0	2794	2877	963	2713	2698	1341
Stage 1	-	-	-	-	-	-	1287	1287	-	1397	1397	-
Stage 2	-	-	-	-	-	-	1507	1590	-	1316	1301	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	434	-	-	706	-	-	12	16	310	14	21	~ 186
Stage 1	-	-	-	-	-	-	202	235	-	175	208	-
Stage 2	-	-	-	-	-	-	151	167	-	194	231	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	434	-	-	706	-	-	-	10	310	~ 7	13	~ 186
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	10	-	~ 7	13	-
Stage 1	-	-	-	-	-	-	127	147	-	110	200	-
Stage 2	-	-	-	-	-	-	-	160	-	99	145	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.6			0.2			19.2			164.7		
HCM LOS							C			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	310	434	-	-	706	-	-	186				
HCM Lane V/C Ratio	0.183	0.373	-	-	0.039	-	-	1.153				
HCM Control Delay (s)	19.2	18.1	-	-	10.3	-	-	164.7				
HCM Lane LOS	C	C	-	-	B	-	-	F				
HCM 95th %tile Q(veh)	0.7	1.7	-	-	0.1	-	-	10.9				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s				+: Computation Not Defined				*: All major volume in platoon		

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	4	0	0	121	44
Future Vol, veh/h	0	4	0	0	121	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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	0	4	0	0	132	48
Major/Minor	Minor2		Major2			
Conflicting Flow All	-	90	-	-	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	950	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	950	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		SB			
HCM Control Delay, s	8.8		0			
HCM LOS	A					
Minor Lane/Major Mvmt	EBLn1	SBT	SBR			
Capacity (veh/h)	950	-	-			
HCM Lane V/C Ratio	0.005	-	-			
HCM Control Delay (s)	8.8	-	-			
HCM Lane LOS	A	-	-			
HCM 95th %tile Q(veh)	0	-	-			

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	89	279	19	2	21
Future Vol, veh/h	5	89	279	19	2	21
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	5	97	303	21	2	23
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	324	0	-	0	421	314
Stage 1	-	-	-	-	314	-
Stage 2	-	-	-	-	107	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1236	-	-	-	589	726
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1236	-	-	-	587	726
Mov Cap-2 Maneuver	-	-	-	-	587	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	917	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		10.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1236	-	-	-	711	
HCM Lane V/C Ratio	0.004	-	-	-	0.035	
HCM Control Delay (s)	7.9	0	-	-	10.2	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱		↱	↱		↱	↱	
Traffic Vol, veh/h	0	134	0	161	97	0	4	0	201	51	27	6
Future Vol, veh/h	0	134	0	161	97	0	4	0	201	51	27	6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	151	0	181	109	0	4	0	226	57	30	7
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	10.9	10.9	10.6	9.8
HCM LOS	B	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	100%	0%	82%
Vol Right, %	0%	100%	0%	0%	0%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	201	134	161	97	51	33
LT Vol	4	0	0	161	0	51	0
Through Vol	0	0	134	0	97	0	27
RT Vol	0	201	0	0	0	0	6
Lane Flow Rate	4	226	151	181	109	57	37
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.008	0.331	0.247	0.31	0.171	0.106	0.062
Departure Headway (Hd)	6.471	5.282	5.905	6.167	5.663	6.644	6.007
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	554	684	608	584	634	540	597
Service Time	4.198	2.982	3.935	3.893	3.389	4.377	3.74
HCM Lane V/C Ratio	0.007	0.33	0.248	0.31	0.172	0.106	0.062
HCM Control Delay	9.3	10.6	10.9	11.7	9.6	10.2	9.1
HCM Lane LOS	A	B	B	B	A	B	A
HCM 95th-tile Q	0	1.4	1	1.3	0.6	0.4	0.2

Timings

Build Out 2024 Background AM - mitigation.syn

12: Walnut St & Byron Nelson Blvd

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	1171	116	103	453	35	21	17	96	17	1	32
Future Volume (vph)	65	1171	116	103	453	35	21	17	96	17	1	32
Adj. Flow (vph)	68	1233	122	108	477	37	22	18	101	18	1	34
Lane Group Flow (vph)	68	1355	0	108	514	0	0	141	0	0	53	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	20.0	80.0		20.0	80.0		30.0	30.0		30.0	30.0	
Total Split (%)	15.4%	61.5%		15.4%	61.5%		23.1%	23.1%		23.1%	23.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	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	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	84.6	75.1		83.5	79.4			11.4			11.4	
Actuated g/C Ratio	0.77	0.68		0.76	0.72			0.10			0.10	
v/c Ratio	0.10	1.08		0.54	0.39			0.58			0.34	
Control Delay	2.8	69.1		27.1	7.6			30.1			29.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.8	69.1		27.1	7.6			30.1			29.0	
LOS	A	E		C	A			C			C	
Approach Delay		66.0			11.0			30.1			29.0	
Approach LOS		E			B			C			C	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 110

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 47.5

Intersection LOS: D

Intersection Capacity Utilization 95.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 12: Walnut St & Byron Nelson Blvd

		
Ø1	Ø2	Ø4
20 s	80 s	30 s
		
Ø5	Ø6	Ø8
20 s	80 s	30 s

Timings
13: SH 114 EBFR & Byron Nelson Blvd

Build Out 2024 Background AM - mitigation.syn

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	1120	11	10	507	79	0	6	51	11	4	174
Future Volume (vph)	120	1120	11	10	507	79	0	6	51	11	4	174
Adj. Flow (vph)	124	1155	11	10	523	81	0	6	53	11	4	179
Lane Group Flow (vph)	124	1166	0	10	604	0	0	59	0	0	194	0
Turn Type	D.P+P	NA		D.P+P	NA			NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	20.0	60.0		20.0	60.0		30.0	30.0		30.0	30.0	
Total Split (%)	18.2%	54.5%		18.2%	54.5%		27.3%	27.3%		27.3%	27.3%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	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	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	52.1	55.3		56.3	45.1			10.5			10.5	
Actuated g/C Ratio	0.67	0.71		0.72	0.58			0.14			0.14	
v/c Ratio	0.24	0.88		0.05	0.57			0.22			0.52	
Control Delay	4.3	20.1		3.3	12.8			13.6			12.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.3	20.1		3.3	12.8			13.6			12.5	
LOS	A	C		A	B			B			B	
Approach Delay		18.6			12.6			13.6			12.5	
Approach LOS		B			B			B			B	

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 77.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 94.5%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 13: SH 114 EBFR & Byron Nelson Blvd

 Ø1	 Ø2	 Ø4
20 s	60 s	30 s
 Ø5	 Ø6	 Ø8
20 s	60 s	30 s

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶		↶	↶		↶	↶		↶	↶	
Traffic Vol, veh/h	0	92	4	194	230	0	22	0	500	55	42	20
Future Vol, veh/h	0	92	4	194	230	0	22	0	500	55	42	20
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	96	4	202	240	0	23	0	521	57	44	21
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	12.4	14.8	30	11.1
HCM LOS	B	B	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	0%	96%	0%	100%	0%	68%
Vol Right, %	0%	100%	4%	0%	0%	0%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	22	500	96	194	230	55	62
LT Vol	22	0	0	194	0	55	0
Through Vol	0	0	92	0	230	0	42
RT Vol	0	500	4	0	0	0	20
Lane Flow Rate	23	521	100	202	240	57	65
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.044	0.832	0.207	0.404	0.445	0.123	0.126
Departure Headway (Hd)	6.974	5.753	7.463	7.198	6.69	7.755	7.009
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	510	625	483	497	534	465	514
Service Time	4.76	3.539	5.469	4.991	4.483	5.461	4.715
HCM Lane V/C Ratio	0.045	0.834	0.207	0.406	0.449	0.123	0.126
HCM Control Delay	10.1	30.9	12.4	14.8	14.8	11.5	10.7
HCM Lane LOS	B	D	B	B	B	B	B
HCM 95th-tile Q	0.1	8.8	0.8	1.9	2.3	0.4	0.4

Timings

Build Out 2024 Background PM - mitigation.syn

12: Walnut St & Byron Nelson Blvd

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	905	56	83	1115	33	20	6	98	18	8	94
Future Volume (vph)	29	905	56	83	1115	33	20	6	98	18	8	94
Adj. Flow (vph)	30	943	58	86	1161	34	21	6	102	19	8	98
Lane Group Flow (vph)	30	1001	0	86	1195	0	0	129	0	0	125	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	20.0	80.0		20.0	80.0		30.0	30.0		30.0	30.0	
Total Split (%)	15.4%	61.5%		15.4%	61.5%		23.1%	23.1%		23.1%	23.1%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	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	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	80.3	73.1		79.2	76.8			10.7			10.7	
Actuated g/C Ratio	0.77	0.70		0.76	0.74			0.10			0.10	
v/c Ratio	0.15	0.77		0.26	0.87			0.55			0.53	
Control Delay	3.9	16.5		4.3	20.5			23.5			23.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	3.9	16.5		4.3	20.5			23.5			23.4	
LOS	A	B		A	C			C			C	
Approach Delay		16.1			19.4			23.5			23.4	
Approach LOS		B			B			C			C	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 103.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 18.5

Intersection LOS: B

Intersection Capacity Utilization 87.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 12: Walnut St & Byron Nelson Blvd

		
Ø1	Ø2	Ø4
20 s	80 s	30 s
		
Ø5	Ø6	Ø8
20 s	80 s	30 s

Timings
13: SH 114 EBFR & Byron Nelson Blvd

Build Out 2024 Background PM - mitigation.syn

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	895	28	27	1108	355	1	1	55	10	6	206
Future Volume (vph)	157	895	28	27	1108	355	1	1	55	10	6	206
Adj. Flow (vph)	162	923	29	28	1142	366	1	1	57	10	6	212
Lane Group Flow (vph)	162	952	0	28	1508	0	0	59	0	0	228	0
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	5	2		1	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.0	15.0		10.0	15.0		15.0	15.0		15.0	15.0	
Total Split (s)	20.0	130.0		20.0	130.0		20.0	20.0		20.0	20.0	
Total Split (%)	11.8%	76.5%		11.8%	76.5%		11.8%	11.8%		11.8%	11.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	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	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	Min		None	Min		None	None		None	None	
Act Effect Green (s)	138.8	137.3		140.9	125.0			11.3			11.3	
Actuated g/C Ratio	0.84	0.83		0.85	0.76			0.07			0.07	
v/c Ratio	0.85	0.62		0.06	1.10			0.37			0.75	
Control Delay	84.5	7.7		1.9	79.2			23.8			26.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	84.5	7.7		1.9	79.2			23.8			26.8	
LOS	F	A		A	E			C			C	
Approach Delay		18.9			77.8			23.8			26.8	
Approach LOS		B			E			C			C	

Intersection Summary

Cycle Length: 170

Actuated Cycle Length: 165.1

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 50.4

Intersection LOS: D

Intersection Capacity Utilization 120.4%

ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 13: SH 114 EBFR & Byron Nelson Blvd

 Ø1	 Ø2	 Ø4
20 s	130 s	20 s
 Ø5	 Ø6	 Ø8
20 s	130 s	20 s

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱		↱	↱		↱	↱		↱	↱	
Traffic Vol, veh/h	0	137	0	161	100	0	11	0	201	54	29	6
Future Vol, veh/h	0	137	0	161	100	0	11	0	201	54	29	6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	154	0	181	112	0	12	0	226	61	33	7
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

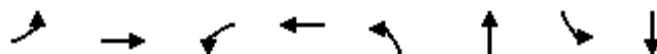
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	11	11	10.5	9.9
HCM LOS	B	B	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	100%	0%	83%
Vol Right, %	0%	100%	0%	0%	0%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	11	201	137	161	100	54	35
LT Vol	11	0	0	161	0	54	0
Through Vol	0	0	137	0	100	0	29
RT Vol	0	201	0	0	0	0	6
Lane Flow Rate	12	226	154	181	112	61	39
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.022	0.332	0.255	0.312	0.178	0.113	0.066
Departure Headway (Hd)	6.507	5.291	5.955	6.217	5.713	6.687	6.057
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	551	680	603	579	629	536	591
Service Time	4.237	3.021	3.985	3.944	3.439	4.421	3.791
HCM Lane V/C Ratio	0.022	0.332	0.255	0.313	0.178	0.114	0.066
HCM Control Delay	9.4	10.6	11	11.8	9.7	10.3	9.2
HCM Lane LOS	A	B	B	B	A	B	A
HCM 95th-tile Q	0.1	1.5	1	1.3	0.6	0.4	0.2

Timings

Build Out 2024 Total AM - mitigation.syn

12: Walnut St & Byron Nelson Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	67	1171	103	456	21	19	52	7
Future Volume (vph)	67	1171	103	456	21	19	52	7
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	84.0	10.0	84.0	16.0	16.0	16.0	16.0
Total Split (%)	9.1%	76.4%	9.1%	76.4%	14.5%	14.5%	14.5%	14.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	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
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effect Green (s)	84.0	79.0	85.0	81.0		11.0		11.0
Actuated g/C Ratio	0.76	0.72	0.77	0.74		0.10		0.10
v/c Ratio	0.11	1.02	0.74	0.38		0.61		0.93
Control Delay	2.6	48.1	48.2	6.5		32.4		109.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	2.6	48.1	48.2	6.5		32.4		109.3
LOS	A	D	D	A		C		F
Approach Delay		45.9		13.7		32.4		109.3
Approach LOS		D		B		C		F

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 39.0

Intersection LOS: D

Intersection Capacity Utilization 99.0%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 12: Walnut St & Byron Nelson Blvd

Ø2	Ø3	Ø4
16 s	10 s	84 s
Ø6	Ø7	Ø8
16 s	10 s	84 s

Timings
13: SH 114 EBFR & Byron Nelson Blvd

Build Out 2024 Total AM - mitigation.syn

							
Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	120	1155	10	509	6	11	4
Future Volume (vph)	120	1155	10	509	6	11	4
Turn Type	pm+pt	NA	pm+pt	NA	NA	Perm	NA
Protected Phases	7	4	3	8	2		6
Permitted Phases	4		8			6	
Detector Phase	7	4	3	8	2	6	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	15.0	120.0	15.0	120.0	25.0	25.0	25.0
Total Split (%)	9.4%	75.0%	9.4%	75.0%	15.6%	15.6%	15.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	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
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Min	Min	Min
Act Effect Green (s)	71.4	69.4	62.2	55.2	9.2		9.2
Actuated g/C Ratio	0.76	0.74	0.66	0.59	0.10		0.10
v/c Ratio	0.22	0.87	0.04	0.57	0.28		0.61
Control Delay	3.0	17.7	2.6	11.0	22.6		20.3
Queue Delay	0.0	0.1	0.0	0.0	0.0		0.0
Total Delay	3.0	17.8	2.6	11.0	22.6		20.3
LOS	A	B	A	B	C		C
Approach Delay		16.4		10.9	22.6		20.3
Approach LOS		B		B	C		C

Intersection Summary

Cycle Length: 160

Actuated Cycle Length: 93.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 15.4

Intersection LOS: B

Intersection Capacity Utilization 96.5%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 13: SH 114 EBFR & Byron Nelson Blvd

		
Ø2	Ø3	Ø4
25 s	15 s	120 s
		
Ø6	Ø7	Ø8
25 s	15 s	120 s

Intersection	
Intersection Delay, s/veh	21.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	93	4	194	237	0	40	0	500	57	44	20
Future Vol, veh/h	0	93	4	194	237	0	40	0	500	57	44	20
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	97	4	202	247	0	42	0	521	59	46	21
Number of Lanes	0	1	0	1	1	0	1	1	0	1	1	0

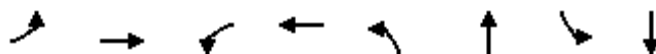
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	1
HCM Control Delay	12.5	15.2	30.1	11.3
HCM LOS	B	C	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%
Vol Thru, %	0%	0%	96%	0%	100%	0%	69%
Vol Right, %	0%	100%	4%	0%	0%	0%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	500	97	194	237	57	64
LT Vol	40	0	0	194	0	57	0
Through Vol	0	0	93	0	237	0	44
RT Vol	0	500	4	0	0	0	20
Lane Flow Rate	42	521	101	202	247	59	67
Geometry Grp	7	7	6	7	7	7	7
Degree of Util (X)	0.081	0.838	0.211	0.407	0.463	0.129	0.131
Departure Headway (Hd)	7.016	5.795	7.528	7.256	6.748	7.828	7.089
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	507	620	479	493	531	460	509
Service Time	4.808	3.586	5.536	5.053	4.544	5.535	4.795
HCM Lane V/C Ratio	0.083	0.84	0.211	0.41	0.465	0.128	0.132
HCM Control Delay	10.4	31.7	12.5	15	15.3	11.7	10.9
HCM Lane LOS	B	D	B	B	C	B	B
HCM 95th-tile Q	0.3	9	0.8	2	2.4	0.4	0.4

Timings

Build Out 2024 Total PM-mitigation.syn

12: Walnut St & Byron Nelson Blvd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	36	905	83	1117	20	13	42	12
Future Volume (vph)	36	905	83	1117	20	13	42	12
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	15.0	70.0	15.0	70.0	25.0	25.0	25.0	25.0
Total Split (%)	13.6%	63.6%	13.6%	63.6%	22.7%	22.7%	22.7%	22.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	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
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effect Green (s)	68.2	63.3	71.0	66.7		11.5		11.5
Actuated g/C Ratio	0.72	0.67	0.75	0.71		0.12		0.12
v/c Ratio	0.20	0.81	0.29	0.92		0.52		0.73
Control Delay	6.3	20.5	5.8	28.3		20.6		42.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	6.3	20.5	5.8	28.3		20.6		42.9
LOS	A	C	A	C		C		D
Approach Delay		20.0		26.8		20.6		42.9
Approach LOS		C		C		C		D

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 94.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 24.8

Intersection LOS: C

Intersection Capacity Utilization 92.6%

ICU Level of Service F

Analysis Period (min) 15

Splits and Phases: 12: Walnut St & Byron Nelson Blvd

Ø2	Ø3	Ø4
25 s	15 s	70 s
Ø6	Ø7	Ø8
25 s	15 s	70 s

Timings
13: SH 114 EBFR & Byron Nelson Blvd

Build Out 2024 Total PM-mitigation.syn

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	157	920	27	1114	1	1	10	6
Future Volume (vph)	157	920	27	1114	1	1	10	6
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	7	4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	15.0	120.0	15.0	120.0	25.0	25.0	25.0	25.0
Total Split (%)	9.4%	75.0%	9.4%	75.0%	15.6%	15.6%	15.6%	15.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	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
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effect Green (s)	129.6	123.7	121.0	115.1		9.5		9.5
Actuated g/C Ratio	0.87	0.83	0.81	0.77		0.06		0.06
v/c Ratio	0.98	0.64	0.07	1.11		0.38		0.77
Control Delay	106.1	8.6	2.4	78.6		23.2		29.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	106.1	8.6	2.4	78.6		23.2		29.3
LOS	F	A	A	E		C		C
Approach Delay		22.5		77.3		23.2		29.3
Approach LOS		C		E		C		C

Intersection Summary

Cycle Length: 160	
Actuated Cycle Length: 149.7	
Natural Cycle: 140	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 51.6	Intersection LOS: D
Intersection Capacity Utilization 122.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 13: SH 114 EBFR & Byron Nelson Blvd

 Ø2	 Ø3	 Ø4
25 s	15 s	120 s
 Ø6	 Ø7	 Ø8
25 s	15 s	120 s

PREVIOUS CONFIGURATION

Table 1: Trip Generation Characteristics for Proposed Roanoke North Residential Development

Land Use		Rates ¹								
Description	ITE Code	Average Weekday			AM Peak Hour			PM Peak Hour		
Multifamily Housing (Mid-Rise)	221	T = 5.45(X) – 1.75			Ln(T) = 0.98*Ln(X) – 0.98			Ln(T) = 0.96Ln*(X) – 0.63		
Senior Adult Housing - Attached	252	T = 4.02(X) - 25.37			T = 0.2(X) - 0.18			T = 0.26(X)		
Townhomes	220	T = 7.56(X) - 40.86			Ln(T) = 0.95*Ln(X) - 0.51			Ln(T) = 0.89*Ln(X) - 0.02		
Single-Family Detached Housing	210	Ln(T) = 0.92*Ln(X) + 2.71			T = 0.71(X) + 4.80			Ln(T) = 0.96*Ln(X) + 0.20		
Land Use		Directional Split ²								
Description	ITE Code	Average Weekday			AM Peak Hour			PM Peak Hour		
Multifamily Housing (Mid-Rise)	221	50 / 50			26 / 74			61 / 39		
Senior Adult Housing - Attached	252	50 / 50			35 / 65			55 / 45		
Townhomes	220	50 / 50			23 / 77			63 / 37		
Single-Family Detached Housing	210	50 / 50			25 / 75			63 / 37		
Land Use		Number of Trips								
Land Use	Variable ³	Average Weekday			AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	289	1,574	787	787	97	25	72	123	75	48
Senior Adult Housing - Attached	129	494	247	247	26	9	17	34	19	15
Townhomes	9	28	14	14	5	1	4	7	4	3
Single-Family Detached Housing	41	458	229	229	34	9	25	43	27	16
TOTAL		2,554	1,277	1,277	162	44	118	207	125	82

¹T = Trips Ends; X = Number of Dwelling Units

²XX / YY = % entering vehicles / % exiting vehicles

³Number of Dwelling Units

***Based on ITE Trip Generation, 10th Edition**

Roanoke Zoning Comparison Table							
Section	Description	MF-12	Proposed	R	Proposed	SF-A	Proposed
			Tract 1		Tract 2		Tract 3
			Multi-Family, Age Targeted, Townhome for rent				Townhome for sale
Sec. 12.261. Permitted Uses. Sec. 12.311. Permitted Uses.	Land uses	Those uses listed for the MF-12 district in article VI of this chapter as "P" or "S" are authorized uses permitted by right or specially permitted uses, respectively. Special uses must be approved utilizing procedures set forth in article V of this chapter.	Multi-family	Staybridge Suites	Multi-family	Those uses listed for the SFA district in article VI of this chapter as "P" or "S" are authorized uses permitted by right or specially permitted uses, respectively. Special uses must be approved utilizing procedures set forth in article V of this chapter.	Townhomes
Sec. 12.262. Height Regulations. Sec. 12.312. Height Regulations.	Maximum Height: Main Building	2.5 Story / 35'	4 Story / 55'* *Highest point on front facing façade. Remainder of building is 48'	4 Story / 54.5'	4 Story / 55'* *Highest point. Remainder of building is 50'	2.5 Story / 35'	2.5 story / 35'
	Maximum Height: Accessory Building Other	1 story / 16' for other accessory buildings, including detached garage, garden shed, gazebo, etc. Other requirements (see article VII, division 6 of this chapter).	NC	1 story	1 story	1 story / 16' for other accessory buildings, including detached garages, carports, garden shed, gazebo, clubhouse, mail kiosks, etc. Other requirements (see article VII, division 6 of this chapter).	NC
Sec. 12.313. Area Regulations. Sec. 12.313. Area Regulations.	Minimum Lot Area	3,500 sf / du	1,012 sf / du	10,000 sf	NC	6,000 sf	3,300 sf
	Maximum Density	12 du / gross acre	37.66 units / acre	34.62 rooms/acre	33.68 units/acre	8 units / acre	NC
	Minimum project size	30,000 sf	NC	73,632 sf	NC	5 acres	NC
	Maximum project size	10 acres	10.62 acres	2.86 acres	3.83 acres	20 acres	7.88 acres
	Minimum Lot Width	125'	NC	25'	NC	40'	30'
	Minimum Lot Depth	200'	NC	100'	NC	100'	110'
	Size of Yards: Minimum Front Yard Minimum Side Yard Minimum Rear Yard	25' 7.5' 25'	BLDG I 30' 25' 25' BLDG II Front - 15' Side - 0' Rear - 15'	25' 15' 0'	30' 25' 25'	15' 8' (15' for adjacent building complexes) 8' (24') for garage)	5' 0' on zero lot, 3' on non-zero 10'
	Building Separation: One-Story	15' /20'	NC	n/a	NC	n/a	NC

	Two-Story Over Two-Story	20' /25' 25'					
	Minimum Dwelling Unit Size	900 sf - Efficiency 950 sf - One Bedroom 1075 sf - Two or more bedrooms	BLDG I 700 sf - One Bedroom (average 815 sf btw. unit types) 1,060 sf - Two or more bedroom 1,380 sf - Three bedroom BLDG II NC - One Bedroom NC - Two or more bedrooms	n/a	735 sf - One Bedroom 1,080 sf - Two or more bedrooms	1,000 sf	1,200 sf
	Maximum Lot Coverage	35%, including main and accessory buildings	50%	16.16%	50%	50%	75%
	Parking Regulations: Efficiency / One Bedroom Two Bedroom Three Bedroom	1 enclosed space per unit 1.5 spaces 2 spaces 2.5 spaces (avg 2 spaces / unit Req'd)	BLDG I 1.70 spaces per unit BLDG II 1.5 spaces per unit	1 Space required per guest room + 3 for 1 st 20 rooms + 1 per 10 rooms after	1.5 spaces per unit	2 enclosed spaces per unit	NC
Sec. 12.781. - Minimum Exterior Construction Standards.	Minimum Exterior Masonry Construction	85%, all walls 100%, facing a street & have elevation offsets of at least 5' for every 50' length of flat wall, both horizontally and vertically	80%, facing a street	n/a	80%, facing a street	85%, all walls 100%, facing a street & have elevation offsets of at least 5' for every 50' length of flat wall, both horizontally and vertically	80% facing a street
Sec. 12.314. - Special Requirements.	Usable Open Space Requirements.	Min 15% of tract area	18.5%	n/a		20%	26.1%
	Landscape Area Requirements.	Min 20% of tract area (includes open space)	30%	Min 20% of tract area (includes open space)			n/a
	Refuse Facilities.	dwelling units shall be located within 150' of a refuse facility	1 Compactor *valet trash to be provided				n/a
	Swimming Pool	For 50 or more units, plus one (1) additional pool per 100 units	1 Swimming pool for all units in Tract I		1 Swimming pool for all units in Tract 2		n/a
	Playground Area	One playground area containing at least 5 pieces of play equipment shall be provided for every 100 dwelling units	Provided in open space if required				n/a

Tract 1 and 2 (Multifamily and Age Targeted): The following standards shall apply to Tract 1 and 2.

- (a) Size of Tract: Tract 1 and 2 shall contain approximately 10.62 acres.
- (b) Uses Generally: In the development of Tract 1 and 2, no land shall be used, and no building or structure shall be installed, erected, or converted to any use other than:
 - (A) Permitted Uses: Multifamily Residential
 - (B) Accessory Uses: Accessory buildings and uses, customarily incident to the above uses and located on the same lot therewith, not involving the conduct of a retail business.
 - (C) Limitation of Uses: Any use not expressly permitted herein is prohibited:
 - (1) Area and Building Regulations:
 - (i) Minimum Lot Size: Tract 1 and 2 shall be developed as two lots.
 - (ii) Maximum Building Coverage: The combined foundation area of all main and accessory buildings shall not exceed 40% of the total area of Tract 1 and 2.
 - (iii) Maximum Open Space: All areas (but in any event at least 25% of the total area of Tract 1 and 2) not devoted to buildings, pedestrian walkways, structures or off-street parking area shall be devoted to grass, trees, gardens, shrubs, courtyards, community pool including decorative hardscape, pocket parks, hike and bike trails or other suitable landscape or decorative hard scape materials.
 - (iv) Maximum Unit Count: The maximum number of units on Tract 1 and 2 shall be 400.
 - (v) Maximum Impervious Area: The combined area occupied by all buildings, structures, off-street parking and paved areas shall not exceed 75% of the total area of Tract 1 and 2.
 - (vi) Depth of Front Yard: There shall be a front yard having a depth of not less than ten (10) feet along Street A. There shall be no parking allowed in the required front yard.

Stoops, steps, retaining walls, raised planters, and other decorative landscape items may be located within the required front yard setback.
 - (vii) Depth of Side and Rear Yards: There shall be a rear and side yard having a depth of not less than ten (10) feet. Automobile parking, including associated carports, will be permitted in such rear and side yards.
 - (viii) Height:
 - (1) No building or structure shall exceed four stories or fifty-five (55) feet in height.

(ix) Minimum Floor Areas:

- (1) Multi-family: The minimum square footage of a dwelling unit, exclusive of garages, breezeways, and porches, shall be as follows:

One Bedroom: 700 square feet

Two Bedroom: 1,060 square feet

Three Bedroom: 1,380 square feet

- (2) Age Targeted: The minimum square footage of a dwelling unit, exclusive of garages, breezeways, and porches, shall be as follows:

One Bedroom: 735 square feet

Two Bedroom: 1,080 square feet

(1) Street Frontage:

- (i) Both angled and parallel parking is permitted along the frontage of internal streets, if approved by the engineering department.
- (ii) One (1) large shade tree shall be required per fifty (50) linear feet (or portion thereof) of street frontage (less vehicular entry drives and associated visibility triangle). Trees to be located in the right-of-way adjacent to Street A within a minimum five foot (5') width parkway and/or within a minimum five feet (5') by ten feet (10') tree well leave-out in paving. Trees to be evenly spaced and aligned as to the extent site conditions allow.
- (2) Parking and Loading Regulations: Off-street parking and loading spaces shall be provided in accordance with the requirements for specific uses set forth in Section 12.700 –12.704 of the City of Roanoke Zoning Ordinance.
- Notwithstanding the forgoing, the total parking requirement shall be 1.7 spaces per dwelling unit for building I and 1.5 spaces per dwelling unit for buildings II and III. Tandem spaces behind private garages shall count toward the off-street parking requirement. Parking spaces along internal streets, if approved by the engineering department, shall count towards the off street parking requirement.
- (3) Building Materials: The following building material requirements shall apply:
- (i) Multi-family: All street facing facades shall have a masonry requirement of not less than 80% of the total street facing exterior wall excluding doors, windows and patios.

- (ii) Age Targeted: All street facing facades shall have a masonry requirement of not less than 80% of the total street facing exterior wall excluding doors, windows and patios.
- (4) Landscaping:
 - (i) Materials: Landscape materials such as decomposed granite and synthetic turf may be used as surface material at resident activity /amenity zones within the site.
 - (ii) Tree Mitigation: All trees planted on site shall be counted toward protected tree mitigation.
- (D) Signage: Signage shall meet all of the requirements of the Uniform Sign Regulations and attached signs are allowed on buildings I and II subject to the following provisions:
 - (1) All attached signs must be on-premise signs. All businesses shall be permitted to have one (1) attached sign per public street frontage.
 - (2) Maximum Effective Area. Total effective area of attached signs shall not exceed the following: an attached sign or signs shall not exceed or cover more than fifteen percent (15%) of the façade area of a building face or area of the front of the leasable building space.
 - (3) Projected from Building Surface. All attached signs and their words shall be mounted parallel to the building surface to which they are attached, and shall project no more than eighteen inches (18") from the surface.

Tract 3 (Townhomes for Sale): The following standards shall apply to Tract 3.

- (a) Size of Tract: Tract 3 shall contain approximately 7.88 acres.
- (b) Uses Generally: In the development of Tract 3, no land shall be used, and no building or structure shall be installed, erected, or converted to any use other than:
 - (A) Permitted Uses: Townhomes
 - (B) Accessory Uses: Accessory buildings and uses, customarily incident to the above uses and located on the same lot therewith, not involving the conduct of a retail business.
 - (C) Limitation of Uses: Any use not expressly permitted herein is prohibited:
 - (1) Area and Building Regulations:
 - (i) Minimum Lot Size: Tract 3 shall be developed with minimum lot sizes of 3,300 square feet.
 - (ii) Maximum Building Coverage: The combined foundation area of all main and accessory buildings shall not exceed 75% of the total area of Tract 3.
 - (iii) Maximum Open Space: All areas (but in any event at least 25% of the total area of Tract 3) not devoted to buildings, pedestrian walkways, structures or off-street parking area shall be devoted to grass, trees, gardens, shrubs, courtyards including decorative hardscape, pocket parks, hike and bike trails or other suitable landscape or decorative hard scape materials.
 - (iv) Maximum Unit Count: The maximum number of units on Tract 3 shall be 45.
 - (v) Maximum Impervious Area: The combined area occupied by all buildings, structures, off-street parking and paved areas shall not exceed 75% of the total area of Tract 3.
 - (vi) Minimum Yards:
 - (1) Depth of Front Yard: There shall be a front yard having a depth of not less than five (5) feet. Stoops, steps, retaining walls, raised planters, and other decorative landscape items may be located within the required front yard setback.
 - (2) Depth of Side Yard: There shall be a side yard having a depth of zero (0) feet on one side of the lot and a three (3) foot setback on the other side.
 - (3) Depth of Rear Yard: There shall be a rear yard having a depth of not less than ten (10) feet.

- (vii) Height:
 - (1) Main structure limited to 2.5 stories or thirty-five (35) feet in height.
 - (2) Any accessory buildings limited to 1 story or sixteen (16) feet.
- (viii) Minimum Floor Area: The minimum square footage of a dwelling unit, exclusive of garages, breezeways, and porches, shall be 1,200.
- (4) Street Frontage:
 - (i) Parallel parking is permitted along the frontage of internal streets, if approved by the engineering department.
 - (ii) One (1) large shade tree shall be required per fifty (50) linear feet (or portion thereof) of street frontage (less vehicular entry drives and associated visibility triangle). Trees to be located in the right-of-way adjacent to Street A within a minimum five foot (5') width parkway and/or within a minimum five feet (5') by ten feet (10') tree well leave-out in paving. Trees to be evenly spaced and aligned as to the extent site conditions allow.
- (5) Parking and Loading Regulations: Off-street parking and loading spaces shall be provided in accordance with the requirements for specific uses set forth in Section 12.700 –12.704 of the City of Roanoke Zoning Ordinance.

Notwithstanding the forgoing, the total parking requirement shall be 2 spaces per dwelling unit. Tandem spaces behind private garages shall count toward the off-street parking requirement. Parking spaces along internal streets, if approved by the engineering department, shall count towards the off street parking requirement.
- (6) Building Materials: The following building material requirements shall apply:
 - (i) All street facing facades shall have a masonry requirement of not less than 80% of the total street facing exterior wall excluding doors, windows and patios.
- (7) Landscaping:
 - (iii) Materials: Landscape materials such as decomposed granite and synthetic turf may be used as surface material at resident activity /amenity zones within the site.
 - (iv) Tree Mitigation: All trees planted on site shall be counted toward protected tree mitigation.



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: ORD NO 2022-105 - Creation of Crime Control Prevention District

MEETING DATE: January 25, 2022

DEPARTMENT: City Manager

ITEM SUMMARY:

Consideration and action on approval of Ordinance No. 2022-105 proposing the creation of the Roanoke Crime Control and Prevention District.

INFORMATION:

As reported at the last Council Meeting, approval of this ordinance is one of the procedural steps required for the CCPD effort.

STAFF RECOMMENDATION:

Recommend approval of Ordinance No. 2022-105 as presented.

SPECIAL CONSIDERATION:

NA

FINANCIAL CONSIDERATION:

NA

ATTACHMENTS:

1. ORD NO 2022-105 - Proposed Creation of Crime Control Prevention District - jlm draft - 011922

ORDINANCE No. 2021-105

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS, PROPOSING THE CREATION OF THE ROANOKE CRIME CONTROL AND PREVENTION DISTRICT; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Chapter 363 of the Texas Local Government Code, as amended, known as the Crime Control and Prevention District Act authorizes the City of Roanoke, Texas, to create a crime control and prevention district, and to levy a sales and use tax for financing thereof; and

WHEREAS, Section 363.053 of the Texas Local Government Code requires the proposed sales and use tax to be approved by a majority of the qualified voters of the City of Roanoke, Texas, voting at a sales and use tax election called and held for that purpose; and

WHEREAS, Section 363.051 of the Texas Local Government Code provides that the creation of a crime control and prevention district may be proposed by a majority vote of the City Council of the City of Roanoke, Texas; and

WHEREAS, the first step in creating a Crime Control and Prevention District, is the adoption of an ordinance by the City Council proposing the creation of the Roanoke Crime Control and Prevention District and establishing its boundaries.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS, THAT:

Section 1. FINDINGS INCORPORATED

The findings set forth above are incorporated into the body of this Ordinance as if fully set forth herein.

Section 2. PROPOSE CREATION OF ROANOKE CRIME CONTROL AND PREVENTION DISTRICT

The City Council of the City of Roanoke, Texas, does hereby propose the creation of the Roanoke Crime Control and Prevention District (the "District"), in accordance with Chapter 363 of the Texas Local Government Code, as amended.

Section 3. BOUNDARIES OF THE OF ROANOKE CRIME CONTROL AND PREVENTION DISTRICT

The boundaries of the proposed District shall correspond to the boundaries of the City of Roanoke, Texas.

Section 4. AUTHORITY OF THE ROANOKE CRIME CONTROL AND PREVENTION DISTRICT

The proposed District shall have all powers, authority, jurisdiction and obligations prescribed by the Crime Control and Prevention District Act, including but not limited to the power to levy a sales and use tax authorized pursuant to Section 363.055 of the Texas Local Government Code, and Section 323.105 of the Texas Tax Code.

Section 5. REQUIRED VOTER APPROVAL FOR ROANOKE CRIME CONTROL AND PREVENTION DISTRICT

In accordance with Chapter 363 of the Texas Local Government Code, as amended, creation of the Roanoke Crime Control and Prevention District shall occur only after approval by a majority

of the qualified voters of the City voting at a sales and use tax election ordered by the Crime Control and Prevention District's temporary board of directors.

Section 6. DISSOLUTION OF ROANOKE CRIME CONTROL AND PREVENTION DISTRICT

If upon the fifth (5th) anniversary date of the passage of this Ordinance the Roanoke Crime Control and Prevention District has not been created, then upon said date the temporary board of directors shall be dissolved in accordance with section 363.060 of the Texas Local Government Code.

Section 7. EFFECTIVE DATE

This Ordinance shall become effective immediately upon its passage.

PASSED, APPROVED AND ADOPTED by the City Council of the City of Roanoke, Texas, on this the 25th day of January, 2022.

Carl E. Gierisch, Jr., Mayor

ATTEST:

April S. Hill, City Secretary

APPROVED AS TO FORM:

Jeff Moore, City Attorney



AGENDA ITEM

TO: Mayor and City Council

SUBJECT: RES NO 2022-101R - Appointing a temporary board to CCPD

MEETING DATE: January 25, 2022

DEPARTMENT: City Manager

ITEM SUMMARY:

Consideration and action on approval of Resolution No. 2022-101R appointing a temporary board of directors to the proposed Roanoke Crime Control and prevention District.

INFORMATION:

As reported at the last Council Meeting, the City Attorney recommends this Resolution to formally ratify the temporary board as appointed at the last meeting. The CCCP board is meeting on Monday, January 24 to elect their president and receive staff's presentation on the CCPD process and police facility feasibility study (as previously presented to the Council).

STAFF RECOMMENDATION:

Recommend approval of Resolution No. 2022-101R as presented.

SPECIAL CONSIDERATION:

NA

FINANCIAL CONSIDERATION:

NA

ATTACHMENTS:

1. RES NO 2022-101R - Appointing Temporary Board of Directors - Crime Control District
- jlm draft - 011922

RESOLUTION NO. 2022-101R

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS,
APPOINTING A TEMPORARY BOARD OF DIRECTORS TO THE PROPOSED
ROANOKE CRIME CONTROL AND PREVENTION DISTRICT; AND
PROVIDING FOR AN IMMEDIATE EFFECTIVE DATE.**

WHEREAS, Section 363.052 of the Texas Local Government Code provides the authority for the City Council of the City of Roanoke, Texas, to appoint a seven (7) member temporary board of directors for the proposed Roanoke Crime Control and Prevention District; and

WHEREAS, the City Council of the City of Roanoke, Texas, finds and determines that it is in the best interest of the City to provide for the appointment of the Temporary Board of Directors of the Roanoke Crime Control and Prevention District.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ROANOKE, TEXAS:

Section 1. That the foregoing recitals are hereby found to be true and correct legislative findings of the City of Roanoke, Texas, and are fully incorporated into the body of this Resolution.

Section 2. The City Council of the City of Roanoke, Texas, does hereby appoint the following members to serve as the Temporary Board of Directors of the City of Roanoke Crime Control and Prevention District:

1. Angie Grimm ;
2. Sean Turner ;
3. Werner Rindfleisch ;
4. Krystle Joyner ;
5. John Thompson ;
6. Victor Molaschi ; and
7. Jim Harper .

Section 3. This Resolution shall become effective from and after its passage.

DULY RESOLVED by the City Council of the City of Roanoke, Texas, on this the 25th day of January, 2022.

APPROVED:

Carl E. Gierisch, Jr., Mayor

ATTEST:

April S. Hill, City Secretary

APPROVED AS TO FORM:

Jeff Moore, City Attorney