# TRAFFIC IMPACT STUDY

FOR THE

# JIM WILSON ROAD DEVELOPMENT

LOCATED
IN
LANCASTER COUNTY, SOUTH CAROLINA

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# TABLE OF CONTENTS

**1. INTRODUCTION ..... 1**
1.1. Purpose of Report ..... 1
1.2. Study Objectives ..... 1
**2. AREA CONDITIONS ..... 1**
2.1. Transportation Network Study Area ..... 1
2.1.1. Area Roadway System ..... 1
2.1.1.1. Existing ..... 2
2.1.1.2. Future ..... 2
2.1.2. Existing Traffic Volumes and Conditions ..... 2
2.1.3. Area of Significant Traffic Impact ..... 3
2.2. Study Area - Adjacent Land Use ..... 3
2.2.1. Existing Land Uses ..... 3
2.2.2. Anticipated or Approved Future Development ..... 3
**3. PROJECTED TRAFFIC ..... 4**
3.1. Site Traffic ..... 4
3.1.1. Trip Generation ..... 4
3.1.2. Trip Distribution and Assignment ..... 5
3.2. Total Future Traffic ..... 5
3.2.1. No-Build Condition ..... 5
3.2.2. Build Condition ..... 5
**4. TRAFFIC ANALYSIS ..... 6**
4.1. Traffic Analysis Procedure ..... 6
4.2. Capacity and Level of Service at Study Intersections ..... 7
4.2.1. Jim Wilson Road and Henry Harris Road ..... 7
4.2.2. Henry Harris Road and 12 Mile Creek Road (Site Drive 2) ..... 10
4.2.3. Jim Wilson Road and US 521 ..... 11
4.2.4. Jim Wilson Road and Site Drive 1 ..... 13
**5. CONCLUSIONS ..... 13**
5.1. Summary of Recommended Improvements ..... 14

## LIST OF TABLES


Table 1 Study Area Roads ..... 2
Table 2 Site Trip Generation ..... 4
Table 3 Highway Capacity Manual - Levels of Service and Delay ..... 7
Table 4 Analysis Summary of Jim Wilson Road and Henry Harris Road ..... 8
Table 5 SimTraffic 95th Queue Summary ..... 9
Table 6 Analysis Summary of Henry Harris Road and 12 Mile Creek Road ..... 10
Table 7 Analysis Summary of Jim Wilson Road and US 521 ..... 12
Table 8 Analysis Summary of Jim Wilson Road and Site Drive 1 ..... 13


## LIST OF FIGURES


Figure 1 Site Location Map. ..... Appendix A
Figure 2 Preliminary Site Plan ..... Appendix A
Figure 3 Existing (2013) Lane Configurations ..... Appendix A
Figure 4 Existing (2013) Peak Hour Traffic Volumes ..... Appendix A
Figure 5 Cornerstone Site Trip distribution Percentages ..... Appendix A
Figure 6 Carolina Reserve Site Trip Distribution Percentages ..... Appendix A
Figure 7 Walnut Creek Site Trip Distribution Percentages ..... Appendix A
Figure 8 Cornerstone Site Trip Assignment ..... Appendix A
Figure 9 Carolina Reserve Site Trip Assignment ..... Appendix A
Figure 10 Walnut Creek Site Trip Assignment ..... Appendix A
Figure 11 Primary Site Trip Distribution Percentages ..... Appendix A
Figure 12 Total Peak Hour Site Trip Assignment ..... Appendix A
Figure 13 Projected (2018) Peak Hour Traffic Volumes ..... Appendix A
Figure 14 No-Build (2018) Peak Hour Traffic Volumes ..... Appendix A
Figure 15 Build (2018) Peak Hour Traffic Volumes ..... Appendix A
Figure 16 Recommended Lane Configurations ..... Appendix A

# TECHNICAL APPENDIX


| | |
|---|---|
| Appendix A | Figures |
| Appendix B | Traffic Count Data |
| Appendix C | Adjacent Development Information |
| Appendix D | Jim Wilson Road and Henry Harris Road – Synchro and SimTraffic Reports |
| Appendix E | Henry Harris Road and 12 Mile Creek Road – Synchro Reports |
| Appendix F | Jim Wilson Road and US 521 – Synchro Reports |
| Appendix G | Jim Wilson Road and Site Drive 1 – Synchro Reports |

# TRAFFIC IMPACT STUDY
**JIM WILSON ROAD DEVELOPMENT**
**LANCASTER COUNTY, SOUTH CAROLINA**

## 1. INTRODUCTION

### 1.1. Purpose of Report

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the Jim Wilson Road Development. The proposed site is located south of Jim Wilson Road and east of Henry Harris Road in Lancaster, South Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the proposed development.

### 1.2. Study Objectives

The Jim Wilson Road Development is proposed to consist of 271 single-family detached homes. One site driveway is proposed on Jim Wilson Road and another on Henry Harris Road. For purposes of this study, it is assumed that the development will be fully built out by 2018.

Refer to Figure 1 in Appendix A for an illustration of the site location. Refer to Figure 2 for the preliminary site plan. The objective of this report is to determine what geometric improvements are necessary to mitigate traffic conditions on the transportation network surrounding the site with the proposed development fully built out.

## 2. AREA CONDITIONS

### 2.1. Transportation Network Study Area

#### 2.1.1. Area Roadway System

The project study area for this TIS was determined through coordination with the South Carolina Department of Transportation (SCDOT) and Lancaster County. Table 1 summarizes the characteristics of the roadways within the study area. The SCDOT Functional Class map was used to determine the classification of each road. The average daily traffic (ADT) volumes in vehicles per day (vpd) were found in average annual daily traffic (AADT) data sheets from SCDOT. A field visit was conducted to verify the existing cross-sections and speed limits in miles per hour (mph).

**TABLE 1**
**STUDY AREA ROADS**

| ROADWAY | CLASSIFICATION | CROSS-SECTION | ADT (vpd) | SPEED LIMIT (mph) |
|---|---|---|---|---|
| Jim Wilson Road | Major Collector | 2-Lane | 3,100 | 45 |
| Henry Harris Road | Local / State Maintained | 2-Lane | No Data | 35 |
| 12 Mile Creek Road | Local / State Maintained | 2-Lane (Gravel) | No Data | Not Posted |
| US 521 | Minor Arterial | 4-Lane | 12,800 | 45 |

#### 2.1.1.1. Existing

Existing lane configurations (number of traffic lanes on the intersection approach), storage capacities, and other intersection and roadway information within the study area was collected through field reconnaissance by Ramey Kemp and Associates, Inc. (RKA). Refer to Figure 3 for the existing lane configurations and traffic control at study intersections.

#### 2.1.1.2. Future

Based on discussions with local agencies, one roadway project was identified in the study area. The bridge on 12 Mile Creek Road (over 12 Mile Creek) is expected to be closed in the future. This will dead end 12 Mile Creek Road just east of the proposed development.

### 2.1.2. Existing Traffic Volumes and Conditions

Existing peak hour traffic volumes were obtained from traffic counts performed at the intersection of Jim Wilson Road and Henry Harris Road. The intersection of Jim Wilson Road and US 521 was also counted. Traffic counts were conducted by RKA during the AM peak period (from 7:00 AM to 9:00 AM) and during the PM peak period (from 4:00 PM to 6:00 PM). No traffic count was performed for the intersection of Henry Harris Road and 12 Mile Creek Road due to the expected low volumes. Instead of counting the intersection, it was assumed each turn movement would carry 10 vehicles per hour (vph). The through movements on Henry Harris Road were balanced with the intersection of Jim Wilson Road and Henry Harris Road. A copy of the traffic count data can be found in Appendix B of this report. Refer to Figure 4 for an illustration of the existing peak hour traffic volumes.

2.1.3. Area of Significant Traffic Impact

The study area for the TIS was determined through coordination with SCDOT and Lancaster County and consists of the following intersections:

1) Jim Wilson Road and Henry Harris Road
2) Henry Harris Road and 12 Mile Creek Road (Site Drive 2)
3) Jim Wilson Road and US 521
4) Jim Wilson Road and Site Drive 1

## 2.2. Study Area – Adjacent Land Use

2.2.1. Existing Land Uses

The existing site is undeveloped. The surrounding land uses primarily consist of residential and undeveloped land.

2.2.2. Anticipated or Approved Future Development

Based on coordination with SCDOT and Lancaster County, there are three offsite developments that were determined to have an impact on the project study area. The Cornerstone, Carolina Reserve, and Walnut Creek developments are expected to generate trips that are not accounted for in the existing traffic counts.

The Cornerstone development is located on the east side of the Jim Wilson Road and US 521 intersection. The site is partially built. For purposes of this report it was assumed that a 15,000 square foot pharmacy and 42,000 square feet of office space are currently built.

Carolina Reserve is a residential development located on the north side of Jim Wilson Road between US 521 and Henry Harris Road. This site is also partially built. It was estimated that 225 homes have yet to be built.

Walnut Creek is located on the east side of US 521 just north of Waxhaw Highway. The development will consist of single-family detached homes, a shopping center, county park, and EMS station. A portion of the residential lots have been built. It was estimated that 1,790 homes have yet to be built.

Trip distribution percentages and trip assignments were developed for these three developments. Some trip distribution percentages were obtained from SCDOT for Cornerstone and Walnut Creek. No information for Carolina Reserve was available. The available trip distribution percentages, existing traffic patterns, location of population centers, and engineering judgment was used to develop trip distribution percentages for the three sites within the study area. See Appendix C for the trip generation, and available distribution percentages. Figures 5 through 7 illustrate the distribution percentages used in this study for the three offsite developments. Figures 8 through 10 illustrate the trip assignments used in this study for the three offsite developments.

# 3. PROJECTED TRAFFIC

## 3.1. Site Traffic

In order to determine the future traffic conditions after the development is completed, an estimate of traffic projected to travel to/from the proposed development is required.

### 3.1.1. Trip Generation

The average weekday daily as well as AM and PM peak hour site trips for this study were calculated based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition*. At build-out, the site is expected to consist of 271 single-family detached homes. Table 2 presents a summary of the trip generation calculations for the proposed development.

**TABLE 2**
**SITE TRIP GENERATION**

| LAND USE | DENSITY | AVERAGE DAILY TRAFFIC (vpd) | AM PEAK HOUR (vph) | | PM PEAK HOUR (vph) | |
|---|---|---|---|---|---|---|
| | | | Enter | Exit | Enter | Exit |
| Single-Family Detached Home (210) | 271 DU | 2,628 | 50 | 150 | 162 | 95 |

#### 3.1.2. Trip Distribution and Assignment

For this study, the trip distribution percentages were developed based on existing traffic patterns, location of population centers, and engineering judgment. Refer to Figures 11 and 12 for an illustration of the site distribution percentages and assignments.

### 3.2. Total Future Traffic

#### 3.2.1. No-Build Condition

In order to account for the growth of traffic and subsequent traffic conditions at a future year, no-build traffic projections are needed. No-build traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether the proposed development is constructed. No-build traffic is comprised of projected traffic growth within the study area and additional traffic created as a result of nearby future developments.

To account for the growth of traffic that is anticipated to occur regardless of the proposed development, the existing traffic volumes were projected to the horizon year 2018 by applying a compounded annual growth rate to traffic volumes at the study intersections. An annual growth rate of 3% per year was used for this study per discussions with SCDOT and Lancaster County. Refer to Figure 13 for an illustration of the projected 2018 peak hour traffic volumes.

Trips generated by the three offsite developments (Figures 8 through 10) were added to the projected 2018 peak hour traffic volumes (Figure 13) to determine the future no-build traffic volumes. Figure 14 illustrates the no-build 2018 peak hour traffic volumes.

#### 3.2.2. Build Condition

In order to determine peak hour traffic volumes with the development built out, the total peak hour site traffic (Figure 12) was combined with the no-build 2018 traffic volumes (Figure 14) to determine build 2018 traffic volumes. The build 2018 traffic volumes are illustrated in Figure 15.

# 4. TRAFFIC ANALYSIS

## 4.1. Traffic Analysis Procedure

All study intersections (both unsignalized and signalized) were analyzed using the methodology outlined in the Highway Capacity Manual (HCM) published by the Transportation Research Board. A computer software package, Synchro (Version 7), was used to complete the analyses for all of the study area intersections. Synchro 7 was developed by Trafficware Corporation and allows the user to input data into the Synchro software and calculate the output based on methodologies in the HCM.

Analysis results for signalized intersections provide level of service calculations for all approaches and an overall resulting level of service. The capacity analysis for an unsignalized intersection does not provide an overall level of service for the intersection, but rather a level of service for movements and/or approaches that have a conflicting movement. Capacity and level of service are the design criteria for this traffic study.

The HCM defines capacity as "the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions". Level of service (LOS) is a term used to represent different driving conditions, and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". Level of service varies from Level "A" representing free flow, to Level "F" where greater vehicle delays are evident.

Refer to Table 3 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes "initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay". As shown in Table 3, an average control delay of 40 seconds at a signalized intersection results in a LOS D operation.

**TABLE 3**
**HIGHWAY CAPACITY MANUAL - LEVELS OF SERVICE AND DELAY**

| UNSIGNALIZED INTERSECTION | | SIGNALIZED INTERSECTION | |
|---|---|---|---|
| LEVEL OF SERVICE | AVERAGE CONTROL DELAY PER VEHICLE (SECONDS) | LEVEL OF SERVICE | AVERAGE CONTROL DELAY PER VEHICLE (SECONDS) |
| A | 0-10 | A | 0-10 |
| B | 10-15 | B | 10-20 |
| C | 15-25 | C | 20-35 |
| D | 25-35 | D | 35-55 |
| E | 35-50 | E | 55-80 |
| F | >50 | F | >80 |

## 4.2. Capacity and Level of Service at Study Intersections

### 4.2.1. Jim Wilson Road and Henry Harris Road

The intersection of Jim Wilson Road and Henry Harris Road currently operates under four-way stop control. All approaches currently operate at LOS A during both peak hours. The background traffic growth and offsite developments are expected to increase delay at the intersection as seen in the No-Build (2018) scenario. The eastbound Jim Wilson Road approach is expected to operate near capacity at LOS E during the PM peak hour of the No-Build (2018) scenario. Refer to Table 4 for a summary of the analysis results.

Improvements on Jim Wilson Road are recommended due to the background traffic growth and offsite developments. In the No-Build (2018) Improvements By Others scenario, stop control was removed on the Jim Wilson Road approaches. Turn lane warrant analysis was performed for this intersection based on the guidelines in Chapter 15 of the SCDOT Highway Design Manual. The no-build PM peak hour volumes meet the warrant for left turn lanes on the eastbound and westbound Jim Wilson Road approaches. This is expected to provide LOS A on the Jim Wilson Road approaches without creating queue issues on the side street.

SimTraffic 7.0 simulations were analyzed because Synchro does not calculate queue lengths at four-way stop controlled intersections. SimTraffic 7.0 is part of the Synchro 7.0 software package developed by Trafficware. It allows for simulation of the Synchro 7.0 traffic models. The SimTraffic 7.0 results indicate that the recommended left turn movements would require the

minimum 150 feet of storage. No queue issues are expected at the intersection. Refer to Table 5 for a summary of the SimTraffic 95th queue lengths.

**TABLE 4**
**ANALYSIS SUMMARY OF JIM WILSON ROAD AND HENRY HARRIS ROAD**

| ANALYSIS SCENARIO | APPROACH | LANE CONFIGURATIONS | WEEKDAY AM PEAK HOUR LEVEL OF SERVICE | | WEEKDAY PM PEAK HOUR LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|
| | | | Approach | Overall | Approach | Overall |
| Existing (2013) | EB[2]<br>WB[2]<br>NB[2]<br>SB[2] | 1 LT-TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT | A<br>A<br>A<br>A | N/A[3] | A<br>A<br>A<br>A | N/A[3] |
| No-Build (2018) | EB[2]<br>WB[2]<br>NB[2]<br>SB[2] | 1 LT-TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT | B<br>C<br>A<br>A | N/A[3] | E<br>C<br>B<br>B | N/A[3] |
| No-Build (2018) Improvements By Others | EB[1]<br>WB[1]<br>NB[2]<br>SB[2] | **1 LT**, 1 TH-RT<br>**1 LT**, 1 TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT | A<br>A<br>C<br>C | N/A[3] | A<br>A<br>D<br>D | N/A[3] |
| Build (2018) | EB[2]<br>WB[2]<br>NB[2]<br>SB[2] | 1 LT-TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT | B<br>C<br>B<br>A | N/A[3] | F<br>D<br>B<br>B | N/A[3] |
| Build (2018) Improvements By Others | EB[1]<br>WB[1]<br>NB[2]<br>SB[2] | **1 LT**, 1 TH-RT<br>**1 LT**, 1 TH-RT<br>1 LT-TH-RT<br>1 LT-TH-RT | A<br>A<br>C<br>C | N/A[3] | A<br>A<br>F<br>D | N/A[3] |

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

**Bold** denotes improvement by others.

Both build scenarios are expected to result in slightly worse levels of service than the no-build scenarios. The eastbound Jim Wilson Road approach is expected to operate at LOS F during the PM peak hour of the Build (2018) scenario under four-way stop control. In the Build (2018) Improvements By Others scenario, stop control was removed on the Jim Wilson Road approaches and left turn lanes were added. This is expected to provide LOS A on the Jim Wilson Road approaches without creating queue issues on the side street.

It is recommended that local agencies monitor traffic operations at this intersection. Traffic volumes at the intersection are expected to increase due to the background traffic growth and offsite developments. To provide additional capacity in the future, it is recommended to remove the stop control on Jim Wilson Road. It is also recommended to separate the left turn movements from the through movements on Jim Wilson Road by constructing left turn lanes with 150 feet of storage. It is recommended these improvements be provided by others. No improvements by the developer are recommended at this intersection. Refer to Appendix D for the Synchro capacity analysis reports and SimTraffic queue reports.

**TABLE 5**
**SIMTRAFFIC 95$^{TH}$ QUEUE SUMMARY**

| ANALYSIS SCENARIO | APPROACH | SIMTRAFFIC 95$^{TH}$ QUEUE (FT) | | RECOMMENDED STORAGE (FT) |
|---|---|---|---|---|
| | | AM PEAK HOUR | PM PEAK HOUR | |
| Existing (2013) | EB[2] | 50 | 72 | - |
| | WB[2] | 67 | 63 | - |
| | NB[2] | 26 | 30 | - |
| | SB[2] | 41 | 41 | - |
| No-Build (2018) | EB | 72 | 155 | - |
| | WB | 97 | 143 | - |
| | NB | 29 | 31 | - |
| | SB | 39 | 42 | - |
| No-Build (2018) Improvements By Others | EBL | 10 | 30 | 150 |
| | WBL | 12 | 14 | 150 |
| | NB | 29 | 32 | - |
| | SB | 39 | 45 | - |
| Build (2018) | EB | 81 | 211 | - |
| | WB | 113 | 139 | - |
| | NB | 36 | 37 | - |
| | SB | 38 | 47 | - |
| Build (2018) Improvements By Others | EBL | 12 | 30 | 150 |
| | WBL | 18 | 25 | 150 |
| | NB | 45 | 47 | - |
| | SB | 40 | 40 | - |

### 4.2.2. Henry Harris Road and 12 Mile Creek Road (Site Drive 2)

Henry Harris Road intersects 12 Mile Creek Road forming a tee intersection. Henry Harris Road is free-flowing while 12 Mile Creek Road is stop controlled. The bridge on 12 Mile Creek Road (over 12 Mile Creek) is expected to be closed in the future. This will dead end 12 Mile Creek Road just east of the proposed development. The southbound left turn movement on Henry Harris Road is expected to operate at LOS A during all scenarios. The 12 Mile Creek Road approach is also expected to operate at LOS A during all scenarios. No turn lane warrants were met at this intersection, so no improvements are recommended. Refer to Table 6 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports.

**TABLE 6**
**ANALYSIS SUMMARY OF HENRY HARRIS ROAD AND 12 MILE CREEK ROAD**

| ANALYSIS SCENARIO | APPROACH | LANE CONFIGURATIONS | WEEKDAY AM PEAK HOUR LEVEL OF SERVICE | | WEEKDAY PM PEAK HOUR LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|
| | | | Approach | Overall | Approach | Overall |
| Existing (2013) | WB[2]<br>NB<br>SB[1] | 1 LT-RT<br>1 TH-RT<br>1 LT-TH | A<br>-<br>A | N/A[3] | A<br>-<br>A | N/A[3] |
| No-Build (2018) | WB[2]<br>NB<br>SB[1] | 1 LT-RT<br>1 TH-RT<br>1 LT-TH | A<br>-<br>A | N/A[3] | A<br>-<br>A | N/A[3] |
| Build (2018) | WB[2]<br>NB<br>SB[1] | 1 LT-RT<br>1 TH-RT<br>1 LT-TH | A<br>-<br>A | N/A[3] | A<br>-<br>A | N/A[3] |

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

#### 4.2.3. Jim Wilson Road and US 521

Jim Wilson Road and US 521 form a four-leg signalized intersection. The intersection currently operates at LOS B during both peak hours. The background traffic growth and offsite developments are expected to increase delay at the intersection as seen in the No-Build (2018) scenario. The eastbound Jim Wilson Road approach is expected to operate at LOS C during both peak hours. All other approaches are expected to operate at LOS E or LOS F during both peak hours of the No-Build (2018) scenario. The overall intersection is expected to operate at LOS F during both peak hours of the No-Build (2018) scenario. Refer to Table 7 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports.

The traffic impact study, dated July 2007, for the Cornerstone development included recommendations for improvements at the intersection of Jim Wilson Road and US 521. It is unclear at this time whether or not these improvements will be constructed. New recommendations have been made for this intersection. The No-Build (2018) Improvements By Others scenario includes the following improvements:

- Construct dual westbound left and right turn lanes. The dual left turn lanes would need 250 feet of storage. The dual right turn lanes would need 275 feet of storage.
- Construct one northbound right turn lane with 150 feet of storage.
- Extend the southbound left turn lane to provide 450 feet of storage. Change the southbound inner through lane to a left turn movement.
- Construct an additional departure lane on eastbound Jim Wilson Road.

These recommended improvements by others are expected to provide additional capacity. The No-Build (2018) Improvements By Others scenario is expected to provide an overall intersection LOS C during the AM peak hour and LOS D during the PM peak hour.

The build scenario was modeled with and without the recommended improvements by others. Without any improvements, the Build (2018) scenario is expected to increase in overall intersection delay by approximately 15 percent during the AM peak hour and by 12 percent during the PM peak hour. With the recommended improvements by others, the Build (2018) Improvements By Others scenario is expected to increase in overall intersection delay by less than

4 percent during both peak hours. No improvements are recommended by the developer at this intersection due to the low increase in delay.

**TABLE 7**
**ANALYSIS SUMMARY OF JIM WILSON ROAD AND US 521**

| ANALYSIS SCENARIO | APPROACH | LANE CONFIGURATIONS | WEEKDAY AM PEAK HOUR LEVEL OF SERVICE | | WEEKDAY PM PEAK HOUR LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|
| | | | Approach | Overall | Approach | Overall |
| Existing (2013) | EB<br>WB<br>NB<br>SB | 1 LT, 1 TH, 1 RT<br>1 LT-TH-RT<br>1 LT, 1 TH, 1 TH-RT<br>1 LT, 2 TH, 1 TH-RT | B<br>A<br>C<br>A | B<br>(16.9) | B<br>B<br>C<br>B | B<br>(15.6) |
| No-Build (2018) | EB<br>WB<br>NB<br>SB | 1 LT, 1 TH, 1 RT<br>1 LT-TH-RT<br>1 LT, 1 TH, 1 TH-RT<br>1 LT, 2 TH, 1 TH-RT | C<br>F<br>F<br>E | F<br>(148.8) | C<br>F<br>F<br>F | F<br>(191.3) |
| No-Build (2018) Improvements By Others | EB<br>WB<br>NB<br>SB | 1 LT, 1 TH, 1 RT<br>**2 LT**, 1 TH, **2 RT**<br>1 LT, 2 TH, **1 RT**<br>**2 LT**, **1 TH**, 1 TH-RT | D<br>C<br>D<br>C | C<br>(34.4) | D<br>D<br>E<br>D | D<br>(54.3) |
| Build (2018) | EB<br>WB<br>NB<br>SB | 1 LT, 1 TH, 1 RT<br>1 LT-TH-RT<br>1 LT, 1 TH, 1 TH-RT<br>1 LT, 2 TH, 1 TH-RT | C<br>F<br>F<br>E | F<br>(171.8) | C<br>F<br>F<br>F | F<br>(213.6) |
| Build (2018) Improvements By Others | EB<br>WB<br>NB<br>SB | 1 LT, 1 TH, 1 RT<br>**2 LT**, 1 TH, **2 RT**<br>1 LT, 2 TH, **1 RT**<br>**2 LT**, **1 TH**, 1 TH-RT | D<br>C<br>D<br>C | D<br>(35.9) | E<br>D<br>E<br>D | D<br>(54.4) |

**Bold** denotes improvement by others.

### 4.2.4. Jim Wilson Road and Site Drive 1

Site Drive 1 is proposed to intersect Jim Wilson Road east of Henry Harris Road. The intersection would be stop controlled on Site Drive 1. A turn lane warrant analysis was performed for this intersection based on the guidelines in Chapter 15 of the SCDOT Highway Design Manual. A westbound Jim Wilson Road left turn lane is warranted based on the Build (2018) PM peak hour volumes. It is recommended the developer construct a westbound Jim Wilson Road left turn lane with 150 feet of storage. The westbound left turn movement is expected to operate at LOS A. The Site Drive 1 approach is expected to operate at LOS C during the AM peak hour and at LOS D during the PM peak hour. Refer to Table 8 for a summary of the analysis results. Refer to Appendix G for the Synchro capacity analysis reports.

**TABLE 8**
**ANALYSIS SUMMARY OF JIM WILSON ROAD AND SITE DRIVE 1**

| ANALYSIS SCENARIO | APPROACH | LANE CONFIGURATIONS | WEEKDAY AM PEAK HOUR LEVEL OF SERVICE | | WEEKDAY PM PEAK HOUR LEVEL OF SERVICE | |
|---|---|---|---|---|---|---|
| | | | Approach | Overall | Approach | Overall |
| Build (2018) | EB<br>WB[1]<br>NB[2] | 1 TH-RT<br>**1 LT**, 1 TH<br>1 LT-RT | -<br>A<br>C | N/A[3] | -<br>A<br>D | N/A[3] |

1. Major street left-turn movement for unsignalized intersection.
2. Stop controlled approach for unsignalized intersection.
3. Overall intersection LOS is not provided for unsignalized intersections

**Bold** denotes improvement by developer.

## 5. CONCLUSIONS

This report summarizes the findings of the Traffic Impact Study (TIS) that was performed for the Jim Wilson Road Development. The proposed site is located south of Jim Wilson Road and east of Henry Harris Road in Lancaster, South Carolina. The purpose of this study is to determine the potential impact to the surrounding transportation system caused by the traffic generated by the proposed development.

The Jim Wilson Road Development is proposed to consist of 271 single-family detached homes. One site driveway is proposed on Jim Wilson Road and another on Henry Harris Road. For purposes of this study, it is assumed that the development will be fully built out by 2018.

### 5.1. Summary of Recommended Improvements

Based on the analysis results, certain geometric improvements have been identified. Refer to Figure 16 for an illustration of the recommended lane configurations.

The following improvements have been identified to be constructed by others:

Jim Wilson Road and Henry Harris Road

- Remove stop signs on Jim Wilson Road
- Construct one eastbound Jim Wilson Road left turn lane with 150 feet of storage.
- Construct one westbound Jim Wilson Road left turn lane with 150 feet of storage.

Jim Wilson Road and US 521

- Extend the southbound US 521 left turn lane to provide 450 feet of storage.
- Change the southbound US 521 inner through lane to a left turn lane.
- Construct dual left turn lanes on westbound Jim Wilson Road. Each lane would have 250 feet of storage. Construct an additional eastbound Jim Wilson Road departure lane.
- Construct dual right turn lanes on westbound Jim Wilson Road. Each lane would have 275 feet of storage.
- Construct one northbound US 521 right turn lane with 150 feet of storage.

The following improvements have been identified to be constructed by the developer:

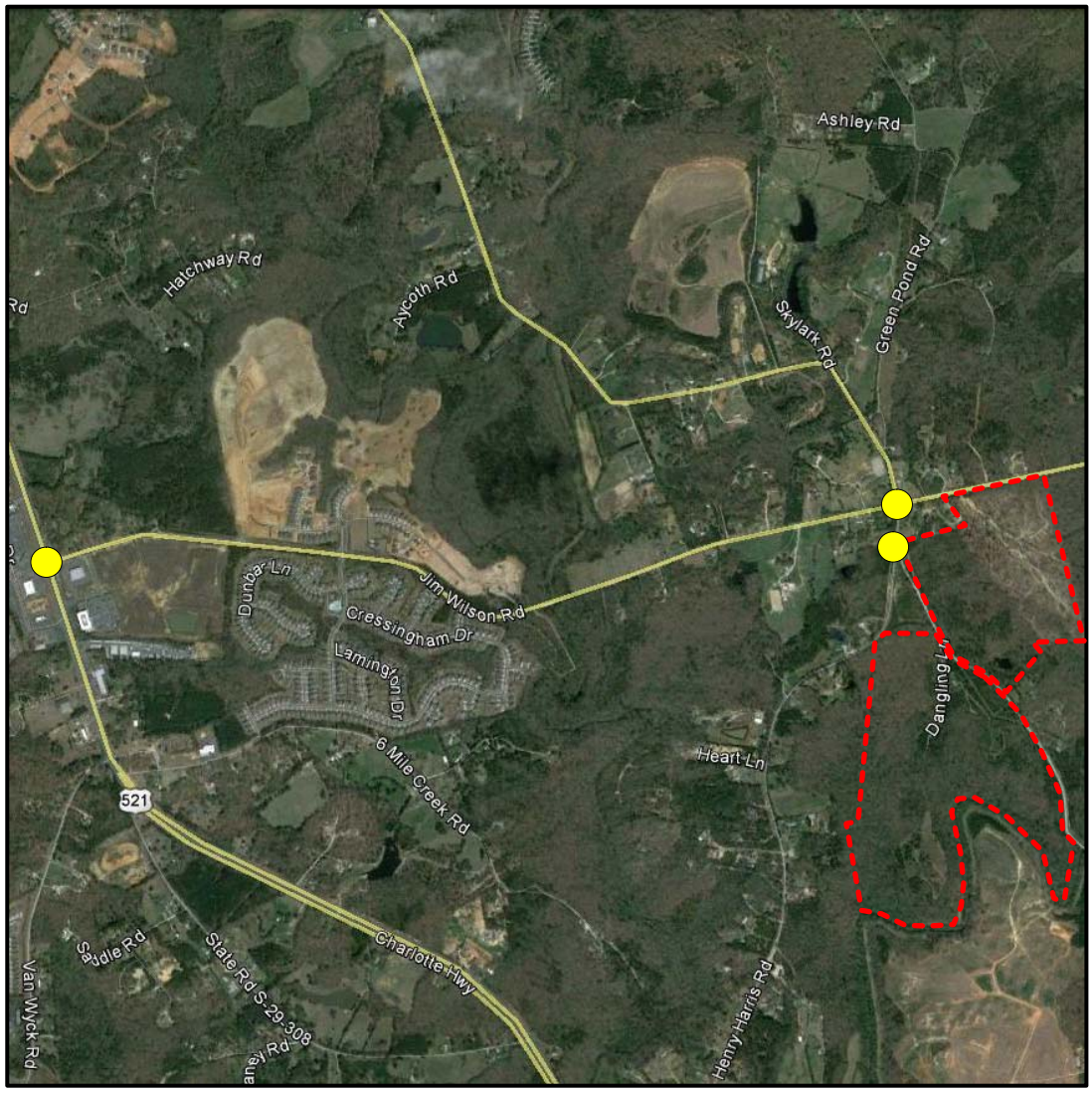
Jim Wilson Road and Site Drive 1

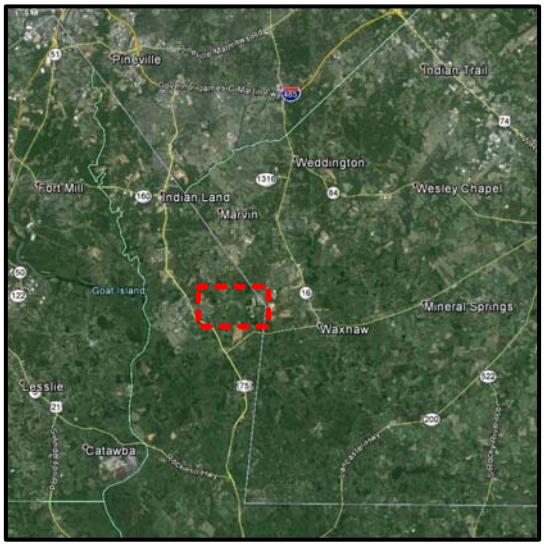
- Construct one westbound Jim Wilson Road left turn lane with 150 feet of storage.

# TECHNICAL APPENDIX

# APPENDIX A

## FIGURES




**LEGEND**

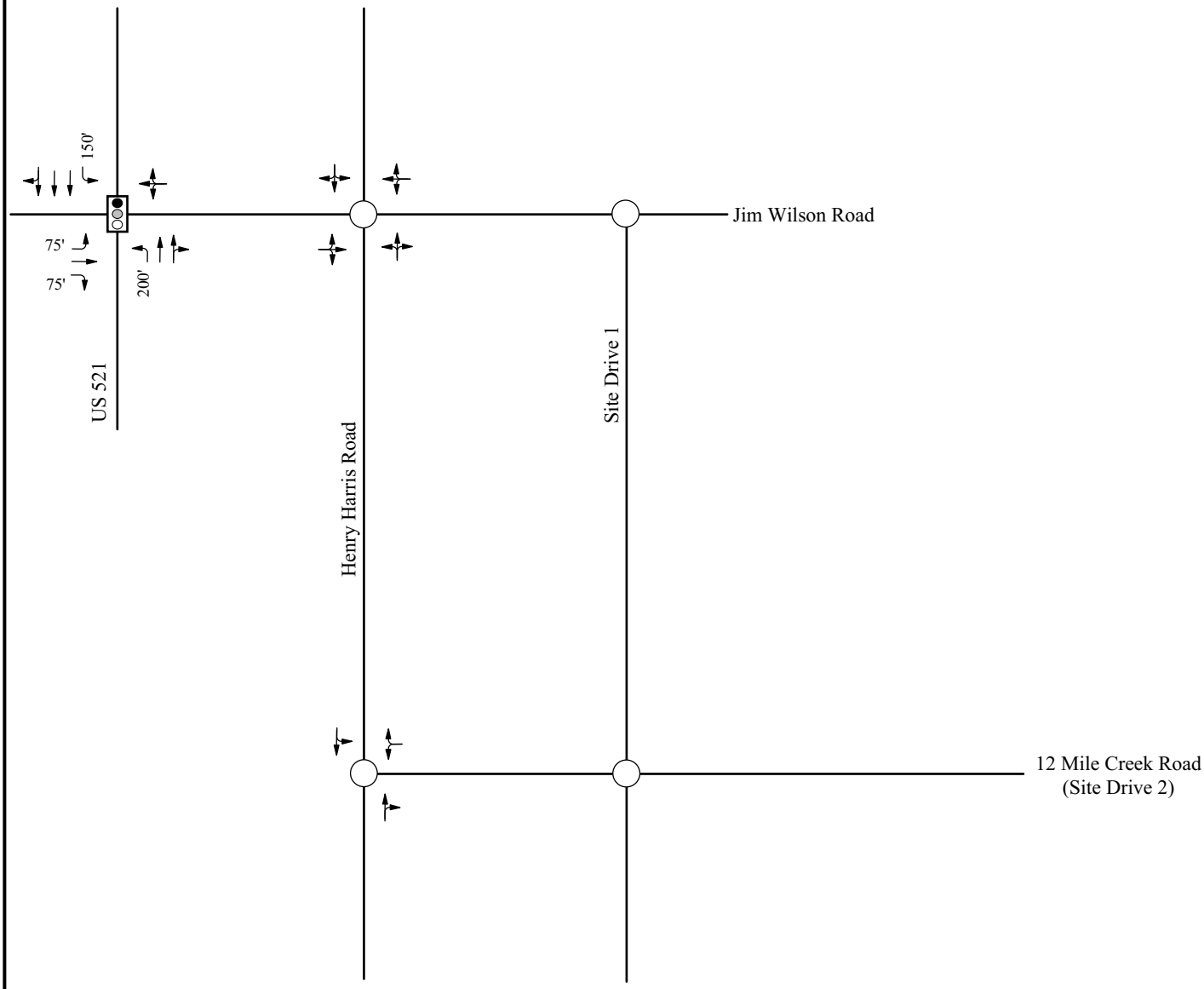
N

Proposed Site Location

Off-Site Study Intersection

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Site Location Map |
| | | Scale: Not to Scale / Figure 1 |

| | | | |
|---|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Preliminary Site Plan | |
| | | Scale: Not to Scale | Figure 2 |




**LEGEND**

Unsignalized Intersection

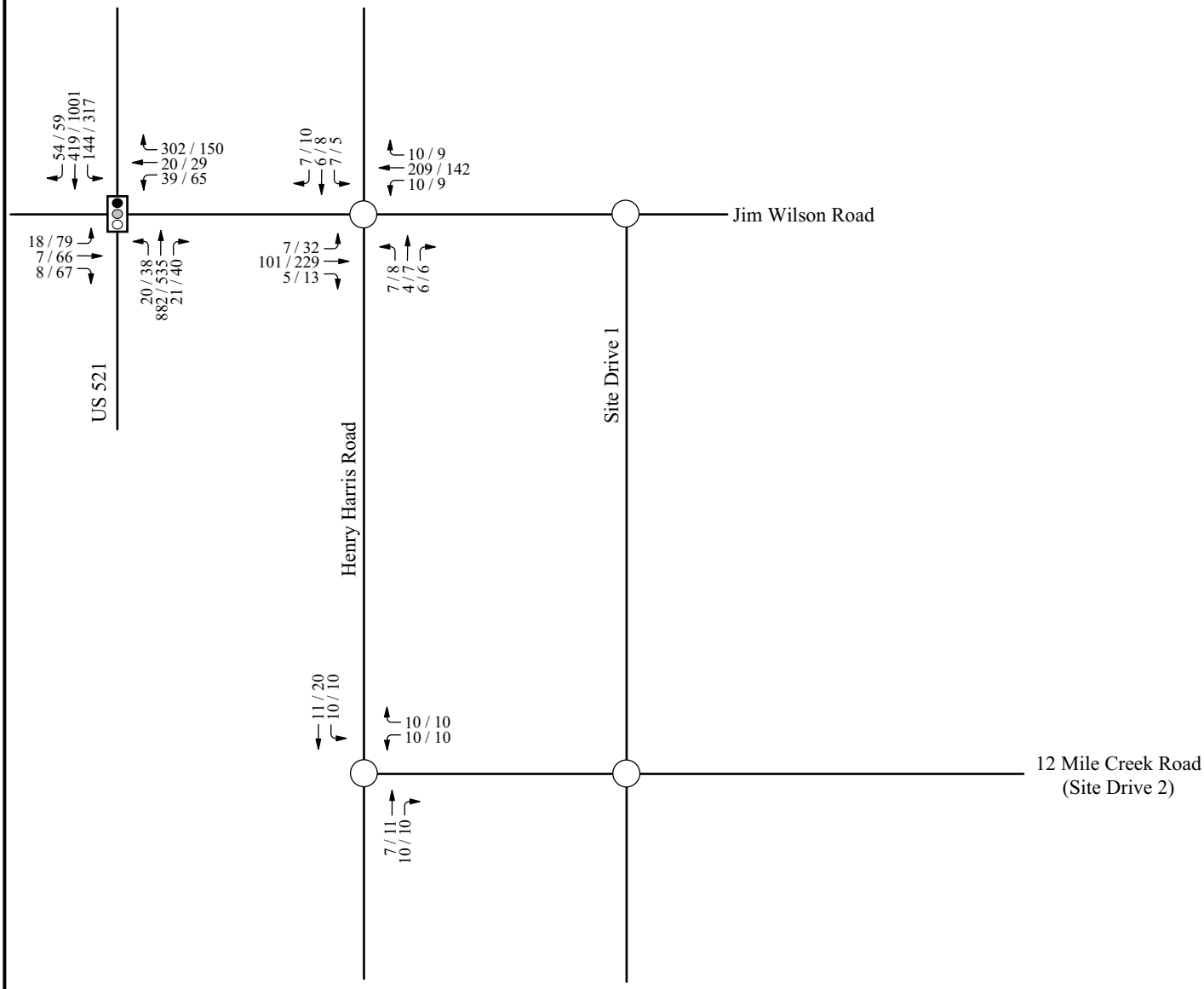
Signalized Intersection

Existing Lane

**X'** Storage (In Feet)

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Existing (2013) Lane Configurations<br>Scale: Not to Scale \| Figure 3 |




**LEGEND**

Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

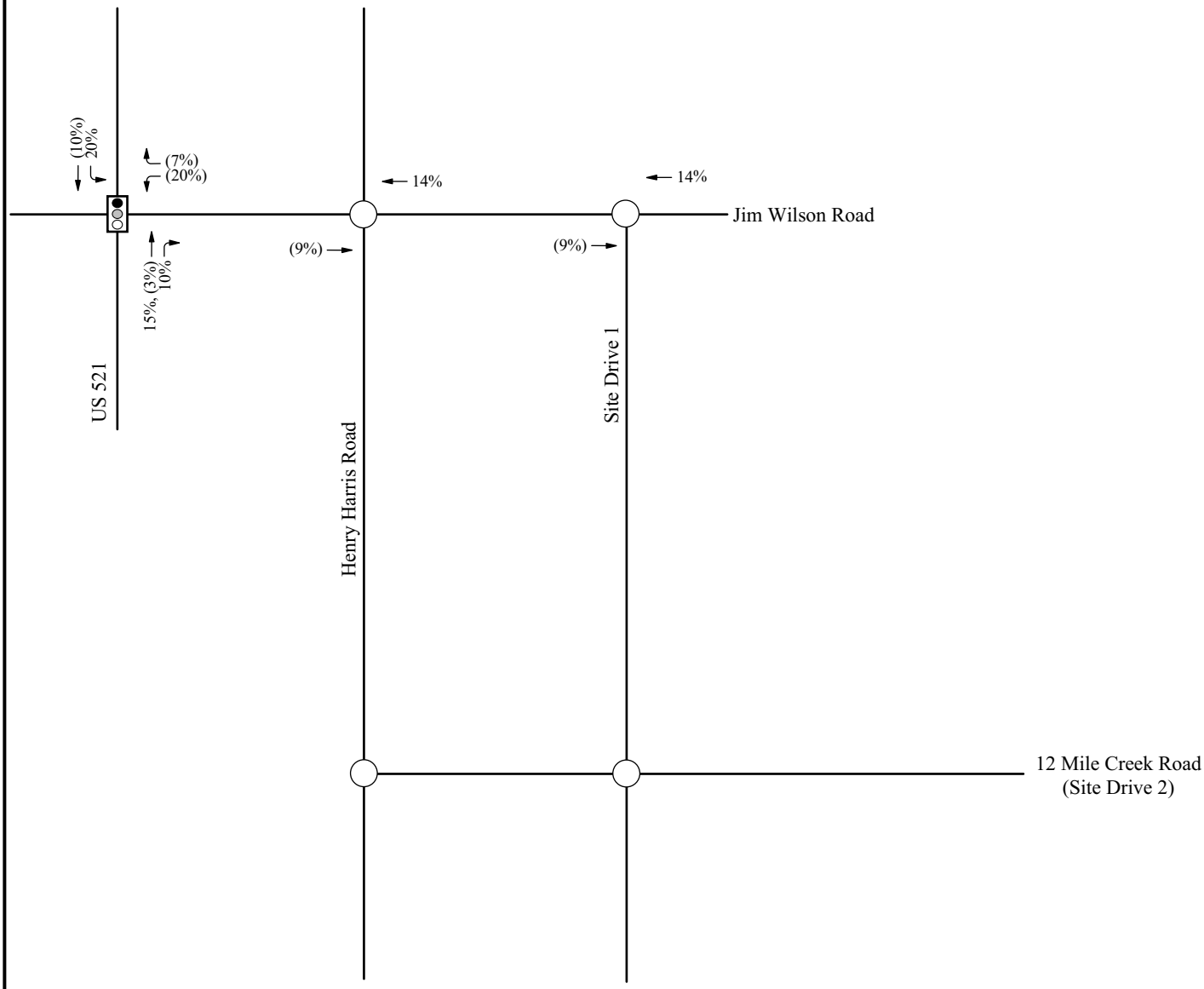
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

JIM WILSON ROAD DEVELOPMENT
Lancaster, SC

Existing (2013)
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 4




**LEGEND**

Unsignalized Intersection

Signalized Intersection

X% → Entering Trip Distribution

(X%) → Exiting Trip Distribution

**XX%** Regional Distribution

N

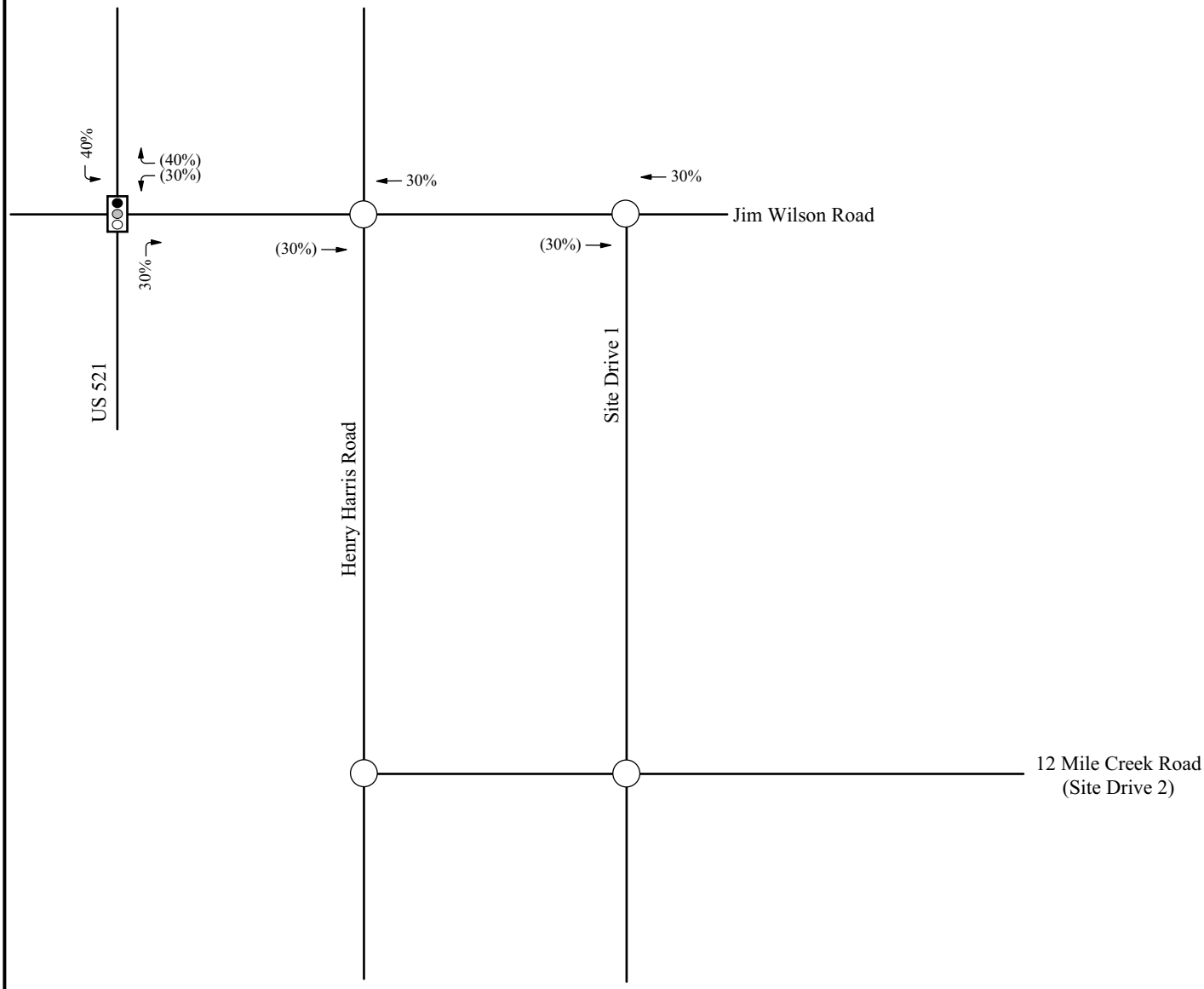
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

JIM WILSON ROAD DEVELOPMENT
Lancaster, SC

Cornerstone Site Trip Distribution Percentages

Scale: Not to Scale

Figure 5




**LEGEND**

Unsignalized Intersection

Signalized Intersection

X% → Entering Trip Distribution

(X%) → Exiting Trip Distribution

**XX%** Regional Distribution

N

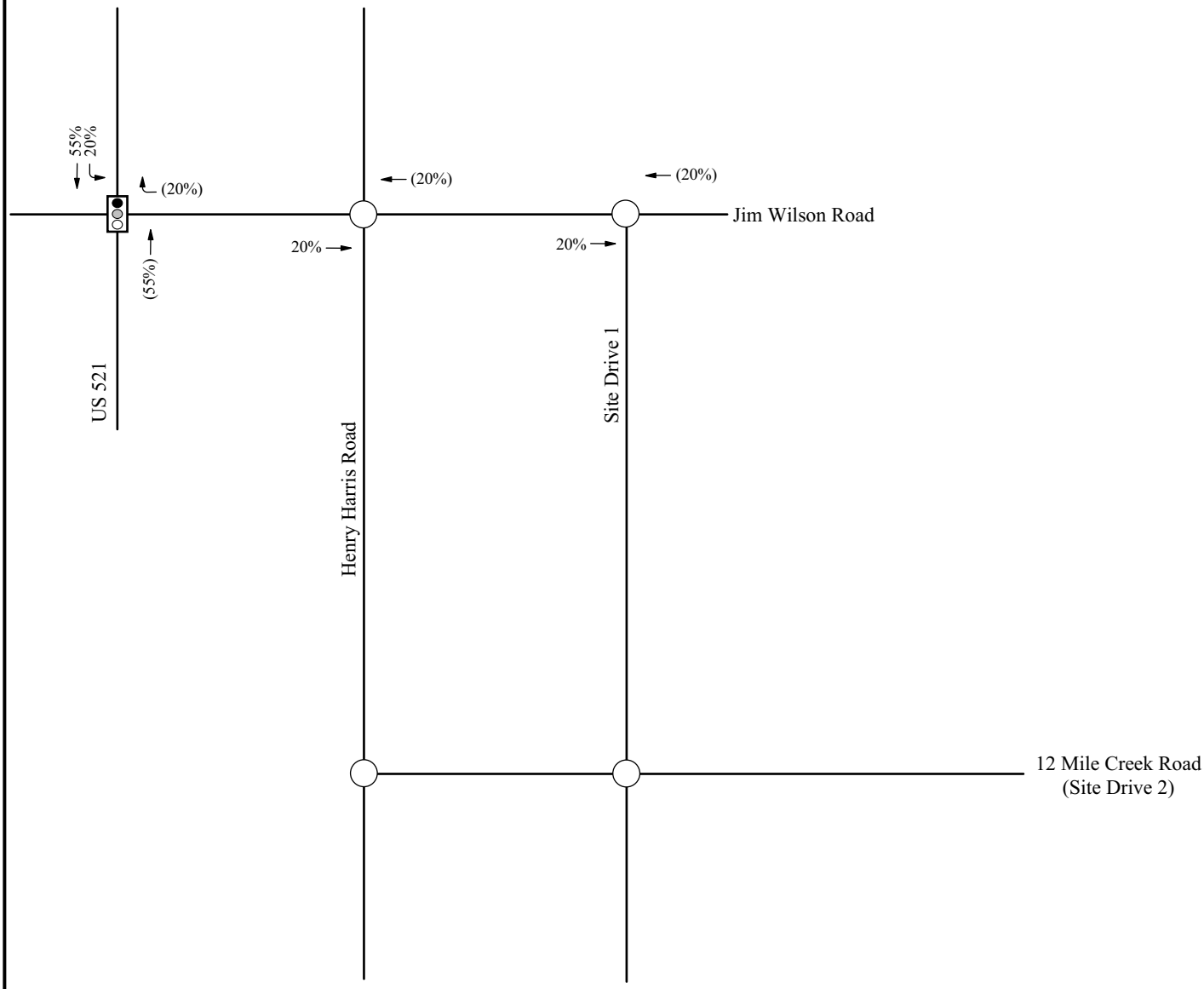
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

JIM WILSON ROAD DEVELOPMENT
Lancaster, SC

Carolina Reserve Site Trip Distribution Percentages

Scale: Not to Scale

Figure 6




**LEGEND**

Unsignalized Intersection

Signalized Intersection

X% → Entering Trip Distribution

(X%) → Exiting Trip Distribution

**XX%** Regional Distribution

N

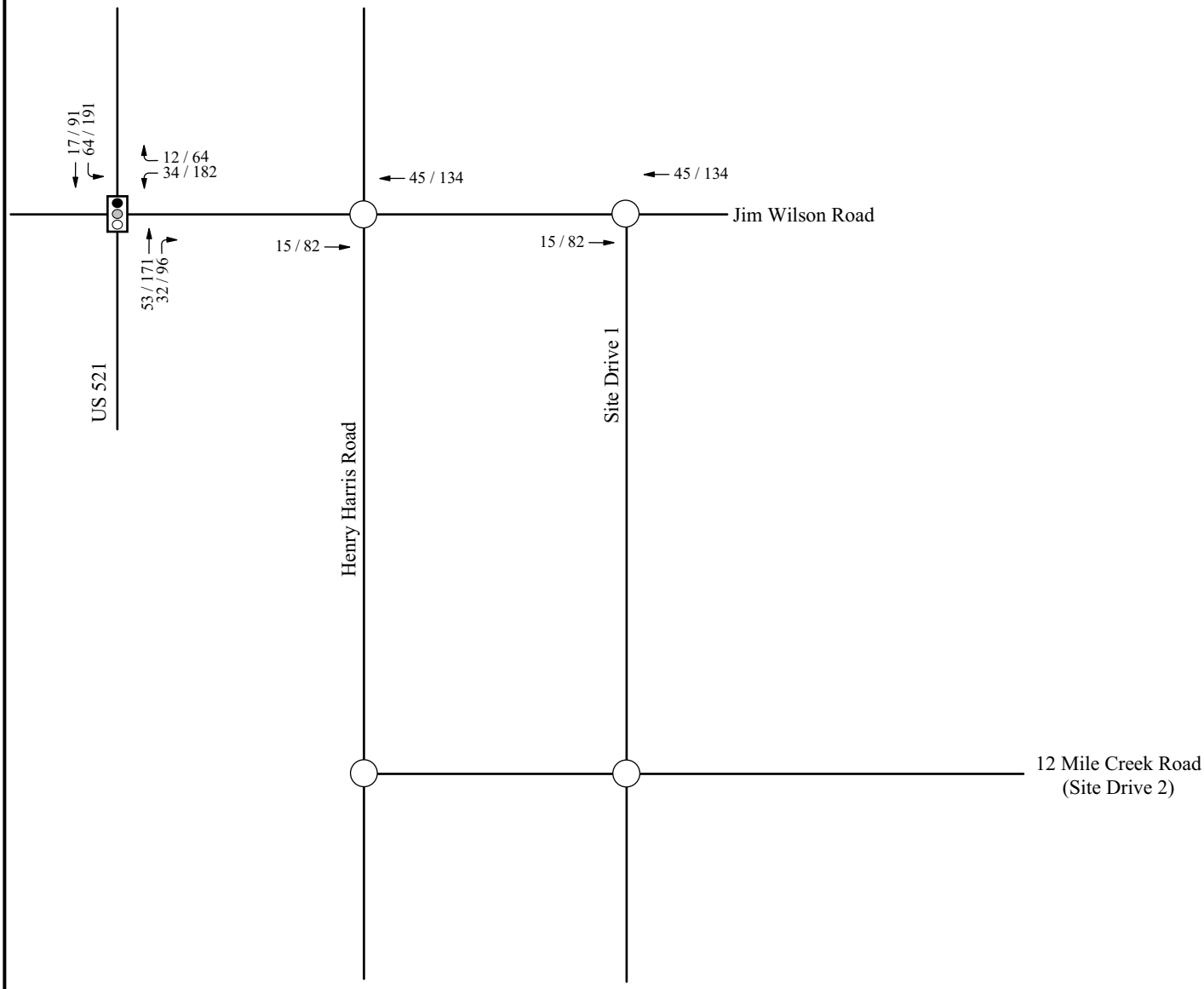
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

JIM WILSON ROAD DEVELOPMENT
Lancaster, SC

Walnut Creek Site Trip Distribution Percentages

Scale: Not to Scale

Figure 7




**LEGEND**

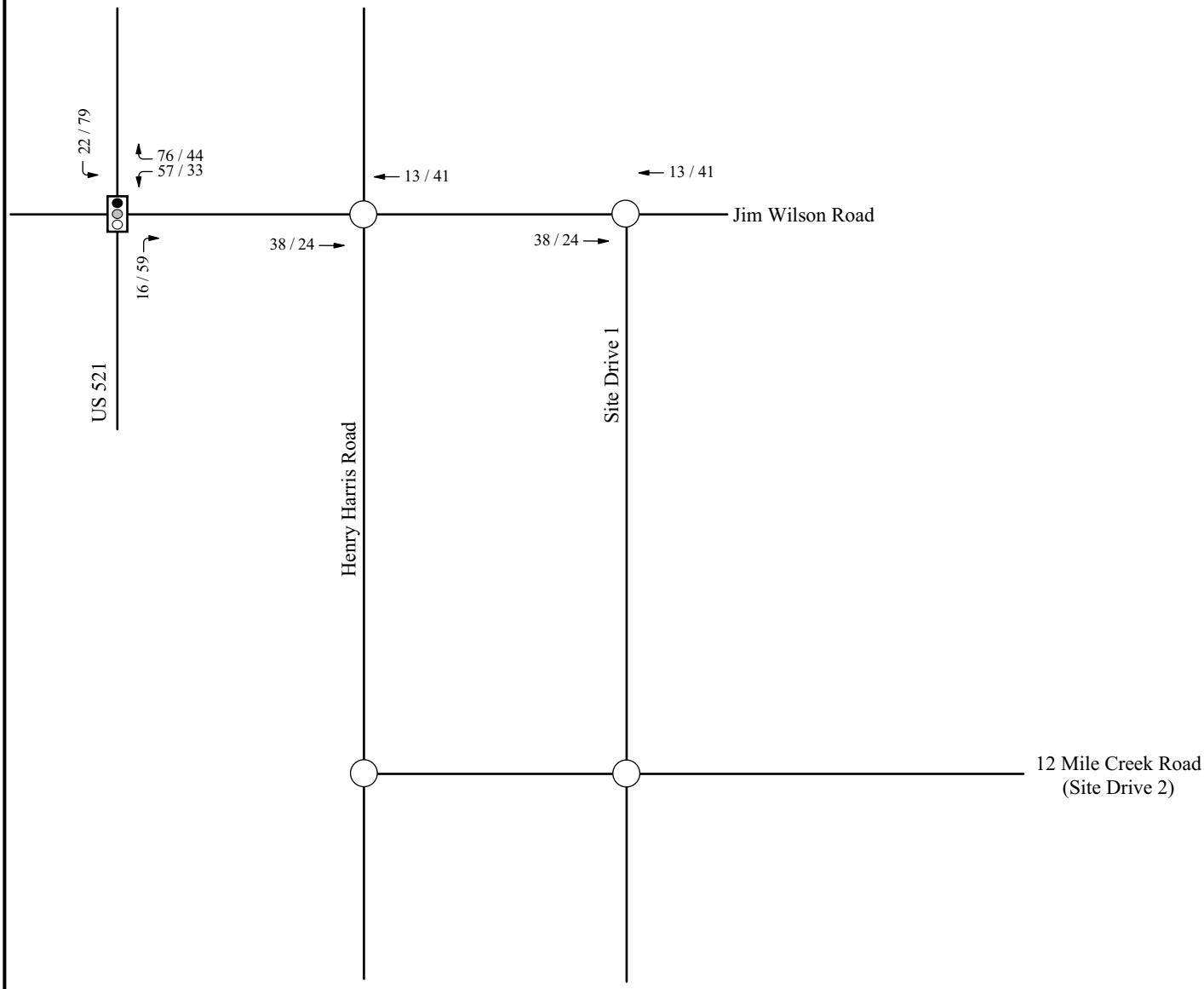
Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Cornerstone Site Trip Assignment<br>Scale: Not to Scale \| Figure 8 |




**LEGEND**

Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

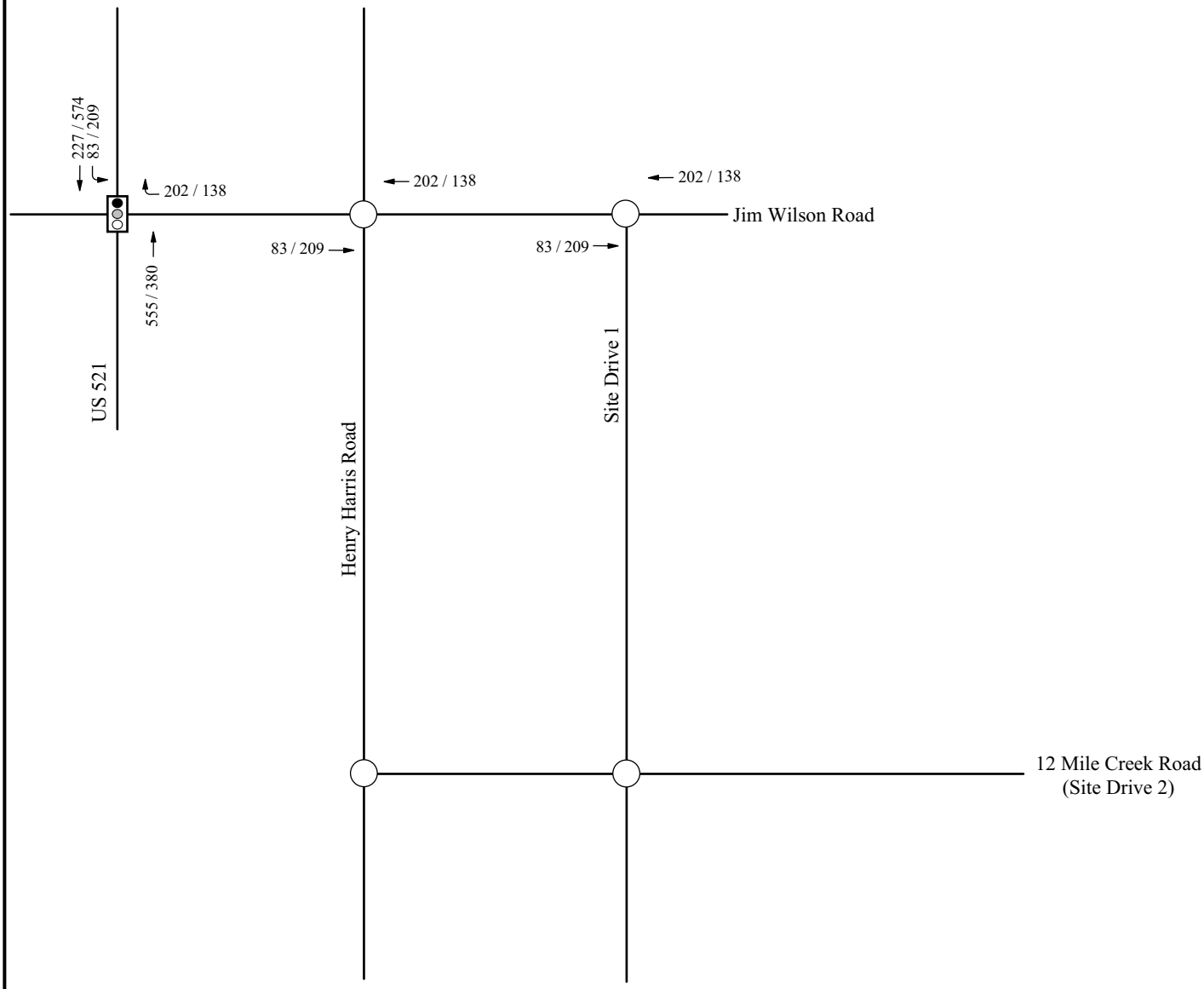
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

JIM WILSON ROAD DEVELOPMENT
Lancaster, SC

Carolina Reserve Site Trip Assignment

Scale: Not to Scale

Figure 9




**LEGEND**

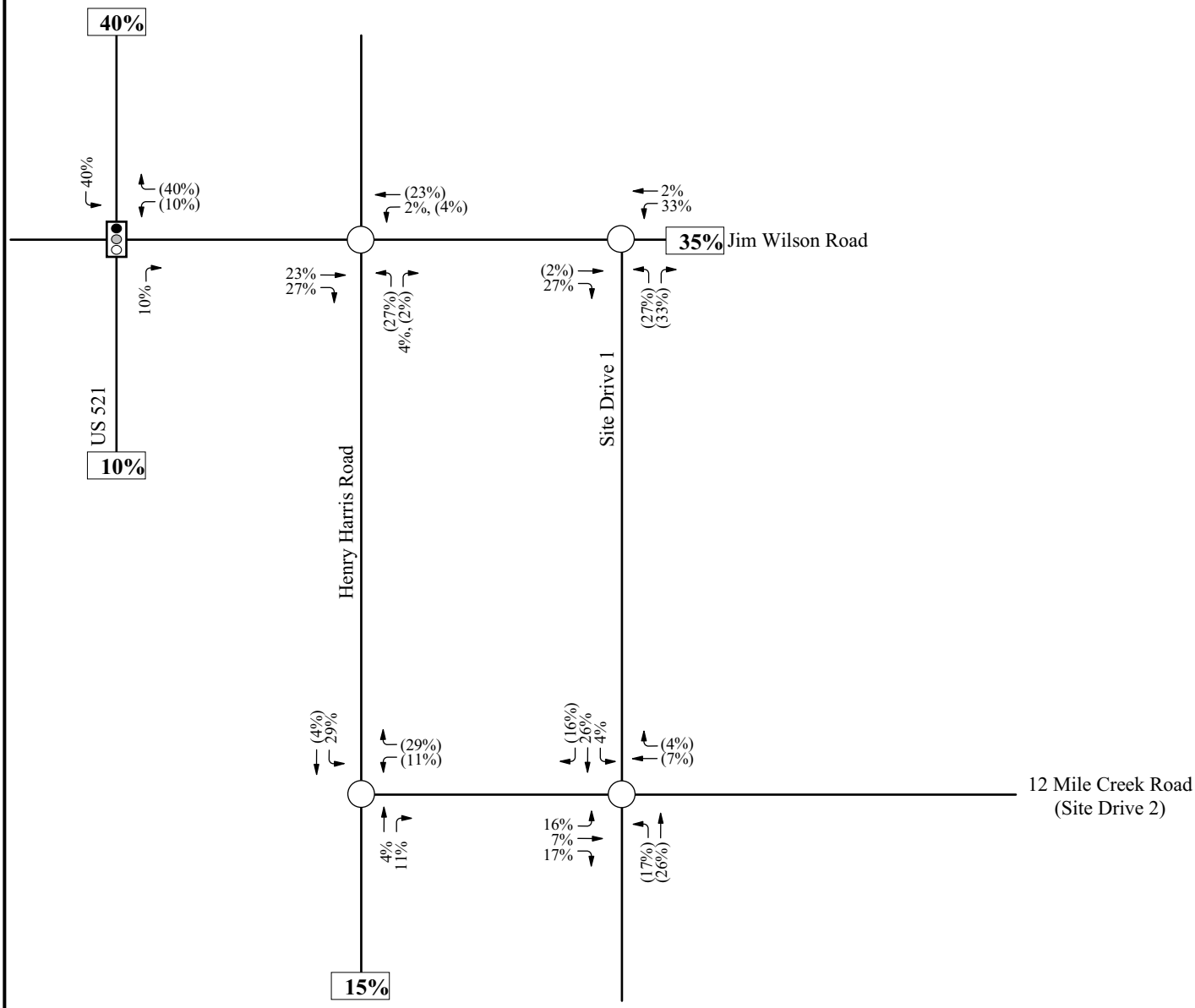
Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Walnut Creek Site Trip Assignment<br>Scale: Not to Scale \| Figure 10 |




**LEGEND**

Unsignalized Intersection

Signalized Intersection

X% → Entering Trip Distribution

(X%) → Exiting Trip Distribution

XX% Regional Distribution

N

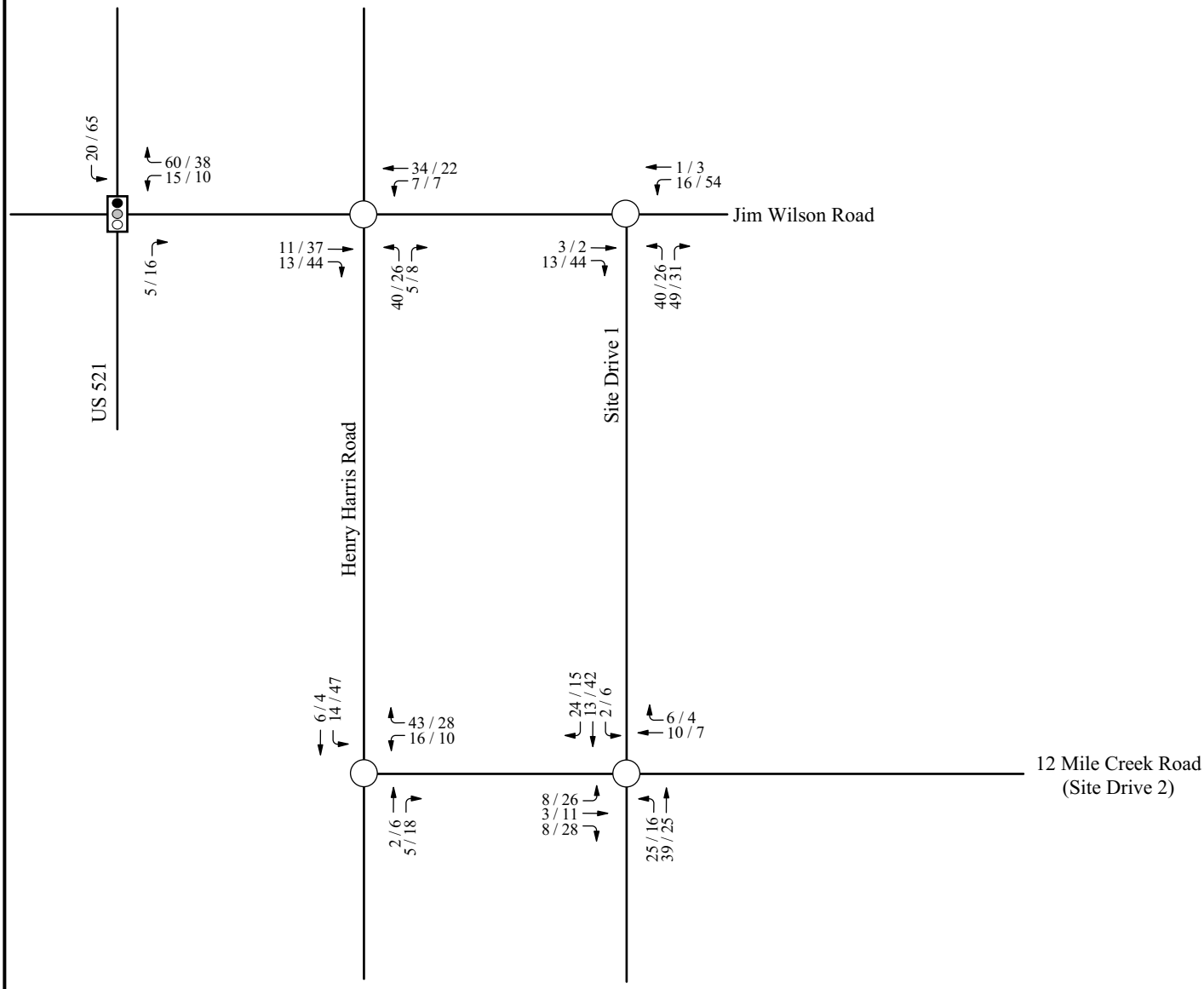
RAMEY KEMP & ASSOCIATES
TRANSPORTATION ENGINEERS

JIM WILSON ROAD DEVELOPMENT
Lancaster, SC

Primary Site Trip Distribution Percentages

Scale: Not to Scale

Figure 11




**LEGEND**

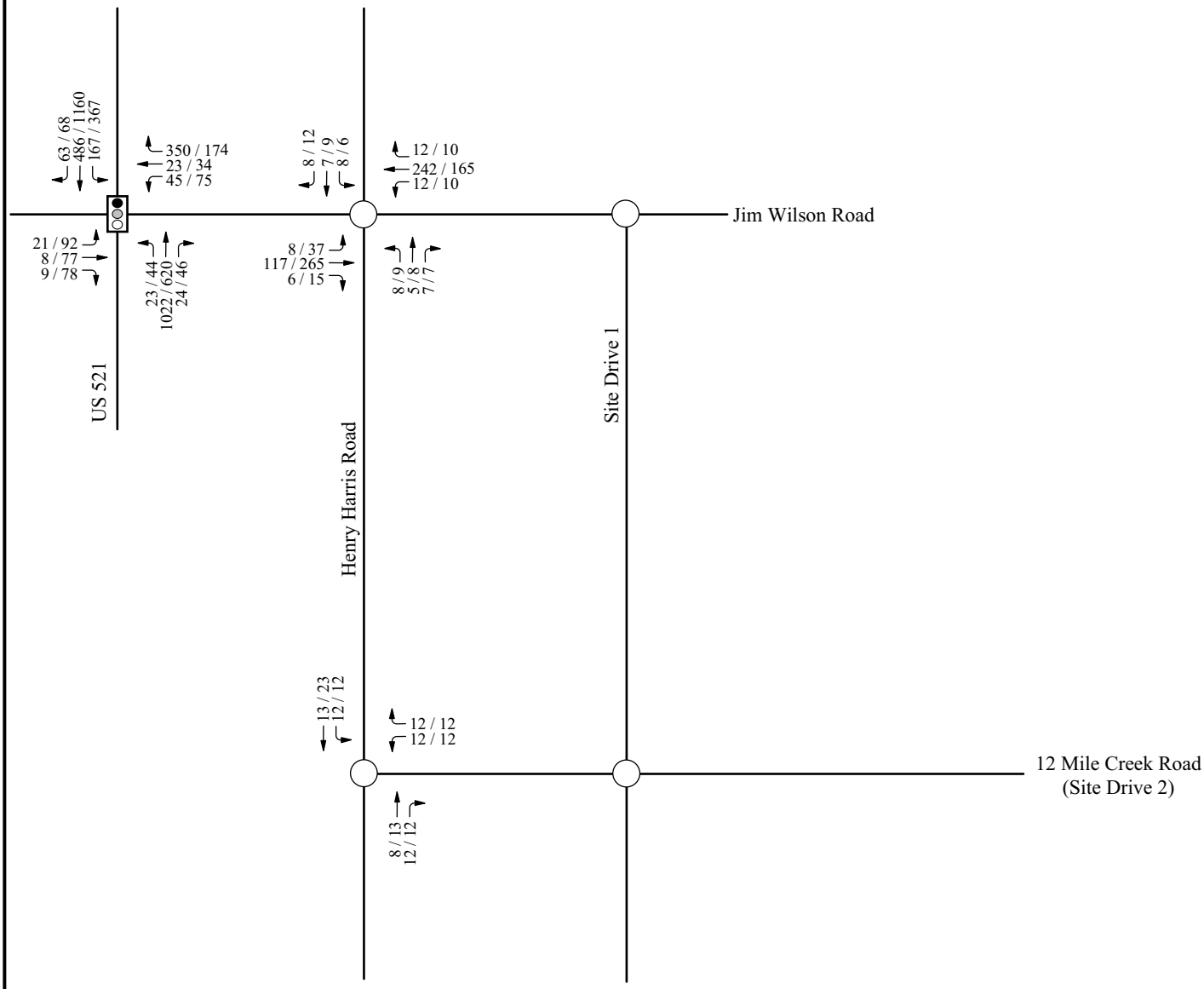
Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Total Peak Hour Site Trip Assignment<br>Scale: Not to Scale — Figure 12 |




**LEGEND**

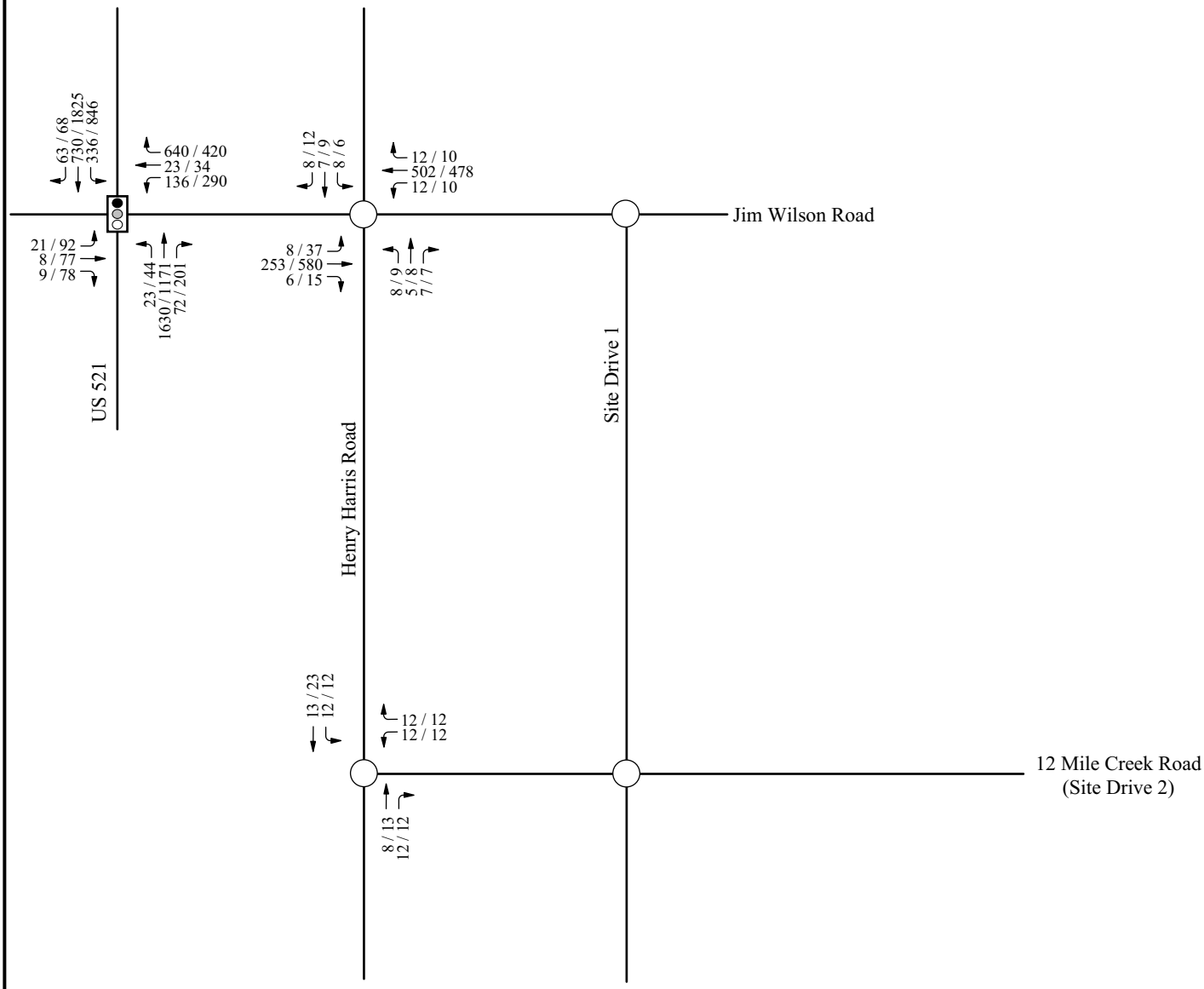
Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Projected (2018)<br>Peak Hour Traffic Volumes |
| | | Scale: Not to Scale / Figure 13 |




**LEGEND**

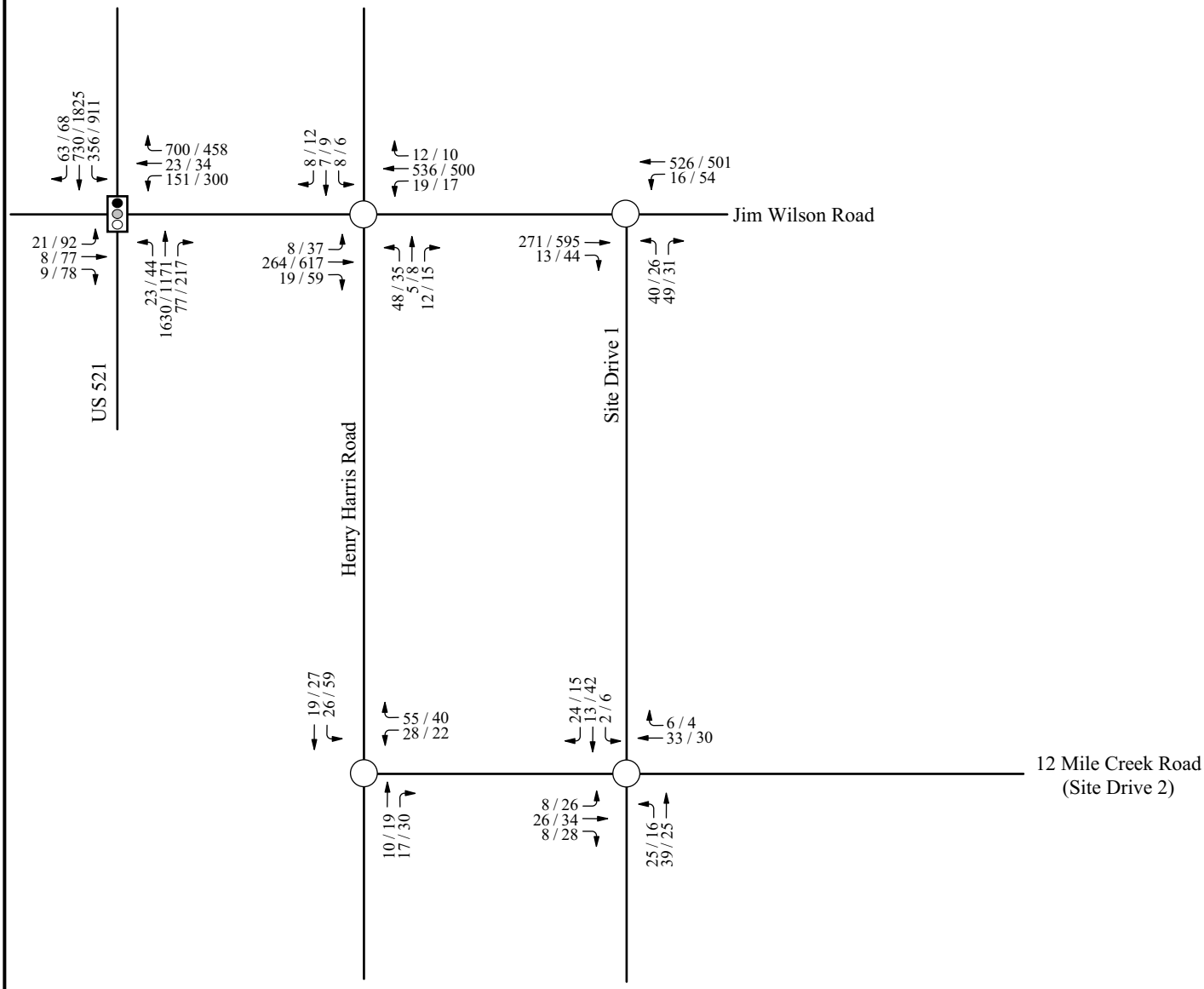
Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | No-Build (2018)<br>Peak Hour Traffic Volumes |
| | | Scale: Not to Scale / Figure 14 |




**LEGEND**

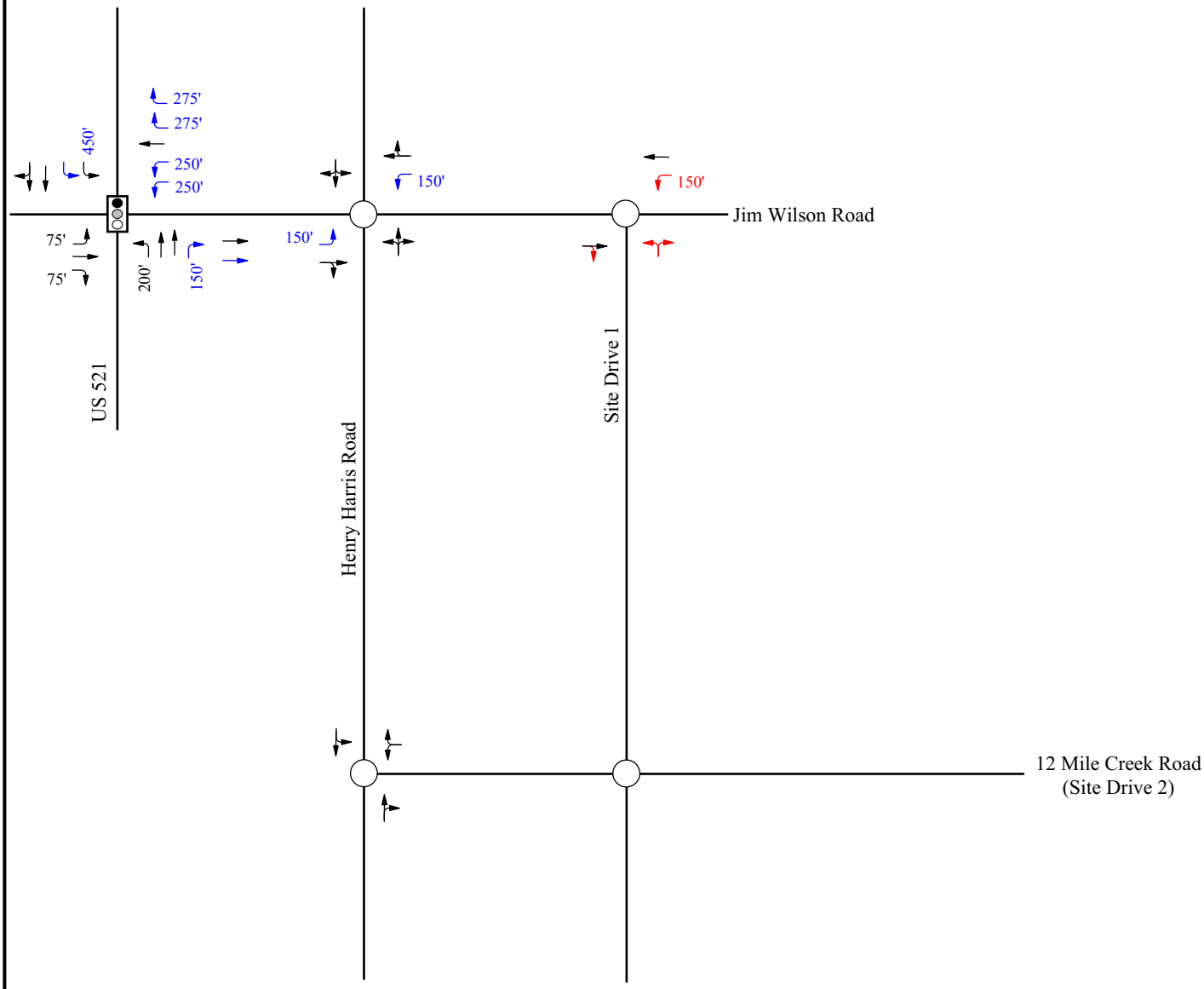
Unsignalized Intersection

Signalized Intersection

X / Y → AM / PM Peak Hour Traffic

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Build (2018)<br>Peak Hour Traffic Volumes |
| | | Scale: Not to Scale / Figure 15 |




**LEGEND**

- Unsignalized Intersection
- Signalized Intersection
- Existing Lane
- X' Storage (In Feet)
- Improvements By Others
- Improvements By Developer

N

| | | |
|---|---|---|
| RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS | JIM WILSON ROAD DEVELOPMENT<br>Lancaster, SC | Recommended Lane Configurations<br>Scale: Not to Scale \| Figure 16 |

# APPENDIX B

## TRAFFIC COUNT DATA

Ramey Kemp and Associates, Inc.
8307 University Exec. Park Dr. Ste 260
Charlotte, NC 28262

File Name : Jim Wilson Rd & Henry Harris Rd
Site Code : 12121301
Start Date : 12/11/2013
Page No : 1

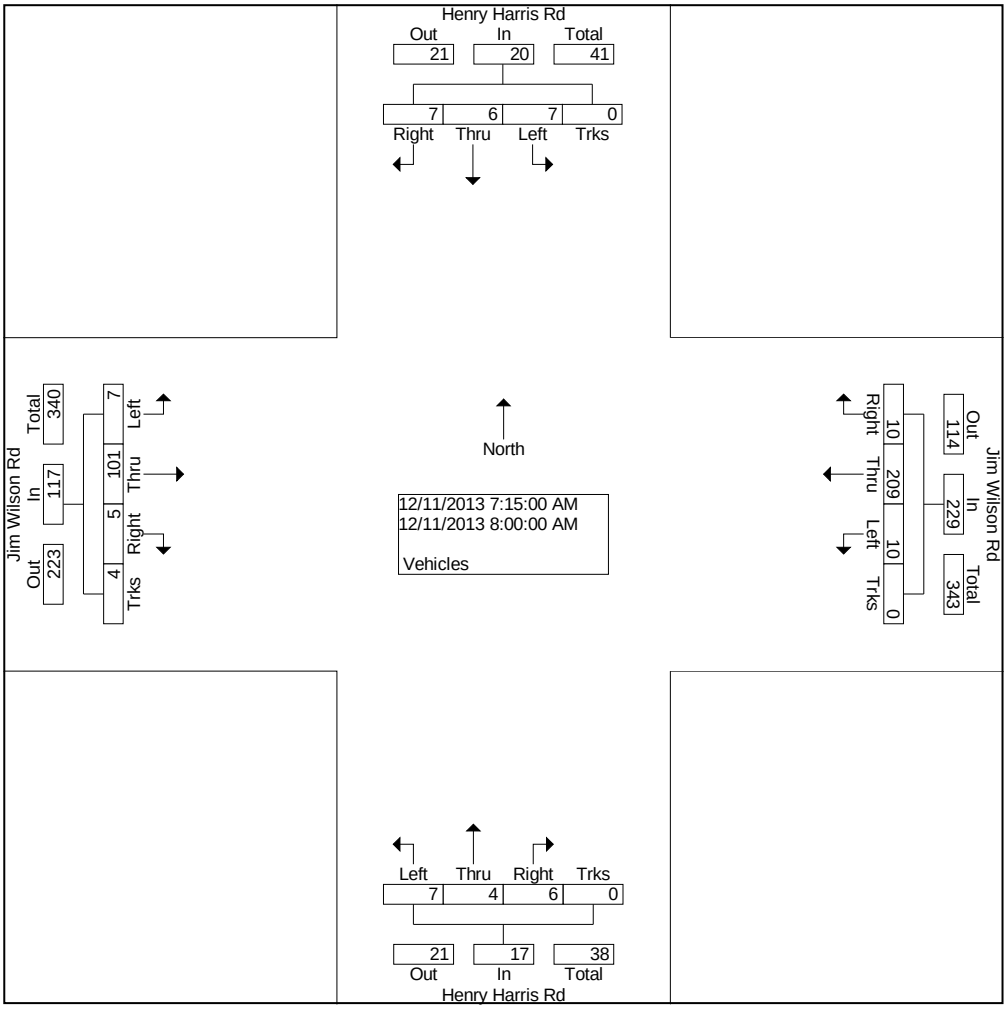
Groups Printed- Vehicles

| | Henry Harris Rd Southbound | | | | | Jim Wilson Rd Westbound | | | | | Henry Harris Rd Northbound | | | | | Jim Wilson Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Int. Total |
| Factor | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | | |
| 07:00 AM | 1 | 0 | 0 | 0 | 1 | 0 | 28 | 3 | 0 | 31 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 4 | 37 |
| 07:15 AM | 3 | 1 | 2 | 0 | 6 | 2 | 59 | 1 | 0 | 62 | 2 | 2 | 1 | 0 | 5 | 1 | 24 | 2 | 0 | 27 | 100 |
| 07:30 AM | 0 | 2 | 3 | 0 | 5 | 3 | 55 | 4 | 0 | 62 | 3 | 1 | 0 | 0 | 4 | 3 | 15 | 2 | 1 | 21 | 92 |
| 07:45 AM | 1 | 1 | 1 | 0 | 3 | 4 | 50 | 2 | 0 | 56 | 0 | 1 | 3 | 0 | 4 | 1 | 37 | 1 | 3 | 42 | 105 |
| Total | 5 | 4 | 6 | 0 | 15 | 9 | 192 | 10 | 0 | 211 | 6 | 4 | 4 | 0 | 14 | 5 | 80 | 5 | 4 | 94 | 334 |
| 08:00 AM | 3 | 2 | 1 | 0 | 6 | 1 | 45 | 3 | 0 | 49 | 1 | 0 | 3 | 0 | 4 | 0 | 25 | 2 | 0 | 27 | 86 |
| 08:15 AM | 3 | 1 | 1 | 0 | 5 | 3 | 29 | 2 | 0 | 34 | 1 | 0 | 3 | 0 | 4 | 2 | 19 | 1 | 4 | 26 | 69 |
| 08:30 AM | 1 | 1 | 3 | 0 | 5 | 1 | 26 | 0 | 0 | 27 | 1 | 0 | 1 | 0 | 2 | 0 | 20 | 0 | 2 | 22 | 56 |
| 08:45 AM | 3 | 0 | 1 | 0 | 4 | 2 | 32 | 0 | 0 | 34 | 4 | 0 | 2 | 0 | 6 | 0 | 28 | 1 | 3 | 32 | 76 |
| Total | 10 | 4 | 6 | 0 | 20 | 7 | 132 | 5 | 0 | 144 | 7 | 0 | 9 | 0 | 16 | 2 | 92 | 4 | 9 | 107 | 287 |
| 04:00 PM | 3 | 1 | 1 | 0 | 5 | 2 | 30 | 2 | 0 | 34 | 0 | 2 | 1 | 0 | 3 | 4 | 34 | 4 | 0 | 42 | 84 |
| 04:15 PM | 4 | 1 | 0 | 0 | 5 | 3 | 36 | 1 | 0 | 40 | 3 | 1 | 1 | 0 | 5 | 1 | 35 | 4 | 0 | 40 | 90 |
| 04:30 PM | 3 | 2 | 2 | 0 | 7 | 1 | 21 | 3 | 0 | 25 | 1 | 3 | 0 | 0 | 4 | 3 | 51 | 5 | 0 | 59 | 95 |
| 04:45 PM | 2 | 0 | 0 | 0 | 2 | 0 | 26 | 3 | 0 | 29 | 0 | 1 | 3 | 0 | 4 | 0 | 42 | 1 | 0 | 43 | 78 |
| Total | 12 | 4 | 3 | 0 | 19 | 6 | 113 | 9 | 0 | 128 | 4 | 7 | 5 | 0 | 16 | 8 | 162 | 14 | 0 | 184 | 347 |
| 05:00 PM | 1 | 4 | 2 | 0 | 7 | 2 | 31 | 3 | 0 | 36 | 0 | 2 | 3 | 0 | 5 | 3 | 51 | 8 | 0 | 62 | 110 |
| 05:15 PM | 2 | 1 | 1 | 0 | 4 | 2 | 31 | 5 | 0 | 38 | 1 | 1 | 2 | 0 | 4 | 1 | 55 | 8 | 0 | 64 | 110 |
| 05:30 PM | 5 | 2 | 1 | 0 | 8 | 3 | 46 | 1 | 0 | 50 | 1 | 2 | 2 | 0 | 5 | 4 | 57 | 5 | 0 | 66 | 129 |
| 05:45 PM | 2 | 1 | 1 | 0 | 4 | 2 | 34 | 0 | 1 | 37 | 4 | 2 | 1 | 0 | 7 | 5 | 66 | 11 | 0 | 82 | 130 |
| Total | 10 | 8 | 5 | 0 | 23 | 9 | 142 | 9 | 1 | 161 | 6 | 7 | 8 | 0 | 21 | 13 | 229 | 32 | 0 | 274 | 479 |
| Grand Total | 37 | 20 | 20 | 0 | 77 | 31 | 579 | 33 | 1 | 644 | 23 | 18 | 26 | 0 | 67 | 28 | 563 | 55 | 13 | 659 | 1447 |
| Apprch % | 48.1 | 26.0 | 26.0 | 0.0 | | 4.8 | 89.9 | 5.1 | 0.2 | | 34.3 | 26.9 | 38.8 | 0.0 | | 4.2 | 85.4 | 8.3 | 2.0 | | |
| Total % | 2.6 | 1.4 | 1.4 | 0.0 | 5.3 | 2.1 | 40.0 | 2.3 | 0.1 | 44.5 | 1.6 | 1.2 | 1.8 | 0.0 | 4.6 | 1.9 | 38.9 | 3.8 | 0.9 | 45.5 | |

Ramey Kemp and Associates, Inc.
8307 University Exec. Park Dr. Ste 260
Charlotte, NC 28262

File Name : Jim Wilson Rd & Henry Harris Rd
Site Code : 12121301
Start Date : 12/11/2013
Page No : 2

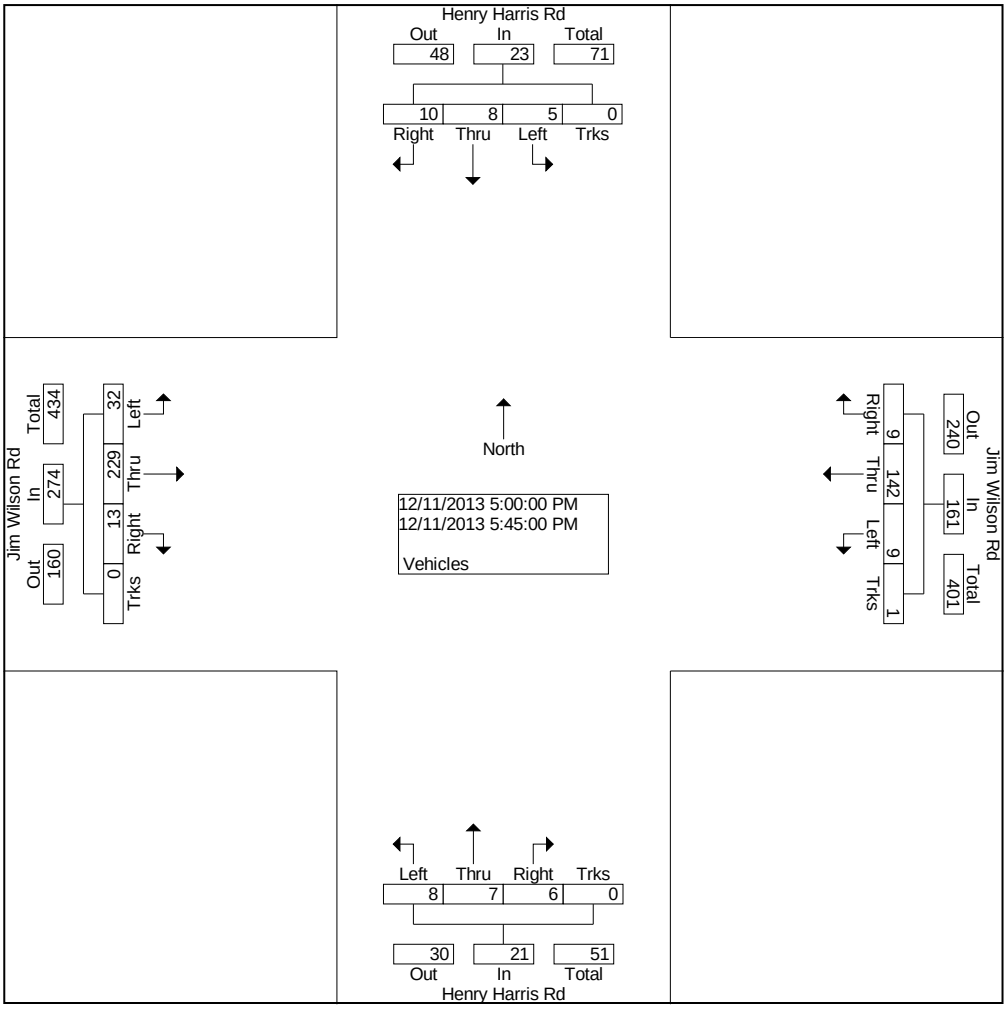
| | Henry Harris Rd Southbound | | | | | Jim Wilson Rd Westbound | | | | | Henry Harris Rd Northbound | | | | | Jim Wilson Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Int. Total |
| Peak Hour From 07:00 AM to 11:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Intersection | 07:15 AM | | | | | | | | | | | | | | | | | | | | |
| Volume | 7 | 6 | 7 | 0 | 20 | 10 | 209 | 10 | 0 | 229 | 6 | 4 | 7 | 0 | 17 | 5 | 101 | 7 | 4 | 117 | 383 |
| Percent | 35.0 | 30.0 | 35.0 | 0.0 | | 4.4 | 91.3 | 4.4 | 0.0 | | 35.3 | 23.5 | 41.2 | 0.0 | | 4.3 | 86.3 | 6.0 | 3.4 | | |
| 07:45 Volume | 1 | 1 | 1 | 0 | 3 | 4 | 50 | 2 | 0 | 56 | 0 | 1 | 3 | 0 | 4 | 1 | 37 | 1 | 3 | 42 | 105 |
| Peak Factor | | | | | | | | | | | | | | | | | | | | | 0.912 |
| High Int. | 07:15 AM | | | | | 07:15 AM | | | | | 07:15 AM | | | | | 07:45 AM | | | | | |
| Volume | 3 | 1 | 2 | 0 | 6 | 2 | 59 | 1 | 0 | 62 | 2 | 2 | 1 | 0 | 5 | 1 | 37 | 1 | 3 | 42 | |
| Peak Factor | | | | | 0.833 | | | | | 0.923 | | | | | 0.850 | | | | | 0.696 | |



Ramey Kemp and Associates, Inc.
8307 University Exec. Park Dr. Ste 260
Charlotte, NC 28262

File Name : Jim Wilson Rd & Henry Harris Rd
Site Code : 12121301
Start Date : 12/11/2013
Page No : 3

| | Henry Harris Rd Southbound | | | | | Jim Wilson Rd Westbound | | | | | Henry Harris Rd Northbound | | | | | Jim Wilson Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Right | Thru | Left | Trks | App. Total | Int. Total |
| Peak Hour From 12:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Intersection | 05:00 PM | | | | | | | | | | | | | | | | | | | | |
| Volume | 10 | 8 | 5 | 0 | 23 | 9 | 142 | 9 | 1 | 161 | 6 | 7 | 8 | 0 | 21 | 13 | 229 | 32 | 0 | 274 | 479 |
| Percent | 43.5 | 34.8 | 21.7 | 0.0 | | 5.6 | 88.2 | 5.6 | 0.6 | | 28.6 | 33.3 | 38.1 | 0.0 | | 4.7 | 83.6 | 11.7 | 0.0 | | |
| 05:45 Volume | 2 | 1 | 1 | 0 | 4 | 2 | 34 | 0 | 1 | 37 | 4 | 2 | 1 | 0 | 7 | 5 | 66 | 11 | 0 | 82 | 130 |
| Peak Factor | | | | | | | | | | | | | | | | | | | | | 0.921 |
| High Int. | 05:30 PM | | | | | 05:30 PM | | | | | 05:45 PM | | | | | 05:45 PM | | | | | |
| Volume | 5 | 2 | 1 | 0 | 8 | 3 | 46 | 1 | 0 | 50 | 4 | 2 | 1 | 0 | 7 | 5 | 66 | 11 | 0 | 82 | |
| Peak Factor | | | | | 0.719 | | | | | 0.805 | | | | | 0.750 | | | | | 0.835 | |



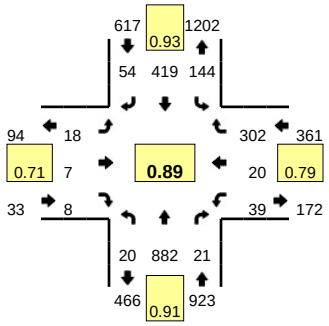
Type of peak hour being reported: Intersection Peak

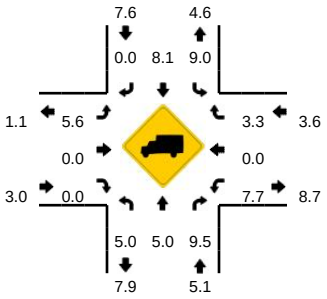
Method for determining peak hour: Total Entering Volume

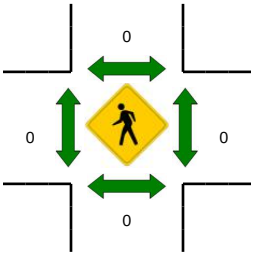
**LOCATION:** Charlotte Hwy -- Jim Wilson Rd
**CITY/STATE:** Fort Mill, SC

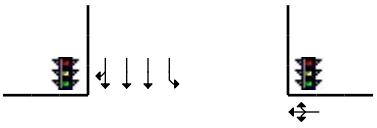
**QC JOB #:** 11594501
**DATE:** Tue, Dec 17 2013

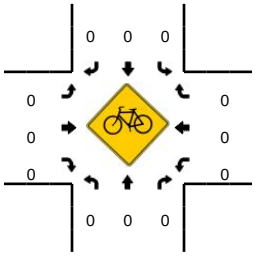
**Peak-Hour: 7:15 AM -- 8:15 AM**
**Peak 15-Min: 7:45 AM -- 8:00 AM**

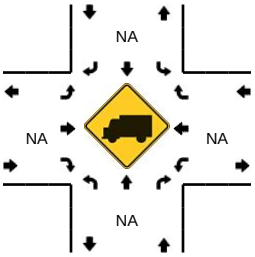


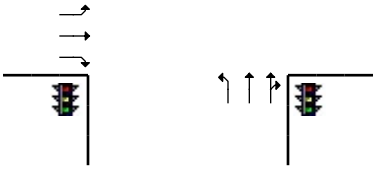



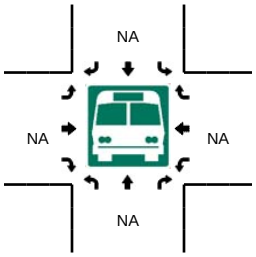








| 15-Min Count Period Beginning At | Charlotte Hwy (Northbound) | | | | Charlotte Hwy (Southbound) | | | | Jim Wilson Rd (Eastbound) | | | | Jim Wilson Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 1 | 171 | 3 | 0 | 35 | 100 | 8 | 0 | 0 | 0 | 2 | 0 | 8 | 3 | 73 | 0 | 404 | |
| 7:15 AM | 1 | 225 | 5 | 0 | 34 | 108 | 11 | 0 | 3 | 0 | 0 | 0 | 11 | 1 | 74 | 0 | 473 | |
| 7:30 AM | 4 | 218 | 4 | 0 | 33 | 98 | 10 | 0 | 6 | 2 | 2 | 0 | 6 | 6 | 61 | 0 | 450 | |
| 7:45 AM | 5 | 240 | 8 | 0 | 33 | 112 | 20 | 0 | 7 | 3 | 3 | 0 | 13 | 8 | 93 | 0 | 545 | 1872 |
| 8:00 AM | 10 | 199 | 4 | 0 | 44 | 101 | 13 | 0 | 2 | 2 | 3 | 0 | 9 | 5 | 74 | 0 | 466 | 1934 |
| 8:15 AM | 7 | 164 | 2 | 0 | 33 | 91 | 12 | 0 | 14 | 3 | 4 | 0 | 7 | 2 | 61 | 0 | 400 | 1861 |
| 8:30 AM | 8 | 181 | 5 | 0 | 32 | 72 | 10 | 0 | 5 | 1 | 6 | 0 | 8 | 6 | 53 | 0 | 387 | 1798 |
| 8:45 AM | 8 | 158 | 4 | 1 | 38 | 86 | 9 | 1 | 12 | 2 | 6 | 0 | 5 | 2 | 44 | 0 | 376 | 1629 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 20 | 960 | 32 | 0 | 132 | 448 | 80 | 0 | 28 | 12 | 12 | 0 | 52 | 32 | 372 | 0 | 2180 |
| Heavy Trucks | 0 | 48 | 4 | | 16 | 28 | 0 | | 4 | 0 | 0 | | 0 | 0 | 8 | | 108 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 12/19/2013 6:21 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

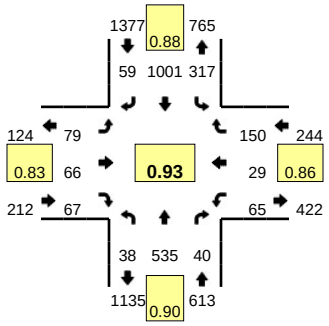
Type of peak hour being reported: Intersection Peak

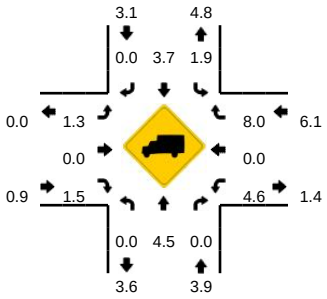
Method for determining peak hour: Total Entering Volume

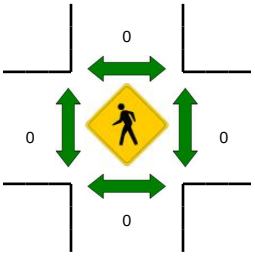
**LOCATION:** Charlotte Hwy -- Jim Wilson Rd
**CITY/STATE:** Fort Mill, SC

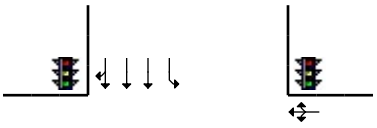
**QC JOB #:** 11594502
**DATE:** Tue, Dec 17 2013

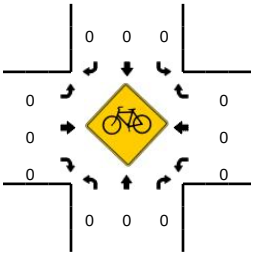
**Peak-Hour: 4:45 PM -- 5:45 PM**
**Peak 15-Min: 5:15 PM -- 5:30 PM**

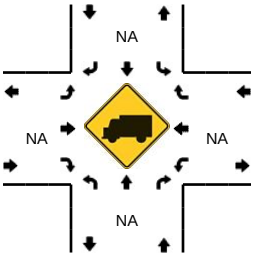


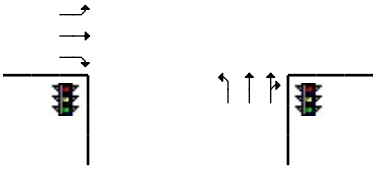



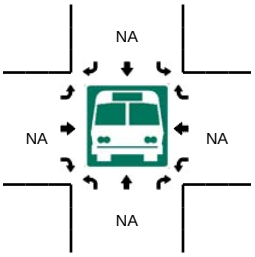








| 15-Min Count Period Beginning At | Charlotte Hwy (Northbound) | | | | Charlotte Hwy (Southbound) | | | | Jim Wilson Rd (Eastbound) | | | | Jim Wilson Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 11 | 154 | 8 | 0 | 64 | 200 | 19 | 0 | 34 | 14 | 16 | 0 | 11 | 2 | 42 | 0 | 575 | |
| 4:15 PM | 9 | 131 | 7 | 0 | 61 | 194 | 17 | 0 | 24 | 11 | 11 | 0 | 14 | 13 | 46 | 0 | 538 | |
| 4:30 PM | 9 | 132 | 11 | 0 | 55 | 184 | 12 | 1 | 23 | 11 | 13 | 0 | 14 | 8 | 30 | 0 | 503 | |
| 4:45 PM | 12 | 134 | 7 | 0 | 71 | 261 | 16 | 1 | 29 | 14 | 13 | 0 | 20 | 4 | 39 | 0 | 621 | 2237 |
| 5:00 PM | 13 | 117 | 6 | 1 | 67 | 207 | 12 | 0 | 19 | 22 | 19 | 0 | 16 | 8 | 38 | 0 | 545 | 2207 |
| 5:15 PM | 4 | 141 | 10 | 0 | 100 | 279 | 12 | 0 | 17 | 15 | 17 | 0 | 15 | 10 | 39 | 0 | 659 | 2328 |
| 5:30 PM | 7 | 143 | 17 | 1 | 78 | 254 | 19 | 0 | 14 | 15 | 18 | 0 | 14 | 7 | 34 | 0 | 621 | 2446 |
| 5:45 PM | 13 | 117 | 7 | 0 | 74 | 213 | 18 | 0 | 16 | 18 | 17 | 0 | 9 | 9 | 50 | 0 | 561 | 2386 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 16 | 564 | 40 | 0 | 400 | 1116 | 48 | 0 | 68 | 60 | 68 | 0 | 60 | 40 | 156 | 0 | 2636 |
| Heavy Trucks | 0 | 20 | 0 | | 4 | 28 | 0 | | 4 | 0 | 4 | | 0 | 0 | 16 | | 76 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

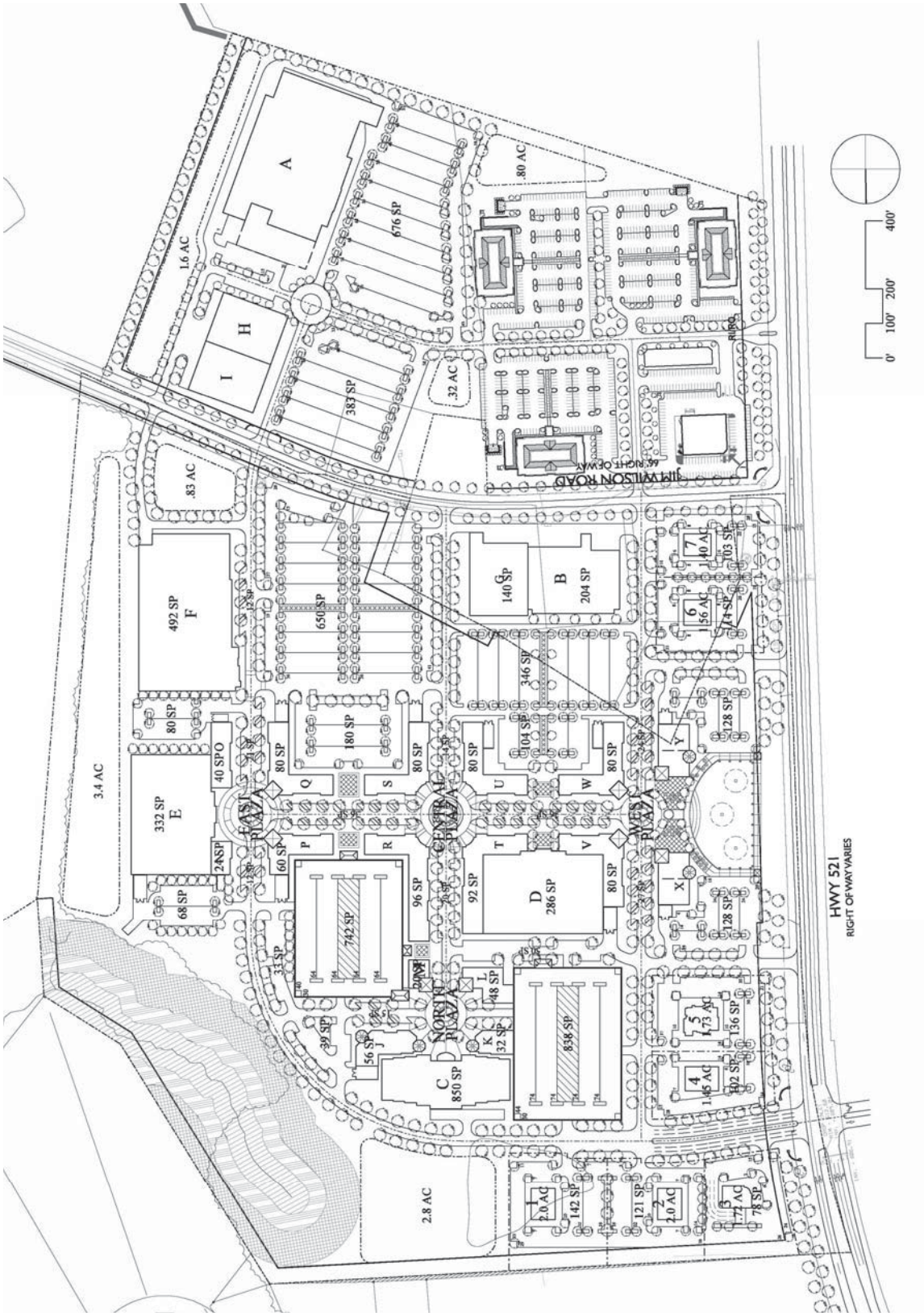
Report generated on 12/19/2013 6:21 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

# APPENDIX C

## ADJACENT DEVELOPMENT INFORMATION

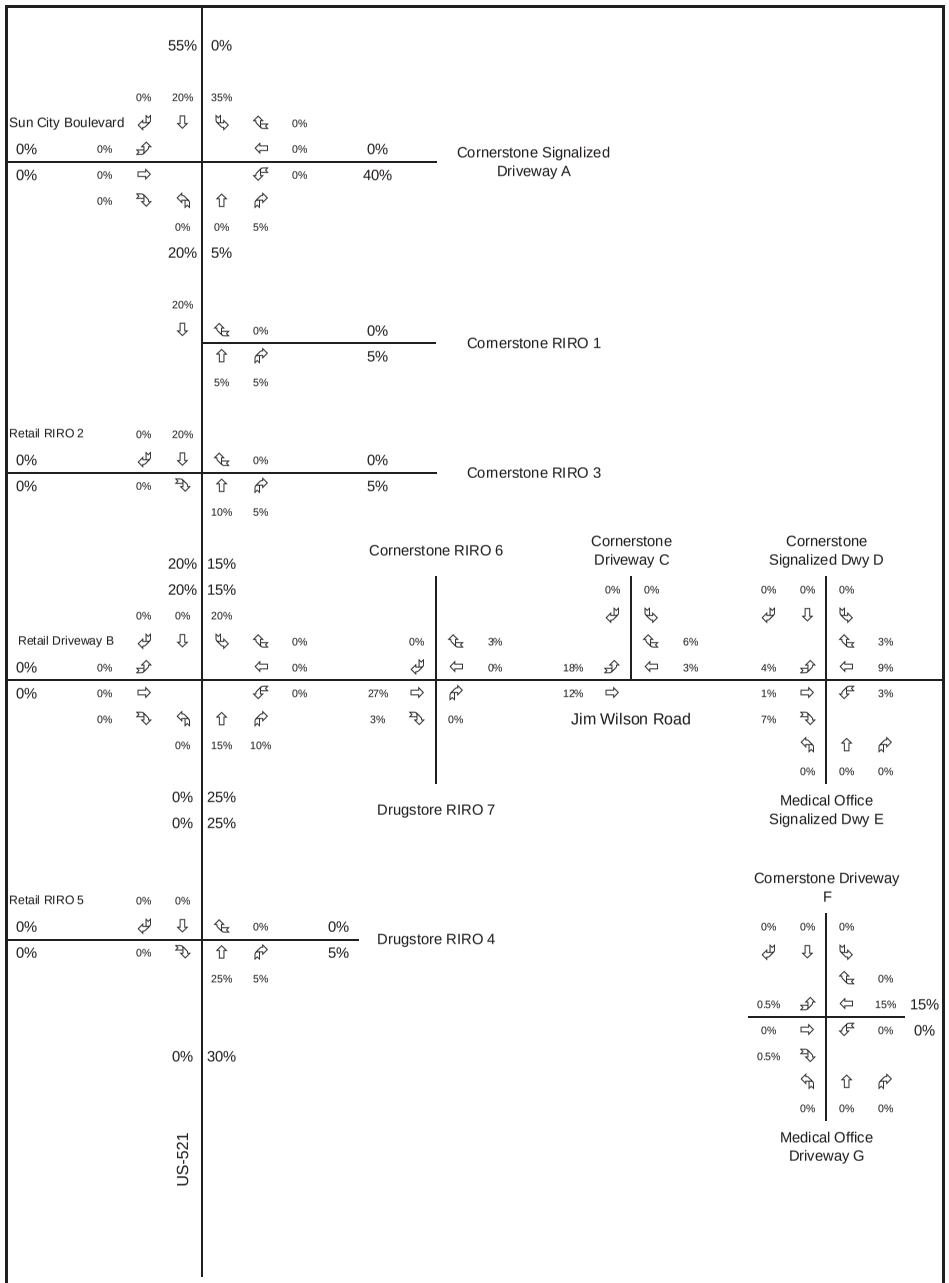
**Figure 1 – Illustrative Cornerstone Retail Development Site Plan**



## TABLE 3: Trip Generation for US 521 Commercial and Office Site Development

| Comments | ITE Code | Variable | Unit | (X) | ADT | Total AM | Total PM | AM Peak | | PM Peak | | AM Peak | | | PM Peak | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Entry | Exit | Entry | Exit | Enter | Exit | Total | Enter | Exit | Total |
| **Proposed Commercial and Office** | | | | | | | | | | | | | | | | | |
| Grocery Store | 850 | gross sq.ft. | 51,000 | 51.0 | 4,806 | 193 | 548 | 61% | 39% | 51% | 49% | 118 | 75 | 193 | 279 | 268 | 548 |
| Restaurant | 932 | gross sq.ft. | 14,000 | 14.0 | 1,780 | 81 | 153 | 52% | 48% | 61% | 39% | 42 | 39 | 81 | 93 | 60 | 153 |
| Movie Theatre | 445 | gross sq.ft. | 49,000 | 16.0 | 4,680 | 0 | 368 | - | - | 60% | 40% | 0 | 0 | 0 | 221 | 147 | 368 |
| Medical Office | 710 | gross sq.ft. | 120,000 | 120.0 | 1,535 | 217 | 213 | 88% | 12% | 17% | 83% | 191 | 26 | 217 | 36 | 177 | 213 |
| Drug Store | 881 | gross sq.ft. | 15,000 | 15.0 | 1,322 | 40 | 129 | 57% | 43% | 49% | 51% | 23 | 17 | 40 | 63 | 66 | 129 |
| Home Improvement | 862 | gross sq.ft. | 125,000 | 125.0 | 3,751 | 150 | 306 | 54% | 46% | 47% | 53% | 81 | 69 | 150 | 144 | 162 | 306 |
| Retial | 814 | gross sq.ft. | 603,000 | 603.0 | 25,834 | 0 | 1,469 | 0% | 0% | 53% | 47% | 0 | 0 | 0 | 778 | 690 | 1469 |
| Internal Capture | 15% | | | | -6,556 | -102 | -478 | | | | | -68 | -34 | -102 | -242 | -236 | -478 |
| ***Sub Totals*** | | | ***977,000*** | | ***37,152*** | ***579*** | ***2,709*** | | | | | ***386*** | ***192*** | ***579*** | ***1,373*** | ***1,335*** | ***2,709*** |
| Pass-By | 27% | gsf all all retial | | | -9,286 | 0 | -627 | | | | | 0 | 0 | 0 | -324 | -303 | -627 |
| **Total New Trips** | | **gsf** | **977,000** | | **27,867** | **579** | **2,081** | | | | | **386** | **192** | **579** | **1,049** | **1,033** | **2,081** |
| **Background Approved: "Sun City Carolina Lakes" retial development west of US 521 at Jim Wilson Road [1]** | | | | | | | | | | | | | | | | | |
| Single Family Homes | 210 | units | | | 11,389 | 610 | 649 | | | | | 232 | 378 | 610 | 396 | 253 | 649 |
| Retail | | gross sq.ft. | | | 12,320 | 271 | 1,146 | | | | | 165 | 106 | 271 | 550 | 596 | 1146 |
| Golf Course | | 18 holes | | | 643 | 40 | 50 | | | | | 32 | 8 | 40 | 22 | 28 | 50 |
| Internal Capture | 10% | | | | -2,464 | -30 | -244 | | | | | -15 | -15 | -30 | -122 | -122 | -244 |
| ***Sub Totals*** | | | ***0*** | | ***21,888*** | ***891*** | ***1,601*** | | | | | ***414*** | ***477*** | ***891*** | ***846*** | ***755*** | ***1,601*** |
| Pass-By Trips | 20% | gsf all all retial | | | -2,218 | 0 | 0 | | | | | 0 | 0 | 0 | -103 | -103 | -206 |
| **Total New Trips** | | **gsf** | **0** | | **19,670** | **891** | **1,601** | | | | | **414** | **477** | **891** | **743** | **652** | **1,395** |
| **Background Approved: "Belair at Carolina Lakes" single-family and townhomes reisdential site on Jim Wilson Road** | | | | | | | | | | | | | | | | | |
| Bel-Air Residential (SF) | 210 | dwelling units | 713 | 713 | 6,335 | 509 | 628 | 25% | 75% | 63% | 37% | 127 | 381 | 509 | 396 | 232 | 628 |
| Bel-Air Residential (TH) | 230 | dwelling units | 150 | 300 | 1,633 | 124 | 148 | 17% | 83% | 67% | 33% | 21 | 103 | 124 | 99 | 49 | 148 |
| **Total New Trips** | | | | | **7,969** | **633** | **776** | | | | | **148** | **485** | **633** | **495** | **281** | **776** |
| **Total New Area Trips (2011)** | | | | | **55,505** | **2,103** | **4,458** | **0** | **0** | **0** | **0** | **949** | **1,154** | **2,103** | **2,287** | **1,966** | **4,252** |

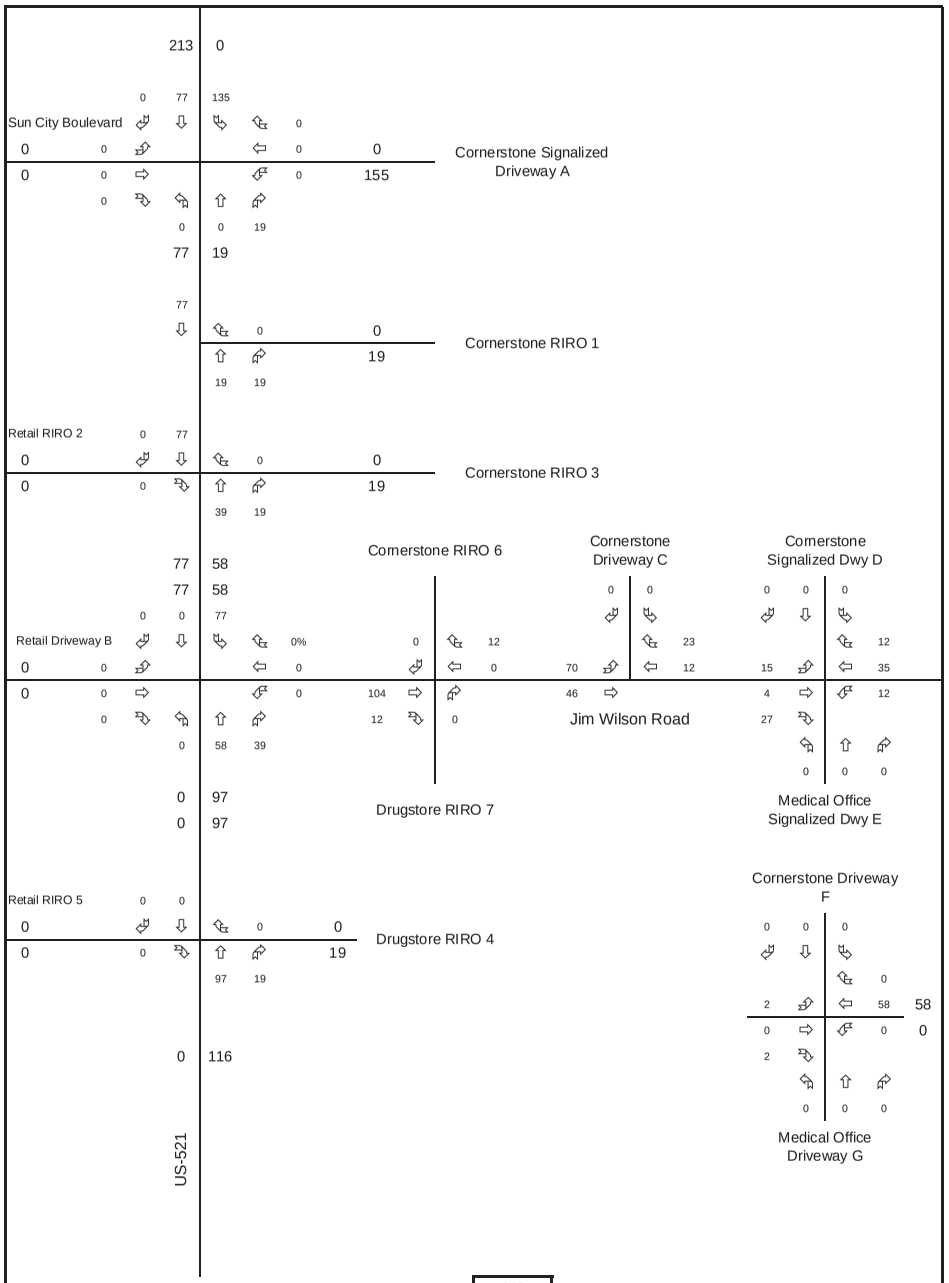
[1] Taken from Kublins 2004 Traffic Impact Study for Sun City Residential and Retial Site




Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Entering AM Peak Site Traffic (Percentages)

**FIGURE 3a**

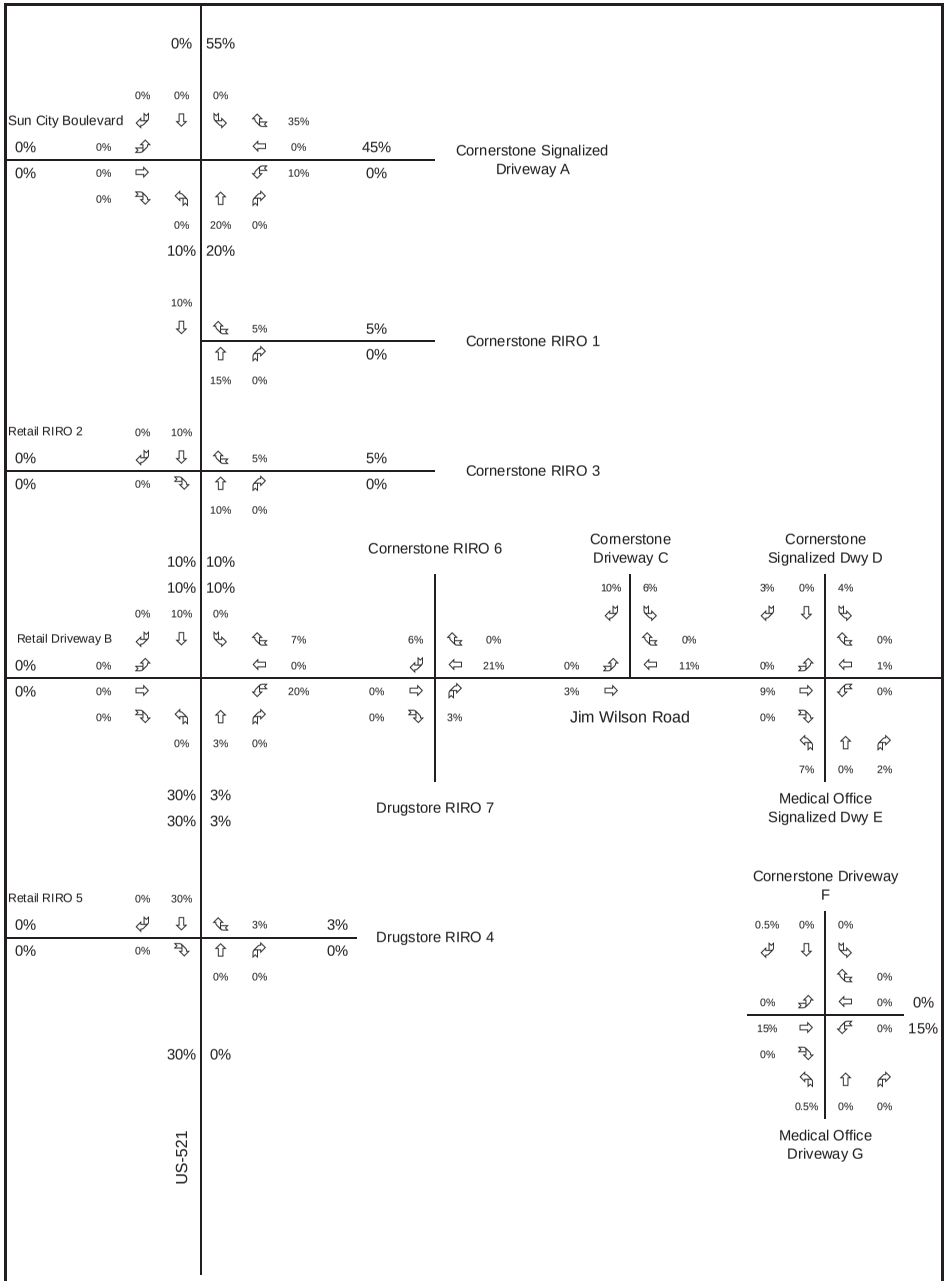



**386** = TOTAL AM PEAK ENTERING TRIPS

Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Entering AM Peak Site Trips (Volumes)

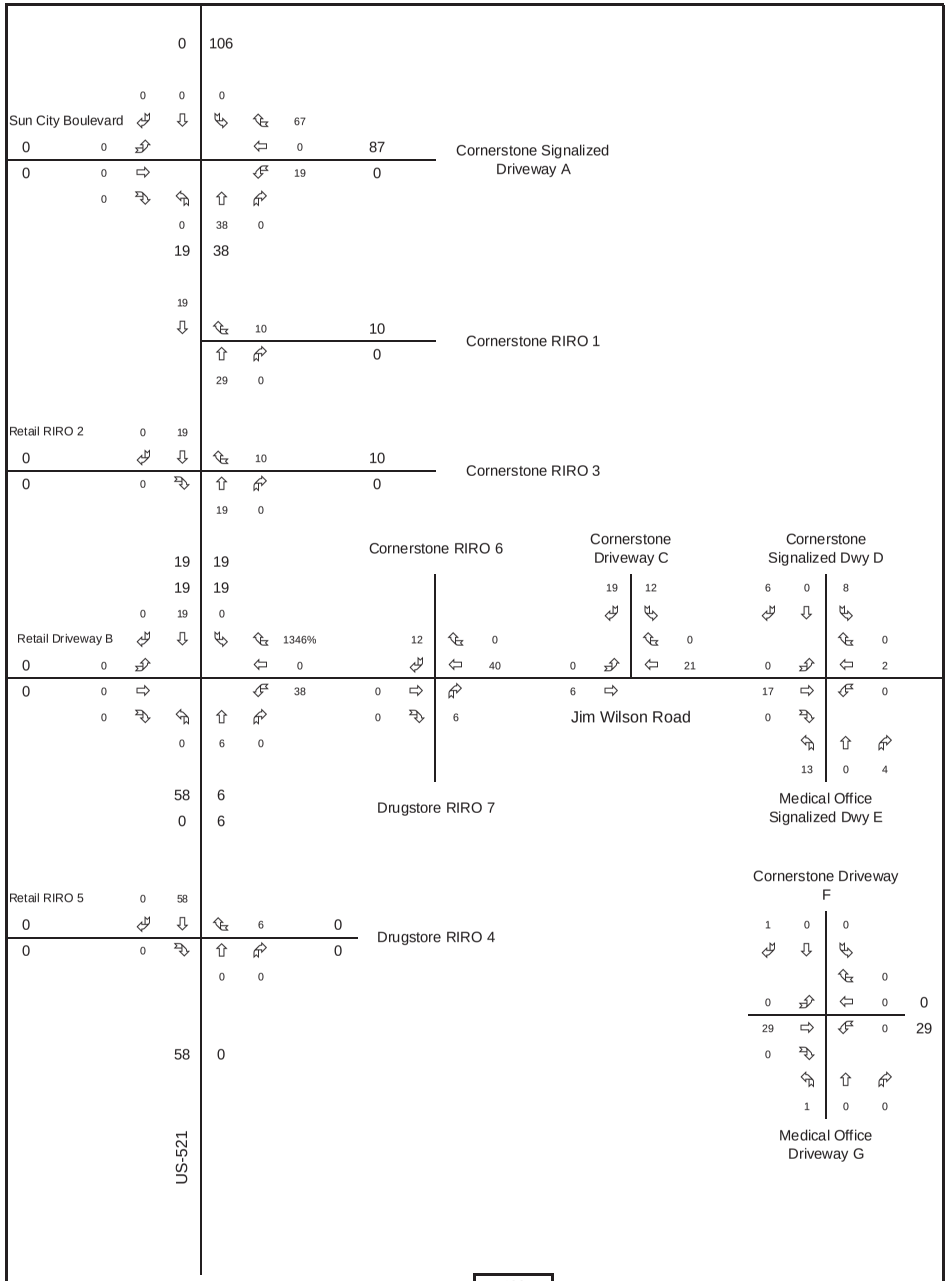
**FIGURE 3b**




Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Exiting AM Peak Site Trips (Percentages)

**FIGURE 3c**

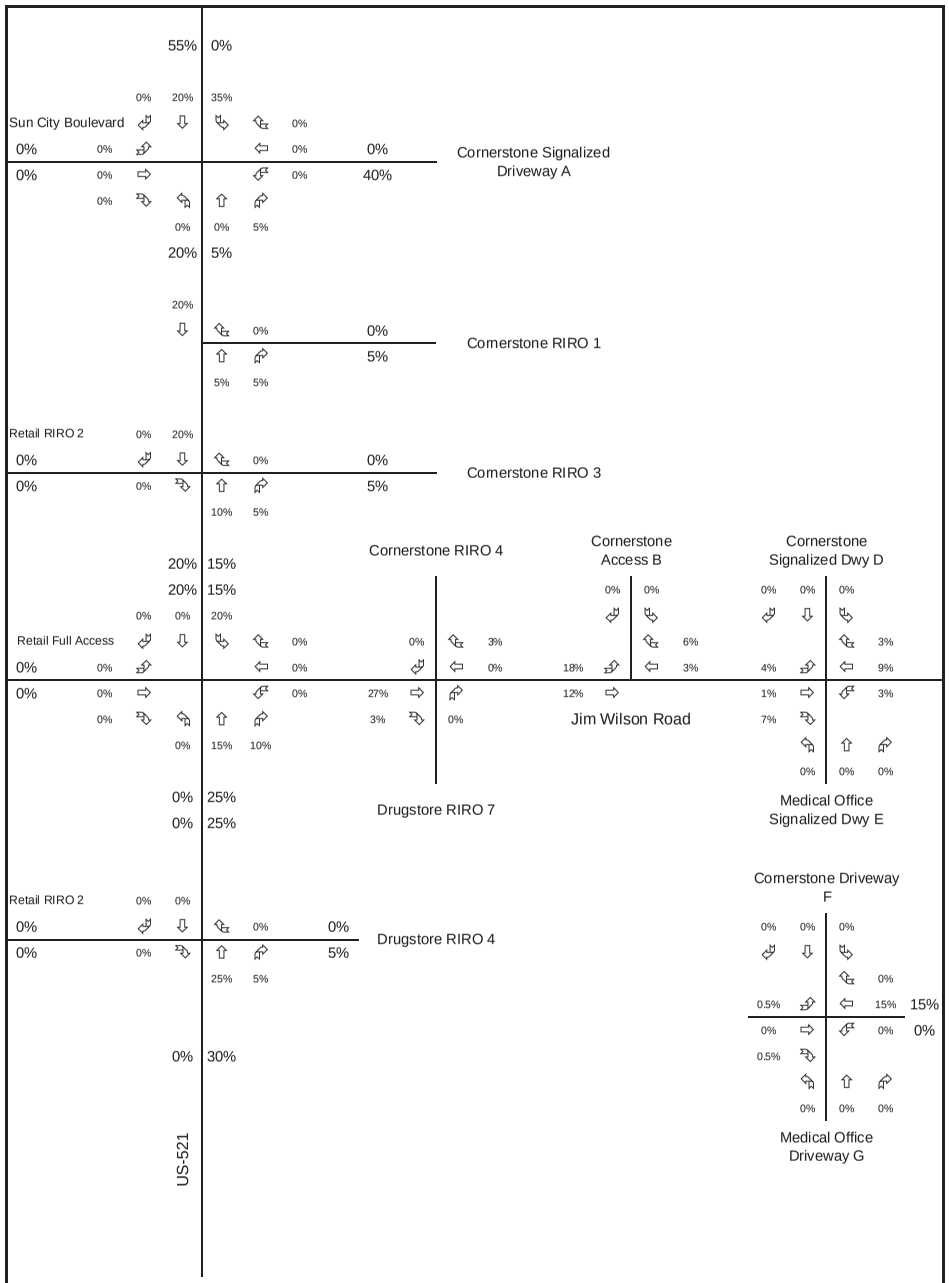



192 = TOTAL AM PEAK EXITING TRIPS

Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Exiting AM Peak Site Trips (Volumes)

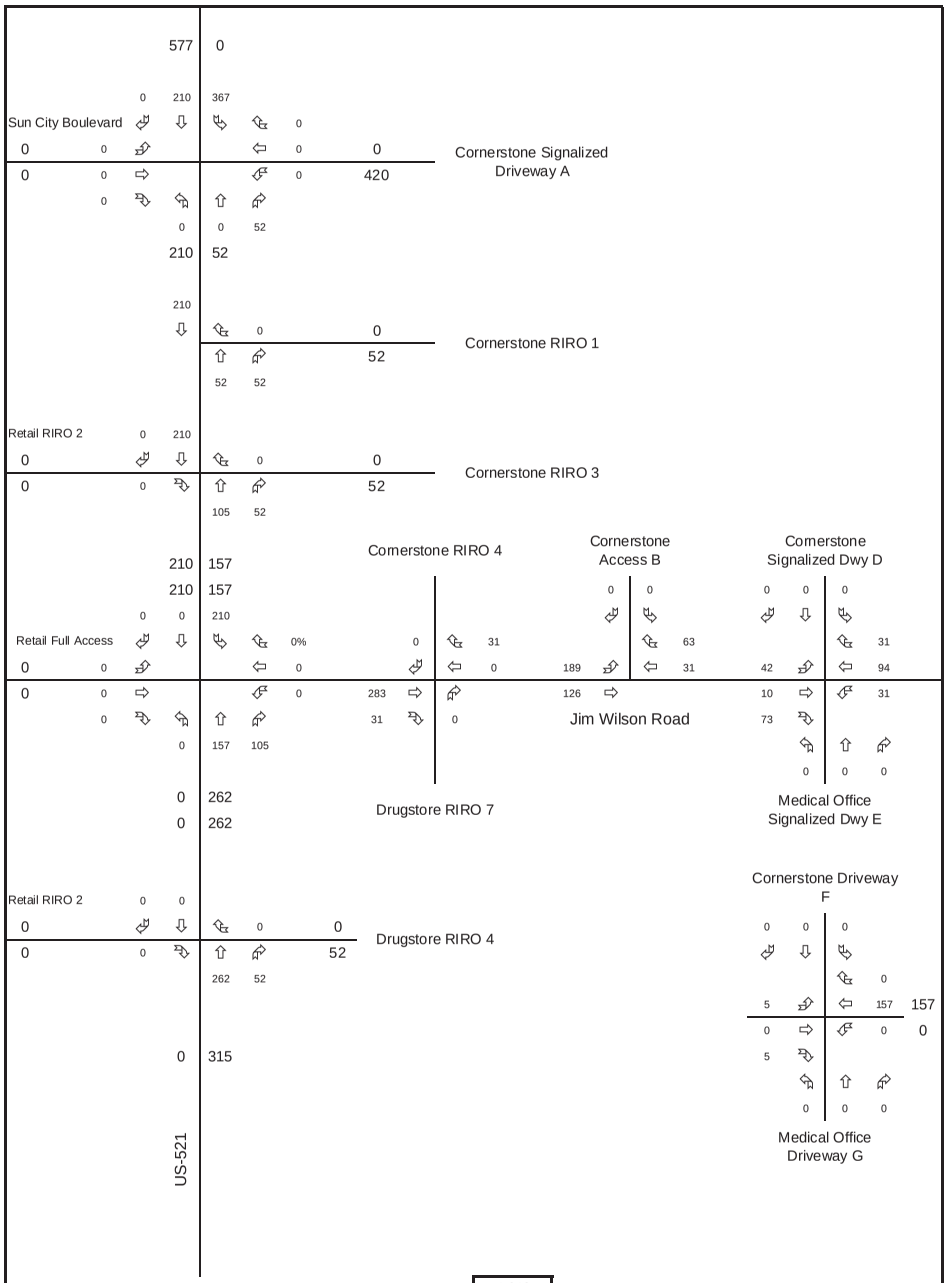
**FIGURE 3d**




Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Entering PM Peak Site Traffic (Percentages)

**FIGURE 4a**

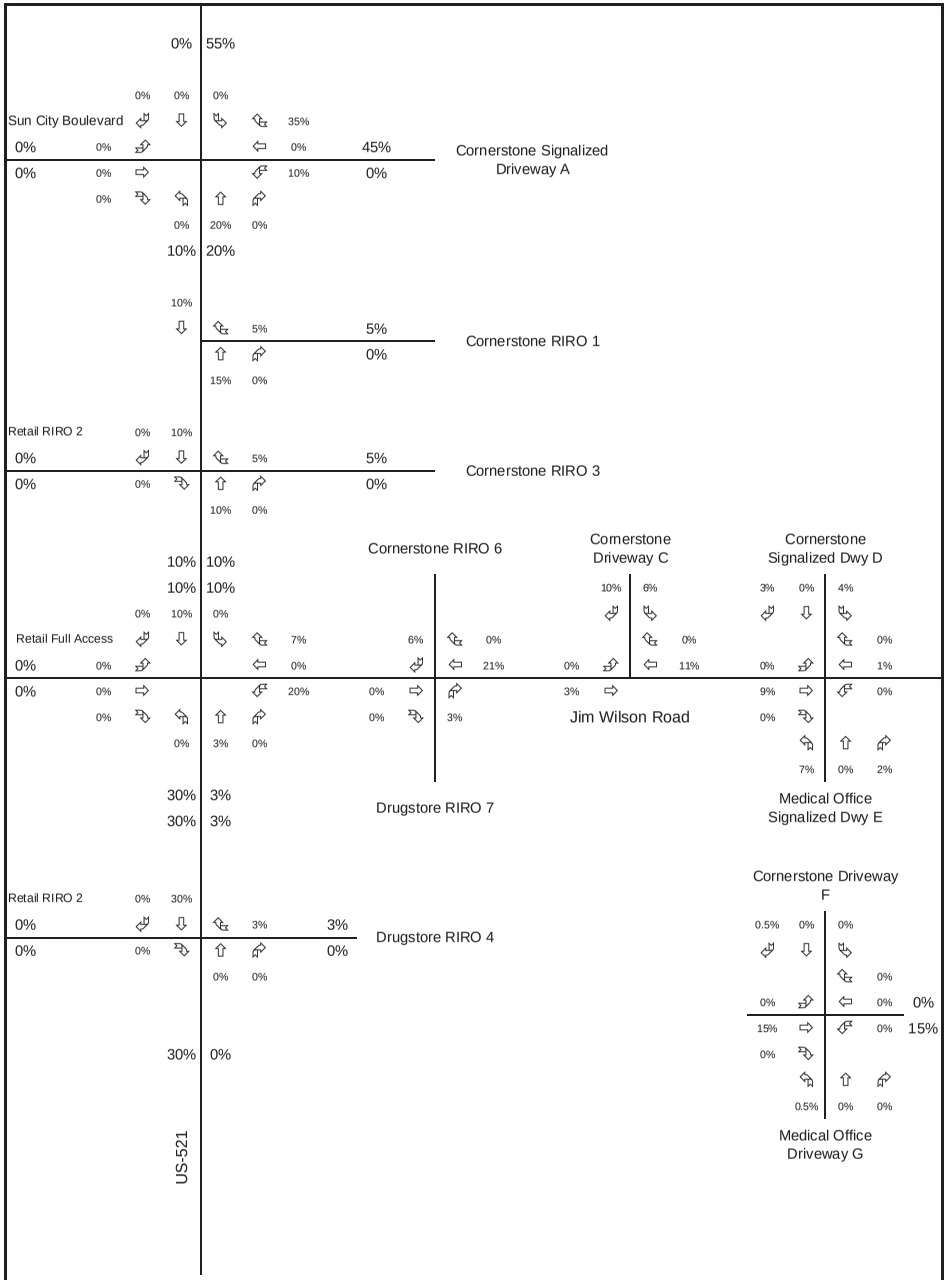



**1,049** = TOTAL PM PEAK ENTERING TRIPS

Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Entering PM Peak Site Trips (Volumes)

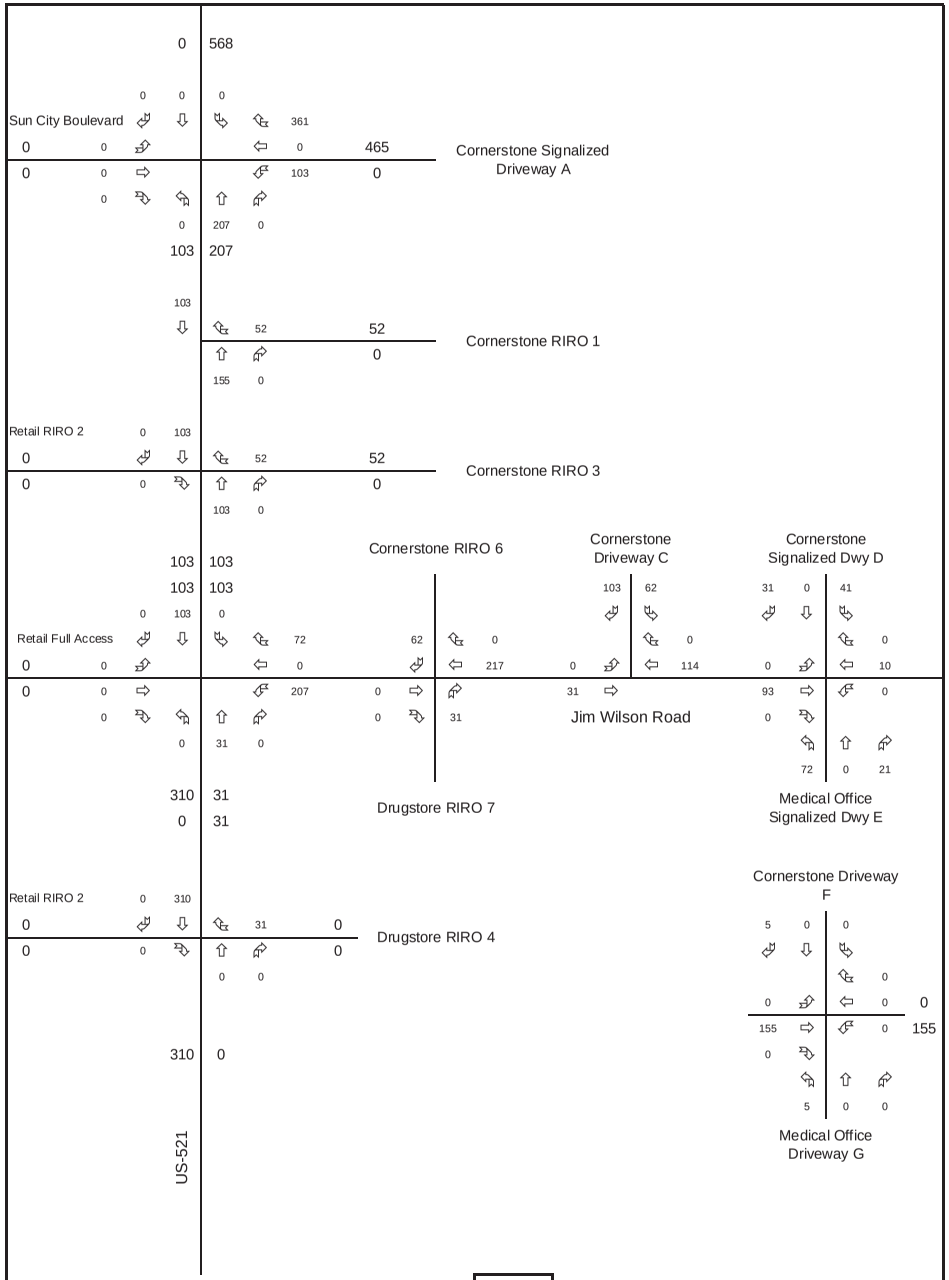
**FIGURE 4b**




Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Exiting PM Peak Site Trips (Percentages)

**FIGURE 4c**



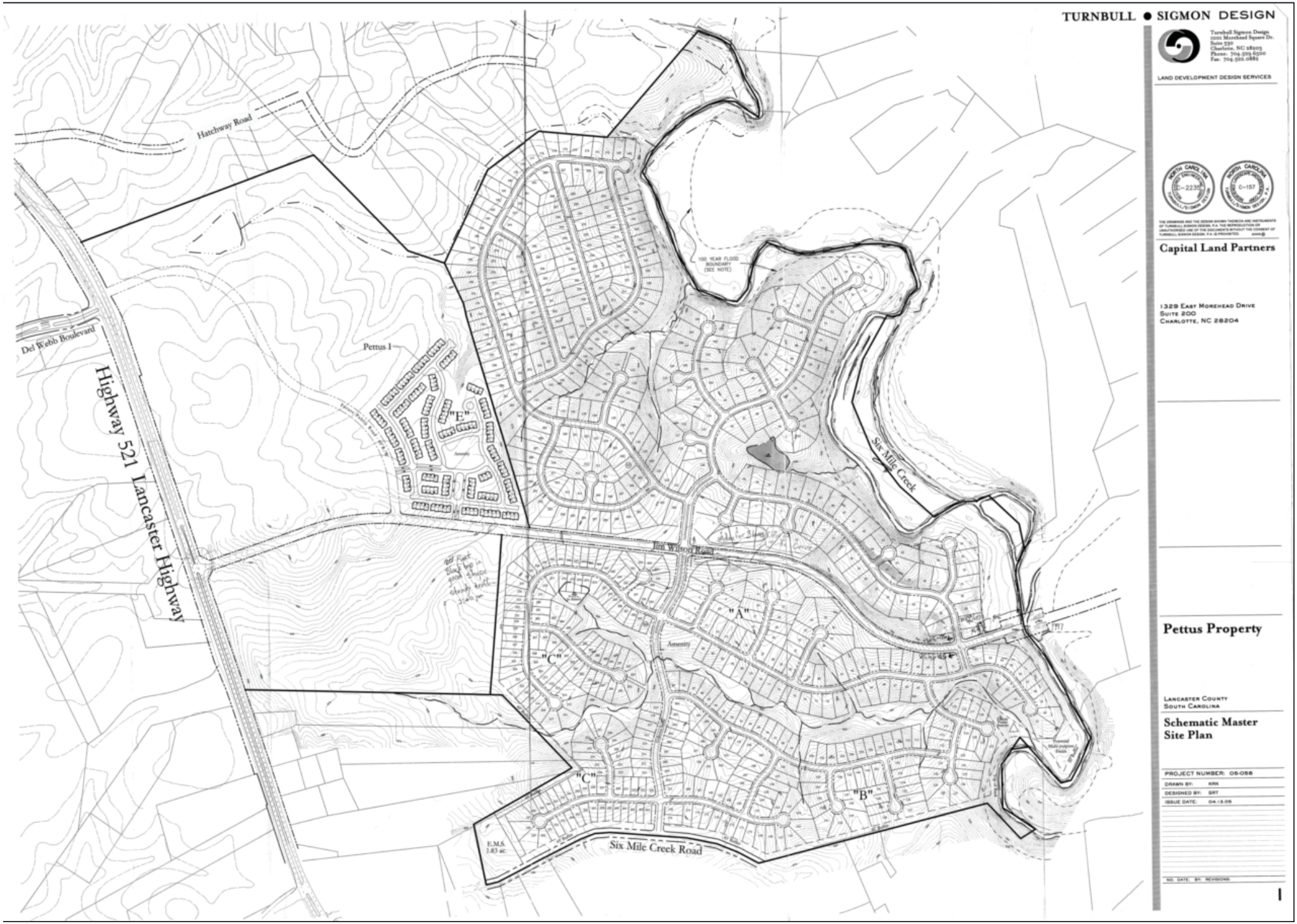

**1,033** = TOTAL PM PEAK EXITING TRIPS

Prepared by:
PARSONS BRINCKERHOFF
121 W Trade Street, Suite 1950
Charlotte NC 28202

**US 521 Wallace Property TIA**
Exiting PM Peak Site Trips (Volumes)

**FIGURE 4d**

# CAROLINA RESERVE (NORTH OF JIM WILSON ROAD)



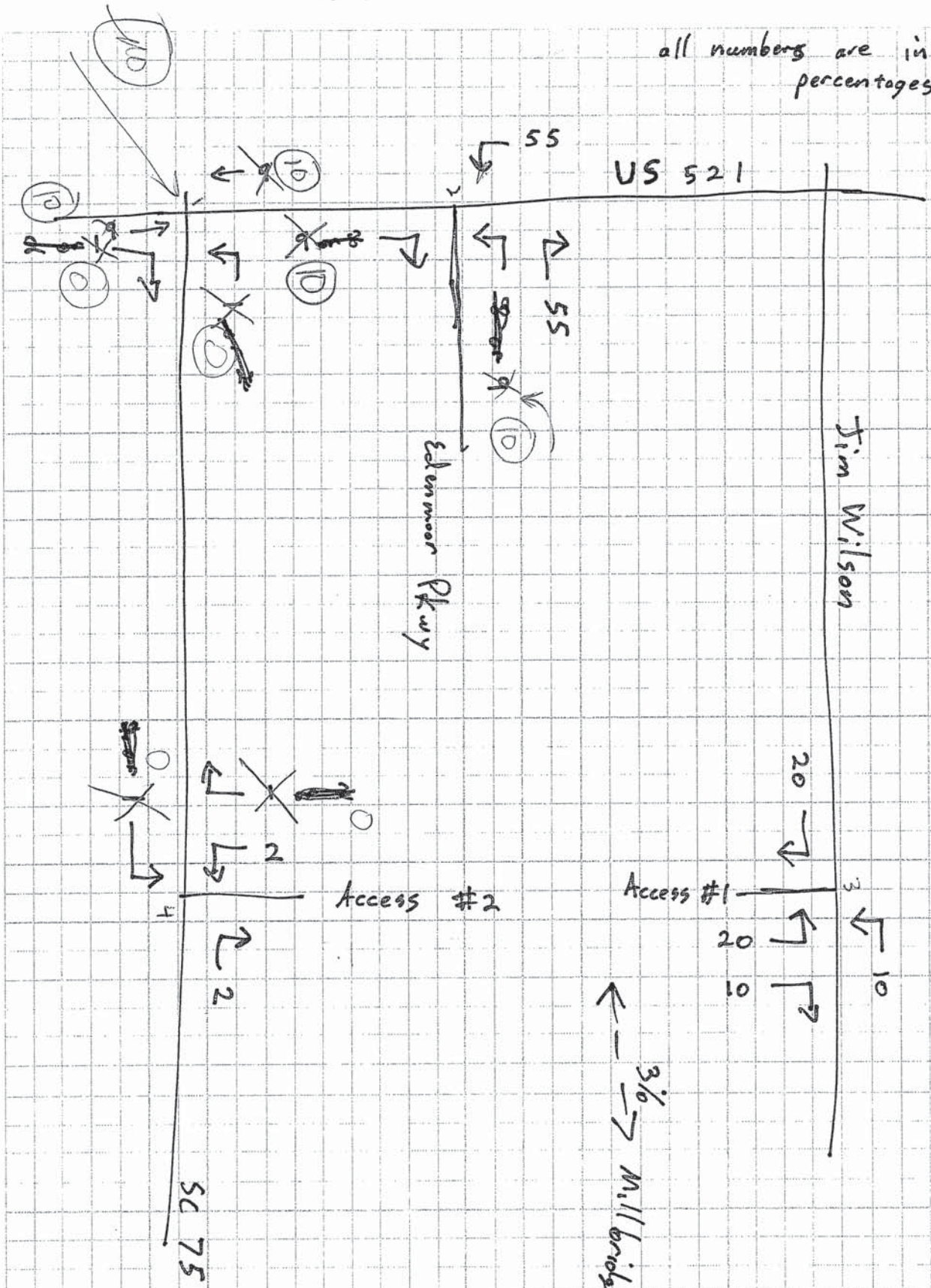
| Table 1 - Trip Generation (Edenmoor) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Land Use | Intensity | Daily | AM Peak Hour | | | PM Peak Hour | | |
| | | | Total | In | Out | Total | In | Out |
| | | | | | | | | |
| Single Family | 1,962 DU | 16,078 | 1,383 | 346 | 1,037 | 1,562 | 984 | 578 |
| Soccer Complex | 13 Fields | 927 | 18 | 9 | 9 | 269 | 186 | 83 |
| Shopping Center | 90,000 SF | 6,342 | 147 | 90 | 57 | 584 | 280 | 304 |
| **Subtotal** | | **23,347** | **1,548** | **445** | **1,103** | **2,415** | **1,450** | **965** |
| | | | | | | | | |
| **Internal Capture Reductions** | | | | | | | | |
| Residential | 1,962 DU | -866 | 0 | 0 | 0 | -128 | -56 | -72 |
| Soccer Complex (25% internal capture assumed) | 13 Fields | -232 | 0 | 0 | 0 | -67 | -47 | -20 |
| Retail | 90,000 SF | -634 | 0 | 0 | 0 | -61 | -25 | -36 |
| | | | | | | | | |
| **Internal Capture Totals** | | **-1,732** | **0** | **0** | **0** | **-256** | **-128** | **-128** |
| | | | | | | | | |
| **Pass-By (34%)** | | **0** | **0** | **0** | **0** | **-178** | **-87** | **-91** |
| | | | | | | | | |
| **Net New External Trips** | | **21,615** | **1,548** | **445** | **1,103** | **1,981** | **1,235** | **746** |

Kimley-Horn and Associates, Inc.

Job Edenmoor Subject Assignment % Sheet No. 1 of ____ Job No. 018235001

Designed by ____ Date ____ Checked by ____ Date ____

all numbers are in percentages



**Proposed Site Trip Generation**

| Land Use (ITE Code used) | Size | Units | Weekday | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Daily | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| Single-Family Detached Housing (210) | 271 | DU | 1,314 | 1,314 | 2,628 | 50 | 150 | 199 | 162 | 95 | 258 |

(1) Based on ITE Trip Generation - 9th Edition

**Cornerstone Retail Development**
**Adjusted Trip Generation**

| Land Use (ITE Code used) | Size | Units | Weekday | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Daily | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| Supermarket (850) | 51,000 | SF | 2,403 | 2,403 | 4,806 | 118 | 75 | 193 | 279 | 268 | 547 |
| High-Turnover (Sit-Down) Restaurant (932) | 14,000 | SF | 890 | 890 | 1,780 | 42 | 39 | 81 | 93 | 60 | 153 |
| Multiplex Movie Theatre (445) | 49,000 | SF | 2,340 | 2,340 | 4,680 | 0 | 0 | 0 | 221 | 147 | 368 |
| General Office Building (710) | 78,000 | SF | 544 | 544 | 1,088 | 138 | 19 | 157 | 28 | 138 | 166 |
| Home Improvement Superstore (862) | 125,000 | SF | 1,876 | 1,876 | 3,752 | 81 | 69 | 150 | 144 | 162 | 306 |
| Variety Store (814) | 603,000 | SF | 12,917 | 12,917 | 25,834 | 0 | 0 | 0 | 778 | 690 | 1,468 |
| Internal Capture (15%) | | | | | | -57 | -30 | -87 | -231 | -220 | -451 |
| Subtotal | | | | | | 322 | 172 | 494 | 1,312 | 1,245 | 2,557 |
| Pass-by (27%) | | | | | | 0 | 0 | 0 | -354 | -336 | -690 |
| **Total New Trips** | | | | | | **322** | **172** | **494** | **957** | **909** | **1,866** |

**Walnut Creek (Edenmoor) Development**
**Adjusted Trip Generation**

| Land Use (ITE Code used) | Size | Units | Weekday | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Daily | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| Single-Family Detached Housing (210) | 1,784 | DU | 7,439 | 7,439 | 14,879 | 315 | 944 | 1,259 | 885 | 520 | 1,405 |
| Soccer Complex (902) | 13 | Fields | 464 | 464 | 928 | 9 | 9 | 18 | 186 | 83 | 269 |
| Shopping Center (820) | 90,000 | SF | 3,171 | 3,171 | 6,342 | 90 | 57 | 147 | 280 | 304 | 584 |
| **Internal Capture Reductions** | | | | | | | | | | | |
| Single-Family Detached Housing (210) | | | | | | 0 | 0 | 0 | -57 | -72 | -129 |
| Soccer Complex (902) | | | | | | 0 | 0 | 0 | -47 | -21 | -68 |
| Shopping Center (820) | | | | | | 0 | 0 | 0 | -25 | -36 | -61 |
| Total Internal Capture | | | | | | 0 | 0 | 0 | -129 | -129 | -258 |
| Subtotal | | | | | | 414 | 1,010 | 1,424 | 1,222 | 778 | 2,000 |
| Pass-by | | | | | | 0 | 0 | 0 | -178 | -87 | -91 |
| **Total New Trips** | | | | | | **414** | **1,010** | **1,424** | **1,044** | **691** | **1,909** |

**Carolina Reserve**
**Adjusted Trip Generation**

| Land Use (ITE Code used) | Size | Units | Weekday | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Daily | | | AM Peak Hour | | | PM Peak Hour | | |
| | | | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| Single-Family Detached Housing (210) | 225 | DU | 1,107 | 1,107 | 2,215 | 42 | 125 | 167 | 137 | 81 | 218 |
| Residential Condominium/Townhouse (230) | 163 | DU | 492 | 492 | 984 | 13 | 63 | 76 | 60 | 30 | 90 |
| **Total New Trips** | | | | | | 55 | 189 | 244 | 197 | 110 | 308 |

# APPENDIX D

## JIM WILSON ROAD AND HENRY HARRIS ROAD

## SYNCHRO AND SIMTRAFFIC REPORTS

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 7 | 101 | 5 | 10 | 209 | 10 | 7 | 4 | 6 | 7 | 6 | 7 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 8 | 112 | 6 | 11 | 232 | 11 | 8 | 4 | 7 | 8 | 7 | 8 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 126 | 254 | 19 | 22 |
| Volume Left (vph) | 8 | 11 | 8 | 8 |
| Volume Right (vph) | 6 | 11 | 7 | 8 |
| Hadj (s) | 0.02 | 0.02 | -0.10 | -0.11 |
| Departure Headway (s) | 4.3 | 4.1 | 4.7 | 4.6 |
| Degree Utilization, x | 0.15 | 0.29 | 0.02 | 0.03 |
| Capacity (veh/h) | 823 | 855 | 708 | 705 |
| Control Delay (s) | 8.0 | 8.9 | 7.8 | 7.8 |
| Approach Delay (s) | 8.0 | 8.9 | 7.8 | 7.8 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 8.5 | | |
| HCM Level of Service | A | | |
| Intersection Capacity Utilization | 24.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 8 | 253 | 6 | 12 | 502 | 12 | 8 | 5 | 7 | 8 | 7 | 8 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 9 | 281 | 7 | 13 | 558 | 13 | 9 | 6 | 8 | 9 | 8 | 9 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 297 | 584 | 22 | 26 |
| Volume Left (vph) | 9 | 13 | 9 | 9 |
| Volume Right (vph) | 7 | 13 | 8 | 9 |
| Hadj (s) | 0.03 | 0.02 | -0.10 | -0.11 |
| Departure Headway (s) | 4.7 | 4.4 | 5.8 | 5.8 |
| Degree Utilization, x | 0.39 | 0.71 | 0.04 | 0.04 |
| Capacity (veh/h) | 747 | 806 | 549 | 545 |
| Control Delay (s) | 10.6 | 17.6 | 9.0 | 9.0 |
| Approach Delay (s) | 10.6 | 17.6 | 9.0 | 9.0 |
| Approach LOS | B | C | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 14.9 | | |
| HCM Level of Service | B | | |
| Intersection Capacity Utilization | 42.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 8 | 253 | 6 | 12 | 502 | 12 | 8 | 5 | 7 | 8 | 7 | 8 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 9 | 281 | 7 | 13 | 558 | 13 | 9 | 6 | 8 | 9 | 8 | 9 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 571 | | | 288 | | | 899 | 900 | 284 | 901 | 897 | 564 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 571 | | | 288 | | | 899 | 900 | 284 | 901 | 897 | 564 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 99 | | | 96 | 98 | 99 | 96 | 97 | 98 |
| cM capacity (veh/h) | 1002 | | | 1274 | | | 246 | 273 | 755 | 249 | 274 | 525 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 9 | 288 | 13 | 571 | 22 | 26 |
| Volume Left | 9 | 0 | 13 | 0 | 9 | 9 |
| Volume Right | 0 | 7 | 0 | 13 | 8 | 9 |
| cSH | 1002 | 1700 | 1274 | 1700 | 333 | 315 |
| Volume to Capacity | 0.01 | 0.17 | 0.01 | 0.34 | 0.07 | 0.08 |
| Queue Length 95th (ft) | 1 | 0 | 1 | 0 | 5 | 7 |
| Control Delay (s) | 8.6 | 0.0 | 7.9 | 0.0 | 16.6 | 17.4 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.3 | | 0.2 | | 16.6 | 17.4 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 37.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 8 | 264 | 19 | 19 | 536 | 12 | 48 | 5 | 12 | 8 | 7 | 8 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 9 | 293 | 21 | 21 | 596 | 13 | 53 | 6 | 13 | 9 | 8 | 9 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 323 | 630 | 72 | 26 |
| Volume Left (vph) | 9 | 21 | 53 | 9 |
| Volume Right (vph) | 21 | 13 | 13 | 9 |
| Hadj (s) | 0.00 | 0.03 | 0.07 | -0.11 |
| Departure Headway (s) | 5.0 | 4.7 | 6.2 | 6.2 |
| Degree Utilization, x | 0.45 | 0.81 | 0.13 | 0.04 |
| Capacity (veh/h) | 694 | 764 | 530 | 518 |
| Control Delay (s) | 11.9 | 24.6 | 10.1 | 9.5 |
| Approach Delay (s) | 11.9 | 24.6 | 10.1 | 9.5 |
| Approach LOS | B | C | B | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 19.3 | | |
| HCM Level of Service | C | | |
| Intersection Capacity Utilization | 51.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 8 | 264 | 19 | 19 | 536 | 12 | 48 | 5 | 12 | 8 | 7 | 8 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 9 | 293 | 21 | 21 | 596 | 13 | 53 | 6 | 13 | 9 | 8 | 9 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 609 | | | 314 | | | 972 | 973 | 304 | 972 | 977 | 602 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 609 | | | 314 | | | 972 | 973 | 304 | 972 | 977 | 602 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 99 | | | 98 | | | 76 | 98 | 98 | 96 | 97 | 98 |
| cM capacity (veh/h) | 970 | | | 1246 | | | 218 | 246 | 736 | 219 | 244 | 499 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 9 | 314 | 21 | 609 | 72 | 26 |
| Volume Left | 9 | 0 | 21 | 0 | 53 | 9 |
| Volume Right | 0 | 21 | 0 | 13 | 13 | 9 |
| cSH | 970 | 1700 | 1246 | 1700 | 253 | 284 |
| Volume to Capacity | 0.01 | 0.18 | 0.02 | 0.36 | 0.29 | 0.09 |
| Queue Length 95th (ft) | 1 | 0 | 1 | 0 | 29 | 7 |
| Control Delay (s) | 8.7 | 0.0 | 7.9 | 0.0 | 24.8 | 19.0 |
| Lane LOS | A | | A | | C | C |
| Approach Delay (s) | 0.2 | | 0.3 | | 24.8 | 19.0 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 42.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 32 | 229 | 13 | 9 | 142 | 9 | 8 | 7 | 6 | 5 | 8 | 10 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 36 | 254 | 14 | 10 | 158 | 10 | 9 | 8 | 7 | 6 | 9 | 11 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 304 | 178 | 23 | 26 |
| Volume Left (vph) | 36 | 10 | 9 | 6 |
| Volume Right (vph) | 14 | 10 | 7 | 11 |
| Hadj (s) | 0.03 | 0.01 | -0.06 | -0.18 |
| Departure Headway (s) | 4.2 | 4.3 | 4.9 | 4.8 |
| Degree Utilization, x | 0.36 | 0.21 | 0.03 | 0.03 |
| Capacity (veh/h) | 834 | 801 | 657 | 669 |
| Control Delay (s) | 9.6 | 8.5 | 8.1 | 8.0 |
| Approach Delay (s) | 9.6 | 8.5 | 8.1 | 8.0 |
| Approach LOS | A | A | A | A |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 9.1 | | |
| HCM Level of Service | A | | |
| Intersection Capacity Utilization | 33.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 37 | 580 | 15 | 10 | 478 | 10 | 9 | 8 | 7 | 6 | 9 | 12 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 41 | 644 | 17 | 11 | 531 | 11 | 10 | 9 | 8 | 7 | 10 | 13 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 702 | 553 | 27 | 30 |
| Volume Left (vph) | 41 | 11 | 10 | 7 |
| Volume Right (vph) | 17 | 11 | 8 | 13 |
| Hadj (s) | 0.03 | 0.03 | -0.07 | -0.19 |
| Departure Headway (s) | 4.8 | 4.9 | 6.8 | 6.6 |
| Degree Utilization, x | 0.94 | 0.76 | 0.05 | 0.06 |
| Capacity (veh/h) | 739 | 712 | 500 | 504 |
| Control Delay (s) | 40.5 | 21.8 | 10.1 | 10.0 |
| Approach Delay (s) | 40.5 | 21.8 | 10.1 | 10.0 |
| Approach LOS | E | C | B | B |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 31.3 | | |
| HCM Level of Service | D | | |
| Intersection Capacity Utilization | 60.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 37 | 580 | 15 | 10 | 478 | 10 | 9 | 8 | 7 | 6 | 9 | 12 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 41 | 644 | 17 | 11 | 531 | 11 | 10 | 9 | 8 | 7 | 10 | 13 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 542 | | | 661 | | | 1307 | 1299 | 653 | 1298 | 1302 | 537 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 542 | | | 661 | | | 1307 | 1299 | 653 | 1298 | 1302 | 537 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 96 | | | 99 | | | 92 | 94 | 98 | 95 | 93 | 98 |
| cM capacity (veh/h) | 1027 | | | 927 | | | 122 | 153 | 467 | 125 | 152 | 544 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 41 | 661 | 11 | 542 | 27 | 30 |
| Volume Left | 41 | 0 | 11 | 0 | 10 | 7 |
| Volume Right | 0 | 17 | 0 | 11 | 8 | 13 |
| cSH | 1027 | 1700 | 927 | 1700 | 170 | 209 |
| Volume to Capacity | 0.04 | 0.39 | 0.01 | 0.32 | 0.16 | 0.14 |
| Queue Length 95th (ft) | 3 | 0 | 1 | 0 | 14 | 12 |
| Control Delay (s) | 8.7 | 0.0 | 8.9 | 0.0 | 30.1 | 25.1 |
| Lane LOS | A | | A | | D | D |
| Approach Delay (s) | 0.5 | | 0.2 | | 30.1 | 25.1 |
| Approach LOS | | | | | D | D |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 41.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Stop | | | Stop | | | Stop | | | Stop | |
| Volume (vph) | 37 | 617 | 59 | 17 | 500 | 10 | 35 | 8 | 15 | 6 | 9 | 12 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 41 | 686 | 66 | 19 | 556 | 11 | 39 | 9 | 17 | 7 | 10 | 13 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total (vph) | 792 | 586 | 64 | 30 |
| Volume Left (vph) | 41 | 19 | 39 | 7 |
| Volume Right (vph) | 66 | 11 | 17 | 13 |
| Hadj (s) | -0.01 | 0.03 | 0.00 | -0.19 |
| Departure Headway (s) | 5.0 | 5.1 | 6.9 | 6.9 |
| Degree Utilization, x | 1.10 | 0.84 | 0.12 | 0.06 |
| Capacity (veh/h) | 712 | 692 | 495 | 486 |
| Control Delay (s) | 85.5 | 28.5 | 10.9 | 10.3 |
| Approach Delay (s) | 85.5 | 28.5 | 10.9 | 10.3 |
| Approach LOS | F | D | B | B |

| Intersection Summary | | | |
|---|---|---|---|
| Delay | 58.1 | | |
| HCM Level of Service | F | | |
| Intersection Capacity Utilization | 66.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 37 | 617 | 59 | 17 | 500 | 10 | 35 | 8 | 15 | 6 | 9 | 12 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 41 | 686 | 66 | 19 | 556 | 11 | 39 | 9 | 17 | 7 | 10 | 13 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 567 | | | 751 | | | 1412 | 1405 | 718 | 1388 | 1432 | 561 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 567 | | | 751 | | | 1412 | 1405 | 718 | 1388 | 1432 | 561 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 96 | | | 98 | | | 61 | 93 | 96 | 94 | 92 | 97 |
| cM capacity (veh/h) | 1005 | | | 858 | | | 101 | 131 | 429 | 104 | 126 | 527 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 41 | 751 | 19 | 567 | 64 | 30 |
| Volume Left | 41 | 0 | 19 | 0 | 39 | 7 |
| Volume Right | 0 | 66 | 0 | 11 | 17 | 13 |
| cSH | 1005 | 1700 | 858 | 1700 | 131 | 178 |
| Volume to Capacity | 0.04 | 0.44 | 0.02 | 0.33 | 0.49 | 0.17 |
| Queue Length 95th (ft) | 3 | 0 | 2 | 0 | 57 | 15 |
| Control Delay (s) | 8.7 | 0.0 | 9.3 | 0.0 | 56.7 | 29.3 |
| Lane LOS | A | | A | | F | D |
| Approach Delay (s) | 0.5 | | 0.3 | | 56.7 | 29.3 |
| Approach LOS | | | | | F | D |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.4 | | |
| Intersection Capacity Utilization | 50.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 62 | 83 | 24 | 38 |
| Average Queue (ft) | 33 | 44 | 8 | 16 |
| 95th Queue (ft) | 50 | 67 | 26 | 41 |
| Link Distance (ft) | 4323 | 819 | 384 | 3180 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 73 | 107 | 24 | 39 |
| Average Queue (ft) | 50 | 71 | 11 | 14 |
| 95th Queue (ft) | 72 | 97 | 29 | 39 |
| Link Distance (ft) | 4323 | 819 | 384 | 3180 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | L | L | LTR | LTR |
| Maximum Queue (ft) | 23 | 26 | 24 | 39 |
| Average Queue (ft) | 1 | 2 | 11 | 14 |
| 95th Queue (ft) | 10 | 12 | 29 | 39 |
| Link Distance (ft) | | | 378 | 3174 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | 150 | 150 | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 98 | 142 | 31 | 31 |
| Average Queue (ft) | 52 | 74 | 21 | 14 |
| 95th Queue (ft) | 81 | 113 | 36 | 38 |
| Link Distance (ft) | 4323 | 820 | 384 | 3180 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | L | L | LTR | LTR |
| Maximum Queue (ft) | 23 | 26 | 53 | 31 |
| Average Queue (ft) | 2 | 4 | 24 | 17 |
| 95th Queue (ft) | 12 | 18 | 45 | 40 |
| Link Distance (ft) | | | 378 | 3174 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | 150 | 150 | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 89 | 71 | 24 | 31 |
| Average Queue (ft) | 49 | 39 | 12 | 17 |
| 95th Queue (ft) | 72 | 63 | 30 | 41 |
| Link Distance (ft) | 4323 | 819 | 384 | 3180 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 192 | 204 | 31 | 39 |
| Average Queue (ft) | 95 | 80 | 12 | 16 |
| 95th Queue (ft) | 155 | 143 | 31 | 42 |
| Link Distance (ft) | 4323 | 819 | 384 | 3180 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | L | L | LTR | LTR |
| Maximum Queue (ft) | 42 | 26 | 38 | 46 |
| Average Queue (ft) | 10 | 2 | 12 | 18 |
| 95th Queue (ft) | 30 | 14 | 32 | 45 |
| Link Distance (ft) | | | 378 | 3174 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | 150 | 150 | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | WB | NB | SB |
|---|---|---|---|---|
| Directions Served | LTR | LTR | LTR | LTR |
| Maximum Queue (ft) | 249 | 191 | 46 | 53 |
| Average Queue (ft) | 119 | 82 | 20 | 21 |
| 95th Queue (ft) | 211 | 139 | 37 | 47 |
| Link Distance (ft) | 4323 | 820 | 384 | 3180 |
| Upstream Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |
| Storage Bay Dist (ft) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

## Intersection: 1: Jim Wilson Road & Henry Harris Road

| Movement | EB | EB | WB | NB | SB |
|---|---|---|---|---|---|
| Directions Served | L | TR | L | LTR | LTR |
| Maximum Queue (ft) | 34 | 7 | 26 | 57 | 46 |
| Average Queue (ft) | 10 | 0 | 7 | 25 | 15 |
| 95th Queue (ft) | 30 | 4 | 25 | 47 | 40 |
| Link Distance (ft) | | 4322 | | 378 | 3174 |
| Upstream Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |
| Storage Bay Dist (ft) | 150 | | 150 | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

# APPENDIX E

## HENRY HARRIS ROAD AND 12 MILE CREEK ROAD

## SYNCHRO REPORTS

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 10 | 10 | 7 | 10 | 10 | 11 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 11 | 11 | 8 | 11 | 11 | 12 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 48 | 13 | | | 19 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 48 | 13 | | | 19 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 99 | |
| cM capacity (veh/h) | 955 | 1067 | | | 1598 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 22 | 19 | 23 |
| Volume Left | 11 | 0 | 11 |
| Volume Right | 11 | 11 | 0 |
| cSH | 1008 | 1700 | 1598 |
| Volume to Capacity | 0.02 | 0.01 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 8.7 | 0.0 | 3.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.7 | 0.0 | 3.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.2 | | |
| Intersection Capacity Utilization | 17.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 12 | 12 | 8 | 12 | 12 | 13 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 13 | 13 | 9 | 13 | 13 | 14 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 57 | 16 | | | 22 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 57 | 16 | | | 22 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 99 | |
| cM capacity (veh/h) | 943 | 1064 | | | 1593 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 27 | 22 | 28 |
| Volume Left | 13 | 0 | 13 |
| Volume Right | 13 | 13 | 0 |
| cSH | 1000 | 1700 | 1593 |
| Volume to Capacity | 0.03 | 0.01 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 8.7 | 0.0 | 3.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.7 | 0.0 | 3.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.3 | | |
| Intersection Capacity Utilization | 18.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 28 | 55 | 10 | 17 | 26 | 19 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 31 | 61 | 11 | 19 | 29 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 99 | 21 | | | 30 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 99 | 21 | | | 30 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 96 | 94 | | | 98 | |
| cM capacity (veh/h) | 883 | 1057 | | | 1583 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 92 | 30 | 50 |
| Volume Left | 31 | 0 | 29 |
| Volume Right | 61 | 19 | 0 |
| cSH | 991 | 1700 | 1583 |
| Volume to Capacity | 0.09 | 0.02 | 0.02 |
| Queue Length 95th (ft) | 8 | 0 | 1 |
| Control Delay (s) | 9.0 | 0.0 | 4.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 4.3 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.1 | | |
| Intersection Capacity Utilization | 20.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 10 | 10 | 11 | 10 | 10 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 11 | 11 | 12 | 11 | 11 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 62 | 18 | | | 23 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 62 | 18 | | | 23 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 99 | |
| cM capacity (veh/h) | 937 | 1061 | | | 1592 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 22 | 23 | 33 |
| Volume Left | 11 | 0 | 11 |
| Volume Right | 11 | 11 | 0 |
| cSH | 995 | 1700 | 1592 |
| Volume to Capacity | 0.02 | 0.01 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 8.7 | 0.0 | 2.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.7 | 0.0 | 2.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.5 | | |
| Intersection Capacity Utilization | 18.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 12 | 12 | 13 | 12 | 12 | 23 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 13 | 13 | 14 | 13 | 13 | 26 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 73 | 21 | | | 28 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 73 | 21 | | | 28 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 99 | |
| cM capacity (veh/h) | 923 | 1056 | | | 1586 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 27 | 28 | 39 |
| Volume Left | 13 | 0 | 13 |
| Volume Right | 13 | 13 | 0 |
| cSH | 985 | 1700 | 1586 |
| Volume to Capacity | 0.03 | 0.02 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 8.8 | 0.0 | 2.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.8 | 0.0 | 2.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.6 | | |
| Intersection Capacity Utilization | 18.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 22 | 40 | 19 | 30 | 59 | 27 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 24 | 44 | 21 | 33 | 66 | 30 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 199 | 38 | | | 54 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 199 | 38 | | | 54 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 97 | 96 | | | 96 | |
| cM capacity (veh/h) | 756 | 1034 | | | 1551 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 69 | 54 | 96 |
| Volume Left | 24 | 0 | 66 |
| Volume Right | 44 | 33 | 0 |
| cSH | 915 | 1700 | 1551 |
| Volume to Capacity | 0.08 | 0.03 | 0.04 |
| Queue Length 95th (ft) | 6 | 0 | 3 |
| Control Delay (s) | 9.3 | 0.0 | 5.2 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.3 | 0.0 | 5.2 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.2 | | |
| Intersection Capacity Utilization | 21.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX F

## JIM WILSON ROAD AND US 521

## SYNCHRO REPORTS

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 18 | 7 | 8 | 39 | 20 | 302 | 20 | 882 | 21 | 144 | 419 | 54 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 0 | | 0 | 200 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.91 | 0.91 |
| Frt | | | 0.850 | | 0.887 | | | 0.997 | | | 0.983 | |
| Flt Protected | 0.950 | | | | 0.995 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 0 | 1644 | 0 | 1770 | 3529 | 0 | 1770 | 4999 | 0 |
| Flt Permitted | 0.330 | | | | 0.965 | | 0.447 | | | 0.157 | | |
| Satd. Flow (perm) | 615 | 1863 | 1583 | 0 | 1594 | 0 | 833 | 3529 | 0 | 292 | 4999 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 9 | | 336 | | | 4 | | | 39 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 20 | 8 | 9 | 43 | 22 | 336 | 22 | 980 | 23 | 160 | 466 | 60 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 20 | 8 | 9 | 0 | 401 | 0 | 22 | 1003 | 0 | 160 | 526 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Perm | | | pm+pt | | | pm+pt | | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 7.0 | 12.0 | | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 15.0 | 22.0 | | 15.0 | 22.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 0.0 | 15.0 | 23.0 | 0.0 | 15.0 | 23.0 | 0.0 |
| Total Split (%) | 36.7% | 36.7% | 36.7% | 36.7% | 36.7% | 0.0% | 25.0% | 38.3% | 0.0% | 25.0% | 38.3% | 0.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | | 9.0 | 17.0 | | 9.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | 0.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 6.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | | None | None | | None | None | |
| Act Effct Green (s) | 14.0 | 14.0 | 14.0 | | 14.0 | | 23.5 | 17.5 | | 27.3 | 25.5 | |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.27 | | 0.27 | | 0.45 | 0.34 | | 0.52 | 0.49 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.12 | 0.02 | 0.02 | | 0.59 | | 0.04 | 0.84 | | 0.40 | 0.21 | |
| Control Delay | 18.4 | 15.9 | 9.8 | | 8.4 | | 6.2 | 26.3 | | 9.9 | 8.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 18.4 | 15.9 | 9.8 | | 8.4 | | 6.2 | 26.3 | | 9.9 | 8.2 | |
| LOS | B | B | A | | A | | A | C | | A | A | |
| Approach Delay | | 15.8 | | | 8.4 | | | 25.9 | | | 8.6 | |
| Approach LOS | | B | | | A | | | C | | | A | |
| Queue Length 50th (ft) | 5 | 2 | 0 | | 17 | | 3 | 153 | | 21 | 23 | |
| Queue Length 95th (ft) | 20 | 11 | 9 | | 81 | | 11 | #303 | | 56 | 69 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | | | | 200 | | | 150 | | |
| Base Capacity (vph) | 206 | 624 | 536 | | 757 | | 585 | 1254 | | 444 | 2560 | |
| 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 | 0.10 | 0.01 | 0.02 | | 0.53 | | 0.04 | 0.80 | | 0.36 | 0.21 | |

## Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 52.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 74.0% ICU Level of Service D
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 21 | 8 | 9 | 136 | 23 | 640 | 23 | 1630 | 72 | 336 | 730 | 63 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 0 | | 0 | 200 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.91 | 0.91 |
| Frt | | | 0.850 | | 0.892 | | | 0.994 | | | 0.988 | |
| Flt Protected | 0.950 | | | | 0.992 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 0 | 1648 | 0 | 1770 | 3518 | 0 | 1770 | 5024 | 0 |
| Flt Permitted | 0.187 | | | | 0.938 | | 0.310 | | | 0.071 | | |
| Satd. Flow (perm) | 348 | 1863 | 1583 | 0 | 1559 | 0 | 577 | 3518 | 0 | 132 | 5024 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 10 | | 174 | | | 4 | | | 15 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 23 | 9 | 10 | 151 | 26 | 711 | 26 | 1811 | 80 | 373 | 811 | 70 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 23 | 9 | 10 | 0 | 888 | 0 | 26 | 1891 | 0 | 373 | 881 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Perm | | | pm+pt | | | pm+pt | | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 7.0 | 12.0 | | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 15.0 | 22.0 | | 15.0 | 22.0 | |
| Total Split (s) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 0.0 | 15.0 | 54.0 | 0.0 | 20.0 | 59.0 | 0.0 |
| Total Split (%) | 38.3% | 38.3% | 38.3% | 38.3% | 38.3% | 0.0% | 12.5% | 45.0% | 0.0% | 16.7% | 49.2% | 0.0% |
| Maximum Green (s) | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | | 9.0 | 48.0 | | 14.0 | 53.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | 0.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 6.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | | None | None | | None | None | |
| Act Effct Green (s) | 41.0 | 41.0 | 41.0 | | 41.0 | | 57.0 | 49.0 | | 69.0 | 61.2 | |
| Actuated g/C Ratio | 0.34 | 0.34 | 0.34 | | 0.34 | | 0.48 | 0.41 | | 0.58 | 0.51 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.19 | 0.01 | 0.02 | | 1.37 | | 0.07 | 1.31 | | 1.33 | 0.34 | |
| Control Delay | 33.1 | 26.4 | 13.2 | | 204.5 | | 12.2 | 177.8 | | 200.6 | 18.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 33.1 | 26.4 | 13.2 | | 204.5 | | 12.2 | 177.8 | | 200.6 | 18.4 | |
| LOS | C | C | B | | F | | B | F | | F | B | |
| Approach Delay | | 26.9 | | | 204.5 | | | 175.6 | | | 72.6 | |
| Approach LOS | | C | | | F | | | F | | | E | |
| Queue Length 50th (ft) | 13 | 5 | 0 | | ~821 | | 8 | ~999 | | ~328 | 154 | |
| Queue Length 95th (ft) | 36 | 17 | 12 | | #1070 | | 21 | #1141 | | #523 | 189 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | | | | 200 | | | 150 | | |
| Base Capacity (vph) | 119 | 637 | 547 | | 647 | | 383 | 1439 | | 281 | 2570 | |
| 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 | 0.19 | 0.01 | 0.02 | | 1.37 | | 0.07 | 1.31 | | 1.33 | 0.34 | |

## Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.37
Intersection Signal Delay: 148.8 Intersection LOS: F
Intersection Capacity Utilization 133.3% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 21 | 8 | 9 | 136 | 23 | 640 | 23 | 1630 | 72 | 336 | 730 | 63 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | 0 |
| Storage Lanes | 1 | | 1 | 2 | | 2 | 1 | | 1 | 2 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 0.88 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | 0.988 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 3433 | 1863 | 2787 | 1770 | 3539 | 1583 | 3433 | 3497 | 0 |
| Flt Permitted | 0.740 | | | 0.950 | | | 0.306 | | | 0.950 | | |
| Satd. Flow (perm) | 1378 | 1863 | 1583 | 3433 | 1863 | 2787 | 570 | 3539 | 1583 | 3433 | 3497 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 10 | | | 11 | | | 37 | | 12 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 23 | 9 | 10 | 151 | 26 | 711 | 26 | 1811 | 80 | 373 | 811 | 70 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 23 | 9 | 10 | 151 | 26 | 711 | 26 | 1811 | 80 | 373 | 881 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Prot | | pm+ov | pm+pt | | Perm | Prot | | |
| Protected Phases | | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | | | 8 | 2 | | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 7.0 | 12.0 | 7.0 | 7.0 | 12.0 | 12.0 | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 13.0 | 22.0 | 15.0 | 15.0 | 22.0 | 22.0 | 15.0 | 22.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 13.0 | 35.0 | 17.0 | 15.0 | 58.0 | 58.0 | 17.0 | 60.0 | 0.0 |
| Total Split (%) | 20.0% | 20.0% | 20.0% | 11.8% | 31.8% | 15.5% | 13.6% | 52.7% | 52.7% | 15.5% | 54.5% | 0.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 7.0 | 29.0 | 11.0 | 9.0 | 52.0 | 52.0 | 11.0 | 54.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | Lag | Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | |
| Act Effct Green (s) | 13.1 | 13.1 | 13.1 | 10.2 | 20.5 | 37.5 | 61.3 | 53.2 | 53.2 | 12.0 | 62.9 | |
| Actuated g/C Ratio | 0.13 | 0.13 | 0.13 | 0.10 | 0.20 | 0.37 | 0.61 | 0.53 | 0.53 | 0.12 | 0.62 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.13 | 0.04 | 0.05 | 0.44 | 0.07 | 0.68 | 0.06 | 0.97 | 0.09 | 0.91 | 0.40 | |
| Control Delay | 43.2 | 41.6 | 22.3 | 49.2 | 31.6 | 29.6 | 6.7 | 39.5 | 8.5 | 72.1 | 12.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 43.2 | 41.6 | 22.3 | 49.2 | 31.6 | 29.6 | 6.7 | 39.5 | 8.5 | 72.1 | 12.2 | |
| LOS | D | D | C | D | C | C | A | D | A | E | B | |
| Approach Delay | | 37.9 | | | 33.0 | | | 37.8 | | | 30.0 | |
| Approach LOS | | D | | | C | | | D | | | C | |
| Queue Length 50th (ft) | 14 | 5 | 0 | 52 | 14 | 211 | 6 | ~691 | 15 | 131 | 182 | |
| Queue Length 95th (ft) | 39 | 21 | 16 | 85 | 36 | 280 | 15 | #830 | 39 | #224 | 232 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | |
| Base Capacity (vph) | 233 | 316 | 276 | 347 | 557 | 1045 | 477 | 1869 | 853 | 411 | 2186 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.10 | 0.03 | 0.04 | 0.44 | 0.05 | 0.68 | 0.05 | 0.97 | 0.09 | 0.91 | 0.40 | |

## Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 100.8
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 34.4 Intersection LOS: C
Intersection Capacity Utilization 89.9% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 21 | 8 | 9 | 151 | 23 | 700 | 23 | 1630 | 77 | 356 | 730 | 63 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 0 | | 0 | 200 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.91 | 0.91 |
| Frt | | | 0.850 | | 0.892 | | | 0.993 | | | 0.988 | |
| Flt Protected | 0.950 | | | | 0.991 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 0 | 1647 | 0 | 1770 | 3514 | 0 | 1770 | 5024 | 0 |
| Flt Permitted | 0.178 | | | | 0.937 | | 0.310 | | | 0.079 | | |
| Satd. Flow (perm) | 332 | 1863 | 1583 | 0 | 1557 | 0 | 577 | 3514 | 0 | 147 | 5024 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 10 | | 194 | | | 5 | | | 16 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 23 | 9 | 10 | 168 | 26 | 778 | 26 | 1811 | 86 | 396 | 811 | 70 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 23 | 9 | 10 | 0 | 972 | 0 | 26 | 1897 | 0 | 396 | 881 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Perm | | | pm+pt | | | pm+pt | | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 7.0 | 12.0 | | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 15.0 | 22.0 | | 15.0 | 22.0 | |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 43.0 | 0.0 | 15.0 | 48.0 | 0.0 | 19.0 | 52.0 | 0.0 |
| Total Split (%) | 39.1% | 39.1% | 39.1% | 39.1% | 39.1% | 0.0% | 13.6% | 43.6% | 0.0% | 17.3% | 47.3% | 0.0% |
| Maximum Green (s) | 37.0 | 37.0 | 37.0 | 37.0 | 37.0 | | 9.0 | 42.0 | | 13.0 | 46.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | 0.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 6.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | | None | None | | None | None | |
| Act Effct Green (s) | 38.0 | 38.0 | 38.0 | | 38.0 | | 51.0 | 43.0 | | 62.0 | 54.2 | |
| Actuated g/C Ratio | 0.35 | 0.35 | 0.35 | | 0.35 | | 0.46 | 0.39 | | 0.56 | 0.49 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.20 | 0.01 | 0.02 | | 1.46 | | 0.07 | 1.38 | | 1.37 | 0.35 | |
| Control Delay | 30.9 | 23.9 | 12.1 | | 240.9 | | 11.7 | 204.1 | | 215.3 | 18.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 30.9 | 23.9 | 12.1 | | 240.9 | | 11.7 | 204.1 | | 215.3 | 18.2 | |
| LOS | C | C | B | | F | | B | F | | F | B | |
| Approach Delay | | 24.9 | | | 240.9 | | | 201.5 | | | 79.3 | |
| Approach LOS | | C | | | F | | | F | | | E | |
| Queue Length 50th (ft) | 11 | 4 | 0 | | ~854 | | 8 | ~943 | | ~324 | 146 | |
| Queue Length 95th (ft) | 34 | 15 | 12 | | #1104 | | 20 | #1084 | | #518 | 181 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | | | | 200 | | | 150 | | |
| Base Capacity (vph) | 115 | 644 | 553 | | 665 | | 386 | 1377 | | 289 | 2484 | |
| 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 | 0.20 | 0.01 | 0.02 | | 1.46 | | 0.07 | 1.38 | | 1.37 | 0.35 | |

## Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.46
Intersection Signal Delay: 171.8 Intersection LOS: F
Intersection Capacity Utilization 139.1% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 21 | 8 | 9 | 151 | 23 | 700 | 23 | 1630 | 77 | 356 | 730 | 63 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | 0 |
| Storage Lanes | 1 | | 1 | 2 | | 2 | 1 | | 1 | 2 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 0.88 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | 0.988 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 3433 | 1863 | 2787 | 1770 | 3539 | 1583 | 3433 | 3497 | 0 |
| Flt Permitted | 0.740 | | | 0.950 | | | 0.306 | | | 0.950 | | |
| Satd. Flow (perm) | 1378 | 1863 | 1583 | 3433 | 1863 | 2787 | 570 | 3539 | 1583 | 3433 | 3497 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 10 | | | 11 | | | 40 | | 12 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 23 | 9 | 10 | 168 | 26 | 778 | 26 | 1811 | 86 | 396 | 811 | 70 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 23 | 9 | 10 | 168 | 26 | 778 | 26 | 1811 | 86 | 396 | 881 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Prot | | pm+ov | pm+pt | | Perm | Prot | | |
| Protected Phases | | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | | | 8 | 2 | | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 7.0 | 12.0 | 7.0 | 7.0 | 12.0 | 12.0 | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 13.0 | 22.0 | 15.0 | 15.0 | 22.0 | 22.0 | 15.0 | 22.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 13.0 | 35.0 | 17.0 | 15.0 | 58.0 | 58.0 | 17.0 | 60.0 | 0.0 |
| Total Split (%) | 20.0% | 20.0% | 20.0% | 11.8% | 31.8% | 15.5% | 13.6% | 52.7% | 52.7% | 15.5% | 54.5% | 0.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 7.0 | 29.0 | 11.0 | 9.0 | 52.0 | 52.0 | 11.0 | 54.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | Lag | Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | |
| Act Effct Green (s) | 13.1 | 13.1 | 13.1 | 10.2 | 20.5 | 37.5 | 61.3 | 53.2 | 53.2 | 12.0 | 62.9 | |
| Actuated g/C Ratio | 0.13 | 0.13 | 0.13 | 0.10 | 0.20 | 0.37 | 0.61 | 0.53 | 0.53 | 0.12 | 0.62 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.13 | 0.04 | 0.05 | 0.48 | 0.07 | 0.74 | 0.06 | 0.97 | 0.10 | 0.96 | 0.40 | |
| Control Delay | 43.2 | 41.6 | 22.3 | 50.2 | 31.6 | 31.8 | 6.7 | 39.5 | 8.4 | 82.4 | 12.2 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 43.2 | 41.6 | 22.3 | 50.2 | 31.6 | 31.8 | 6.7 | 39.5 | 8.4 | 82.4 | 12.2 | |
| LOS | D | D | C | D | C | C | A | D | A | F | B | |
| Approach Delay | | 37.9 | | | 35.0 | | | 37.7 | | | 34.0 | |
| Approach LOS | | D | | | C | | | D | | | C | |
| Queue Length 50th (ft) | 14 | 5 | 0 | 58 | 14 | 239 | 6 | ~691 | 16 | ~143 | 182 | |
| Queue Length 95th (ft) | 39 | 21 | 16 | #95 | 36 | 315 | 15 | #830 | 42 | #243 | 232 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | |
| Base Capacity (vph) | 233 | 316 | 276 | 347 | 557 | 1045 | 477 | 1869 | 855 | 411 | 2186 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.10 | 0.03 | 0.04 | 0.48 | 0.05 | 0.74 | 0.05 | 0.97 | 0.10 | 0.96 | 0.40 | |

## Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 100.8
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 35.9 Intersection LOS: D
Intersection Capacity Utilization 92.0% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 79 | 66 | 67 | 65 | 29 | 150 | 38 | 535 | 40 | 317 | 1001 | 59 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 0 | | 0 | 200 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.91 | 0.91 |
| Frt | | | 0.850 | | 0.917 | | | 0.990 | | | 0.992 | |
| Flt Protected | 0.950 | | | | 0.987 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 0 | 1686 | 0 | 1770 | 3504 | 0 | 1770 | 5045 | 0 |
| Flt Permitted | 0.518 | | | | 0.886 | | 0.228 | | | 0.251 | | |
| Satd. Flow (perm) | 965 | 1863 | 1583 | 0 | 1513 | 0 | 425 | 3504 | 0 | 468 | 5045 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 74 | | 134 | | | 13 | | | 15 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 88 | 73 | 74 | 72 | 32 | 167 | 42 | 594 | 44 | 352 | 1112 | 66 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 88 | 73 | 74 | 0 | 271 | 0 | 42 | 638 | 0 | 352 | 1178 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Perm | | | pm+pt | | | pm+pt | | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 7.0 | 12.0 | | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 15.0 | 22.0 | | 15.0 | 22.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 0.0 | 15.0 | 22.0 | 0.0 | 16.0 | 23.0 | 0.0 |
| Total Split (%) | 36.7% | 36.7% | 36.7% | 36.7% | 36.7% | 0.0% | 25.0% | 36.7% | 0.0% | 26.7% | 38.3% | 0.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | | 9.0 | 16.0 | | 10.0 | 17.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | 0.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 6.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | | None | None | | None | None | |
| Act Effct Green (s) | 14.0 | 14.0 | 14.0 | | 14.0 | | 22.7 | 14.6 | | 29.4 | 25.3 | |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.26 | | 0.26 | | 0.42 | 0.27 | | 0.54 | 0.47 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.35 | 0.15 | 0.16 | | 0.55 | | 0.11 | 0.67 | | 0.70 | 0.50 | |
| Control Delay | 21.8 | 17.1 | 6.0 | | 14.2 | | 7.1 | 21.4 | | 17.2 | 12.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 21.8 | 17.1 | 6.0 | | 14.2 | | 7.1 | 21.4 | | 17.2 | 12.6 | |
| LOS | C | B | A | | B | | A | C | | B | B | |
| Approach Delay | | 15.3 | | | 14.2 | | | 20.6 | | | 13.6 | |
| Approach LOS | | B | | | B | | | C | | | B | |
| Queue Length 50th (ft) | 23 | 18 | 0 | | 35 | | 5 | 92 | | 52 | 65 | |
| Queue Length 95th (ft) | 60 | 46 | 25 | | 100 | | 18 | 152 | | #164 | 174 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | | | | 200 | | | 150 | | |
| Base Capacity (vph) | 304 | 587 | 549 | | 568 | | 442 | 1112 | | 519 | 2364 | |
| Starvation Cap Reductn | 0 | 0 | 0 | | 0 | | 0 | 0 | | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | | 0 | | 0 | 0 | | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | | 0 | | 0 | 0 | | 0 | 0 | |
| Reduced v/c Ratio | 0.29 | 0.12 | 0.13 | | 0.48 | | 0.10 | 0.57 | | 0.68 | 0.50 | |

## Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 54.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 67.1% 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: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 92 | 77 | 78 | 290 | 34 | 420 | 44 | 1171 | 201 | 846 | 1825 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 0 | | 0 | 200 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.91 | 0.91 |
| Frt | | | 0.850 | | 0.924 | | | 0.978 | | | 0.995 | |
| Flt Protected | 0.950 | | | | 0.981 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 0 | 1688 | 0 | 1770 | 3461 | 0 | 1770 | 5060 | 0 |
| Flt Permitted | 0.386 | | | | 0.833 | | 0.088 | | | 0.080 | | |
| Satd. Flow (perm) | 719 | 1863 | 1583 | 0 | 1434 | 0 | 164 | 3461 | 0 | 149 | 5060 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 87 | | 46 | | | 13 | | | 5 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 102 | 86 | 87 | 322 | 38 | 467 | 49 | 1301 | 223 | 940 | 2028 | 76 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 102 | 86 | 87 | 0 | 827 | 0 | 49 | 1524 | 0 | 940 | 2104 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Perm | | | pm+pt | | | pm+pt | | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 7.0 | 12.0 | | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 15.0 | 22.0 | | 15.0 | 22.0 | |
| Total Split (s) | 54.0 | 54.0 | 54.0 | 54.0 | 54.0 | 0.0 | 15.0 | 49.0 | 0.0 | 47.0 | 81.0 | 0.0 |
| Total Split (%) | 36.0% | 36.0% | 36.0% | 36.0% | 36.0% | 0.0% | 10.0% | 32.7% | 0.0% | 31.3% | 54.0% | 0.0% |
| Maximum Green (s) | 48.0 | 48.0 | 48.0 | 48.0 | 48.0 | | 9.0 | 43.0 | | 41.0 | 75.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | 0.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 6.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | | None | None | | None | None | |
| Act Effct Green (s) | 49.0 | 49.0 | 49.0 | | 49.0 | | 52.3 | 44.0 | | 91.0 | 80.3 | |
| Actuated g/C Ratio | 0.33 | 0.33 | 0.33 | | 0.33 | | 0.35 | 0.29 | | 0.61 | 0.54 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.43 | 0.14 | 0.15 | | 1.66 | | 0.34 | 1.49 | | 1.73 | 0.78 | |
| Control Delay | 46.7 | 36.5 | 7.3 | | 335.7 | | 27.6 | 261.8 | | 364.8 | 30.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 46.7 | 36.5 | 7.3 | | 335.7 | | 27.6 | 261.8 | | 364.8 | 30.8 | |
| LOS | D | D | A | | F | | C | F | | F | C | |
| Approach Delay | | 31.0 | | | 335.7 | | | 254.5 | | | 133.9 | |
| Approach LOS | | C | | | F | | | F | | | F | |
| Queue Length 50th (ft) | 78 | 60 | 0 | | ~1148 | | 19 | ~1082 | | ~1315 | 603 | |
| Queue Length 95th (ft) | 141 | 104 | 40 | | #1407 | | 41 | #1224 | | #1578 | 679 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | | | | 200 | | | 150 | | |
| Base Capacity (vph) | 235 | 609 | 576 | | 499 | | 166 | 1024 | | 544 | 2712 | |
| 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 | 0.43 | 0.14 | 0.15 | | 1.66 | | 0.30 | 1.49 | | 1.73 | 0.78 | |

## Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.73
Intersection Signal Delay: 191.3 Intersection LOS: F
Intersection Capacity Utilization 148.4% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 92 | 77 | 78 | 290 | 34 | 420 | 44 | 1171 | 201 | 846 | 1825 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | 0 |
| Storage Lanes | 1 | | 1 | 2 | | 2 | 1 | | 1 | 2 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 0.88 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 3433 | 1863 | 2787 | 1770 | 3539 | 1583 | 3433 | 3522 | 0 |
| Flt Permitted | 0.732 | | | 0.950 | | | 0.075 | | | 0.950 | | |
| Satd. Flow (perm) | 1364 | 1863 | 1583 | 3433 | 1863 | 2787 | 140 | 3539 | 1583 | 3433 | 3522 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 87 | | | 15 | | | 93 | | 4 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 102 | 86 | 87 | 322 | 38 | 467 | 49 | 1301 | 223 | 940 | 2028 | 76 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 102 | 86 | 87 | 322 | 38 | 467 | 49 | 1301 | 223 | 940 | 2104 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Prot | | pm+ov | pm+pt | | Perm | Prot | | |
| Protected Phases | | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | | | 8 | 2 | | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 7.0 | 12.0 | 7.0 | 7.0 | 12.0 | 12.0 | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 13.0 | 22.0 | 15.0 | 15.0 | 22.0 | 22.0 | 15.0 | 22.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 18.0 | 40.0 | 43.0 | 15.0 | 57.0 | 57.0 | 43.0 | 85.0 | 0.0 |
| Total Split (%) | 15.7% | 15.7% | 15.7% | 12.9% | 28.6% | 30.7% | 10.7% | 40.7% | 40.7% | 30.7% | 60.7% | 0.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 12.0 | 34.0 | 37.0 | 9.0 | 51.0 | 51.0 | 37.0 | 79.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 |
| Lead/Lag | Lag | Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | |
| Act Effct Green (s) | 15.5 | 15.5 | 15.5 | 13.0 | 33.5 | 76.5 | 60.2 | 52.0 | 52.0 | 38.0 | 84.5 | |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.11 | 0.09 | 0.24 | 0.55 | 0.43 | 0.38 | 0.38 | 0.27 | 0.61 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.67 | 0.41 | 0.34 | 1.00 | 0.08 | 0.30 | 0.31 | 0.98 | 0.34 | 1.00 | 0.98 | |
| Control Delay | 80.5 | 63.5 | 14.7 | 112.1 | 41.1 | 16.7 | 22.9 | 63.0 | 19.4 | 78.8 | 42.1 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 80.5 | 63.5 | 14.7 | 112.1 | 41.1 | 16.7 | 22.9 | 63.0 | 19.4 | 78.8 | 42.1 | |
| LOS | F | E | B | F | D | B | C | E | B | E | D | |
| Approach Delay | | 54.4 | | | 54.9 | | | 55.5 | | | 53.5 | |
| Approach LOS | | D | | | D | | | E | | | D | |
| Queue Length 50th (ft) | 90 | 73 | 0 | ~155 | 27 | 119 | 14 | 614 | 81 | ~447 | ~1061 | |
| Queue Length 95th (ft) | #156 | 130 | 52 | #258 | 57 | 157 | 34 | #780 | 151 | #594 | #1212 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | |
| Base Capacity (vph) | 168 | 229 | 271 | 322 | 471 | 1546 | 180 | 1328 | 652 | 942 | 2150 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.61 | 0.38 | 0.32 | 1.00 | 0.08 | 0.30 | 0.27 | 0.98 | 0.34 | 1.00 | 0.98 | |

## Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 138.5
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 54.3 Intersection LOS: D
Intersection Capacity Utilization 85.9% ICU Level of Service E
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 92 | 77 | 78 | 300 | 34 | 458 | 44 | 1171 | 217 | 911 | 1825 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 0 | | 0 | 200 | | 0 | 150 | | 0 |
| Storage Lanes | 1 | | 1 | 0 | | 0 | 1 | | 0 | 1 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | 0.91 | 0.91 |
| Frt | | | 0.850 | | 0.922 | | | 0.977 | | | 0.995 | |
| Flt Protected | 0.950 | | | | 0.981 | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 0 | 1685 | 0 | 1770 | 3458 | 0 | 1770 | 5060 | 0 |
| Flt Permitted | 0.376 | | | | 0.837 | | 0.090 | | | 0.081 | | |
| Satd. Flow (perm) | 700 | 1863 | 1583 | 0 | 1438 | 0 | 168 | 3458 | 0 | 151 | 5060 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 87 | | 49 | | | 14 | | | 5 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 3829 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 58.0 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 102 | 86 | 87 | 333 | 38 | 509 | 49 | 1301 | 241 | 1012 | 2028 | 76 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 102 | 86 | 87 | 0 | 880 | 0 | 49 | 1542 | 0 | 1012 | 2104 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 12 | | | 12 | | | 12 | | | 12 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Perm | | | pm+pt | | | pm+pt | | |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 7.0 | 12.0 | | 7.0 | 12.0 | |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 15.0 | 22.0 | | 15.0 | 22.0 | |
| Total Split (s) | 54.0 | 54.0 | 54.0 | 54.0 | 54.0 | 0.0 | 15.0 | 48.0 | 0.0 | 48.0 | 81.0 | 0.0 |
| Total Split (%) | 36.0% | 36.0% | 36.0% | 36.0% | 36.0% | 0.0% | 10.0% | 32.0% | 0.0% | 32.0% | 54.0% | 0.0% |
| Maximum Green (s) | 48.0 | 48.0 | 48.0 | 48.0 | 48.0 | | 9.0 | 42.0 | | 42.0 | 75.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 | | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | 0.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 | -1.0 | -1.0 | 0.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 6.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | 5.0 | 5.0 | 4.0 |
| Lead/Lag | | | | | | | Lead | Lag | | Lead | Lag | |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | | None | None | | None | None | |
| Act Effct Green (s) | 49.0 | 49.0 | 49.0 | | 49.0 | | 51.3 | 43.0 | | 91.0 | 80.3 | |
| Actuated g/C Ratio | 0.33 | 0.33 | 0.33 | | 0.33 | | 0.34 | 0.29 | | 0.61 | 0.54 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.45 | 0.14 | 0.15 | | 1.75 | | 0.34 | 1.54 | | 1.82 | 0.78 | |
| Control Delay | 47.4 | 36.5 | 7.3 | | 375.0 | | 27.8 | 284.1 | | 404.4 | 30.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Total Delay | 47.4 | 36.5 | 7.3 | | 375.0 | | 27.8 | 284.1 | | 404.4 | 30.8 | |
| LOS | D | D | A | | F | | C | F | | F | C | |
| Approach Delay | | 31.3 | | | 375.0 | | | 276.2 | | | 152.1 | |
| Approach LOS | | C | | | F | | | F | | | F | |
| Queue Length 50th (ft) | 79 | 60 | 0 | | ~1251 | | 19 | ~1114 | | ~1451 | 603 | |
| Queue Length 95th (ft) | 143 | 104 | 40 | | #1512 | | 41 | #1254 | | #1717 | 679 | |
| Internal Link Dist (ft) | | 3267 | | | 3749 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | | | | 200 | | | 150 | | |
| Base Capacity (vph) | 229 | 609 | 576 | | 503 | | 166 | 1001 | | 556 | 2712 | |
| 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 | 0.45 | 0.14 | 0.15 | | 1.75 | | 0.30 | 1.54 | | 1.82 | 0.78 | |

## Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.82
Intersection Signal Delay: 213.6 Intersection LOS: F
Intersection Capacity Utilization 155.5% ICU Level of Service H
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 92 | 77 | 78 | 300 | 34 | 458 | 44 | 1171 | 217 | 911 | 1825 | 68 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | 0 |
| Storage Lanes | 1 | | 1 | 2 | | 2 | 1 | | 1 | 2 | | 0 |
| Taper Length (ft) | 100 | | 100 | 100 | | 100 | 100 | | 100 | 100 | | 100 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 0.97 | 1.00 | 0.88 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 0.95 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | 0.995 | |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1770 | 1863 | 1583 | 3433 | 1863 | 2787 | 1770 | 3539 | 1583 | 3433 | 3522 | 0 |
| Flt Permitted | 0.732 | | | 0.950 | | | 0.066 | | | 0.950 | | |
| Satd. Flow (perm) | 1364 | 1863 | 1583 | 3433 | 1863 | 2787 | 123 | 3539 | 1583 | 3433 | 3522 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 87 | | | 15 | | | 88 | | 4 | |
| Link Speed (mph) | | 30 | | | 45 | | | 45 | | | 45 | |
| Link Distance (ft) | | 3347 | | | 997 | | | 2196 | | | 3479 | |
| Travel Time (s) | | 76.1 | | | 15.1 | | | 33.3 | | | 52.7 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 102 | 86 | 87 | 333 | 38 | 509 | 49 | 1301 | 241 | 1012 | 2028 | 76 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 102 | 86 | 87 | 333 | 38 | 509 | 49 | 1301 | 241 | 1012 | 2104 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(ft) | | 24 | | | 24 | | | 24 | | | 24 | |
| Link Offset(ft) | | 0 | | | 0 | | | 0 | | | 0 | |
| Crosswalk Width(ft) | | 10 | | | 10 | | | 10 | | | 10 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Turning Speed (mph) | 15 | | 9 | 15 | | 9 | 15 | | 9 | 15 | | 9 |
| Turn Type | Perm | | Perm | Prot | | pm+ov | pm+pt | | Perm | Prot | | |
| Protected Phases | | 4 | | 3 | 8 | 1 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | | | 8 | 2 | | 2 | | | |
| Detector Phase | 4 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 1.0 | 1.0 | 1.0 | 7.0 | 12.0 | 7.0 | 7.0 | 12.0 | 12.0 | 7.0 | 12.0 | |
| Minimum Split (s) | 7.0 | 7.0 | 7.0 | 13.0 | 22.0 | 15.0 | 15.0 | 22.0 | 22.0 | 15.0 | 22.0 | |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 21.0 | 43.0 | 53.0 | 15.0 | 64.0 | 64.0 | 53.0 | 102.0 | 0.0 |
| Total Split (%) | 13.8% | 13.8% | 13.8% | 13.1% | 26.9% | 33.1% | 9.4% | 40.0% | 40.0% | 33.1% | 63.8% | 0.0% |
| Maximum Green (s) | 16.0 | 16.0 | 16.0 | 15.0 | 37.0 | 47.0 | 9.0 | 58.0 | 58.0 | 47.0 | 96.0 | |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Lost Time Adjust (s) | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 | -1.0 |
| Total Lost Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 |
| Lead/Lag | Lag | Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lead | Lag | |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | |
| Vehicle Extension (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | |
| Act Effct Green (s) | 15.6 | 15.6 | 15.6 | 16.0 | 36.6 | 89.7 | 67.4 | 59.0 | 59.0 | 48.0 | 101.4 | |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.23 | 0.57 | 0.42 | 0.37 | 0.37 | 0.30 | 0.64 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| v/c Ratio | 0.76 | 0.47 | 0.37 | 0.96 | 0.09 | 0.32 | 0.35 | 0.99 | 0.37 | 0.97 | 0.93 | |
| Control Delay | 101.9 | 76.2 | 16.6 | 109.5 | 48.4 | 18.4 | 31.0 | 71.2 | 24.5 | 76.6 | 35.8 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay | 101.9 | 76.2 | 16.6 | 109.5 | 48.4 | 18.4 | 31.0 | 71.2 | 24.5 | 76.6 | 35.8 | |
| LOS | F | E | B | F | D | B | C | E | C | E | D | |
| Approach Delay | | 66.9 | | | 54.1 | | | 62.9 | | | 49.0 | |
| Approach LOS | | E | | | D | | | E | | | D | |
| Queue Length 50th (ft) | 105 | 86 | 0 | 181 | 31 | 150 | 15 | 714 | 115 | 544 | 1048 | |
| Queue Length 95th (ft) | #196 | 146 | 56 | #286 | 65 | 192 | 44 | #880 | 193 | #691 | #1305 | |
| Internal Link Dist (ft) | | 3267 | | | 917 | | | 2116 | | | 3399 | |
| Turn Bay Length (ft) | 75 | | 75 | 250 | | 275 | 200 | | 150 | 450 | | |
| Base Capacity (vph) | 146 | 200 | 247 | 346 | 446 | 1582 | 157 | 1316 | 644 | 1039 | 2251 | |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Reduced v/c Ratio | 0.70 | 0.43 | 0.35 | 0.96 | 0.09 | 0.32 | 0.31 | 0.99 | 0.37 | 0.97 | 0.93 | |

## Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 158.7
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 54.4 Intersection LOS: D
Intersection Capacity Utilization 86.2% ICU Level of Service E
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Jim Wilson Road & US 521

# APPENDIX G

## JIM WILSON ROAD AND SITE DRIVE 1

## SYNCHRO REPORTS

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 271 | 13 | 16 | 526 | 40 | 49 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 301 | 14 | 18 | 584 | 44 | 54 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 316 | | 928 | 308 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 316 | | 928 | 308 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 85 | 93 |
| cM capacity (veh/h) | | | 1245 | | 293 | 732 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 |
|---|---|---|---|---|
| Volume Total | 316 | 18 | 584 | 99 |
| Volume Left | 0 | 18 | 0 | 44 |
| Volume Right | 14 | 0 | 0 | 54 |
| cSH | 1700 | 1245 | 1700 | 437 |
| Volume to Capacity | 0.19 | 0.01 | 0.34 | 0.23 |
| Queue Length 95th (ft) | 0 | 1 | 0 | 21 |
| Control Delay (s) | 0.0 | 7.9 | 0.0 | 15.6 |
| Lane LOS | | A | | C |
| Approach Delay (s) | 0.0 | 0.2 | | 15.6 |
| Approach LOS | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 39.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 595 | 44 | 54 | 501 | 26 | 31 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Hourly flow rate (vph) | 661 | 49 | 60 | 557 | 29 | 34 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 710 | | 1362 | 686 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 710 | | 1362 | 686 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 93 | | 81 | 92 |
| cM capacity (veh/h) | | | 889 | | 152 | 448 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 |
|---|---|---|---|---|
| Volume Total | 710 | 60 | 557 | 63 |
| Volume Left | 0 | 60 | 0 | 29 |
| Volume Right | 49 | 0 | 0 | 34 |
| cSH | 1700 | 889 | 1700 | 237 |
| Volume to Capacity | 0.42 | 0.07 | 0.33 | 0.27 |
| Queue Length 95th (ft) | 0 | 5 | 0 | 26 |
| Control Delay (s) | 0.0 | 9.3 | 0.0 | 25.6 |
| Lane LOS | | A | | D |
| Approach Delay (s) | 0.0 | 0.9 | | 25.6 |
| Approach LOS | | | | D |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 50.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |