TRAFFIC IMPACT ANALYSIS REPORT

STARBUCKS

San Bernardino, California

January 24, 2024

(Update of January 4, 2024 Report)

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- The proposed Project is forecast to generate approximately 531 net daily trips, with 87 net trips (44 inbound, 43 outbound) produced in the AM peak hour and 38 net trips (19 inbound, 19 outbound) produced in the PM peak hour on a "typical" weekday.

Study Area

- Three (3) key study intersections were selected for evaluation based on discussions with City of San Bernardino Public Works Department staff. The intersections listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation.

  Key Study Intersections

  1. Shandin Hills Drive/40th Street at Kendall Drive
  2. Project Driveway at Kendall Drive
  3. Shandin Hills Circle/F Street at Kendall Drive

Cumulative Projects Description

- The four (4) cumulative projects are expected to generate 6,918 daily trips (one half arriving, one half departing), with 395 trips (203 inbound and 192 outbound) forecast during the AM peak hour and 335 trips (172 inbound and 163 outbound) forecast during the PM peak hour on a "typical" weekday.

Traffic Impact Analysis

Existing Traffic Conditions

- For Existing traffic conditions, all three (3) key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours.

Existing With Project Traffic Conditions

- All three (3) key study intersections are forecast to continue to operate at an acceptable LOS during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

Year 2024 Traffic Conditions

- All three (3) key study intersections are forecast to operate at acceptable levels of service during the AM and PM peak hours with the addition of ambient traffic growth and cumulative projects traffic.

Year 2024 With Project Traffic Conditions

- All three (3) key study intersections are forecast to continue to operate at an acceptable LOS during the AM and PM peak hours with the addition of Project generated traffic in the horizon Year 2024.

Site Access and Internal Circulation Evaluation

- The project driveway on Kendall Drive is forecast to operate at an acceptable level of service during the AM and PM peak hours under Year 2024 With Project traffic conditions.

- Adequate storage is provided to accommodate the forecast 95th percentile queues under Year 2024 With Project for all ingress and egress movements at the project driveway.

- The on-site circulation layout of the proposed Project on an overall basis is adequate. Curb return radii appear adequate for passenger cars, service/delivery trucks and trash trucks. Based on our review of the project site plan, the overall layout does not create significant vehicle-pedestrian conflict points and project traffic is not anticipated to cause significant internal queuing/stacking at the Project driveways.

Recommended Improvements

Existing With Project Traffic Conditions

- The results of the Existing With Project intersection capacity analysis indicate that the proposed Project will not adversely impact any of the three (3) key study intersections. As such, improvements are not recommended under Existing With Project traffic conditions.

Year 2024 With Project Traffic Conditions

- The results of the Year 2024 With Project intersection capacity analysis indicate that the proposed Project will not adversely impact any of the three (3) key study intersections. As such, improvements are not recommended under Year 2024 With Project traffic conditions.

Drive-Through Queueing Evaluation

- Based on empirical data from three (3) existing Starbucks sites, the expected queue of the proposed Project will likely be 9 vehicles or less 85% of the time. The proposed Project will provide storage for up to 16 vehicles within the proposed drive-through lane without encroaching into the drive aisle. Therefore, the 85th percentile expected queues can be accommodated without interfering with internal circulation or causing congestion to the drive aisles. It should be noted that the proposed 14 vehicle storage drive-through lane can also accommodate the observed 95th percentile queues (i.e. queue range between 10 vehicles and 12 vehicles). Based on this empirical data, the expected queue of the proposed Project will likely be 12 vehicles or less 95% of the time. Lastly, it should be noted that the observed maximum queue of 15 vehicles, which only occurred two times and only at one site throughout the survey days, can easily be accommodated within adjacent drive aisle without affecting circulation within the existing shopping center. However, should the queue exceed the drive-through lane storage, Starbucks will develop a contingency plan and Staff will be deployed to manage the queue within the adjacent drive aisle.

TRAFFIC IMPACT ANALYSIS REPORT

STARBUCKS

San Bernardino, California

January 24, 2024

(Update of January 4, 2023 Report)

1.0 INTRODUCTION

This traffic impact analysis evaluates the potential traffic impacts and circulation needs associated with the proposed Starbucks in San Bernardino (hereinafter referred to as Project). The proposed Project site is a vacant parcel of land within an existing commercial center and is generally located south of Kendall Drive and west of Shandin Hills Circle in the City of San Bernardino, California. The proposed Project will consist of a 1,990 square-foot (SF) Starbucks coffee shop with drive-through window and minimal indoor seating. The proposed Project is anticipated to be completed by the Year 2024.

This report documents the findings and recommendations of a traffic impact analysis conducted by Linscott, Law & Greenspan, Engineers (LLG) to determine the potential traffic impacts that the Project may have on the local and/or regional transportation network in the vicinity of the Project site. The traffic impact analysis evaluates the operating conditions at three (3) key study intersections within the Project vicinity, estimates the trip generation potential of the Project and forecasts future (near-term) operating conditions without and with the Project.

This traffic report satisfies the *City of San Bernardino Traffic Impact Analysis Guidelines,* dated August 2020, and is consistent with the most current *Congestion Management Program (CMP) for San Bernardino County.* The Scope of Work for this traffic study, which is included in ***Appendix A***, was developed in conjunction with City of San Bernardino Public Works Department staff.

The project site has been visited and an inventory of adjacent area roadways and intersections was performed. Existing traffic information has been collected at three (3) key study intersections on a "typical" weekday for use in the preparation of intersection level of service calculations. Information concerning cumulative projects (planned and/or approved) in the vicinity of the proposed Project has been researched at the City of San Bernardino. Based on our research, there are four (4) cumulative projects in the City of San Bernardino within the vicinity of the subject site. These four (4) planned and/or approved cumulative projects were considered in the cumulative traffic analysis for this project.

This traffic report analyzes existing and future weekday AM peak hour and PM peak hour traffic conditions for a near-term (Year 2024: Project Opening Year) traffic setting upon completion of the proposed Project. Peak hour traffic forecasts for the Year 2024 horizon year have been projected by increasing existing traffic volumes by an annual growth rate of three percent (3.0%) per year and adding traffic volumes generated by four (4) cumulative projects.

1.1 Study Area

1.1.1 Intersections

Three (3) key study intersections were selected for evaluation based on discussions with City of San Bernardino Public Works Department staff. The intersections listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation.

Key Study Intersections:

1. Shandin Hills Drive/40th Street at Kendall Drive
2. Project Driveway at Kendall Drive
3. Shandin Hills Circle/F Street at Kendall Drive

1.2 Traffic Impact Analysis Components

The Highway Capacity Manual (HCM) Delay, Volume to Capacity (V/C) ratio and corresponding Level of Service (LOS) calculations at the key study locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the Project. When necessary, this report recommends intersection improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or addresses the impact of the Project.

Included in this Traffic Impact Analysis are:

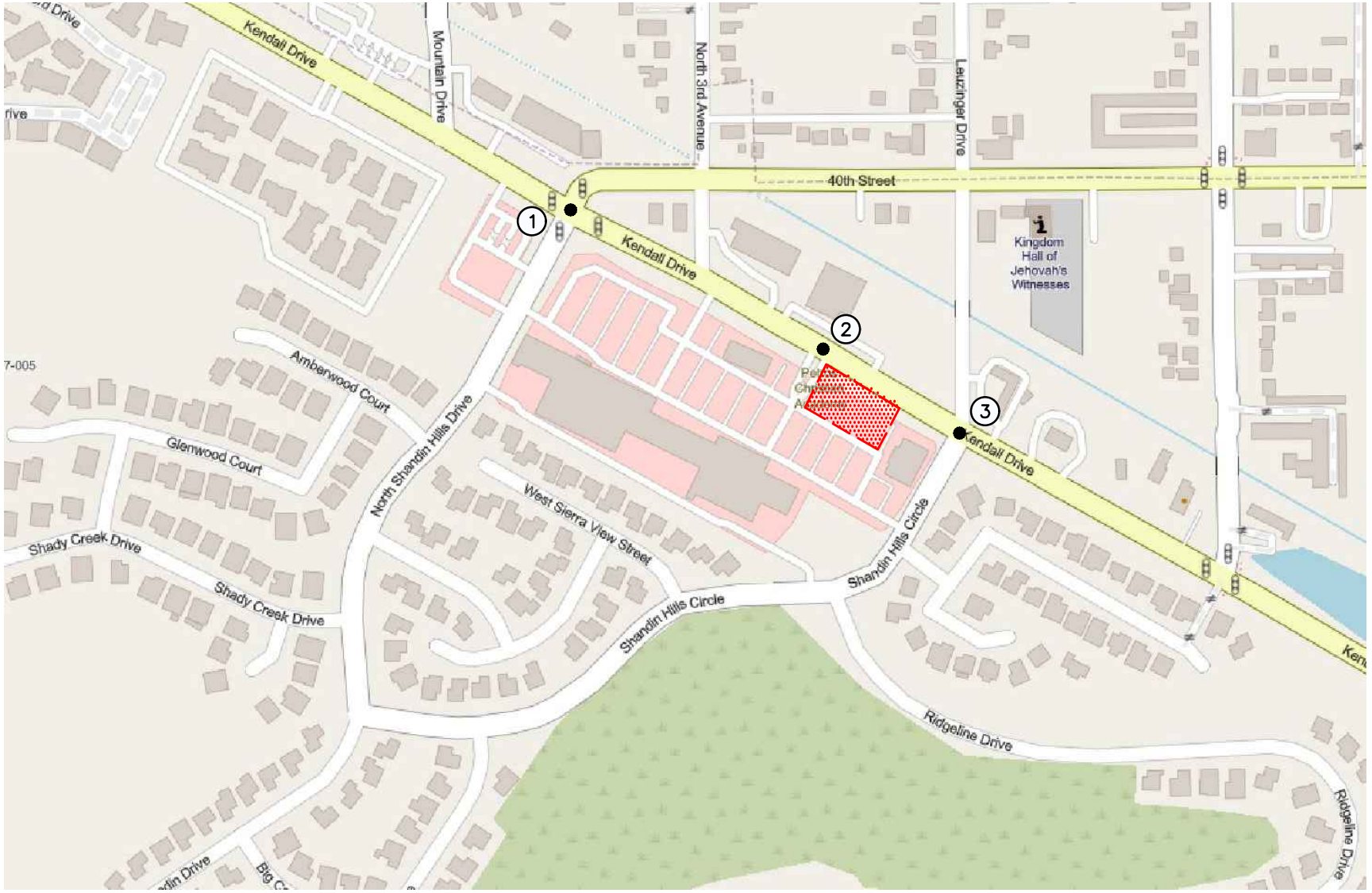
- Existing Traffic Counts,
- Estimated Project traffic generation/distribution/assignment,
- Estimated Cumulative Projects traffic generation/distribution/assignment,
- AM and PM peak hour LOS analyses for Existing (i.e. Baseline) Conditions,
- AM and PM peak hour for Existing (i.e. Baseline) Conditions with Project traffic,
- AM and PM peak hour LOS analyses for Near-Term (Year 2024) Conditions without and with Project traffic,
- Site Access and Internal Circulation Evaluation,
- Recommended Improvements,

Figure 1-1 presents a Vicinity Map, which illustrates the general location of the Project and depicts the study locations and surrounding street system.

1.3 Traffic Impact Analysis Scenarios

The following scenarios are those for which volume/capacity and corresponding LOS calculations have been performed at the key study intersections for existing and near-term traffic conditions:

1. Existing (i.e. Baseline) Traffic Conditions,
2. Existing (i.e. Baseline) With Project Traffic Conditions,
3. Scenario (2) with Recommended Improvements, if any,
4. Year 2024 Without Project Traffic Conditions,
5. Year 2024 With Project Traffic Conditions,
6. Scenario (5) With Recommended Improvements, if any.



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: GOOGLE

KEY

= PROJECT SITE

FIGURE 1-1

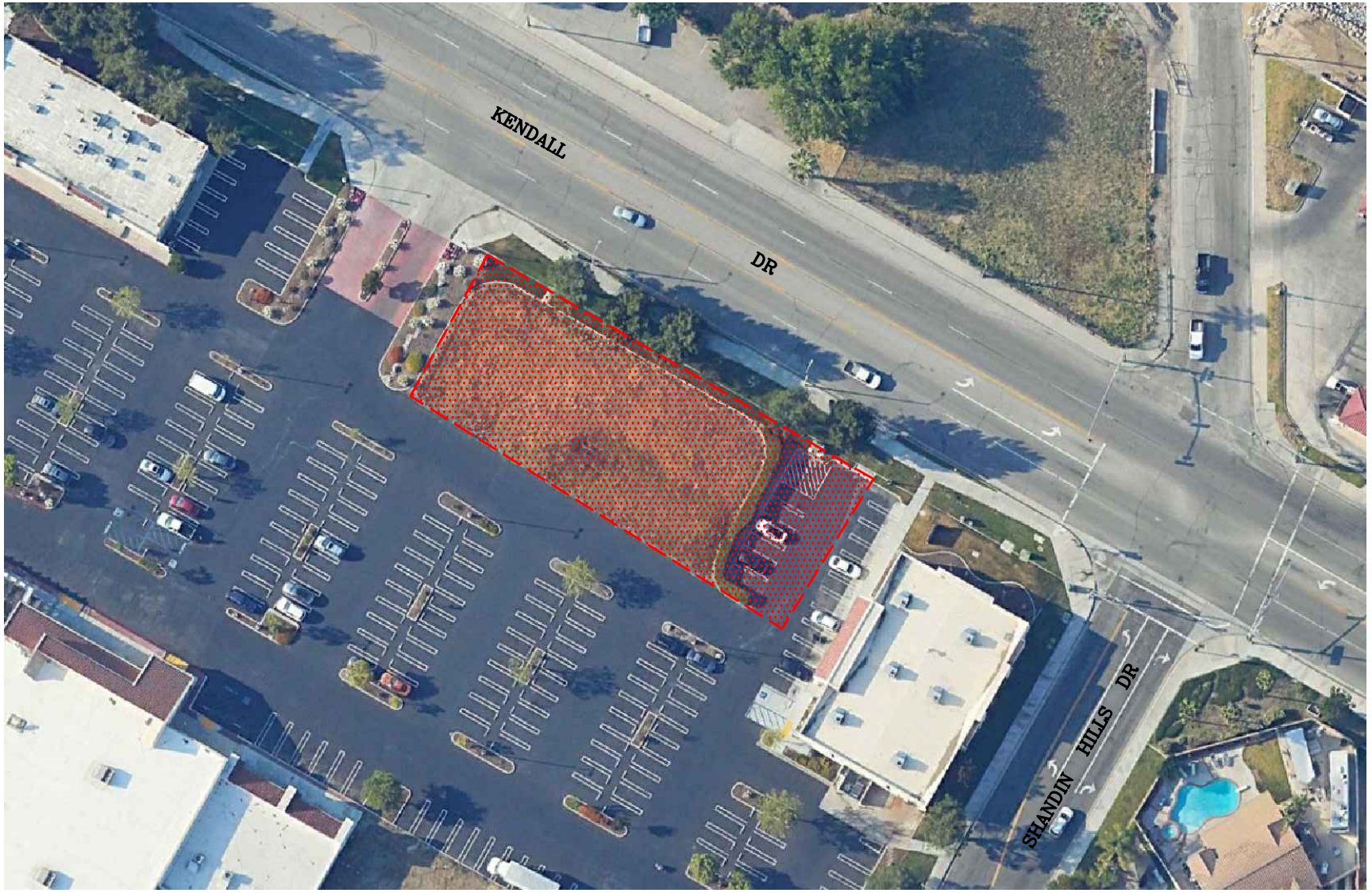
VICINITY MAP

STARBUCKS, SAN BERNARDINO

2.0 PROJECT DESCRIPTION AND LOCATION

The proposed Project site is a vacant parcel of land within an existing commercial center and is generally located south of Kendall Drive and west of Shandin Hills Circle in the City of San Bernardino, California. The proposed Project will consist of a 1,990 square-foot (SF) Starbucks coffee shop with drive-through window. Minimal indoor seating will be provided and walk-in service will be provided during store hours, which are proposed to be 4:30 AM to 11:00 PM. The typical total number of employees will be approximately 30 employees with between 8 to 10 employees during the peak shift. The proposed drive-through lane will provide storage for up to 14 vehicles, which is consistent with Starbucks standards of providing storage for a minimum of 12 vehicles. The proposed Project is anticipated to be completed by the Year 2024.

Primary access to the proposed Project will be provided via one full access unsignalized driveway located along Kendall Drive. ***Figure 2-1*** presents an aerial image of the existing site for the proposed Project. ***Figure 2-2*** presents the site plan for the proposed Project. As shown in *Figure 2-2*, 13 on-site unreserved parking spaces are provided (11 required), of which four (4) spaces will be designated as EV stalls. In addition, the Project site has a reciprocal agreement with the shopping center, which can accommodate customer and employee parking within the spaces directly south of the Project site (parcel).



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SOURCE: GOOGLE

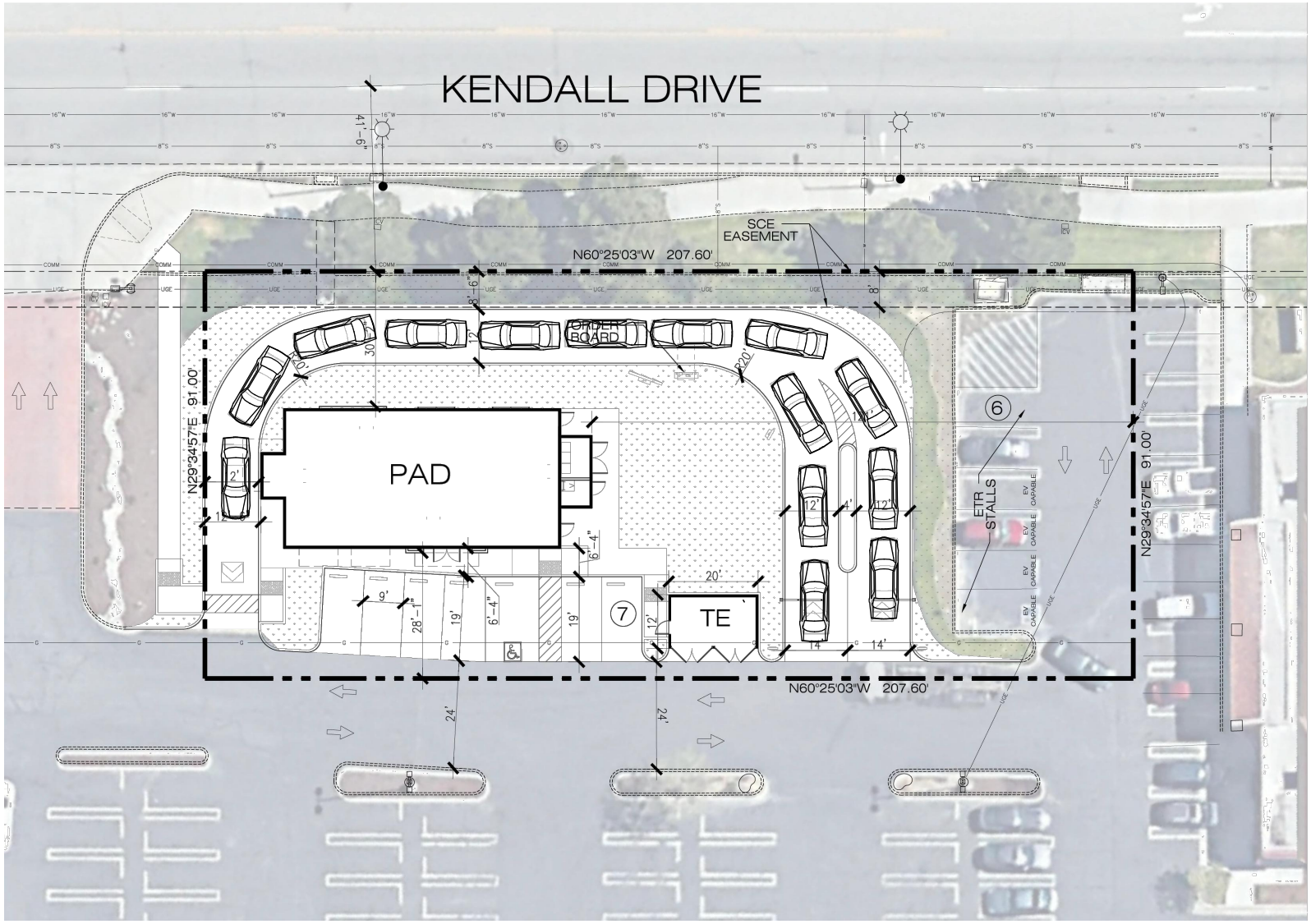
KEY

= PROJECT SITE

FIGURE 2-1

EXISTING SITE AERIAL

STARBUCKS, SAN BERNARDINO



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SOURCE: BICKEL GROUP ARCHITECTURE

FIGURE 2-2

PROPOSED SITE PLAN

STARBUCKS, SAN BERNARDINO

3.0 ANALYSIS CONDITIONS AND METHODOLOGY

3.1 Existing Street Network

Regional access to the project site is provided via the I-215 Freeway, which is located southwest of the project site. The principal local network of streets serving the project site includes Kendall Drive, 40th Street/Shandin Hills Drive, and Shandin Hills Circle/F Street. The following discussion provides a brief synopsis of these key area streets.

Kendall Drive is generally a four-lane, divided roadway, oriented in the east-west direction that borders the project site to the north. The posted speed limit on Kendall Drive is 45 miles per hour (mph) within the vicinity of the Project. On-street parking is generally not permitted along either side of the roadway within the vicinity of the Project site. Traffic signals control the study intersections of Kendall Drive at 40th Street/Sandin Hills Drive and F Street/Sandin Hills Circle. Kendall Drive is classified as a Major Arterial in the City of San Bernardino General Plan.

Shandin Hills Drive/40th Street is generally a four-lane, divided roadway, oriented in the north-south direction. The posted speed limit on Shandin Hills Drive/40th Street is 45 miles per hour (mph) within the vicinity of the Project. On-street parking is generally not permitted along either side of the roadway within the vicinity of the Project site. A traffic signal controls the study intersection of 40th Street/Shandin Hills Drive at Kendall Drive. 40th Street is classified as a Major Arterial in the City of San Bernardino General Plan.

Shandin Hills Circle/F Street is generally a two-lane, undivided roadway, oriented in the north-south direction. The posted speed limit on Shandin Hills Circle/F Street is 25 miles per hour (mph) within the vicinity of the Project. On-street parking is generally permitted along both sides of the roadway within the vicinity of the Project site. A traffic signal controls the study intersection of Shandin Hills Circle/F Street at Kendall Drive. F Street is classified as a Collector in the City of San Bernardino General Plan.

Figure 3-1 presents an inventory of the existing roadway conditions within the study area evaluated in this report. The number of travel lanes and intersection controls for the key area study intersections are identified.

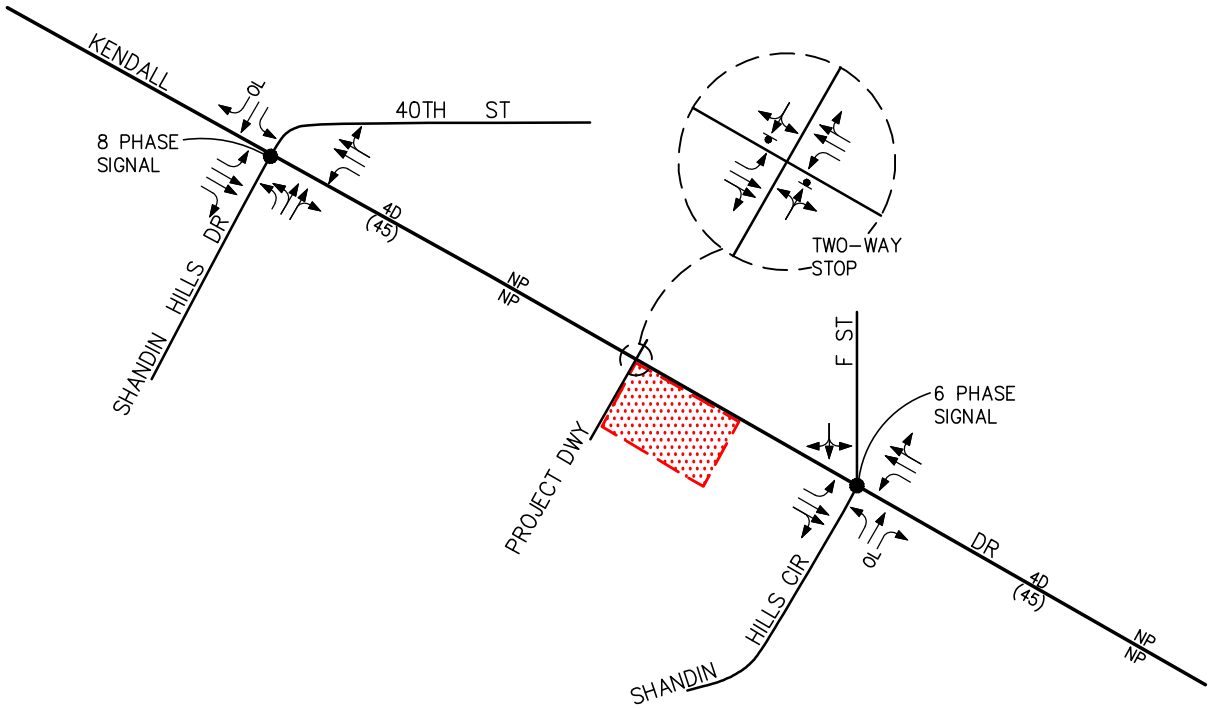
3.2 Existing Public Transit

OmniTrans operates several bus lines within the study area. A description of the transit services within the Project vicinity are as follows:

<u>OmniTrans</u>

sbX Green Line:

- The sbX Green Line provides service along the E Street Corridor, from Cal State University San Bernardino at the north to Loma Linda University & Medical Center at the south.



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KEY

← = APPROACH LANE ASSIGNMENT	2 = NUMBER OF TRAVEL LANES
● = TRAFFIC SIGNAL, ▼ = STOP SIGN	(XX)= POSTED SPEED LIMIT (MPH)
P = PARKING, NP = NO PARKING	OL = OVERLAP
U = UNDIVIDED, D = DIVIDED	= PROJECT SITE

FIGURE 3-1

EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

STARBUCKS, SAN BERNARDINO

- Most notably, the sbX Green Line provides service to Cal State University San Bernardino and Loma Linda University & Medical Center.
- The route traverses the cities of San Bernardino and Loma Linda.
- During the AM and PM peak hour, the sbX Green Line has approximate headways of 20-30 minutes in the northbound and southbound directions.

Route 2:

- Route 2 provides service from Cal State San Bernardino to Loma Linda via Kendall, E Street, Hospitality Lane, and Tippecanoe/Anderson.
- Most notably, Route 2 provides service to Cal State University San Bernardino and Loma Linda University & Medical Center.
- The route traverses the cities of San Bernardino and Loma Linda.
- During the AM and PM peak hour, Route 2 has approximate headways of 75 minutes in the northbound and southbound directions.

3.3 Bicycle and Pedestrian Facilities

The Federal and State transportation system recognizes three primary bikeway facilities: Bicycle Paths (Class I), Bicycle Lanes (Class II), and Bicycle Routes (Class III). Bicycle Paths (Class I) are exclusive car free facilities that are typically not located within a roadway area. Bicycle Lanes (Class II) are part of the street design that is dedicated only for bicycles and identified by a striped lane separating vehicle lanes from bicycle lanes. Bicycle Routes (Class III) are preferably located on collector and lower volume arterial streets. The following bicycle facilities are located within the vicinity of the project site.

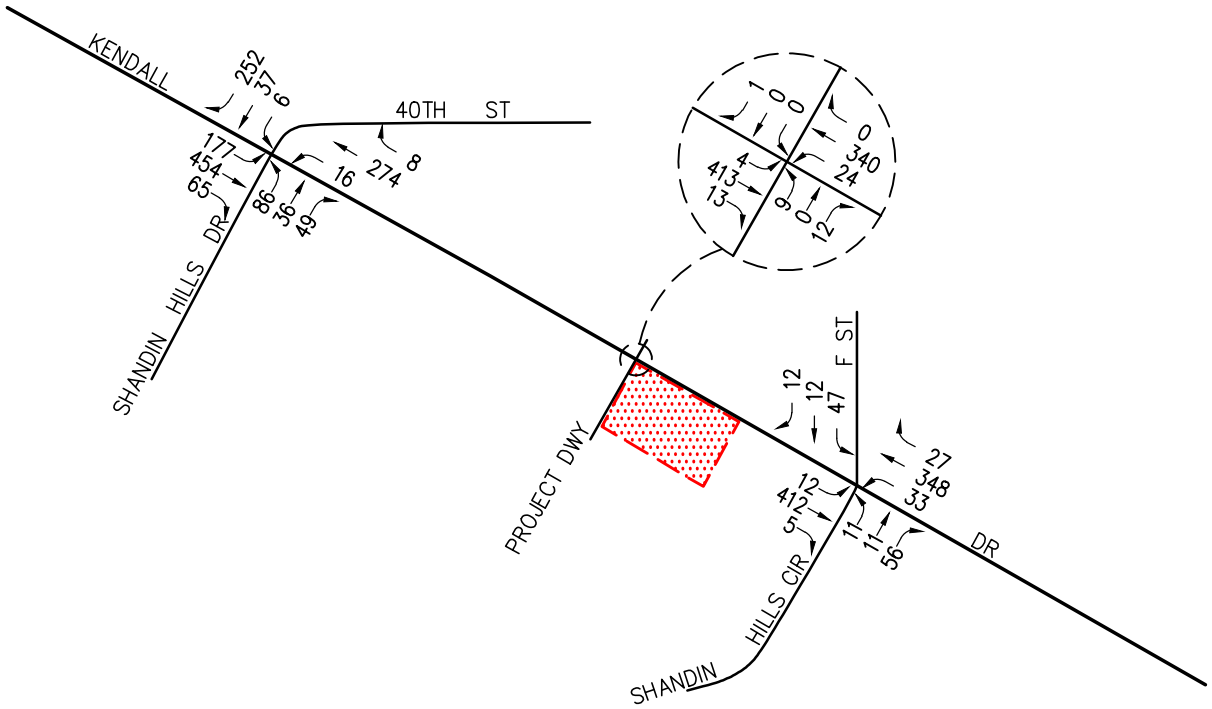
- A Class II Bike Lane currently exists along Kendall Drive (i.e. on both sides of the street), west of 40th Street/Shandin Hills Drive.

Pedestrian connection to the surrounding commercial and residential developments, as well as nearby public transit stops, is provided via existing sidewalks along the Project frontage on Kendall Drive. Existing sidewalks are also provided along most streets within the Project vicinity.

3.4 Existing Traffic Volumes

Three (3) key study intersections have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections, and their analysis will reveal the expected relative impacts of the project. These key intersections were selected for evaluation based on coordination with City of San Bernardino staff.

Existing AM peak hour and PM peak hour traffic volumes for the three (3) key study intersections evaluated in this report were conducted by Counts Unlimited in September 2023, when local area schools were in session. ***Figures 3-2*** and ***3-3*** illustrate the existing AM and PM peak hour traffic volumes at the three (3) key study intersections evaluated in this report, respectively.



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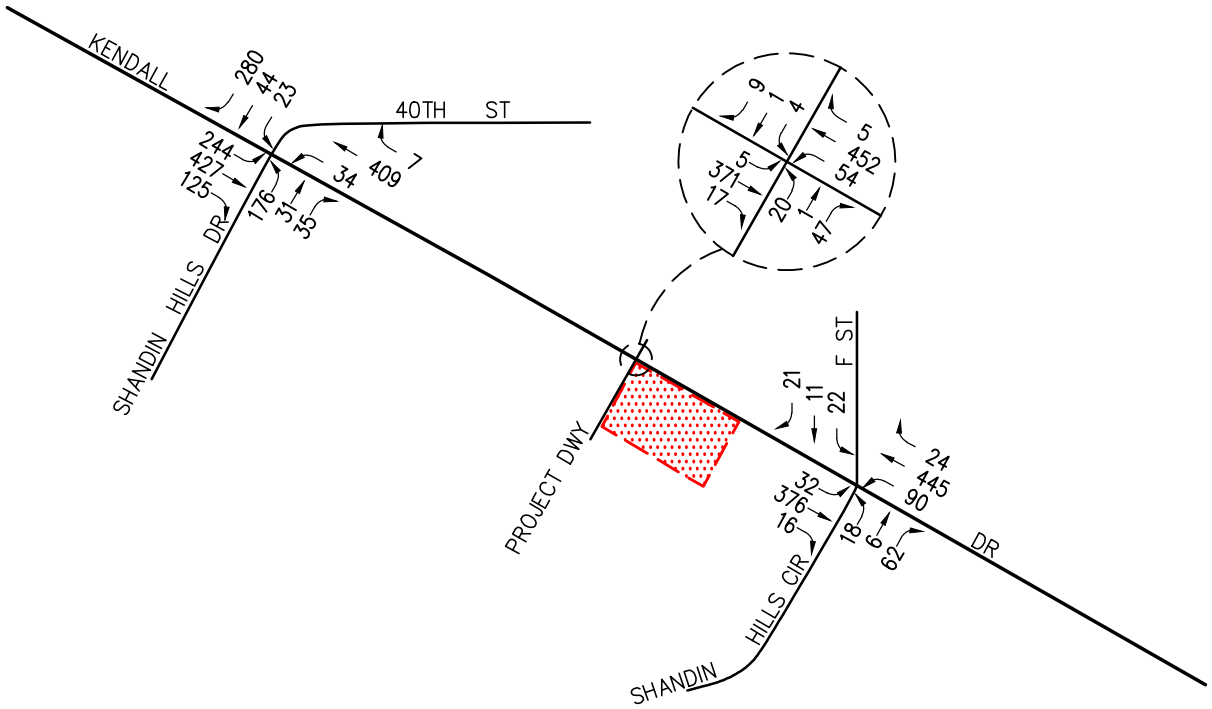
KEY

= PROJECT SITE

FIGURE 3-2

EXISTING AM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO



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KEY

= PROJECT SITE

FIGURE 3-3

EXISTING PM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO

Appendix B contains the detailed peak hour traffic count sheets for the key intersections evaluated in this report.

3.5 Level of Service (LOS) Analysis Methodologies

AM and PM peak hour operating conditions for the key study intersections were evaluated using the methodology outlined in *Chapter 19 of the Highway Capacity Manual 7 (HCM 7)* for signalized intersections, the methodology outlined in *Chapter 20 of the HCM 7* for two-way stop-controlled intersections.

3.5.1 Highway Capacity Manual 7 (HCM 7) Method of Analysis (Signalized Intersections)

Based on the HCM operations method of analysis, level of service for signalized intersections and approaches is defined in terms of control delay, which is a measure of the increase in travel time due to traffic signal control, driver discomfort and fuel consumption. Control delay includes the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue and the time needed for vehicles to accelerate to their desired speed. LOS criteria for traffic signals are stated in terms of the control delay in seconds per vehicle. The LOS thresholds established for the automobile mode at a signalized intersection are shown in ***Table 3-1***.

3.5.2 Highway Capacity Manual 7 (HCM 7) Method of Analysis (Unsignalized Intersections)

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay. Unsignalized intersections are also associated with more uncertainty for users, as delays are less predictable, which can reduce users' delay tolerance.

3.5.2.1 Two-Way Stop-Controlled Intersections

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value ranges for two-way stop-controlled intersections are shown in ***Table 3-2***.

3.6 Impact Criteria and Thresholds

According to the *City of San Bernardino Traffic Impact Analysis Guidelines,* dated August 2020, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours. Therefore, any intersection operating at LOS E or LOS F is considered deficient/unsatisfactory.

- For signalized intersections, intersection operations are considered to be deficient when any of the following changes in the volume to capacity (V/C) ratios occur between the "without project" and the "with project" conditions:

LOS Without Project	V/C Difference
C	> 0.0400
D	> 0.0200
E, F	> 0.0100

Given that the City of San Bernardino does not have specific impact criteria for unsignalized intersections, this report defines the following impact criteria for unsignalized intersections.

- An unsignalized intersection is considered to be deficient if the project causes an intersection at LOS D or better to degrade to LOS E or LOS F, and the traffic signal warrant analysis determines that a traffic signal is justified.

TABLE 3-1

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[1]

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and ≤ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and ≤ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Very long traffic delays This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	≥ 80.0	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

[1] Source: *Highway Capacity Manual 7*, Chapter 19: Signalized Intersections.

TABLE 3-2

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM METHODOLOGY)[2]

Level of Service (LOS)	Highway Capacity Manual (HCM) Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

[2] Source: *Highway Capacity Manual 7*, Chapter 20: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

4.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations and/or rates to the Project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound Project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of Project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds.

Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway segments and intersection turning movements throughout the study area.

With the forecasting process complete and Project traffic assignments developed, the impact of the Project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast Project traffic. If necessary, the need for site-specific and/or cumulative local area improvements can then be evaluated.

5.0 PROJECT TRAFFIC CHARACTERISTICS

5.1 Project Trip Generation Forecast

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 11th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2021].

Table 5-1 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed Project and presents the forecast daily and peak hour project traffic volumes for a "typical" weekday. As shown in the upper portion of *Table 5-1,* the trip generation potential of the proposed Project has been estimated using ITE Land Use 937: Coffee/Donut Shop with Drive-Through Window trip rates.

A review of the last row of *Table 5-1* indicates that the proposed Project is forecast to generate approximately 531 net daily trips, with 87 net trips (44 inbound, 43 outbound) produced in the AM peak hour and 38 net trips (19 inbound, 19 outbound) produced in the PM peak hour on a "typical" weekday.

It should be noted that the aforementioned overall trip generation includes adjustments for pass-by to account for trips that are already in the everyday traffic stream on the adjoining streets (i.e. Kendall Drive) and will stop as they pass by the Project site as a matter of convenience on their path to another destination. The pass-by reduction factors utilized are summarized in the footnotes of *Table 5-1*. It should also be noted that the trip generation methodology and forecasts were approved by City of San Bernardino staff prior to proceeding with further analysis.

5.2 Project Trip Distribution and Assignment

The Project directional trip distribution pattern is presented in ***Figure 5-1***. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- the site's proximity to major traffic carriers,
- expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals, and
- ingress/egress availability at the Project site.

It should be noted that the Project trip distribution pattern was submitted to City staff for their review and approval prior to proceeding with further analyses.

The anticipated AM and PM peak hour Project traffic volumes at the three (3) key study intersections are presented in ***Figures 5-2*** and ***5-3***, respectively. The traffic volume assignments presented in the above-mentioned figures reflect the Project trip distribution characteristics shown in *Figure 5-1* and the Project trip generation forecast presented in *Table 5-1*.

TABLE 5-1

PROJECT TRIP GENERATION RATES AND FORECAST[3]

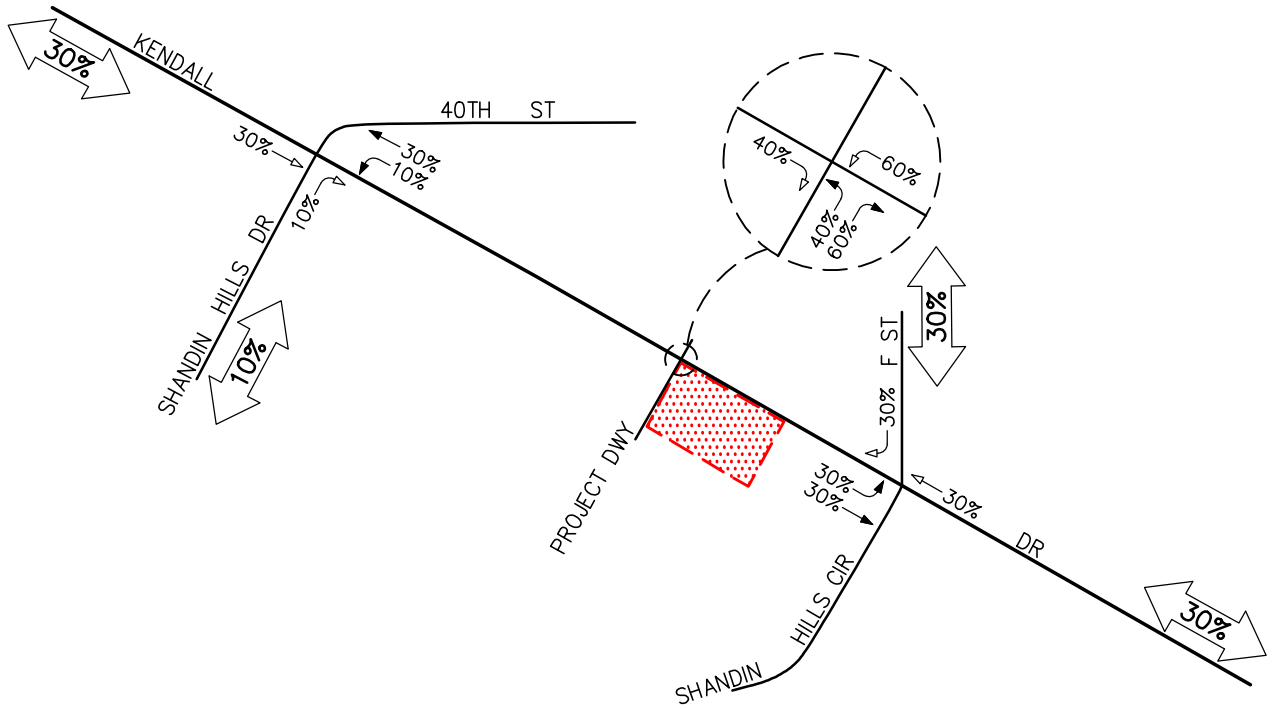
ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Generation Rates:							
▪ 937: Coffee/Donut Shop With Drive-Through Window (TE/TSF)	533.57	51%	49%	85.88	50%	50%	38.99
Proposed Project Generation Forecast:							
▪ Starbucks with Drive-Thru (1,990 SF)	1,062	87	84	171	39	39	78
Pass-By (Daily: 50%, AM: 49%, PM: 50%)[4]	-531	-43	-41	-84	-20	-20	-40
Total Project Trip Generation Forecast	**531**	**44**	**43**	**87**	**19**	**19**	**38**

Notes:

- TE/TSF = Trip ends per thousand square feet

[3] Source*: Trip Generation, 11th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2021)].

[4] Pass-By Trips are trips made as intermediate stops on the way from an origin to a primary trip destination. Pass-by trips are attracted from traffic passing the site on adjacent streets, which contain direct access to the generator. For this analysis, the pass-by reduction factors were provided by the City of San Bernardino Staff.



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

= INBOUND PERCENTAGE

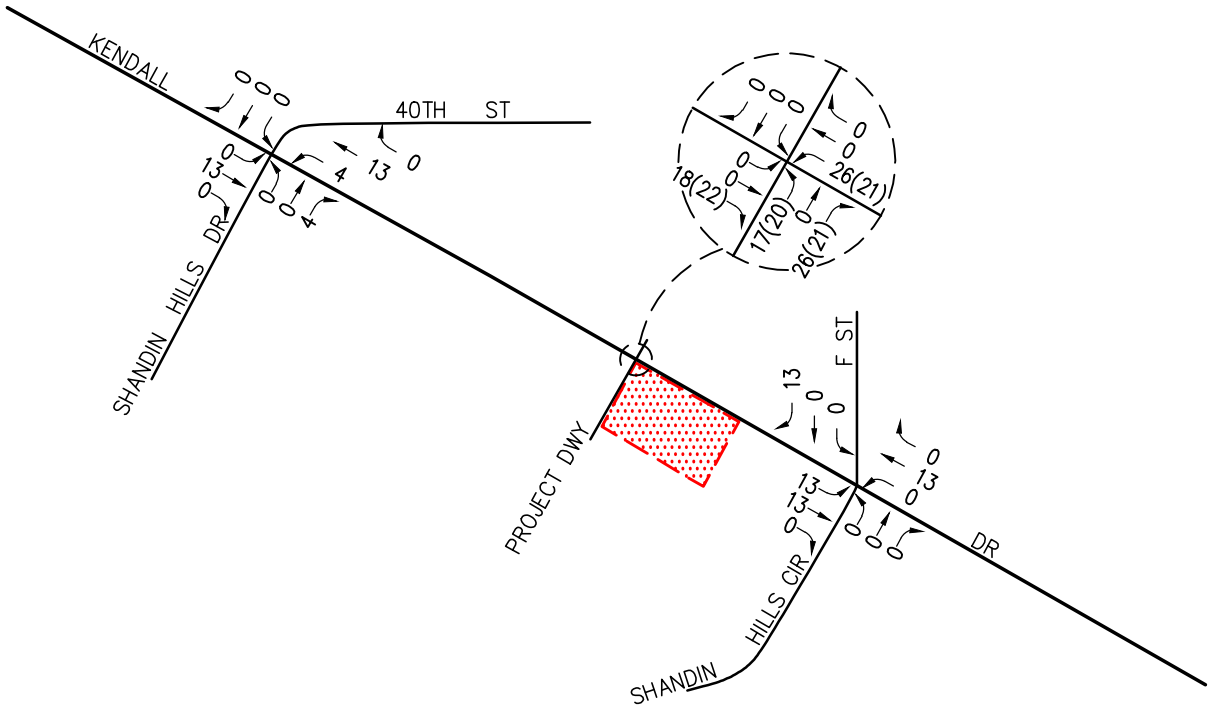
= OUTBOUND PERCENTAGE

= PROJECT SITE

FIGURE 5-1

PROJECT TRAFFIC DISTRIBUTION PATTERN

STARBUCKS, SAN BERNARDINO



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

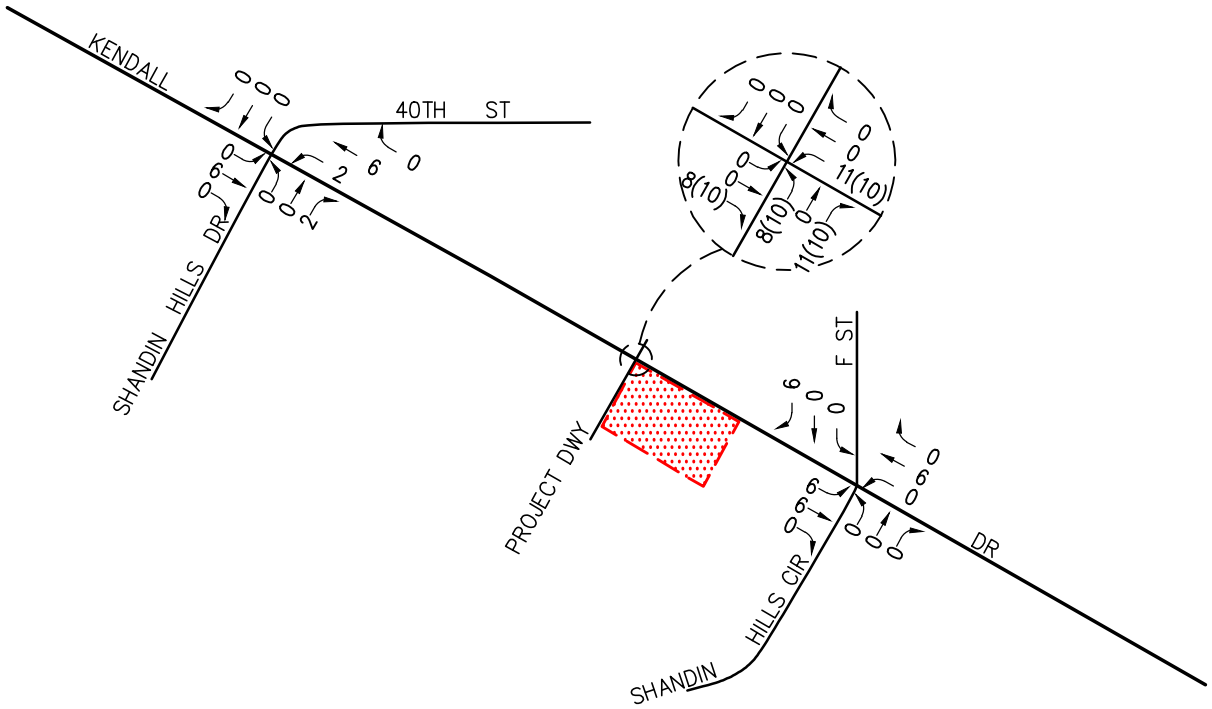
(XX) = PASS-BY TRIPS

= PROJECT SITE

FIGURE 5-2

AM PEAK HOUR PROJECT TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

(XX) = PASS-BY TRIPS

= PROJECT SITE

FIGURE 5-3

PM PEAK HOUR PROJECT TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO

6.0 FUTURE TRAFFIC CONDITIONS

6.1 Existing With Project Traffic Volumes

The estimates of Project generated traffic volumes were added to the Existing traffic conditions to develop traffic projections for Existing With Project traffic conditions. ***Figures 6-1*** and ***6-2*** present the anticipated AM and PM peak hour Existing With Project traffic volumes, respectively, at the three (3) key study intersections.

6.2 Year 2024 Without Project Traffic Volumes

6.2.1 Ambient Growth Traffic

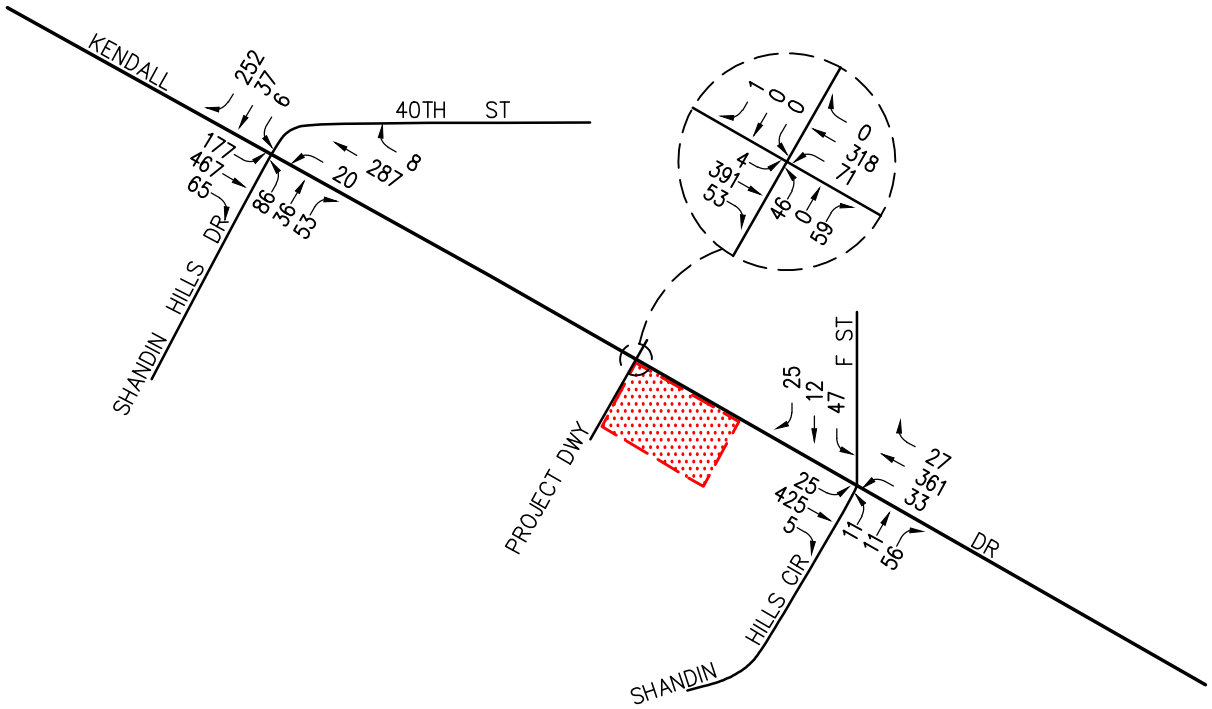
Near-term horizon year, traffic growth estimates have been calculated using an ambient growth factor. The ambient growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The application of the three percent (3.0%) annual growth rate to Year 2023 baseline traffic volumes results in a three percent (3.0%) growth in existing baseline volumes at the three (3) key study intersections to horizon Year 2024.

6.2.2 Cumulative Projects Traffic

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed Project, the status of other known development projects (cumulative projects) in the vicinity of the proposed Project has been researched at the City of San Bernardino. With this information, the potential impact of the proposed Project can be evaluated within the context of the cumulative impact of all ongoing development. Based on our research, there are four (4) cumulative projects in the City of San Bernardino within the vicinity of the Project site. These four (4) planned and/or approved cumulative projects have been included as part of the cumulative background setting. The locations of the four (4) cumulative projects are presented in ***Figure 6-3***.

Table 6-1 presents the jurisdiction, description, and development totals for each of the four (4) cumulative projects. ***Table 6-2*** presents the resultant trip generation for the four (4) cumulative projects. As shown in *Table 6-2*, the cumulative projects are expected to generate 6,918 daily trips (one half arriving, one half departing), with 395 trips (203 inbound and 192 outbound) forecast during the AM peak hour and 335 trips (172 inbound and 163 outbound) forecast during the PM peak hour on a "typical" weekday. The anticipated AM and PM peak hour cumulative projects traffic volumes at the three (3) key study intersections are presented in ***Figures 6-4*** and ***6-5***, respectively.

Figures 6-6 and ***6-7*** present Year 2024 Without Project AM and PM peak hour traffic volumes at the three (3) key study intersections, respectively. It should be noted that the Year 2024 Without Project traffic volumes include ambient traffic growth as well as the traffic from the four (4) cumulative projects.



LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

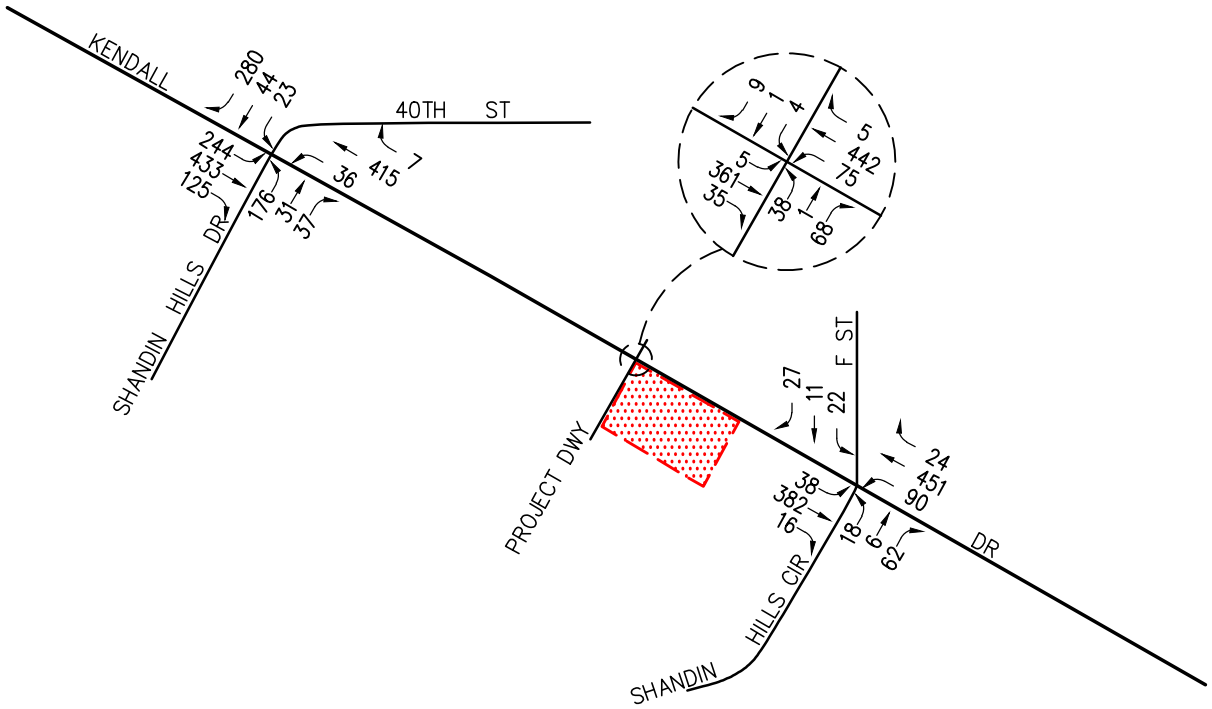
KEY

= PROJECT SITE

FIGURE 6-1

EXISTING WITH PROJECT AM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

= PROJECT SITE

FIGURE 6-2

EXISTING WITH PROJECT PM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO

It should again be emphasized that because this traffic impact analysis utilizes both an ambient growth factor along with a list of cumulative projects approach to analyze cumulative impacts, this traffic impact analysis is highly conservative and would tend to overstate cumulative traffic impacts.

6.3 Year 2024 With Project Traffic Volumes

The estimates of Project generated traffic volumes were added to the Year 2024 Without Project traffic conditions to develop traffic projections for Year 2024 With Project traffic conditions. ***Figures 6-8*** and ***6-9*** present the anticipated AM and PM peak hour Year 2024 With Project traffic volumes at the three (3) key study intersections, respectively.

TABLE 6-1
LOCATION AND DESCRIPTION OF CUMULATIVE PROJECTS[5]

No.	Cumulative Project	Location/Address	Description
City of San Bernardino			
1.	University Parkway Project	4200 N. University Parkway	9,321 SF restaurants with drive-throughs and 5,137 SF automated car wash
2.	Checkers Drive-Thru	164 and 170 40th Street	1,011 SF fast-food restaurant with drive-through
3.	Dollar General	3191 E Street	10,542 SF retail
4.	Chevron Service Station & Circle K	847 Highland Avenue	Demolition of 8 VFP gas station with 500 SF convenience store, and 1,200 SF automobile parts and service center and construction of 12 VFP gas station with 3,880 SF convenience store, 2,040 SF automobile parts and service center, and 3,880 SF automated car wash

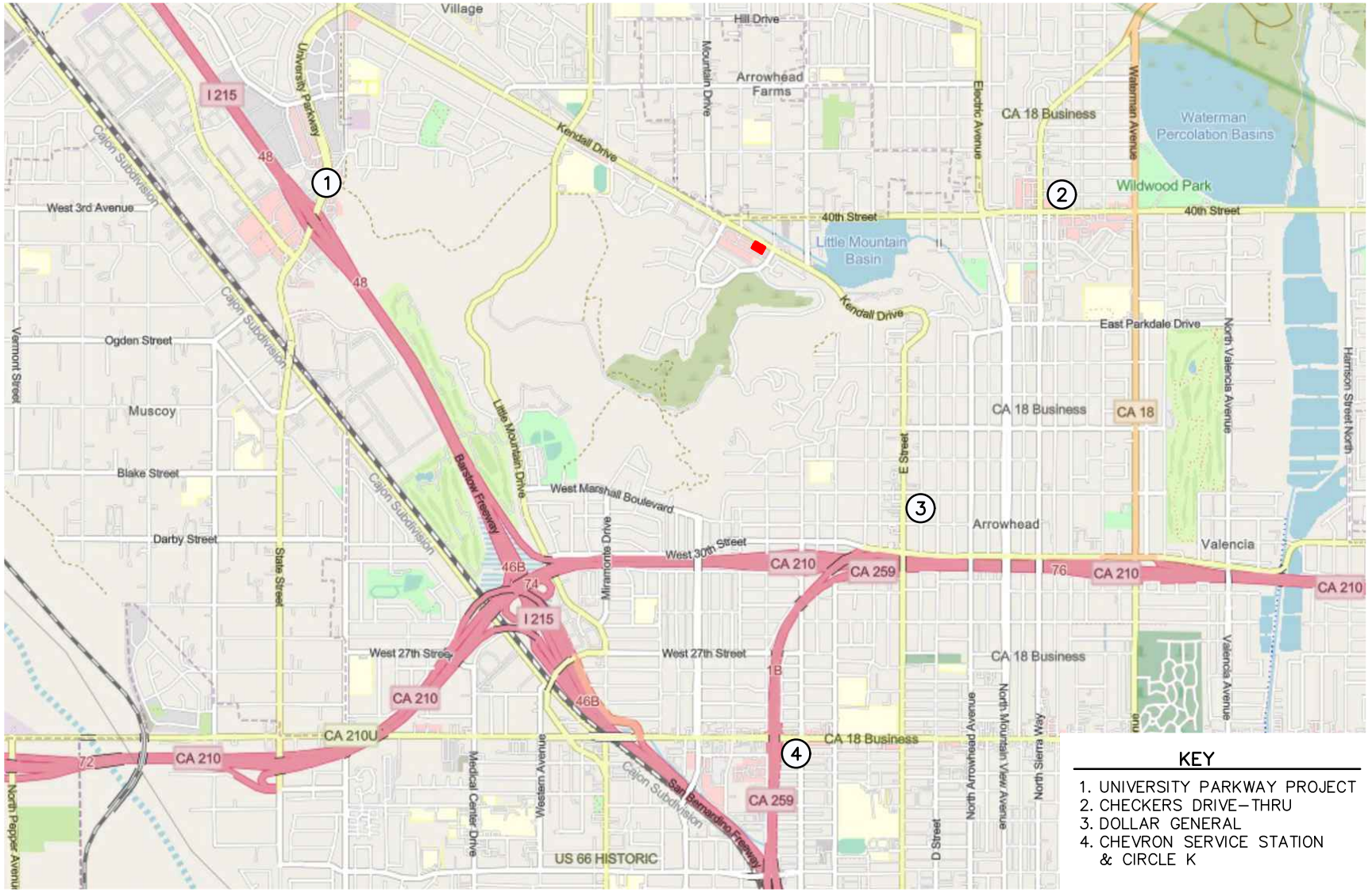
Notes:
- SF = Square-feet
- VFP = Vehicle Fueling Positions

[5] Source: City of San Bernardino Planning Department.

TABLE 6-2
CUMULATIVE PROJECTS TRAFFIC GENERATION FORECAST[6]

Cumulative Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
1. University Parkway Project	3,815	134	129	263	100	94	194
2. Checkers Drive-Thru	355	11	11	22	8	7	15
3. Dollar General	517	13	9	22	21	20	41
4. Chevron Service Station & Circle K	2,231	45	43	88	43	42	85
Cumulative Projects Total Trip Generation Potential	**6,918**	**203**	**192**	**395**	**172**	**163**	**335**

[6] Unless otherwise noted, Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).



KEY

1. UNIVERSITY PARKWAY PROJECT
2. CHECKERS DRIVE-THRU
3. DOLLAR GENERAL
4. CHEVRON SERVICE STATION & CIRCLE K

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N NO SCALE

SOURCE: OPEN STREETS

KEY

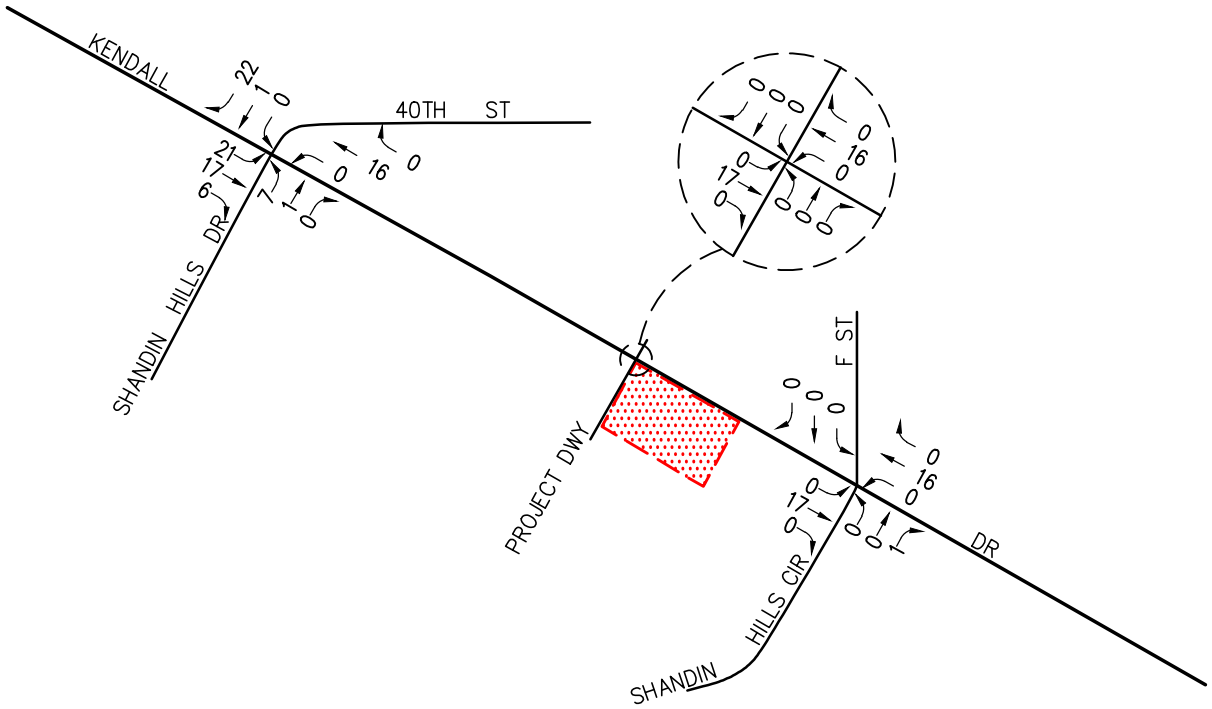
(#) = CUMULATIVE PROJECT LOCATION

= PROJECT SITE

FIGURE 6-3

LOCATION OF CUMULATIVE PROJECTS

STARBUCKS, SAN BERNARDINO



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N NO SCALE

KEY

= PROJECT SITE

FIGURE 6-4

AM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO

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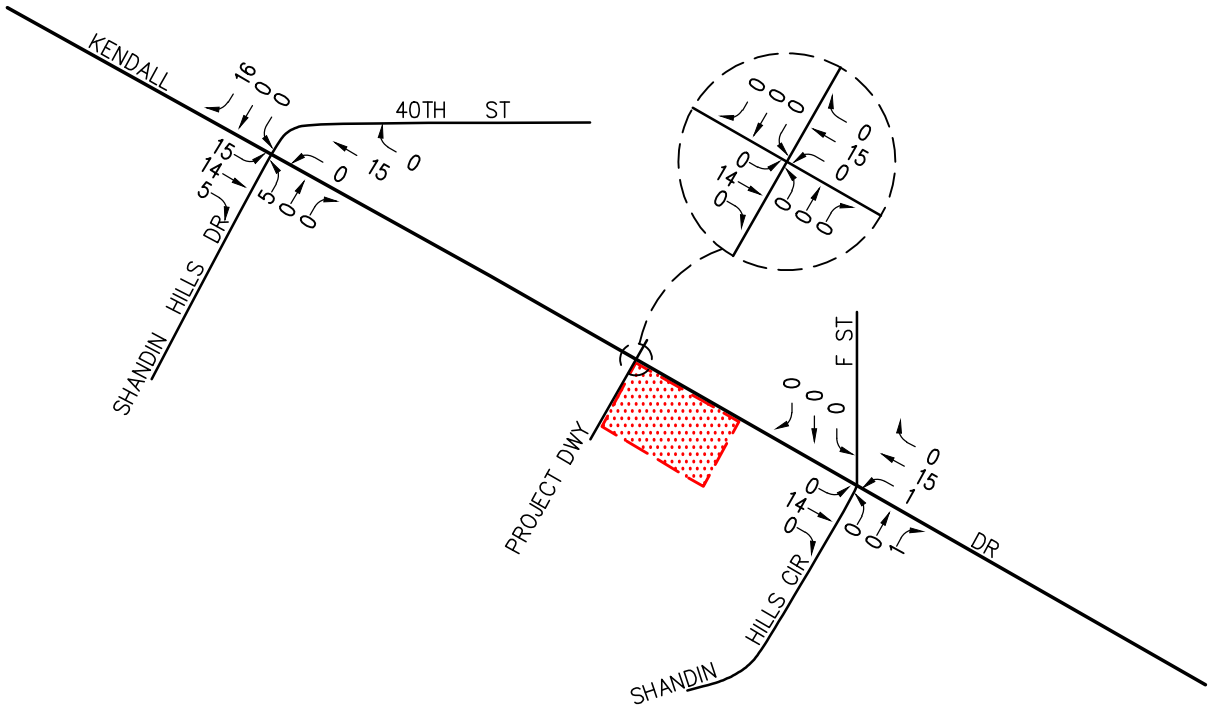

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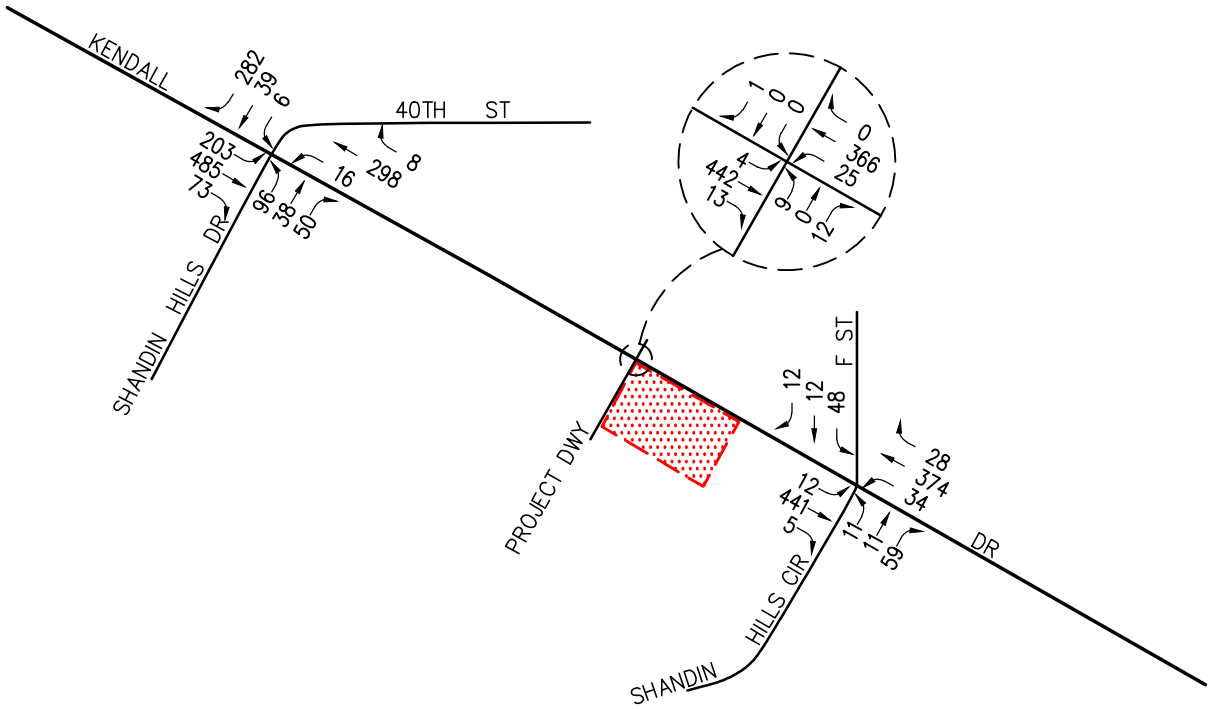
KEY

= PROJECT SITE

FIGURE 6-5

PM PEAK HOUR CUMULATIVE PROJECTS TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO



KEY

= PROJECT SITE

N NO SCALE

FIGURE 6-6

YEAR 2024 WITHOUT PROJECT AM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO

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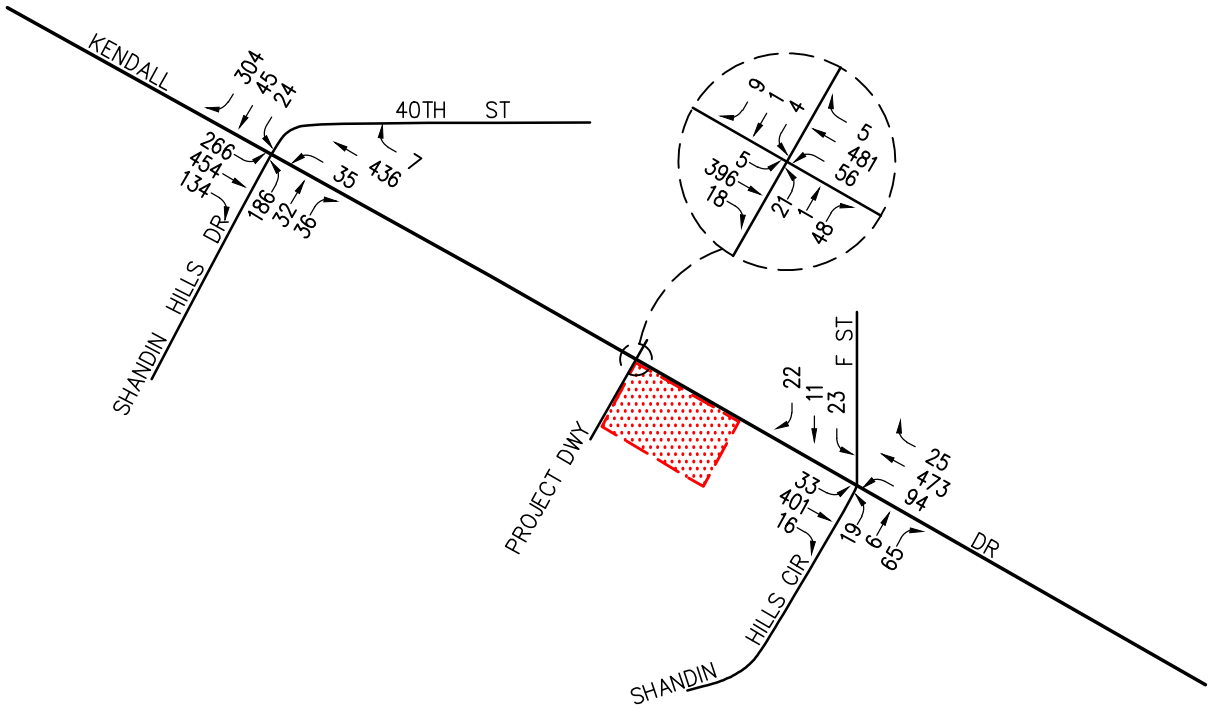

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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

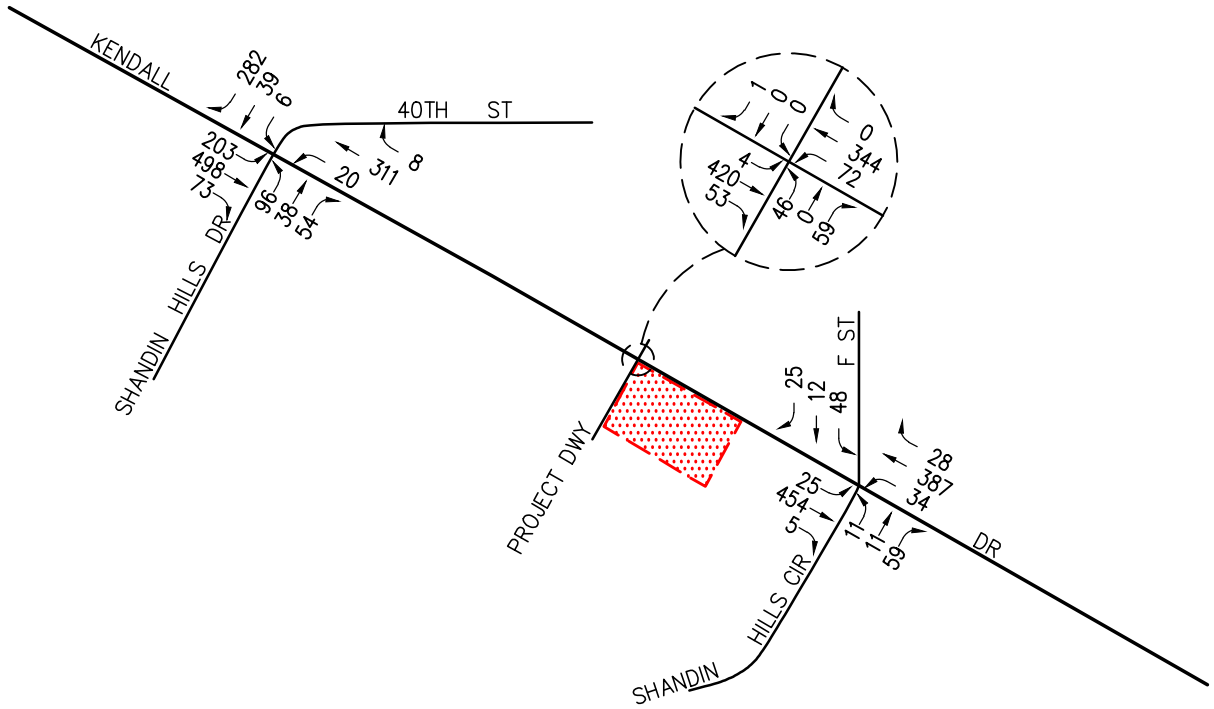
KEY

= PROJECT SITE

FIGURE 6-7

YEAR 2024 WITHOUT PROJECT PM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO



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LINSCOTT LAW & GREENSPAN engineers

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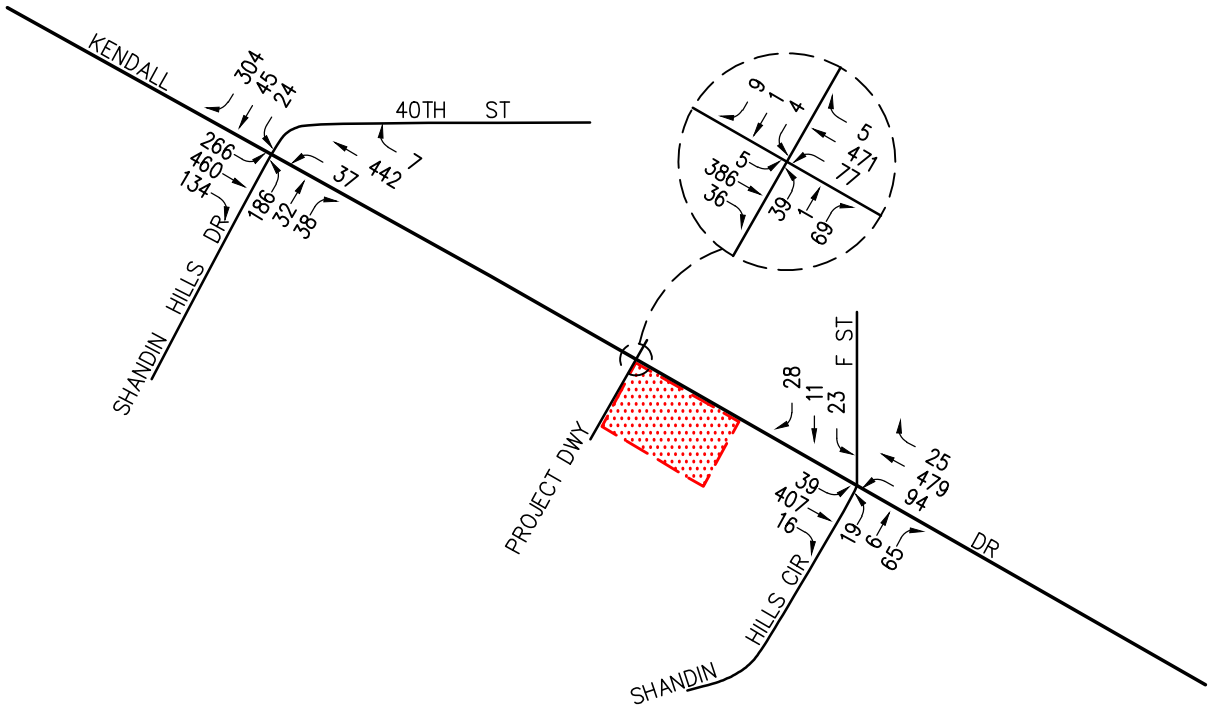
KEY

= PROJECT SITE

FIGURE 6-8

YEAR 2024 WITH PROJECT AM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO



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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

= PROJECT SITE

FIGURE 6-9

YEAR 2024 WITH PROJECT PM PEAK HOUR TRAFFIC VOLUMES

STARBUCKS, SAN BERNARDINO

7.0 EXISTING CONDITIONS TRAFFIC IMPACT ANALYSIS

The existing conditions analysis establishes the basis for the future forecasts for the Project. This analysis was based on existing intersection counts. The existing conditions analysis reflects these counts as well as existing lane configurations for all analyzed intersections.

7.1 Existing Conditions Intersection Capacity Analysis

Table 7-1 summarizes the peak hour Level of Service results at the three (3) key study intersections for existing traffic conditions, without and with the proposed Project. The first column (1) of Delay/LOS values in *Table 7-1* presents a summary of Existing AM and PM peak hour traffic conditions. The second column (2) presents forecast Existing With Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will cause an operational deficiency based on the LOS criteria defined in this report. The fourth column (4) indicates the anticipated operating conditions with implementation of recommended improvements.

7.1.1 Existing Traffic Conditions

Review of column (1) of *Table 7-1* indicates that for Existing traffic conditions, all three (3) key study intersections currently operate at acceptable LOS D or better during the AM and PM peak hours.

7.1.2 Existing With Project Traffic Conditions

Review of columns (2) and (3) of *Table 7-1* indicates that all three (3) key study intersections are forecast to continue to operate at an acceptable LOS during the AM and PM peak hours with the addition of Project generated traffic to existing traffic.

Appendix C contains the Delay/LOS calculation worksheets for Existing and Existing With Project Traffic Conditions.

TABLE 7-1

EXISTING WITH PROJECT CONDITIONS PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersection	Min. Acceptable LOS	Control Type	Time Period	(1) Existing Traffic Conditions			(2) Existing With Project Traffic Conditions			(3) Operational Deficiency		(4) Existing With Project With Improvements		
				Delay (s/v)	LOS	V/C	Delay (s/v)	LOS	V/C	V/C Inc.	Yes/No	Delay (s/v)	LOS	V/C
1. Shandin Hills Drive/40th Street at Kendall Drive	D	8∅ Traffic Signal	AM	26.4	C	0.423	26.5	C	0.428	0.005	No	--	--	--
			PM	29.3	C	0.536	29.3	C	0.538	0.002	No	--	--	--
2. Project Driveway at Kendall Drive	D	Two-Way Stop	AM	11.2	B	0.021	12.9	B	0.117	0.096	No	--	--	--
			PM	11.5	B	0.003	12.3	B	0.003	0.000	No	--	--	--
3. Shandin Hills Circle/F Street Kendall Drive	D	6∅ Traffic Signal	AM	34.8	C	0.230	35.4	B	0.244	0.014	No	--	--	--
			PM	28.0	D	0.236	38.0	D	0.241	0.005	No	--	--	--

Notes:

- s/v = seconds per vehicle (delay)
- LOS = Level of Service
- **Bold Delay/LOS values** indicate adverse service levels based on the LOS standards as defined in this report

8.0 YEAR 2024 WITH PROJECT ANALYSIS

The relative impacts of the added Project traffic volumes generated by the proposed Project during the AM and PM peak hours, was evaluated based on analysis of future Year 2024 operating conditions at the three (3) key study intersections, without and with the proposed Project. The previously discussed capacity analysis procedures were utilized to investigate the future HCM and V/C relationships and service level characteristics at each study intersection. The potential impacts of the Project at each key intersection was then evaluated using the traffic impact criteria mentioned in this report.

8.1 Year 2024 Conditions Intersection Capacity Analysis

Table 8-1 summarizes the AM and PM peak hour Level of Service results at the three (3) key study intersections for Year 2024 traffic conditions. The first column (1) of Delay/LOS values in *Table 8-1* presents forecast Year 2024 Without Project traffic conditions. The second column (2) identifies forecast Year 2024 With Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will cause an operational deficiency based on the LOS criteria defined in this report. The fourth column (4) indicates the anticipated operating conditions with implementation of recommended improvements.

8.1.1 Year 2024 Without Project Traffic Conditions

An analysis of future (Year 2024) cumulative traffic conditions indicates that all three (3) key study intersections are forecast to operate at acceptable levels of service during the AM and PM peak hours with the addition of ambient traffic growth and cumulative projects traffic.

8.1.2 Year 2024 With Project Traffic Conditions

Review of columns (2) and (3) of *Table 8-1* indicates that all three (3) key study intersections are forecast to continue to operate at an acceptable LOS during the AM and PM peak hours with the addition of Project generated traffic in the horizon Year 2024.

Appendix D contains the Delay/LOS calculation worksheets for Year 2024 Traffic Conditions and Year 2024 With Project Traffic Conditions.

TABLE 8-1

YEAR 2024 WITH PROJECT CONDITIONS PEAK HOUR INTERSECTION CAPACITY ANALYSIS SUMMARY

Key Intersection	Min. Accept. LOS	Control Type	Time Period	(1) Year 2024 Without Project Traffic Conditions			(2) Year 2024 With Project Traffic Conditions			(3) Operational Deficiency		(4) Year 2024 With Project With Improvements		
				Delay (s/v)	LOS	V/C	Delay (s/v)	LOS	V/C	V/C Inc.	Yes/No	Delay (s/v)	LOS	V/C
1. Shandin Hills Drive/40th Street at Kendall Drive	D	8∅ Traffic Signal	AM	26.7	C	0.467	26.8	C	0.473	0.006	No	--	--	--
			PM	29.9	C	0.575	29.9	C	0.577	0.002	No	--	--	--
2. Project Driveway at Kendall Drive	D	Two-Way Stop	AM	11.5	B	0.022	13.3	B	0.122	0.100	No	--	--	--
			PM	11.7	B	0.003	12.7	B	0.003	0.000	No	--	--	--
3. Shandin Hills Circle/F Street Kendall Drive	D	6∅ Traffic Signal	AM	34.5	C	0.242	35.1	D	0.256	0.014	No	--	--	--
			PM	37.9	D	0.250	37.9	D	0.255	0.005	No	--	--	--

Notes:

- s/v = seconds per vehicle (delay)
- LOS = Level of Service
- **Bold Delay/LOS values** indicate adverse service levels based on the LOS standards as defined in this report

9.0 SITE ACCESS AND INTERNAL CIRCULATION EVALUATION

9.1 Site Access

As shown previously in *Figure 2-2*, primary access to the proposed Project will be provided via one (1) full access unsignalized driveway located along Kendall Drive.

The level of service at the project driveway was previously summarized in *Table 8-1* for Year 2024 With Project traffic conditions. As indicated in *Table 8-1,* the project driveway on Kendall Drive is forecast to operate at an acceptable level of service during the AM and PM peak hours under Year 2024 With Project traffic conditions.

Appendix D contains the Delay/LOS calculation worksheets for the Year 2024 With Project.

9.2 Project Driveway Queuing Analysis

Table 9-1 presents the project driveway queuing analysis results for Year 2024 With Project traffic conditions. Review of *Table 9-1* indicates that adequate storage is provided to accommodate the forecast 95th percentile queues under Year 2024 With Project for all ingress and egress movements at the project driveway. In addition, as shown in *Table 10*-2, the 95th percentile queue for the eastbound shared through/right-turn lane and westbound left-turn movement on is nominal (essentially zero), but 25 feet is reported in the table to indicate a conservative result, which reflects one vehicle slowing to enter the driveway with nominal delay.

9.3 Internal Circulation Evaluation

The on-site circulation layout of the proposed Project as illustrated in *Figure 2-2* on an overall basis is adequate. Curb return radii appear adequate for passenger cars, service/delivery trucks and trash trucks. Based on our review of the project site plan, the overall layout does not create significant vehicle-pedestrian conflict points and project traffic is not anticipated to cause significant internal queuing/stacking at the Project driveways. It should be noted that store deliveries will occur within the last hour of store operation (i.e. 10 PM – 11 PM) and trash pick-up access and location has been approved by the Waste Management company.

TABLE 9-1
PROJECT DRIVEWAY PEAK HOUR QUEUING ANALYSIS[7]

Key Intersection	(1) Year 2024 With Project Traffic Conditions			
	AM Peak Hour		PM Peak Hour	
	Max. Queue (feet)	Adequate Storage (Yes / No)	Max Queue (feet)	Adequate Storage (Yes / No)
2. Project Driveway at Kendall Drive				
Northbound Shared Left/Right-Turn	25’	Yes	25’	Yes
Eastbound Shared Through/Right-Turn	25’ [a]	Yes	25’ [a]	Yes
Westbound Left-Turn	25’ [a]	Yes	25’ [a]	Yes

Note:

[a] = It should be noted that the movement delay is nominal and the queue reported for this uncontrolled movement is also nominal, but 25 feet is reported in the table to indicate a conservative result, which reflects one vehicle slowing to enter the driveway.

[7] Queue is based on the *95th Percentile Queue* and is reported in total queue length (feet) per lane for unsignalized intersections.

10.0 PLANNED AND RECOMMENDED IMPROVEMENTS

For those intersections where projected traffic volumes are expected to result in deficiencies, this report recommends traffic improvements that change the intersection geometry to increase capacity. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) roadways to specific approaches of a key intersection. The identified improvements are expected to:

- Address the impact of existing traffic, Project traffic and future non-project (ambient traffic growth and cumulative) traffic, and
- Improve Levels of Service to an acceptable range and/or to pre-project conditions.

10.1 Existing With Project Traffic Conditions Recommended Improvements

The results of the Existing With Project intersection capacity analysis indicate that the proposed Project will not adversely impact any of the three (3) key study intersections. As such, improvements are not recommended under Existing With Project traffic conditions.

10.2 Year 2024 With Project Traffic Conditions Recommended Improvements

The results of the Year 2024 With Project intersection capacity analysis indicate that the proposed Project will not adversely impact any of the three (3) key study intersections. As such, improvements are not recommended under Year 2024 With Project traffic conditions.

11.0 DRIVE-THROUGH QUEUEING EVALUATION

A drive-through queuing evaluation has been completed to ensure that the proposed Project will not impact internal circulation of the existing retail center and to ensure that the proposed drive-through lane will provide adequate storage. To confirm the adequacy of storage provided for the proposed drive-through lane, existing queuing observations from the following three (3) existing Starbucks stores were utilized.

- Starbucks Site #1, located at 23622 Rockfield Boulevard, Rancho Santa Margarita
- Starbucks Site #2, located at 7876 Valley View Street, Buena Park
- Starbucks Site #3, located at 1224 N. Harbor Boulevard, Anaheim

These Starbucks stores are similar in size, design, and setting to the proposed Project and have been utilized in other jurisdictions in the Region. Furthermore, the results are consistent with Starbucks standards of providing storage for a minimum of 12 vehicles. Lastly, the proposed Starbucks would presumably reduce the drive through queuing demand at the existing Starbucks within 1½ miles to the east along East 40th Street, such that any local counts would likely be lesser in the future and not be specifically applicable.

Drive-through queuing observations were conducted at the three (3) locations on three weekdays (i.e. Wednesday, Thursday and Friday) during the morning, mid-day and evening service periods, generally between the hours of 7:00 AM and 9:00 AM, 11:00 AM and 1:00 PM, and 4:00 PM and 7:00 PM. The queuing observations for Site #1 and Site #2 were conducted on Wednesday April 6, 2022, Thursday April 7, 2022 and Friday April 8, 2022. The queuing observations for Site #3 were conducted on Wednesday September 29, 2021, Thursday September 30, 2021 and Friday October 1, 2021. In order to provide a detailed queuing analysis, the vehicular queues observed at the three (3) sites were recorded at 1-minute intervals.

Tables 11-1 through ***11-3*** summarize the queue frequency that was observed at the three (3) existing sites for the weekday (Wednesday), weekday (Thursday) and weekday (Friday) peak periods, respectively. Our evaluation of this data indicates that on average during the weekday (Wednesday) peak periods, an average queue of 4 vehicles in the drive-through lane can be expected, with an 85th percentile queue of approximately 8 vehicles, a 95th percentile queue of approximately 10 vehicles and a max queue of approximately 13 vehicles. Similarly, our evaluation of this data indicates that on average during the weekday (Thursday) peak periods, an average queue of 4 vehicles in the drive-through lane can be expected, with an 85th percentile queue of approximately 9 vehicles, a 95th percentile queue of approximately 12 vehicles and a max queue of approximately 15 vehicles. In addition, our evaluation of this data also indicates that on average during the weekday (Friday) peak periods, an average queue of 5 vehicles in the drive-through lane can be expected, with an 85th percentile queue of approximately 9 vehicles, a 95th percentile queue of approximately 11 vehicles and a max queue of approximately 14 vehicles. It should be noted that the 85th percentile queue is generally utilized when designing/sizing the length of the proposed drive-through lane.

In conclusion, the three (3) existing study sites experienced an 85th percentile queue range between 8 vehicles and 9 vehicles. Based on this empirical data, the expected queue of the proposed Project will likely be 9 vehicles or less 85% of the time. As shown in *Figure 2-2,* the proposed Project will provide storage for up to 14 vehicles within the proposed drive-through lane without encroaching into the drive aisle. Therefore, the 85th percentile expected queues can be accommodated without interfering with internal circulation or causing congestion to the drive aisles. It should be noted that the proposed 14 vehicle storage drive-through lane can also accommodate the observed 95th percentile queues (i.e. queue range between 10 vehicles and 12 vehicles). Based on this empirical data, the expected queue of the proposed Project will likely be 12 vehicles or less 95% of the time. Lastly, it should be noted that the observed maximum queue of 15 vehicles, which only occurred two times and only at one site throughout the survey days, can easily be accommodated within adjacent drive aisle without affecting circulation within the existing shopping center. However, should the queue exceed the drive-through lane storage, Starbucks will develop a contingency plan and Staff will be deployed to manage the queue within the adjacent drive aisle.

TABLE 11-1

STARBUCKS QUEUING ANALYSIS SUMMARY – WEDNESDAY[8]

Queue Length (Vehicles)	Queue Frequency of Vehicles Observed				Cumulative	
	Site #1 23622 Rockfield Boulevard	Site #2 7876 Valley View Street	Site #3 1224 N. Harbor Boulevard	Total	Frequency	Percentage
0	39	58	5	102	102	8.1%
1	47	80	23	150	252	20.0%
2	39	37	44	120	372	29.5%
3	39	52	38	129	501	39.8%
4	35	54	41	130	631	50.1%
5	51	52	51	154	785	62.3%
6	50	38	45	133	918	72.9%
7	27	32	49	108	1,026	81.4%
8	30	13	49	92	1,118	88.7%
9	32	3	38	73	1,191	94.5%
10	10	1	21	32	1,223	97.1%
11	11	0	10	21	1,244	98.7%
12	8	0	5	13	1,257	99.8%
13	2	0	1	3	1,260	100.0%
Total	**420**	**420**	**420**	**1,260**	**--**	**--**
Average	**5.0**	**3.0**	**6.0**	**4.0**	**--**	**--**
85th Percentile	**8.0**	**6.0**	**9.0**	**8.0**	**--**	**--**
95th Percentile	**10.0**	**7.0**	**10.0**	**10.0**	**--**	**--**
Max	**13.0**	**10.0**	**13.0**	**13.0**	**--**	**--**

[8] Source: Queuing surveys conducted every minute, between the hours of 7:00 AM to 9:00 AM, 11:00 AM to 1:00 PM, and 4:00 PM to 7:00 PM on Wednesday, April 6, 2022 for sites #1 and #2, and on Wednesday, September 29, 2021 for site #3.

TABLE 11-2
STARBUCKS QUEUING ANALYSIS SUMMARY – THURSDAY[9]

Queue Length (Vehicles)	Queue Frequency of Vehicles Observed				Cumulative	
	Site #1 23622 Rockfield Boulevard	Site #2 7876 Valley View Street	Site #3 1224 N. Harbor Boulevard	Total	Frequency	Percentage
0	21	42	8	71	71	5.6%
1	41	93	23	157	228	18.1%
2	41	73	44	158	386	30.6%
3	26	57	65	148	534	42.4%
4	29	48	76	153	687	54.5%
5	33	35	79	147	834	66.2%
6	19	25	53	97	931	73.9%
7	18	14	20	52	983	78.0%
8	32	27	15	74	1,057	83.9%
9	35	6	26	67	1,124	89.2%
10	29	0	6	35	1,159	92.0%
11	26	0	5	31	1,190	94.4%
12	22	0	0	22	1,212	96.2%
13	24	0	0	24	1,236	98.1%
14	22	0	0	22	1,258	99.8%
15	2	0	0	2	1,260	100.0%
Total	**420**	**420**	**420**	**1,260**	**--**	**--**
Average	**7.0**	**3.0**	**5.0**	**4.0**	**--**	**--**
85th Percentile	**12.0**	**6.0**	**7.0**	**9.0**	**--**	**--**
95th Percentile	**14.0**	**8.0**	**9.0**	**12.0**	**--**	**--**
Max	**15.0**	**9.0**	**11.0**	**15.0**	**--**	**--**

[9] Source: Queuing surveys conducted every minute, between the hours of 7:00 AM to 9:00 AM, 11:00 AM to 1:00 PM, and 4:00 PM to 7:00 PM on Thursday, April 7, 2022 for sites #1 and #2, and on Thursday, September 30, 2021 for site #3.

TABLE 11-3
STARBUCKS QUEUING ANALYSIS SUMMARY – FRIDAY[10]

Queue Length (Vehicles)	Queue Frequency of Vehicles Observed				Cumulative	
	Site #1 23622 Rockfield Boulevard	Site #2 7876 Valley View Street	Site #3 1224 N. Harbor Boulevard	Total	Frequency	Percentage
0	19	47	6	72	72	5.7%
1	10	66	34	110	182	14.4%
2	17	61	67	145	327	26.0%
3	33	54	56	143	470	37.3%
4	31	53	57	141	611	48.5%
5	32	24	38	94	705	56.0%
6	50	34	30	114	819	65.0%
7	35	35	19	89	908	72.1%
8	46	28	21	95	1,003	79.6%
9	66	11	18	95	1,098	87.1%
10	44	5	21	70	1,168	92.7%
11	28	2	16	46	1,214	96.3%
12	2	0	21	23	1,237	98.2%
13	7	0	11	18	1,255	99.6%
14	0	0	5	5	1,260	100.0%
Total	**420**	**420**	**420**	**1,260**	**--**	**--**
Average	**7.0**	**4.0**	**5.0**	**5.0**	**--**	**--**
85th Percentile	**10.0**	**7.0**	**10.0**	**9.0**	**--**	**--**
95th Percentile	**11.0**	**8.0**	**12.0**	**11.0**	**--**	**--**
Max	**13.0**	**11.0**	**14.0**	**14.0**	**--**	**--**

[10] Source: Queuing surveys conducted every minute, between the hours of 7:00 AM to 9:00 AM, 11:00 AM to 1:00 PM, and 4:00 PM to 7:00 PM on Friday, April 8, 2022 for sites #1 and #2, and on Friday, October 1, 2021 for site #3.

APPENDIX A

TRAFFIC STUDY SCOPE OF WORK

City of San Bernardino Public Works / Traffic Engineering Department
Traffic Scope Approval Form

To be completed by applicant consultant and approved by Public Works prior to start of study

Project Name: Project: Starbucks Drive-Thru
Name: Project: Starbucks
Address: Project: SWC Kendall Dr and Shandin Hills Cir
Description: Coffee and drinks drive-thru with seating (See Attachment 2)
Developer's Name: Fountainhead Shrugged, LLC
Address: 1401 Quail Street, Suite 100, Newport Beach, CA 92660
Telephone No. (949) 752-2515 Email address: fchu@fountainheaddev.com

Trip Generation Rates from ITE Latest Edition (See Attachment 3)

	Land Use (1)	Land Use (2)
Development Sq Ft	1,990	
ITE Land Use Code	937	
Daily Trips	1,062	
AM Peak Hour Trips		
Inbound	87	
Outbound	84	
Total	171	
PM Peak Hour Trips		
Inbound	39	
Outbound	39	
Total	78	

(Use Additional Sheet(s), if necessary)

Pass-by Trips (%), if applicable: 50% Daily / 49% AM / 50% PM

	Land Use (1)	Land Use (2)
ITE Land Use Code		
Daily Trips	-531	
AM Peak Hour Trips		
Inbound	-43	
Outbound	-41	
Total	-84	
PM Peak Hour Trips:		
Inbound	-20	
Outbound	-20	
Total	-40	

Project Opening Year: 2024 **Build-out Year:**

Study Intersections: (See Attachment 4)

1. Kendall Dr at 40th St/Shandin Hills Dr
2. Kendall Dr at Project Driveway
3. Kendall Dr at F St/Shandin Hills Cir
4.
5.
6.
7.
8.
9.
10.

(Use Additional Sheet(s) and Maps to show project Boundaries & Attach memo for project Description)

City of San Bernardino Public Works / Traffic Engineering Department
Traffic Scope Approval Form

To be completed by applicant consultant and approved by Public Works prior to start of study

Study Roadway Segments: 1 _____ 2 _____
3 _____ 4 _____
5 _____ 6 _____

Proposed Development Use: ☐ Residential ☒ Commercial ☐ Mixed Use ☐ Other

Software Methodology: ☐ Synchro ☐ HCS

Additional issues to be considered:
☐ Traffic calming measures ☐ Queuing Analysis
☐ Bike/Ped Accommodations ☐ Merge Analysis ☐ Gap Analysis
☐ Actuation/Coordination ☐ Safety Analysis ☐ Sight Distance Analysis

Is the project screened from VMT assessment? ☒ Yes ☐ No

VMT Screening Justification: Transit Priority Area, Low VMT Area, and Project Type screenings. See separate VMT Screening Memoarandum.

Ambient Growth Rate: 3 %

Trip Distribution: East 30 % West 30 % North 30 % South 10 %
(See Attachment 4)

Consultant Preparer's Name: Trevor Briggs

Address: 1100 W Town and County Rd, Suite 700; Orange, CA 92868

Telephone No. (714) 786-6117 **PE / TE License #:** C87664

Email Address: Trevor.Briggs@Kimley-Horn.com

Signature: Trevor Briggs **Date:** 07/10/2023

Approved By (Public Works Department):

Signature: _____ **Date:** 8/3/2023

Name: Azzam Jabsheh **Title:** Traffic Engineer

Submit a TIA

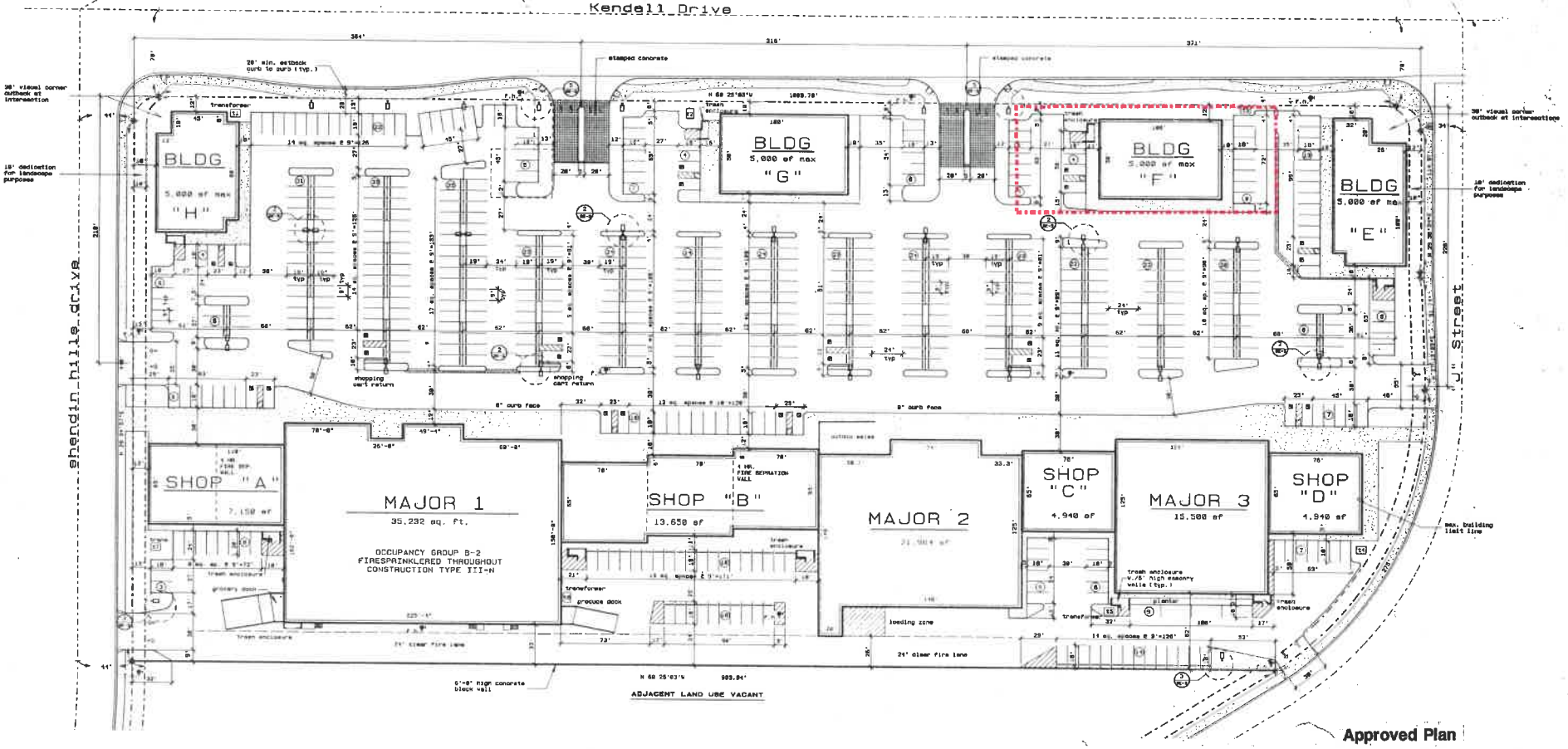
ATTACHMENT 1 - APPROVED SITE PLAN

AREA ANALYSIS

Total Site Area	466,092 sq. ft.
Total Building Area	123,376 sq. ft.
Land to Building Ratio	2.8/1
Parking Required	4/1000 = 493 spaces
Parking Provided	540 cars
Total Landscaping	38,594 sq. ft.
Lot Coverage	8.3% lot coverage

LEGAL DESCRIPTION

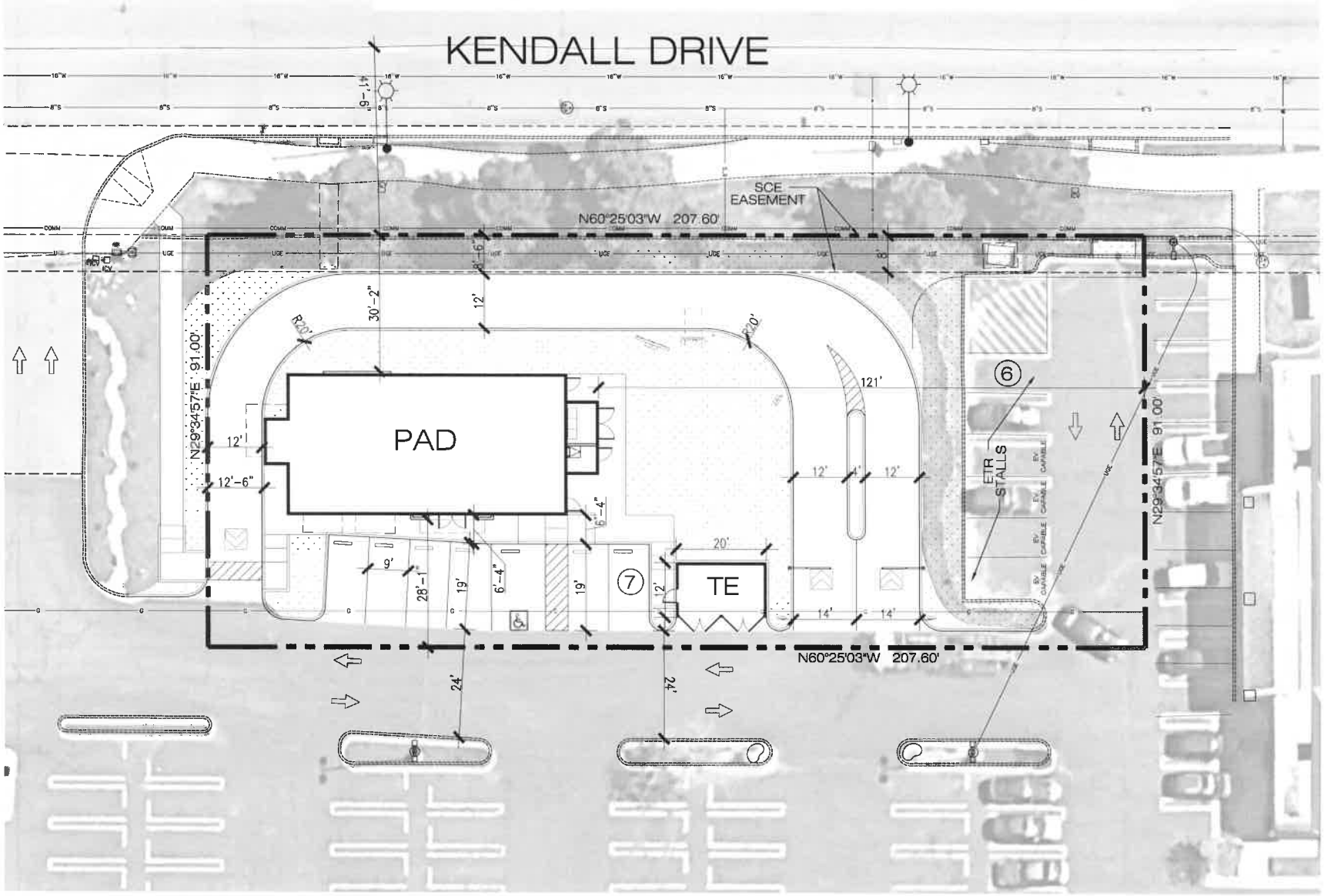
IN THE CITY OF SAN BERNARDINO, BEING A SUBDIVISION OF LOT 1 OF PARCEL MAP 9393 AS SHOWN BY MAP ON FILE IN BOOK NO. 104, PAGES 51 and 52 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.
A.P. #266-521-03



Approved Plan
City Plot Plan # 86-110

Stater Bros. Development
Stater Bros. Market No. 107

ATTACHMENT 2 - PROPOSED SITE PLAN



SITE INFORMATION

APN: 0266-521-12

ZONING: COMMERCIAL GENERAL-1

GENERAL PLAN LAND USE: COMMERCIAL GENERAL (CG)

TOTAL LOT AREA: ±18,892 SF (±0.43 AC)

TOTAL BUILDING AREA: ±1,990 SF
(NOT INCLUDING UTILITY AREAS)

LANDSCAPE AREA: ±5,487 SF (±29.05%)

PARKING INFORMATION

PARKING REQUIREMENT: 1/100 SF

STALLS REQUIRED: 20 STALLS

STALLS PROVIDED: 13 STALLS

ASSUME RECIPROCAL AGREEMENT W/ CENTER

VICINITY MAP

BICKEL GROUP ARCHITECTURE
BICKEL GROUP INCORPORATED
3600 BIRCH STREET, SUITE 120
NEWPORT BEACH, CA 92660
P: 949.757.0411 F: 949.757.0511
www.bickelgrp.com

COFFEE

SWC KENDALL DR & SHANDIN HILLS DR
SAN BERNARDINO, CALIFORNIA

SITE PLAN

Scale: 1" = 10'

June 27, 2023

P123/23210 - San Bernardino Shaw Kendall & Shandin
Hills/Design/Plans/23210 - Site Plan.dwg

ATTACHMENT 3
SUMMARY OF PROJECT TRIP GENERATION
SAN BERNARDINO STARBUCKS (SWC KENDALL DR AND SHANDIN HILLS CIR)

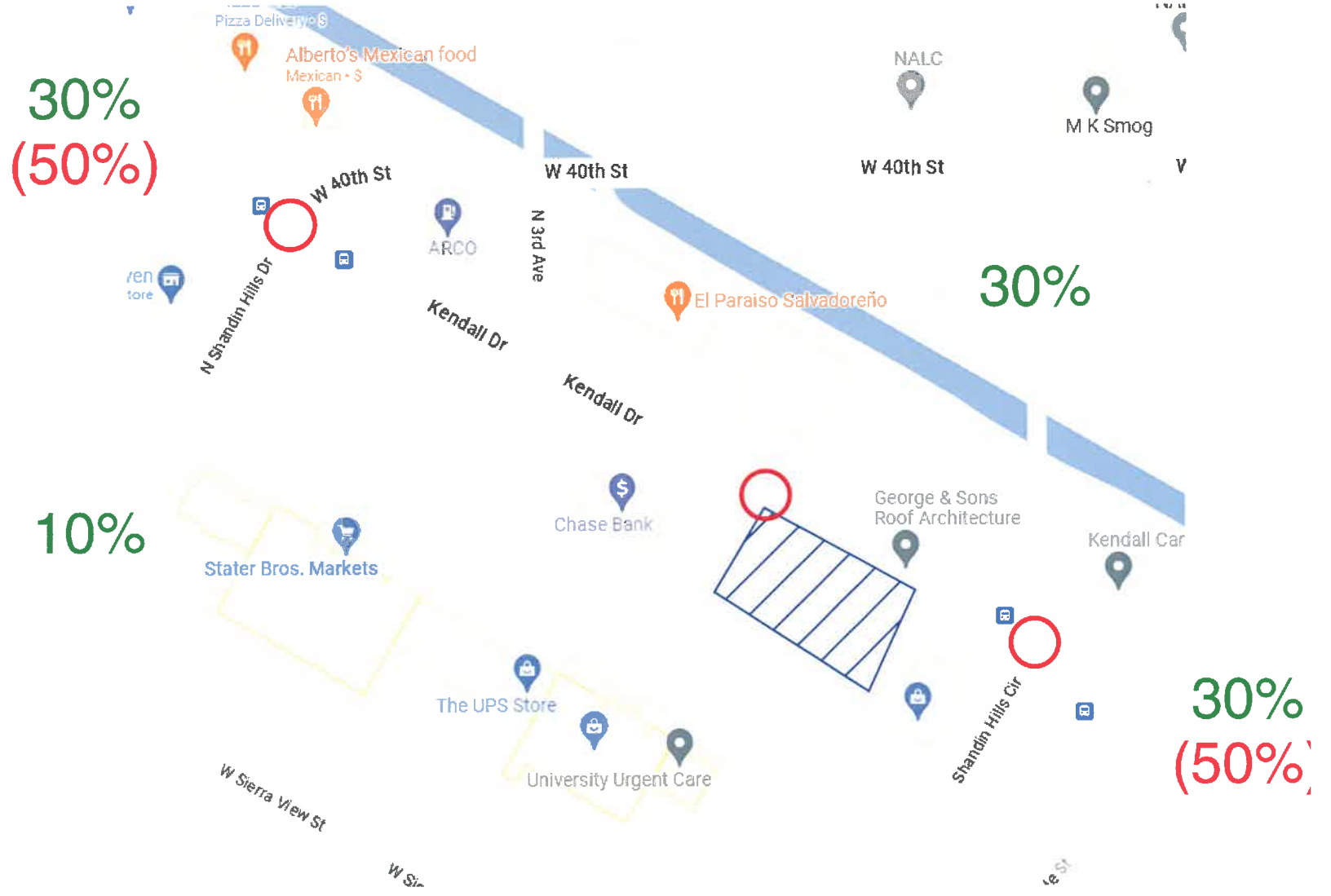
Land Use	ITE Code	Unit	Trip Generation Rates [1]						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Coffee/Donut Shop w/ D.T.	937	KSF	533.57	43.799	42.081	85.88	19.495	19.495	38.99

Land Use	Quantity	Unit	Trip Generation Estimates						
			Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Coffee/Donut Shop w/ D.T.	1.990	KSF	1,062	87	84	171	39	39	78
Pass-by Trips (50% Daily, 49% AM, 50% PM) [2]			*-531*	*-43*	*-41*	*-84*	*-20*	*-20*	*-40*
Net Trips			*531*	*44*	*43*	*87*	*19*	*19*	*38*
Total Project Trips			531	44	43	87	19	19	38

[1] Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition

[2] Pass-by rates provided by City of San Bernardino staff

ATTACHMENT 4 - STUDY AREA



Legend:

Project Site

Study Intersection

XX% Trip Distribution

(YY%) Pass-By Distribution

Study Intersections

1. Kendall Dr at 40th St/Sandin Hills Dr
2. Kendall Dr at Project Driveway
3. Kendall Dr at F St/Shandin Hills Cir

APPENDIX B

EXISTING TRAFFIC COUNT DATA

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of San Bernardino
N/S: W 40th Street/N Shandin Hills Drive
E/W: Kendall Drive
Weather: Clear

File Name : 01_SBC_40th_Ken AM
Site Code : 05723843
Start Date : 9/19/2023
Page No : 1

Groups Printed- Total Volume

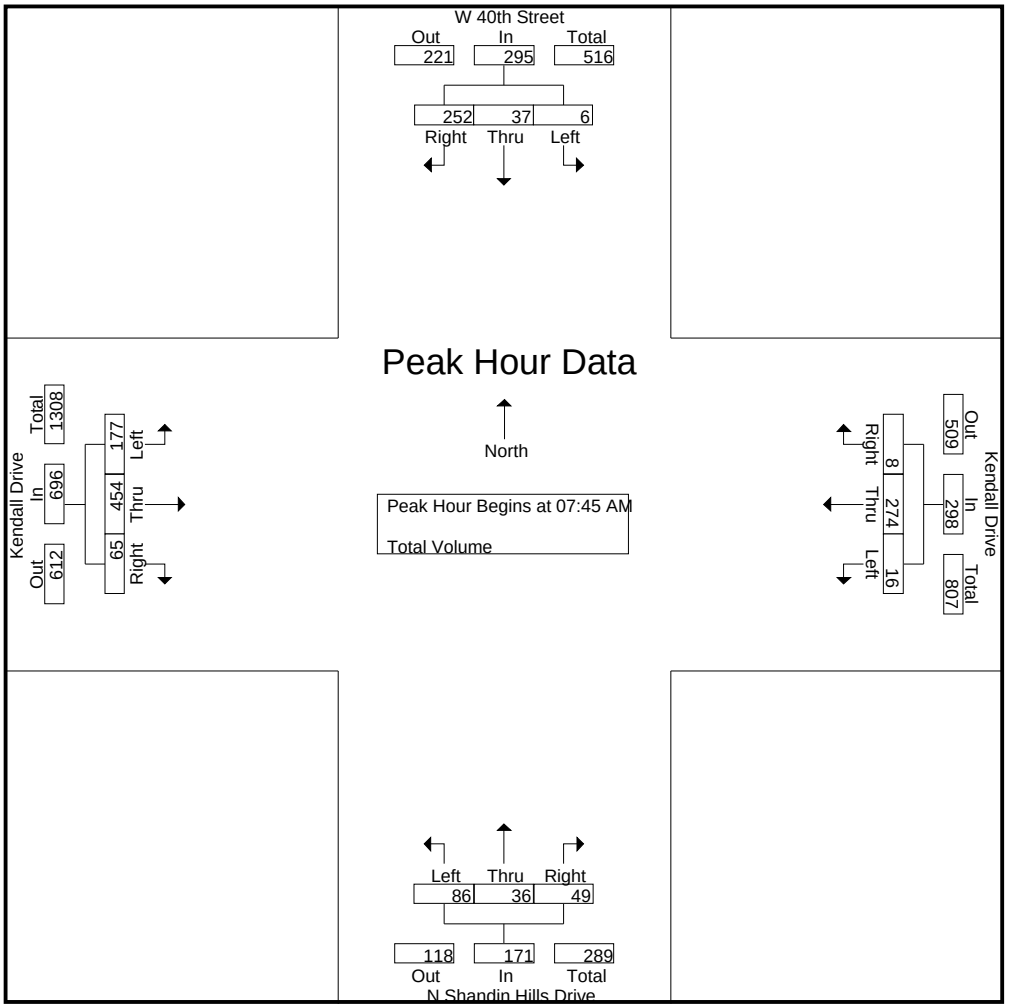
	W 40th Street Southbound				Kendall Drive Westbound				N Shandin Hills Drive Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	3	34	38	4	29	1	34	9	2	12	23	20	68	11	99	194
07:15 AM	1	2	43	46	1	38	0	39	13	5	9	27	25	88	6	119	231
07:30 AM	2	6	86	94	2	54	0	56	13	5	15	33	28	129	8	165	348
07:45 AM	2	9	83	94	7	68	0	75	24	4	19	47	52	113	10	175	391
Total	6	20	246	272	14	189	1	204	59	16	55	130	125	398	35	558	1164
08:00 AM	0	8	45	53	4	69	0	73	19	11	15	45	45	111	13	169	340
08:15 AM	1	7	57	65	3	69	2	74	25	11	3	39	43	102	26	171	349
08:30 AM	3	13	67	83	2	68	6	76	18	10	12	40	37	128	16	181	380
08:45 AM	4	8	47	59	2	74	1	77	21	7	8	36	36	98	21	155	327
Total	8	36	216	260	11	280	9	300	83	39	38	160	161	439	76	676	1396
Grand Total	14	56	462	532	25	469	10	504	142	55	93	290	286	837	111	1234	2560
Apprch %	2.6	10.5	86.8		5	93.1	2		49	19	32.1		23.2	67.8	9		
Total %	0.5	2.2	18	20.8	1	18.3	0.4	19.7	5.5	2.1	3.6	11.3	11.2	32.7	4.3	48.2	

	W 40th Street Southbound				Kendall Drive Westbound				N Shandin Hills Drive Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	2	9	**83**	**94**	**7**	68	0	75	24	4	**19**	**47**	**52**	113	10	175	**391**
08:00 AM	0	8	45	53	4	**69**	0	73	19	**11**	15	45	45	111	13	169	340
08:15 AM	1	7	57	65	3	69	2	74	**25**	11	3	39	43	102	**26**	171	349
08:30 AM	**3**	**13**	67	83	2	68	**6**	**76**	18	10	12	40	37	**128**	16	**181**	380
Total Volume	6	37	252	295	16	274	8	298	86	36	49	171	177	454	65	696	1460
% App. Total	2	12.5	85.4		5.4	91.9	2.7		50.3	21.1	28.7		25.4	65.2	9.3		
PHF	.500	.712	.759	.785	.571	.993	.333	.980	.860	.818	.645	.910	.851	.887	.625	.961	.934

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of San Bernardino
N/S: W 40th Street/N Shandin Hills Drive
E/W: Kendall Drive
Weather: Clear

File Name : 01_SBC_40th_Ken AM
Site Code : 05723843
Start Date : 9/19/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:45 AM				07:45 AM			
+0 mins.	**2**	6	**86**	**94**	**4**	69	0	73	24	4	**19**	**47**	**52**	113	10	175
+15 mins.	2	**9**	83	94	3	69	2	74	19	**11**	15	45	45	111	13	169
+30 mins.	0	8	45	53	2	68	**6**	76	**25**	11	3	39	43	102	**26**	171
+45 mins.	1	7	57	65	2	**74**	1	**77**	18	10	12	40	37	**128**	16	**181**
Total Volume	5	30	271	306	11	280	9	300	86	36	49	171	177	454	65	696
% App. Total	1.6	9.8	88.6		3.7	93.3	3		50.3	21.1	28.7		25.4	65.2	9.3	
PHF	.625	.833	.788	.814	.688	.946	.375	.974	.860	.818	.645	.910	.851	.887	.625	.961

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of San Bernardino
N/S: W 40th Street/N Shandin Hills Drive
E/W: Kendall Drive
Weather: Clear

File Name : 01_SBC_40th_Ken PM
Site Code : 05723843
Start Date : 9/19/2023
Page No : 1

Groups Printed- Total Volume

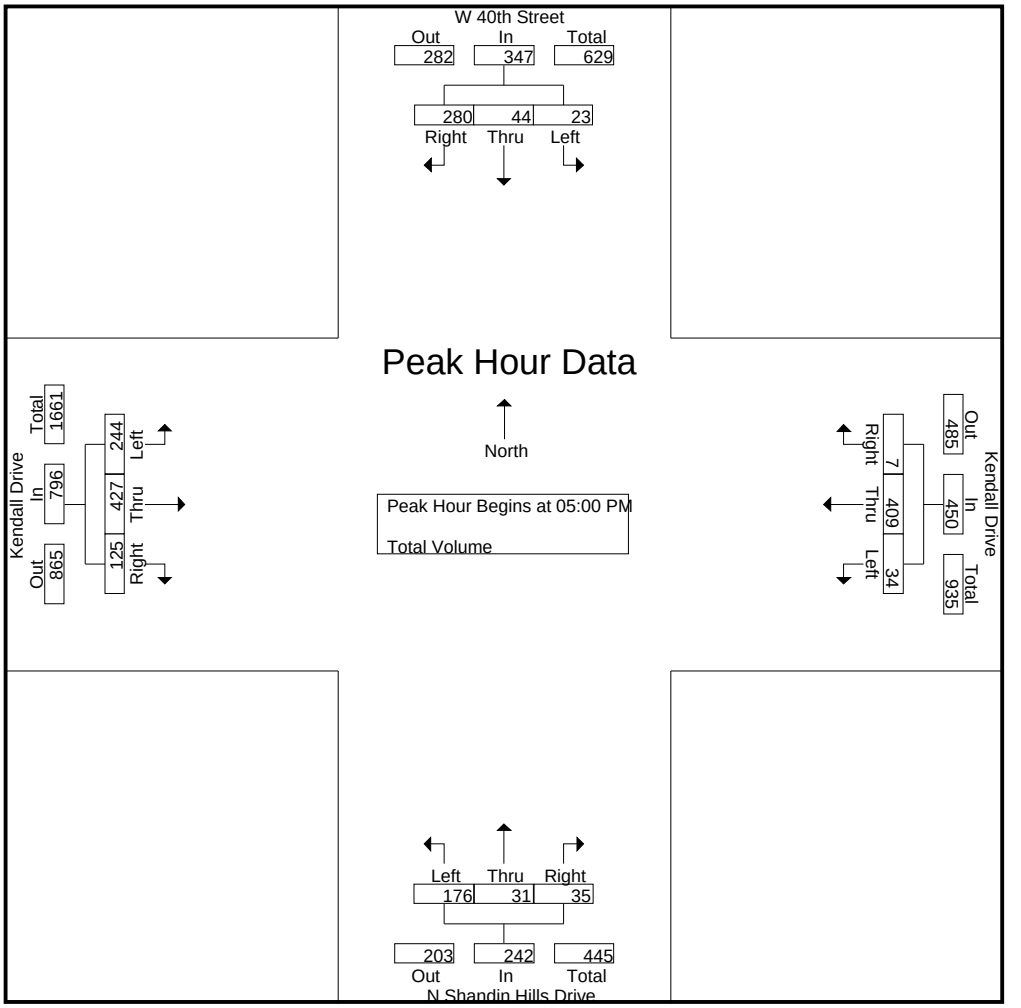
	W 40th Street Southbound				Kendall Drive Westbound				N Shandin Hills Drive Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	10	65	79	2	105	2	109	36	13	5	54	70	126	42	238	480
04:15 PM	4	6	69	79	12	99	2	113	38	7	12	57	50	133	34	217	466
04:30 PM	4	10	57	71	8	86	3	97	46	11	7	64	74	98	19	191	423
04:45 PM	1	8	62	71	1	87	4	92	30	10	8	48	57	117	22	196	407
Total	13	34	253	300	23	377	11	411	150	41	32	223	251	474	117	842	1776
05:00 PM	3	14	56	73	12	93	2	107	37	11	10	58	61	99	34	194	432
05:15 PM	8	14	70	92	7	109	1	117	51	5	6	62	69	116	31	216	487
05:30 PM	7	7	73	87	6	107	2	115	44	8	5	57	50	109	29	188	447
05:45 PM	5	9	81	95	9	100	2	111	44	7	14	65	64	103	31	198	469
Total	23	44	280	347	34	409	7	450	176	31	35	242	244	427	125	796	1835
Grand Total	36	78	533	647	57	786	18	861	326	72	67	465	495	901	242	1638	3611
Apprch %	5.6	12.1	82.4		6.6	91.3	2.1		70.1	15.5	14.4		30.2	55	14.8		
Total %	1	2.2	14.8	17.9	1.6	21.8	0.5	23.8	9	2	1.9	12.9	13.7	25	6.7	45.4	

	W 40th Street Southbound				Kendall Drive Westbound				N Shandin Hills Drive Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	**14**	56	73	**12**	93	**2**	107	37	**11**	10	58	61	99	**34**	194	432
05:15 PM	**8**	14	70	92	7	**109**	1	**117**	**51**	5	6	62	**69**	**116**	31	**216**	**487**
05:30 PM	7	7	73	87	6	107	2	115	44	8	5	57	50	109	29	188	447
05:45 PM	5	9	**81**	**95**	9	100	2	111	44	7	**14**	**65**	64	103	31	198	469
Total Volume	23	44	280	347	34	409	7	450	176	31	35	242	244	427	125	796	1835
% App. Total	6.6	12.7	80.7		7.6	90.9	1.6		72.7	12.8	14.5		30.7	53.6	15.7		
PHF	.719	.786	.864	.913	.708	.938	.875	.962	.863	.705	.625	.931	.884	.920	.919	.921	.942

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of San Bernardino
N/S: W 40th Street/N Shandin Hills Drive
E/W: Kendall Drive
Weather: Clear

File Name : 01_SBC_40th_Ken PM
Site Code : 05723843
Start Date : 9/19/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				04:00 PM			
+0 mins.	3	**14**	56	73	**12**	93	**2**	107	37	**11**	10	58	70	126	**42**	**238**
+15 mins.	**8**	14	70	92	7	**109**	1	**117**	**51**	5	6	62	50	**133**	34	217
+30 mins.	7	7	73	87	6	107	2	115	44	8	5	57	**74**	98	19	191
+45 mins.	5	9	**81**	**95**	9	100	2	111	44	7	**14**	**65**	57	117	22	196
Total Volume	23	44	280	347	34	409	7	450	176	31	35	242	251	474	117	842
% App. Total	6.6	12.7	80.7		7.6	90.9	1.6		72.7	12.8	14.5		29.8	56.3	13.9	
PHF	.719	.786	.864	.913	.708	.938	.875	.962	.863	.705	.625	.931	.848	.891	.696	.884

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of San Bernardino
N/S: Project Driveway
E/W: Kendall Drive
Weather: Clear

File Name : 02_SBC_PDW_Ken AM
Site Code : 05723843
Start Date : 9/19/2023
Page No : 1

Groups Printed- Total Volume

	Discount Store Driveway Southbound				Kendall Drive Westbound				Project Driveway Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	1	37	0	38	0	0	0	0	0	77	0	77	115
07:15 AM	0	0	0	0	3	47	0	50	0	0	1	1	0	93	1	94	145
07:30 AM	0	0	0	0	3	55	0	58	1	0	2	3	0	138	2	140	201
07:45 AM	0	0	0	0	2	82	0	84	2	0	2	4	0	119	2	121	209
Total	0	0	0	0	9	221	0	230	3	0	5	8	0	427	5	432	670
08:00 AM	0	0	0	0	4	79	0	83	1	0	1	2	0	101	3	104	189
08:15 AM	0	0	1	1	5	82	0	87	3	0	0	3	0	92	3	95	186
08:30 AM	0	0	0	0	5	86	0	91	2	0	2	4	1	128	4	133	228
08:45 AM	0	0	0	0	10	93	0	103	3	0	9	12	3	92	3	98	213
Total	0	0	1	1	24	340	0	364	9	0	12	21	4	413	13	430	816
Grand Total	0	0	1	1	33	561	0	594	12	0	17	29	4	840	18	862	1486
Apprch %	0	0	100		5.6	94.4	0		41.4	0	58.6		0.5	97.4	2.1		
Total %	0	0	0.1	0.1	2.2	37.8	0	40	0.8	0	1.1	2	0.3	56.5	1.2	58	

	Discount Store Driveway Southbound				Kendall Drive Westbound				Project Driveway Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	4	79	0	83	1	0	1	2	0	101	3	104	189
08:15 AM	0	0	**1**	**1**	5	82	0	87	**3**	0	0	3	0	92	3	95	186
08:30 AM	0	0	0	0	5	86	0	91	2	0	2	4	1	**128**	**4**	**133**	**228**
08:45 AM	0	0	0	0	**10**	**93**	0	**103**	3	0	**9**	**12**	**3**	92	3	98	213
Total Volume	0	0	1	1	24	340	0	364	9	0	12	21	4	413	13	430	816
% App. Total	0	0	100		6.6	93.4	0		42.9	0	57.1		0.9	96	3		
PHF	.000	.000	.250	.250	.600	.914	.000	.883	.750	.000	.333	.438	.333	.807	.813	.808	.895

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File Name : 02_SBC_PDW_Ken AM
Site Code : 05723843
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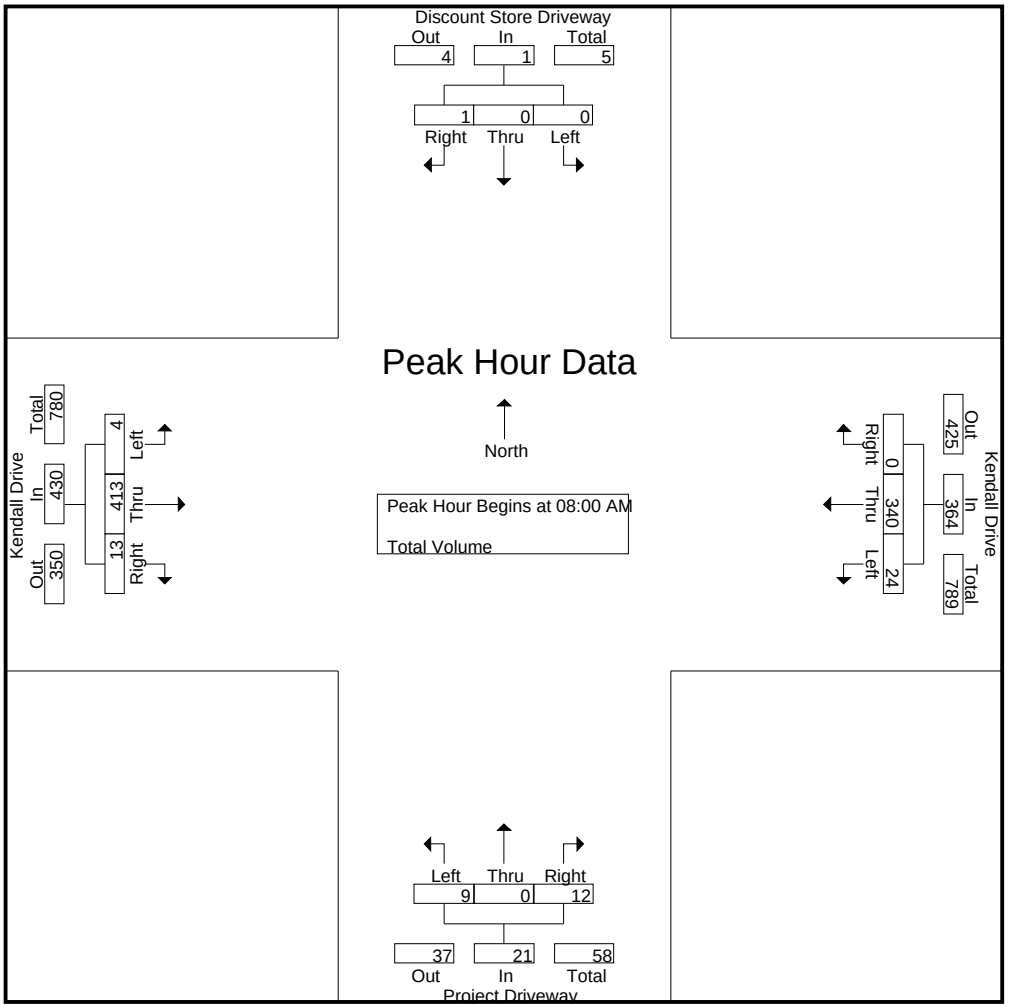

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				08:00 AM				07:30 AM			
+0 mins.	0	0	0	0	4	79	0	83	1	0	1	2	0	**138**	2	**140**
+15 mins.	0	0	0	0	5	82	0	87	**3**	0	0	3	0	119	2	121
+30 mins.	0	0	0	0	5	86	0	91	2	0	2	4	0	101	**3**	104
+45 mins.	0	0	**1**	**1**	**10**	**93**	0	**103**	3	0	**9**	**12**	0	92	3	95
Total Volume	0	0	1	1	24	340	0	364	9	0	12	21	0	450	10	460
% App. Total	0	0	100		6.6	93.4	0		42.9	0	57.1		0	97.8	2.2	
PHF	.000	.000	.250	.250	.600	.914	.000	.883	.750	.000	.333	.438	.000	.815	.833	.821

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Groups Printed- Total Volume

	Discount Store Driveway Southbound				Kendall Drive Westbound				Project Driveway Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	1	1	15	112	0	127	6	0	9	15	0	108	6	114	257
04:15 PM	0	0	0	0	16	96	0	112	9	0	13	22	0	109	9	118	252
04:30 PM	0	0	2	2	13	107	0	120	6	0	12	18	1	88	4	93	233
04:45 PM	0	0	3	3	17	107	1	125	7	0	12	19	1	86	3	90	237
Total	0	0	6	6	61	422	1	484	28	0	46	74	2	391	22	415	979
05:00 PM	0	1	2	3	9	112	1	122	6	1	13	20	1	90	4	95	240
05:15 PM	1	0	4	5	12	114	2	128	3	0	5	8	0	96	7	103	244
05:30 PM	3	0	0	3	16	119	1	136	4	0	17	21	3	99	3	105	265
05:45 PM	1	0	3	4	8	101	2	111	9	0	11	20	0	92	6	98	233
Total	5	1	9	15	45	446	6	497	22	1	46	69	4	377	20	401	982
Grand Total	5	1	15	21	106	868	7	981	50	1	92	143	6	768	42	816	1961
Apprch %	23.8	4.8	71.4		10.8	88.5	0.7		35	0.7	64.3		0.7	94.1	5.1		
Total %	0.3	0.1	0.8	1.1	5.4	44.3	0.4	50	2.5	0.1	4.7	7.3	0.3	39.2	2.1	41.6	

	Discount Store Driveway Southbound				Kendall Drive Westbound				Project Driveway Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	3	3	**17**	107	1	125	**7**	0	12	19	1	86	3	90	237
05:00 PM	0	**1**	2	3	9	112	1	122	6	**1**	13	20	1	90	4	95	240
05:15 PM	1	0	**4**	**5**	12	114	**2**	128	3	0	5	8	0	96	**7**	103	244
05:30 PM	**3**	0	0	3	16	**119**	1	**136**	4	0	**17**	**21**	**3**	**99**	3	**105**	**265**
Total Volume	4	1	9	14	54	452	5	511	20	1	47	68	5	371	17	393	986
% App. Total	28.6	7.1	64.3		10.6	88.5	1		29.4	1.5	69.1		1.3	94.4	4.3		
PHF	.333	.250	.563	.700	.794	.950	.625	.939	.714	.250	.691	.810	.417	.937	.607	.936	.930

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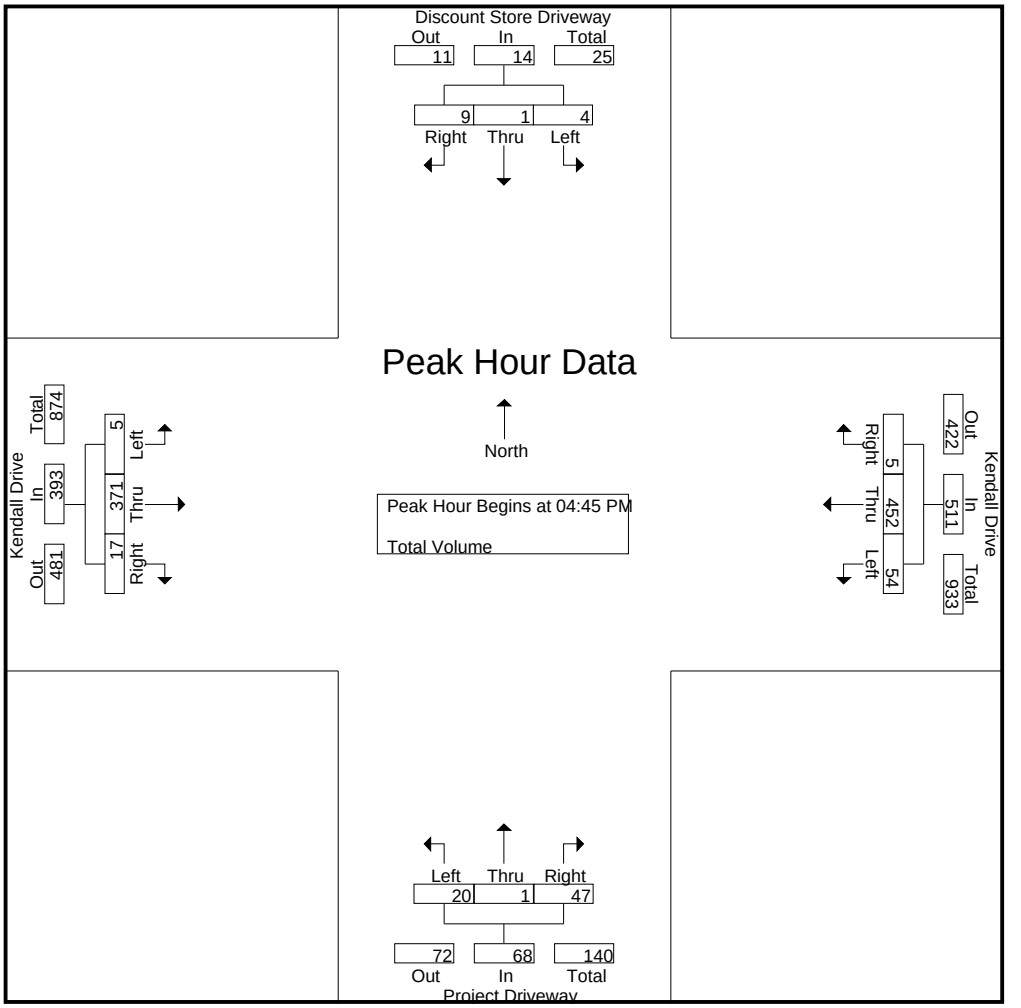

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:15 PM				04:00 PM			
+0 mins.	0	**1**	2	3	**17**	107	1	125	**9**	0	**13**	**22**	0	108	6	114
+15 mins.	1	0	**4**	**5**	9	112	1	122	6	0	12	18	0	**109**	**9**	**118**
+30 mins.	**3**	0	0	3	12	114	**2**	128	7	0	12	19	**1**	88	4	93
+45 mins.	1	0	3	4	16	**119**	1	**136**	6	**1**	13	20	1	86	3	90
Total Volume	5	1	9	15	54	452	5	511	28	1	50	79	2	391	22	415
% App. Total	33.3	6.7	60		10.6	88.5	1		35.4	1.3	63.3		0.5	94.2	5.3	
PHF	.417	.250	.563	.750	.794	.950	.625	.939	.778	.250	.962	.898	.500	.897	.611	.879

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File Name : 03_SBC_F St_Ken AM
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Groups Printed- Total Volume

	N F Street Southbound				Kendall Drive Westbound				Shaden Hills Circle Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	4	0	0	4	5	35	1	41	3	2	22	27	1	74	0	75	147
07:15 AM	7	0	0	7	3	44	1	48	5	2	28	35	0	94	0	94	184
07:30 AM	9	0	1	10	6	58	1	65	0	2	21	23	0	136	3	139	237
07:45 AM	5	0	1	6	8	78	4	90	2	5	21	28	3	109	1	113	237
Total	25	0	2	27	22	215	7	244	10	11	92	113	4	413	4	421	805
08:00 AM	9	1	2	12	6	79	10	95	4	2	14	20	4	100	1	105	232
08:15 AM	9	3	4	16	4	81	5	90	2	5	13	20	1	94	1	96	222
08:30 AM	22	6	3	31	10	88	5	103	2	4	18	24	3	125	2	130	288
08:45 AM	7	2	3	12	13	100	7	120	3	0	11	14	4	93	1	98	244
Total	47	12	12	71	33	348	27	408	11	11	56	78	12	412	5	429	986
Grand Total	72	12	14	98	55	563	34	652	21	22	148	191	16	825	9	850	1791
Apprch %	73.5	12.2	14.3		8.4	86.3	5.2		11	11.5	77.5		1.9	97.1	1.1		
Total %	4	0.7	0.8	5.5	3.1	31.4	1.9	36.4	1.2	1.2	8.3	10.7	0.9	46.1	0.5	47.5	

	N F Street Southbound				Kendall Drive Westbound				Shaden Hills Circle Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	9	1	2	12	6	79	**10**	95	**4**	2	14	20	**4**	100	1	105	232
08:15 AM	9	3	**4**	16	4	81	5	90	2	**5**	13	20	1	94	1	96	222
08:30 AM	**22**	**6**	3	**31**	10	88	5	103	2	4	**18**	**24**	3	**125**	**2**	**130**	**288**
08:45 AM	7	2	3	12	**13**	**100**	7	**120**	3	0	11	14	4	93	1	98	244
Total Volume	47	12	12	71	33	348	27	408	11	11	56	78	12	412	5	429	986
% App. Total	66.2	16.9	16.9		8.1	85.3	6.6		14.1	14.1	71.8		2.8	96	1.2		
PHF	.534	.500	.750	.573	.635	.870	.675	.850	.688	.550	.778	.813	.750	.824	.625	.825	.856

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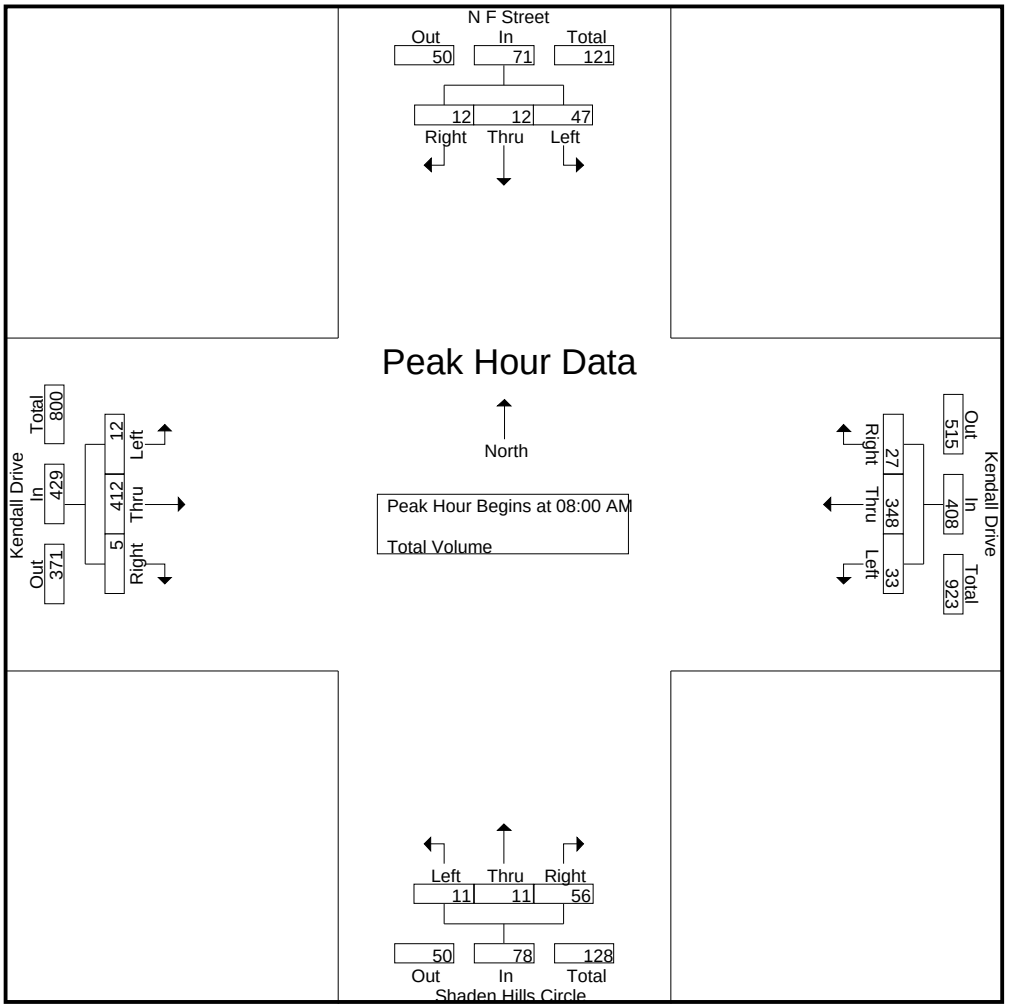

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				08:00 AM				07:00 AM				07:30 AM			
+0 mins.	9	1	2	12	6	79	**10**	95	3	2	22	27	0	**136**	**3**	**139**
+15 mins.	9	3	**4**	16	4	81	5	90	**5**	2	**28**	**35**	3	109	1	113
+30 mins.	**22**	**6**	3	**31**	10	88	5	103	0	2	21	23	**4**	100	1	105
+45 mins.	7	2	3	12	**13**	**100**	7	**120**	2	**5**	21	28	1	94	1	96
Total Volume	47	12	12	71	33	348	27	408	10	11	92	113	8	439	6	453
% App. Total	66.2	16.9	16.9		8.1	85.3	6.6		8.8	9.7	81.4		1.8	96.9	1.3	
PHF	.534	.500	.750	.573	.635	.870	.675	.850	.500	.550	.821	.807	.500	.807	.500	.815

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Groups Printed- Total Volume

	N F Street Southbound				Kendall Drive Westbound				Shaden Hills Circle Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	5	5	3	13	24	116	7	147	6	1	13	20	10	109	5	124	304
04:15 PM	5	3	5	13	19	100	8	127	5	0	19	24	7	99	3	109	273
04:30 PM	8	2	7	17	25	109	3	137	5	4	10	19	7	91	3	101	274
04:45 PM	4	1	6	11	22	120	6	148	2	1	20	23	8	77	5	90	272
Total	22	11	21	54	90	445	24	559	18	6	62	86	32	376	16	424	1123
05:00 PM	4	0	2	6	13	115	8	136	4	3	10	17	13	92	2	107	266
05:15 PM	6	1	6	13	23	120	5	148	5	2	12	19	3	96	2	101	281
05:30 PM	3	2	3	8	21	125	5	151	5	1	15	21	8	105	3	116	296
05:45 PM	7	5	1	13	19	114	5	138	3	5	14	22	6	98	2	106	279
Total	20	8	12	40	76	474	23	573	17	11	51	79	30	391	9	430	1122
Grand Total	42	19	33	94	166	919	47	1132	35	17	113	165	62	767	25	854	2245
Apprch %	44.7	20.2	35.1		14.7	81.2	4.2		21.2	10.3	68.5		7.3	89.8	2.9		
Total %	1.9	0.8	1.5	4.2	7.4	40.9	2.1	50.4	1.6	0.8	5	7.3	2.8	34.2	1.1	38	

	N F Street Southbound				Kendall Drive Westbound				Shaden Hills Circle Northbound				Kendall Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	5	**5**	3	13	24	116	7	147	**6**	1	13	20	**10**	**109**	**5**	**124**	**304**
04:15 PM	5	3	5	13	19	100	**8**	127	5	0	19	**24**	7	99	3	109	273
04:30 PM	**8**	2	**7**	**17**	**25**	109	3	137	5	**4**	10	19	7	91	3	101	274
04:45 PM	4	1	6	11	22	**120**	6	**148**	2	1	**20**	23	8	77	5	90	272
Total Volume	22	11	21	54	90	445	24	559	18	6	62	86	32	376	16	424	1123
% App. Total	40.7	20.4	38.9		16.1	79.6	4.3		20.9	7	72.1		7.5	88.7	3.8		
PHF	.688	.550	.750	.794	.900	.927	.750	.944	.750	.375	.775	.896	.800	.862	.800	.855	.924

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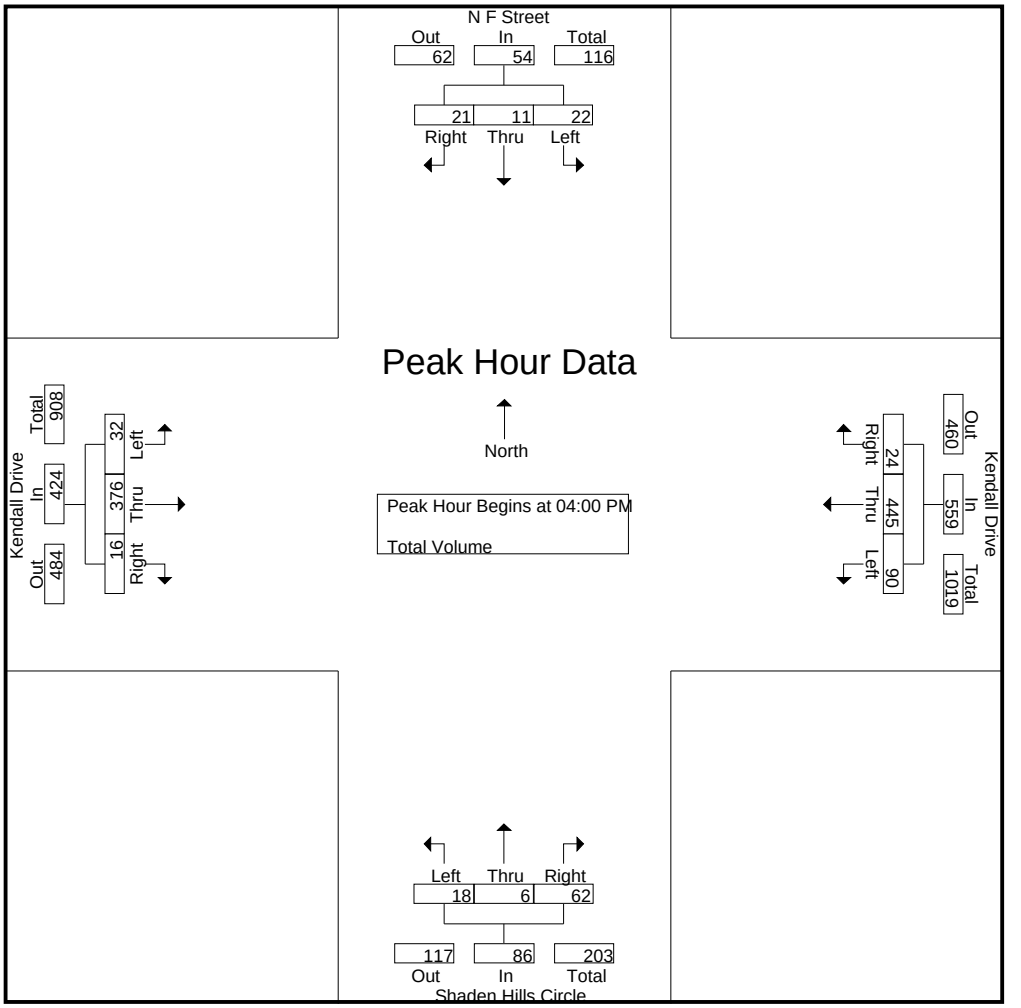


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:45 PM				04:00 PM				05:00 PM			
+0 mins.	5	**5**	3	13	22	120	6	148	**6**	1	13	20	**13**	92	2	107
+15 mins.	5	3	5	13	13	115	**8**	136	5	0	19	**24**	3	96	2	101
+30 mins.	**8**	2	**7**	**17**	**23**	120	5	148	5	**4**	10	19	8	**105**	**3**	**116**
+45 mins.	4	1	6	11	21	**125**	5	**151**	2	1	**20**	23	6	98	2	106
Total Volume	22	11	21	54	79	480	24	583	18	6	62	86	30	391	9	430
% App. Total	40.7	20.4	38.9		13.6	82.3	4.1		20.9	7	72.1		7	90.9	2.1	
PHF	.688	.550	.750	.794	.859	.960	.750	.965	.750	.375	.775	.896	.577	.931	.750	.927

APPENDIX C

EXISTING TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX C-I

EXISTING TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	26.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.423

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	86	36	49	6	37	252	177	454	65	16	274	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	36	49	6	37	252	177	454	65	16	274	8
Peak Hour Factor	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	10	13	2	10	67	47	122	17	4	73	2
Total Analysis Volume [veh/h]	92	39	52	6	40	270	190	486	70	17	293	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	46	16	77	77	3	64	64
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.38	0.13	0.64	0.64	0.03	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.03	0.00	0.02	0.15	0.11	0.14	0.04	0.01	0.08	0.08
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	189	151	143	151	691	226	2303	1151	45	959	959
d1, Uniform Delay [s]	51.94	52.66	52.14	50.56	51.53	26.81	50.81	9.02	8.11	57.51	14.31	14.30
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.14	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.86	1.27	1.69	0.12	0.92	0.48	8.15	0.21	0.10	5.30	0.35	0.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.38	0.40	0.04	0.26	0.39	0.84	0.21	0.06	0.38	0.16	0.16
d, Delay for Lane Group [s/veh]	52.81	53.93	53.82	50.68	52.45	27.29	58.96	9.23	8.22	62.81	14.66	14.65
Lane Group LOS	D	D	D	D	D	C	E	A	A	E	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.48	2.17	1.78	0.17	1.17	5.71	6.08	2.62	0.70	0.57	2.19	2.17
50th-Percentile Queue Length [ft/ln]	37.01	54.31	44.55	4.28	29.27	142.75	152.01	65.58	17.38	14.35	54.71	54.36
95th-Percentile Queue Length [veh/ln]	2.66	3.91	3.21	0.31	2.11	9.63	10.12	4.72	1.25	1.03	3.94	3.91
95th-Percentile Queue Length [ft/ln]	66.62	97.76	80.20	7.71	52.69	240.72	253.11	118.05	31.28	25.82	98.47	97.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.28	53.91	53.82	50.68	52.45	27.29	58.96	9.23	8.22	62.81	14.66	14.65
Movement LOS	D	D	D	D	D	C	E	A	A	E	B	B
d_A, Approach Delay [s/veh]	53.59			30.92			21.80			17.22		
Approach LOS	D			C			C			B		
d_I, Intersection Delay [s/veh]	26.43											
Intersection LOS	C											
Intersection V/C	0.423											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.374	2.422	0.000	2.482
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.711	2.081	2.175	1.823
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.021

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	9	0	12	0	0	1	4	413	13	24	340	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	0	12	0	0	1	4	413	13	24	340	0
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	3	0	0	0	1	115	4	7	95	0
Total Analysis Volume [veh/h]	10	0	13	0	0	1	4	461	15	27	380	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
d_M, Delay for Movement [s/veh]	12.86	13.49	9.95	12.40	13.47	9.40	8.07	0.00	0.00	8.41	0.00	0.00
Movement LOS	B	B	A	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.12	0.12	0.00	0.00	0.00	0.01	0.00	0.00	0.08	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.97	2.97	2.97	0.09	0.09	0.09	0.26	0.00	0.00	1.92	0.00	0.00
d_A, Approach Delay [s/veh]	11.22			9.40			0.07			0.56		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.58											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.230

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	11	11	56	47	12	12	12	412	5	33	348	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	11	56	47	12	12	12	412	5	33	348	27
Peak Hour Factor	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	16	14	4	4	4	120	1	10	102	8
Total Analysis Volume [veh/h]	13	13	65	55	14	14	14	481	6	39	407	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	12	36	36	0	24	0	12	30	0	24	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	2	57	66	50	2	14	14	4	16	16
g / C, Green / Cycle	0.02	0.63	0.74	0.55	0.02	0.15	0.15	0.05	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.03	0.04	0.01	0.12	0.12	0.02	0.11	0.11
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	45	1263	1473	1174	47	305	305	98	356	356
d1, Uniform Delay [s]	43.34	6.15	3.24	9.35	43.24	36.84	36.82	41.54	34.22	34.14
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.54	0.01	0.06	0.12	3.40	4.81	4.74	2.57	1.78	1.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.01	0.04	0.07	0.30	0.80	0.80	0.40	0.62	0.61
d, Delay for Lane Group [s/veh]	46.88	6.16	3.29	9.47	46.64	41.65	41.56	44.11	36.00	35.84
Lane Group LOS	D	A	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.33	0.09	0.27	0.75	0.35	5.50	5.47	0.90	4.58	4.48
50th-Percentile Queue Length [ft/ln]	8.16	2.20	6.80	18.81	8.71	137.42	136.79	22.55	114.57	112.02
95th-Percentile Queue Length [veh/ln]	0.59	0.16	0.49	1.35	0.63	9.34	9.31	1.62	8.09	7.95
95th-Percentile Queue Length [ft/ln]	14.68	3.95	12.23	33.86	15.68	233.55	232.69	40.59	202.33	198.81

Movement, Approach, & Intersection Results

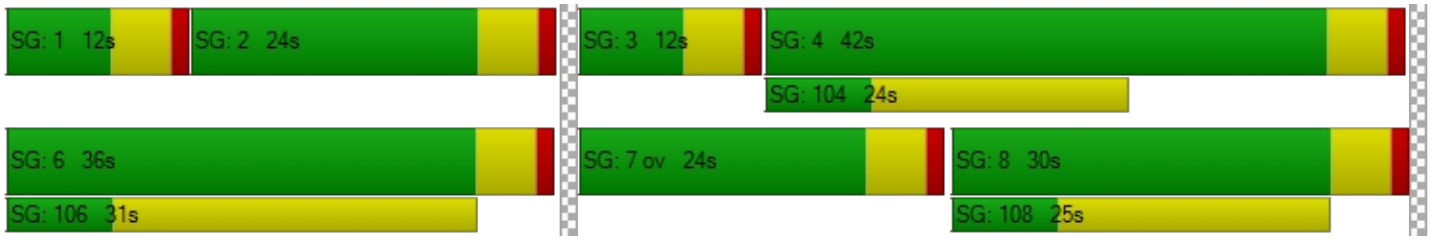
d_M, Delay for Movement [s/veh]	46.88	6.16	3.29	9.47	9.47	9.47	46.64	41.61	41.56	44.11	35.93	35.84
Movement LOS	D	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	9.93			9.47			41.75			36.59		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	34.77											
Intersection LOS	C											
Intersection V/C	0.230											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.70	34.70	0.00	34.70
l_p,int, Pedestrian LOS Score for Intersection	2.167	1.784	0.000	2.588
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	689	422	555	822
d_b, Bicycle Delay [s]	19.36	28.03	23.49	15.63
l_b,int, Bicycle LOS Score for Intersection	1.710	1.697	1.973	1.954
Bicycle LOS	A	A	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	29.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.536

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	176	31	35	23	44	280	244	427	125	34	409	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	176	31	35	23	44	280	244	427	125	34	409	7
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	8	9	6	12	74	65	113	33	9	109	2
Total Analysis Volume [veh/h]	187	33	37	24	47	297	259	453	133	36	434	7
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	51	20	75	75	5	59	59
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.42	0.17	0.62	0.62	0.04	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.04	0.01	0.03	0.17	0.15	0.13	0.07	0.02	0.12	0.12
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	203	151	143	151	759	290	2246	1123	71	891	891
d1, Uniform Delay [s]	53.32	53.32	52.42	51.11	51.73	24.03	48.70	9.71	9.17	56.34	17.47	17.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.19	0.15	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	2.39	1.63	2.20	0.55	1.16	0.57	12.31	0.20	0.22	5.54	0.67	0.66
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.46	0.46	0.17	0.31	0.39	0.89	0.20	0.12	0.51	0.25	0.25
d, Delay for Lane Group [s/veh]	55.71	54.95	54.63	51.66	52.89	24.60	61.01	9.91	9.38	61.88	18.13	18.12
Lane Group LOS	E	D	D	D	D	C	E	A	A	E	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.86	2.83	2.11	0.70	1.38	5.96	8.56	2.56	1.45	1.18	3.67	3.66
50th-Percentile Queue Length [ft/ln]	71.40	70.75	52.70	17.39	34.60	148.98	214.05	63.91	36.23	29.47	91.87	91.44
95th-Percentile Queue Length [veh/ln]	5.14	5.09	3.79	1.25	2.49	9.96	13.36	4.60	2.61	2.12	6.61	6.58
95th-Percentile Queue Length [ft/ln]	128.53	127.34	94.85	31.29	62.28	249.06	334.01	115.03	65.21	53.04	165.37	164.58

Movement, Approach, & Intersection Results

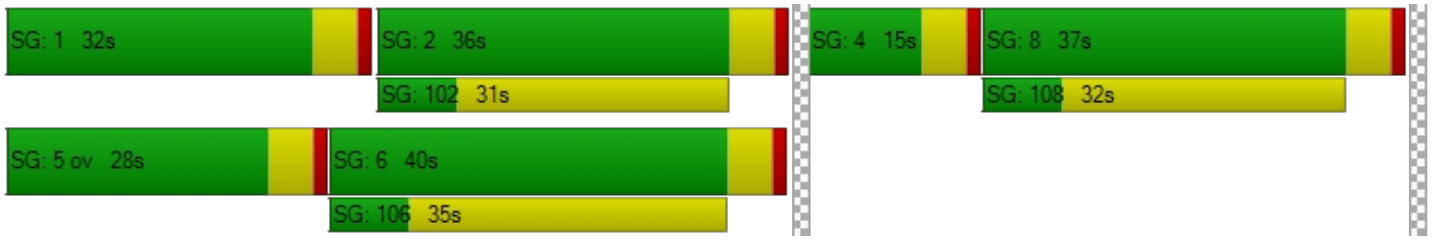
d_M, Delay for Movement [s/veh]	55.33	54.63	54.63	51.66	52.89	24.60	61.01	9.91	9.38	61.88	18.13	18.12
Movement LOS	E	D	D	D	D	C	E	A	A	E	B	B
d_A, Approach Delay [s/veh]	55.14			29.97			25.49			21.43		
Approach LOS	E			C			C			C		
d_I, Intersection Delay [s/veh]	29.26											
Intersection LOS	C											
Intersection V/C	0.536											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.406	2.444	0.000	2.507
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.772	2.167	2.257	1.953
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	20	1	47	4	1	9	5	371	17	54	452	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	1	47	4	1	9	5	371	17	54	452	5
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	13	1	0	2	1	100	5	15	122	1
Total Analysis Volume [veh/h]	22	1	51	4	1	10	5	399	18	58	486	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.06	0.01	0.00	0.01	0.00	0.00	0.00	0.05	0.00	0.00
d_M, Delay for Movement [s/veh]	13.68	15.02	10.24	14.53	14.71	9.94	8.38	0.00	0.00	8.33	0.00	0.00
Movement LOS	B	C	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.39	0.39	0.39	0.08	0.08	0.08	0.01	0.00	0.00	0.16	0.00	0.00
95th-Percentile Queue Length [ft/ln]	9.70	9.70	9.70	2.02	2.02	2.02	0.35	0.00	0.00	4.02	0.00	0.00
d_A, Approach Delay [s/veh]	11.33			11.48			0.10			0.88		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.45											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	18	6	62	22	11	21	32	376	16	90	445	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	6	62	22	11	21	32	376	16	90	445	24
Peak Hour Factor	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	2	17	6	3	6	9	102	4	24	120	6
Total Analysis Volume [veh/h]	19	6	67	24	12	23	35	407	17	97	482	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	12	36	36	0	24	0	18	30	0	24	36	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	3	56	68	49	4	12	12	6	15	15
g / C, Green / Cycle	0.03	0.63	0.75	0.54	0.05	0.14	0.14	0.07	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.03	0.03	0.02	0.11	0.11	0.05	0.13	0.13
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	62	1250	1505	1133	94	274	274	144	324	324
d1, Uniform Delay [s]	42.76	6.37	2.86	9.90	41.71	37.60	37.56	40.82	36.31	36.23
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.78	0.01	0.06	0.09	2.46	4.77	4.57	5.37	4.31	4.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.00	0.04	0.05	0.37	0.78	0.77	0.67	0.79	0.78
d, Delay for Lane Group [s/veh]	45.54	6.37	2.92	9.98	44.17	42.37	42.13	46.19	40.62	40.26
Lane Group LOS	D	A	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.46	0.04	0.25	0.55	0.81	4.83	4.76	2.29	5.70	5.58
50th-Percentile Queue Length [ft/ln]	11.45	1.04	6.31	13.80	20.29	120.75	119.11	57.25	142.51	139.55
95th-Percentile Queue Length [veh/ln]	0.82	0.07	0.45	0.99	1.46	8.43	8.34	4.12	9.62	9.46
95th-Percentile Queue Length [ft/ln]	20.60	1.86	11.35	24.83	36.53	210.85	208.60	103.05	240.39	236.41

Movement, Approach, & Intersection Results

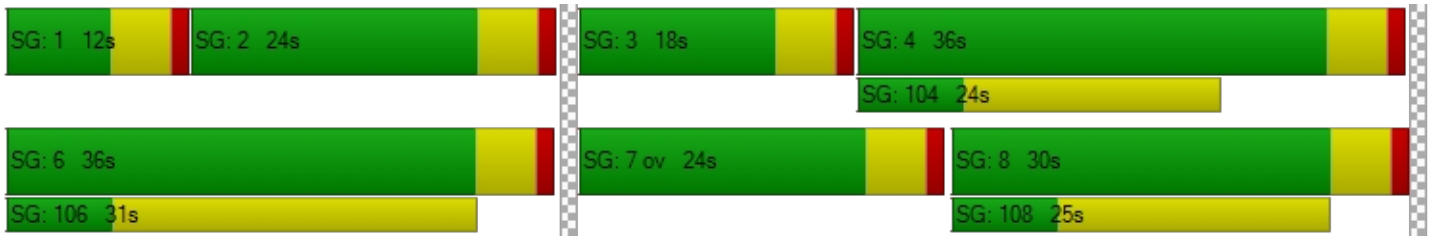
d_M, Delay for Movement [s/veh]	45.54	6.37	2.92	9.98	9.98	9.98	44.17	42.26	42.13	46.19	40.45	40.26
Movement LOS	D	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	11.95			9.98			42.40			41.36		
Approach LOS	B			A			D			D		
d_I, Intersection Delay [s/veh]	38.00											
Intersection LOS	D											
Intersection V/C	0.236											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	0.00	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.184	1.776	0.000	2.549
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	688	422	555	688
d_b, Bicycle Delay [s]	19.38	28.05	23.52	19.38
l_b,int, Bicycle LOS Score for Intersection	1.711	1.657	1.938	2.059
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX C-II

EXISTING WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	26.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.428

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	86	36	53	6	37	252	177	467	65	20	287	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	36	53	6	37	252	177	467	65	20	287	8
Peak Hour Factor	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	10	14	2	10	67	47	125	17	5	77	2
Total Analysis Volume [veh/h]	92	39	57	6	40	270	190	500	70	21	307	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	46	16	76	76	4	64	64
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.38	0.13	0.64	0.64	0.03	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.03	0.00	0.02	0.15	0.11	0.14	0.04	0.01	0.09	0.09
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	188	151	143	151	691	226	2288	1144	52	959	959
d1, Uniform Delay [s]	51.99	52.71	52.18	50.56	51.53	26.81	50.81	9.27	8.30	57.16	14.37	14.36
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.14	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.90	1.35	1.76	0.12	0.92	0.48	8.15	0.22	0.10	5.10	0.37	0.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.40	0.41	0.04	0.26	0.39	0.84	0.22	0.06	0.41	0.17	0.16
d, Delay for Lane Group [s/veh]	52.89	54.06	53.94	50.68	52.45	27.29	58.96	9.49	8.41	62.26	14.74	14.73
Lane Group LOS	D	D	D	D	D	C	E	A	A	E	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.53	2.23	1.83	0.17	1.17	5.71	6.08	2.75	0.71	0.70	2.30	2.29
50th-Percentile Queue Length [ft/ln]	38.19	55.77	45.84	4.28	29.27	142.74	152.01	68.80	17.64	17.49	57.50	57.14
95th-Percentile Queue Length [veh/ln]	2.75	4.02	3.30	0.31	2.11	9.63	10.12	4.95	1.27	1.26	4.14	4.11
95th-Percentile Queue Length [ft/ln]	68.74	100.38	82.52	7.71	52.69	240.71	253.11	123.84	31.74	31.48	103.51	102.85

Movement, Approach, & Intersection Results

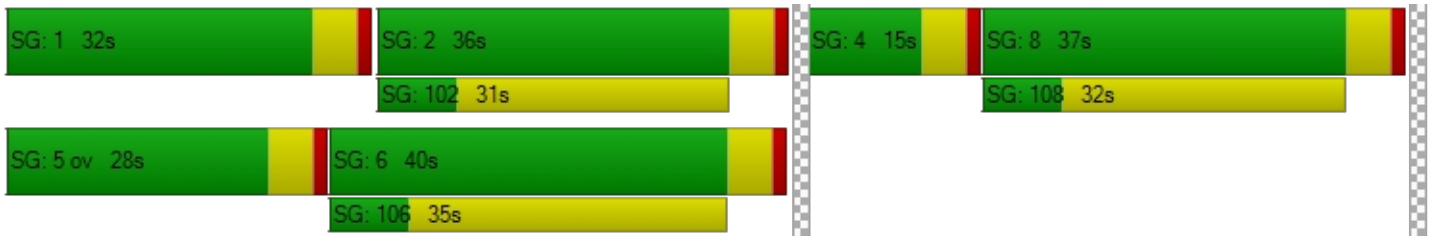
d_M, Delay for Movement [s/veh]	53.36	54.05	53.94	50.68	52.45	27.29	58.96	9.49	8.41	62.26	14.74	14.73
Movement LOS	D	D	D	D	D	C	E	A	A	E	B	B
d_A, Approach Delay [s/veh]	53.70			30.92			21.76			17.70		
Approach LOS	D			C			C			B		
d_I, Intersection Delay [s/veh]	26.46											
Intersection LOS	C											
Intersection V/C	0.428											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.376	2.422	0.000	2.489
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.715	2.081	2.187	1.838
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.117

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	46	0	59	0	0	1	4	391	53	71	318	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	0	59	0	0	1	4	391	53	71	318	0
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	16	0	0	0	1	109	15	20	89	0
Total Analysis Volume [veh/h]	51	0	66	0	0	1	4	437	59	79	355	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	14.86	15.63	11.40	13.77	14.75	9.32	8.01	0.00	0.00	8.65	0.00	0.00
Movement LOS	B	C	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.76	0.76	0.76	0.00	0.00	0.00	0.01	0.00	0.00	0.24	0.00	0.00
95th-Percentile Queue Length [ft/ln]	19.04	19.04	19.04	0.09	0.09	0.09	0.25	0.00	0.00	6.00	0.00	0.00
d_A, Approach Delay [s/veh]	12.91			9.32			0.06			1.58		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	2.12											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	35.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.244

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	11	11	56	47	12	25	25	425	5	33	361	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	11	56	47	12	25	25	425	5	33	361	27
Peak Hour Factor	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	16	14	4	7	7	124	1	10	105	8
Total Analysis Volume [veh/h]	13	13	65	55	14	29	29	496	6	39	422	32
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	15	36	36	0	21	0	12	30	0	24	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	2	57	66	50	4	14	14	4	15	15
g / C, Green / Cycle	0.02	0.63	0.73	0.55	0.04	0.16	0.16	0.05	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.03	0.05	0.01	0.13	0.13	0.02	0.11	0.11
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	45	1255	1465	1162	82	313	313	98	330	330
d1, Uniform Delay [s]	43.34	6.28	3.33	9.60	42.05	36.65	36.63	41.54	35.48	35.40
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.54	0.02	0.06	0.14	2.59	4.79	4.72	2.57	2.63	2.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.01	0.04	0.08	0.35	0.80	0.80	0.40	0.69	0.68
d, Delay for Lane Group [s/veh]	46.88	6.30	3.39	9.74	44.65	41.45	41.36	44.11	38.11	37.88
Lane Group LOS	D	A	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.33	0.09	0.28	0.91	0.68	5.66	5.63	0.90	4.90	4.79
50th-Percentile Queue Length [ft/ln]	8.16	2.23	6.97	22.67	17.01	141.42	140.76	22.55	122.56	119.77
95th-Percentile Queue Length [veh/ln]	0.59	0.16	0.50	1.63	1.22	9.56	9.52	1.62	8.53	8.38
95th-Percentile Queue Length [ft/ln]	14.68	4.01	12.54	40.80	30.61	238.93	238.05	40.59	213.34	209.51

Movement, Approach, & Intersection Results

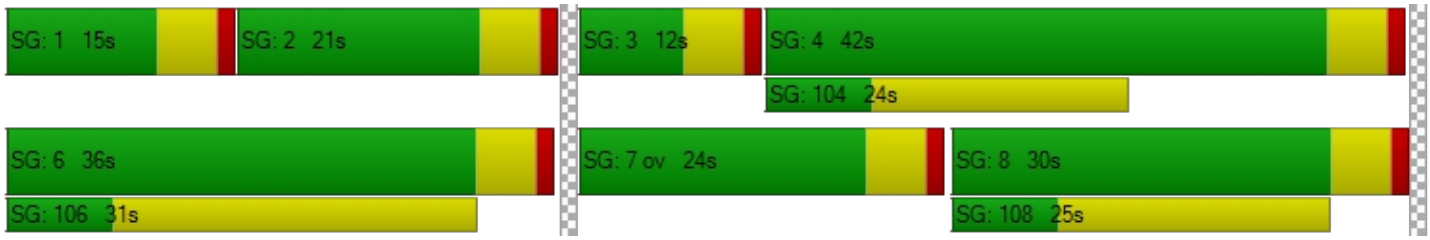
d_M, Delay for Movement [s/veh]	46.88	6.30	3.39	9.74	9.74	9.74	44.65	41.40	41.36	44.11	38.01	37.88
Movement LOS	D	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	10.02			9.74			41.58			38.48		
Approach LOS	B			A			D			D		
d_I, Intersection Delay [s/veh]	35.38											
Intersection LOS	D											
Intersection V/C	0.244											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.70	34.70	0.00	34.70
l_p,int, Pedestrian LOS Score for Intersection	2.167	1.798	0.000	2.594
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	689	355	555	822
d_b, Bicycle Delay [s]	19.36	30.45	23.49	15.63
l_b,int, Bicycle LOS Score for Intersection	1.710	1.721	1.998	1.966
Bicycle LOS	A	A	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	29.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	176	31	37	23	44	280	244	433	125	36	415	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	176	31	37	23	44	280	244	433	125	36	415	7
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	8	10	6	12	74	65	115	33	10	110	2
Total Analysis Volume [veh/h]	187	33	39	24	47	297	259	460	133	38	441	7
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	51	20	75	75	5	59	59
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.42	0.17	0.62	0.62	0.04	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.04	0.01	0.03	0.17	0.15	0.13	0.07	0.02	0.12	0.12
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	203	151	143	151	759	290	2242	1121	73	891	891
d1, Uniform Delay [s]	53.32	53.32	52.48	51.11	51.73	24.03	48.70	9.79	9.22	56.27	17.51	17.50
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.19	0.15	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	2.39	1.63	2.32	0.55	1.16	0.57	12.31	0.21	0.22	5.70	0.68	0.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.46	0.48	0.17	0.31	0.39	0.89	0.21	0.12	0.52	0.25	0.25
d, Delay for Lane Group [s/veh]	55.71	54.95	54.81	51.66	52.89	24.60	61.01	10.00	9.44	61.97	18.19	18.17
Lane Group LOS	E	D	D	D	D	C	E	A	A	E	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.86	2.83	2.17	0.70	1.38	5.96	8.56	2.61	1.45	1.24	3.74	3.72
50th-Percentile Queue Length [ft/ln]	71.40	70.75	54.32	17.39	34.60	148.98	214.05	65.29	36.36	31.11	93.55	93.11
95th-Percentile Queue Length [veh/ln]	5.14	5.09	3.91	1.25	2.49	9.96	13.36	4.70	2.62	2.24	6.74	6.70
95th-Percentile Queue Length [ft/ln]	128.53	127.34	97.78	31.29	62.28	249.06	334.01	117.53	65.45	55.99	168.39	167.59

Movement, Approach, & Intersection Results

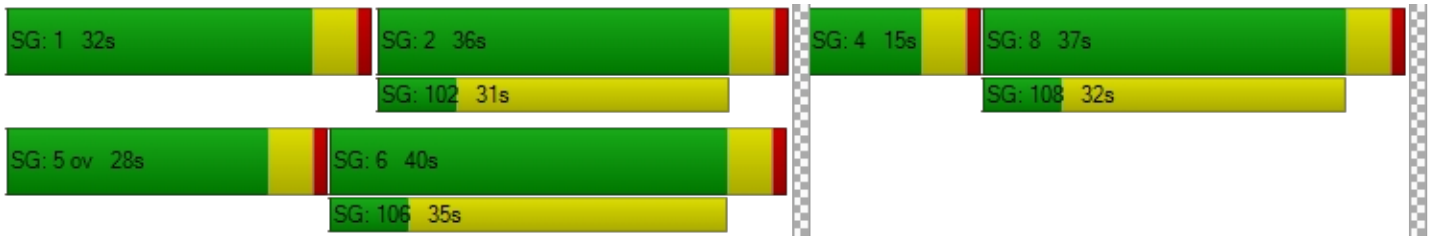
d_M, Delay for Movement [s/veh]	55.33	54.81	54.81	51.66	52.89	24.60	61.01	10.00	9.44	61.97	18.18	18.17
Movement LOS	E	D	D	D	D	C	E	A	A	E	B	B
d_A, Approach Delay [s/veh]	55.19			29.97			25.42			21.60		
Approach LOS	E			C			C			C		
d_I, Intersection Delay [s/veh]	29.25											
Intersection LOS	C											
Intersection V/C	0.538											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.407	2.444	0.000	2.510
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.773	2.167	2.263	1.961
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	16.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	38	1	68	4	1	9	5	361	35	75	442	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	1	68	4	1	9	5	361	35	75	442	5
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	0	18	1	0	2	1	97	9	20	119	1
Total Analysis Volume [veh/h]	41	1	73	4	1	10	5	388	38	81	475	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.00	0.09	0.01	0.00	0.01	0.00	0.00	0.00	0.07	0.00	0.00
d_M, Delay for Movement [s/veh]	14.74	16.14	10.93	15.26	15.33	9.91	8.35	0.00	0.00	8.43	0.00	0.00
Movement LOS	B	C	B	C	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.70	0.70	0.70	0.08	0.08	0.08	0.01	0.00	0.00	0.23	0.00	0.00
95th-Percentile Queue Length [ft/ln]	17.39	17.39	17.39	2.09	2.09	2.09	0.35	0.00	0.00	5.78	0.00	0.00
d_A, Approach Delay [s/veh]	12.34			11.70			0.10			1.22		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.07											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	38.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.241

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	18	6	62	22	11	27	38	382	16	90	451	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	6	62	22	11	27	38	382	16	90	451	24
Peak Hour Factor	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	2	17	6	3	7	10	103	4	24	122	6
Total Analysis Volume [veh/h]	19	6	67	24	12	29	41	413	17	97	488	26
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	20	36	36	0	16	0	12	41	0	13	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	3	56	67	48	5	13	13	6	14	14
g / C, Green / Cycle	0.03	0.62	0.75	0.54	0.05	0.14	0.14	0.07	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.03	0.03	0.02	0.11	0.11	0.05	0.13	0.13
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	60	1245	1498	1128	101	280	280	143	321	321
d1, Uniform Delay [s]	42.78	6.45	2.93	10.00	41.45	37.37	37.33	40.82	36.46	36.38
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.94	0.01	0.06	0.10	2.59	4.54	4.35	5.53	4.77	4.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.00	0.04	0.06	0.41	0.77	0.77	0.68	0.81	0.79
d, Delay for Lane Group [s/veh]	45.71	6.45	2.99	10.10	44.04	41.91	41.68	46.35	41.23	40.83
Lane Group LOS	D	A	A	B	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.46	0.04	0.26	0.61	0.95	4.87	4.80	2.29	5.82	5.69
50th-Percentile Queue Length [ft/ln]	11.48	1.05	6.44	15.35	23.66	121.73	120.09	57.35	145.41	142.33
95th-Percentile Queue Length [veh/ln]	0.83	0.08	0.46	1.11	1.70	8.49	8.40	4.13	9.77	9.61
95th-Percentile Queue Length [ft/ln]	20.67	1.88	11.60	27.63	42.59	212.20	209.94	103.24	244.29	240.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.71	6.45	2.99	10.10	10.10	10.10	44.04	41.80	41.68	46.35	41.04	40.83
Movement LOS	D	A	A	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	12.04			10.10			41.99			41.88		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	38.04											
Intersection LOS	D											
Intersection V/C	0.241											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.70	34.70	0.00	34.70
l_p,int, Pedestrian LOS Score for Intersection	2.184	1.782	0.000	2.551
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	689	244	800	822
d_b, Bicycle Delay [s]	19.36	34.70	16.22	15.63
l_b,int, Bicycle LOS Score for Intersection	1.711	1.667	1.948	2.064
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX D

YEAR 2024 TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX D-I

YEAR 2024 WITHOUT PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	26.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.467

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	96	38	50	6	39	282	203	485	73	16	298	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	38	50	6	39	282	203	485	73	16	298	8
Peak Hour Factor	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	10	13	2	10	75	54	130	20	4	80	2
Total Analysis Volume [veh/h]	103	41	54	6	42	302	217	519	78	17	319	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	48	18	77	77	3	62	62
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.40	0.15	0.64	0.64	0.03	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.03	0.05	0.04	0.00	0.02	0.17	0.13	0.14	0.04	0.01	0.09	0.09
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	191	151	143	151	719	252	2302	1151	45	931	931
d1, Uniform Delay [s]	52.05	52.81	52.32	50.56	51.59	26.01	49.90	9.12	8.16	57.51	15.40	15.39
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.19	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.95	1.39	1.99	0.12	0.99	0.70	8.33	0.23	0.11	5.30	0.41	0.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.41	0.44	0.04	0.28	0.42	0.86	0.23	0.07	0.38	0.18	0.18
d, Delay for Lane Group [s/veh]	53.01	54.20	54.31	50.68	52.58	26.71	58.22	9.34	8.27	62.81	15.82	15.81
Lane Group LOS	D	D	D	D	D	C	E	A	A	E	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.59	2.33	1.98	0.17	1.23	6.37	6.93	2.83	0.78	0.57	2.49	2.48
50th-Percentile Queue Length [ft/ln]	39.83	58.26	49.57	4.28	30.79	159.23	173.27	70.82	19.46	14.35	62.36	61.97
95th-Percentile Queue Length [veh/ln]	2.87	4.20	3.57	0.31	2.22	10.51	11.25	5.10	1.40	1.03	4.49	4.46
95th-Percentile Queue Length [ft/ln]	71.69	104.88	89.22	7.71	55.41	262.70	281.21	127.47	35.03	25.82	112.25	111.55

Movement, Approach, & Intersection Results

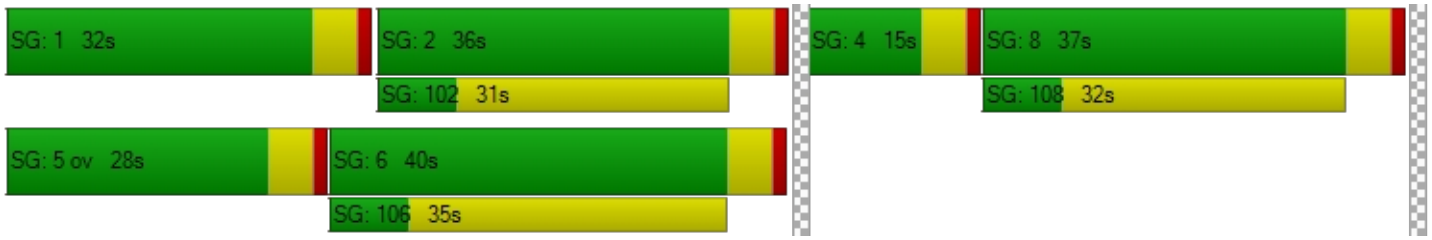
d_M, Delay for Movement [s/veh]	53.54	54.23	54.31	50.68	52.58	26.71	58.22	9.34	8.27	62.81	15.81	15.81
Movement LOS	D	D	D	D	D	C	E	A	A	E	B	B
d_A, Approach Delay [s/veh]	53.91			30.23			22.27			18.13		
Approach LOS	D			C			C			B		
d_I, Intersection Delay [s/veh]	26.74											
Intersection LOS	C											
Intersection V/C	0.467											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.379	2.434	0.000	2.494
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.723	2.137	2.231	1.844
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	9	0	12	0	0	1	4	442	13	25	366	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	0	12	0	0	1	4	442	13	25	366	0
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	0	3	0	0	0	1	123	4	7	102	0
Total Analysis Volume [veh/h]	10	0	13	0	0	1	4	494	15	28	409	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
d_M, Delay for Movement [s/veh]	13.25	13.88	10.09	12.76	13.87	9.49	8.15	0.00	0.00	8.51	0.00	0.00
Movement LOS	B	B	B	B	B	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.12	0.12	0.12	0.00	0.00	0.00	0.01	0.00	0.00	0.08	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.09	3.09	3.09	0.09	0.09	0.09	0.26	0.00	0.00	2.05	0.00	0.00
d_A, Approach Delay [s/veh]	11.46			9.49			0.06			0.55		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	0.56											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	34.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.242

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	11	11	59	48	12	12	12	441	5	34	374	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	11	59	48	12	12	12	441	5	34	374	28
Peak Hour Factor	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	17	14	4	4	4	129	1	10	109	8
Total Analysis Volume [veh/h]	13	13	69	56	14	14	14	515	6	40	437	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	18	36	36	0	18	0	12	30	0	24	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	2	56	66	49	2	15	15	4	17	17
g / C, Green / Cycle	0.02	0.62	0.73	0.55	0.02	0.16	0.16	0.05	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.03	0.04	0.01	0.13	0.13	0.02	0.12	0.12
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	45	1244	1455	1155	47	323	323	100	376	376
d1, Uniform Delay [s]	43.34	6.48	3.47	9.77	43.24	36.41	36.40	41.49	33.72	33.63
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.54	0.02	0.06	0.12	3.40	4.77	4.70	2.58	1.76	1.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.01	0.05	0.07	0.30	0.81	0.80	0.40	0.63	0.62
d, Delay for Lane Group [s/veh]	46.88	6.49	3.53	9.89	46.64	41.19	41.10	44.08	35.47	35.30
Lane Group LOS	D	A	A	A	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.33	0.09	0.31	0.78	0.35	5.86	5.83	0.92	4.88	4.77
50th-Percentile Queue Length [ft/ln]	8.16	2.28	7.64	19.60	8.71	146.46	145.79	23.11	121.94	119.19
95th-Percentile Queue Length [veh/ln]	0.59	0.16	0.55	1.41	0.63	9.83	9.79	1.66	8.50	8.35
95th-Percentile Queue Length [ft/ln]	14.68	4.10	13.75	35.28	15.68	245.69	244.80	41.59	212.49	208.72

Movement, Approach, & Intersection Results

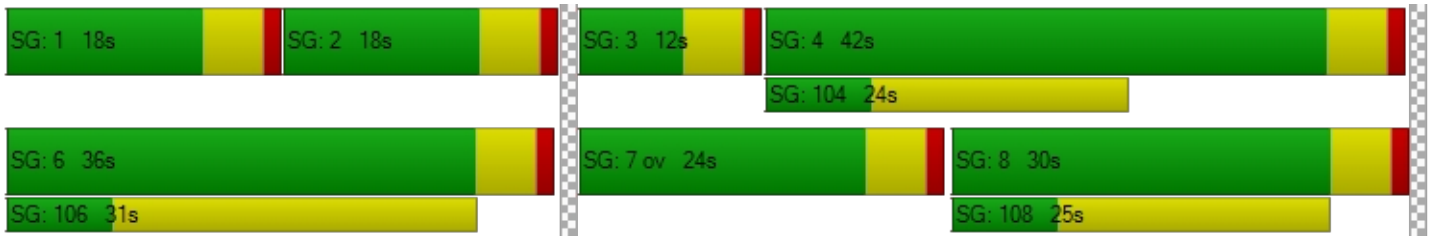
d_M, Delay for Movement [s/veh]	46.88	6.49	3.53	9.89	9.89	9.89	46.64	41.14	41.10	44.08	35.39	35.30
Movement LOS	D	A	A	A	A	A	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	9.87			9.89			41.29			36.07		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	34.52											
Intersection LOS	C											
Intersection V/C	0.242											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.70	34.70	0.00	34.70
l_p,int, Pedestrian LOS Score for Intersection	2.168	1.785	0.000	2.603
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	689	289	555	822
d_b, Bicycle Delay [s]	19.36	32.96	23.49	15.63
l_b,int, Bicycle LOS Score for Intersection	1.716	1.698	2.001	1.980
Bicycle LOS	A	A	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	186	32	36	24	45	304	266	454	134	35	436	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	186	32	36	24	45	304	266	454	134	35	436	7
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	8	10	6	12	81	71	120	36	9	116	2
Total Analysis Volume [veh/h]	197	34	38	25	48	323	282	482	142	37	463	7
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	52	22	75	75	5	58	58
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.43	0.18	0.62	0.62	0.04	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.04	0.01	0.03	0.18	0.17	0.13	0.08	0.02	0.13	0.13
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	203	151	143	151	780	310	2244	1122	72	870	870
d1, Uniform Delay [s]	53.48	53.48	52.48	51.14	51.76	23.47	48.11	9.83	9.25	56.30	18.45	18.44
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.23	0.19	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	2.67	1.80	2.32	0.58	1.19	0.74	15.83	0.22	0.23	5.62	0.77	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.49	0.48	0.18	0.32	0.41	0.91	0.21	0.13	0.52	0.27	0.27
d, Delay for Lane Group [s/veh]	56.16	55.29	54.81	51.71	52.96	24.21	63.94	10.05	9.48	61.92	19.22	19.21
Lane Group LOS	E	E	D	D	D	C	E	B	A	E	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.03	2.99	2.17	0.73	1.41	6.47	9.61	2.75	1.56	1.21	4.07	4.05
50th-Percentile Queue Length [ft/ln]	75.64	74.87	54.32	18.13	35.37	161.74	240.18	68.78	38.97	30.29	101.66	101.19
95th-Percentile Queue Length [veh/ln]	5.45	5.39	3.91	1.31	2.55	10.64	14.69	4.95	2.81	2.18	7.32	7.29
95th-Percentile Queue Length [ft/ln]	136.15	134.76	97.78	32.63	63.66	266.02	367.26	123.80	70.14	54.51	182.99	182.13

Movement, Approach, & Intersection Results

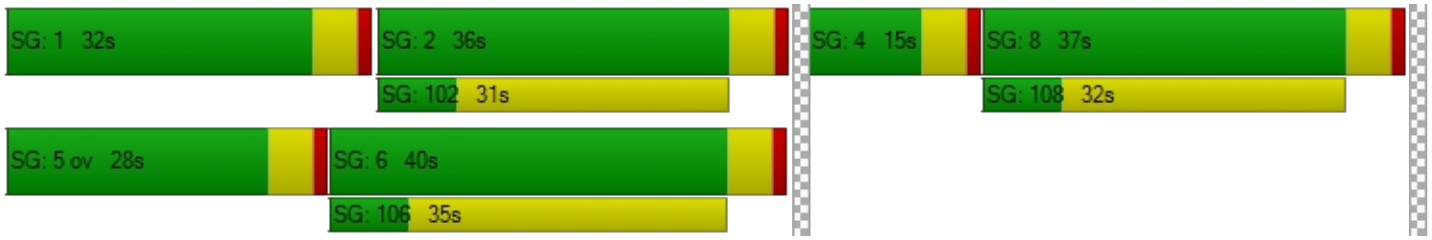
d_M, Delay for Movement [s/veh]	55.72	54.81	54.81	51.71	52.96	24.21	63.94	10.05	9.48	61.92	19.21	19.21
Movement LOS	E	D	D	D	D	C	E	B	A	E	B	B
d_A, Approach Delay [s/veh]	55.48			29.43			26.73			22.33		
Approach LOS	E			C			C			C		
d_I, Intersection Delay [s/veh]	29.89											
Intersection LOS	C											
Intersection V/C	0.575											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.410	2.454	0.000	2.519
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.782	2.213	2.307	1.978
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	21	1	48	4	1	9	5	396	18	56	481	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	1	48	4	1	9	5	396	18	56	481	5
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	13	1	0	2	1	106	5	15	129	1
Total Analysis Volume [veh/h]	23	1	52	4	1	10	5	426	19	60	517	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.07	0.01	0.00	0.01	0.00	0.00	0.00	0.05	0.01	0.00
d_M, Delay for Movement [s/veh]	14.10	15.53	10.41	15.05	15.18	10.06	8.48	0.00	0.00	8.42	0.00	0.00
Movement LOS	B	C	B	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.42	0.42	0.42	0.08	0.08	0.08	0.01	0.00	0.00	0.17	0.00	0.00
95th-Percentile Queue Length [ft/ln]	10.39	10.39	10.39	2.10	2.10	2.10	0.36	0.00	0.00	4.27	0.00	0.00
d_A, Approach Delay [s/veh]	11.60			11.74			0.09			0.87		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	1.43											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	37.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.250

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	19	6	65	23	11	22	33	401	16	94	473	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	6	65	23	11	22	33	401	16	94	473	25
Peak Hour Factor	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	2	18	6	3	6	9	108	4	25	128	7
Total Analysis Volume [veh/h]	21	6	70	25	12	24	36	434	17	102	512	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	19	36	36	0	17	0	12	30	0	24	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	3	56	67	48	4	13	13	7	15	15
g / C, Green / Cycle	0.03	0.62	0.75	0.53	0.05	0.14	0.14	0.07	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.04	0.03	0.02	0.11	0.11	0.05	0.14	0.13
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	66	1234	1490	1113	95	288	288	146	339	339
d1, Uniform Delay [s]	42.60	6.64	3.04	10.36	41.66	37.26	37.22	40.85	36.01	35.92
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.68	0.01	0.06	0.09	2.46	4.74	4.55	5.97	4.44	4.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.32	0.00	0.05	0.05	0.38	0.79	0.78	0.70	0.80	0.79
d, Delay for Lane Group [s/veh]	45.28	6.65	3.10	10.45	44.12	42.01	41.76	46.82	40.45	40.06
Lane Group LOS	D	A	A	B	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.50	0.04	0.28	0.59	0.83	5.12	5.05	2.43	6.05	5.92
50th-Percentile Queue Length [ft/ln]	12.55	1.07	6.93	14.70	20.85	128.04	126.32	60.68	151.21	147.98
95th-Percentile Queue Length [veh/ln]	0.90	0.08	0.50	1.06	1.50	8.83	8.74	4.37	10.08	9.91
95th-Percentile Queue Length [ft/ln]	22.60	1.92	12.48	26.46	37.52	220.82	218.48	109.22	252.05	247.73

Movement, Approach, & Intersection Results

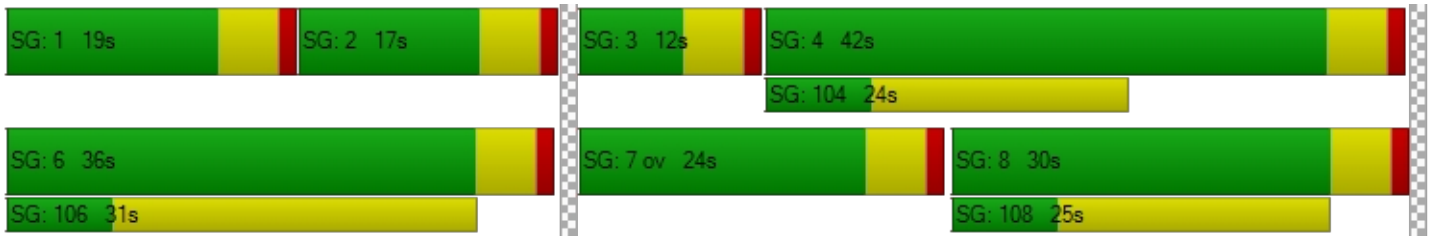
d_M, Delay for Movement [s/veh]	45.28	6.65	3.10	10.45	10.45	10.45	44.12	41.89	41.76	46.82	40.26	40.06
Movement LOS	D	A	A	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	12.45			10.45			42.05			41.30		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	37.94											
Intersection LOS	D											
Intersection V/C	0.250											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	0.00	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.186	1.778	0.000	2.563
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	688	266	555	821
d_b, Bicycle Delay [s]	19.38	33.85	23.52	15.65
l_b,int, Bicycle LOS Score for Intersection	1.720	1.660	1.961	2.088
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX D-II

YEAR 2024 WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.473

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	96	38	54	6	39	282	203	498	73	20	311	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	38	54	6	39	282	203	498	73	20	311	8
Peak Hour Factor	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340	0.9340
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	10	14	2	10	75	54	133	20	5	83	2
Total Analysis Volume [veh/h]	103	41	58	6	42	302	217	533	78	21	333	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	48	18	76	76	4	62	62
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.40	0.15	0.64	0.64	0.03	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.03	0.05	0.04	0.00	0.02	0.17	0.13	0.15	0.04	0.01	0.10	0.09
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	190	151	143	151	719	252	2287	1144	52	931	931
d1, Uniform Delay [s]	52.09	52.86	52.35	50.56	51.59	26.01	49.90	9.37	8.34	57.16	15.47	15.46
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.19	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	0.99	1.45	2.06	0.12	0.99	0.70	8.33	0.24	0.12	5.10	0.44	0.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.42	0.45	0.04	0.28	0.42	0.86	0.23	0.07	0.41	0.18	0.18
d, Delay for Lane Group [s/veh]	53.08	54.31	54.41	50.68	52.58	26.71	58.22	9.61	8.46	62.26	15.91	15.89
Lane Group LOS	D	D	D	D	D	C	E	A	A	E	B	B
Critical Lane Group	No	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.64	2.38	2.02	0.17	1.23	6.37	6.93	2.97	0.79	0.70	2.61	2.60
50th-Percentile Queue Length [ft/ln]	40.90	59.44	50.50	4.28	30.79	159.22	173.27	74.16	19.75	17.49	65.32	64.91
95th-Percentile Queue Length [veh/ln]	2.94	4.28	3.64	0.31	2.22	10.51	11.25	5.34	1.42	1.26	4.70	4.67
95th-Percentile Queue Length [ft/ln]	73.61	106.99	90.89	7.71	55.41	262.69	281.21	133.49	35.55	31.48	117.58	116.84

Movement, Approach, & Intersection Results

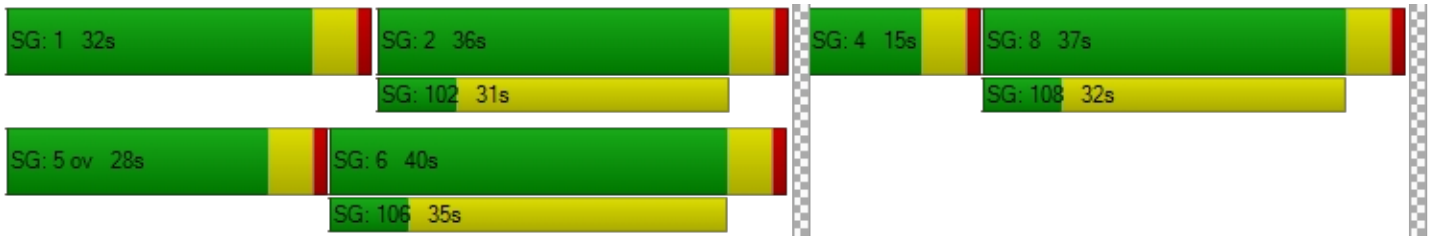
d_M, Delay for Movement [s/veh]	53.61	54.33	54.41	50.68	52.58	26.71	58.22	9.61	8.46	62.26	15.90	15.89
Movement LOS	D	D	D	D	D	C	E	A	A	E	B	B
d_A, Approach Delay [s/veh]	54.00			30.23			22.24			18.58		
Approach LOS	D			C			C			B		
d_I, Intersection Delay [s/veh]	26.76											
Intersection LOS	C											
Intersection V/C	0.473											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.381	2.434	0.000	2.501
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.726	2.137	2.243	1.859
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	15.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.122

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	46	0	59	0	0	1	4	420	53	72	344	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	0	59	0	0	1	4	420	53	72	344	0
Peak Hour Factor	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950	0.8950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	0	16	0	0	0	1	117	15	20	96	0
Total Analysis Volume [veh/h]	51	0	66	0	0	1	4	469	59	80	384	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00
d_M, Delay for Movement [s/veh]	15.38	16.17	11.65	14.21	15.23	9.41	8.08	0.00	0.00	8.77	0.00	0.00
Movement LOS	C	C	B	B	C	A	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.80	0.80	0.80	0.00	0.00	0.00	0.01	0.00	0.00	0.25	0.00	0.00
95th-Percentile Queue Length [ft/ln]	19.90	19.90	19.90	0.09	0.09	0.09	0.26	0.00	0.00	6.27	0.00	0.00
d_A, Approach Delay [s/veh]	13.27			9.41			0.06			1.51		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	2.06											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	35.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.256

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	11	11	59	48	12	25	25	454	5	34	387	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	11	59	48	12	25	25	454	5	34	387	28
Peak Hour Factor	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560	0.8560
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	17	14	4	7	7	133	1	10	113	8
Total Analysis Volume [veh/h]	13	13	69	56	14	29	29	530	6	40	452	33
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	16	36	36	0	20	0	12	30	0	24	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	2	56	65	49	4	15	15	4	16	16
g / C, Green / Cycle	0.02	0.62	0.72	0.54	0.04	0.17	0.17	0.05	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.01	0.01	0.03	0.05	0.01	0.13	0.13	0.02	0.12	0.12
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	45	1236	1447	1143	82	331	331	100	349	349
d1, Uniform Delay [s]	43.34	6.62	3.57	10.02	42.05	36.23	36.21	41.49	34.97	34.88
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.54	0.02	0.06	0.15	2.59	4.76	4.68	2.58	2.56	2.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.01	0.05	0.09	0.35	0.81	0.81	0.40	0.70	0.69
d, Delay for Lane Group [s/veh]	46.88	6.63	3.63	10.17	44.65	40.98	40.89	44.08	37.53	37.29
Lane Group LOS	D	A	A	B	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.33	0.09	0.31	0.94	0.68	6.02	5.99	0.92	5.20	5.08
50th-Percentile Queue Length [ft/ln]	8.16	2.31	7.82	23.56	17.01	150.42	149.73	23.11	130.12	127.12
95th-Percentile Queue Length [veh/ln]	0.59	0.17	0.56	1.70	1.22	10.04	10.00	1.66	8.95	8.78
95th-Percentile Queue Length [ft/ln]	14.68	4.16	14.08	42.42	30.61	250.99	250.07	41.59	223.65	219.57

Movement, Approach, & Intersection Results

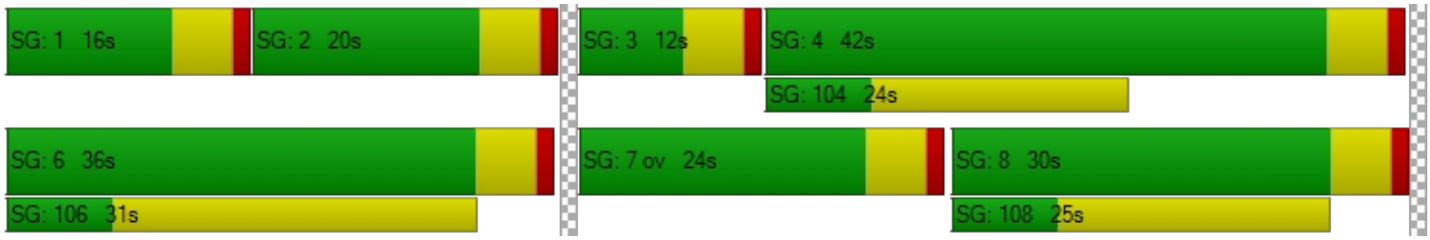
d_M, Delay for Movement [s/veh]	46.88	6.63	3.63	10.17	10.17	10.17	44.65	40.94	40.89	44.08	37.42	37.29
Movement LOS	D	A	A	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	9.96			10.17			41.13			37.92		
Approach LOS	A			B			D			D		
d_I, Intersection Delay [s/veh]	35.12											
Intersection LOS	D											
Intersection V/C	0.256											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.70	34.70	0.00	34.70
l_p,int, Pedestrian LOS Score for Intersection	2.168	1.799	0.000	2.609
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	689	333	555	822
d_b, Bicycle Delay [s]	19.36	31.27	23.49	15.63
l_b,int, Bicycle LOS Score for Intersection	1.716	1.723	2.026	1.993
Bicycle LOS	A	A	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: 40th St/Shandin Hills Dr at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.577

Intersection Setup

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hills Dr			40th St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	186	32	38	24	45	304	266	460	134	37	442	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	186	32	38	24	45	304	266	460	134	37	442	7
Peak Hour Factor	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420	0.9420
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	8	10	6	12	81	71	122	36	10	117	2
Total Analysis Volume [veh/h]	197	34	40	25	48	323	282	488	142	39	469	7
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	10	7	10	0	7	10	0
Maximum Green [s]	0	30	0	0	30	30	30	30	0	30	30	0
Amber [s]	0.0	4.0	0.0	0.0	4.0	4.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	37	0	0	15	15	28	36	0	32	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	25	0	0	0	0	0	24	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	10	10	10	10	10	52	22	75	75	5	58	58
g / C, Green / Cycle	0.08	0.08	0.08	0.08	0.08	0.43	0.18	0.62	0.62	0.04	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.04	0.01	0.03	0.18	0.17	0.14	0.08	0.02	0.13	0.13
s, saturation flow rate [veh/h]	1700	1700	1800	1700	1800	1800	1700	3600	1800	1700	1800	1800
c, Capacity [veh/h]	178	203	151	143	151	780	310	2240	1120	74	870	870
d1, Uniform Delay [s]	53.48	53.48	52.55	51.14	51.76	23.47	48.11	9.91	9.30	56.24	18.49	18.48
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.23	0.19	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering 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
d2, Incremental Delay [s]	2.67	1.80	2.45	0.58	1.19	0.74	15.83	0.22	0.23	5.79	0.78	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.49	0.49	0.18	0.32	0.41	0.91	0.22	0.13	0.53	0.27	0.27
d, Delay for Lane Group [s/veh]	56.16	55.29	54.99	51.71	52.96	24.21	63.94	10.13	9.53	62.03	19.27	19.26
Lane Group LOS	E	E	D	D	D	C	E	B	A	E	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.03	2.99	2.24	0.73	1.41	6.47	9.61	2.80	1.56	1.28	4.13	4.11
50th-Percentile Queue Length [ft/ln]	75.64	74.87	55.95	18.13	35.37	161.73	240.18	70.03	39.11	31.93	103.17	102.69
95th-Percentile Queue Length [veh/ln]	5.45	5.39	4.03	1.31	2.55	10.64	14.69	5.04	2.82	2.30	7.43	7.39
95th-Percentile Queue Length [ft/ln]	136.15	134.76	100.72	32.63	63.66	266.02	367.26	126.06	70.40	57.47	185.71	184.84

Movement, Approach, & Intersection Results

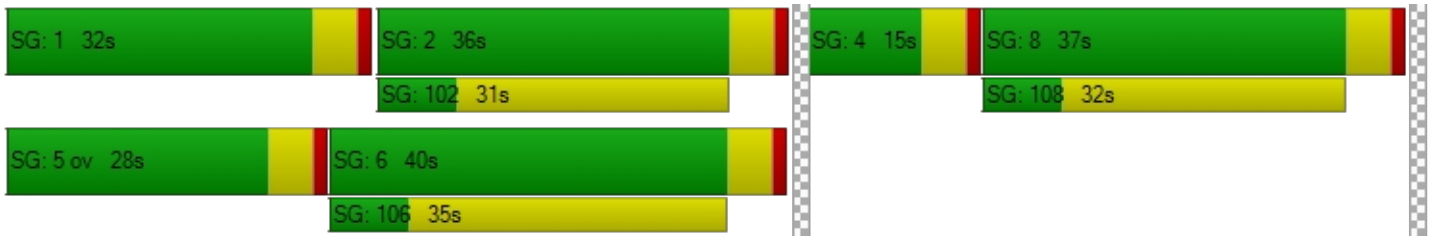
d_M, Delay for Movement [s/veh]	55.72	54.99	54.99	51.71	52.96	24.21	63.94	10.13	9.53	62.03	19.26	19.26
Movement LOS	E	D	D	D	D	C	E	B	A	E	B	B
d_A, Approach Delay [s/veh]	55.52			29.43			26.68			22.50		
Approach LOS	E			C			C			C		
d_I, Intersection Delay [s/veh]	29.90											
Intersection LOS	C											
Intersection V/C	0.577											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	0.00	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.411	2.454	0.000	2.522
Crosswalk LOS	B	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	533	167	516	583
d_b, Bicycle Delay [s]	32.28	50.44	33.02	30.12
l_b,int, Bicycle LOS Score for Intersection	1.783	2.213	2.312	1.984
Bicycle LOS	A	B	B	A

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Project Dwy at Kendall Drive

Control Type:	Two-way stop	Delay (sec / veh):	16.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.003

Intersection Setup

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Project Dwy			Ex. Dwy			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	39	1	69	4	1	9	5	386	36	77	471	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	1	69	4	1	9	5	386	36	77	471	5
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	0	19	1	0	2	1	104	10	21	127	1
Total Analysis Volume [veh/h]	42	1	74	4	1	10	5	415	39	83	506	5
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No	No		
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	Yes	Yes		
Number of Storage Spaces in Median	2	2	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.00	0.10	0.01	0.00	0.01	0.00	0.00	0.00	0.08	0.01	0.00
d_M, Delay for Movement [s/veh]	15.24	16.73	11.17	15.82	15.84	10.04	8.44	0.00	0.00	8.53	0.00	0.00
Movement LOS	C	C	B	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.74	0.74	0.74	0.09	0.09	0.09	0.01	0.00	0.00	0.24	0.00	0.00
95th-Percentile Queue Length [ft/ln]	18.50	18.50	18.50	2.17	2.17	2.17	0.36	0.00	0.00	6.09	0.00	0.00
d_A, Approach Delay [s/veh]	12.68			11.97			0.09			1.19		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	2.04											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 3: F St/Shandin Hills Cir at Kendall Dr

Control Type:	Signalized	Delay (sec / veh):	37.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.255

Intersection Setup

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	0	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Shandin Hill Cir			F St			Kendall Dr			Kendall Dr		
Base Volume Input [veh/h]	19	6	65	23	11	28	39	407	16	94	479	25
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	6	65	23	11	28	39	407	16	94	479	25
Peak Hour Factor	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240	0.9240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	2	18	6	3	8	11	110	4	25	130	7
Total Analysis Volume [veh/h]	21	6	70	25	12	30	42	440	17	102	518	27
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	6	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups			6,7									
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	10	10	0	10	0	7	10	0	7	10	0
Maximum Green [s]	30	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	4.0	4.0	4.0	0.0	4.0	0.0	4.0	4.0	0.0	4.0	4.0	0.0
All red [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
Split [s]	12	44	44	0	32	0	14	27	0	19	32	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	0	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	24	0	0	0	0	18	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Minimum Recall	No	No	No		No		No	No		No	No	
Maximum Recall	No	No	No		No		No	No		No	No	
Pedestrian Recall	No	No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	0.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	3	55	67	47	5	13	13	6	15	15
g / C, Green / Cycle	0.03	0.61	0.74	0.53	0.05	0.15	0.15	0.07	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.04	0.03	0.02	0.11	0.11	0.05	0.14	0.14
s, saturation flow rate [veh/h]	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
c, Capacity [veh/h]	65	1228	1483	1107	103	295	295	145	337	337
d1, Uniform Delay [s]	42.61	6.74	3.11	10.48	41.42	37.00	36.95	40.86	36.12	36.03
k, delay calibration	0.11	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.82	0.01	0.06	0.10	2.60	4.46	4.28	6.16	4.84	4.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.32	0.00	0.05	0.06	0.41	0.78	0.77	0.71	0.82	0.80
d, Delay for Lane Group [s/veh]	45.44	6.74	3.17	10.58	44.02	41.47	41.24	47.02	40.96	40.52
Lane Group LOS	D	A	A	B	D	D	D	D	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.50	0.04	0.28	0.65	0.97	5.15	5.08	2.43	6.16	6.02
50th-Percentile Queue Length [ft/ln]	12.59	1.08	7.09	16.32	24.22	128.82	127.10	60.81	153.97	150.62
95th-Percentile Queue Length [veh/ln]	0.91	0.08	0.51	1.18	1.74	8.88	8.78	4.38	10.23	10.05
95th-Percentile Queue Length [ft/ln]	22.66	1.94	12.77	29.38	43.60	221.89	219.55	109.45	255.71	251.25

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.44	6.74	3.17	10.58	10.58	10.58	44.02	41.36	41.24	47.02	40.75	40.52
Movement LOS	D	A	A	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	12.55			10.58			41.58			41.73		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	37.92											
Intersection LOS	D											
Intersection V/C	0.255											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.70	34.70	0.00	34.70
l_p,int, Pedestrian LOS Score for Intersection	2.186	1.784	0.000	2.565
Crosswalk LOS	B	A	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	866	600	489	600
d_b, Bicycle Delay [s]	14.47	22.07	25.71	22.07
l_b,int, Bicycle LOS Score for Intersection	1.720	1.670	1.971	2.093
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-