

CENTURY PARK MULTI-FAMILY DEVELOPMENT

TRAFFIC IMPACT STUDY

SHERRILL BOULEVARD
KNOXVILLE, TN

CCI PROJECT NO. 01633-0000

REV 2



PREPARED FOR:
Brand Properties
3328 Peachtree Road Suite 100
Atlanta, GA 30326

SUBMITTED BY
Cannon & Cannon, Inc.
8550 Kingston Pike
Knoxville, TN 37919
865.670.8555

REVISED
JUNE 16

2022

6-A-22-TOB
TIS Version 3
6/16/2022

CENTURY PARK MULTI-FAMILY DEVELOPMENT

TRAFFIC IMPACT STUDY

SHERRILL BOULEVARD
KNOXVILLE, TN

CCI PROJECT NO. 01633-0000



REVISION 2 (6/16/2022)

This report replaces the previous version of the traffic impact study dated 06/16/2022 prepared for this project in its entirety. The associated changes are a result of comments received from City of Knoxville staff which resulted in a shift in the Mabry Hood Road driveway location. City comments are located in APPENDIX D.

PREPARED FOR:
Brand Properties
3328 Peachtree Road Suite 100
Atlanta, GA 30326

SUBMITTED BY
Cannon & Cannon, Inc.
8550 Kingston Pike
Knoxville, TN 37919
865.670.8555

REVIS
JUNE 16
2022

TABLE OF CONTENTS

SECTION 1	EXECUTIVE SUMMARY	1
SECTION 2	INTRODUCTION & PURPOSE OF STUDY	3
SECTION 3	EXISTING CONDITIONS	7
SECTION 4	BACKGROUND CONDITIONS	10
SECTION 5	FUTURE CONDITIONS	13
SECTION 6	EVALUATIONS	19
SECTION 7	CONCLUSIONS & RECOMMENDATIONS	22
SECTION 8	APPENDICES	23

TABLE OF CONTENTS

FIGURES

FIGURE 1	LOCATION MAP	3
FIGURE 2	CONCEPTUAL CENTURY PARK SITE PLAN	5
FIGURE 3	MULTI-FAMILY RESIDENTIAL SITE PLAN	6
FIGURE 4	EXISTING TRAFFIC VOLUMES	9
FIGURE 5	2024 BACKGROUND TRAFFIC VOLUMES	11
FIGURE 6	2029 BACKGROUND TRAFFIC VOLUMES	12
FIGURE 7	TRIP DISTRIBUTION PATTERNS	15
FIGURE 8	TRIP ASSIGNMENTS	16
FIGURE 9	2024 COMBINED TRAFFIC DATA	17
FIGURE 10	2029 COMBINED TRAFFIC DATA	18

TABLES

TABLE 1	AVERAGE DAILY TRAFFIC COUNT SUMMARY	7
TABLE 2	TRIP GENERATION SUMMARY	13
TABLE 3	CAPACITY ANALYSES SUMMARY	19
TABLE 4	TRAFFIC SIGNAL WARRANT EVALUATION SUMMARY	20

APPENDICES

APPENDIX A	TRAFFIC DATA	A-1
APPENDIX B	TRIP GENERATION	B-1
APPENDIX C	ANALYSES	C-1
APPENDIX D	CITY OF KNOXVILLE COMMENTS	D-1

EXECUTIVE SUMMARY

This report provides a summary of a traffic impact study update that was performed a multi-family residential development to be located on Sherrill Boulevard adjacent to the Century Park development in west Knoxville, Tennessee. The project site is located on the east side of Sherrill Boulevard approximately 1,500 feet south of Dutchtown Road. The proposed site includes Lot 9 of the Century Park development. The current plans for this project propose 286 multi-family residential apartment units on approximately 23.65 acres. The development proposes two access points, one onto Sherrill Boulevard and one onto Mabry Hood Road.

The purpose of this study was the evaluation of the traffic operational and safety impacts of the proposed development upon the roadways in the vicinity of the project site. Of particular interest were the intersections of Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway Northbound Ramps, Dutchtown Road at Mabry Hood Road, and the proposed site access locations onto Sherrill Boulevard and Mabry Hood Road. Appropriate intersection evaluations were conducted at these locations for existing and future conditions, both with and without traffic volumes generated from the proposed development, in order to determine the anticipated impact and to establish recommended measures to mitigate these impacts. The study included updated traffic counts, intersection capacity analyses, and other evaluations as appropriate.

The primary conclusion of this study is that the traffic generated from the proposed development will have a minimal impact on most of the study intersections. At the intersection of Dutchtown Road and Sherrill Boulevard/Pellissippi Parkway Northbound Ramps, the LOS will remain unchanged from 2021 existing traffic conditions with a LOS "D" for all analysis periods. The intersections of the proposed site driveways with Sherrill Boulevard and Mabry Hood Road are anticipated to operate at LOS "B" or better under both 2024 and 2029 traffic conditions. The intersection of Dutchtown Road and Mabry Hood Road currently experiences poor levels-of-service of LOS "F" with excessive vehicle delays during the P.M. peak hour. Under existing traffic volumes, this unsignalized intersection will meet MUTCD signal warrants for signalization.

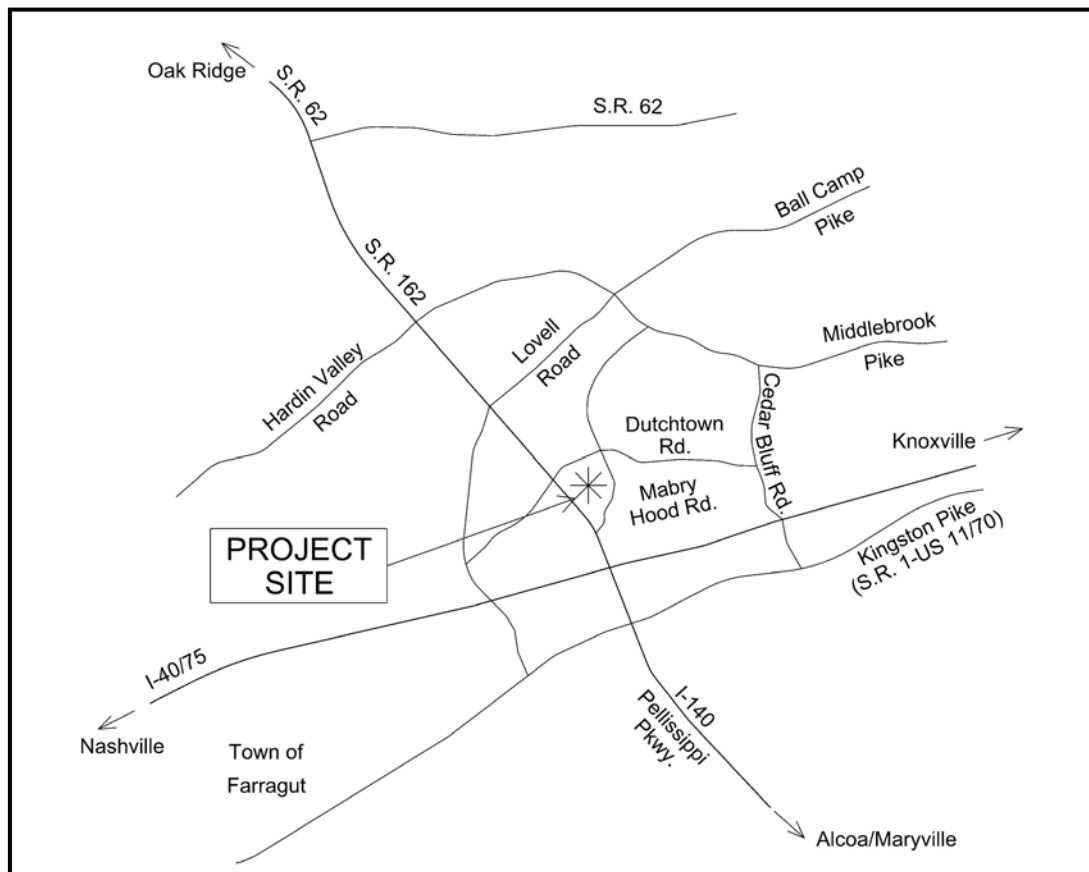
The following is a list of measures that should be considered in an effort to address these issues and concerns at the study intersections:

1. Install a STOP sign on the site entrance roadway approach to Sherrill Boulevard and Mabry Hood Road.
2. Maintain intersection corner sight distance at the proposed site entrance roadways by ensuring any site landscaping, grading, or site signage is properly placed such that sight distances along Sherrill Boulevard and Mabry Hood Road are not restricted.
3. A southbound left-turn lane on Sherrill Boulevard at the proposed entrance roadway will be required by the City of Knoxville. The design of the left-turn lane should include 100 feet of storage, 160 feet of bay taper, 320 feet of approach taper, and 320 feet of departure taper resulting in a project length of approximately 1,000 feet. It is anticipated the installation of this turn lane can be accomplished by including a pavement overlay and restriping the roadway to include the southbound left-turn lane into the development.

4. Consider installation of a traffic signal at the intersection of Dutchtown Road at Mabry Hood Road. The unsignalized intersection currently experiences poor levels-of-service and excessive vehicle delays. Under existing traffic conditions, the intersection meets MUTCD warrants for signalization. Southbound Mabry Hood Road volumes (non-site traffic) were utilized in satisfying the side street requirements for the two warrants.

INTRODUCTION & PURPOSE OF STUDY

This report provides a summary of a traffic impact study update that was performed a multi-family residential development to be located on Sherrill Boulevard adjacent to the Century Park development in west Knoxville, Tennessee. The project site is located on the east side of Sherrill Boulevard approximately 1,500 feet south of Dutchtown Road. FIGURE 1 is a project location map identifying the project site in relation to the major roadways in the vicinity of the proposed development.

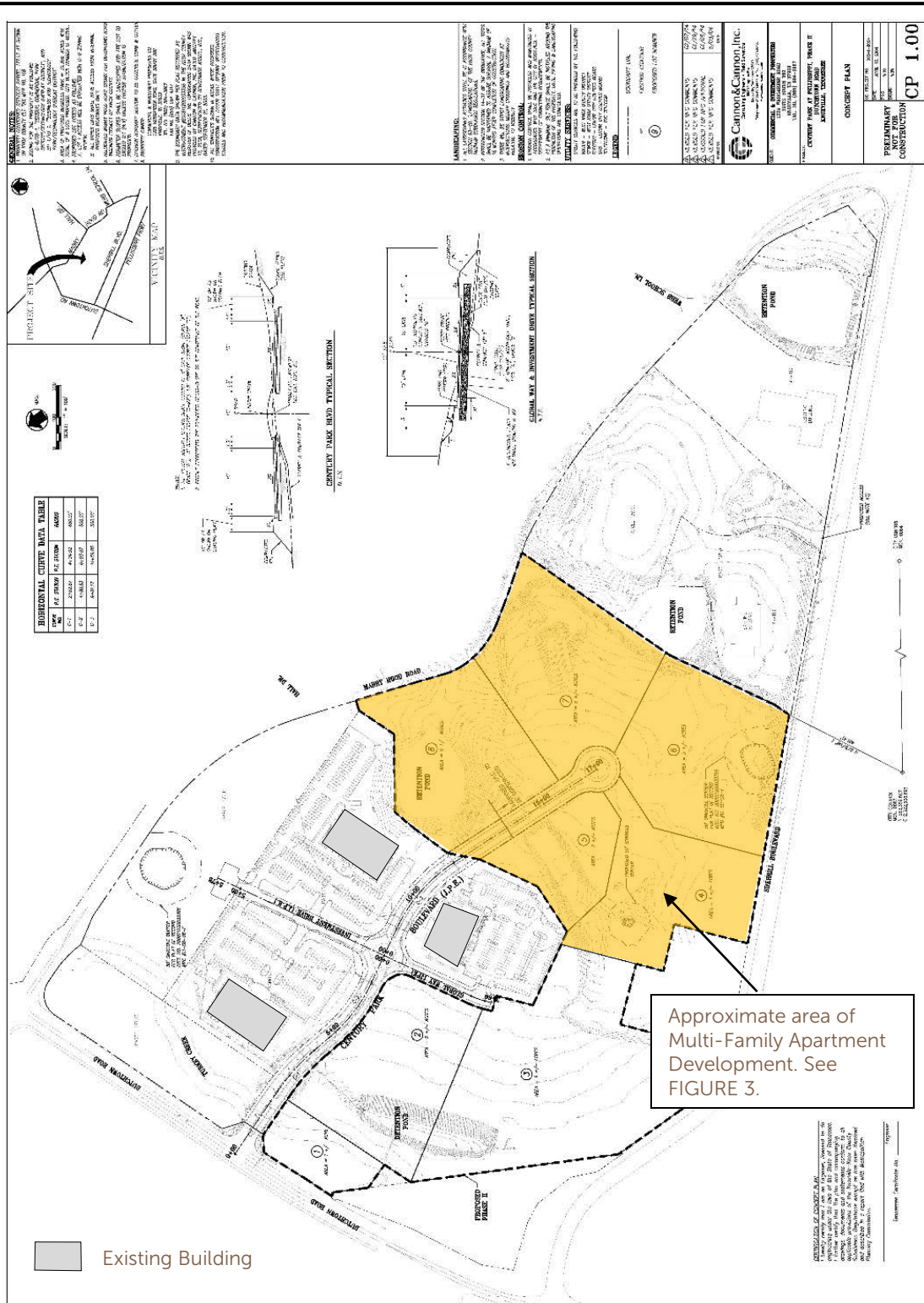


**FIGURE 1
LOCATION MAP**

The proposed site includes Lot 9 of the Century Park development. The current plans for this project propose 286 multi-family residential apartment units on approximately 23.65 acres. The development proposes two access points, one onto Sherrill Boulevard and one onto Mabry Hood Road. FIGURE 2 is a site map showing an overview of the Century Park development while FIGURE 3 is a site plan for the proposed multi-family apartment development.

The purpose of this study was the evaluation of the traffic operational and safety impacts of the proposed development upon the roadways in the vicinity of the project site. Of particular interest were the intersections of Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway Northbound Ramps, Dutchtown Road at Mabry Hood Road, and the proposed site access locations onto Sherrill Boulevard

and Mabry Hood Road. Appropriate intersection evaluations were conducted at these locations for existing and future conditions, both with and without traffic volumes generated from the proposed development, in order to determine the anticipated impact and to establish recommended measures to mitigate these impacts. The study included updated traffic counts, intersection capacity analyses, and other evaluations as appropriate.



CONCEPTUAL CENTURY PARK SITE PLAN

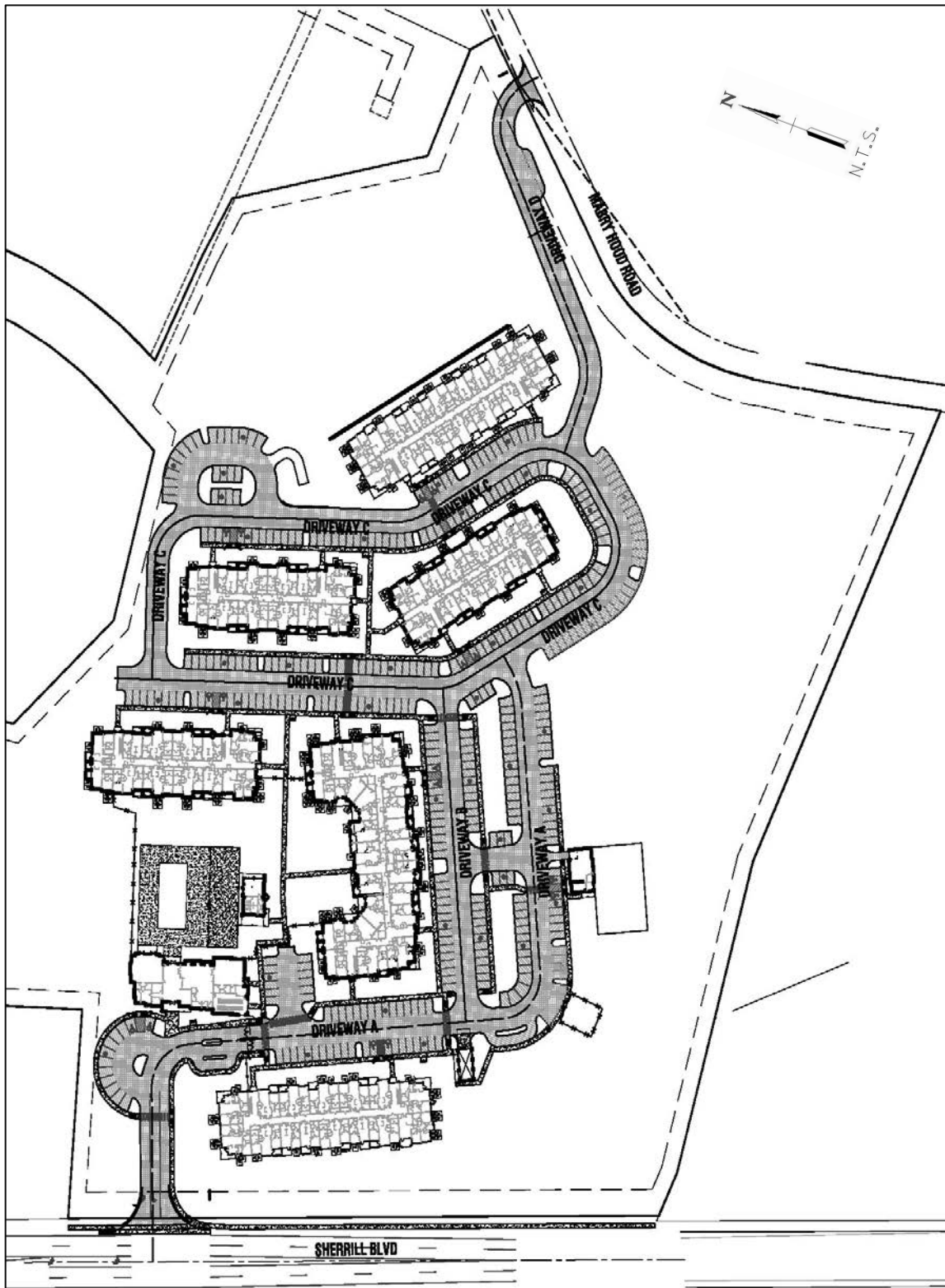


FIGURE 3
MULTI-FAMILY RESIDENTIAL SITE PLAN

EXISTING CONDITIONS

EXISTING ROADWAY CONDITIONS

Dutchtown Road in the vicinity of the proposed development is a five-lane Minor Arterial facility maintained by the City of Knoxville consisting of two twelve foot wide travel lanes in each direction, a center two-way left-turn lane, and curb and gutter. The speed limit on Dutchtown Road is posted as 40 mph.

Sherrill Boulevard is a Major Collector roadway maintained by the City of Knoxville and consists of four traffic lanes twelve feet in width with eight foot shoulders. The posted speed limit on Sherrill Boulevard is 40 mph.

Mabry Hood Road is a Minor Collector roadway maintained by the City of Knoxville and consists of two lanes with lane widths varying from nine to twelve foot in width. The posted speed limit on Mabry Hood Road is 30 mph.

The intersections of Dutchtown Road at Cogdill Road/Pellissippi Parkway Southbound Ramps and Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway Northbound Ramps are signalized and operate in a coordinated signal system with the adjacent signal to the west at the intersection of Dutchtown Road and Innovation Drive. The intersection of Dutchtown Road and Mabry Hood Road is unsignalized with STOP control assigned to the Mabry Hood Road approaches to the intersection.

EXISTING TRAFFIC DATA

Existing traffic data was gathered for this study. The Tennessee Department of Transportation (TDOT) and the Knoxville-Knox County Metropolitan Planning Organization collects average daily traffic data (ADT) annually on roadways in the study area. Three count stations were found near the project site that were felt to have particular relevance for this study. The most currently available data from these count stations is contained in TABLE 1.

TABLE 1: AVERAGE DAILY TRAFFIC COUNT SUMMARY

COUNT YEAR	STATION T464 MURDOCK ROAD WEST OF PELLISSIPPI PARKWAY	STATION M56 DUTCHTOWN ROAD WEST OF MABRY HOOD ROAD	STATION T553 MABRY HOOD ROAD NORTH OF SHERRILL BLVD
2022	5,724	-	493
2021	5,122	-	-
2020	5,973	-	517
2019	6,555	12,370	606
2018	6,476	-	424
2017	6,861	12,330	578
2016	7,147	11,130	500

In addition to the available ADT data, intersection turning movement traffic counts were conducted specifically for this study at the intersections of Dutchtown Road and Sherrill Boulevard (10/19/2021) and Dutchtown Road and Mabry Hood Road (3/31/2022) for the primary purpose of determining the current peak hour operating volumes. These counts were conducted during the A.M. and P.M. peak traffic hours. The existing traffic counts are summarized on FIGURE 4 for the A.M. and P.M. peak traffic hours, and the raw data traffic count summary sheets are contained in APPENDIX A.

EXISTING CAPACITY ANALYSES / LEVELS-OF-SERVICE

Capacity analyses employing the methods of the Highway Capacity Manual were conducted at the existing study intersections. The analyses were performed with the existing traffic volumes and existing intersection traffic control and lane configurations for both A.M. and P.M. peak traffic periods. The most currently available signal timing was used in order to evaluate capacity at the signalized intersection of Dutchtown Road at Sherrill Boulevard / Pellissippi Parkway Northbound Ramps. Existing analyses indicate that the signalized intersection of Dutchtown Road at Sherrill Boulevard / Pellissippi Parkway Northbound Ramps currently operates at level-of-service (LOS) "D" during both the A.M. and P.M. peak traffic periods.

Unsignalized capacity analyses conducted for the intersection of Dutchtown Road at Mabry Hood Road utilizing existing traffic volumes, intersection geometry, and existing side street stop control on the Mabry Hood Road approaches. The Mabry Hood Road southbound right-turn lane is currently channelized and operates as a free-flow movement. Southbound right-turn volumes were omitted from the unsignalized capacity analyses. Unsignalized capacity analysis results indicate the intersection currently operates at a LOS "E" and "F" for the side street approaches during both the A.M. and P.M. peak traffic periods, respectively. A signal warrant evaluation was conducted for this intersection utilizing the existing traffic volumes. The intersection of Dutchtown Road and Mabry Hood Road was found to meet two of the three volume-based warrants, 4-Hour and Peak Hour, under existing traffic conditions.

The Evaluations section of this report may be referenced for tabular summaries of these analyses, while more detailed summaries are presented on the computer printouts contained in APPENDIX C. Also contained in APPENDIX C is a section entitled "Intersection Capacity and Level of Service Concepts", which provides a description of the utilized procedures.

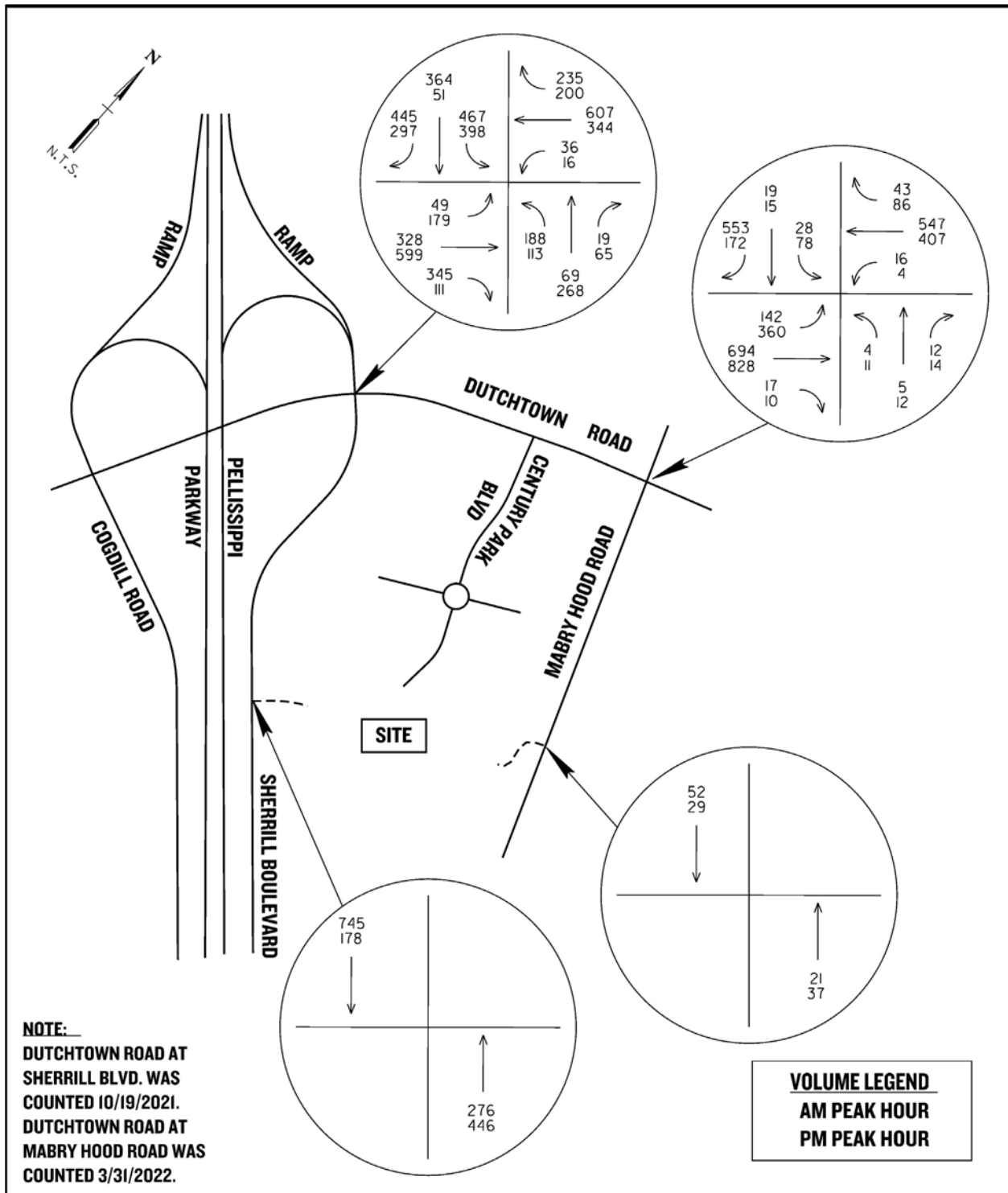


FIGURE 4
EXISTING TRAFFIC VOLUMES

BACKGROUND CONDITIONS

BACKGROUND TRAFFIC GROWTH

The proposed development is anticipated to be constructed in one general phase with completion of full build-out of the development by year 2024. Therefore, year 2024 was established as the evaluation year for this project. Year 2029 was also established as an evaluation year, as this is five years beyond the anticipated completion of the development and TDOT recommends this type of assessment of future conditions.

In order to determine traffic volumes resulting solely from background traffic growth to years 2024 and 2029, it was necessary to establish an annual growth rate for existing traffic. The TDOT ADT values previously discussed and knowledge of the area were used to determine an approximate annual growth rate. Based on the available data, a background annual growth rate of 2.0% was assumed. FIGURE 5 contains the background traffic volumes that would result from a 2.0% annual growth from years 2021 and 2022, when the traffic counts were conducted, to year 2024. FIGURE 6 contains the background traffic volumes that would result from a 2.0% annual growth from year 2024 to year 2029.

BACKGROUND CAPACITY ANALYSES / LEVELS-OF-SERVICE

Capacity analyses as described in the Existing Conditions section of this report were conducted utilizing the FIGURES 5 and 6 background traffic volumes and existing intersection traffic control and lane configurations. The analyses indicate that the intersection of Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway NB Ramps will continue to operate at level-of-service (LOS) "D" during both the A.M. and P.M. peak traffic periods under years 2024 and 2029 background traffic conditions.

Unsignalized capacity analyses conducted for the intersection of Dutchtown Road at Mabry Hood Road indicate the intersection will operate at a LOS "F" for the side street approaches during both the A.M. and P.M. peak traffic periods under years 2024 and 2029 background traffic conditions. While the level of service is anticipated to be LOS "F", the anticipated delay for the side street vehicles will increase significantly to intolerable levels under 2024 and 2029 conditions. A signal warrant evaluation was again conducted for this intersection utilizing the 2024 and 2029 background traffic volumes. The intersection of Dutchtown Road and Mabry Hood Road was found to meet two of the three volume-based warrants, 4-Hour and Peak Hour, under background conditions.

The Evaluations section of this report may be referenced for tabular summaries of these analyses, while more detailed summaries are presented on the computer printouts contained in APPENDIX C

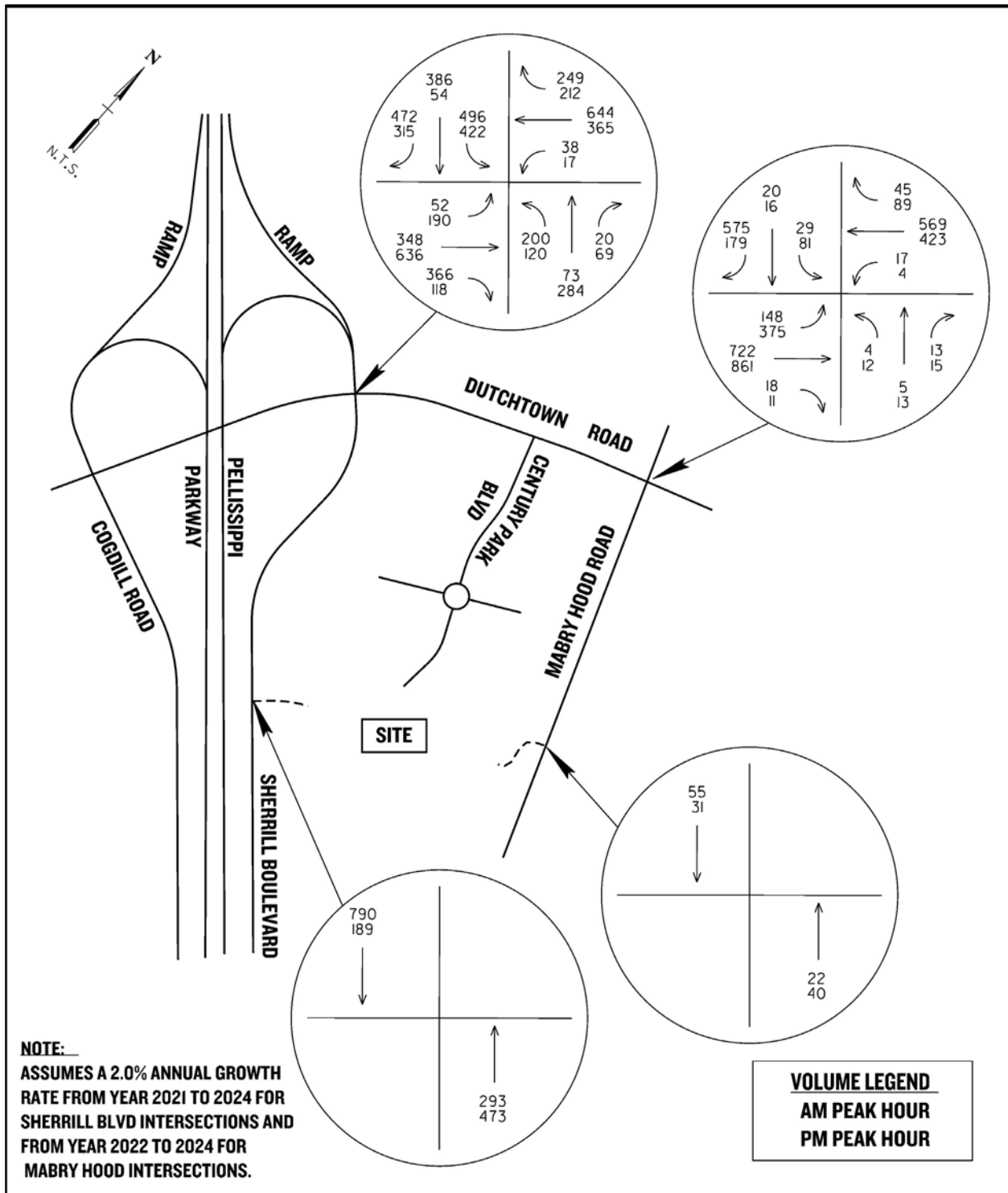


FIGURE 5
 2024 BACKGROUND TRAFFIC VOLUMES

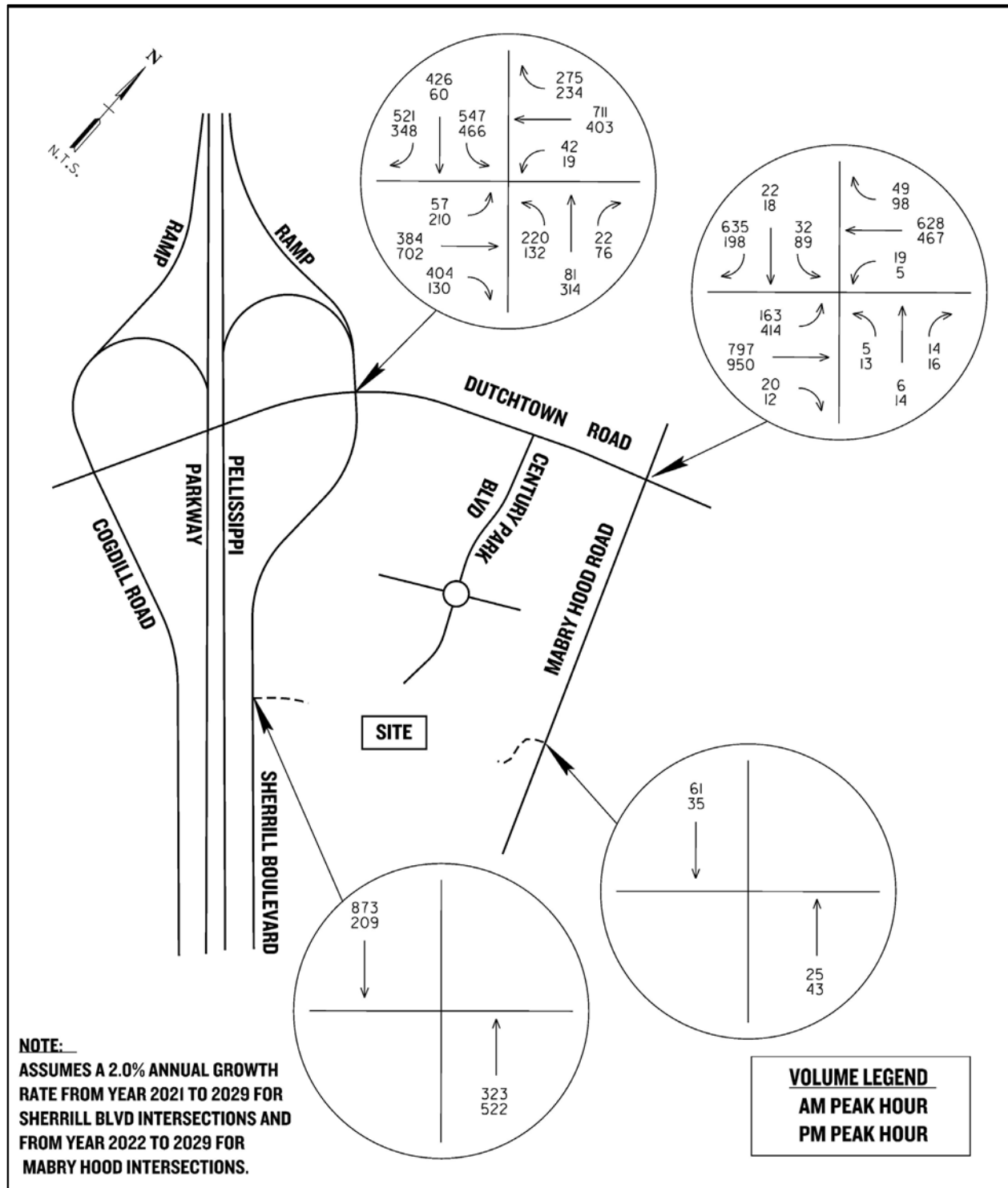


FIGURE 6
 2029 BACKGROUND TRAFFIC VOLUMES

FUTURE CONDITIONS

TRIP GENERATION

In order to estimate the expected traffic volumes to be generated by the proposed development, the procedures recommended by the Institute of Transportation Engineers (ITE) were utilized. Local trip generation rates developed by the Knoxville-Knox County Metropolitan Planning Commission for multi-family apartment type developments within the region were utilized to generate the estimated trips. Trip generation was based on a maximum of 300 units, however the anticipated total number of units is 286. The generated traffic volumes were determined based on the data for the peak hours of adjacent street traffic. See TABLE 2 for a summary of the traffic generated for this project. More detailed information is contained in APPENDIX B.

TABLE 2: TRIP GENERATION SUMMARY

LAND USE	ITE CODE	SIZE	WEEKDAY (TRIPS/DAY)	AM PEAK HOUR (TRIPS/HR)	PM PEAK HOUR (TRIPS/HR)
Multi-family Apartments	Local	300 units			
Entering Trips			1,281	32	116
Exiting Trips			<u>1,281</u>	<u>115</u>	<u>95</u>
TOTAL			2,562	147	211

TRIP DISTRIBUTION AND ASSIGNMENT

The existing traffic volume patterns around the study site were evaluated in order to establish the likely trip distribution orientation for newly generated trips. For the multi-family residential apartments, it was estimated that approximately 80 percent of the new trips will be oriented to and from the north and 20 percent to and from the south. FIGURE 7 provides a summary of the entering and exiting trip distribution patterns assumed for this study.

The newly generated trips were then assigned to the study intersections, including the proposed new site intersection, utilizing this orientation. FIGURE 8 show the generated trips as assigned to the study intersections in accordance with the distribution patterns shown in FIGURE 7. FIGURES 9 and 10 show the combined year 2024 and 2029 volumes reflecting the existing traffic, the background traffic growth, and the newly generated traffic from the proposed development. These are the combined volumes used in the analysis of the future conditions.

FUTURE CAPACITY ANALYSES / LEVELS-OF-SERVICE

Capacity analyses as described in the Existing Conditions section of this report were conducted for 2024 conditions and 2029 conditions utilizing FIGURES 9 and 10 combined traffic volumes and existing intersection traffic control and lane configurations. The analyses indicate that the intersection of Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway NB Ramps will continue to operate at

level-of-service (LOS) "D" during both the A.M. and P.M. peak traffic periods under years 2024 and 2029 combined traffic conditions.

Unsignalized capacity analyses conducted for the intersection of Dutchtown Road at Mabry Hood Road indicate the intersection will continue to operate at a LOS "F" for the side street approaches during both the A.M. and P.M. peak traffic periods under years 2024 and 2029 combined traffic conditions. As experienced under background traffic conditions without the development, the anticipated unsignalized delay for the side street vehicles is quite significant.

Unsignalized capacity analyses conducted for the site access driveways located on Sherrill Boulevard and Mabry Hood Road indicate both intersections will operate at LOS "B" or better during both the A.M. and P.M. peak traffic periods under years 2024 and 2029 combined traffic conditions.

The Evaluations section of this report may be referenced for tabular summaries of these analyses, while more detailed summaries are presented on the computer printouts contained in APPENDIX C.

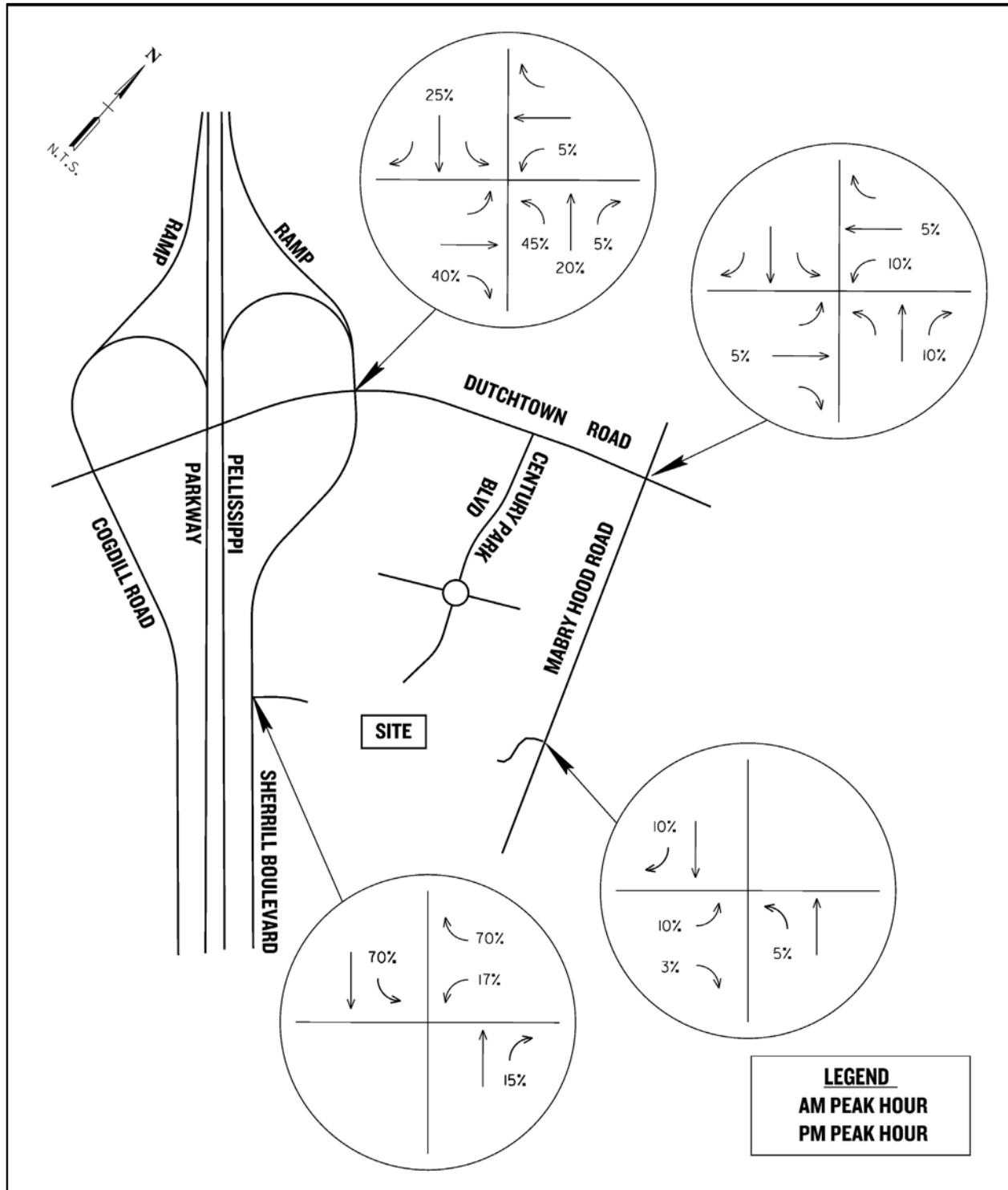


FIGURE 7
TRIP DISTRIBUTION PATTERNS

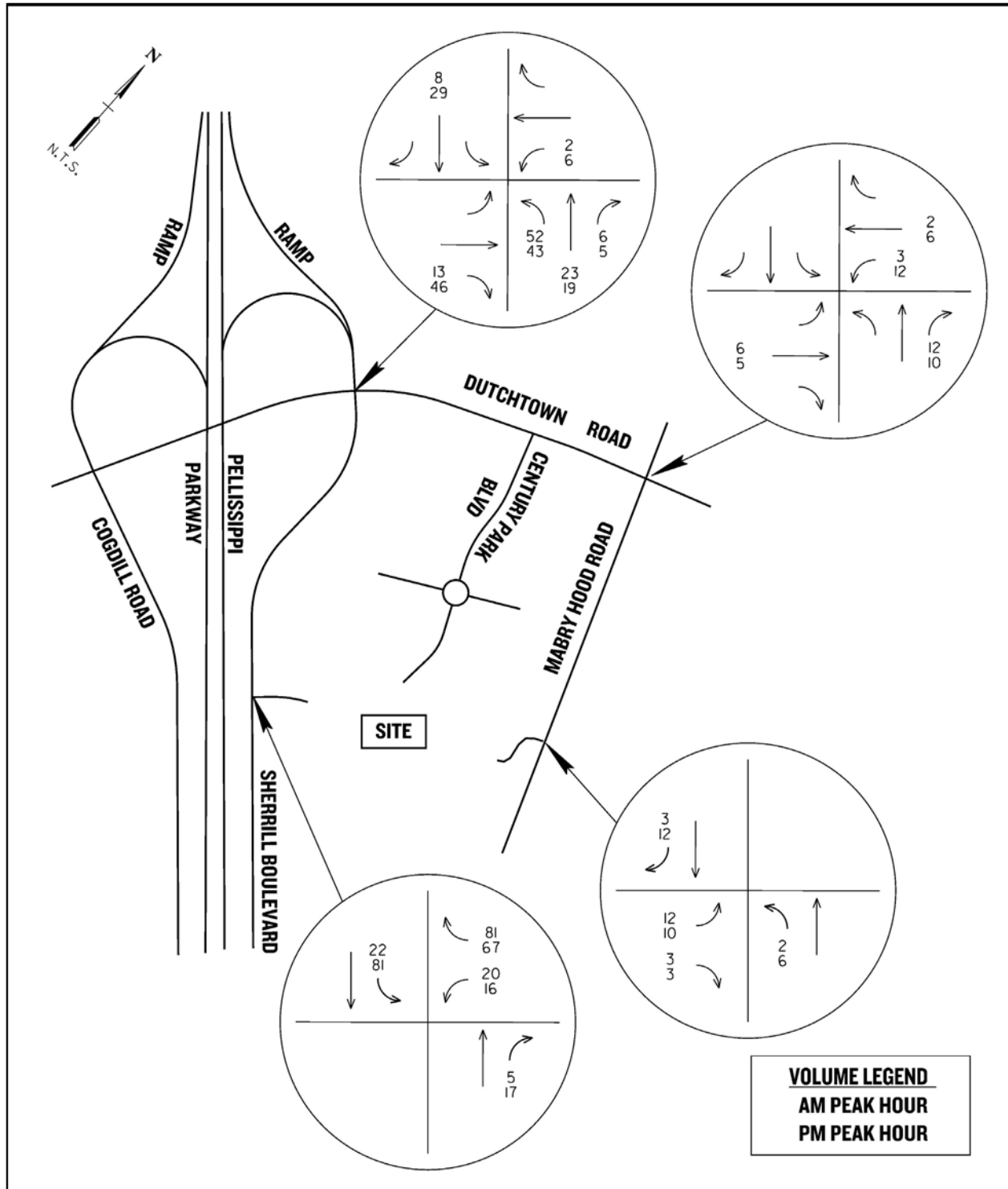


FIGURE 8
TRIP ASSIGNMENTS

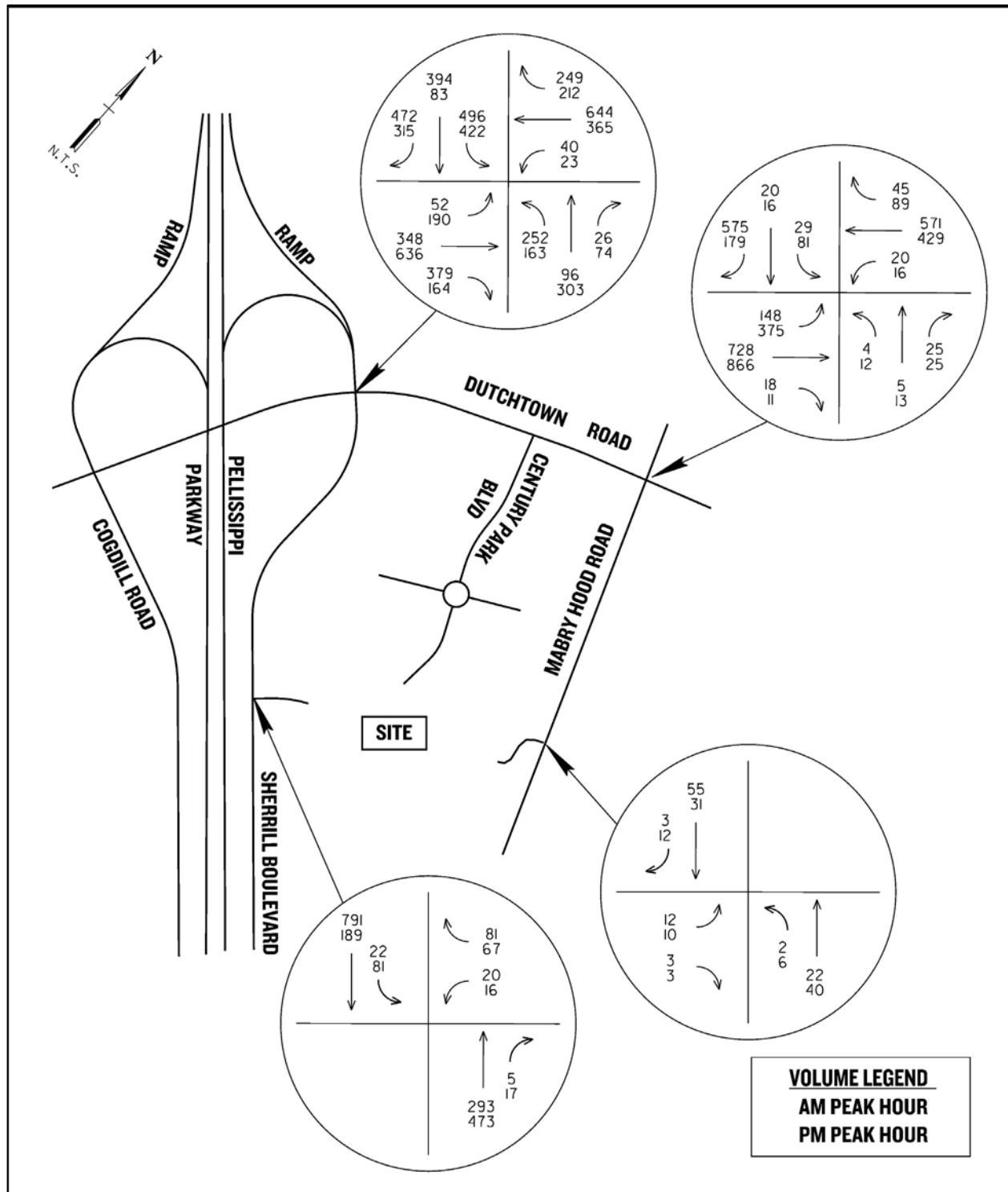


FIGURE 9
2024 COMBINED TRAFFIC VOLUMES

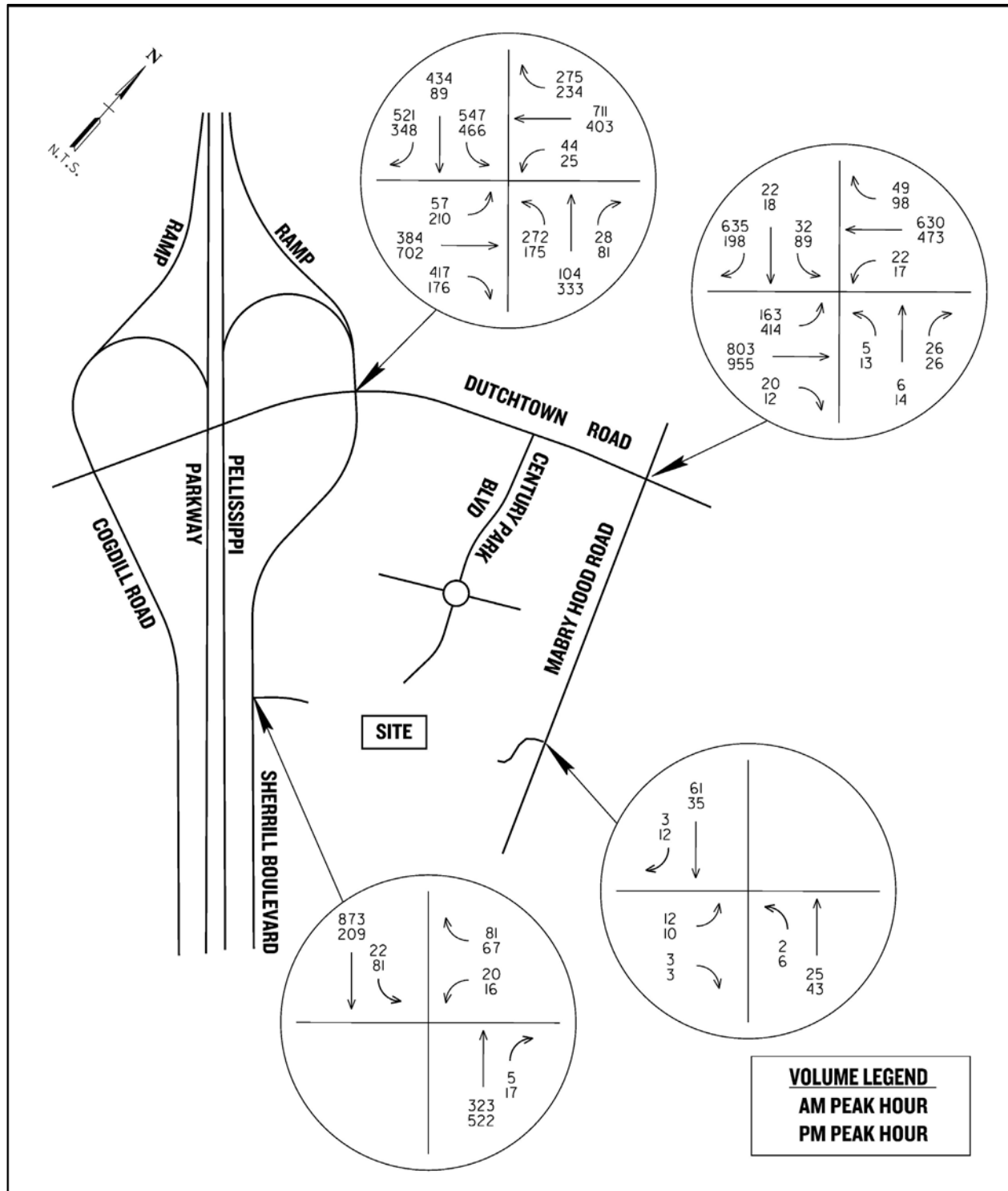


FIGURE 10
2029 COMBINED TRAFFIC DATA

EVALUATIONS

INTERSECTION CAPACITY ANALYSES

As discussed in the preceding sections of this report, capacity analyses employing the methods of the Highway Capacity Manual (HCM) were conducted for the study intersections. These analyses were performed for existing, background, and anticipated 2024 and 2029 combined traffic conditions. Existing geometry and traffic control were used in these analyses of the study intersections. TABLE 3 may be referenced for tabular summaries of these analyses, while more detailed summaries are presented on the computer printouts contained in the APPENDIX C.

TABLE 3: CAPACITY ANALYSES SUMMARY

INTERSECTION	TIME	EXISTING (LOS/ DELAY)	YEAR 2024 BACK GROUND (LOS/ DELAY)	YEAR 2029 BACK GROUND (LOS/ DELAY)	YEAR 2024 COMBINED (LOS/ DELAY)	YEAR 2029 COMBINED (LOS/ DELAY)
Dutchtown Rd at Sherrill Blvd/Pellissippi Pkwy NB Ramps Existing Geometry and Control (SIGNALIZED) ¹	A.M. P.M.	D 39.7 D 39.4	D 40.7 D 40.4	D 47.3 D 43.1	D 42.9 D 41.8	D 41.9 D 44.7
Dutchtown Rd at Mabry Hood Rd Existing Geometry and Control (SIDE STREET STOP) ²	A.M. P.M.	E 47.7 F 575.6	F 55.4 F 1203.9	F 86.1 F N/A ³	F 57.7 F 4788.5	F 90.6 F N/A ³
Dutchtown Rd at Mabry Hood Rd Existing Geometry and Proposed Control (SIGNALIZED) ¹	A.M. P.M.	-	A 5.9 B 11.2	A 6.6 B 13.5	A 6.3 B 11.7	A 7.2 B 13.9
Sherrill Blvd at Proposed Driveway Proposed Geometry and Control (SIDE STREET STOP) ²	A.M. P.M.	n/a n/a	n/a n/a	n/a n/a	B 11.0 B 11.6	B 11.3 B 12.0
Mabry Hood Rd at Proposed Driveway Proposed Geometry and Control (SIDE STREET STOP) ²	A.M. P.M.	n/a n/a	n/a n/a	n/a n/a	A 9.0 A 9.0	A 9.0 A 9.0

¹ SIGNALIZED - Level-of-Service and Average Vehicular Delay (seconds) for full intersection using HCM methodology.

² SIDE-STREET STOP CONTROLLED - Level-of-service and Average Vehicular Delay (seconds) for movement or approach utilizing HCM methodology.

³ Delay exceeds HCS calculation thresholds and is indeterminable.

See Appendix for detailed computer print-out summaries and discussion of Capacity and Level-of-Service concepts.

The analyses indicated that the development will have a minimal impact on most of the study intersections. At the intersection of Dutchtown Road at Sherrill Boulevard/Pellissippi Parkway Northbound Ramps, the LOS will remain unchanged from 2021 existing traffic conditions with a LOS "D" for all analysis periods. The intersections of the proposed site driveways with Sherrill Boulevard and Mabry Hood Road are anticipated to operate at LOS "B" or better under both 2024 and 2029 traffic conditions.

The intersection of Dutchtown Road at Mabry Hood Road currently, under existing traffic conditions, operates at a LOS "F" with significant delays encountered by side street vehicles. The average delay during the P.M. peak to southbound left-turn and through vehicles is estimated to be 636 seconds and 260 seconds, respectively. With the addition of anticipated background traffic growth, delay estimates continue to increase for the side street approaches to intolerable levels.

Due to the poor operating conditions and excessive delays experienced at the Dutchtown Road and Mabry Hood Road intersection under unsignalized conditions, signalized capacity analyses were conducted for this intersection. Signalized analysis results indicate the intersection of Dutchtown Road and Mabry Hood Road is anticipated to operate at LOS "B" or better under year 2024 and 2029 conditions, both with and without the proposed development.

TRAFFIC SIGNAL WARRANT ASSESSMENT

The traffic signal volume warrants from the *Manual on Uniform Traffic Control Devices* were evaluated for the intersection of Dutchtown Road with Mabry Hood Road. This assessment utilized volumes collected from the 8-hour intersection turning movement count conducted at this intersection. Traffic signal warrant analyses were performed for existing and background conditions. The intersection of Dutchtown Road and Mabry Hood Road was found to meet two of the three volume-based warrants, 4-Hour and Peak Hour, under existing and background traffic conditions. Southbound Mabry Hood Road volumes (non-site traffic) were utilized in satisfying the side street requirements for the two warrants. The results of the traffic signal warrant analyses are summarized in TABLE 4. Worksheets summarizing these analyses are contained in APPENDIX D.

TABLE 4: TRAFFIC SIGNAL WARRANT EVALUATION SUMMARY

INTERSECTION	YEAR 2022 EXISTING	YEAR 2024 BACKGROUND	YEAR 2029 BACKGROUND
Dutchtown Road at Mabry Hood Road	WARRANTS MET: 4-HOUR PEAK HOUR	WARRANTS MET: 4-HOUR PEAK HOUR	WARRANTS MET: 4-HOUR PEAK HOUR

TURN LANE ASSESSMENTS

The need for intersection right and left turn lanes was assessed at the proposed site driveways located on Sherrill Boulevard and Mabry Hood Road. The methods used employed forms taken from the *Knox County Access Control and Driveway Design Policy*, which are based on a nationally accepted turn lane warrant threshold methodology developed by Harmelink. The results were that neither left-turn lanes nor right-turn lanes were found to be warranted under 2024 and 2029 combined conditions at either of the proposed site driveway locations. The associated turn lane threshold worksheets are located in APPENDIX C.

Due to traffic volumes and the current four-lane undivided configuration of Sherrill Boulevard, a southbound left-turn lane on Sherrill Boulevard at the proposed site driveway will be required by the City of Knoxville.

CORNER SIGHT DISTANCE

A field review of corner sight distance was conducted at the proposed development entrances located on Sherrill Boulevard and Mabry Hood Road. With a posted speed limit of 40 mph on Sherrill Boulevard, the AASHTO recommended intersection sight distance is 500 feet. Sight distance measurements made at this location found the available sight distance to be in excess of 600 feet looking both north and south along Sherrill Boulevard.

Along Mabry Hood Road the posted speed limit is 30 mph. The AASHTO recommended intersection sight distance for 30 mph is 335 feet. Sight distance measurements from the proposed development entrance were found to be 342 feet looking to the north and 340 feet looking to the south along Mabry Hood Road. The sight distance measurement from the proposed development entrance looking to the right, or south, along Mabry Hood Road crosses the front edge of a property located across the street from the proposed development. This is due to a horizontal curve located south of the proposed development entrance. The property is currently clear of vegetation and the AASHTO recommended sight distance is achievable.

CONCLUSIONS & RECOMMENDATIONS

The primary conclusion of this study is that the traffic generated from the proposed development will have a minimal impact on most of the study intersections. At the intersection of Dutchtown Road and Sherrill Boulevard/Pellissippi Parkway Northbound Ramps, the LOS will remain unchanged from 2021 existing traffic conditions with a LOS "D" for all analysis periods. The intersections of the proposed site driveways with Sherrill Boulevard and Mabry Hood Road are anticipated to operate at LOS "B" or better under both 2024 and 2029 traffic conditions. The intersection of Dutchtown Road and Mabry Hood Road currently experiences poor levels-of-service of LOS "F" with excessive vehicle delays during the P.M. peak hour. Under existing traffic volumes, this unsignalized intersection will meet MUTCD signal warrants for signalization.

The following is a list of measures that should be considered in an effort to address these issues and concerns at the study intersections:

1. Install a STOP sign on the site entrance roadway approach to Sherrill Boulevard and Mabry Hood Road.
2. Maintain intersection corner sight distance at the proposed site entrance roadways by ensuring any site landscaping, grading, or site signage is properly placed such that sight distances along Sherrill Boulevard and Mabry Hood Road are not restricted.
3. A southbound left-turn lane on Sherrill Boulevard at the proposed entrance roadway will be required by the City of Knoxville. The design of the left-turn lane should include 100 feet of storage, 160 feet of bay taper, 320 feet of approach taper, and 320 feet of departure taper resulting in a project length of approximately 1,000 feet. It is anticipated the installation of this turn lane can be accomplished by including a pavement overlay and restriping the roadway to include the southbound left-turn lane into the development.
4. Consider installation of a traffic signal at the intersection of Dutchtown Road at Mabry Hood Road. The unsignalized intersection currently experiences poor levels-of-service and excessive vehicle delays. Under existing traffic conditions, the intersection meets MUTCD warrants for signalization. Southbound Mabry Hood Road volumes (non-site traffic) were utilized in satisfying the side street requirements for the two warrants.

APPENDIX

APPENDIX A – TRAFFIC DATA

APPENDIX B – TRIP GENERATION

APPENDIX C - ANALYSES

APPENDIX D – CITY OF KNOXVILLE COMMENTS

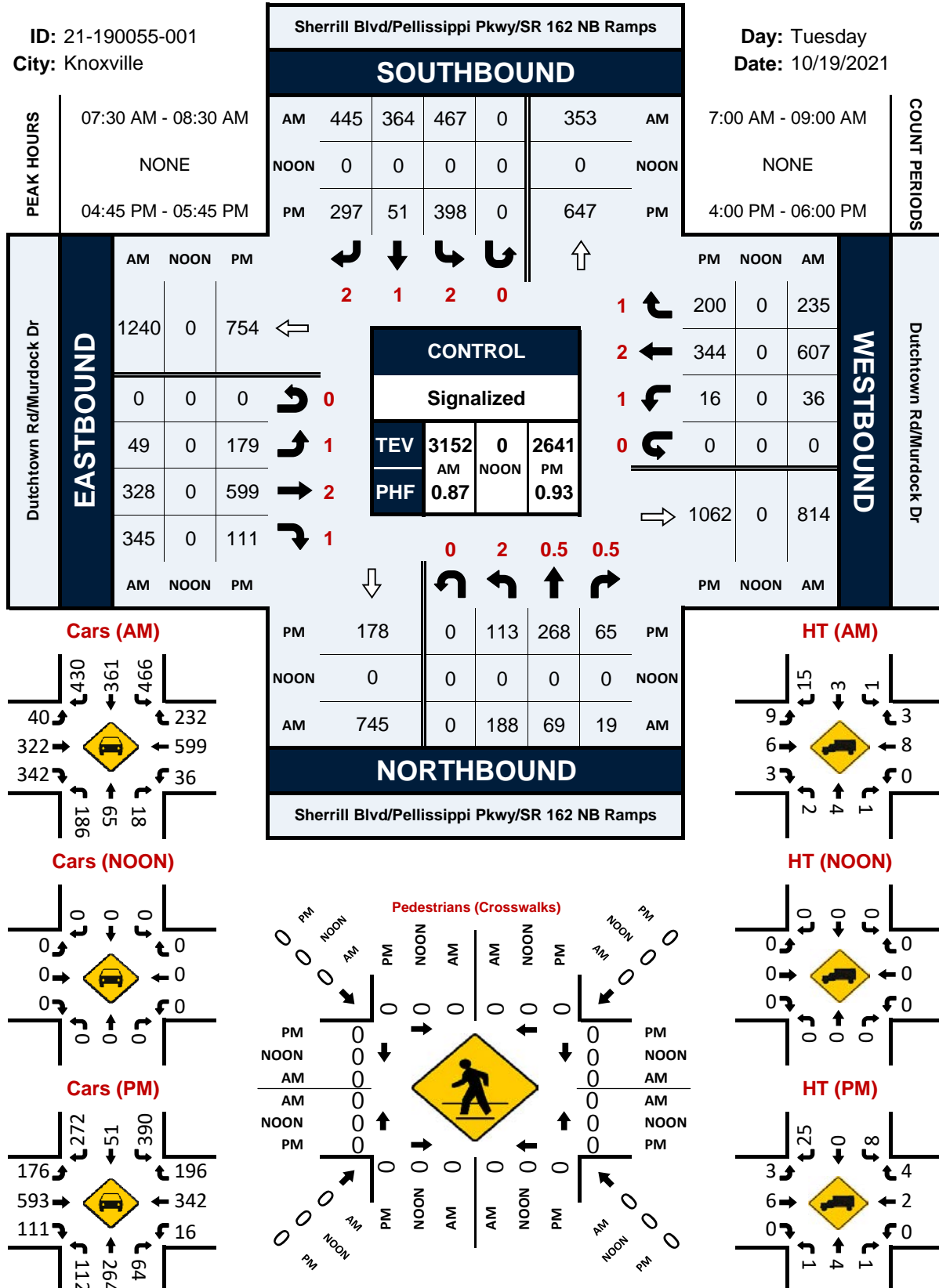
APPENDIX A – TRAFFIC DATA

Sherrill Blvd/Pellissippi Pkwy/SR 162 NB Ramps & Dutchtown Rd/Murdock Dr

Peak Hour Turning Movement Count

ID: 21-190055-001
City: Knoxville

Day: Tuesday
Date: 10/19/2021



Groups Printed - Cars, PU, Vans - Heavy Trucks																								
Start Time	errill Blvd/Pellissippi Pkwy/SR 162 NB Ram Northbound						errill Blvd/Pellissippi Pkwy/SR 162 NB Ram Southbound						Dutchtown Rd/Murdock Dr Eastbound						Dutchtown Rd/Murdock Dr Westbound					
	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total	Left	Thru	Rgt	Uturn	Peds	App. Total
7:00 AM	1	2	0	0	0	3	34	31	72	0	137	15	20	33	0	68	2	114	32	0	0	148	356	
7:15 AM	12	14	1	0	0	27	84	47	84	0	215	17	68	52	0	137	3	124	46	0	0	173	552	
7:30 AM	34	8	1	0	0	43	154	94	126	0	374	12	85	83	0	180	7	129	57	0	0	193	790	
7:45 AM	53	26	4	0	0	83	142	115	99	0	356	14	100	101	0	215	9	168	76	0	0	253	907	
Total	100	50	6	0	0	156	414	287	381	0	1082	58	273	269	0	600	21	535	211	0	0	767	2605	
8:00 AM	67	27	9	0	0	103	107	114	122	0	343	15	69	85	0	169	11	162	62	0	0	235	850	
8:15 AM	34	8	5	0	0	47	64	41	98	0	203	8	74	76	0	158	9	148	40	0	0	197	605	
8:30 AM	13	9	0	0	0	22	34	45	83	0	162	10	38	56	0	104	4	119	30	0	0	153	441	
8:45 AM	13	8	5	0	0	26	27	34	111	0	172	20	26	33	0	79	6	111	28	0	0	145	422	
Total	127	52	19	0	0	198	232	234	414	0	880	53	207	250	0	510	30	540	160	0	0	730	2318	
BREAK																								
4:00 PM	64	34	8	0	0	106	59	12	35	0	106	41	97	22	0	160	2	100	25	0	0	127	499	
4:15 PM	54	37	3	0	0	94	85	14	48	0	147	39	92	41	0	172	1	85	17	0	0	103	516	
4:30 PM	35	62	14	0	0	111	74	35	81	0	190	50	114	24	0	188	2	68	33	0	0	103	592	
4:45 PM	36	63	19	0	0	118	81	17	89	0	187	45	106	32	0	183	4	83	46	0	0	133	621	
Total	189	196	44	0	0	429	299	78	253	0	630	175	409	119	0	703	9	336	121	0	0	466	2228	
5:00 PM	16	78	16	0	0	110	82	6	92	0	180	63	192	20	0	275	2	54	66	0	0	122	687	
5:15 PM	27	78	20	0	0	125	124	16	65	0	205	35	164	31	0	230	7	89	51	0	0	147	707	
5:30 PM	34	49	10	0	0	93	111	12	51	0	174	36	137	28	0	201	3	118	37	0	0	158	626	
5:45 PM	42	31	9	0	0	82	77	10	68	0	155	32	93	21	0	146	3	84	46	0	0	133	516	
Total	119	236	55	0	0	410	394	44	276	0	714	166	586	100	0	852	15	345	200	0	0	560	2536	
Grand Total	535	534	124	0	0	1193	1339	643	1324	0	3306	452	1475	738	0	2665	75	1756	692	0	0	2523	9687	
Approch %	44.8	44.8	10.4	0.0	0.0		40.5	19.4	40.0	0.0	0.0	17.0	55.3	27.7	0.0	0.0	3.0	69.6	27.4	0.0	0.0			
Total %	5.5	5.5	1.3	0.0	0.0	12.3	13.8	6.6	13.7	0.0	34.1	4.7	15.2	7.6	0.0	27.5	0.8	18.1	7.1	0.0	0.0	26.0		
Cars, PU, Vans	531	525	120	0	0	1176	1320	636	1242	0	3198	423	1447	732	0	2602	74	1739	681	0	0	2494	9470	
% Cars, PU, Vans	99.3	98.3	96.8	0.0	0.0	98.6	98.6	98.9	93.8	0.0	96.7	93.6	98.1	99.2	0.0	97.6	98.7	99.0	98.4	0.0	0.0	98.9	97.8	
Heavy trucks	4	9	4	0	0	17	19	7	82	0	108	29	28	6	0	63	1	17	11	0	0	29	217	
%Heavy trucks	0.7	1.7	3.2	0.0	0.0	1.4	1.4	1.1	6.2	0.0	3.3	6.4	1.9	0.8	0.0	2.4	1.3	1.0	1.6	0.0	0.0	1.1	2.2	

Project ID: 21-190055-001

Location: Sherrill Blvd/Pellissippi Pkwy/SR 162 NB Ramps 8

City: Knoxville

PEAK HOURS

Day: Tuesday
Date: 10/19/2021

AM

Start Time	Northbound				Southbound				Dutchtown Rd/Murdock Dr Eastbound				Dutchtown Rd/Murdock Dr Westbound			
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM - 09:00 AM																
Peak Hour for Entire Intersection Begins at 07:30 AM																
7:30 AM	34	8	1	0	43	154	94	126	0	374	12	85	83	0	180	790
7:45 AM	53	26	4	0	83	142	115	99	0	356	14	100	101	0	215	907
8:00 AM	67	27	9	0	103	107	114	122	0	343	15	69	85	0	169	850
8:15 AM	34	8	5	0	47	64	41	98	0	203	8	74	76	0	158	605
Total Volume	188	69	19	0	276	467	364	445	0	1276	49	328	345	0	722	3152
% App. Total	68.1	25.0	6.9	0.0	100	36.6	28.5	34.9	0.0	100	6.8	45.4	47.8	0.0	100	100
PHF					0.670					0.853					0.840	0.868
Cars, PU, Vans	186	65	18	0	269	466	361	430	0	1257	40	322	342	0	704	867
% Cars, PU, Vans	98.9	94.2	94.7	0.0	97.5	99.8	99.2	96.6	0.0	98.5	81.6	98.2	99.1	0.0	97.5	100.0
Heavy trucks	2	4	1	0	7	1	3	15	0	19	9	6	3	0	18	55
% Heavy trucks	1.1	5.8	5.3	0.0	2.5	0.2	0.8	3.4	0.0	1.5	18.4	1.8	0.9	0.0	2.5	1.3

PM

Start Time	Northbound				Southbound				Dutchtown Rd/Murdock Dr Eastbound				Dutchtown Rd/Murdock Dr Westbound			
	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Left	Thru	Rgt	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM - 06:00 PM																
Peak Hour for Entire Intersection Begins at 04:45 PM																
4:45 PM	36	63	19	0	118	81	17	89	0	187	45	106	32	0	183	621
5:00 PM	16	78	16	0	110	82	6	92	0	180	63	192	20	0	275	687
5:15 PM	27	78	20	0	125	124	16	65	0	205	35	164	31	0	230	707
5:30 PM	34	49	10	0	93	111	12	51	0	174	36	137	28	0	201	626
Total Volume	113	268	65	0	446	398	51	297	0	746	179	599	111	0	889	2641
% App. Total	25.3	60.1	14.6	0.0	100	53.4	6.8	39.8	0.0	100	20.1	67.4	12.5	0.0	100	100
PHF					0.892					0.970					0.808	0.934
Cars, PU, Vans	112	264	64	0	440	390	51	272	0	713	176	593	111	0	880	2587
% Cars, PU, Vans	99.1	98.5	98.5	0.0	98.7	98.0	100.0	91.6	0.0	95.6	98.3	99.0	100.0	0.0	99.0	98.9
Heavy trucks	1	4	1	0	6	8	0	25	0	33	3	6	0	0	9	54
% Heavy trucks	0.9	1.5	1.5	0.0	1.3	2.0	0.0	8.4	0.0	4.4	1.7	1.0	0.0	0.0	1.0	2.0

Cannon & Cannon, Inc.
Consulting Engineers - Field Surveyors
8550 Kingston Pike
Knoxville, TN 37919

CCI Project Name: Century Park Apt TIS
CCI Project Number: 01633-0000
Intersection: Dutchtown / Mabry Hood
Counted By: AC

File Name : Dutchtown at Mabry Hood_2022-03-31
Site Code : 00000000
Start Date : 3/31/2022
Page No : 1

Groups Printed- Unshifted

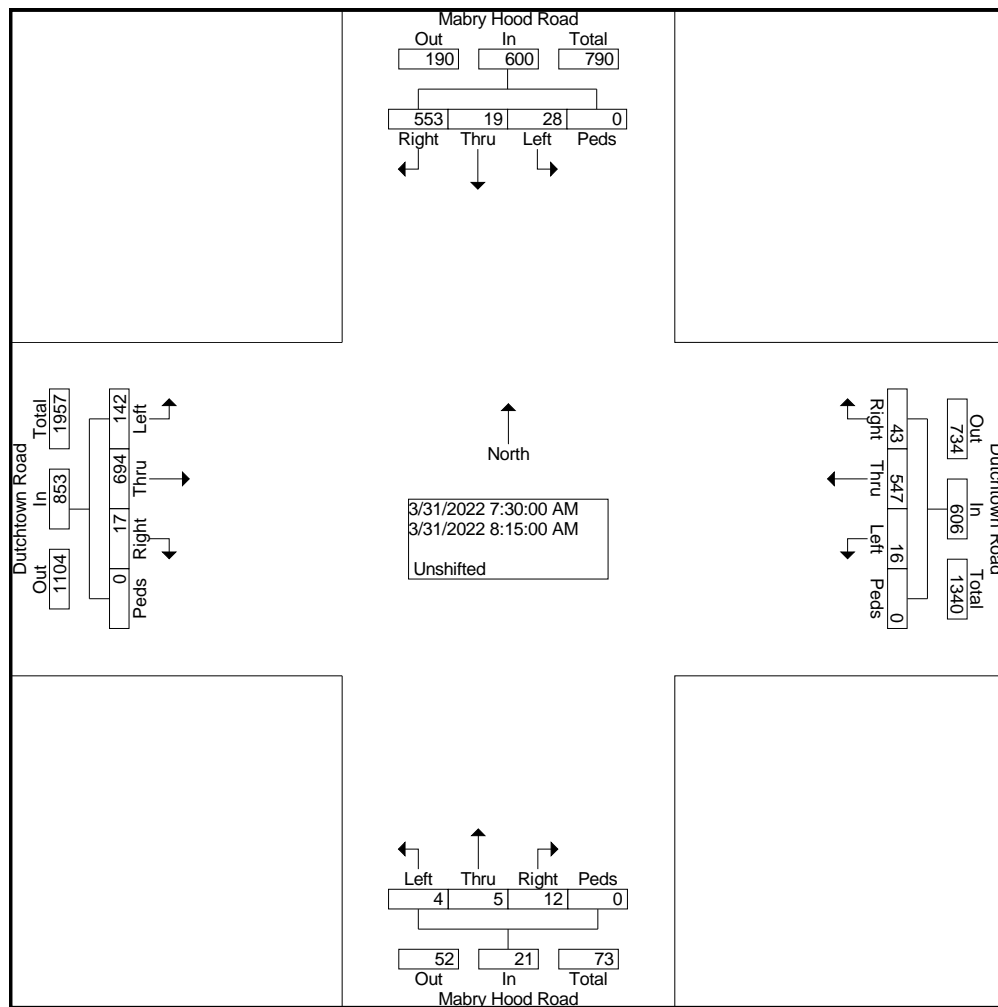
	Mabry Hood Road Southbound					Dutchtown Road Westbound					Mabry Hood Road Northbound					Dutchtown Road Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
07:00 AM	8	2	66	0	76	0	61	2	0	63	1	0	0	0	1	7	53	0	0	60	200
07:15 AM	11	3	102	0	116	1	85	11	0	97	1	0	0	0	1	15	118	0	0	133	347
07:30 AM	8	4	129	0	141	2	145	10	0	157	0	0	4	0	4	23	184	2	0	209	511
07:45 AM	10	4	172	0	186	5	149	13	0	167	1	0	5	0	6	37	221	4	0	262	621
Total	37	13	469	0	519	8	440	36	0	484	3	0	9	0	12	82	576	6	0	664	1679
08:00 AM	3	6	128	0	137	7	149	10	0	166	1	4	2	0	7	58	168	7	0	233	543
08:15 AM	7	5	124	0	136	2	104	10	0	116	2	1	1	0	4	24	121	4	0	149	405
08:30 AM	8	3	90	0	101	1	97	7	0	105	0	0	1	0	1	16	69	0	0	85	292
08:45 AM	11	2	66	0	79	3	79	5	0	87	1	0	0	0	1	18	45	0	0	63	230
Total	29	16	408	0	453	13	429	32	0	474	4	5	4	0	13	116	403	11	0	530	1470
*** BREAK ***																					
11:00 AM	3	1	30	0	34	1	42	3	0	46	3	3	1	0	7	21	43	1	0	65	152
11:15 AM	7	2	22	0	31	0	55	4	0	59	1	0	0	0	1	29	48	2	0	79	170
11:30 AM	7	3	30	0	40	0	53	5	0	58	3	3	0	0	6	29	38	1	0	68	172
11:45 AM	5	2	24	0	31	0	47	9	0	56	0	3	1	0	4	29	52	1	0	82	173
Total	22	8	106	0	136	1	197	21	0	219	7	9	2	0	18	108	181	5	0	294	667
12:00 PM	5	1	30	0	36	1	43	2	0	46	0	5	3	0	8	36	69	0	0	105	195
12:15 PM	14	1	29	0	44	1	42	4	0	47	0	2	0	0	2	28	51	1	0	80	173
12:30 PM	9	3	41	0	53	0	56	8	0	64	0	2	1	0	3	22	65	0	0	87	207
12:45 PM	5	6	43	0	54	0	52	10	0	62	1	1	0	0	2	33	59	2	0	94	212
Total	33	11	143	0	187	2	193	24	0	219	1	10	4	0	15	119	244	3	0	366	787
*** BREAK ***																					
02:00 PM	6	1	32	0	39	0	49	3	0	52	1	0	3	0	4	22	53	2	0	77	172
02:15 PM	3	4	27	0	34	0	54	11	0	65	1	0	2	0	3	23	77	2	0	102	204
02:30 PM	11	2	24	0	37	3	56	8	0	67	3	2	0	0	5	43	99	1	0	143	252
02:45 PM	10	2	42	0	54	0	75	12	0	87	2	4	2	0	8	49	126	1	0	176	325
Total	30	9	125	0	164	3	234	34	0	271	7	6	7	0	20	137	355	6	0	498	953
03:00 PM	5	2	27	0	34	1	71	18	0	90	2	2	3	0	7	48	107	0	0	155	286
03:15 PM	5	5	34	0	44	1	64	13	0	78	1	1	1	0	3	37	94	1	0	132	257
03:30 PM	5	2	36	0	43	1	152	14	0	167	3	2	1	0	6	51	110	3	0	164	380
03:45 PM	12	1	32	0	45	1	88	16	0	105	0	5	0	0	5	38	101	5	0	144	299
Total	27	10	129	0	166	4	375	61	0	440	6	10	5	0	21	174	412	9	0	595	1222
04:00 PM	13	0	33	0	46	1	89	13	0	103	2	3	3	0	8	55	113	2	0	170	327
04:15 PM	12	1	46	0	59	1	77	22	0	100	2	3	4	0	9	66	163	3	0	232	400
04:30 PM	18	7	40	0	65	1	80	21	0	102	7	5	4	0	16	68	217	3	0	288	471
04:45 PM	25	3	34	0	62	1	90	18	0	109	1	4	2	0	7	87	174	3	0	264	442
Total	68	11	153	0	232	4	336	74	0	414	12	15	13	0	40	276	667	11	0	954	1640
05:00 PM	20	1	51	0	72	1	121	30	0	152	1	0	5	0	6	106	252	1	0	359	589
05:15 PM	15	4	47	0	66	1	116	17	0	134	2	3	3	0	8	99	185	3	0	287	495
05:30 PM	21	3	37	0	61	2	90	21	0	113	0	2	4	0	6	68	173	4	0	245	425
05:45 PM	20	1	45	0	66	2	118	32	0	152	4	2	2	0	8	52	156	5	0	213	439
Total	76	9	180	0	265	6	445	100	0	551	7	7	14	0	28	325	766	13	0	1104	1948
Grand Total	322	87	1713	0	2122	41	2649	382	0	3072	47	62	58	0	167	1337	3604	64	0	5005	10366
Apprch %	15.2	4.1	80.7	0.0		1.3	86.2	12.4	0.0		28.1	37.1	34.7	0.0		26.7	72.0	1.3	0.0		
Total %	3.1	0.8	16.5	0.0	20.5	0.4	25.6	3.7	0.0	29.6	0.5	0.6	0.6	0.0	1.6	12.9	34.8	0.6	0.0	48.3	

Cannon & Cannon, Inc.
Consulting Engineers - Field Surveyors
8550 Kingston Pike
Knoxville, TN 37919

CCI Project Name: Century Park Apt TIS
CCI Project Number: 01633-0000
Intersection: Dutchtown / Mabry Hood
Counted By: AC

File Name : Dutchtown at Mabry Hood_2022-03-31
Site Code : 00000000
Start Date : 3/31/2022
Page No : 2

	Mabry Hood Road Southbound					Dutchtown Road Westbound					Mabry Hood Road Northbound					Dutchtown Road Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Intersection	07:30 AM																				
Volume	28	19	553	0	600	16	547	43	0	606	4	5	12	0	21	142	694	17	0	853	2080
Percent	4.7	3.2	92.2	0.0		2.6	90.3	7.1	0.0		19.0	23.8	57.1	0.0		16.6	81.4	2.0	0.0		
07:45 Volume	10	4	172	0	186	5	149	13	0	167	1	0	5	0	6	37	221	4	0	262	621
Peak Factor																					0.837
High Int. Volume	07:45 AM					07:45 AM					08:00 AM					07:45 AM					
Peak Factor	10	4	172	0	186	5	149	13	0	167	1	4	2	0	7	37	221	4	0	262	
	0.80					0.90					0.75					0.81					4
	6					7					0										

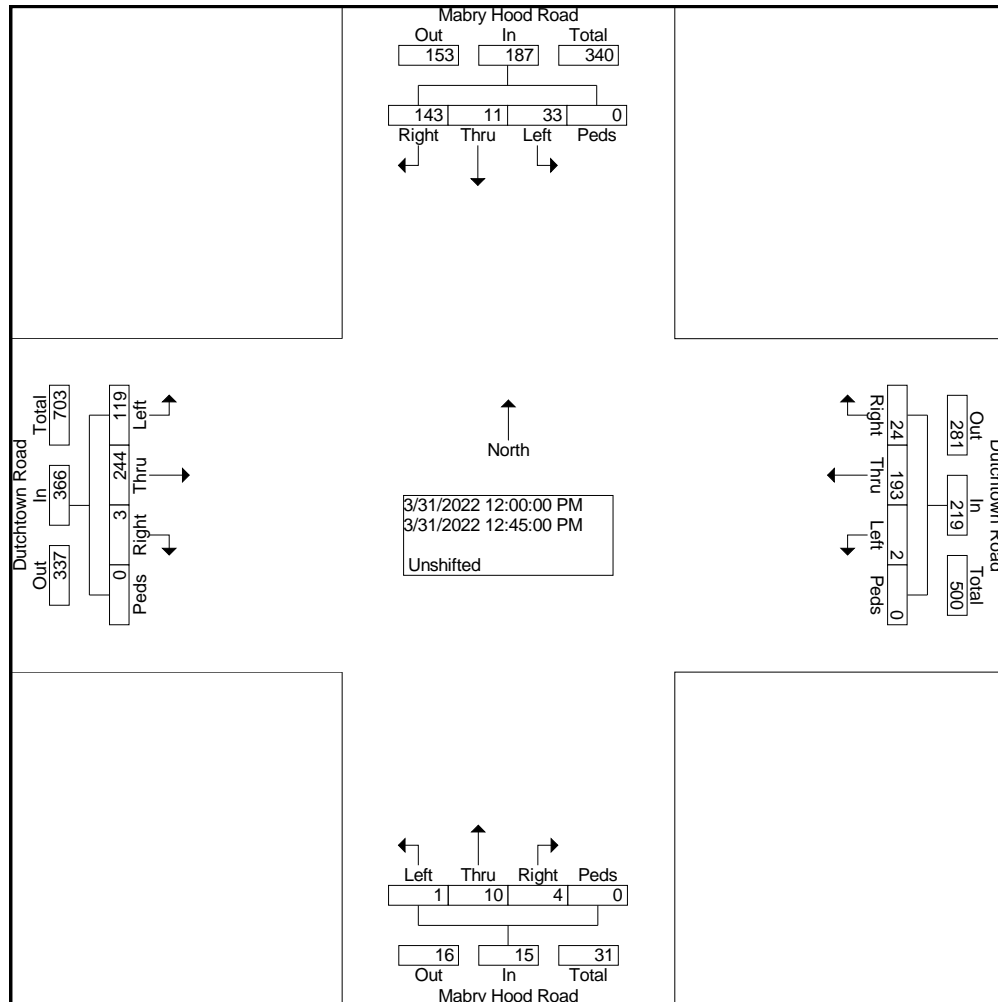


Cannon & Cannon, Inc.
Consulting Engineers - Field Surveyors
8550 Kingston Pike
Knoxville, TN 37919

CCI Project Name: Century Park Apt TIS
CCI Project Number: 01633-0000
Intersection: Dutchtown / Mabry Hood
Counted By: AC

File Name : Dutchtown at Mabry Hood_2022-03-31
Site Code : 00000000
Start Date : 3/31/2022
Page No : 3

	Mabry Hood Road Southbound					Dutchtown Road Westbound					Mabry Hood Road Northbound					Dutchtown Road Eastbound					Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Intersection	12:00 PM																				
Volume	33	11	143	0	187	2	193	24	0	219	1	10	4	0	15	119	244	3	0	366	787
Percent	17.6	5.9	76.5	0.0		0.9	88.1	11.0	0.0		6.7	66.7	26.7	0.0		32.5	66.7	0.8	0.0		
12:45 Volume	5	6	43	0	54	0	52	10	0	62	1	1	0	0	2	33	59	2	0	94	212
Peak Factor																					0.928
High Int. Volume	12:45 PM					12:30 PM					12:00 PM					12:00 PM					
Peak Factor	5	6	43	0	54	0	56	8	0	64	0	5	3	0	8	36	69	0	0	105	
	0.86					0.85					0.46					0.87					1
	6					5					9										

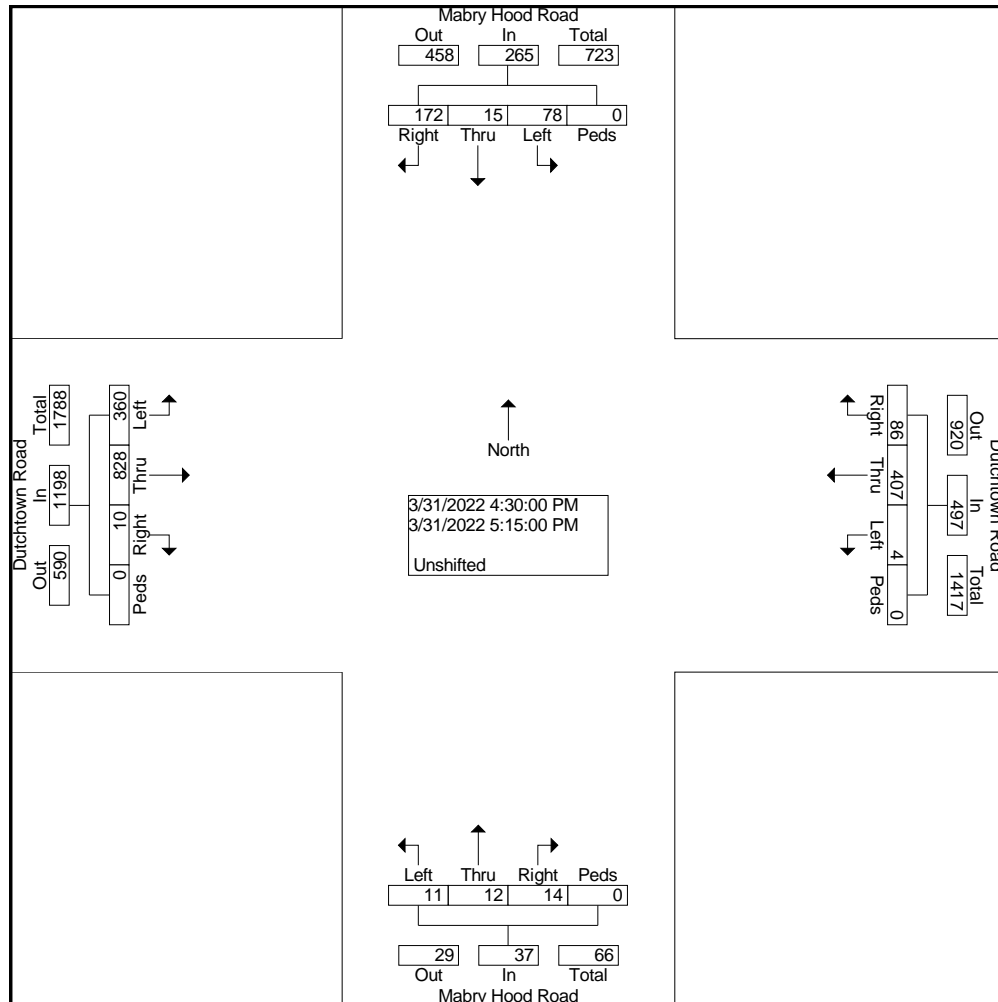


Cannon & Cannon, Inc.
Consulting Engineers - Field Surveyors
8550 Kingston Pike
Knoxville, TN 37919

CCI Project Name: Century Park Apt TIS
CCI Project Number: 01633-0000
Intersection: Dutchtown / Mabry Hood
Counted By: AC

File Name : Dutchtown at Mabry Hood_2022-03-31
Site Code : 00000000
Start Date : 3/31/2022
Page No : 4

	Mabry Hood Road Southbound					Dutchtown Road Westbound					Mabry Hood Road Northbound					Dutchtown Road Eastbound					Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	04:30 PM																				
Volume	78	15	172	0	265	4	407	86	0	497	11	12	14	0	37	360	828	10	0	1198	1997
Percent	29.4	5.7	64.9	0.0		0.8	81.9	17.3	0.0		29.7	32.4	37.8	0.0		30.1	69.1	0.8	0.0		
05:00 Volume	20	1	51	0	72	1	121	30	0	152	1	0	5	0	6	106	252	1	0	359	589
Peak Factor																					0.848
High Int. Volume	05:00 PM					05:00 PM					04:30 PM					05:00 PM					
Peak Factor	20	1	51	0	72	1	121	30	0	152	7	5	4	0	16	106	252	1	0	359	
	0.92					0.81					0.57					0.83					4
	0					7					8										



INTERSECTION NUMBER: 1

Date Prepared: 2/19/2021 By: EJJ

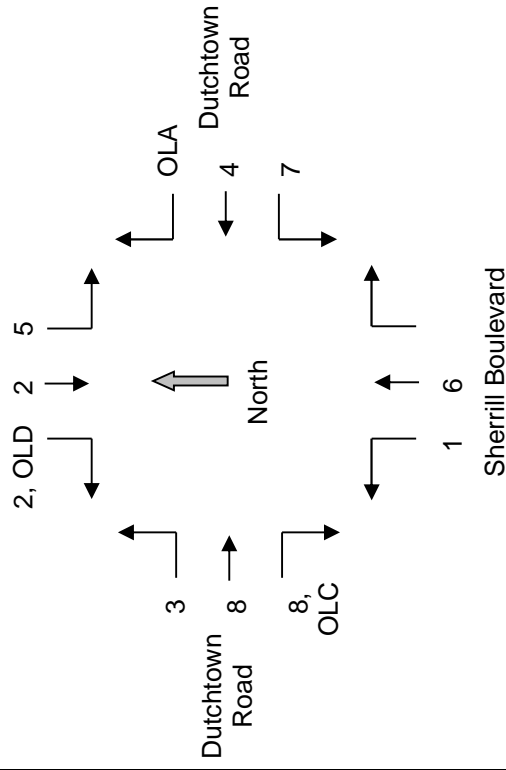
INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Implemented: By:

2.1 Phase Parameters	Set 1	1	2	3	4	5	6	7	8
Min. Green		6	8	6	20	6	8	6	20
Passage /10		15	35	15	35	15	35	15	35
Max. 1		15	40	15	35	15	40	15	35
Max. 2		15	45	15	45	15	45	15	45
Yel/10		40	40	45	45	30	40	40	45
Red/10		35	15	40	15	25	15	35	15
Walk							7		
Pedestrian Clear							26		
Walk									
Pedestrian Clear									
Add In/10									
Max. Initial									
TBR									
CBR									
TTR									
Reduce/10									
Min Gp/10									
DM Limit									
Dm Step/10									
Red Revert/10									
CS Min									
Alt Min Green									
Alt Passage/10									
Alt Walk									
Adv Walk									
Delay Walk									
St Dly/10									
Green Clr/10									

PHASING SCHEMATIC

SR-162 NB Ramps





INTERSECTION NUMBER: 1

Date Prepared: 2/19/2021

By: EJW

INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Implemented:

By:

2.2 Phase Options	Set 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phase Omit																	
Ped Omit																	
Min Recall				X					X								
Max Recall																	
Soft Recall																	
Ped Recall																	
Pedestrian Recycle																	
Condition Service																	
Detector Lock				X			X		X								
Dual Entry				X					X								
Simultaneous Gap																	
Guaranteed Passage																	
Added Initial Calc																	
Walk Rest																	
Red Rest																	
Flash Entry																	
Flash Exit																	
CNA-1																	
CNA-2																	
No Backup																	
Max Walk																	
Max Extension																	
Sequential Timing																	
No Min Yellow																	
FDW PED Recycle																	

INTERSECTION NUMBER: 1

Date Prepared: 2/19/2021 By: EJW

INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Implemented: By:

5.1 Coordination Constants		
Correction Mode	Shortway	
Max Cycles Trans	3	
Coord Max Mode	Max Inhibit	
Coord Force Mode	Fixed	
Perm Strategy	Maximum	
Omit Strategy	Minimum	
Sync Point	End Green	
No Early Return	Disable	
Sync Ref Time	0	

5.2 Pattern Parameters								
Cycle Time	1	2	3	4	5	6	7	8
Offset Time	120	100	120	FREE				
Split	116	67	46					
Sequence	1	2	3					
Phase Timing Set	1	1	1	1				
Phase Option Set	1	1	1	1				
Vehicle Overlap Set	1	1	1	1				
PED Overlap Set	1	1	1	1				
Transit Priority Set	1	1	1	1				
Vehicle Detector Set	1	1	1	1				
PED Detector Set	1	1	1	1				
Vehicle Det. Diag Set	1	1	1	1				
Ped Det. Diag Set	1	1	1	1				
Detector Reset								
Max 2 Phases								
Correction Mode								
Coord Max Mode								
Coord Force Mode								
Perm Strategy								
Omit Strategy								
No Early Return								
TX Diamond Type								

INTERSECTION NUMBER: 1

INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Prepared: 2/19/2021 By: EJJ

Date Implemented: By:

5.3 Split Table 1																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time (sec)		24	41	15	40	NONE	39	15	40							
Mode	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Coord. Phase				X					X							
Manual Permit																
Manual Omit																

5.3 Split Table 2																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time (sec)		15	39	15	31	NONE	39	15	31							
Mode	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Coord. Phase				X					X							
Manual Permit																
Manual Omit																

5.3 Split Table 3																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Time (sec)		28	33	33	26	36	15	44								
Mode	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Coord. Phase				X				X								
Manual Permit																
Manual Omit																

INTERSECTION NUMBER: 1	Date Prepared: 2/19/2021	By: EJV
INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps	Date Implemented:	By:

6.2 Time Zone	Global DST: Enable DST	Standard Time Zone (+/- hr): -5
---------------	------------------------	---------------------------------

[illegible]

INTERSECTION NUMBER: 1

Date Prepared: 2/19/2021 By: EJW

INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Implemented: By:

6.5 DayPlan		1		
Event		Hour	Minute	Action
1		0	0	4
2		6	15	2
3		7	0	1
4		9	0	2
5		14	30	3
6		18	0	2
7		19	30	4
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

6.5 DayPlan		2		
Event		Hour	Minute	Action
1		0	0	4
2		9	0	2
3		19	0	4
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

6.5 DayPlan		Hour	Minute	Action
Event				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				

INTERSECTION NUMBER: 1

INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Prepared: 2/19/2021

By: EJW

Date Implemented:

By:

6.6 Action Parameters	1	2	3	4	5	6	7	8
Pattern	1	2	3	254				
Auxiliary Function								
Special Function								
Detector Reset								
Detector VOS Log								
Speed Trap Log								
Cycle MOE Log								
Hi-Res Log								

6.6 Action Parameters	9	10	11	12	13	14	15	16
Pattern								
Auxiliary Function								
Special Function								
Detector Reset								
Detector VOS Log								
Speed Trap Log								
Cycle MOE Log								
Hi-Res Log								

6.6 Action Parameters	17	18	19	20	21	22	23	24
Pattern								
Auxiliary Function								
Special Function								
Detector Reset								
Detector VOS Log								
Speed Trap Log								
Cycle MOE Log								
Hi-Res Log								

Omni eX v1.8

INTERSECTION NUMBER: 1

Date Prepared: 2/19/2021 By: EJJW

INTERSECTION: Dutchtown Road at Sherrill Boulevard / SR-162 NB On/Off Ramps

Date Implemented: By:

2.3 Phase Sequence	1	2	3	4	5	6	7	8
Ring 1	1,2,3,4							
Ring 2	5,6,7,8							
Ring 3								
Ring 4								

2.3 Phase Sequence	9	10	11	12	13	14	15	16
Ring 1								
Ring 2								
Ring 3								
Ring 4								

APPENDIX B – TRIP GENERATION

TRIP GENERATION

Century Park Multi-Family Development (1633-0000)

Knoxville MPC APARTMENT

300 Dwelling Units

WEEKDAY

$$T = 15.193(X)^{0.899}$$

$$T = 2562$$

50% ENTERING = 1281 trips

50% EXITING = 1281 trips

2562 trips

AM PEAK

$$T = 0.758(X)^{0.924}$$

$$T = 147$$

22% ENTERING = 32.34 trips

78% EXITING = 114.66 trips

147 trips

MID-DAY PEAK (AM Peak of the Generator)

T = NO RATE GIVEN FOR MID-DAY

T =

0% ENTERING = 0 trips

0% EXITING = 0 trips

0 trips

PM PEAK

$$T = 0.669(X) + 10.069$$

$$T = 211$$

55% ENTERING = 116.05 trips

45% EXITING = 94.95 trips

211 trips

KNOX COUNTY

LOCAL APARTMENT TRIP GENERATION STUDY

PURPOSE

A Traffic Impact Study (TIS) is currently required in Knox County when a proposed development is projected to generate in excess of 750 trips per day. The determinations of when the threshold is met as well as all subsequent analyses in the TIS are performed using the rates and equations given in the Institute of Transportation Engineers (ITE) Trip Generation Manual. Local governmental agencies rely heavily on the accuracy of these trip generation rates in order to correctly predict the impacts of a proposed development on the transportation system. Therefore, in certain instances, it is logical to verify whether the "national" rates and equations given in the ITE Trip Generation Manual are appropriate for use in a specific local area or region.

The decision was made to study the local trip-making characteristics of apartments because of the discrepancy between the trip generation rates for apartments and single family residential land uses as given in the ITE Trip Generation Manual. While these two land uses are similar in nature, the Trip Generation Manual predicts about three less trips per dwelling unit generated by apartments for the average weekday. Additionally the Trip Generation Manual points out that due to the age of their database, which dates back to the 1960's, "the rates for apartments probably had changed over time". It is also assumed that some of the ITE data had come from larger metropolitan areas with denser development and greater transit use than Knox County, which would contribute to lower trip generation rates. Therefore, this study will be used to either verify the rates given in the Trip Generation Manual or generate new ones that can be applied to locally proposed apartment developments.

PROCEDURE

The procedures recommended by ITE in conducting local trip generation studies were generally followed for this study, along with some important assumptions that have made. ITE has published a proposed recommended practice entitled "Trip Generation Handbook" which specifically outlines procedures for conducting local trip generation studies and establishing new rates and equations.

The first step in the study was to define the number and location of the sites to be studied, as well as the counting methodology. Initially 14 sites were selected, although one apartment complex – the College Park Apartments – was later omitted due to uncharacteristically high traffic generation numbers. The number of sites used in this study far exceeds the recommended minimum amount suggested by ITE, which is five sites. Traffic counts were taken for week-long periods at 15-minute intervals between July 22, 1996 and August 9, 1996 at the access points to the apartment complexes. A Technical Appendix to this report contains the traffic count data collected at each apartment complex.

RESULTS

The traffic count data was analyzed using spreadsheets in order to determine the weighted average rates and regression equations. In order to be considered valid, the local rates and equations for each time period of analysis that were generated must meet certain statistical criteria. First, the standard deviation of the independent variable (dwelling units) should be no more than 110 percent of the weighted average rate; and secondly, the regression equations require a computed coefficient of determination (R^2) value of at least 0.75 before good data fit is indicated. This statistical criteria is met by the local data results, and in fact it often exceeds the level of data fit given by their counterparts in the ITE Trip Generation Manual. Finally, in order to simplify the use of the local data, plots were generated that appear identical to the actual ones in the ITE Trip Generation Manual.

The resulting rates and equations calculated from the local data indicate that the average weekday trip generation of apartments in this area is well above the national rates reported in the ITE manual. For example, the locally computed average rate for number of trips generated during a weekday is 35% higher than the rate given by ITE (increase from 6.63 trips per dwelling unit to 9.03 trips per dwelling unit). The trip generation rates do not increase as much for the AM and PM peak hours however. The local rate is roughly 8% higher for the AM peak, and 16% higher for the PM peak. The plots from the ITE Trip Generation Manual are included in the Technical Appendix for comparison purposes.

ASSUMPTIONS MADE

Some important assumptions have been made which may affect the results of the local data that was collected:

- It is important to note that the local trip generation rates were computed for the *total* number of dwelling units in the apartment complex, and not necessarily for the number of *occupied* dwelling units. There are several reasons why this was done, chiefly because of the need for comparability with the rates given in ITE Trip Generation Manual, as it does not specify whether the dwelling units are occupied. According to ITE procedures the selected sites must only be of "reasonably full occupancy (i.e. at least 85%)". The Apartment Association of Greater Knoxville (AAGK) publishes quarterly reports on occupancy levels of apartment complexes, and the report covering the period of the data collection was reviewed to determine occupancy levels. According to the AAGK report from July 1, 1996 – September 30, 1996 all of the apartment complexes surveyed in this study met the minimum 85% occupancy level, with an average occupancy rate for all sites studied of 94%.
- The count data that was collected at each apartment complex was used "raw" meaning that it was not factored for possible daily or seasonal variations. Once again, according to an ITE representative it is not known whether the data used in the Trip Generation Manual was factored or not, so therefore in order to be able to compare

local rates to those in the manual you must assume that count data should not be factored. Additionally, it was felt that apartment complexes would generally not be as susceptible to major seasonal fluctuations as other land uses might be. The local rates were also developed using count data that was collected and averaged over an entire week, which should limit some of the daily variations. Finally, reliable local daily and seasonal variation factors do not truly exist.

CONCLUSION

The local apartment study methodology and results were distributed for comment to a group of local transportation professionals who are directly responsible for either preparing or reviewing traffic impact studies. A meeting was held between this group on February 16, 2000 in order to gather comments and discuss the study in greater detail. The following conclusions are based on the discussion and consensus reached at this meeting:

1. The trip generation rates and equations meet statistical requirements and resulted from a study that followed accepted procedures; therefore they should be adopted for future use. Furthermore, the rates and equations are recommended for use in reviewing the traffic impact of any development termed as "multi-family", such as townhouse and condominium developments due to their similarity to apartment complexes.
2. The Traffic Access and Impact Study Guidelines and Procedures adopted by MPC should be amended with the language that local data should be used when available, which will allow the implementation of these new multi-family trip generation rates.
3. The following suggestions were made for future consideration:
 - This study should be updated with data collected from local townhouse and condominium developments in order to further justify the use of the new trip generation rates.
 - A statistical comparison should be made between any newly developed rates and the ITE single family trip generation rates to determine if there is a significant difference. If there is no difference then perhaps ITE single-family rates could be used for any residential development proposed in Knox County.

Local Apartment Trip Generation Study

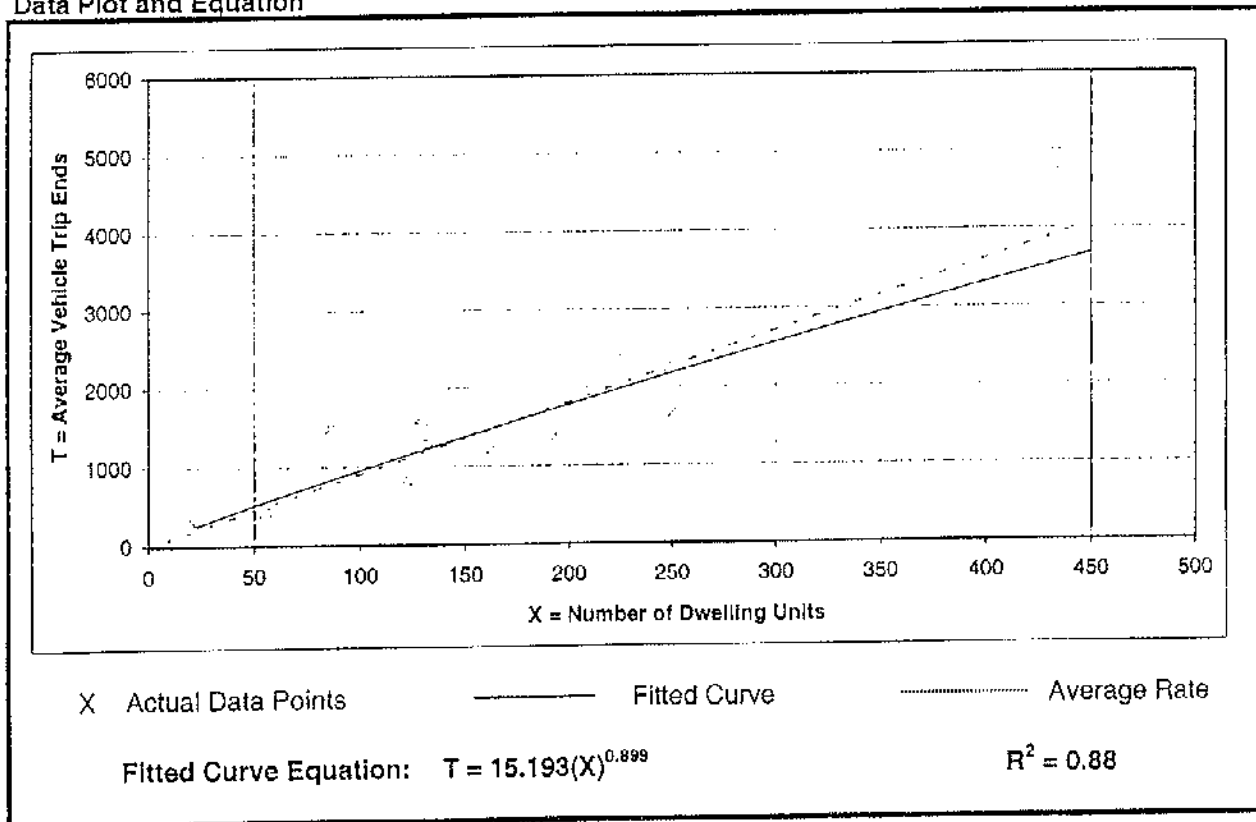
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Number of Studies: 13
Average Number of Dwelling Units: 193
Directional Distribution: 50% entering, 50% exiting

Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
9.03	6.59 - 17.41	2.47

Data Plot and Equation



Local Apartment Trip Generation Study

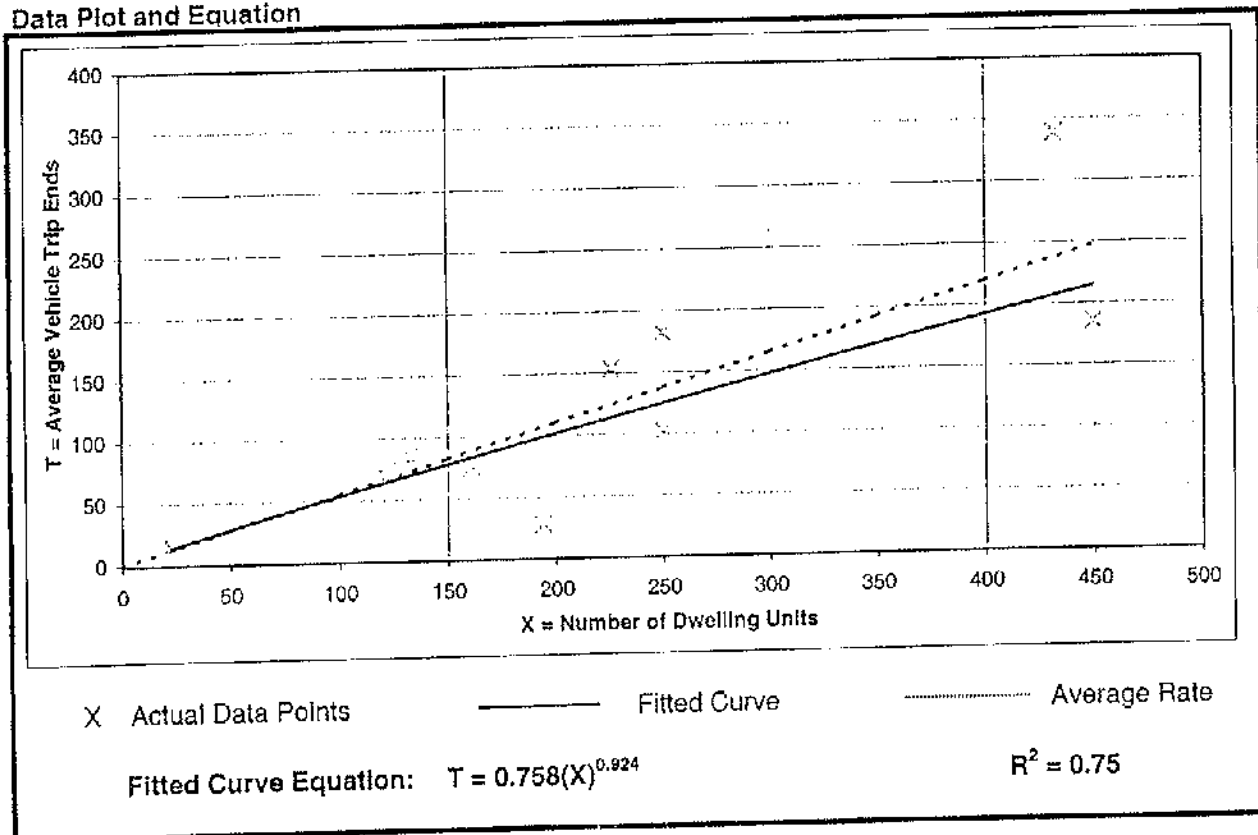
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 13
Average Number of Dwelling Units: 193
Directional Distribution: 22% entering, 78% exiting

Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
0.55	0.14 - 0.78	0.18

Data Plot and Equation



Local Apartment Trip Generation Study

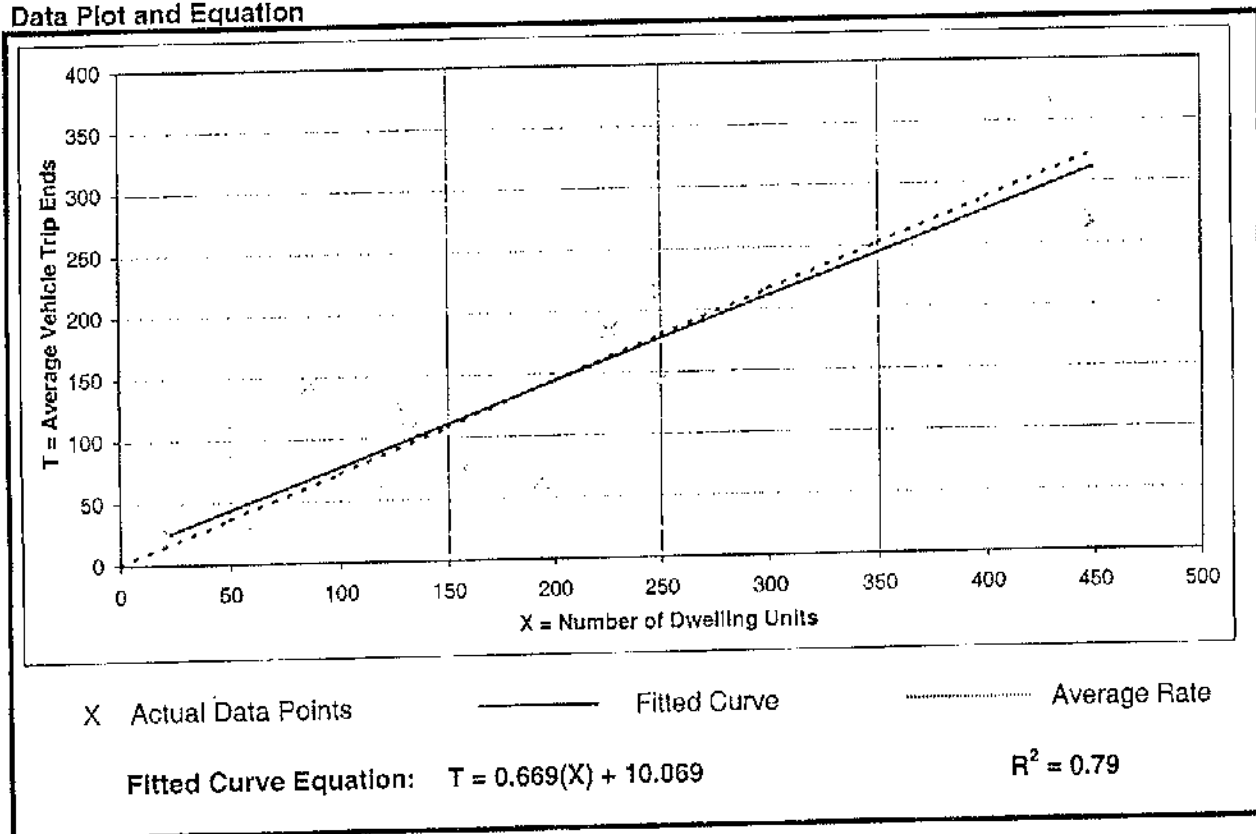
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 13
Average Number of Dwelling Units: 193
Directional Distribution: 55% entering, 45% exiting

Trip Generation Per Dwelling Unit

Average Rate	Ranges of Rates	Standard Deviation
0.72	0.32 - 1.66	0.25

Data Plot and Equation



APPENDIX C - ANALYSES

CAPACITY AND LEVEL-OF-SERVICE CONCEPTS

In a general sense, a roadway is similar to a pipeline or other material carrying conduit in that it has a certain capacity for the amount of material (vehicles) that it can efficiently carry. As the number of vehicles in a given time period gradually increases, the quality of traffic flow gradually decreases. On roadway sections this results in increasing turbulence in the traffic stream, and at intersections it results in increasing stops and delay. As the volumes begin to approach the capacity of the facility, these problems rapidly magnify, with resulting serious levels of congestion, stops, delay, excess fuel consumption, pollutant emissions, etc.

The Transportation Research Board has published the Year 2010 Highway Capacity Manual (HCM2010), which establishes theoretical techniques to quantify the capacity conditions on all types of roadways, intersections, ramps, pedestrian facilities, etc. A basic concept that is applicable to most of these techniques is the idea of level of service (LOS). This concept establishes a rating system that quantifies the quality of traffic flow, as perceived by motorists and/or passengers. The general system is similar to a school grade scale, and is outlined as follows:

Level of Service (LOS)	General Quality of Traffic Flow	Description of Corresponding Conditions
A	Excellent	Roadways – Free flow, high maneuverability Intersections – Very few stops, very low delay
B	Very Good	Roadways – Free flow, slightly lower maneuverability Intersections – Minor stops, low delay
C	Good	Roadways – Stable flow, restricted maneuverability Intersections – Significant stops, significant delay
D	Fair	Roadways – Marginally stable flow, congestion seriously restricts maneuverability Intersections – High stops, long but tolerable delay
E	Poor	Roadways – Unstable flow*, lower operating speeds, congestion severely restricts maneuverability Intersections – All vehicles stop, very long queues and very long intolerable delay
F	Very Poor	Roadways – Forced flow, stoppages may be lengthy, congestion severely restricts maneuverability Intersections – All vehicles stop, extensive queues and extremely long intolerable delay

*Unstable flow is such that minor fluctuations or disruptions can result in rapid degradation to LOS F.

LOS CRITERIA: SIGNALIZED & UNSIGNALIZED INTERSECTIONS
























LOS	CONTROL DELAY (S/VEH)		
	SIGNALIZED	UNSIGNALIZED	ROUNDAABOUT
A	≤10	≤10	≤10
B	>10-20	>10-15	>10-15
C	>20-35	>15-25	>15-25
D	>35-55	>25-35	>25-35
E	>55-80	>35-50	>35-50
F	>80	>50	>50

Another measure of intersection capacity that is often used in the evaluation of intersection operations is the volume to capacity (V/C) ratio. This ratio is defined as “the ratio of flow rate to capacity”, and is a good measure of how much of an intersection’s available capacity has been used up by the analysis volumes. Conversely, it also provides an indication of the reserve capacity available for future growth in traffic volumes.

The Intersection Capacity Utilization (ICU) is another measure that expresses a value similar to the V/C ratio. Specifically, the ICU method “sums the amount of the time required to serve all movements at saturation for a given cycle length and divides by that reference cycle length.” The ICU is considered a more accurate measure of volume to capacity conditions for a signalized intersection, primarily because it accounts for the effects of the signal timing on intersection capacity.

Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS
Existing 2021 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	328	345	36	607	235	188	69	19	467	364	445
Future Volume (vph)	49	328	345	36	607	235	188	69	19	467	364	445
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850		0.967				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1801	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1801	0	3433	1863	2787
Satd. Flow (RTOR)			219			270		12				
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	377	397	41	698	270	216	101	0	537	418	511
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	15.0	40.0	24.0	15.0	40.0	26.0	24.0	39.0		26.0	41.0	
Total Split (%)	12.5%	33.3%	20.0%	12.5%	33.3%	21.7%	20.0%	32.5%		21.7%	34.2%	
Maximum Green (s)	6.5	34.0	16.5	7.5	34.0	20.5	16.5	33.5		20.5	35.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	6.7	44.3	61.7	6.7	40.6	66.7	11.4	27.1		20.1	33.8	48.9
Actuated g/C Ratio	0.06	0.37	0.51	0.06	0.34	0.56	0.10	0.23		0.17	0.28	0.41
v/c Ratio	0.57	0.29	0.43	0.41	0.58	0.27	0.66	0.24		0.94	0.80	0.45
Control Delay	82.5	30.9	17.3	67.3	36.6	2.6	62.0	32.9		74.1	51.7	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	82.5	30.9	17.3	67.3	36.6	2.6	62.0	32.9		74.1	51.7	26.6
LOS	F	C	B	E	D	A	E	C		E	D	C
Approach Delay		27.8			28.8			52.7			51.2	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	46	97	111	31	244	0	84	55		212	292	151
Queue Length 95th (ft)	#98	127	145	67	308	37	117	95		#295	390	196
Internal Link Dist (ft)		1064			738			825			857	
Turn Bay Length (ft)	375			75						250		250
Base Capacity (vph)	99	1305	977	110	1197	1004	472	511		586	569	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.57	0.29	0.41	0.37	0.58	0.27	0.46	0.20		0.92	0.73	0.45

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 7 - Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 39.7

Intersection LOS: D

Intersection Capacity Utilization 68.9%

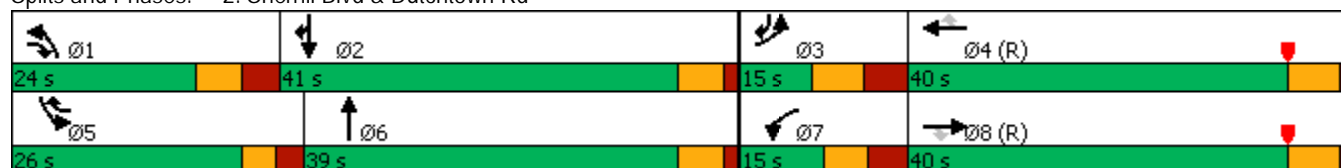
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
























Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS

Existing 2021 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	599	111	16	344	200	113	268	65	398	51	297
Future Volume (vph)	179	599	111	16	344	200	113	268	65	398	51	297
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850		0.971				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Satd. Flow (RTOR)			119			215		10				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	192	644	119	17	370	215	122	358	0	428	55	319
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	33.0	44.0	28.0	15.0	26.0	25.0	28.0	36.0		25.0	33.0	
Total Split (%)	27.5%	36.7%	23.3%	12.5%	21.7%	20.8%	23.3%	30.0%		20.8%	27.5%	
Maximum Green (s)	24.5	38.0	20.5	7.5	20.0	19.5	20.5	30.5		19.5	27.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	16.9	52.4	66.7	6.2	32.7	56.4	8.3	27.2		17.7	34.7	60.0
Actuated g/C Ratio	0.14	0.44	0.56	0.05	0.27	0.47	0.07	0.23		0.15	0.29	0.50
v/c Ratio	0.77	0.42	0.13	0.19	0.38	0.25	0.51	0.86		0.84	0.10	0.23
Control Delay	67.1	25.8	9.0	59.2	39.6	3.8	61.3	62.9		65.5	30.3	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	67.1	25.8	9.0	59.2	39.6	3.8	61.3	62.9		65.5	30.3	16.4
LOS	E	C	A	E	D	A	E	E		E	C	B
Approach Delay		32.0			27.4			62.5			43.5	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	148	180	9	13	127	0	47	256		166	30	72
Queue Length 95th (ft)	222	275	57	37	192	48	78	#374		223	63	90
Internal Link Dist (ft)		1064			738			825			857	
Turn Bay Length (ft)	375			75						250		250
Base Capacity (vph)	361	1546	1082	110	963	878	586	467		557	541	1551
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.53	0.42	0.11	0.15	0.38	0.24	0.21	0.77		0.77	0.10	0.21

Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 7 - Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 46 (38%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 39.4

Intersection LOS: D

Intersection Capacity Utilization 77.2%

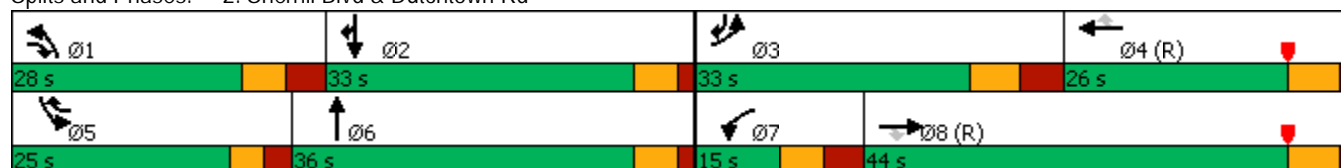
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS
Background 2024 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	348	366	38	644	249	200	73	20	496	386	472
Future Volume (vph)	52	348	366	38	644	249	200	73	20	496	386	472
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Fr't			0.850			0.850			0.968			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Satd. Flow (RTOR)			198			286			11			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	400	421	44	740	286	230	107	0	570	444	543
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	15.0	40.0	24.0	15.0	40.0	26.0	24.0	39.0		26.0	41.0	
Total Split (%)	12.5%	33.3%	20.0%	12.5%	33.3%	21.7%	20.0%	32.5%		21.7%	34.2%	
Maximum Green (s)	6.5	34.0	16.5	7.5	34.0	20.5	16.5	33.5		20.5	35.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	6.8	42.7	60.6	6.8	39.0	65.5	11.9	28.2		20.5	34.8	50.1
Actuated g/C Ratio	0.06	0.36	0.50	0.06	0.32	0.55	0.10	0.24		0.17	0.29	0.42
v/c Ratio	0.60	0.32	0.47	0.44	0.64	0.29	0.68	0.25		0.97	0.82	0.47
Control Delay	82.8	31.9	19.2	68.7	39.0	2.6	62.1	33.0		80.8	53.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	82.8	31.9	19.2	68.7	39.0	2.6	62.1	33.0		80.8	53.0	26.4
LOS	F	C	B	E	D	A	E	C		F	D	C
Approach Delay		29.3			30.5			52.9			53.9	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	49	105	120	34	272	0	90	58		228	308	157
Queue Length 95th (ft)	#109	135	157	70	330	38	123	100		#323	423	211
Internal Link Dist (ft)		1064			738			825			857	
Turn Bay Length (ft)	375			75						250		250
Base Capacity (vph)	101	1260	951	110	1149	993	472	511		586	571	1147
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.59	0.32	0.44	0.40	0.64	0.29	0.49	0.21		0.97	0.78	0.47

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 7 - Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 41.7

Intersection LOS: D

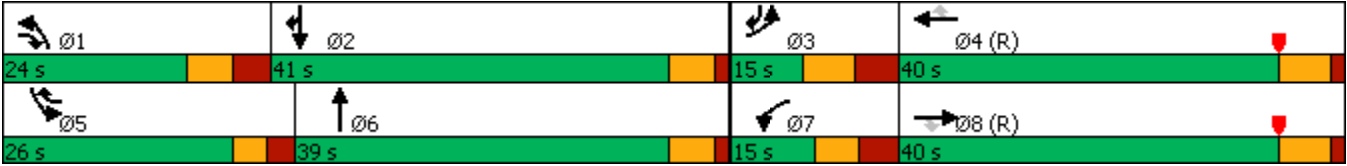
Intersection Capacity Utilization 71.0%

ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd


























Lanes, Volumes, Timings

2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS

Background 2024 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	636	118	17	365	212	120	284	69	422	54	315
Future Volume (vph)	190	636	118	17	365	212	120	284	69	422	54	315
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Fr't			0.850			0.850		0.971				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Satd. Flow (RTOR)			127			228		10				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	204	684	127	18	392	228	129	379	0	454	58	339
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	33.0	44.0	28.0	15.0	26.0	25.0	28.0	36.0		25.0	33.0	
Total Split (%)	27.5%	36.7%	23.3%	12.5%	21.7%	20.8%	23.3%	30.0%		20.8%	27.5%	
Maximum Green (s)	24.5	38.0	20.5	7.5	20.0	19.5	20.5	30.5		19.5	27.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	17.7	50.9	65.4	6.2	30.4	54.7	8.5	28.1		18.3	35.9	62.1
Actuated g/C Ratio	0.15	0.42	0.54	0.05	0.25	0.46	0.07	0.23		0.15	0.30	0.52
v/c Ratio	0.78	0.46	0.14	0.20	0.44	0.27	0.53	0.88		0.87	0.10	0.24
Control Delay	66.9	27.1	8.5	59.4	41.9	3.9	61.5	64.7		67.4	30.0	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	66.9	27.1	8.5	59.4	41.9	3.9	61.5	64.7		67.4	30.0	15.5
LOS	E	C	A	E	D	A	E	E		E	C	B
Approach Delay		32.8			28.8			63.9			44.2	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	157	199	10	14	140	0	50	270		177	31	73
Queue Length 95th (ft)	234	311	59	38	205	51	81	#422		#251	65	95
Internal Link Dist (ft)		1064			738			825			857	
Turn Bay Length (ft)	375			75						250		250
Base Capacity (vph)	361	1502	1066	110	895	859	586	467		557	557	1600
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.57	0.46	0.12	0.16	0.44	0.27	0.22	0.81		0.82	0.10	0.21

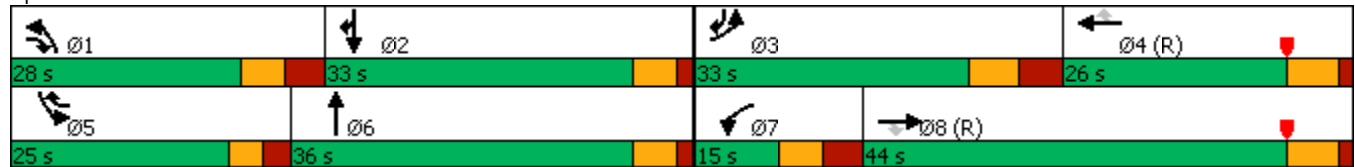
Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 7 - Report
Page 1

Intersection Summary
























Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 46 (38%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 40.4
 Intersection LOS: D
 Intersection Capacity Utilization 79.6%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS
Background 2029 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	384	404	42	711	275	220	81	22	547	426	521
Future Volume (vph)	57	384	404	42	711	275	220	81	22	547	426	521
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850		0.968				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Satd. Flow (RTOR)			168			316		11				
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	441	464	48	817	316	253	118	0	629	490	599
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	15.0	40.0	24.0	15.0	40.0	26.0	24.0	39.0		26.0	41.0	
Total Split (%)	12.5%	33.3%	20.0%	12.5%	33.3%	21.7%	20.0%	32.5%		21.7%	34.2%	
Maximum Green (s)	6.5	34.0	16.5	7.5	34.0	20.5	16.5	33.5		20.5	35.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	6.6	40.2	58.9	6.8	36.8	63.3	12.7	30.7		20.5	36.5	51.5
Actuated g/C Ratio	0.06	0.34	0.49	0.06	0.31	0.53	0.11	0.26		0.17	0.30	0.43
v/c Ratio	0.69	0.37	0.54	0.48	0.75	0.32	0.70	0.25		1.07	0.87	0.50
Control Delay	91.2	33.5	22.7	70.6	43.6	2.7	62.0	32.6		105.5	56.1	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	91.2	33.5	22.7	70.6	43.6	2.7	62.0	32.6		105.5	56.1	26.5
LOS	F	C	C	E	D	A	E	C		F	E	C
Approach Delay		32.3			33.7			52.7			63.9	
Approach LOS		C			C			D			E	
Queue Length 50th (ft)	54	118	140	37	310	0	98	64		~278	345	179
Queue Length 95th (ft)	#123	147	180	75	371	39	134	110		#374	#521	240
Internal Link Dist (ft)		1064			837			825			857	
Turn Bay Length (ft)	375			75		300				250		250
Base Capacity (vph)	97	1185	907	110	1084	983	472	511		586	578	1191
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.68	0.37	0.51	0.44	0.75	0.32	0.54	0.23		1.07	0.85	0.50

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 47.3

Intersection LOS: D

Intersection Capacity Utilization 75.0%

ICU Level of Service D

Analysis Period (min) 15

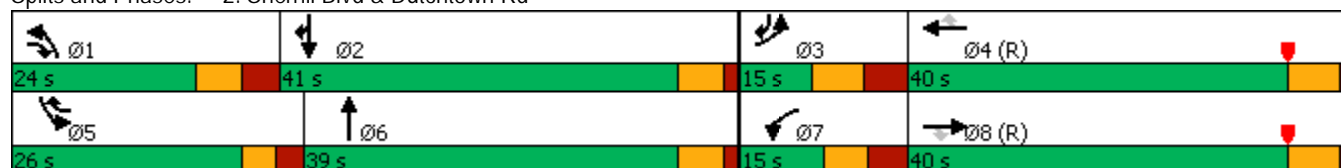
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

























Queue shown is maximum after two cycles.

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS
Background 2029 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	702	130	19	403	234	132	314	76	466	60	348
Future Volume (vph)	210	702	130	19	403	234	132	314	76	466	60	348
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850		0.971				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Satd. Flow (RTOR)			140			216		10				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	755	140	20	433	252	142	420	0	501	65	374
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	33.0	44.0	28.0	15.0	26.0	25.0	28.0	36.0		25.0	33.0	
Total Split (%)	27.5%	36.7%	23.3%	12.5%	21.7%	20.8%	23.3%	30.0%		20.8%	27.5%	
Maximum Green (s)	24.5	38.0	20.5	7.5	20.0	19.5	20.5	30.5		19.5	27.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	18.8	48.7	63.6	6.3	27.1	52.1	8.9	29.5		19.0	37.7	65.0
Actuated g/C Ratio	0.16	0.41	0.53	0.05	0.23	0.43	0.07	0.25		0.16	0.31	0.54
v/c Ratio	0.82	0.53	0.15	0.22	0.54	0.31	0.56	0.93		0.92	0.11	0.25
Control Delay	68.4	28.8	8.1	59.8	45.6	6.1	61.8	71.1		73.4	30.0	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.4	28.8	8.1	59.8	45.6	6.1	61.8	71.1		73.4	30.0	14.5
LOS	E	C	A	E	D	A	E	E		E	C	B
Approach Delay		34.2			31.9			68.8			47.0	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	174	225	15	15	160	16	55	309		198	35	80
Queue Length 95th (ft)	257	368	62	41	227	75	87	#498		#294	72	105
Internal Link Dist (ft)		1064			837			825			857	
Turn Bay Length (ft)	375			75		300				250		250
Base Capacity (vph)	361	1437	1044	110	799	815	586	467		557	584	1641
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.63	0.53	0.13	0.18	0.54	0.31	0.24	0.90		0.90	0.11	0.23

Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 46 (38%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 43.1

Intersection LOS: D

Intersection Capacity Utilization 84.0%

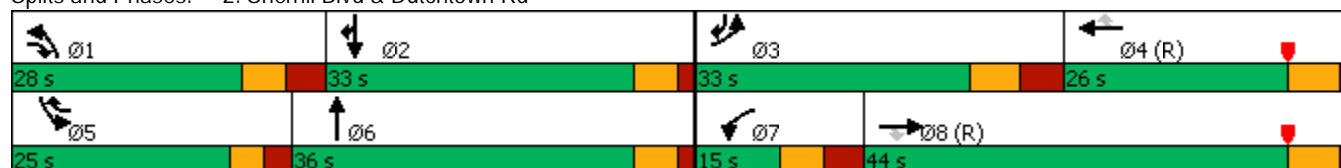
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS
Combined 2024 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	348	379	40	644	249	252	96	26	496	394	472
Future Volume (vph)	52	348	379	40	644	249	252	96	26	496	394	472
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850		0.968				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Satd. Flow (RTOR)			190			286		11				
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	400	436	46	740	286	290	140	0	570	453	543
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	15.0	40.0	24.0	15.0	40.0	26.0	24.0	39.0		26.0	41.0	
Total Split (%)	12.5%	33.3%	20.0%	12.5%	33.3%	21.7%	20.0%	32.5%		21.7%	34.2%	
Maximum Green (s)	6.5	34.0	16.5	7.5	34.0	20.5	16.5	33.5		20.5	35.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	6.5	41.3	61.0	6.8	38.0	64.5	13.7	29.6		20.5	34.4	49.4
Actuated g/C Ratio	0.05	0.34	0.51	0.06	0.32	0.54	0.11	0.25		0.17	0.29	0.41
v/c Ratio	0.63	0.33	0.49	0.46	0.66	0.29	0.74	0.31		0.97	0.85	0.47
Control Delay	87.1	32.9	20.6	69.7	40.0	2.6	63.2	34.5		80.8	55.9	27.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	87.1	32.9	20.6	69.7	40.0	2.6	63.2	34.5		80.8	55.9	27.1
LOS	F	C	C	E	D	A	E	C		F	E	C
Approach Delay		30.5			31.3			53.9			55.0	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	49	107	125	35	273	0	113	78		228	316	162
Queue Length 95th (ft)	#111	136	164	73	330	38	151	129		#323	#449	214
Internal Link Dist (ft)		1064			837			825			857	
Turn Bay Length (ft)	375			75		300				250		250
Base Capacity (vph)	96	1218	930	110	1119	982	472	511		586	561	1128
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.63	0.33	0.47	0.42	0.66	0.29	0.61	0.27		0.97	0.81	0.48

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 42.9

Intersection LOS: D

Intersection Capacity Utilization 72.0%

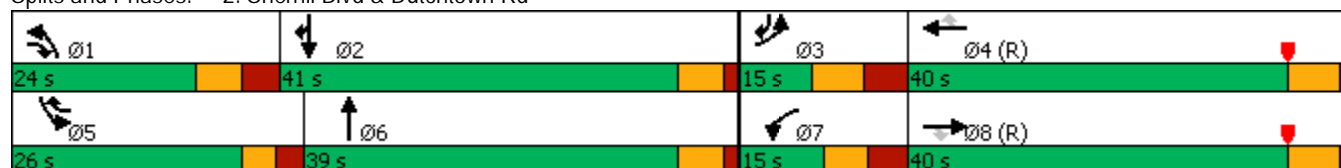
ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
























Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS

Combined 2024 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	636	164	23	365	212	163	303	74	422	83	315
Future Volume (vph)	190	636	164	23	365	212	163	303	74	422	83	315
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Fr't			0.850			0.850			0.970			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1807	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1807	0	3433	1863	2787
Satd. Flow (RTOR)			176			228			10			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	204	684	176	25	392	228	175	406	0	454	89	339
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	33.0	44.0	28.0	15.0	26.0	25.0	28.0	36.0		25.0	33.0	
Total Split (%)	27.5%	36.7%	23.3%	12.5%	21.7%	20.8%	23.3%	30.0%		20.8%	27.5%	
Maximum Green (s)	24.5	38.0	20.5	7.5	20.0	19.5	20.5	30.5		19.5	27.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	17.7	47.1	63.1	6.4	29.4	53.7	10.0	29.1		18.3	35.4	61.6
Actuated g/C Ratio	0.15	0.39	0.53	0.05	0.24	0.45	0.08	0.24		0.15	0.30	0.51
v/c Ratio	0.78	0.49	0.19	0.27	0.45	0.27	0.61	0.91		0.87	0.16	0.24
Control Delay	67.1	30.2	8.8	61.4	42.6	3.9	62.1	68.7		67.4	31.9	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	67.1	30.2	8.8	61.4	42.6	3.9	62.1	68.7		67.4	31.9	16.0
LOS	E	C	A	E	D	A	E	E		E	C	B
Approach Delay		33.7			29.7			66.7			44.0	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	156	227	15	19	140	0	68	296		177	49	76
Queue Length 95th (ft)	233	313	71	48	205	51	103	#472		#251	94	100
Internal Link Dist (ft)		1064			837			825			857	
Turn Bay Length (ft)	375			75		300				250		250
Base Capacity (vph)	361	1388	1038	110	866	848	586	466		557	549	1587
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.57	0.49	0.17	0.23	0.45	0.27	0.30	0.87		0.82	0.16	0.21

Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 46 (38%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 41.8

Intersection LOS: D

Intersection Capacity Utilization 80.9%

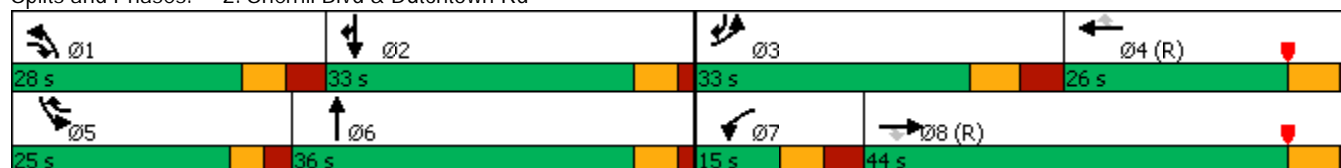
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
























Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS

Combined 2029 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	384	417	44	711	275	272	104	28	547	434	521
Future Volume (vph)	57	384	417	44	711	275	272	104	28	547	434	521
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850			0.968			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1803	0	3433	1863	2787
Satd. Flow (RTOR)			183			316			10			
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	441	479	51	817	316	313	152	0	629	499	599
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	15.0	40.0	21.0	16.0	41.0	35.0	21.0	29.0		35.0	43.0	
Total Split (%)	12.5%	33.3%	17.5%	13.3%	34.2%	29.2%	17.5%	24.2%		29.2%	35.8%	
Maximum Green (s)	6.5	34.0	13.5	8.5	35.0	29.5	13.5	23.5		29.5	37.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	6.4	39.7	58.6	7.3	36.9	68.2	13.0	25.9		25.4	36.3	51.2
Actuated g/C Ratio	0.05	0.33	0.49	0.06	0.31	0.57	0.11	0.22		0.21	0.30	0.43
v/c Ratio	0.70	0.38	0.55	0.48	0.75	0.31	0.85	0.38		0.87	0.89	0.50
Control Delay	93.4	33.8	22.6	69.0	43.2	2.0	73.2	41.2		58.8	58.6	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	93.4	33.8	22.6	69.0	43.2	2.0	73.2	41.2		58.8	58.6	26.7
LOS	F	C	C	E	D	A	E	D		E	E	C
Approach Delay		32.3			33.3			62.7			47.6	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	54	118	142	39	306	0	123	93		243	362	185
Queue Length 95th (ft)	#123	148	183	78	367	32	#180	157		287	#512	232
Internal Link Dist (ft)		1064			837			825			857	
Turn Bay Length (ft)	375			75		300				250		250
Base Capacity (vph)	95	1170	873	125	1087	1080	386	396		843	582	1191
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.69	0.38	0.55	0.41	0.75	0.29	0.81	0.38		0.75	0.86	0.50

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 116 (97%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 41.9

Intersection LOS: D

Intersection Capacity Utilization 76.5%

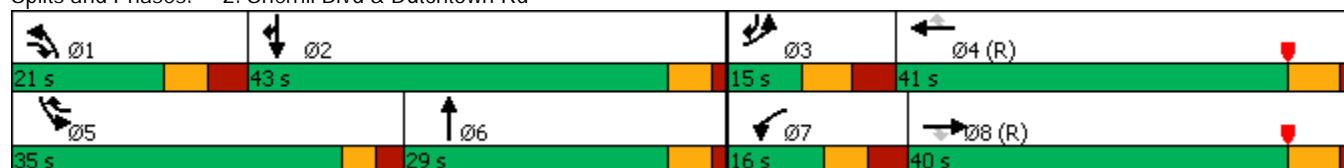
ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.
























Queue shown is maximum after two cycles.

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd



Lanes, Volumes, Timings
2: Sherrill Blvd & Dutchtown Rd

Century Park Multi-family TIS
Combined 2029 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	702	176	25	403	234	175	333	81	466	89	348
Future Volume (vph)	210	702	176	25	403	234	175	333	81	466	89	348
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	0.97	1.00	0.88
Frt			0.850			0.850		0.971				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1809	0	3433	1863	2787
Satd. Flow (RTOR)			189			204		10				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	226	755	189	27	433	252	188	445	0	501	96	374
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pt+ov
Protected Phases	3	8	1	7	4	5	1	6		5	2	2 3
Permitted Phases			8			4						
Detector Phase	3	8	1	7	4	5	1	6		5	2	2 3
Switch Phase												
Minimum Initial (s)	6.0	20.0	6.0	6.0	20.0	6.0	6.0	8.0		6.0	8.0	
Minimum Split (s)	15.0	26.0	14.0	14.0	26.0	12.0	14.0	14.0		12.0	14.0	
Total Split (s)	33.0	44.0	28.0	15.0	26.0	25.0	28.0	36.0		25.0	33.0	
Total Split (%)	27.5%	36.7%	23.3%	12.5%	21.7%	20.8%	23.3%	30.0%		20.8%	27.5%	
Maximum Green (s)	24.5	38.0	20.5	7.5	20.0	19.5	20.5	30.5		19.5	27.5	
Yellow Time (s)	4.5	4.5	4.0	4.0	4.5	3.0	4.0	4.0		3.0	4.0	
All-Red Time (s)	4.0	1.5	3.5	3.5	1.5	2.5	3.5	1.5		2.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	6.0	7.5	7.5	6.0	5.5	7.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	3.5	1.5	1.5	3.5	1.5	1.5	3.5		1.5	3.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	
Act Effect Green (s)	18.8	45.1	61.6	6.5	26.4	51.4	10.5	30.3		19.0	36.8	64.2
Actuated g/C Ratio	0.16	0.38	0.51	0.05	0.22	0.43	0.09	0.25		0.16	0.31	0.54
v/c Ratio	0.82	0.57	0.21	0.28	0.56	0.32	0.63	0.96		0.92	0.17	0.25
Control Delay	68.6	31.9	8.5	62.1	46.2	6.9	62.1	76.6		73.4	31.9	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	68.6	31.9	8.5	62.1	46.2	6.9	62.1	76.6		73.4	31.9	15.1
LOS	E	C	A	E	D	A	E	E		E	C	B
Approach Delay		35.2			32.9			72.3			46.8	
Approach LOS		D			C			E			D	
Queue Length 50th (ft)	173	254	21	21	160	22	73	334		198	54	82
Queue Length 95th (ft)	257	367	76	52	227	82	109	#542		#294	101	110
Internal Link Dist (ft)		1064			837			825			857	
Turn Bay Length (ft)	375			75		300				250		250
Base Capacity (vph)	361	1331	1021	110	777	799	586	467		557	571	1622
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.63	0.57	0.19	0.25	0.56	0.32	0.32	0.95		0.90	0.17	0.23

Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 46 (38%), Referenced to phase 4:WBT and 8:EBT, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 44.7

Intersection LOS: D

Intersection Capacity Utilization 85.3%

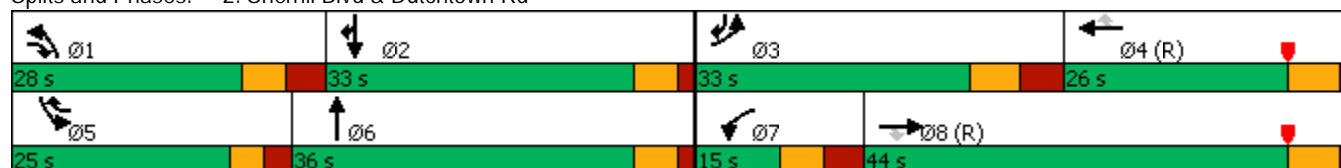
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Sherrill Blvd & Dutchtown Rd

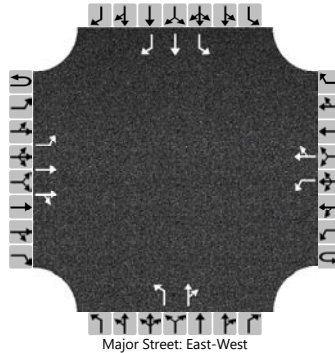


HCS7 Two-Way Stop-Control Report

General Information

Analyst	RCB	Intersection	Dutchtown at Mabry Hood
Agency/Co.	Cannon and Cannon	Jurisdiction	Knoxville
Date Performed	5/20/2022	East/West Street	Dutchtown
Analysis Year	2022	North/South Street	Mabry Hood
Time Analyzed	AM Peak - Existing	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Existing geometry and traffic control		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		142	694	17	0	16	547	43		4	5	12		28	19	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		154				17				4		18		30	21	0
Capacity, c (veh/h)		932				466				93		182		194	69	485
v/c Ratio		0.17				0.04				0.05		0.10		0.16	0.30	0.00
95% Queue Length, Q ₉₅ (veh)		0.6				0.1				0.1		0.3		0.5	1.1	0.0
Control Delay (s/veh)		9.6				13.0				45.6		27.1		27.0	78.1	12.4
Level of Service (LOS)		A				B				E		D		D	F	B
Approach Delay (s/veh)	1.6				0.3				30.6				47.7			
Approach LOS									D				E			

HCS7 Two-Way Stop-Control Report

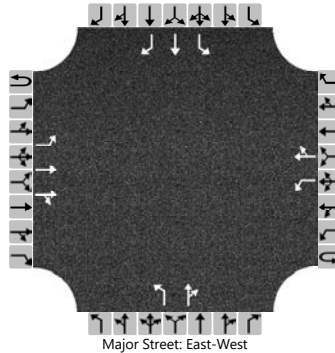
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2022
Time Analyzed	PM Peak - Existing
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		360	828	10	0	4	407	86		11	12	14		78	15	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

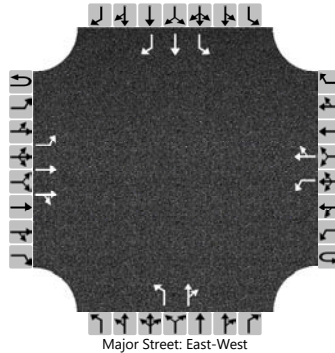
Flow Rate, v (veh/h)		391				4				12		28		85	16	0
Capacity, c (veh/h)		1021				372				71		52		44	27	574
v/c Ratio		0.38				0.01				0.17		0.54		1.93	0.60	0.00
95% Queue Length, Q ₉₅ (veh)		1.8				0.0				0.6		2.1		8.7	1.9	0.0
Control Delay (s/veh)		10.7				14.8				65.8		136.7		636.3	260.0	11.3
Level of Service (LOS)		B				B				F		F		F	F	B
Approach Delay (s/veh)	3.2				0.1				115.6				575.6			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

General Information

Analyst	RCB	Intersection	Dutchtown at Mabry Hood
Agency/Co.	Cannon and Cannon	Jurisdiction	Knoxville
Date Performed	5/20/2022	East/West Street	Dutchtown
Analysis Year	2024	North/South Street	Mabry Hood
Time Analyzed	AM Peak - Background	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Existing geometry and traffic control		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		148	722	18	0	17	569	45		4	5	13		29	20	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		161				18				4		20		32	22	0
Capacity, c (veh/h)		911				443				74		171		180	61	469
v/c Ratio		0.18				0.04				0.06		0.11		0.18	0.36	0.00
95% Queue Length, Q ₉₅ (veh)		0.6				0.1				0.2		0.4		0.6	1.3	0.0
Control Delay (s/veh)		9.8				13.5				56.9		28.8		29.2	93.4	12.7
Level of Service (LOS)		A				B				F		D		D	F	B
Approach Delay (s/veh)	1.6				0.4				33.9				55.4			
Approach LOS									D				F			

HCS7 Two-Way Stop-Control Report

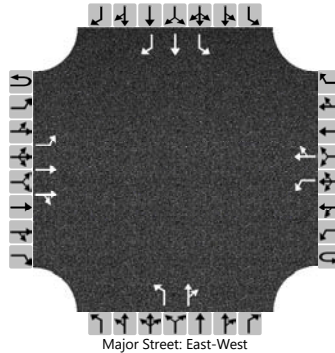
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2024
Time Analyzed	PM Peak - Background
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		375	861	11	0	4	423	89		12	13	15		81	16	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		408				4				13		30		88	17	0
Capacity, c (veh/h)		1003				351				55		44		26	23	560
v/c Ratio		0.41				0.01				0.24		0.69		3.36	0.76	0.00
95% Queue Length, Q ₉₅ (veh)		2.0				0.0				0.8		2.6		10.8	2.2	0.0
Control Delay (s/veh)		11.0				15.4				89.5		191.5		1372.7	349.4	11.4
Level of Service (LOS)		B				C				F		F		F	F	B
Approach Delay (s/veh)	3.3				0.1				160.9				1203.9			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

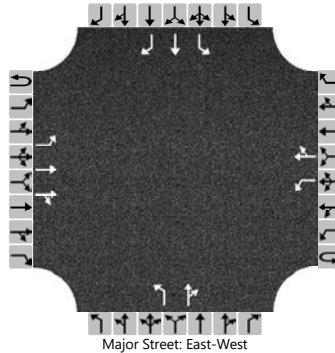
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	AM Peak - Background
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		163	797	20	0	19	628	49		5	6	14		32	22	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		177				21				5		22		35	24	0
Capacity, c (veh/h)		859				386						122		144	44	429
v/c Ratio		0.21				0.05						0.18		0.24	0.54	0.00
95% Queue Length, Q ₉₅ (veh)		0.8				0.2						0.6		0.9	2.0	0.0
Control Delay (s/veh)		10.3				14.8						40.6		37.6	156.6	13.4
Level of Service (LOS)		B				B						E		E	F	B
Approach Delay (s/veh)	1.7				0.4								86.1			
Approach LOS													F			

HCS7 Two-Way Stop-Control Report

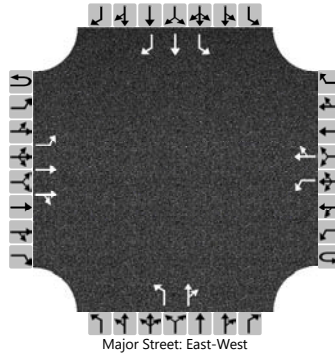
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	PM Peak - Background
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		414	950	12	0	5	467	98		13	14	16		89	18	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		450				5				14		33		97	20	0
Capacity, c (veh/h)		955				299						27			14	523
v/c Ratio		0.47				0.02						1.19			1.38	0.00
95% Queue Length, Q ₉₅ (veh)		2.6				0.1						3.8			3.1	0.0
Control Delay (s/veh)		12.1				17.3						447.1			753.0	11.9
Level of Service (LOS)		B				C						F			F	B
Approach Delay (s/veh)	3.6				0.2											
Approach LOS																

HCS7 Two-Way Stop-Control Report

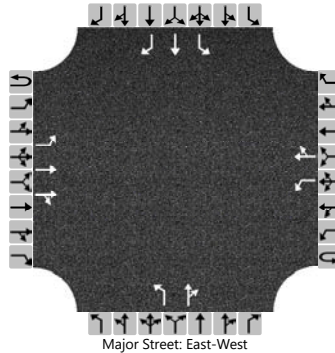
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2024
Time Analyzed	AM Peak - Combined
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		148	728	18	0	20	571	45		4	5	25		29	20	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		161				22				4		33		32	22	0
Capacity, c (veh/h)		910				438				69		234		173	59	468
v/c Ratio		0.18				0.05				0.06		0.14		0.18	0.37	0.00
95% Queue Length, Q ₉₅ (veh)		0.6				0.2				0.2		0.5		0.6	1.3	0.0
Control Delay (s/veh)		9.8				13.6				60.6		22.9		30.4	97.3	12.7
Level of Service (LOS)		A				B				F		C		D	F	B
Approach Delay (s/veh)	1.6				0.4				27.3				57.7			
Approach LOS									D				F			

HCS7 Two-Way Stop-Control Report

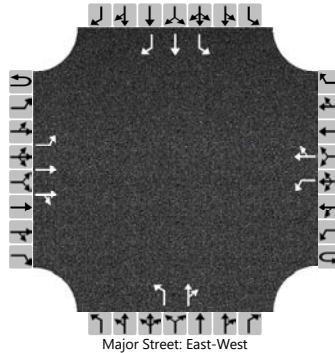
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2024
Time Analyzed	PM Peak - Combined
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		375	866	11	0	16	429	89		12	13	25		81	16	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		408				17				13		41		88	17	0
Capacity, c (veh/h)		998				348				54		53		8	21	555
v/c Ratio		0.41				0.05				0.24		0.78		11.47	0.84	0.00
95% Queue Length, Q ₉₅ (veh)		2.0				0.2				0.8		3.3		12.7	2.4	0.0
Control Delay (s/veh)		11.1				15.9				92.6		186.2		5654.5	404.5	11.5
Level of Service (LOS)		B				C				F		F		F	F	B
Approach Delay (s/veh)	3.3				0.5				163.8				4788.5			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

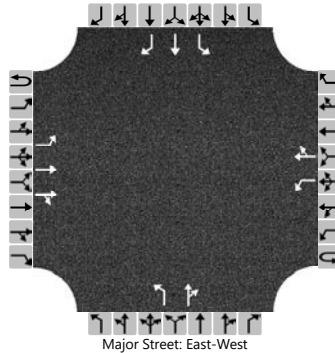
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	AM Peak - Combined
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		163	803	20	0	22	630	49		5	6	26		32	22	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		177				24				5		35		35	24	0
Capacity, c (veh/h)		857				382						169		138	43	428
v/c Ratio		0.21				0.06						0.21		0.25	0.56	0.00
95% Queue Length, Q ₉₅ (veh)		0.8				0.2						0.7		0.9	2.0	0.0
Control Delay (s/veh)		10.3				15.0						31.8		39.7	164.7	13.4
Level of Service (LOS)		B				C						D		E	F	B
Approach Delay (s/veh)	1.7				0.5								90.6			
Approach LOS													F			

HCS7 Two-Way Stop-Control Report

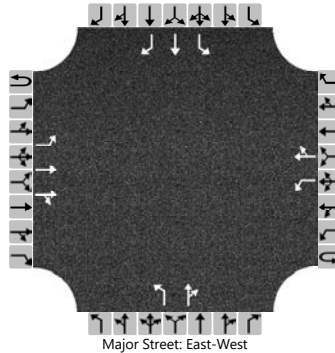
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	PM Peak - Combined
Intersection Orientation	East-West
Project Description	Existing geometry and traffic control

Site Information

Intersection	Dutchtown at Mabry Hood
Jurisdiction	Knoxville
East/West Street	Dutchtown
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	1	0		1	1	0		1	1	1
Configuration		L	T	TR		L		TR		L		TR		L	T	R
Volume (veh/h)		414	955	12	0	17	473	98		13	14	26		89	18	0
Percent Heavy Vehicles (%)		3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized													Yes			
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.2
Critical Headway (sec)		4.16				6.86				7.56	6.56	6.96		7.56	6.56	6.26
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

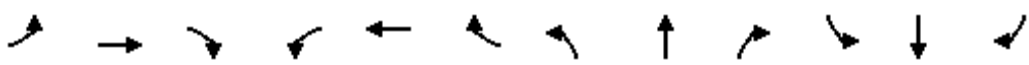
Flow Rate, v (veh/h)		450				18				14		43		97	20	0
Capacity, c (veh/h)		949				296						32			13	518
v/c Ratio		0.47				0.06						1.34			1.54	0.00
95% Queue Length, Q ₉₅ (veh)		2.6				0.2						4.8			3.2	0.0
Control Delay (s/veh)		12.2				18.0						463.8			870.1	11.9
Level of Service (LOS)		B				C						F			F	B
Approach Delay (s/veh)	3.6				0.5											
Approach LOS																

Lanes, Volumes, Timings

4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Background 2024 AM













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	722	18	17	569	45	4	5	13	29	20	575
Future Volume (vph)	148	722	18	17	569	45	4	5	13	29	20	575
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.889				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3525	0	1770	1842	0	1770	1656	0	1770	1863	1583
Flt Permitted	0.330			0.348			0.743			0.745		
Satd. Flow (perm)	615	3525	0	648	1842	0	1384	1656	0	1388	1863	1583
Satd. Flow (RTOR)		4			6			14				482
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	805	0	18	667	0	4	19	0	32	22	625
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	18.0	86.0		11.0	79.0		23.0	23.0		23.0	23.0	
Total Split (%)	15.0%	71.7%		9.2%	65.8%		19.2%	19.2%		19.2%	19.2%	
Maximum Green (s)	12.0	80.0		5.5	73.0		17.5	17.5		17.5	17.5	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	101.3	99.0		95.2	89.0		8.3	8.3		8.3	8.3	120.0
Actuated g/C Ratio	0.84	0.82		0.79	0.74		0.07	0.07		0.07	0.07	1.00
v/c Ratio	0.27	0.28		0.03	0.49		0.04	0.15		0.34	0.17	0.39
Control Delay	3.1	4.0		2.3	8.7		51.2	30.4		61.8	54.4	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	3.1	4.0		2.3	8.7		51.2	30.4		61.8	54.4	0.7
LOS	A	A		A	A		D	C		E	D	A
Approach Delay		3.8			8.5			34.0			5.4	
Approach LOS		A			A			C			A	
Queue Length 50th (ft)	17	52		2	195		3	4		24	16	0
Queue Length 95th (ft)	34	136		6	320		14	28		56	43	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	640	2909		567	1367		201	253		202	271	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Lanes, Volumes, Timings 4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS
Background 2024 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.28		0.03	0.49		0.02	0.08		0.16	0.08	0.39

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 5.9

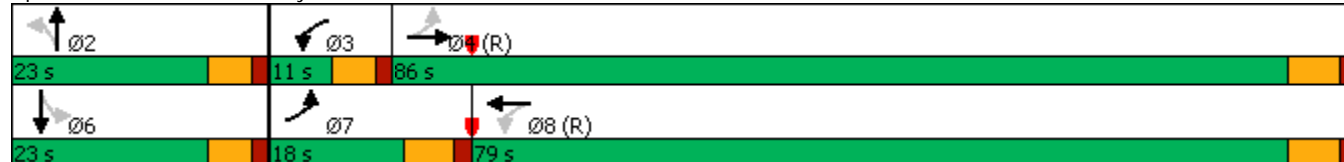
Intersection LOS: A

Intersection Capacity Utilization 63.7%

ICU Level of Service B

Analysis Period (min) 15






















Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Background 2024 PM













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	861	11	4	423	89	12	13	15	81	16	179
Future Volume (vph)	375	861	11	4	423	89	12	13	15	81	16	179
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.974			0.920				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3532	0	1770	1814	0	1770	1714	0	1770	1863	1583
Flt Permitted	0.341			0.302			0.746			0.738		
Satd. Flow (perm)	635	3532	0	563	1814	0	1390	1714	0	1375	1863	1583
Satd. Flow (RTOR)		2			12			16				195
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	408	948	0	4	557	0	13	30	0	88	17	195
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	37.0	87.0		10.0	60.0		23.0	23.0		23.0	23.0	
Total Split (%)	30.8%	72.5%		8.3%	50.0%		19.2%	19.2%		19.2%	19.2%	
Maximum Green (s)	31.0	81.0		4.5	54.0		17.5	17.5		17.5	17.5	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	95.7	93.7		80.6	74.8		12.8	12.8		12.8	12.8	120.0
Actuated g/C Ratio	0.80	0.78		0.67	0.62		0.11	0.11		0.11	0.11	1.00
v/c Ratio	0.63	0.34		0.01	0.49		0.09	0.15		0.60	0.09	0.12
Control Delay	8.2	5.0		5.5	15.8		47.3	29.6		67.6	47.0	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.2	5.0		5.5	15.8		47.3	29.6		67.6	47.0	0.2
LOS	A	A		A	B		D	C		E	D	A
Approach Delay		6.0			15.7			34.9			22.6	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	68	87		1	203		9	10		66	12	0
Queue Length 95th (ft)	122	193		3	413		28	38		118	34	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	799	2759		431	1135		202	263		200	271	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0

Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS
Background 2024 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.51	0.34		0.01	0.49		0.06	0.11		0.44	0.06	0.12

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 11.2

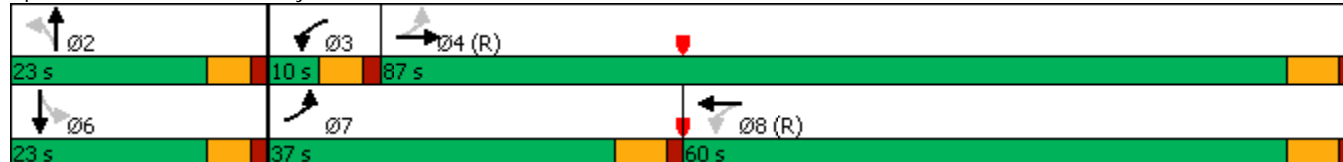
Intersection LOS: B

Intersection Capacity Utilization 74.2%

ICU Level of Service D

Analysis Period (min) 15






















Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Background 2029 AM













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	797	20	19	628	49	5	6	14	32	22	635
Future Volume (vph)	163	797	20	19	628	49	5	6	14	32	22	635
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.898				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3525	0	1770	1842	0	1770	1673	0	1770	1863	1583
Flt Permitted	0.290			0.320			0.742			0.743		
Satd. Flow (perm)	540	3525	0	596	1842	0	1382	1673	0	1384	1863	1583
Satd. Flow (RTOR)		5			4			15				536
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	888	0	21	736	0	5	22	0	35	24	690
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	35.0	88.8		9.6	63.4		21.6	21.6		21.6	21.6	
Total Split (%)	29.2%	74.0%		8.0%	52.8%		18.0%	18.0%		18.0%	18.0%	
Maximum Green (s)	29.0	82.8		4.1	57.4		16.1	16.1		16.1	16.1	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	101.5	98.7		94.2	87.9		8.6	8.6		8.6	8.6	120.0
Actuated g/C Ratio	0.85	0.82		0.78	0.73		0.07	0.07		0.07	0.07	1.00
v/c Ratio	0.33	0.31		0.04	0.55		0.05	0.17		0.36	0.18	0.44
Control Delay	3.6	4.2		2.6	10.3		51.2	30.6		62.1	54.2	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	3.6	4.2		2.6	10.3		51.2	30.6		62.1	54.2	0.9
LOS	A	A		A	B		D	C		E	D	A
Approach Delay		4.1			10.1			34.4			5.4	
Approach LOS		A			B			C			A	
Queue Length 50th (ft)	19	60		2	234		4	5		26	18	0
Queue Length 95th (ft)	38	156		7	421		17	31		59	45	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	756	2900		524	1350		185	237		185	249	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS
Background 2029 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.23	0.31		0.04	0.55		0.03	0.09		0.19	0.10	0.44

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 6.6

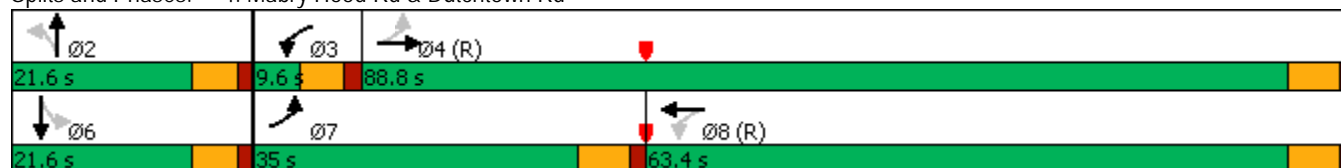
Intersection LOS: A

Intersection Capacity Utilization 68.1%

ICU Level of Service C

Analysis Period (min) 15

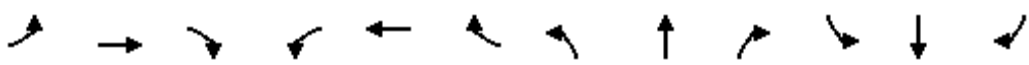
Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Background 2029 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	414	950	12	5	467	98	13	14	16	89	18	198
Future Volume (vph)	414	950	12	5	467	98	13	14	16	89	18	198
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.974			0.920				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3532	0	1770	1814	0	1770	1714	0	1770	1863	1583
Flt Permitted	0.279			0.274			0.744			0.736		
Satd. Flow (perm)	520	3532	0	510	1814	0	1386	1714	0	1371	1863	1583
Satd. Flow (RTOR)		2			11			17				215
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	450	1046	0	5	615	0	14	32	0	97	20	215
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	38.0	88.4		9.6	60.0		22.0	22.0		22.0	22.0	
Total Split (%)	31.7%	73.7%		8.0%	50.0%		18.3%	18.3%		18.3%	18.3%	
Maximum Green (s)	32.0	82.4		4.1	54.0		16.5	16.5		16.5	16.5	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	95.4	93.5		74.5	69.0		13.1	13.1		13.1	13.1	120.0
Actuated g/C Ratio	0.80	0.78		0.62	0.58		0.11	0.11		0.11	0.11	1.00
v/c Ratio	0.72	0.38		0.01	0.59		0.09	0.16		0.65	0.10	0.14
Control Delay	12.0	5.3		7.2	21.8		47.5	29.4		70.6	47.3	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	12.0	5.3		7.2	21.8		47.5	29.4		70.6	47.3	0.2
LOS	B	A		A	C		D	C		E	D	A
Approach Delay		7.3			21.7			34.9			23.6	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)	81	104		1	288		10	11		73	14	0
Queue Length 95th (ft)	166	210		5	529		30	41		129	38	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	746	2751		369	1047		190	250		188	256	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0













Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Background 2029 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.38		0.01	0.59		0.07	0.13		0.52	0.08	0.14

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 13.5

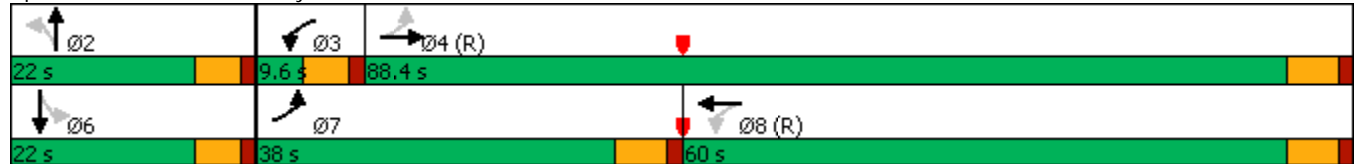
Intersection LOS: B

Intersection Capacity Utilization 79.6%

ICU Level of Service D

Analysis Period (min) 15






















Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS













Combined 2024 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	728	18	20	571	45	4	5	25	29	20	575
Future Volume (vph)	148	728	18	20	571	45	4	5	25	29	20	575
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.873				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3525	0	1770	1842	0	1770	1626	0	1770	1863	1583
Flt Permitted	0.331			0.346			0.743			0.736		
Satd. Flow (perm)	617	3525	0	645	1842	0	1384	1626	0	1371	1863	1583
Satd. Flow (RTOR)		5			4			27				586
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	811	0	22	670	0	4	32	0	32	22	625
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	40.0	88.8		9.6	58.4		21.6	21.6		21.6	21.6	
Total Split (%)	33.3%	74.0%		8.0%	48.7%		18.0%	18.0%		18.0%	18.0%	
Maximum Green (s)	34.0	82.8		4.1	52.4		16.1	16.1		16.1	16.1	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	100.7	96.7		94.9	88.7		8.3	8.3		8.3	8.3	120.0
Actuated g/C Ratio	0.84	0.81		0.79	0.74		0.07	0.07		0.07	0.07	1.00
v/c Ratio	0.27	0.29		0.04	0.49		0.04	0.23		0.34	0.17	0.39
Control Delay	3.1	4.6		2.4	9.0		51.2	25.4		61.9	54.3	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	3.1	4.6		2.4	9.0		51.2	25.4		61.9	54.3	0.7
LOS	A	A		A	A		D	C		E	D	A
Approach Delay		4.4			8.8			28.3			5.4	
Approach LOS		A			A			C			A	
Queue Length 50th (ft)	17	95		2	197		3	4		24	16	0
Queue Length 95th (ft)	34	138		7	339		14	35		56	43	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	852	2841		564	1362		185	241		183	249	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0

Timing Plan: AM Peak
Cannon & Cannon, Inc.

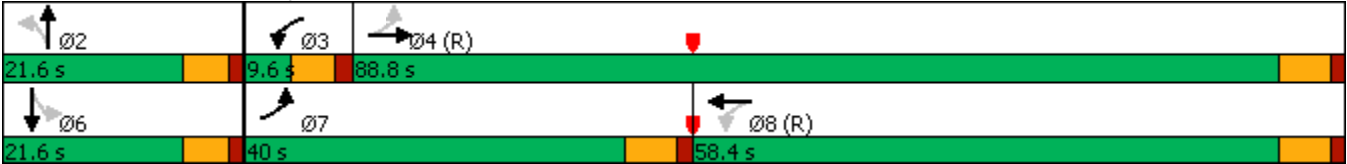
Synchro 10 Report
Page 1

Lanes, Volumes, Timings
 4: Mabry Hood Rd & Dutchtown Rd

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.19	0.29		0.04	0.49		0.02	0.13		0.17	0.09	0.39

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 63.8%	ICU Level of Service B
Analysis Period (min) 15	






















Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Combined 2024 PM













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	866	11	16	429	89	12	13	25	81	16	179
Future Volume (vph)	375	866	11	16	429	89	12	13	25	81	16	179
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.974			0.901				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3532	0	1770	1814	0	1770	1678	0	1770	1863	1583
Flt Permitted	0.337			0.300			0.746			0.730		
Satd. Flow (perm)	628	3532	0	559	1814	0	1390	1678	0	1360	1863	1583
Satd. Flow (RTOR)		2			11			27				195
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	408	953	0	17	563	0	13	41	0	88	17	195
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	37.0	87.0		10.0	60.0		23.0	23.0		23.0	23.0	
Total Split (%)	30.8%	72.5%		8.3%	50.0%		19.2%	19.2%		19.2%	19.2%	
Maximum Green (s)	31.0	81.0		4.5	54.0		17.5	17.5		17.5	17.5	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	95.7	91.4		80.5	74.6		12.8	12.8		12.8	12.8	120.0
Actuated g/C Ratio	0.80	0.76		0.67	0.62		0.11	0.11		0.11	0.11	1.00
v/c Ratio	0.63	0.35		0.04	0.50		0.09	0.20		0.61	0.09	0.12
Control Delay	8.3	6.0		5.4	16.1		47.3	25.4		68.1	46.9	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.3	6.0		5.4	16.1		47.3	25.4		68.1	46.9	0.2
LOS	A	A		A	B		D	C		E	D	A
Approach Delay		6.7			15.8			30.7			22.7	
Approach LOS		A			B			C			C	
Queue Length 50th (ft)	68	87		2	207		9	10		66	12	0
Queue Length 95th (ft)	122	194		8	424		28	43		118	34	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	795	2691		429	1131		202	267		198	271	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0

Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

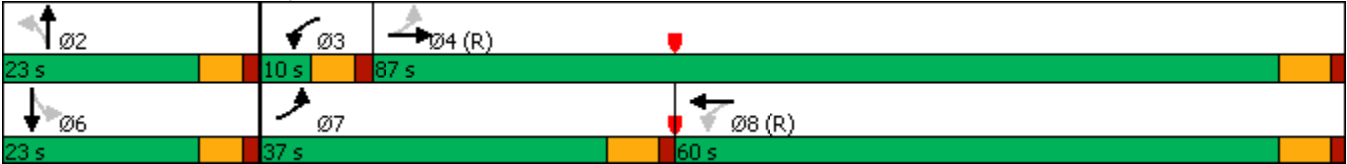
Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS
Combined 2024 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.51	0.35		0.04	0.50		0.06	0.15		0.44	0.06	0.12

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 74.5%	ICU Level of Service D
Analysis Period (min) 15	






















Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Combined 2029 AM













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	803	20	22	630	49	5	6	26	32	22	635
Future Volume (vph)	163	803	20	22	630	49	5	6	26	32	22	635
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.880				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3525	0	1770	1842	0	1770	1639	0	1770	1863	1583
Flt Permitted	0.283			0.318			0.742			0.734		
Satd. Flow (perm)	527	3525	0	592	1842	0	1382	1639	0	1367	1863	1583
Satd. Flow (RTOR)		5			4			28				561
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	895	0	24	738	0	5	35	0	35	24	690
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	39.0	88.8		9.6	59.4		21.6	21.6		21.6	21.6	
Total Split (%)	32.5%	74.0%		8.0%	49.5%		18.0%	18.0%		18.0%	18.0%	
Maximum Green (s)	33.0	82.8		4.1	53.4		16.1	16.1		16.1	16.1	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	101.7	96.4		92.5	86.2		8.6	8.6		8.6	8.6	120.0
Actuated g/C Ratio	0.85	0.80		0.77	0.72		0.07	0.07		0.07	0.07	1.00
v/c Ratio	0.32	0.32		0.05	0.56		0.05	0.24		0.36	0.18	0.44
Control Delay	3.5	4.9		2.9	11.7		51.0	26.2		62.3	54.1	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	3.5	4.9		2.9	11.7		51.0	26.2		62.3	54.1	0.9
LOS	A	A		A	B		D	C		E	D	A
Approach Delay		4.7			11.4			29.3			5.5	
Approach LOS		A			B			C			A	
Queue Length 50th (ft)	19	110		2	248		4	5		26	18	0
Queue Length 95th (ft)	39	158		8	465		17	37		59	45	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	790	2833		512	1324		185	244		183	249	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0

Timing Plan: AM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS
Combined 2029 AM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.22	0.32		0.05	0.56		0.03	0.14		0.19	0.10	0.44

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 7.2

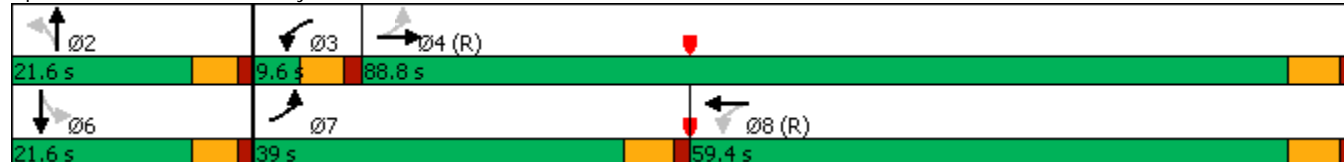
Intersection LOS: A

Intersection Capacity Utilization 68.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd
























Lanes, Volumes, Timings

4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Combined 2029 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	414	955	12	17	473	98	13	14	26	89	18	198
Future Volume (vph)	414	955	12	17	473	98	13	14	26	89	18	198
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.974			0.902				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3532	0	1770	1814	0	1770	1680	0	1770	1863	1583
Flt Permitted	0.278			0.272			0.744			0.729		
Satd. Flow (perm)	518	3532	0	507	1814	0	1386	1680	0	1358	1863	1583
Satd. Flow (RTOR)		2			12			28				215
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	450	1051	0	18	621	0	14	43	0	97	20	215
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	Free
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8			2			6		Free
Detector Phase	7	4		3	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	22.0		9.5	22.0		21.5	21.5		21.5	21.5	
Total Split (s)	37.0	88.4		9.6	61.0		22.0	22.0		22.0	22.0	
Total Split (%)	30.8%	73.7%		8.0%	50.8%		18.3%	18.3%		18.3%	18.3%	
Maximum Green (s)	31.0	82.4		4.1	55.0		16.5	16.5		16.5	16.5	
Yellow Time (s)	4.5	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		5.5	6.0		5.5	5.5		5.5	5.5	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Walk Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effect Green (s)	95.3	91.4		75.0	69.5		13.2	13.2		13.2	13.2	120.0
Actuated g/C Ratio	0.79	0.76		0.62	0.58		0.11	0.11		0.11	0.11	1.00
v/c Ratio	0.73	0.39		0.05	0.59		0.09	0.21		0.65	0.10	0.14
Control Delay	12.5	6.2		6.9	21.4		47.5	25.6		70.9	47.3	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	12.5	6.2		6.9	21.4		47.5	25.6		70.9	47.3	0.2
LOS	B	A		A	C		D	C		E	D	A
Approach Delay		8.1			21.0			31.0			23.7	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)	81	105		2	289		10	11		73	14	0
Queue Length 95th (ft)	168	212		10	528		30	45		129	38	0
Internal Link Dist (ft)		909			633			449			358	
Turn Bay Length (ft)	125			125			150			100		100
Base Capacity (vph)	734	2691		369	1055		190	255		186	256	1583
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0













Timing Plan: PM Peak
Cannon & Cannon, Inc.

Synchro 10 Report
Page 1

Lanes, Volumes, Timings
4: Mabry Hood Rd & Dutchtown Rd

Century Park Multi-family TIS

Combined 2029 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.61	0.39		0.05	0.59		0.07	0.17		0.52	0.08	0.14

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 76 (63%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 13.9

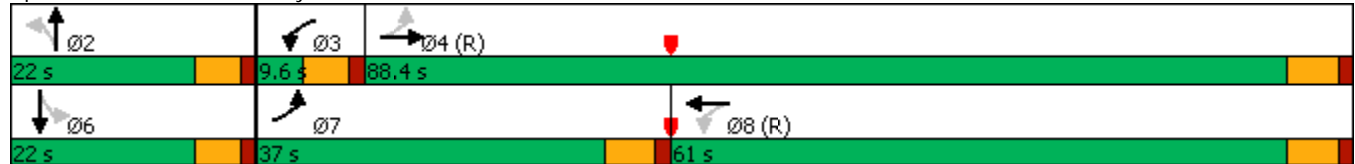
Intersection LOS: B

Intersection Capacity Utilization 80.0%

ICU Level of Service D

Analysis Period (min) 15

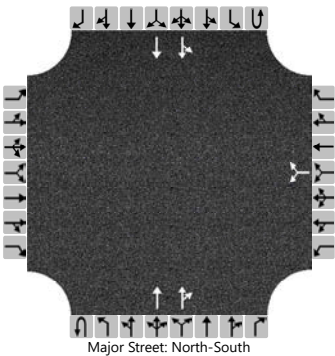
Splits and Phases: 4: Mabry Hood Rd & Dutchtown Rd



HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	RCB	Intersection	Sherrill Blvd at Driveway
Agency/Co.	Cannon and Cannon	Jurisdiction	Knoxville
Date Performed	5/20/2022	East/West Street	Proposed Driveway
Analysis Year	2024	North/South Street	Sherrill Blvd
Time Analyzed	AM Peak - Combined	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Proposed geometry and traffic control		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						20		81			293	5		22	791	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.86		6.96						4.16		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

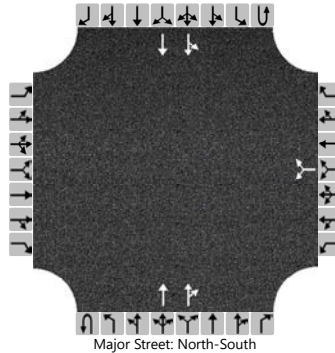
Flow Rate, v (veh/h)						110								24		
Capacity, c (veh/h)						710								1225		
v/c Ratio						0.15								0.02		
95% Queue Length, Q ₉₅ (veh)						0.5								0.1		
Control Delay (s/veh)						11.0								8.0		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)						11.0								0.4		
Approach LOS						B										

HCS7 Two-Way Stop-Control Report

General Information

Analyst	RCB	Intersection	Sherrill Blvd at Driveway
Agency/Co.	Cannon and Cannon	Jurisdiction	Knoxville
Date Performed	5/20/2022	East/West Street	Proposed Driveway
Analysis Year	2024	North/South Street	Sherrill Blvd
Time Analyzed	PM Peak - Combined	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Proposed geometry and traffic control		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						16		67			473	17		81	189	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.86		6.96						4.16		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

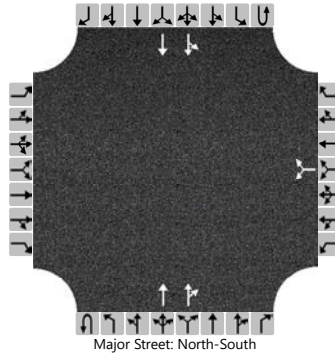
Flow Rate, v (veh/h)						90								88		
Capacity, c (veh/h)						632								1024		
v/c Ratio						0.14								0.09		
95% Queue Length, Q ₉₅ (veh)						0.5								0.3		
Control Delay (s/veh)						11.6								8.8		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					11.6								2.8			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

General Information

Analyst	RCB	Intersection	Sherrill Blvd at Driveway
Agency/Co.	Cannon and Cannon	Jurisdiction	Knoxville
Date Performed	5/20/2022	East/West Street	Proposed Driveway
Analysis Year	2029	North/South Street	Sherrill Blvd
Time Analyzed	AM Peak - Combined	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Proposed geometry and traffic control		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						20		81			323	5		22	873	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.86		6.96						4.16		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						110								24		
Capacity, c (veh/h)						681								1192		
v/c Ratio						0.16								0.02		
95% Queue Length, Q ₉₅ (veh)						0.6								0.1		
Control Delay (s/veh)						11.3								8.1		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					11.3								0.4			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

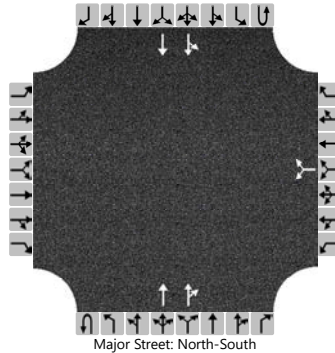
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	PM Peak - Combined
Intersection Orientation	North-South
Project Description	Proposed geometry and traffic control

Site Information

Intersection	Sherrill Blvd at Driveway
Jurisdiction	Knoxville
East/West Street	Proposed Driveway
North/South Street	Sherrill Blvd
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	2	0	0	0	2	0
Configuration							LR				T	TR		LT	T	
Volume (veh/h)						16		67			522	17		81	209	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)						7.5		6.9						4.1		
Critical Headway (sec)						6.86		6.96						4.16		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						90								88		
Capacity, c (veh/h)						603								978		
v/c Ratio						0.15								0.09		
95% Queue Length, Q ₉₅ (veh)						0.5								0.3		
Control Delay (s/veh)						12.0								9.0		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					12.0								2.7			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

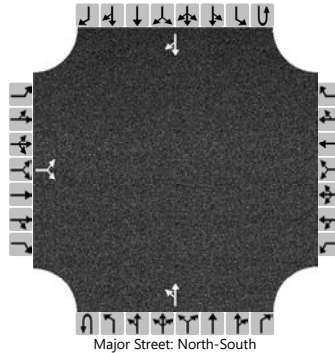
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2024
Time Analyzed	AM Peak - Combined
Intersection Orientation	North-South
Project Description	Proposed geometry and traffic control

Site Information

Intersection	Mabry Hood at Driveway
Jurisdiction	Knoxville
East/West Street	Proposed Driveway
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		12		3						2	22				55	3
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

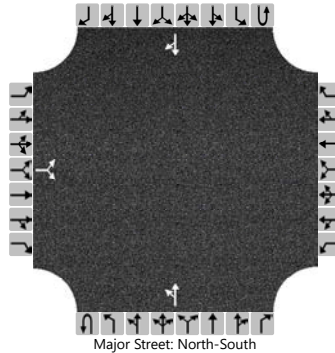
Flow Rate, v (veh/h)			16							2						
Capacity, c (veh/h)			924							1533						
v/c Ratio			0.02							0.00						
95% Queue Length, Q ₉₅ (veh)			0.1							0.0						
Control Delay (s/veh)			9.0							7.4						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.0								0.6							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

General Information

Analyst	RCB	Intersection	Mabry Hood at Driveway
Agency/Co.	Cannon and Cannon	Jurisdiction	Knoxville
Date Performed	5/20/2022	East/West Street	Proposed Driveway
Analysis Year	2024	North/South Street	Mabry Hood
Time Analyzed	PM Peak - Combined	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Proposed geometry and traffic control		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		10		3						6	40				31	12
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			14							7						
Capacity, c (veh/h)			924							1554						
v/c Ratio			0.02							0.00						
95% Queue Length, Q ₉₅ (veh)			0.0							0.0						
Control Delay (s/veh)			9.0							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.0								1.0							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

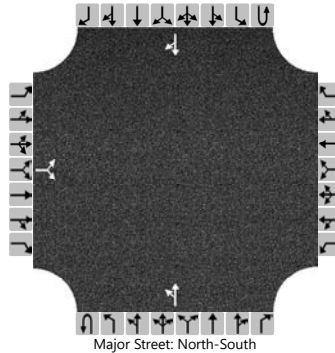
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	AM Peak - Combined
Intersection Orientation	North-South
Project Description	Proposed geometry and traffic control

Site Information

Intersection	Mabry Hood at Driveway
Jurisdiction	Knoxville
East/West Street	Proposed Driveway
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		12		3						2	25				61	3
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			16							2						
Capacity, c (veh/h)			913							1525						
v/c Ratio			0.02							0.00						
95% Queue Length, Q ₉₅ (veh)			0.1							0.0						
Control Delay (s/veh)			9.0							7.4						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.0								0.6							
Approach LOS	A															

HCS7 Two-Way Stop-Control Report

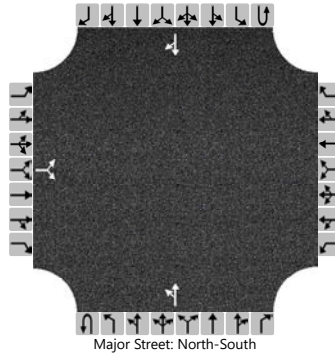
General Information

Analyst	RCB
Agency/Co.	Cannon and Cannon
Date Performed	5/20/2022
Analysis Year	2029
Time Analyzed	PM Peak - Combined
Intersection Orientation	North-South
Project Description	Proposed geometry and traffic control

Site Information

Intersection	Mabry Hood at Driveway
Jurisdiction	Knoxville
East/West Street	Proposed Driveway
North/South Street	Mabry Hood
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		10		3						6	43				35	12
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			14							7						
Capacity, c (veh/h)			915							1549						
v/c Ratio			0.02							0.00						
95% Queue Length, Q ₉₅ (veh)			0.0							0.0						
Control Delay (s/veh)			9.0							7.3						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.0								0.9							
Approach LOS	A															

HCS7 Warrants Report

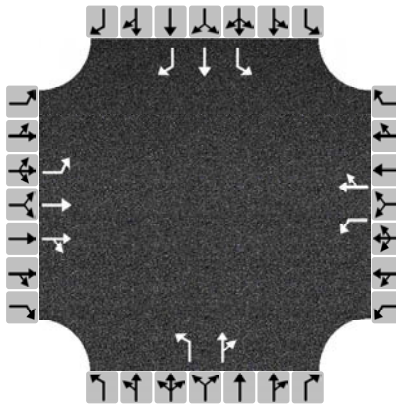
Project Information

Analyst	RCB	Date	4/20/2022
Agency	CCI	Analysis Year	2022
Jurisdiction	Knox County	Time Period Analyzed	Existing
Project Description	Dutchtown at Mabry Hood		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	Yes
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	40	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	1900		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	1	2	0	1	1	0	1	1	0	1	1	1
Lane Usage	L	TR		L	TR		L	TR		L	T	R
Vehicle Volumes Averages (veh/h)	111	300	5	3	220	31	3	5	4	26	7	142
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	10

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (80%)	4A (70%)	4B (56%)
07 - 08	1148	519	1679	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
08 - 09	1004	453	1470	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
09 - 10	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10 - 11	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11 - 12	513	136	667	0	0	No	No	No	No	No	No	No	No	No
12 - 13	585	187	787	0	0	No	Yes	No	No	No	No	No	No	No
13 - 14	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14 - 15	769	164	953	0	0	No	Yes	No	Yes	No	No	No	No	No
15 - 16	1035	166	1222	0	0	No	Yes	Yes	Yes	No	No	No	No	No
16 - 17	1368	232	1640	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1655	265	1948	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	8077	2122	10366	0	0	4	7	5	6	4	0	4	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume

A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	

Warrant 2: Four-Hour Vehicular Volume

Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
--	---

Warrant 3: Peak Hour

A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓

Warrant 4: Pedestrian Volume

A. Four Hour Volumes --or--	
B. One-Hour Volumes	

Warrant 5: School Crossing

Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓

Warrant 6: Coordinated Signal System

Degree of Platooning (Predominant direction or both directions)	✓
---	---

Warrant 7: Crash Experience

A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	

Warrant 8: Roadway Network

A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	

Warrant 9: Grade Crossing

A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

C-59

HCS7 Warrants Report

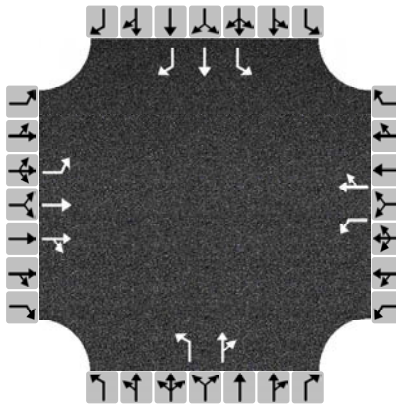
Project Information

Analyst	RCB	Date	5/20/2022
Agency	CCI	Analysis Year	2024 Background
Jurisdiction	Knox County	Time Period Analyzed	Background
Project Description	Dutchtown at Mabry Hood		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	Yes
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	40	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	1900		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	1	2	0	1	1	0	1	1	0	1	1	1
Lane Usage	L	TR		L	TR		L	TR		L	T	R
Vehicle Volumes Averages (veh/h)	116	312	5	3	229	33	3	5	4	28	7	148
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	10

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (80%)	4A (70%)	4B (56%)
07 - 08	1196	540	1748	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
08 - 09	1044	471	1528	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
09 - 10	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10 - 11	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11 - 12	533	140	691	0	0	No	No	No	No	No	No	No	No	No
12 - 13	607	198	820	0	0	No	Yes	No	No	No	No	No	No	No
13 - 14	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14 - 15	801	172	993	0	0	No	Yes	No	Yes	No	No	No	No	No
15 - 16	1076	174	1271	0	0	No	Yes	Yes	Yes	Yes	No	No	No	No
16 - 17	1424	240	1704	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1722	277	2027	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	8403	2212	10782	0	0	4	7	5	6	5	0	4	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume

A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	

Warrant 2: Four-Hour Vehicular Volume

Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
--	---

Warrant 3: Peak Hour

A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓

Warrant 4: Pedestrian Volume

A. Four Hour Volumes --or--	
B. One-Hour Volumes	

Warrant 5: School Crossing

Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓

Warrant 6: Coordinated Signal System

Degree of Platooning (Predominant direction or both directions)	✓
---	---

Warrant 7: Crash Experience

A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	

Warrant 8: Roadway Network

A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	

Warrant 9: Grade Crossing

A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	C-61

HCS7 Warrants Report

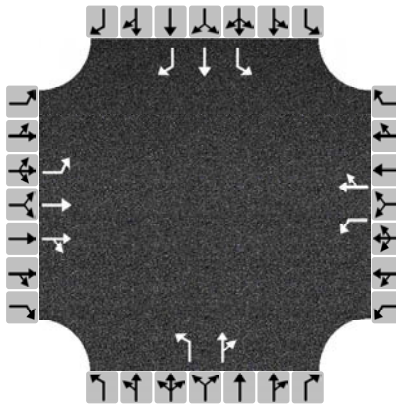
Project Information

Analyst	RCB	Date	5/20/2022
Agency	CCI	Analysis Year	2029 Background
Jurisdiction	Knox County	Time Period Analyzed	Background
Project Description	Dutchtown at Mabry Hood		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	Yes
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	40	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	1900		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	1	2	0	1	1	0	1	1	0	1	1	1
Lane Usage	L	TR		L	TR		L	TR		L	T	R
Vehicle Volumes Averages (veh/h)	127	343	5	3	252	36	4	5	5	31	8	163
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)	-	Tractor-Trailer Trucks (%)	10

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (80%)	4A (70%)	4B (56%)
07 - 08	1316	594	1923	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
08 - 09	1149	519	1682	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
09 - 10	0	0	0	0	0	No	No	No	No	No	No	No	No	No
10 - 11	0	0	0	0	0	No	No	No	No	No	No	No	No	No
11 - 12	586	155	761	0	0	No	No	No	No	No	No	No	No	No
12 - 13	668	214	898	0	0	Yes	Yes	No	No	No	No	No	No	No
13 - 14	0	0	0	0	0	No	No	No	No	No	No	No	No	No
14 - 15	881	189	1093	0	0	No	Yes	No	Yes	No	No	No	No	No
15 - 16	1182	191	1397	0	0	No	Yes	Yes	Yes	Yes	No	No	No	No
16 - 17	1565	265	1874	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	1892	304	2227	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	9239	2431	11855	0	0	5	7	5	6	5	0	4	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume

A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	

Warrant 2: Four-Hour Vehicular Volume

Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
--	---

Warrant 3: Peak Hour

A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓

Warrant 4: Pedestrian Volume

A. Four Hour Volumes --or--	
B. One-Hour Volumes	

Warrant 5: School Crossing

Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓

Warrant 6: Coordinated Signal System

Degree of Platooning (Predominant direction or both directions)	✓
---	---

Warrant 7: Crash Experience

A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	

Warrant 8: Roadway Network

A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	

Warrant 9: Grade Crossing

A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	C-63

<p>TABLE 4A</p> <p>KNOX COUNTY LEFT-TURN LANE VOLUME THRESHOLDS</p> <p>FOR 2-LANE ROADWAYS WITH A PREVAILING SPEED OF 0 TO 35 MPH</p>	<p>Project No: 1633-0000</p> <p>Project Name: Century Park Apts TIS</p> <p>Notes: Combined Volumes</p>
---	--

(If the left-turn volume exceeds the table value a left-turn lane is needed)

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	100 - 149	150 - 199	200 - 249	250 - 299	300 - 349	350 - 399
100 - 149	300	235	185	145	120	100
150 - 199	245	200	160	130	110	90
200 - 249	205	170	140	115	100	80
250 - 299	175	150	125	105	90	70
300 - 349	155	135	110	95	80	65
350 - 399	135	120	100	85	70	60
400 - 449	120	105	90	75	65	55
450 - 499	105	90	80	70	60	50
500 - 549	95	80	70	65	55	50
550 - 599	85	70	65	60	50	45
600 - 649	75	65	60	55	45	40
650 - 699	70	60	55	50	40	35
700 - 749	65	55	50	45	35	30
750 or More	60	50	45	40	35	30

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149	100	80	70	60	55	50
150 - 199	90	75	65	55	50	45
200 - 249	80	72	60	55	50	45
250 - 299	70	65	55	50	45	40
300 - 349	65	60	50	50	45	40
350 - 399	60	55	50	45	40	40
400 - 449	55	50	45	45	40	35
450 - 499	50	45	45	40	35	35
500 - 549	50	45	40	40	35	35
550 - 599	45	40	40	35	35	35
600 - 649	40	35	35	35	35	30
650 - 699	35	35	35	30	30	30
700 - 749	30	30	30	30	30	30
750 or More	30	30	30	30	30	30

* Or through volume only if a right-turn lane exists

Intersection	Time Period	Opposing Volume	Through Volume	Left-Turn Volume	Warrant Threshold	Left-Turn Lane Warranted (Yes / No)
Mabry Hood / Drive	2024 AM	58	22	2	n/a	No
Mabry Hood / Drive	2024 PM	43	40	6	n/a	No
Mabry Hood / Drive	2029 AM	64	25	2	n/a	No
Mabry Hood / Drive	2029 PM	47	43	6	n/a	No

<p>TABLE 4B</p> <p>KNOX COUNTY RIGHT-TURN LANE VOLUME THRESHOLDS</p> <p>FOR 2-LANE ROADWAYS WITH A PREVAILING SPEED OF 0 TO 35 MPH</p>	<p>Project No: 1633-0000</p> <p>Project Name: Century Park Apts TIS</p> <p>Notes: Combined Volumes</p>
--	--

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	< 100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25						
25 - 49						
50 - 99						
100 - 149						
150 - 199						
200 - 249						
250 - 299						Yes
300 - 349					Yes	Yes
350 - 399				Yes	Yes	Yes
400 - 449			Yes	Yes	Yes	Yes
450 - 499			Yes	Yes	Yes	Yes
500 - 549		Yes	Yes	Yes	Yes	Yes
550 - 599		Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
Fewer Than 25						
25 - 49						Yes
50 - 99					Yes	Yes
100 - 149				Yes	Yes	Yes
150 - 199			Yes	Yes	Yes	Yes
200 - 249		Yes	Yes	Yes	Yes	Yes
250 - 299	Yes	Yes	Yes	Yes	Yes	Yes
300 - 349	Yes	Yes	Yes	Yes	Yes	Yes
350 - 399	Yes	Yes	Yes	Yes	Yes	Yes
400 - 449	Yes	Yes	Yes	Yes	Yes	Yes
450 - 499	Yes	Yes	Yes	Yes	Yes	Yes
500 - 549	Yes	Yes	Yes	Yes	Yes	Yes
550 - 599	Yes	Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

* Or through volume only if a left-turn lane exists

Intersection	Time Period	Through Volume	Right-Turn Volume	Right-Turn Lane Warranted (Yes / No)
Mabry Hood / Drive	2024 AM	55	3	No
Mabry Hood / Drive	2024 PM	31	12	No
Mabry Hood / Drive	2029 AM	61	3	No
Mabry Hood / Drive	2029 PM	35	12	No

<p>TABLE 5A</p> <p>KNOX COUNTY LEFT-TURN LANE VOLUME THRESHOLDS</p> <p>FOR 2-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH</p>	<p>Project No: 1633-0000</p> <p>Project Name: Century Park Apts TIS</p> <p>Notes: Combined Volumes</p>
--	--

(If the left-turn volume exceeds the table value a left-turn lane is needed)

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	100 - 149	150 - 199	200 - 249	250 - 299	300 - 349	350 - 399
100 - 149	250	180	140	110	80	70
150 - 199	200	140	105	90	70	60
200 - 249	160	115	85	75	65	55
250 - 299	130	100	75	65	60	50
300 - 349	110	90	70	60	55	45
350 - 399	100	80	65	55	50	40
400 - 449	90	70	60	50	45	35
450 - 499	80	65	55	45	40	30
500 - 549	70	60	45	35	35	25
550 - 599	65	55	40	35	30	25
600 - 649	60	45	35	30	25	25
650 - 699	55	35	35	30	25	20
700 - 749	50	35	30	25	20	20
750 or More	45	35	25	25	20	20

OPPOSING VOLUME	THROUGH VOLUME PLUS RIGHT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
100 - 149	70	60	50	45	40	35
150 - 199	60	55	45	40	35	30
200 - 249	55	50	40	35	30	30
250 - 299	50	45	35	30	30	30
300 - 349	45	40	35	30	25	25
350 - 399	40	35	30	25	25	20
400 - 449	35	30	30	25	20	20
450 - 499	30	25	25	20	20	20
500 - 549	25	25	20	20	20	15
550 - 599	25	20	20	20	20	15
600 - 649	25	20	20	20	20	15
650 - 699	20	20	20	20	20	15
700 - 749	20	20	20	15	15	15
750 or More	20	20	20	15	15	15

* Or through volume only if a right-turn lane exists

Intersection	Time Period	(Equivalent) Opposing Volume	(Equivalent) Through Volume	Left-Turn Volume	Warrant Threshold	Left-Turn Lane Warranted (Yes / No)
Sherrill / Driveway	2024 AM	156	415	22	55	No
Sherrill / Driveway	2024 PM	257	99	81	130	No
Sherrill / Driveway	2029 AM	172	458	22	45	No
Sherrill / Driveway	2029 PM	283	110	81	130	No

<p>TABLE 5B</p> <p>KNOX COUNTY RIGHT-TURN LANE VOLUME THRESHOLDS</p> <p>FOR 2-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH</p>	<p>Project No: 1633-0000</p> <p>Project Name: Century Park Apts TIS</p> <p>Notes: Combined Volumes</p>
---	--

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	< 100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25						
25 - 49						
50 - 99						
100 - 149						
150 - 199						
200 - 249						Yes
250 - 299					Yes	Yes
300 - 349				Yes	Yes	Yes
350 - 399			Yes	Yes	Yes	Yes
400 - 449			Yes	Yes	Yes	Yes
450 - 499		Yes	Yes	Yes	Yes	Yes
500 - 549		Yes	Yes	Yes	Yes	Yes
550 - 599	Yes	Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 599	= / > 600
Fewer Than 25						
25 - 49					Yes	Yes
50 - 99				Yes	Yes	Yes
100 - 149			Yes	Yes	Yes	Yes
150 - 199		Yes	Yes	Yes	Yes	Yes
200 - 249	Yes	Yes	Yes	Yes	Yes	Yes
250 - 299	Yes	Yes	Yes	Yes	Yes	Yes
300 - 349	Yes	Yes	Yes	Yes	Yes	Yes
350 - 399	Yes	Yes	Yes	Yes	Yes	Yes
400 - 449	Yes	Yes	Yes	Yes	Yes	Yes
450 - 499	Yes	Yes	Yes	Yes	Yes	Yes
500 - 549	Yes	Yes	Yes	Yes	Yes	Yes
550 - 599	Yes	Yes	Yes	Yes	Yes	Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

* Or through volume only if a left-turn lane exists

Intersection	Time Period	(Equivalent) Through Volume	Right-Turn Volume	Right-Turn Lane Warranted (Yes / No)
Sherrill / DW	2024 AM	154	5	No
Sherrill / DW	2024 PM	248	17	No
Sherrill / DW	2029 AM	170	5	No
Sherrill / DW	2029 PM	274	17	No

APPENDIX D – CITY OF KNOXVILLE COMMENTS

Date: May 23, 2022

Project Name: Century Park Multi-Family Development (Sugarloaf Apartments)

To: TTCDA and City of Knoxville Engineering

**Subject: TIS Comment Response Document for Century Park Multi-Family Development
Review Comments Dated May 17, 2022.**

Dear TTCDA and City of Knoxville staff,

The following comment response document is submitted to address comments dated May 17, 2022:

Reviewer Comment: Study states Dutchtown Road, Sherrill Boulevard, and Mabry Hood Road are maintained by Knox County. The roads in the vicinity of the site are all partially or entirely in the City of Knoxville, please adjust the study accordingly. (Page 6)

Response: The Existing Roadway Conditions section of the report (old page 6 / new page 7) has been updated to reflect the study roadways are maintained by the City of Knoxville.

Reviewer Comment: Study assigns a LOS “F” to Mabry Hood/Dutchtown intersection, specifically the southbound right turn. The existing allows for free flow right turns, but the analysis does not address this condition. Please address the right turn lane’s channelized condition and how that affects the LOS. (Pages 7, C-24, C-25)

Response: Unsignalized capacity analyses were updated to remove the southbound right-turn volumes from the analyses. For the A.M. conditions, the removal of the southbound right-turns decreased the southbound approach delay. However, for the P.M. conditions the southbound left-turn and through movements contributed the greater delay. Removal of the southbound right-turn volumes from the analyses for the P.M. conditions did not reduce the overall approach delay. Updates to text on pages 8 10,14, and 20 (new page numbers) and Table 3 on page 19 (old page 18).

Reviewer Comment: Study states full buildout will occur in 2023. NOI submitted with site plan states construction will not be complete until 2024, please adjust the TIS accordingly. (Page 9)

Response: Updated Figures 5, 6, 9, & 10. Updated all background and combined years analyses – capacity, signal warrant, and turn lane analyses.

Reviewer Comment: Study states that a turn lane is not warranted at the Sherrill Boulevard entrance. Due to the amount of traffic and the 4-lane configuration of Sherrill, a turn lane will be required for the project. Please specify a design for the turn lane in the TIS (as a 4th recommendation of the study). (Page 20)

Response: A southbound left-turn lane on Sherrill Boulevard at the proposed site entrance has been added to the recommendations. (New page 21 and 22). Design parameters for the southbound left-turn lane were included in the recommendations. (New page 22)

Reviewer Comment: Provide a stamped drawing showing the appropriate sight distance triangles for the driveways. The sight distance submittal shall specify the required sight distance per AASHTO (Green Book 7th Edition) intersection sight distance standards, the posted speed limit, the grades of the roadways, and all assumptions. Ensure there are no vertical (e.g. plants or utilities) or horizontal obstructions; provide sight line profiles when appropriate. (Page 20)

Response: Sight distance measurements were added to the discussion on page 21 (old page 20). Sight distance triangle drawing has been added to the TTCDA resubmittal plan set.

Sincerely,



Rebecca Bottoms, P.E., PTOE

Date: June 16, 2022

Project Name: Century Park Multi-Family Development (Sugarloaf Apartments)

To: TTCDA and City of Knoxville Engineering

**Subject: TIS Comment Response Document for Century Park Multi-Family Development
Review Comments Dated June 9, 2022.**

Dear TTCDA and City of Knoxville staff,

The following comment response document is submitted to address comments dated June 9, 2022:

Reviewer Comment: Provide a stamped drawing showing the appropriate sight distance triangles for the driveways. The sight distance submittal shall specify the required sight distance per AASHTO (Green Book 7th Edition) intersection sight distance standards, the posted speed limit, the grades of the roadways, and all assumptions. Ensure there are no vertical (e.g. plants or utilities) or horizontal obstructions; provide sight line profiles when appropriate. (Page 20)

- i. **Mabry Hood southbound has an approximate down grade of 6% and requires an adjustment factor of 1.1.**

Response: According to the Green Book, for intersections with Stop Control on the minor roadway adjustments of the recommended sight distance values are generally not needed to due grades on the major roadway (Green Book page 9-45). Exceptions would be if the minor roadway experiences heavy vehicles and is located near a sag vertical curve. Neither condition exist.

- ii. **Required right turn sight distance on Sherrill should be 385 ft per AASHTO table 9-9, drawing states 305 ft.**

Response: City comment is correct. The required right -turn sight distance on Sherrill Blvd should have been stated as 385 feet. The table on the drawing has been updated to reflect the overall required sight distance of 500 feet, which is based on the left-turn movement since the requirements for the left-turn movement is greater than the right-turn movement.

- iii. **Please provide sight line profiles for Mabry Hood entrance.**

Response: Sight line provide for the Mabry Hood entrance has been added to the Sight Triangles plan sheet (Sheet 2).

- iv. **Sight distance should be measured along the roadway, submitted drawing measures the line of sight.**

Response: The dimensional arrows have been revised to indicate the sight distance was measured along the roadway.

Sincerely,



Rebecca Bottoms, P.E., PTOE