## The Anderson 400 Traffic Impact Study

## City of Princeton, IA

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## Executive Summary

Paul and Marijo Anderson initiated this traffic study to identify potential traffic impacts on the adjacent roadway network and provide traffic mitigation measures, if necessary, due to their proposed Anderson 400 development. The proposed Anderson 400 development site will be located on approximately 400 acres near Princeton, lowa. Two access points are ultimately proposed, with one onto Great River Road (US 67) and one onto Lost Grove Road. The access onto Great River Road will be located near the existing driveway to the Anderson's farm. The access onto Lost Grove Road will be located between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street. Sight visibility zones corresponding to intersection sight distance calculations as defined through AASHTO should be identified and maintained at these access points. These zones should not contain structures or plantings that would preclude unobstructed views of oncoming traffic.

The following study intersections within the study area were identified for analysis:

1. Great River Road \& South Access
2. Lost Grove Road \& North Access

The above list assigns each study intersection with a number that is used throughout the report. (e.g. \#1 = Great River Road and South Access). The area immediately surrounding the proposed development incorporates agricultural, undeveloped, and residential land uses.

The Anderson 400 development's initial vision is a corporate headquarters technology campus that will include a public park with an outdoor theater and multi-purpose trails. A bike sharing service is anticipated to be provided within the park. The development is expected to be completely built by the end of 2030 and employ up to 6,100 employees. 6,100 employees was identified as the approximate maximum number of employees allowable while maintaining acceptable vehicle operations at the two study intersections through the design year of 2050. Acceptable vehicle operations was defined as having an overall intersection Level of Service (LOS) of D or better, as well as not allowing more than one individual movement to operate at LOS E or worse. The Traffic Modeling section discusses vehicle operations in greater detail.

Turning movement volumes were collected at the intersection of the Anderson Farm driveway and Great River Road (\#1 Great River Road and South Access) and Lost Grove Road and 270 ${ }^{\text {th }}$ Avenue. Only the eastbound and westbound volumes at Lost Grove Road and $270^{\text {th }}$ Avenue were used in the analysis presented herein. Turning movement volumes were collected between the hours of 5:00 AM and 8:00 PM. The peak hours of the study intersections were determined based on the highest consecutive four consecutive 15 -minute turning movement counts at the intersection of Great River Road and South Access. The AM and PM peak hours at the intersection of Great River Road and South Access governed the AM and PM peak hour because it is the study intersection with the highest volume of entering vehicles. The AM peak hour was determined to occur between 6:15 and 7:15. The PM peak hour was determined to occur between 4:30 and 5:30. The AM and PM peak hour volumes were collected on Wednesday, September $26^{\text {th }}, 2018$. The raw and the refined volume data are provided in Appendix 1 of this report.
Projected traffic analysis will typically apply an annual growth rate to study intersections' existing turning movement volumes prior to adding project development trips to account for traffic volume growth passing through study intersections. This traffic volume growth is often referred to as background traffic growth. A review of Annual Average Daily Traffic (AADT) provided by the Iowa Department of Transportation (DOT) volumes near the development site indicated an approximate 2.0 percent annual growth rate. However, the Bi State Regional Commission traffic model indicates a negative growth rate between 2018 and 2045. It should also be noted, over time growth rates generally do not exhibit a straight line growth, but rather tends to level off as the surrounding area continues to develop. Therefore in order to provide a conservative analysis, a 2.0 percent annual growth rate was applied between 2018 and 2030 (full buildout), a 1.0 percent annual growth rate was applied between 2030 and 2040, and 0.5 percent annual growth rate was applied between 2040 and 2050 (design year). This approach is meant to represent a period of relative rapid traffic volume growth followed by a period of more moderate traffic volume growth.

The Iowa Crash Analysis Tool (ICAT) website administered by the lowa DOT was used to collect available crash data for the ten-year period between January 1, 2008 and December 31, 2017. There were no crashes
near the Anderson Farm driveway (\#1 Great River Road and South Access), which will become the south access for the proposed development. There were 11 crashes along Lost Grove Road between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street, which is the segment of roadway that is anticipated to have the north access for the proposed development. The crash data indicates animal crossings may be an issue along this segment of roadway. Watch for Wildlife or Wild Life Crossing signs could be installed to potentially alert drivers of this potential safety issue. Crash data for this analysis is provided in Appendix 2.

LOS D or better is generally identified as acceptable in urban conditions. The analysis presented herein indicates the study intersections will all operate at acceptable LOS C or better during the AM and PM peak hour conditions through 2050 with buildout of the proposed Anderson 400 development. This determination is based on the improvement schedule outline in Table 5, as well as traffic volume and trip generation trends identified herein. Operational analysis worksheets are contained in Appendix 4.

Trip distribution percentages for the proposed Anderson 400 development are based upon existing traffic patterns observed in the AM and PM peak hour volumes, as well expected traffic patterns in the surrounding roadway network over the 2050 design year. Trip distribution percentages for the Anderson 400 development are presented in the following figures.

Figure ES1 Trip Distribution - One Access Point 2020 to 2025


Figure ES2 Trip Distribution - Two Access Points 2025 through 2050


## Existing \& Projected No Build Conditions

Paul and Marijo Anderson initiated this traffic study to identify potential traffic impacts on the adjacent roadway network and provide traffic mitigation measures, if necessary, due to their proposed Anderson 400 development. The proposed Anderson 400 development site will be located on approximately 400 acres near Princeton, lowa. Two access points are ultimately proposed, with one onto Great River Road (US 67) and one onto Lost Grove Road. The access onto Great River Road will be located near the existing driveway to the Anderson's farm. The access onto Lost Grove Road will be located between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street.

The following study intersections within the study area were identified for analysis:

1. Great River Road \& South Access
2. Lost Grove Road \& North Access

The above list assigns each study intersection with a number that is used throughout the report. (e.g. \#1 = Great River Road and South Access).

The area immediately surrounding the proposed development incorporates agricultural, undeveloped, and residential land uses. A study area map depicting the location of the study intersections, as well as the location of proposed development site (delineated in red) is depicted in Figure 1.

Figure $1 \quad$ Study Area Map


## Adjacent Streets

The following descriptions are specific to the area near the proposed development.
Great River Road is a north/south two-lane (one lane in each direction) principal arterial roadway. Parking is prohibited along Great River Road and the posted speed is 55 mph .

Lost Grove Road is an east/west two-lane (one lane in each direction) minor collector roadway. Parking is prohibited along Lost Grove Road and the posted speed is 40 mph .

## Traffic Volume Data

Turning movement volumes were collected at the intersection of the Anderson Farm driveway and Great River Road (\#1 Great River Road and South Access) and Lost Grove Road and 270 ${ }^{\text {th }}$ Avenue. Only the eastbound and westbound volumes at Lost Grove Road and 270 th Avenue were used in the analysis presented herein. Turning movement volumes were collected between the hours of 5:00 AM and 8:00 PM. The peak hours of the study intersections were determined based on the highest consecutive four consecutive 15-minute turning movement counts at the intersection of Great River Road and South Access. The AM and PM peak hours at the intersection of Great River Road and South Access governed the AM and PM peak hour because it is the study intersection with the highest volume of entering vehicles. The AM peak hour was determined to occur between $6: 15$ and $7: 15$. The PM peak hour was determined to occur between $4: 30$ and $5: 30$. The AM and PM peak hour volumes were collected on Wednesday, September $26^{\text {th }}, 2018$. The raw and the refined volume data are provided in Appendix 1 of this report.

## Background Traffic Growth

Projected traffic analysis will typically apply an annual growth rate to study intersections' existing turning movement volumes prior to adding project development trips to account for traffic volume growth passing through study intersections. This traffic volume growth is often referred to as background traffic growth. A review of Annual Average Daily Traffic (AADT) provided by the lowa Department of Transportation (DOT) volumes near the development site indicated an approximate 2.0 percent annual growth rate. However, the BiState Regional Commission traffic model indicates a negative growth rate between 2018 and 2045. It should also be noted, over time growth rates generally do not exhibit a straight line growth, but rather tends to level off as the surrounding area continues to develop. Therefore in order to provide a conservative analysis, a 2.0 percent annual growth rate was applied between 2018 and 2030 (full buildout), a 1.0 percent annual growth rate was applied between 2030 and 2040, and 0.5 percent annual growth rate was applied between 2040 and 2050 (design year). This approach is meant to represent a period of relative rapid traffic volume growth followed by a period of more moderate traffic volume growth. Projected 2020 and 2050 AM and PM peak hour turning movement volumes without the proposed development (no build) are presented in Figure 2.

Figure 2 Study Intersections - AM \& PM Peak Hour No Build Volumes


2020 AM Peak Hour


2050 AM Peak Hour


2020 PM Peak Hour


2050 PM Peak Hour


## Crash Analysis

The Iowa Crash Analysis Tool (ICAT) website administered by the lowa DOT was used to collect available crash data for the ten-year period between January 1, 2008 and December 31, 2017.

There were no crashes near the Anderson Farm driveway (\#1 Great River Road and South Access), which will become the south access for the proposed development. There were 11 crashes along Lost Grove Road between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street, which is the segment of roadway that is anticipated to have the north access for the proposed development.

Figure 3 presents the location of the eleven crashes along Lost Grove Road between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street. The red dots indicate locations of crash incidents.

Figure 3 Lost Grove Road - 270 ${ }^{\text {th }}$ Avenue to $5^{\text {th }}$ Street


Table 1 presents crash statistics for each crash organized by crash type.
Table 1 Crash Type - Lost Grove Rd 270 ${ }^{\text {th }}$ Ave to $5^{\text {th }}$ St (1/1/08 - 12/31/17)

| Crash Type |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Single <br> Vehicle | Head On | Rear End | Broadside | Not <br> Reported/ <br> Other | Total |
| 7 | 1 | 1 | 1 | 1 | $\mathbf{1 1}$ |
|  |  |  |  |  |  |
| Source: lowa Department of Transportation, Bureau of Transportation Safety. |  |  |  |  |  |

4 of the 11 crashes occurred during dry roadway conditions; the remaining 7 crashes occurred during the following roadway conditions:

- Wet = 1
- Ice/Frost = 1
- Snow = 1
- Not Reported $=4$

Table 2 summarizes reported major causes for the crashes.
Table 2 Major Causes of Crashes - Lost Grove Rd 270 ${ }^{\text {th }}$ Ave to $5^{\text {th }}$ St (1/1/08 - 12/31/17)

| Major Causes |  |  |  |
| :---: | :---: | :---: | :---: |
| Animal | Followed Too <br> Closely | Ran Off Road <br> (Right) | Swerving <br> Evasive Action |
| 6 | 1 | 3 | 1 |
| Source: lowa Department of Transportation, Bureau of Transportation Safety. |  |  |  |

Table 3 presents crash injury statistics for the crashes organized by severity.
Table $3 \quad$ Crash Severity - Lost Grove Rd $270^{\text {th }}$ Ave to $5^{\text {th }}$ St (1/1/08-12/31/17)

| Number <br> of <br> Crashes | Crash Severity |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | Major <br> Injury | Minor <br> Injury | Property <br> Damage Only | Injuries per <br> Crash |
| $\mathbf{1 1}$ | 0 | 1 | 10 | 0.09 |

The crash data indicates animal crossings may be an issue along this segment of roadway. Watch for Wildlife or Wild Life Crossing signs could be installed to potentially alert drivers of this potential safety issue. Crash data for this analysis is provided in Appendix 2.

## Projected Buildout Conditions \& Mitigation

## Development Description

The Anderson 400 development's initial vision is a corporate headquarters technology campus that will include a public park with an outdoor theater and multi-purpose trails. A bike sharing service is anticipated to be provided within the park. The development is expected to be completely built by the end of 2030 and employ up to 6,100 employees. The total of 6,100 employees was identified as the approximate maximum number of employees allowable while maintaining acceptable vehicle operations at the two study intersections through the design year of 2050. Acceptable vehicle operations was defined as having an overall intersection Level of Service (LOS) of D or better, as well as not allowing more than one individual movement to operate at LOS E or worse. The Traffic Modeling section discusses vehicle operations in greater detail. A preliminary site plan is provided in Figure 4. Opening and design year exhibits are provided in Appendix 3.

Figure $4 \quad$ Preliminary Site Plan


The site plan indicates two access points onto Great River Road, with the further south access point operating as an emergency only access and the further north access point operating as the main access point. The further south access point is intended to be 20 feet wide with a gravel surface and is it anticipated to be barricaded except for emergency uses and as such the analysis presented herein assumes all trips will be using the further north (main) access point. The emergency access is intended to provide an additional access point for emergency vehicles should the main access point become unusable (e.g. during a crash incident). Construction vehicles are also anticipated to use the emergency access road during the construction of the further north (main) access point onto Great River Road. As discussed in greater detail in Table 5, the further north (main) access point onto Great River Road will initially be constructed with northbound and southbound single lane approaches and then later improved with additional turn bays as needed.

## Trip Generation

Project trip generation is based on nationally accepted trip generation rates and fitted curve equations contained in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. For the purposes of this study the development will be analyzed under four phases, which include buildout year 2020, 2025, and 2030, as well as the design year of 2050. Additionally, it is assumed the proposed public park will be fully built by 2020 .

The proposed Anderson 400 development is most closely represented by ITE's Corporate Headquarters Building (ITE 714). However, due to the small ITE sample size of studies (both the AM and PM peak hours only had 1 study) Office Park (ITE Code 750) was chosen, which has a larger sample size of studies (both the AM and PM peak hours had 3 studies). These ITE studies are used in the development of the ITE trip generation rates and fitted curve equations. Therefore, it is reasonable to assume a larger sample size of studies would produce more accurate rates and fitted curve equations. Public Park (ITE Code 411) was chosen for the proposed public park. Generated trips correspond to the weekday AM and PM peak hour of the generator. The AM and PM peak hours at the study intersections are anticipated to be determined by employees traveling to/from the proposed development. Table 4 presents AM and PM peak hour trip generation estimates for the proposed Anderson 400 development.

Table 4 Trip Generation

|  |  |  | Daily |  |  | Peak H |  |  |  |  | Peak Ho |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Land Use | ITE <br> Code ${ }^{1}$ | Quantity | Total Trips | Total Trips | \% In | \% Out | Trips In | Trips Out | Total <br> Trips | \% In | \% Out | Trips In | Trips Out |
| Office Park | 750 | $\begin{gathered} 6,100 \\ \text { Employees } \\ \hline \end{gathered}$ | 21,594 | 2,379 | 92\% | 8\% | 2,189 | 190 | 2,257 | 15\% | 85\% | 339 | 1,918 |
| Public Park | 411 | 100 Acres | $152{ }^{2}$ | 2 | 59\% | 41\% | 1 | 1 | $29^{3}$ | 55\% | 45\% | 16 | 13 |
| 2020 Buildout Trip Generation (5\% of Total) |  |  | 1,232 | 121 |  |  | 110 | 11 | 142 |  |  | 33 | 109 |
| 2025 Buildout Trip Generation (40\% of Total) |  |  | 8,790 | 954 |  |  | 877 | 77 | 932 |  |  | 152 | 780 |
| 2030 Buildout Trip Generation (100\% of Total) |  |  | 21,746 | 2,381 |  |  | 2,190 | 191 | 2,286 |  |  | 355 | 1,931 |

${ }^{1}$ Institue of Transportation Engineers Trip Generation Handbook, $10^{\text {th }}$ Edition, 2017
${ }^{2}$ Fitted curve equation, $T=0.64(X)+88.46$, was used
${ }^{3}$ Fitted curve equation, $T=0.06(X)+22.60$, was used

## Trip Distribution

Trip distribution percentages for the proposed Anderson 400 development, with only the initial access point onto Great River Road are based upon expected travel patterns to/from the proposed development and are presented in Figure 5. Trip distribution percentages with both planned access points (one onto Great River Road and one onto Lost Grove Road) are based upon expected travel patterns to/from the proposed development over the design year of 2050 and are presented in Figure 6.

Figure $5 \quad$ Trip Distribution - One Access Point 2020 to 2025


Figure $6 \quad$ Trip Distribution - Two Access Points 2025 through 2050


The 45 percent to/from the west on Lost Grove Road South is justifiable in that motorists will generally choose routes that minimize their travel time/distance. Therefore, as the initial access point onto US 67 becomes congested, motorists become more likely to use the access point on to Lost Grove Road to/from their ultimate destinations/origins that is largely anticipated to be the Quade Cities, which is south and west of the proposed development. It should also be noted GPS data indicates the shortest path to the Quad Cities is via Lost Grove Road and $240^{\text {th }}$ Avenue, therefore justifying the trip distribution adopted.

## Left-Turn Bay Warrant Analysis

The subsequent analysis was performed under the guidelines and procedures as outlined in the National Cooperative Highway Research Program (NCHRP) report Development of Left-Turn Warrants for Unsignalized Intersections (2013). This report states that left-turn bays should be provided where there are more than 12 left turns during the peak hour, when delay caused by left-turning vehicles blocking through vehicles would become a problem, and that dedicated left-turn bays not only increase intersection capacity but also increase vehicle safety. Figure 7 provides thresholds curve figures for determining if a left-turn bay is warranted based on approach volume.

Figure 7 Left-Turn Bay Warrant Based on Approach Volume


Please note Great River Road has a posted speed limit of 55 mph in the vicinity of the Great River Road and South Access intersection. However, for the purposes of this analysis the $40-45 \mathrm{mph}$ threshold curve will be used to determine if a left-turn bay is warranted on the northbound approach to the Great River Road and South Access intersection. The analysis presented herein projects that 99 and 31 vehicles will be making a left turn during the projected 2020 buildout AM and PM peak hours, respectively. As such a left-turn bay is warranted during both the AM and PM peak hour 2020 buildout condition.

The $95^{\text {th }}$ percentile queue length is the length of which a queue will be less than 95 percent of the time and is often analyzed to determine appropriate lengths for turn bays. The AM and PM peak hour northbound left-turn $95^{\text {th }}$ percentile queue at the Great River Road and South Access intersection under projected 2050 buildout conditions is anticipated to be 247 and 207 feet, respectively. As such a 250 foot northbound left-turn bay is recommended at the Great River Road and South Access intersection.

## Right-Turn Bay Warrant Analysis

The lowa DOT requested a review of the lowa DOT Design Manual and The National Cooperative Highway Research Program Report (NCHRP) 457 Evaluating Intersection Improvements: An Engineering Study Guide. The review request is specific to determine whether a right-turn bay on the southbound approach to the Great River Road and South Access intersection is warranted, which based on the analysis presented herein is recommended to be signalized by 2025.

Figure 8 provides a threshold curve figure, prepared by the lowa DOT Office of Design (Chapter 6A-1) for determining if a right-turn bay is warranted based on approach volume on a two-lane roadway at unsignalized intersections.

Figure 8 Right-Turn Bay Warrant Based on Approach Volume - lowa DOT Chapter 6A-1 Rural Two-Lane Highways



Traffic volume is based on current ADT for right turns, and design year ADT for left turns.
*Traffic volume must be adjusted for trucks based on Table 1.
${ }^{* *}$ At gravel road intersections, use minor right furn.
Based on projected 2025 buildout peak hour turning movement volumes a right-turn bay is not warranted during the AM or PM peak hours for the above threshold curve warrant. Additionally, it is recommended the intersection be signalized by 2025, which would make the above figure inapplicable at this intersection.

The NCHRP 457 report, states "provision of a right-turn bay on the major road to a two-way stop-controlled intersection can significantly improve operations and safety at the intersection".

Figure 9 provides a threshold curve figure, prepared for NCHRP 457 report, for determining if a right-turn bay is warranted at unsignalized intersections based on approach volume on a two-lane roadway with a 60,55 ,

50, 45, and 40 mph posted speed limit. It should be noted Great River Road (US 67) has a posted speed limit of 55 mph near the proposed access point.

Figure 9 Right-Turn Bay Warrant Based on Approach Volume - NCHRP 457 Report


Based on projected 2025 buildout peak hour turning movement volumes a right-turn bay is warranted during the AM peak hour, but not during the PM peak hour for the above threshold curve warrant. Additionally, it is recommended the intersection be signalized by 2025, which would make the above figure inapplicable. It should be noted based on projected 2020 buildout peak hour turning movement volumes a right-turn bay is not warranted during the AM or PM peak hours for the above threshold curve warrant.

## Signal Warrant Analysis

The subsequent analysis was performed under the guidelines and procedures as outlined in the 2009 Manual of Uniform Traffic Control Devices (MUTCD) and is used to determine the approximate year a traffic signal will be warranted at the intersections of Great River Road and South Access and Lost Grove Road and North Access. The MUTCD states a traffic control signal should not be installed unless one or more signal warrants are met. If these requirements are not met, the MUTCD states a traffic control signal should not be put into operation.

For the purposes of this analysis the MUTCD Warrant 2 - Four-Hour Vehicular Volume was analyzed. The Four-Hour warrant was chosen, because it is anticipated a traffic signal will only be warranted during the period of time when the majority of employees are traveling to and from the proposed development. For the purposes of this analysis the 7:00-8:00 AM and 8:00-9:00 AM and 4:00-5:00 PM and 5:00-6:00 PM hours were chosen. The ITE Trip Generation Manual, $10^{\text {th }}$ Edition was used to estimate inbound and outbound trips during these hours. Please note the hourly signal warrant turning movement volumes do not match the AM and PM peak hour volumes, because the analyzed hourly periods of time are different. The AM peak hour was determined to occur between 6:15 and 7:15. The PM peak hour was determined to occur between 4:30 and 5:30. The signal warrant will analyze the 7:00 to 8:00 and 8:00 to 9:00 AM hours and the 4:00 to 5:00 and 5:00 to 6:00 PM hours

The following figures identify the anticipated lane configuration under projected 2050 buildout conditions at the intersections of Great River Road and South Access (\#1) and Lost Grove Road and North Access (\#2). It is anticipated the intersection of Great River Road and South access (\#1) will be the sole access until operational considerations indicate the second access onto Lost Grove Road is needed


Please note the MUTCD provides the following guidance with regards to the consideration of the number of lanes at intersection approaches:
"Engineering judgment should also be used in applying various traffic signal warrants to cases where approaches consist of one lane plus one left-turn or right-turn lane. The site-specific traffic characteristics dictate whether an approach should be considered as one lane or two lanes. For example, for an approach with a shared through and right-turning lane plus a left-turn lane, engineering judgment could indicate that it should be considered a one-lane approach if the traffic using the left-turn lane is minor. In such a case, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach. The approach should be considered two lanes if approximately half of the traffic on the approach turns left and the left-turn lane is of sufficient length to accommodate all left-turn vehicles. Similar engineering judgment and rationale should be applied to a street approach with one lane plus a right-turn lane. In this case, the degree of conflict of minor-street right-turn traffic with traffic on the major street should be considered. Thus, right-turn traffic should not be included in the minor-street volume if the movement enters the major street with minimal conflict. The approach should be evaluated as a one-lane approach with only the traffic volume in the through/left-turn lane considered."

Based on the trip distributions identified in Figures 5 and Figure 6, less than half of anticipated vehicles will be turning left at the eastbound approach and more than half will be making a left at the northbound approach to the intersection of Great River Road and South Access. As such, the following signal warrant analysis will assume the following lane configuration at the intersection of Great River Road and South Access:


## Warrant 2 - Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant condition is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. This warrant is satisfied when the plotted points representing vehicles per hour on the major street (total of both approaches) and corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in the figure below for the existing combination of approach lanes for all four selected hours of an average day. The applicable threshold curve for the intersection is identified in the figure below by a green rectangle. On the minor street, the higher volume is not required to be on the same approach during each of the four hours. Figure 10 presents the Warrant 2 - Four-Hour Vehicular Volume for the intersection of Great River Road and South Access by the end of the year 2028.

Figure 10 Four Hour Vehicular Volume Warrant - Analysis Year 2028, Great River Road \& South Access


## MAJOR STREET - TOTAL OF BOTH APPROACHES - VPH

*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Source: Manual of Uniform Traffic Control Devices, December 2009
Based on the traffic volume and trip generation trends identified herein, traffic volume characteristics at the intersection of Great River Road and South Access is expected to meet the threshold to justify a signalized intersection under Warrant 2 - Four-Hour Vehicular Volume by the end of the year 2028 (as shown in Figure 10). However, for operational purposes it is recommended that the intersection of Great River Road and South Access be signalized by the end of 2025 .

Based on the traffic volume and trip generation trends identified herein the second access onto Lost Grove Road will be needed operationally by the end of 2025 to relieve congestion at the initial access onto Great River Road and will need to be signalized by the end of 2030 (as shown in Figure 11). Figure 11 presents the Warrant 2 - Four-Hour Vehicular Volume for the intersection of Lost Grove Road and North Access by the end of the year 2030.

Figure 11 Four Hour Vehicular Volume Warrant - Analysis Year 2030, Lost Grove Road and North Access


## MAJOR STREET - TOTAL OF BOTH APPROACHES - VPH

*Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Source: Manual of Uniform Traffic Control Devices, December 2009
Please note, the MUTCD states a satisfaction of a traffic control warrant or warrants does not in itself require a modification to the existing traffic control. In general, a modification to an existing traffic control should not be made unless analysis indicates it will improve the overall safety and or operations of the intersection. The ultimate decision resides on engineering judgement.

Table 5 provides a comprehensive schedule of improvements based on the traffic volume and trip generation trends identified herein. The identified improvements are assumed to be implemented by the identified dates for the purposes of the operational analysis. The no build condition assumes the Anderson Farm's driveway remains a private driveway and the Lost Grove Road and North Access intersection is never constructed.

Table 5 Scheduled Improvements

|  | Intersection | Year Implemented | Existing/Assumed Configuration | Recommended Configuration | Details |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Rd \& South Access | 2020 |  | $\binom{10}{1 /}$ | The intersection is anticipated to be constructed with dedicated eastbound and northbound left turn bays. |
| 1 | Great River Rd \& South Access | 2025 | )/ | $\left(\begin{array}{cc} \lambda & 0 \\ i \end{array}\right)$ | The intersection is anticipated to be signalized and the northbound left movement is anticipated to operate as a permitted (green ball) only movement. |
| 2 | Lost Grove Rd \& North Access | 2025 | $7$ |  | The north access is anticipated to be constructed as an unsignalized intersection with a stop sign on the northbound approach. |
| 2 | Lost Grove Rd \& North Access | 2030 | $\left(\begin{array}{lll} \Gamma & & \\ & 0 & \gamma \end{array}\right)$ |  | The north access is anticipated to be signalized. |
| 1 | Great River Rd \& South Access | 2030 | $17$ | $\left(\begin{array}{ll} 2 & 8 \end{array}\right)$ | The northbound left movement is anticipated to operate with protectedpermitted (green arrow followed by green ball) phases. |

The recommended lane configuration and control for the study intersections by the end of 2030 under full buildout conditions is presented in Figure 12.

Figure 12 Study Intersections - 2030 Buildout Recommended Lane Configuration and Control


Projected 2020, 2025, 2030, and 2050 AM and PM peak hour turning movement volumes upon buildout of the proposed Anderson 400 development are presented in Figure 13. Table 6 and 7 present turning movement volumes at the study intersection organized by the following volume classifications:

- 2020 Volumes No Build
- Background Traffic Volume Growth
- 2050 Volumes No Build
- Development Trips
- 2020 Volumes Buildout
- 2050 Volumes Buildout

Figure 13 Study Intersections - AM \& PM Peak Hour Build Volumes


2020 AM Peak Hour


2025 AM Peak Hour


2030 AM Peak Hour


2050 AM Peak Hour


2020 PM Peak Hour


2025 PM Peak Hour


2030 PM Peak Hour


2050 PM Peak Hour


Table 6 AM Peak Hour Turning Movement Volumes

| \#1 Great River Road \& South Access |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Traffic Volume Classification | Southbound |  |  | Westbound |  |  | Northbound |  |  | Eastbound |  |  | Int. Count |
|  | Great River Road |  |  | NA |  |  | Great River Road |  |  | South Access |  |  |  |
|  | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |  |
| 2020 Volumes Without Project | 0 | 246 | 2 | 0 | 0 | 0 | 0 | 131 | 0 | 1 | 0 | 1 | 381 |
| Background Traffic Volume Growth | 0 | 101 | 1 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 157 |
| 2050 Volumes Without Project | 0 | 347 | 3 | 0 | 0 | 0 | 0 | 186 | 0 | 1 | 0 | 1 | 538 |
| 2020 Development Trips | 0 | 0 | 12 | 0 | 0 | 0 | 99 | 0 | 0 | 2 | 0 | 9 | 122 |
| 2050 Development Trips | 0 | 0 | 110 | 0 | 0 | 0 | 986 | 0 | 0 | 10 | 0 | 85 | 1,191 |
| 2020 Volumes With Project | 0 | 246 | 14 | 0 | 0 | 0 | 99 | 131 | 0 | 3 | 0 | 10 | 503 |
| 2050 Volumes With Project | 0 | 347 | 113 | 0 | 0 | 0 | 986 | 186 | 0 | 11 | 0 | 86 | 1,729 |
| \#2 Lost Grove Road \& North Access |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume Classification | Southbound |  |  | Westbound |  |  | Northbound |  |  | Eastbound |  |  | Int. Count |
|  | NA |  |  | Lost Grove Road |  |  | North Access |  |  | Lost Grove Road |  |  |  |
|  | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |  |
| 2020 Volumes Without Project | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 51 |
| Background Traffic Volume Growth | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 21 |
| 2050 Volumes Without Project | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 72 |
| 2020 Development Trips | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 7 |
| 2050 Development Trips | 0 | 0 | 0 | 110 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 986 | 1,096 |
| 2020 Volumes With Project | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 58 |
| 2050 Volumes With Project | 0 | 0 | 0 | 110 | 57 | 0 | 0 | 0 | 0 | 0 | 15 | 986 | 1,168 |

Table $7 \quad$ PM Peak Hour Turning Movement Volumes

| \#1 Great River Road \& South Access |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Traffic Volume Classification | Southbound |  |  | Westbound |  |  | Northbound |  |  | Eastbound |  |  | Int. Count |
|  | Great River Road |  |  | NA |  |  | Great River Road |  |  | South Access |  |  |  |
|  | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |  |
| 2020 Volumes Without Project | 0 | 222 | 0 | 0 | 0 | 0 | 1 | 267 | 0 | 1 | 0 | 2 | 493 |
| Background Traffic Volume Growth | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 111 | 0 | 0 | 0 | 1 | 203 |
| 2050 Volumes Without Project | 0 | 313 | 0 | 0 | 0 | 0 | 1 | 378 | 0 | 1 | 0 | 3 | 696 |
| 2020 Development Trips | 0 | 0 | 4 | 0 | 0 | 0 | 30 | 0 | 0 | 10 | 0 | 99 | 143 |
| 2050 Development Trips | 0 | 0 | 18 | 0 | 0 | 0 | 160 | 0 | 0 | 97 | 0 | 868 | 1,143 |
| 2020 Volumes With Project | 0 | 222 | 4 | 0 | 0 | 0 | 31 | 267 | 0 | 11 | 0 | 101 | 636 |
| 2050 Volumes With Project | 0 | 313 | 18 | 0 | 0 | 0 | 161 | 378 | 0 | 98 | 0 | 871 | 1,839 |
| \#2 Lost Grove Road \& North Access |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Traffic Volume Classification | Southbound |  |  | Westbound |  |  | Northbound |  |  | Eastbound |  |  | Int. Count |
|  | NA |  |  | Lost Grove Road |  |  | North Access |  |  | Lost Grove Road |  |  |  |
|  | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |  |
| 2020 Volumes Without Project | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 54 | 0 | 82 |
| Background Traffic Volume Growth | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 35 |
| 2050 Volumes Without Project | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 77 | 0 | 117 |
| 2020 Development Trips | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 7 |
| 2050 Development Trips | 0 | 0 | 0 | 18 | 0 | 0 | 869 |  | 97 | 0 | 0 | 160 | 1,144 |
| 2020 Volumes With Project | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 56 | 0 | 89 |
| 2050 Volumes With Project | 0 | 0 | 0 | 18 | 40 | 0 | 869 | 0 | 97 | 0 | 77 | 160 | 1,261 |

## Traffic Modeling

## Operational Analysis

Vehicular operational analysis for this study was performed using the methodology of the $6^{\text {th }}$ Edition Highway Capacity Manual (HCM) through PTV Vistro 5.00-00 traffic analysis software. Operational analysis is generally categorized in terms of Level of Service (LOS). LOS describes the quality of traffic operations and is graded from A to F; with LOS A representing free-flow conditions and LOS F representing congested conditions.

Procedures outlined in Chapter 19 of the HCM $6^{\text {th }}$ Edition were used to analyze intersection performance at signalized intersections. The primary measure ${ }^{1}$ used to quantify LOS at signalized intersections is average intersection control delay. Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection and the time for vehicles to speed up through the intersection and enter into the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches.

A queueing analysis was also performed at the signalized intersections. A vehicle queue is a line of vehicles waiting to pass through an intersection. As vehicles arrive the queue grows and as the movement is served, the queue length shrinks. To account for this variation, it is common to consider the $95^{\text {th }}$ percentile queue length. The $95^{\text {th }}$ percentile queue is the length of which the queue will be less than 95 percent of the time.

Procedures outlined in Chapters 20 (two-way stop control) of the HCM $6^{\text {th }}$ Edition were used to analyze intersection performance at unsignalized intersections. While LOS for signalized intersections is primarily based on the volume weighted average delay per vehicle traveling through the intersection (average intersection control delay), LOS for unsignalized intersections is based primarily on the movement with the longest delay.

Table 8 presents the range of traffic delays associated for signalized and unsignalized intersections.

## Table 8 LOS Criteria for Signalized and Unsignalized Intersections

| LOS | Signalized Intersection <br> Average Delay (sec/veh) | Unsignalized Intersection <br> Delay (sec/veh) |
| :---: | :---: | :---: |
| A | $\leq 10$ | $\leq 10$ |
| B | $>10$ to 20 | $>10$ to 15 |
| C | $>20$ to 35 | $>15$ to 25 |
| D | $>35$ to 55 | $>25$ to 35 |
| E | $>55$ to 80 | $>35$ to 50 |
| F | $>80$ | $>50$ |

Source: HCM 6 ${ }^{\text {th }}$ Edition, Exhibit 19-8 LOS Criteria for Signalized Intersections and
Exhibit 20-2 LOS Criteria for Unsignalized Intersections.
sec/veh = seconds per vehicle
The following operational analysis assumes the lane configuration and control presented in Table 5. The signalized operations assume optimized cycle lengths and phasing splits as identified through PTV 5.00-00. Table 9 presents operational conditions including $95^{\text {th }}$ percentile queue lengths for the signalized study intersection. Table 10 presents delay and LOS on the worse movement at the unsignalized study intersection. The no build condition assumes the Anderson Farm's driveway remains a private driveway and the Lost Grove Road and North Access intersection is never constructed. Operational analysis worksheets are contained in Appendix 4.

[^0]Table $9 \quad$ Projected Signalized Intersection Operations

| Intersection |  | Scenario | Metric | AM <br> Peak Hour |  |  |  | PM <br> Peak Hour |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | NB |  | SB | EB | WB | NB | SB | EB | WB |
| 1 | Great River Rd \& South Access |  | Projected 2025Buildout | Approach Delay | 8.0 | 1.1 | 63.3 | - | 9.5 | 8.1 | 23.6 | - |
|  |  | Approach LOS |  | A | A | E | - | A | A | C | - |
|  |  | $95^{\text {th }}$ \%tile Queue |  | LT | TR | R | - | LT | TR | R | - |
|  |  | (Longest Movement) in Feet |  | 173 | 7 | 42 | - | 93 | 59 | 232 | - |
|  |  | Intersection Delay \& LOS |  | 7.4, A |  |  |  | 15.0, B |  |  |  |
|  |  | $\text { Projected } 2030^{1}$Buildout | Approach Delay | 26.5 | 30.0 | 35.0 | - | 16.5 | 26.3 | 25.1 | - |
|  |  |  | Approach LOS | C | C | D | - | B | C | C | - |
|  |  |  | $95^{\text {th }} \%$ tile Queue | L | TR | R | - | T | TR | R | - |
|  |  |  | (Longest Movement) in Feet | 247 | 228 | 47 | - | 154 | 184 | 381 | - |
|  |  |  | Intersection Delay \& LOS | 27.7, C |  |  |  | 22.5, C |  |  |  |
|  |  | Projected $2050{ }^{1}$ Buildout | Approach Delay | 31.2 | 37.7 | 65.2 | - | 16.9 | 35.7 | 23.1 | - |
|  |  |  | Approach LOS | C | D | E | - | B | D | C | - |
|  |  |  | $95^{\text {th }}$ \%tile Queue | L | TR | R | - | T | TR | R | - |
|  |  |  | (Longest Movement) in Feet | 247 | 371 | 87 | - | 163 | 224 | 332 | - |
|  |  |  | Intersection Delay \& LOS | 34.3, C |  |  |  | 23.6, C |  |  |  |
| 2 | Lost Grove Rd \& North Access | $\text { Projected } 2030^{1}$Buildout | Approach Delay | 34.4 | - | 4.1 | 4.7 | 20.3 | - | 18.7 | 16.3 |
|  |  |  | Approach LOS | C | - | A | A | C | - | B | B |
|  |  |  | $95^{\text {th }}$ \%tile Queue | LR | - | TR | TL | LR | - | TR | TL |
|  |  |  | (Longest Movement) in Feet | 69 | - | 33 | 39 | 416 | - | 89 | 25 |
|  |  |  | Intersection Delay \& LOS | 7.1, A |  |  |  | 19.9, B |  |  |  |
|  |  | Projected $2050{ }^{1}$ Buildout | Approach Delay | 34.2 | - | 4.1 | 4.6 | 20.3 | - | 19.0 | 16.3 |
|  |  |  | Approach LOS | C | - | A | A | C | - | B | B |
|  |  |  |  | LR | - | TR | TL | LR | - | TR | TL |
|  |  |  | (Longest Movement) in Feet | 71 | - | 36 | 41 | 416 | - | 97 | 28 |
|  |  |  | Intersection Delay \& LOS | 7.2, A |  |  |  | 19.9, B |  |  |  |

Queue, Delay, and LOS analysis based on HCM 6 ${ }^{\text {th }}$ Edition Signalized Methodology
${ }^{1}$ The frequency of arriving vehicles is anticipated to be nearly consistent.
Table 10 Projected Unsignalized Intersection Operations

| Intersection |  | Scenario | AM <br> Peak Hour |  |  | PMPeak Hour |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Worst Approach Movement Delay (sec) | $\begin{array}{\|c} \text { HCM } \\ \text { LOS } \end{array}$ | Worst Approach Movement Delay (sec) |  | $\begin{aligned} & \text { HCM } \\ & \text { LOS } \end{aligned}$ |
| 1 | Great River Rd \& South Access |  |  | Projected 2020 No Build | EBL | 10.8 | EBL | 11.8 | B |
|  |  | Projected 2025 No Build | EBL | 11.1 | B | EBL | 12.3 | B |
|  |  | Projected 2030 No Build | EBL | 12.1 | B | EBL | 12.9 | B |
|  |  | Projected 2050 No Build | EBL | 12.9 | B | EBL | 14.0 | B |
| 2 | Lost Grove Rd \& North Access | Projected 2025 Buildout | NBL | 15.7 | C | NBL | 13.7 | B |

Delay and LOS analysis based on HCM $6^{\text {th }}$ Edition Two-way Stop Control Methodology
LOS D or better is generally identified as acceptable in urban conditions. The analysis presented herein indicates the study intersections will all operate at acceptable LOS C or better during the AM and PM peak hour conditions through 2050 with buildout of the proposed Anderson 400 development. This determination is based on the improvement schedule outline in Table 5, as well as traffic volume and trip generation trends identified herein.

## Comparative Operational Analysis

A southbound right-turn bay at the intersection of Great River Road and South Access was analyzed for comparative operational purposes in the following table.

Table 11 Projected Signalized Comparative Operations

| Intersection |  | Scenario | Metric | AM Peak Hour |  |  |  | PM <br> Peak Hour |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | NB |  | SB | EB | WB | NB | SB | EB | WB |
|  | Great River Rd \& South Access |  | Projected $2050{ }^{1}$ <br> Buildout Without <br> Southbound <br> Right-Turn Bay | Approach Delay | 31.2 | 37.7 | 65.2 | - | 16.9 | 35.7 | 23.1 | - |
|  |  | Approach LOS |  | C | D | E | - | B | D | C | - |
|  |  |  |  | L | TR | R | - | T | TR | R | - |
|  |  | (Longest Movement) in Feet |  | 247 | 371 | 87 | - | 163 | 224 | 332 | - |
|  |  | Intersection Delay \& LOS |  | 34.3, C |  |  |  | 23.6, C |  |  |  |
|  |  | Projected 2050 Buildout With Southbound Right-Turn Bay | Approach Delay | 20.9 | 23.7 | 35.0 | - | 17.6 | 27.5 | 25.5 | - |
|  |  |  | Approach LOS | C | C | D | - | B | C | C | - |
|  |  |  | $95^{\text {th }}$ \%tile Queue | L | T | R | - | T | T | R | - |
|  |  |  | (Longest Movement) in Feet | 208 | 196 | 47 | - | 188 | 206 | 384 | - |
|  |  |  | Intersection Delay \& LOS | 22.2, C |  |  |  | 23.2, C |  |  |  |

Queue, Delay, and LOS analysis based on HCM $6^{\text {th }}$ Edition Signalized Methodology
${ }^{1}$ The frequency of arriving vehicles is anticipated to be nearly consistent.
A southbound right-turn bay at the intersection of Great River Road and South Access is expected to provide a higher LOS than what is expected at this intersection without a southbound right-turn bay. However, a southbound right-turn bay at the Great River Road and South Access intersection is not expected to be needed in order to provide a LOS of C or better through the buildout design year of 2050.

## Summary and Conclusion

The Anderson 400 development's initial vision is a corporate headquarters technology campus that will include a public park with an outdoor theater and multi-purpose trails. A bike sharing service is anticipated to be provided within the park. The development is expected to be completely built by the end of 2030 and employ up to 6,100 employees. 6,100 employees was identified as the approximate maximum number of employees allowable while maintaining acceptable vehicle operations at the two study intersections through the design year of 2050. Acceptable vehicle operations was defined as having an overall intersection Level of Service (LOS) of D or better, as well as not allowing more than one individual movement operate at LOS E or worse. Two access points are ultimately proposed, with one onto Great River Road and one onto Lost Grove Road. The access onto Great River Road will be located near the existing driveway to the Anderson's farm. The access onto Lost Grove Road will be located between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street. Sight visibility zones corresponding to intersection sight distance calculations as defined through AASHTO should be identified and maintained at these access points. These zones should not contain structures or plantings that would preclude unobstructed views of oncoming traffic.

The Iowa Crash Analysis Tool (ICAT) website administered by the lowa Department of Transportation (DOT) was used to collect available crash data at the study intersections for the ten-year period between January 1, 2008 and December 31, 2017.

There were no crashes near the Anderson Farm driveway (\#1 Great River Road and South Access), which will become the south access for the proposed development. There were 11 crashes along Lost Grove Road between $270^{\text {th }}$ Avenue and $5^{\text {th }}$ Street, which is the segment of roadway that is anticipated to have the north access for the proposed development. The crash data indicates animal crossings may be an issue along this segment of roadway. Watch for Wildlife or Wild Life Crossing signs could be installed to potentially alert drivers of this potential safety issue. Crash data for this analysis is provided in Appendix 2.

LOS D or better is generally identified as acceptable in urban conditions. The analysis presented herein indicates the study intersections will all operate at acceptable LOS C or better during the AM and PM peak hour conditions through 2050 with buildout of the proposed Anderson 400 development. This determination is based on the improvement schedule outline in Table 5, as well as traffic volume and trip generation trends identified herein. Operational analysis worksheets are contained in Appendix 4.

Appendix 1

# Turning Movement Volume Counts (Raw Data) 

(1) Great River Road and South Access - All Vehicles 5AM to 8PM

| 15-min Interval | From North (Southbound) |  |  | From East (Westbound) |  |  | From South (Northbound) |  |  | From West (Eastbound) South Access |  |  | Int Count | Peak <br> Hour |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Green River Road |  |  | NA |  |  | Green River Road |  |  |  |  |  |  |  |
|  | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |  |  |
| 5:00-5:15 |  | 28 | 0 |  |  |  | 0 | 7 |  | 0 |  | 0 | 35 | 179 |
| 5:15-5:30 |  | 30 | 0 |  |  |  | 0 | 16 |  | 0 |  | 0 | 46 | 221 |
| 5:30-5:45 |  | 28 | 0 |  |  |  | 0 | 15 |  | 0 |  | 0 | 43 | 281 |
| 5:45-6:00 |  | 30 | 0 |  |  |  | 0 | 25 |  | 0 |  | 0 | 55 | 336 |
| 6:00-6:15 |  | 48 | 0 |  |  |  | 0 | 29 |  | 0 |  | 0 | 77 | 357 |
| 6:15-6:30 |  | 66 | 1 |  |  |  | 0 | 39 |  | 0 |  | 0 | 106 | 366 |
| 6:30-6:45 |  | 70 | 0 |  |  |  | 0 | 27 |  | 0 |  | 1 | 98 | 346 |
| 6:45-7:00 |  | 48 | 0 |  |  |  | 0 | 27 |  | 1 |  | 0 | 76 | 325 |
| 7:00-7:15 |  | 52 | 1 |  |  |  | 0 | 33 |  | 0 |  | 0 | 86 | 343 |
| 7:15-7:30 |  | 56 | 0 |  |  |  | 0 | 30 |  | 0 |  | 0 | 86 | 345 |
| 7:30-7:45 |  | 38 | 0 |  |  |  | 0 | 39 |  | 0 |  | 0 | 77 | 316 |
| 7:45-8:00 |  | 52 | 0 |  |  |  | 0 | 42 |  | 0 |  | 0 | 94 | 328 |
| 8:00-8:15 |  | 46 | 0 |  |  |  | 1 | 41 |  | 0 |  | 0 | 88 | 277 |
| 8:15-8:30 |  | 37 | 0 |  |  |  | 0 | 20 |  | 0 |  | 0 | 57 | 252 |
| 8:30-8:45 |  | 49 | 0 |  |  |  | 0 | 40 |  | 0 |  | 0 | 89 | 269 |
| 8:45-9:00 |  | 24 | 0 |  |  |  | 0 | 19 |  | 0 |  | 0 | 43 | 252 |
| 9:00-9:15 |  | 30 | 0 |  |  |  | 0 | 32 |  | 1 |  | 0 | 63 | 284 |
| 9:15-9:30 |  | 38 | 0 |  |  |  | 0 | 36 |  | 0 |  | 0 | 74 | 273 |
| 9:30-9:45 |  | 34 | 0 |  |  |  | 0 | 37 |  | 1 |  | 0 | 72 | 249 |
| 9:45-10:00 |  | 31 | 0 |  |  |  | 0 | 44 |  | 0 |  | 0 | 75 | 241 |
| 10:00-10:15 |  | 31 | 1 |  |  |  | 0 | 20 |  | 0 |  | 0 | 52 | 220 |
| 10:15-10:30 |  | 20 | 0 |  |  |  | 0 | 30 |  | 0 |  | 0 | 50 | 232 |
| 10:30-10:45 |  | 30 | 0 |  |  |  | 0 | 34 |  | 0 |  | 0 | 64 | 242 |
| 10:45-11:00 |  | 28 | 0 |  |  |  | 0 | 26 |  | 0 |  | 0 | 54 | 233 |
| 11:00-11:15 |  | 32 | 0 |  |  |  | 0 | 31 |  | 1 |  | 0 | 64 | 253 |
| 11:15-11:30 |  | 30 | 0 |  |  |  | 0 | 30 |  | 0 |  | 0 | 60 | 270 |
| 11:30-11:45 |  | 29 | 0 |  |  |  | 0 | 26 |  | 0 |  | 0 | 55 | 281 |
| 11:45-12:00 |  | 33 | 0 |  |  |  | 0 | 41 |  | 0 |  | 0 | 74 | 303 |
| 12:00-12:15 |  | 41 | 0 |  |  |  | 0 | 40 |  | 0 |  | 0 | 81 | 296 |
| 12:15-12:30 |  | 32 | 0 |  |  |  | 1 | 38 |  | 0 |  | 0 | 71 | 278 |
| 12:30-12:45 |  | 34 | 0 |  |  |  | 0 | 43 |  | 0 |  | 0 | 77 | 282 |
| 12:45-1:00 |  | 40 | 0 |  |  |  | 0 | 27 |  | 0 |  | 0 | 67 | 277 |
| 1:00-1:15 |  | 29 | 0 |  |  |  | 0 | 34 |  | 0 |  | 0 | 63 | 280 |
| 1:15-1:30 |  | 38 | 0 |  |  |  | 0 | 37 |  | 0 |  | 0 | 75 | 296 |
| 1:30-1:45 |  | 39 | 0 |  |  |  | 0 | 33 |  | 0 |  | 0 | 72 | 314 |
| 1:45-2:00 |  | 29 | 0 |  |  |  | 0 | 41 |  | 0 |  | 0 | 70 | 333 |
| 2:00-2:15 |  | 47 | 0 |  |  |  | 0 | 32 |  | 0 |  | 0 | 79 | 348 |
| 2:15-2:30 |  | 45 | 0 |  |  |  | 0 | 47 |  | 1 |  | 0 | 93 | 346 |
| 2:30-2:45 |  | 47 | 0 |  |  |  | 0 | 44 |  | 0 |  | 0 | 91 | 364 |
| 2:45-3:00 |  | 29 | 0 |  |  |  | 0 | 56 |  | 0 |  | 0 | 85 | 381 |
| 3:00-3:15 |  | 38 | 0 |  |  |  | 0 | 39 |  | 0 |  | 0 | 77 | 417 |
| 3:15-3:30 |  | 57 | 0 |  |  |  | 0 | 54 |  | 0 |  | 0 | 111 | 434 |
| 3:30-3:45 |  | 37 | 0 |  |  |  | 0 | 71 |  | 0 |  | 0 | 108 | 429 |
| 3:45-4:00 |  | 58 | 0 |  |  |  | 0 | 63 |  | 0 |  | 0 | 121 | 436 |
| 4:00-4:15 |  | 40 | 1 |  |  |  | 0 | 53 |  | 0 |  | 0 | 94 | 436 |
| 4:15-4:30 |  | 51 | 0 |  |  |  | 0 | 55 |  | 0 |  | 0 | 106 | 458 |
| 4:30-4:45 |  | 51 | 0 |  |  |  | 0 | 63 |  | 1 |  | 0 | 115 | 474 |
| 4:45-5:00 |  | 53 | 0 |  |  |  | 0 | 68 |  | 0 |  | 0 | 121 | 467 |
| 5:00-5:15 |  | 59 | 0 |  |  |  | 0 | 57 |  | 0 |  | 0 | 116 | 408 |
| 5:15-5:30 |  | 50 | 0 |  |  |  | 1 | 69 |  | 0 |  | 2 | 122 | 349 |
| 5:30-5:45 |  | 50 | 0 |  |  |  | 0 | 58 |  | 0 |  | 0 | 108 | 304 |
| 5:45-6:00 |  | 28 | 0 |  |  |  | 0 | 34 |  | 0 |  | 0 | 62 | 252 |
| 6:00-6:15 |  | 26 | 1 |  |  |  | 0 | 29 |  | 1 |  | 0 | 57 | 241 |
| 6:15-6:30 |  | 24 | 0 |  |  |  | 0 | 53 |  | 0 |  | 0 | 77 | 184 |
| 6:30-6:45 |  | 23 | 0 |  |  |  | 0 | 33 |  | 0 |  | 0 | 56 | 152 |
| 6:45-7:00 |  | 18 | 0 |  |  |  | 0 | 33 |  | 0 |  | 0 | 51 | 138 |
| 7:00-7:15 |  | 20 | 1 |  |  |  | 0 | 24 |  | 0 |  | 0 | 45 | 160 |
| 7:15-7:30 |  | 20 | 0 |  |  |  | 0 | 22 |  | 0 |  | 0 | 42 |  |
| 7:30-7:45 |  | 19 | 0 |  |  |  | 0 | 19 |  | 0 |  | 0 | 38 |  |
| 7:45-8:00 |  | 13 | 0 |  |  |  | 0 | 22 |  | 0 |  | 0 | 35 |  |
| * Counts collected during peak hours on Wednesday, September 26th, 2018. |  |  |  |  |  |  |  |  |  | AM Intersection Peak Hour Factor (PHF) = |  |  |  | 0.86 0.97 |

# Turning Movement Volume Counts (Raw Data) 

(1) Great River Road and South Access - Articulated Trucks 5AM to 8PM

| 15-min Interval | From North (Southbound) |  |  | From East (Westbound) |  |  | From South (Northbound) |  |  | From West (Eastbound) |  |  | $\begin{aligned} & \text { Int } \\ & \text { Count } \end{aligned}$ | Peak <br> Hour |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Green River Road |  |  | NA |  |  | Green River Road |  |  | South Access |  |  |  |  |
|  | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |  |  |
| 5:00-5:15 |  | 1 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 1 | 8 |
| 5:15-5:30 |  | 2 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 2 | 8 |
| 5:30-5:45 |  | 1 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 1 | 6 |
| 5:45-6:00 |  | 2 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 4 | 6 |
| 6:00-6:15 |  | 0 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 1 | 7 |
| 6:15-6:30 |  | 0 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 0 | 12 |
| 6:30-6:45 |  | 0 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 1 | 15 |
| 6:45-7:00 |  | 2 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 5 | 19 |
| 7:00-7:15 |  | 1 | 0 |  |  |  | 0 | 5 |  | 0 |  | 0 | 6 | 25 |
| 7:15-7:30 |  | 2 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 3 | 26 |
| 7:30-7:45 |  | 0 | 0 |  |  |  | 0 | 5 |  | 0 |  | 0 | 5 | 26 |
| 7:45-8:00 |  | 6 | 0 |  |  |  | 0 | 5 |  | 0 |  | 0 | 11 | 29 |
| 8:00-8:15 |  | 0 | 0 |  |  |  | 0 | 7 |  | 0 |  | 0 | 7 | 23 |
| 8:15-8:30 |  | 3 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 3 | 28 |
| 8:30-8:45 |  | 4 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 8 | 34 |
| 8:45-9:00 |  | 3 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 5 | 37 |
| 9:00-9:15 |  | 5 | 0 |  |  |  | 0 | 7 |  | 0 |  | 0 | 12 | 41 |
| 9:15-9:30 |  | 6 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 9 | 32 |
| 9:30-9:45 |  | 4 | 0 |  |  |  | 0 | 7 |  | 0 |  | 0 | 11 | 30 |
| 9:45-10:00 |  | 3 | 0 |  |  |  | 0 | 6 |  | 0 |  | 0 | 9 | 30 |
| 10:00-10:15 |  | 1 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 3 | 30 |
| 10:15-10:30 |  | 1 | 0 |  |  |  | 0 | 6 |  | 0 |  | 0 | 7 | 32 |
| 10:30-10:45 |  | 5 | 0 |  |  |  | 0 | 6 |  | 0 |  | 0 | 11 | 35 |
| 10:45-11:00 |  | 5 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 9 | 30 |
| 11:00-11:15 |  | 3 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 5 | 26 |
| 11:15-11:30 |  | 3 | 0 |  |  |  | 0 | 7 |  | 0 |  | 0 | 10 | 32 |
| 11:30-11:45 |  | 2 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 6 | 27 |
| 11:45-12:00 |  | 2 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 5 | 25 |
| 12:00-12:15 |  | 2 | 0 |  |  |  | 0 | 9 |  | 0 |  | 0 | 11 | 31 |
| 12:15-12:30 |  | 3 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 5 | 29 |
| 12:30-12:45 |  | 1 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 4 | 31 |
| 12:45-1:00 |  | 7 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 11 | 34 |
| 1:00-1:15 |  | 4 | 0 |  |  |  | 0 | 5 |  | 0 |  | 0 | 9 | 28 |
| 1:15-1:30 |  | 6 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 7 | 31 |
| 1:30-1:45 |  | 4 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 7 | 28 |
| 1:45-2:00 |  | 3 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 5 | 27 |
| 2:00-2:15 |  | 7 | 0 |  |  |  | 0 | 5 |  | 0 |  | 0 | 12 | 29 |
| 2:15-2:30 |  | 3 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 4 | 22 |
| 2:30-2:45 |  | 3 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 6 | 27 |
| 2:45-3:00 |  | 2 | 0 |  |  |  | 0 | 5 |  | 0 |  | 0 | 7 | 29 |
| 3:00-3:15 |  | 4 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 5 | 29 |
| 3:15-3:30 |  | 5 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 9 | 28 |
| 3:30-3:45 |  | 6 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 8 | 23 |
| 3:45-4:00 |  | 4 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 7 | 20 |
| 4:00-4:15 |  | 2 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 4 | 18 |
| 4:15-4:30 |  | 0 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 4 | 16 |
| 4:30-4:45 |  | 3 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 5 | 13 |
| 4:45-5:00 |  | 2 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 5 | 14 |
| 5:00-5:15 |  | 1 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 2 | 13 |
| 5:15-5:30 |  | 1 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 1 | 15 |
| 5:30-5:45 |  | 2 | 0 |  |  |  | 0 | 4 |  | 0 |  | 0 | 6 | 15 |
| 5:45-6:00 |  | 1 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 4 | 9 |
| 6:00-6:15 |  | 2 | 0 |  |  |  | 0 | 2 |  | 0 |  | 0 | 4 | 6 |
| 6:15-6:30 |  | 0 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 1 | 2 |
| 6:30-6:45 |  | 0 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 0 | 4 |
| 6:45-7:00 |  | 0 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 1 | 5 |
| 7:00-7:15 |  | 0 | 0 |  |  |  | 0 | 3 |  | 0 |  | 0 | 3 | 8 |
| 7:15-7:30 |  | 1 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 1 |  |
| 7:30-7:45 |  | 1 | 0 |  |  |  | 0 | 0 |  | 0 |  | 0 | 1 |  |
| 7:45-8:00 |  | 2 | 0 |  |  |  | 0 | 1 |  | 0 |  | 0 | 3 |  |

* Counts collected during peak hours on Wednesday, September 26th, 2018.


# Turning Movement Volume Counts (Raw Data) 

(2) Lost Grove Road and 270th Avenue - All Vehicles 5AM to 8PM

| 15-min Interval | From North (Southbound) |  |  | From East (Westbound) |  |  | From South (Northbound) |  |  | From West (Eastbound) |  |  | Int Count | Peak Hour |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Driveway |  |  | Lost Grove Road |  |  | 270th Avenue |  |  | Lost Grove Road |  |  |  |  |
|  | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |  |  |
| 5:00-5:15 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 22 |
| 5:15-5:30 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 31 |
| 5:30-5:45 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 39 |
| 5:45-6:00 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 13 | 44 |
| 6:00-6:15 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 11 | 38 |
| 6:15-6:30 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 11 | 50 |
| 6:30-6:45 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 9 | 60 |
| 6:45-7:00 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 7 | 85 |
| 7:00-7:15 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 23 | 99 |
| 7:15-7:30 | 0 | 0 | 0 | 0 | 16 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 21 | 96 |
| 7:30-7:45 | 0 | 0 | 0 | 0 | 15 | 0 | 1 | 1 | 1 | 1 | 12 | 3 | 34 | 91 |
| 7:45-8:00 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 1 | 0 | 8 | 2 | 21 | 69 |
| 8:00-8:15 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 20 | 65 |
| 8:15-8:30 | 0 | 0 | 0 | 0 | 8 | 0 | 1 | 0 | 1 | 0 | 6 | 0 | 16 | 52 |
| 8:30-8:45 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 12 | 51 |
| 8:45-9:00 | 1 | 0 | 1 | 1 | 5 | 0 | 1 | 0 | 1 | 0 | 6 | 1 | 17 | 45 |
| 9:00-9:15 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 7 | 40 |
| 9:15-9:30 | 0 | 0 | 0 | 0 | 9 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 15 | 44 |
| 9:30-9:45 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 6 | 42 |
| 9:45-10:00 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 4 | 1 | 12 | 56 |
| 10:00-10:15 | 0 | 0 | 0 | 2 | 3 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 11 | 56 |
| 10:15-10:30 | 0 | 1 | 1 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 13 | 58 |
| 10:30-10:45 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 2 | 0 | 0 | 5 | 3 | 20 | 56 |
| 10:45-11:00 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 4 | 1 | 12 | 44 |
| 11:00-11:15 | 1 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 13 | 45 |
| 11:15-11:30 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 11 | 47 |
| 11:30-11:45 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 8 | 42 |
| 11:45-12:00 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 13 | 47 |
| 12:00-12:15 | 0 | 0 | 0 | 1 | 2 | 0 | 4 | 0 | 0 | 0 | 7 | 1 | 15 | 42 |
| 12:15-12:30 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 6 | 43 |
| 12:30-12:45 | 0 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 13 | 52 |
| 12:45-1:00 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | 8 | 58 |
| 1:00-1:15 | 0 | 1 | 0 | 0 | 6 | 0 | 1 | 2 | 1 | 0 | 5 | 0 | 16 | 62 |
| 1:15-1:30 | 1 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 15 | 56 |
| 1:30-1:45 | 2 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 19 | 59 |
| 1:45-2:00 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 12 | 57 |
| 2:00-2:15 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 10 | 65 |
| 2:15-2:30 | 3 | 0 | 0 | 1 | 5 | 1 | 0 | 1 | 1 | 0 | 5 | 1 | 18 | 77 |
| 2:30-2:45 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 1 | 0 | 6 | 1 | 17 | 78 |
| 2:45-3:00 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 1 | 0 | 13 | 0 | 20 | 91 |
| 3:00-3:15 | 0 | 0 | 0 | 2 | 7 | 0 | 0 | 0 | 2 | 0 | 11 | 0 | 22 | 92 |
| 3:15-3:30 | 0 | 0 | 0 | 0 | 12 | 0 | 1 | 0 | 0 | 1 | 5 | 0 | 19 | 85 |
| 3:30-3:45 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 1 | 0 | 14 | 0 | 30 | 87 |
| 3:45-4:00 | 0 | 1 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 11 | 0 | 21 | 78 |
| 4:00-4:15 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 15 | 80 |
| 4:15-4:30 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 1 | 0 | 10 | 0 | 21 | 83 |
| 4:30-4:45 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 21 | 83 |
| 4:45-5:00 | 0 | 0 | 0 | 1 | 9 | 0 | 1 | 0 | 0 | 0 | 12 | 0 | 23 | 88 |
| 5:00-5:15 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 18 | 84 |
| 5:15-5:30 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 0 | 13 | 0 | 21 | 86 |
| 5:30-5:45 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 20 | 0 | 26 | 80 |
| 5:45-6:00 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 1 | 0 | 10 | 0 | 19 | 67 |
| 6:00-6:15 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 20 | 62 |
| 6:15-6:30 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 10 | 0 | 15 | 42 |
| 6:30-6:45 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 13 | 33 |
| 6:45-7:00 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 14 | 27 |
| 7:00-7:15 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 6 | 25 |
| 7:15-7:30 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 7 |  |
| 7:30-7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 7 |  |
| 7:45-8:00 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 5 |  |

* Counts collected during peak hours on Wednesday, September 26th, 2018.

| 15-min Interval | From North (Southbound) |  |  | From East (Westbound) |  |  | From South (Northbound) |  |  | From West (Eastbound) |  |  | IntCount | Peak Hour |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Driveway |  |  | Lost Grove Road |  |  | 270th Avenue |  |  | Lost Grove Road |  |  |  |  |
|  | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |  |  |
| 5:00-5:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15-5:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30-5:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45-6:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:00-6:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15-6:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30-6:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6:45-7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:00-7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15-7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:30-7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45-8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 8:00-8:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 8:15-8:30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 4 |
| 8:30-8:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 |
| 8:45-9:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 |
| 9:00-9:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 9:15-9:30 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 6 |
| 9:30-9:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 |
| 9:45-10:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 5 |
| 10:00-10:15 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 3 |
| 10:15-10:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 10:30-10:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 |
| 10:45-11:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 11:00-11:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 6 |
| 11:15-11:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 7 |
| 11:30-11:45 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 7 |
| 11:45-12:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 12:00-12:15 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 7 |
| 12:15-12:30 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 7 |
| 12:30-12:45 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 6 |
| 12:45-1:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 1:00-1:15 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 5 |
| 1:15-1:30 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 |
| 1:30-1:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| 1:45-2:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2:00-2:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2:15-2:30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2:30-2:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2:45-3:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:00-3:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:15-3:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:30-3:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3:45-4:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:00-4:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15-4:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30-4:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45-5:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00-5:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15-5:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30-5:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45-6:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:00-6:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15-6:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30-6:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45-7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:00-7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15-7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| 7:30-7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |
| 7:45-8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |

* Counts collected during peak hours on Wednesday, September 26th, 2018.

Peak Hour Turning Movement Volumes
(1) Great River Road and South Access

| 15-min <br> Interval | From North (Southbound) |  |  | From East (Westbound) |  |  | From South (Northbound)Green River Road |  |  | From West (Eastbound) South Access |  |  | Intersection Count |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Green River Road |  |  | NA |  |  |  |  |  |  |  |  |  |
|  | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |  |
| 6:15-6:30 |  | 66 | 1 |  |  |  | 0 | 39 |  | 0 |  | 0 | 106 |
| 6:30-6:45 |  | 70 | 0 |  |  |  | 0 | 27 |  | 0 |  | 1 | 98 |
| 6:45-7:00 |  | 48 | 0 |  |  |  | 0 | 27 |  | 1 |  | 0 | 76 |
| 7:00-7:15 |  | 52 | 1 |  |  |  | 0 | 33 |  | 0 |  | 0 | 86 |
| 2018 Volumes | 0 | 236 | 2 | 0 | 0 | 0 | 0 | 126 | 0 | 1 | 0 | 1 | 366 |
| Growth Factor From 2018 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| 2020 Volumes | 0 | 246 | 2 | 0 | 0 | 0 | 0 | 131 | 0 | 1 | 0 | 1 | 381 |
| Growth Factor From 2018 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| 2025 Volumes | 0 | 271 | 2 | 0 | 0 | 0 | 0 | 145 | 0 | 1 | 0 | 1 | 420 |
| Growth Factor From 2018 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| 2030 Volumes | 0 | 299 | 3 | 0 | 0 | 0 | 0 | 160 | 0 | 1 | 0 | 1 | 464 |
| Growth Factor From 2030 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 |
| 2040 Volumes | 0 | 330 | 3 | 0 | 0 | 0 | 0 | 177 | 0 | 1 | 0 | 1 | 512 |
| Growth Factor From 2040 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| 2050 Volumes | 0 | 347 | 3 | 0 | 0 | 0 | 0 | 186 | 0 | 1 | 0 | 1 | 538 |
| Percent Heavy Vehicle | \#DIV/0! | 1\% | 0\% | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | 7\% | \#DIV/0! | 0\% | \#DIV/0! | 0\% | - |
|  |  |  |  |  |  |  |  |  |  |  |  | PHF | 0.86 |


| 4:30-4:45 |  | 51 | 0 |  |  |  | 0 | 63 |  | 1 |  | 0 | 115 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 4:45-5:00 |  | 53 | 0 |  |  |  | 0 | 68 |  | 0 |  | 0 | 121 |
| 5:00-5:15 |  | 59 | 0 |  |  |  | 0 | 57 |  | 0 |  | 0 | 116 |
| 5:15-5:30 |  | 50 | 0 |  |  |  | 1 | 69 |  | 0 |  | 2 | 122 |
| 2018 Volumes | 0 | 213 | 0 | 0 | 0 | 0 | 1 | 257 | 0 | 1 | 0 | 2 | 474 |
| Growth Factor From 2018 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| 2020 Volumes | 0 | 222 | 0 | 0 | 0 | 0 | 1 | 267 | 0 | 1 | 0 | 2 | 493 |
| Growth Factor From 2018 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| 2025 Volumes | 0 | 245 | 0 | 0 | 0 | 0 | 1 | 295 | 0 | 1 | 0 | 2 | 544 |
| Growth Factor From 2018 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.1717 |
| 2030 Volumes | 0 | 270 | 0 | 0 | 0 | 0 | 1 | 326 | 0 | 1 | 0 | 3 | 601 |
| Growth Factor From 2030 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 |
| 2040 Volumes | 0 | 298 | 0 | 0 | 0 | 0 | 1 | 360 | 0 | 1 | 0 | 3 | 663 |
| Growth Factor From 2040 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| 2050 Volumes | 0 | 313 | 0 | 0 | 0 | 0 | 1 | 378 | 0 | 1 | 0 | 3 | 696 |
| Percent Heavy Vehicle | \#DIV/0! | 3\% | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | 0\% | 2\% | \#DIV/0! | 0\% | \#DIV/0! | 0\% | - |

Peak Hour Turning Movement Volumes
(2) Lost Grove Road \& 270th Avenue

| 15-min Interval | From North (Southbound) |  |  | From East (Westbound) |  |  | From South (Northbound) |  |  | From West (Eastbound) |  |  | Intersection Count |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Driveway |  |  | Lost Grove Road |  |  | 270th Avenue |  |  | Lost Grove Road |  |  |  |
|  | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |  |
| 6:15-6:30 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 11 |
| 6:30-6:45 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 8 |
| 6:45-7:00 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 7 |
| 7:00-7:15 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 23 |
| 2018 Volumes | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 49 |
| Growth Factor From 2018 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| 2020 Volumes | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 51 |
| Growth Factor From 2018 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| 2025 Volumes | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 56 |
| Growth Factor From 2018 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| 2030 Volumes | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 62 |
| Growth Factor From 2030 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 |
| 2040 Volumes | 0 | 0 | 0 | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 68 |
| Growth Factor From 2040 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| 2050 Volumes | 0 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 72 |
| Percent Heavy Vehicle | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | 0\% | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | 0\% | \#DIV/0! | - |

$\mathrm{PHF}=0.53$

| 4:30-4:45 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 14 | 0 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{4 : 4 5 - 5 : 0 0}$ | 0 | 0 | 0 | 1 | 9 | 0 | 1 | 0 | 0 | 0 | 12 | 0 | 21 |
| $\mathbf{5 : 0 0 - 5 : 1 5}$ | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 13 | 0 |  |
| $\mathbf{5 : 1 5 - 5 : 3 0}$ | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 18 | 0 | 13 | 0 |  |
| 2018 Volumes | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{2 7}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{5 2}$ | $\mathbf{0}$ | $\mathbf{7}$ |
| Growth Factor From 2018 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| 2020 Volumes | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{2 8}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{5 4}$ | $\mathbf{0}$ | $\mathbf{8 2}$ |
| Growth Factor From 2018 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| 2025 Volumes | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{3 1}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{6 0}$ | $\mathbf{0}$ | $\mathbf{9}$ |
| Growth Factor From 2018 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| 2030 Volumes | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{3 4}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{6 6}$ | $\mathbf{0}$ | $\mathbf{1 0 0}$ |
| Growth Factor From 2030 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 | 1.1046 |
| 2040 Volumes | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{3 8}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{7 3}$ | $\mathbf{0}$ | $\mathbf{1 1 1}$ |
| Growth Factor From 2040 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| 2050 Volumes | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{4 0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{0}$ | $\mathbf{7 7}$ | $\mathbf{0}$ | $\mathbf{1 1 7}$ |
| Percent Heavy Vehicle | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | $0 \%$ | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | \#DIV/0! | $0 \%$ | \#DIV/0! | - |

$\mathrm{PHF}=0.86$

Appendix 2

| Crash Severity | $\mathbf{1}$ |
| :--- | :--- |
| Fatal | 0 |
| Major Injury | 0 |
| Minor Injury | 0 |
| Possible/Unknown | 0 |
| Property Damage Only | 1 |


| Injury Status Summary | $\mathbf{0}$ |
| :--- | :--- |
| Fatal | 0 |
| Suspected serious/incapacitating | 0 |
| Suspected minor/non-incapacitating | 0 |
| Possible (complaint of pain/injury) | 0 |
| Uninjured | 0 |
| Fatal, not crash-related | 0 |
| Unknown | 0 |
| Not reported | 0 |

## Property/Vehicles/Occupants

| Property Damage Total (dollars): | $2,000.00$ |
| ---: | ---: |
| Average (per crash dollars): | $2,000.00$ |
| Total Vehicles: | 1.00 |
| Average (per crash): | 1.00 |
| Total Occupants: | 777.00 |
| Average (per crash): | 777.00 |


| Average Severity |  |  |
| ---: | ---: | ---: |
|  | Fatalities/Fatal Crash: | 0.00 |
|  | Fatalities/Crash: | 0.00 |
| Injuries/Crash: | 0.00 |  |
|  | Major Injuries/Crash: | 0.00 |
| Minor Injuries/Crash: | 0.00 |  |
| Possible/Unknown Injuries/Crash: | 0.00 |  |



| Major Cause |  |  |  |
| :--- | :--- | :--- | :--- |
| Animal | 1 | Ran traffic signal | $\mathbf{1}$ |
| Ran stop sign | 0 | Failed to yield to emergency vehicle | 0 |
| FTYROW: At uncontrolled intersection | 0 | FTYROW: Making right turn on red signal | 0 |
| FTYROW: From stop sign | 0 | FTYROW: From yield sign | 0 |
| FTYROW: Making left turn | 0 | FTYROW: From driveway | 0 |
| FTYROW: From parked position | 0 | FTYROW: To pedestrian | 0 |
| FTYROW: Other | 0 | Drove around RR grade crossing gates | 0 |
| Disregarded RR Signal | 0 | Crossed centerline (undivided) | 0 |
| Crossed median (divided) | 0 | Traveling wrong way or on wrong side of road | 0 |
| Aggressive driving/road rage | 0 | Driving too fast for conditions | 0 |
| Exceeded authorized speed | 0 | Improper or erratic lane changing | 0 |
| Operating vehicle in an reckless, erratic, ca... | 0 | Followed too close | 0 |
| Passing: On wrong side | 0 | Passing: Where prohibited by signs/markings | 0 |
| Passing: With insufficient distance/inadequa... | 0 | Passing: Through/around barrier | 0 |
| Passing: Other passing | 0 | Made improper turn | 0 |
| Driver Distraction: Manual operation of an e... | 0 | Driver Distraction: Talking on a hand-held d... | 0 |
| Driver Distraction: Talking on a hands free ... | 0 | Driver Distraction: Adjusting devices (radio... | 0 |
| Driver Distraction: Other electronic device ... | 0 | Driver Distraction: Passenger | 0 |
| Driver Distraction: Unrestrained animal | 0 | Driver Distraction: Reaching for object(s)/f... | 0 |
| Driver Distraction: Inattentive/lost in thou... | 0 | Driver Distraction: Other interior distracti... | 0 |
| Driver Distraction: Exterior distraction | 0 | Ran offroad - right | 0 |
| Ran off road - straight | 0 | Ran off road - left | 0 |
| Lost control | 0 | Swerving/Evasive Action | 0 |
| Over correcting/over steering | 0 | Failed to keep in proper lane | 0 |
| Failure to signal intentions | 0 | Traveling on prohibited traffic way | 0 |
| Vehicle stopped on railroad tracks | 0 | Other: Vision obstructed | 0 |
| Other: Improper operation | 0 | Other: Disregarded warning sign | 0 |
| Other: Disregarded signs/road markings | 0 | Other: Illegal off-road driving | 0 |
| Downhill runaway | 0 | Separation of units | 0 |
| Towing improperly | 0 | Cargo/equipment loss or shift | 0 |
| Equipment failure | 0 | Oversized load/vehicle | 0 |
| Other: Getting off/out of vehicle | 0 | Failure to dim lights/have lights on | 0 |
| Improper backing | 0 | Improper starting | 0 |
| Illegally parked/unattended | 0 | Driving less than the posted speed limit | 0 |
| Operator inexperience | 0 | Other | 0 |
| Unknown | 0 | Not reported | 0 |
| Other: No improper action | 0 | 0 |  |

## Time of Day/Day of Week

| Day of Week | $\begin{array}{\|c\|} \hline 12 \mathrm{AM} \\ \text { to } \\ 2 \mathrm{AM} \\ \hline \end{array}$ | $\begin{gathered} 2 \mathrm{AM} \\ \text { to } \quad 4 \\ \quad \mathrm{AM} \end{gathered}$ | $\begin{aligned} & 4 \mathrm{AM} \\ & \text { to } \quad 6 \\ & \quad \mathrm{AM} \\ & \hline \end{aligned}$ | $\begin{array}{r} 6 \mathrm{AM} \\ \text { to } 8 \\ \quad \mathrm{AM} \end{array}$ | $\begin{gathered} 8 \mathrm{AM} \\ \text { to } \\ 10 \mathrm{AM} \\ \hline \end{gathered}$ | $\begin{gathered} 10 \mathrm{AM} \\ \text { to } \\ \text { Noon } \end{gathered}$ | Noon to $\begin{array}{r}2 \\ \\ \mathrm{PM}\end{array}$ | $\begin{gathered} 2 \mathrm{PM} \\ \text { to } \quad 4 \\ \quad \mathrm{PM} \\ \hline \end{gathered}$ | $\begin{aligned} & 4 \mathrm{PM} \\ & \text { to } 6 \end{aligned}$ | $\begin{gathered} 6 \mathrm{PM} \\ \text { to } 8 \\ \quad \mathrm{PM} \end{gathered}$ | $\begin{gathered} 8 \mathrm{PM} \\ \text { to } \\ 10 \mathrm{PM} \end{gathered}$ | $\begin{gathered} 10 \mathrm{PM} \\ \text { to } \\ 12 \mathrm{AM} \\ \hline \end{gathered}$ |  | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Sunday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Monday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tuesday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wednesday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thursday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Friday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Saturday | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |


| Manner of Crash Collision | $\mathbf{1}$ |
| :--- | :--- |
| Non-collision (single vehicle) | 0 |
| Head-on (front to front) | 0 |
| Rear-end (front to rear) | 0 |
| Angle, oncoming left turn | 0 |
| Broadside (front to side) | 0 |
| Sideswipe, same direction | 0 |
| Sideswipe, opposite direction | 0 |
| Rear to rear | 0 |
| Rear to side | 0 |
| Not reported | 1 |
| Other | 0 |
| Unknown | 0 |


| Surface Conditions | $\mathbf{1}$ |
| :--- | :--- |
| Dry | 0 |
| Wet | 0 |
| lce/frost | 0 |
| Snow | 0 |
| Slush | 0 |
| Mud, dirt | 0 |
| Water (standing or moving) | 0 |
| Sand | 0 |
| Oil | 0 |
| Gravel | 0 |
| Not reported | 1 |
| Other | 1 |
| Unknown | 0 |


| Fixed Object Struck |  | $\mathbf{1}$ |
| :--- | :--- | :--- |
| Bridge overhead structure | 0 | Bridge pier or support |
| Bridge/bridge rail parapet | 0 | Curb/island/raised median |
| Ditch | 0 | Embankment |
| Ground | 0 | Culvert/pipe opening |
| Guardrail - face | 0 | Guardrail - end |
| Concrete traffic barrier (median or right sid... | 0 | Other traffic barrier |
| Cable barrier | 0 | Impact attenuator/crash cushion |
| Utility pole/light support | 0 | Traffic sign support |
| Traffic signal support | 0 | Other post/pole/support |
| Fire hydrant | 0 | Mailbox |
| Tree | 0 | Landscape/shrubbery |
| Snow bank | 0 | Fence |
| Wall | 0 | Building |
| Other fixed object | 0 | None (no fixed object struck) |

Iowa Crash Analysis Tool Quick Report
2008-2017

| Driver Age/Driver Gender |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Driver Age - 5 year Bins | Female | Male |  | Unknown | Total |
| <14 | 0 | 0 | 0 | 0 | 0 |
| $=14$ | 0 | 0 | 0 | 0 | 0 |
| $=15$ | 0 | 0 | 0 | 0 | 0 |
| $=16$ | 0 | 0 | 0 | 0 | 0 |
| $=17$ | 0 | 0 | 0 | 0 | 0 |
| $=18$ | 0 | 1 | 0 | 0 | 1 |
| $=19$ | 0 | 0 | 0 | 0 | 0 |
| $=20$ | 0 | 0 | 0 | 0 | 0 |
| $>=21$ and <= 24 | 0 | 0 | 0 | 0 | 0 |
| $>=25$ and $<=29$ | 0 | 0 | 0 | 0 | 0 |
| $>=30$ and $<=34$ | 0 | 0 | 0 | 0 | 0 |
| $>=35$ and $<=39$ | 0 | 0 | 0 | 0 | 0 |
| $>=40$ and $<=44$ | 0 | 0 | 0 | 0 | 0 |
| $>=45$ and $<=49$ | 0 | 0 | 0 | 0 | 0 |
| $>=50$ and $<=54$ | 0 | 0 | 0 | 0 | 0 |
| $>=55$ and $<=59$ | 0 | 0 | 0 | 0 | 0 |
| $>=60$ and $<=64$ | 0 | 0 | 0 | 0 | 0 |
| $>=65$ and $<=69$ | 0 | 0 | 0 | 0 | 0 |
| $>=70$ and $<=74$ | 0 | 0 | 0 | 0 | 0 |
| $>=75$ and $<=79$ | 0 | 0 | 0 | 0 | 0 |
| $>=80$ and $<=84$ | 0 | 0 | 0 | 0 | 0 |
| $>=85$ and <= 89 | 0 | 0 | 0 | 0 | 0 |
| >= 90 and <= 94 | 0 | 0 | 0 | 0 | 0 |
| >= 95 | 0 | 0 | 0 | 0 | 0 |
| Not reported | 0 | 0 | 0 | 0 | 0 |
| Unknown | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 0 | 0 | 1 |


| Alcohol Test Given | $\mathbf{1}$ |
| :--- | ---: |
| None | 1 |
| Blood | 0 |
| Urine | 0 |
| Breath | 0 |
| Vitreous | 0 |
| Refused | 0 |
| Not reported | 0 |
| Drug Test Given | $\mathbf{1}$ |
| None | 1 |
| Blood | 0 |
| Urine | 0 |
| Breath | 0 |
| Vitreous | 0 |
| Refused | 0 |
| Not reported | 0 |
| Drug Test Result | $\mathbf{1}$ |
| Negative | 0 |
| Cannabis | 0 |
| Central Nervous System depressants | 0 |
| Central Nervous System stimulants | 0 |
| Hallucinogens | 0 |
| lnhalants | 0 |
| Narcotic Analgesics | 0 |
| Dissociative Anesthetic (PCP) | 0 |
| Prescription Drug | 0 |
| Not reported | 0 |
| Other | 0 |
|  | 0 |


| Drug/Alcohol Related | $\mathbf{1}$ |
| :--- | :--- |
| Drug | 0 |
| Alcohol (< Statutory) | 0 |
| Alcohol (Statutory) | 0 |
| Drug/Alcohol (< Statutory) | 0 |
| Drug/Alcohol (Statutory) | 0 |
| Refused | 0 |
| Under Influence of Alcohol/Drugs/Medications | 0 |
| None Indicated | 1 |


| Crash Severity - Annual |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Year | Fatal | Major Injury | Minor Injury | Possible/Unknown | Property Damage Only | Total |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 1 | 1 |



| Injury Status - Annual |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Crash Year | Fatal | Suspected serious/incapac itating | Suspected minor/nonincapacitating | Possible (complaint of pain/injury) | Uninjured | Fatal, not crash-related | Unknown | Total |
| 2008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2014 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |


| Injury Status/Year |  |  |
| ---: | ---: | ---: | ---: |
| 1.2 |  |  |

## Meeting the following criteria

Jurisdiction: Statewide
Year: 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017
Map Selection: Yes
Filter: None

Analyst Information

## Appendix 3




## Design Year Turning Paths

Appendix 4

## Volume-to-Capacity Ratios

Volume-to-capacity ( $\mathrm{v} / \mathrm{c}$ ) is defined as the maximum rate at which vehicles can pass through a given point in an hour under prevailing conditions. The $\mathrm{v} / \mathrm{c}$ ratio is calculated by dividing the total hourly volume of vehicles using the intersection by the hourly capacity. This ratio is used to determine an intersection's sufficiency to accommodate vehicular demand. A v/c ratio less than 0.85 generally indicates adequate capacity is available and vehicles are not expected to experience significant queues and delays. As the $\mathrm{v} / \mathrm{c}$ ratio approaches 1.0 , traffic flow may become unstable and delay and queuing conditions may occur. Table 1 presents ranges of $\mathrm{v} / \mathrm{c}$ ratios and their corresponding level of service (LOS). The ranges are taken from Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and Interim Materials on Highway Capacity, MCHRP Circular 212, 1982.

Table 1 Volume to Capacity Ratio LOS Criteria for Signalized Intersections

| LOS | Signalized Intersection V/C Ratio |
| :---: | :---: |
| A | $<0.600$ |
| B | 0.601 to 0.700 |
| C | 0.701 to 0.800 |
| D | 0.801 to 0.900 |
| E | 0.901 to 1.000 |
| F | $>1.001$ |

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington, D.C., 1985 and Interim Materials on Highway Capacity, MCHRP Circular 212, 1982.

Version 5.00-00

Vistro File: D:\...INetwork 20181026.vistro
Report File: D:I.... 2020 AM Peak.pdf
Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 10.8 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 10.8 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $F$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 126 | 236 | 2 | 1 | 1 |
| Base Volume Adjustment Factor | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 131 | 246 | 2 | 1 | 1 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 33 | 63 | 1 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 134 | 251 | 2 | 1 | 1 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00

## Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  | No |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.72 | 0.00 | 0.00 | 0.00 | 10.81 | 9.56 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.22 |
| d_A, Approach Delay [s/veh] | 0.00 |  | 0.00 |  | 10.19 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.05 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Version 5.00-00

Vistro File: D:I....INetwork 20181026.vistro

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 11.8 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 11.8 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $\dagger$ |  | $F$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 257 | 213 | 0 | 1 | 2 |
| Base Volume Adjustment Factor | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1 | 267 | 222 | 0 | 1 | 2 |
| Peak Hour Factor | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 69 | 57 | 0 | 0 | 1 |
| Total Analysis Volume [veh/h] | 1 | 275 | 229 | 0 | 1 | 2 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

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Intersection Settings

| Prority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  | No |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.67 | 0.00 | 0.00 | 0.00 | 11.83 | 9.44 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.77 | 0.77 | 0.00 | 0.00 | 0.01 | 0.01 |
| 95th-Percentile Queue Length [ft] | 19.15 | 19.15 | 0.00 | 0.00 | 0.33 | 0.33 |
| d_A, Approach Delay [s/veh] | 0.03 |  | 0.00 |  | 10.23 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.08 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Version 5.00-00

Vistro File: D:I....Network 20181221.vistro

Scenario 102020 AM Build
12/21/2018

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.007 | 13.4 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay (sec /veh): | 13.4 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.007 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $\uparrow$ |  | $\stackrel{\rightharpoonup}{t}$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name |  | oad |  | oad |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 126 | 236 | 2 | 1 | 1 |
| Base Volume Adjustment Factor | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 99 | 0 | 0 | 12 | 2 | 9 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 99 | 131 | 246 | 14 | 3 | 10 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 25 | 33 | 63 | 4 | 1 | 3 |
| Total Analysis Volume [veh/h] | 101 | 134 | 251 | 14 | 3 | 10 |
| Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |

Version 5.00-00

## Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  |  |
| Storage Area [veh] | 0 | 0 |  |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.08 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.98 | 0.00 | 0.00 | 0.00 | 13.40 | 9.64 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.65 | 0.65 | 0.00 | 0.00 | 0.02 | 0.04 |
| 95th-Percentile Queue Length [ft] | 16.31 | 16.31 | 0.00 | 0.00 | 0.52 | 0.97 |
| d_A, Approach Delay [s/veh] | 3.43 |  | 0.00 |  | 10.51 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 1.84 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Version 5.00-00

2020 PM Peak Build
Vistro File: D:I....|Network 20181221.vistro Report File: D:I... 142020 PM Peak Build.pdf

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.023 | 12.8 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 12.8 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.023 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $F$ |  | $7 \Gamma$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 257 | 213 | 0 | 1 | 2 |
| Base Volume Adjustment Factor | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 | 1.0404 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 30 | 0 | 0 | 4 | 10 | 99 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 31 | 267 | 222 | 4 | 11 | 101 |
| Peak Hour Factor | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 69 | 57 | 1 | 3 | 26 |
| Total Analysis Volume [veh/h] | 32 | 275 | 229 | 4 | 11 | 104 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  |  |

Version 5.00-00

## Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  |  |
| Storage Area [veh] | 0 | 0 |  |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.02 | 0.00 | 0.00 | 0.00 | 0.02 | 0.13 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.74 | 0.00 | 0.00 | 0.00 | 12.80 | 10.08 |
| Movement LOS | A | A | A | A | B | B |
| 95th-Percentile Queue Length [veh] | 0.88 | 0.88 | 0.00 | 0.00 | 0.07 | 0.44 |
| 95th-Percentile Queue Length [ft] | 22.00 | 22.00 | 0.00 | 0.00 | 1.78 | 10.94 |
| d_A, Approach Delay [s/veh] | 0.81 |  | 0.00 |  | 10.34 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 2.19 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....Network 20181026.vistro

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 11.1 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 11.1 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $F$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 126 | 236 | 2 | 1 | 1 |
| Base Volume Adjustment Factor | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 145 | 271 | 2 | 1 | 1 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 37 | 69 | 1 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 148 | 277 | 2 | 1 | 1 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00

## Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  | No |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.78 | 0.00 | 0.00 | 0.00 | 11.13 | 9.72 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.23 |
| d_A, Approach Delay [s/veh] | 0.00 |  | 0.00 |  | 10.42 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.05 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....|Network 20181026.vistro

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 12.3 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 12.3 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $F$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 257 | 213 | 0 | 1 | 2 |
| Base Volume Adjustment Factor | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1 | 295 | 245 | 0 | 1 | 2 |
| Peak Hour Factor | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 76 | 63 | 0 | 0 | 1 |
| Total Analysis Volume [veh/h] | 1 | 304 | 253 | 0 | 1 | 2 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00
Intersection Settings

| Prority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  | No |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.72 | 0.00 | 0.00 | 0.00 | 12.33 | 9.58 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 0.89 | 0.89 | 0.00 | 0.00 | 0.01 | 0.01 |
| 95th-Percentile Queue Length [ft] | 22.29 | 22.29 | 0.00 | 0.00 | 0.34 | 0.34 |
| d_A, Approach Delay [s/veh] | 0.03 |  | 0.00 |  | 10.49 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.07 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....|Network 20181221.vistro Report File: D:I.... 172025 AM Peak Build.pdf

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Signalized | HCM 6th <br> Edition | EB Right | 0.680 | 7.4 | A |
| 2 | Lost Grove Road \& North <br> Access | Two-way stop | HCM 6th <br> Edition | NB Left | 0.161 | 15.7 | C |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Version 5.00-00

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South AccessControl Type:
Analysis Method:
Analysis Period:
Signalized
HCM 6 th Edition
15 minutes

| Delay (sec / veh): | 7.4 |
| :---: | :---: |
| Level Of Service: | A |
| Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.680 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $\dagger$ |  | $F$ |  | 7 |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 126 | 236 | 2 | 1 | 1 |
| Base Volume Adjustment Factor | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 395 | 0 | 0 | 44 | 4 | 34 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 14 | 0 | 11 |
| Total Hourly Volume [veh/h] | 395 | 145 | 271 | 32 | 5 | 24 |
| Peak Hour Factor | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 115 | 42 | 79 | 9 | 1 | 7 |
| Total Analysis Volume [veh/h] | 459 | 169 | 315 | 37 | 6 | 28 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing m | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin ${ }^{\text {b }}$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

## Version 5.00-00

Intersection Settings

| Located in CBD | Yes |
| :---: | :---: |
| Signal Coordination Group | - |
| Cycle Length [s] | 110 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Semi-actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 0.00 |

## Phasing \& Timing

| Control Type | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | - | - |  | Lead |  |  |
| Minimum Green [s] | 0 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 90 | 90 | 0 | 20 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| 2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall |  | No | No |  | No |  |
| Maximum Recall |  | No | No |  | No |  |
| Pedestrian Recall |  | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group | 0 |
| :---: | :--- |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

## Lane Group Calculations

| Lane Group | C | C | L | R |
| :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 110 | 110 | 110 | 110 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 0.00 |
| I2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 99 | 99 | 3 | 3 |
| g / C, Green / Cycle | 0.90 | 0.90 | 0.03 | 0.03 |
| (v/s)_i Volume / Saturation Flow Rate | 0.66 | 0.21 | 0.00 | 0.02 |
| s, saturation flow rate [veh/h] | 950 | 1666 | 1629 | 1454 |
| c, Capacity [veh/h] | 908 | 1493 | 51 | 45 |
| d1, Uniform Delay [s] | 3.63 | 0.75 | 51.81 | 52.64 |
| k, delay calibration | 0.50 | 0.50 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 4.32 | 0.37 | 1.02 | 12.90 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 |  | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.69 | 0.24 | 0.12 | 0.62 |
| :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 7.95 | 1.12 | 52.84 | 65.54 |
| Lane Group LOS | A | A | D | N |
| Critical Lane Group | Yes | 0.15 | No | Yes |
| 50th-Percentile Queue Length [veh] | 3.84 | 3.85 | 0.18 | 0.93 |
| 50th-Percentile Queue Length [ft] | 95.99 | 0.28 | 4.39 | 23.15 |
| 95th-Percentile Queue Length [veh] | 6.91 | 6.94 | 0.32 | 1.67 |
| 95th-Percentile Queue Length [ft] | 172.79 | 7.90 | 41.67 |  |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 7.95 | 7.95 | 1.12 | 1.12 | 52.84 | 65.54 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | A | A | A | A | D | E |
| d_A, Approach Delay [s/veh] | 7.95 |  | 1.12 |  | 63.29 |  |
| Approach LOS | A |  | A |  | E |  |
| d_l, Intersection Delay [s/veh] | 7.44 |  |  |  |  |  |
| Intersection LOS | A |  |  |  |  |  |
| Intersection V/C | 0.680 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 16.0 | 86.0 | 86.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 40.16 | 2.62 | 2.62 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.598 | 2.123 | 2.685 |
| Crosswalk LOS | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 55.00 | 55.00 | 55.00 |
| I_b,int, Bicycle LOS Score for Intersection | 5.169 | 4.736 | 4.132 |
| Bicycle LOS | F | E | D |

Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |


| SG: 290 s |  |  |
| :--- | :--- | :--- |
| SG: 690 s |  |  |

## Intersection Level Of Service Report

 Intersection 2: Lost Grove Road \& North Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 15.7 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.161 |

Intersection Setup

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Westbound |  | Southeastbound |  |
| Lane Configuration | $\Gamma$ |  | $T$ |  | $Y$ |  |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 |  | 30.00 |  | 40.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 0 | 0 | 39 | 10 | 0 |
| Base Volume Adjustment Factor | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| Heavy Vehicles Percentage [\%] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 35 | 4 | 44 | 0 | 0 | 395 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 35 | 4 | 44 | 45 | 11 | 395 |
| Peak Hour Factor | 0.5400 | 0.5400 | 0.5400 | 0.5400 | 0.5400 | 0.5400 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 16 | 2 | 20 | 21 | 5 | 183 |
| Total Analysis Volume [veh/h] | 65 | 7 | 81 | 83 | 20 | 731 |
| Pedestrian Volume [ped/h] |  | 0 |  |  | 0 |  |

Version 5.00-00
Intersection Settings

| Priority Scheme | Stop | Free | Free |
| :---: | :---: | :---: | :---: |
| Flared Lane | No |  |  |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | No |  |  |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

## Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.16 | 0.01 | 0.09 | 0.00 | 0.00 | 0.01 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 15.66 | 12.16 | 9.58 | 0.00 | 0.00 | 0.00 |
| Movement LOS | C | B | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 0.61 | 0.61 | 0.69 | 0.69 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 15.27 | 15.27 | 17.35 | 17.35 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 15.32 |  | 4.73 |  | 0.00 |  |
| Approach LOS | C |  | A |  | A |  |
| d_I, Intersection Delay [s/veh] | 1.90 |  |  |  |  |  |
| Intersection LOS | C |  |  |  |  |  |

Vistro File: D:I....|Network 20181221.vistro Report File: D:I.... 182025 PM Peak Build.pdf

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Signalized | HCM 6th <br> Edition | EB Right | 0.533 | 15.0 | B |
| 2 | Lost Grove Road \& North <br> Access | Two-way stop | HCM 6th <br> Edition | NB Left | 0.468 | 13.7 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 15.0 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.533 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $\stackrel{F}{2}$ |  | 75 |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 257 | 213 | 0 | 1 | 2 |
| Base Volume Adjustment Factor | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 68 | 0 | 0 | 8 | 39 | 351 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 5 | 0 | 211 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 4 | 0 | 169 |
| Total Hourly Volume [veh/h] | 69 | 295 | 245 | 9 | 40 | 395 |
| Peak Hour Factor | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 18 | 76 | 63 | 2 | 10 | 102 |
| Total Analysis Volume [veh/h] | 71 | 304 | 253 | 9 | 41 | 407 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossin¢ | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing m | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin ${ }^{\text {b }}$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

Version 5.00-00
Intersection Settings

| Located in CBD | Yes |
| :---: | :---: |
| Signal Coordination Group | - |
| Cycle Length [s] | 60 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Semi-actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 0.00 |

## Phasing \& Timing

| Control Type | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | - | - |  | Lead |  |  |
| Minimum Green [s] | 0 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 9 | 9 | 0 | 51 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| 2, Clearance Lost Time [s] | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall |  | No | No |  | No |  |
| Maximum Recall |  | No | No |  | No |  |
| Pedestrian Recall |  | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group | 0 |
| :---: | :--- |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

Version 5.00-00
Lane Group Calculations

| Lane Group | C | C | L | R |
| :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 2.00 | 0.00 | 0.00 | 0.00 |
| 12, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 33 | 33 | 19 | 19 |
| g / C, Green / Cycle | 0.55 | 0.55 | 0.32 | 0.32 |
| (v / s)_i Volume / Saturation Flow Rate | 0.25 | 0.16 | 0.03 | 0.28 |
| s , saturation flow rate [veh/h] | 1482 | 1659 | 1629 | 1454 |
| c, Capacity [veh/h] | 881 | 906 | 522 | 466 |
| d1, Uniform Delay [s] | 7.97 | 7.34 | 14.21 | 19.24 |
| k, delay calibration | 0.50 | 0.50 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.51 | 0.81 | 0.06 | 5.28 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.43 | 0.29 | 0.08 | 0.87 |
| :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 9.48 | 8.14 | 14.27 | 24.52 |
| Lane Group LOS | A | A | B | C |
| Critical Lane Group | Yes | No | No | Yes |
| 50th-Percentile Queue Length [veh] | 2.07 | 1.30 | 0.36 | 5.46 |
| 50th-Percentile Queue Length [ft] | 51.78 | 32.52 | 9.12 | 136.58 |
| 95th-Percentile Queue Length [veh] | 3.73 | 2.34 | 0.66 | 9.30 |
| 95th-Percentile Queue Length [ft] | 93.20 | 58.53 | 16.42 | 232.41 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 9.48 | 9.48 | 8.14 | 8.14 | 14.27 | 24.52 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | A | A | A | A | B | C |
| d_A, Approach Delay [s/veh] | 9.48 | 8.14 | 23.58 |  |  |  |
| Approach LOS | A | A | C |  |  |  |
| d_I, Intersection Delay [s/veh] | 14.98 |  |  |  |  |  |
| Intersection LOS | 0.533 |  |  |  |  |  |
| Intersection V/C |  |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 47.0 | 5.0 | 5.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 1.41 | 25.21 | 25.21 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.662 | 2.312 | 2.496 |
| Crosswalk LOS | B | B | B |
| s_b, Saturation Flow Rate of the bicycle lan_ | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 30.00 |
| I_b,int, Bicycle LOS Score for Intersection | 4.751 | 4.571 | 4.132 |
| Bicycle LOS | E | E | D |

Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | - | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

## Intersection Level Of Service Report

 Intersection 2: Lost Grove Road \& North Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 13.7 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.468 |

Intersection Setup

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Westbound |  | Southeastbound |  |
| Lane Configuration | $T$ |  | $\uparrow$ |  | $Y$ |  |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 |  | 30.00 |  | 40.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 0 | 0 | 27 | 52 | 0 |
| Base Volume Adjustment Factor | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 | 1.1487 |
| Heavy Vehicles Percentage [\%] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 351 | 39 | 8 | 0 | 0 | 68 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 351 | 39 | 8 | 31 | 60 | 68 |
| Peak Hour Factor | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 98 | 11 | 2 | 9 | 17 | 19 |
| Total Analysis Volume [veh/h] | 390 | 43 | 9 | 34 | 67 | 76 |
| Pedestrian Volume [ped/h] |  | 0 |  |  | 0 |  |

Version 5.00-00
Intersection Settings

| Priority Scheme | Stop | Free | Free |
| :---: | :---: | :---: | :---: |
| Flared Lane | No |  |  |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance | No |  |  |
| Number of Storage Spaces in Median | 0 | 0 | 0 |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.47 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 13.72 | 13.17 | 7.49 | 0.00 | 0.00 | 0.00 |
| Movement LOS | B | B | A | A | A | A |
| 95th-Percentile Queue Length [veh] | 2.98 | 2.98 | 0.09 | 0.09 | 0.00 | 0.00 |
| 95th-Percentile Queue Length [ft] | 74.62 | 74.62 | 2.29 | 2.29 | 0.00 | 0.00 |
| d_A, Approach Delay [s/veh] | 13.66 |  | 1.57 |  | 0.00 |  |
| Approach LOS | B |  | A |  | A |  |
| d_I, Intersection Delay [s/veh] | 9.67 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Version 5.00-00

Vistro File: D:\...INetwork 20181028.vistro

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 12.1 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 12.1 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $F$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 126 | 236 | 2 | 1 | 1 |
| Base Volume Adjustment Factor | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 160 | 299 | 3 | 1 | 1 |
| Peak Hour Factor | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 47 | 87 | 1 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 186 | 348 | 3 | 1 | 1 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00

## Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  | No |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.95 | 0.00 | 0.00 | 0.00 | 12.09 | 10.18 |
| Movement LOS | A | A | A | A | B | B |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.26 |
| d_A, Approach Delay [s/veh] | 0.00 |  | 0.00 |  | 11.13 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.04 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....|Network 20181221.vistro
Report File: D:I...l10 2030 PM Peak.pdf

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 12.9 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 12.9 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $4$ |  | $F$ |  | $T$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 257 | 213 | 0 | 1 | 2 |
| Base Volume Adjustment Factor | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1 | 326 | 270 | 0 | 1 | 3 |
| Peak Hour Factor | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 84 | 70 | 0 | 0 | 1 |
| Total Analysis Volume [veh/h] | 1 | 336 | 278 | 0 | 1 | 3 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00
Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  | No |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.78 | 0.00 | 0.00 | 0.00 | 12.91 | 9.74 |
| Movement LOS | A | A | A | A | B | A |
| 95th-Percentile Queue Length [veh] | 1.04 | 1.04 | 0.00 | 0.00 | 0.02 | 0.02 |
| 95th-Percentile Queue Length [ft] | 26.12 | 26.12 | 0.00 | 0.00 | 0.46 | 0.46 |
| d_A, Approach Delay [s/veh] | 0.02 |  | 0.00 |  | 10.53 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.08 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....Network 20181028.vistro
Report File: D:I... 1112030 AM Peak Build.pdf

Scenario 182030 AM Build
10/29/2018

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Signalized | HCM 6th <br> Edition | EB Right | 0.685 | 27.7 | C |
| 2 | Lost Grove Road \& North <br> Access | Signalized | HCM 6th <br> Edition | NB Left | 0.496 | 7.1 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 27.7 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.685 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $7$ |  | $\stackrel{F}{2}$ |  | 75 |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 126 | 236 | 2 | 1 | 1 |
| Base Volume Adjustment Factor | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 986 | 0 | 0 | 110 | 10 | 85 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 34 | 0 | 26 |
| Total Hourly Volume [veh/h] | 986 | 160 | 299 | 79 | 11 | 60 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 252 | 41 | 76 | 20 | 3 | 15 |
| Total Analysis Volume [veh/h] | 1006 | 163 | 305 | 81 | 11 | 61 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing p | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $\$$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

Version 5.00-00
Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | - |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | Lead | - |
| Minimum Green [s] | 5 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 30 | 51 | 21 | 0 | 9 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No |  | No |  |
| Maximum Recall | No | No | No |  | No |  |
| Pedestrian Recall | No | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

Lane Group Calculations

| Lane Group | L | C | C | L | R |
| :---: | :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| I2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 48 | 48 | 18 | 4 | 4 |
| g / C, Green / Cycle | 0.81 | 0.81 | 0.31 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.76 | 0.10 | 0.24 | 0.01 | 0.04 |
| s , saturation flow rate [veh/h] | 1327 | 1615 | 1636 | 1629 | 1454 |
| c, Capacity [veh/h] | 1044 | 1301 | 499 | 100 | 89 |
| d1, Uniform Delay [s] | 10.28 | 1.26 | 18.95 | 26.61 | 27.59 |
| k, delay calibration | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 20.31 | 0.20 | 11.07 | 0.48 | 8.88 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp , platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.96 | 0.13 | 0.77 | 0.11 | 27.09 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 30.59 | 1.46 | 30.02 | 36.46 |  |
| Lane Group LOS | C | A | C | D |  |
| Critical Lane Group | Yes | No | Yes | No |  |
| 50th-Percentile Queue Length [veh] | 5.89 | 0.07 | 5.34 | 0.15 | 1.03 |
| 50th-Percentile Queue Length [ft] | 147.28 | 1.79 | 133.50 | 3.87 | 25.85 |
| 95th-Percentile Queue Length [veh] | 9.87 | 0.13 | 9.13 | 1.86 |  |
| 95th-Percentile Queue Length [ft] | 246.79 | 3.22 | 228.25 | 6.28 |  |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 30.59 | 1.46 | 30.02 | 30.02 | 27.09 | 36.46 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | C | A | C | C | C | D |
| d_A, Approach Delay [s/veh] | 26.53 |  | 30.02 |  | 35.03 |  |
| Approach LOS | C |  | C |  | D |  |
| d_l, Intersection Delay [s/veh] | 27.73 |  |  |  |  |  |
| Intersection LOS | C |  |  |  |  |  |
| Intersection V/C | 0.685 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 5.0 | 47.0 | 17.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 25.21 | 1.41 | 15.41 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.857 | 2.181 | 2.827 |
| Crosswalk LOS | C | B | C |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 30.00 |
| I_b,int, Bicycle LOS Score for Intersection | 6.061 | 4.825 | 4.132 |
| Bicycle LOS | F | E | D |

Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |


| SG: 2 51s |  | SG: 3 9s |
| :---: | :---: | :---: |
| SG: 5 30s | SG: 6 21s |  |

## Intersection Level Of Service Report

 Intersection 2: Lost Grove Road \& North AccessControl Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6 th Edition
15 minutes
Delay (sec / veh):
7.1

Level Of Service:
Volume to Capacity ( $\mathrm{v} / \mathrm{c}$ ):

A
0.496

Intersection Setup

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Westbound |  | Southeastbound |  |
| Lane Configuration | $\Gamma$ |  | $T$ |  | $Y$ |  |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 |  | 30.00 |  | 40.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 0 | 0 | 39 | 10 | 0 |
| Base Volume Adjustment Factor | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| Heavy Vehicles Percentage [\%] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 86 | 10 | 110 | 0 | 0 | 986 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 3 | 0 | 0 | 0 | 296 |
| Total Hourly Volume [veh/h] | 86 | 7 | 110 | 49 | 13 | 690 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 22 | 2 | 28 | 13 | 3 | 176 |
| Total Analysis Volume [veh/h] | 88 | 7 | 112 | 50 | 13 | 704 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing m | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $¢$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

Version 5.00-00
Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | - |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 0 | 0 | 4 | 8 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | - | - |
| Minimum Green [s] | 5 | 0 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 39 | 0 | 0 | 21 | 21 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | No |  |  | No | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No |  |  | No | No |  |
| Maximum Recall | No |  |  | No | No |  |
| Pedestrian Recall | No |  |  | No | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

## Lane Group Calculations

| Lane Group | C | C | C |
| :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 |
| 11_p, Permitted Start-Up Lost Time [s] | 0.00 | 2.00 | 0.00 |
| 12, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 48 | 48 |
| $\mathrm{g} / \mathrm{C}, \mathrm{Green}$ / Cycle | 0.07 | 0.79 | 0.79 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.23 | 0.44 |
| s , saturation flow rate [veh/h] | 1794 | 690 | 1619 |
| c, Capacity [veh/h] | 132 | 649 | 1284 |
| d1, Uniform Delay [s] | 27.19 | 3.79 | 2.30 |
| k, delay calibration | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.21 | 0.92 | 1.76 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 |
| Lane Group Results |  |  |  |
| X, volume / capacity | 0.72 | 0.25 | 0.56 |
| d, Delay for Lane Group [s/veh] | 34.40 | 4.71 | 4.06 |
| Lane Group LOS | C | A | A |
| Critical Lane Group | Yes | No | Yes |
| 50th-Percentile Queue Length [veh] | 1.53 | 0.86 | 0.73 |
| 50th-Percentile Queue Length [ft] | 38.16 | 21.59 | 18.28 |
| 95th-Percentile Queue Length [veh] | 2.75 | 1.55 | 1.32 |
| 95th-Percentile Queue Length [ft] | 68.68 | 38.87 | 32.91 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 34.40 | 34.40 | 4.71 | 4.71 | 4.06 | 4.06 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | C | C | A | A | A | A |
| d_A, Approach Delay [s/veh] | 34.40 | 4.71 | 4.06 |  |  |  |
| Approach LOS | C | A | A |  |  |  |
| d_I, Intersection Delay [s/veh] | 7.13 |  |  |  |  |  |
| Intersection LOS |  |  |  |  |  |  |
| Intersection V/C | 0.496 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 17.0 | 35.0 | 17.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 15.41 | 5.21 | 15.41 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.435 | 1.729 | 2.976 |
| Crosswalk LOS | B | A | C |
| s_b, Saturation Flow Rate of the bicycle lan_ | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 30.00 |
| I_b,int, Bicycle LOS Score for Intersection | 4.294 | 4.400 | 5.804 |
| Bicycle LOS | E | E | F |

Sequence


Vistro File: D:I....Network 20181221.vistro
Report File: D:I... 1122030 PM Peak Build.pdf

Scenario 192030 PM Build 1/7/2019

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Signalized | HCM 6th <br> Edition | EB Right | 0.670 | 22.5 | C |
| 2 | Lost Grove Road \& North <br> Access | Signalized | HCM 6th <br> Edition | NB Left | 0.639 | 19.9 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 22.5 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.670 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $7$ |  | $\stackrel{F}{2}$ |  | 75 |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 257 | 213 | 0 | 1 | 2 |
| Base Volume Adjustment Factor | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 160 | 0 | 0 | 18 | 97 | 868 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 5 | 0 | 261 |
| Total Hourly Volume [veh/h] | 161 | 326 | 270 | 13 | 98 | 610 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 83 | 69 | 3 | 25 | 156 |
| Total Analysis Volume [veh/h] | 164 | 333 | 276 | 13 | 100 | 622 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossin¢ | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing n | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $¢$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

Version 5.00-00
Intersection Settings

| Located in CBD | Yes |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] | - |
| Coordination Type | 70 |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | Lead | - |
| Minimum Green [s] | 5 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 9 | 18 | 9 | 0 | 52 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No |  | No |  |
| Maximum Recall | No | No | No |  | No |  |
| Pedestrian Recall | No | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

Lane Group Calculations

| Lane Group | L | C | C | L | R |
| :---: | :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 70 | 70 | 70 | 70 | 70 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| I2, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 30 | 30 | 21 | 32 | 32 |
| g / C, Green / Cycle | 0.42 | 0.42 | 0.30 | 0.46 | 0.46 |
| (v/s)_i Volume / Saturation Flow Rate | 0.14 | 0.20 | 0.17 | 0.06 | 0.43 |
| s , saturation flow rate [veh/h] | 1146 | 1683 | 1656 | 1629 | 1454 |
| c, Capacity [veh/h] | 468 | 713 | 489 | 753 | 672 |
| d1, Uniform Delay [s] | 14.11 | 14.50 | 21.07 | 10.79 | 17.70 |
| k, delay calibration | 0.50 | 0.50 | 0.50 | 0.11 | 0.19 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.06 | 2.19 | 5.19 | 0.08 | 9.65 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.35 | 0.47 | 0.59 | 0.13 | 10.87 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 16.17 | 16.69 | 26.26 | 27.34 |  |
| Lane Group LOS | B | B | C | C |  |
| Critical Lane Group | Yes | No | Yes | No |  |
| 50th-Percentile Queue Length [veh] | 1.58 | 3.41 | 4.09 | 0.82 | 10.04 |
| 50th-Percentile Queue Length [ft] | 39.43 | 85.37 | 102.32 | 20.61 | 251.11 |
| 95th-Percentile Queue Length [veh] | 2.84 | 6.15 | 7.37 | 1.48 | 15.24 |
| 95th-Percentile Queue Length [ft] | 70.98 | 153.67 | 184.17 | 37.10 | 381.05 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 16.17 | 16.69 | 26.26 | 26.26 | 10.87 | 27.34 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | B | B | C | C | B | C |
| d_A, Approach Delay [s/veh] | 16.52 |  | 26.26 |  | 25.06 |  |
| Approach LOS | B |  | C |  | C |  |
| d_l, Intersection Delay [s/veh] | 22.48 |  |  |  |  |  |
| Intersection LOS | C |  |  |  |  |  |
| Intersection V/C | 0.670 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 48.0 | 14.0 | 5.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 3.46 | 22.40 | 30.18 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.834 | 2.496 | 2.760 |
| Crosswalk LOS | C | B | C |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 35.00 | 35.00 | 35.00 |
| I_b,int, Bicycle LOS Score for Intersection | 4.952 | 4.618 | 4.132 |
| Bicycle LOS | E | E | D |

Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |


| SG: 2 18s |  | SG: 3 52s |
| :---: | :---: | :---: |
| SG: 5 95 | SG: 6 9s |  |

## Intersection Level Of Service Report

 Intersection 2: Lost Grove Road \& North Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 19.9 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.639 |

Intersection Setup

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Westbound |  | Southeastbound |  |
| Lane Configuration | $\Gamma$ |  | $T$ |  | $Y$ |  |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 |  | 30.00 |  | 40.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 0 | 0 | 27 | 52 | 0 |
| Base Volume Adjustment Factor | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 | 1.2682 |
| Heavy Vehicles Percentage [\%] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 869 | 97 | 18 | 0 | 0 | 160 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 29 | 0 | 0 | 0 | 48 |
| Total Hourly Volume [veh/h] | 869 | 68 | 18 | 34 | 66 | 112 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 222 | 17 | 5 | 9 | 17 | 29 |
| Total Analysis Volume [veh/h] | 887 | 69 | 18 | 35 | 67 | 114 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing in | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossinq | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

Version 5.00-00
Intersection Settings

| Located in CBD | No |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] | - |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Semi-actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 0.00 |

## Phasing \& Timing

| Control Type | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 0 | 0 | 4 | 8 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | - | - |
| Minimum Green [s] | 5 | 0 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 51 | 0 | 0 | 9 | 9 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | No |  |  | No | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No |  |  | No | No |  |
| Maximum Recall | No |  |  | No | No |  |
| Pedestrian Recall | No |  |  | No | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

## Lane Group Calculations

| Lane Group | C | C | C |
| :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 |
| 11_p, Permitted Start-Up Lost Time [s] | 0.00 | 2.00 | 0.00 |
| 12, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 34 | 18 | 18 |
| $\mathrm{g} / \mathrm{C}, \mathrm{Green} / \mathrm{Cycle}$ | 0.57 | 0.30 | 0.30 |
| (v / s)_i Volume / Saturation Flow Rate | 0.53 | 0.05 | 0.11 |
| s, saturation flow rate [veh/h] | 1794 | 1152 | 1710 |
| c, Capacity [veh/h] | 1026 | 420 | 504 |
| d1, Uniform Delay [s] | 11.77 | 15.63 | 16.69 |
| k, delay calibration | 0.23 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.53 | 0.62 | 1.99 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 |
| Lane Group Results |  |  |  |
| X, volume / capacity | 0.93 | 0.13 | 0.36 |
| d, Delay for Lane Group [s/veh] | 20.30 | 16.25 | 18.68 |
| Lane Group LOS | C | B | B |
| Critical Lane Group | Yes | No | Yes |
| 50th-Percentile Queue Length [veh] | 11.14 | 0.56 | 1.98 |
| 50th-Percentile Queue Length [ft] | 278.62 | 13.88 | 49.52 |
| 95th-Percentile Queue Length [veh] | 16.62 | 1.00 | 3.57 |
| 95th-Percentile Queue Length [ft] | 415.49 | 24.99 | 89.13 |

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Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 20.30 | 20.30 | 16.25 | 16.25 | 18.68 | 18.68 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | C | C | B | B | B | B |
| d_A, Approach Delay [s/veh] | 20.30 |  | 16.25 | 18.68 |  |  |
| Approach LOS | C | B | B |  |  |  |
| d_I, Intersection Delay [s/veh] | 19.87 |  |  |  |  |  |
| Intersection LOS | 0.639 |  |  |  |  |  |
| Intersection V/C |  |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 5.0 | 47.0 | 5.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft2/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 25.21 | 1.41 | 25.21 |
| I_p,int, Pedestrian LOS Score for Intersectign | 2.336 | 1.692 | 3.780 |
| Crosswalk LOS | B | A | D |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 30.00 |
| l_b,int, Bicycle LOS Score for Intersection | 5.758 | 4.220 | 4.510 |
| Bicycle LOS | F | D | E |

Sequence


Vistro File: D:I....|Network 20181028.vistro

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 12.9 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 12.9 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $7$ |  | $\stackrel{F}{F}$ |  | $7 \Gamma$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 177 | 330 | 3 | 1 | 1 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 186 | 347 | 3 | 1 | 1 |
| Peak Hour Factor | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 | 0.8600 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 54 | 101 | 1 | 0 | 0 |
| Total Analysis Volume [veh/h] | 0 | 216 | 403 | 3 | 1 | 1 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00

## Intersection Settings

| Priority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  |  |
| Storage Area [veh] | 0 | 0 |  |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 8.09 | 0.00 | 0.00 | 0.00 | 12.94 | 10.54 |
| Movement LOS | A | A | A | A | B | B |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| 95th-Percentile Queue Length [ft] | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.12 |
| d_A, Approach Delay [s/veh] | 0.00 |  | 0.00 |  | 11.74 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.04 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....Network 20181028.vistro

Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Two-way stop | HCM 6th <br> Edition | EB Left | 0.002 | 14.0 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Two-way stop | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 14.0 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.002 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $7$ |  | $\stackrel{F}{F}$ |  | $7 \Gamma$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 360 | 298 | 0 | 1 | 3 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 1 | 378 | 313 | 0 | 1 | 3 |
| Peak Hour Factor | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 | 0.9700 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 97 | 81 | 0 | 0 | 1 |
| Total Analysis Volume [veh/h] | 1 | 390 | 323 | 0 | 1 | 3 |
| Pedestrian Volume [ped/h] |  | 0 |  | 0 |  | 0 |

Version 5.00-00
Intersection Settings

| Prority Scheme | Free | Free | Stop |
| :---: | :---: | :---: | :---: |
| Flared Lane |  |  |  |
| Storage Area [veh] | 0 | 0 | 0 |
| Two-Stage Gap Acceptance |  |  |  |
| Number of Storage Spaces in Median | 0 | 0 | No |

Movement, Approach, \& Intersection Results

| V/C, Movement V/C Ratio | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d_M, Delay for Movement [s/veh] | 7.89 | 0.00 | 0.00 | 0.00 | 14.02 | 10.00 |
| Movement LOS | A | A | A | A | B | B |
| 95th-Percentile Queue Length [veh] | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| 95th-Percentile Queue Length [ft] | 0.06 | 0.00 | 0.00 | 0.00 | 0.19 | 0.31 |
| d_A, Approach Delay [s/veh] | 0.02 |  | 0.00 |  | 11.01 |  |
| Approach LOS | A |  | A |  | B |  |
| d_I, Intersection Delay [s/veh] | 0.07 |  |  |  |  |  |
| Intersection LOS | B |  |  |  |  |  |

Vistro File: D:I....|Network 20181028.vistro
Report File: D:I... 1132050 AM Peak Build.pdf
Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Signalized | HCM 6th <br> Edition | EB Right | 0.696 | 34.3 | C |
| 2 | Lost Grove Road \& North <br> Access | Signalized | HCM 6th <br> Edition | NB Left | 0.499 | 7.2 | A |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 34.3 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.696 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $71$ |  | $\stackrel{F}{2}$ |  | 7F |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 177 | 330 | 3 | 1 | 1 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 986 | 0 | 0 | 110 | 10 | 85 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 34 | 0 | 26 |
| Total Hourly Volume [veh/h] | 986 | 186 | 347 | 79 | 11 | 60 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 252 | 47 | 89 | 20 | 3 | 15 |
| Total Analysis Volume [veh/h] | 1006 | 190 | 354 | 81 | 11 | 61 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing p | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $\$$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

## Version 5.00-00

Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | - |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |

## Phasing \& Timing

| Control Type | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | Lead | - |
| Minimum Green [s] | 5 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 52 | 91 | 39 | 0 | 9 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No |  | No |  |
| Maximum Recall | No | No | No |  | No |  |
| Pedestrian Recall | No | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

Lane Group Calculations

| Lane Group | L | C | C | L | R |
| :---: | :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 100 | 100 | 100 | 100 | 100 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 87 | 87 | 35 | 5 | 5 |
| $\mathrm{g} / \mathrm{C}$, Green / Cycle | 0.87 | 0.87 | 0.35 | 0.05 | 0.05 |
| (v / s)_i Volume / Saturation Flow Rate | 0.77 | 0.12 | 0.26 | 0.01 | 0.04 |
| s , saturation flow rate [veh/h] | 1306 | 1615 | 1643 | 1629 | 1454 |
| c, Capacity [veh/h] | 1044 | 1405 | 576 | 81 | 73 |
| d1, Uniform Delay [s] | 16.51 | 0.96 | 28.70 | 45.43 | 47.10 |
| k, delay calibration | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 20.33 | 0.20 | 8.95 | 0.74 | 21.54 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.96 | 0.14 | 0.76 | 0.14 | 0.84 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 36.84 | 1.16 | 37.65 | 46.18 | 68.64 |
| Lane Group LOS | D | A | D | D | E |
| Critical Lane Group | Yes | No | Yes | No | Yes |
| 50th-Percentile Queue Length [veh] | 5.90 | 0.08 | 9.73 | 0.28 | 1.93 |
| 50th-Percentile Queue Length [ft] | 147.42 | 1.95 | 243.30 | 6.93 | 48.29 |
| 95th-Percentile Queue Length [veh] | 9.88 | 0.14 | 14.85 | 0.50 | 3.48 |
| 95th-Percentile Queue Length [ft] | 246.99 | 3.52 | 371.20 | 12.47 | 86.92 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 36.84 | 1.16 | 37.65 | 37.65 | 46.18 | 68.64 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | D | A | D | D | D | E |
| d_A, Approach Delay [s/veh] | 31.17 |  | 37.65 |  | 65.21 |  |
| Approach LOS | C |  | D |  | E |  |
| d_l, Intersection Delay [s/veh] | 34.27 |  |  |  |  |  |
| Intersection LOS | C |  |  |  |  |  |
| Intersection V/C | 0.696 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 5.0 | 87.0 | 35.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 45.13 | 0.85 | 21.13 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.926 | 2.228 | 2.883 |
| Crosswalk LOS | C | B | C |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 50.00 | 50.00 | 50.00 |
| I_b,int, Bicycle LOS Score for Intersection | 6.106 | 4.906 | 4.132 |
| Bicycle LOS | F | E | D |

Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



## Intersection Level Of Service Report

 Intersection 2: Lost Grove Road \& North AccessControl Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6 th Edition
15 minutes
Delay (sec / veh):
7.2

Level Of Service:
Volume to Capacity ( $\mathrm{v} / \mathrm{c}$ ):

A
0.499

Intersection Setup

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Westbound |  | Southeastbound |  |
| Lane Configuration | $\Gamma$ |  | $T$ |  | $Y$ |  |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 |  | 30.00 |  | 40.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 0 | 0 | 54 | 14 | 0 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 86 | 10 | 110 | 0 | 0 | 986 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 3 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 3 | 0 | 0 | 0 | 296 |
| Total Hourly Volume [veh/h] | 86 | 10 | 110 | 57 | 15 | 690 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 22 | 3 | 28 | 15 | 4 | 176 |
| Total Analysis Volume [veh/h] | 88 | 10 | 112 | 58 | 15 | 704 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing m | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $\beta^{\text {a }}$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

## Version 5.00-00

Intersection Settings

| Located in CBD | No |
| :---: | :---: |
| Signal Coordination Group | - |
| Cycle Length [s] | 60 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Semi-actuated |
| Offset [s] | 0.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 0.00 |

## Phasing \& Timing

| Control Type | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 0 | 0 | 4 | 8 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - |  |  | - |  |
| Minimum Green [s] | 5 | 0 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 40 | 0 | 0 | 20 | 20 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | No |  |  | No | No |  |
| I1, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| 2, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No |  |  | No | No |  |
| Maximum Recall | No |  |  | No | No |  |
| Pedestrian Recall | No |  |  | No | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group | 0 |
| :---: | :--- |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

## Lane Group Calculations

| Lane Group | C | C | C |
| :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 2.00 | 0.00 |
| I2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 4 | 48 | 48 |
| g / C, Green / Cycle | 0.07 | 0.79 | 0.79 |
| (v/s)_i Volume / Saturation Flow Rate | 0.05 | 0.24 | 0.44 |
| s, saturation flow rate [veh/h] | 1788 | 707 | 1620 |
| c, Capacity [veh/h] | 136 | 659 | 1281 |
| d1, Uniform Delay [s] | 27.10 | 3.64 | 2.36 |
| k, delay calibration | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.05 | 0.95 | 1.78 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 |  |

## Lane Group Results

| X, volume / capacity | 0.72 | 0.26 | 0.56 |
| :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 34.15 | 4.59 | 4.14 |
| Lane Group LOS | C | A | A |
| Critical Lane Group | Yes | No | Yes |
| 50th-Percentile Queue Length [veh] | 1.57 | 0.91 | 0.79 |
| 50th-Percentile Queue Length [ft] | 39.16 | 22.78 | 19.81 |
| 95th-Percentile Queue Length [veh] | 2.82 | 1.64 | 1.43 |
| 95th-Percentile Queue Length [ft] | 70.49 | 41.01 | 35.65 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 34.15 | 34.15 | 4.59 | 4.59 | 4.14 | 4.14 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | C | C | A | A | A | A |
| d_A, Approach Delay [s/veh] | 34.15 |  | 4.59 |  | 4.14 |  |
| Approach LOS | C |  | A |  | A |  |
| d_I, Intersection Delay [s/veh] | 7.20 |  |  |  |  |  |
| Intersection LOS | A |  |  |  |  |  |
| Intersection V/C | 0.499 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 16.0 | 36.0 | 16.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 16.13 | 4.80 | 16.13 |
| I_p,int, Pedestrian LOS Score for Intersectign | 2.439 | 1.732 | 2.985 |
| Crosswalk LOS | B | A |  |
| s_b, Saturation Flow Rate of the bicycle lan¢ | 2000 | 2000 | C |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 2000 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 0 |
| I_b,int, Bicycle LOS Score for Intersection | 4.299 | 4.413 | E |
| Bicycle LOS | E | 50.00 |  |

Sequence

| Ring 1 | - | - | 4 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



Vistro File: D:I....Network 20181221.vistro
Report File: D:I... 1162050 PM Peak Build.pdf
Intersection Analysis Summary

| ID | Intersection Name | Control Type | Method | Worst Mvmt | V/C | Delay (s/veh) | LOS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | Great River Road \& South <br> Access | Signalized | HCM 6th <br> Edition | SB Thru | 0.700 | 23.6 | C |
| 2 | Lost Grove Road \& North <br> Access | Signalized | HCM 6th <br> Edition | NB Left | 0.646 | 19.9 | B |

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 23.6 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6th Edition | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.700 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $7$ |  | $\stackrel{F}{2}$ |  | 75 |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 360 | 298 | 0 | 1 | 3 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 160 | 0 | 0 | 18 | 97 | 868 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 5 | 0 | 261 |
| Total Hourly Volume [veh/h] | 161 | 378 | 313 | 13 | 98 | 610 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 96 | 80 | 3 | 25 | 156 |
| Total Analysis Volume [veh/h] | 164 | 386 | 319 | 13 | 100 | 622 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing in | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin¢ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing rii | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

## Version 5.00-00

Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | - |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | Lead | - |
| Minimum Green [s] | 5 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 9 | 18 | 9 | 0 | 42 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No |  | No |  |
| Maximum Recall | No | No | No |  | No |  |
| Pedestrian Recall | No | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

Lane Group Calculations

| Lane Group | L | C | C | L | R |
| :---: | :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 24 | 24 | 15 | 28 | 28 |
| g / C, Green / Cycle | 0.40 | 0.40 | 0.25 | 0.47 | 0.47 |
| (v/s)_i Volume / Saturation Flow Rate | 0.14 | 0.23 | 0.20 | 0.06 | 0.43 |
| s , saturation flow rate [veh/h] | 1153 | 1683 | 1658 | 1629 | 1454 |
| c, Capacity [veh/h] | 453 | 675 | 416 | 758 | 677 |
| d1, Uniform Delay [s] | 13.30 | 13.96 | 21.04 | 9.13 | 14.98 |
| k, delay calibration | 0.50 | 0.50 | 0.50 | 0.11 | 0.22 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.24 | 3.50 | 14.66 | 0.08 | 10.33 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.36 | 0.57 | 0.80 | 0.13 | 9.92 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 15.54 | 17.46 | 35.70 | 25.31 |  |
| Lane Group LOS | B | B | D | C |  |
| Critical Lane Group | Yes | No | Yes | No |  |
| 50th-Percentile Queue Length [veh] | 1.37 | 3.64 | 5.20 | 0.66 | 8.50 |
| 50th-Percentile Queue Length [ft] | 34.19 | 90.95 | 130.12 | 16.47 | 212.47 |
| 95th-Percentile Queue Length [veh] | 2.46 | 6.55 | 8.95 | 1.19 | 13.28 |
| 95th-Percentile Queue Length [ft] | 61.53 | 163.70 | 223.66 | 29.65 | 331.99 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 15.54 | 17.46 | 35.70 | 35.70 | 9.21 | 25.31 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | B | B | D | D | A | C |
| d_A, Approach Delay [s/veh] | 16.89 |  | 35.70 |  | 23.08 |  |
| Approach LOS | B |  | D |  | C |  |
| d_l, Intersection Delay [s/veh] | 23.57 |  |  |  |  |  |
| Intersection LOS | C |  |  |  |  |  |
| Intersection V/C | 0.700 |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 38.0 | 14.0 | 5.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 4.03 | 17.63 | 25.21 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.897 | 2.572 | 2.743 |
| Crosswalk LOS | C | B | B |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 30.00 |
| I_b,int, Bicycle LOS Score for Intersection | 5.040 | 4.688 | 4.132 |
| Bicycle LOS | F | E | D |

## Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |



## Intersection Level Of Service Report

 Intersection 2: Lost Grove Road \& North Access| Control Type: | Signalized | Delay $(\mathrm{sec} / \mathrm{veh}):$ | 19.9 |
| :---: | :---: | :---: | :---: |
| Analysis Method: | HCM 6 th Edition | Level Of Service: | B |
| Analysis Period: | 15 minutes | Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.646 |

Intersection Setup

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Westbound |  | Southeastbound |  |
| Lane Configuration | $\Gamma$ |  | $T$ |  | $Y$ |  |
| Turning Movement | Left | Right | Left | Thru | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 |  | 30.00 |  | 40.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | North Access |  | Lost Grove Road |  | Lost Grove Road |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 0 | 0 | 38 | 73 | 0 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 869 | 97 | 18 | 0 | 0 | 160 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 29 | 0 | 0 | 0 | 46 |
| Total Hourly Volume [veh/h] | 869 | 68 | 18 | 40 | 77 | 114 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 222 | 17 | 5 | 10 | 20 | 29 |
| Total Analysis Volume [veh/h] | 887 | 69 | 18 | 41 | 79 | 116 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing in | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing rii | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

## Version 5.00-00

Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | - |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | Permissive | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 0 | 0 | 4 | 8 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | - | - |
| Minimum Green [s] | 5 | 0 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 30 | 0 | 0 | 30 | 30 | 0 |
| Amber [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 51 | 0 | 0 | 9 | 9 | 0 |
| Vehicle Extension [s] | 3.0 | 0.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | No |  |  | No | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 0.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | No |  |  | No | No |  |
| Maximum Recall | No |  |  | No | No |  |
| Pedestrian Recall | No |  |  | No | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Version 5.00-00

## Lane Group Calculations

| Lane Group | C | C | C |
| :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 2.00 | 0.00 |
| 12, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 34 | 18 | 18 |
| $\mathrm{g} / \mathrm{C}$, Green / Cycle | 0.57 | 0.30 | 0.30 |
| (v / s)_i Volume / Saturation Flow Rate | 0.53 | 0.05 | 0.11 |
| s , saturation flow rate [veh/h] | 1794 | 1205 | 1719 |
| c, Capacity [veh/h] | 1026 | 433 | 507 |
| d1, Uniform Delay [s] | 11.77 | 15.64 | 16.83 |
| k, delay calibration | 0.23 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.53 | 0.65 | 2.20 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 |
| Lane Group Results |  |  |  |
| X, volume / capacity | 0.93 | 0.14 | 0.38 |
| d, Delay for Lane Group [s/veh] | 20.30 | 16.30 | 19.04 |
| Lane Group LOS | C | B | B |
| Critical Lane Group | Yes | No | Yes |
| 50th-Percentile Queue Length [veh] | 11.14 | 0.62 | 2.16 |
| 50th-Percentile Queue Length [ft] | 278.62 | 15.46 | 54.00 |
| 95th-Percentile Queue Length [veh] | 16.62 | 1.11 | 3.89 |
| 95th-Percentile Queue Length [ft] | 415.49 | 27.82 | 97.20 |

Version 5.00-00
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 20.30 | 20.30 | 16.30 | 16.30 | 19.04 | 19.04 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | C | C | B | B | B | B |
| d_A, Approach Delay [s/veh] | 20.30 |  | 16.30 | 19.04 |  |  |
| Approach LOS | C | B | B |  |  |  |
| d_I, Intersection Delay [s/veh] | 19.90 |  |  |  |  |  |
| Intersection LOS | 0.646 |  |  |  |  |  |
| Intersection V/C |  |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 5.0 | 47.0 | 5.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 25.21 | 1.41 | 25.21 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.336 | 1.701 | 3.789 |
| Crosswalk LOS | B | A | D |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 30.00 |
| I_b,int, Bicycle LOS Score for Intersection | 5.758 | 4.230 | 4.530 |
| Bicycle LOS | F | D | E |

## Sequence



## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South AccessControl Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6 th Edition
15 minutes

| Delay (sec / veh): | 22.2 |
| :---: | :---: |
| Level Of Service: | C |
| Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.658 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $71$ |  | $\\| \Gamma$ |  | 75 |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 0 | 177 | 330 | 3 | 1 | 1 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 7.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 986 | 0 | 0 | 110 | 10 | 85 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 34 | 0 | 26 |
| Total Hourly Volume [veh/h] | 986 | 186 | 347 | 79 | 11 | 60 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 252 | 47 | 89 | 20 | 3 | 15 |
| Total Analysis Volume [veh/h] | 1006 | 190 | 354 | 81 | 11 | 61 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing p | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $\$$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

2050 AM Peak Build
Version 5.00-00 With Southbound Right-Turn Bay

Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | - |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | Lead | - |
| Minimum Green [s] | 5 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 30 | 51 | 21 | 0 | 9 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No |  | No |  |
| Maximum Recall | No | No | No |  | No |  |
| Pedestrian Recall | No | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Generated with PTV VISTRO

2050 AM Peak Build
Version 5.00-00
With Southbound Right-Turn Bay

## Lane Group Calculations

| Lane Group | L | C | C | R | L | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 60 | 60 | 60 | 60 | 60 | 60 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 48 | 48 | 18 | 18 | 4 | 4 |
| $\mathrm{g} / \mathrm{C}$, Green / Cycle | 0.81 | 0.81 | 0.31 | 0.31 | 0.06 | 0.06 |
| (v / s)_i Volume / Saturation Flow Rate | 0.75 | 0.12 | 0.21 | 0.06 | 0.01 | 0.04 |
| s , saturation flow rate [veh/h] | 1339 | 1615 | 1696 | 1454 | 1629 | 1454 |
| c, Capacity [veh/h] | 1074 | 1301 | 518 | 444 | 100 | 89 |
| d1, Uniform Delay [s] | 8.59 | 1.29 | 18.30 | 15.33 | 26.61 | 27.59 |
| k, delay calibration | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.11 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 15.96 | 0.24 | 7.15 | 0.90 | 0.48 | 8.88 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.94 | 0.15 | 0.68 | 0.18 | 0.11 | 0.68 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 24.54 | 1.53 | 25.44 | 16.24 | 27.09 | 36.46 |
| Lane Group LOS | C | A | C | B | C | D |
| Critical Lane Group | Yes | No | Yes | No | No | Yes |
| 50th-Percentile Queue Length [veh] | 4.76 | 0.09 | 4.40 | 0.76 | 0.15 | 1.03 |
| 50th-Percentile Queue Length [ft] | 118.97 | 2.14 | 109.93 | 18.94 | 3.87 | 25.85 |
| 95th-Percentile Queue Length [veh] | 8.34 | 0.15 | 7.84 | 1.36 | 0.28 | 1.86 |
| 95th-Percentile Queue Length [ft] | 208.41 | 3.85 | 195.91 | 34.08 | 6.97 | 46.53 |

Version 5.00-00
With Southbound Right-Turn Bay
Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 24.54 | 1.53 | 25.44 | 16.24 | 27.09 | 36.46 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | C | A | C | B | C |  |
| d_A, Approach Delay [s/veh] | 20.89 | 23.73 | D |  |  |  |
| Approach LOS | C | C |  |  |  |  |
| d_I, Intersection Delay [s/veh] | 22.21 | C |  |  |  |  |
| Intersection LOS | 0.658 |  |  |  |  |  |
| Intersection V/C |  |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 5.0 | 47.0 | 17.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 25.21 | 1.41 | 15.41 |
| I_p,int, Pedestrian LOS Score for Intersectiqn | 2.902 | 2.274 | 2.827 |
| Crosswalk LOS | C | B |  |
| s_b, Saturation Flow Rate of the bicycle lanф | 2000 | 2000 | C |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 2000 |
| d_b, Bicycle Delay [s] | 30.00 | 30.00 | 0 |
| I_b,int, Bicycle LOS Score for Intersection | 6.106 | 4.906 | 30.00 |
| Bicycle LOS | F | E |  |

## Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |


| SG: 2 51s |  | SG: 3 9s |
| :---: | :---: | :---: |
| SG: 5 30s | SG: 6 21s |  |

## Intersection Level Of Service Report

 Intersection 1: Great River Road \& South AccessControl Type:
Analysis Method:
Analysis Period:

Signalized
HCM 6th Edition
15 minutes

| Delay (sec / veh): | 23.2 |
| :---: | :---: |
| Level Of Service: | C |
| Volume to Capacity $(\mathrm{v} / \mathrm{c}):$ | 0.687 |

Intersection Setup

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Approach | Northbound |  | Southbound |  | Eastbound |  |
| Lane Configuration | $71$ |  | $\\| \Gamma$ |  | $7 \Gamma$ |  |
| Turning Movement | Left | Thru | Thru | Right | Left | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 55.00 |  | 55.00 |  | 30.00 |  |
| Grade [\%] | 0.00 |  | 0.00 |  | 0.00 |  |
| Curb Present | No |  | No |  | No |  |
| Crosswalk | Yes |  | Yes |  | Yes |  |

## Volumes

| Name | Great River Road |  | Great River Road |  | South Access |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Base Volume Input [veh/h] | 1 | 360 | 298 | 0 | 1 | 3 |
| Base Volume Adjustment Factor | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 | 1.0511 |
| Heavy Vehicles Percentage [\%] | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 160 | 0 | 0 | 18 | 97 | 868 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 5 | 0 | 261 |
| Total Hourly Volume [veh/h] | 161 | 378 | 313 | 13 | 98 | 610 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 41 | 96 | 80 | 3 | 25 | 156 |
| Total Analysis Volume [veh/h] | 164 | 386 | 319 | 13 | 100 | 622 |
| Presence of On-Street Parking | No | No | No | No | No | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 |
| v_do, Outbound Pedestrian Volume crossing | 0 |  | 0 |  | 0 |  |
| v_di, Inbound Pedestrian Volume crossing m | 0 |  | 0 |  | 0 |  |
| v_co, Outbound Pedestrian Volume crossin $¢$ | 0 |  | 0 |  | 0 |  |
| v_ci, Inbound Pedestrian Volume crossing mi | 0 |  | 0 |  | 0 |  |
| v_ab, Corner Pedestrian Volume [ped/h] | 0 |  | 0 |  | 0 |  |
| Bicycle Volume [bicycles/h] | 0 |  | 0 |  | 0 |  |

2050 PM Peak Build
Version 5.00-00 With Southbound Right-Turn Bay

Intersection Settings

| Located in CBD |  |
| :---: | :---: |
| Signal Coordination Group |  |
| Cycle Length [s] |  |
| Coordination Type | Yes |
| Actuation Type | Time of Day Pattern Coordinated |
| Offset [s] | Semi-actuated |
| Offset Reference | 0.0 |
| Permissive Mode | LeadGreen |
| Lost time [s] | SingleBand |
|  | 0.00 |

## Phasing \& Timing

| Control Type | ProtectedPermissi | Permissive | Permissive | Permissive | Permissive | Permissive |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Signal group | 5 | 2 | 6 | 0 | 3 | 0 |
| Auxiliary Signal Groups |  |  |  |  |  |  |
| Lead / Lag | Lead | - | - | - | Lead | - |
| Minimum Green [s] | 5 | 5 | 5 | 0 | 5 | 0 |
| Maximum Green [s] | 30 | 30 | 30 | 0 | 30 | 0 |
| Amber [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 1.0 | 1.0 | 1.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 9 | 19 | 10 | 0 | 51 | 0 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk |  | No | No |  | No |  |
| 11, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| 12, Clearance Lost Time [s] | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | No | No | No |  | No |  |
| Maximum Recall | No | No | No |  | No |  |
| Pedestrian Recall | No | No | No |  | No |  |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

## Exclusive Pedestrian Phase

| Pedestrian Signal Group |  |
| :---: | :--- |
| Pedestrian Walk [s] |  |
| Pedestrian Clearance [s] | 0 |

## Generated with PTV VISTRO

2050 PM Peak Build
Version 5.00-00
With Southbound Right-Turn Bay

## Lane Group Calculations

| Lane Group | L | C | C | R | L | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| C, Cycle Length [s] | 70 | 70 | 70 | 70 | 70 | 70 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| I1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12, Clearance Lost Time [s] | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 30 | 30 | 21 | 21 | 32 | 32 |
| $\mathrm{g} / \mathrm{C}$, Green / Cycle | 0.42 | 0.42 | 0.30 | 0.30 | 0.46 | 0.46 |
| (v / s)_i Volume / Saturation Flow Rate | 0.15 | 0.23 | 0.19 | 0.01 | 0.06 | 0.43 |
| s , saturation flow rate [veh/h] | 1125 | 1683 | 1669 | 1454 | 1629 | 1454 |
| c, Capacity [veh/h] | 450 | 713 | 493 | 429 | 752 | 671 |
| d1, Uniform Delay [s] | 14.32 | 15.08 | 21.49 | 17.54 | 10.80 | 17.71 |
| k, delay calibration | 0.50 | 0.50 | 0.50 | 0.50 | 0.11 | 0.20 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 2.28 | 2.94 | 6.44 | 0.13 | 0.08 | 10.10 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Lane Group Results

| X, volume / capacity | 0.36 | 0.54 | 0.65 | 0.03 | 0.13 | 0.93 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| d, Delay for Lane Group [s/veh] | 16.60 | 18.01 | 27.93 | 17.67 | 10.88 | 27.81 |
| Lane Group LOS | B | B | C | B | B | C |
| Critical Lane Group | Yes | No | Yes | No | No | Yes |
| 50th-Percentile Queue Length [veh] | 1.59 | 4.18 | 4.70 | 0.14 | 0.82 | 10.13 |
| 50th-Percentile Queue Length [ft] | 39.83 | 104.38 | 117.43 | 3.56 | 20.62 | 253.32 |
| 95th-Percentile Queue Length [veh] | 2.87 | 7.52 | 8.25 | 0.26 | 1.48 | 15.35 |
| 95th-Percentile Queue Length [ft] | 71.70 | 187.89 | 206.28 | 6.41 | 37.12 | 383.83 |

Generated with PTV VISTRO
Version 5.00-00

## 2050 PM Peak Build

With Southbound Right-Turn Bay

Movement, Approach, \& Intersection Results

| d_M, Delay for Movement [s/veh] | 16.60 | 18.01 | 27.93 | 17.67 | 10.88 | 27.81 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Movement LOS | B | B | C | B | B | C |
| d_A, Approach Delay [s/veh] | 17.59 |  | 27.53 | C | C |  |
| Approach LOS | B | 25.47 |  |  |  |  |
| d_I, Intersection Delay [s/veh] | 23.19 |  |  |  |  |  |
| Intersection LOS | 0.687 |  |  |  |  |  |
| Intersection V/C |  |  |  |  |  |  |

## Other Modes

| g_Walk,mi, Effective Walk Time [s] | 47.0 | 15.0 | 6.0 |
| :---: | :---: | :---: | :---: |
| M_corner, Corner Circulation Area [ft²/ped] | 0.00 | 0.00 | 0.00 |
| M_CW, Crosswalk Circulation Area [ft²/ped | 0.00 | 0.00 | 0.00 |
| d_p, Pedestrian Delay [s] | 3.78 | 21.61 | 29.26 |
| I_p,int, Pedestrian LOS Score for Intersection | 2.895 | 2.560 | 2.758 |
| Crosswalk LOS | C | B | C |
| s_b, Saturation Flow Rate of the bicycle lan | 2000 | 2000 | 2000 |
| c_b, Capacity of the bicycle lane [bicycles/h] | 0 | 0 | 0 |
| d_b, Bicycle Delay [s] | 35.00 | 35.00 | 35.00 |
| I_b,int, Bicycle LOS Score for Intersection | 5.040 | 4.688 | 4.132 |
| Bicycle LOS | F | E | D |

Sequence

| Ring 1 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Ring 2 | 5 | 6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




[^0]:    ${ }^{1}$ Volume to Capacity (V/C) ratio is another measurement used to determine LOS. If the V/C ratio is greater than 1.0 LOS is F regardless of delay. An expanded discussion of $\mathrm{v} / \mathrm{c}$ ratios is provided in Appendix 4.

