BERTIN ENGINEERING

TRAFFIC IMPACT STUDY

Residential Development
Grover's Mill Road
Lawrence, New Jersey

BE: 21-210TR

March 19, 2024

PREPARED FOR: **Tricone Company**
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Residential Development
Grover's Mill Road
Lawrence, New Jersey

BE: 21-210TR

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Residential Development
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Lawrence, New Jersey

BE: 21-210TR

1.0 Introduction

This report addresses the traffic impact associated with the development of a proposed residential development by Tricone Company. The site is located on the north side of Grovers Mill Road at the intersection with the Mall Access Road in the Township of Lawerence, Mercer County, New Jersey.

The traffic impact study includes:

(a) An inventory of the existing roads and traffic controls;
(b) Traffic counts at the Grovers Mill Road – Mall Access Road & the Mall Access Road – Outer Ring Road intersection to determine the existing traffic in the area;
(c) An estimate of the traffic to be generated by the project; and
(d) An analysis of the impact this traffic will have on local traffic.

2.0 Site

2.1 The site is located in the AT-3 (Apartment & Township Residential) Zone of the Township of Lawrence. The land uses in the area are a combination of residential and commercial, including the "Quaker Bridge Mall" to the north, car dealerships along Route 1 to the west and residential developments to the east.

2.2 The property is located on the north side of Grovers Mill Road as seen below.

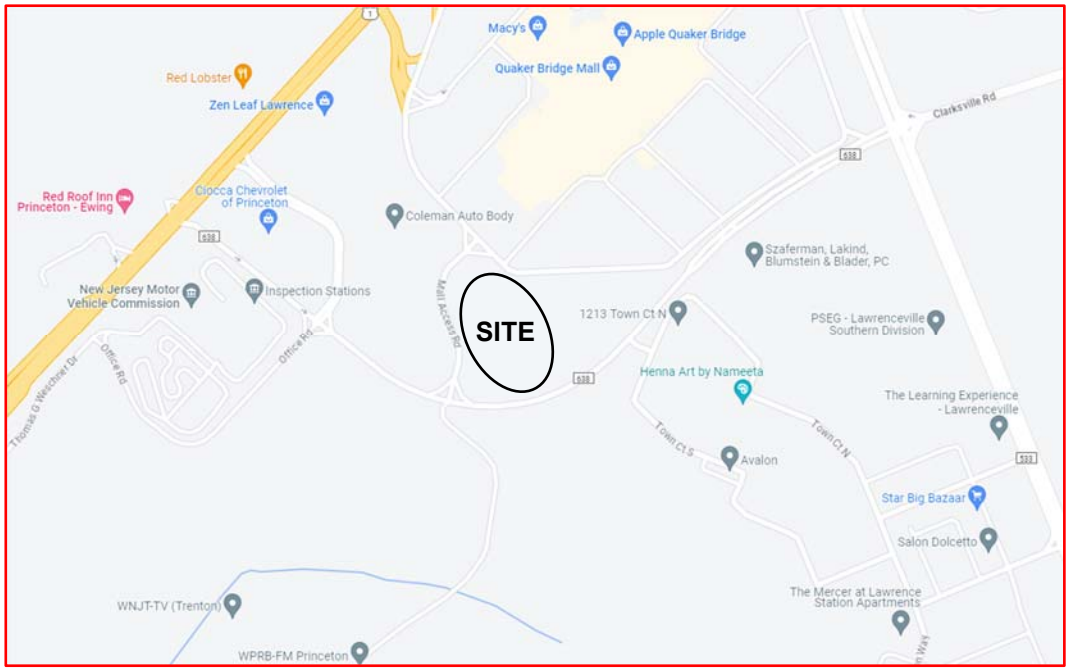


Figure 1 – Street Location

Figure 2 - Aerial

2.3 The property is currently vacant and entirely wooded. The site is 6.86 acres in area with approximately 600 feet of frontage along Grovers Mill Road and approximately 630 feet of frontage along Mall Access Road.

2.4 Bus stops are available in the area on Grover's Mill Road to the east of the site and at the Quaker Bridge Mall to the north of the site. School bus routes currently travel along Grover's Mill Road.

2.5 The rationale for choosing this area is that the location is consistent with existing residential uses in the area and has convenient access to nearby transit via bus stops and close proximity to major highways.

3.0 Roadways

3.1 **Grovers Mill Road (County Route 638)** is a county roadway that travels in a general east-west direction. It contains one travel lane in each direction separated by a solid yellow double line. There is no curbing or sidewalks on either side of the roadway and the posted speed limit is 40 MPH in the vicinity of the site.

3.2 **Mall Access Road** is a local roadway that runs from Grovers Mill Road to the south to Outer Ring Road of the Quaker Bridge Mall to the north. It contains one lane in each direction separated by a solid yellow double line. There is curbing with no sidewalks along both sides of the road and the posted speed limit is 25 MPH in the vicinity of the site.

3.3 **Outer Ring Road** is a local roadway that circulates around the "Quaker Bridge Mall" to the north of the site. It contains two lanes in each direction separated by a solid yellow double line. There is curbing with no sidewalks along both sides of the road and the posted speed limit is 25 MPH in the vicinity of the site.

3.4 The **Grovers Mill Road – Mall Access Road intersection** is a stop-controlled intersection located to southwest of the site with the Mall Access Road acting as the minor roadway approach. The Grovers Mill Road eastbound approach contains two approach lanes including a left-turn only lane and a thru lane. The Grovers Mill Road westbound approach contains one shared thru-right turn lane. The Mall Access Road approach contains two approach lanes including a left-turn only lane and a right-turn only lane.

3.5 The **Mall Access Road – Outer Ring Road intersection** is a stop-controlled intersection located northwest of the site with the Mall Access Road acting as the minor roadway approach. The Outer Ring Road eastbound approach contains two approach lanes including a shared right-turn/thru lane and a thru only lane. The Outer Ring Road westbound approach contains two approach lanes including a shared left-turn/thru lane and a thru only lane. The Mall Access Road approach contains two approach lanes including a left-turn only lane and a right-turn only lane.

4.0 Traffic Activity

4.1 A study of traffic activity was conducted at the Grovers Mill Road – Mall Access Road intersection. Traffic was observed and counted on Tuesday, September 19, 2023 during the morning peak period between the hours of 7:00 AM and 9:00 AM and the evening peak period between the hours of 4:00 PM and 6:00 PM. The traffic activity for the weekday morning and weekday evening are summarized in the following table. The traffic count sheets are attached, and the peak-hour traffic volume is shown in **Figure 3**.

GROVERS MILL ROAD – MALL ACCESS ROAD INTERSECTION Peak-Hour Traffic						
Peak Hour	Grovers Mill Road				Mall Access Road	
	Eastbound		Westbound		Southbound	
	Left	Thru	Thru	Right	Left	Right
AM (8:00-9:00)	46	471	57	44	6	34
PM (4:15-5:15)	98	668	41	44	42	22

4.2 The majority of traffic travels on Grovers Mill Road eastbound with the greater volume in the PM peak-hour. Mall Access Road was found to have more volume in the PM peak-hour. The maximum observed queue on the southbound approach of Mall Access Road was 2 vehicles.

4.3 A study of traffic activity was also conducted at the Mall Access Road – Outer Ring Road intersection. Traffic was observed and counted on Tuesday, September 19, 2023 during the morning peak period between the hours of 7:00 AM and 9:00 AM and the evening peak period between the hours of 4:00 PM and 6:00 PM. The traffic activity for the weekday morning and weekday evening are summarized in the following table. The traffic count sheets are attached and the peak-hour traffic volume is shown in **Figure 3**.

MALL ACCESS ROAD – OUTER RING INTERSECTION Peak-Hour Traffic						
Peak Hour	Outer Ring Road				Mall Access Road	
	Eastbound		Westbound		Northbound	
	Thru	Right	Left	Thru	Left	Right
AM (8:00-9:00)	20	33	6	31	79	13
PM (4:15-5:15)	35	47	17	84	98	43

4.4 The majority of traffic on Mall Access Road eastbound turns left onto Outer Ring Road with a greater volume in the PM peak-hour. The majority of traffic on Outer Ring Road travels eastbound in the AM peak-hour and westbound in the PM peak-hour. The maximum observed queue on the northbound approach of Mall Access Road was 2 vehicles.

4.5 There was minimal truck traffic observed with more volume in the morning. At the AM peak-hour, a total of 26 trucks were observed at the Grovers Mill Road–Mall Access Road intersection and a total of 16 trucks were observed at the Mall Access Road–Outer Ring Road intersection.

4.6 There was minimal pedestrian traffic during the studied time periods with one pedestrian observed crossing Outer Ring Road in the AM peak hour.

5.0 Proposed Development

5.1 The applicant proposes to construct six (6) residential buildings at the project site including two (2) multi-family apartment buildings and four (4) townhouse buildings. There will be a total of 85 units in the proposed development including 54 apartment units and 31 townhouse units. There is parking provided in front of the proposed buildings as well as garage parking located under the two (2) multi-family apartment buildings.

5.2 The site will have two access driveways along the Mall Access Road including a right-turn only ingress and egress driveway closest to Grovers Mill Road and a full movement driveway closest to the Outer Ring Road.

5.3 Trash rooms are provided near the garage entrance for both apartment buildings to be picked up by a private hauler.

5.4 The development will also include a proposed pool with pool house and dog run located in the center of the property between the townhouse buildings.

6.0 Site Circulation & Pedestrian Access

6.1 The proposed interior parking aisles will be 24 feet wide for two-way traffic to provide adequate circulation and the proposed parking spaces will be 9 feet x18 feet.

6.2 The site circulation complies with the Lawrence Township Master Plan as the layout was designed to provide efficient movements of people and goods. Private garbage haulers can safely circulate the site for trash pick up during non-peak traffic hours.

6.3 Sidewalks which are 5 feet wide are proposed from Mall Access Road that access the building entrances of the multi-family apartment buildings. Interior crosswalks are also provided which access the interior townhouses.

7.0 Parking

7.1 The Township of Lawrence zoning ordinance requires 1.8 spaces for every 1-Bedroom apartment unit, 2.0 spaces for every 2-Bedroom apartment unit and 2.1 spaces for every 3-Bedroom apartment unit. The total number of spaces required by ordinance is calculated below:

1-Bedroom (15 Units)	= 15 x 1.8	= 27 spaces
2-Bedroom (36 Units)	= 36 x 2.0	= 72 spaces
3-Bedroom (3 Units)	= 3 x 2.1	= 6.3 spaces
		105 spaces required

7.2 There will be a total of 105 parking spaces provided for the apartment buildings included 37 spaces for the northernmost Building ‘A’ (14 surface spaces and 23 garage spaces) and 55 parking spaces for the southernmost Building ‘F’ (20 surface spaces and 35 garage spaces).

7.3 There will also be 13 parking spaces located in front of the proposed pool and dog run for a total of **105 parking spaces** provided overall for the two (2) apartment buildings.

7.4 The ADA requires 5 accessible parking spaces for lots from 101 to 150 spaces. Six (6) accessible handicap spaces are provided, which are in both parking garages and in front of the proposed pool.

7.5 The Township of Lawrence zoning ordinance requires 2.4 spaces for each townhouse unit for a total of 75 parking spaces required. Each proposed townhouse will provide 2 garage spaces and 1 driveway space for a total of **93 parking spaces** provided for the 31 proposed townhouse units.

7.6 There will be 16 electric vehicle supply equipment (EVSE) spaces proposed and according to recent state legislature, EV spaces shall be counted as 2 for the purpose of complying with required parking resulting in no more than 10% of required.

When accounting for this, 10 of the EVSE can be counted as 2, which will bring the total amount of proposed parking to **208 parking spaces.**

8.0 Traffic Generation and Distribution

8.1 The amount of traffic to be generated has been determined from data published in the TRIP GENERATION, 11th Edition manual, published by the Institute of Transportation Engineers (ITE). "Multifamily Housing (Low-Rise)" (Land Use Code 220) will be used for the proposed use and the table below shows the anticipated traffic to be generated by the proposed development during the weekday peak-hours.

SITE GENERATED TRAFFIC						
Land Use	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Multi-Family Residential (85 Units)	3	23	26	27	3	30
Total Trips Generated	**3**	**23**	**26**	**24**	**3**	**30**

8.2 The site-generated traffic has been dispersed onto Mall Access Road as per the existing traffic distribution and the anticipated movements and is shown in **Figure 4.**

9.0 Traffic Impact

9.1 It is anticipated that the residential development will be completed in 2028, the "Build-Year". The traffic growth rate used by the NJDOT for this area is 1.0% per year. The "No Build Year" traffic is shown on **Figure 5** and the combined site-generated and "No Build Year" traffic, which is the "Build-Year Traffic", is shown on **Figure 6**.

GROVERS MILL ROAD – MALL ACCESS ROAD INTERSECTION Level of Service (LOS) Analysis						
	Morning Peak-Hour			Afternoon Peak-Hour		
Approach	Existing	No Build	Build-Year	Existing	No Build	Build-Year
Southbound (Mall Access Road)	A (9.7 sec.)	A (9.7 sec.)	B (10.6 sec.)	C (19.1 sec.)	C (20.7 sec.)	C (21.9 sec.)
Eastbound (Grovers Mill Road)	A (0.7 sec.)	A (0.7 sec.)	A (0.7 sec.)	A (1.0 sec.)	A (1.0 sec.)	A (1.1 sec.)

9.2 A capacity analysis has been performed to determine the operating conditions, or Level of Service (LOS), at the Grovers Mill Road – Mall Access Road intersection during existing conditions, "no build-year" conditions, and "build-year" traffic conditions. The results of this analysis are shown in the table below and the worksheets attached.

9.3 The LOS of the Grovers Mill Road – Mall Access Road intersection is not significantly impacted by the site-generated traffic with the LOS of the Mall Access Road approach degrading from an 'A' to a 'B' in AM peak-hour and remaining a LOS 'C' in the PM peak-hour. The Mall Access Road approach delay increased by 0.9 seconds in the AM peak-hour and 1.2 seconds in the PM peak-hour.

9.4 An access driveway to a broadcasting station exists on the south side of the intersection, which was not utilized during the site investigation and, therefore, not included in the analysis.

9.5 A capacity analysis has been performed to determine the operating conditions, or Level of Service (LOS), at the Outer Ring Road – Mall Access Road intersection during existing conditions, "no build-year" conditions, and "build-year" traffic conditions. The results of this analysis are shown in the table below and the worksheets attached.

OUTER RING ROAD – MALL ACCESS ROAD INTERSECTION Level of Service (LOS) Analysis						
	Morning Peak-Hour			Afternoon Peak-Hour		
Approach	Existing	No Build	Build-Year	Existing	No Build	Build-Year
Northbound (Mall Access Road)	A (9.3 sec.)	A (9.4 sec.)	A (9.4 sec.)	A (9.8 sec.)	A (9.9 sec.)	A (10.0 sec.)
Westbound (Outer Ring Road)	A (1.3 sec.)	A (1.2 sec.)	A (1.2 sec.)	A (1.3 sec.)	A (1.3 sec.)	A (1.4 sec.)

9.6 The LOS of the Outer Ring Road – Mall Access Road intersection is not significantly impacted by the site-generated traffic and no approach LOS is degraded upon completion of the project. The Mall Access Road approach delay increases by 0.1 seconds in the PM peak-hour.

9.7 A capacity analysis has also been performed at the proposed northernmost site driveway on Mall Access Road during the weekday peak hours under the Build-Year conditions and the results are shown in the table below and the worksheets attached.

Mall Access Road – Proposed Northern Site Driveway Intersection Level of Service (LOS) (Build-Year 2028)		
	AM Peak-Hour	PM Peak-Hour
Northern Site Driveway (Westbound)	A (9.2 sec)	A (9.7 sec)
Mall Access Road (Southbound)	A (0.0 sec)	A (0.7 sec)

9.8 The LOS of the Mall Access Road – Northern Site Driveway Intersection during peak hours will be acceptable upon completion of the project.

9.9 A capacity analysis has also been performed at the proposed southernmost site driveway on Mall Access Road during the weekday peak hours under the Build-Year conditions and the results are shown in the table below and the worksheets attached.

Mall Access Road – Proposed Southern Site Driveway Intersection Level of Service (LOS) (Build-Year 2028)		
	AM Peak-Hour	PM Peak-Hour
Southern Site Driveway (Westbound)	A (8.6 sec)	A (9.2 sec)

9.10 The LOS of the Mall Access Road – Southern Site Driveway Intersection during peak hours will be acceptable upon completion of the project.

10.0 Conclusion

The proposed development will not have a substantial negative impact on area traffic for the reasons discussed in this report and summarized below:

(a) The proposed residential development is compatible from a traffic generation standpoint with the surrounding properties in the area;

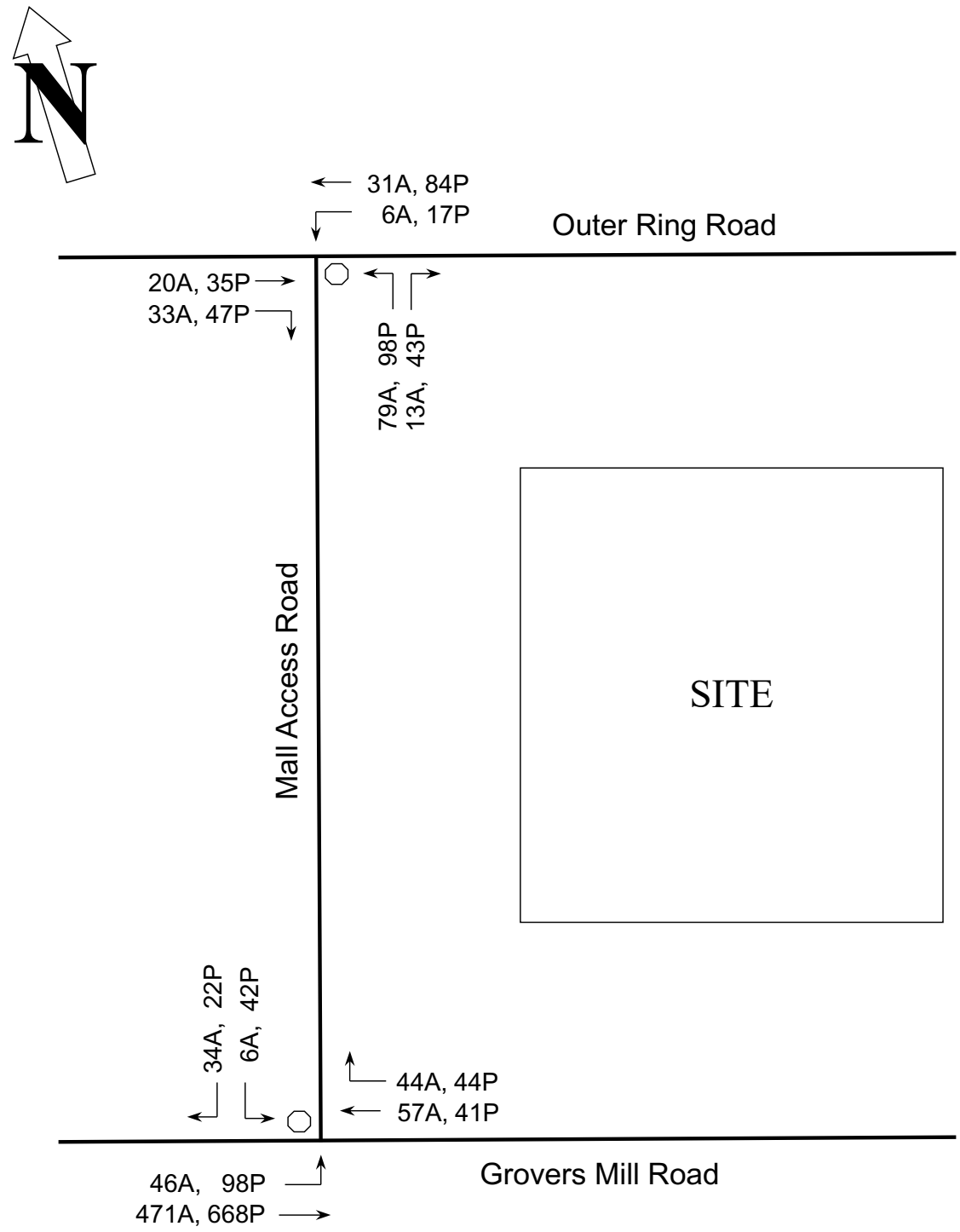
(b) The proposed access driveways for the site are properly located to provide sufficient sight visibility of the street traffic;

(c) The on-site vehicular traffic circulation is safe and efficient;

(d) The proposed sidewalks promote transit use and a reduction in vehicle trips.

(e) The overall LOS of the studied intersections are adequate upon completion of the project, and

(f) The LOS of both site driveways are adequate upon completion of the project.



LEGEND

12A = AM Peak-hour traffic
12P = PM Peak-hour traffic
= Traffic Signal
= Stop Sign

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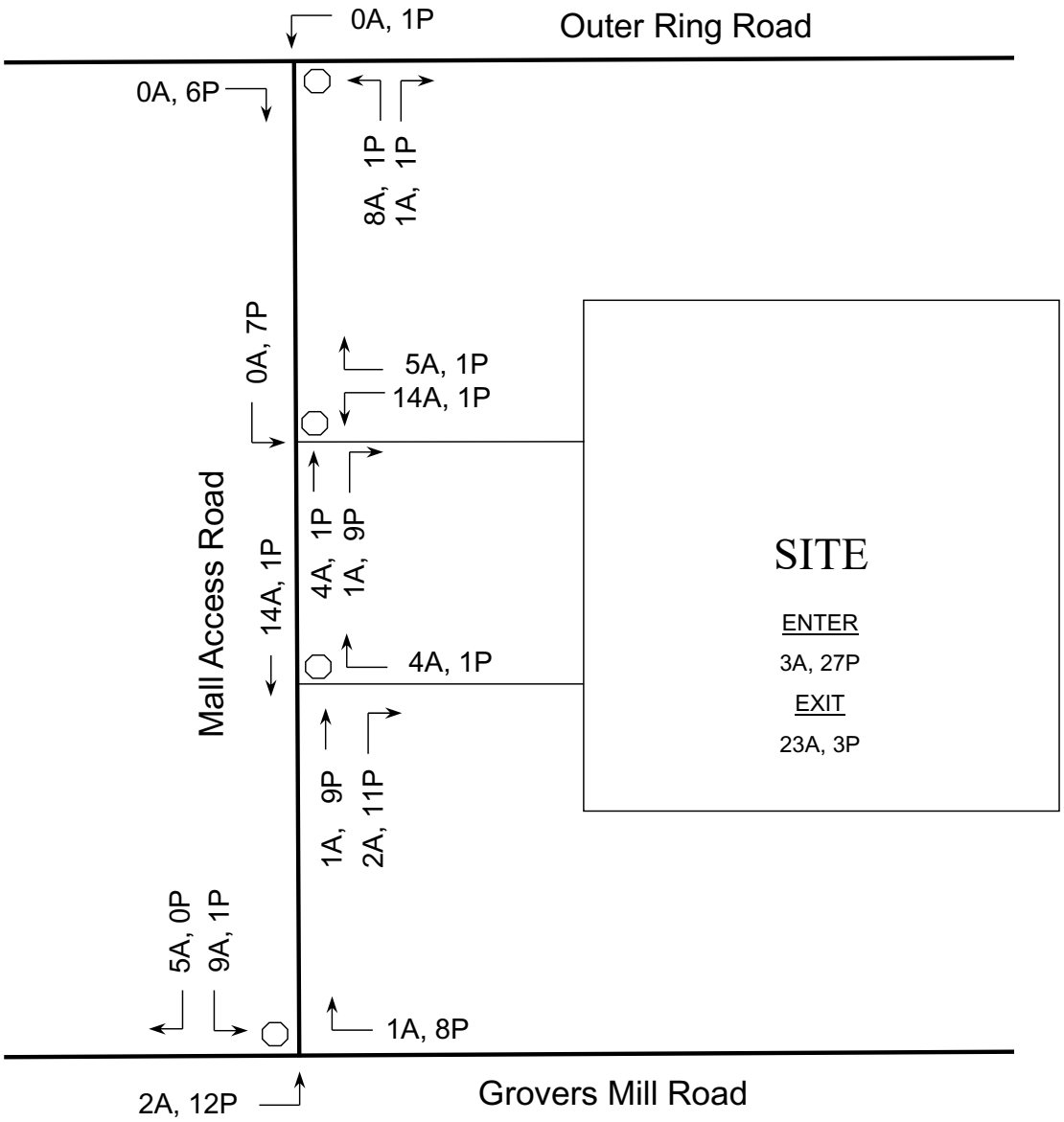
Existing Peak-Hour Traffic (2023)

Grovers Mill Road & Mall Access Road
Lawrence, New Jersey

November, 2023

BE No. 21-210

FIGURE 3



LEGEND

12A = AM Peak-hour traffic
12P = PM Peak-hour traffic
= Traffic Signal
= Stop Sign

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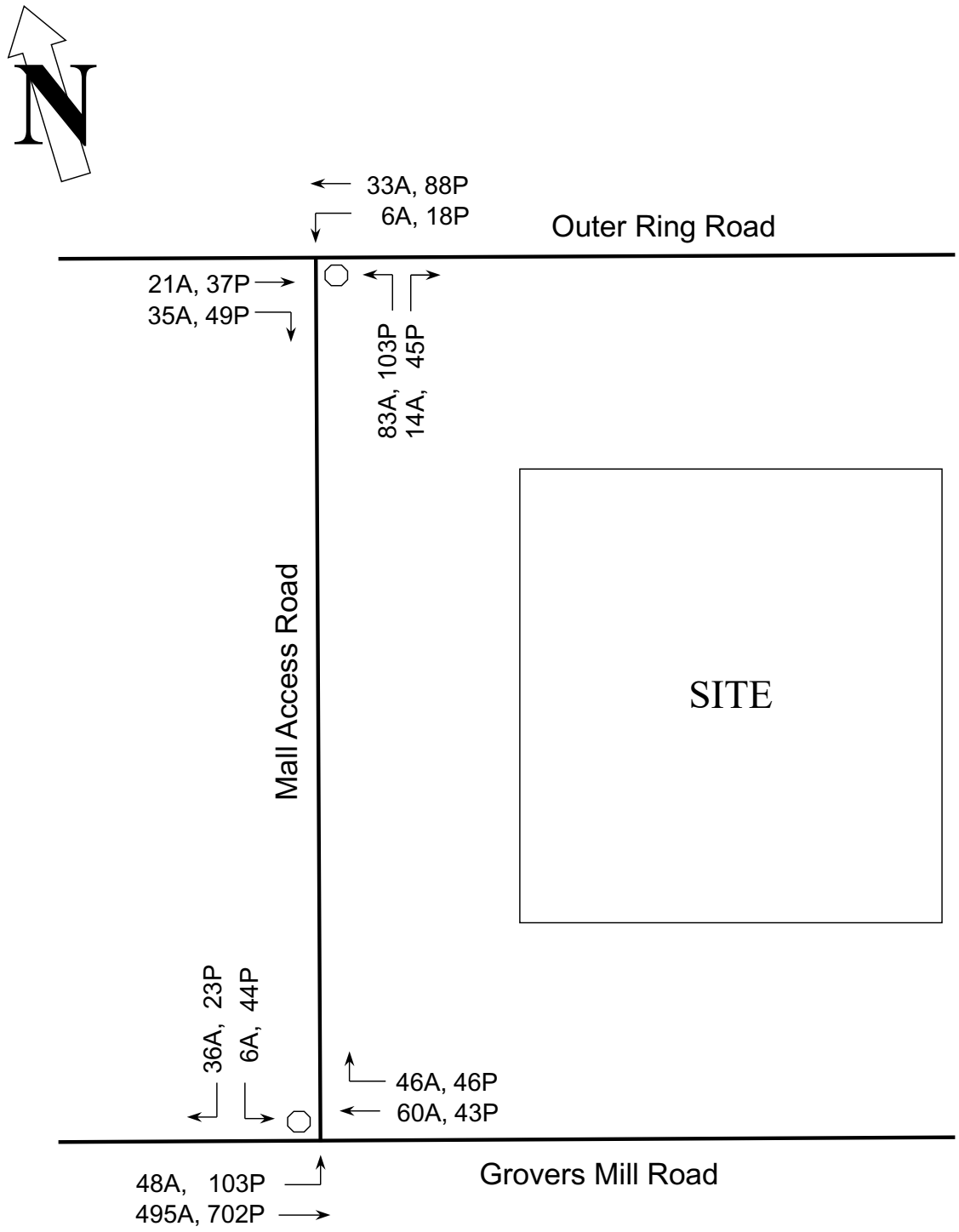
Site Generated Peak-Hour Traffic (2028)

Grovers Mill Road & Mall Access Road
Lawrence, New Jersey

November, 2023

BE No. 21-210

FIGURE 4



LEGEND

12A = AM Peak-hour traffic
12P = PM Peak-hour traffic
= Traffic Signal
= Stop Sign

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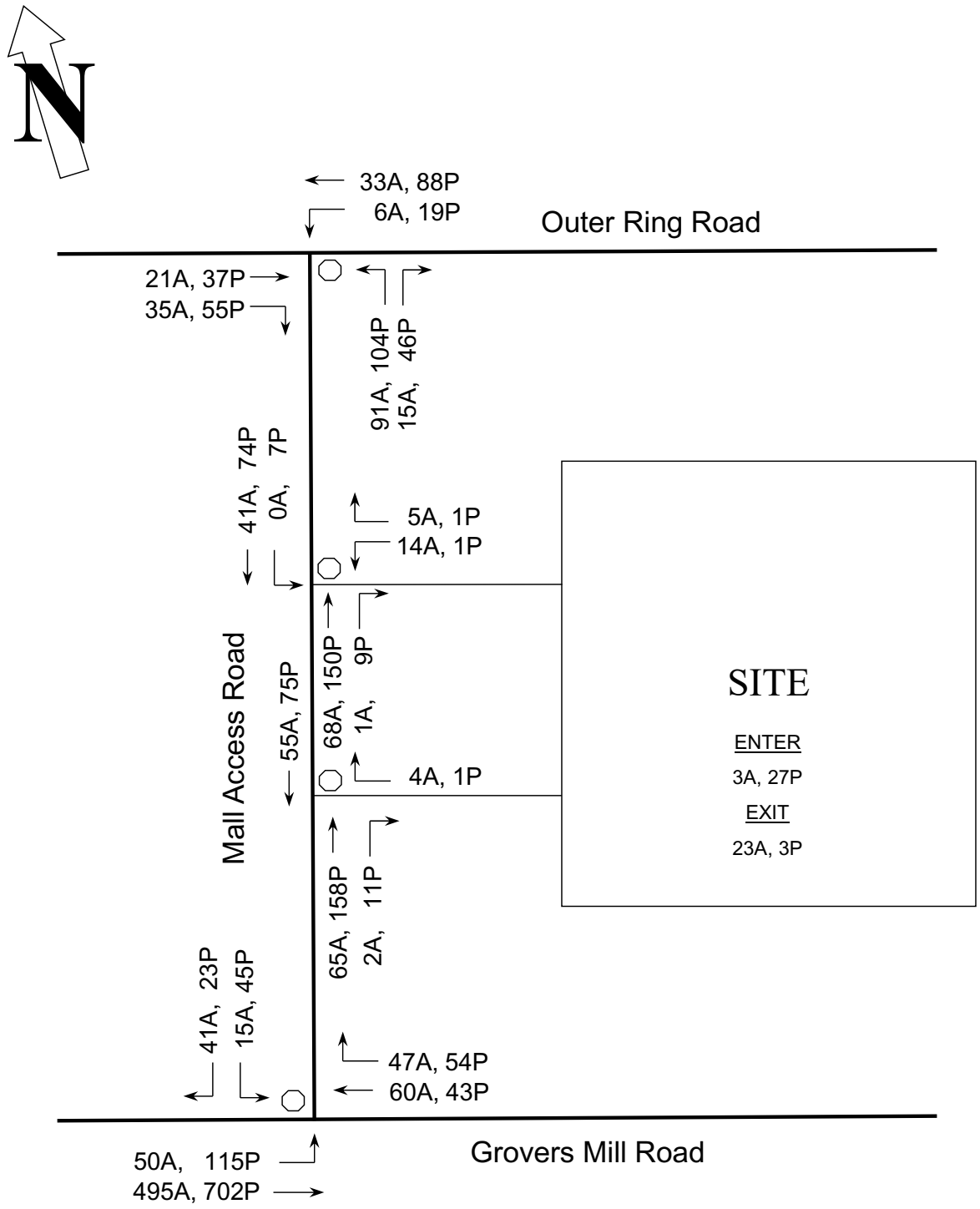
No Build Year Peak-Hour Traffic (1% Increase) (2028)

Grovers Mill Road & Mall Access Road
Lawrence, New Jersey

November, 2023

BE No. 21-210

FIGURE 5



LEGEND

12A = AM Peak-hour traffic
12P = PM Peak-hour traffic
= Traffic Signal
= Stop Sign

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Build-Year Peak-Hour Traffic (2028)

Grovers Mill Road & Mall Access Road
Lawrence, New Jersey

November, 2023

BE No. 21-210

FIGURE 6

HCS Two-Way Stop-Control Report

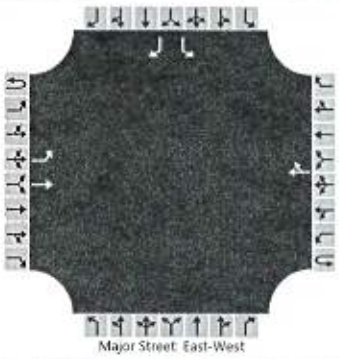
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2023
Time Analyzed	AM Existing
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Grovers Mill Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Grovers Mill Road
North/South Street	Mall Access Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		46	471				57	44						6		34
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized														No		
Median Type | Storage			Undivided													

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		50												7		37
Capacity, c (veh/h)		1474												391		970
v/c Ratio		0.03												0.02		0.04
95% Queue Length, Q_{95} (veh)		0.1												0.1		0.1
Control Delay (s/veh)		7.5												14.4		8.9
Level of Service (LOS)		A												B		A
Approach Delay (s/veh)		0.7												9.7		
Approach LOS		A												A		

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HCS Two-Way Stop-Control Report

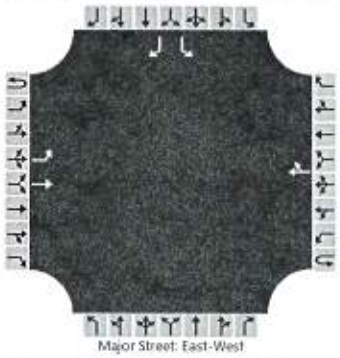
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	AM No-Build
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Grovers Mill Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Grovers Mill Road
North/South Street	Mall Access Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		48	495				60	46						6		36
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized														No		
Median Type | Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		52												7		39
Capacity, c (veh/h)		1467												373		965
v/c Ratio		0.04												0.02		0.04
95% Queue Length, Q_{95} (veh)		0.1												0.1		0.1
Control Delay (s/veh)		7.5												14.8		8.9
Level of Service (LOS)		A												B		A
Approach Delay (s/veh)	0.7												9.7			
Approach LOS	A												A			

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HCS Two-Way Stop-Control Report

General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	AM Build-Year
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

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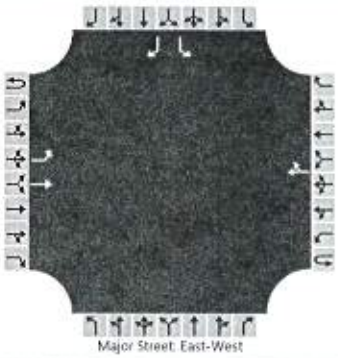
East/West Street	Grovers Mill Road
North/South Street	Mall Access Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		50	495				60	47						15		41
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized														No		
Median Type | Storage			Undivided													

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		54												16		45
Capacity, c (veh/h)		1466												370		964
v/c Ratio		0.04												0.04		0.05
95% Queue Length, Q_{95} (veh)		0.1												0.1		0.1
Control Delay (s/veh)		7.6												15.2		8.9
Level of Service (LOS)		A												C		A
Approach Delay (s/veh)		0.7												10.6		
Approach LOS		A												B		

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HCS Two-Way Stop-Control Report

General Information

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Time Analyzed	PM Existing
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Project Description	Proposed Residential - 21-210

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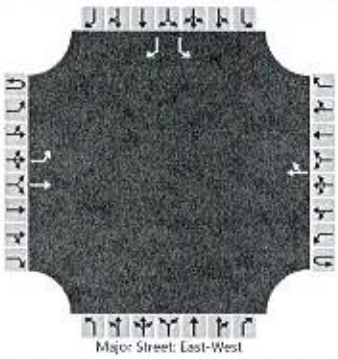
Jurisdiction	Lawrence
East/West Street	Grovers Mill Road
North/South Street	Mall Access Road
Peak Hour Factor	0.88
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		98	668				41	44						42		22
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized														No		
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		111												48		25
Capacity, c (veh/h)		1497												232		991
v/c Ratio		0.07												0.21		0.03
95% Queue Length, Q_{95} (veh)		0.2												0.8		0.1
Control Delay (s/veh)		7.6												24.5		8.7
Level of Service (LOS)		A												C		A
Approach Delay (s/veh)	1.0												19.1			
Approach LOS	A												C			

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HCS Two-Way Stop-Control Report

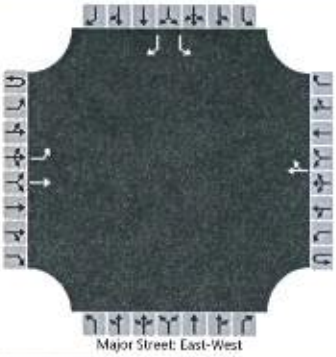
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	PM No-Build
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Grovers Mill Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Grovers Mill Road
North/South Street	Mall Access Road
Peak Hour Factor	0.88
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		103	702				43	46						44		23
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized														No		
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		117												50		26
Capacity, c (veh/h)		1491												214		986
v/c Ratio		0.08												0.23		0.03
95% Queue Length, Q_{95} (veh)		0.3												0.9		0.1
Control Delay (s/veh)		7.6												26.9		8.7
Level of Service (LOS)		A												D		A
Approach Delay (s/veh)	1.0												20.7			
Approach LOS	A												C			

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HCS Two-Way Stop-Control Report

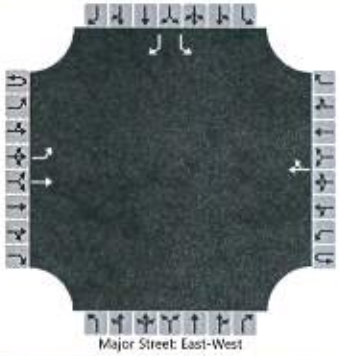
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	PM Build-Year
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Grovers Mill Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Grovers Mill Road
North/South Street	Mall Access Road
Peak Hour Factor	0.88
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0		0	0	0		1	0	1
Configuration		L	T					TR						L		R
Volume (veh/h)		115	702				43	54						45		23
Percent Heavy Vehicles (%)		2												2		2
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized														No		
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		131												51		26
Capacity, c (veh/h)		1480												203		981
v/c Ratio		0.09												0.25		0.03
95% Queue Length, Q_{95} (veh)		0.3												1.0		0.1
Control Delay (s/veh)		7.7												28.7		8.8
Level of Service (LOS)		A												D		A
Approach Delay (s/veh)	1.1												21.9			
Approach LOS	A												C			

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HCS Two-Way Stop-Control Report

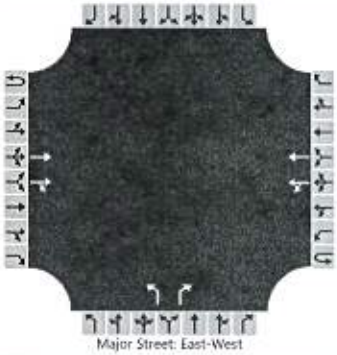
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2023
Time Analyzed	AM Existing
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Outer Ring Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Outer Ring Road
North/South Street	Mall Access Road
Peak Hour Factor	0.80
Analysis Time Period (hrs)	1.00

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	0	2	0	0	0	2	0		1	0	1		0	0	0
Configuration			T	TR		LT	T			L		R				
Volume (veh/h)			20	33		6	31			79		13				
Percent Heavy Vehicles (%)						33				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.5		6.9				
Critical Headway (sec)						4.76				6.86		6.96				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.53				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						8				99		16				
Capacity, c (veh/h)						1334				905		1030				
v/c Ratio						0.01				0.11		0.02				
95% Queue Length, Q_{95} (veh)						0.0				0.4		0.0				
Control Delay (s/veh)						7.7	0.0			9.5		8.6				
Level of Service (LOS)						A	A			A		A				
Approach Delay (s/veh)					1.3				9.3							
Approach LOS					A				A							

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HCS Two-Way Stop-Control Report

General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	AM No-Build
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Outer Ring Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Outer Ring Road
North/South Street	Mall Access Road
Peak Hour Factor	0.80
Analysis Time Period (hrs)	1.00

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	0	2	0	0	0	2	0		1	0	1		0	0	0
Configuration			T	TR		LT	T			L		R				
Volume (veh/h)			21	35		6	33			83		14				
Percent Heavy Vehicles (%)						33				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.5		6.9				
Critical Headway (sec)						4.76				6.86		6.96				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.53				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						8				104		18				
Capacity, c (veh/h)						1329				900		1027				
v/c Ratio						0.01				0.12		0.02				
95% Queue Length, Q_{95} (veh)						0.0				0.4		0.1				
Control Delay (s/veh)						7.7	0.0			9.5		8.6				
Level of Service (LOS)						A	A			A		A				
Approach Delay (s/veh)					1.2				9.4							
Approach LOS					A				A							

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HCS Two-Way Stop-Control Report

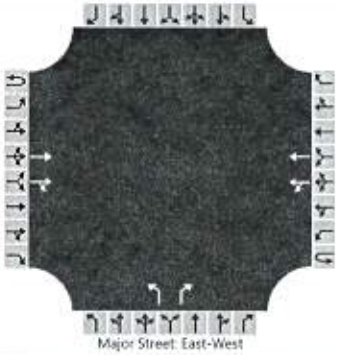
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	AM Build-Year
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Outer Ring Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Outer Ring Road
North/South Street	Mall Access Road
Peak Hour Factor	0.80
Analysis Time Period (hrs)	1.00

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	0	2	0	0	0	2	0		1	0	1		0	0	0
Configuration			T	TR		LT	T			L		R				
Volume (veh/h)			21	35		6	33			91		15				
Percent Heavy Vehicles (%)						33				3		3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.5		6.9				
Critical Headway (sec)						4.76				6.86		6.96				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.53				3.53		3.33				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						8				114		19				
Capacity, c (veh/h)						1329				900		1027				
v/c Ratio						0.01				0.13		0.02				
95% Queue Length, Q_{95} (veh)						0.0				0.4		0.1				
Control Delay (s/veh)						7.7	0.0			9.6		8.6				
Level of Service (LOS)						A	A			A		A				
Approach Delay (s/veh)					1.2				9.4							
Approach LOS					A				A							

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HCS Two-Way Stop-Control Report

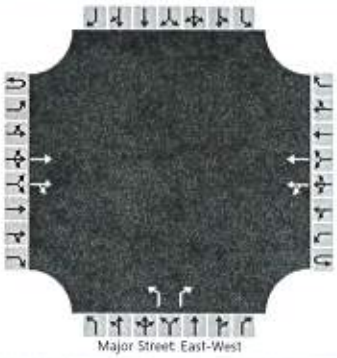
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2023
Time Analyzed	PM Existing
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Outer Ring Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Outer Ring Road
North/South Street	Mall Access Road
Peak Hour Factor	0.82
Analysis Time Period (hrs)	1.00

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	0	2	0	0	0	2	0		1	0	1		0	0	0
Configuration			T	TR		LT	T			L		R				
Volume (veh/h)			35	47		17	84			98		43				
Percent Heavy Vehicles (%)						1				2		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.5		6.9				
Critical Headway (sec)						4.12				6.84		6.94				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						21				120		52				
Capacity, c (veh/h)						1498				799		1008				
v/c Ratio						0.01				0.15		0.05				
95% Queue Length, Q_{95} (veh)						0.0				0.5		0.2				
Control Delay (s/veh)						7.4	0.1			10.3		8.8				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)					1.3				9.8							
Approach LOS					A				A							

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HCS Two-Way Stop-Control Report

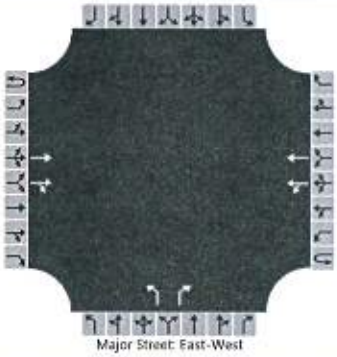
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	PM No-Build
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Outer Ring Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Outer Ring Road
North/South Street	Mall Access Road
Peak Hour Factor	0.82
Analysis Time Period (hrs)	1.00

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	0	2	0	0	0	2	0		1	0	1		0	0	0
Configuration			T	TR		LT	T			L		R				
Volume (veh/h)			37	49		18	88			103		45				
Percent Heavy Vehicles (%)						1				2		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.5		6.9				
Critical Headway (sec)						4.12				6.84		6.94				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						22				126		55				
Capacity, c (veh/h)						1492				789		1004				
v/c Ratio						0.01				0.16		0.05				
95% Queue Length, Q_{95} (veh)						0.0				0.6		0.2				
Control Delay (s/veh)						7.4	0.1			10.4		8.8				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)					1.3				9.9							
Approach LOS					A				A							

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HCS Two-Way Stop-Control Report

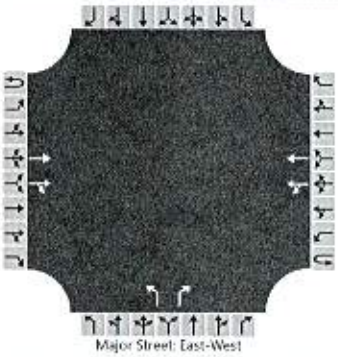
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	PM Build-Year
Intersection Orientation	East-West
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Outer Ring Road - Mall Access Road
Jurisdiction	Lawrence
East/West Street	Outer Ring Road
North/South Street	Mall Access Road
Peak Hour Factor	0.82
Analysis Time Period (hrs)	1.00

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	0	2	0	0	0	2	0		1	0	1		0	0	0
Configuration			T	TR		LT	T			L		R				
Volume (veh/h)			37	55		19	88			104		46				
Percent Heavy Vehicles (%)						1				2		2				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.5		6.9				
Critical Headway (sec)						4.12				6.84		6.94				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.52		3.32				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						23				127		56				
Capacity, c (veh/h)						1483				781		999				
v/c Ratio						0.02				0.16		0.06				
95% Queue Length, Q_{95} (veh)						0.0				0.6		0.2				
Control Delay (s/veh)						7.5	0.1			10.5		8.8				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)					1.4				10.0							
Approach LOS					A				A							

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HCS Two-Way Stop-Control Report

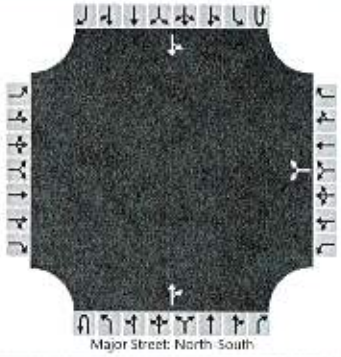
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	AM Build-Year
Intersection Orientation	North-South
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Mall Access Road - Northern Site Driveway
Jurisdiction	Lawrence
East/West Street	Northern Site Driveway
North/South Street	Mall Access Road
Peak Hour Factor	0.80
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						14		5			68	1		0	41	
Percent Heavy Vehicles (%)						0		0						0		
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)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							24							0		
Capacity, c (veh/h)							889							1523		
v/c Ratio							0.03							0.00		
95% Queue Length, Q_{95} (veh)							0.1							0.0		
Control Delay (s/veh)							9.2							7.4	0.0	
Level of Service (LOS)							A							A	A	
Approach Delay (s/veh)					9.2								0.0			
Approach LOS					A								A			

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HCS Two-Way Stop-Control Report

General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	PM Build-Year
Intersection Orientation	North-South
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Mall Access Road - Northern Site Driveway
Jurisdiction	Lawrence
East/West Street	Northern Site Driveway
North/South Street	Mall Access Road
Peak Hour Factor	0.82
Analysis Time Period (hrs)	1.00

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	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						1		1			150	9		7	74	
Percent Heavy Vehicles (%)						0		0						0		
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)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							2							9		
Capacity, c (veh/h)							768							1391		
v/c Ratio							0.00							0.01		
95% Queue Length, Q_{95} (veh)							0.0							0.0		
Control Delay (s/veh)							9.7							7.6	0.0	
Level of Service (LOS)							A							A	A	
Approach Delay (s/veh)					9.7								0.7			
Approach LOS					A								A			

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HCS Two-Way Stop-Control Report

General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	AM Build-Year
Intersection Orientation	North-South
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Mall Access Road - Southern Site Driveway
Jurisdiction	Lawrence
East/West Street	Southern Site Driveway
North/South Street	Mall Access Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

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	0	1	0	0	1	0	0	0	1	0
Configuration								R				TR			T	
Volume (veh/h)								4			65	2			55	
Percent Heavy Vehicles (%)								0								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized						No										
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)								6.2								
Critical Headway (sec)								6.20								
Base Follow-Up Headway (sec)								3.3								
Follow-Up Headway (sec)								3.30								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								4								
Capacity, c (veh/h)								996								
v/c Ratio								0.00								
95% Queue Length, Q_{95} (veh)								0.0								
Control Delay (s/veh)								8.6								
Level of Service (LOS)								A								
Approach Delay (s/veh)						8.6										
Approach LOS						A										

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HCS Two-Way Stop-Control Report

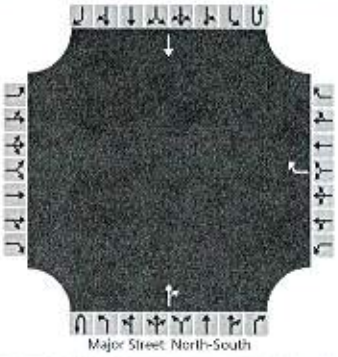
General Information

Analyst	Eric M. Hough
Agency/Co.	Bertin Engineering
Date Performed	11/28/2023
Analysis Year	2028
Time Analyzed	PM Build-Year
Intersection Orientation	North-South
Project Description	Proposed Residential - 21-210

Site Information

Intersection	Mall Access Road - Southern Site Driveway
Jurisdiction	Lawrence
East/West Street	Southern Site Driveway
North/South Street	Mall Access Road
Peak Hour Factor	0.88
Analysis Time Period (hrs)	1.00

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	0	1	0	0	1	0	0	0	1	0
Configuration								R				TR			T	
Volume (veh/h)								1			158	11			75	
Percent Heavy Vehicles (%)								0								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized						No										
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)								6.2								
Critical Headway (sec)								6.20								
Base Follow-Up Headway (sec)								3.3								
Follow-Up Headway (sec)								3.30								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								1								
Capacity, c (veh/h)								862								
v/c Ratio								0.00								
95% Queue Length, Q_{95} (veh)								0.0								
Control Delay (s/veh)								9.2								
Level of Service (LOS)								A								
Approach Delay (s/veh)						9.2										
Approach LOS						A										

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Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

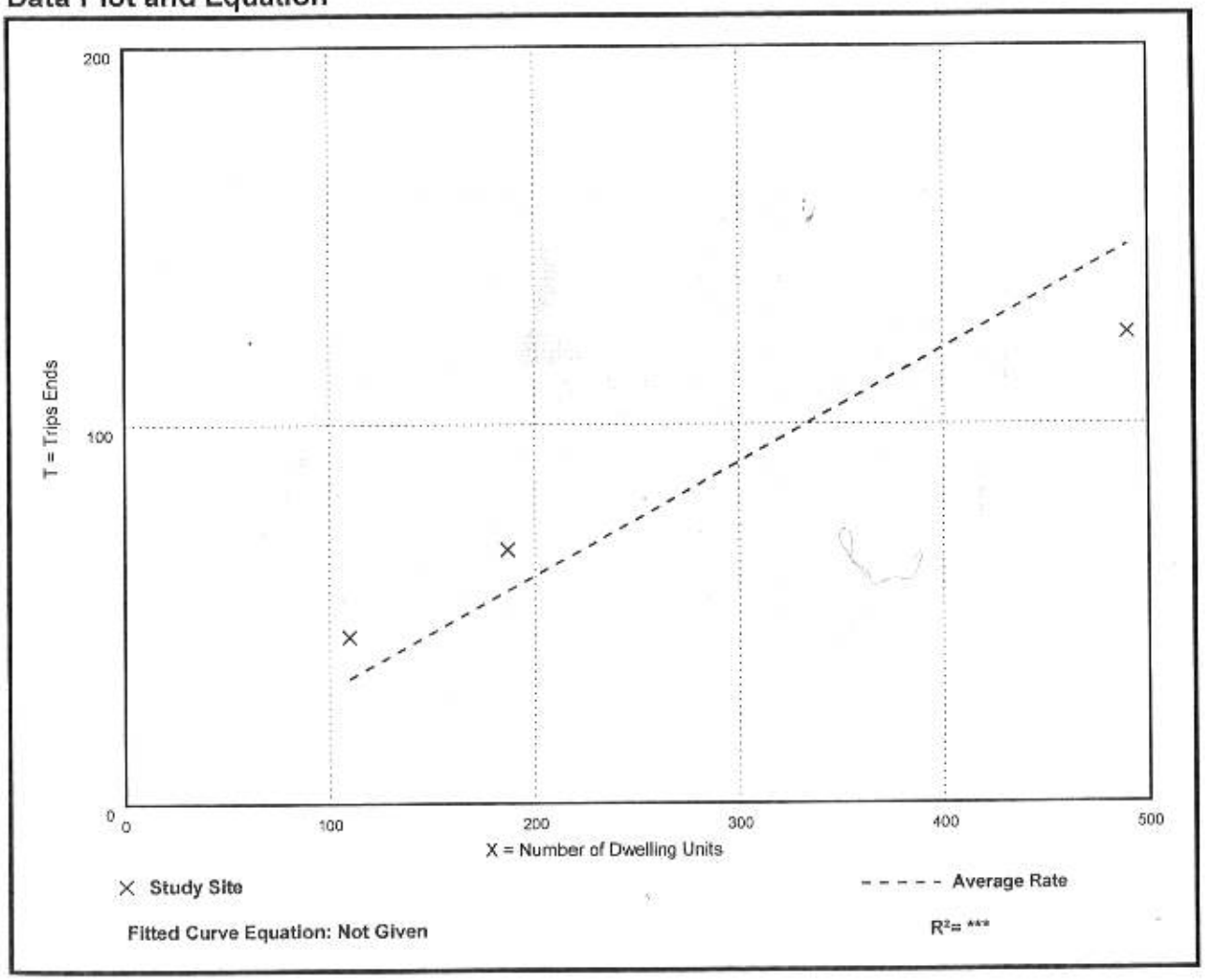
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: Dense Multi-Use Urban
Number of Studies: 3
Avg. Num. of Dwelling Units: 262
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.25 - 0.40	0.07

Data Plot and Equation



Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

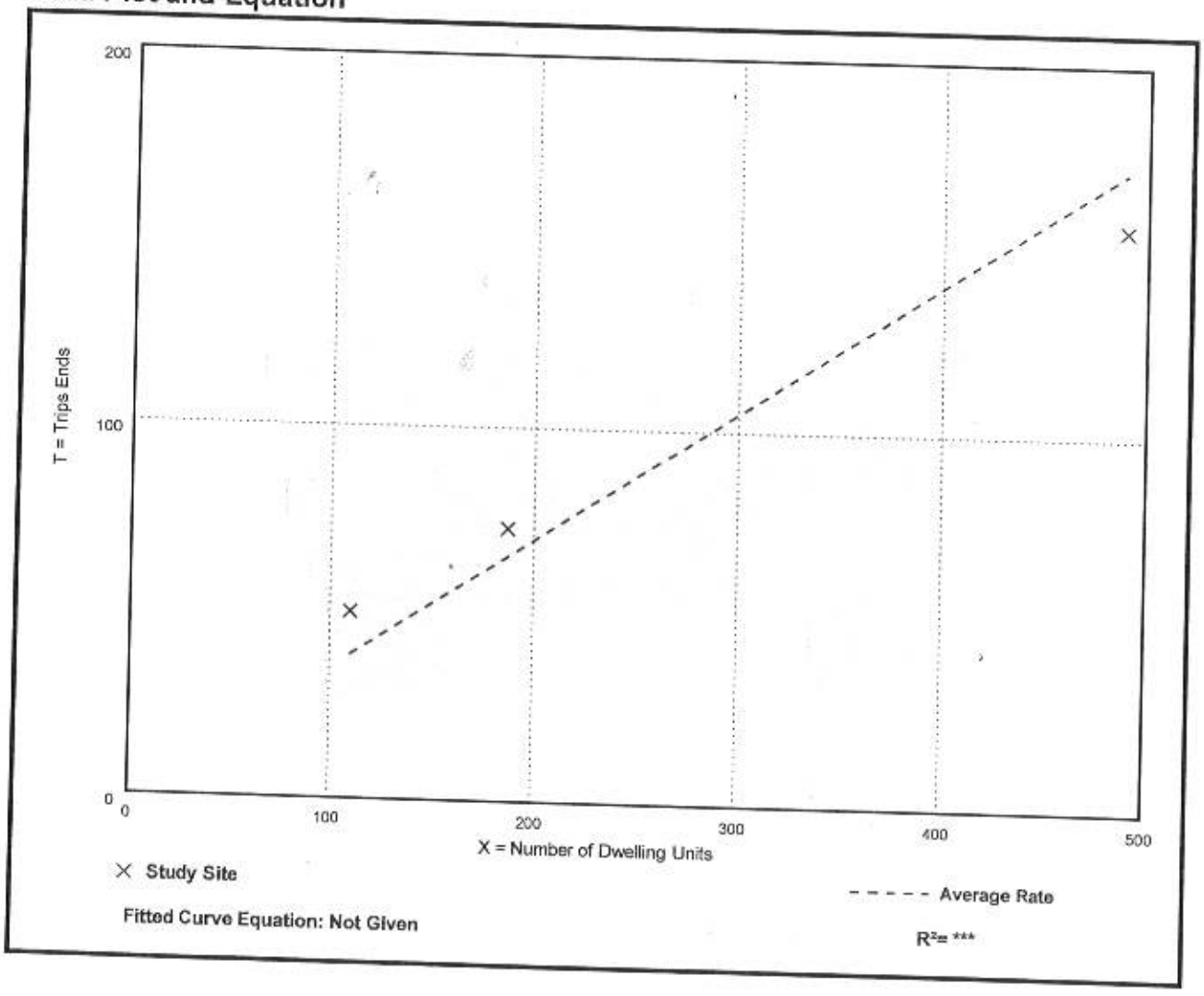
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: Dense Multi-Use Urban
Number of Studies: 3
Avg. Num. of Dwelling Units: 262
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.35	0.32 - 0.45	0.06

Data Plot and Equation



National Data & Surveying Services Intersection Turning Movement Count

Location: Mall Access Rd & Rte 638
City: Lawrence Township
Control: 1-Way Stop(SB)

Project ID: 23-340113-002
Date: 9/19/2023

Data - Total

NS/EW Streets:	Mall Access Rd				Mall Access Rd				Rte 638				Rte 638				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	0 NT	0 NR	0 NU	1 SL	0 ST	1 SR	0 SU	1 EL	1 ET	0 ER	0 EU	0 WL	1 WT	1 WR	0 WU	TOTAL
7:00 AM	0	0	0	0	2	0	1	0	4	86	0	0	0	4	5	0	102
7:15 AM	0	0	0	0	2	0	4	0	4	103	0	0	0	7	8	0	128
7:30 AM	0	0	0	0	3	0	8	0	4	94	0	0	0	17	14	0	140
7:45 AM	0	0	0	0	0	0	3	0	8	118	0	0	0	14	16	0	159
8:00 AM	0	0	0	0	2	0	9	0	9	113	0	0	0	20	10	0	163
8:15 AM	0	0	0	0	0	0	6	0	9	119	0	0	0	18	12	0	164
8:30 AM	0	0	0	0	2	0	5	0	10	114	0	0	0	8	13	0	152
8:45 AM	0	0	0	0	2	0	14	0	18	125	0	0	0	11	9	0	179
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	13	0	50	0	66	872	0	0	0	99	87	0	1187
APPROACH %'s :					20.63%	0.00%	79.37%	0.00%	7.04%	92.96%	0.00%	0.00%	0.00%	53.23%	46.77%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	0	0	0	6	0	34	0	46	471	0	0	0	57	44	0	658
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.750	0.000	0.607	0.000	0.639	0.942	0.000	0.000	0.000	0.713	0.846	0.000	0.919
						0.625				0.904				0.842			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0 NL	0 NT	0 NR	0 NU	1 SL	0 ST	1 SR	0 SU	1 EL	1 ET	0 ER	0 EU	0 WL	1 WT	1 WR	0 WU	TOTAL
4:00 PM	0	0	0	0	7	0	9	0	23	159	0	0	0	10	9	0	217
4:15 PM	0	0	0	0	8	0	2	0	22	154	0	0	0	9	11	0	206
4:30 PM	0	0	0	0	8	0	6	0	19	145	0	0	0	10	11	0	199
4:45 PM	0	0	0	0	10	0	7	0	32	185	0	0	0	10	7	0	251
5:00 PM	0	0	0	0	16	0	7	0	25	184	0	0	0	12	15	0	259
5:15 PM	0	0	0	0	7	0	8	0	14	151	0	0	0	6	13	0	199
5:30 PM	0	0	0	0	12	0	6	0	9	139	0	0	0	4	10	0	180
5:45 PM	0	0	0	0	6	0	6	0	9	117	0	0	0	9	7	0	154
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	74	0	51	0	153	1234	0	0	0	70	83	0	1665
APPROACH %'s :					59.20%	0.00%	40.80%	0.00%	11.03%	88.97%	0.00%	0.00%	0.00%	45.75%	54.25%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	0	0	0	42	0	22	0	98	668	0	0	0	41	44	0	915
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.656	0.000	0.786	0.000	0.766	0.903	0.000	0.000	0.000	0.854	0.733	0.000	0.883
						0.696				0.882				0.787			

National Data & Surveying Services Intersection Turning Movement Count

Location: Mall Access Rd & Outer Ring Rd
City: Lawrence Township
Control: 1-Way Stop(NB)

Project ID: 23-340113-001
Date: 9/19/2023

Data - Total

NS/EW Streets:	Mall Access Rd				Mall Access Rd				Outer Ring Rd				Outer Ring Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	2	1	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	5	0	4	0	0	0	0	0	0	4	1	0	2	5	0	0	21
7:15 AM	9	0	2	0	0	0	0	0	0	6	4	0	3	7	0	0	31
7:30 AM	17	0	2	0	0	0	0	0	0	5	9	0	1	4	0	0	38
7:45 AM	17	0	5	0	0	0	0	0	0	1	2	0	2	3	0	0	30
8:00 AM	13	0	6	0	0	0	0	0	0	5	8	0	2	9	0	0	43
8:15 AM	21	0	1	0	0	0	0	0	0	4	6	0	0	7	0	0	39
8:30 AM	20	0	4	0	0	0	0	0	0	3	6	0	2	8	0	0	43
8:45 AM	25	0	2	0	0	0	0	0	0	8	13	0	2	7	0	0	57
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	127	0	26	0	0	0	0	0	0	36	49	0	14	50	0	0	302
APPROACH %'s :	83.01%	0.00%	16.99%	0.00%					0.00%	42.35%	57.65%	0.00%	21.88%	78.13%	0.00%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	79	0	13	0	0	0	0	0	0	20	33	0	6	31	0	0	182
PEAK HR FACTOR :	0.790	0.000	0.542	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.635	0.000	0.750	0.861	0.000	0.000	0.798
	0.852								0.631				0.841				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	2	1	0	0	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	22	0	11	0	0	0	0	0	0	7	9	0	7	29	0	0	85
4:15 PM	17	0	15	0	0	0	0	0	0	9	9	0	2	22	0	0	74
4:30 PM	26	0	5	0	0	0	0	0	0	10	12	0	1	16	0	0	70
4:45 PM	24	0	15	0	0	0	0	0	0	6	10	0	7	20	0	0	82
5:00 PM	31	0	8	0	0	0	0	0	0	10	16	0	7	26	0	1	99
5:15 PM	16	0	12	0	0	0	0	0	0	6	10	0	5	18	0	0	67
5:30 PM	11	0	6	0	0	0	0	0	0	13	15	0	4	20	0	0	69
5:45 PM	10	0	8	0	0	0	0	0	0	9	8	0	3	25	0	0	63
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	157	0	80	0	0	0	0	0	0	70	89	0	36	176	0	1	609
APPROACH %'s :	66.24%	0.00%	33.76%	0.00%					0.00%	44.03%	55.97%	0.00%	16.90%	82.63%	0.00%	0.47%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	98	0	43	0	0	0	0	0	0	35	47	0	17	84	0	1	325
PEAK HR FACTOR :	0.790	0.000	0.717	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.734	0.000	0.607	0.808	0.000	0.250	0.821
	0.904								0.788				0.750				