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MEMORANDUM

DATE: September 9, 2022

TO: Arthur Gonzales – Access Manager

FROM: Jeffrey C. Hodsdon, P.E. - LSC Transportation Consultants, Inc.

SUBJECT: Ellicott Gas Station
RE: Traffic Impact Study
Response to CDOT Comments Memorandum
LSC #204481

Following are the LSC Transportation Consultants, Inc. responses to the January 12, 2022 CDOT Comments (posted to EDARP) regarding CS-21-002.

a. *CDOT staff does not have any comments regarding the rezone of the fueling station from agricultural to commercial.*

b. *A new CDOT Access Permit will be required for this development. Please contact CDOT, Arthur Gonzales, Access Manager to make application (719) 546-5732 or email* arthur.gonzales@state.co.us.

LSC Response: Comment noted.

c. *A single point of access shall be granted for this development and secondary access to the site may not be allowed per the State Highway Access Code.*

LSC Response: Comment noted. The new/additional west access previously proposed for the site has been removed from the plan.

d. *Auxiliary lanes will be required for this development with highway widening and roadway improvements will also be required per the design standards of the State Highway Access Code.*

LSC Response: Comment noted. This project is at the rezone stage. Design of the access modifications and any associated highway improvements would occur at the site-development application. The updated TIS addresses the auxiliary turn-lane requirements based on the SHAC turning volume thresholds. However, the report contains the following note for consideration: Based on the planned net increase of one vehicle fueling position, and the associated trip-generation estimate, the use of the access would not increase by more than 20 percent, which is the typical threshold requiring a new access permit in Access Code section 2.6.3. Other provisions may apply, but generally when the proposed increase in vehicle volume will be less than 20 percent, changes in the use of the property are considered "minor modifications."

1. *Traffic Impact Study (TIS), dated December 17, 2020, is not signed and stamped. A signed and stamped copy should be provided before final approval.*

LSC Response: The TIS has been updated and has been signed & stamped.

2. *The TIS refers to a school expansion and school peak hours in the Trip Generation paragraph on page 4 & 5. This should be corrected and resubmitted.*

LSC Response: Corrected in the updated TIS

3. *The TIS is missing a reference in the 2040 Total Traffic Volumes paragraph on page 6. This should be corrected.*

LSC Response: Corrected in the updated TIS

4. *The TIS states that it is not possible for trucks to circulate through the site with a single access. Evidence to support this claim has not been provided. The size of the parcel appears to be about 4 acres.*

LSC Response: The site plan has been revised. The new/additional west access previously proposed for the site has been removed from the plan.

5. *There are two existing uses for this property – the gas station and a fire station. The TIS needs to include the gas station use, its access, and associated impacts. This information needs to be submitted.*

LSC Response: Comment noted. The updated TIS addresses this comment. Note: the TIS has been modified to remove the reference to a "fire station." The building on the east side of the site is leased by the fire district for storage.

6. *The proposed modification of the existing access would not meet the standards of the State Highway Access Code (SHAC) regarding spacing from the intersection of SH94 and Ellicott Highway due to the required lengths of auxiliary lanes for acceleration and deceleration lanes.*

   LSC Response: The site plan has been revised. The new/additional west access previously proposed for the site has been removed from the plan and TIS report. The TIS addresses auxiliary lanes.

7. ***The access does not meet the one-half mile spacing standard for NR-A Highway for full movement accesses.***

   LSC Response: Comment noted. Site access at half-mile spacing would not be feasible.

8. *Any new access would need to be a minimum of 400 feet from any other access which is not possible for this parcel unless an access is shared.*

   LSC Response: The site plan has been revised. The new/additional west access previously proposed for the site has been removed from the plan and TIS report.

9. *The site plan provided shows a total of 4 proposed accesses: a one-way ingress next to a full movement driveway on the west side of the parcel and a one-way egress next to a full movement driveway near the east side of the parcel. Only one single point of access is allowed by the SHAC access should be allowed and only if it can meet the standards of the SHAC.*

   LSC Response: The site plan and proposed access plan has been revised. Please refer to the "Access Plan" section of the TIS and Figure 2, which depicts a proposed access reconfiguration plan.

10. *Per the Hwy 94 Access Management Plan, the intersection of SH94 and Ellicott Highway is identified for signalization in the future. The TIS should analyze the impacts of queue lengths and other operational components of a future signal. Left turning outbound trucks would have to wait for a gap in westbound traffic generated by a future signal at the Ellicott Highway and then may be prevented from doing so due to a queue of eastbound traffic stopped at the signal.*

    LSC Response: This comment has been addressed in the updated report. A queuing analysis has been added. Also, see the note on Figure 2 regarding the gas station access location.

11. *Due to the turning volumes, right and left turn deceleration lanes are required.*

    LSC Response: The updated TIS addresses the auxiliary turn-lane requirements based on the SHAC turning volume thresholds. However, the report contains the following note for

consideration: Based on the planned net increase of one vehicle fueling position, and the associated trip-generation estimate, the use of the access would not increase by more than 20 percent, which is the typical threshold requiring a new access permit in Access Code section 2.6.3. Other provisions may apply, but generally when the proposed increase in vehicle volume will be less than 20 percent, changes in the use of the property are considered "minor modifications."

12. *Right turn and left turn acceleration lanes are required due to the traffic volume on the highway, the posted speed of 45 MPH and the new trips generated by trucks.*

LSC Response: A left-turn acceleration lane is not feasible given the proximity of the downstream intersection of Ellicott Highway/SH 94. Please refer to the response to comment no. 11 above.

13. *A revised site plan with access that meets the standards of the SHAC needs to be provided.*

LSC Response: The site plan and proposed access plan has been revised. Please refer to the "Access Plan" section of the TIS and Figure 2, which depicts a proposed access reconfiguration plan.

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Ellicott Gas Station
Traffic Impact Study Update
PCD File No.: CS-21-002
(LSC #204481)
September 8, 2022

Traffic Engineer's Statement

This traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

COLORADO LICENSED
JEFFREY C. HOUSDON
31684
9-8-22
PROFESSIONAL ENGINEER

Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

_____ _____
Date

Ellicott Gas Station

Traffic Impact Study Update

Prepared for:
Baseline Engineering Corporation
112 N. Rubey Drive, #210
Golden, CO 80403
Contact: Ben Thurston, AICP
Planning Director

SEPTEMBER 8, 2022

LSC Transportation Consultants
Prepared by:
Jeffrey C. Hodsdon, P.E.

LSC #204481

PCD File No. CS-21-002

CONTENTS

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September 8, 2022

Ben Thurston, AICP
Planning Director
Baseline Engineering Corporation
112 N. Rubey Drive #210
Golden, CO 80403

RE: Ellicott Gas Station
Traffic Impact Study
El Paso County, Colorado
LSC #204481
PCD File No. CS-21-002

Dear Mr. Thurston,

In response to your request, LSC Transportation Consultants, Inc. has prepared this updated traffic impact study (TIS) for the proposed rezone of the parcel located at 23580 Highway 94 in the Ellicott area of El Paso County, Colorado (El Paso County parcel no. 3412000015). As shown in Figure 1, the site is located on the north of State Highway (SH) 94 approximately 250 feet west of the intersection of SH 94/Ellicott Highway.

The purpose of the rezone is to expand the existing Fuel B's gas station & convenience store business by adding new diesel fuel pumps and removing the existing diesel fuel pump. The net increase would be **one** diesel fueling position. The prior site plan submitted showed an additional access point to State Highway 94 (SH 94). In response to Colorado Department of Transportation (CDOT) comments, the site plan has been revised, and the second access has been removed from the plan.

REPORT CONTENTS

The preparation of this report included the following:

- An inventory of existing roadway and traffic conditions on the adjacent and nearby roadway system, including surface conditions, functional classification, widths, pavement markings, traffic control signs, posted speed limits, intersection and access spacing, roadway and intersection alignments, roadway grades, and auxiliary turn lanes;

- Updated weekday morning and afternoon peak-hour turning-movement traffic counts at the intersections:
    - SH 94/Ellicott Highway
    - Existing site access
- CDOT annual average daily traffic and estimated current average weekday traffic (AWT) volumes on the study area streets;
- Projections of 20-year background traffic volumes on the study-area streets;
- The proposed site expansion and access plan;
- Estimates of average weekday and weekday peak-hour trip generation for the proposed gas station expansion;
- Assignment of the site-generated traffic to the roadway network;
- Projected resulting total peak-hour intersection traffic volumes at the intersections:
    - SH 94/Ellicott Highway
    - Existing site access to SH 94
- Projected total daily (AWT) volumes on the study area streets;
- Intersection level of service analysis at the study intersections for both background and total traffic scenarios;
- Queuing analysis and auxiliary turn-lane analysis at the site access; and
- Findings and recommendations;

RECENT TRAFFIC REPORTS

The following traffic reports were utilized in the preparation of this report:

- The prior version of this TIS report: "Ellicott Gas Station" by LSC (December 2020)
- SH 94 Access Management Plan, 2012
- "Ellicott Town Center Rezone" by LSC (June 2020)

LAND USE

Figure 1 shows the site location relative to the adjacent and nearby streets and roadways. As shown, the gas station is located on the north side of SH 94 approximately 250 feet west of the intersection of SH 94/Ellicott Highway. The gas station currently has 10 vehicle fueling positions with a convenience store and fast food. The proposed expansion would involve construction of three new diesel fueling positions, while the existing diesel pump (two fueling positions) would be removed (for a net increase of 1 new fueling position). No building expansion is proposed. The updated site plan is shown in Figure 2.

The parcel to the west of the site has been developed for a liquor store and a Subway. Immediately to the east on the same parcel is a building leased by the Ellicott Fire Protection District. It is our understanding that this building is used for storage.

ACCESS PLAN

The combined gas station and fire district building existing access point is currently about 165' wide, the west edge of which is about 440 feet west of the centerline of the SH 94/Ellicott Highway intersection. The revised site plan shows a proposed new west edge of the gas station access at 375 feet west of the centerline of the SH 94/Ellicott Highway intersection. The plan shows the access width for the gas station narrowed to 40 feet. The centerline spacing from SH 94/Ellicott Highway intersection would be 355 feet. The plan shows the proposed reconfiguration of the wide access for the gas station and a separate access for the fire district centered on the front of the fire station. The plan shows separate fire district access point because placement of the gas station access to allow for trucks to enter, circulate within, and exit the gas station site would create a more difficult and cumbersome ingress and egress for the storage building.

Please refer to notes on Figure 2 regarding the proposed access reconfiguration plan.

STUDY AREA BOUNDARIES

The study area is the site frontage of SH 94 (including the access), east to and including the intersection of SH 94/Ellicott Highway.

EXISTING ROAD AND TRAFFIC CONDITIONS

Figure 1 shows the streets adjacent to and in the vicinity of the site. Adjacent streets serving the site are identified below followed by a brief description of each:

State Highway 94 is generally a two-lane, paved rural highway in this area of El Paso County with a posted speed limit of 55 miles per hour (mph) adjacent to the site. The highway extends east from US Highway 24 near Peterson Air Force Base for about 85 miles to Highway 287 in Cheyenne County.

CDOT has identified the governing document with respect to access management for SH 94 in the vicinity of the site as the *State Highway 94 Access Management Plan* (2012). SH 94 is a three-lane roadway in the vicinity of the site and is classified as NR-A (non-rural principal arterial) adjacent to the site. There is a single through lane in each direction and a two-way left-turn center lane. The posted speed limit is 45 miles per hour (mph) adjacent to the site.

The El Paso County 2040 *Major Transportation Corridors Plan* (*MTCP*) identifies SH 94 as a two-lane Principal Arterial adjacent to the site. The *MTCP* 2060 *Corridor Preservation Plan* identifies SH 94 as a future four-lane Principal Arterial. However, future right-of-way needs will be identified by CDOT.

Ellicott Highway is classified as a two-lane Minor Arterial on the 2040 El Paso County *MTCP*. Posted speed limits adjacent to the site are 55 mph and 45 mph north and south of SH 94,

respectively. Auxiliary left-turn lanes currently exist on the eastbound and westbound approaches at the TWSC intersection of Ellicott Highway/State Highway 94.

Existing Traffic Volumes

Figure 3 shows the results of morning and afternoon peak-hour traffic-volume counts conducted in March and June 2022 at the intersections of SH 94/Ellicott Highway and the gas station site access, along with existing lane geometries and traffic controls. CDOT data indicates that heavy vehicles make up approximately 7 percent of the traffic during the morning and afternoon peak hours.

Pedestrian, Bicycle and Public Transit Access

There are no sidewalks along SH 94 or Ellicott Highway in the vicinity of the site. In the El Paso County *Major Transportation Corridors Plan Update,* it is shown that a regional trail is planned adjacent to SH 94. Additionally, the plan showed Ellicott Highway south of SH 94 is a proposed bicycle route.

There are no Mountain Metropolitan public transit routes in the vicinity of the site.

FUTURE BACKGROUND CONDITIONS

Background traffic is traffic that is anticipated to occur without the addition of the proposed development. Figure 8 shows the projected long-term background traffic volumes for the year 2042. Traffic from the proposed gas station expansion is not included in the 2042 background traffic volumes.

The planned Mayberry Town Center (formerly called "Ellicott Town Center") development site is located west of the site. Future traffic projections from the most recent comprehensive TIS report for that project have been used in this report. The Colorado Department of Transportation (CDOT) 20-year growth factor for SH 94 along this segment of highway is 1.19. Use of this growth factor would result in lower estimates than those shown in Figure 8. In order to be conservative, LSC aligned long-term traffic volumes at SH 94/Ellicott Highway in this study with those from the "Ellicott Town Center Rezone" report (submitted in June 2020).

TRIP GENERATION

Short Term

Estimates of the vehicle trips currently being generated and projected to be generated in the short term following the site expansion were developed using counts recorded at the existing gas station. Traffic counts conducted at the site access were used to develop current trip-generation rates, based on the existing number of fueling positions (ten). Then those rates were used to

forecast how much traffic would be generated with the proposed net one additional fueling position (factored by 1.1).

Table 1 provides the existing traffic generated by the gas station during the morning and afternoon peak hours.

Table 1: Existing Site Vehicle-Trip Generation for 10 Fueling Pumps (Based on LSC Count Data)

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	63	64	127
Afternoon Peak Hour	72	64	136

Table 2 provides the increase in site-generated traffic projected to occur with the additional pumps. A detailed short-term trip-generation estimate for the gas station, including calculated trip-generation rates, is presented in Table 5 (attached).

Table 2: Estimated Increase in Site Vehicle-Trip Generation for Additional Fueling Pumps

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	6	6	12
Afternoon Peak Hour	7	6	13

The proposed gas station expansion is projected to generate approximately 12 additional vehicle trips during the morning peak hour and 13 additional vehicle trips during the afternoon peak hour.

Long Term

Estimates of the vehicle trips projected to be generated by the proposed gas station site have been made using nationally-published trip-generation rates from *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). ITE land-use code "945 – Convenience Store/Gas Station (2.0 – 4.0 KSF)" has been used to estimate trip generation for the site.

Table 3 provides the existing traffic generated by the gas station during the morning and afternoon peak hours. These trip generation totals include combined counts for the existing gas station and adjacent fire station.

Table 3: Future "Baseline" Site Vehicle-Trip Generation for 10 Fueling Pumps (Based on ITE-Rate-Based Estimates)

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	85	85	170
Afternoon Peak Hour	93	93	186

Table 4 provides the increase-above-baseline site-generated trips projected to occur with the additional pumps. A detailed long-term trip-generation estimate for the gas station, including calculated trip-generation rates, is presented in Table 5 (attached).

Table 4: Estimated Increase-Above-Baseline in Site Vehicle-Trip Generation for 3 Additional Fueling Pumps (ITE-Rate-Based Estimates)

Analysis Period	Weekday		
	In	Out	Total
Morning Peak Hour	9	9	18
Afternoon Peak Hour	9	9	18

The proposed gas station expansion is projected to generate 18 additional vehicle trips during the morning peak hour and 18 additional vehicle trips during the afternoon peak hour.

Pass-By Trips

A large percentage of gas station traffic is typically from pass-by traffic. Based on the ITE "Trip Generation Handbook," it is anticipated that approximately 75 percent of the traffic generated by the additional gas pumps will be pass-by trips. These trips are not new to the adjacent roadway but are new to the site access.

A pass-by trip is one made by a motorist who would already be on an adjacent road regardless of the proposed development, but who stops in at the site while passing by. That pass-by motorist would then continue on his or her way to a final destination in the original direction. Figure 4 (attached) shows the percent of the trips generated that were assumed to be pass-by trips. The pass-by trip percentage of 76 percent has been based on data from the *Trip Generation Handbook – An ITE Proposed Recommended Practice, 3rd Edition, 2014* by ITE.

TRIP DISTRIBUTION AND ASSIGNMENT

Estimating the directional distribution of site-generated vehicle-trips to the study-area roads and intersections is a necessary component in determining the site's traffic impacts. Figure 4 shows

the percentages of the site-generated vehicle trips projected to be oriented to/from each approach to the site. Pass-by trip splits/percentages have also been estimated. Estimates have been based on the directional distribution of existing traffic.

Site-generated traffic volumes have been estimated at the study intersections, as shown in Figure 5 and Figure 6. These volumes have been calculated by applying directional distribution percentages to the trip-generation estimates (from Table 5, attached). Both non-pass-by trips and pass-by trips are provided in the figure. The figures show both the estimated increases/additional site-generated trips resulting from the expansion, as well as the resulting total site-generated trips assuming the site expansion ("build" scenario).

TOTAL TRAFFIC

Short-Term Total Traffic Volumes

Figure 7 shows the sum of the existing traffic volumes (from Figure 3) and the additional trips due to three additional pumps (shown in Figure 5). These volumes represent the projected short-term total traffic following the construction of the additional pumps. Laneage and traffic control at the study-area intersections are also shown in this figure.

2042 Total Traffic Volumes

Figure 9 shows the sum of the long-term baseline (from Figure 8) and the long-term site-generated peak-hour traffic volumes (shown in Figure 6). The long-term future total trips are essentially an estimate based on ITE Trip Generation rates for an 11-pump gas station/convenience store. These volumes represent the projected long-term total traffic following the construction of the additional pumps. Laneage and traffic control at the study-area intersections are also shown in this figure.

LEVEL OF SERVICE ANALYSIS

The following intersections have been analyzed to determine the projected intersection levels of service for short- and long-term background and total traffic scenarios for the morning and afternoon peak-hour periods:

- SH 94/Ellicott Highway
- Site access point

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 3 shows the level of service delay ranges for signalized and unsignalized intersections.

Table 3: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections Average Control Delay (seconds per vehicle)	Unsignalized Intersections Average Control Delay (seconds per vehicle)(1)
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more

(1) For unsignalized intersections, if V/C ratio is greater than 1.0 the level of service is LOS F, regardless of the projected average control delay per vehicle.

LOS values have been included on each figure for each turning movement/approach during the weekday morning and evening peak hours for the proposed site access intersections and off-site intersections in the study area:

- Figure 3: Existing Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 7: Existing + Site Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 8: 2042 Background Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 9: 2042 Background + Site Traffic, Lane Geometry, Traffic Control, and LOS

LOS calculations for long-term scenarios were based upon the recommended lane geometries and traffic controls outlined in the figures above.

SH 94/Site Access

All turning movements at the intersection of SH 94/site access currently operate at and are projected to remain LOS C or better during all peak hours through the long term, with or without the additional site traffic. Analysis assumes that a westbound right-turn deceleration lane would be constructed on SH 94 at the site access.

SH 94/Ellicott Highway

Short Term

All individual turning movements and single-lane approaches at SH 94/Ellicott Highway currently operate at and would continue to operate at LOS C or better during both short-term peak hours, with or without additional site-generated traffic. Short-term analysis assumed no modifications would be made to existing lane geometries and traffic control at this intersection.

Long Term

If the intersection of SH 94/Ellicott Highway were to remain two-way stop-sign controlled during the long term, the northbound and southbound single-lane approaches would operate at LOS F during at least one peak hour, with or without additional site-generated traffic. However, all individual turning movements would improve to LOS B or better if the intersection were to be signalized or converted to a roundabout in the long term, as summarized in the attached figures and Synchro reports.

Signal Warrants

Based on the existing-plus-site volumes, the threshold for an hourly time period of the Four-Hour Volume traffic-signal warrant would not be exceeded during the AM or late afternoon peak hours (two hours of the day). By 2042, the projected background and total volumes are projected to exceed these thresholds. The addition of one net additional diesel fueling position on this site would have minimal impact on the side-street approach volumes.

QUEUING ANALYSIS

Eastbound Approach at the SH 94/Ellicott Highway Intersection

If the intersection of SH 94/Ellicott Highway were to be signalized during the long term, queues on SH 94 would extend back from Ellicott Highway towards the site access during the red phase of each cycle. The centerline spacing between the proposed site-access location and the SH 94/Ellicott Highway intersection would be 355 feet. Queues exceeding 355 feet would block the site access. Synchro reports indicate that the 95th-percentile queue length for any of the projected future eastbound turn lanes would not exceed 58 feet during either peak hour. As such, queues on the eastbound approach would **not** block the access or hamper the ability for traffic to turn southbound-left out of the site and head east if SH 94/Ellicott Highway were to be converted to a signalized intersection.

Eastbound Left Turn at the Site Access

There currently exists a two-way left-turn lane on SH 94 adjacent to the site. This allows eastbound left-turning vehicles to move out of the through lane for queuing prior to turning into the site. The queuing analysis shows that none of the left-turning movements into the site are anticipated to have a 95th percentile queue length exceeding 25 feet.

AUXILIARY LANES

SH 94/Site Access

Note: Based on the planned net increase of one vehicle fueling position, and the associated trip-generation estimate, the use of the access would not increase by more than 20 percent, which is the typical threshold requiring a new access permit in Access Code section 2.6.3. Other provisions may apply, but generally when the proposed increase in vehicle volume will be less than 20 percent, changes in the use of the property are considered "minor modifications."

The proposed site-access location relative to Ellicott Highway does not meet the one-half mile spacing standard for NR-A highways for full-movement accesses. Any new access would need to be a minimum of 400 feet from any other access, which is not possible for this parcel. The prior site plan has been modified to maintain the single access to the gas station/convenience store. This access is shown about 400 feet east of the access to the north side to the property to the west.

The plan shows separate fire station access point because placement of the gas station access to allow for trucks to enter, circulate within, and exit the gas station site would create a more difficult and cumbersome ingress and egress for fire station vehicles.

Westbound-Right Deceleration Lane

Based on current traffic volumes, the site access meets the minimum threshold to require a westbound right-turn lane. The Access Code requirement for a westbound right-turn lane is 435 feet in length, which includes a taper of 165 feet. The spacing between this access and the intersection of SH 94/Ellicott Highway is not adequate for a full-length turn lane with taper.

Westbound-Right Acceleration Lane

Per CDOT criteria, a westbound right-turn acceleration lane is required on NR-A classified roadways with an egress volume exceeding 50 vehicles per hour (vph). As shown on the figures, the southbound-right volume exiting the site would exceed this 50-vph threshold. The Access Code criteria indicates this movement requires a 550-foot acceleration lane, consisting of 388 feet of full-width lane length plus a 162-foot transition taper (13.5-to-1 ratio).

Eastbound-Left Turn Deceleration Lane

There currently exists a two-way left-turn lane on SH 94 adjacent to the site-access point. This functions as the left-turn lane into the site. The roadway is striped for a two-way center left-turn lane due to the numerous access points on both sides of the highway through this section.

SH 94/Ellicott Highway

The westbound right turn to the SH 94/Ellicott Highway intersection currently exceeds the minimum threshold for requiring a right-turn lane. This movement requires a 435-foot deceleration lane, which includes a taper of 162 feet (13.5-to-1 ratio).

A potential future signal or roundabout was called out for the SH 94/Ellicott Highway intersection in the Ellicott Town Center TIS report. Please refer to Figure 8 and Figure 9 for potential future additional auxiliary turn lanes at this intersection, including conceptual-level future laneage with lane geometry arrows.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

- During the short term, the site is projected to generate approximately 12 new morning peak-hour trips, with 6 inbound and 6 outbound. Approximately 13 new afternoon trips (7 additional inbound and 6 additional outbound) would be generated during the short term. Approximately 75 percent of these trips will be pass-by trips.
- During the long term, the site is projected to generate approximately 18 new morning peak-hour trips, with 9 inbound and 9 outbound. Approximately 18 new afternoon trips (9 inbound and 9 outbound) would be generated during the long term. Approximately 75 percent of these trips will be pass-by trips.

Level of Service

- All individual turning movements at the unsignalized intersection of SH 94/Ellicott Highway are projected to operate at LOS C or better during both short-term peak hours, with or without the proposed gas station expansion.
- If SH 94/Ellicott Highway were to remain two-way stop-sign controlled during the long term, the northbound and southbound single-lane approaches would operate at LOS F during at least one peak hour, with or without the proposed gas station expansion. However, all individual turning movements and approaches would operate at LOS C or better during the long term if this intersection were to be signalized or converted to a roundabout, with or without the proposed gas station expansion.
- All individual turning movements at the site access are projected to operate at LOS C or better during both peak hours in the short-term and long-term scenarios.

Site Access and Potential Improvements

- Based on the planned net increase of one vehicle fueling position, and the associated trip-generation estimate, the use of the access would not increase by more than 20 percent, which is the typical threshold requiring a new access permit in Access Code

section 2.6.3. Other provisions may apply, but generally when the proposed increase in vehicle volume will be less than 20 percent, changes in the use of the property are considered “minor modifications.”

- Please refer to the “Access Plan” section and Figure 2, which depicts a proposed access-reconfiguration plan.
- Please refer to the “Auxiliary Lanes" section above for Access Code thresholds for auxiliary turn lanes with respect to the projected volumes.

* * * * *

Please contact me if you have any questions regarding this report.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By: Jeffrey C. Hodsdon, P.E.
Principal

JCH/JAB:jas

Enclosures: Table 5
Figure 1 - Figure 9
Traffic Count Reports
Synchro Level of Service Reports

Tables

TRANSPORTATION
CONSULTANTS, INC.

Table 5: Detailed Trip-Generation Estimates

Scenario	ITE Code	ITE Description	Value	Units [1]	Trip Generation Rates [2] Average Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out	Driveway Trips Generated Average Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out	% Primary Trips	% Pass-By Trips [3]	External Trips Generated Average Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out
Short Term -- Based on LSC Count Data (June 2022) [4]																					
No Build	945	Convenience Store/Gas Station (2.0-4.0 KSF)	10	VFP	-	-	-	-	-	1959	63	64	72	64	25%	75%	490	16	16	18	16
Build	945	Convenience Store/Gas Station (2.0-4.0 KSF)	11	VFP	-	-	-	-	-	2155	69	70	79	70	25%	75%	539	17	18	20	18
								Difference		**196**	**6**	**6**	**7**	**6**		**Difference**	**49**	**2**	**2**	**2**	**2**
Long Term -- Based on ITE Rates																					
No Build	945	Convenience Store/Gas Station (2.0-4.0 KSF)	10	VFP	265.12	8.48	8.48	9.21	9.21	2652	85	85	93	93	25%	75%	663	21	21	23	23
Build	945	Convenience Store/Gas Station (2.0-4.0 KSF)	11	VFP	265.12	8.48	8.48	9.21	9.21	2917	94	94	102	102	25%	75%	729	24	24	26	26
								Difference		**265**	**9**	**9**	**9**	**9**		**Difference**	**66**	**2**	**2**	**2**	**2**

[1] VFP = vehicle fueling positions

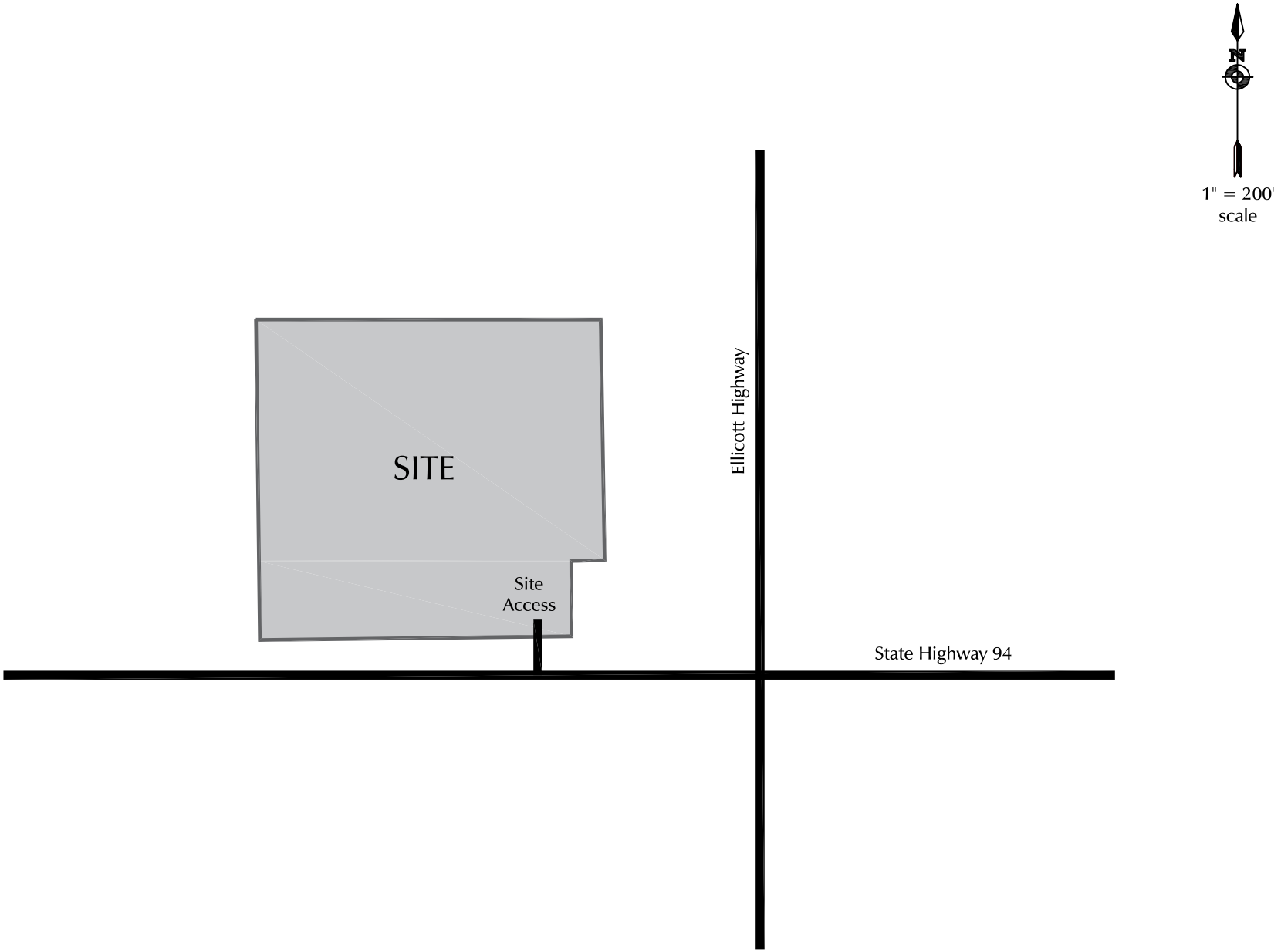
[2] Source: *Trip Generation, 11th Edition (2021)* by the Institute of Transportation Engineers (ITE)

[3] Source: *Trip Generation Handbook - An ITE Recommended Practice, 3rd Edition (2017)* by ITE

[4] Assumes ratio of 1.1 would be applied to existing entering and exiting counts during the future, as 11 vph/10 vph = 1.1

Figures

TRANSPORTATION
CONSULTANTS, INC.



LSC
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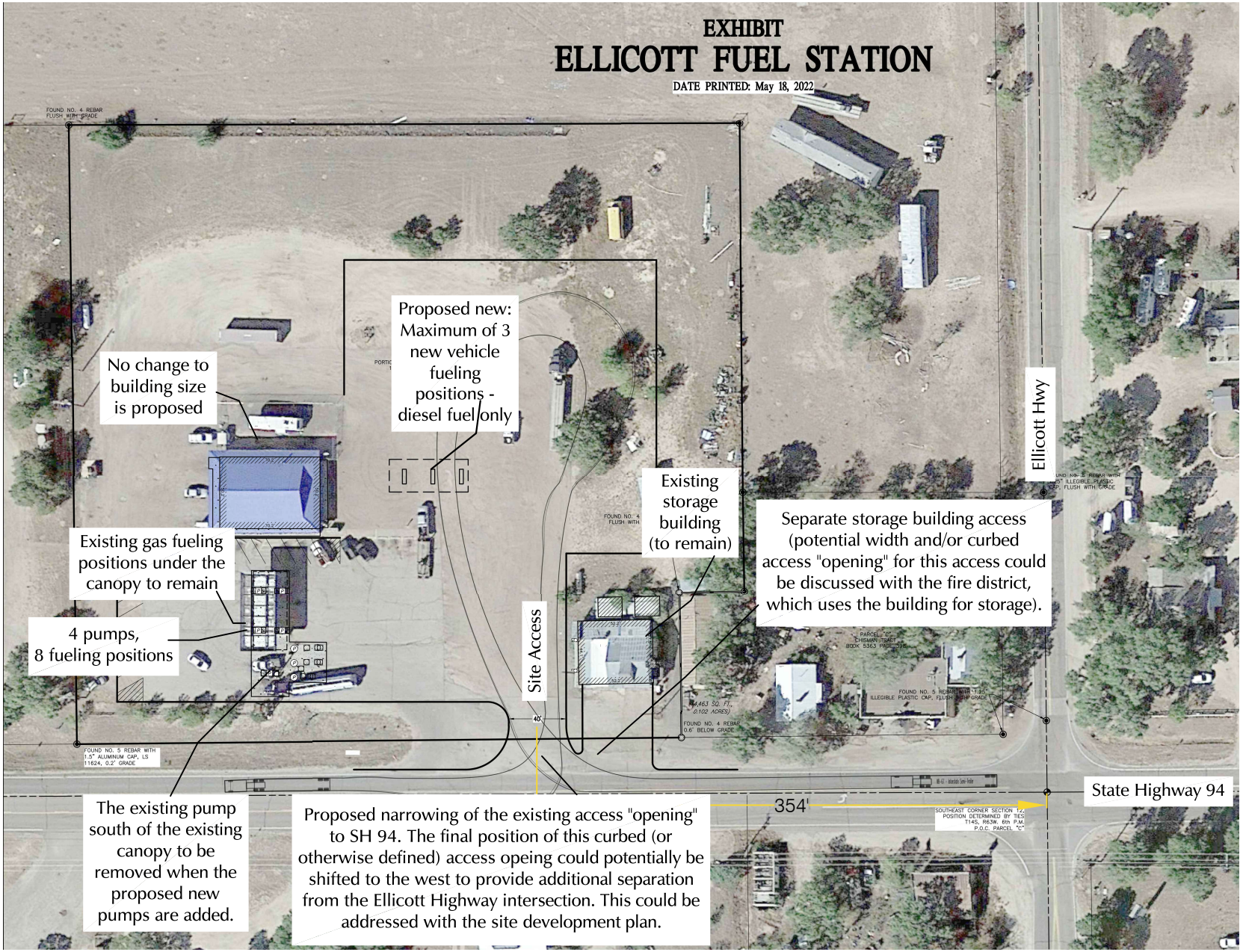
CONSULTANTS, INC.

Figure 1

Vicinity Map

Ellicott Gas Station (LSC#S224481)



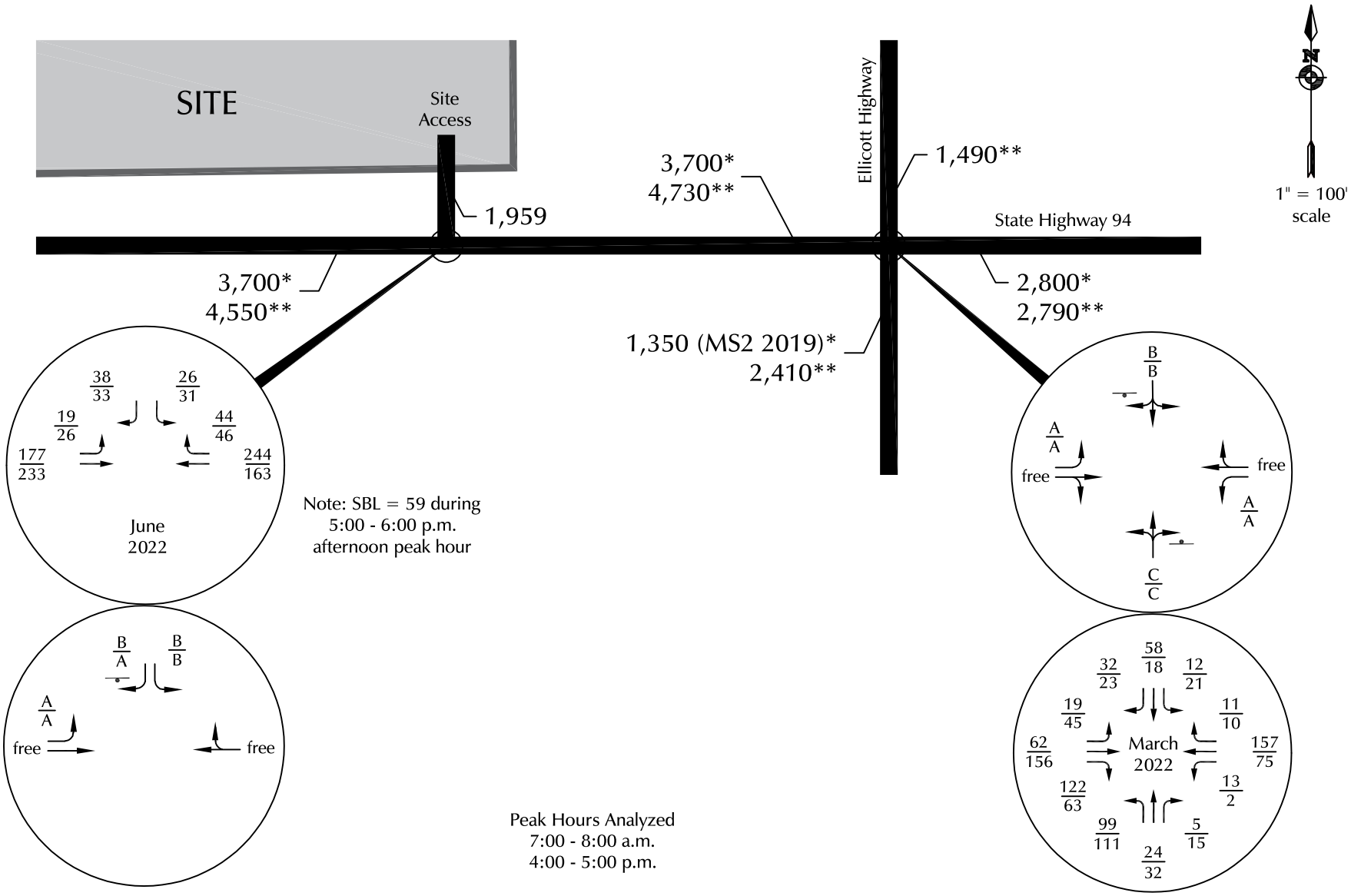
1" = 100' to scale

Figure 2

Site Plan

Ellicott Gas Station (LSC#S224481)

LSC TRANSPORTATION CONSULTANTS, INC.



Peak Hours Analyzed
7:00 - 8:00 a.m.
4:00 - 5:00 p.m.

* Based on CDOT AADT (2021)
** Estimated by LSC (10x PM)

X/X = AM Individual Movement Peak-Hour LOS / PM Individual Movement Peak-Hour LOS

XX/XX = AM Weekday Peak-Hour Traffic (Veh/Hour) / PM Weekday Peak-Hour Traffic (Veh/Hour)

X,XXX = Average Daily Traffic (Vehicles/Day)

= Stop Sign

= Traffic Signal

Counts by LSC (March 2022, June 2022)

Figure 3

Existing Traffic, Lane Geometry, Traffic Control, and LOS

Ellicott Gas Station (LSC#S224481)

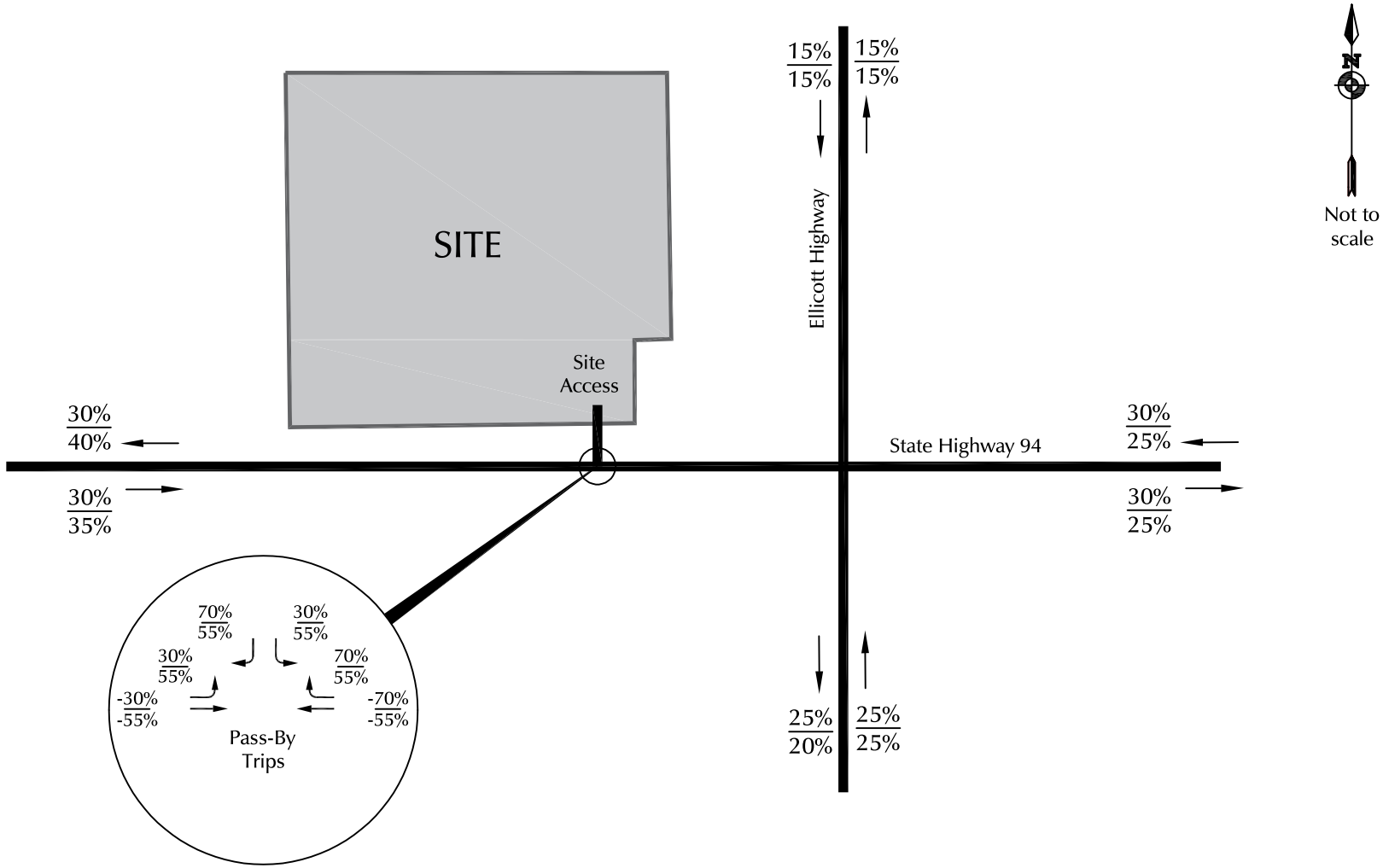


Figure 4

Directional Distribution

Ellicott Gas Station (LSC#S224481)

$$\frac{XX\%}{XX\%} = \frac{\text{A.M. Peak Hour Non-Passby \% Distribution}}{\text{P.M. Peak Hour Non-Passby \% Distribution}}$$

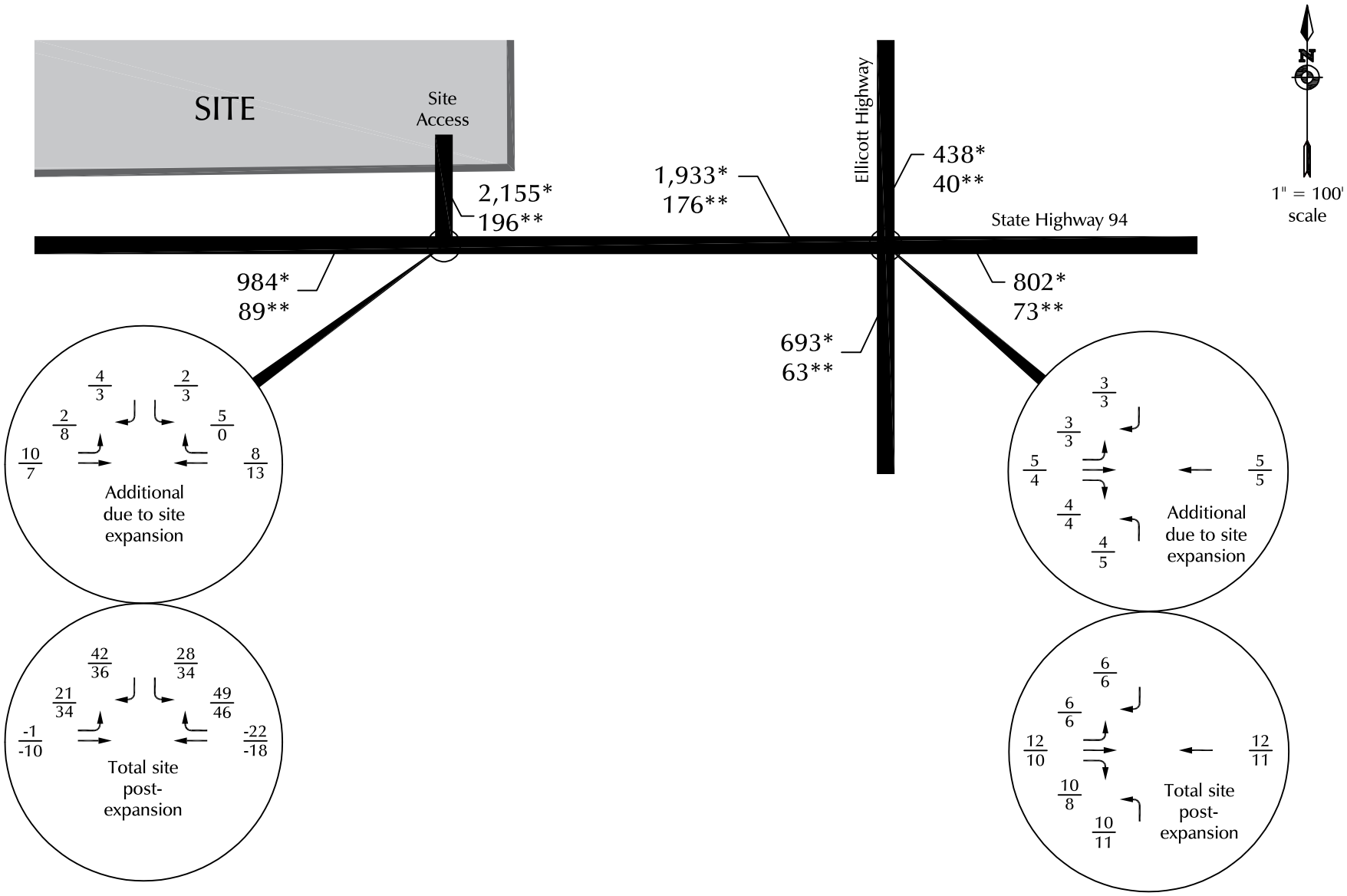


Figure 5

Site-Generated Traffic Short Term

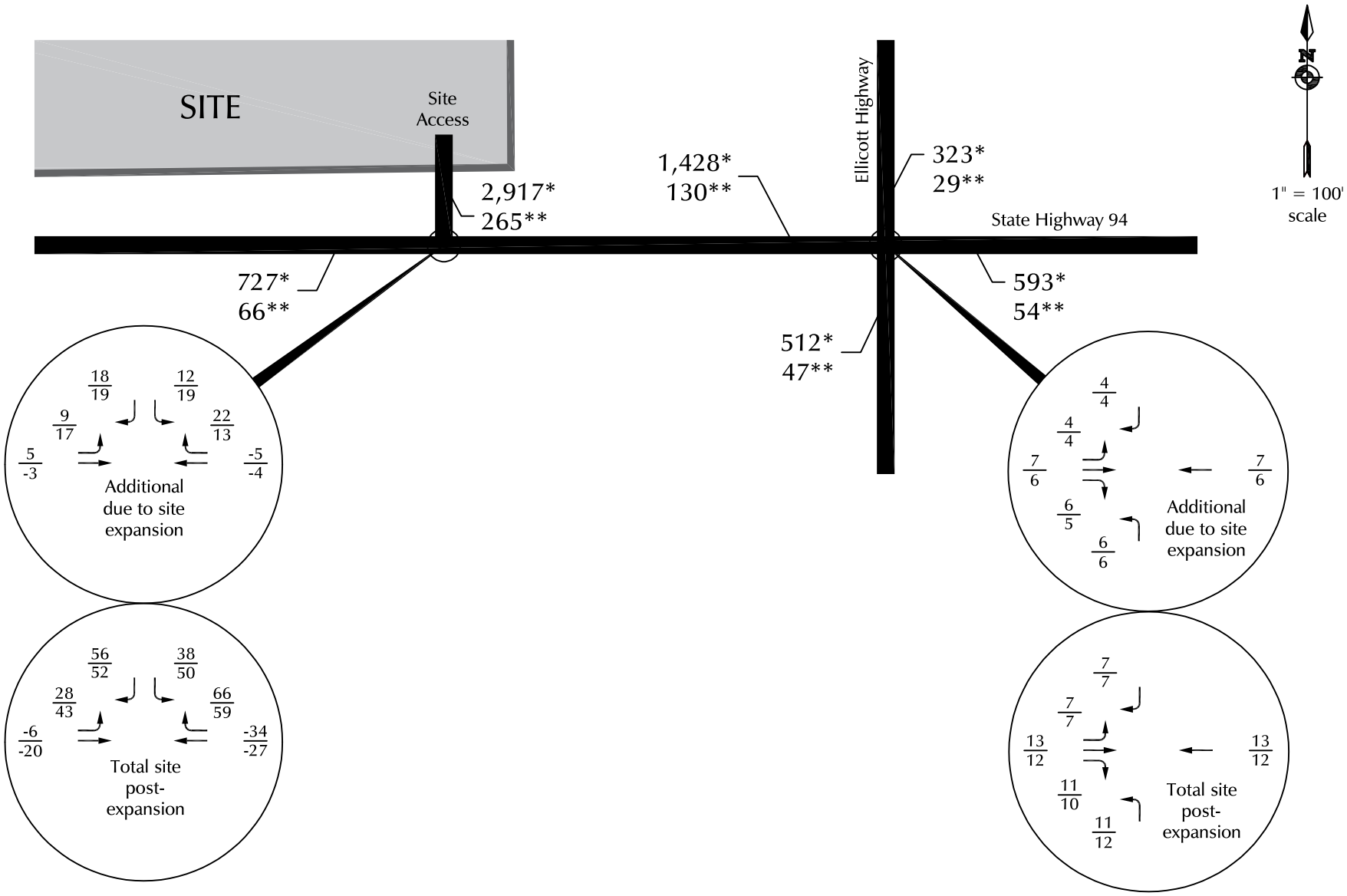
Ellicott Gas Station (LSC#S224481)

XX/XX = AM Weekday Peak-Hour Traffic (Veh/Hour) / PM Weekday Peak-Hour Traffic (Veh/Hour)

X,XXX = Average Daily Traffic (Vehicles/Day)

* Total site following expansion (includes existing)

** Increase in site traffic following expansion (does not include existing), as shown in Table 5



* Total site following expansion (includes existing)

** Increase in site traffic following expansion (does not include existing), as shown in Table 5

*** Based on ITE trip generation, accounting for additional fueling positions

XX/XX = AM Weekday Peak-Hour Traffic (Veh/Hour) / PM Weekday Peak-Hour Traffic (Veh/Hour)

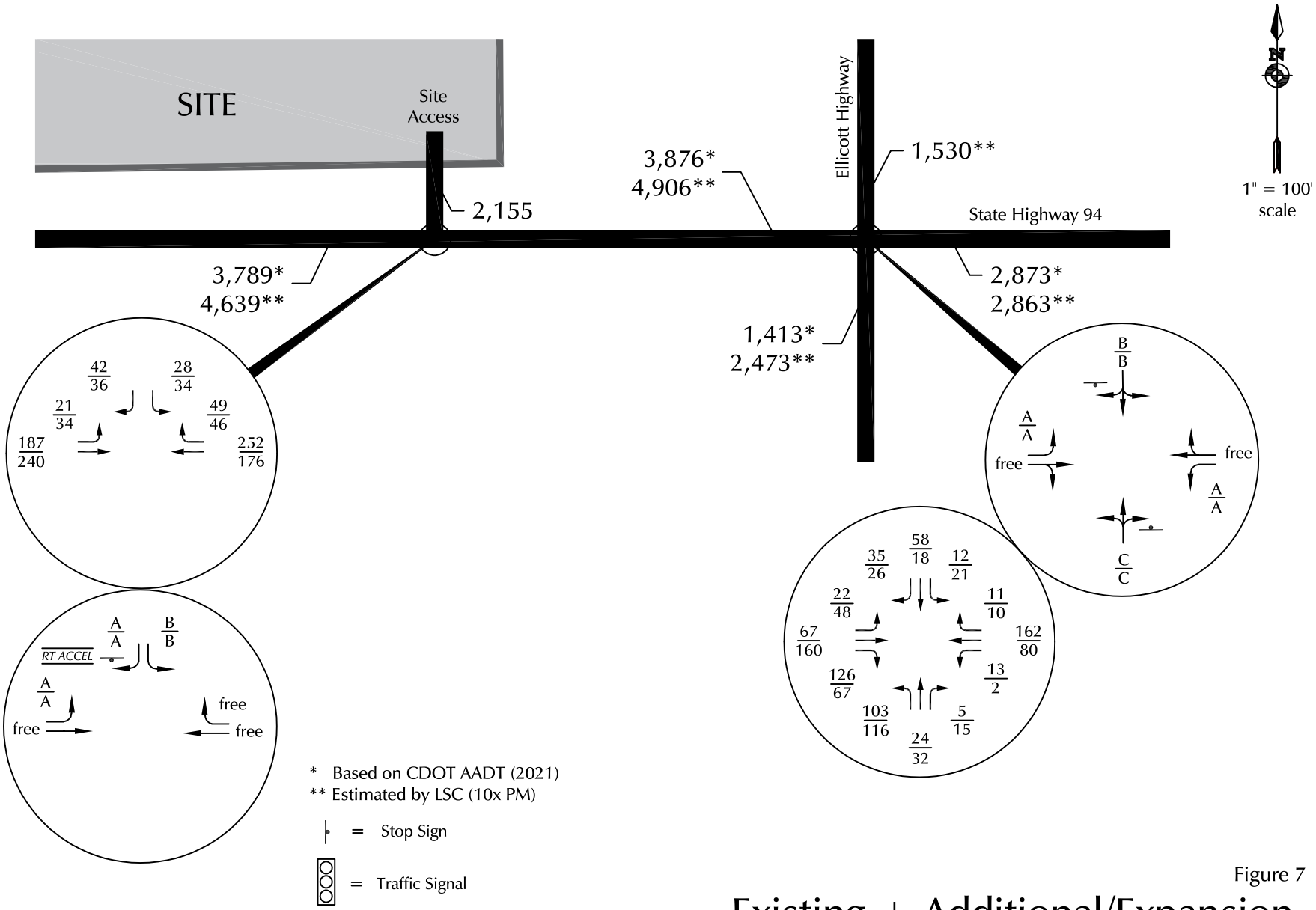
X,XXX = Average Daily Traffic (Vehicles/Day)

LSC Transportation Consultants, Inc.

Figure 6

Site-Generated Traffic Long Term***

Ellicott Gas Station (LSC#S224481)



X/X = AM Individual Movement Peak-Hour LOS / PM Individual Movement Peak-Hour LOS

XX/XX = AM Weekday Peak-Hour Traffic (Veh/Hour) / PM Weekday Peak-Hour Traffic (Veh/Hour)

X,XXX = Average Daily Traffic (Vehicles/Day)

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Figure 7

Existing + Additional/Expansion-Generated Site Traffic, Lane Geometry, Traffic Control, and LOS

Ellicott Gas Station (LSC#S224481)

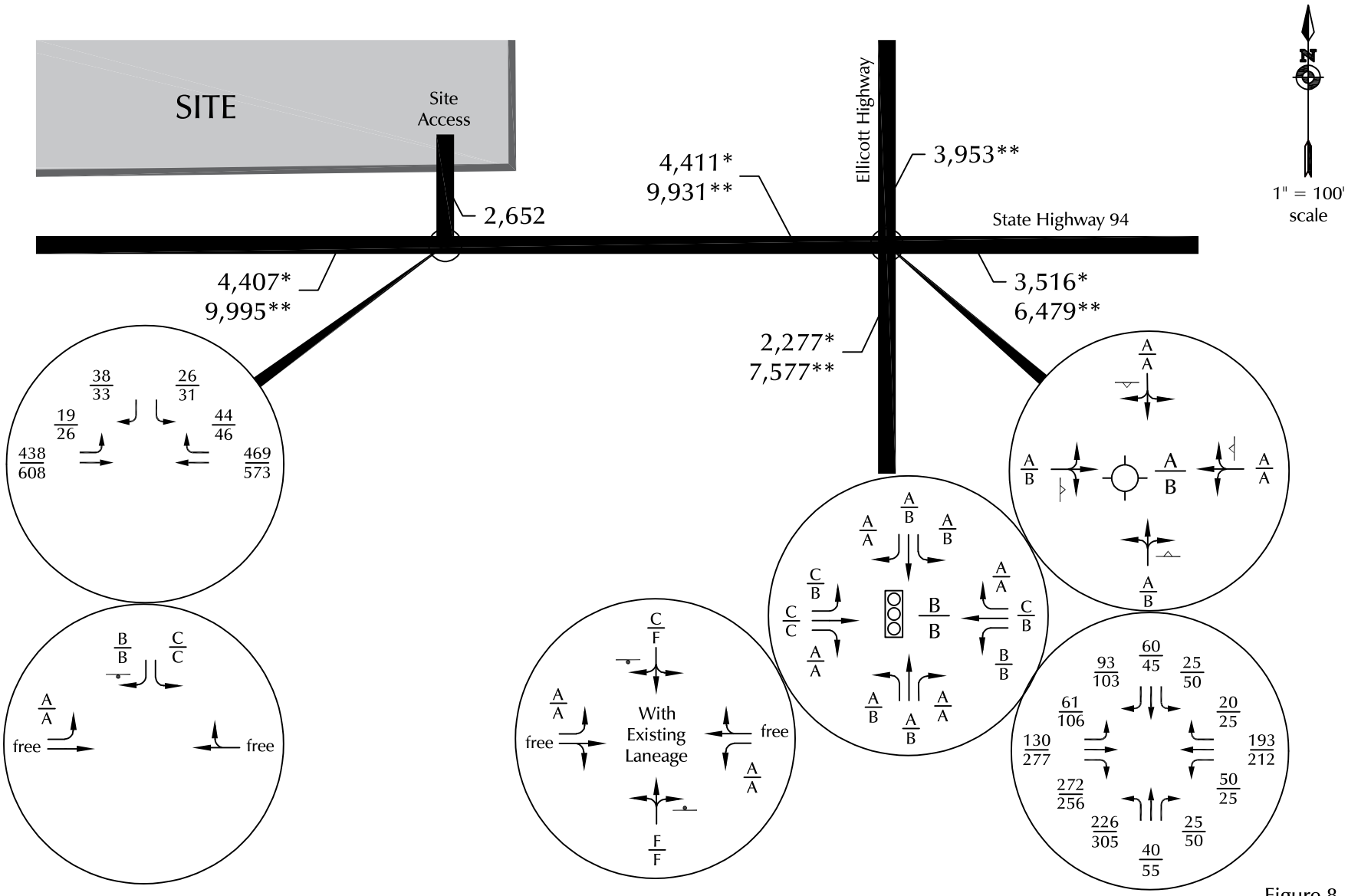


Figure 8

2042 Baseline Background Traffic, Lane Geometry, Traffic Control, and LOS

Ellicott Gas Station (LSC#S224481)

* Based on CDOT AADT (2021)
** Estimated by LSC (10x PM)

$\frac{X}{X}$ = AM Individual Movement Peak-Hour LOS / PM Individual Movement Peak-Hour LOS

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (Veh/Hour) / PM Weekday Peak-Hour Traffic (Veh/Hour)

X,XXX = Average Daily Traffic (Vehicles/Day)

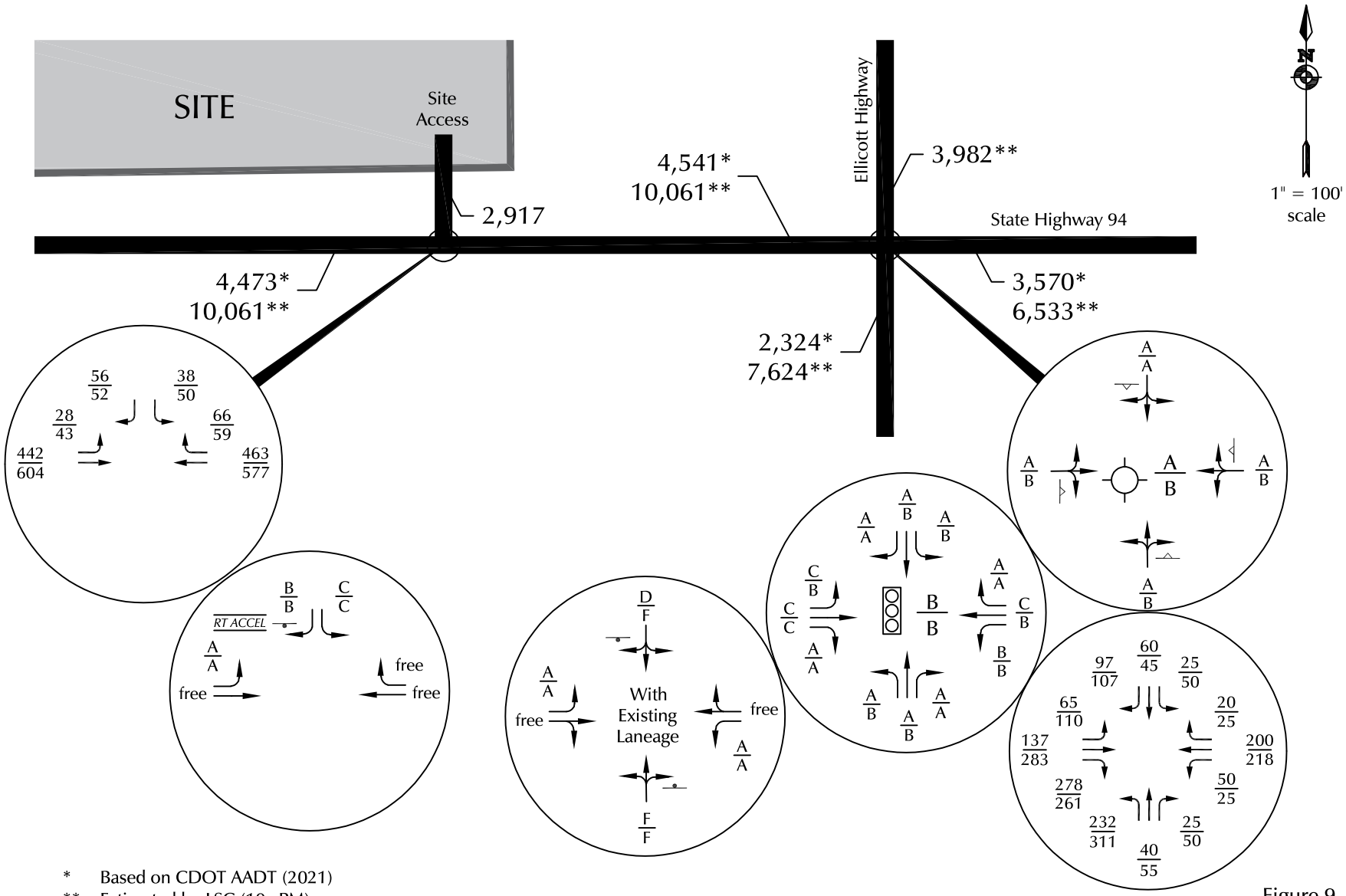
= Yield Sign

= Roundabout

= Stop Sign

= Traffic Signal

LSC TRANSPORTATION CONSULTANTS, INC.



* Based on CDOT AADT (2021)

** Estimated by LSC (10x PM)

*** Based on ITE trip generation, accounting for additional fueling positions

$\frac{X}{X}$ = AM Individual Movement Peak-Hour LOS / PM Individual Movement Peak-Hour LOS

$\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (Veh/Hour) / PM Weekday Peak-Hour Traffic (Veh/Hour)

X,XXX = Average Daily Traffic (Vehicles/Day)

= Yield Sign

= Roundabout

= Stop Sign

= Traffic Signal

Figure 9

2042 Baseline Background + Site Traffic***, Lane Geometry, Traffic Control, and LOS

Ellicott Gas Station (LSC#S224481)

LSC TRANSPORTATION CONSULTANTS, INC.

Traffic Counts

TRANSPORTATION
CONSULTANTS, INC.

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
Colorado Springs, CO 80909
719-633-2868

File Name : Ellicott Hwy - Hwy 94 AM 3-22
Site Code : S224120
Start Date : 3/30/2022
Page No : 1

Groups Printed- Unshifted

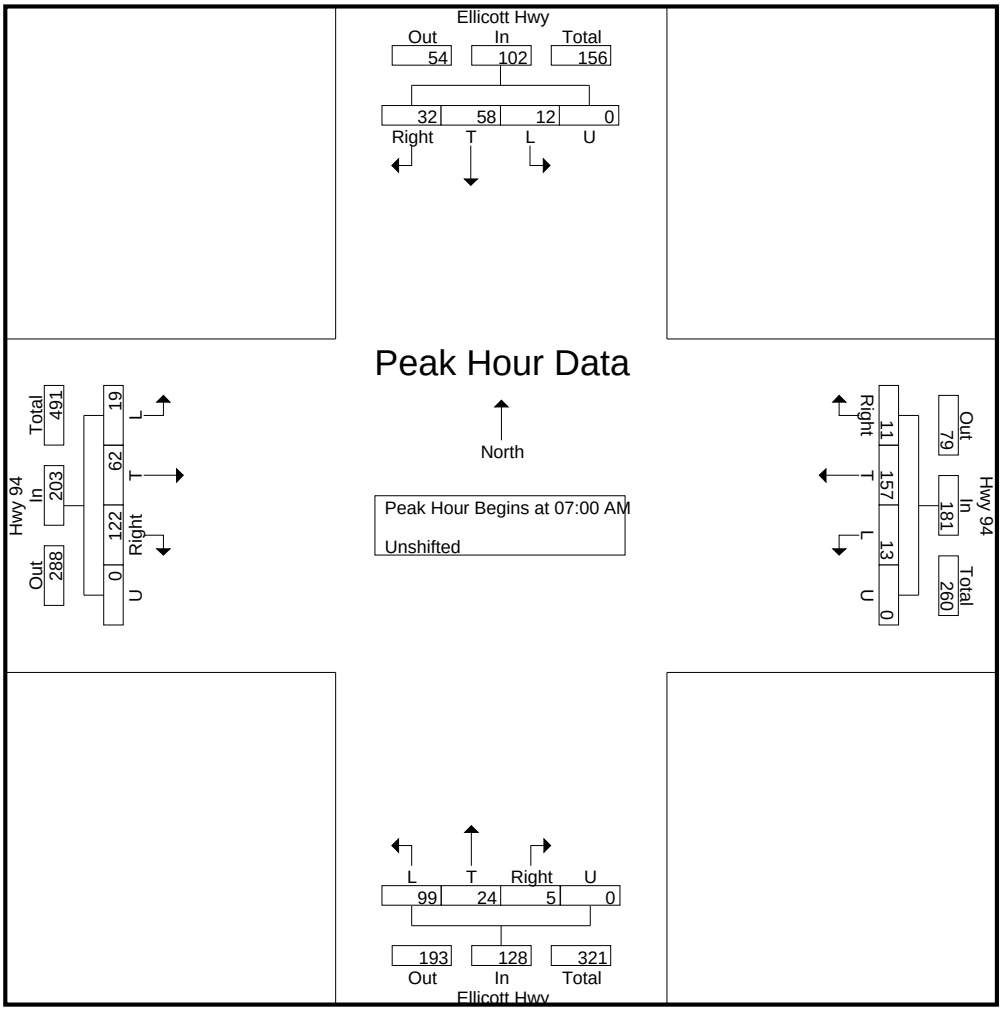
	Ellicott Hwy Southbound					Hwy 94 Westbound					Ellicott Hwy Northbound					Hwy 94 Eastbound					
Start Time	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Int. Total
06:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
06:35 AM	5	3	0	0	8	1	16	0	0	17	0	0	4	0	4	1	3	0	0	4	33
06:40 AM	5	1	1	0	7	2	13	0	0	15	0	3	5	0	8	1	1	0	0	2	32
06:45 AM	6	1	0	0	7	3	9	0	0	12	0	0	6	0	6	3	3	3	0	9	34
06:50 AM	3	0	0	0	3	0	12	1	0	13	0	1	3	0	4	2	7	1	0	10	30
06:55 AM	7	3	2	0	12	1	15	0	0	16	0	1	3	0	4	5	4	1	0	10	42
Total	26	8	3	0	37	7	66	1	0	74	0	5	21	0	26	12	18	5	0	35	172
07:00 AM	5	5	1	0	11	2	16	0	0	18	0	0	3	0	3	4	3	1	0	8	40
07:05 AM	4	1	1	0	6	0	14	3	0	17	0	1	6	0	7	6	2	1	0	9	39
07:10 AM	4	1	2	0	7	2	16	3	0	21	0	0	2	0	2	3	6	3	0	12	42
07:15 AM	3	4	2	0	9	0	15	0	0	15	0	0	4	0	4	4	1	1	0	6	34
07:20 AM	3	6	3	0	12	0	12	0	0	12	0	0	6	0	6	16	5	2	0	23	53
07:25 AM	2	4	1	0	7	0	14	2	0	16	0	3	10	0	13	10	4	2	0	16	52
07:30 AM	3	8	0	0	11	1	14	1	0	16	1	2	8	0	11	14	6	2	0	22	60
07:35 AM	3	7	1	0	11	1	9	2	0	12	1	4	11	0	16	23	7	1	0	31	70
07:40 AM	3	11	0	0	14	1	11	0	0	12	1	7	9	0	17	19	5	1	0	25	68
07:45 AM	1	4	0	0	5	1	11	1	0	13	1	2	8	0	11	11	3	2	0	16	45
07:50 AM	0	4	0	0	4	2	17	1	0	20	1	4	18	0	23	7	5	1	0	13	60
07:55 AM	1	3	1	0	5	1	8	0	0	9	0	1	14	0	15	5	15	2	0	22	51
Total	32	58	12	0	102	11	157	13	0	181	5	24	99	0	128	122	62	19	0	203	614
08:00 AM	1	4	1	0	6	1	11	2	0	14	0	1	8	0	9	2	3	2	0	7	36
08:05 AM	3	2	0	0	5	1	10	0	0	11	1	2	11	0	14	0	2	1	0	3	33
08:10 AM	1	1	0	0	2	2	13	1	0	16	0	0	1	0	1	1	5	3	0	9	28
08:15 AM	1	2	0	0	3	3	6	0	0	9	1	2	2	0	5	0	6	2	0	8	25
08:20 AM	4	1	1	0	6	1	7	0	0	8	1	1	5	0	7	1	3	1	0	5	26
08:25 AM	0	0	0	0	0	3	12	2	0	17	0	1	4	0	5	1	2	2	0	5	27
Grand Total	68	76	17	0	161	29	282	19	0	330	8	36	151	0	195	139	101	35	0	275	961
Apprch %	42.2	47.2	10.6	0		8.8	85.5	5.8	0		4.1	18.5	77.4	0		50.5	36.7	12.7	0		
Total %	7.1	7.9	1.8	0	16.8	3	29.3	2	0	34.3	0.8	3.7	15.7	0	20.3	14.5	10.5	3.6	0	28.6	

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
Colorado Springs, CO 80909
719-633-2868

File Name : Ellicott Hwy - Hwy 94 AM 3-22
Site Code : S224120
Start Date : 3/30/2022
Page No : 2

	Ellicott Hwy Southbound					Hwy 94 Westbound					Ellicott Hwy Northbound					Hwy 94 Eastbound					
Start Time	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	**5**	5	1	0	11	**2**	16	0	0	18	0	0	3	0	3	4	3	1	0	8	40
07:05 AM	4	1	1	0	6	0	14	**3**	0	17	0	1	6	0	7	6	2	1	0	9	39
07:10 AM	4	1	2	0	7	2	16	3	0	**21**	0	0	2	0	2	3	6	**3**	0	12	42
07:15 AM	3	4	2	0	9	0	15	0	0	15	0	0	4	0	4	4	1	1	0	6	34
07:20 AM	3	6	**3**	0	12	0	12	0	0	12	0	0	6	0	6	16	5	2	0	23	53
07:25 AM	2	4	1	0	7	0	14	2	0	16	0	3	10	0	13	10	4	2	0	16	52
07:30 AM	3	8	0	0	11	1	14	1	0	16	**1**	2	8	0	11	14	6	2	0	22	60
07:35 AM	3	7	1	0	11	1	9	2	0	12	1	4	11	0	16	**23**	7	1	0	**31**	**70**
07:40 AM	3	**11**	0	0	**14**	1	11	0	0	12	1	**7**	9	0	17	19	5	1	0	25	68
07:45 AM	1	4	0	0	5	1	11	1	0	13	1	2	8	0	11	11	3	2	0	16	45
07:50 AM	0	4	0	0	4	2	**17**	1	0	20	1	4	**18**	0	**23**	7	5	1	0	13	60
07:55 AM	1	3	1	0	5	1	8	0	0	9	0	1	14	0	15	5	**15**	2	0	22	51
Total Volume	32	58	12	0	102	11	157	13	0	181	5	24	99	0	128	122	62	19	0	203	614
% App. Total	31.4	56.9	11.8	0		6.1	86.7	7.2	0		3.9	18.8	77.3	0		60.1	30.5	9.4	0		
PHF	.533	.439	.333	.000	.607	.458	.770	.361	.000	.718	.417	.286	.458	.000	.464	.442	.344	.528	.000	.546	.731



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2504 E. Pikes Peak Ave, Suite 304
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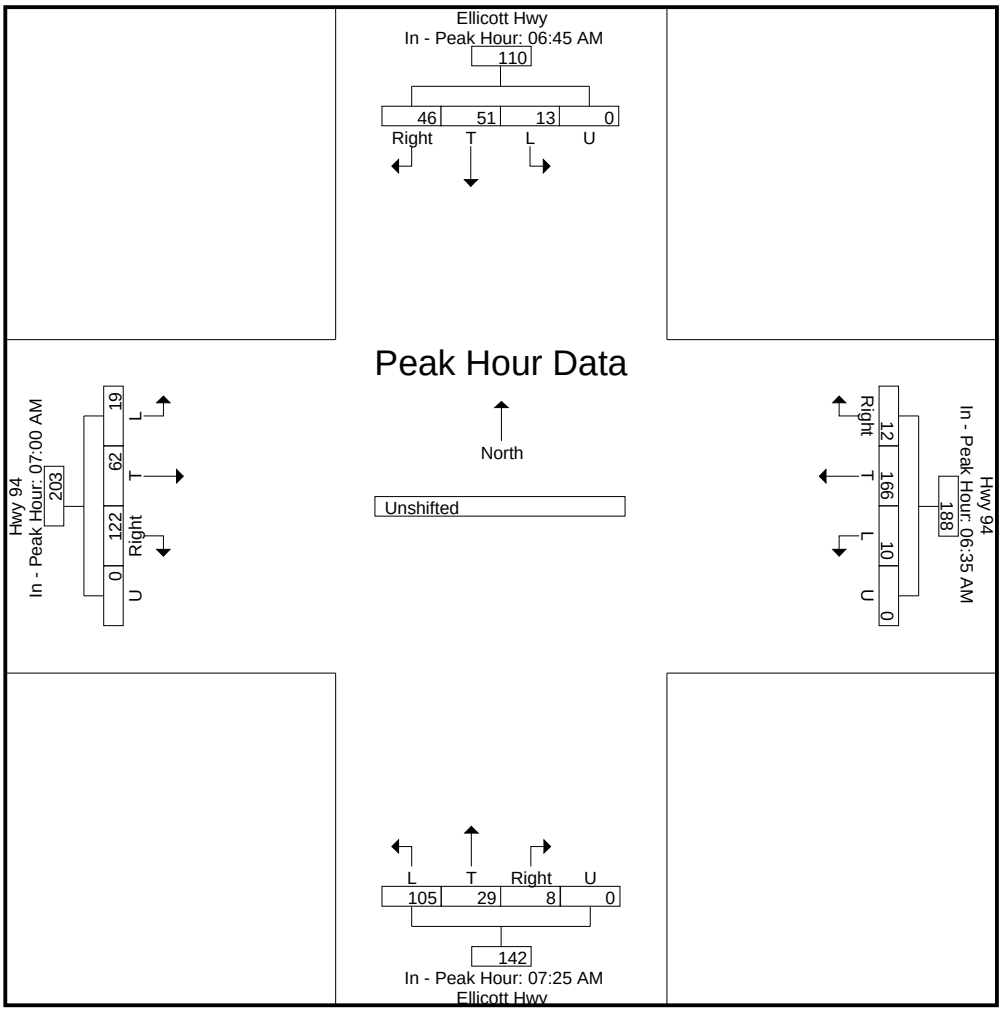
719-633-2868

File Name : Ellicott Hwy - Hwy 94 AM 3-22
Site Code : S224120
Start Date : 3/30/2022
Page No : 3

	Ellicott Hwy Southbound					Hwy 94 Westbound					Ellicott Hwy Northbound					Hwy 94 Eastbound					
Start Time	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Int. Total
Peak Hour Analysis From 06:30 AM to 08:25 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	06:45 AM					06:35 AM					07:25 AM					07:00 AM					
+0 mins.	6	1	0	0	7	1	**16**	0	0	17	0	3	10	0	13	4	3	1	0	8	
+5 mins.	3	0	0	0	3	2	13	0	0	15	**1**	2	8	0	11	6	2	1	0	9	
+10 mins.	**7**	3	2	0	12	**3**	9	0	0	12	1	4	11	0	16	3	6	**3**	0	12	
+15 mins.	5	5	1	0	11	0	12	1	0	13	1	**7**	9	0	17	4	1	1	0	6	
+20 mins.	4	1	1	0	6	1	15	0	0	16	1	2	8	0	11	16	5	2	0	23	
+25 mins.	4	1	2	0	7	2	16	0	0	18	1	4	**18**	0	**23**	10	4	2	0	16	
+30 mins.	3	4	2	0	9	0	14	**3**	0	17	0	1	14	0	15	14	6	2	0	22	
+35 mins.	3	6	**3**	0	12	2	16	3	0	**21**	0	1	8	0	9	**23**	7	1	0	**31**	
+40 mins.	2	4	1	0	7	0	15	0	0	15	1	2	11	0	14	19	5	1	0	25	
+45 mins.	3	8	0	0	11	0	12	0	0	12	0	0	1	0	1	11	3	2	0	16	
+50 mins.	3	7	1	0	11	0	14	2	0	16	1	2	2	0	5	7	5	1	0	13	
+55 mins.	3	**11**	0	0	**14**	1	14	1	0	16	1	1	5	0	7	5	**15**	2	0	22	
Total Volume	46	51	13	0	110	12	166	10	0	188	8	29	105	0	142	122	62	19	0	203	
% App. Total	41.8	46.4	11.8	0		6.4	88.3	5.3	0		5.6	20.4	73.9	0		60.1	30.5	9.4	0		
PHF	.548	.386	.361	.000	.655	.333	.865	.278	.000	.746	.667	.345	.486	.000	.514	.442	.344	.528	.000	.546	



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719-633-2868

LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304
Colorado Springs, CO 80909
719-633-2868

File Name : Ellicott Hwy - Hwy 94 PM 3-22
Site Code : S224120
Start Date : 3/30/2022
Page No : 1

Groups Printed- Unshifted

	Ellicott Hwy Southbound					Hwy 94 Westbound					Ellicott Hwy Northbound					Hwy 94 Eastbound					
Start Time	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Int. Total
04:00 PM	2	0	1	0	3	0	7	0	0	7	1	1	8	0	10	5	10	2	0	17	37
04:05 PM	1	3	4	0	8	2	8	1	0	11	0	6	19	0	25	4	12	4	0	20	64
04:10 PM	2	1	3	0	6	0	5	1	0	6	2	1	15	0	18	8	10	1	0	19	49
04:15 PM	3	1	0	0	4	1	9	0	0	10	4	5	17	0	26	5	14	4	0	23	63
04:20 PM	2	1	3	0	6	2	7	0	0	9	0	5	16	0	21	3	18	7	0	28	64
04:25 PM	5	0	0	0	5	1	13	0	0	14	2	2	5	0	9	6	20	3	0	29	57
04:30 PM	0	1	2	0	3	1	7	0	0	8	0	5	2	0	7	2	11	2	0	15	33
04:35 PM	1	4	4	0	9	1	3	0	0	4	2	1	7	0	10	5	14	4	0	23	46
04:40 PM	1	1	1	0	3	0	5	0	0	5	2	3	8	0	13	1	9	4	0	14	35
04:45 PM	1	1	3	0	5	0	1	0	0	1	1	1	6	0	8	13	13	6	0	32	46
04:50 PM	5	3	0	0	8	1	5	0	0	6	1	2	6	0	9	8	13	5	0	26	49
04:55 PM	0	2	0	0	2	1	5	0	0	6	0	0	2	0	2	3	12	3	0	18	28
Total	23	18	21	0	62	10	75	2	0	87	15	32	111	0	158	63	156	45	0	264	571
05:00 PM	1	1	3	0	5	3	9	0	0	12	1	2	3	0	6	4	15	2	0	21	44
05:05 PM	3	2	3	0	8	2	8	1	0	11	2	1	8	0	11	4	18	2	0	24	54
05:10 PM	1	4	3	0	8	0	9	0	0	9	1	1	8	0	10	5	9	7	0	21	48
05:15 PM	1	2	0	0	3	2	3	0	0	5	0	1	3	0	4	4	17	5	0	26	38
05:20 PM	2	5	3	0	10	0	13	0	0	13	1	0	2	0	3	3	10	5	0	18	44
05:25 PM	2	1	0	0	3	2	8	0	0	10	1	3	3	0	7	13	16	3	0	32	52
05:30 PM	4	2	2	0	8	0	4	0	0	4	1	1	4	0	6	7	16	3	0	26	44
05:35 PM	1	0	1	0	2	0	3	0	0	3	0	0	6	0	6	4	13	8	0	25	36
05:40 PM	1	1	4	0	6	1	5	0	0	6	0	0	10	0	10	7	11	2	0	20	42
05:45 PM	2	1	3	0	6	0	1	0	0	1	1	1	4	0	6	3	15	1	0	19	32
05:50 PM	0	2	2	0	4	1	2	0	0	3	1	4	6	0	11	3	15	5	0	23	41
05:55 PM	3	0	1	0	4	3	2	1	0	6	0	4	7	0	11	3	10	6	0	19	40
Total	21	21	25	0	67	14	67	2	0	83	9	18	64	0	91	60	165	49	0	274	515
Grand Total	44	39	46	0	129	24	142	4	0	170	24	50	175	0	249	123	321	94	0	538	1086
Apprch %	34.1	30.2	35.7	0		14.1	83.5	2.4	0		9.6	20.1	70.3	0		22.9	59.7	17.5	0		
Total %	4.1	3.6	4.2	0	11.9	2.2	13.1	0.4	0	15.7	2.2	4.6	16.1	0	22.9	11.3	29.6	8.7	0	49.5	

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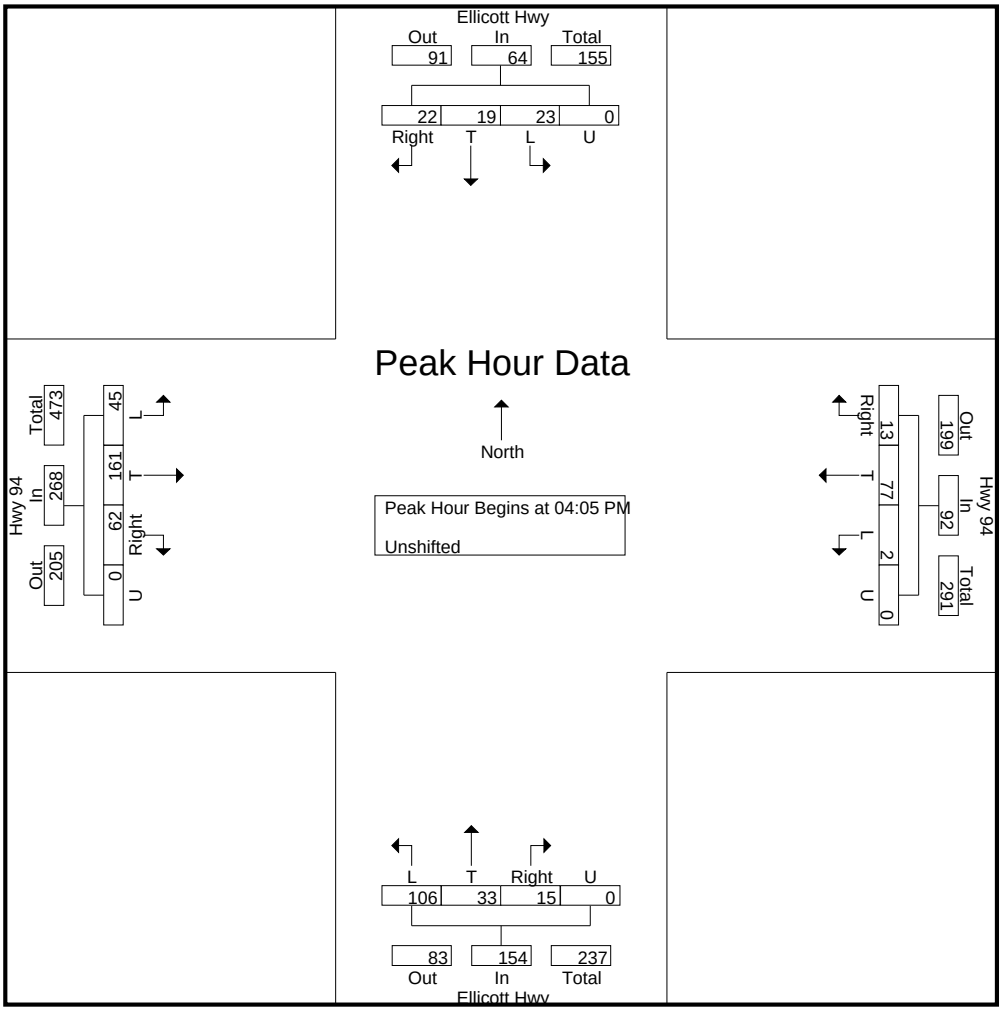
719-633-2868

File Name : Ellicott Hwy - Hwy 94 PM 3-22
Site Code : S224120
Start Date : 3/30/2022
Page No : 2

	Ellicott Hwy Southbound					Hwy 94 Westbound					Ellicott Hwy Northbound					Hwy 94 Eastbound					
Start Time	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:05 PM																					
04:05 PM	1	3	**4**	0	8	2	8	**1**	0	11	0	**6**	**19**	0	25	4	12	4	0	20	**64**
04:10 PM	2	1	3	0	6	0	5	1	0	6	2	1	15	0	18	8	10	1	0	19	49
04:15 PM	3	1	0	0	4	1	9	0	0	10	**4**	5	17	0	**26**	5	14	4	0	23	63
04:20 PM	2	1	3	0	6	2	7	0	0	9	0	5	16	0	21	3	18	**7**	0	28	64
04:25 PM	**5**	0	0	0	5	1	**13**	0	0	**14**	2	2	5	0	9	6	**20**	3	0	29	57
04:30 PM	0	1	2	0	3	1	7	0	0	8	0	5	2	0	7	2	11	2	0	15	33
04:35 PM	1	**4**	4	0	**9**	1	3	0	0	4	2	1	7	0	10	5	14	4	0	23	46
04:40 PM	1	1	1	0	3	0	5	0	0	5	2	3	8	0	13	1	9	4	0	14	35
04:45 PM	1	1	3	0	5	0	1	0	0	1	1	1	6	0	8	**13**	13	6	0	**32**	46
04:50 PM	5	3	0	0	8	1	5	0	0	6	1	2	6	0	9	8	13	5	0	26	49
04:55 PM	0	2	0	0	2	1	5	0	0	6	0	0	2	0	2	3	12	3	0	18	28
05:00 PM	1	1	3	0	5	**3**	9	0	0	12	1	2	3	0	6	4	15	2	0	21	44
Total Volume	22	19	23	0	64	13	77	2	0	92	15	33	106	0	154	62	161	45	0	268	578
% App. Total	34.4	29.7	35.9	0		14.1	83.7	2.2	0		9.7	21.4	68.8	0		23.1	60.1	16.8	0		
PHF	.367	.396	.479	.000	.593	.361	.494	.167	.000	.548	.313	.458	.465	.000	.494	.397	.671	.536	.000	.698	.753



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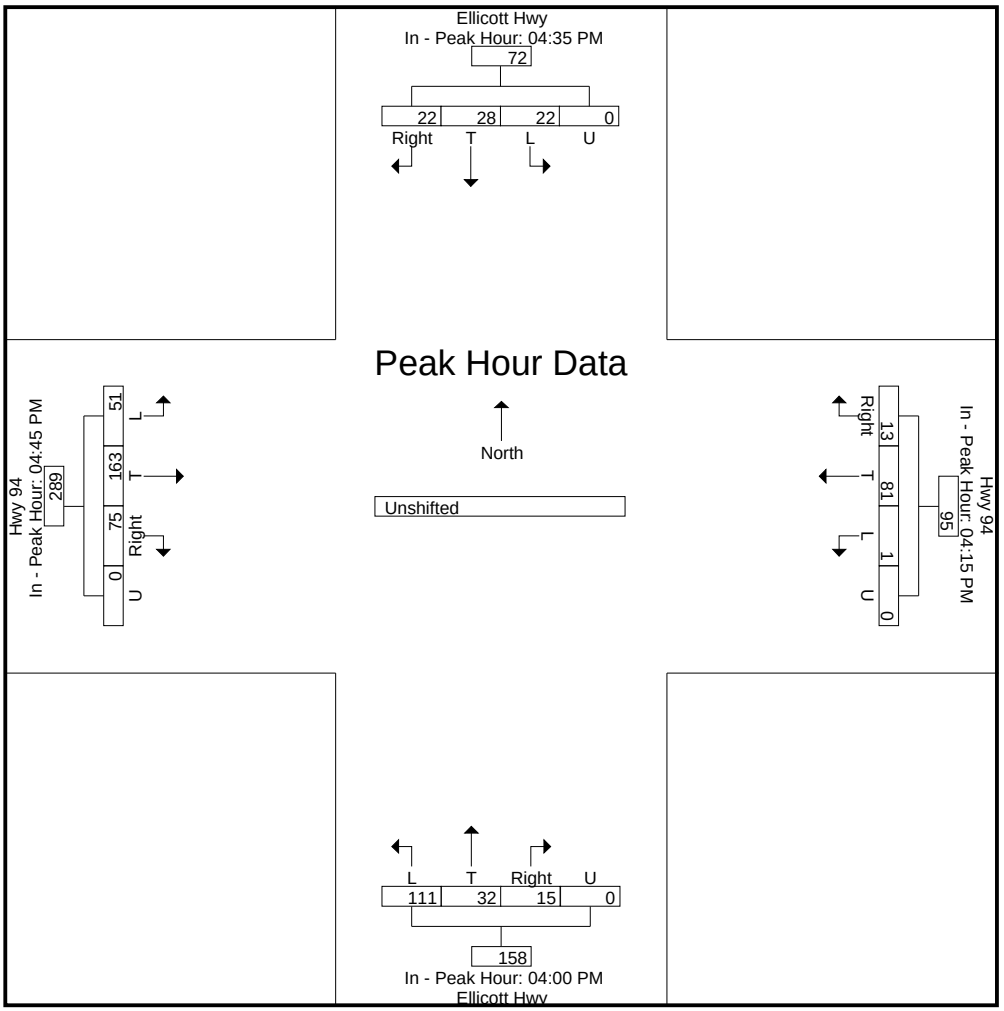
File Name : Ellicott Hwy - Hwy 94 PM 3-22
Site Code : S224120
Start Date : 3/30/2022
Page No : 3

	Ellicott Hwy Southbound					Hwy 94 Westbound					Ellicott Hwy Northbound					Hwy 94 Eastbound					
Start Time	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Right	T	L	U	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:55 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:35 PM					04:15 PM					04:00 PM					04:45 PM					
+0 mins.	1	4	**4**	0	9	1	9	0	0	10	1	1	8	0	10	**13**	13	6	0	**32**	
+5 mins.	1	1	1	0	3	2	7	0	0	9	0	**6**	**19**	0	25	8	13	5	0	26	
+10 mins.	1	1	3	0	5	1	**13**	0	0	**14**	2	1	15	0	18	3	12	3	0	18	
+15 mins.	**5**	3	0	0	8	1	7	0	0	8	**4**	5	17	0	**26**	4	15	2	0	21	
+20 mins.	0	2	0	0	2	1	3	0	0	4	0	5	16	0	21	4	**18**	2	0	24	
+25 mins.	1	1	3	0	5	0	5	0	0	5	2	2	5	0	9	5	9	7	0	21	
+30 mins.	3	2	3	0	8	0	1	0	0	1	0	5	2	0	7	4	17	5	0	26	
+35 mins.	1	4	3	0	8	1	5	0	0	6	2	1	7	0	10	3	10	5	0	18	
+40 mins.	1	2	0	0	3	1	5	0	0	6	2	3	8	0	13	13	16	3	0	32	
+45 mins.	2	**5**	3	0	**10**	**3**	9	0	0	12	1	1	6	0	8	7	16	3	0	26	
+50 mins.	2	1	0	0	3	2	8	**1**	0	11	1	2	6	0	9	4	13	**8**	0	25	
+55 mins.	4	2	2	0	8	0	9	0	0	9	0	0	2	0	2	7	11	2	0	20	
Total Volume	22	28	22	0	72	13	81	1	0	95	15	32	111	0	158	75	163	51	0	289	
% App. Total	30.6	38.9	30.6	0		13.7	85.3	1.1	0		9.5	20.3	70.3	0		26	56.4	17.6	0		
PHF	.367	.467	.458	.000	.600	.361	.519	.083	.000	.565	.313	.444	.487	.000	.506	.481	.755	.531	.000	.753	



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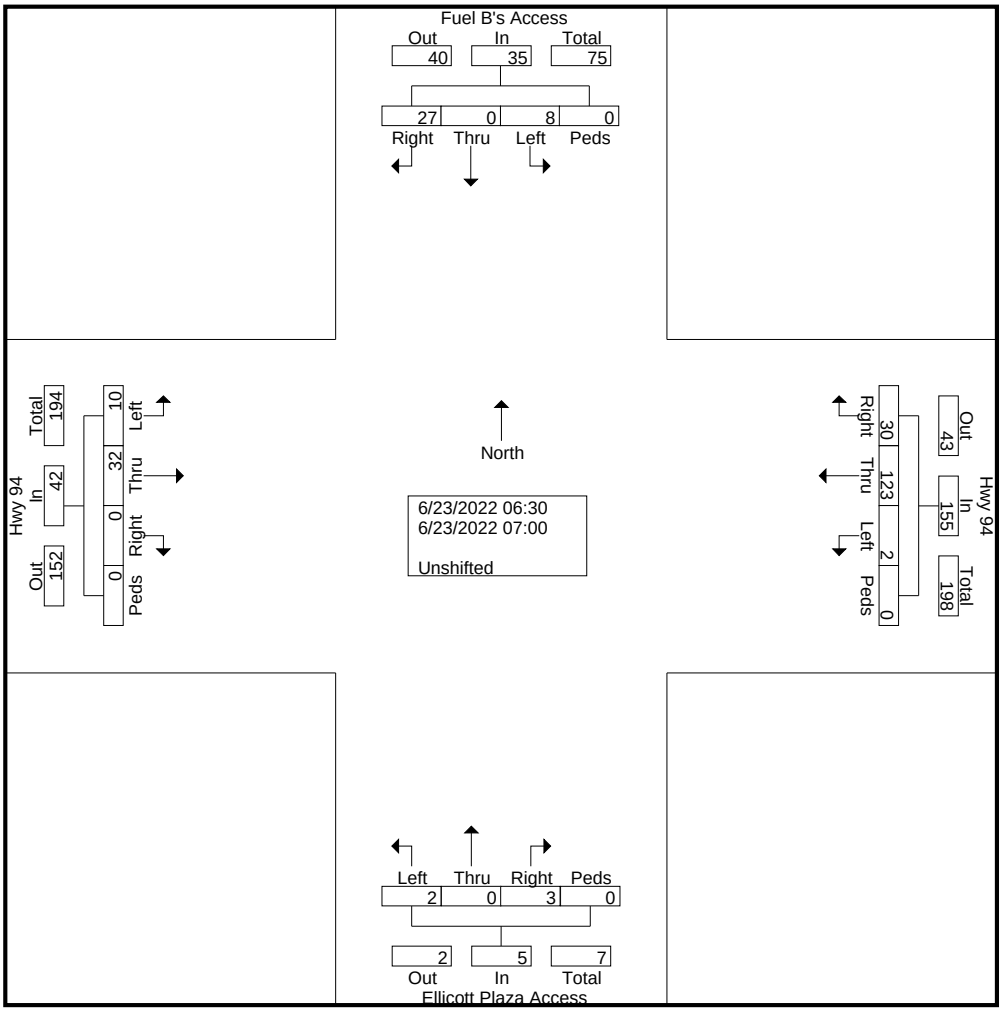
719-633-2868

File Name : Fuel B's Access - Hwy 94 AM 6-22
Site Code : S224120
Start Date : 6/23/2022
Page No : 1

Groups Printed- Unshifted

	Fuel B's Access Southbound					Hwy 94 Westbound					Ellicott Plaza Access Northbound					Hwy 94 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
06:30	12	0	2	0	14	9	43	0	0	52	0	0	0	0	0	0	8	2	0	10	76
06:45	8	0	2	0	10	10	42	1	0	53	2	0	2	0	4	0	14	4	0	18	85
Total	20	0	4	0	24	19	85	1	0	105	2	0	2	0	4	0	22	6	0	28	161
07:00	7	0	4	0	11	11	38	1	0	50	1	0	0	0	1	0	10	4	0	14	76
Grand Total	27	0	8	0	35	30	123	2	0	155	3	0	2	0	5	0	32	10	0	42	237
Apprch %	77.1	0	22.9	0		19.4	79.4	1.3	0		60	0	40	0		0	76.2	23.8	0		
Total %	11.4	0	3.4	0	14.8	12.7	51.9	0.8	0	65.4	1.3	0	0.8	0	2.1	0	13.5	4.2	0	17.7	



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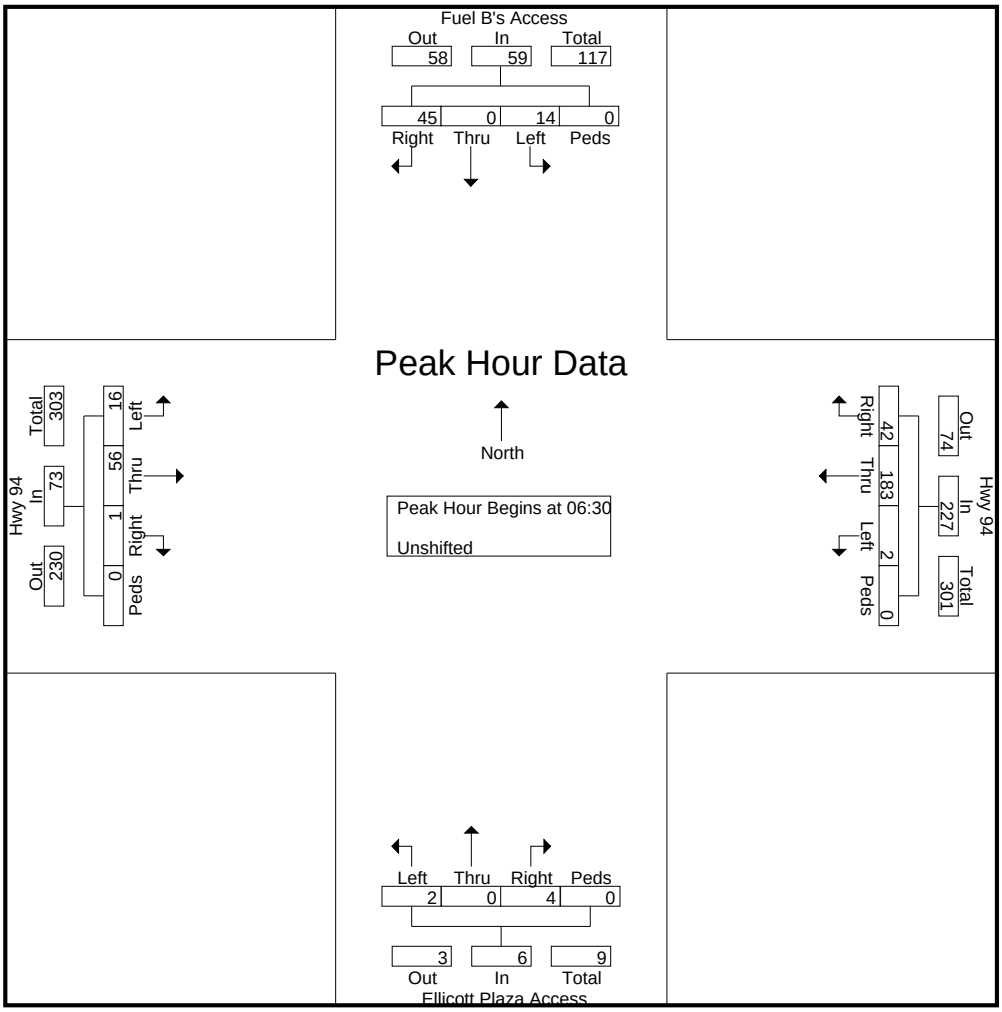
719-633-2868

File Name : Fuel B's Access - Hwy 94 AM 6-22
Site Code : S224120
Start Date : 6/23/2022
Page No : 2

	Fuel B's Access Southbound					Hwy 94 Westbound					Ellicott Plaza Access Northbound					Hwy 94 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 7:00:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 6:30:00 AM																					
6:30:00 AM	**12**	0	2	0	**14**	9	**43**	0	0	52	0	0	0	0	0	0	8	2	0	10	76
6:45:00 AM	8	0	2	0	10	10	42	**1**	0	**53**	**2**	0	**2**	0	**4**	0	**14**	**4**	0	**18**	**85**
7:00:00 AM	7	0	**4**	0	11	**11**	38	1	0	50	1	0	0	0	1	0	10	4	0	14	76
06:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	27	0	8	0	35	30	123	2	0	155	3	0	2	0	5	0	32	10	0	42	237
% App. Total	77.1	0	22.9	0		19.4	79.4	1.3	0		60	0	40	0		0	76.2	23.8	0		
PHF	.563	.000	.500	.000	.625	.682	.715	.500	.000	.731	.375	.000	.250	.000	.313	.000	.571	.625	.000	.583	.697



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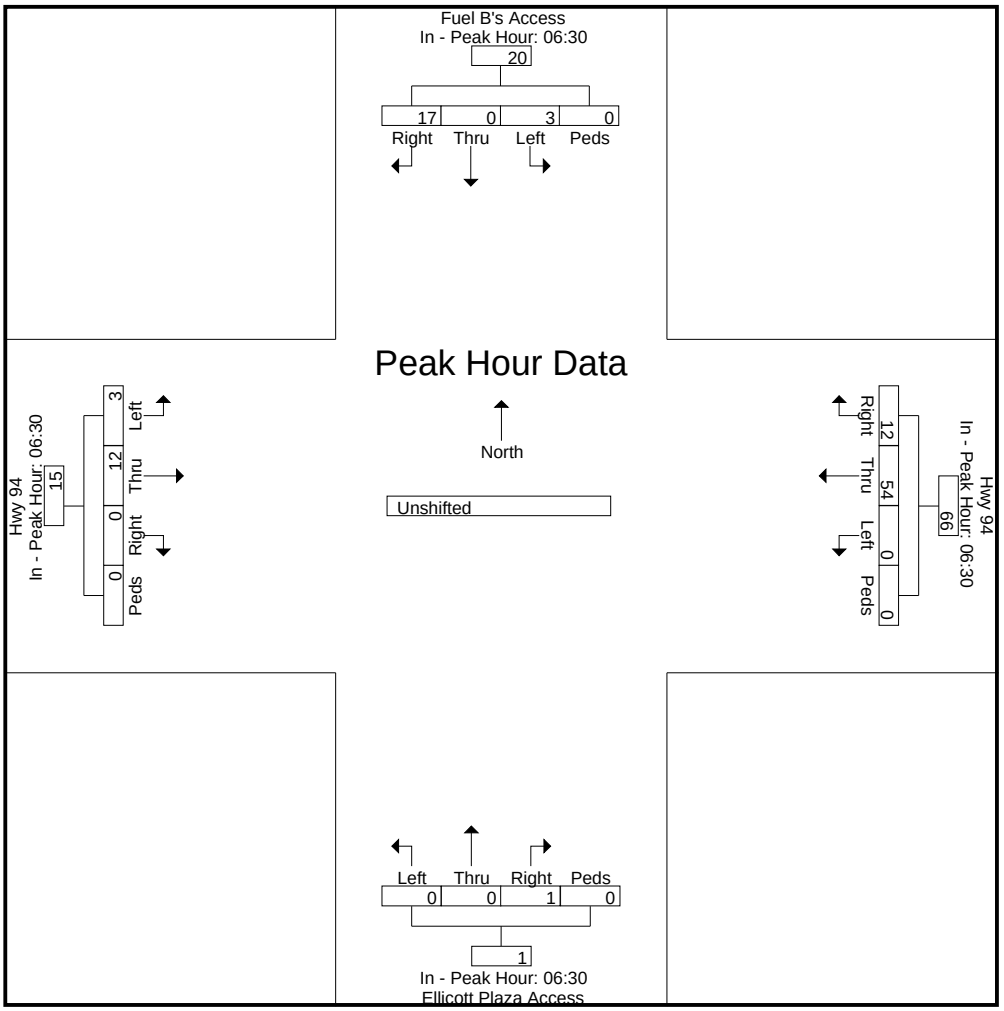
File Name : Fuel B's Access - Hwy 94 AM 6-22
Site Code : S224120
Start Date : 6/23/2022
Page No : 3

	Fuel B's Access Southbound					Hwy 94 Westbound					Ellicott Plaza Access Northbound					Hwy 94 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 6:30:00 AM to 7:00:00 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	6:30:00 AM					6:30:00 AM					6:30:00 AM					6:30:00 AM					
+0 mins.	**12**	0	2	0	**14**	9	**43**	0	0	52	0	0	0	0	0	0	8	2	0	10	
+5 mins.	8	0	2	0	10	10	42	**1**	0	**53**	**2**	0	**2**	0	**4**	0	**14**	**4**	0	**18**	
+10 mins.	7	0	**4**	0	11	**11**	38	1	0	50	1	0	0	0	1	0	10	4	0	14	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	27	0	8	0	35	30	123	2	0	155	3	0	2	0	5	0	32	10	0	42	
% App. Total	77.1	0	22.9	0		19.4	79.4	1.3	0		60	0	40	0		0	76.2	23.8	0		
PHF	.563	.000	.500	.000	.625	.682	.715	.500	.000	.731	.375	.000	.250	.000	.313	.000	.571	.625	.000	.583	



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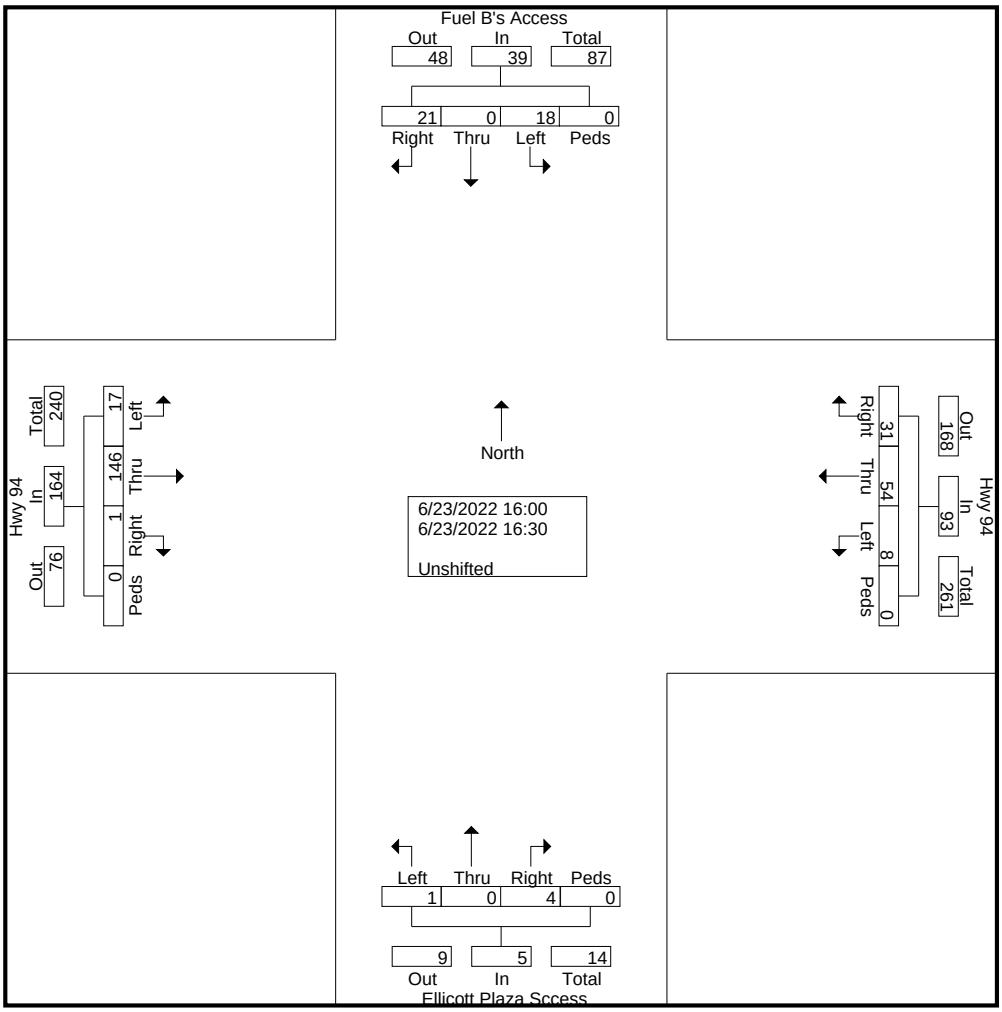
File Name : Fuel B's Access - Hwy 94 PM 6-22
Site Code : S224120
Start Date : 6/23/2022
Page No : 1

Groups Printed- Unshifted

	Fuel B's Access Southbound					Hwy 94 Westbound					Ellicott Plaza Sccess Northbound					Hwy 94 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
16:00	6	0	5	0	11	9	15	4	0	28	0	0	0	0	0	0	53	5	0	58	97
16:15	7	0	6	0	13	16	16	3	0	35	2	0	1	0	3	0	53	5	0	58	109
16:30	8	0	7	0	15	6	23	1	0	30	2	0	0	0	2	1	40	7	0	48	95
Grand Total	21	0	18	0	39	31	54	8	0	93	4	0	1	0	5	1	146	17	0	164	301
Apprch %	53.8	0	46.2	0		33.3	58.1	8.6	0		80	0	20	0		0.6	89	10.4	0		
Total %	7	0	6	0	13	10.3	17.9	2.7	0	30.9	1.3	0	0.3	0	1.7	0.3	48.5	5.6	0	54.5	



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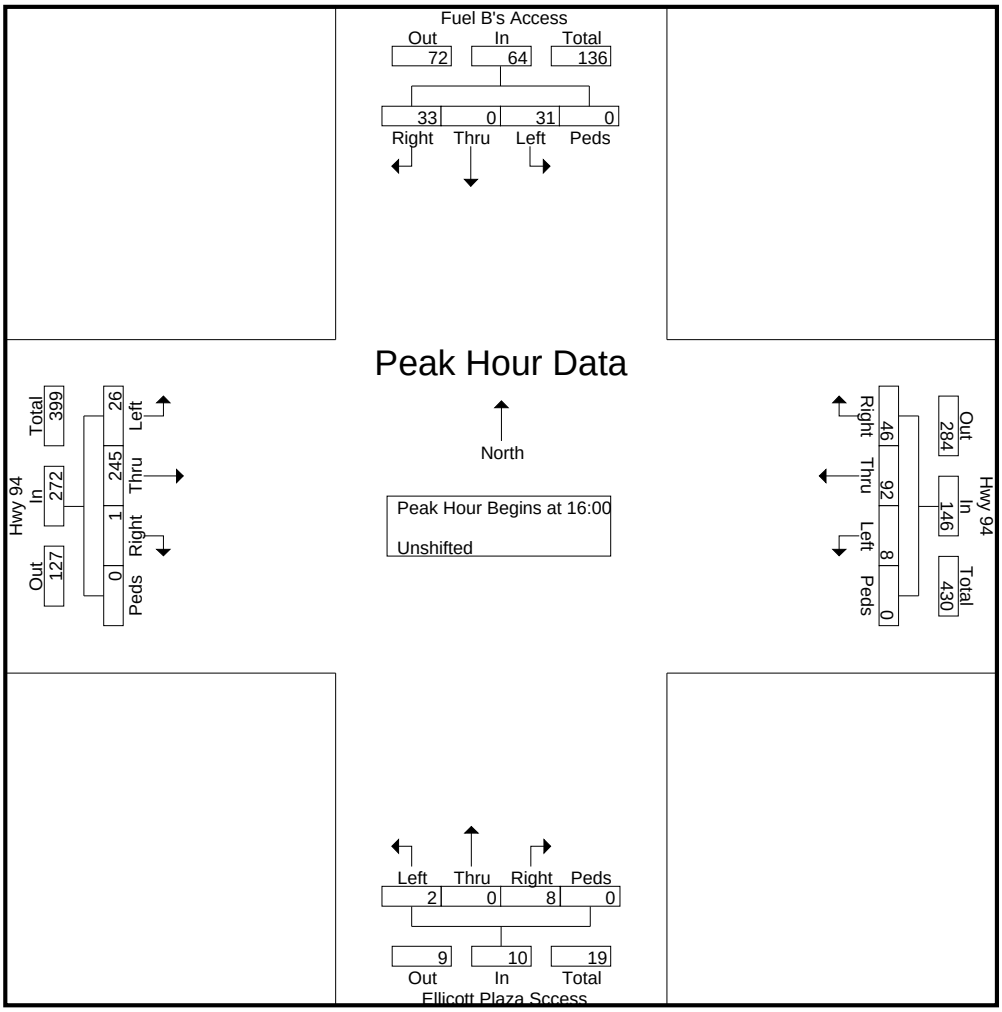
File Name : Fuel B's Access - Hwy 94 PM 6-22
Site Code : S224120
Start Date : 6/23/2022
Page No : 2

	Fuel B's Access Southbound					Hwy 94 Westbound					Ellicott Plaza Sccess Northbound					Hwy 94 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 4:30:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:00:00 PM																					
4:00:00 PM	6	0	5	0	11	9	15	**4**	0	28	0	0	0	0	0	0	**53**	**5**	0	**58**	97
4:15:00 PM	**7**	0	**6**	0	**13**	**16**	**16**	3	0	**35**	**2**	0	**1**	0	**3**	0	53	5	0	58	**109**
4:30:00 PM	4	0	4	0	8	1	7	0	0	8	2	0	0	0	2	0	20	3	0	23	41
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	17	0	15	0	32	26	38	7	0	71	4	0	1	0	5	0	126	13	0	139	247
% App. Total	53.1	0	46.9	0		36.6	53.5	9.9	0		80	0	20	0		0	90.6	9.4	0		
PHF	.607	.000	.625	.000	.615	.406	.594	.438	.000	.507	.500	.000	.250	.000	.417	.000	.594	.650	.000	.599	.567



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File Name : Fuel B's Access - Hwy 94 PM 6-22
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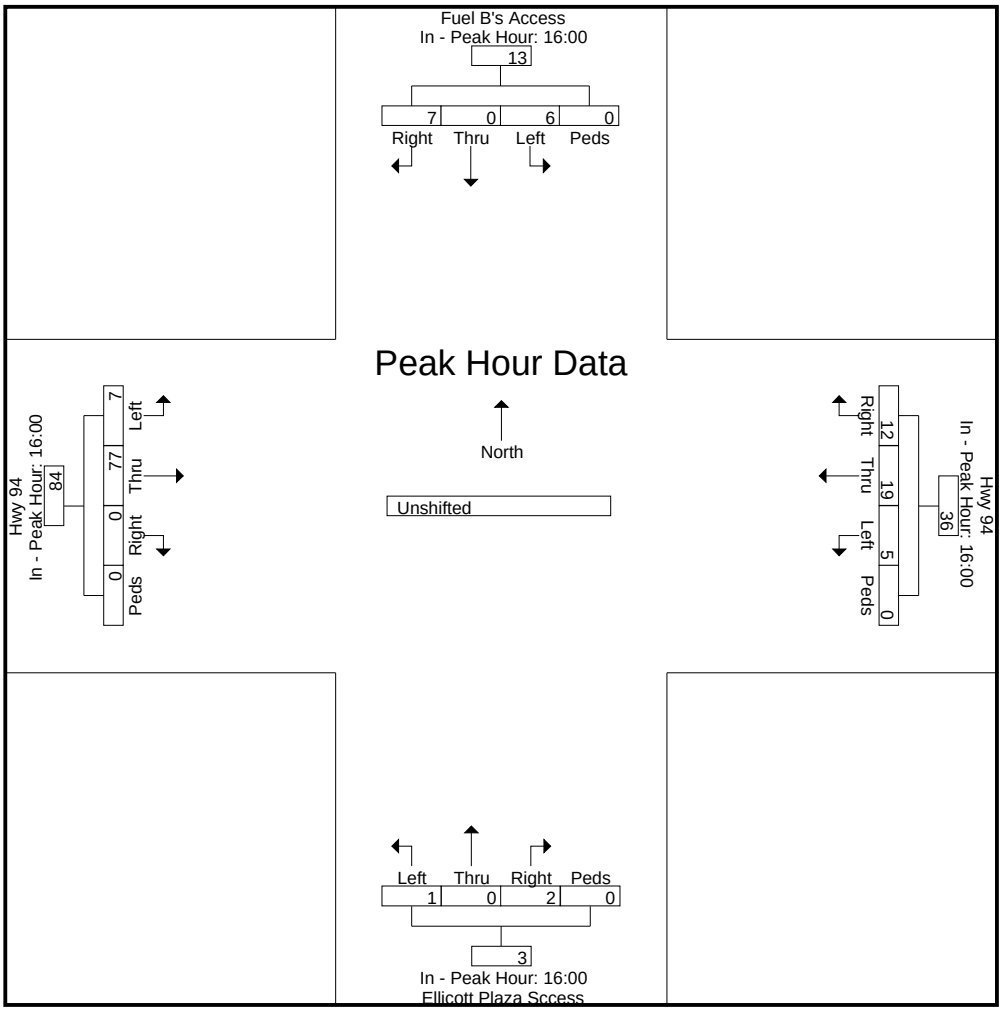
Start Date : 6/23/2022
Page No : 3

	Fuel B's Access Southbound					Hwy 94 Westbound					Ellicott Plaza Sccess Northbound					Hwy 94 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 4:30:00 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	4:00:00 PM					4:00:00 PM					4:00:00 PM					4:00:00 PM					
+0 mins.	6	0	5	0	11	9	15	**4**	0	28	0	0	0	0	0	0	**53**	**5**	0	**58**
+5 mins.	**7**	0	**6**	0	**13**	**16**	**16**	3	0	**35**	**2**	0	**1**	0	**3**	0	53	5	0	58
+10 mins.	4	0	4	0	8	1	7	0	0	8	2	0	0	0	2	0	20	3	0	23
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	17	0	15	0	32	26	38	7	0	71	4	0	1	0	5	0	126	13	0	139
% App. Total	53.1	0	46.9	0		36.6	53.5	9.9	0		80	0	20	0		0	90.6	9.4	0	
PHF	.607	.000	.625	.000	.615	.406	.594	.438	.000	.507	.500	.000	.250	.000	.417	.000	.594	.650	.000	.599



Levels of Service

TRANSPORTATION
CONSULTANTS, INC.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	177	244	44	26	38
Future Vol, veh/h	19	177	244	44	26	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	273	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	92	92	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	22	203	265	48	31	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	313	0	-	0	536	289
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1220	-	-	-	497	738
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1220	-	-	-	488	738
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	736	-
Stage 2	-	-	-	-	783	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1220	-	-	-	568	738
HCM Lane V/C Ratio	0.018	-	-	-	0.055	0.062
HCM Control Delay (s)	8	-	-	-	11.7	10.2
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	62	122	13	157	11	99	24	5	12	58	32
Future Vol, veh/h	19	62	122	13	157	11	99	24	5	12	58	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	83	83	83	83	83	83
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	22	71	140	15	180	13	119	29	6	14	70	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	193	0	0	211	0	0	456	408	141	420	472	187
Stage 1	-	-	-	-	-	-	185	185	-	217	217	-
Stage 2	-	-	-	-	-	-	271	223	-	203	255	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1351	-	-	1330	-	-	506	525	894	535	483	842
Stage 1	-	-	-	-	-	-	805	737	-	774	714	-
Stage 2	-	-	-	-	-	-	724	710	-	788	687	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1351	-	-	1330	-	-	419	511	894	498	470	842
Mov Cap-2 Maneuver	-	-	-	-	-	-	419	511	-	498	470	-
Stage 1	-	-	-	-	-	-	792	725	-	762	706	-
Stage 2	-	-	-	-	-	-	615	702	-	739	676	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.6	17.4	13.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	443	1351	-	-	1330	-	-	550
HCM Lane V/C Ratio	0.348	0.016	-	-	0.011	-	-	0.223
HCM Control Delay (s)	17.4	7.7	-	-	7.7	-	-	13.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.5	0	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	233	163	46	31	33
Future Vol, veh/h	26	233	163	46	31	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	273	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	87	87	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	28	253	187	53	37	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	240	0	-	0	523	214
Stage 1	-	-	-	-	214	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1298	-	-	-	506	814
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	733	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1298	-	-	-	495	814
Mov Cap-2 Maneuver	-	-	-	-	572	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	733	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1298	-	-	-	572	814
HCM Lane V/C Ratio	0.022	-	-	-	0.065	0.049
HCM Control Delay (s)	7.8	-	-	-	11.7	9.7
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	156	63	2	75	10	111	32	15	21	18	23
Future Vol, veh/h	45	156	63	2	75	10	111	32	15	21	18	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	83	83	83	87	87	87	83	83	83
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	49	170	68	2	90	12	128	37	17	25	22	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	102	0	0	238	0	0	427	408	204	429	436	96
Stage 1	-	-	-	-	-	-	302	302	-	100	100	-
Stage 2	-	-	-	-	-	-	125	106	-	329	336	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1459	-	-	1300	-	-	529	525	824	528	506	947
Stage 1	-	-	-	-	-	-	697	655	-	894	803	-
Stage 2	-	-	-	-	-	-	867	798	-	674	633	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1459	-	-	1300	-	-	483	506	824	475	488	947
Mov Cap-2 Maneuver	-	-	-	-	-	-	483	506	-	475	488	-
Stage 1	-	-	-	-	-	-	673	633	-	864	801	-
Stage 2	-	-	-	-	-	-	818	796	-	601	611	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	16	12
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	508	1459	-	-	1300	-	-	588
HCM Lane V/C Ratio	0.357	0.034	-	-	0.002	-	-	0.127
HCM Control Delay (s)	16	7.6	-	-	7.8	-	-	12
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	187	252	49	28	42
Future Vol, veh/h	21	187	252	49	28	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	273	-	-	235	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	92	92	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	24	215	274	53	34	51

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	327	0	-	0	537	274
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	263	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1205	-	-	-	496	753
Stage 1	-	-	-	-	761	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1205	-	-	-	486	753
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1205	-	-	-	568	753
HCM Lane V/C Ratio	0.02	-	-	-	0.059	0.067
HCM Control Delay (s)	8	-	-	-	11.7	10.1
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	67	126	13	162	11	103	24	5	12	58	35
Future Vol, veh/h	22	67	126	13	162	11	103	24	5	12	58	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	83	83	83	83	83	83
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	25	77	145	15	186	13	124	29	6	14	70	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	199	0	0	222	0	0	479	429	150	440	495	193
Stage 1	-	-	-	-	-	-	200	200	-	223	223	-
Stage 2	-	-	-	-	-	-	279	229	-	217	272	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1344	-	-	1318	-	-	489	511	883	519	469	836
Stage 1	-	-	-	-	-	-	790	726	-	768	710	-
Stage 2	-	-	-	-	-	-	717	705	-	774	676	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1344	-	-	1318	-	-	400	496	883	482	455	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	400	496	-	482	455	-
Stage 1	-	-	-	-	-	-	775	712	-	753	702	-
Stage 2	-	-	-	-	-	-	606	697	-	724	663	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.5	18.5	13.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	424	1344	-	-	1318	-	-	541
HCM Lane V/C Ratio	0.375	0.019	-	-	0.011	-	-	0.234
HCM Control Delay (s)	18.5	7.7	-	-	7.8	-	-	13.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.7	0.1	-	-	0	-	-	0.9

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	240	176	46	34	36
Future Vol, veh/h	34	240	176	46	34	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	273	-	-	235	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	39	276	202	53	41	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	255	0	-	0	556	202
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	354	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	1281	-	-	-	484	826
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	469	826
Mov Cap-2 Maneuver	-	-	-	-	551	-
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	699	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1281	-	-	-	551	826
HCM Lane V/C Ratio	0.031	-	-	-	0.074	0.053
HCM Control Delay (s)	7.9	-	-	-	12.1	9.6
HCM Lane LOS	A	-	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.2

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	160	67	2	80	10	116	32	15	21	18	26
Future Vol, veh/h	48	160	67	2	80	10	116	32	15	21	18	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	83	83	83	87	87	87	83	83	83
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	52	174	73	2	96	12	133	37	17	25	22	31

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	108	0	0	247	0	0	448	427	211	448	457	102
Stage 1	-	-	-	-	-	-	315	315	-	106	106	-
Stage 2	-	-	-	-	-	-	133	112	-	342	351	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1452	-	-	1290	-	-	513	512	817	513	493	940
Stage 1	-	-	-	-	-	-	685	647	-	888	798	-
Stage 2	-	-	-	-	-	-	859	793	-	663	623	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1452	-	-	1290	-	-	465	493	817	460	474	940
Mov Cap-2 Maneuver	-	-	-	-	-	-	465	493	-	460	474	-
Stage 1	-	-	-	-	-	-	660	624	-	856	796	-
Stage 2	-	-	-	-	-	-	806	791	-	589	601	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.2	16.8	12.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	490	1452	-	-	1290	-	-	584
HCM Lane V/C Ratio	0.382	0.036	-	-	0.002	-	-	0.134
HCM Control Delay (s)	16.8	7.6	-	-	7.8	-	-	12.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0	-	-	0.5

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	503	286	316	205
Demand Flow Rate, veh/h	539	307	338	219
Vehicles Circulating, veh/h	163	380	253	546
Vehicles Exiting, veh/h	602	211	449	141
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.4	7.8	6.9	8.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	539	307	338	219
Cap Entry Lane, veh/h	1169	937	1066	791
Entry HV Adj Factor	0.933	0.933	0.935	0.937
Flow Entry, veh/h	503	286	316	205
Cap Entry, veh/h	1091	873	997	741
V/C Ratio	0.461	0.328	0.317	0.277
Control Delay, s/veh	8.4	7.8	6.9	8.1
LOS	A	A	A	A
95th %tile Queue, veh	2	1	1	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	130	272	50	193	20	226	40	25	25	60	93
Future Volume (vph)	61	130	272	50	193	20	226	40	25	25	60	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	273		273	273		273	273		273	378		37
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	162			162			162			222		
Lane Util. 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
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	1776	1509	1687	1776	1509	1687	1776	1509	1687	1776	1509
Flt Permitted	0.615			0.667			0.712			0.729		
Satd. Flow (perm)	1092	1776	1509	1184	1776	1509	1264	1776	1509	1294	1776	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			296			55			55			107
Link Speed (mph)		45			45			45			55	
Link Distance (ft)		676			616			604			609	
Travel Time (s)		10.2			9.3			9.2			7.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	66	141	296	54	210	22	246	43	27	29	69	107
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	141	296	54	210	22	246	43	27	29	69	107
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		30			30			30			30	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Maximum Green (s)	39.0	39.0	39.0	39.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	9.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	12.8	12.8	12.8	12.8	12.8	12.8	35.2	35.2	35.2	35.2	35.2	35.2
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.59	0.59	0.59	0.59	0.59	0.59
v/c Ratio	0.28	0.37	0.53	0.21	0.56	0.06	0.33	0.04	0.03	0.04	0.07	0.12
Control Delay	21.4	21.8	6.5	19.8	26.0	1.9	9.1	6.8	1.2	7.0	6.9	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	21.8	6.5	19.8	26.0	1.9	9.1	6.8	1.2	7.0	6.9	2.3
LOS	C	C	A	B	C	A	A	A	A	A	A	A
Approach Delay		12.7			23.0			8.1			4.5	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)	20	44	0	16	68	0	40	6	0	4	9	0
Queue Length 95th (ft)	44	77	47	37	111	5	98	20	5	15	28	18
Internal Link Dist (ft)		596			536			524			529	
Turn Bay Length (ft)	273		273	273		273	273		273	378		37
Base Capacity (vph)	709	1154	1084	769	1154	1000	741	1042	908	759	1042	929
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.12	0.27	0.07	0.18	0.02	0.33	0.04	0.03	0.04	0.07	0.12

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 23.5 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 12.6 — Intersection LOS: B
Intersection Capacity Utilization 48.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Ellicott Hwy & SH 94

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	438	469	44	26	38
Future Vol, veh/h	19	438	469	44	26	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	273	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	21	476	510	48	31	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	558	0	-	0	1052	534
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	518	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	988	-	-	-	245	536
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	988	-	-	-	240	536
Mov Cap-2 Maneuver	-	-	-	-	373	-
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	588	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	988	-	-	-	373	536
HCM Lane V/C Ratio	0.021	-	-	-	0.084	0.085
HCM Control Delay (s)	8.7	-	-	-	15.5	12.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0.3

Intersection	
Int Delay, s/veh	82.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	130	272	50	193	20	226	40	25	25	60	93
Future Vol, veh/h	61	130	272	50	193	20	226	40	25	25	60	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	87	87	87
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	66	141	296	54	210	22	246	43	27	29	69	107

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	232	0	0	437	0	0	838	761	289	785	898	221
Stage 1	-	-	-	-	-	-	421	421	-	329	329	-
Stage 2	-	-	-	-	-	-	417	340	-	456	569	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1307	-	-	1097	-	-	280	329	738	304	274	806
Stage 1	-	-	-	-	-	-	600	580	-	674	638	-
Stage 2	-	-	-	-	-	-	603	630	-	575	498	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1307	-	-	1097	-	-	~ 177	297	738	241	247	806
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 177	297	-	241	247	-
Stage 1	-	-	-	-	-	-	570	551	-	640	607	-
Stage 2	-	-	-	-	-	-	441	599	-	484	473	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	1.6	$ 323.3	24.5
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	201	1307	-	-	1097	-	-	385
HCM Lane V/C Ratio	1.574	0.051	-	-	0.05	-	-	0.531
HCM Control Delay (s)	$ 323.3	7.9	-	-	8.5	-	-	24.5
HCM Lane LOS	F	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	20.3	0.2	-	-	0.2	-	-	3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	687	284	446	227
Demand Flow Rate, veh/h	735	304	477	243
Vehicles Circulating, veh/h	146	541	502	630
Vehicles Exiting, veh/h	727	438	379	215
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.4	9.7	13.7	9.6
Approach LOS	B	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	735	304	477	243
Cap Entry Lane, veh/h	1189	795	827	726
Entry HV Adj Factor	0.935	0.934	0.935	0.936
Flow Entry, veh/h	687	284	446	227
Cap Entry, veh/h	1112	742	773	679
V/C Ratio	0.618	0.383	0.577	0.335
Control Delay, s/veh	11.4	9.7	13.7	9.6
LOS	B	A	B	A
95th %tile Queue, veh	4	2	4	1

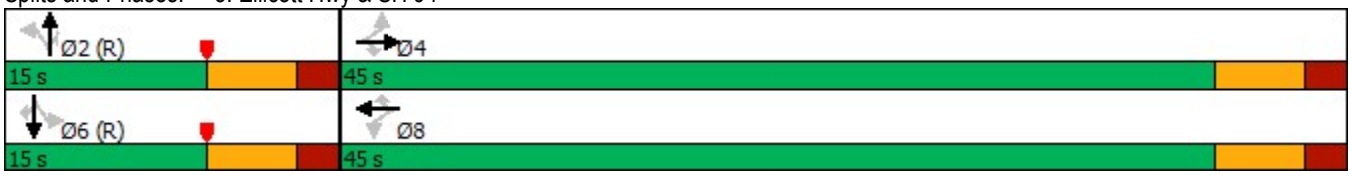
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	277	256	25	212	25	305	55	50	50	45	103
Future Volume (vph)	106	277	256	25	212	25	305	55	50	50	45	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	273		273	273		273	273		273	378		37
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	162			162			162			222		
Lane Util. 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
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	1776	1509	1687	1776	1509	1687	1776	1509	1687	1776	1509
Flt Permitted	0.605			0.493			0.723			0.718		
Satd. Flow (perm)	1074	1776	1509	875	1776	1509	1284	1776	1509	1275	1776	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			275			55			55			118
Link Speed (mph)		45			45			45			55	
Link Distance (ft)		676			616			604			609	
Travel Time (s)		10.2			9.3			9.2			7.5	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	114	298	275	27	230	27	332	60	54	57	52	118
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	298	275	27	230	27	332	60	54	57	52	118
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		30			30			30			30	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Maximum Green (s)	39.0	39.0	39.0	39.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	9.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	17.1	17.1	17.1	17.1	17.1	17.1	30.9	30.9	30.9	30.9	30.9	30.9
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.52	0.52	0.52	0.52	0.52	0.52
v/c Ratio	0.37	0.59	0.44	0.11	0.45	0.06	0.50	0.07	0.07	0.09	0.06	0.14
Control Delay	18.7	22.2	4.3	13.8	19.1	1.8	15.7	10.1	4.1	10.5	10.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	22.2	4.3	13.8	19.1	1.8	15.7	10.1	4.1	10.5	10.1	3.3
LOS	B	C	A	B	B	A	B	B	A	B	B	A
Approach Delay		14.4			17.0			13.5			6.7	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	33	93	0	7	68	0	71	10	0	9	9	0
Queue Length 95th (ft)	56	125	36	18	96	6	#208	34	18	32	29	25
Internal Link Dist (ft)		596			536			524			529	
Turn Bay Length (ft)	273		273	273		273	273		273	378		37
Base Capacity (vph)	698	1154	1077	568	1154	1000	661	914	803	656	914	834
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.26	0.26	0.05	0.20	0.03	0.50	0.07	0.07	0.09	0.06	0.14

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 23.5 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 3: Ellicott Hwy & SH 94



Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	608	573	46	31	33
Future Vol, veh/h	26	608	573	46	31	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	273	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	28	654	616	49	37	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	665	0	-	0	1351	641
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	710	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	901	-	-	-	162	466
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	478	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	901	-	-	-	157	466
Mov Cap-2 Maneuver	-	-	-	-	294	-
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	901	-	-	-	294	466
HCM Lane V/C Ratio	0.031	-	-	-	0.127	0.085
HCM Control Delay (s)	9.1	-	-	-	19	13.4
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	0.3

Intersection	
Int Delay, s/veh	277.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	106	277	256	25	212	25	305	55	50	50	45	103
Future Vol, veh/h	106	277	256	25	212	25	305	55	50	50	45	103
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	92	92	92	92	92	92	87	87	87
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	114	298	275	27	230	27	332	60	54	57	52	118

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	257	0	0	573	0	0	1047	975	436	1019	1099	244
Stage 1	-	-	-	-	-	-	664	664	-	298	298	-
Stage 2	-	-	-	-	-	-	383	311	-	721	801	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1279	-	-	976	-	-	~ 202	247	610	211	208	783
Stage 1	-	-	-	-	-	-	442	451	-	700	658	-
Stage 2	-	-	-	-	-	-	630	649	-	411	390	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1279	-	-	976	-	-	~ 123	219	610	139	184	783
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 123	219	-	139	184	-
Stage 1	-	-	-	-	-	-	403	411	-	638	640	-
Stage 2	-	-	-	-	-	-	478	631	-	291	355	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0.8	$ 988.6	63.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	146	1279	-	-	976	-	-	269
HCM Lane V/C Ratio	3.052	0.089	-	-	0.028	-	-	0.846
HCM Control Delay (s)	$ 988.6	8.1	-	-	8.8	-	-	63.1
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	41.5	0.3	-	-	0.1	-	-	7

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	516	293	322	209
Demand Flow Rate, veh/h	552	314	345	224
Vehicles Circulating, veh/h	163	391	263	560
Vehicles Exiting, veh/h	621	217	452	145
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.6	8.0	7.1	8.4
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	552	314	345	224
Cap Entry Lane, veh/h	1169	926	1055	779
Entry HV Adj Factor	0.934	0.933	0.933	0.934
Flow Entry, veh/h	516	293	322	209
Cap Entry, veh/h	1092	864	985	728
V/C Ratio	0.472	0.339	0.327	0.287
Control Delay, s/veh	8.6	8.0	7.1	8.4
LOS	A	A	A	A
95th %tile Queue, veh	3	2	1	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	137	278	50	200	20	232	40	25	25	60	97
Future Volume (vph)	65	137	278	50	200	20	232	40	25	25	60	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	273		273	273		273	273		273	378		37
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	162			162			162			222		
Lane Util. 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
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	1776	1509	1687	1776	1509	1687	1776	1509	1687	1776	1509
Flt Permitted	0.603			0.663			0.712			0.729		
Satd. Flow (perm)	1071	1776	1509	1177	1776	1509	1264	1776	1509	1294	1776	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			299			55			55			111
Link Speed (mph)		45			45			45			55	
Link Distance (ft)		676			616			604			609	
Travel Time (s)		10.2			9.3			9.2			7.5	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	70	147	299	54	217	22	252	43	27	29	69	111
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	147	299	54	217	22	252	43	27	29	69	111
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		30			30			30			30	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Maximum Green (s)	39.0	39.0	39.0	39.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	9.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.2	13.2	13.2	13.2	13.2	13.2	34.8	34.8	34.8	34.8	34.8	34.8
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.22	0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.30	0.38	0.53	0.21	0.56	0.06	0.34	0.04	0.03	0.04	0.07	0.12
Control Delay	21.2	21.4	6.2	19.2	25.4	1.8	9.6	7.2	1.3	7.3	7.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	21.4	6.2	19.2	25.4	1.8	9.6	7.2	1.3	7.3	7.2	2.4
LOS	C	C	A	B	C	A	A	A	A	A	A	A
Approach Delay		12.6			22.5			8.6			4.7	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)	21	46	0	16	71	0	41	6	0	4	9	0
Queue Length 95th (ft)	45	77	46	36	111	5	106	21	5	16	29	19
Internal Link Dist (ft)		596			536			524			529	
Turn Bay Length (ft)	273		273	273		273	273		273	378		37
Base Capacity (vph)	696	1154	1085	765	1154	1000	732	1029	898	750	1029	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.13	0.28	0.07	0.19	0.02	0.34	0.04	0.03	0.04	0.07	0.12

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 23.5 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 49.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: Ellicott Hwy & SH 94

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	442	463	66	38	56
Future Vol, veh/h	28	442	463	66	38	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	273	-	-	235	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	83	83
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	30	480	503	72	46	67

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	575	0	-	0	1043	503
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	540	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	974	-	-	-	249	559
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	574	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	974	-	-	-	241	559
Mov Cap-2 Maneuver	-	-	-	-	373	-
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	974	-	-	-	373	559
HCM Lane V/C Ratio	0.031	-	-	-	0.123	0.121
HCM Control Delay (s)	8.8	-	-	-	16	12.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	0.4

Intersection	
Int Delay, s/veh	98.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	137	278	50	200	20	232	40	25	25	60	97
Future Vol, veh/h	65	137	278	50	200	20	232	40	25	25	60	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	87	87	87
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	71	149	302	54	217	22	252	43	27	29	69	111

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	239	0	0	451	0	0	868	789	300	813	929	228
Stage 1	-	-	-	-	-	-	442	442	-	336	336	-
Stage 2	-	-	-	-	-	-	426	347	-	477	593	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1299	-	-	1084	-	-	267	317	728	291	262	799
Stage 1	-	-	-	-	-	-	585	568	-	668	633	-
Stage 2	-	-	-	-	-	-	597	626	-	560	486	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1299	-	-	1084	-	-	~ 164	285	728	228	235	799
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 164	285	-	228	235	-
Stage 1	-	-	-	-	-	-	553	537	-	631	601	-
Stage 2	-	-	-	-	-	-	432	595	-	468	459	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	1.6	$ 391.8	26.2
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	187	1299	-	-	1084	-	-	374
HCM Lane V/C Ratio	1.726	0.054	-	-	0.05	-	-	0.559
HCM Control Delay (s)	$ 391.8	7.9	-	-	8.5	-	-	26.2
HCM Lane LOS	F	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	22.4	0.2	-	-	0.2	-	-	3.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	703	291	452	232
Demand Flow Rate, veh/h	752	312	484	249
Vehicles Circulating, veh/h	146	552	512	645
Vehicles Exiting, veh/h	748	444	386	219
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.8	10.1	14.2	10.0
Approach LOS	B	B	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	752	312	484	249
Cap Entry Lane, veh/h	1189	786	819	715
Entry HV Adj Factor	0.934	0.934	0.933	0.933
Flow Entry, veh/h	703	291	452	232
Cap Entry, veh/h	1111	734	764	667
V/C Ratio	0.632	0.397	0.591	0.348
Control Delay, s/veh	11.8	10.1	14.2	10.0
LOS	B	B	B	A
95th %tile Queue, veh	5	2	4	2

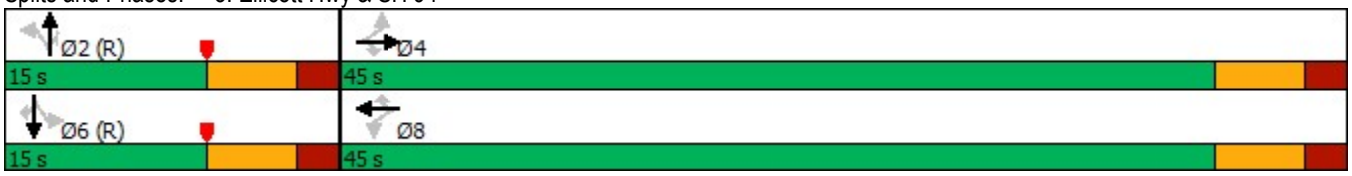
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	283	261	25	218	25	311	55	50	50	45	107
Future Volume (vph)	110	283	261	25	218	25	311	55	50	50	45	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	273		273	273		273	273		273	378		37
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	162			162			162			222		
Lane Util. 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
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1687	1776	1509	1687	1776	1509	1687	1776	1509	1687	1776	1509
Flt Permitted	0.594			0.486			0.723			0.718		
Satd. Flow (perm)	1055	1776	1509	863	1776	1509	1284	1776	1509	1275	1776	1509
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			55			55			123
Link Speed (mph)		45			45			45			55	
Link Distance (ft)		676			616			604			609	
Travel Time (s)		10.2			9.3			9.2			7.5	
Peak Hour Factor	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.87	0.87	0.87
Adj. Flow (vph)	118	304	281	27	237	27	338	60	54	57	52	123
Shared Lane Traffic (%)												
Lane Group Flow (vph)	118	304	281	27	237	27	338	60	54	57	52	123
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		30			30			30			30	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (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
Detector 1 Queue (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
Detector 1 Delay (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
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	15.0	15.0	15.0	15.0	15.0	15.0
Total Split (%)	75.0%	75.0%	75.0%	75.0%	75.0%	75.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%
Maximum Green (s)	39.0	39.0	39.0	39.0	39.0	39.0	9.0	9.0	9.0	9.0	9.0	9.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	17.3	17.3	17.3	17.3	17.3	17.3	30.7	30.7	30.7	30.7	30.7	30.7
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.51	0.51	0.51	0.51	0.51	0.51
v/c Ratio	0.39	0.59	0.44	0.11	0.46	0.06	0.52	0.07	0.07	0.09	0.06	0.15
Control Delay	18.9	22.1	4.2	13.7	19.1	1.7	16.4	10.2	4.2	10.6	10.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	22.1	4.2	13.7	19.1	1.7	16.4	10.2	4.2	10.6	10.2	3.3
LOS	B	C	A	B	B	A	B	B	A	B	B	A
Approach Delay		14.4			17.0			14.1			6.7	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	34	94	0	7	70	0	73	10	0	10	9	0
Queue Length 95th (ft)	58	126	36	18	98	6	#216	34	18	33	30	25
Internal Link Dist (ft)		596			536			524			529	
Turn Bay Length (ft)	273		273	273		273	273		273	378		37
Base Capacity (vph)	685	1154	1079	560	1154	1000	656	908	798	651	908	831
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.26	0.26	0.05	0.21	0.03	0.52	0.07	0.07	0.09	0.06	0.15

Intersection Summary	
Area Type:	Other
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 23.5 (39%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 58.0%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 3: Ellicott Hwy & SH 94



Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	604	577	59	50	52
Future Vol, veh/h	43	604	577	59	50	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	273	-	-	235	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	87	87
Heavy Vehicles, %	7	7	7	7	7	7
Mvmt Flow	46	649	620	63	57	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	683	0	-	0	1361	620
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	741	-
Critical Hdwy	4.17	-	-	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	2.263	-	-	-	3.563	3.363
Pot Cap-1 Maneuver	887	-	-	-	159	479
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	887	-	-	-	151	479
Mov Cap-2 Maneuver	-	-	-	-	288	-
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	462	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	887	-	-	-	288	479
HCM Lane V/C Ratio	0.052	-	-	-	0.2	0.125
HCM Control Delay (s)	9.3	-	-	-	20.6	13.6
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	0.4

Intersection	
Int Delay, s/veh	316

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	283	261	25	218	25	311	55	50	50	45	107
Future Vol, veh/h	110	283	261	25	218	25	311	55	50	50	45	107
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	130	-	-	285	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	87	87	87
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	120	308	284	27	237	27	338	60	54	57	52	123

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	264	0	0	592	0	0	1082	1008	450	1052	1137	251
Stage 1	-	-	-	-	-	-	690	690	-	305	305	-
Stage 2	-	-	-	-	-	-	392	318	-	747	832	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1272	-	-	960	-	-	~ 191	236	599	200	197	776
Stage 1	-	-	-	-	-	-	427	439	-	694	653	-
Stage 2	-	-	-	-	-	-	623	645	-	397	377	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1272	-	-	960	-	-	~ 113	208	599	129	174	776
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 113	208	-	129	174	-
Stage 1	-	-	-	-	-	-	387	398	-	629	635	-
Stage 2	-	-	-	-	-	-	468	627	-	278	342	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	0.8	$ 1137.3	74.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	134	1272	-	-	960	-	-	258
HCM Lane V/C Ratio	3.374	0.094	-	-	0.028	-	-	0.9
HCM Control Delay (s)	$ 1137.3	8.1	-	-	8.9	-	-	74.9
HCM Lane LOS	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	43.7	0.3	-	-	0.1	-	-	7.9

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon