# RESIDENTIAL / COMMERCIAL DEVELOPMENT

# 460 KEIL DRIVE SOUTH

# CHATHAM, ON

# TRAFFIC IMPACT STUDY

RC SPENCER ASSOCIATES INC.
Consulting Engineers
**Windsor:** 800 University Avenue W. – Windsor ON N9A 5R9
**Leamington:** 18 Talbot Street W. – Leamington ON N8H 1M4
**Chatham-Kent:** 49 Raleigh Street – Chatham ON N7M 2M6
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File No.: 21-1083X February 2021

**RESIDENTIAL / COMMERCIAL DEVELOPMENT**

**460 KEIL DRIVE SOUTH, CHATHAM, ON**

**TRAFFIC IMPACT STUDY (FEBRUARY 2021)**

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## INTRODUCTION AND BACKGROUND

A residential / commercial development has been proposed for lands situated at 460 Keil Drive South in Chatham, Ontario. As may be noted on Figure 1, the site is located on the southwest corner of Keil Drive South at Park Avenue West. Keil Drive South is a major collector roadway that runs northwesterly from its origin south of Park Avenue West; it becomes a section of County Road 2 from Richmond Street to Grand Avenue West and then continues as a major collector until its terminus, about one kilometre north of Grand Avenue West. Richmond Street is a northeast / southwest arterial roadway that is also defined as County Road 2 west of Keil Drive South. Park Avenue West is a major northeast / southwest collector roadway that runs through Chatham. For the sake of simplicity, in this study, Richmond Street was assumed to run east/west, Keil Drive South was assumed to run north/south, and Park Avenue West was assumed to run east/west.

As illustrated on Figure 2, the study area includes the proposed eastbound stop-controlled site access at Keil Drive South, the northbound stop-controlled site access at Park Avenue West, and the signalized intersections of Richmond Street and Park Avenue West at Keil Drive South.

The proposed site plan, provided on Figure 3, is comprised of a total of 117 residential units in a single six-storey apartment building; the apartment building will also include approximately 5005 sq. ft. of ground floor commercial space. A total of 208 parking spaces are proposed to accommodate the entire development. Vehicular access is proposed via the site accesses on Park Avenue West and Keil Drive South, and a bus stop located on the west side of the Keil Drive South, immediately north of the proposed site access, will accommodate potential transit system users.

The purpose of this study is to examine, quantify, and qualify the potential traffic impact of the proposed development on area traffic operations; in particular, the study will investigate the potential effects of the development at the existing signalized intersections of Richmond Street and Park Avenue West with Keil Drive South.

## TRAFFIC DATA COLLECTION

Turning movement counts for the signalized intersections of Richmond Street at Keil Drive South and Park Avenue West at Keil Drive South were obtained by RC Spencer Associates Inc. on 15 and 16 December 2020, respectively. The collected turning movement counts are provided in Appendix A.

## METHODOLOGY

The aforementioned turning movement counts provided the basis for industry-standard traffic operations analysis; the software package utilized for the analysis (Synchro 10) calculates various parameters of intersection performance, such as level of service (LOS), intersection capacity utilization (ICU), control delay, and queue lengths on individual approaches.

Signalized level of service results are reported based on the following industry standard:

| Level of Service | Average Control Delay (sec/veh) | General Description (Signalized Intersections) |
|---|---|---|
| A | ≤10 | Free Flow |
| B | >10 - 20 | Stable Flow (slight delays) |
| C | >20 - 35 | Stable flow (acceptable delays) |
| D | >35 - 55 | Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding) |
| E | >55 - 80 | Unstable flow (intolerable delay) |
| F | >80 | Forced flow (jammed) |

Unsignalized level of service results are reported based on the following industry standard:

| Level of Service | Average Control Delay (sec/veh) |
|---|---|
| A | 0 - 10 |
| B | >10 - 15 |
| C | >15 - 25 |
| D | >25 - 35 |
| E | >35 - 50 |
| F | >50 |

## TRIP GENERATION AND DISTRIBUTION

Trip generation for the proposed development was estimated from the ITE Trip Generation Manual (10th Edition). The dataset's average rate was used instead of the fitted curve because the value of the independent variables is in the lower range of the dataset, and the fitted curve equation does not pass through the origin. It was determined that ITE Land Use Codes 221 (Mid-Rise Multifamily Housing) and 820 (Shopping Center) were the most appropriate land use codes for the proposed development. All trips to and from the proposed development site were assumed to be vehicle trips; the nearby bus stop may result in some modal split, but no reductions were considered in the calculations.

The following information was extracted from the ITE Trip Generation Manual:

- Land Use Code 221 (Mid-Rise Multifamily Housing) provides average generation rates of 0.36 trips per unit in the AM peak hour, with 26% entering and 74% exiting, and 0.44 trips per unit in the PM peak hour, with 61% entering and 39% exiting; and
- Land Use Code 820 (Shopping Center) provides average generation rates of 0.94 trips per 1000 sq. ft. GLA in the AM peak hour, with 62% entering and 38% exiting, and 3.81 trips per 1000 sq. ft. GLA in the PM peak hour, with 48% entering and 52% exiting.

The trip generation calculations are contained in Appendix B. When combined, the total trips generated by the proposed development are estimated to be 14 entering and 33 exiting during the AM peak hour and 40 entering and 31 exiting during the PM peak hour. Site generated traffic was distributed to and from the proposed site accesses at Keil Drive South and Park Avenue West. The distribution of intersection turning movements was based on the directional flow of existing traffic volumes on Keil Drive South and Park Avenue West, as taken from the collected turning movement counts. The resulting site generated turning movements are illustrated on Figure 4.

## CAPACITY AND LEVEL OF SERVICE ANALYSIS

Detailed Synchro 10 analysis was carried with respect to the following traffic scenarios:

- Existing Traffic;
- Existing + Site Generated Traffic;
- Total Traffic 2026 (Background Traffic 2026 + Site Generated Traffic); and
- Total Traffic 2031 (Background Traffic 2031 + Site Generated Traffic).

To be conservative, the analysis was carried out assuming full build-out conditions for existing, 2026 and 2031 horizon years. Background traffic was increased by 1% per year for the 2026 and 2031 horizon forecasts, which is conservative for the region. Figures 5 to 8 summarize total traffic estimates that result from adding the site generated traffic to the existing, 2026, and 2031 horizon year forecasts for background traffic in the study area. The effect of adding site generated traffic from the proposed development to existing and horizon traffic volumes at each specific intersection can be found in Appendix C.

The resulting Synchro 10 simulation reports are provided in Appendix D. Optimal signal timings were used for all traffic scenarios at the signalized intersections of Richmond Street at Keil Drive South and Park Avenue West at Keil Drive South. To quantify the effect of traffic growth on individual intersections within the study area and to assess the need for geometric or traffic infrastructure improvements, the Synchro results were summarized in the following tables:

## Richmond Street at Keil Drive South

The signalized intersection of Richmond Street at Keil Drive South is currently operating at a very satisfactory level of service. As observed in Tables 1 and 2, it is anticipated that the intersection will continue to operate at a satisfactory level of service in all horizon traffic scenarios, even with the addition of site generated traffic and background traffic growth.

**Table 1: Overall Signalized Intersection Level of Service – Richmond Street at Keil Drive South**

| Scenario | Richmond Street at Keil Drive South | |
|---|---|---|
| | AM Peak Hour | PM Peak Hour |
| Existing Traffic | B | B |
| Existing + Site Generated Traffic | B | B |
| Total Traffic 2026 | B | B |
| Total Traffic 2031 | B | B |

**Table 2: Level of Service by Approach – Richmond Street at Keil Drive South**

| Scenario | Richmond Street at Keil Drive South | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | | PM Peak Hour | | | |
| | E/B | W/B | N/B | S/B | E/B | W/B | N/B | S/B |
| Existing Traffic | B | B | C | B | B | B | C | B |
| Existing + Site Generated Traffic | B | B | C | B | B | B | C | B |
| Total Traffic 2026 | B | B | C | B | C | B | C | B |
| Total Traffic 2031 | C | B | C | B | B | B | C | C |

## Park Avenue West at Keil Drive South

The signalized intersection of Park Avenue West at Keil Drive South is currently operating at a satisfactory level of service. As observed in Tables 3 and 4, it is anticipated that the intersection will continue to operate at a satisfactory level of service in all horizon traffic scenarios, even with the addition of site generated traffic and background traffic growth.

**Table 3: Overall Signalized Intersection Level of Service – Park Avenue West at Keil Drive South**

| Scenario | Park Avenue West at Keil Drive South | |
|---|---|---|
| | AM Peak Hour | PM Peak Hour |
| Existing Traffic | B | B |
| Existing + Site Generated Traffic | B | B |
| Total Traffic 2026 | B | B |
| Total Traffic 2031 | B | B |

**Table 4: Level of Service by Approach – Park Avenue West at Keil Drive South**

| Scenario | Park Avenue West at Keil Drive South | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | | PM Peak Hour | | | |
| | E/B | W/B | N/B | S/B | E/B | W/B | N/B | S/B |
| Existing Traffic | B | A | C | B | B | A | C | B |
| Existing + Site Generated | B | A | C | B | B | A | C | B |
| Total Traffic 2026 | B | A | C | B | B | A | C | B |
| Total Traffic 2031 | B | A | C | B | B | A | C | C |

## Site Access at Keil Drive South

The proposed eastbound stop-controlled site access at Keil Drive South was modelled under the assumption that the site will require a single lane for ingress and a single lane for egress. Based on the level of service results provided in Table 5, it is anticipated that the site access will operate favourably in all horizon year scenarios.

**Table 5: Level of Service by Approach – Site Access at Keil Drive South**

| Scenario | Site Access at Keil Drive South | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | | PM Peak Hour | | | |
| | E/B | W/B | N/B | S/B | E/B | W/B | N/B | S/B |
| Existing + Site Generated | B | - | A | A | B | - | A | A |
| Total Traffic 2026 | B | - | A | A | B | - | A | A |
| Total Traffic 2031 | B | - | A | A | B | - | A | A |

## Site Access at Park Avenue West

The proposed northbound stop-controlled site access at Park Avenue West was modelled under the assumption that the site will require a single lane for ingress and a single lane for egress. Based on the level of service results provided in Table 6, it is anticipated that the site access will operate favourably in all horizon year scenarios.

**Table 6: Level of Service by Approach – Site Access at Park Avenue West**

| Scenario | Site Access at Park Avenue West | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak Hour | | | | PM Peak Hour | | | |
| | E/B | W/B | N/B | S/B | E/B | W/B | N/B | S/B |
| Existing + Site Generated | A | A | A | - | A | A | B | - |
| Total Traffic 2026 | A | A | A | - | A | A | B | - |
| Total Traffic 2031 | A | A | A | - | A | A | B | - |

## SIGHT LINE ANALYSIS

A sight line analysis was completed for the proposed site accesses at Keil Drive South and Park Avenue West. The analysis was completed per the TAC Geometric Design Guide for Canadian Roads (2017). On both Keil Drive South and Park Avenue West, the posted speed limit is 60 km/h, so the analysis was completed for a 70 km/h design speed. As calculated in Appendix E, the minimum intersection sight distance is determined to be 146m for the worst-case left turn egress maneuver and 126m for the right turn egress maneuver.

Based on the sight lines illustrated on Figures 9A and 9B, it is the engineers' opinion that there is sufficient sight distance in both directions for safe egress from the proposed accesses. However, it is the engineers' recommendation that the developer and road authority verify all sight lines on-site to ensure that all boulevard areas within the right-of-way are clear of obstructions before the commencement of construction.

## SUMMARY AND CONCLUSIONS

A residential / commercial development has been proposed for lands situated at 460 Keil Drive South in Chatham, Ontario. The proposed development site is located on the southwest corner of Keil Drive South at Park Avenue West. The study area includes the proposed eastbound stop-controlled site access at Keil Drive South, the northbound stop-controlled site access at Park Avenue West, and the signalized intersections of Richmond Street and Park Avenue West at Keil Drive South.

The proposed site plan is comprised of a total of 117 residential units in a single six-storey apartment building; the apartment building will also include approximately 5005 sq. ft. of ground floor commercial space. A total of 208 parking spaces are proposed to accommodate the entire development.

Using recently obtained turning movement counts and applying the best available trip generation and distribution data and methodologies, an analysis was completed to quantify the potential impact of the development on area traffic operations. Site generated traffic volumes were added to all horizon traffic scenarios; background traffic was increased by 1% per year for the 2026 and 2031 horizon years. Upon completion of the analysis, it was concluded that:

- The signalized intersection of Richmond Street at Keil Drive South is currently operating at a satisfactory level of service; even with the addition of site generated traffic and background traffic growth, it is anticipated that the intersection will continue to operate at a satisfactory level of service in all horizon traffic scenarios;

- The intersection of Park Avenue West at Keil Drive South is currently operating at a satisfactory level of service; even with the addition of site generated traffic and background traffic growth, it is anticipated that the intersection will continue to operate at a satisfactory level of service in all horizon traffic scenarios;
- The proposed site accesses at Keil Drive South and Park Avenue West will operate favourably in all horizon scenarios; there is sufficient sight distance to accommodate safe egress from the proposed site accesses.

Therefore, based on the results of the technical work, it is the engineers' opinion that the proposed development will not adversely affect area traffic operations.

All of which is respectfully submitted,

**RC Spencer Associates Inc.**



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**Associate / Traffic Operations Project Engineer**


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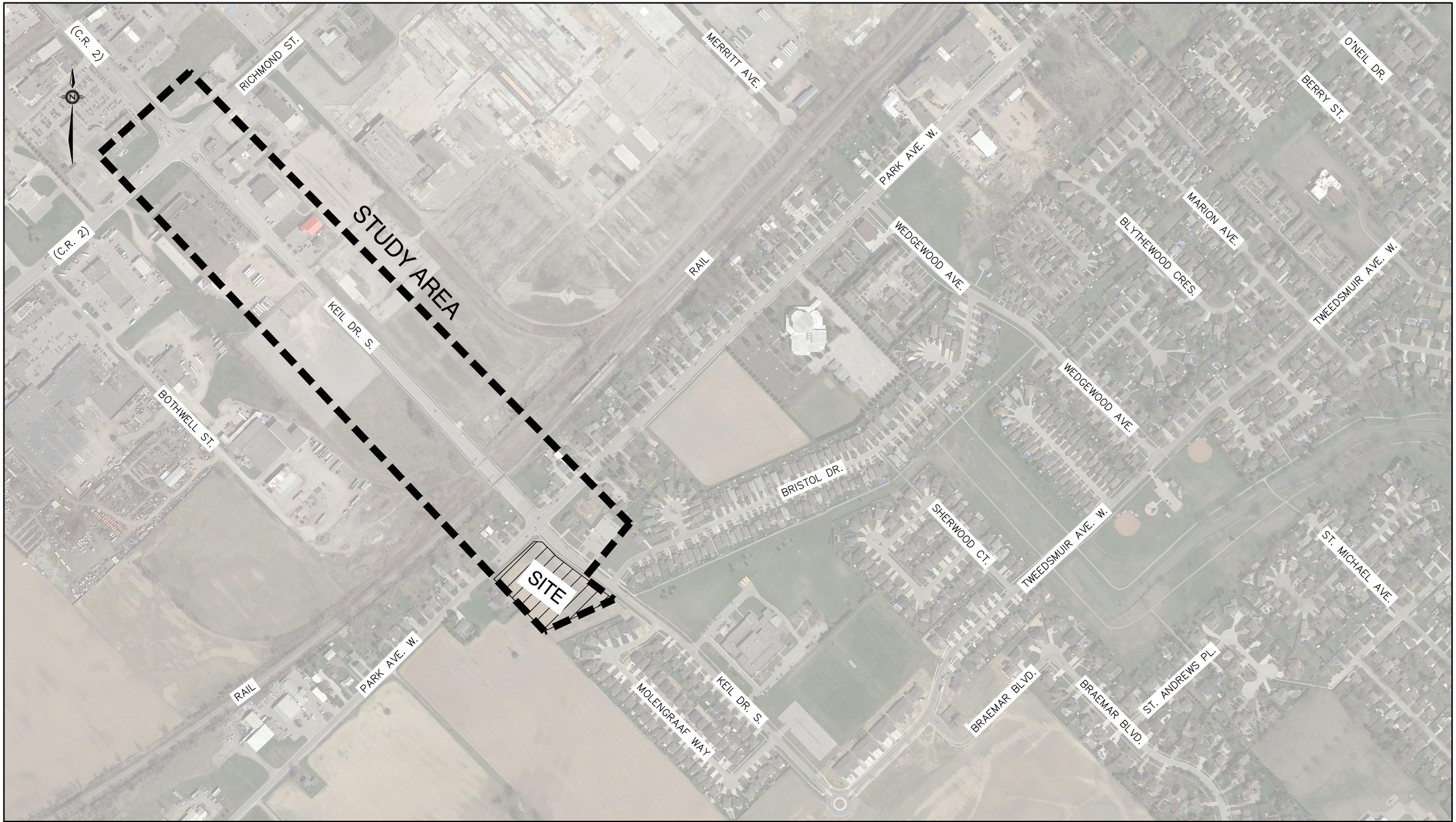
# AREA PLAN

PROJECT NO. 20–1083
FIGURE NO. 1
OF 9

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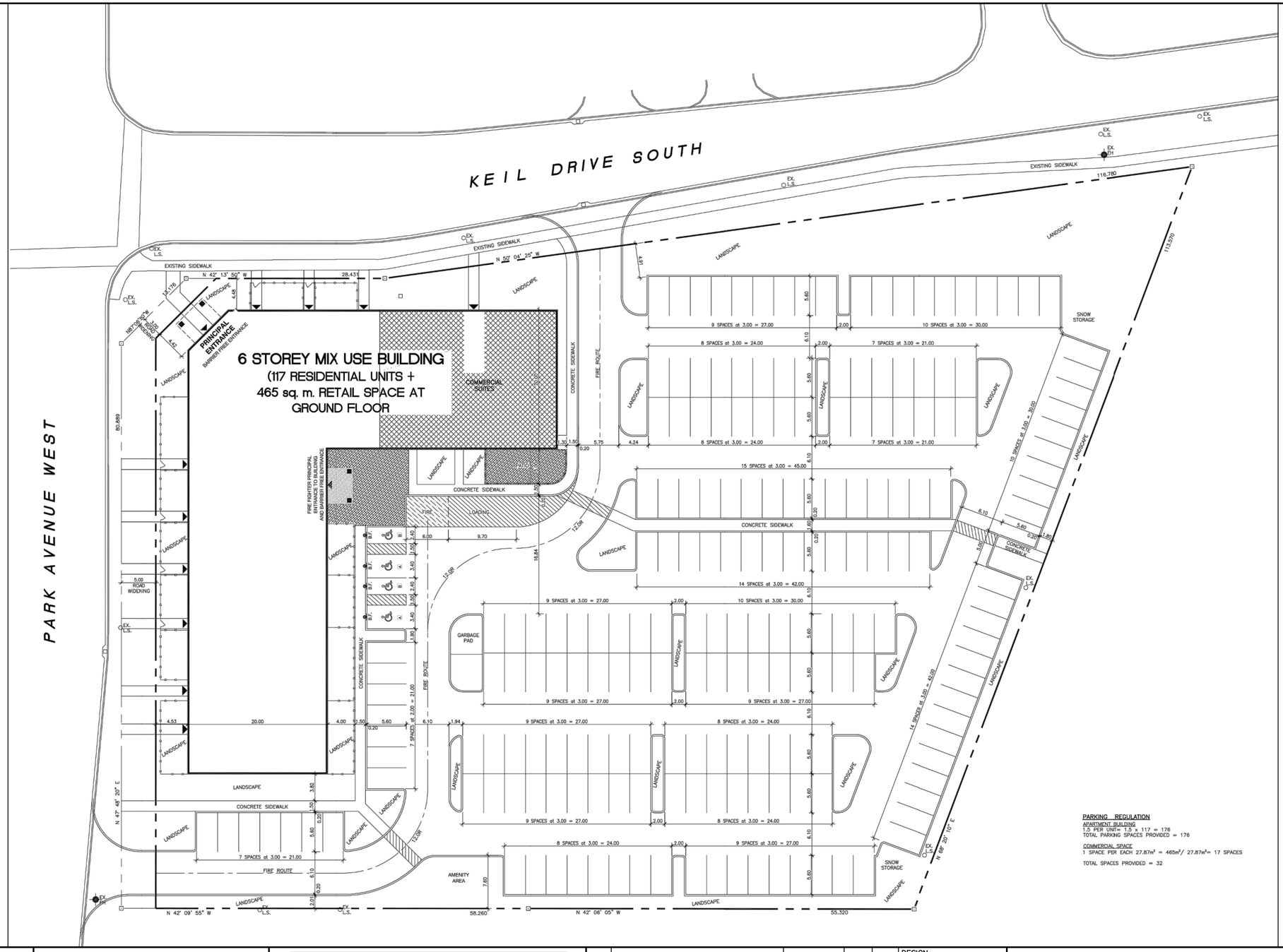
# STUDY AREA

PROJECT NO. 20–1083
FIGURE NO. 2
OF 9




PARKING REGULATION
APARTMENT BUILDING
1.5 PER UNIT= 1.5 x 117 = 176
TOTAL PARKING SPACES PROVIDED = 176

COMMERCIAL SPACE
1 SPACE PER EACH 27.87m² = 465m²/ 27.87m²= 17 SPACES

TOTAL SPACES PROVIDED = 32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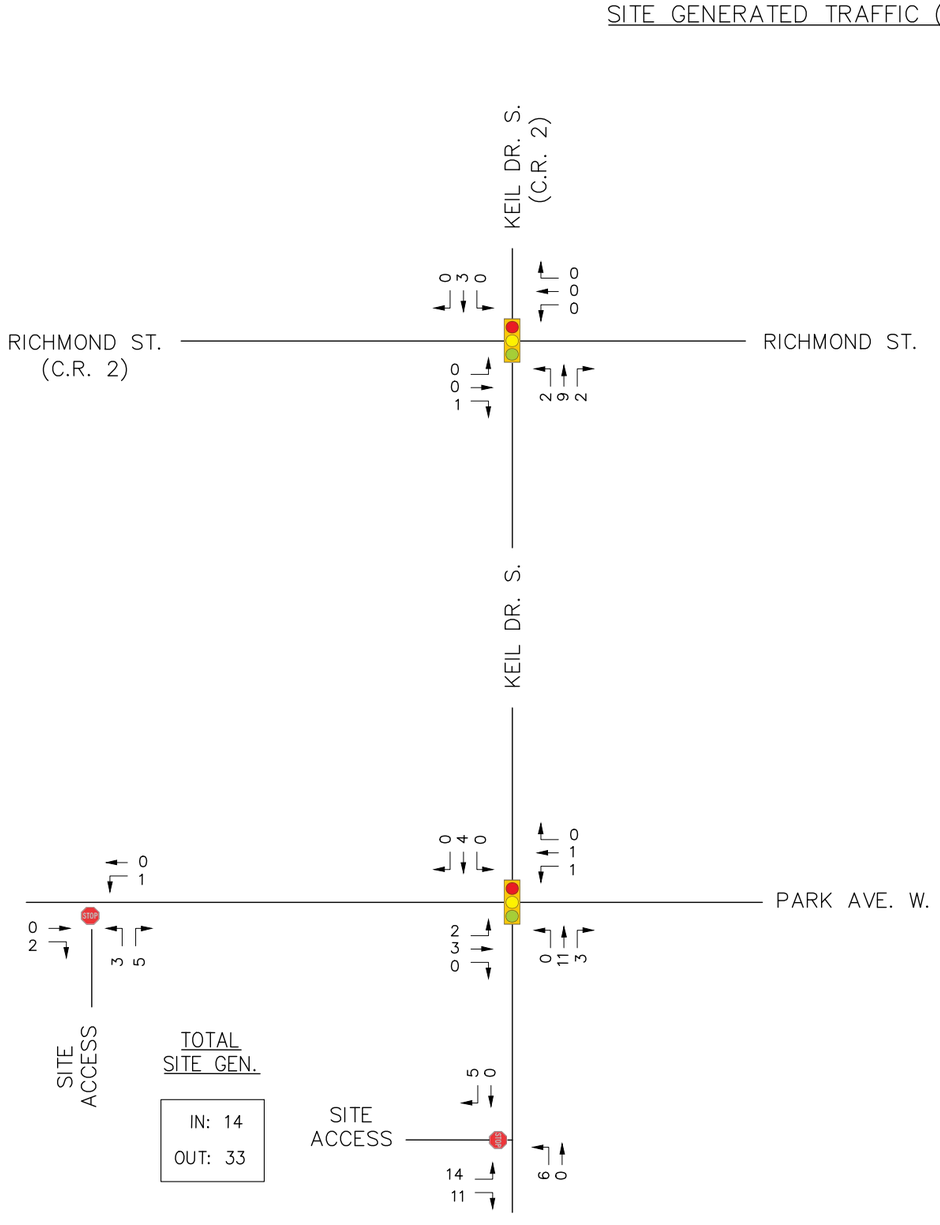
# SITE PLAN

PROJECT NO. 20–1083
FIGURE NO. 3
OF 9

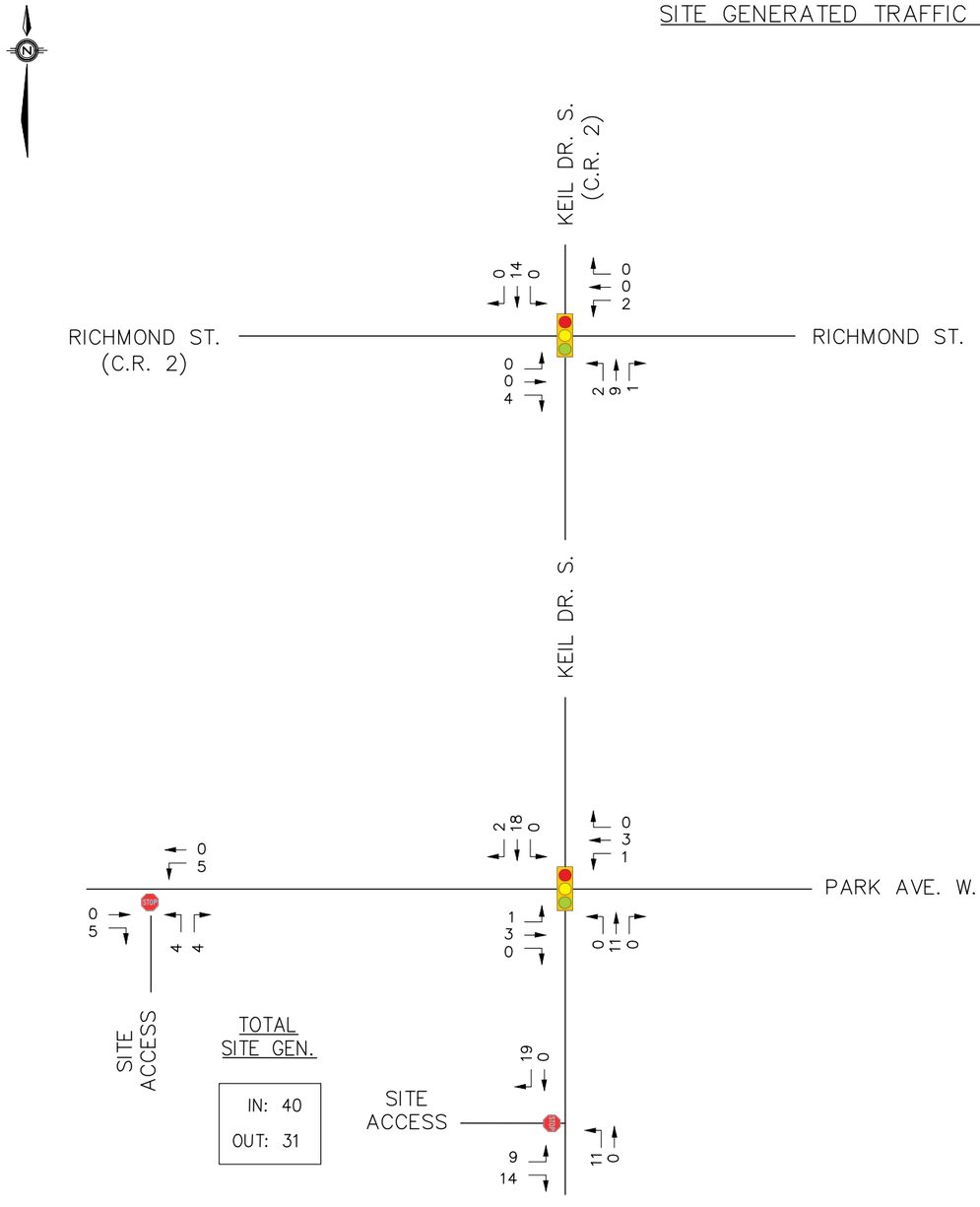
## SITE GENERATED TRAFFIC (AM)




TOTAL SITE GEN.

| | |
|---|---|
| IN: | 14 |
| OUT: | 33 |

## SITE GENERATED TRAFFIC (PM)




TOTAL SITE GEN.

| | |
|---|---|
| IN: | 40 |
| OUT: | 31 |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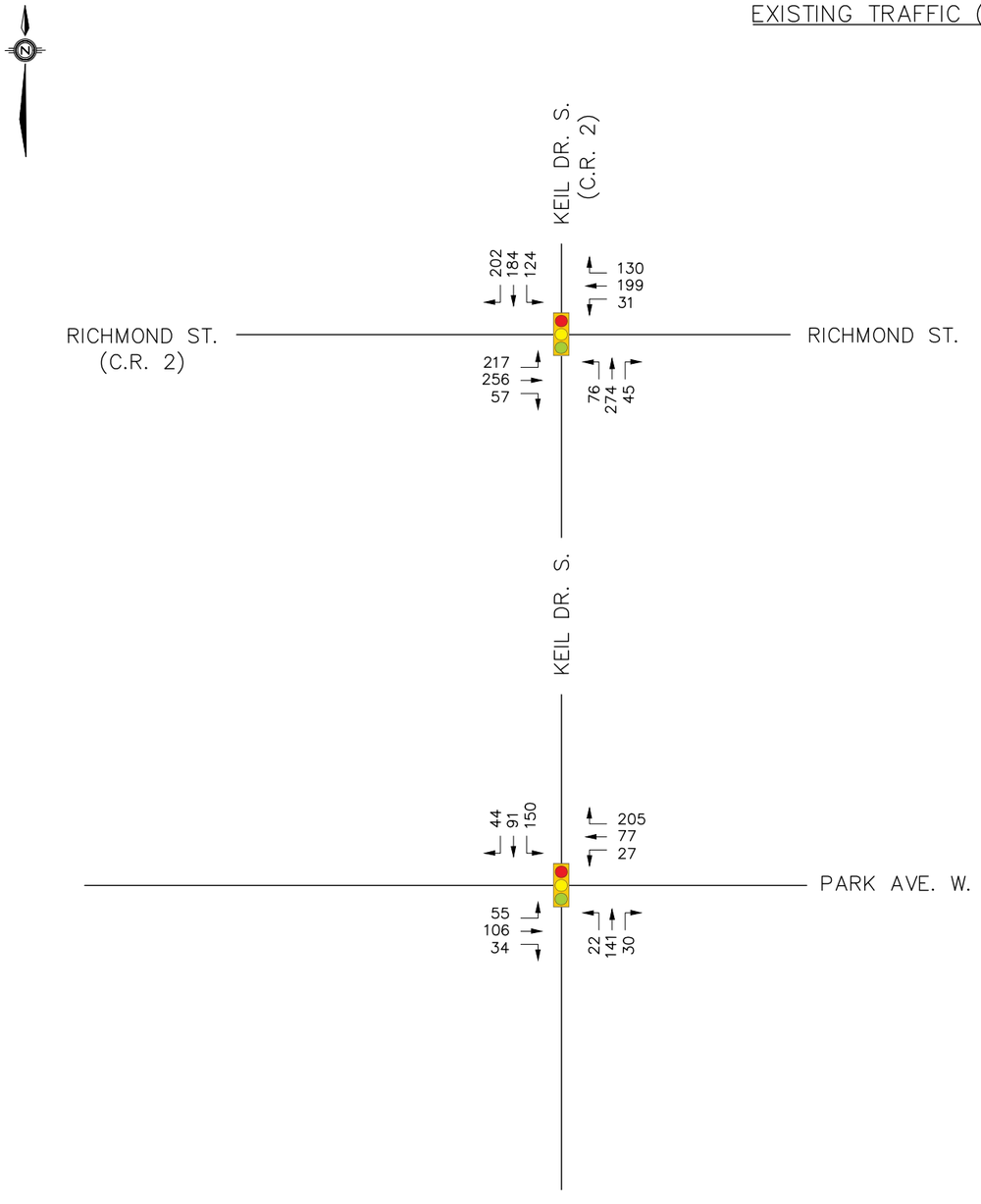
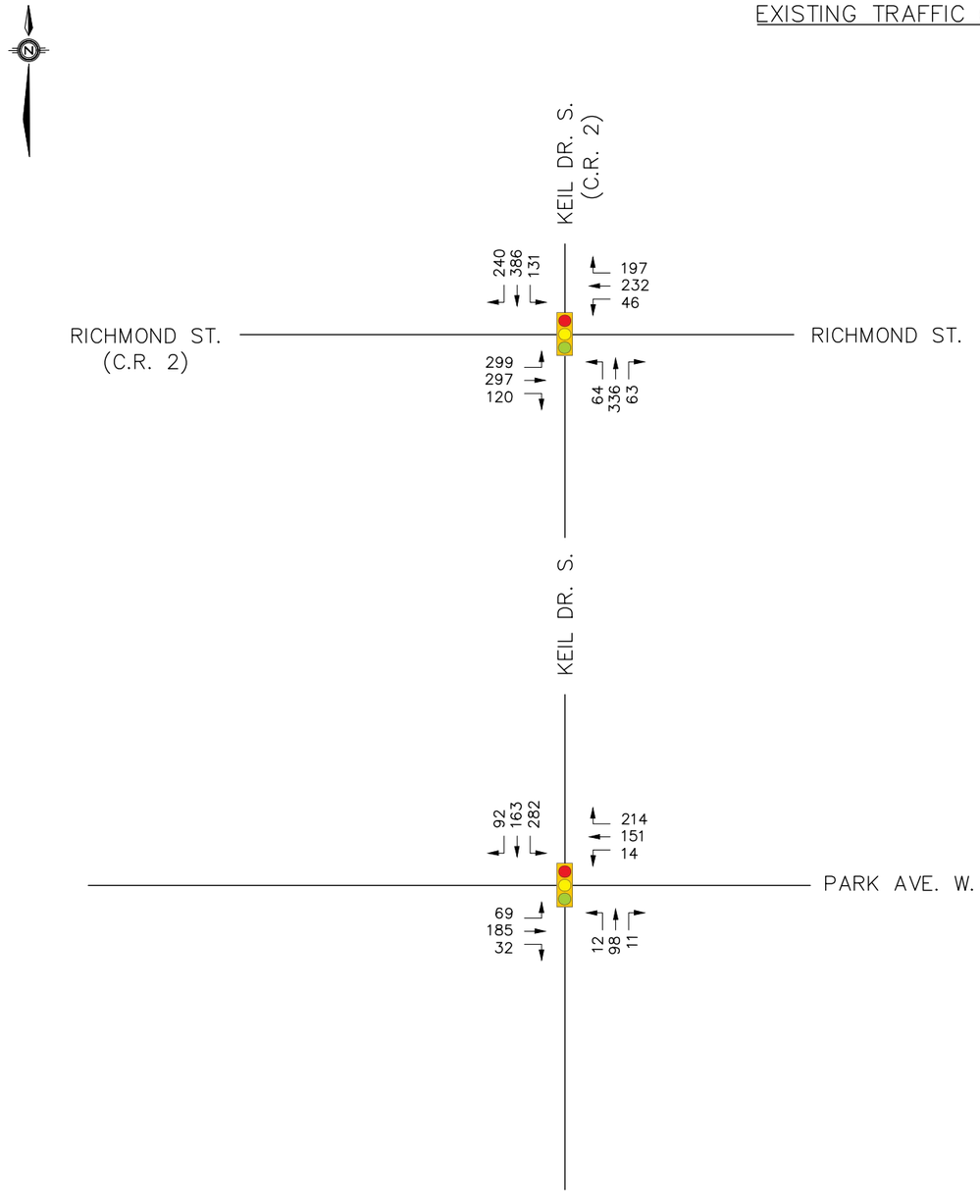
# SITE GENERATED TRAFFIC (AM/PM PEAK HOUR)

PROJECT NO. 20–1083
FIGURE NO. 4
OF 9

## EXISTING TRAFFIC (AM)




## EXISTING TRAFFIC (PM)





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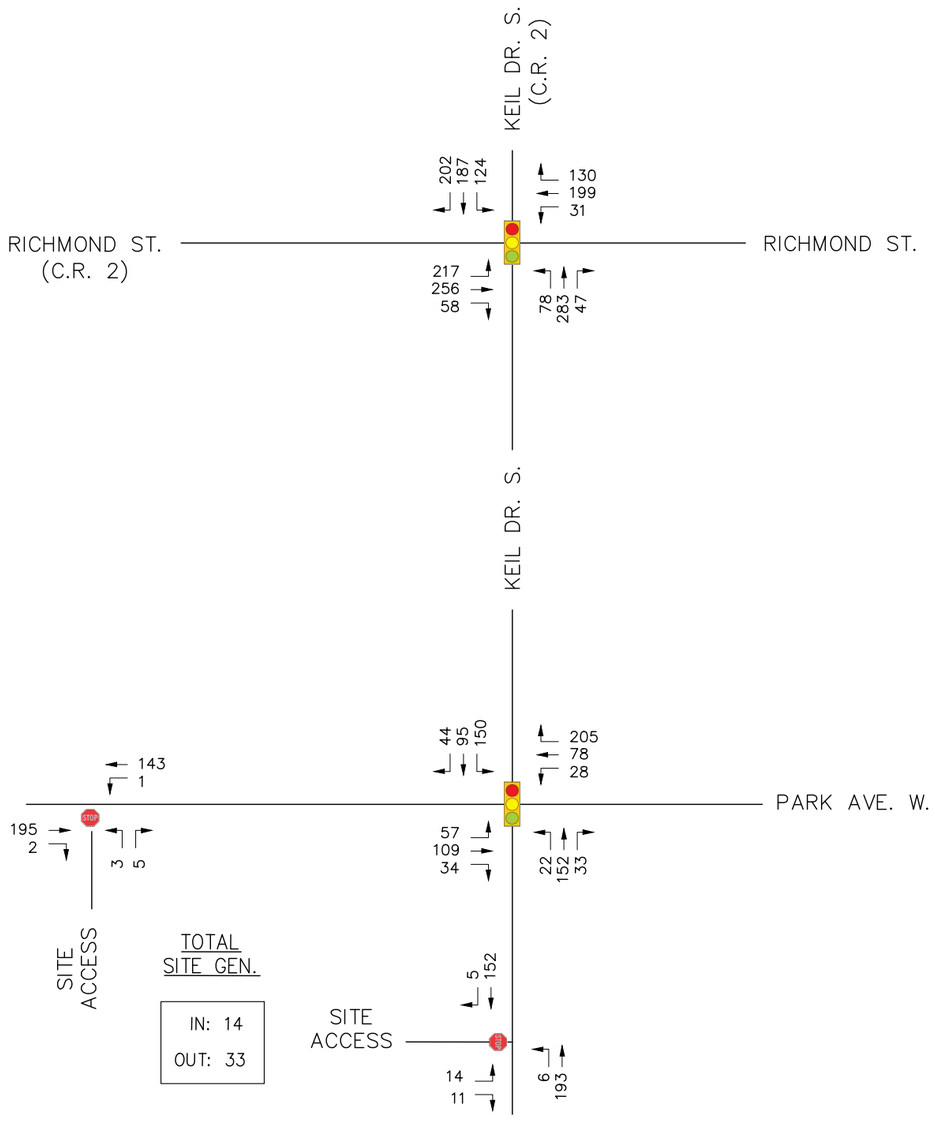
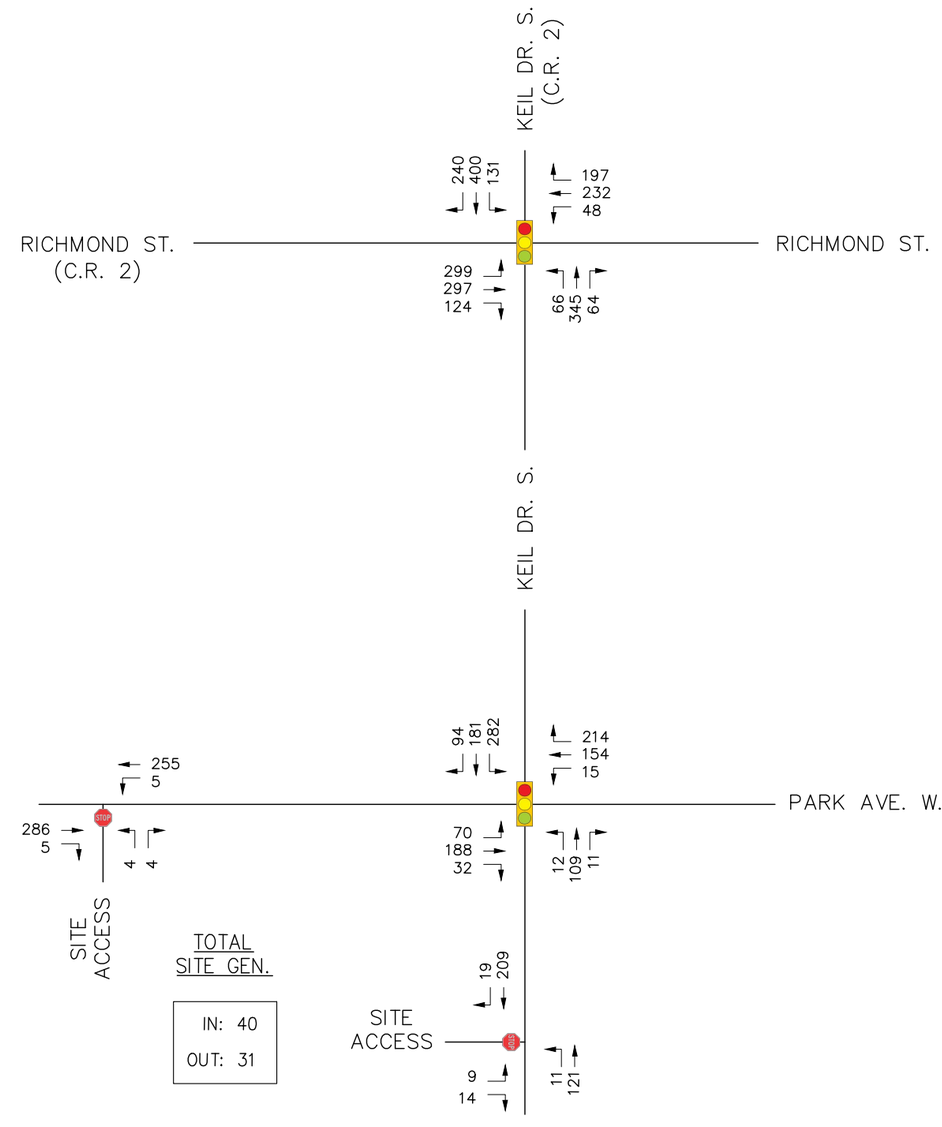
# EXISTING TRAFFIC (AM/PM PEAK HOUR)

PROJECT NO. 20–1083
FIGURE NO. 5
OF 9

## EXISTING + SITE GENERATED TRAFFIC (AM)




## EXISTING + SITE GENERATED TRAFFIC (PM)

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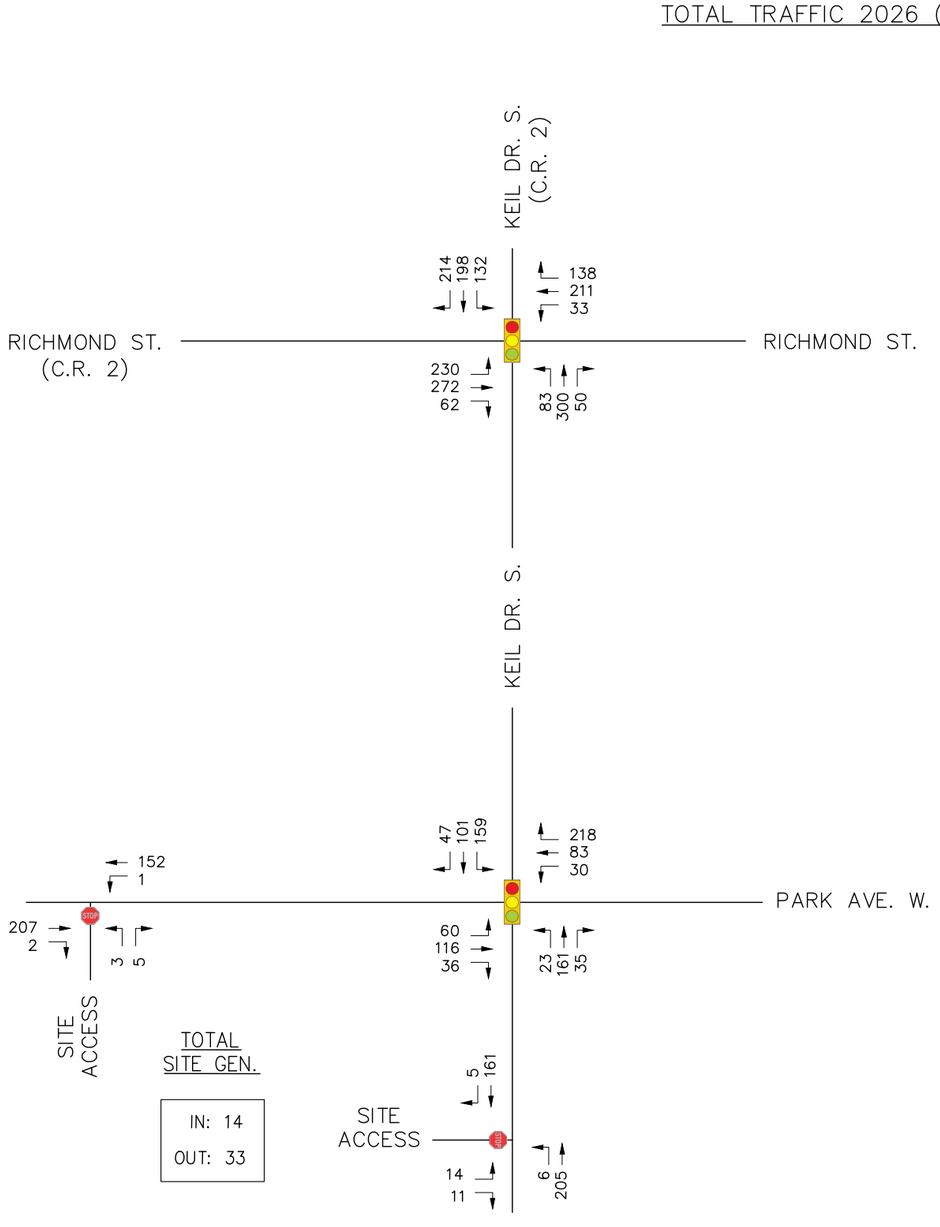
# EXISTING + SITE GENERATED TRAFFIC (AM/PM PEAK HOUR)

PROJECT NO. 20–1083
FIGURE NO. 6
OF 9

## TOTAL TRAFFIC 2026 (AM)

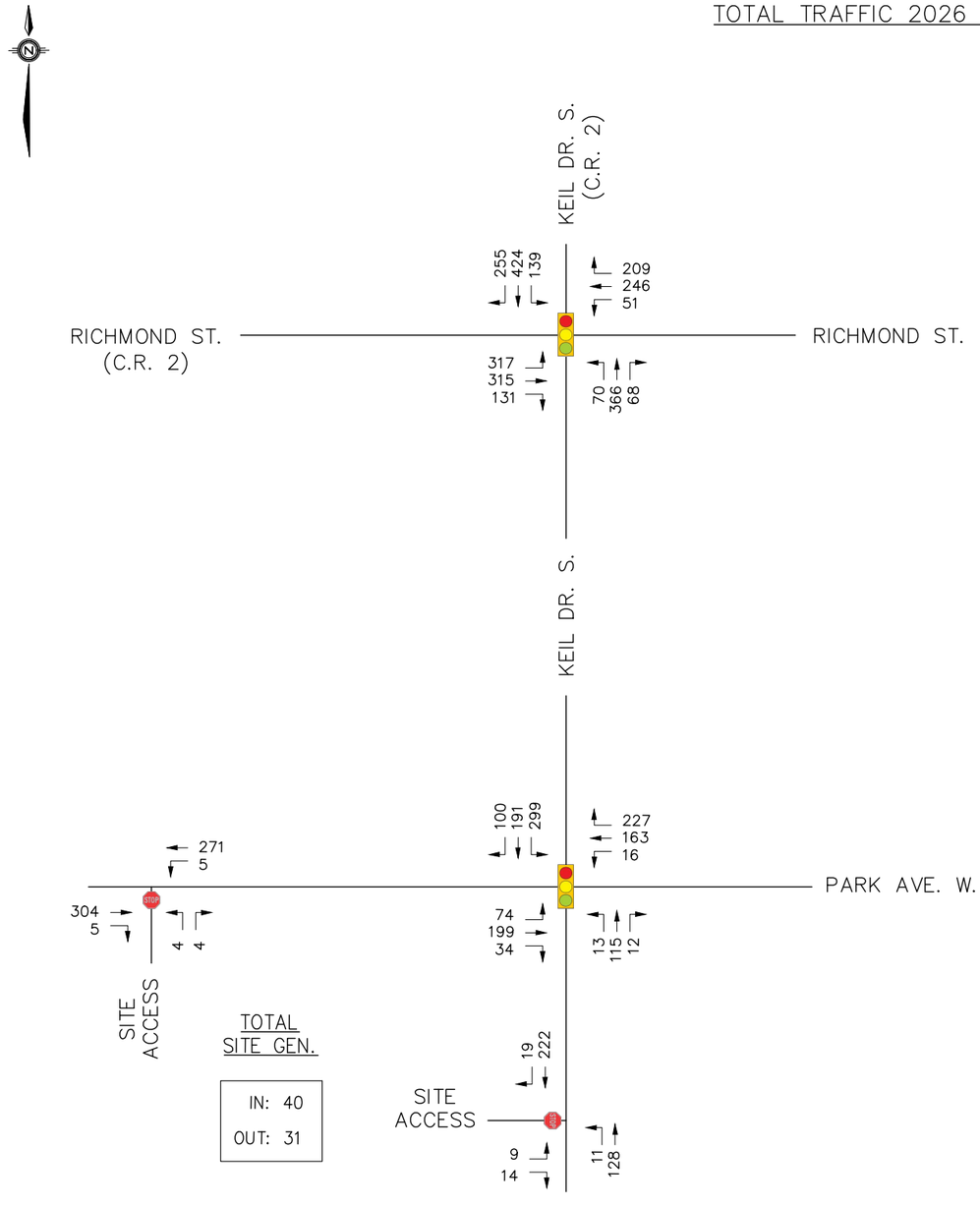



TOTAL SITE GEN.

IN: 14

OUT: 33

## TOTAL TRAFFIC 2026 (PM)




TOTAL SITE GEN.

IN: 40

OUT: 31

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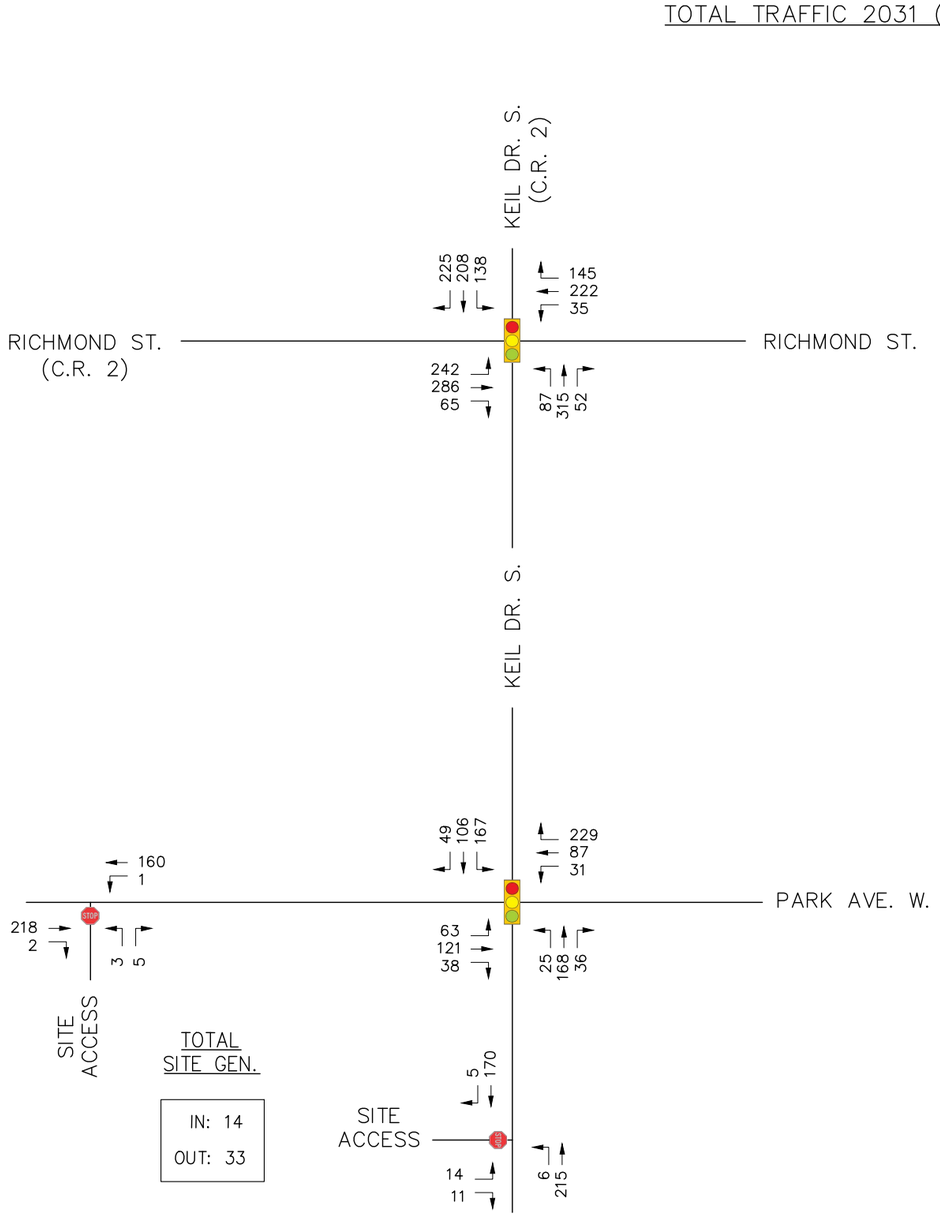
# TOTAL TRAFFIC 2026 (AM/PM PEAK HOUR)

PROJECT NO. 20–1083

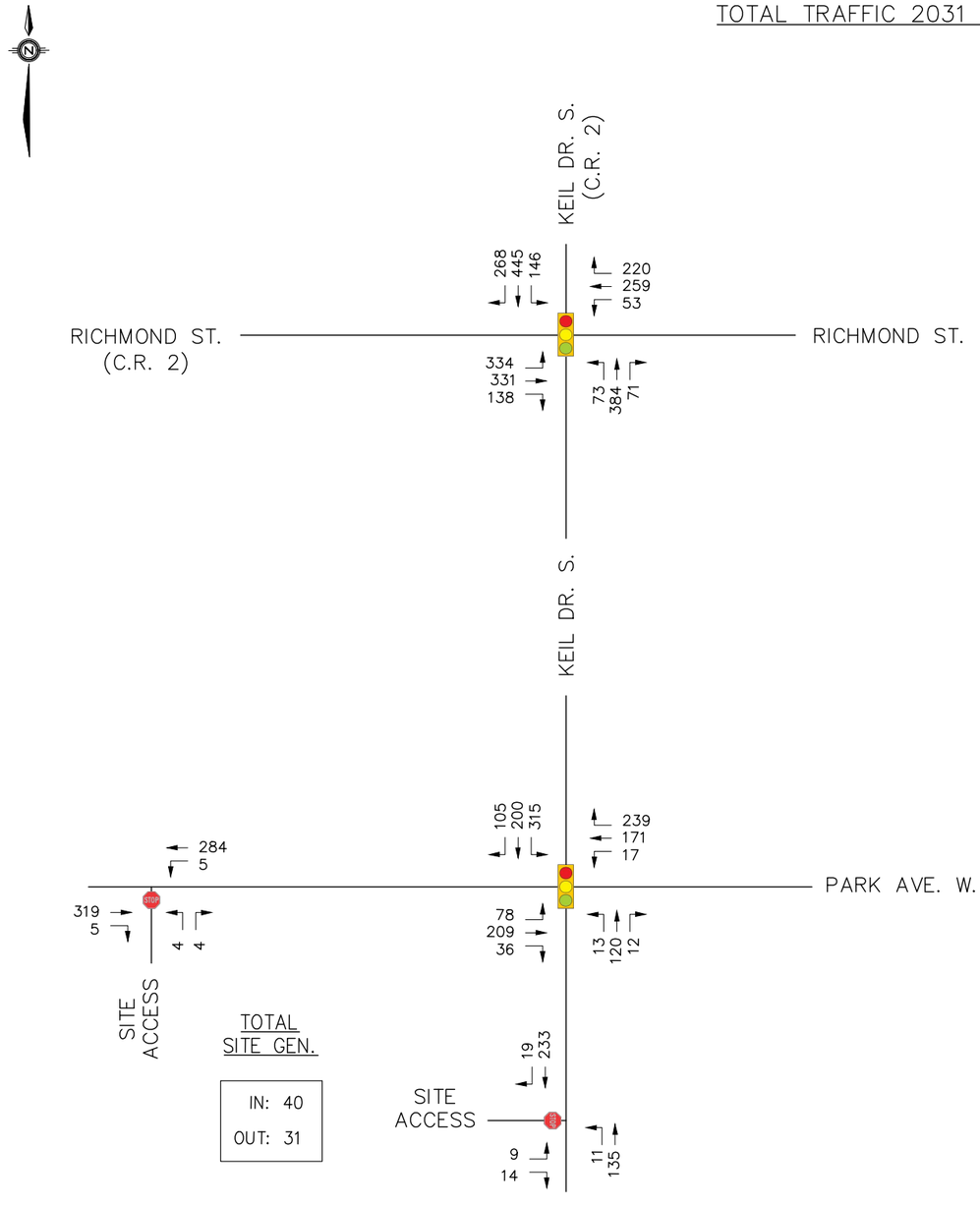
FIGURE NO. 7

OF 9

## TOTAL TRAFFIC 2031 (AM)




## TOTAL TRAFFIC 2031 (PM)

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# TOTAL TRAFFIC 2031 (AM/PM PEAK HOUR)

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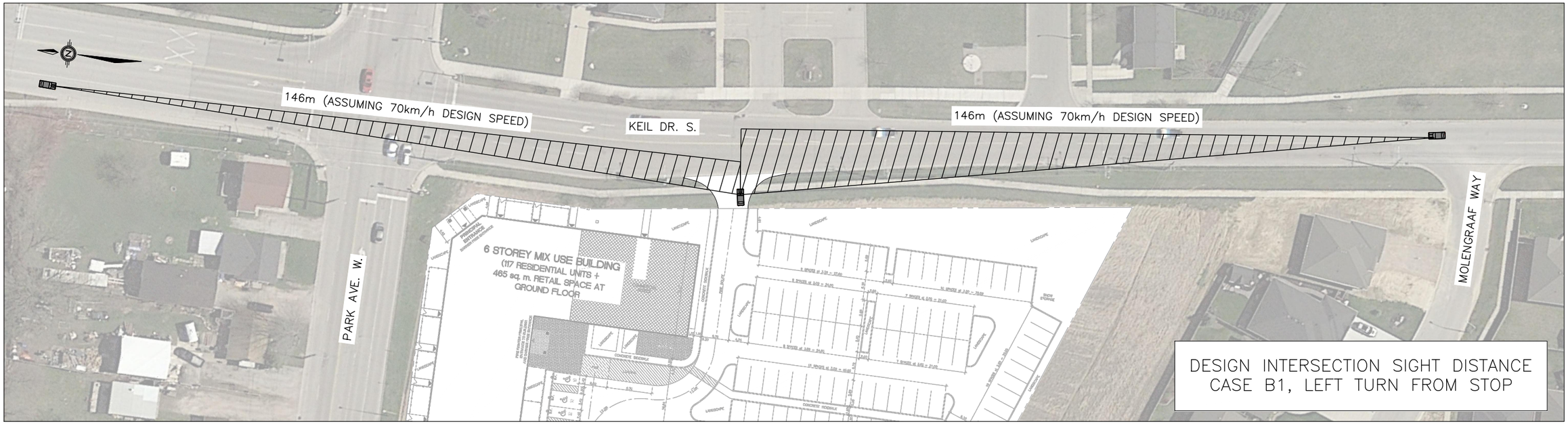
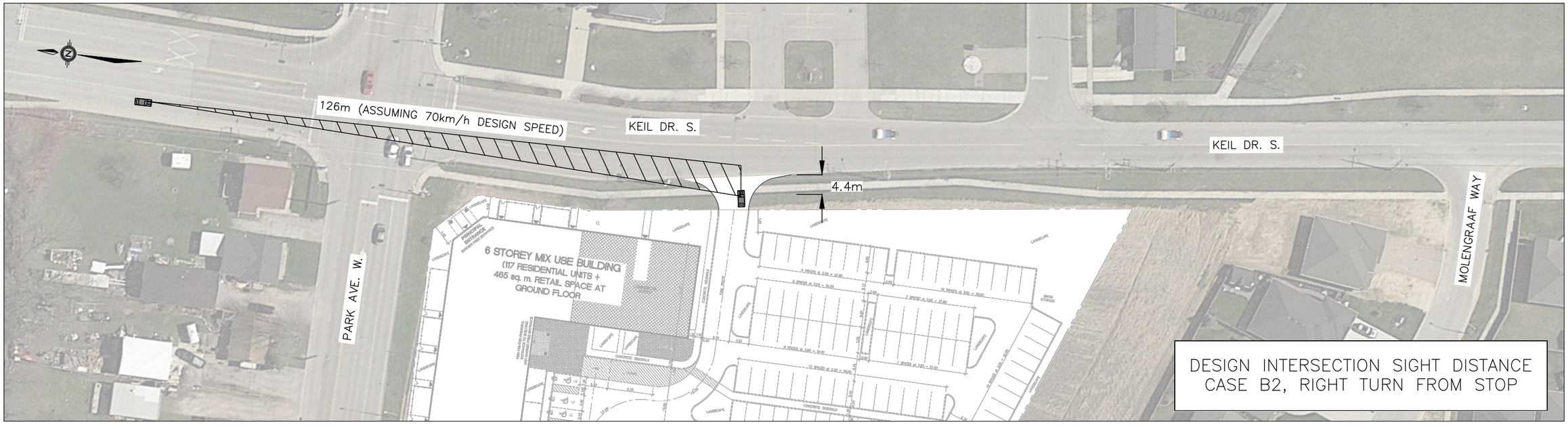
FIGURE NO. 8
OF 9




DESIGN INTERSECTION SIGHT DISTANCE
CASE B1, LEFT TURN FROM STOP




DESIGN INTERSECTION SIGHT DISTANCE
CASE B2, RIGHT TURN FROM STOP

RC SPENCER ASSOCIATES INC.
Consulting Engineers
**Windsor:** 800 University Avenue W. – Windsor ON N9A 5R9
**Leamington:** 18 Talbot Street W. – Leamington ON N8H 1M4
**Chatham-Kent:** 49 Raleigh Street – Chatham ON N7M 2M6
Professional Engineers Ontario

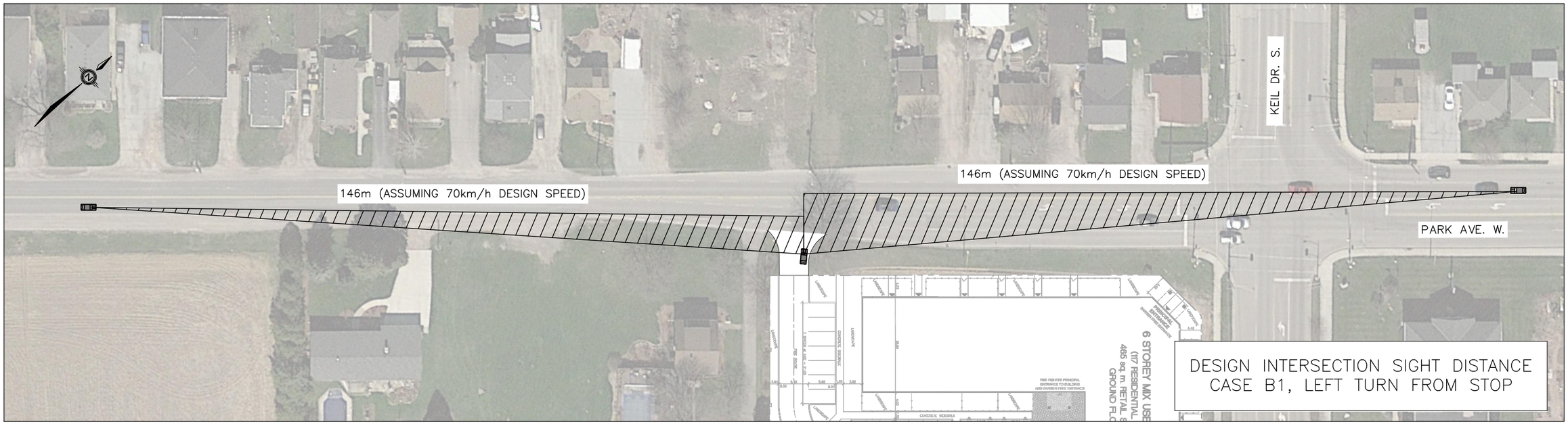
| NO. | REVISION | DATE | BY | APP |
|---|---|---|---|---|
| 1. | COMPLETED REPORT FIGURES | 12 FEB 2021 | A.D.B. | A.D.B. |

DESIGN A.D.B.
CHECKED J.T.
DRAWN A.D.B.
CHECKED A.D.B.
DATE FEBRUARY 2021
SCALE N.T.S.

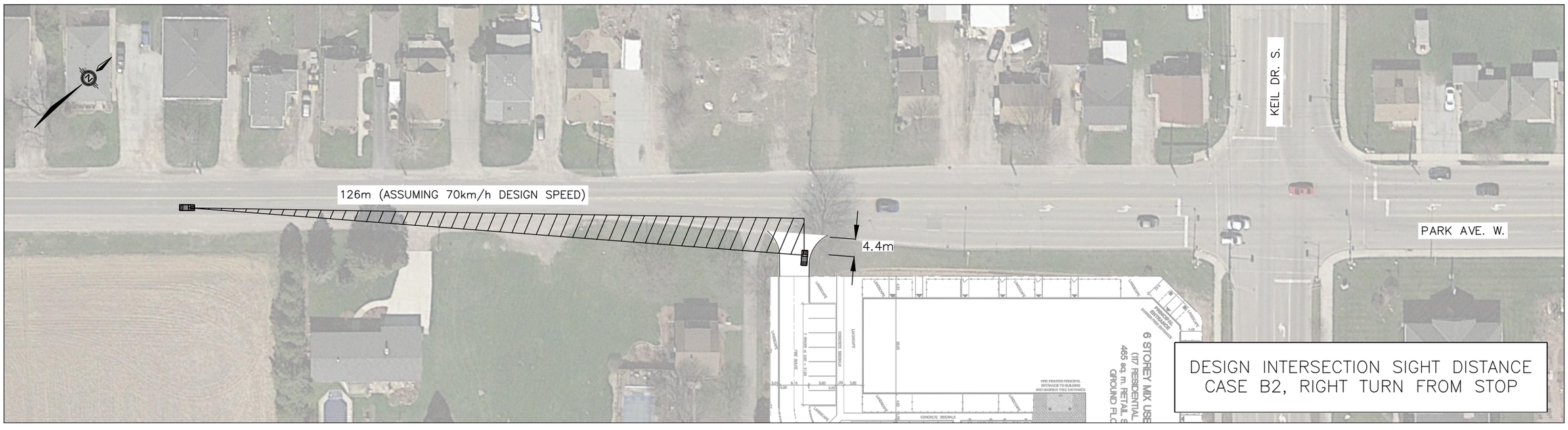
460 KEIL DRIVE SOUTH, CHATHAM – TIS

# SIGHT LINE ANALYSIS
# SITE ACCESS AT
# KEIL DRIVE SOUTH

PROJECT NO. 20–1083
FIGURE NO. 9A
OF 9




DESIGN INTERSECTION SIGHT DISTANCE
CASE B1, LEFT TURN FROM STOP




DESIGN INTERSECTION SIGHT DISTANCE
CASE B2, RIGHT TURN FROM STOP

RC SPENCER ASSOCIATES INC.
Consulting Engineers
**Windsor:** 800 University Avenue W. – Windsor ON N9A 5R9
**Leamington:** 18 Talbot Street W. – Leamington ON N8H 1M4
**Chatham-Kent:** 49 Raleigh Street – Chatham ON N7M 2M6
Professional Engineers Ontario

| NO. | REVISION | DATE | BY | APP |
|---|---|---|---|---|
| 1. | COMPLETED REPORT FIGURES | 12 FEB 2021 | A.D.B. | A.D.B. |

| | |
|---|---|
| DESIGN | A.D.B. |
| CHECKED | J.T. |
| DRAWN | A.D.B. |
| CHECKED | A.D.B. |
| DATE | FEBRUARY 2021 |
| SCALE | N.T.S. |

460 KEIL DRIVE SOUTH, CHATHAM – TIS

# SIGHT LINE ANALYSIS SITE ACCESS AT PARK AVENUE WEST

PROJECT NO. 20–1083

FIGURE NO. 9B

OF 9

# Appendix A

# TRAFFIC DATA COLLECTION

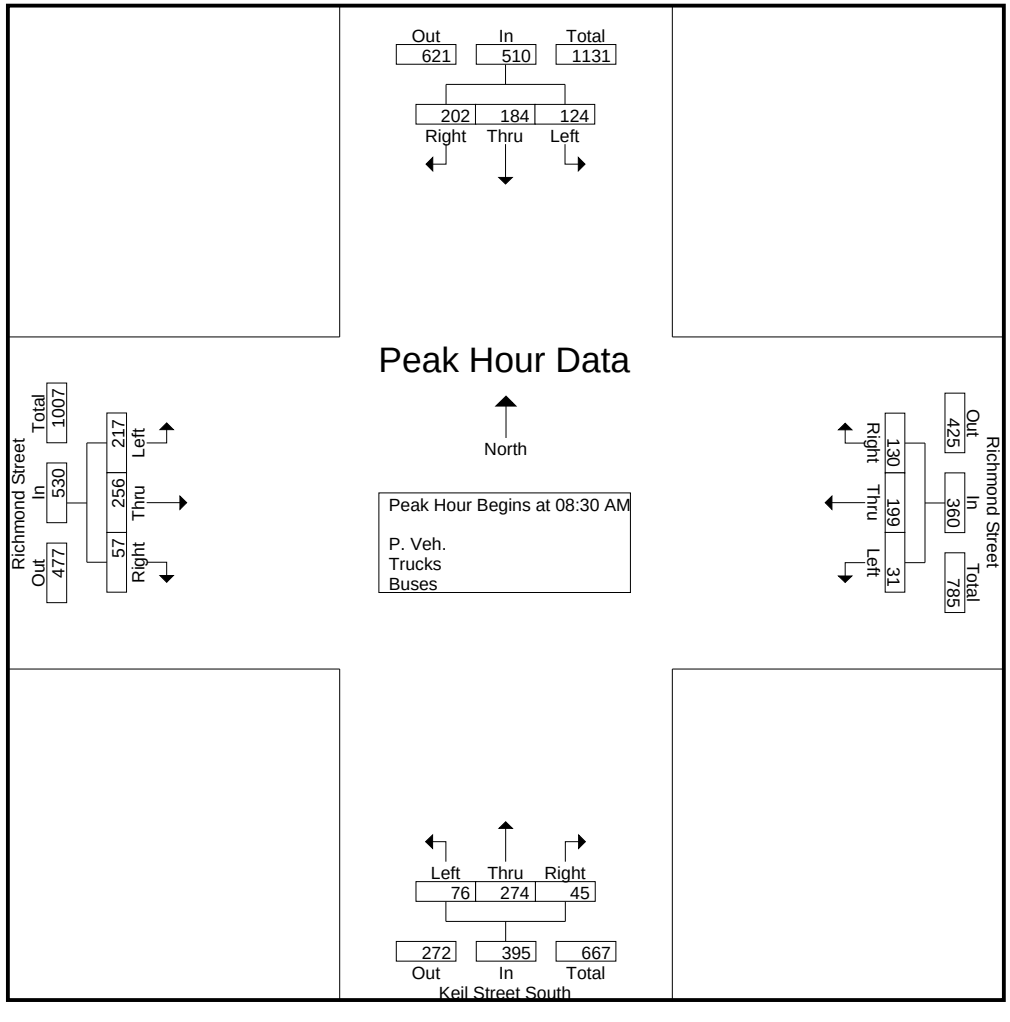
## Richmond Street at Keil Drive South
## Park Avenue West at Keil Drive South

Date: 17 December 2020
Counted By: Kevin Brito
Weather Conditions: Overcast / Snow
Richmond Street at Keil Drive South

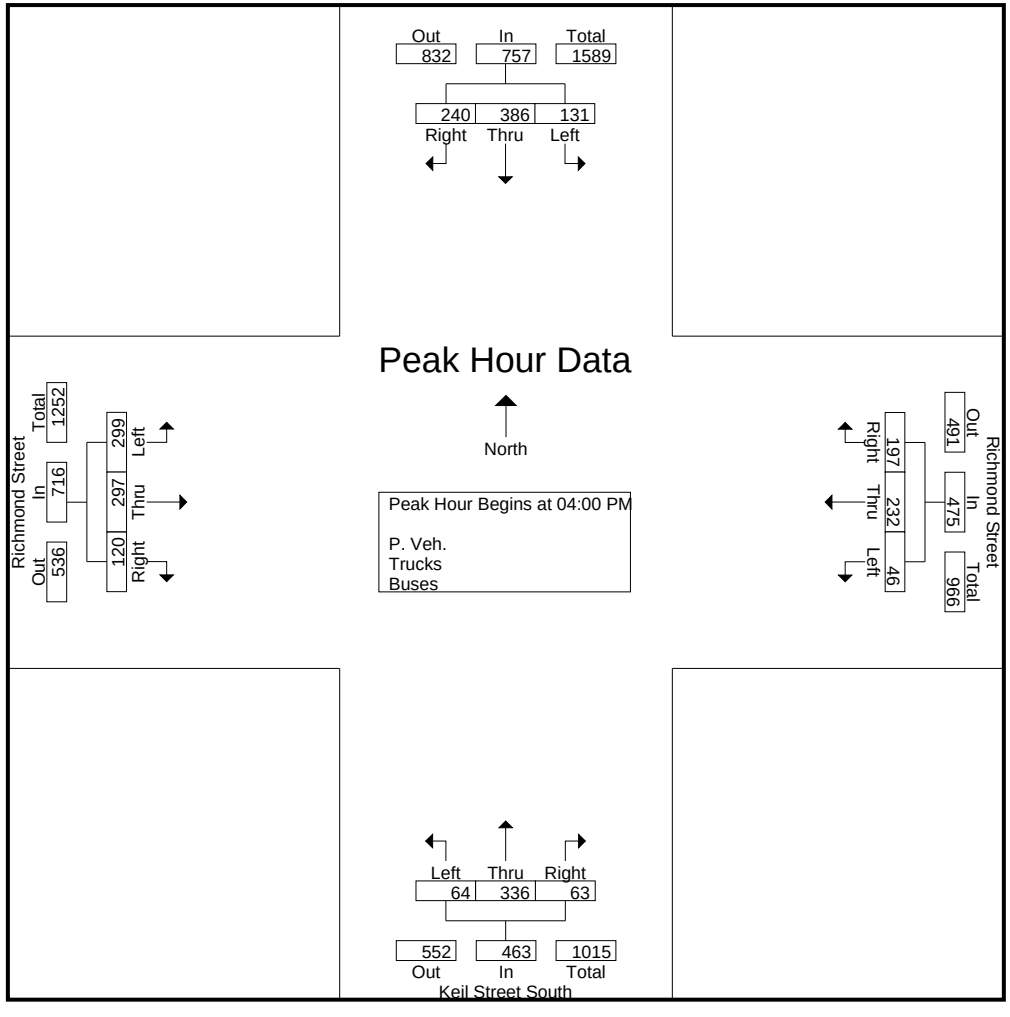
**Groups Printed- P. Veh. - Trucks - Buses**

| | Keil Street South N/B | | | | | S/B | | | | | Richmond Street E/B | | | | | Richmond Street W/B | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:30 AM | 7 | 47 | 35 | (2) | 89 | 45 | 37 | 16 | (0) | 98 | 7 | 58 | 44 | (0) | 109 | 16 | 60 | 4 | (0) | 80 | 2 | 376 | 378 |
| 07:45 AM | 19 | 81 | 24 | (1) | 124 | 45 | 44 | 37 | (0) | 126 | 9 | 76 | 49 | (2) | 134 | 17 | 49 | 15 | (1) | 81 | 4 | 465 | 469 |
| Total | 26 | 128 | 59 | (3) | 213 | 90 | 81 | 53 | (0) | 224 | 16 | 134 | 93 | (2) | 243 | 33 | 109 | 19 | (1) | 161 | 6 | 841 | 847 |
| 08:00 AM | 14 | 52 | 26 | (1) | 92 | 45 | 49 | 15 | (0) | 109 | 20 | 70 | 55 | (0) | 145 | 30 | 67 | 3 | (0) | 100 | 1 | 446 | 447 |
| 08:15 AM | 11 | 49 | 21 | (0) | 81 | 46 | 48 | 18 | (0) | 112 | 21 | 66 | 51 | (0) | 138 | 20 | 42 | 13 | (1) | 75 | 1 | 406 | 407 |
| 08:30 AM | 17 | 54 | 24 | (0) | 95 | 48 | 42 | 18 | (1) | 108 | 15 | 87 | 73 | (0) | 175 | 26 | 46 | 10 | (0) | 82 | 1 | 460 | 461 |
| 08:45 AM | 10 | 86 | 27 | (0) | 123 | 53 | 46 | 43 | (0) | 142 | 15 | 54 | 48 | (0) | 117 | 33 | 54 | 8 | (0) | 95 | 0 | 477 | 477 |
| Total | 52 | 241 | 98 | (1) | 391 | 192 | 185 | 94 | (1) | 471 | 71 | 277 | 227 | (0) | 575 | 109 | 209 | 34 | (1) | 352 | 3 | 1789 | 1792 |
| 09:00 AM | 14 | 72 | 17 | (1) | 103 | 51 | 49 | 37 | (0) | 137 | 14 | 56 | 45 | (0) | 115 | 32 | 51 | 6 | (0) | 89 | 1 | 444 | 445 |
| 09:15 AM | 4 | 62 | 8 | (0) | 74 | 50 | 47 | 26 | (0) | 123 | 13 | 59 | 51 | (1) | 123 | 39 | 48 | 7 | (0) | 94 | 1 | 414 | 415 |
| 09:30 AM | 4 | 43 | 17 | (1) | 64 | 39 | 43 | 38 | (0) | 120 | 15 | 60 | 54 | (0) | 129 | 32 | 59 | 2 | (0) | 93 | 1 | 406 | 407 |
| 09:45 AM | 9 | 51 | 22 | (0) | 82 | 53 | 45 | 27 | (0) | 125 | 25 | 45 | 47 | (1) | 117 | 26 | 61 | 9 | (3) | 96 | 4 | 420 | 424 |
| Total | 31 | 228 | 64 | (2) | 323 | 193 | 184 | 128 | (0) | 505 | 67 | 220 | 197 | (2) | 484 | 129 | 219 | 24 | (3) | 372 | 7 | 1684 | 1691 |
| *** BREAK *** | | | | | | | | | | | | | | | | | | | | | | | |
| 04:00 PM | 11 | 84 | 15 | (0) | 110 | 61 | 97 | 29 | (1) | 187 | 51 | 80 | 79 | (0) | 210 | 55 | 61 | 11 | (2) | 127 | 3 | 634 | 637 |
| 04:15 PM | 17 | 84 | 17 | (1) | 118 | 59 | 107 | 35 | (0) | 201 | 24 | 72 | 61 | (0) | 157 | 44 | 63 | 11 | (1) | 118 | 2 | 594 | 596 |
| 04:30 PM | 16 | 76 | 19 | (2) | 111 | 58 | 86 | 38 | (0) | 182 | 26 | 80 | 75 | (1) | 181 | 50 | 60 | 11 | (0) | 121 | 3 | 595 | 598 |
| 04:45 PM | 19 | 92 | 13 | (0) | 124 | 62 | 96 | 29 | (0) | 187 | 19 | 65 | 84 | (1) | 168 | 48 | 48 | 13 | (0) | 109 | 1 | 588 | 589 |
| Total | 63 | 336 | 64 | (3) | 463 | 240 | 386 | 131 | (1) | 757 | 120 | 297 | 299 | (2) | 716 | 197 | 232 | 46 | (3) | 475 | 9 | 2411 | 2420 |
| 05:00 PM | 12 | 74 | 18 | (1) | 104 | 56 | 109 | 39 | (0) | 204 | 31 | 71 | 88 | (2) | 190 | 39 | 64 | 20 | (0) | 123 | 3 | 621 | 624 |
| 05:15 PM | 14 | 70 | 14 | (0) | 98 | 62 | 99 | 27 | (0) | 188 | 34 | 53 | 68 | (3) | 155 | 55 | 56 | 12 | (1) | 123 | 4 | 564 | 568 |
| 05:30 PM | 11 | 77 | 23 | (2) | 111 | 42 | 78 | 35 | (0) | 155 | 25 | 40 | 46 | (1) | 111 | 17 | 35 | 7 | (1) | 59 | 4 | 436 | 440 |
| 05:45 PM | 6 | 53 | 13 | (0) | 72 | 52 | 64 | 32 | (0) | 148 | 15 | 52 | 49 | (0) | 116 | 26 | 41 | 8 | (0) | 75 | 0 | 411 | 411 |
| Total | 43 | 274 | 68 | (3) | 385 | 212 | 350 | 133 | (0) | 695 | 105 | 216 | 251 | (6) | 572 | 137 | 196 | 47 | (2) | 380 | 11 | 2032 | 2043 |
| Grand Total | 215 | 1207 | 353 | (12) | 1775 | 927 | 1186 | 539 | (2) | 2652 | 379 | 1144 | 1067 | (12) | 2590 | 605 | 965 | 170 | (10) | 1740 | 36 | 8757 | 8793 |
| Apprch % | 12.1 | 68 | 19.9 | | | 35 | 44.7 | 20.3 | | | 14.6 | 44.2 | 41.2 | | | 34.8 | 55.5 | 9.8 | | | | | |
| Total % | 2.5 | 13.8 | 4 | | 20.3 | 10.6 | 13.5 | 6.2 | | 30.3 | 4.3 | 13.1 | 12.2 | | 29.6 | 6.9 | 11 | 1.9 | | 19.9 | 0.4 | 99.6 | |
| P. Veh. | 207 | 1183 | 334 | | 1736 | 866 | 1175 | 510 | | 2553 | 353 | 1065 | 1009 | | 2439 | 588 | 894 | 167 | | 1659 | 0 | 0 | 8387 |
| % P. Veh. | 96.3 | 98 | 94.6 | 100 | 97.1 | 93.4 | 99.1 | 94.6 | 100 | 96.2 | 93.1 | 93.1 | 94.6 | 100 | 93.7 | 97.2 | 92.6 | 98.2 | 100 | 94.8 | 0 | 0 | 95.4 |
| Trucks | 3 | 17 | 17 | | 37 | 46 | 7 | 8 | | 61 | 24 | 67 | 49 | | 140 | 13 | 67 | 3 | | 83 | 0 | 0 | 321 |
| % Trucks | 1.4 | 1.4 | 4.8 | 0 | 2.1 | 5 | 0.6 | 1.5 | 0 | 2.3 | 6.3 | 5.9 | 4.6 | 0 | 5.4 | 2.1 | 6.9 | 1.8 | 0 | 4.7 | 0 | 0 | 3.7 |
| Buses | 5 | 7 | 2 | | 14 | 15 | 4 | 21 | | 40 | 2 | 12 | 9 | | 23 | 4 | 4 | 0 | | 8 | 0 | 0 | 85 |
| % Buses | 2.3 | 0.6 | 0.6 | 0 | 0.8 | 1.6 | 0.3 | 3.9 | 0 | 1.5 | 0.5 | 1 | 0.8 | 0 | 0.9 | 0.7 | 0.4 | 0 | 0 | 0.5 | 0 | 0 | 1 |

| | Keil Street South N/B | | | | S/B | | | | Richmond Street E/B | | | | Richmond Street W/B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:30 AM | | | | | | | | | | | | | | | | | |
| 08:30 AM | **17** | 54 | 24 | 95 | 48 | 42 | 18 | 108 | **15** | **87** | **73** | **175** | 26 | 46 | **10** | 82 | 460 |
| 08:45 AM | 10 | **86** | **27** | **123** | **53** | 46 | **43** | **142** | 15 | 54 | 48 | 117 | 33 | **54** | 8 | **95** | **477** |
| 09:00 AM | 14 | 72 | 17 | 103 | 51 | **49** | 37 | 137 | 14 | 56 | 45 | 115 | 32 | 51 | 6 | 89 | 444 |
| 09:15 AM | 4 | 62 | 8 | 74 | 50 | 47 | 26 | 123 | 13 | 59 | 51 | 123 | **39** | 48 | 7 | 94 | 414 |
| Total Volume | 45 | 274 | 76 | 395 | 202 | 184 | 124 | 510 | 57 | 256 | 217 | 530 | 130 | 199 | 31 | 360 | 1795 |
| % App. Total | 11.4 | 69.4 | 19.2 | | 39.6 | 36.1 | 24.3 | | 10.8 | 48.3 | 40.9 | | 36.1 | 55.3 | 8.6 | | |
| PHF | .662 | .797 | .704 | .803 | .953 | .939 | .721 | .898 | .950 | .736 | .743 | .757 | .833 | .921 | .775 | .947 | .941 |



| | Keil Street South N/B | | | | S/B | | | | Richmond Street E/B | | | | Richmond Street W/B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 11 | 84 | 15 | 110 | 61 | 97 | 29 | 187 | **51** | **80** | 79 | **210** | **55** | 61 | 11 | **127** | **634** |
| 04:15 PM | 17 | 84 | 17 | 118 | 59 | **107** | 35 | **201** | 24 | 72 | 61 | 157 | 44 | **63** | 11 | 118 | 594 |
| 04:30 PM | 16 | 76 | **19** | 111 | 58 | 86 | **38** | 182 | 26 | 80 | 75 | 181 | 50 | 60 | 11 | 121 | 595 |
| 04:45 PM | **19** | **92** | 13 | **124** | **62** | 96 | 29 | 187 | 19 | 65 | **84** | 168 | 48 | 48 | **13** | 109 | 588 |
| Total Volume | 63 | 336 | 64 | 463 | 240 | 386 | 131 | 757 | 120 | 297 | 299 | 716 | 197 | 232 | 46 | 475 | 2411 |
| % App. Total | 13.6 | 72.6 | 13.8 | | 31.7 | 51 | 17.3 | | 16.8 | 41.5 | 41.8 | | 41.5 | 48.8 | 9.7 | | |
| PHF | .829 | .913 | .842 | .933 | .968 | .902 | .862 | .942 | .588 | .928 | .890 | .852 | .895 | .921 | .885 | .935 | .951 |

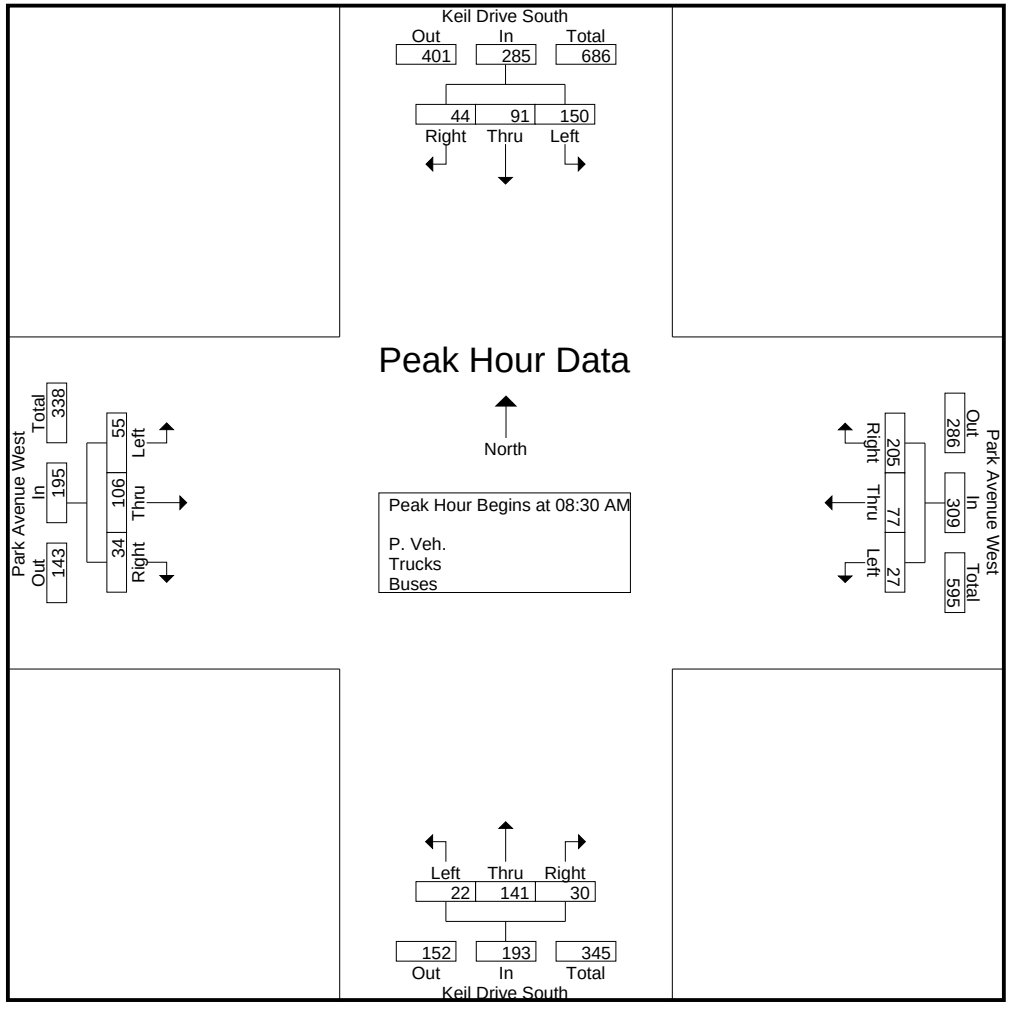


Date: 16 December 2020
Counted By: Kevin Brito
Weather Conditions: Overcast / Snow
Park Avenue West at Keil Drive South

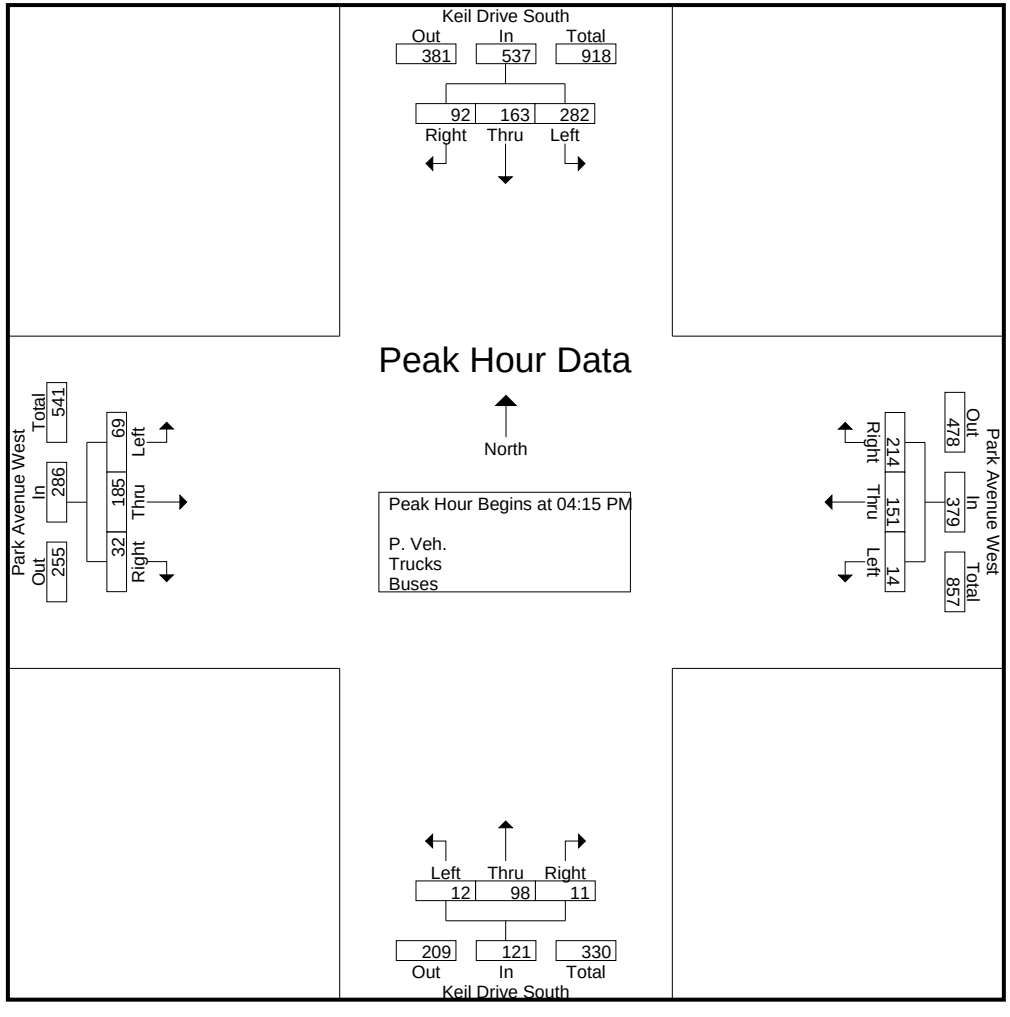
**Groups Printed- P. Veh. - Trucks - Buses**

| | Keil Drive South N/B | | | | | Keil Drive South S/B | | | | | Park Avenue West E/B | | | | | Park Avenue West W/B | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:30 AM | 4 | 33 | 5 | (0) | 42 | 8 | 10 | 26 | (0) | 44 | 1 | 27 | 18 | (0) | 46 | 50 | 35 | 7 | (0) | 92 | 0 | 224 | 224 |
| 07:45 AM | 1 | 32 | 6 | (0) | 39 | 13 | 10 | 26 | (0) | 49 | 10 | 42 | 22 | (0) | 74 | 51 | 30 | 0 | (0) | 81 | 0 | 243 | 243 |
| Total | 5 | 65 | 11 | (0) | 81 | 21 | 20 | 52 | (0) | 93 | 11 | 69 | 40 | (0) | 120 | 101 | 65 | 7 | (0) | 173 | 0 | 467 | 467 |
| 08:00 AM | 2 | 28 | 5 | (0) | 35 | 11 | 22 | 27 | (0) | 60 | 3 | 25 | 15 | (0) | 43 | 38 | 36 | 3 | (0) | 77 | 0 | 215 | 215 |
| 08:15 AM | 1 | 28 | 1 | (0) | 30 | 8 | 24 | 22 | (0) | 54 | 8 | 32 | 14 | (0) | 54 | 39 | 20 | 10 | (0) | 69 | 0 | 207 | 207 |
| 08:30 AM | 15 | 53 | 9 | (0) | 77 | 10 | 23 | 28 | (0) | 61 | 16 | 29 | 19 | (0) | 64 | 37 | 19 | 17 | (0) | 73 | 0 | 275 | 275 |
| 08:45 AM | 8 | 52 | 6 | (0) | 66 | 14 | 23 | 28 | (0) | 65 | 11 | 28 | 14 | (0) | 53 | 65 | 27 | 6 | (0) | 98 | 0 | 282 | 282 |
| Total | 26 | 161 | 21 | (0) | 208 | 43 | 92 | 105 | (0) | 240 | 38 | 114 | 62 | (0) | 214 | 179 | 102 | 36 | (0) | 317 | 0 | 979 | 979 |
| 09:00 AM | 3 | 19 | 4 | (0) | 26 | 8 | 21 | 51 | (0) | 80 | 2 | 18 | 10 | (0) | 30 | 51 | 16 | 3 | (0) | 70 | 0 | 206 | 206 |
| 09:15 AM | 4 | 17 | 3 | (0) | 24 | 12 | 24 | 43 | (0) | 79 | 5 | 31 | 12 | (0) | 48 | 52 | 15 | 1 | (1) | 68 | 1 | 219 | 220 |
| 09:30 AM | 5 | 17 | 4 | (0) | 26 | 10 | 20 | 43 | (0) | 73 | 4 | 25 | 12 | (0) | 41 | 43 | 14 | 0 | (0) | 57 | 0 | 197 | 197 |
| 09:45 AM | 2 | 28 | 5 | (0) | 35 | 7 | 14 | 29 | (1) | 50 | 4 | 21 | 15 | (1) | 40 | 57 | 11 | 1 | (0) | 69 | 2 | 194 | 196 |
| Total | 14 | 81 | 16 | (0) | 111 | 37 | 79 | 166 | (1) | 282 | 15 | 95 | 49 | (1) | 159 | 203 | 56 | 5 | (1) | 264 | 3 | 816 | 819 |
| *** BREAK *** | | | | | | | | | | | | | | | | | | | | | | | |
| 04:00 PM | 3 | 27 | 7 | (1) | 37 | 20 | 46 | 60 | (0) | 126 | 9 | 46 | 19 | (0) | 74 | 68 | 29 | 2 | (0) | 99 | 1 | 336 | 337 |
| 04:15 PM | 4 | 22 | 1 | (0) | 27 | 32 | 36 | 59 | (0) | 127 | 7 | 39 | 16 | (0) | 62 | 52 | 36 | 6 | (0) | 94 | 0 | 310 | 310 |
| 04:30 PM | 4 | 29 | 2 | (0) | 35 | 9 | 43 | 76 | (0) | 128 | 11 | 47 | 19 | (0) | 77 | 62 | 42 | 3 | (1) | 107 | 1 | 347 | 348 |
| 04:45 PM | 3 | 28 | 3 | (0) | 34 | 23 | 38 | 75 | (0) | 136 | 7 | 43 | 14 | (0) | 64 | 54 | 36 | 3 | (0) | 93 | 0 | 327 | 327 |
| Total | 14 | 106 | 13 | (1) | 133 | 84 | 163 | 270 | (0) | 517 | 34 | 175 | 68 | (0) | 277 | 236 | 143 | 14 | (1) | 393 | 2 | 1320 | 1322 |
| 05:00 PM | 0 | 19 | 6 | (0) | 25 | 28 | 46 | 72 | (0) | 146 | 7 | 56 | 20 | (0) | 83 | 46 | 37 | 2 | (0) | 85 | 0 | 339 | 339 |
| 05:15 PM | 3 | 28 | 0 | (0) | 31 | 25 | 28 | 50 | (0) | 103 | 8 | 42 | 13 | (1) | 63 | 55 | 30 | 2 | (2) | 87 | 3 | 284 | 287 |
| 05:30 PM | 1 | 11 | 3 | (0) | 15 | 11 | 33 | 49 | (2) | 93 | 4 | 26 | 8 | (0) | 38 | 40 | 19 | 4 | (0) | 63 | 2 | 209 | 211 |
| 05:45 PM | 3 | 22 | 2 | (0) | 27 | 13 | 29 | 29 | (0) | 71 | 2 | 33 | 8 | (0) | 43 | 35 | 32 | 4 | (0) | 71 | 0 | 212 | 212 |
| Total | 7 | 80 | 11 | (0) | 98 | 77 | 136 | 200 | (2) | 413 | 21 | 157 | 49 | (1) | 227 | 176 | 118 | 12 | (2) | 306 | 5 | 1044 | 1049 |
| Grand Total | 66 | 493 | 72 | (1) | 631 | 262 | 490 | 793 | (3) | 1545 | 119 | 610 | 268 | (2) | 997 | 895 | 484 | 74 | (4) | 1453 | 10 | 4626 | 4636 |
| Apprch % | 10.5 | 78.1 | 11.4 | | | 17 | 31.7 | 51.3 | | | 11.9 | 61.2 | 26.9 | | | 61.6 | 33.3 | 5.1 | | | | | |
| Total % | 1.4 | 10.7 | 1.6 | | 13.6 | 5.7 | 10.6 | 17.1 | | 33.4 | 2.6 | 13.2 | 5.8 | | 21.6 | 19.3 | 10.5 | 1.6 | | 31.4 | 0.2 | 99.8 | |
| P. Veh. | 65 | 488 | 70 | | 624 | 253 | 486 | 755 | | 1497 | 106 | 577 | 259 | | 944 | 861 | 460 | 70 | | 1394 | 0 | 0 | 4459 |
| % P. Veh. | 98.5 | 99 | 97.2 | 100 | 98.7 | 96.6 | 99.2 | 95.2 | 100 | 96.7 | 89.1 | 94.6 | 96.6 | 100 | 94.5 | 96.2 | 95 | 94.6 | 75 | 95.7 | 0 | 0 | 96.2 |
| Trucks | 0 | 2 | 1 | | 3 | 9 | 1 | 35 | | 45 | 0 | 26 | 5 | | 31 | 32 | 19 | 2 | | 54 | 0 | 0 | 133 |
| % Trucks | 0 | 0.4 | 1.4 | 0 | 0.5 | 3.4 | 0.2 | 4.4 | 0 | 2.9 | 0 | 4.3 | 1.9 | 0 | 3.1 | 3.6 | 3.9 | 2.7 | 25 | 3.7 | 0 | 0 | 2.9 |
| Buses | 1 | 3 | 1 | | 5 | 0 | 3 | 3 | | 6 | 13 | 7 | 4 | | 24 | 2 | 5 | 2 | | 9 | 0 | 0 | 44 |
| % Buses | 1.5 | 0.6 | 1.4 | 0 | 0.8 | 0 | 0.6 | 0.4 | 0 | 0.4 | 10.9 | 1.1 | 1.5 | 0 | 2.4 | 0.2 | 1 | 2.7 | 0 | 0.6 | 0 | 0 | 0.9 |

| | Keil Drive South N/B | | | | Keil Drive South S/B | | | | Park Avenue West E/B | | | | Park Avenue West W/B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:30 AM | | | | | | | | | | | | | | | | | |
| 08:30 AM | **15** | **53** | **9** | **77** | 10 | 23 | 28 | 61 | **16** | 29 | **19** | **64** | 37 | 19 | **17** | 73 | 275 |
| 08:45 AM | 8 | 52 | 6 | 66 | **14** | 23 | 28 | 65 | 11 | 28 | 14 | 53 | **65** | **27** | 6 | **98** | **282** |
| 09:00 AM | 3 | 19 | 4 | 26 | 8 | 21 | **51** | **80** | 2 | 18 | 10 | 30 | 51 | 16 | 3 | 70 | 206 |
| 09:15 AM | 4 | 17 | 3 | 24 | 12 | **24** | 43 | 79 | 5 | **31** | 12 | 48 | 52 | 15 | 1 | 68 | 219 |
| Total Volume | 30 | 141 | 22 | 193 | 44 | 91 | 150 | 285 | 34 | 106 | 55 | 195 | 205 | 77 | 27 | 309 | 982 |
| % App. Total | 15.5 | 73.1 | 11.4 | | 15.4 | 31.9 | 52.6 | | 17.4 | 54.4 | 28.2 | | 66.3 | 24.9 | 8.7 | | |
| PHF | .500 | .665 | .611 | .627 | .786 | .948 | .735 | .891 | .531 | .855 | .724 | .762 | .788 | .713 | .397 | .788 | .871 |



| | Keil Drive South N/B | | | | Keil Drive South S/B | | | | Park Avenue West E/B | | | | Park Avenue West W/B | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Right | Thru | Left | App. Total | Int. Total |
| Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | **4** | 22 | 1 | 27 | **32** | 36 | 59 | 127 | 7 | 39 | 16 | 62 | 52 | 36 | **6** | 94 | 310 |
| 04:30 PM | 4 | **29** | 2 | **35** | 9 | 43 | **76** | 128 | **11** | 47 | 19 | 77 | **62** | **42** | 3 | **107** | **347** |
| 04:45 PM | 3 | 28 | 3 | 34 | 23 | 38 | 75 | 136 | 7 | 43 | 14 | 64 | 54 | 36 | 3 | 93 | 327 |
| 05:00 PM | 0 | 19 | **6** | 25 | 28 | **46** | 72 | **146** | 7 | **56** | **20** | **83** | 46 | 37 | 2 | 85 | 339 |
| Total Volume | 11 | 98 | 12 | 121 | 92 | 163 | 282 | 537 | 32 | 185 | 69 | 286 | 214 | 151 | 14 | 379 | 1323 |
| % App. Total | 9.1 | 81 | 9.9 | | 17.1 | 30.4 | 52.5 | | 11.2 | 64.7 | 24.1 | | 56.5 | 39.8 | 3.7 | | |
| PHF | .688 | .845 | .500 | .864 | .719 | .886 | .928 | .920 | .727 | .826 | .863 | .861 | .863 | .899 | .583 | .886 | .953 |



## Appendix B

# ITE TRIP GENERATION MANUAL – 10TH EDITION REFERENCES

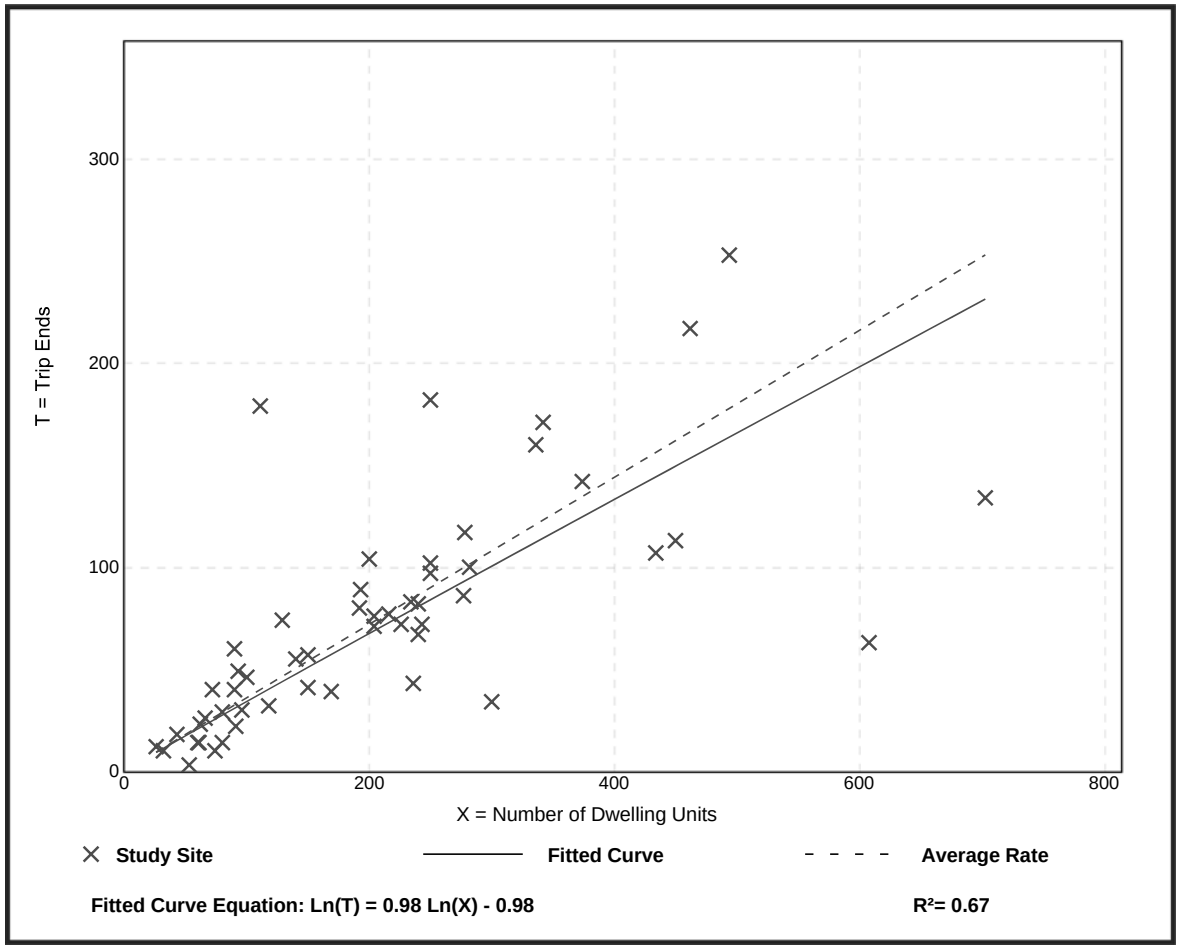
# Multifamily Housing (Mid-Rise)
(221)

**Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 7 and 9 a.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 53
Avg. Num. of Dwelling Units: 207
Directional Distribution: 26% entering, 74% exiting

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.36 | 0.06 - 1.61 | 0.19 |

## Data Plot and Equation



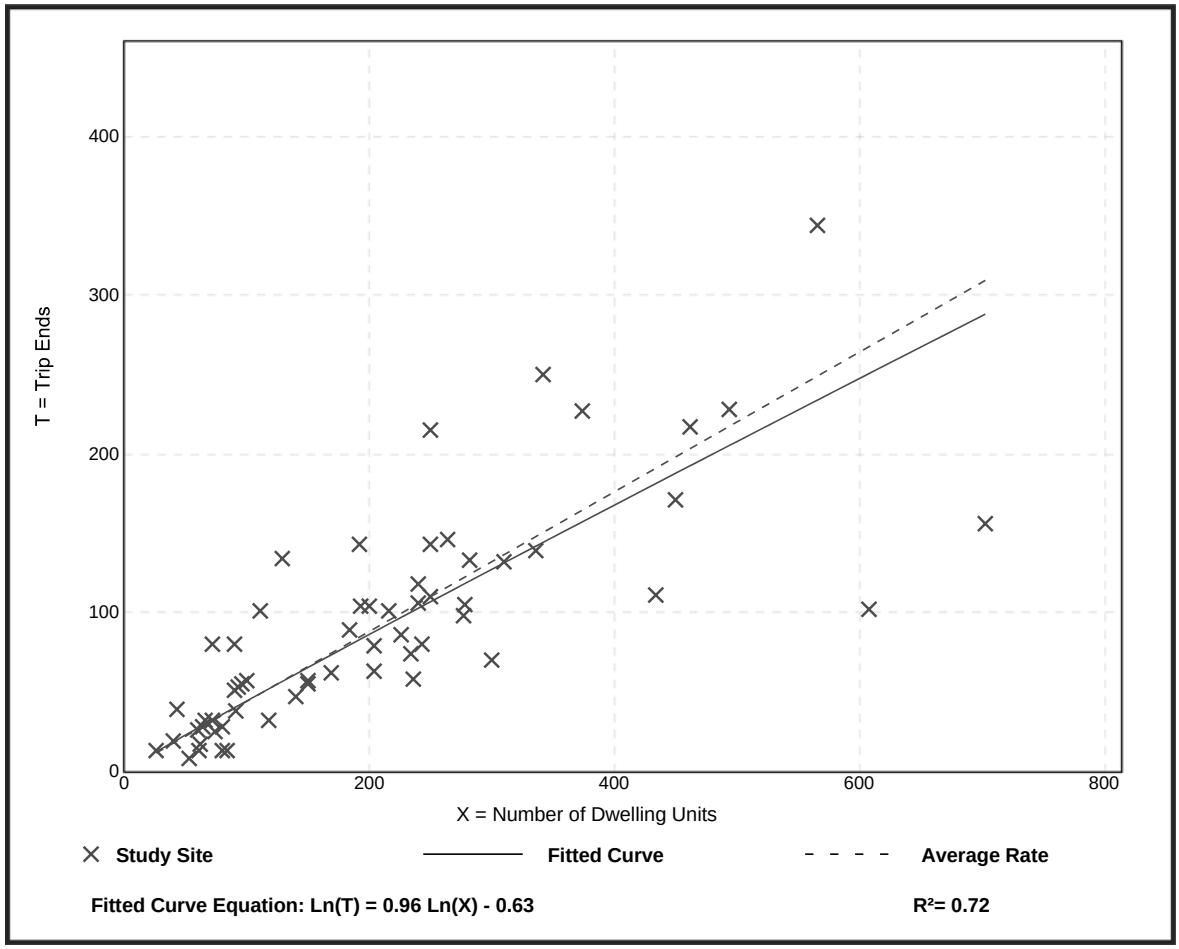
# Multifamily Housing (Mid-Rise)
(221)

**Vehicle Trip Ends vs:** **Dwelling Units**
**On a:** **Weekday,**
**Peak Hour of Adjacent Street Traffic,**
**One Hour Between 4 and 6 p.m.**
**Setting/Location:** **General Urban/Suburban**
Number of Studies: 60
Avg. Num. of Dwelling Units: 208
Directional Distribution: 61% entering, 39% exiting

## Vehicle Trip Generation per Dwelling Unit

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.44 | 0.15 - 1.11 | 0.19 |

## Data Plot and Equation



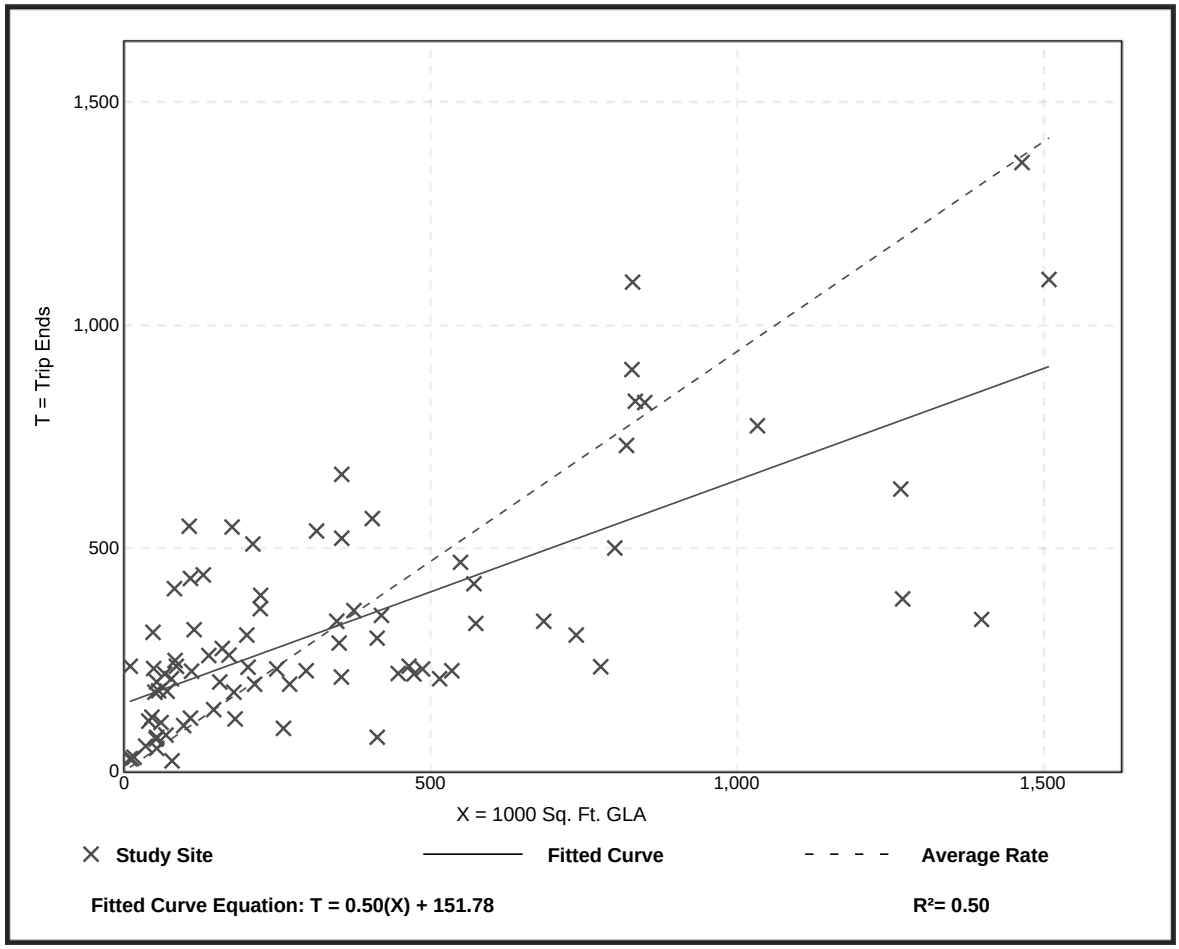
# Shopping Center
(820)

| | |
|---|---|
| **Vehicle Trip Ends vs:** | **1000 Sq. Ft. GLA** |
| **On a:** | **Weekday,** |
| | **Peak Hour of Adjacent Street Traffic,** |
| | **One Hour Between 7 and 9 a.m.** |
| **Setting/Location:** | **General Urban/Suburban** |
| Number of Studies: | 84 |
| Avg. 1000 Sq. Ft. GLA: | 351 |
| Directional Distribution: | 62% entering, 38% exiting |

## Vehicle Trip Generation per 1000 Sq. Ft. GLA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 0.94 | 0.18 - 23.74 | 0.87 |

## Data Plot and Equation



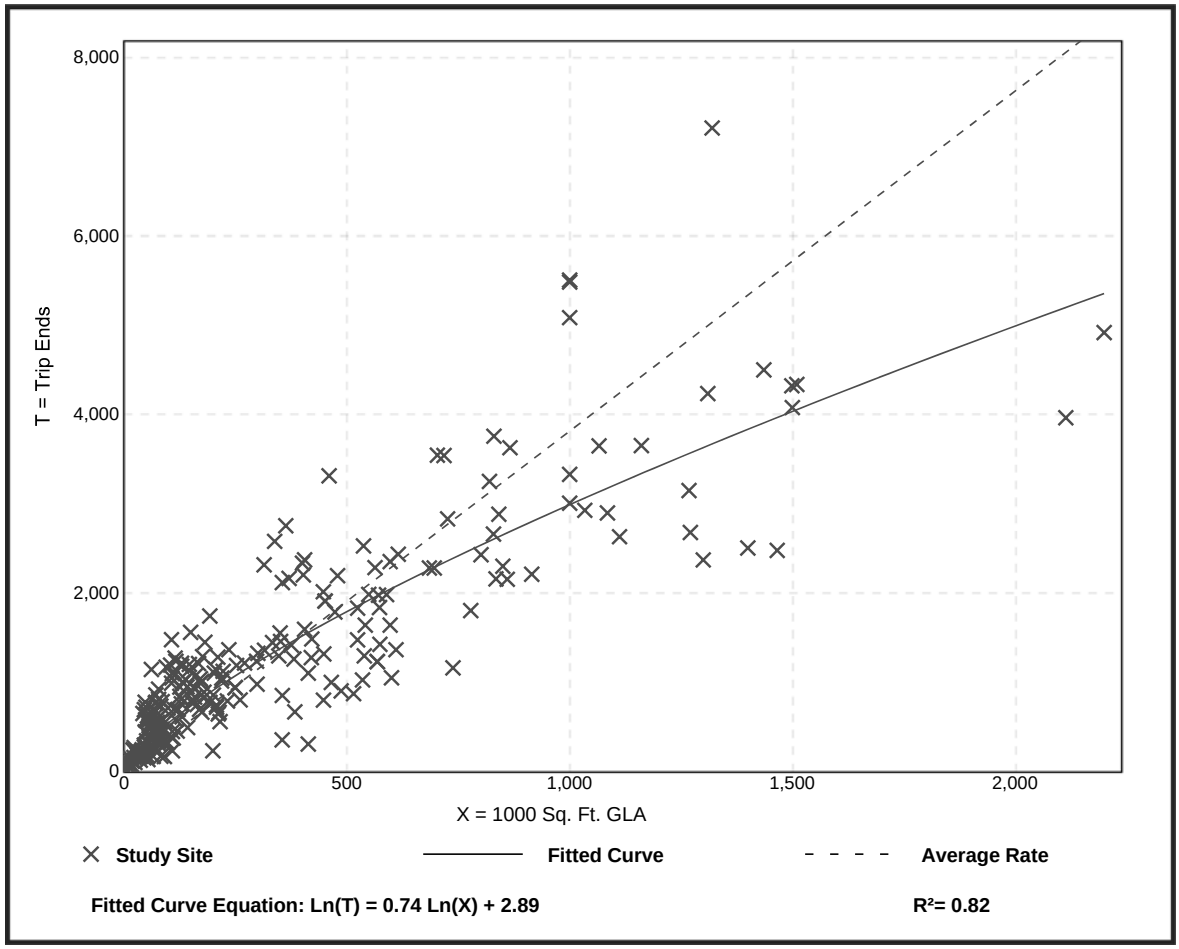
# Shopping Center
(820)

| | |
|---|---|
| **Vehicle Trip Ends vs:** | **1000 Sq. Ft. GLA** |
| **On a:** | **Weekday,** |
| | **Peak Hour of Adjacent Street Traffic,** |
| | **One Hour Between 4 and 6 p.m.** |
| **Setting/Location:** | **General Urban/Suburban** |
| Number of Studies: | 261 |
| Avg. 1000 Sq. Ft. GLA: | 327 |
| Directional Distribution: | 48% entering, 52% exiting |

## Vehicle Trip Generation per 1000 Sq. Ft. GLA

| Average Rate | Range of Rates | Standard Deviation |
|---|---|---|
| 3.81 | 0.74 - 18.69 | 2.04 |

## Data Plot and Equation



## Proposed Site Development Trip Generation and Distribution

**Project:** 460 Keil Drive South TIS

**Site:** 460 Keil Drive South, Chatham, Ontario

**Assumed Land Use (1):** Multifamily Housing (Mid-Rise) - ITE No. 221
**Note: Data not filtered based on region.

**Average Vehicle Trip Ends vs.:** Dwelling Units

**ITE Trip Generation Data collected on a:** Weekday

| | | | | |
|---|---|---|---|---|
| **AM Peak Hour:** | 0.36 | = Average Rate | 26 | % Entering |
| | | | 74 | % Exiting |
| **PM Peak Hour:** | 0.44 | = Average Rate | 61 | % Entering |
| | | | 39 | % Exiting |

---

**Assumed Land Use (2):** Shopping Center - ITE No. 820
**Note: Data not filtered based on region.

**Average Vehicle Trip Ends vs.:** 1000 sq. ft. GLA

**ITE Trip Generation Data collected on a:** Weekday

| | | | | |
|---|---|---|---|---|
| **AM Peak Hour:** | 0.94 | = Average Rate | 62 | % Entering |
| | | | 38 | % Exiting |
| **PM Peak Hour:** | 3.81 | = Average Rate | 48 | % Entering |
| | | | 52 | % Exiting |

---

| Assumed Land Use (1): Multifamily Housing (Mid-Rise) - ITE No. 221 | | | | |
|---|---|---|---|---|
| | **No. of Units** | **Trips Generated** | **Trips Entering** | **Trips Exiting** |
| **AM Peak** | 117 | 42 | 11 | 31 |
| **PM Peak** | 117 | 51 | 31 | 20 |

| Assumed Land Use (2): Shopping Center - ITE No. 820 | | | | |
|---|---|---|---|---|
| | **1000 sq. ft. GLA** | **Trips Generated** | **Trips Entering** | **Trips Exiting** |
| **AM Peak** | 5.005 | 5 | 3 | 2 |
| **PM Peak** | 5.005 | 19 | 9 | 10 |

| Total Trips | | |
|---|---|---|
| | **Trips Entering** | **Trips Exiting** |
| **AM Peak** | 14 | 33 |
| **PM Peak** | 40 | 31 |

## Appendix C

# TRAFFIC PROJECTION FIGURES

**Richmond Street at Keil Drive South**

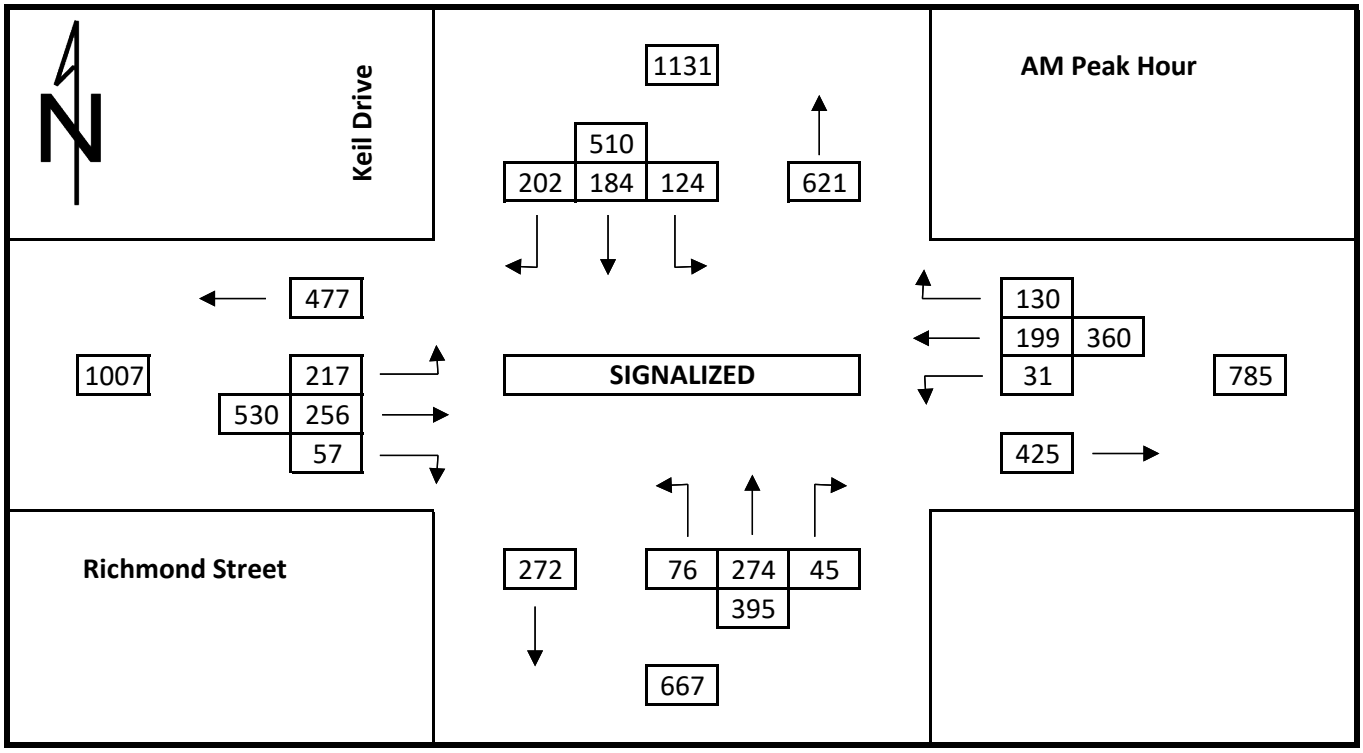
**Park Avenue West at Keil Drive South**

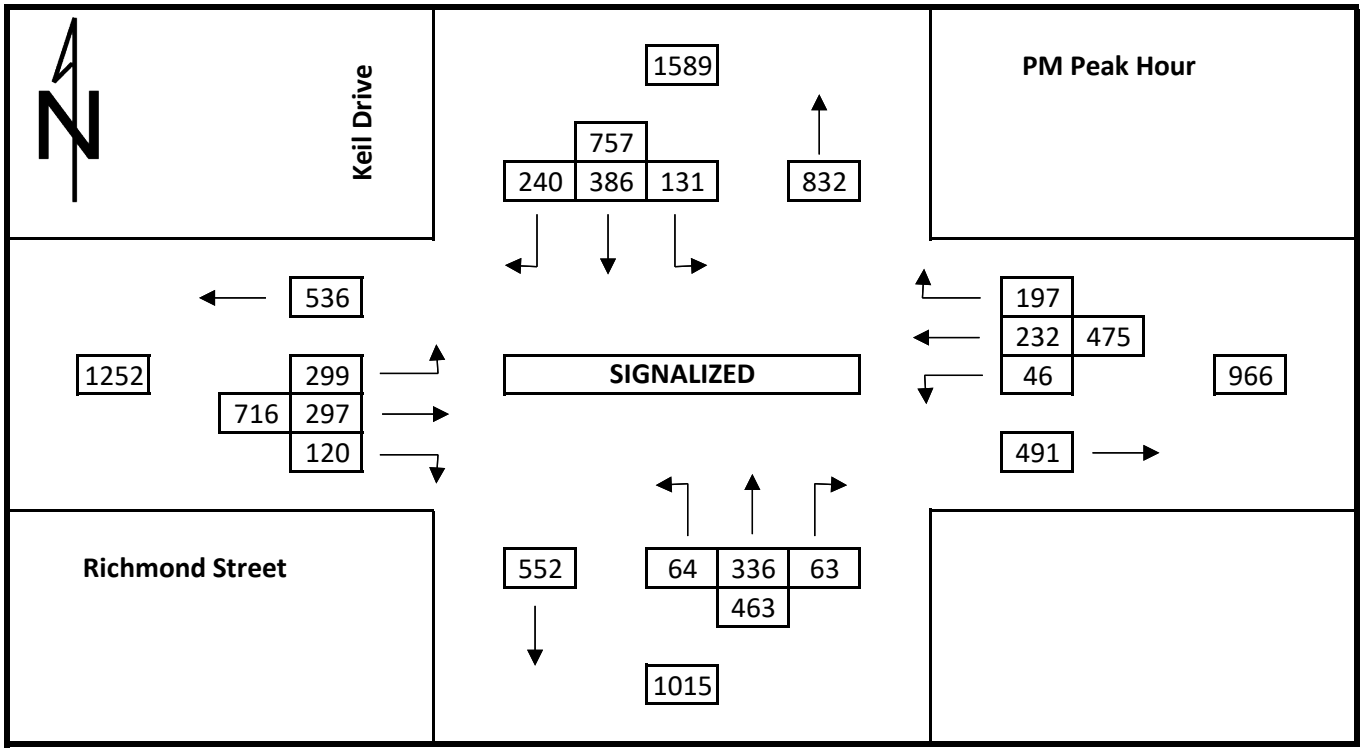
**Site Access at Keil Drive South**

**Site Access at Park Avenue West**

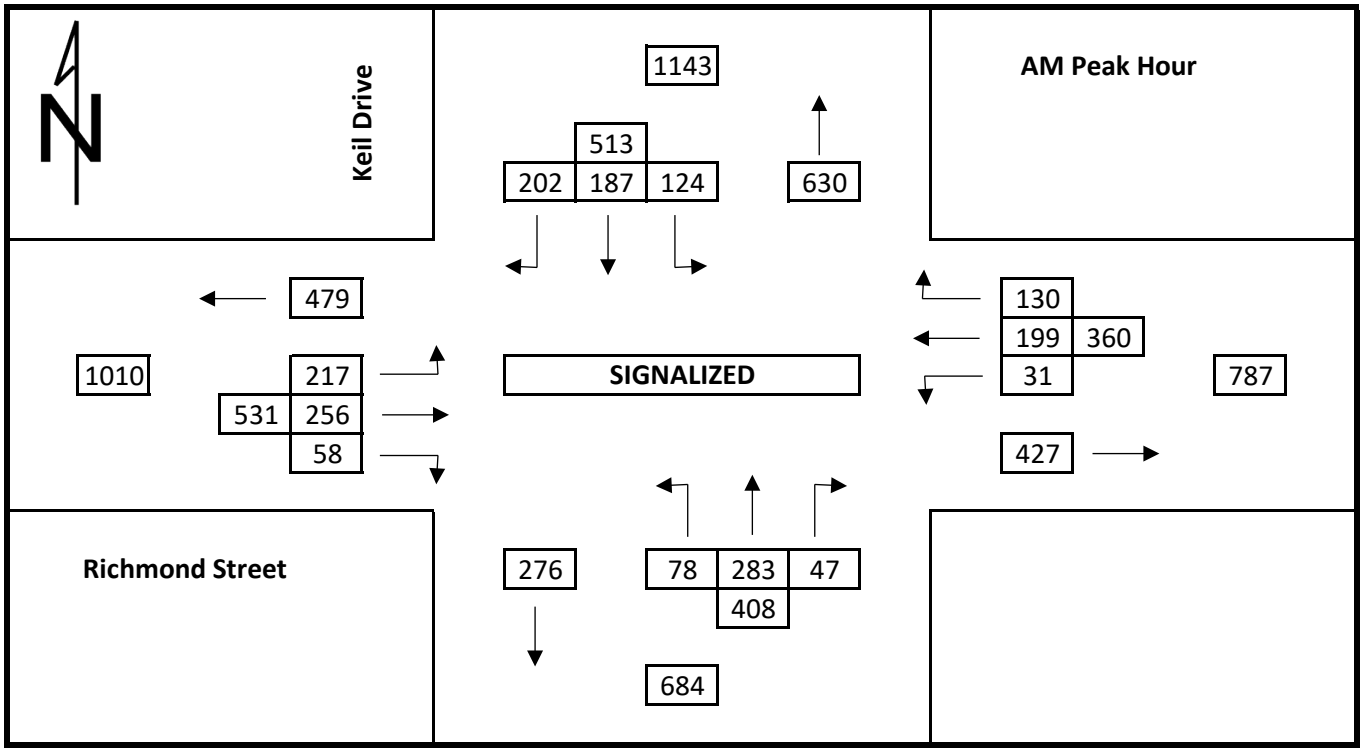
**Existing Traffic Counts**

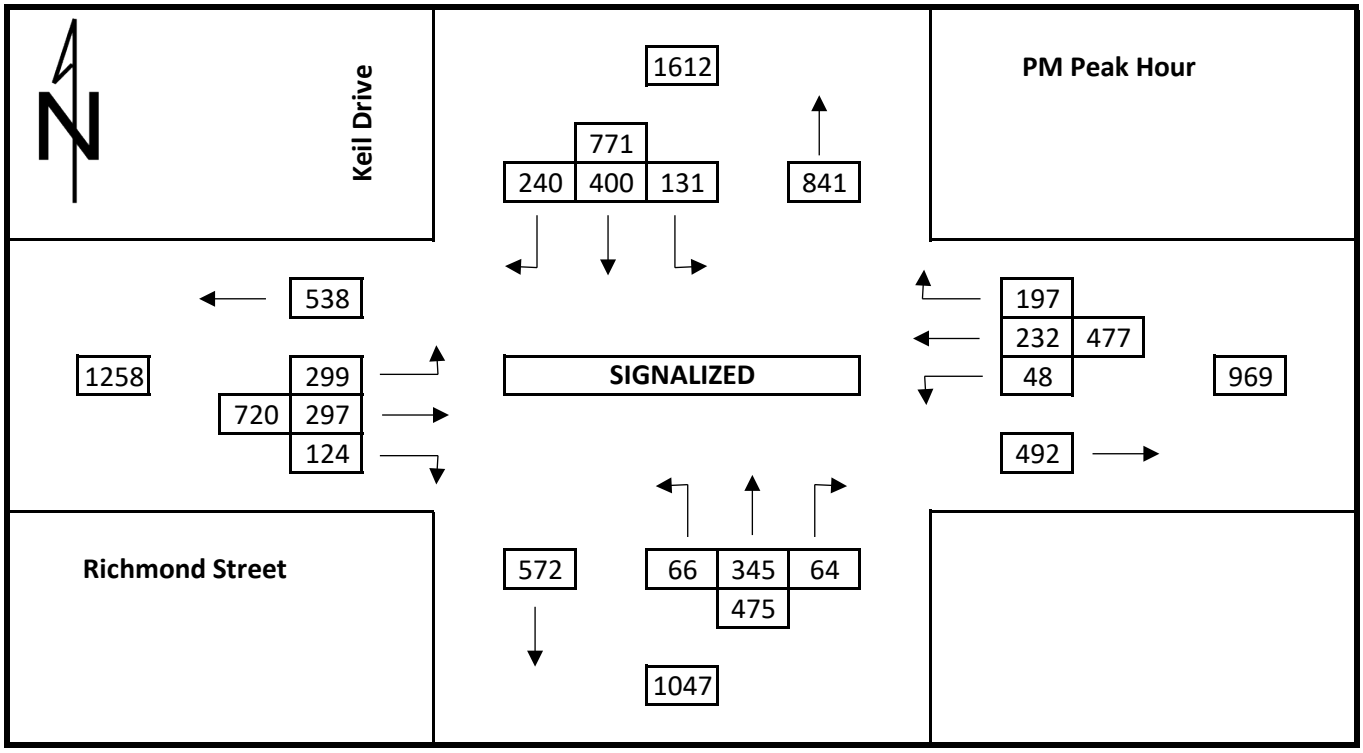
Richmond Street at Keil Drive South



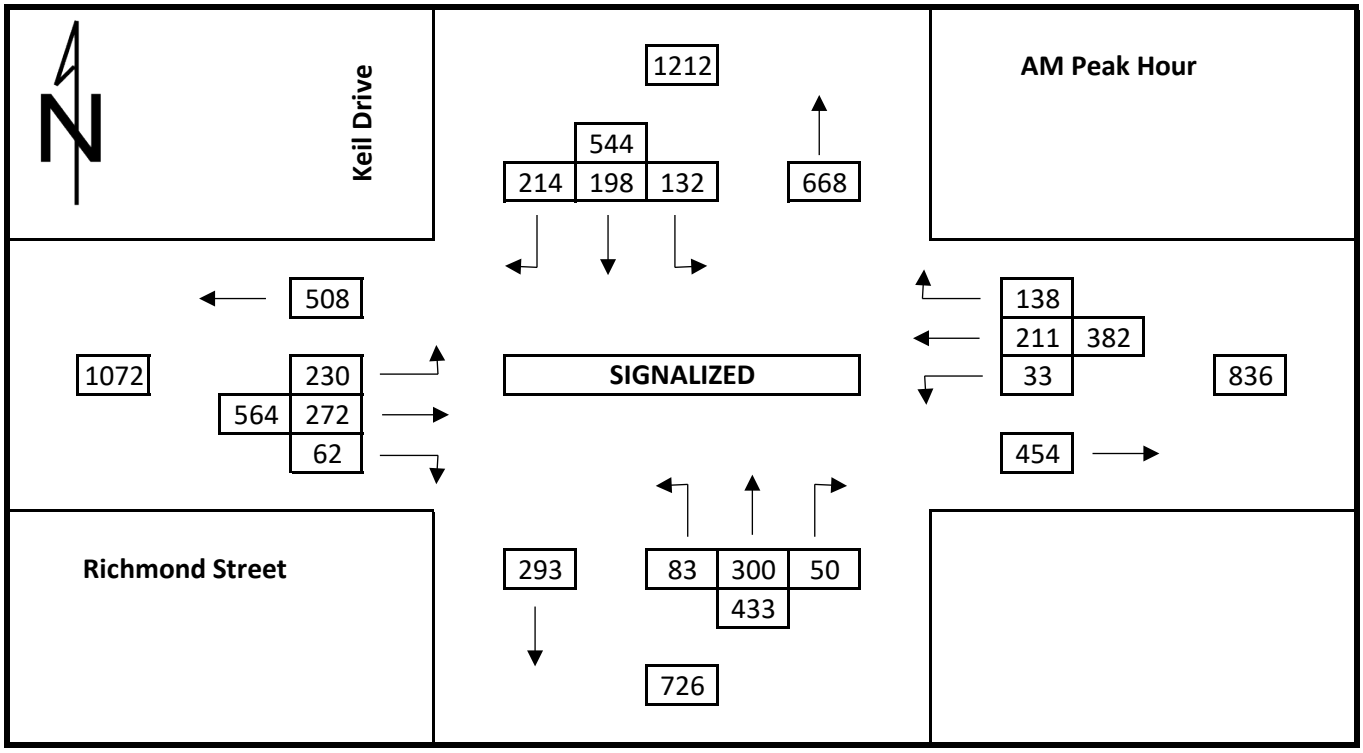
**Existing + Site Generated Traffic**
Richmond Street at Keil Drive South

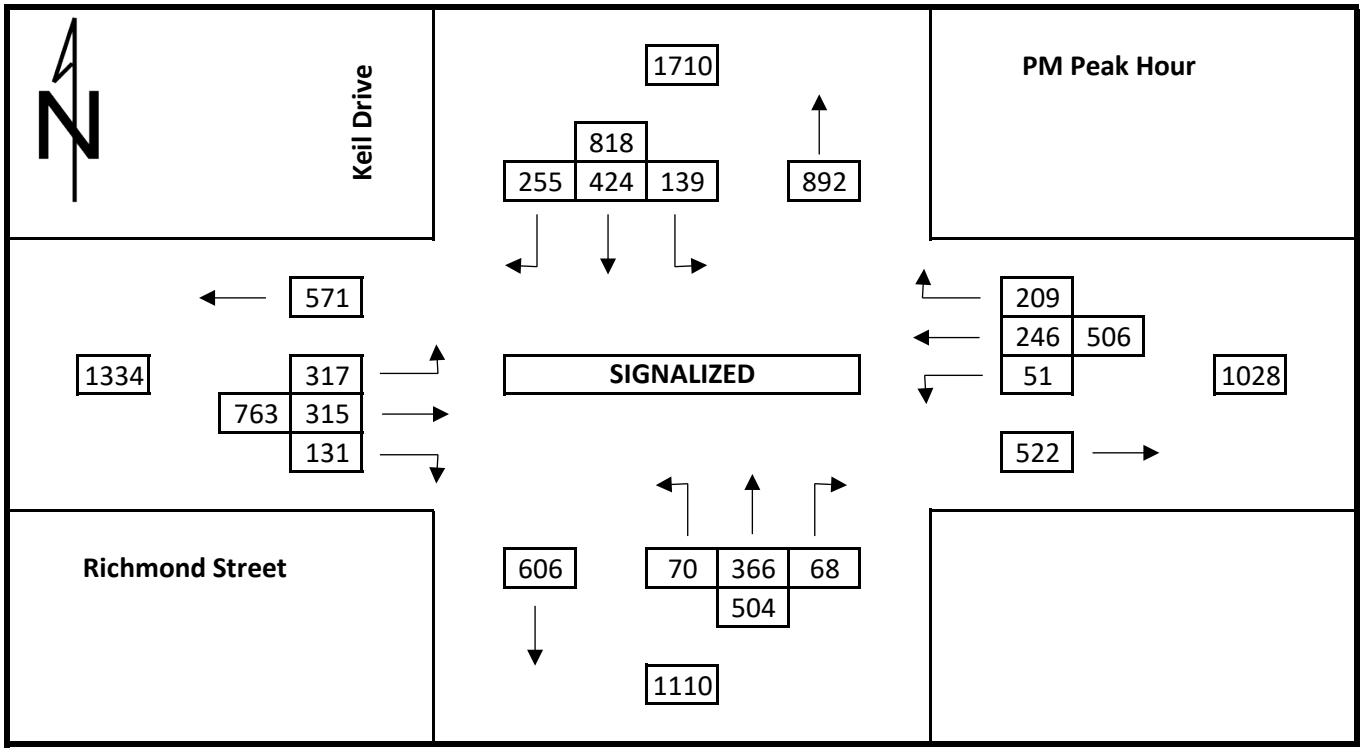


**Total Traffic 2026**

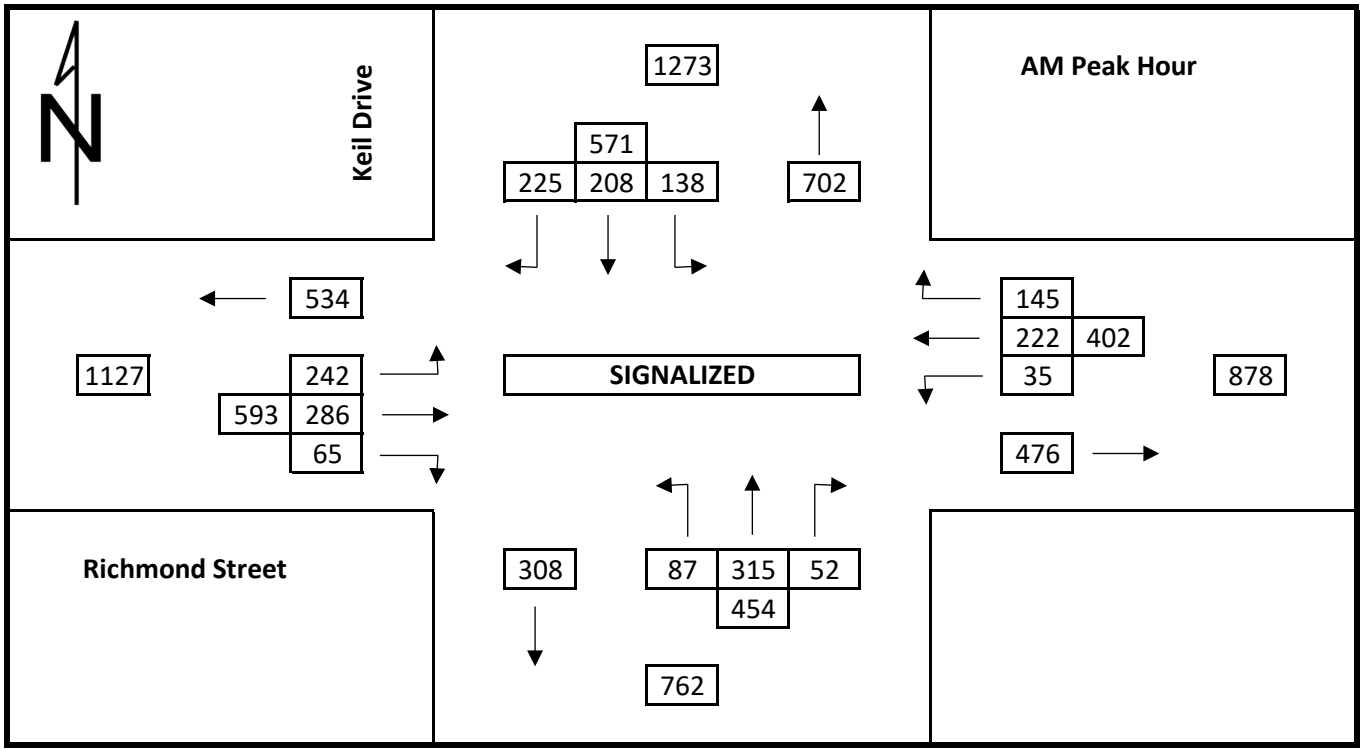
Richmond Street at Keil Drive South

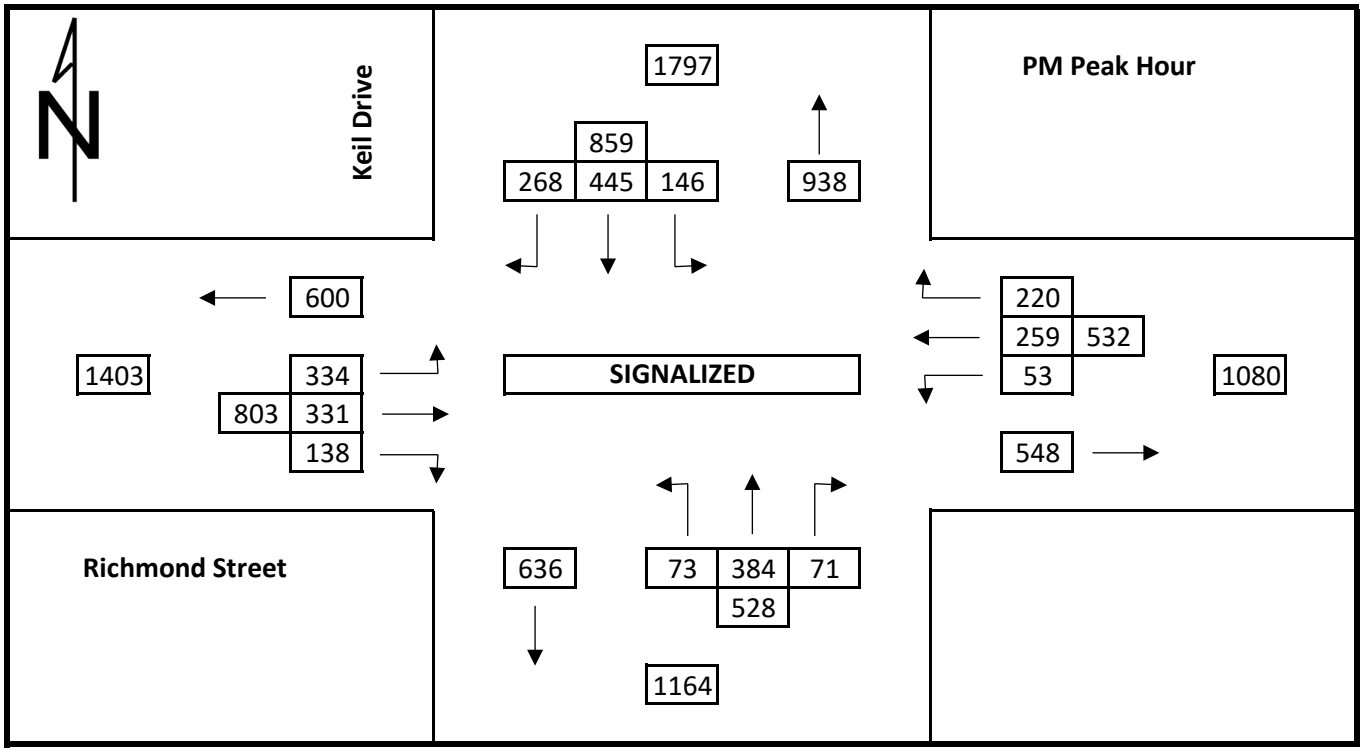


**Total Traffic 2031**

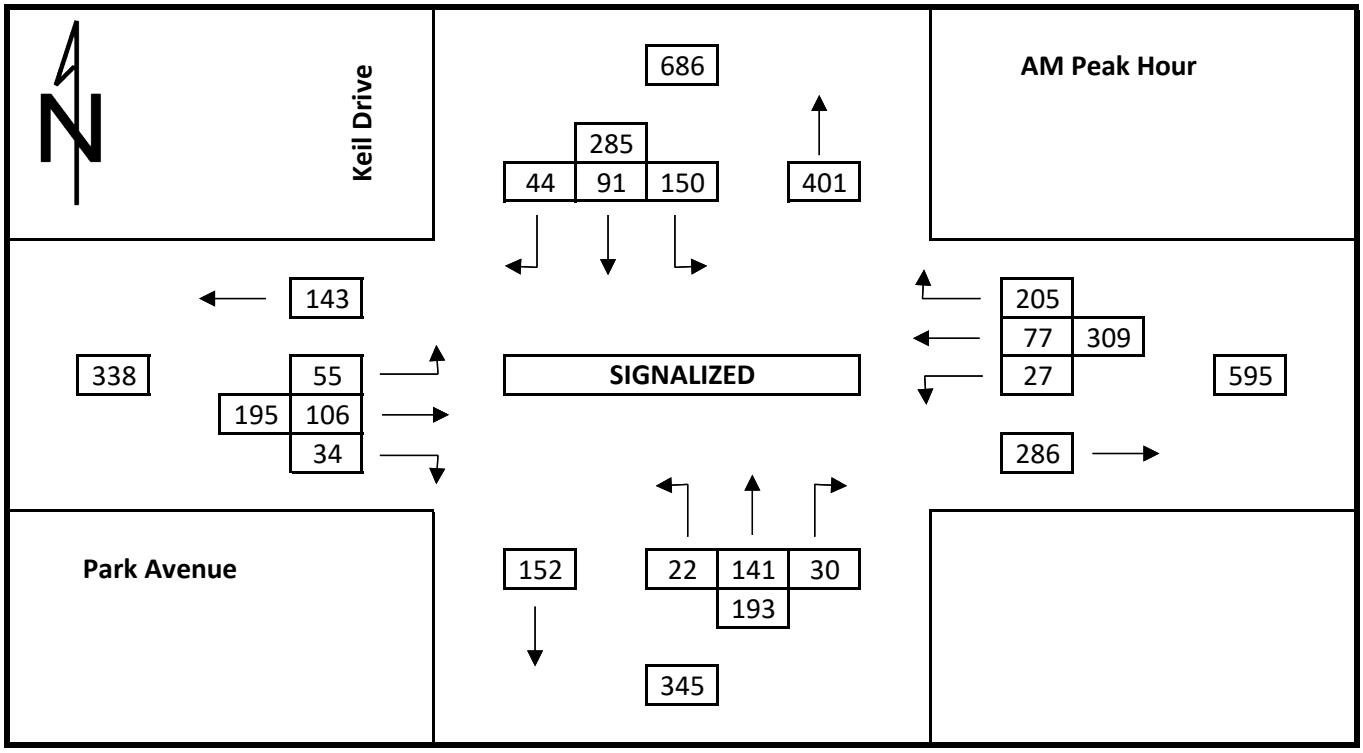
Richmond Street at Keil Drive South

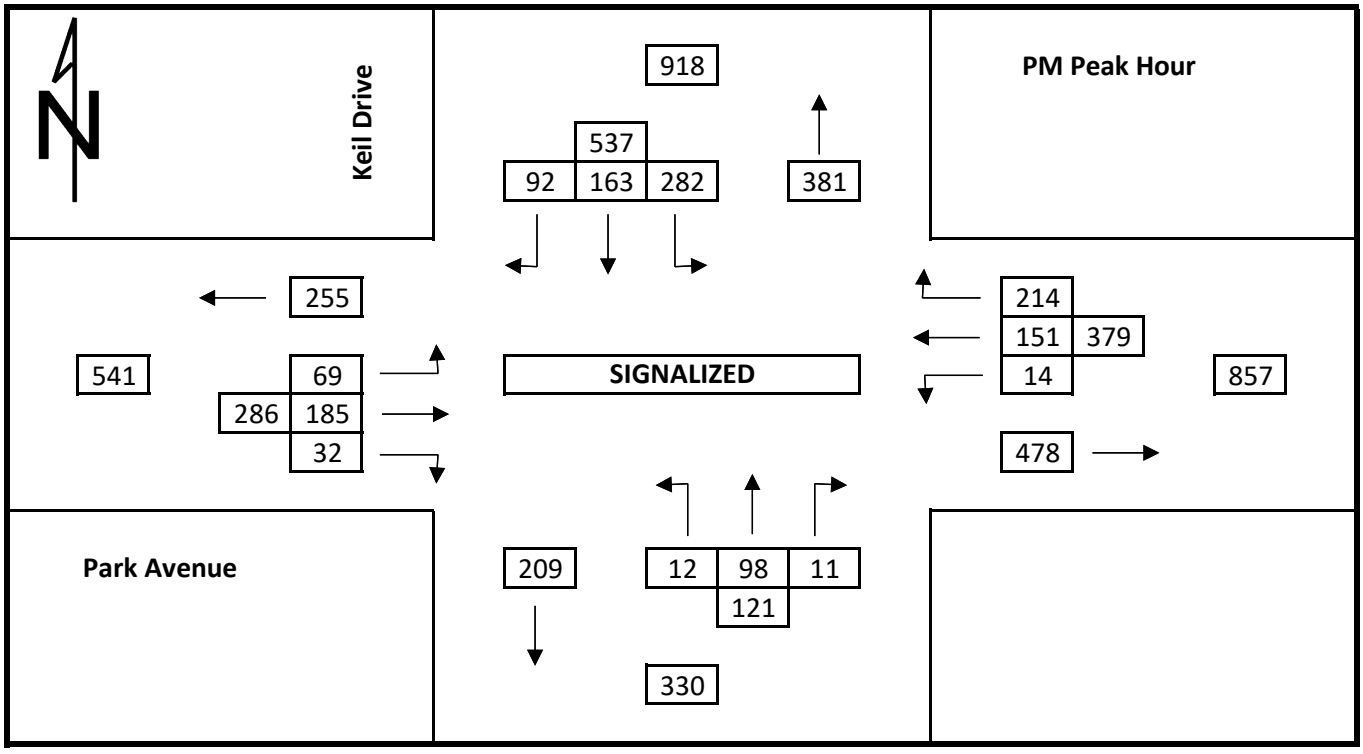


**Existing Traffic Counts**

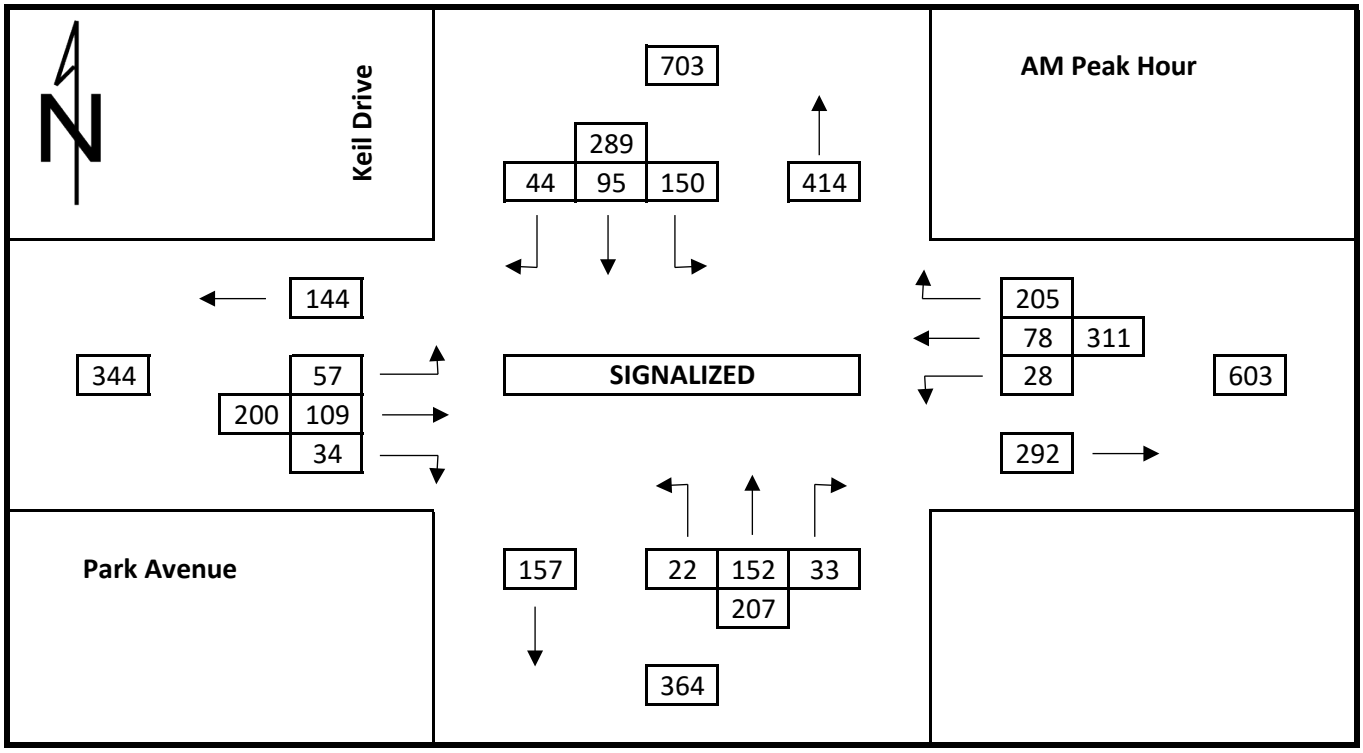
Park Avenue West at Keil Drive South

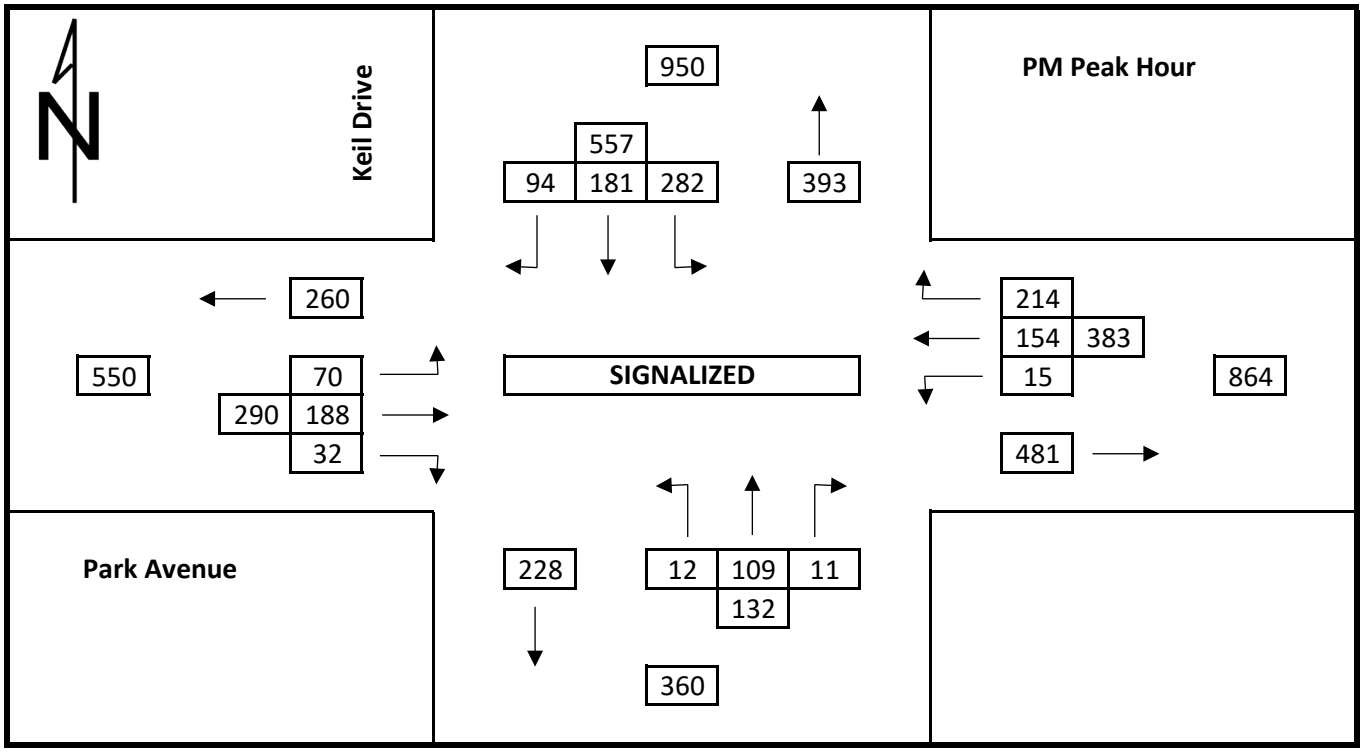


**Existing + Site Generated Traffic**

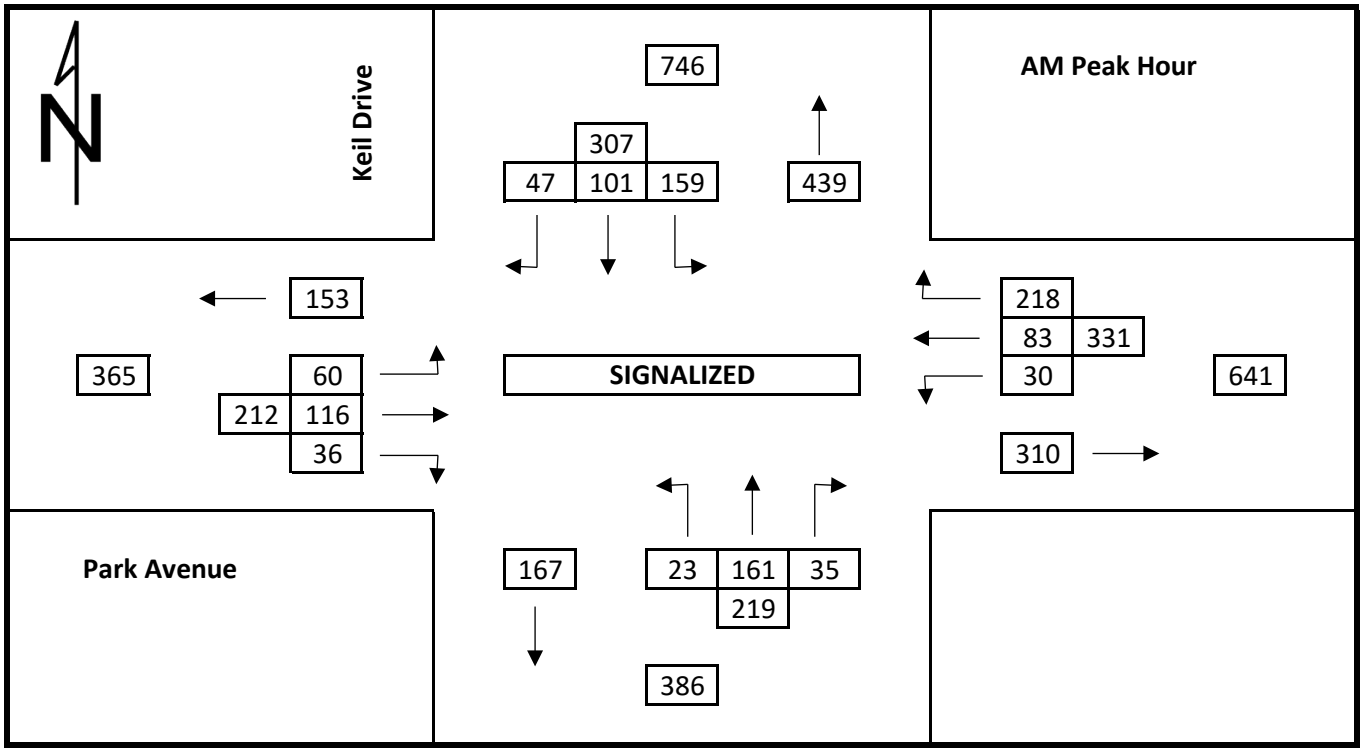
Park Avenue West at Keil Drive South

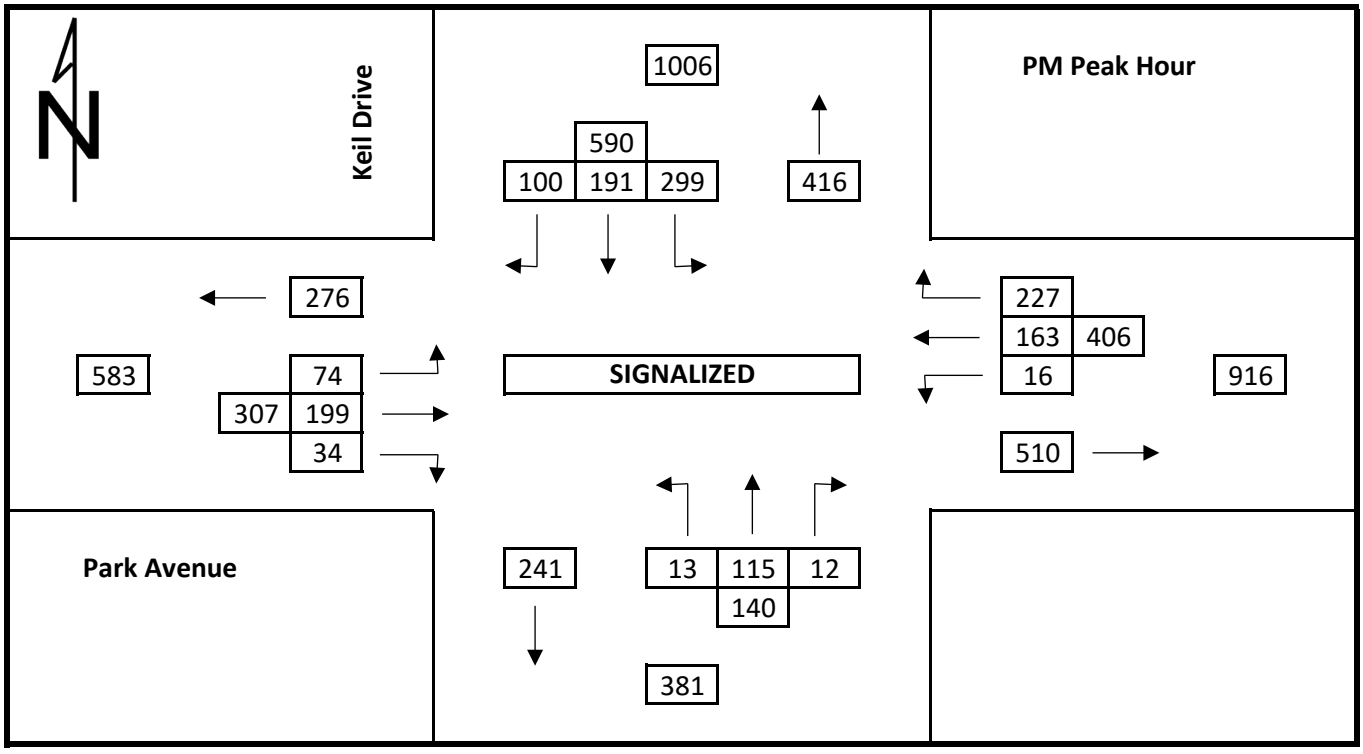


**Total Traffic 2026**

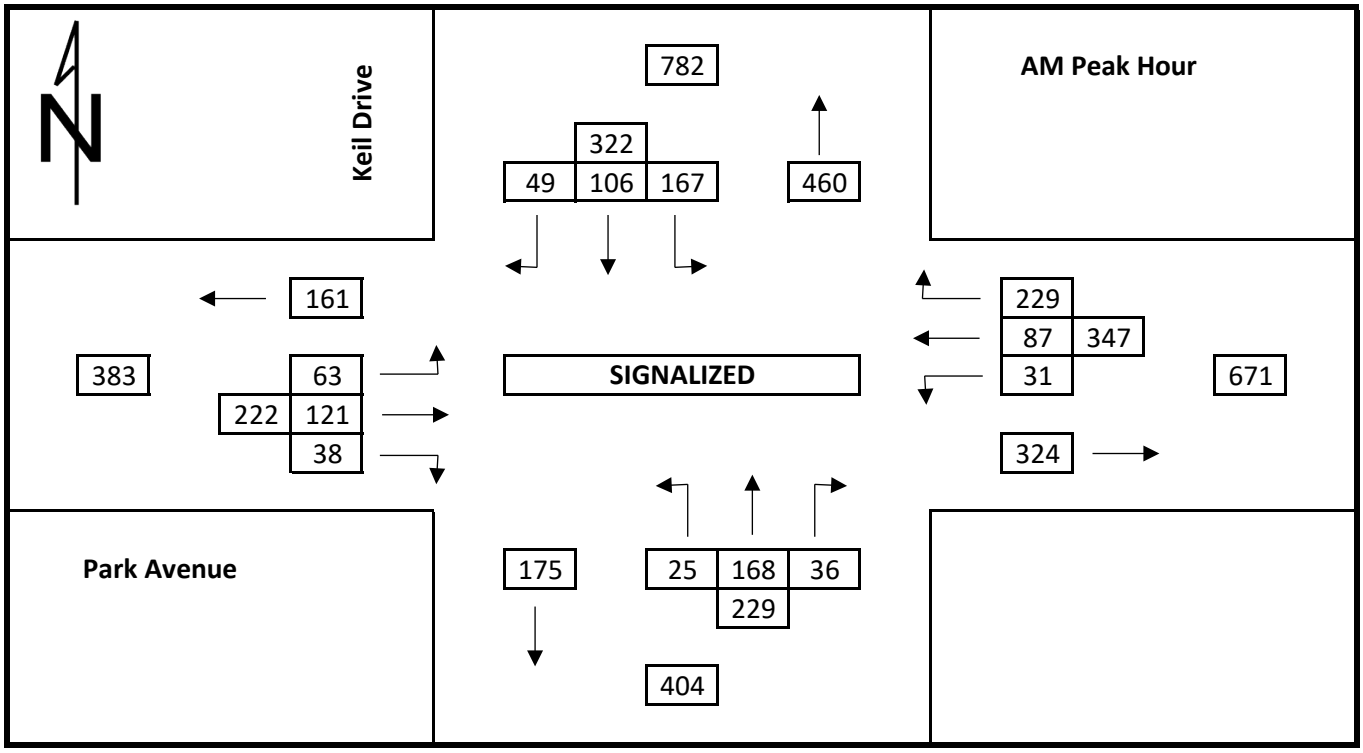
Park Avenue West at Keil Drive South

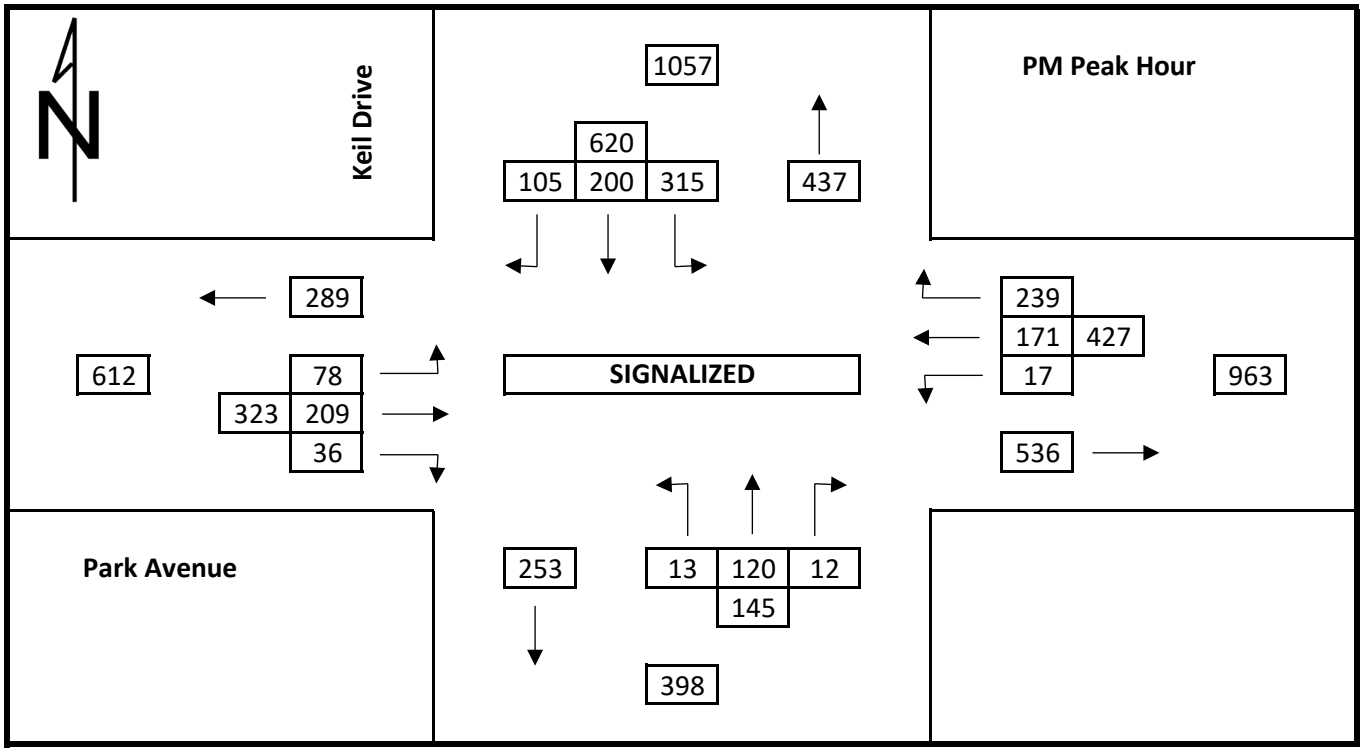


**Total Traffic 2031**

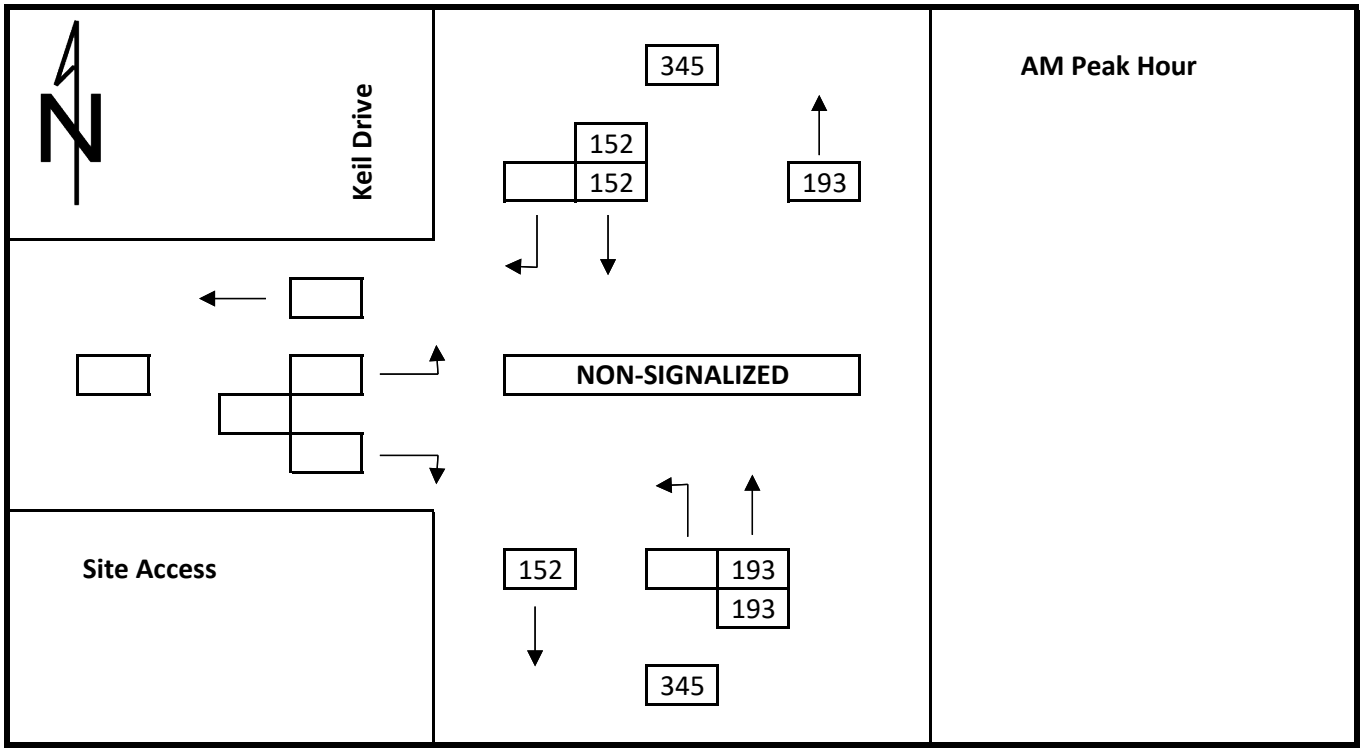
Park Avenue West at Keil Drive South

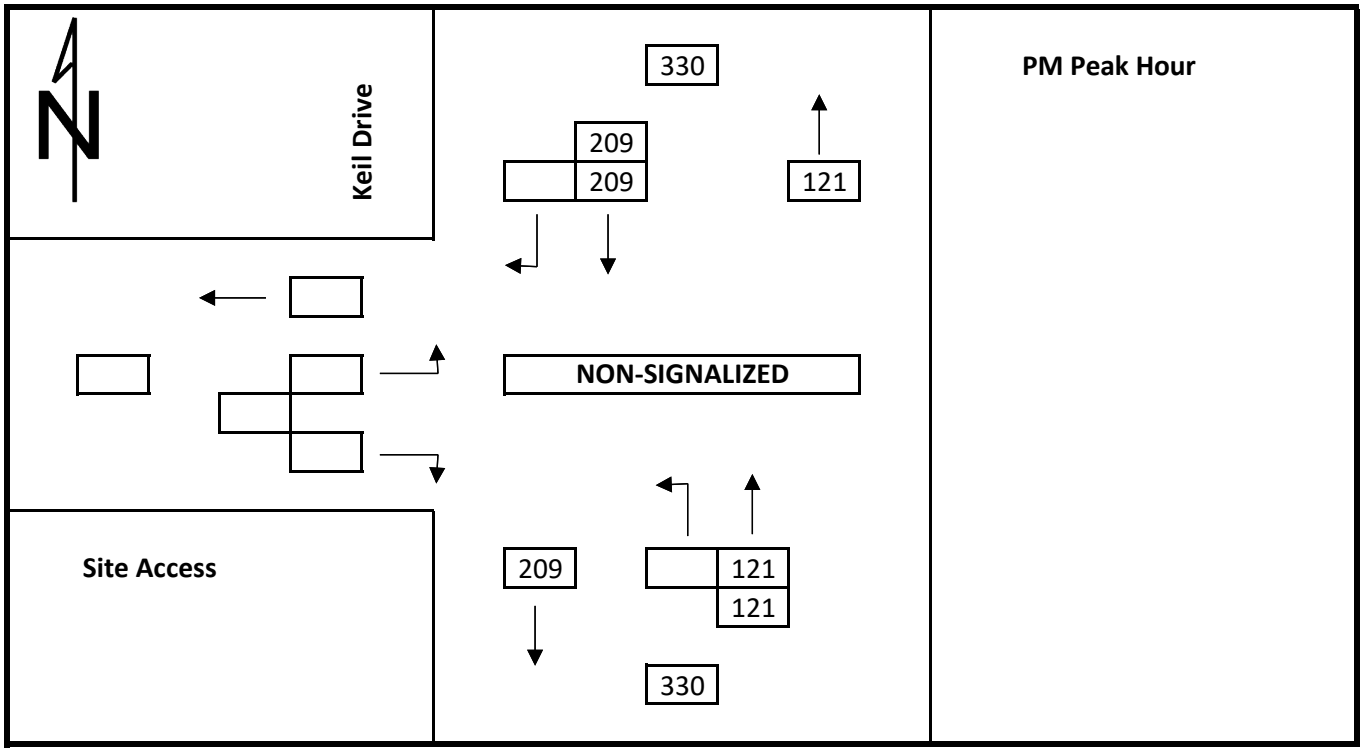


**Existing Traffic Counts**

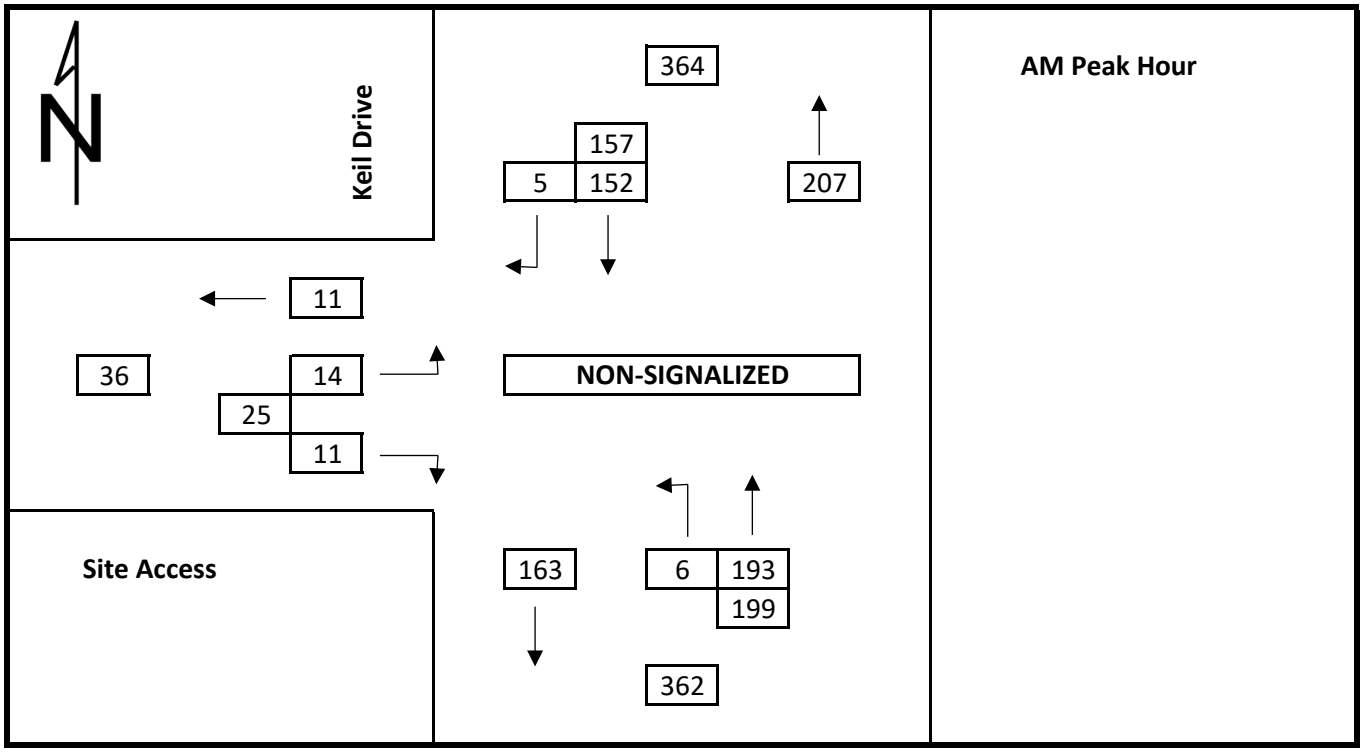
Site Access at Keil Drive South

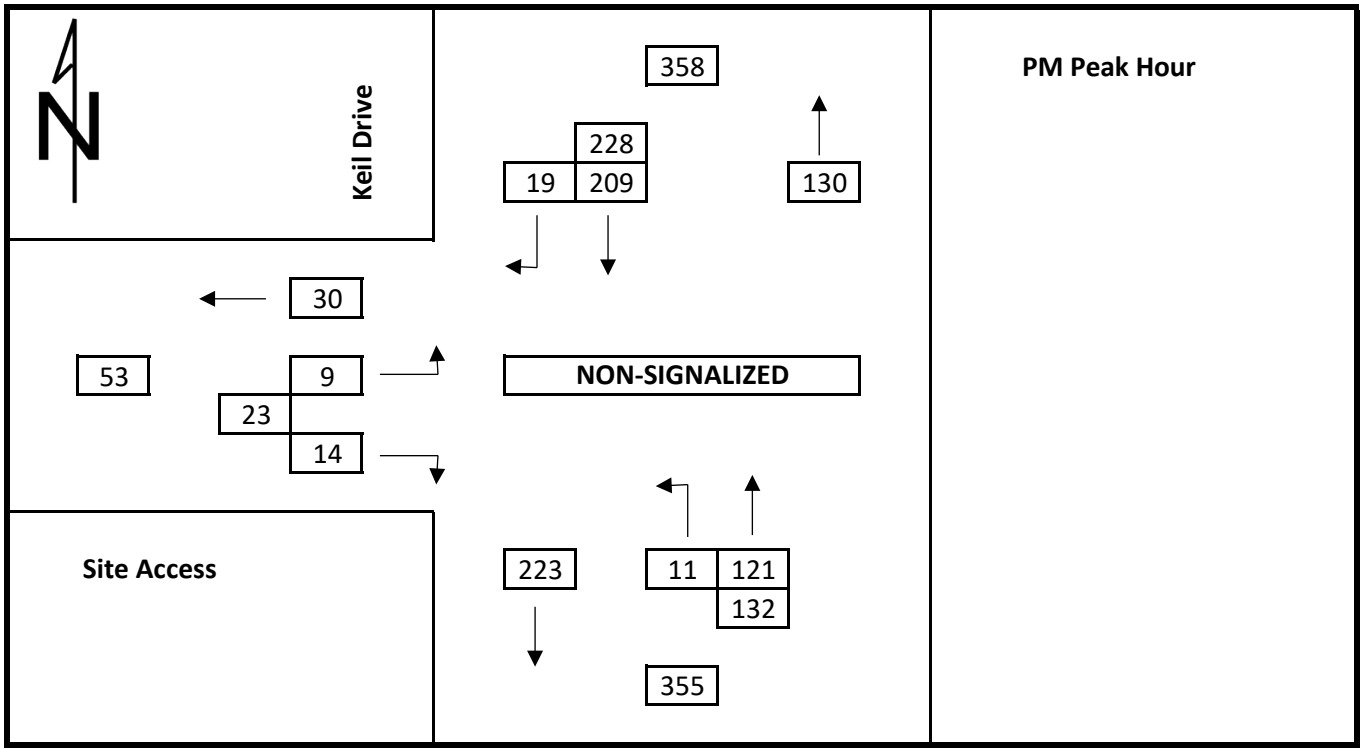


**Existing + Site Generated Traffic**

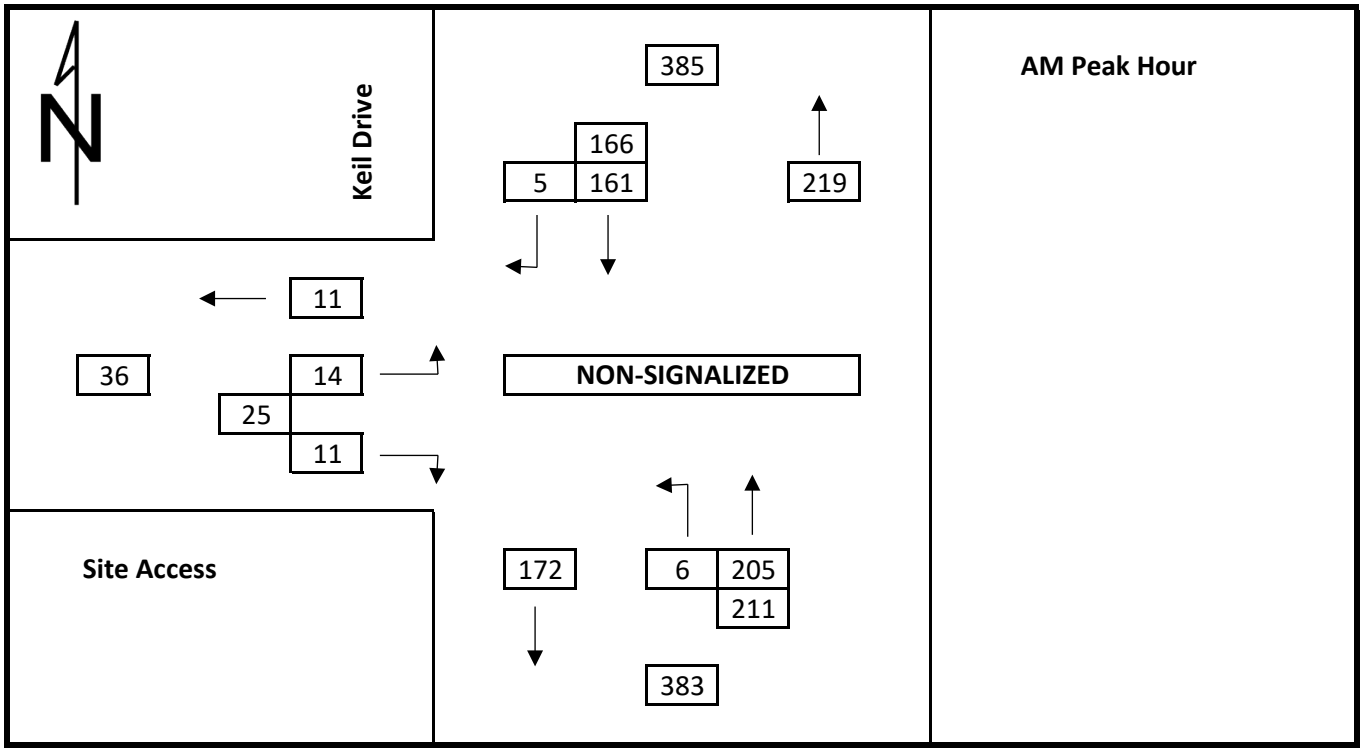
Site Access at Keil Drive South

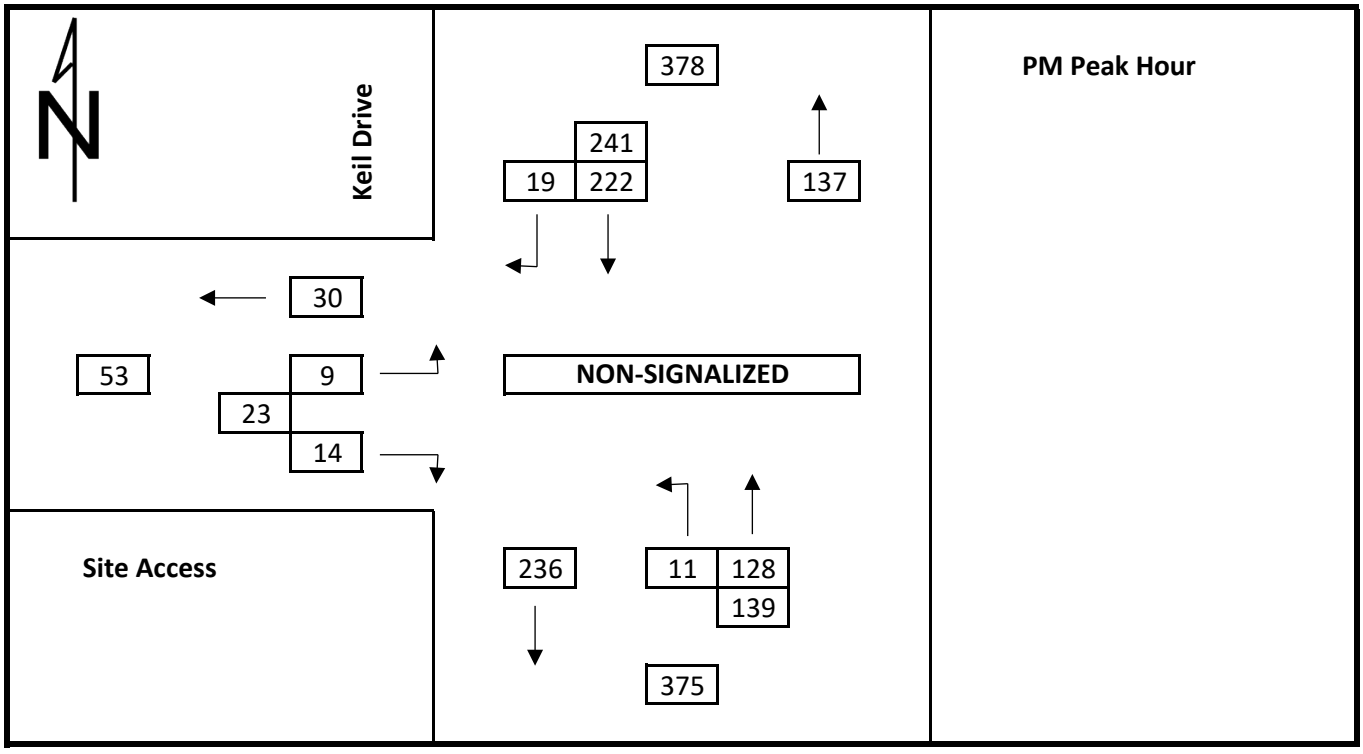


**Total Traffic 2026**

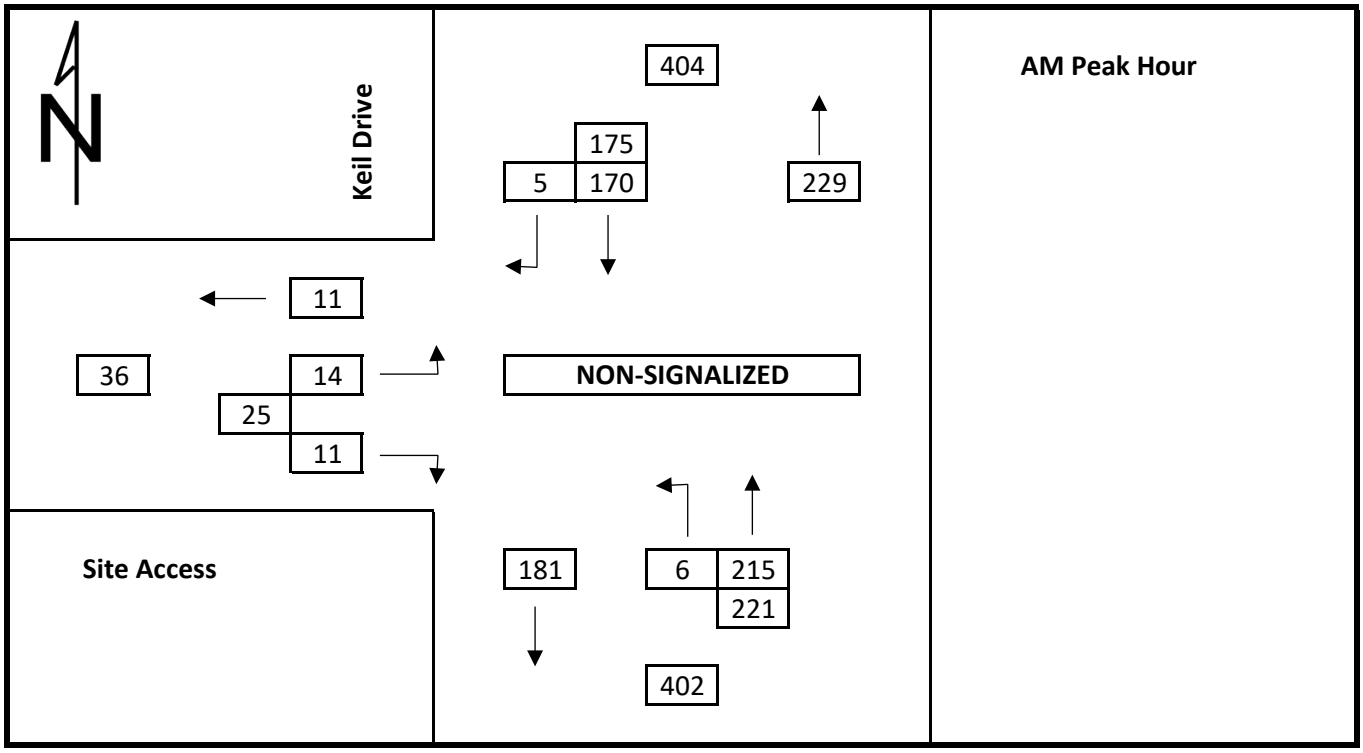
Site Access at Keil Drive South

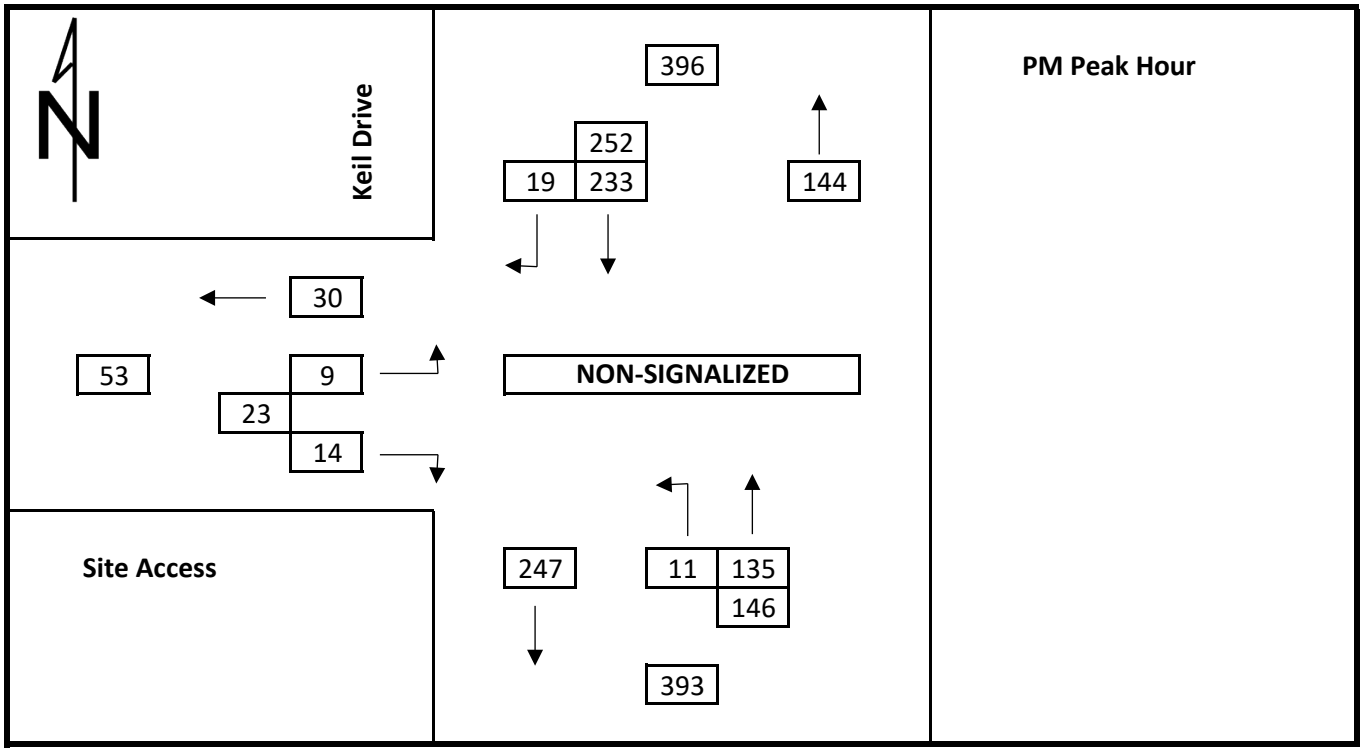


**Total Traffic 2031**

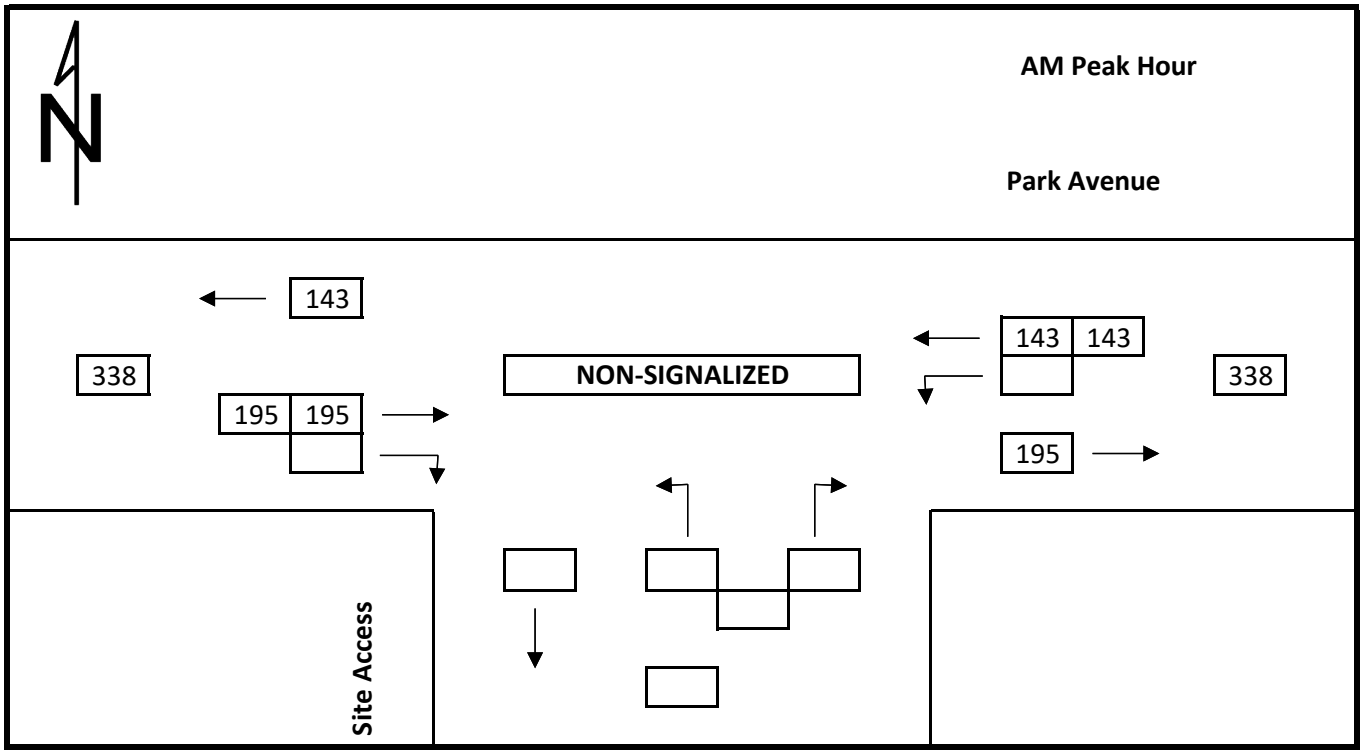
Site Access at Keil Drive South

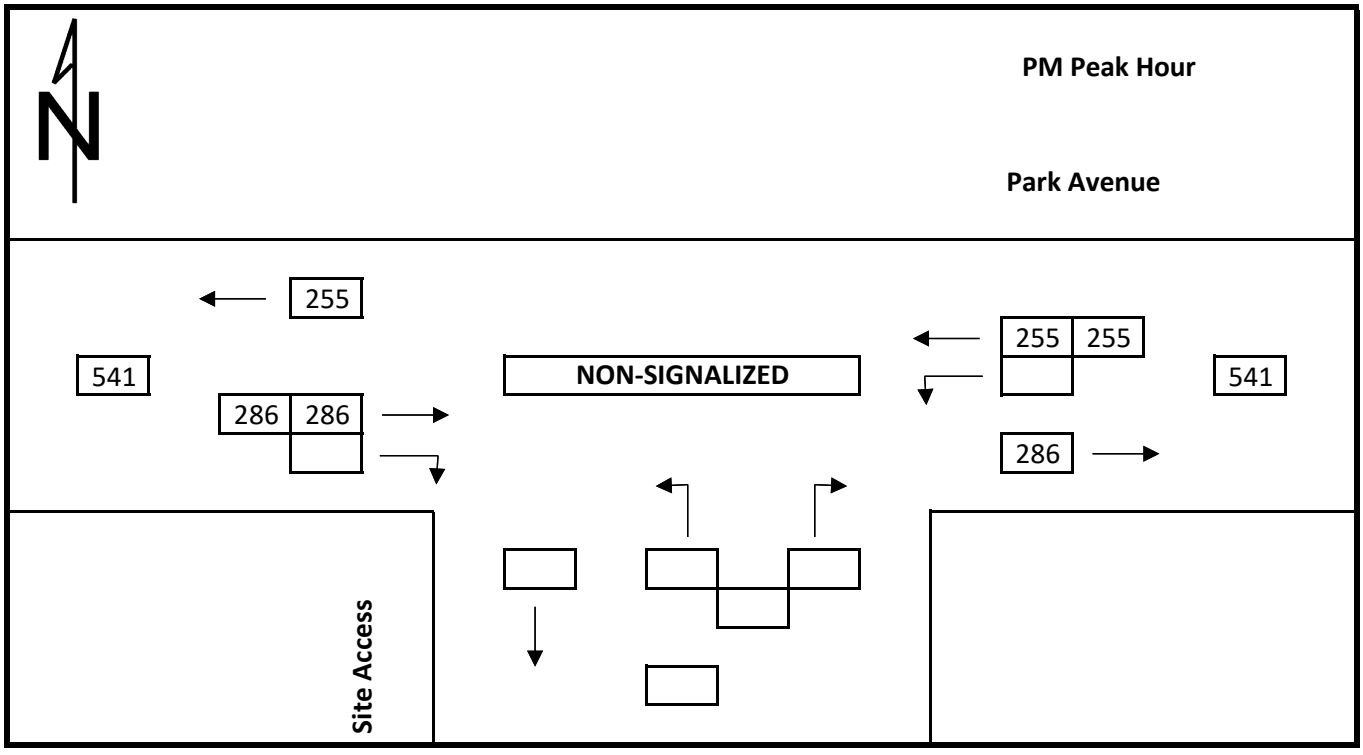


**Existing Traffic Counts**

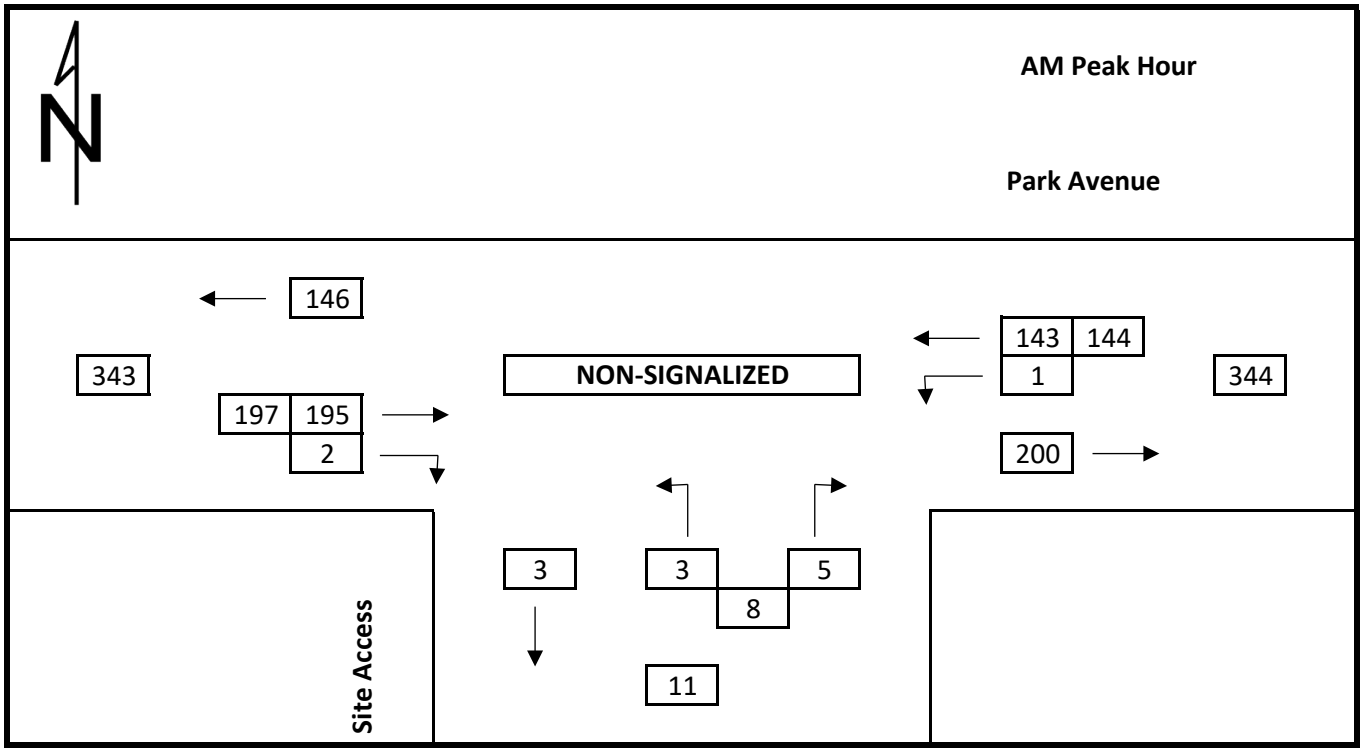
Site Access at Park Avenue West

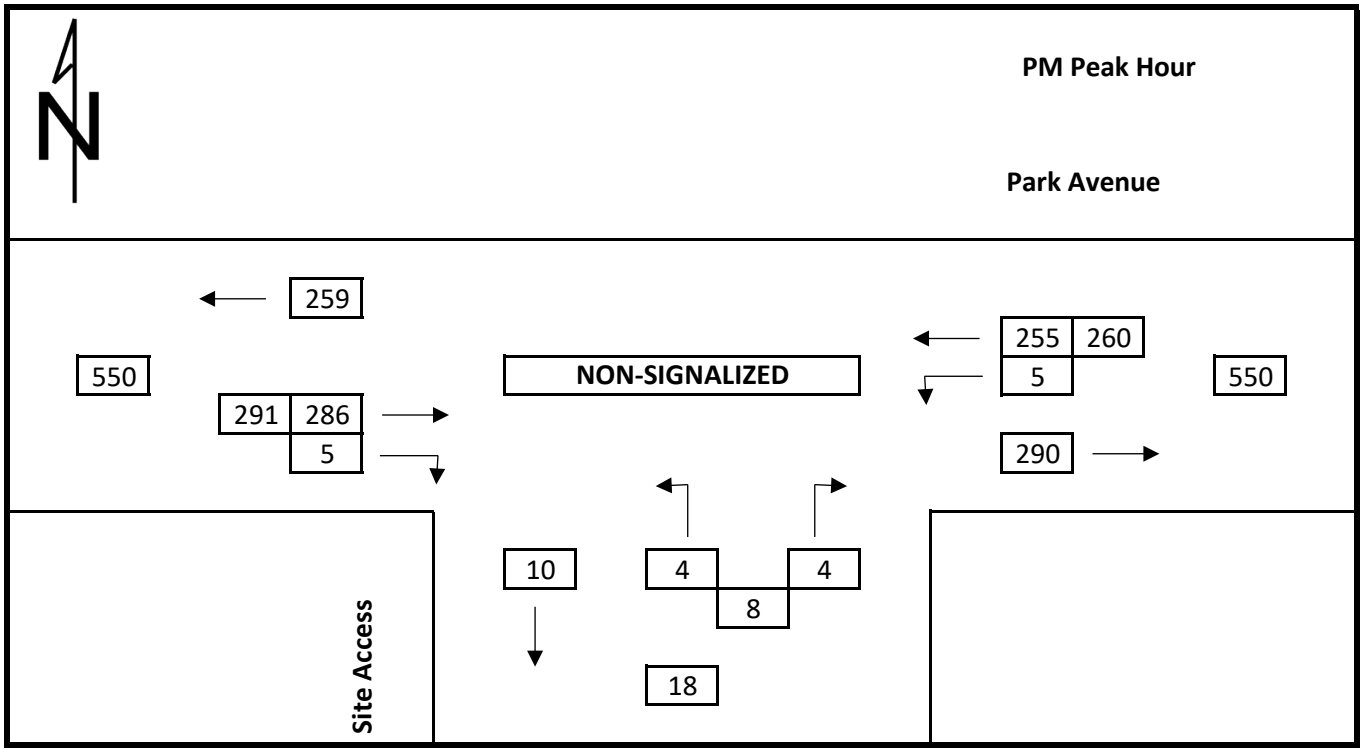


**Existing + Site Generated Traffic**

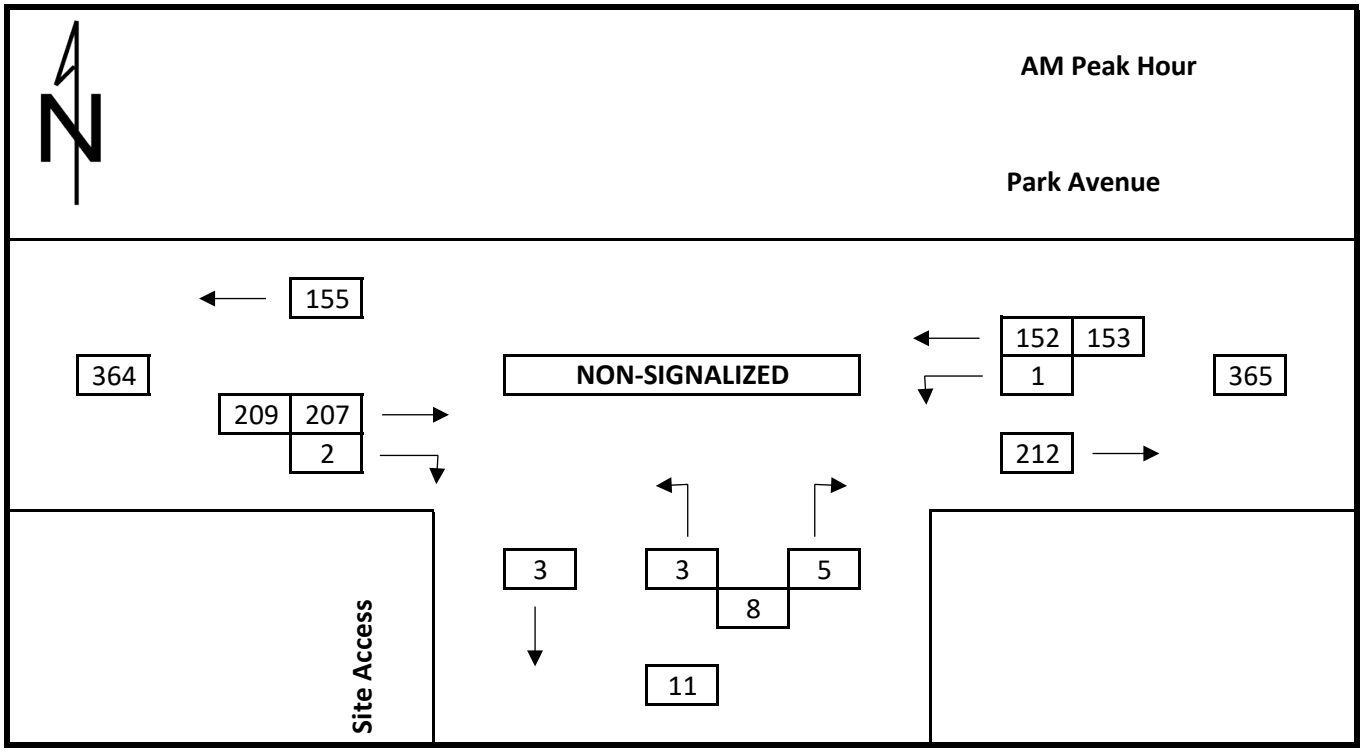
Site Access at Park Avenue West

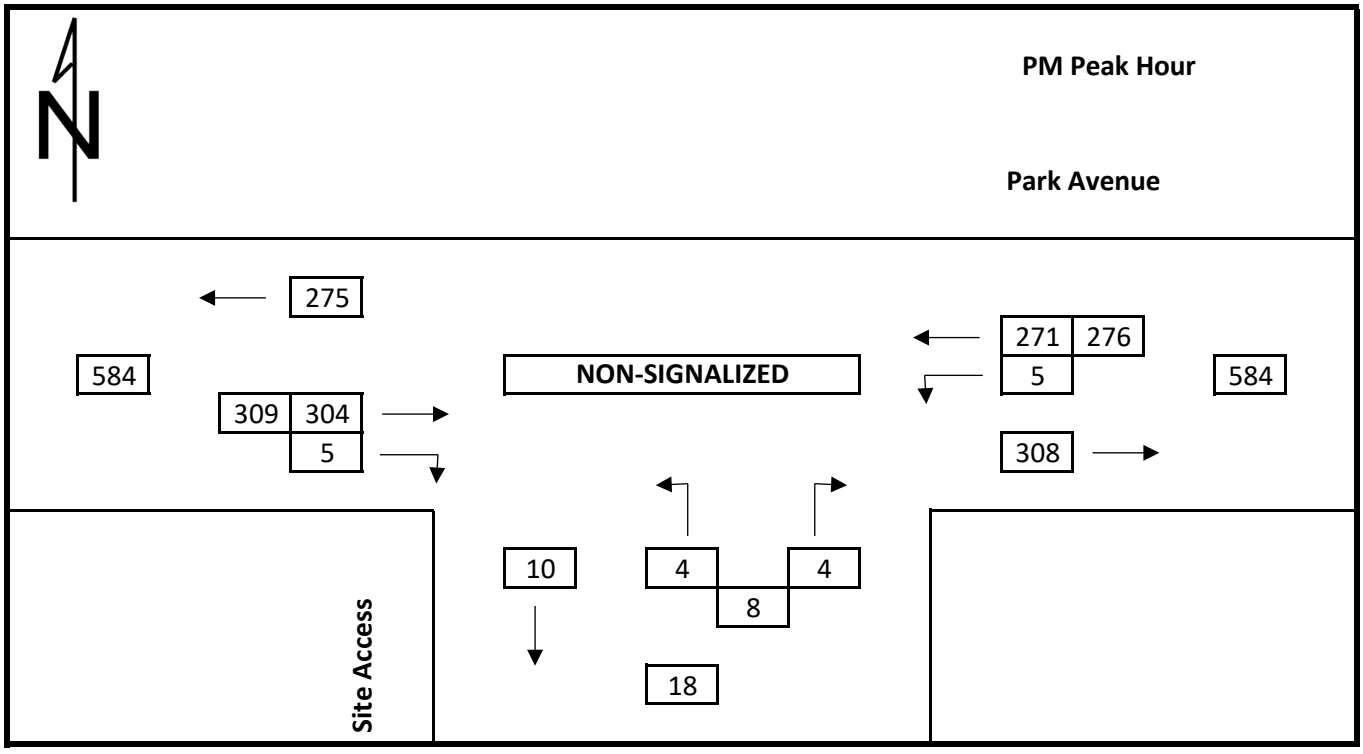


**Total Traffic 2026**

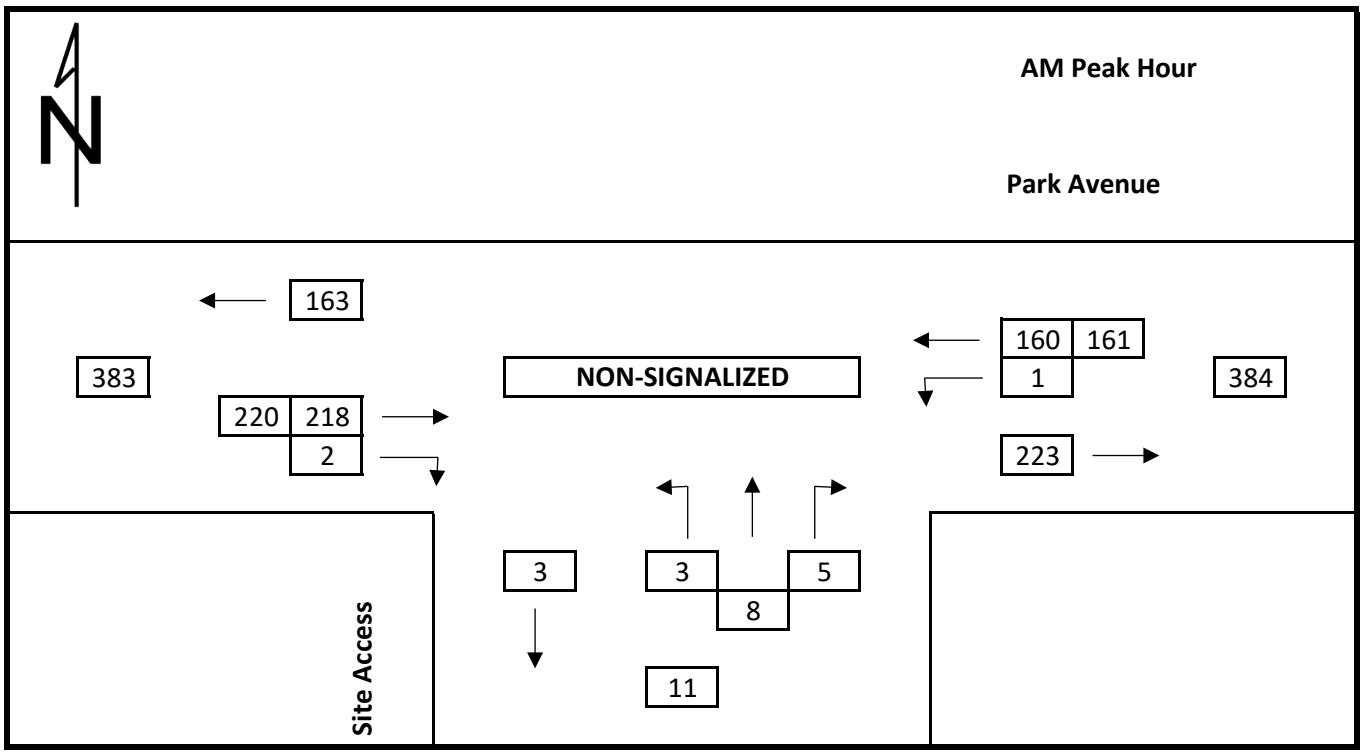
Site Access at Park Avenue West

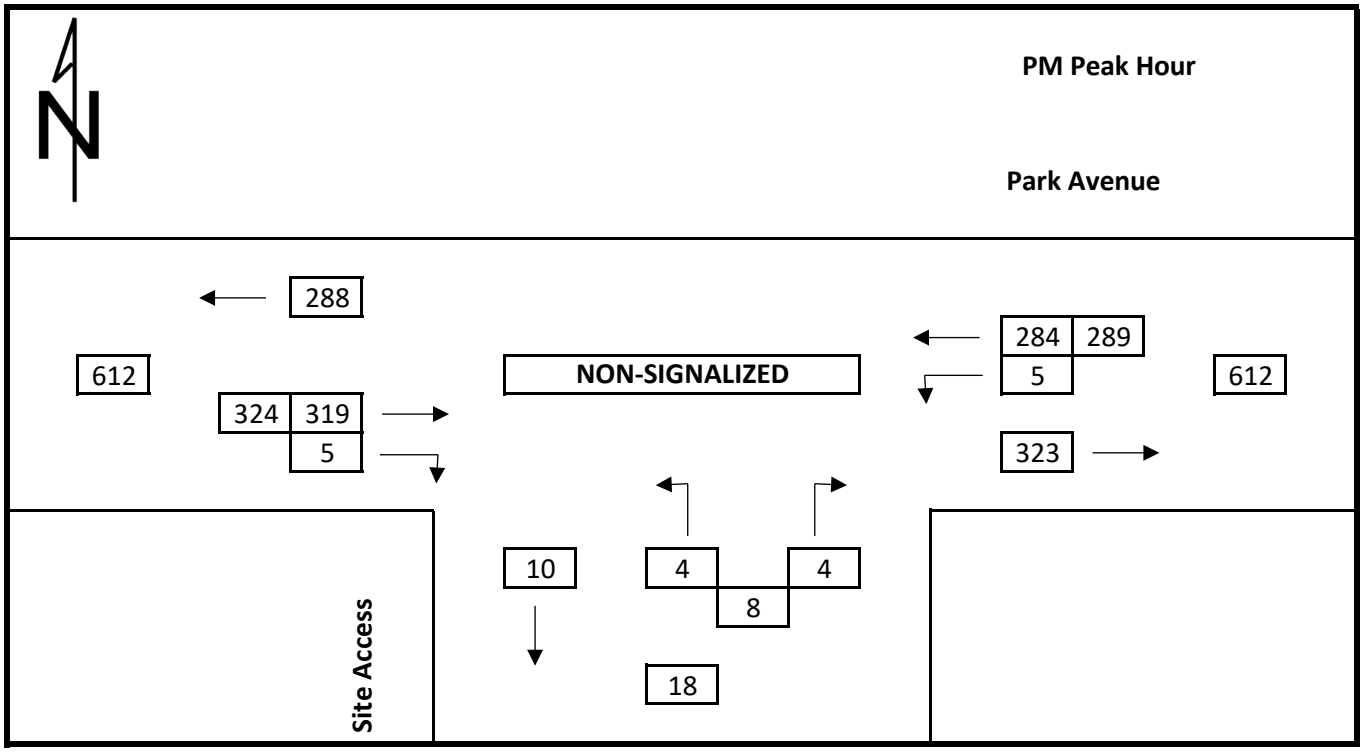


**Total Traffic 2031**

Site Access at Park Avenue West

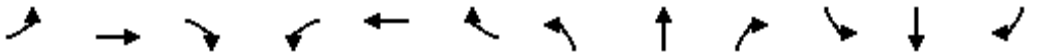


# Appendix D

# DETAILED SYNCHRO RESULTS

## Richmond Street at Keil Drive South
## Park Avenue West at Keil Drive South
## Site Access at Keil Drive South
## Site Access at Park Avenue West

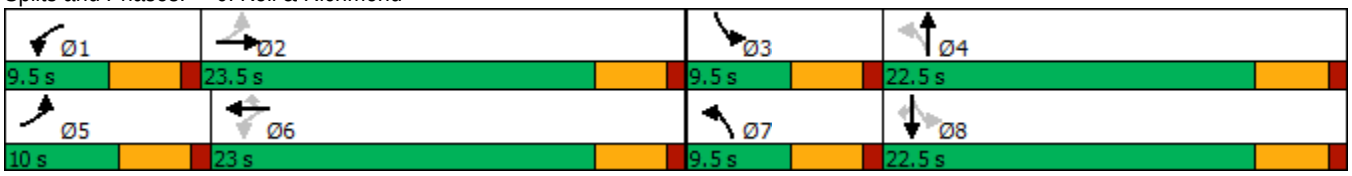


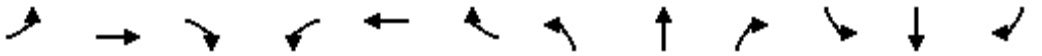
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 217 | 256 | 57 | 31 | 199 | 130 | 76 | 274 | 45 | 124 | 184 | 202 |
| Future Volume (vph) | 217 | 256 | 57 | 31 | 199 | 130 | 76 | 274 | 45 | 124 | 184 | 202 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.973 | | | | 0.850 | | 0.979 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 3024 | 0 | 1630 | 3107 | 1444 | 1583 | 3183 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.526 | | | 0.547 | | | 0.626 | | | 0.457 | | |
| Satd. Flow (perm) | 877 | 3024 | 0 | 938 | 3107 | 1444 | 1043 | 3183 | 0 | 762 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 41 | | | | 176 | | 28 | | | | 220 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 236 | 278 | 62 | 34 | 216 | 141 | 83 | 298 | 49 | 135 | 200 | 220 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 236 | 340 | 0 | 34 | 216 | 141 | 83 | 347 | 0 | 135 | 200 | 220 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.0 | 23.5 | | 9.5 | 23.0 | 23.0 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.4% | 36.2% | | 14.6% | 35.4% | 35.4% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.5 | 19.0 | | 5.0 | 18.5 | 18.5 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 27.4 | 25.3 | | 23.8 | 18.7 | 18.7 | 14.7 | 10.9 | | 15.6 | 12.8 | 12.8 |
| Actuated g/C Ratio | 0.49 | 0.45 | | 0.42 | 0.33 | 0.33 | 0.26 | 0.19 | | 0.28 | 0.23 | 0.23 |
| v/c Ratio | 0.47 | 0.24 | | 0.07 | 0.21 | 0.24 | 0.26 | 0.54 | | 0.47 | 0.27 | 0.45 |
| Control Delay | 14.2 | 11.7 | | 9.2 | 15.6 | 3.1 | 14.9 | 22.4 | | 19.6 | 19.8 | 6.9 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 14.2 | 11.7 | | 9.2 | 15.6 | 3.1 | 14.9 | 22.4 | | 19.6 | 19.8 | 6.9 |
| LOS | B | B | | A | B | A | B | C | | B | B | A |
| Approach Delay | | 12.7 | | | 10.6 | | | 21.0 | | | 14.6 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (m) | 14.5 | 9.1 | | 1.8 | 9.1 | 0.0 | 6.2 | 17.0 | | 10.3 | 10.2 | 0.0 |
| Queue Length 95th (m) | 30.9 | 24.2 | | 6.2 | 17.7 | 7.5 | 14.0 | 28.1 | | 21.1 | 18.2 | 14.8 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 498 | 1388 | | 460 | 1037 | 599 | 322 | 1053 | | 285 | 1082 | 604 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.24 | | 0.07 | 0.21 | 0.24 | 0.26 | 0.33 | | 0.47 | 0.18 | 0.36 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 56.1 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.54 | | | |
| Intersection Signal Delay: 14.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 51.3% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Keil & Richmond



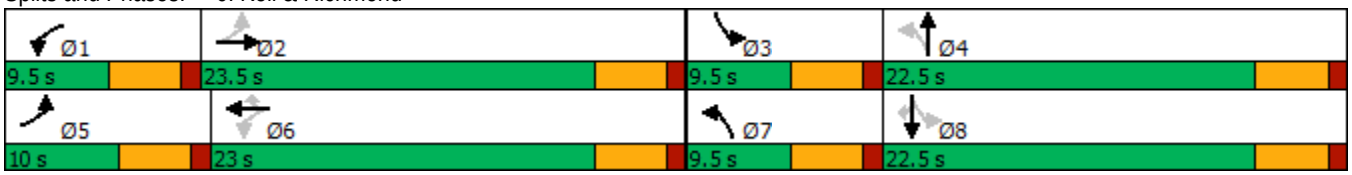


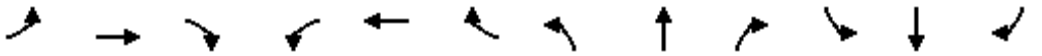
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 299 | 297 | 120 | 46 | 232 | 197 | 64 | 336 | 63 | 131 | 386 | 240 |
| Future Volume (vph) | 299 | 297 | 120 | 46 | 232 | 197 | 64 | 336 | 63 | 131 | 386 | 240 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.957 | | | | 0.850 | | 0.976 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 2974 | 0 | 1630 | 3107 | 1444 | 1583 | 3172 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.525 | | | 0.491 | | | 0.466 | | | 0.384 | | |
| Satd. Flow (perm) | 875 | 2974 | 0 | 842 | 3107 | 1444 | 777 | 3172 | 0 | 640 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 94 | | | | 214 | | 33 | | | | 204 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 325 | 323 | 130 | 50 | 252 | 214 | 70 | 365 | 68 | 142 | 420 | 261 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 325 | 453 | 0 | 50 | 252 | 214 | 70 | 433 | 0 | 142 | 420 | 261 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.0 | 23.5 | | 9.5 | 23.0 | 23.0 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.4% | 36.2% | | 14.6% | 35.4% | 35.4% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.5 | 19.0 | | 5.0 | 18.5 | 18.5 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 26.7 | 23.6 | | 23.9 | 18.8 | 18.8 | 16.9 | 13.1 | | 17.8 | 15.0 | 15.0 |
| Actuated g/C Ratio | 0.46 | 0.40 | | 0.41 | 0.32 | 0.32 | 0.29 | 0.22 | | 0.30 | 0.26 | 0.26 |
| v/c Ratio | 0.70 | 0.36 | | 0.12 | 0.25 | 0.35 | 0.24 | 0.59 | | 0.51 | 0.50 | 0.51 |
| Control Delay | 24.8 | 13.3 | | 10.7 | 17.2 | 5.0 | 14.1 | 22.4 | | 20.4 | 21.3 | 9.8 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 24.8 | 13.3 | | 10.7 | 17.2 | 5.0 | 14.1 | 22.4 | | 20.4 | 21.3 | 9.8 |
| LOS | C | B | | B | B | A | B | C | | C | C | A |
| Approach Delay | | 18.1 | | | 11.5 | | | 21.2 | | | 17.5 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (m) | 23.9 | 17.0 | | 3.0 | 11.6 | 0.0 | 5.1 | 21.9 | | 10.9 | 23.0 | 5.4 |
| Queue Length 95th (m) | #66.0 | 32.0 | | 9.0 | 21.7 | 14.0 | 12.0 | 34.6 | | 21.7 | 35.5 | 23.3 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 467 | 1259 | | 412 | 999 | 609 | 294 | 1015 | | 277 | 1058 | 585 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.36 | | 0.12 | 0.25 | 0.35 | 0.24 | 0.43 | | 0.51 | 0.40 | 0.45 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 58.4 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.70 | | | |
| Intersection Signal Delay: 17.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 60.1% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: Keil & Richmond



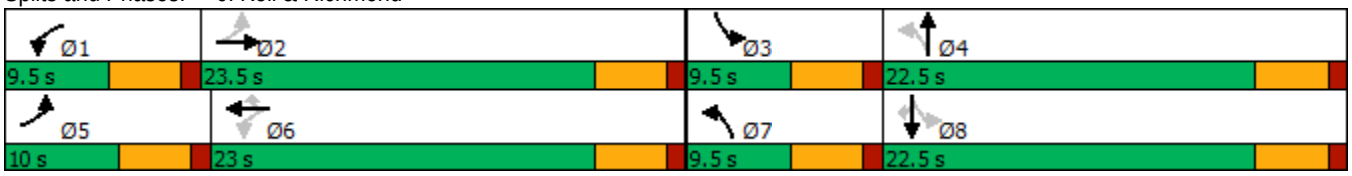


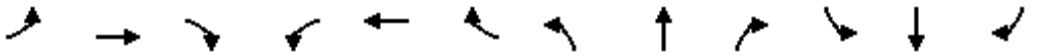
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 217 | 256 | 58 | 31 | 199 | 130 | 78 | 283 | 47 | 124 | 187 | 202 |
| Future Volume (vph) | 217 | 256 | 58 | 31 | 199 | 130 | 78 | 283 | 47 | 124 | 187 | 202 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.972 | | | | 0.850 | | 0.979 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 3020 | 0 | 1630 | 3107 | 1444 | 1583 | 3182 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.527 | | | 0.547 | | | 0.624 | | | 0.476 | | |
| Satd. Flow (perm) | 878 | 3020 | 0 | 938 | 3107 | 1444 | 1040 | 3182 | 0 | 793 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 43 | | | | 176 | | 28 | | | | 220 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 236 | 278 | 63 | 34 | 216 | 141 | 85 | 308 | 51 | 135 | 203 | 220 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 236 | 341 | 0 | 34 | 216 | 141 | 85 | 359 | 0 | 135 | 203 | 220 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.0 | 23.5 | | 9.5 | 23.0 | 23.0 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.4% | 36.2% | | 14.6% | 35.4% | 35.4% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.5 | 19.0 | | 5.0 | 18.5 | 18.5 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 27.4 | 25.3 | | 23.8 | 18.7 | 18.7 | 14.9 | 11.1 | | 14.9 | 11.1 | 11.1 |
| Actuated g/C Ratio | 0.49 | 0.45 | | 0.42 | 0.33 | 0.33 | 0.26 | 0.20 | | 0.26 | 0.20 | 0.20 |
| v/c Ratio | 0.48 | 0.25 | | 0.07 | 0.21 | 0.24 | 0.26 | 0.55 | | 0.48 | 0.31 | 0.49 |
| Control Delay | 14.4 | 11.7 | | 9.3 | 15.8 | 3.1 | 14.9 | 22.6 | | 19.9 | 21.1 | 7.6 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 14.4 | 11.7 | | 9.3 | 15.8 | 3.1 | 14.9 | 22.6 | | 19.9 | 21.1 | 7.6 |
| LOS | B | B | | A | B | A | B | C | | B | C | A |
| Approach Delay | | 12.8 | | | 10.7 | | | 21.1 | | | 15.5 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (m) | 14.7 | 9.2 | | 1.9 | 9.1 | 0.0 | 6.3 | 17.7 | | 10.3 | 10.3 | 0.0 |
| Queue Length 95th (m) | 31.3 | 24.3 | | 6.2 | 17.8 | 7.5 | 14.3 | 29.1 | | 21.1 | 18.4 | 14.8 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 496 | 1382 | | 458 | 1033 | 597 | 324 | 1048 | | 281 | 1065 | 598 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.25 | | 0.07 | 0.21 | 0.24 | 0.26 | 0.34 | | 0.48 | 0.19 | 0.37 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 56.3 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.55 | | | |
| Intersection Signal Delay: 15.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 51.6% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Keil & Richmond



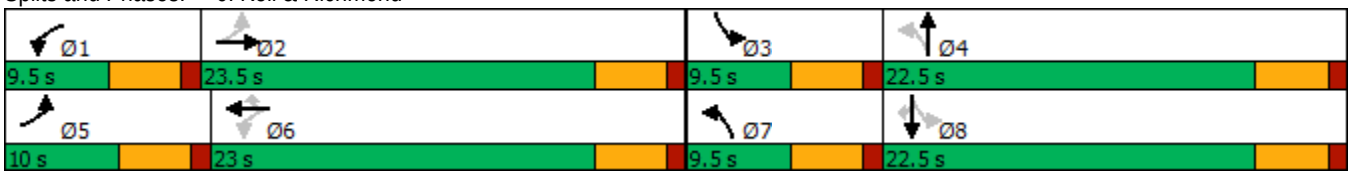


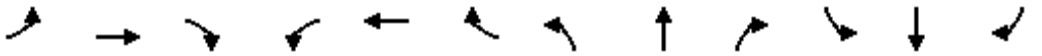
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 299 | 297 | 124 | 48 | 232 | 197 | 66 | 345 | 64 | 131 | 400 | 240 |
| Future Volume (vph) | 299 | 297 | 124 | 48 | 232 | 197 | 66 | 345 | 64 | 131 | 400 | 240 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.956 | | | | 0.850 | | 0.976 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 2971 | 0 | 1630 | 3107 | 1444 | 1583 | 3172 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.525 | | | 0.488 | | | 0.451 | | | 0.374 | | |
| Satd. Flow (perm) | 875 | 2971 | 0 | 837 | 3107 | 1444 | 752 | 3172 | 0 | 623 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 100 | | | | 214 | | 33 | | | | 196 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 325 | 323 | 135 | 52 | 252 | 214 | 72 | 375 | 70 | 142 | 435 | 261 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 325 | 458 | 0 | 52 | 252 | 214 | 72 | 445 | 0 | 142 | 435 | 261 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.0 | 23.5 | | 9.5 | 23.0 | 23.0 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.4% | 36.2% | | 14.6% | 35.4% | 35.4% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.5 | 19.0 | | 5.0 | 18.5 | 18.5 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 26.7 | 23.6 | | 23.9 | 18.8 | 18.8 | 17.1 | 13.3 | | 18.0 | 15.2 | 15.2 |
| Actuated g/C Ratio | 0.46 | 0.40 | | 0.41 | 0.32 | 0.32 | 0.29 | 0.23 | | 0.31 | 0.26 | 0.26 |
| v/c Ratio | 0.70 | 0.36 | | 0.13 | 0.25 | 0.35 | 0.25 | 0.60 | | 0.52 | 0.51 | 0.52 |
| Control Delay | 25.0 | 13.2 | | 10.9 | 17.3 | 5.0 | 14.2 | 22.5 | | 20.6 | 21.4 | 10.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 25.0 | 13.2 | | 10.9 | 17.3 | 5.0 | 14.2 | 22.5 | | 20.6 | 21.4 | 10.3 |
| LOS | C | B | | B | B | A | B | C | | C | C | B |
| Approach Delay | | 18.1 | | | 11.6 | | | 21.4 | | | 17.8 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (m) | 24.1 | 17.1 | | 3.2 | 11.7 | 0.0 | 5.3 | 22.7 | | 10.9 | 24.0 | 6.2 |
| Queue Length 95th (m) | #66.0 | 31.9 | | 9.3 | 21.7 | 14.0 | 12.3 | 35.6 | | 21.7 | 36.7 | 24.5 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 466 | 1257 | | 409 | 995 | 608 | 291 | 1012 | | 274 | 1058 | 579 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.36 | | 0.13 | 0.25 | 0.35 | 0.25 | 0.44 | | 0.52 | 0.41 | 0.45 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 58.6 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.70 | | | |
| Intersection Signal Delay: 17.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 60.4% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: Keil & Richmond



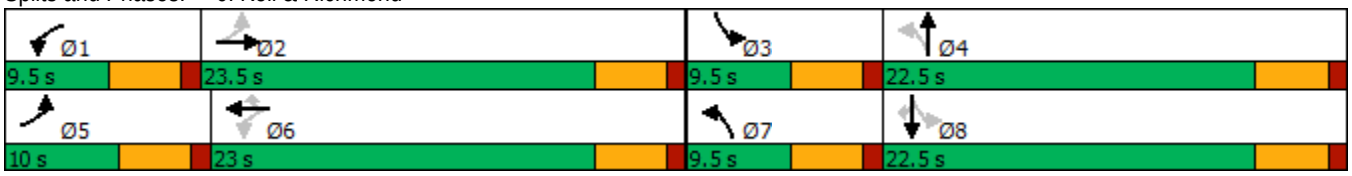


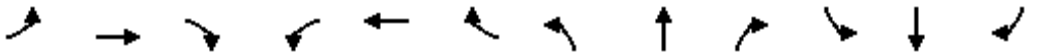
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 230 | 272 | 62 | 33 | 211 | 138 | 83 | 300 | 50 | 132 | 198 | 214 |
| Future Volume (vph) | 230 | 272 | 62 | 33 | 211 | 138 | 83 | 300 | 50 | 132 | 198 | 214 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.972 | | | | 0.850 | | 0.979 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 3020 | 0 | 1630 | 3107 | 1444 | 1583 | 3182 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.520 | | | 0.535 | | | 0.617 | | | 0.452 | | |
| Satd. Flow (perm) | 867 | 3020 | 0 | 918 | 3107 | 1444 | 1028 | 3182 | 0 | 753 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 42 | | | | 176 | | 28 | | | | 233 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 250 | 296 | 67 | 36 | 229 | 150 | 90 | 326 | 54 | 143 | 215 | 233 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 250 | 363 | 0 | 36 | 229 | 150 | 90 | 380 | 0 | 143 | 215 | 233 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.0 | 23.5 | | 9.5 | 23.0 | 23.0 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.4% | 36.2% | | 14.6% | 35.4% | 35.4% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.5 | 19.0 | | 5.0 | 18.5 | 18.5 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 27.4 | 25.4 | | 23.8 | 18.8 | 18.8 | 15.4 | 11.5 | | 15.4 | 11.5 | 11.5 |
| Actuated g/C Ratio | 0.48 | 0.45 | | 0.42 | 0.33 | 0.33 | 0.27 | 0.20 | | 0.27 | 0.20 | 0.20 |
| v/c Ratio | 0.51 | 0.26 | | 0.08 | 0.22 | 0.25 | 0.28 | 0.57 | | 0.52 | 0.32 | 0.50 |
| Control Delay | 15.6 | 12.1 | | 9.6 | 16.1 | 3.6 | 15.0 | 22.8 | | 20.9 | 21.1 | 7.4 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 15.6 | 12.1 | | 9.6 | 16.1 | 3.6 | 15.0 | 22.8 | | 20.9 | 21.1 | 7.4 |
| LOS | B | B | | A | B | A | B | C | | C | C | A |
| Approach Delay | | 13.5 | | | 11.0 | | | 21.3 | | | 15.7 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (m) | 16.0 | 10.1 | | 2.0 | 9.8 | 0.0 | 6.7 | 19.0 | | 11.0 | 11.0 | 0.0 |
| Queue Length 95th (m) | 33.7 | 26.3 | | 6.7 | 19.0 | 8.8 | 14.9 | 30.7 | | 22.1 | 19.2 | 15.1 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 488 | 1371 | | 448 | 1025 | 594 | 327 | 1041 | | 277 | 1057 | 604 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.26 | | 0.08 | 0.22 | 0.25 | 0.28 | 0.37 | | 0.52 | 0.20 | 0.39 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 56.8 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.57 | | | |
| Intersection Signal Delay: 15.4 | | Intersection LOS: B | |
| Intersection Capacity Utilization 53.8% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 6: Keil & Richmond



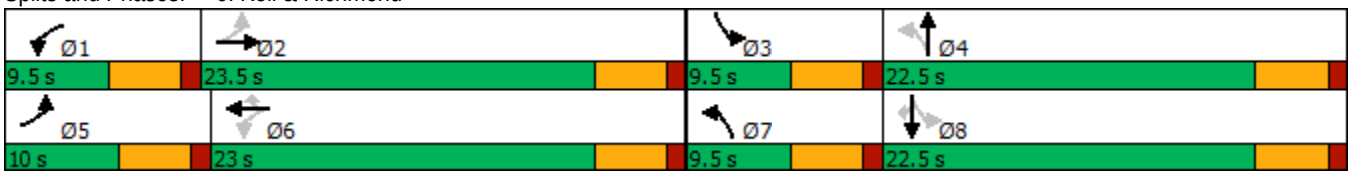


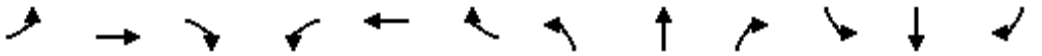
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 317 | 315 | 131 | 51 | 246 | 209 | 70 | 366 | 68 | 139 | 424 | 255 |
| Future Volume (vph) | 317 | 315 | 131 | 51 | 246 | 209 | 70 | 366 | 68 | 139 | 424 | 255 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.956 | | | | 0.850 | | 0.976 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 2971 | 0 | 1630 | 3107 | 1444 | 1583 | 3172 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.517 | | | 0.476 | | | 0.425 | | | 0.351 | | |
| Satd. Flow (perm) | 862 | 2971 | 0 | 817 | 3107 | 1444 | 708 | 3172 | 0 | 585 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 98 | | | | 227 | | 33 | | | | 196 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 345 | 342 | 142 | 55 | 267 | 227 | 76 | 398 | 74 | 151 | 461 | 277 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 345 | 484 | 0 | 55 | 267 | 227 | 76 | 472 | 0 | 151 | 461 | 277 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.0 | 23.5 | | 9.5 | 23.0 | 23.0 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.4% | 36.2% | | 14.6% | 35.4% | 35.4% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.5 | 19.0 | | 5.0 | 18.5 | 18.5 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 26.7 | 23.6 | | 23.9 | 18.8 | 18.8 | 17.5 | 13.7 | | 18.4 | 15.6 | 15.6 |
| Actuated g/C Ratio | 0.45 | 0.40 | | 0.41 | 0.32 | 0.32 | 0.30 | 0.23 | | 0.31 | 0.26 | 0.26 |
| v/c Ratio | 0.75 | 0.39 | | 0.14 | 0.27 | 0.37 | 0.27 | 0.62 | | 0.56 | 0.53 | 0.54 |
| Control Delay | 29.0 | 13.8 | | 11.1 | 17.6 | 5.1 | 14.5 | 23.0 | | 22.4 | 21.6 | 11.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 29.0 | 13.8 | | 11.1 | 17.6 | 5.1 | 14.5 | 23.0 | | 22.4 | 21.6 | 11.3 |
| LOS | C | B | | B | B | A | B | C | | C | C | B |
| Approach Delay | | 20.1 | | | 11.8 | | | 21.8 | | | 18.6 | |
| Approach LOS | | C | | | B | | | C | | | B | |
| Queue Length 50th (m) | 26.5 | 18.9 | | 3.4 | 12.6 | 0.0 | 5.6 | 24.4 | | 11.7 | 25.6 | 7.8 |
| Queue Length 95th (m) | #74.8 | 34.3 | | 9.7 | 23.0 | 14.3 | 12.9 | 38.0 | | 22.9 | 39.0 | 27.6 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 458 | 1248 | | 400 | 989 | 614 | 285 | 1005 | | 268 | 1055 | 579 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.75 | 0.39 | | 0.14 | 0.27 | 0.37 | 0.27 | 0.47 | | 0.56 | 0.44 | 0.48 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 59 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.75 | | | |
| Intersection Signal Delay: 18.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 63.2% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: Keil & Richmond



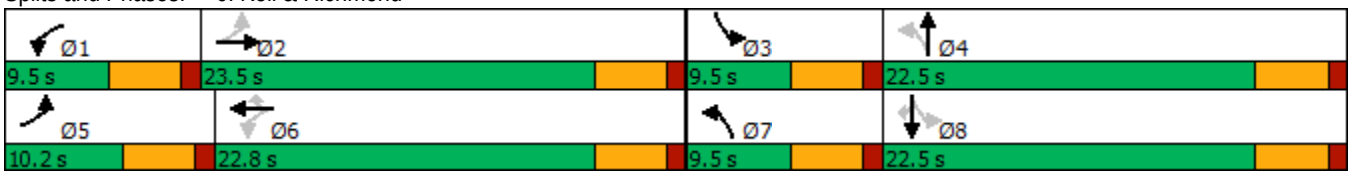


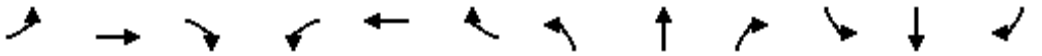
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 242 | 286 | 65 | 35 | 222 | 145 | 87 | 315 | 52 | 138 | 208 | 225 |
| Future Volume (vph) | 242 | 286 | 65 | 35 | 222 | 145 | 87 | 315 | 52 | 138 | 208 | 225 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.972 | | | | 0.850 | | 0.979 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 3020 | 0 | 1630 | 3107 | 1444 | 1583 | 3182 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.507 | | | 0.525 | | | 0.611 | | | 0.431 | | |
| Satd. Flow (perm) | 845 | 3020 | 0 | 901 | 3107 | 1444 | 1018 | 3182 | 0 | 718 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 43 | | | | 176 | | 29 | | | | 245 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 263 | 311 | 71 | 38 | 241 | 158 | 95 | 342 | 57 | 150 | 226 | 245 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 263 | 382 | 0 | 38 | 241 | 158 | 95 | 399 | 0 | 150 | 226 | 245 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 10.2 | 23.5 | | 9.5 | 22.8 | 22.8 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (%) | 15.7% | 36.2% | | 14.6% | 35.1% | 35.1% | 14.6% | 34.6% | | 14.6% | 34.6% | 34.6% |
| Maximum Green (s) | 5.7 | 19.0 | | 5.0 | 18.3 | 18.3 | 5.0 | 18.0 | | 5.0 | 18.0 | 18.0 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 27.5 | 25.4 | | 23.6 | 18.5 | 18.5 | 15.7 | 11.9 | | 15.7 | 11.9 | 11.9 |
| Actuated g/C Ratio | 0.48 | 0.44 | | 0.41 | 0.32 | 0.32 | 0.27 | 0.21 | | 0.27 | 0.21 | 0.21 |
| v/c Ratio | 0.55 | 0.28 | | 0.09 | 0.24 | 0.27 | 0.29 | 0.58 | | 0.55 | 0.33 | 0.51 |
| Control Delay | 17.1 | 12.4 | | 9.8 | 16.5 | 4.1 | 15.1 | 22.9 | | 22.1 | 21.0 | 7.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 17.1 | 12.4 | | 9.8 | 16.5 | 4.1 | 15.1 | 22.9 | | 22.1 | 21.0 | 7.3 |
| LOS | B | B | | A | B | A | B | C | | C | C | A |
| Approach Delay | | 14.3 | | | 11.5 | | | 21.4 | | | 15.9 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (m) | 17.2 | 10.9 | | 2.1 | 10.6 | 0.0 | 7.1 | 20.1 | | 11.6 | 11.6 | 0.0 |
| Queue Length 95th (m) | #39.6 | 28.1 | | 7.1 | 20.3 | 10.0 | 15.5 | 32.2 | | 23.0 | 20.1 | 15.3 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 480 | 1365 | | 436 | 1008 | 587 | 330 | 1035 | | 274 | 1051 | 610 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.55 | 0.28 | | 0.09 | 0.24 | 0.27 | 0.29 | 0.39 | | 0.55 | 0.22 | 0.40 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 57.1 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.58 | | | |
| Intersection Signal Delay: 15.8 | | Intersection LOS: B | |
| Intersection Capacity Utilization 55.8% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: Keil & Richmond



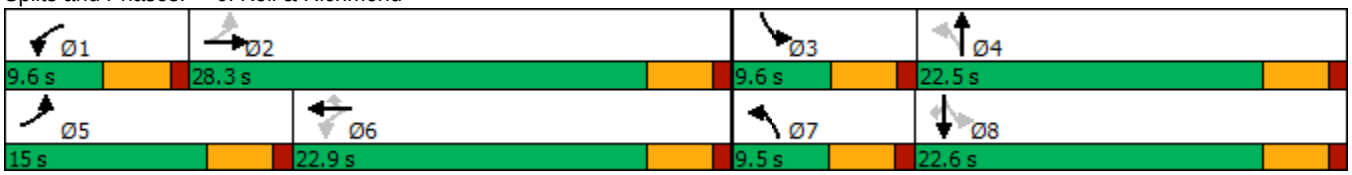


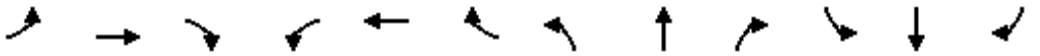
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 334 | 331 | 138 | 53 | 259 | 220 | 73 | 384 | 71 | 146 | 445 | 268 |
| Future Volume (vph) | 334 | 331 | 138 | 53 | 259 | 220 | 73 | 384 | 71 | 146 | 445 | 268 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 200.0 | | 0.0 | 200.0 | | 10.0 | 100.0 | | 0.0 | 100.0 | | 10.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 1 | | 0 | 1 | | 1 |
| Taper Length (m) | 100.0 | | | 100.0 | | | 100.0 | | | 100.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 |
| Frt | | 0.956 | | | | 0.850 | | 0.977 | | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1583 | 2971 | 0 | 1630 | 3107 | 1444 | 1583 | 3175 | 0 | 1583 | 3292 | 1390 |
| Flt Permitted | 0.474 | | | 0.464 | | | 0.385 | | | 0.310 | | |
| Satd. Flow (perm) | 790 | 2971 | 0 | 796 | 3107 | 1444 | 642 | 3175 | 0 | 517 | 3292 | 1390 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 99 | | | | 239 | | 29 | | | | 234 |
| Link Speed (k/h) | | 60 | | | 50 | | | 60 | | | 50 | |
| Link Distance (m) | | 242.3 | | | 224.5 | | | 764.8 | | | 233.5 | |
| Travel Time (s) | | 14.5 | | | 16.2 | | | 45.9 | | | 16.8 | |
| 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 |
| Heavy Vehicles (%) | 5% | 7% | 7% | 2% | 7% | 3% | 5% | 2% | 4% | 5% | 1% | 7% |
| Adj. Flow (vph) | 363 | 360 | 150 | 58 | 282 | 239 | 79 | 417 | 77 | 159 | 484 | 291 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 363 | 510 | 0 | 58 | 282 | 239 | 79 | 494 | 0 | 159 | 484 | 291 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 | 9.5 | 22.5 | | 9.5 | 22.5 | 22.5 |
| Total Split (s) | 15.0 | 28.3 | | 9.6 | 22.9 | 22.9 | 9.5 | 22.5 | | 9.6 | 22.6 | 22.6 |
| Total Split (%) | 21.4% | 40.4% | | 13.7% | 32.7% | 32.7% | 13.6% | 32.1% | | 13.7% | 32.3% | 32.3% |
| Maximum Green (s) | 10.5 | 23.8 | | 5.1 | 18.4 | 18.4 | 5.0 | 18.0 | | 5.1 | 18.1 | 18.1 |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | | 3.5 | 3.5 | 3.5 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 |
| Recall Mode | Max | Max | | None | Max | Max | None | None | | None | None | None |
| Walk Time (s) | | 7.0 | | | 7.0 | 7.0 | | 7.0 | | | 7.0 | 7.0 |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | 11.0 | | 11.0 | | | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | | 0 | | | 0 | 0 |
| Act Effct Green (s) | 33.5 | 27.9 | | 23.6 | 18.4 | 18.4 | 19.9 | 14.9 | | 21.0 | 17.0 | 17.0 |
| Actuated g/C Ratio | 0.50 | 0.42 | | 0.35 | 0.27 | 0.27 | 0.30 | 0.22 | | 0.31 | 0.25 | 0.25 |
| v/c Ratio | 0.70 | 0.39 | | 0.17 | 0.33 | 0.42 | 0.30 | 0.68 | | 0.65 | 0.58 | 0.55 |
| Control Delay | 21.1 | 13.5 | | 11.6 | 21.3 | 5.8 | 17.3 | 27.5 | | 30.8 | 25.7 | 10.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 21.1 | 13.5 | | 11.6 | 21.3 | 5.8 | 17.3 | 27.5 | | 30.8 | 25.7 | 10.3 |
| LOS | C | B | | B | C | A | B | C | | C | C | B |
| Approach Delay | | 16.7 | | | 13.9 | | | 26.1 | | | 21.8 | |
| Approach LOS | | B | | | B | | | C | | | C | |
| Queue Length 50th (m) | 29.6 | 21.2 | | 3.8 | 15.7 | 0.0 | 6.7 | 29.4 | | 14.3 | 30.4 | 6.1 |
| Queue Length 95th (m) | #60.6 | 35.9 | | 9.9 | 26.7 | 15.7 | 15.0 | 44.3 | | #31.7 | 45.1 | 26.7 |
| Internal Link Dist (m) | | 218.3 | | | 200.5 | | | 740.8 | | | 209.5 | |
| Turn Bay Length (m) | 200.0 | | | 200.0 | | 10.0 | 100.0 | | | 100.0 | | 10.0 |
| Base Capacity (vph) | 519 | 1294 | | 343 | 855 | 570 | 260 | 876 | | 243 | 911 | 554 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.39 | | 0.17 | 0.33 | 0.42 | 0.30 | 0.56 | | 0.65 | 0.53 | 0.53 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 67 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.70 | | | |
| Intersection Signal Delay: 19.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 65.6% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: Keil & Richmond



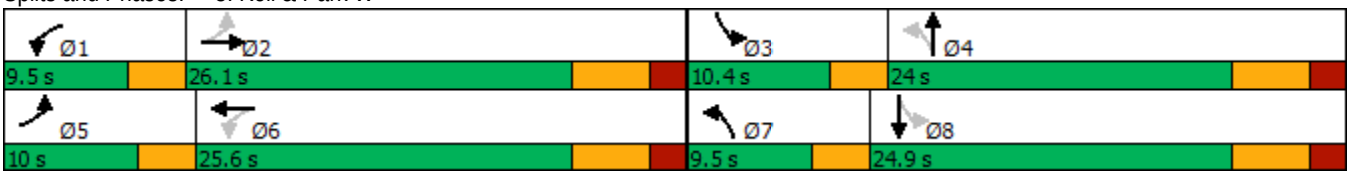


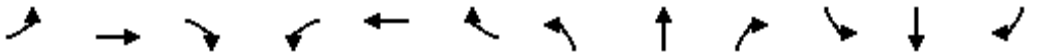
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 55 | 106 | 34 | 27 | 77 | 205 | 22 | 141 | 30 | 150 | 91 | 44 |
| Future Volume (vph) | 55 | 106 | 34 | 27 | 77 | 205 | 22 | 141 | 30 | 150 | 91 | 44 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.963 | | | 0.891 | | | 0.973 | | | 0.951 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3008 | 0 | 1583 | 2841 | 0 | 1614 | 1683 | 0 | 1583 | 3111 | 0 |
| Flt Permitted | 0.528 | | | 0.656 | | | 0.659 | | | 0.517 | | |
| Satd. Flow (perm) | 897 | 3008 | 0 | 1093 | 2841 | 0 | 1120 | 1683 | 0 | 862 | 3111 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 37 | | | 223 | | | 15 | | | 48 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 60 | 115 | 37 | 29 | 84 | 223 | 24 | 153 | 33 | 163 | 99 | 48 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 60 | 152 | 0 | 29 | 307 | 0 | 24 | 186 | 0 | 163 | 147 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 26.1 | | 9.5 | 25.6 | | 9.5 | 24.0 | | 10.4 | 24.9 | |
| Total Split (%) | 14.3% | 37.3% | | 13.6% | 36.6% | | 13.6% | 34.3% | | 14.9% | 35.6% | |
| Maximum Green (s) | 7.0 | 20.1 | | 6.5 | 19.6 | | 6.5 | 18.0 | | 7.4 | 18.9 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 28.7 | 23.1 | | 27.6 | 21.1 | | 19.1 | 11.4 | | 21.6 | 16.0 | |
| Actuated g/C Ratio | 0.49 | 0.40 | | 0.48 | 0.36 | | 0.33 | 0.20 | | 0.37 | 0.28 | |
| v/c Ratio | 0.11 | 0.12 | | 0.05 | 0.26 | | 0.06 | 0.55 | | 0.40 | 0.17 | |
| Control Delay | 9.8 | 12.4 | | 9.4 | 6.5 | | 11.8 | 27.1 | | 15.4 | 13.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 9.8 | 12.4 | | 9.4 | 6.5 | | 11.8 | 27.1 | | 15.4 | 13.6 | |
| LOS | A | B | | A | A | | B | C | | B | B | |
| Approach Delay | | 11.6 | | | 6.8 | | | 25.4 | | | 14.6 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 3.5 | 3.9 | | 1.7 | 3.8 | | 1.8 | 19.5 | | 13.2 | 4.2 | |
| Queue Length 95th (m) | 10.2 | 12.6 | | 6.0 | 13.4 | | 5.6 | 37.3 | | 25.0 | 12.1 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 532 | 1219 | | 577 | 1174 | | 431 | 552 | | 416 | 1119 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.11 | 0.12 | | 0.05 | 0.26 | | 0.06 | 0.34 | | 0.39 | 0.13 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 58.1 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.55 | | | |
| Intersection Signal Delay: 13.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 49.4% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Keil & Park W





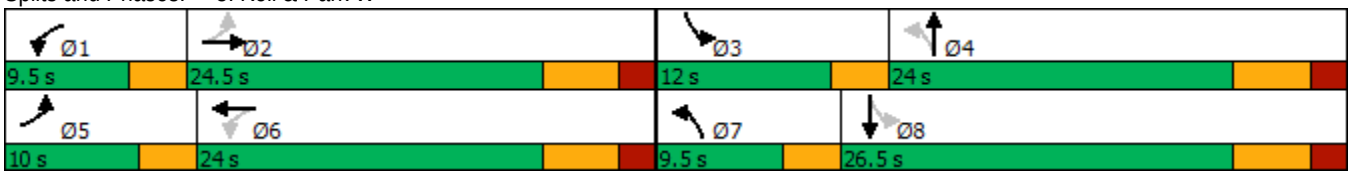
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 69 | 185 | 32 | 14 | 151 | 214 | 12 | 98 | 11 | 282 | 163 | 92 |
| Future Volume (vph) | 69 | 185 | 32 | 14 | 151 | 214 | 12 | 98 | 11 | 282 | 163 | 92 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.978 | | | 0.912 | | | 0.985 | | | 0.946 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3071 | 0 | 1583 | 2904 | 0 | 1614 | 1705 | 0 | 1583 | 3092 | 0 |
| Flt Permitted | 0.459 | | | 0.605 | | | 0.581 | | | 0.501 | | |
| Satd. Flow (perm) | 780 | 3071 | 0 | 1008 | 2904 | 0 | 987 | 1705 | 0 | 835 | 3092 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 233 | | | 8 | | | 100 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 75 | 201 | 35 | 15 | 164 | 233 | 13 | 107 | 12 | 307 | 177 | 100 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 75 | 236 | 0 | 15 | 397 | 0 | 13 | 119 | 0 | 307 | 277 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 24.5 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 12.0 | 26.5 | |
| Total Split (%) | 14.3% | 35.0% | | 13.6% | 34.3% | | 13.6% | 34.3% | | 17.1% | 37.9% | |
| Maximum Green (s) | 7.0 | 18.5 | | 6.5 | 18.0 | | 6.5 | 18.0 | | 9.0 | 20.5 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 27.1 | 22.8 | | 25.5 | 19.2 | | 15.9 | 9.3 | | 21.3 | 16.6 | |
| Actuated g/C Ratio | 0.49 | 0.41 | | 0.46 | 0.35 | | 0.29 | 0.17 | | 0.39 | 0.30 | |
| v/c Ratio | 0.15 | 0.18 | | 0.03 | 0.34 | | 0.04 | 0.41 | | 0.69 | 0.28 | |
| Control Delay | 9.7 | 11.9 | | 8.9 | 8.4 | | 11.4 | 26.0 | | 22.7 | 11.1 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

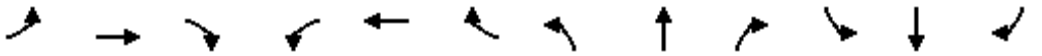
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 9.7 | 11.9 | | 8.9 | 8.4 | | 11.4 | 26.0 | | 22.7 | 11.1 | |
| LOS | A | B | | A | A | | B | C | | C | B | |
| Approach Delay | | 11.4 | | | 8.5 | | | 24.5 | | | 17.2 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 4.3 | 7.1 | | 0.8 | 7.5 | | 0.9 | 12.2 | | 26.3 | 7.4 | |
| Queue Length 95th (m) | 11.4 | 19.1 | | 3.6 | 18.7 | | 3.6 | 25.7 | | #47.9 | 18.9 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 494 | 1284 | | 540 | 1160 | | 373 | 588 | | 450 | 1296 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.15 | 0.18 | | 0.03 | 0.34 | | 0.03 | 0.20 | | 0.68 | 0.21 | |

**Intersection Summary**

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 55.2
Natural Cycle: 70
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 14.1 Intersection LOS: B
Intersection Capacity Utilization 53.1% ICU Level of Service A
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Keil & Park W



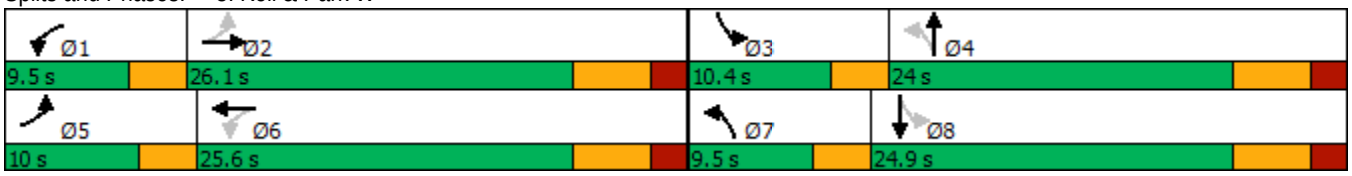


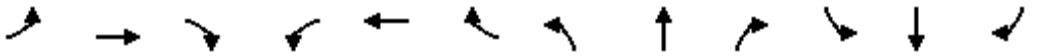
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 57 | 109 | 34 | 28 | 78 | 205 | 22 | 152 | 33 | 150 | 95 | 44 |
| Future Volume (vph) | 57 | 109 | 34 | 28 | 78 | 205 | 22 | 152 | 33 | 150 | 95 | 44 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.964 | | | 0.891 | | | 0.973 | | | 0.952 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3012 | 0 | 1583 | 2841 | 0 | 1614 | 1683 | 0 | 1583 | 3114 | 0 |
| Flt Permitted | 0.527 | | | 0.654 | | | 0.656 | | | 0.510 | | |
| Satd. Flow (perm) | 895 | 3012 | 0 | 1090 | 2841 | 0 | 1115 | 1683 | 0 | 850 | 3114 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 37 | | | 223 | | | 15 | | | 48 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 62 | 118 | 37 | 30 | 85 | 223 | 24 | 165 | 36 | 163 | 103 | 48 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 62 | 155 | 0 | 30 | 308 | 0 | 24 | 201 | 0 | 163 | 151 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 26.1 | | 9.5 | 25.6 | | 9.5 | 24.0 | | 10.4 | 24.9 | |
| Total Split (%) | 14.3% | 37.3% | | 13.6% | 36.6% | | 13.6% | 34.3% | | 14.9% | 35.6% | |
| Maximum Green (s) | 7.0 | 20.1 | | 6.5 | 19.6 | | 6.5 | 18.0 | | 7.4 | 18.9 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 28.4 | 22.8 | | 27.3 | 20.9 | | 19.7 | 12.0 | | 22.2 | 16.5 | |
| Actuated g/C Ratio | 0.49 | 0.39 | | 0.47 | 0.36 | | 0.34 | 0.21 | | 0.38 | 0.28 | |
| v/c Ratio | 0.12 | 0.13 | | 0.05 | 0.27 | | 0.06 | 0.56 | | 0.39 | 0.17 | |
| Control Delay | 10.1 | 12.7 | | 9.8 | 6.7 | | 11.6 | 27.4 | | 15.2 | 13.5 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 10.1 | 12.7 | | 9.8 | 6.7 | | 11.6 | 27.4 | | 15.2 | 13.5 | |
| LOS | B | B | | A | A | | B | C | | B | B | |
| Approach Delay | | 11.9 | | | 7.0 | | | 25.7 | | | 14.4 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 3.7 | 4.1 | | 1.8 | 3.9 | | 1.8 | 21.4 | | 13.2 | 4.4 | |
| Queue Length 95th (m) | 10.7 | 13.1 | | 6.4 | 13.6 | | 5.6 | 39.9 | | 25.0 | 12.3 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 525 | 1200 | | 568 | 1158 | | 439 | 552 | | 420 | 1130 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.12 | 0.13 | | 0.05 | 0.27 | | 0.05 | 0.36 | | 0.39 | 0.13 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 58.4 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.56 | | | |
| Intersection Signal Delay: 13.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 50.2% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Keil & Park W



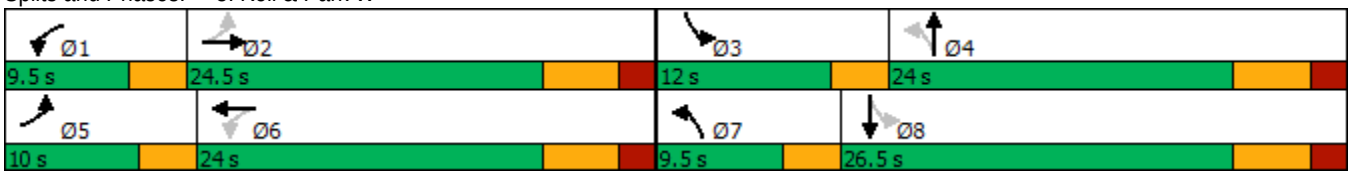


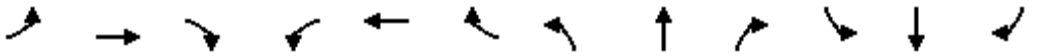
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 188 | 32 | 15 | 154 | 214 | 12 | 109 | 11 | 282 | 181 | 94 |
| Future Volume (vph) | 70 | 188 | 32 | 15 | 154 | 214 | 12 | 109 | 11 | 282 | 181 | 94 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.978 | | | 0.913 | | | 0.986 | | | 0.949 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3071 | 0 | 1583 | 2907 | 0 | 1614 | 1707 | 0 | 1583 | 3103 | 0 |
| Flt Permitted | 0.458 | | | 0.603 | | | 0.569 | | | 0.501 | | |
| Satd. Flow (perm) | 778 | 3071 | 0 | 1005 | 2907 | 0 | 967 | 1707 | 0 | 835 | 3103 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 233 | | | 7 | | | 102 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 76 | 204 | 35 | 16 | 167 | 233 | 13 | 118 | 12 | 307 | 197 | 102 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 76 | 239 | 0 | 16 | 400 | 0 | 13 | 130 | 0 | 307 | 299 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 24.5 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 12.0 | 26.5 | |
| Total Split (%) | 14.3% | 35.0% | | 13.6% | 34.3% | | 13.6% | 34.3% | | 17.1% | 37.9% | |
| Maximum Green (s) | 7.0 | 18.5 | | 6.5 | 18.0 | | 6.5 | 18.0 | | 9.0 | 20.5 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 27.1 | 22.8 | | 25.5 | 19.2 | | 16.2 | 9.6 | | 21.7 | 17.0 | |
| Actuated g/C Ratio | 0.49 | 0.41 | | 0.46 | 0.35 | | 0.29 | 0.17 | | 0.39 | 0.31 | |
| v/c Ratio | 0.16 | 0.19 | | 0.03 | 0.35 | | 0.04 | 0.43 | | 0.68 | 0.29 | |
| Control Delay | 10.0 | 12.2 | | 9.1 | 8.6 | | 11.3 | 26.5 | | 22.1 | 11.3 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 10.0 | 12.2 | | 9.1 | 8.6 | | 11.3 | 26.5 | | 22.1 | 11.3 | |
| LOS | A | B | | A | A | | B | C | | C | B | |
| Approach Delay | | 11.7 | | | 8.6 | | | 25.1 | | | 16.8 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 4.4 | 7.3 | | 0.9 | 7.8 | | 0.9 | 13.5 | | 26.3 | 8.3 | |
| Queue Length 95th (m) | 11.7 | 19.5 | | 3.9 | 19.3 | | 3.6 | 27.9 | | #46.9 | 20.4 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 490 | 1275 | | 535 | 1154 | | 373 | 584 | | 453 | 1301 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.16 | 0.19 | | 0.03 | 0.35 | | 0.03 | 0.22 | | 0.68 | 0.23 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 55.6 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.68 | | | |
| Intersection Signal Delay: 14.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 53.3% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 3: Keil & Park W



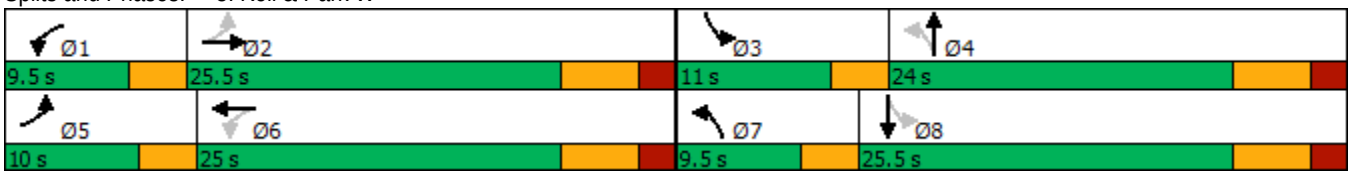


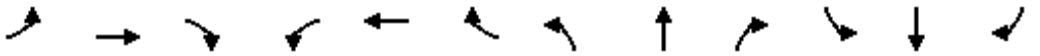
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 116 | 36 | 30 | 83 | 218 | 23 | 161 | 35 | 159 | 101 | 47 |
| Future Volume (vph) | 60 | 116 | 36 | 30 | 83 | 218 | 23 | 161 | 35 | 159 | 101 | 47 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.965 | | | 0.891 | | | 0.973 | | | 0.952 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3015 | 0 | 1583 | 2841 | 0 | 1614 | 1683 | 0 | 1583 | 3115 | 0 |
| Flt Permitted | 0.517 | | | 0.648 | | | 0.650 | | | 0.492 | | |
| Satd. Flow (perm) | 878 | 3015 | 0 | 1080 | 2841 | 0 | 1104 | 1683 | 0 | 820 | 3115 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 39 | | | 237 | | | 15 | | | 51 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 65 | 126 | 39 | 33 | 90 | 237 | 25 | 175 | 38 | 173 | 110 | 51 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 65 | 165 | 0 | 33 | 327 | 0 | 25 | 213 | 0 | 173 | 161 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 25.5 | | 9.5 | 25.0 | | 9.5 | 24.0 | | 11.0 | 25.5 | |
| Total Split (%) | 14.3% | 36.4% | | 13.6% | 35.7% | | 13.6% | 34.3% | | 15.7% | 36.4% | |
| Maximum Green (s) | 7.0 | 19.5 | | 6.5 | 19.0 | | 6.5 | 18.0 | | 8.0 | 19.5 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 27.7 | 22.2 | | 26.7 | 20.2 | | 20.1 | 12.3 | | 23.2 | 17.3 | |
| Actuated g/C Ratio | 0.47 | 0.38 | | 0.46 | 0.34 | | 0.34 | 0.21 | | 0.40 | 0.30 | |
| v/c Ratio | 0.13 | 0.14 | | 0.06 | 0.29 | | 0.06 | 0.58 | | 0.41 | 0.17 | |
| Control Delay | 10.7 | 13.1 | | 10.2 | 6.9 | | 11.3 | 27.8 | | 14.8 | 13.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 10.7 | 13.1 | | 10.2 | 6.9 | | 11.3 | 27.8 | | 14.8 | 13.0 | |
| LOS | B | B | | B | A | | B | C | | B | B | |
| Approach Delay | | 12.4 | | | 7.2 | | | 26.1 | | | 14.0 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 4.1 | 4.5 | | 2.0 | 4.3 | | 1.8 | 23.0 | | 13.8 | 4.6 | |
| Queue Length 95th (m) | 11.3 | 13.9 | | 6.9 | 14.3 | | 5.7 | 42.6 | | 25.8 | 12.8 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 508 | 1166 | | 552 | 1135 | | 443 | 553 | | 433 | 1175 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.13 | 0.14 | | 0.06 | 0.29 | | 0.06 | 0.39 | | 0.40 | 0.14 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 58.6 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.58 | | | |
| Intersection Signal Delay: 14.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 52.0% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Keil & Park W



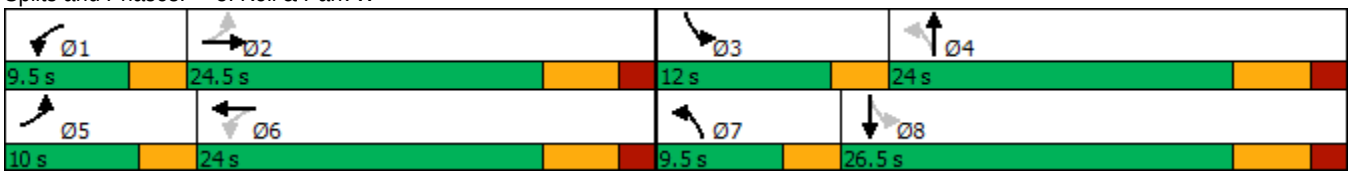


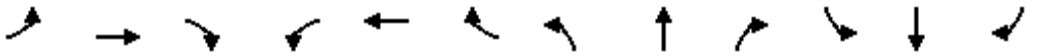
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 199 | 34 | 16 | 163 | 227 | 13 | 115 | 12 | 299 | 191 | 100 |
| Future Volume (vph) | 74 | 199 | 34 | 16 | 163 | 227 | 13 | 115 | 12 | 299 | 191 | 100 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.978 | | | 0.913 | | | 0.986 | | | 0.948 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3071 | 0 | 1583 | 2907 | 0 | 1614 | 1707 | 0 | 1583 | 3100 | 0 |
| Flt Permitted | 0.447 | | | 0.595 | | | 0.560 | | | 0.502 | | |
| Satd. Flow (perm) | 759 | 3071 | 0 | 992 | 2907 | 0 | 951 | 1707 | 0 | 837 | 3100 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 247 | | | 7 | | | 109 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 80 | 216 | 37 | 17 | 177 | 247 | 14 | 125 | 13 | 325 | 208 | 109 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 80 | 253 | 0 | 17 | 424 | 0 | 14 | 138 | 0 | 325 | 317 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 24.5 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 12.0 | 26.5 | |
| Total Split (%) | 14.3% | 35.0% | | 13.6% | 34.3% | | 13.6% | 34.3% | | 17.1% | 37.9% | |
| Maximum Green (s) | 7.0 | 18.5 | | 6.5 | 18.0 | | 6.5 | 18.0 | | 9.0 | 20.5 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 27.2 | 22.8 | | 25.5 | 19.2 | | 16.5 | 9.9 | | 21.9 | 17.3 | |
| Actuated g/C Ratio | 0.49 | 0.41 | | 0.46 | 0.34 | | 0.30 | 0.18 | | 0.39 | 0.31 | |
| v/c Ratio | 0.17 | 0.20 | | 0.03 | 0.37 | | 0.04 | 0.45 | | 0.72 | 0.31 | |
| Control Delay | 10.2 | 12.5 | | 9.3 | 8.8 | | 11.2 | 26.7 | | 24.1 | 11.2 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 10.2 | 12.5 | | 9.3 | 8.8 | | 11.2 | 26.7 | | 24.1 | 11.2 | |
| LOS | B | B | | A | A | | B | C | | C | B | |
| Approach Delay | | 11.9 | | | 8.8 | | | 25.3 | | | 17.7 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 4.7 | 8.0 | | 1.0 | 8.3 | | 1.0 | 14.5 | | 28.2 | 8.8 | |
| Queue Length 95th (m) | 12.3 | 20.8 | | 4.1 | 20.3 | | 3.8 | 29.3 | | #53.0 | 21.4 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 481 | 1270 | | 528 | 1159 | | 373 | 582 | | 455 | 1306 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.17 | 0.20 | | 0.03 | 0.37 | | 0.04 | 0.24 | | 0.71 | 0.24 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 55.9 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.72 | | | |
| Intersection Signal Delay: 14.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 59.3% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 3: Keil & Park W



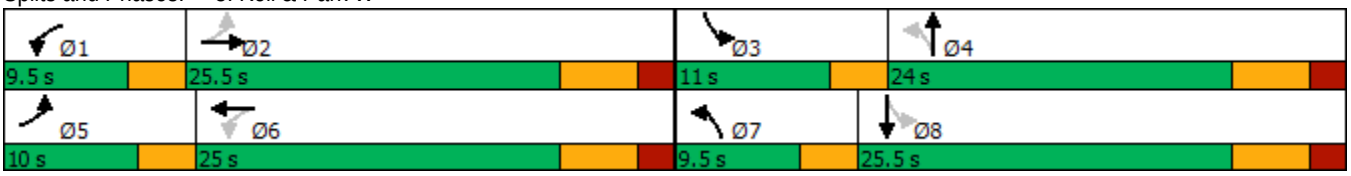


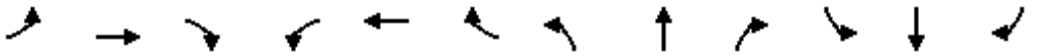
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 63 | 121 | 38 | 31 | 87 | 229 | 25 | 168 | 36 | 167 | 106 | 49 |
| Future Volume (vph) | 63 | 121 | 38 | 31 | 87 | 229 | 25 | 168 | 36 | 167 | 106 | 49 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.964 | | | 0.891 | | | 0.974 | | | 0.953 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3012 | 0 | 1583 | 2841 | 0 | 1614 | 1685 | 0 | 1583 | 3118 | 0 |
| Flt Permitted | 0.508 | | | 0.643 | | | 0.646 | | | 0.478 | | |
| Satd. Flow (perm) | 863 | 3012 | 0 | 1072 | 2841 | 0 | 1098 | 1685 | 0 | 797 | 3118 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 41 | | | 249 | | | 15 | | | 53 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 68 | 132 | 41 | 34 | 95 | 249 | 27 | 183 | 39 | 182 | 115 | 53 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 68 | 173 | 0 | 34 | 344 | 0 | 27 | 222 | 0 | 182 | 168 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 25.5 | | 9.5 | 25.0 | | 9.5 | 24.0 | | 11.0 | 25.5 | |
| Total Split (%) | 14.3% | 36.4% | | 13.6% | 35.7% | | 13.6% | 34.3% | | 15.7% | 36.4% | |
| Maximum Green (s) | 7.0 | 19.5 | | 6.5 | 19.0 | | 6.5 | 18.0 | | 8.0 | 19.5 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 27.7 | 22.2 | | 26.7 | 20.2 | | 20.3 | 12.6 | | 23.4 | 17.5 | |
| Actuated g/C Ratio | 0.47 | 0.38 | | 0.45 | 0.34 | | 0.35 | 0.21 | | 0.40 | 0.30 | |
| v/c Ratio | 0.14 | 0.15 | | 0.06 | 0.30 | | 0.06 | 0.60 | | 0.43 | 0.17 | |
| Control Delay | 10.8 | 13.1 | | 10.4 | 6.9 | | 11.3 | 28.2 | | 15.2 | 13.0 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 10.8 | 13.1 | | 10.4 | 6.9 | | 11.3 | 28.2 | | 15.2 | 13.0 | |
| LOS | B | B | | B | A | | B | C | | B | B | |
| Approach Delay | | 12.5 | | | 7.2 | | | 26.4 | | | 14.1 | |
| Approach LOS | | B | | | A | | | C | | | B | |
| Queue Length 50th (m) | 4.3 | 4.8 | | 2.1 | 4.6 | | 2.0 | 24.1 | | 14.6 | 4.8 | |
| Queue Length 95th (m) | 11.7 | 14.4 | | 7.0 | 14.9 | | 5.9 | 44.3 | | 27.1 | 13.3 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 500 | 1161 | | 546 | 1139 | | 444 | 551 | | 429 | 1179 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.14 | 0.15 | | 0.06 | 0.30 | | 0.06 | 0.40 | | 0.42 | 0.14 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 58.8 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Semi Act-Uncoord | | | |
| Maximum v/c Ratio: 0.60 | | | |
| Intersection Signal Delay: 14.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 53.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: Keil & Park W





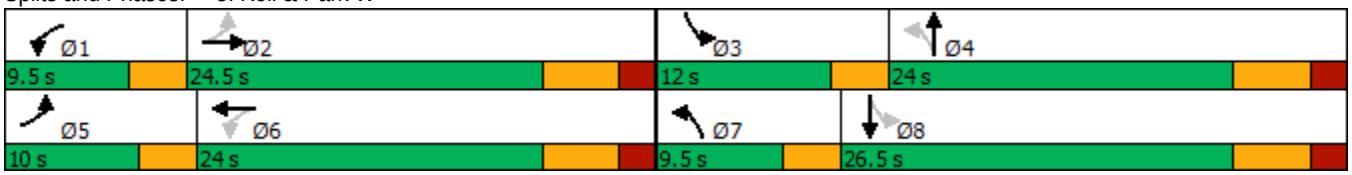
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 78 | 209 | 36 | 17 | 171 | 239 | 13 | 120 | 12 | 315 | 200 | 105 |
| Future Volume (vph) | 78 | 209 | 36 | 17 | 171 | 239 | 13 | 120 | 12 | 315 | 200 | 105 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Storage Length (m) | 50.0 | | 0.0 | 40.0 | | 0.0 | 35.0 | | 0.0 | 110.0 | | 0.0 |
| Storage Lanes | 1 | | 0 | 1 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (m) | 55.0 | | | 40.0 | | | 40.0 | | | 80.0 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 0.95 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 |
| Frt | | 0.978 | | | 0.913 | | | 0.986 | | | 0.948 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1614 | 3071 | 0 | 1583 | 2907 | 0 | 1614 | 1707 | 0 | 1583 | 3100 | 0 |
| Flt Permitted | 0.427 | | | 0.588 | | | 0.552 | | | 0.498 | | |
| Satd. Flow (perm) | 725 | 3071 | 0 | 980 | 2907 | 0 | 938 | 1707 | 0 | 830 | 3100 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 27 | | | 260 | | | 7 | | | 114 | |
| Link Speed (k/h) | | 60 | | | 60 | | | 60 | | | 60 | |
| Link Distance (m) | | 117.3 | | | 179.0 | | | 91.1 | | | 764.8 | |
| Travel Time (s) | | 7.0 | | | 10.7 | | | 5.5 | | | 45.9 | |
| 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 |
| Heavy Vehicles (%) | 3% | 5% | 11% | 5% | 5% | 4% | 3% | 1% | 2% | 5% | 1% | 3% |
| Adj. Flow (vph) | 85 | 227 | 39 | 18 | 186 | 260 | 14 | 130 | 13 | 342 | 217 | 114 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 85 | 266 | 0 | 18 | 446 | 0 | 14 | 143 | 0 | 342 | 331 | 0 |
| Turn Type | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | | pm+pt | NA | |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | | 4 | | | 8 | | |
| Detector Phase | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Minimum Split (s) | 10.0 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 9.5 | 24.0 | |
| Total Split (s) | 10.0 | 24.5 | | 9.5 | 24.0 | | 9.5 | 24.0 | | 12.0 | 26.5 | |
| Total Split (%) | 14.3% | 35.0% | | 13.6% | 34.3% | | 13.6% | 34.3% | | 17.1% | 37.9% | |
| Maximum Green (s) | 7.0 | 18.5 | | 6.5 | 18.0 | | 6.5 | 18.0 | | 9.0 | 20.5 | |
| Yellow Time (s) | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | | 3.0 | 4.0 | |
| All-Red Time (s) | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | | 0.0 | 2.0 | |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Lost Time (s) | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | | 3.0 | 6.0 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Max | | None | Max | | None | None | | None | None | |
| Walk Time (s) | | 7.0 | | | 7.0 | | | 7.0 | | | 7.0 | |
| Flash Dont Walk (s) | | 11.0 | | | 11.0 | | | 11.0 | | | 11.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | | | 0 | | | 0 | |
| Act Effct Green (s) | 29.1 | 24.7 | | 26.6 | 19.1 | | 16.6 | 10.1 | | 22.0 | 17.3 | |
| Actuated g/C Ratio | 0.50 | 0.43 | | 0.46 | 0.33 | | 0.29 | 0.17 | | 0.38 | 0.30 | |
| v/c Ratio | 0.18 | 0.20 | | 0.04 | 0.39 | | 0.04 | 0.47 | | 0.78 | 0.33 | |
| Control Delay | 10.3 | 12.4 | | 9.4 | 9.1 | | 11.2 | 27.8 | | 29.1 | 11.6 | |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Delay | 10.3 | 12.4 | | 9.4 | 9.1 | | 11.2 | 27.8 | | 29.1 | 11.6 | |
| LOS | B | B | | A | A | | B | C | | C | B | |
| Approach Delay | | 11.9 | | | 9.2 | | | 26.3 | | | 20.5 | |
| Approach LOS | | B | | | A | | | C | | | C | |
| Queue Length 50th (m) | 5.0 | 8.5 | | 1.0 | 8.8 | | 1.0 | 15.1 | | 30.2 | 9.2 | |
| Queue Length 95th (m) | 13.0 | 22.0 | | 4.3 | 21.3 | | 3.8 | 30.3 | | #59.8 | 22.2 | |
| Internal Link Dist (m) | | 93.3 | | | 155.0 | | | 67.1 | | | 740.8 | |
| Turn Bay Length (m) | 50.0 | | | 40.0 | | | 35.0 | | | 110.0 | | |
| Base Capacity (vph) | 477 | 1325 | | 527 | 1131 | | 359 | 562 | | 438 | 1272 | |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.18 | 0.20 | | 0.03 | 0.39 | | 0.04 | 0.25 | | 0.78 | 0.26 | |

**Intersection Summary**

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 57.9
Natural Cycle: 70
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 61.4% ICU Level of Service B
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: Keil & Park W



| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 14 | 11 | 6 | 193 | 152 | 5 |
| Future Vol, veh/h | 14 | 11 | 6 | 193 | 152 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 1 | 3 | 2 |
| Mvmt Flow | 15 | 12 | 7 | 210 | 165 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 389 | 165 | 170 | 0 | - | 0 |
| Stage 1 | 165 | - | - | - | - | - |
| Stage 2 | 224 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 615 | 879 | 1407 | - | - | - |
| Stage 1 | 864 | - | - | - | - | - |
| Stage 2 | 813 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 611 | 879 | 1407 | - | - | - |
| Mov Cap-2 Maneuver | 611 | - | - | - | - | - |
| Stage 1 | 859 | - | - | - | - | - |
| Stage 2 | 813 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.3 | 0.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1407 | - | 706 | - | - |
| HCM Lane V/C Ratio | 0.005 | - | 0.038 | - | - |
| HCM Control Delay (s) | 7.6 | 0 | 10.3 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 9 | 14 | 11 | 121 | 209 | 19 |
| Future Vol, veh/h | 9 | 14 | 11 | 121 | 209 | 19 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 1 | 3 | 2 |
| Mvmt Flow | 10 | 15 | 12 | 132 | 227 | 21 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 383 | 227 | 248 | 0 | - | 0 |
| Stage 1 | 227 | - | - | - | - | - |
| Stage 2 | 156 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 620 | 812 | 1318 | - | - | - |
| Stage 1 | 811 | - | - | - | - | - |
| Stage 2 | 872 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 614 | 812 | 1318 | - | - | - |
| Mov Cap-2 Maneuver | 614 | - | - | - | - | - |
| Stage 1 | 803 | - | - | - | - | - |
| Stage 2 | 872 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.2 | 0.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1318 | - | 721 | - | - |
| HCM Lane V/C Ratio | 0.009 | - | 0.035 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 10.2 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 14 | 11 | 6 | 205 | 161 | 5 |
| Future Vol, veh/h | 14 | 11 | 6 | 205 | 161 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 1 | 3 | 2 |
| Mvmt Flow | 15 | 12 | 7 | 223 | 175 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 412 | 175 | 180 | 0 | - | 0 |
| Stage 1 | 175 | - | - | - | - | - |
| Stage 2 | 237 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 596 | 868 | 1396 | - | - | - |
| Stage 1 | 855 | - | - | - | - | - |
| Stage 2 | 802 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 592 | 868 | 1396 | - | - | - |
| Mov Cap-2 Maneuver | 592 | - | - | - | - | - |
| Stage 1 | 850 | - | - | - | - | - |
| Stage 2 | 802 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.4 | 0.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1396 | - | 688 | - | - |
| HCM Lane V/C Ratio | 0.005 | - | 0.039 | - | - |
| HCM Control Delay (s) | 7.6 | 0 | 10.4 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 9 | 14 | 11 | 128 | 222 | 19 |
| Future Vol, veh/h | 9 | 14 | 11 | 128 | 222 | 19 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 1 | 3 | 2 |
| Mvmt Flow | 10 | 15 | 12 | 139 | 241 | 21 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 404 | 241 | 262 | 0 | - | 0 |
| Stage 1 | 241 | - | - | - | - | - |
| Stage 2 | 163 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 603 | 798 | 1302 | - | - | - |
| Stage 1 | 799 | - | - | - | - | - |
| Stage 2 | 866 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 597 | 798 | 1302 | - | - | - |
| Mov Cap-2 Maneuver | 597 | - | - | - | - | - |
| Stage 1 | 791 | - | - | - | - | - |
| Stage 2 | 866 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.3 | 0.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1302 | - | 705 | - | - |
| HCM Lane V/C Ratio | 0.009 | - | 0.035 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 10.3 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 14 | 11 | 6 | 215 | 170 | 5 |
| Future Vol, veh/h | 14 | 11 | 6 | 215 | 170 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 1 | 3 | 2 |
| Mvmt Flow | 15 | 12 | 7 | 234 | 185 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 433 | 185 | 190 | 0 | - | 0 |
| Stage 1 | 185 | - | - | - | - | - |
| Stage 2 | 248 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 580 | 857 | 1384 | - | - | - |
| Stage 1 | 847 | - | - | - | - | - |
| Stage 2 | 793 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 577 | 857 | 1384 | - | - | - |
| Mov Cap-2 Maneuver | 577 | - | - | - | - | - |
| Stage 1 | 842 | - | - | - | - | - |
| Stage 2 | 793 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.6 | 0.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1384 | - | 674 | - | - |
| HCM Lane V/C Ratio | 0.005 | - | 0.04 | - | - |
| HCM Control Delay (s) | 7.6 | 0 | 10.6 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 9 | 14 | 11 | 135 | 233 | 19 |
| Future Vol, veh/h | 9 | 14 | 11 | 135 | 233 | 19 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | 0 |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 1 | 3 | 2 |
| Mvmt Flow | 10 | 15 | 12 | 147 | 253 | 21 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 424 | 253 | 274 | 0 | - | 0 |
| Stage 1 | 253 | - | - | - | - | - |
| Stage 2 | 171 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 587 | 786 | 1289 | - | - | - |
| Stage 1 | 789 | - | - | - | - | - |
| Stage 2 | 859 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 581 | 786 | 1289 | - | - | - |
| Mov Cap-2 Maneuver | 581 | - | - | - | - | - |
| Stage 1 | 781 | - | - | - | - | - |
| Stage 2 | 859 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.4 | 0.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1289 | - | 691 | - | - |
| HCM Lane V/C Ratio | 0.009 | - | 0.036 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | 10.4 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 195 | 2 | 1 | 143 | 3 | 5 |
| Future Vol, veh/h | 195 | 2 | 1 | 143 | 3 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 6 | 2 | 2 | 4 | 2 | 2 |
| Mvmt Flow | 212 | 2 | 1 | 155 | 3 | 5 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 214 | 0 | 370 | 107 |
| Stage 1 | - | - | - | - | 213 | - |
| Stage 2 | - | - | - | - | 157 | - |
| Critical Hdwy | - | - | 4.13 | - | 6.63 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.83 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 | - |
| Follow-up Hdwy | - | - | 2.219 | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | - | - | 1355 | - | 617 | 927 |
| Stage 1 | - | - | - | - | 803 | - |
| Stage 2 | - | - | - | - | 871 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1355 | - | 616 | 927 |
| Mov Cap-2 Maneuver | - | - | - | - | 616 | - |
| Stage 1 | - | - | - | - | 803 | - |
| Stage 2 | - | - | - | - | 870 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.1 | 9.7 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 779 | - | - | 1355 | - |
| HCM Lane V/C Ratio | 0.011 | - | - | 0.001 | - |
| HCM Control Delay (s) | 9.7 | - | - | 7.7 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 286 | 5 | 5 | 255 | 4 | 4 |
| Future Vol, veh/h | 286 | 5 | 5 | 255 | 4 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 6 | 2 | 2 | 4 | 2 | 2 |
| Mvmt Flow | 311 | 5 | 5 | 277 | 4 | 4 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 316 | 0 | 601 | 158 |
| Stage 1 | - | - | - | - | 314 | - |
| Stage 2 | - | - | - | - | 287 | - |
| Critical Hdwy | - | - | 4.13 | - | 6.63 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.83 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 | - |
| Follow-up Hdwy | - | - | 2.219 | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | - | - | 1243 | - | 447 | 860 |
| Stage 1 | - | - | - | - | 714 | - |
| Stage 2 | - | - | - | - | 761 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1243 | - | 445 | 860 |
| Mov Cap-2 Maneuver | - | - | - | - | 445 | - |
| Stage 1 | - | - | - | - | 714 | - |
| Stage 2 | - | - | - | - | 757 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.2 | 11.2 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 587 | - | - | 1243 | - |
| HCM Lane V/C Ratio | 0.015 | - | - | 0.004 | - |
| HCM Control Delay (s) | 11.2 | - | - | 7.9 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 207 | 2 | 1 | 152 | 3 | 5 |
| Future Vol, veh/h | 207 | 2 | 1 | 152 | 3 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 6 | 2 | 2 | 4 | 2 | 2 |
| Mvmt Flow | 225 | 2 | 1 | 165 | 3 | 5 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 227 | 0 | 393 | 114 |
| Stage 1 | - | - | - | - | 226 | - |
| Stage 2 | - | - | - | - | 167 | - |
| Critical Hdwy | - | - | 4.13 | - | 6.63 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.83 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 | - |
| Follow-up Hdwy | - | - | 2.219 | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | - | - | 1340 | - | 597 | 918 |
| Stage 1 | - | - | - | - | 791 | - |
| Stage 2 | - | - | - | - | 862 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1340 | - | 596 | 918 |
| Mov Cap-2 Maneuver | - | - | - | - | 596 | - |
| Stage 1 | - | - | - | - | 791 | - |
| Stage 2 | - | - | - | - | 861 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.1 | 9.8 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 763 | - | - | 1340 | - |
| HCM Lane V/C Ratio | 0.011 | - | - | 0.001 | - |
| HCM Control Delay (s) | 9.8 | - | - | 7.7 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 304 | 5 | 5 | 271 | 4 | 4 |
| Future Vol, veh/h | 304 | 5 | 5 | 271 | 4 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 6 | 2 | 2 | 4 | 2 | 2 |
| Mvmt Flow | 330 | 5 | 5 | 295 | 4 | 4 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 335 | 0 | 638 | 168 |
| Stage 1 | - | - | - | - | 333 | - |
| Stage 2 | - | - | - | - | 305 | - |
| Critical Hdwy | - | - | 4.13 | - | 6.63 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.83 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 | - |
| Follow-up Hdwy | - | - | 2.219 | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | - | - | 1223 | - | 425 | 847 |
| Stage 1 | - | - | - | - | 699 | - |
| Stage 2 | - | - | - | - | 747 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1223 | - | 423 | 847 |
| Mov Cap-2 Maneuver | - | - | - | - | 423 | - |
| Stage 1 | - | - | - | - | 699 | - |
| Stage 2 | - | - | - | - | 743 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.1 | 11.5 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 564 | - | - | 1223 | - |
| HCM Lane V/C Ratio | 0.015 | - | - | 0.004 | - |
| HCM Control Delay (s) | 11.5 | - | - | 8 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 218 | 2 | 1 | 160 | 3 | 5 |
| Future Vol, veh/h | 218 | 2 | 1 | 160 | 3 | 5 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 6 | 2 | 2 | 4 | 2 | 2 |
| Mvmt Flow | 237 | 2 | 1 | 174 | 3 | 5 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 239 | 0 | 414 | 120 |
| Stage 1 | - | - | - | - | 238 | - |
| Stage 2 | - | - | - | - | 176 | - |
| Critical Hdwy | - | - | 4.13 | - | 6.63 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.83 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 | - |
| Follow-up Hdwy | - | - | 2.219 | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | - | - | 1326 | - | 580 | 909 |
| Stage 1 | - | - | - | - | 780 | - |
| Stage 2 | - | - | - | - | 854 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1326 | - | 579 | 909 |
| Mov Cap-2 Maneuver | - | - | - | - | 579 | - |
| Stage 1 | - | - | - | - | 780 | - |
| Stage 2 | - | - | - | - | 853 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0 | 9.9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 749 | - | - | 1326 | - |
| HCM Lane V/C Ratio | 0.012 | - | - | 0.001 | - |
| HCM Control Delay (s) | 9.9 | - | - | 7.7 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 319 | 5 | 5 | 284 | 4 | 4 |
| Future Vol, veh/h | 319 | 5 | 5 | 284 | 4 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 6 | 2 | 2 | 4 | 2 | 2 |
| Mvmt Flow | 347 | 5 | 5 | 309 | 4 | 4 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 352 | 0 | 669 | 176 |
| Stage 1 | - | - | - | - | 350 | - |
| Stage 2 | - | - | - | - | 319 | - |
| Critical Hdwy | - | - | 4.13 | - | 6.63 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.83 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.43 | - |
| Follow-up Hdwy | - | - | 2.219 | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | - | - | 1205 | - | 407 | 837 |
| Stage 1 | - | - | - | - | 685 | - |
| Stage 2 | - | - | - | - | 736 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1205 | - | 405 | 837 |
| Mov Cap-2 Maneuver | - | - | - | - | 405 | - |
| Stage 1 | - | - | - | - | 685 | - |
| Stage 2 | - | - | - | - | 732 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.1 | 11.7 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 546 | - | - | 1205 | - |
| HCM Lane V/C Ratio | 0.016 | - | - | 0.005 | - |
| HCM Control Delay (s) | 11.7 | - | - | 8 | 0 |
| HCM Lane LOS | B | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

# Appendix E

# SIGHT LINE CALCULATIONS

## Site Access at Keil Drive South
## Site Access at Park Avenue West

**21-1083: 460 Keil Drive South, Chatham, Ontario - Sight Line Analysis**

**Design Intersection Sight Distance (TAC Geometric Design Guide for Canadian Roads)**

**Design Speed: 70km/h (Posted Speed Limit = 60 km/h)**

**Table 9.9.3: Time Gap for Case B1, Left Turn from Stop**

| Design Vehicle | Time Gap ($t_g$)(s) at Design Speed of Major Road |
|---|---|
| Passenger car | 7.5 |
| Single-unit truck | 9.5 |
| Combination truck (WB 19 and WB 20 ) | 11.5 |
| Longer truck | To be established by road authority |

Intersection Stopping Distance **(ISD)** = 0.278 $V_{major}$ $t_g$

Where:

ISD = intersection sight distance (m)
*(length of the leg of sight triangle along the major road)*
$V_{major}$ = design speed of the major road (km/h)
$t_g$ = time gap for minor road vehicle to enter the major road (s)

ISD $_{passenger\ car}$ (left turn from stop) = 0.278 x 70 x 7.5 = **146 m**

**Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver**

| Design Vehicle | Time Gap ($t_g$)(s) at Design Speed of Major Road |
|---|---|
| Passenger car | 6.5 |
| Single-unit truck | 8.5 |
| Combination truck (WB 19 and WB 20 ) | 10.5 |

ISD $_{passenger\ car}$ (right turn from stop) = 0.278 x 70 x 6.5 = **126 m**