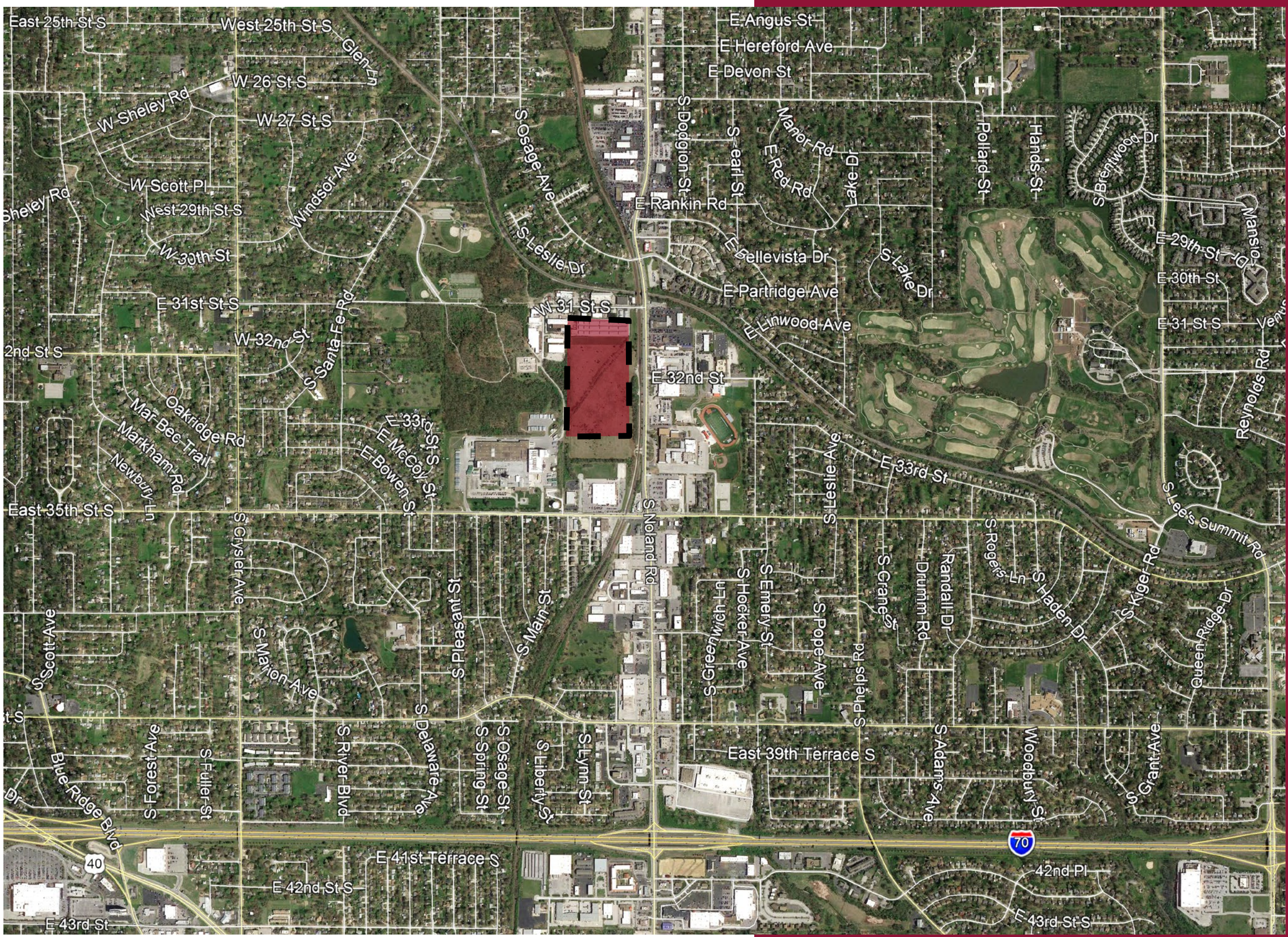
# Cargo Largo Traffic Impact Study

35th Street and Noland Road
Independence, Missouri




Prepared for:

Recovery Management Corporation

Prepared by TranSystems

November 2018

TranSystems
EXPERIENCE | Transportation

**TranSystems**
2400 Pershing Road
Suite 400
Kansas City, MO 64108
Tel 816 329 8600
Fax 816 329 8601
www.transystems.com

November 28, 2018

Mr. Louis D. Pack
Recovery Management Corporation
13900 E. 35th Street
Independence, MO 64055

**RE: Cargo Largo Traffic Impact Study**
**35th Street and Noland Road**
**Independence, Missouri**

Dear Mr. Pack:

In response to your request and authorization, TranSystems has completed a traffic impact study for the proposed Cargo Largo warehouse and retail store to be located generally on the west side of the Noland Road, between 31st Street and 35th Street in Independence, Missouri. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system.

Included in this study is a discussion of the anticipated impact of the proposed development on the adjacent street network and identified improvements to mitigate deficiencies for the following scenarios:

- Existing Conditions
- Existing plus Development Conditions
- Future (Year 2029) Conditions

We trust that the enclosed information proves beneficial to you and the city of Independence in this phase of the development process. We appreciate the opportunity to be of service to you and will be available to review this study at your convenience.

Sincerely,
**TRANSYSTEMS**

By: ______________________ By: ______________________

Jeffrey J. Wilke, PE, PTOE Tobin Bonnell, PE, PTOE

STATE OF MISSOURI
JEFFREY J. WILKE
11-28-18
NUMBER
PE-2007032448
PROFESSIONAL ENGINEER

TTB:JJW/tb/P101180167
Enclosure

## Introduction

TranSystems has completed a traffic impact study for the proposed Cargo Largo warehouse and retail store development to be located generally along the west side of Noland Road, between 31st Street and 35th Street in Independence, Missouri. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system. The location of the development site relative to the major streets in the area is shown on ***Figure A-1*** in ***Appendix A***.

This study also contains a description of the proposed development and the surrounding transportation infrastructure along with trip generation estimates, trip distribution estimates, capacity analyses, and a summary of the findings.

## Proposed Development Plan

The proposed development consists of approximately 463,500 square feet of new warehouse and retail store facility. The proposed facility will replace the existing 75,000 square-foot retail facility, which currently sits just to the south of the proposed site. The proposed warehouse facility includes several truck loading/unloading docks along with parking areas for passenger cars.

Access to the site will be provided via a new access drive that intersects Noland Road approximately 800 feet north of 35th Street, and via connections to Weatherford Road. The new access point on Noland Road is referred to as 33rd Street in this study. As part of the proposed site improvements, Weatherford Road will be extended to connect to the existing Lynn Court, which provides access to 35th Street. Weatherford Road connects to 31st Street, which provides access to Noland Road. A copy of the proposed site plan showing the access points is included on ***Figure A-2*** in ***Appendix A*** for reference.

Cargo Largo has unique operational conditions that are specific to the business. There is a retail store that will have regular business hours for customers. Bid sales are special events held every Thursday from 3:00 P.M. to 8:00 P.M. As many as 800 customers may attend a bid sale over the five hour duration. Customer arrivals and departures are typically spread out over the course of the bid sale, with the peak of the arrivals occurring between 5:00 P.M. and 7:00 P.M.

On Fridays after the bid sales, as many as 375 winning bidders arrive to pick up their merchandise. Pick-up or load-out operations are spread out over the course of the day from 6:30 A.M. to 6:30 P.M. Customers may use cars, light trucks, panel trucks, flatbed trailers, and occasionally semi-trailers for load-out. Most of the trucks used for load-out do not exceed 24 feet in length.

Merchandise is brought into the warehouse on a daily basis by trucks. Delivery trucks are driven by employees and independent operators. The delivery truck route to the site will be via 35th Street and Lynn Court, and Cargo Largo has indicated that they will communicate this truck routing to their drivers.

## Study Area

To assess the impacts of the proposed development, the intersections listed below were identified for study during the A.M. and P.M. peak periods.

- 31st Street and Noland Road
- 33rd Street and Noland Road
- 35th Street and Noland Road
- 35th Street and Lynn Court

### Traffic Counts

Turning-movement traffic volume counts were collected at the existing study intersections on Tuesday September 11, 2018. The counts were collected at each existing intersection from 7:00 to 9:00 A.M. and from 4:00 to 6:00 P.M. In general, the A.M. peak hour occurred from 7:00 A.M. to 8:00 A.M., and the P.M. peak hour occurred from 4:30 to 5:30 P.M. The volume of truck traffic was also collected during the counts for use in analysis. The existing lane configurations, traffic control devices, and peak hour traffic volumes have been illustrated on ***Figures A-3*** through ***A-5***. Traffic counts are shown in ***Appendix B***.

### Surrounding Street Network and Land Uses

The development site is located on primarily undeveloped land. The site is bounded on the east by Union Pacific Railroad, which runs north/south along the west side of Noland Road. To the north, the site is bounded by the existing storage facility that is currently on the south side of 31st Street. The site is bounded on the west by the existing Weatherford Road and existing warehouses that are on the west side of Weatherford Road. To the south, the site is bounded by the existing Cargo Largo retail facility, which sits near the northeast corner of 35th Street and Lynn Court.

Truman High School is located along the east side of Noland Road, across from the development site. The high school is in session from 7:20 A.M. to 2:20 P.M. The school has several driveways onto Noland Road, and other access points have been constructed in recent years. The school has a driveway north to provide access to/from 32nd Street. The school also has two driveways extending south to 35th Street. The developer has had conversations with Independence School District staff, and they do not have any concerns related to the proposed Cargo Largo development or its access to Noland Road.

Noland Road is a major arterial roadway with two lanes in each direction and curbs and gutters along each side. Along the east side of the roadway, there is continuous concrete sidewalk. In the vicinity of the proposed development, the southbound direction has a continuous left-turn lane to allow motorists to access the businesses and institutions along the east side of Noland Road. A northbound left-turn lane is generally not present in the vicinity of the proposed development, but there is a continuous 11-foot-wide painted median that runs adjacent to the southbound left-turn lane. At the signalized intersection of 31st Street, there is a northbound left-turn lane approximately 150 feet long. The posted speed limit on Noland Road is 35 mph adjacent to the proposed development site.

To the west of Noland Road, 35th Street is a minor arterial roadway with one lane in each direction, a two-way left-turn lane, and a posted 35 mph speed limit. To the east of Noland Road, 35th Street is designated as a collector roadway with one lane in each direction and a 25 mph speed limit. Within the vicinity of the proposed development, 35th Street has curb and gutters and sidewalk on both sides of the roadway. Union Pacific Railroad crosses 35th Street approximately 250 feet to the west of the intersection with Noland Road. The traffic signal at 35th Street and Noland Road allows for pre-emption from activation of the gate and signal at this at-grade crossing, and the northbound left-turn movement is halted during times of train passage. Approximately 550 feet west of the Union Pacific Railroad crossing, 35th Street intersects Lynn Court. The south leg of this unsignalized intersection consists of an access drive for a vacant commercial property. The north- and southbound movements from Lynn Court onto 35th Street are stop-controlled, while the east-and westbound approaches are uncontrolled.

There is an existing pavement stub approximately 800 feet north of 35th Street that has an at-grade crossing with Union Pacific Railroad approximately 35 feet west of Noland Road. The at-grade crossing has signals and gates in place. This pavement currently has traffic barriers placed across its width so as to prevent access. This existing pavement will be used as the location for the proposed development's primary customer access to Noland Road and the surrounding roadway network. The proposed site plan on ***Figure A-2*** refers to this proposed access drive as 33rd Street.

Both 31st Street and Weatherford Road are local streets that generally serve existing industrial and warehouse land uses. Both of these roadways include one lane in each direction. Both roadways lack curb and gutter and sidewalk. Union Pacific Railroad crosses 31st Street at-grade approximately 35 feet to the west of the signalized intersection with Noland Road.

Lynn Court is an existing city street that serves as access to the existing Cargo Largo retail site and the Mid-Continent Public Library. Lynn Court has one lane in each direction and a cul-de-sac approximately 450 feet to the north of 35th Street.

## Analysis

The scope of analysis for the assessment of the proposed development's impact on the surrounding transportation system is based in large part on the recommended practices of the Institute of Transportation Engineers (ITE), as outlined in their Traffic Engineering Handbook. ITE is a nationally-recognized organization of transportation professionals with members from both private and public sectors. The analysis of the proposed development's impact included development of trip generation and trip distribution estimates as well as a traffic operations assessment for each study scenario. Each of the analysis methodologies and findings are described in the subsequent sections.

### Trip Generation

Trip generation estimates were prepared using the Institute of Transportation Engineer's Trip Generation, 10th Edition. ***Table 1*** on the following page shows the expected trips to be generated by the proposed development. It is assumed that approximately 20 percent of the development trips consist of truck traffic, as Trip Generation indicates that surveyed sites with warehouse type land uses have encountered as much as 20 percent truck trips.

**Table 1**
**Trip Generation**

| Land Use | Intensity | | ITE Code | Average Weekday | A.M. Peak Hour | | | P.M. Peak Hour | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Total | In | Out | Total | In | Out |
| Warehouse | 485.2 | ksf | 150 | 812 | 84 | 65 | 19 | 87 | 24 | 63 |
| Retail | 73.4 | ksf | 862 | 2,256 | 115 | 66 | 49 | 172 | 85 | 87 |
| | | | ***Total Trips*** | ***3,068*** | ***199*** | ***131*** | ***68*** | ***259*** | ***109*** | ***150*** |

## Trip Distribution

Based on the proposed roadway layout shown with the site plan in ***Figure A-2***, the proposed development will utilize three points of access, 31st Street, 33rd Street, and Lynn Court. The estimated trips generated by the proposed development were distributed onto the surrounding street network based on the trip distributions summarized in ***Table 2***. These distributions are based on the existing travel patterns in the A.M. and P.M. peak hours, knowledge of the proposed land uses, and engineering judgment. The detailed distribution patterns through the study intersections are shown in ***Appendix B***.

**Table 2**
**Trip Distribution**

| Direction To/From | Percentage |
|---|---|
| North on Noland Road | 20% |
| West on 35th Street | 15% |
| South on Noland Road | 50% |
| East on 35th Street | 15% |
| **Total** | **100%** |

## Traffic Operation Assessment

An assessment of traffic operations was made for the scenarios listed below.

- Existing Conditions
- Existing plus Development Conditions
- Future (Year 2029) Conditions

The analyses for each of these scenarios account for the high percentage of truck traffic that is projected to travel through the study intersections on a daily basis by accounting for the volume of trucks in the capacity analysis. The analysis assumes that 20 percent of the trip generation for the proposed development is truck traffic.

The study intersections were evaluated using the Synchro traffic analysis software package. Calculations were performed based on the methodologies outlined in the Highway Capacity Manual (HCM), 2000 Edition, which is published by the Transportation Research Board. The operating conditions at an intersection are graded by the "level of service" experienced by drivers. Level of service (LOS) describes the quality of traffic operating conditions and is rated from "A" to "F". LOS A represents the least congested condition with free-flow movement of traffic and minimal delays. LOS F generally indicates severely congested conditions with excessive delays to motorists. Intermediate grades of B, C, D, and E reflect incremental increases in the average delay per stopped vehicle. Delay is measured in seconds per vehicle. ***Table 3*** shows the upper limit of delay associated with each level of service for signalized and unsignalized intersections.

**Table 3**
**Intersection Level of Service Delay Thresholds**

| Level of Service (LOS) | Signalized | Unsignalized |
|---|---|---|
| A | ≤ 10 Seconds | ≤ 10 Seconds |
| B | ≤ 20 Seconds | ≤ 15 Seconds |
| C | ≤ 35 Seconds | ≤ 25 Seconds |
| D | ≤ 55 Seconds | ≤ 35 Seconds |
| E | ≤ 80 Seconds | ≤ 50 Seconds |
| F | > 80 Seconds | > 50 Seconds |

While LOS measurements apply to both signalized and unsignalized intersections, there are significant differences between how these intersections operate and how they are evaluated. LOS for signalized intersections reflects the operation of the intersection as a whole.

Unsignalized intersections, in contrast, are evaluated based on the movement groupings which are required to yield to other traffic. Typically, these are the left turns off of the major street and the side-street approaches for two-way stop-controlled intersections. At unsignalized intersections lower LOS ratings (D, E and F) do not, in themselves, indicate the need for additional improvements. Many times there are convenient alternative routes to avoid the longer delays. Other times the volumes on the unsignalized approaches are relatively minor when compared to the major street traffic, and improvements such as traffic signal installation may increase the average delay to all users of the intersection.

The decision to install a traffic signal, which is often considered when lower LOS ratings are projected, should be based on engineering studies and the warrants for traffic signal installation as outlined in the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD). Signals are typically not recommended in locations where there are convenient alternative paths, or if the installation of a traffic signal would have negative impacts on the surrounding transportation system.

Traffic queues were also evaluated as part of the analyses. Long traffic queues which extend beyond the amount of storage available, either between intersections or within turn lanes, can have significant impacts on operations. The projected vehicular queues were analyzed to ensure the analyses are reflective of the physical constraints of the study intersections and to identify if additional storage is needed for turn lanes.

The LOS rating deemed acceptable varies by community, facility type and traffic control device. Most communities in the region have identified LOS D as the minimum desirable goal for signalized intersections. However, at unsignalized intersections LOS D, E, or even F are often considered acceptable for low to moderate traffic volumes where the installation of a traffic signal is not warranted by the conditions at the intersection, or the location has been deemed undesirable for signalization.

## Existing Conditions

The results of the existing conditions intersection analyses are summarized below in ***Table 4***. The study intersections were evaluated with the lane configurations, traffic volumes, and traffic control devices shown on ***Figures A-3*** through ***A-5***. The Synchro output files are included in ***Appendix C***.

**Table 4**
**Intersection Operational Analysis**
**Existing Conditions**

| Intersection / *Movement* | A.M. Peak Hour | | P.M. Peak Hour | |
|---|---|---|---|---|
| | LOS[1] | Delay[2] | LOS[1] | Delay[2] |
| **31st Street and Noland Road** | | | | |
| *Traffic Signal* | *A* | *4.1* | *A* | *4.7* |
| **35th Street and Noland Road** | | | | |
| *Traffic Signal* | *C* | *24.5* | *C* | *30.5* |
| **35th Street and Lynn Court** | | | | |
| *Eastbound Left Turn* | *A* | *7.7* | *A* | *8.1* |
| *Westbound Left Turn* | *A* | *0.0* | *A* | *0.0* |
| *Northbound* | *A* | *0.0* | *C* | *20.3* |
| *Southbound Left Turn* | *A* | *0.0* | *C* | *21.3* |
| *Southbound Through/Right Turn* | *A* | *9.4* | *B* | *10.4* |

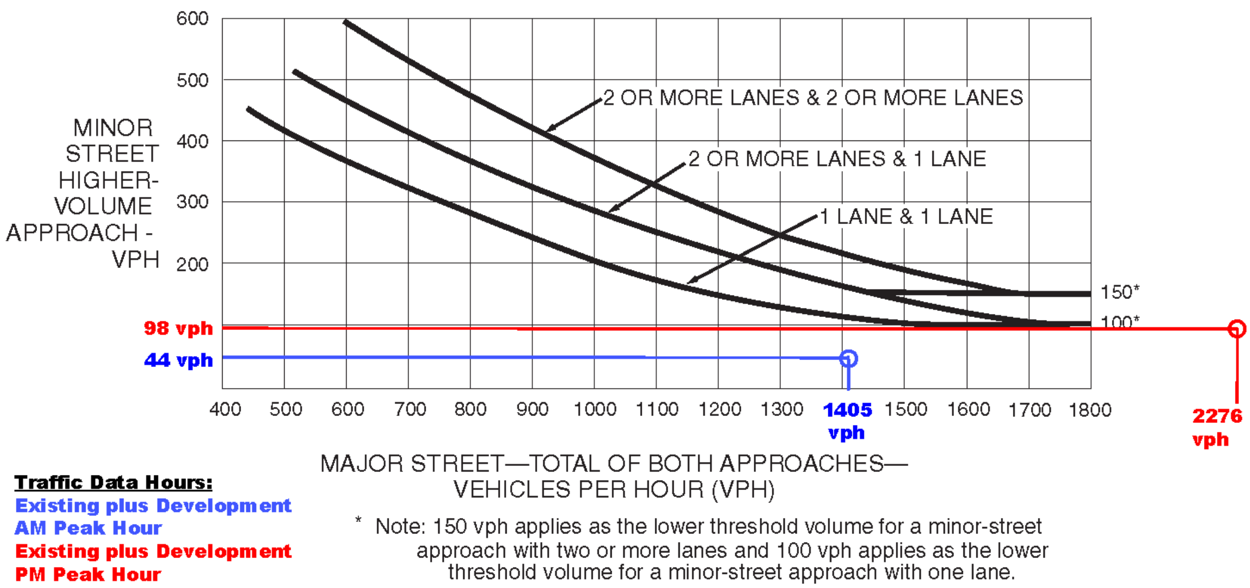
1 – Level of Service
2 – Delay in seconds per vehicle

***Table 4*** shows that all movements at the existing intersections within the study area are operating at acceptable levels of service during the existing peak hours. In addition to levels of service, queue lengths of intersection approaches were reviewed for comparison with existing turn lane lengths. This review found that the existing lane geometry is sufficient to serve existing vehicle queues at the study intersections, with the exception of the eastbound left-turn movement at 35th Street and Noland Road. Traffic models show that the queues in this lane exceed the existing 90-foot length of left-turn lane during the P.M. peak hour. This lane is geometrically constrained by the proximity of the Union Pacific Railroad, and it is understood that operation of the railroad crossing preempts the traffic signal to ensure that clearance sequence time is provided. The addition of another left-turn lane would be challenging due to the existing geometric constraints.

## Existing plus Development Conditions

Given that the proposed development is anticipated to utilize 33rd Street as the primary point of access for customers, review of applicable traffic signal warrants and other access management considerations were evaluated at this location. Based on the traffic volumes anticipated for the peak hours of traffic for the surrounding roadway network, the intersection of 33rd Street and Noland Road was assessed for traffic signal installation. Traffic volumes for the existing plus development scenario were assessed based on procedures outlined in the MUTCD for the Peak Hour Volume Warrant (Warrant 3). ***Figure 1*** below shows the existing plus development traffic volumes plotted relative to the graph from the MUTCD for Warrant 3. The figure shows that with the addition of development-generated traffic, the volumes are projected to be near the threshold for satisfaction of Warrant 3 during the P.M. peak hour scenario.

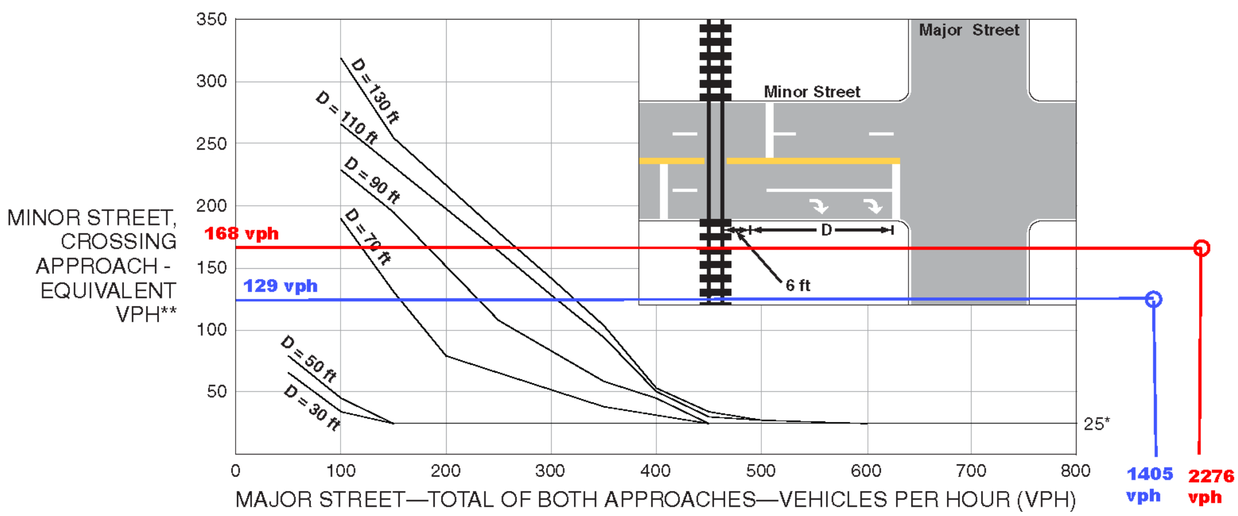
**Figure 1: Warrant 3, Peak Hour**




Another critical factor within the study area that must be considered is Union Pacific Railroad, due to the close proximity to the intersection of 33rd Street and Noland Road. The MUTCD includes the Intersection Near a Grade Crossing Warrant (Warrant 9) for situations such as these. Traffic volumes for the existing plus development scenario were assessed based on procedures outlined in the MUTCD for the Warrant 9. ***Figure 2*** on the following page shows the existing plus development traffic volumes plotted relative to the graph from the MUTCD for Warrant 9. It is important to note that this assessment assumes that trains could use the adjacent railroad at the same time as the peak hour of traffic operations. The figure shows that conversion of the existing pavement stub to a full access intersection would clearly warrant traffic signal installation based on Warrant 9, considering the development-generated traffic volumes and a D distance of approximately 30 feet that currently exists.

Given the results of the analysis, a traffic signal would be warranted for installation at the intersection of 33rd Street and Noland Road with the construction of the proposed development. The MUTCD also recommends that, if Warrant 9 is met, the proposed traffic signal have actuation on the minor street and railroad pre-emption control. It also states that the grade crossing have flashing lights and gates, which exist at the grade crossing today. Furthermore, the MUTCD states that a pre-signal should be considered if an intersection controlled by a traffic signal is located within 50 feet of an at-grade crossing, as is being proposed in this situation. In this case, the pre-signal would be applicable to eastbound traffic, and would display a steady red signal indication during the track clearance portion of the signal pre-emption sequence.

**Figure 2: Warrant 9, Intersection Near a Grade Crossing (Two or More Approach Lanes at the Track Crossing)**




* 25 vph applies as the lower threshold volume
** VPH after applying the adjustment factors in Tables 4C-2, 4C-3, and/or 4C-4, if appropriate

**Traffic Data Hours:**
**Existing plus Development AM Peak Hour**
**Existing plus Development PM Peak Hour**

With the installation of a traffic signal at the intersection of 33rd Street and Noland Road, other turn lanes should be considered. A northbound left-turn lane would be warranted, based on the peak hour traffic volumes and MoDOT access management guidelines. The northbound left-turn lane should have a minimum storage length of 200 feet plus appropriate taper. This turn lane can be provided using the existing pavement that is already striped as a northbound left-turn lane. Additional signing and pavement markings may be needed in the area to instruct queued drivers not to block adjacent driveways and intersections. There is not a warranted need for a southbound right turn lane at this intersection, based on MoDOT access management guidelines. The existing pavement stub that will be converted to be the eastbound approach of this proposed intersection is currently 24 feet wide, which will accommodate two outgoing lanes. The proposed site plan allows for this four-lane section to be extended to the west to a point at which 350 feet of eastbound queue length is provided to the west of the existing railroad crossing gates.

The results of the existing plus development conditions intersection analyses are summarized on the next page in ***Table 5***. This study scenario assessed the street system with the addition of traffic generated by the proposed development, as well as the aforementioned intersection improvements. The study intersections were evaluated with the lane configurations, traffic volumes, and traffic control devices shown on ***Figures A-6*** through ***A-8***. The Synchro output files are included in ***Appendix C***.

**Table 5**
**Intersection Operational Analysis**
**Existing plus Development Conditions**

| Intersection | A.M. Peak Hour | | P.M. Peak Hour | |
|---|---|---|---|---|
| *Movement* | LOS[1] | Delay[2] | LOS[1] | Delay[2] |
| **31st Street and Noland Road** | | | | |
| *Traffic Signal* | A | 4.4 | A | 4.5 |
| **33rd Street (Access Drive) and Noland Road** | | | | |
| *Traffic Signal* | A | 5.0 | A | 5.6 |
| **35th Street and Noland Road** | | | | |
| *Traffic Signal* | C | 24.3 | C | 30.8 |
| **35th Street and Lynn Court** | | | | |
| *Eastbound Left Turn* | A | 8.0 | A | 8.4 |
| *Westbound Left Turn* | A | 0.0 | A | 0.0 |
| *Northbound* | A | 0.0 | C | 22.9 |
| *Southbound Left Turn* | B | 13.3 | D | 26.9 |
| *Southbound Through/Right Turn* | A | 9.7 | B | 11.0 |

1 – Level of Service
2 – Delay in seconds per vehicle

***Table 5*** shows that, with the addition of the traffic generated by the proposed development, all movements at the existing intersections within the study area are anticipated to operate at acceptable levels of service during the peak hours of traffic. Some increases in delay for the southbound movements at the intersection of 35th Street and Lynn Court are notable, but these movements are anticipated to operate at acceptable levels of service.

To accommodate the proposed truck route to the site, improvements are need at the 35th Street and Lynn Court intersection. The corner radius in the northeast corner of the intersection will need to be enlarged to accommodate truck turning movements. While not needed for capacity, it would be beneficial to widen 35th Street to provide a westbound right-turn lane at Lynn Court in conjunction with the intersection improvements. The turn lane would extend roughly 250 feet, to tie into the second westbound lane that currently terminates at an existing driveway.

The queue lengths of intersection approaches were reviewed for comparison with the lengths of existing turn lanes. The only queue that is anticipated to exceed the storage length of turn lanes is the eastbound left-turn movement at the intersection of 35th Street and Noland Road during the P.M. peak hour. This situation also occurs in the existing conditions scenario, and the proposed development is not anticipated to contribute to the traffic volumes for this movement.

## Future Conditions

The results of the future conditions intersection analyses are summarized below in ***Table 6***. This study scenario assessed the study intersections with the addition of traffic generated by the proposed development, as well as assumed background traffic growth on the surrounding roadway network. A one percent annual growth rate was applied to the existing traffic volumes over the planning horizon. Development-generated traffic volumes were included in the future traffic volume projections, but a growth factor was not applied to these trips. The planning horizon was assumed to project to the year 2029, for purposes of this study. The study intersections were evaluated with the lane configurations, traffic volumes, and traffic control devices shown on ***Figures A-9*** through ***A-11***. The Synchro output files are included in ***Appendix C***.

**Table 6**
**Intersection Operational Analysis**
**Future Conditions**

| Intersection | A.M. Peak Hour | | P.M. Peak Hour | |
|---|---|---|---|---|
| *Movement* | LOS[1] | Delay[2] | LOS[1] | Delay[2] |
| **31st Street and Noland Road** | | | | |
| *Traffic Signal* | *A* | *4.6* | *A* | *4.9* |
| **33rd Street (Access Drive) and Noland Road** | | | | |
| *Traffic Signal* | *A* | *4.8* | *A* | *5.3* |
| **35th Street and Noland Road** | | | | |
| *Traffic Signal* | *C* | *25.2* | *C* | *32.6* |
| **35th Street and Lynn Court** | | | | |
| *Eastbound Left Turn* | *A* | *8.0* | *A* | *8.6* |
| *Westbound Left Turn* | *A* | *0.0* | *A* | *0.0* |
| *Northbound* | *A* | *0.0* | *C* | *26.5* |
| *Southbound Left Turn* | *B* | *13.9* | *D* | *33.4* |
| *Southbound Through/Right Turn* | *A* | *9.8* | *B* | *11.3* |

1 – Level of Service
2 – Delay in seconds per vehicle

***Table 6*** shows that, with the addition of the traffic generated by the proposed development, as well as assumed planning horizon traffic growth to/from the surrounding roadway network, all movements at the existing intersections within the study area are anticipated to operate at acceptable levels of service during the peak hours of traffic.

As in the previous scenarios, queue lengths of intersection approaches were reviewed for comparison with the lengths of existing turn lanes. Again, the only queue that is anticipated to exceed the length of turn lanes is the eastbound left-turn movement at the intersection of 35th Street during the P.M. peak hour.

## Summary

TranSystems has completed a traffic impact study for the proposed Cargo Largo warehouse and retail store development to be located generally along the west side of Noland Road, between 31st Street and 35th Street in Independence, Missouri. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system.

In the Existing Conditions scenario, all study intersections were found to operate at an acceptable level of service during the peak hours of traffic on the surrounding roadway network. Queuing for the eastbound left turn movement at the intersection of 35th Street and Noland Road can exceed the length of existing left-turn lane during the P.M. peak hour.

This study was prepared understanding that, upon implementation of the proposed site improvements, the existing pavement stub that sits 800 feet north of the intersection of 35th Street and Noland Road will be modified to be the primary point of access for the site, and will be referred to as 33rd Street. The following improvements are identified to accommodate traffic generated by the proposed development.

*33rd Street and Noland Road*

- Install a fully-actuated traffic signal that is coordinated with the other signals on the Noland Road corridor and provides railroad pre-emption control. Traffic signal infrastructure will include an eastbound pre-signal.
- Provide a northbound left-turn lane with a 200-foot storage length.
- Provide two outbound lanes in the eastbound direction.

*35th Street and Lynn Court*

- Enlarge corner radius in the northeast corner to accommodate truck turning movements.
- Construct a westbound right-turn to extend roughly 250 feet, to tie into the second westbound lane that currently terminates at an existing driveway.

With the addition of traffic from the proposed development and the aforementioned improvements, all movements within the study intersections are projected to operate at an acceptable level of service during the peak hours. Queues for the eastbound left-turn movement are anticipated to continue to exceed the available storage at the intersection of 35th Street and Noland Road, but the proposed development will not add any traffic volume to this movement.

## Appendix A - Figures


Figure A-1

November 2018

No Scale

Cargo Largo
Traffic Impact Study
Independence, Missouri

LOCATION MAP

TranSystems

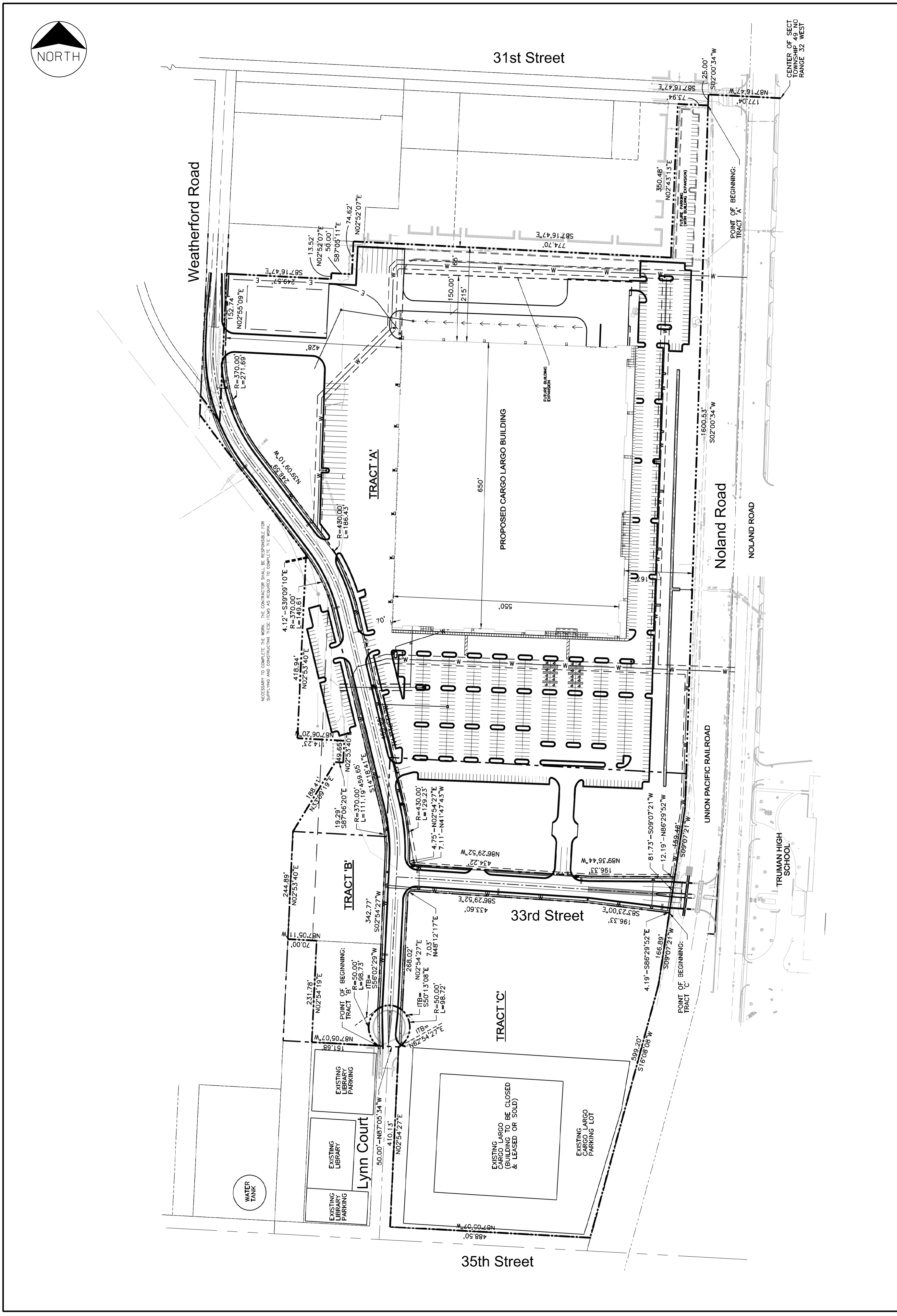



Figure A-2

November 2018

No Scale

Cargo Largo
Traffic Impact Study
Independence, Missouri

SITE PLAN

TranSystems

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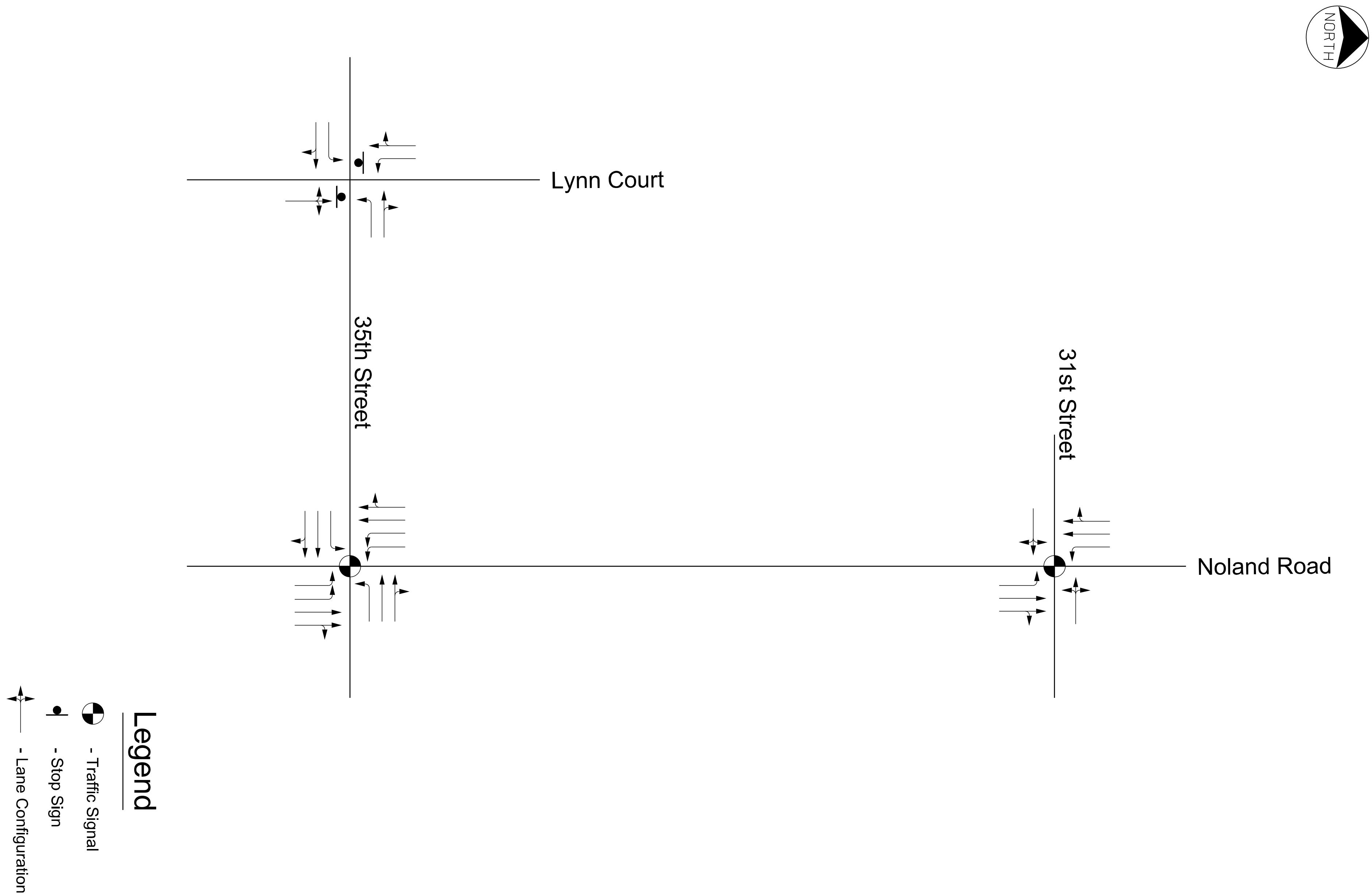


TranSystems

EXISTING LANE CONFIGURATIONS

Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-3

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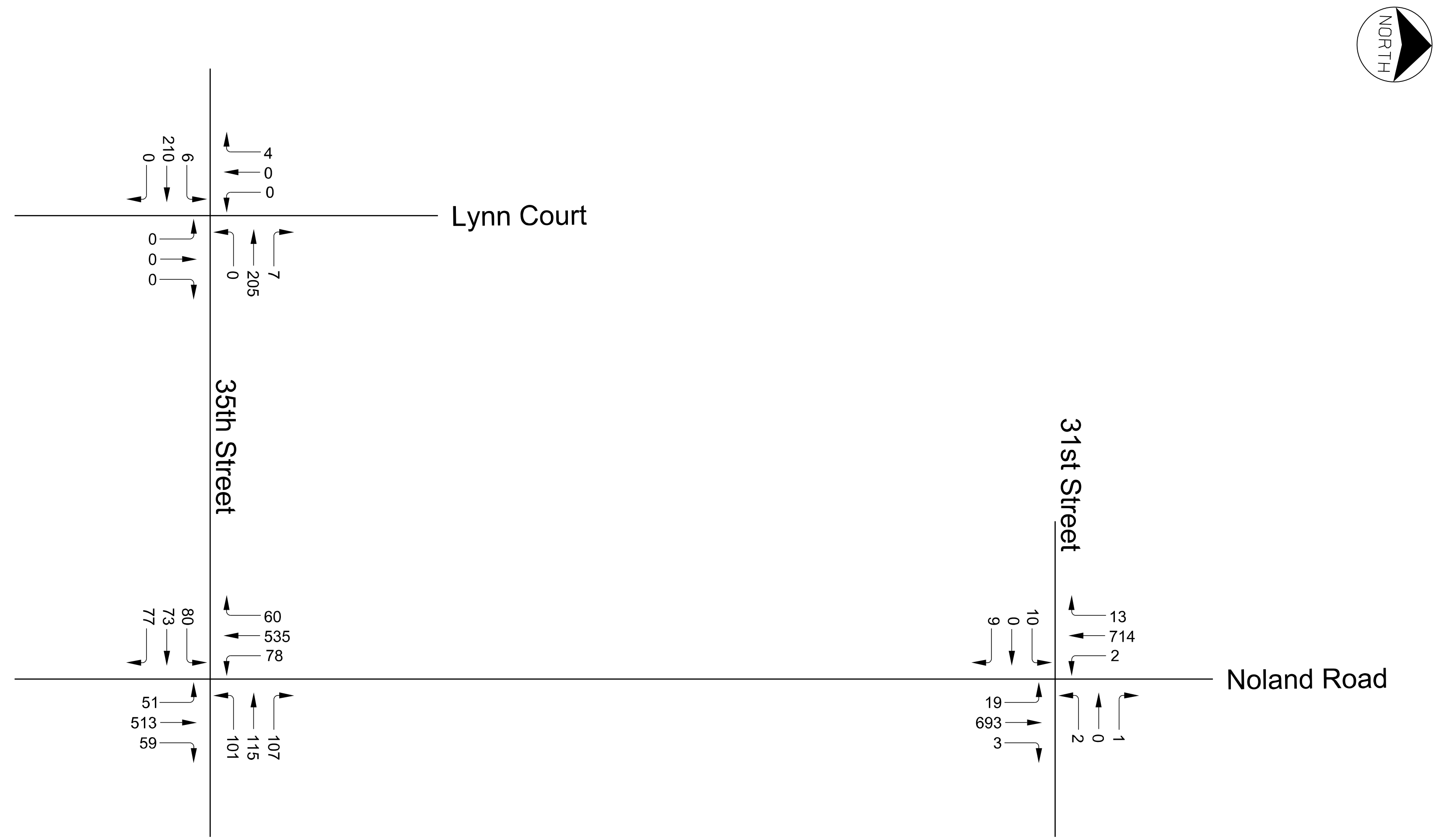


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EXISTING A.M. PEAK HOUR
TRAFFIC VOLUMES

Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-4

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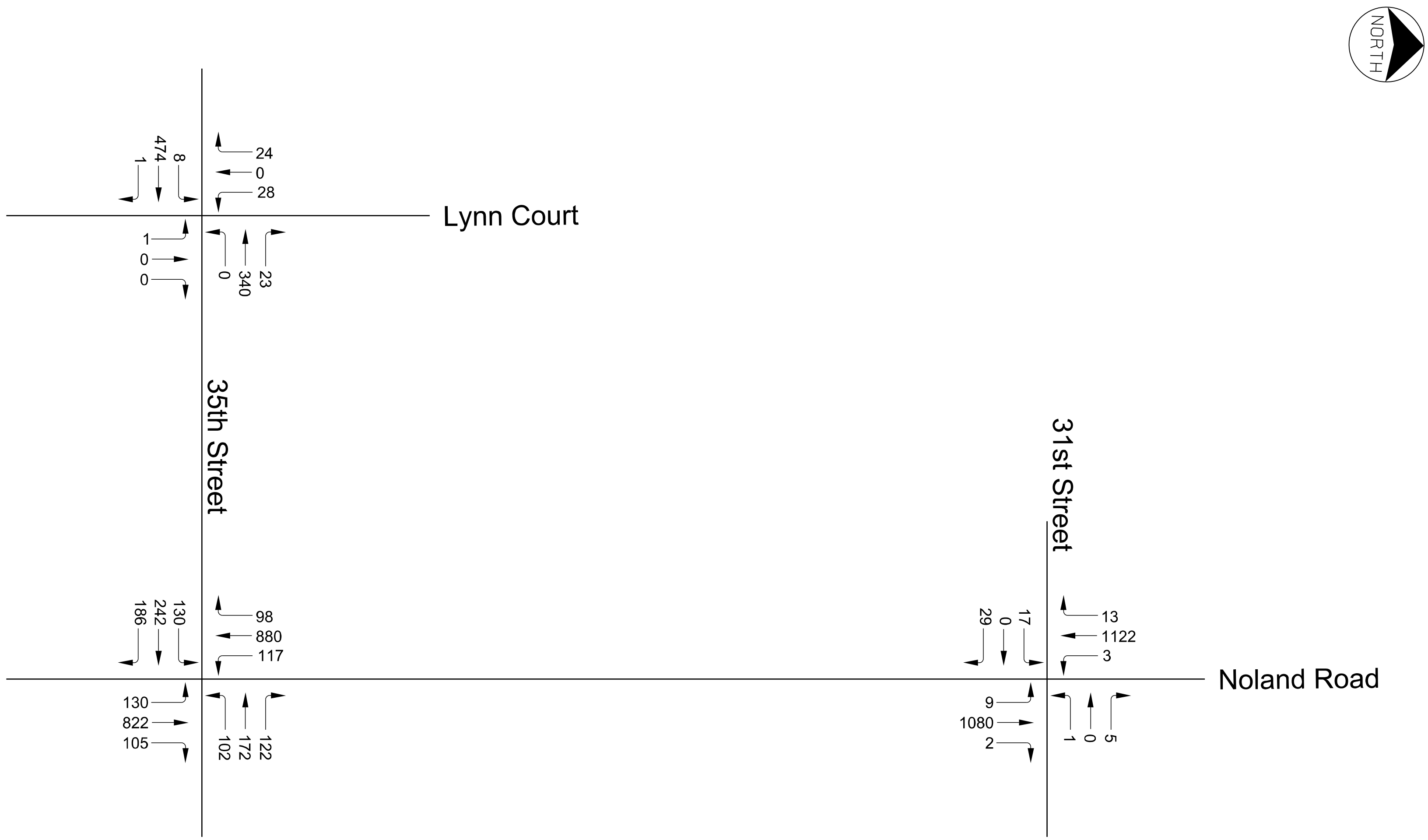
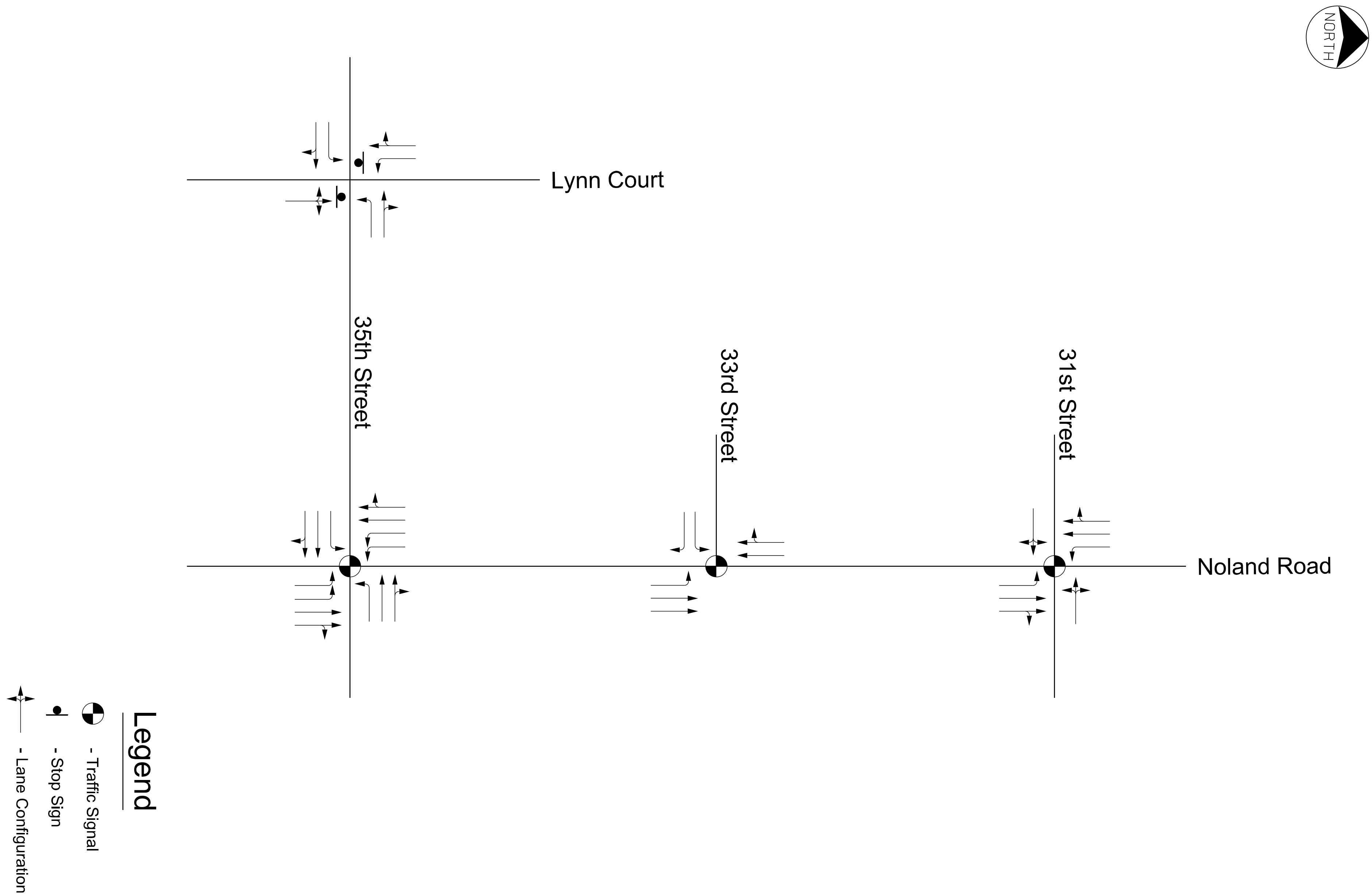



| | | | | |
|---|---|---|---|---|
| TranSystems | EXISTING P.M. PEAK HOUR<br>TRAFFIC VOLUMES | Cargo Largo<br>Traffic Impact Study<br>Independence, Missouri | November 2018<br>No Scale | Figure A-5 |




TranSystems

EXISTING PLUS DEVELOPMENT
LANE CONFIGURATIONS

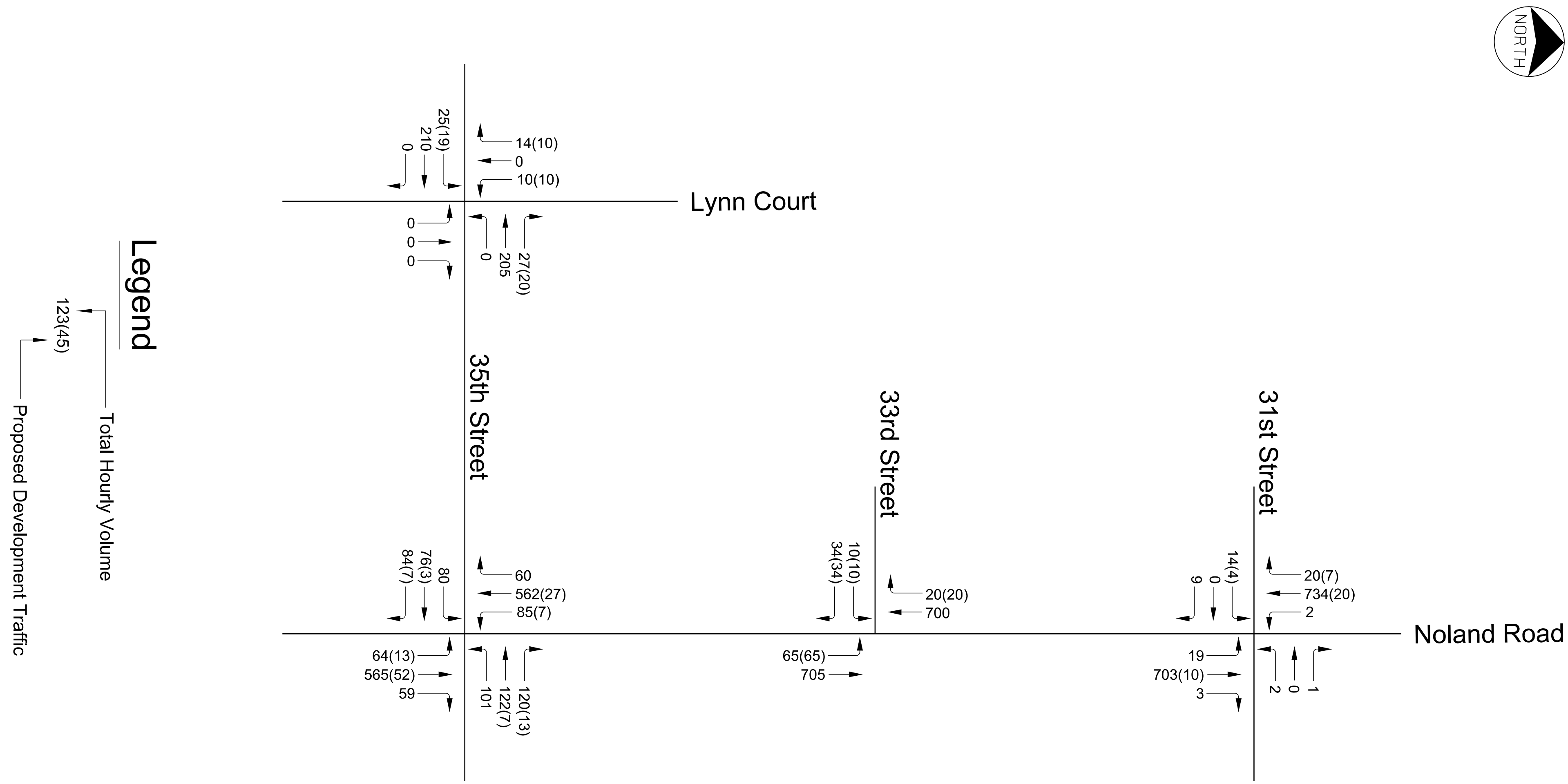
Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-6

pw:\\hq-pwint01.a-e.transyscorp.com:transyscorp-pw1\Documents\Projects_2018\KC101 - Kansas City\P101180167 - Cargo Largo\310.00 - Traffic\310.03 - Studies\figs_V8i_8.5x11




EXISTING PLUS DEVELOPMENT
A.M. PEAK HOUR TRAFFIC VOLUMES

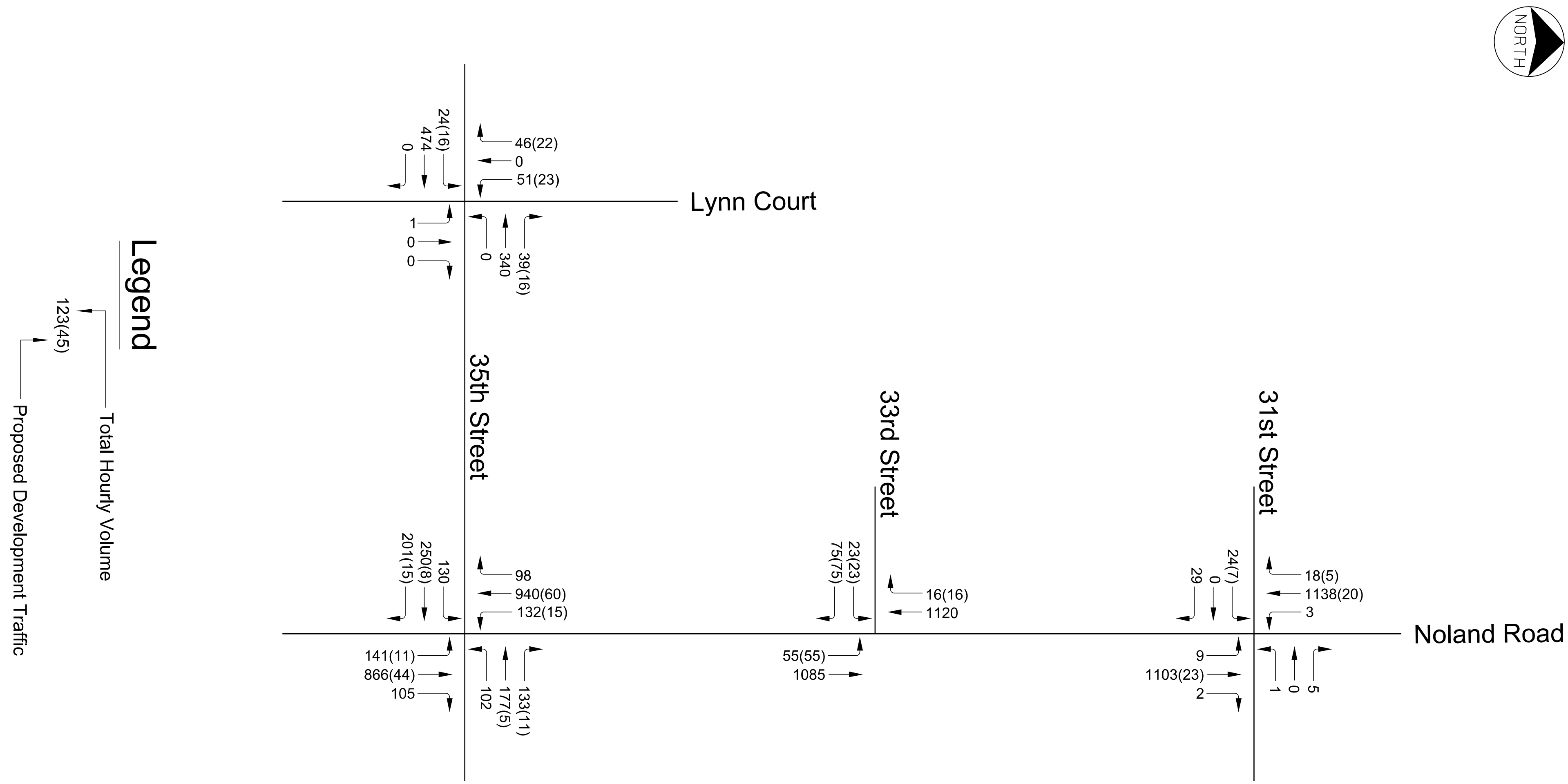
Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-7

TranSystems




TranSystems

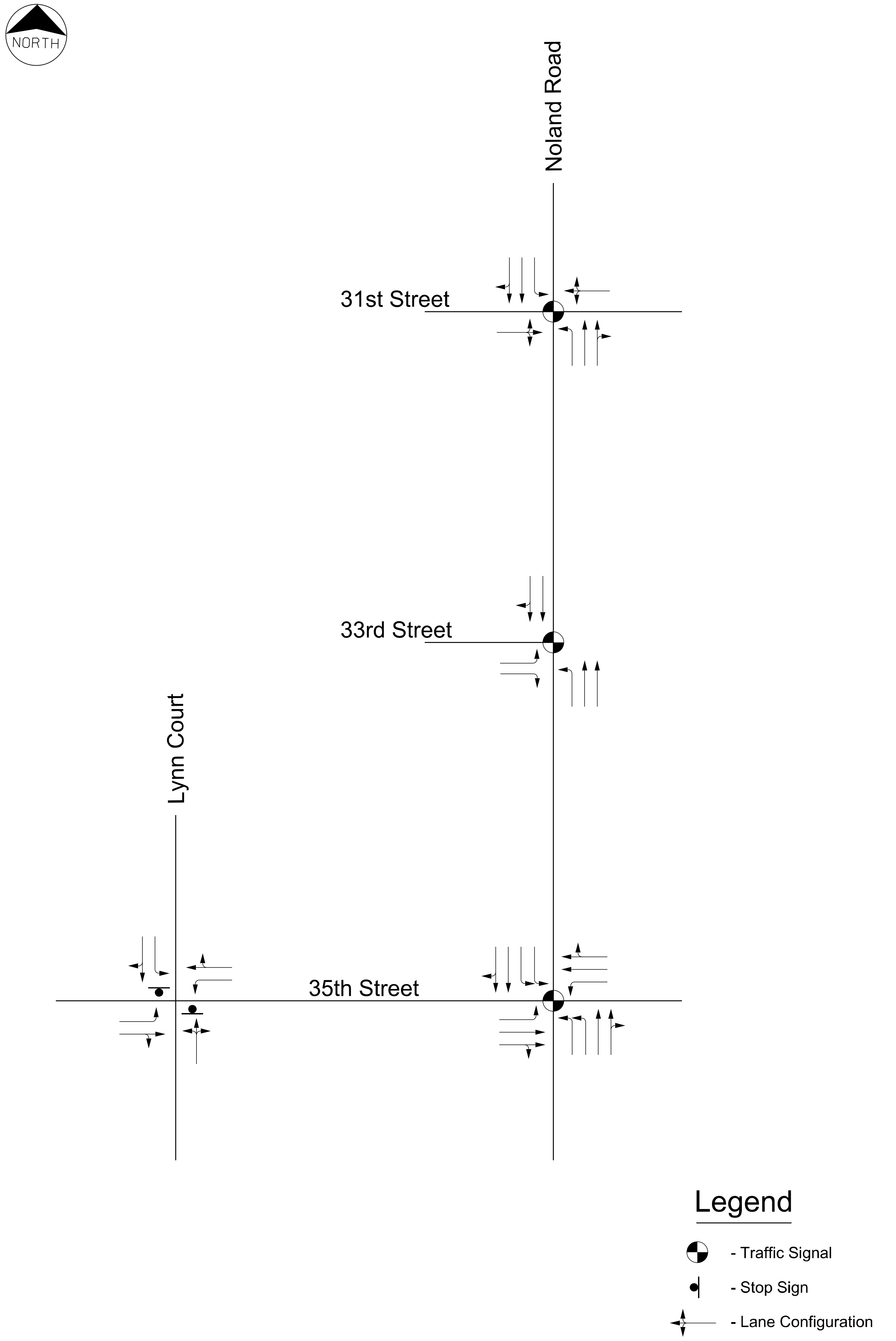
EXISTING PLUS DEVELOPMENT
P.M. PEAK HOUR TRAFFIC VOLUMES

Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-8




# FUTURE LANE CONFIGURATIONS

Cargo Largo
Traffic Impact Study
Independence, Missouri

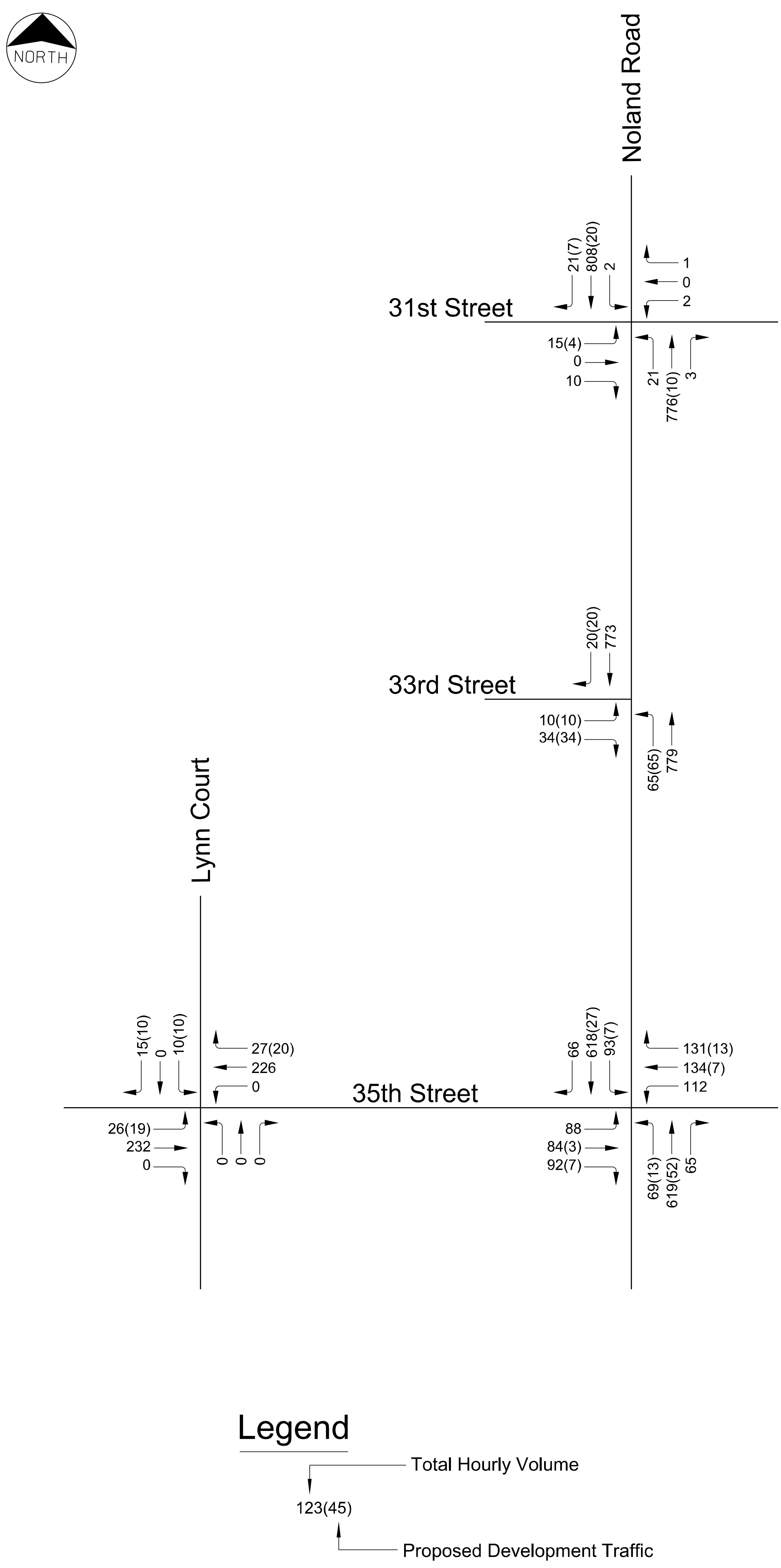
November 2018

No Scale

Figure A-9

TranSystems

pw:\\hq-pwint01.a-e.transyscorp.com:transyscorp-pw1\Documents\Projects_2018\KC101 - Kansas City\P101180167 - Cargo Largo\310.00 - Traffic\310.03 - Studies\figs_V8i_8.5x11



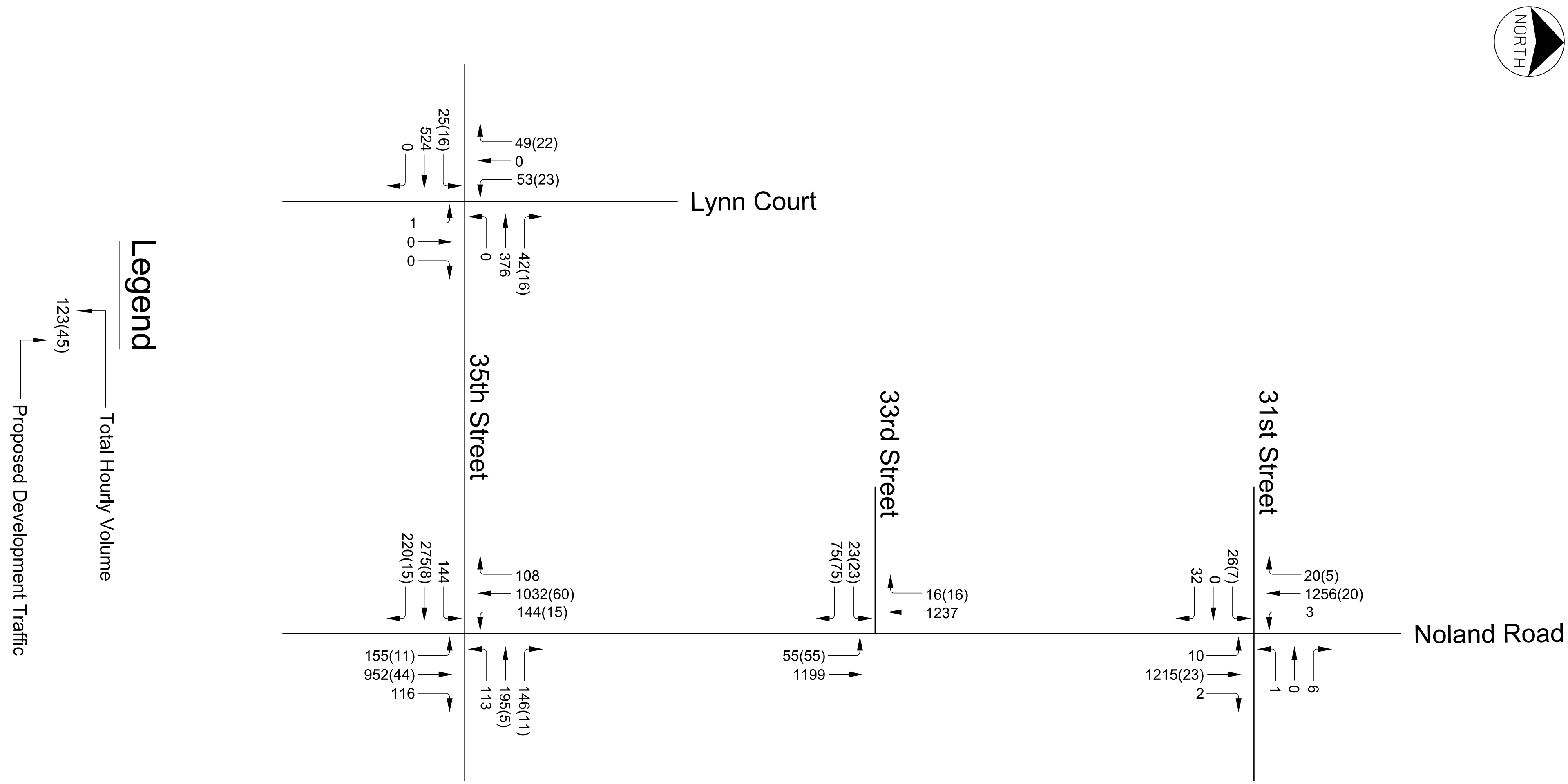

# FUTURE A.M. PEAK HOUR TRAFFIC VOLUMES

Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-10




TranSystems

FUTURE P.M. PEAK HOUR
TRAFFIC VOLUMES

Cargo Largo
Traffic Impact Study
Independence, Missouri

November 2018

No Scale

Figure A-11

## Appendix B – Trip Generation and Distribution

See attached worksheets.

# Cargo Largo Traffic Impact Study
## Independence, Missouri
### Trip Generation - Proposed Development

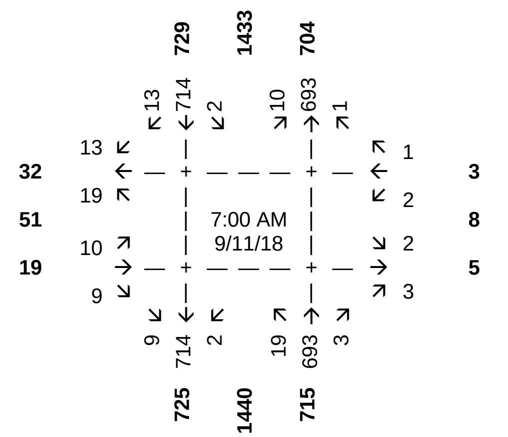
| | | ITE | | A.M. Peak Hour | | | | | P.M. Peak Hour | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Land Use** | **Intensity** | **Code** | **Daily** | **Total** | **% In** | **% Out** | **In** | **Out** | **Total** | **% In** | **% Out** | **In** | **Out** |
| Warehousing | 485.2 ksf | 150 | 812 | 84 | 77% | 23% | 65 | 19 | 87 | 27% | 73% | 24 | 63 |
| Retail | 73.4 ksf | 862 | 2,256 | 115 | 57% | 43% | 66 | 49 | 172 | 49% | 51% | 85 | 87 |
| ***Total Development Trips*** | | | ***3,068*** | ***199*** | | | ***131*** | ***68*** | ***259*** | | | ***109*** | ***150*** |

*Trip generation estimates based on 10th edition; Office space has been grouped under the "Warehousing" land use, as allowed per land use description; Retail land use assessed as "Home Improvement Superstore", based on available similar sample sets*

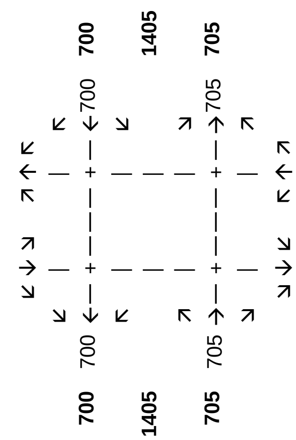
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Existing Traffic Volumes
## A.M. Peak Hour

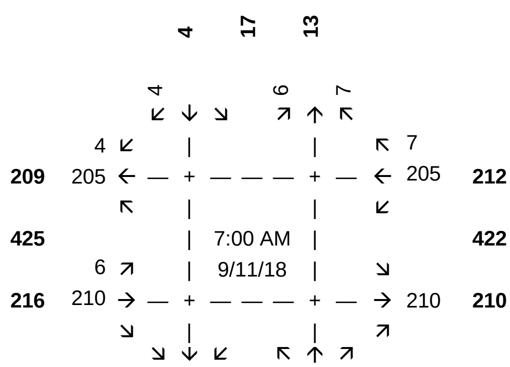
**31st and Noland**



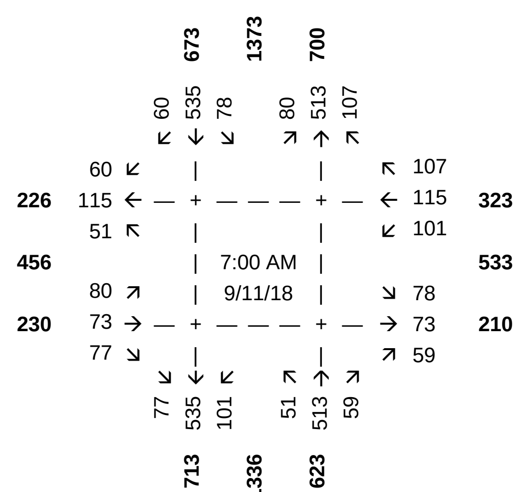

**33rd and Noland**




**35th and Lynn**



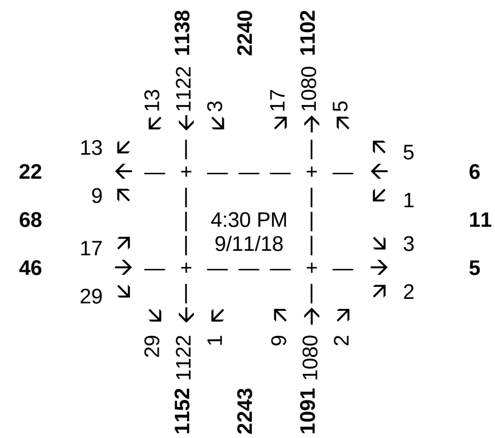

**35th and Noland**



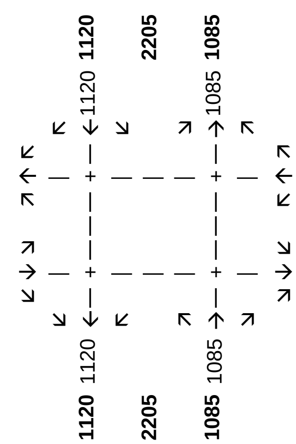
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Existing Traffic Volumes
## P.M. Peak Hour

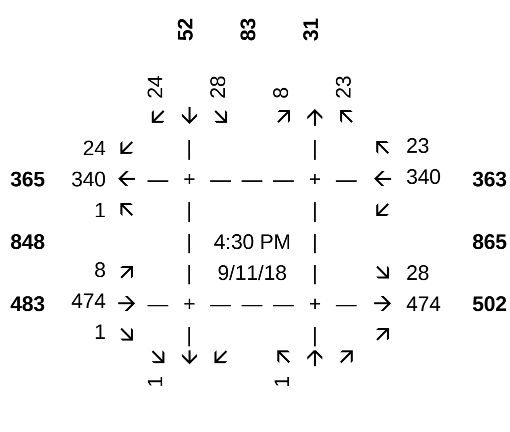
### 31st and Noland



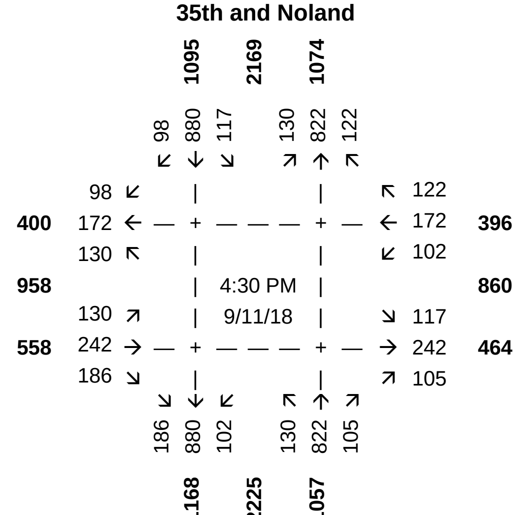

### 33rd and Noland




### 35th and Lynn



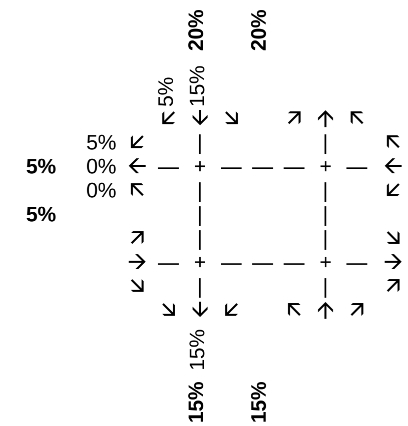

### 35th and Noland



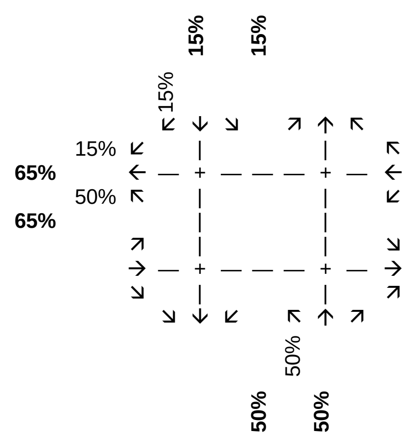
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Trip Distribution
## INBOUND

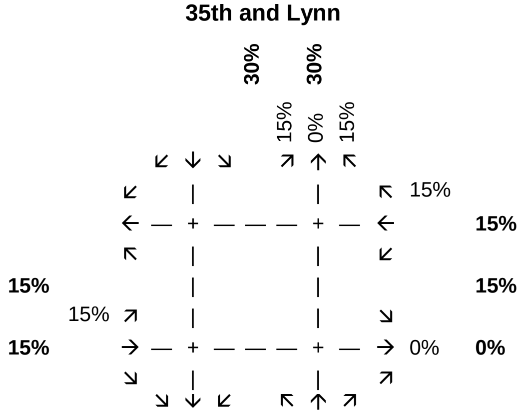
### 31st and Noland



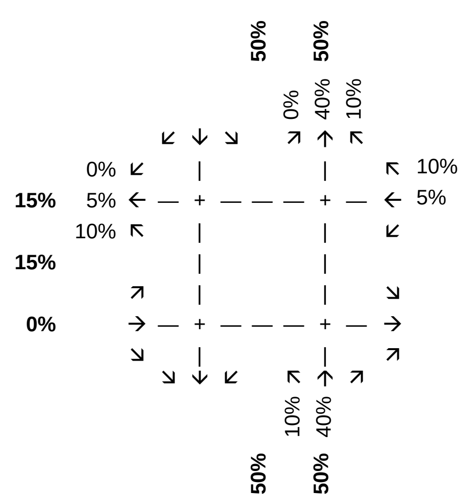

### 33rd and Noland




### 35th and Lynn



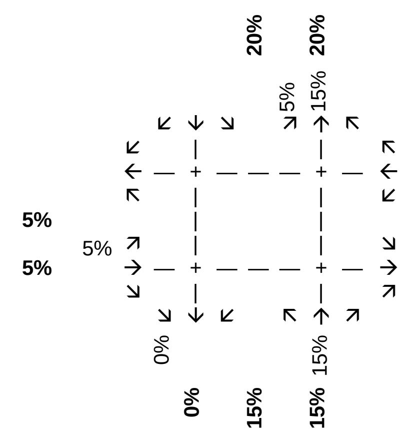

### 35th and Noland



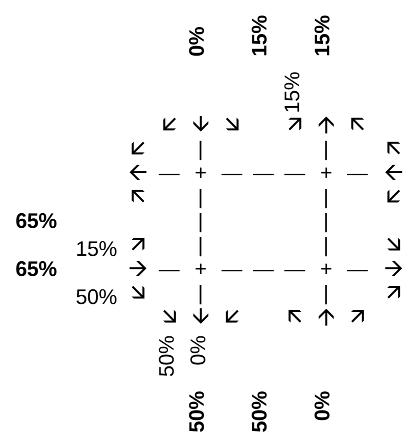
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Trip Distribution
## OUTBOUND

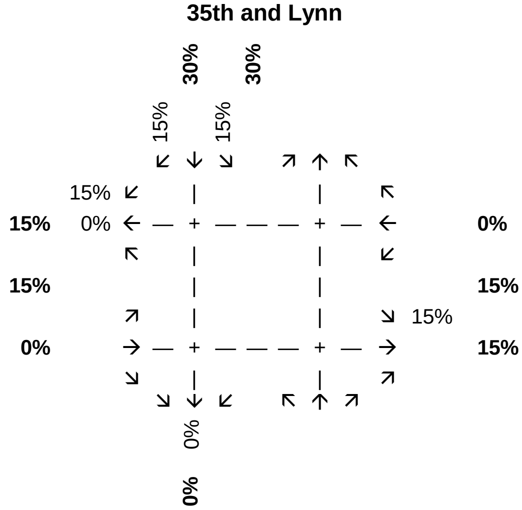
**31st and Noland**



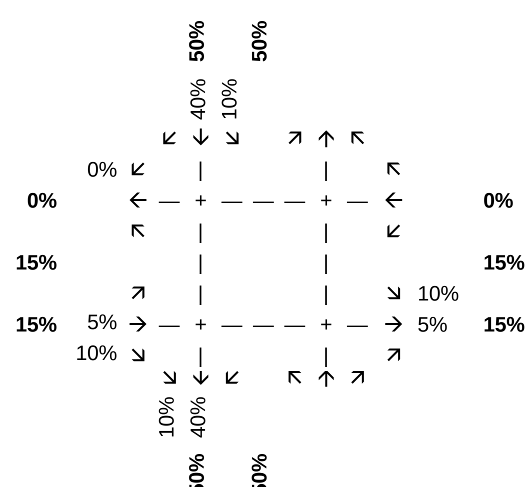

**33rd and Noland**




**35th and Lynn**



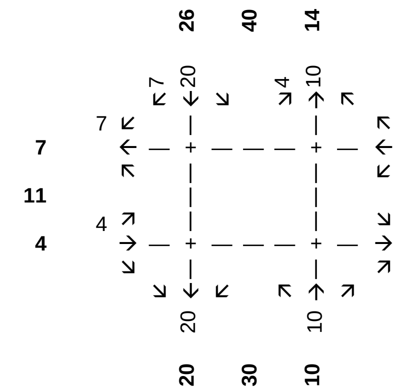

**35th and Noland**



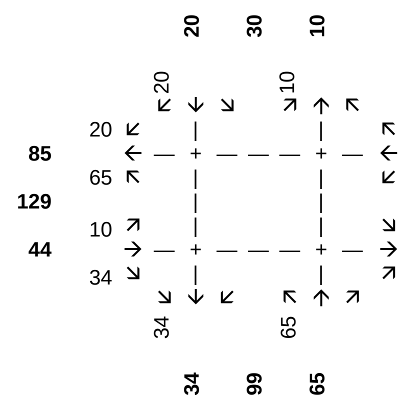
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Development-Generated Traffic Volumes
## A.M. Peak Hour

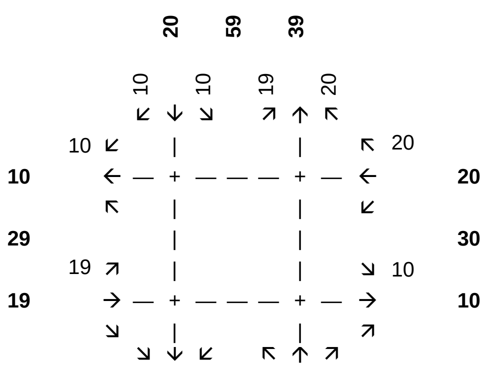
### 31st and Noland



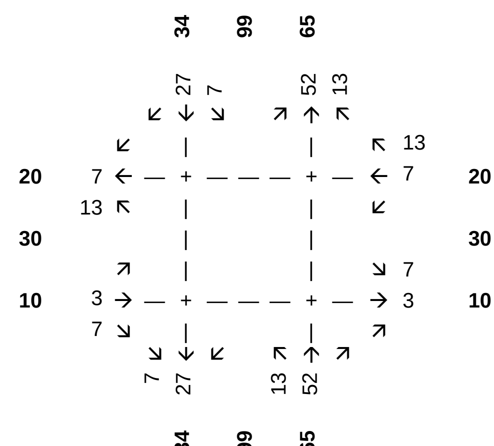

### 33rd and Noland




### 35th and Lynn



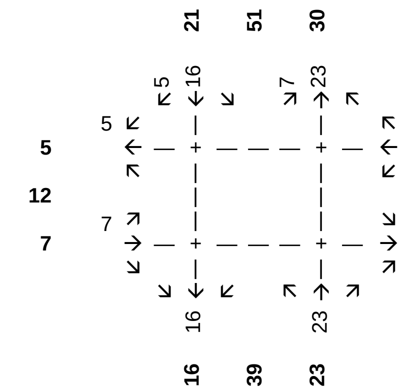

### 35th and Noland



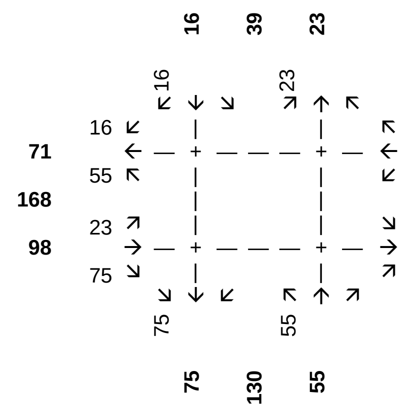
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Development-Generated Traffic Volumes
## P.M. Peak Hour

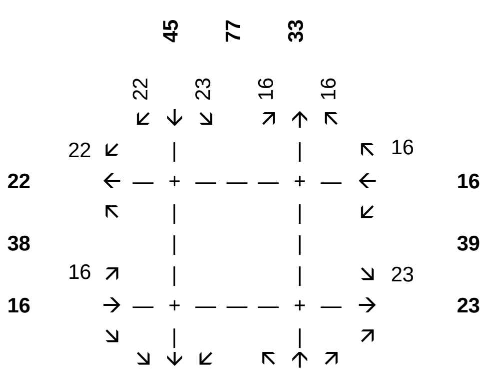
31st and Noland



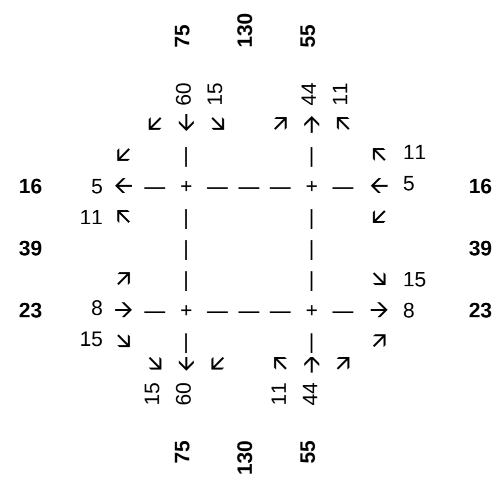

33rd and Noland




35th and Lynn



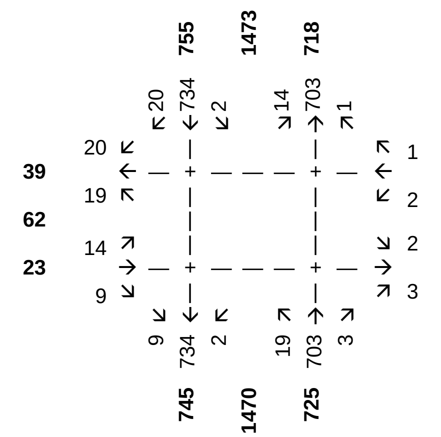

35th and Noland



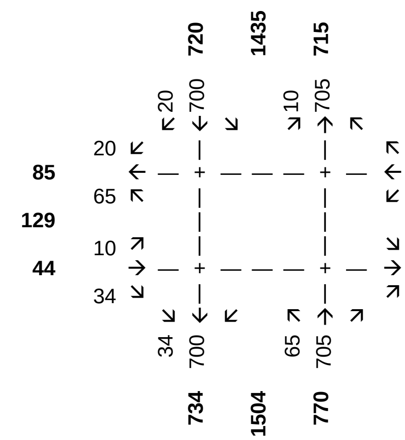
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Existing + Development Traffic Volumes
## A.M. Peak Hour

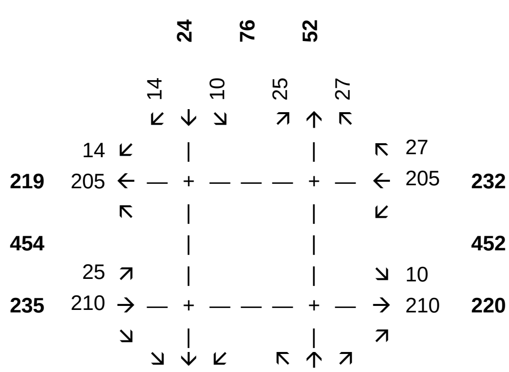
### 31st and Noland



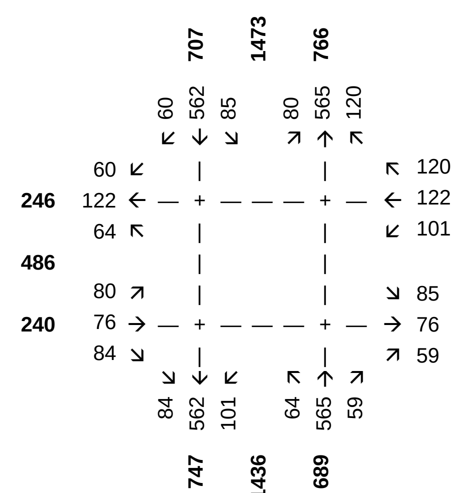

### 33rd and Noland




### 35th and Lynn



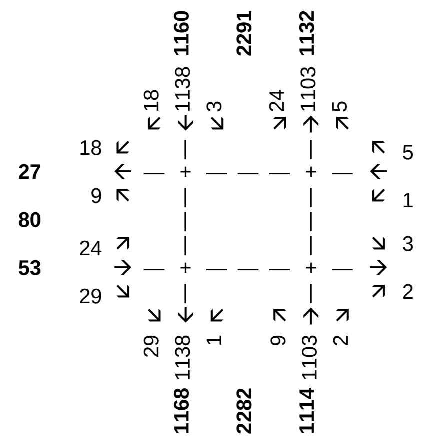

### 35th and Noland



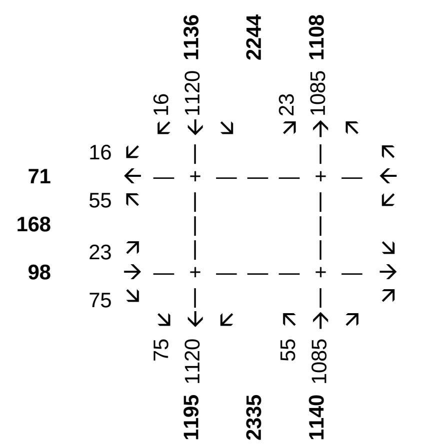
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Existing + Development Traffic Volumes
## P.M. Peak Hour

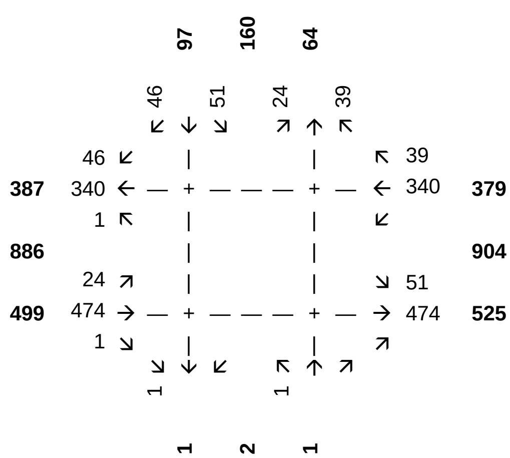
**31st and Noland**



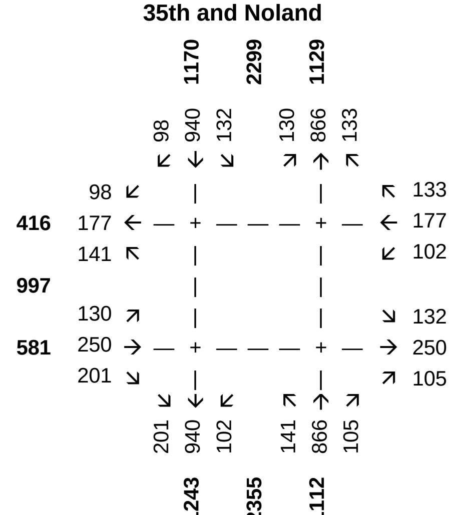

**33rd and Noland**




**35th and Lynn**



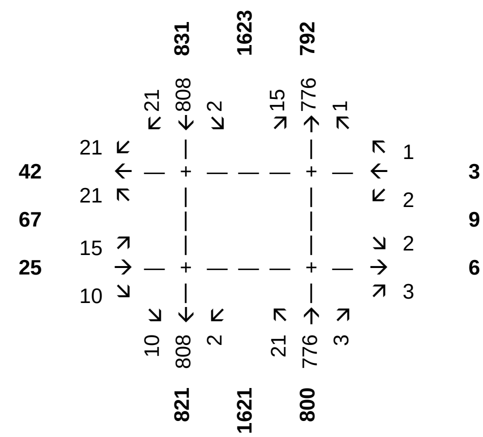

**35th and Noland**



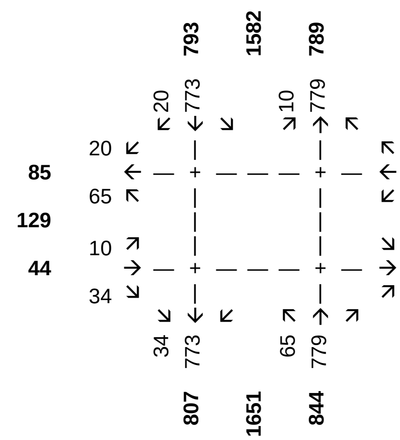
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Future (Year 2029) Traffic Volumes
## A.M. Peak Hour

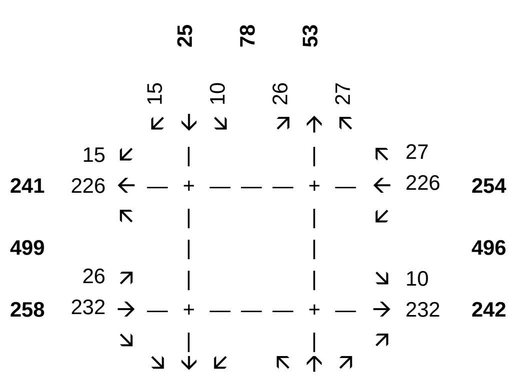
**31st and Noland**



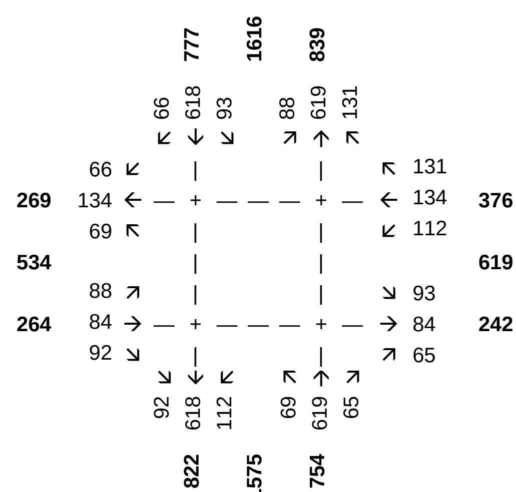

**33rd and Noland**




**35th and Lynn**



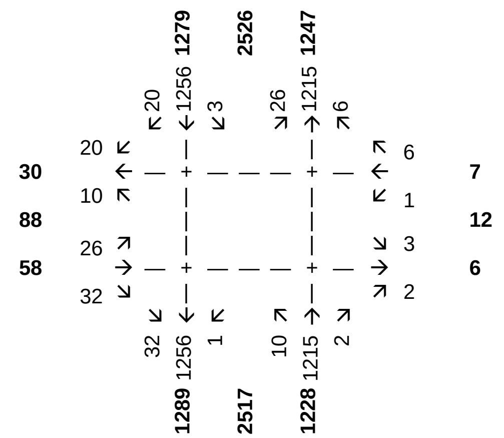

**35th and Noland**



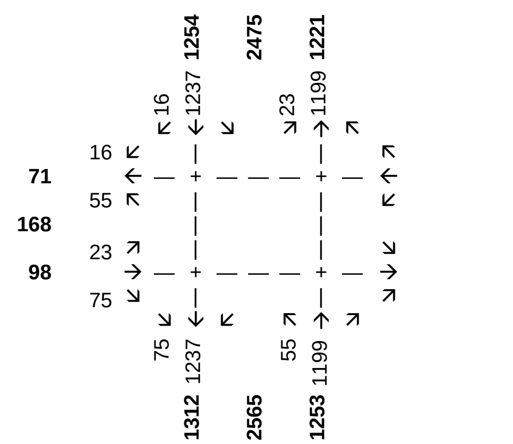
# Cargo Largo Traffic Impact Study
## Independence, Missouri

## Future (Year 2029) Traffic Volumes
## P.M. Peak Hour

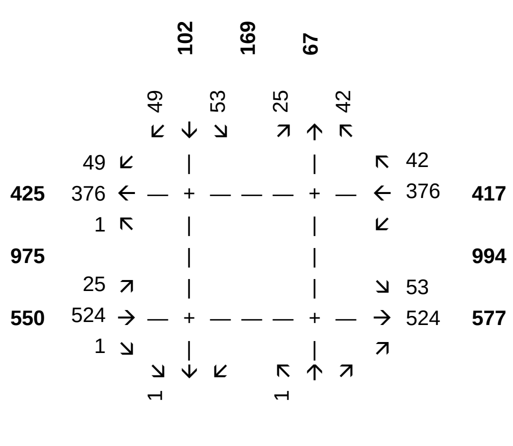
**31st and Noland**



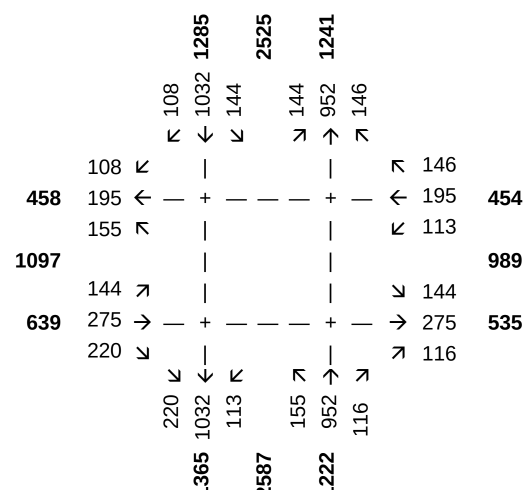

**33rd and Noland**




**35th and Lynn**




**35th and Noland**



# Appendix C – Capacity Analysis Reports

See attached reports.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 80 | 73 | 77 | 101 | 115 | 107 | 51 | 513 | 59 | 78 | 535 | 60 |
| Future Volume (vph) | 80 | 73 | 77 | 101 | 115 | 107 | 51 | 513 | 59 | 78 | 535 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 0.97 | 0.95 | | 0.97 | 0.95 | |
| Frt | 1.00 | 0.92 | | 1.00 | 0.93 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 3266 | | 1770 | 3284 | | 3433 | 3485 | | 3433 | 3486 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 3266 | | 1770 | 3284 | | 3433 | 3485 | | 3433 | 3486 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 87 | 79 | 84 | 110 | 125 | 116 | 55 | 558 | 64 | 85 | 582 | 65 |
| RTOR Reduction (vph) | 0 | 77 | 0 | 0 | 103 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 87 | 86 | 0 | 110 | 138 | 0 | 55 | 617 | 0 | 85 | 642 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Actuated Green, G (s) | 9.4 | 9.3 | | 12.1 | 12.0 | | 6.1 | 63.7 | | 6.9 | 64.5 | |
| Effective Green, g (s) | 9.4 | 9.3 | | 12.1 | 12.0 | | 6.1 | 63.7 | | 6.9 | 64.5 | |
| Actuated g/C Ratio | 0.09 | 0.08 | | 0.11 | 0.11 | | 0.06 | 0.58 | | 0.06 | 0.59 | |
| Clearance Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 151 | 276 | | 194 | 358 | | 190 | 2018 | | 215 | 2044 | |
| v/s Ratio Prot | 0.05 | 0.03 | | c0.06 | c0.04 | | 0.02 | 0.18 | | c0.02 | c0.18 | |
| v/s Ratio Perm | | | | | | | | | | | | |
| v/c Ratio | 0.58 | 0.31 | | 0.57 | 0.38 | | 0.29 | 0.31 | | 0.40 | 0.31 | |
| Uniform Delay, d1 | 48.4 | 47.3 | | 46.5 | 45.6 | | 49.9 | 11.8 | | 49.5 | 11.5 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.93 | 0.73 | |
| Incremental Delay, d2 | 5.2 | 0.6 | | 3.8 | 0.7 | | 0.8 | 0.4 | | 1.2 | 0.4 | |
| Delay (s) | 53.6 | 48.0 | | 50.2 | 46.3 | | 50.7 | 12.2 | | 47.4 | 8.8 | |
| Level of Service | D | D | | D | D | | D | B | | D | A | |
| Approach Delay (s) | | 49.9 | | | 47.5 | | | 15.4 | | | 13.3 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 24.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.37 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 46.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 10 | 0 | 9 | 2 | 0 | 1 | 19 | 693 | 3 | 2 | 714 | 13 |
| Future Volume (vph) | 10 | 0 | 9 | 2 | 0 | 1 | 19 | 693 | 3 | 2 | 714 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.94 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.97 | | | 0.97 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1699 | | | 1722 | | 1770 | 3537 | | 1770 | 3530 | |
| Flt Permitted | | 0.97 | | | 0.97 | | 0.95 | 1.00 | | 0.36 | 1.00 | |
| Satd. Flow (perm) | | 1699 | | | 1722 | | 1770 | 3537 | | 680 | 3530 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 0 | 10 | 2 | 0 | 1 | 21 | 753 | 3 | 2 | 776 | 14 |
| RTOR Reduction (vph) | 0 | 21 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 756 | 0 | 2 | 790 | 0 |
| Turn Type | Split | NA | | Split | NA | | Prot | NA | | Perm | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | | | | | | | | 6 | | |
| Actuated Green, G (s) | | 2.2 | | | 1.1 | | 3.3 | 93.2 | | 85.4 | 85.4 | |
| Effective Green, g (s) | | 2.2 | | | 1.1 | | 3.3 | 93.2 | | 85.4 | 85.4 | |
| Actuated g/C Ratio | | 0.02 | | | 0.01 | | 0.03 | 0.85 | | 0.78 | 0.78 | |
| Clearance Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 33 | | | 17 | | 53 | 2996 | | 527 | 2740 | |
| v/s Ratio Prot | | c0.00 | | | c0.00 | | 0.01 | c0.21 | | | c0.22 | |
| v/s Ratio Perm | | | | | | | | | | 0.00 | | |
| v/c Ratio | | 0.01 | | | 0.00 | | 0.40 | 0.25 | | 0.00 | 0.29 | |
| Uniform Delay, d1 | | 52.8 | | | 53.9 | | 52.4 | 1.6 | | 2.8 | 3.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.03 | 0.70 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.2 | | | 0.0 | | 4.7 | 0.2 | | 0.0 | 0.3 | |
| Delay (s) | | 53.0 | | | 53.9 | | 58.6 | 1.3 | | 2.8 | 3.8 | |
| Level of Service | | D | | | D | | E | A | | A | A | |
| Approach Delay (s) | | 53.0 | | | 53.9 | | | 2.9 | | | 3.8 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.28 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 31.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 6 | 210 | 0 | 0 | 205 | 7 | 0 | 0 | 0 | 0 | 0 | 4 |
| Future Volume (Veh/h) | 6 | 210 | 0 | 0 | 205 | 7 | 0 | 0 | 0 | 0 | 0 | 4 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 7 | 228 | 0 | 0 | 223 | 8 | 0 | 0 | 0 | 0 | 0 | 4 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 866 | | | | | | | |
| pX, platoon unblocked | 0.97 | | | | | | 0.97 | 0.97 | | 0.97 | 0.97 | 0.97 |
| vC, conflicting volume | 231 | | | 228 | | | 469 | 473 | 228 | 469 | 469 | 227 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 198 | | | 228 | | | 442 | 446 | 228 | 442 | 442 | 193 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 100 | 100 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1340 | | | 1340 | | | 508 | 492 | 811 | 510 | 494 | 826 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 7 | 228 | 0 | 231 | 0 | 0 | 4 |
| Volume Left | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 | 8 | 0 | 0 | 4 |
| cSH | 1340 | 1700 | 1700 | 1700 | 1700 | 1700 | 826 |
| Volume to Capacity | 0.01 | 0.13 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Control Delay (s) | 7.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.4 |
| Lane LOS | A | | | | A | A | A |
| Approach Delay (s) | 0.2 | | 0.0 | | 0.0 | 9.4 | |
| Approach LOS | | | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 21.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 130 | 242 | 186 | 102 | 172 | 122 | 130 | 822 | 105 | 117 | 880 | 98 |
| Future Volume (vph) | 130 | 242 | 186 | 102 | 172 | 122 | 130 | 822 | 105 | 117 | 880 | 98 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 0.97 | 0.95 | | 0.97 | 0.95 | |
| Frt | 1.00 | 0.93 | | 1.00 | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 3309 | | 1770 | 3319 | | 3433 | 3479 | | 3433 | 3486 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 3309 | | 1770 | 3319 | | 3433 | 3479 | | 3433 | 3486 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 141 | 263 | 202 | 111 | 187 | 133 | 141 | 893 | 114 | 127 | 957 | 107 |
| RTOR Reduction (vph) | 0 | 135 | 0 | 0 | 116 | 0 | 0 | 8 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 141 | 330 | 0 | 111 | 204 | 0 | 141 | 999 | 0 | 127 | 1057 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Actuated Green, G (s) | 13.5 | 16.1 | | 11.5 | 14.1 | | 9.2 | 55.6 | | 8.8 | 55.2 | |
| Effective Green, g (s) | 13.5 | 16.1 | | 11.5 | 14.1 | | 9.2 | 55.6 | | 8.8 | 55.2 | |
| Actuated g/C Ratio | 0.12 | 0.15 | | 0.10 | 0.13 | | 0.08 | 0.51 | | 0.08 | 0.50 | |
| Clearance Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 217 | 484 | | 185 | 425 | | 287 | 1758 | | 274 | 1749 | |
| v/s Ratio Prot | c0.08 | c0.10 | | 0.06 | 0.06 | | c0.04 | 0.29 | | 0.04 | c0.30 | |
| v/s Ratio Perm | | | | | | | | | | | | |
| v/c Ratio | 0.65 | 0.68 | | 0.60 | 0.48 | | 0.49 | 0.57 | | 0.46 | 0.60 | |
| Uniform Delay, d1 | 46.0 | 44.5 | | 47.1 | 44.5 | | 48.2 | 18.9 | | 48.3 | 19.6 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 0.84 | |
| Incremental Delay, d2 | 6.6 | 3.9 | | 5.2 | 0.9 | | 1.3 | 1.3 | | 1.2 | 1.5 | |
| Delay (s) | 52.6 | 48.5 | | 52.2 | 45.4 | | 49.5 | 20.2 | | 47.9 | 18.0 | |
| Level of Service | D | D | | D | D | | D | C | | D | B | |
| Approach Delay (s) | | 49.4 | | | 47.2 | | | 23.8 | | | 21.2 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.5 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.63 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 64.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 17 | 0 | 29 | 1 | 0 | 5 | 9 | 1080 | 2 | 3 | 1122 | 13 |
| Future Volume (vph) | 17 | 0 | 29 | 1 | 0 | 5 | 9 | 1080 | 2 | 3 | 1122 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.91 | | | 0.89 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1672 | | | 1640 | | 1770 | 3538 | | 1770 | 3533 | |
| Flt Permitted | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.24 | 1.00 | |
| Satd. Flow (perm) | | 1672 | | | 1640 | | 1770 | 3538 | | 448 | 3533 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 18 | 0 | 32 | 1 | 0 | 5 | 10 | 1174 | 2 | 3 | 1220 | 14 |
| RTOR Reduction (vph) | 0 | 48 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 2 | 0 | 0 | 0 | 0 | 10 | 1176 | 0 | 3 | 1234 | 0 |
| Turn Type | Split | NA | | Split | NA | | Prot | NA | | Perm | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | | | | | | | | 6 | | |
| Actuated Green, G (s) | | 4.4 | | | 1.1 | | 1.5 | 91.0 | | 85.0 | 85.0 | |
| Effective Green, g (s) | | 4.4 | | | 1.1 | | 1.5 | 91.0 | | 85.0 | 85.0 | |
| Actuated g/C Ratio | | 0.04 | | | 0.01 | | 0.01 | 0.83 | | 0.77 | 0.77 | |
| Clearance Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 66 | | | 16 | | 24 | 2926 | | 346 | 2730 | |
| v/s Ratio Prot | | c0.00 | | | c0.00 | | 0.01 | c0.33 | | | c0.35 | |
| v/s Ratio Perm | | | | | | | | | | 0.01 | | |
| v/c Ratio | | 0.03 | | | 0.00 | | 0.42 | 0.40 | | 0.01 | 0.45 | |
| Uniform Delay, d1 | | 50.7 | | | 53.9 | | 53.8 | 2.5 | | 2.9 | 4.4 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.87 | 0.63 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.2 | | | 0.1 | | 9.6 | 0.3 | | 0.0 | 0.5 | |
| Delay (s) | | 50.9 | | | 54.0 | | 56.7 | 1.9 | | 2.9 | 4.9 | |
| Level of Service | | D | | | D | | E | A | | A | A | |
| Approach Delay (s) | | 50.9 | | | 54.0 | | | 2.4 | | | 4.9 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.7 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.43 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 44.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 8 | 474 | 1 | 0 | 340 | 23 | 1 | 0 | 0 | 28 | 0 | 24 |
| Future Volume (Veh/h) | 8 | 474 | 1 | 0 | 340 | 23 | 1 | 0 | 0 | 28 | 0 | 24 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 9 | 515 | 1 | 0 | 370 | 25 | 1 | 0 | 0 | 30 | 0 | 26 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 866 | | | | | | | |
| pX, platoon unblocked | 0.93 | | | | | | 0.93 | 0.93 | | 0.93 | 0.93 | 0.93 |
| vC, conflicting volume | 395 | | | 516 | | | 930 | 928 | 516 | 916 | 916 | 382 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 312 | | | 516 | | | 887 | 886 | 516 | 872 | 873 | 299 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 100 | | | 100 | 100 | 100 | 88 | 100 | 96 |
| cM capacity (veh/h) | 1161 | | | 1050 | | | 236 | 262 | 559 | 251 | 266 | 689 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 9 | 516 | 0 | 395 | 1 | 30 | 26 |
| Volume Left | 9 | 0 | 0 | 0 | 1 | 30 | 0 |
| Volume Right | 0 | 1 | 0 | 25 | 0 | 0 | 26 |
| cSH | 1161 | 1700 | 1700 | 1700 | 236 | 251 | 689 |
| Volume to Capacity | 0.01 | 0.30 | 0.00 | 0.23 | 0.00 | 0.12 | 0.04 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 0 | 0 | 10 | 3 |
| Control Delay (s) | 8.1 | 0.0 | 0.0 | 0.0 | 20.3 | 21.3 | 10.4 |
| Lane LOS | A | | | | C | C | B |
| Approach Delay (s) | 0.1 | | 0.0 | | 20.3 | 16.3 | |
| Approach LOS | | | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 35.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 80 | 76 | 84 | 101 | 122 | 120 | 64 | 565 | 59 | 85 | 562 | 60 |
| Future Volume (vph) | 80 | 76 | 84 | 101 | 122 | 120 | 64 | 565 | 59 | 85 | 562 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 0.97 | 0.95 | | 0.97 | 0.95 | |
| Frt | 1.00 | 0.92 | | 1.00 | 0.93 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 3262 | | 1770 | 3277 | | 3433 | 3489 | | 3433 | 3488 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 3262 | | 1770 | 3277 | | 3433 | 3489 | | 3433 | 3488 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 87 | 83 | 91 | 110 | 133 | 130 | 70 | 614 | 64 | 92 | 611 | 65 |
| RTOR Reduction (vph) | 0 | 83 | 0 | 0 | 115 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 87 | 91 | 0 | 110 | 148 | 0 | 70 | 673 | 0 | 92 | 671 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Actuated Green, G (s) | 9.4 | 9.6 | | 12.1 | 12.3 | | 6.5 | 63.2 | | 7.1 | 63.8 | |
| Effective Green, g (s) | 9.4 | 9.6 | | 12.1 | 12.3 | | 6.5 | 63.2 | | 7.1 | 63.8 | |
| Actuated g/C Ratio | 0.09 | 0.09 | | 0.11 | 0.11 | | 0.06 | 0.57 | | 0.06 | 0.58 | |
| Clearance Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 151 | 284 | | 194 | 366 | | 202 | 2004 | | 221 | 2023 | |
| v/s Ratio Prot | 0.05 | 0.03 | | c0.06 | c0.05 | | 0.02 | c0.19 | | c0.03 | 0.19 | |
| v/s Ratio Perm | | | | | | | | | | | | |
| v/c Ratio | 0.58 | 0.32 | | 0.57 | 0.40 | | 0.35 | 0.34 | | 0.42 | 0.33 | |
| Uniform Delay, d1 | 48.4 | 47.1 | | 46.5 | 45.4 | | 49.7 | 12.3 | | 49.5 | 12.0 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.92 | 0.60 | |
| Incremental Delay, d2 | 5.2 | 0.7 | | 3.8 | 0.7 | | 1.0 | 0.5 | | 1.2 | 0.4 | |
| Delay (s) | 53.6 | 47.8 | | 50.2 | 46.2 | | 50.7 | 12.8 | | 46.7 | 7.6 | |
| Level of Service | D | D | | D | D | | D | B | | D | A | |
| Approach Delay (s) | | 49.7 | | | 47.4 | | | 16.3 | | | 12.3 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 24.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.39 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 48.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 14 | 0 | 9 | 2 | 0 | 1 | 19 | 703 | 3 | 2 | 734 | 20 |
| Future Volume (vph) | 14 | 0 | 9 | 2 | 0 | 1 | 19 | 703 | 3 | 2 | 734 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.95 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.97 | | | 0.97 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1589 | | | 1722 | | 1570 | 3537 | | 1770 | 3513 | |
| Flt Permitted | | 0.97 | | | 0.97 | | 0.95 | 1.00 | | 0.36 | 1.00 | |
| Satd. Flow (perm) | | 1589 | | | 1722 | | 1570 | 3537 | | 672 | 3513 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 15 | 0 | 10 | 2 | 0 | 1 | 21 | 764 | 3 | 2 | 798 | 22 |
| RTOR Reduction (vph) | 0 | 24 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 1 | 0 | 0 | 0 | 0 | 21 | 767 | 0 | 2 | 819 | 0 |
| Heavy Vehicles (%) | 15% | 2% | 2% | 2% | 2% | 2% | 15% | 2% | 2% | 2% | 2% | 15% |
| Turn Type | Split | NA | | Split | NA | | Prot | NA | | Perm | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | | | | | | | | 6 | | |
| Actuated Green, G (s) | | 3.3 | | | 1.1 | | 3.4 | 92.1 | | 84.2 | 84.2 | |
| Effective Green, g (s) | | 3.3 | | | 1.1 | | 3.4 | 92.1 | | 84.2 | 84.2 | |
| Actuated g/C Ratio | | 0.03 | | | 0.01 | | 0.03 | 0.84 | | 0.77 | 0.77 | |
| Clearance Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 47 | | | 17 | | 48 | 2961 | | 514 | 2689 | |
| v/s Ratio Prot | | c0.00 | | | c0.00 | | c0.01 | 0.22 | | | c0.23 | |
| v/s Ratio Perm | | | | | | | | | | 0.00 | | |
| v/c Ratio | | 0.02 | | | 0.00 | | 0.44 | 0.26 | | 0.00 | 0.30 | |
| Uniform Delay, d1 | | 51.8 | | | 53.9 | | 52.4 | 1.9 | | 3.0 | 3.9 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.99 | 0.67 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.1 | | | 0.0 | | 6.2 | 0.2 | | 0.0 | 0.3 | |
| Delay (s) | | 51.9 | | | 53.9 | | 57.9 | 1.5 | | 3.0 | 4.2 | |
| Level of Service | | D | | | D | | E | A | | A | A | |
| Approach Delay (s) | | 51.9 | | | 53.9 | | | 3.0 | | | 4.2 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.4 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.30 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 32.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 10 | 34 | 65 | 705 | 700 | 20 |
| Future Volume (vph) | 10 | 34 | 65 | 705 | 700 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1504 | 1346 | 1504 | 3539 | 3507 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1504 | 1346 | 1504 | 3539 | 3507 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 37 | 71 | 766 | 761 | 22 |
| RTOR Reduction (vph) | 0 | 36 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 11 | 1 | 71 | 766 | 782 | 0 |
| Heavy Vehicles (%) | 20% | 20% | 20% | 2% | 2% | 20% |
| Turn Type | Prot | Perm | Prot | NA | NA | |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 4.4 | 4.4 | 9.3 | 96.6 | 82.8 | |
| Effective Green, g (s) | 4.4 | 4.4 | 9.3 | 96.6 | 82.8 | |
| Actuated g/C Ratio | 0.04 | 0.04 | 0.08 | 0.88 | 0.75 | |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 60 | 53 | 127 | 3107 | 2639 | |
| v/s Ratio Prot | c0.01 | | c0.05 | 0.22 | c0.22 | |
| v/s Ratio Perm | | 0.00 | | | | |
| v/c Ratio | 0.18 | 0.03 | 0.56 | 0.25 | 0.30 | |
| Uniform Delay, d1 | 51.1 | 50.7 | 48.4 | 1.0 | 4.3 | |
| Progression Factor | 1.00 | 1.00 | 0.90 | 0.83 | 0.43 | |
| Incremental Delay, d2 | 1.5 | 0.2 | 5.1 | 0.2 | 0.3 | |
| Delay (s) | 52.5 | 51.0 | 48.4 | 1.1 | 2.1 | |
| Level of Service | D | D | D | A | A | |
| Approach Delay (s) | 51.3 | | | 5.1 | 2.1 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 5.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.32 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 39.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 25 | 210 | 0 | 0 | 205 | 27 | 0 | 0 | 0 | 10 | 0 | 14 |
| Future Volume (Veh/h) | 25 | 210 | 0 | 0 | 205 | 27 | 0 | 0 | 0 | 10 | 0 | 14 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 27 | 228 | 0 | 0 | 223 | 29 | 0 | 0 | 0 | 11 | 0 | 15 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 866 | | | | | | | |
| pX, platoon unblocked | 0.97 | | | | | | 0.97 | 0.97 | | 0.97 | 0.97 | 0.97 |
| vC, conflicting volume | 252 | | | 228 | | | 520 | 534 | 228 | 520 | 520 | 238 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 212 | | | 228 | | | 489 | 503 | 228 | 488 | 488 | 197 |
| tC, single (s) | 4.2 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.2 | 6.7 | 6.4 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.3 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.6 | 4.1 | 3.4 |
| p0 queue free % | 98 | | | 100 | | | 100 | 100 | 100 | 98 | 100 | 98 |
| cM capacity (veh/h) | 1245 | | | 1340 | | | 458 | 446 | 811 | 447 | 438 | 787 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 27 | 228 | 0 | 252 | 0 | 11 | 15 |
| Volume Left | 27 | 0 | 0 | 0 | 0 | 11 | 0 |
| Volume Right | 0 | 0 | 0 | 29 | 0 | 0 | 15 |
| cSH | 1245 | 1700 | 1700 | 1700 | 1700 | 447 | 787 |
| Volume to Capacity | 0.02 | 0.13 | 0.00 | 0.15 | 0.00 | 0.02 | 0.02 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 | 2 | 1 |
| Control Delay (s) | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.3 | 9.7 |
| Lane LOS | A | | | | A | B | A |
| Approach Delay (s) | 0.8 | | 0.0 | | 0.0 | 11.2 | |
| Approach LOS | | | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 29.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 130 | 250 | 201 | 102 | 177 | 133 | 141 | 866 | 105 | 132 | 940 | 98 |
| Future Volume (vph) | 130 | 250 | 201 | 102 | 177 | 133 | 141 | 866 | 105 | 132 | 940 | 98 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | *0.97 | 0.95 | | *0.97 | 0.95 | |
| Frt | 1.00 | 0.93 | | 1.00 | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 3303 | | 1770 | 3311 | | 3433 | 3482 | | 3433 | 3489 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 3303 | | 1770 | 3311 | | 3433 | 3482 | | 3433 | 3489 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 141 | 272 | 218 | 111 | 192 | 145 | 153 | 941 | 114 | 143 | 1022 | 107 |
| RTOR Reduction (vph) | 0 | 139 | 0 | 0 | 125 | 0 | 0 | 8 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 141 | 351 | 0 | 111 | 212 | 0 | 153 | 1047 | 0 | 143 | 1122 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Actuated Green, G (s) | 13.5 | 16.8 | | 11.5 | 14.8 | | 9.6 | 54.6 | | 9.1 | 54.1 | |
| Effective Green, g (s) | 13.5 | 16.8 | | 11.5 | 14.8 | | 9.6 | 54.6 | | 9.1 | 54.1 | |
| Actuated g/C Ratio | 0.12 | 0.15 | | 0.10 | 0.13 | | 0.09 | 0.50 | | 0.08 | 0.49 | |
| Clearance Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 217 | 504 | | 185 | 445 | | 299 | 1728 | | 284 | 1715 | |
| v/s Ratio Prot | c0.08 | c0.11 | | 0.06 | 0.06 | | c0.04 | 0.30 | | 0.04 | c0.32 | |
| v/s Ratio Perm | | | | | | | | | | | | |
| v/c Ratio | 0.65 | 0.70 | | 0.60 | 0.48 | | 0.51 | 0.61 | | 0.50 | 0.65 | |
| Uniform Delay, d1 | 46.0 | 44.2 | | 47.1 | 44.0 | | 48.0 | 20.0 | | 48.3 | 20.9 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.10 | 0.73 | |
| Incremental Delay, d2 | 6.6 | 4.2 | | 5.2 | 0.8 | | 1.5 | 1.6 | | 1.3 | 1.8 | |
| Delay (s) | 52.6 | 48.4 | | 52.2 | 44.8 | | 49.4 | 21.5 | | 54.6 | 17.2 | |
| Level of Service | D | D | | D | D | | D | C | | D | B | |
| Approach Delay (s) | | 49.3 | | | 46.6 | | | 25.1 | | | 21.4 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 67.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 24 | 0 | 29 | 1 | 0 | 5 | 9 | 1103 | 2 | 3 | 1138 | 18 |
| Future Volume (vph) | 24 | 0 | 29 | 1 | 0 | 5 | 9 | 1103 | 2 | 3 | 1138 | 18 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.93 | | | 0.89 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1595 | | | 1640 | | 1570 | 3538 | | 1770 | 3524 | |
| Flt Permitted | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.23 | 1.00 | |
| Satd. Flow (perm) | | 1595 | | | 1640 | | 1570 | 3538 | | 437 | 3524 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 26 | 0 | 32 | 1 | 0 | 5 | 10 | 1199 | 2 | 3 | 1237 | 20 |
| RTOR Reduction (vph) | 0 | 56 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 2 | 0 | 0 | 0 | 0 | 10 | 1201 | 0 | 3 | 1257 | 0 |
| Heavy Vehicles (%) | 15% | 2% | 2% | 2% | 2% | 2% | 15% | 2% | 2% | 2% | 2% | 15% |
| Turn Type | Split | NA | | Split | NA | | Prot | NA | | Perm | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | | | | | | | | 6 | | |
| Actuated Green, G (s) | | 4.5 | | | 1.1 | | 1.5 | 90.9 | | 84.9 | 84.9 | |
| Effective Green, g (s) | | 4.5 | | | 1.1 | | 1.5 | 90.9 | | 84.9 | 84.9 | |
| Actuated g/C Ratio | | 0.04 | | | 0.01 | | 0.01 | 0.83 | | 0.77 | 0.77 | |
| Clearance Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 65 | | | 16 | | 21 | 2923 | | 337 | 2719 | |
| v/s Ratio Prot | | c0.00 | | | c0.00 | | 0.01 | c0.34 | | | c0.36 | |
| v/s Ratio Perm | | | | | | | | | | 0.01 | | |
| v/c Ratio | | 0.04 | | | 0.00 | | 0.48 | 0.41 | | 0.01 | 0.46 | |
| Uniform Delay, d1 | | 50.7 | | | 53.9 | | 53.9 | 2.5 | | 2.9 | 4.5 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.39 | 0.15 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.2 | | | 0.1 | | 15.2 | 0.4 | | 0.0 | 0.6 | |
| Delay (s) | | 50.9 | | | 54.0 | | 89.9 | 0.8 | | 2.9 | 5.0 | |
| Level of Service | | D | | | D | | F | A | | A | A | |
| Approach Delay (s) | | 50.9 | | | 54.0 | | | 1.5 | | | 5.0 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.5 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.44 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 46.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 23 | 75 | 55 | 1085 | 1120 | 16 |
| Future Volume (vph) | 23 | 75 | 55 | 1085 | 1120 | 16 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1504 | 1346 | 1504 | 3539 | 3523 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1504 | 1346 | 1504 | 3539 | 3523 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 25 | 82 | 60 | 1179 | 1217 | 17 |
| RTOR Reduction (vph) | 0 | 77 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 25 | 5 | 60 | 1179 | 1233 | 0 |
| Heavy Vehicles (%) | 20% | 20% | 20% | 2% | 2% | 20% |
| Turn Type | Prot | Perm | Prot | NA | NA | |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 6.6 | 6.6 | 8.6 | 94.4 | 81.3 | |
| Effective Green, g (s) | 6.6 | 6.6 | 8.6 | 94.4 | 81.3 | |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.08 | 0.86 | 0.74 | |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 90 | 80 | 117 | 3037 | 2603 | |
| v/s Ratio Prot | c0.02 | | c0.04 | 0.33 | c0.35 | |
| v/s Ratio Perm | | 0.00 | | | | |
| v/c Ratio | 0.28 | 0.06 | 0.51 | 0.39 | 0.47 | |
| Uniform Delay, d1 | 49.4 | 48.8 | 48.7 | 1.7 | 5.8 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 0.73 | 0.50 | |
| Incremental Delay, d2 | 1.7 | 0.3 | 3.1 | 0.3 | 0.6 | |
| Delay (s) | 51.1 | 49.1 | 51.5 | 1.5 | 3.5 | |
| Level of Service | D | D | D | A | A | |
| Approach Delay (s) | 49.6 | | | 3.9 | 3.5 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 5.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.46 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 51.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 24 | 474 | 1 | 0 | 340 | 39 | 1 | 0 | 0 | 51 | 0 | 46 |
| Future Volume (Veh/h) | 24 | 474 | 1 | 0 | 340 | 39 | 1 | 0 | 0 | 51 | 0 | 46 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 26 | 515 | 1 | 0 | 370 | 42 | 1 | 0 | 0 | 55 | 0 | 50 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 866 | | | | | | | |
| pX, platoon unblocked | 0.93 | | | | | | 0.93 | 0.93 | | 0.93 | 0.93 | 0.93 |
| vC, conflicting volume | 412 | | | 516 | | | 988 | 980 | 516 | 958 | 959 | 391 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 326 | | | 516 | | | 947 | 939 | 516 | 915 | 916 | 304 |
| tC, single (s) | 4.2 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.2 | 6.5 | 6.4 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.3 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.6 | 4.0 | 3.4 |
| p0 queue free % | 98 | | | 100 | | | 100 | 100 | 100 | 75 | 100 | 92 |
| cM capacity (veh/h) | 1079 | | | 1050 | | | 203 | 239 | 559 | 219 | 246 | 655 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 26 | 516 | 0 | 412 | 1 | 55 | 50 |
| Volume Left | 26 | 0 | 0 | 0 | 1 | 55 | 0 |
| Volume Right | 0 | 1 | 0 | 42 | 0 | 0 | 50 |
| cSH | 1079 | 1700 | 1700 | 1700 | 203 | 219 | 655 |
| Volume to Capacity | 0.02 | 0.30 | 0.00 | 0.24 | 0.00 | 0.25 | 0.08 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 | 24 | 6 |
| Control Delay (s) | 8.4 | 0.0 | 0.0 | 0.0 | 22.9 | 26.9 | 11.0 |
| Lane LOS | A | | | | C | D | B |
| Approach Delay (s) | 0.4 | | 0.0 | | 22.9 | 19.3 | |
| Approach LOS | | | | | C | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.1 | | |
| Intersection Capacity Utilization | 35.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 88 | 84 | 92 | 112 | 134 | 131 | 69 | 619 | 65 | 93 | 618 | 66 |
| Future Volume (vph) | 88 | 84 | 92 | 112 | 134 | 131 | 69 | 619 | 65 | 93 | 618 | 66 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 0.97 | 0.95 | | 0.97 | 0.95 | |
| Frt | 1.00 | 0.92 | | 1.00 | 0.93 | | 1.00 | 0.99 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 3261 | | 1770 | 3277 | | 3433 | 3489 | | 3433 | 3488 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 3261 | | 1770 | 3277 | | 3433 | 3489 | | 3433 | 3488 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 96 | 91 | 100 | 122 | 146 | 142 | 75 | 673 | 71 | 101 | 672 | 72 |
| RTOR Reduction (vph) | 0 | 92 | 0 | 0 | 128 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 96 | 99 | 0 | 122 | 160 | 0 | 75 | 739 | 0 | 101 | 739 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Actuated Green, G (s) | 11.3 | 8.9 | | 12.9 | 10.5 | | 6.6 | 61.6 | | 8.6 | 63.6 | |
| Effective Green, g (s) | 11.3 | 8.9 | | 12.9 | 10.5 | | 6.6 | 61.6 | | 8.6 | 63.6 | |
| Actuated g/C Ratio | 0.10 | 0.08 | | 0.12 | 0.10 | | 0.06 | 0.56 | | 0.08 | 0.58 | |
| Clearance Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 181 | 263 | | 207 | 312 | | 205 | 1953 | | 268 | 2016 | |
| v/s Ratio Prot | 0.05 | 0.03 | | c0.07 | c0.05 | | 0.02 | 0.21 | | c0.03 | c0.21 | |
| v/s Ratio Perm | | | | | | | | | | | | |
| v/c Ratio | 0.53 | 0.38 | | 0.59 | 0.51 | | 0.37 | 0.38 | | 0.38 | 0.37 | |
| Uniform Delay, d1 | 46.8 | 47.9 | | 46.0 | 47.3 | | 49.7 | 13.5 | | 48.2 | 12.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 0.63 | |
| Incremental Delay, d2 | 3.0 | 0.9 | | 4.2 | 1.4 | | 1.1 | 0.6 | | 0.9 | 0.5 | |
| Delay (s) | 49.8 | 48.8 | | 50.3 | 48.7 | | 50.8 | 14.1 | | 48.0 | 8.3 | |
| Level of Service | D | D | | D | D | | D | B | | D | A | |
| Approach Delay (s) | | 49.2 | | | 49.2 | | | 17.4 | | | 13.1 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 25.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.43 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 51.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 15 | 0 | 10 | 2 | 0 | 1 | 21 | 776 | 3 | 2 | 808 | 21 |
| Future Volume (vph) | 15 | 0 | 10 | 2 | 0 | 1 | 21 | 776 | 3 | 2 | 808 | 21 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.94 | | | 0.95 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.97 | | | 0.97 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1590 | | | 1722 | | 1570 | 3537 | | 1770 | 3514 | |
| Flt Permitted | | 0.97 | | | 0.97 | | 0.95 | 1.00 | | 0.33 | 1.00 | |
| Satd. Flow (perm) | | 1590 | | | 1722 | | 1570 | 3537 | | 622 | 3514 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 16 | 0 | 11 | 2 | 0 | 1 | 23 | 843 | 3 | 2 | 878 | 23 |
| RTOR Reduction (vph) | 0 | 26 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 0 | 1 | 0 | 0 | 0 | 0 | 23 | 846 | 0 | 2 | 900 | 0 |
| Heavy Vehicles (%) | 15% | 2% | 2% | 2% | 2% | 2% | 15% | 2% | 2% | 2% | 2% | 15% |
| Turn Type | Split | NA | | Split | NA | | Prot | NA | | Perm | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | | | | | | | | 6 | | |
| Actuated Green, G (s) | | 3.3 | | | 1.1 | | 3.5 | 92.1 | | 84.1 | 84.1 | |
| Effective Green, g (s) | | 3.3 | | | 1.1 | | 3.5 | 92.1 | | 84.1 | 84.1 | |
| Actuated g/C Ratio | | 0.03 | | | 0.01 | | 0.03 | 0.84 | | 0.76 | 0.76 | |
| Clearance Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 47 | | | 17 | | 49 | 2961 | | 475 | 2686 | |
| v/s Ratio Prot | | c0.00 | | | c0.00 | | c0.01 | 0.24 | | | c0.26 | |
| v/s Ratio Perm | | | | | | | | | | 0.00 | | |
| v/c Ratio | | 0.02 | | | 0.00 | | 0.47 | 0.29 | | 0.00 | 0.34 | |
| Uniform Delay, d1 | | 51.8 | | | 53.9 | | 52.3 | 1.9 | | 3.1 | 4.1 | |
| Progression Factor | | 1.00 | | | 1.00 | | 0.99 | 0.78 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.1 | | | 0.0 | | 6.8 | 0.2 | | 0.0 | 0.3 | |
| Delay (s) | | 51.9 | | | 53.9 | | 58.5 | 1.7 | | 3.1 | 4.4 | |
| Level of Service | | D | | | D | | E | A | | A | A | |
| Approach Delay (s) | | 51.9 | | | 53.9 | | | 3.2 | | | 4.4 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.6 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.32 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 34.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 10 | 34 | 65 | 779 | 773 | 20 |
| Future Volume (vph) | 10 | 34 | 65 | 779 | 773 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1504 | 1346 | 1504 | 3539 | 3510 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1504 | 1346 | 1504 | 3539 | 3510 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 11 | 37 | 71 | 847 | 840 | 22 |
| RTOR Reduction (vph) | 0 | 36 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 11 | 1 | 71 | 847 | 861 | 0 |
| Heavy Vehicles (%) | 20% | 20% | 20% | 2% | 2% | 20% |
| Turn Type | Prot | Perm | Prot | NA | NA | |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 4.4 | 4.4 | 9.3 | 96.6 | 82.8 | |
| Effective Green, g (s) | 4.4 | 4.4 | 9.3 | 96.6 | 82.8 | |
| Actuated g/C Ratio | 0.04 | 0.04 | 0.08 | 0.88 | 0.75 | |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 60 | 53 | 127 | 3107 | 2642 | |
| v/s Ratio Prot | c0.01 | | c0.05 | 0.24 | c0.25 | |
| v/s Ratio Perm | | 0.00 | | | | |
| v/c Ratio | 0.18 | 0.03 | 0.56 | 0.27 | 0.33 | |
| Uniform Delay, d1 | 51.1 | 50.7 | 48.4 | 1.1 | 4.5 | |
| Progression Factor | 1.00 | 1.00 | 0.88 | 1.08 | 0.37 | |
| Incremental Delay, d2 | 1.5 | 0.2 | 5.0 | 0.2 | 0.3 | |
| Delay (s) | 52.5 | 51.0 | 47.7 | 1.4 | 2.0 | |
| Level of Service | D | D | D | A | A | |
| Approach Delay (s) | 51.3 | | | 4.9 | 2.0 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.34 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 41.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 26 | 232 | 0 | 0 | 226 | 27 | 0 | 0 | 0 | 10 | 0 | 15 |
| Future Volume (Veh/h) | 26 | 232 | 0 | 0 | 226 | 27 | 0 | 0 | 0 | 10 | 0 | 15 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 28 | 252 | 0 | 0 | 246 | 29 | 0 | 0 | 0 | 11 | 0 | 16 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 866 | | | | | | | |
| pX, platoon unblocked | 0.96 | | | | | | 0.96 | 0.96 | | 0.96 | 0.96 | 0.96 |
| vC, conflicting volume | 275 | | | 252 | | | 570 | 583 | 252 | 568 | 568 | 260 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 220 | | | 252 | | | 528 | 542 | 252 | 526 | 526 | 205 |
| tC, single (s) | 4.2 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.2 | 6.7 | 6.4 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.3 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.6 | 4.1 | 3.4 |
| p0 queue free % | 98 | | | 100 | | | 100 | 100 | 100 | 97 | 100 | 98 |
| cM capacity (veh/h) | 1221 | | | 1313 | | | 424 | 419 | 787 | 416 | 410 | 769 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 28 | 252 | 0 | 275 | 0 | 11 | 16 |
| Volume Left | 28 | 0 | 0 | 0 | 0 | 11 | 0 |
| Volume Right | 0 | 0 | 0 | 29 | 0 | 0 | 16 |
| cSH | 1221 | 1700 | 1700 | 1700 | 1700 | 416 | 769 |
| Volume to Capacity | 0.02 | 0.15 | 0.00 | 0.16 | 0.00 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 | 2 | 2 |
| Control Delay (s) | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.9 | 9.8 |
| Lane LOS | A | | | | A | B | A |
| Approach Delay (s) | 0.8 | | 0.0 | | 0.0 | 11.5 | |
| Approach LOS | | | | | A | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 30.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 144 | 275 | 220 | 113 | 195 | 146 | 155 | 952 | 116 | 144 | 1032 | 108 |
| Future Volume (vph) | 144 | 275 | 220 | 113 | 195 | 146 | 155 | 952 | 116 | 144 | 1032 | 108 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 0.95 | | 1.00 | 0.95 | | 0.97 | 0.95 | | 0.97 | 0.95 | |
| Frt | 1.00 | 0.93 | | 1.00 | 0.94 | | 1.00 | 0.98 | | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1770 | 3303 | | 1770 | 3312 | | 3433 | 3482 | | 3433 | 3489 | |
| Flt Permitted | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1770 | 3303 | | 1770 | 3312 | | 3433 | 3482 | | 3433 | 3489 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 157 | 299 | 239 | 123 | 212 | 159 | 168 | 1035 | 126 | 157 | 1122 | 117 |
| RTOR Reduction (vph) | 0 | 137 | 0 | 0 | 127 | 0 | 0 | 8 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 157 | 401 | 0 | 123 | 244 | 0 | 168 | 1153 | 0 | 157 | 1232 | 0 |
| Turn Type | Prot | NA | | Prot | NA | | Prot | NA | | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | | | | | | |
| Actuated Green, G (s) | 13.6 | 17.7 | | 11.8 | 15.9 | | 8.9 | 53.7 | | 8.8 | 53.6 | |
| Effective Green, g (s) | 13.6 | 17.7 | | 11.8 | 15.9 | | 8.9 | 53.7 | | 8.8 | 53.6 | |
| Actuated g/C Ratio | 0.12 | 0.16 | | 0.11 | 0.14 | | 0.08 | 0.49 | | 0.08 | 0.49 | |
| Clearance Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 218 | 531 | | 189 | 478 | | 277 | 1699 | | 274 | 1700 | |
| v/s Ratio Prot | c0.09 | c0.12 | | 0.07 | 0.07 | | c0.05 | 0.33 | | 0.05 | c0.35 | |
| v/s Ratio Perm | | | | | | | | | | | | |
| v/c Ratio | 0.72 | 0.76 | | 0.65 | 0.51 | | 0.61 | 0.68 | | 0.57 | 0.72 | |
| Uniform Delay, d1 | 46.4 | 44.1 | | 47.1 | 43.4 | | 48.9 | 21.5 | | 48.8 | 22.4 | |
| Progression Factor | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.14 | 0.72 | |
| Incremental Delay, d2 | 11.1 | 6.1 | | 7.8 | 0.9 | | 3.7 | 2.2 | | 2.6 | 2.4 | |
| Delay (s) | 57.5 | 50.1 | | 54.9 | 44.3 | | 52.6 | 23.8 | | 58.0 | 18.5 | |
| Level of Service | E | D | | D | D | | D | C | | E | B | |
| Approach Delay (s) | | 51.8 | | | 46.9 | | | 27.4 | | | 23.0 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 32.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 72.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 26 | 0 | 32 | 1 | 0 | 6 | 10 | 1215 | 2 | 3 | 1256 | 20 |
| Future Volume (vph) | 26 | 0 | 32 | 1 | 0 | 6 | 10 | 1215 | 2 | 3 | 1256 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Lane Util. Factor | | 1.00 | | | 1.00 | | 1.00 | 0.95 | | 1.00 | 0.95 | |
| Frt | | 0.93 | | | 0.88 | | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Flt Protected | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.95 | 1.00 | |
| Satd. Flow (prot) | | 1595 | | | 1633 | | 1570 | 3538 | | 1770 | 3524 | |
| Flt Permitted | | 0.98 | | | 0.99 | | 0.95 | 1.00 | | 0.20 | 1.00 | |
| Satd. Flow (perm) | | 1595 | | | 1633 | | 1570 | 3538 | | 379 | 3524 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 28 | 0 | 35 | 1 | 0 | 7 | 11 | 1321 | 2 | 3 | 1365 | 22 |
| RTOR Reduction (vph) | 0 | 60 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 3 | 0 | 0 | 0 | 0 | 11 | 1323 | 0 | 3 | 1387 | 0 |
| Heavy Vehicles (%) | 15% | 2% | 2% | 2% | 2% | 2% | 15% | 2% | 2% | 2% | 2% | 15% |
| Turn Type | Split | NA | | Split | NA | | Prot | NA | | Perm | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | | | | | | | | | | 6 | | |
| Actuated Green, G (s) | | 4.6 | | | 1.1 | | 1.6 | 90.8 | | 84.7 | 84.7 | |
| Effective Green, g (s) | | 4.6 | | | 1.1 | | 1.6 | 90.8 | | 84.7 | 84.7 | |
| Actuated g/C Ratio | | 0.04 | | | 0.01 | | 0.01 | 0.83 | | 0.77 | 0.77 | |
| Clearance Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| Vehicle Extension (s) | | 3.0 | | | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | | 66 | | | 16 | | 22 | 2920 | | 291 | 2713 | |
| v/s Ratio Prot | | c0.00 | | | c0.00 | | 0.01 | c0.37 | | | c0.39 | |
| v/s Ratio Perm | | | | | | | | | | 0.01 | | |
| v/c Ratio | | 0.04 | | | 0.01 | | 0.50 | 0.45 | | 0.01 | 0.51 | |
| Uniform Delay, d1 | | 50.6 | | | 53.9 | | 53.8 | 2.7 | | 2.9 | 4.8 | |
| Progression Factor | | 1.00 | | | 1.00 | | 1.36 | 0.28 | | 1.00 | 1.00 | |
| Incremental Delay, d2 | | 0.2 | | | 0.1 | | 15.6 | 0.5 | | 0.1 | 0.7 | |
| Delay (s) | | 50.8 | | | 54.0 | | 88.6 | 1.2 | | 3.0 | 5.5 | |
| Level of Service | | D | | | D | | F | A | | A | A | |
| Approach Delay (s) | | 50.8 | | | 54.0 | | | 1.9 | | | 5.5 | |
| Approach LOS | | D | | | D | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 4.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 18.0 |
| Intersection Capacity Utilization | 51.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 23 | 75 | 55 | 1199 | 1237 | 16 |
| Future Volume (vph) | 23 | 75 | 55 | 1199 | 1237 | 16 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | |
| Frt | 1.00 | 0.85 | 1.00 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | 1504 | 1346 | 1504 | 3539 | 3525 | |
| Flt Permitted | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (perm) | 1504 | 1346 | 1504 | 3539 | 3525 | |
| Peak-hour factor, PHF | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Adj. Flow (vph) | 25 | 82 | 60 | 1303 | 1345 | 17 |
| RTOR Reduction (vph) | 0 | 77 | 0 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 25 | 5 | 60 | 1303 | 1361 | 0 |
| Heavy Vehicles (%) | 20% | 20% | 20% | 2% | 2% | 20% |
| Turn Type | Prot | Perm | Prot | NA | NA | |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | 4 | | | | |
| Actuated Green, G (s) | 6.6 | 6.6 | 8.6 | 94.4 | 81.3 | |
| Effective Green, g (s) | 6.6 | 6.6 | 8.6 | 94.4 | 81.3 | |
| Actuated g/C Ratio | 0.06 | 0.06 | 0.08 | 0.86 | 0.74 | |
| Clearance Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Lane Grp Cap (vph) | 90 | 80 | 117 | 3037 | 2605 | |
| v/s Ratio Prot | c0.02 | | 0.04 | c0.37 | c0.39 | |
| v/s Ratio Perm | | 0.00 | | | | |
| v/c Ratio | 0.28 | 0.06 | 0.51 | 0.43 | 0.52 | |
| Uniform Delay, d1 | 49.4 | 48.8 | 48.7 | 1.8 | 6.1 | |
| Progression Factor | 1.00 | 1.00 | 0.98 | 0.56 | 0.48 | |
| Incremental Delay, d2 | 1.7 | 0.3 | 2.8 | 0.3 | 0.7 | |
| Delay (s) | 51.1 | 49.1 | 50.5 | 1.3 | 3.6 | |
| Level of Service | D | D | D | A | A | |
| Approach Delay (s) | 49.6 | | | 3.5 | 3.6 | |
| Approach LOS | D | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 5.3 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 110.0 | Sum of lost time (s) | 13.5 |
| Intersection Capacity Utilization | 54.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 25 | 524 | 1 | 0 | 376 | 42 | 1 | 0 | 0 | 53 | 0 | 49 |
| Future Volume (Veh/h) | 25 | 524 | 1 | 0 | 376 | 42 | 1 | 0 | 0 | 53 | 0 | 49 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 27 | 570 | 1 | 0 | 409 | 46 | 1 | 0 | 0 | 58 | 0 | 53 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 866 | | | | | | | |
| pX, platoon unblocked | 0.91 | | | | | | 0.91 | 0.91 | | 0.91 | 0.91 | 0.91 |
| vC, conflicting volume | 455 | | | 571 | | | 1086 | 1080 | 570 | 1056 | 1057 | 432 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 356 | | | 571 | | | 1047 | 1040 | 570 | 1014 | 1015 | 331 |
| tC, single (s) | 4.2 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.2 | 6.7 | 6.4 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.3 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.6 | 4.1 | 3.4 |
| p0 queue free % | 97 | | | 100 | | | 99 | 100 | 100 | 68 | 100 | 91 |
| cM capacity (veh/h) | 1036 | | | 1002 | | | 169 | 205 | 521 | 184 | 201 | 623 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 | SB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 27 | 571 | 0 | 455 | 1 | 58 | 53 |
| Volume Left | 27 | 0 | 0 | 0 | 1 | 58 | 0 |
| Volume Right | 0 | 1 | 0 | 46 | 0 | 0 | 53 |
| cSH | 1036 | 1700 | 1700 | 1700 | 169 | 184 | 623 |
| Volume to Capacity | 0.03 | 0.34 | 0.00 | 0.27 | 0.01 | 0.32 | 0.09 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 0 | 0 | 32 | 7 |
| Control Delay (s) | 8.6 | 0.0 | 0.0 | 0.0 | 26.5 | 33.4 | 11.3 |
| Lane LOS | A | | | | D | D | B |
| Approach Delay (s) | 0.4 | | 0.0 | | 26.5 | 22.8 | |
| Approach LOS | | | | | D | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 37.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |