Kenel

Frederick County, Maryland
REVISED May 6, 2022
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Traffic Impact Analysis

Prepared for:
St. John Properties

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Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am duly licensed professional engineer under the laws of the State of Maryland, License No. 25547 Expiration Date: 09/25/2022.

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INTRODUCTION AND SUMMARY OF FINDINGS

Study Purpose

The Traffic Group, Inc. has prepared this Revised Traffic Impact Analysis to determine the impact of the proposed rezoning of the existing Creative Landscapes Development from Agriculture to MXD for the Kenel Development on the roadway network. The Kenel Development is generally located along the north side of MD 180 (Jefferson Pike), just south of I-70 in Frederick County, Maryland.

This development is now proposed with a 275,000-square foot Business Park (old TIS was with 179,160 square feet) with access proposed at the existing property location directly across from Jefferson Commons Way and is expected to be built out within 5 years (2027).

Study Criteria/Methodology

The Scope of Work for this Traffic Impact Analysis was determined by Frederick County and can be found in Appendix A. This Traffic Impact Analysis was prepared in accordance with Frederick County's Adequate Public Facilities Ordinance (APFO).

Based on the Rezoning, this Traffic Impact Analysis was also prepared based on the Approval Criteria, §1-19-10.500.3.(E), which states, "The Transportation System is or will be made adequate to serve the proposed development in addition to existing and pipeline uses in the area. Factors to be evaluated include: roadway capacity, level of service and safety, on-street parking impacts, access requirements, neighborhood and natural resource impacts, projected construction schedule of planned improvements, pedestrian and bicycle safety, and results of travel demand modeling assessing the change in future daily travel volumes, with and without the proposed development."

Scope of Services

- *Conduct a field inspection to collect physical information concerning the nearby road system, including the compilation of aerial photography.*
- *Collect intersection turning movement counts at each of the key intersections during the weekday morning and evening peak periods.*
- *Provide an allowance for regional traffic growth throughout the corridor.*
- *Obtain background development information from Frederick County.*

- *Prepare trip generation and trip distribution for each background development and the subject site.*

- *Undertake Intersection Capacity Analyses and Level of Service (LOS) evaluations for existing, background, and total traffic conditions using Critical Lane Volume (CLV), Highway Capacity Manual (HCM), and SIDRA Methodologies.*

- *Prepare Queuing Analyses using the Maryland Department of Transportation State Highway Administration (MDOT SHA) 95th Percentile Methodology.*

- *Provide an overall assessment of traffic operations and the Transportation System Approval Criteria.*

Summary of Findings and Recommendations

The results of the Traffic Impact Analysis indicate that all study intersections are operating at acceptable levels of service and will continue to operate with acceptable levels of service during each of the peak periods using the CLV, HCM, and SIDRA Methodologies. Additionally, all queues can be accommodated within the existing storage areas at all intersections during the morning and evening peak hours. Additionally, we reviewed and evaluated the factors outlined in the Transportation System Approval Criteria, and it is our opinion that all factors are acceptable.

Therefore, it is our opinion that the Kenel Development meets the Transportation System Approval Criteria and would also meet the requirements of Frederick County's APFO for approval with the necessary pro rata contributions to the local escrow accounts.

The data and methodology used to undertake this study is detailed in the sections that follow.

EXISTING TRAFFIC CONDITIONS

Site Information

The Kenel Development is generally located along the north side of MD 180 (Jefferson Pike), just south of I-70 in Frederick County, Maryland. A map showing the general area can be found on Figure 1 along with the study intersections, and an MXD Plan can be found on Figure 1A.

Figure 1. Site Location and Study Intersection Map

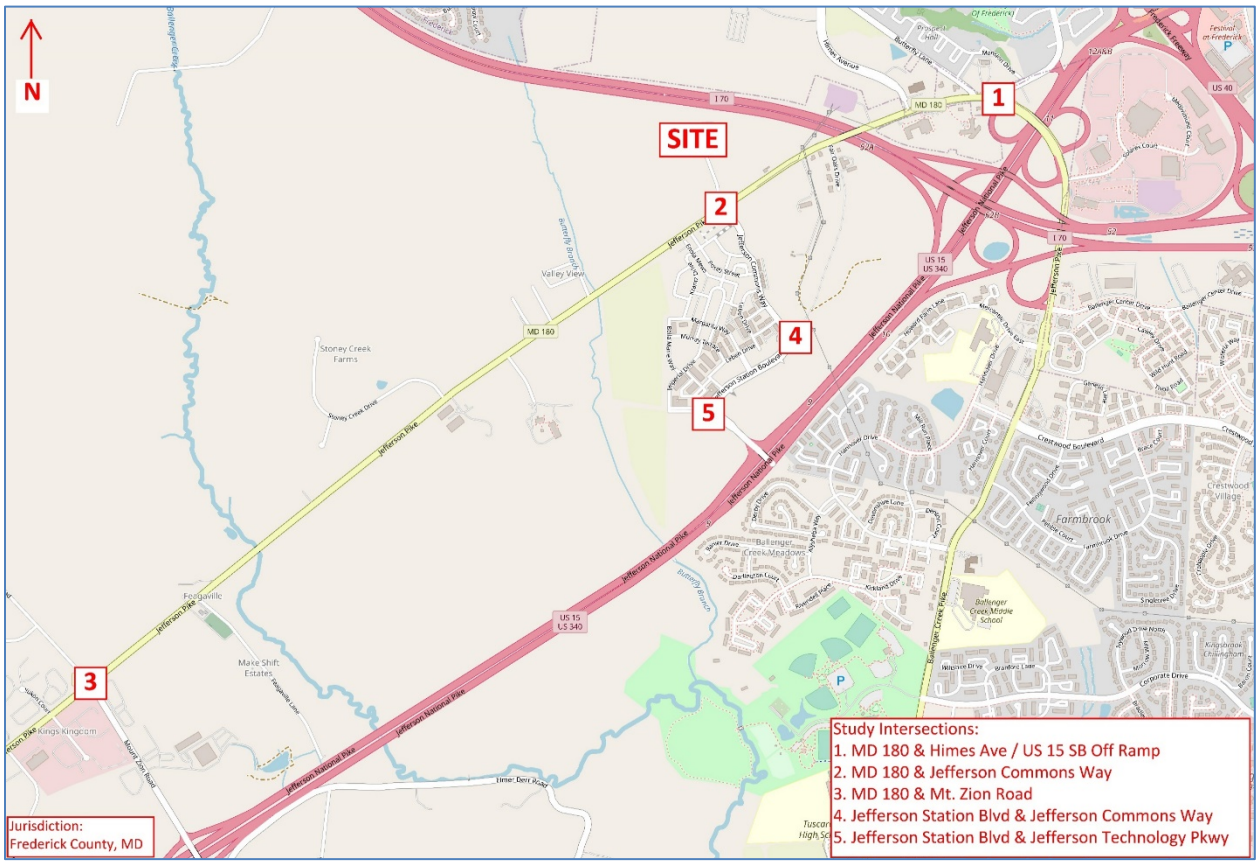
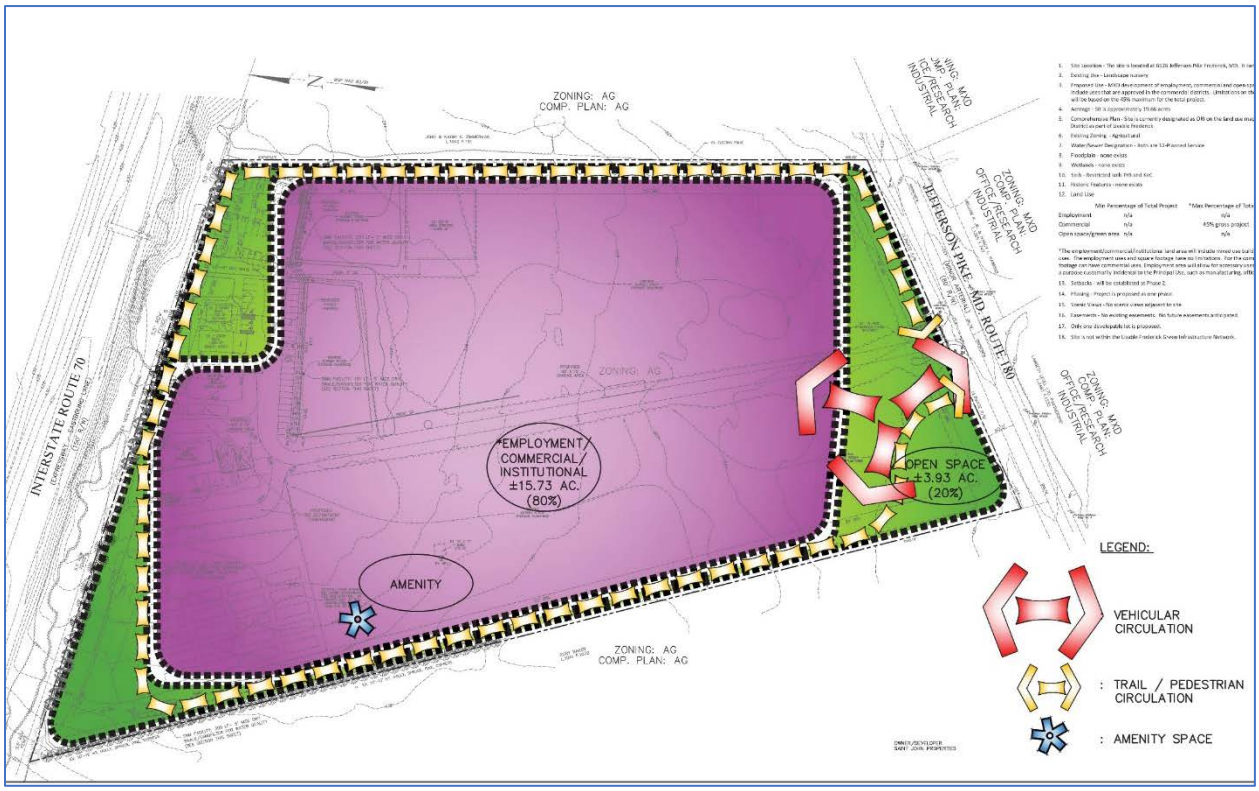


Figure 1A. MXD Plan



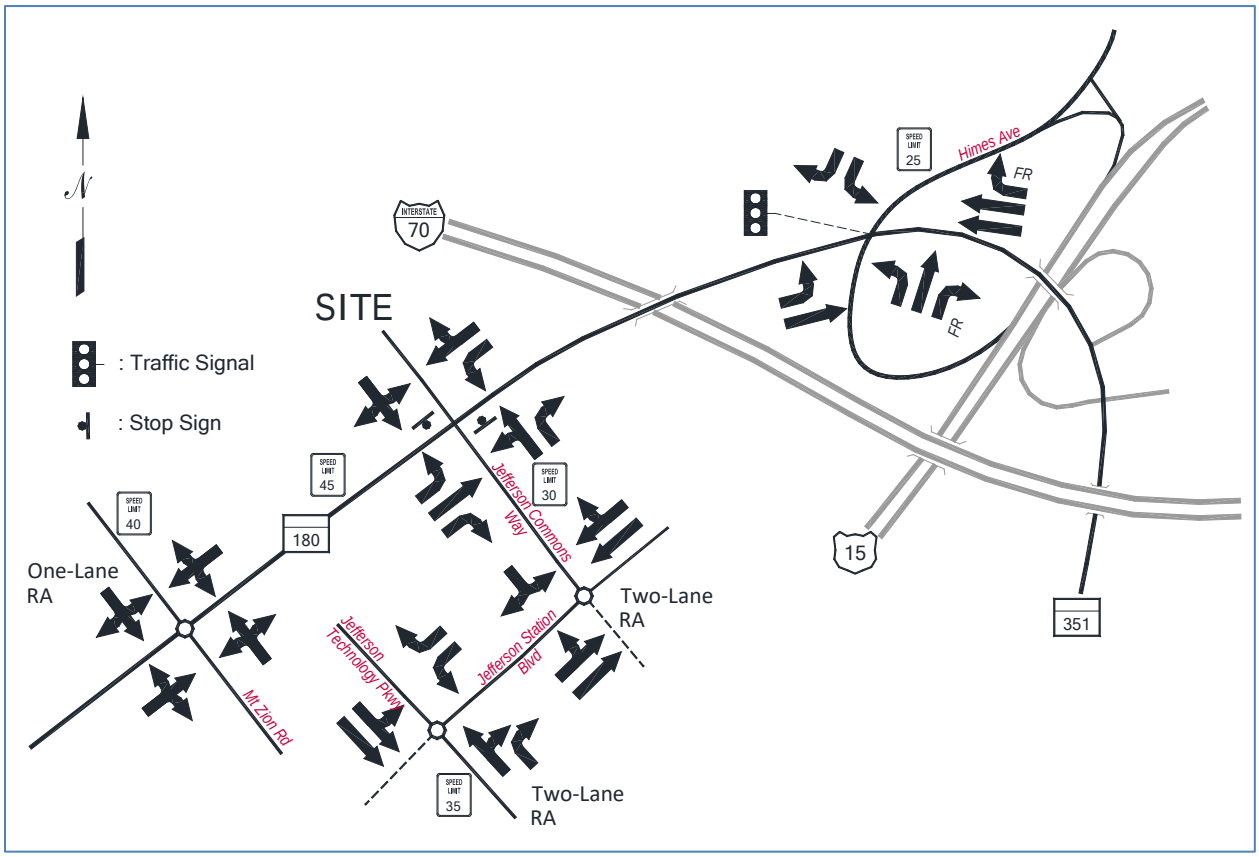
Study Area

Based on the Scoping Agreement, the following intersections were identified to be included as part of this analysis:

1. MD 180 @ Himes Avenue/US 15 Southbound Off-Ramp (Traffic Signal);
2. MD 180 @ Jefferson Commons Way/Creative Landscapes Access (Unsignalized);
3. MD 180 @ Mt. Zion Road (Roundabout);
4. Jefferson Commons Way @ Jefferson Station Boulevard (Roundabout); and
5. Jefferson Technology Parkway @ Jefferson Station Boulevard (Roundabout).

Figure 2 has been prepared to detail the existing lane use and traffic control devices at each of the study intersections. Aerial photography can be found in Appendix A.

Figure 2. Existing Lane Use

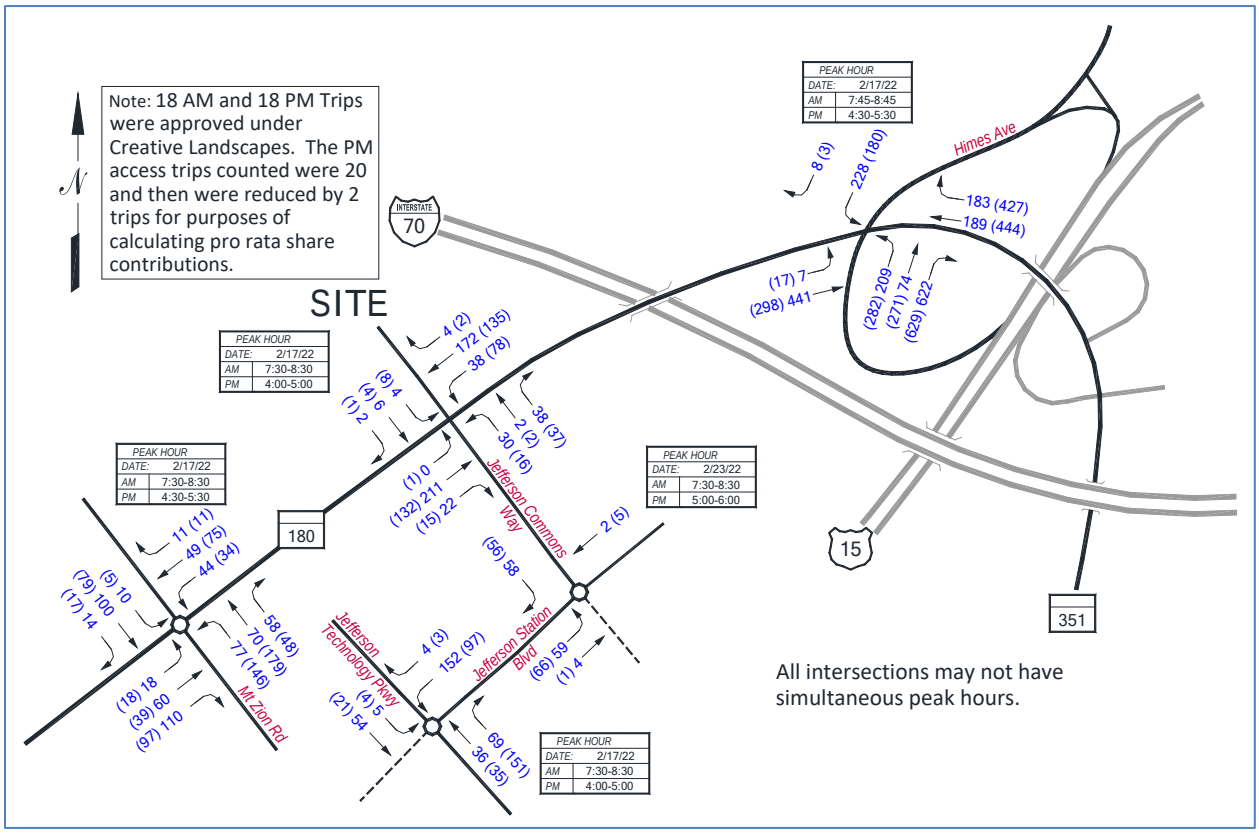


Traffic Volumes

The Traffic Group, Inc. collected intersection turning movement counts from 7–9 AM and 4–6 PM on a weekday at each of the key intersections in the study area. All traffic counts were in February 2022. A summary of the existing peak hour traffic volumes can be found on Figure 3. Complete turning movement count worksheets are contained in Appendix A.

Please note that based on previous approvals with Frederick County, the existing Creative Landscapes development was approved with 18 AM and 18 PM peak hour trips. During the PM peak hour, at the Site Access, we observed 18 AM and 20 PM peak hour trips. For purposes of this Traffic Impact Analysis, the existing approval of trips, and to determine the impact of trips from the proposed Kenel Development, the Site Access trips were reduced by 2 PM trips to match the 18 PM peak hour trips.

Figure 3. Existing Peak Hour Traffic Volumes



Analysis of Existing Traffic Conditions

Intersection Capacity Analyses were undertaken at each of the study intersections based on existing traffic conditions using the MDOT SHA CLV, HCM, and SIDRA Methodologies. The results can be found in Tables 3, 4, and 5, respectively.

A review of Table 3 indicates that each signalized intersection currently exhibits an acceptable LOS "A" based on CLV during the weekday morning and evening peak hours.

As shown in Table 4, the HCM Unsignalized Methodology, the results indicate that all movements are operating at acceptable levels of service during the weekday morning and evening peak hours. A review of Table 5 also indicates that the roundabouts at are operating at acceptable LOS "A" based on the SIDRA Methodology during the morning and evening peak hours.

Queuing Analyses for all intersections were conducted based on the MDOT SHA's 95th Percentile Methodology, and the results can be found in Table 6. As shown, all queues can be accommodated within the existing storage areas at all intersections during the morning and evening peak hours.

Complete capacity worksheets for all analyses can be found in Appendix B.

BACKGROUND TRAFFIC CONDITIONS

Design Year(s)

Full buildout of the Kenel Development is expected by the year 2027 (5 years). To account for regional growth, a 1% annual growth rate was incorporated within the study area for 5 years (from 2022 to 2027) and the regional growth is shown on Figure 4, and the resulting 2027 base peak hour traffic volumes can be found on Figure 5.

Figure 4. Regional Traffic Growth

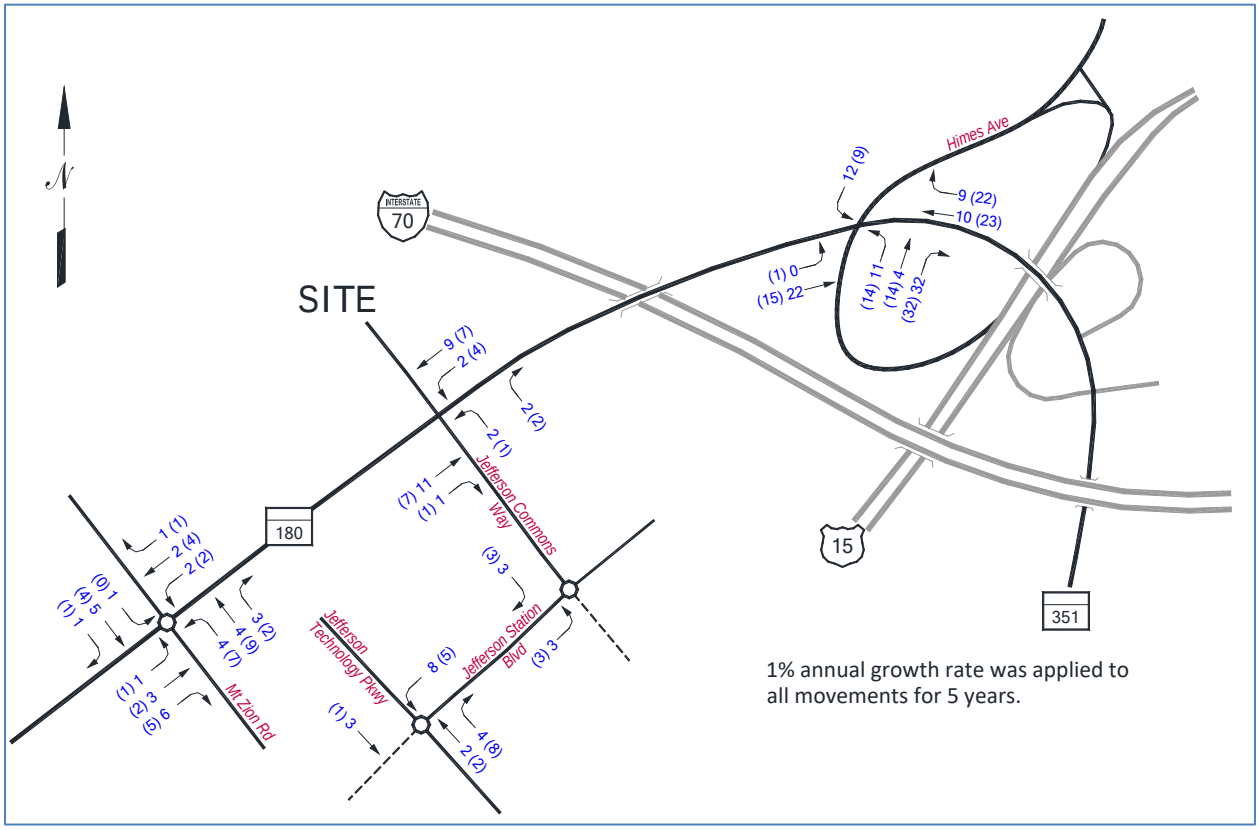
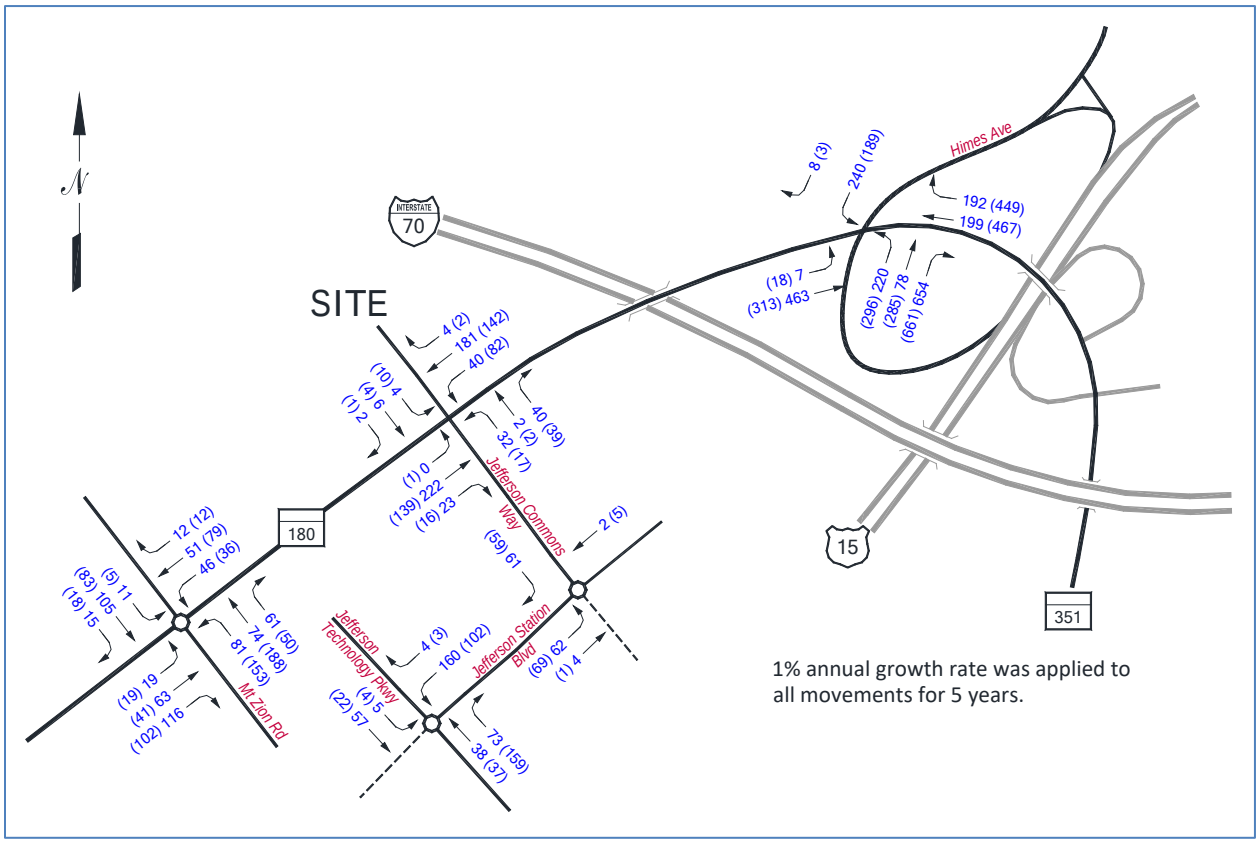


Figure 5. 2027 Base Peak Hour Traffic Volumes



Background Traffic

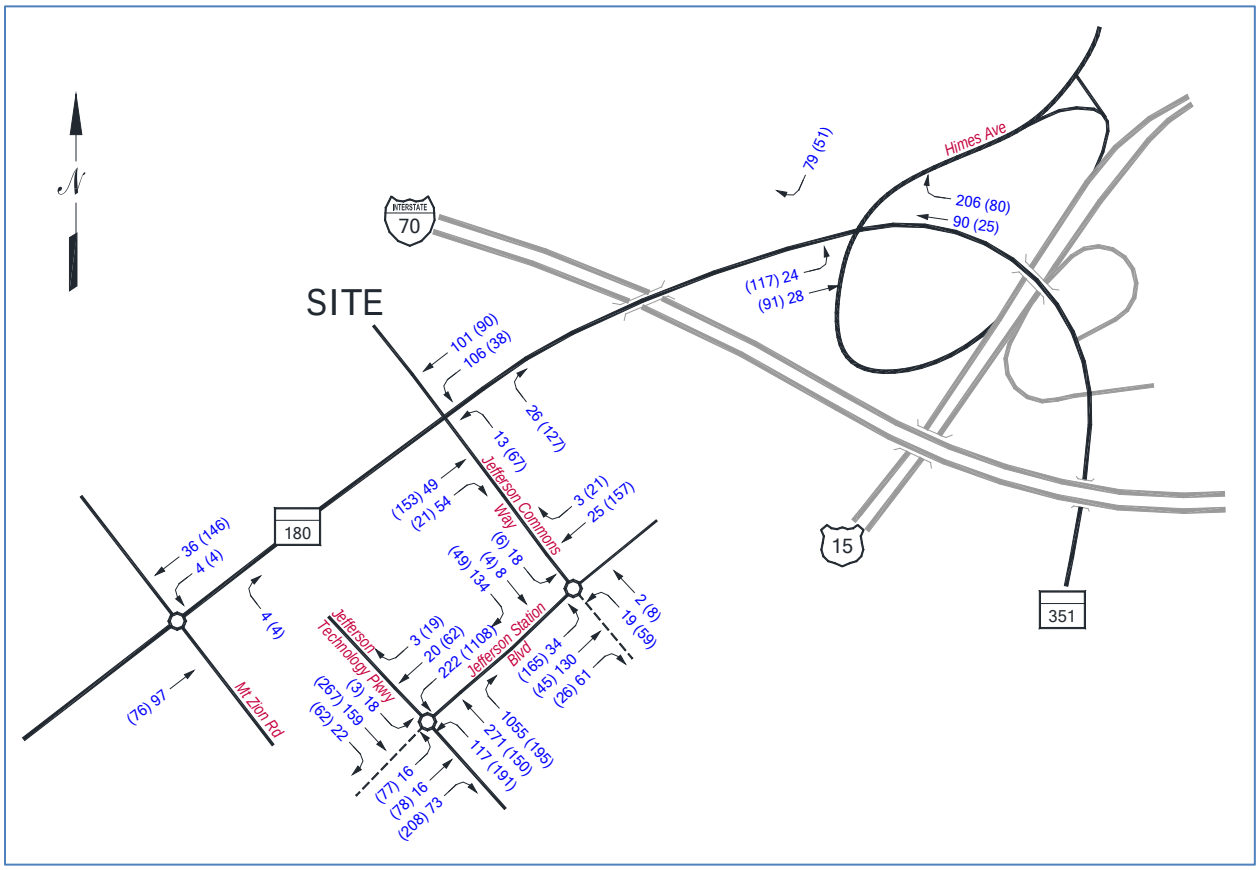
In addition to regional traffic growth, traffic projected to be generated by other approved developments in the vicinity of the subject site must also be taken into consideration. Frederick County provided two approved background developments to be included in the study. Previously approved Traffic Impact Studies were utilized to determine the number of trips projected to be generated. Table 1 details the trip generation for the background developments.

Table 1. Trip Generation for Background Developments

TRIP TOTALS			MORNING PEAK HOUR			EVENING PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
1. Jefferson Tech Park								
Residential	825	units	Buildout					
Retail / Commercial	125,000	sq. ft. Shopping Center	83	63	146	248	310	558
Hotel	250	Hotel Rooms	76	42	118	67	53	120
Office	200,000	sq. ft. R & D Center	212	43	255	35	200	235
	1,150,000	sq. ft. General Office	1241	261	1502	229	1304	1533
Total New Trips			**1612**	**409**	**2021**	**579**	**1867**	**2446**
(Trips obtained from JTP TIS dated November 2, 2005. Details included in Appendix C)								
2. Jefferson Park West								
Phase 1	325	Townhouse/Condo Unit	23	110	133	95	47	142
		171 units built, 154 units remaining						
		Remaining Trips	11	52	63	45	22	67
Phase 2	33,539	sq. ft. Shopping Center	50	30	80	57	62	119
	85,968	sq. ft. R & D Center	87	18	105	15	89	104
Phase 3	180,444	sq. ft. R & D Center	183	37	220	25	139	164
Total New Trips			**331**	**137**	**468**	**142**	**312**	**454**
(Trips obtained from Jefferson Park West TIS dated April 17, 2014. Details included in Appendix C)								
3. Jefferson Village								
	Small Commercial/Residential		8	8	16	8	8	16

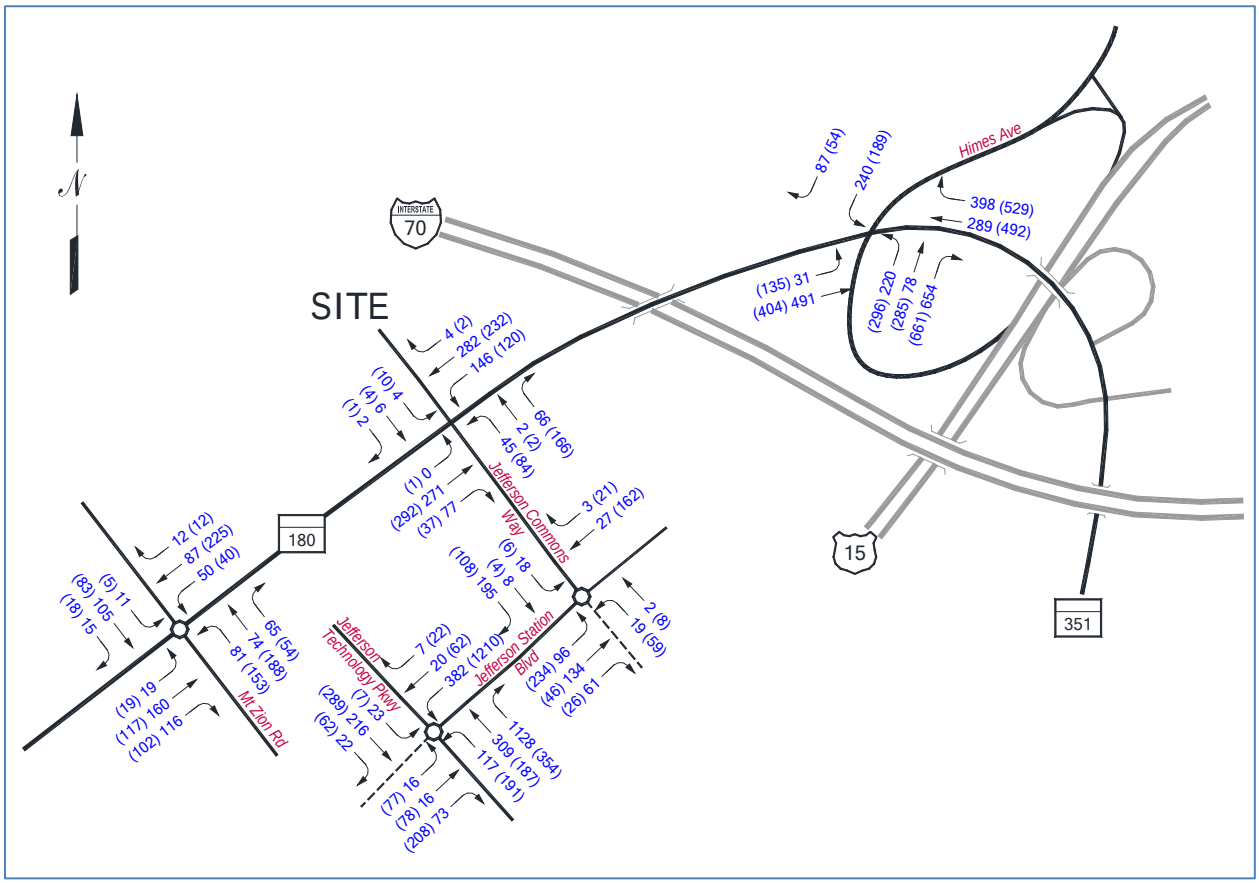
Trips from these background developments were assigned throughout the roadway network based on the previously approved Traffic Impact Studies. The combined trip assignment for all these developments is found on Figure 6 while the individual background development trip distribution can be found in Appendix C.

Figure 6. Combined Trips Generated by Background Developments



Combining the background trips from the approved developments and the 2027 base peak hour traffic volumes results in the 2027 background peak hour traffic volumes found on Figure 7.

Figure 7. 2027 Background Peak Hour Traffic Volumes



Analysis of Background Traffic Conditions

Intersection Capacity Analyses were undertaken at each of the study intersections based on background traffic conditions using the MDOT SHA CLV, HCM, and SIDRA Methodologies. The results can be found in Tables 3, 4, and 5, respectively.

A review of Table 3 indicates that each signalized intersection is projected to exhibit acceptable LOS “A” based on CLV during the weekday morning and evening peak hours under both scenarios.

As shown in Table 4, the HCM Unsignalized Methodology, the results indicate that all movements are projected to operate at acceptable levels of service during the weekday morning and evening peak hours. A review of Table 5 also indicates that the roundabouts are projected to operate at acceptable LOS “D” or better based on the SIDRA Methodology during the morning and evening peak hours.

Queuing Analyses for all intersections were conducted based on the MDOT SHA's 95th Percentile Methodology, and the results can be found in Table 6. As shown, all queues can be accommodated within the existing storage areas at all intersections during the morning and evening peak hours.

Complete capacity worksheets for all analyses can be found in Appendix B.

TOTAL TRAFFIC CONDITIONS

Site Information

The Kenel Development is proposed as a 275,000 square foot Business Park with access proposed at the existing property location directly across from Jefferson Commons Way and is expected to be built out within 5 years (2027).

Trip Generation/Distribution

The Institute of Transportation Engineers Trip Generation Manual (10th Edition) was utilized to determine the number of trips projected to be generated by the Kenel Development. The trip generation rates and totals can be found in Table 2. Please note that the proposed trips were reduced by the existing approved 18 AM and 18 PM trips for Creative Landscapes.

Table 2. Trip Generation for Subject Site

TRIP GENERATION RATES

LAND USE	FORMULA	IN/OUT
Business Park (ksf, ITE-770)		
	Morning Trips = 0.40 x ksf	61/39
	Evening Trips = 0.42 x ksf	46/54

TRIP GENERATION TOTALS

	Morning Peak Hour			Evening Peak Hour		
	In	Out	Total	In	Out	Total
Kenel Rezoning						
Proposed:						
275,000 sq. ft. Business Park	67	43	110	53	63	116
Existing Approved:						
Wholesale Landscaping	4	14	18	9	9	18
New Trips	**63**	**29**	**92**	**44**	**54**	**98**

Note: Trip generation rates derived from ITE Trip Generation Manual, 10th Edition, 2017.

Figure 8 details the trip distribution and trip assignment and were then added to the 2027 background peak hour traffic volumes, which results in the 2027 total peak hour traffic volumes as shown on Figure 9.

Figure 8. New Trip Assignment for Subject Site

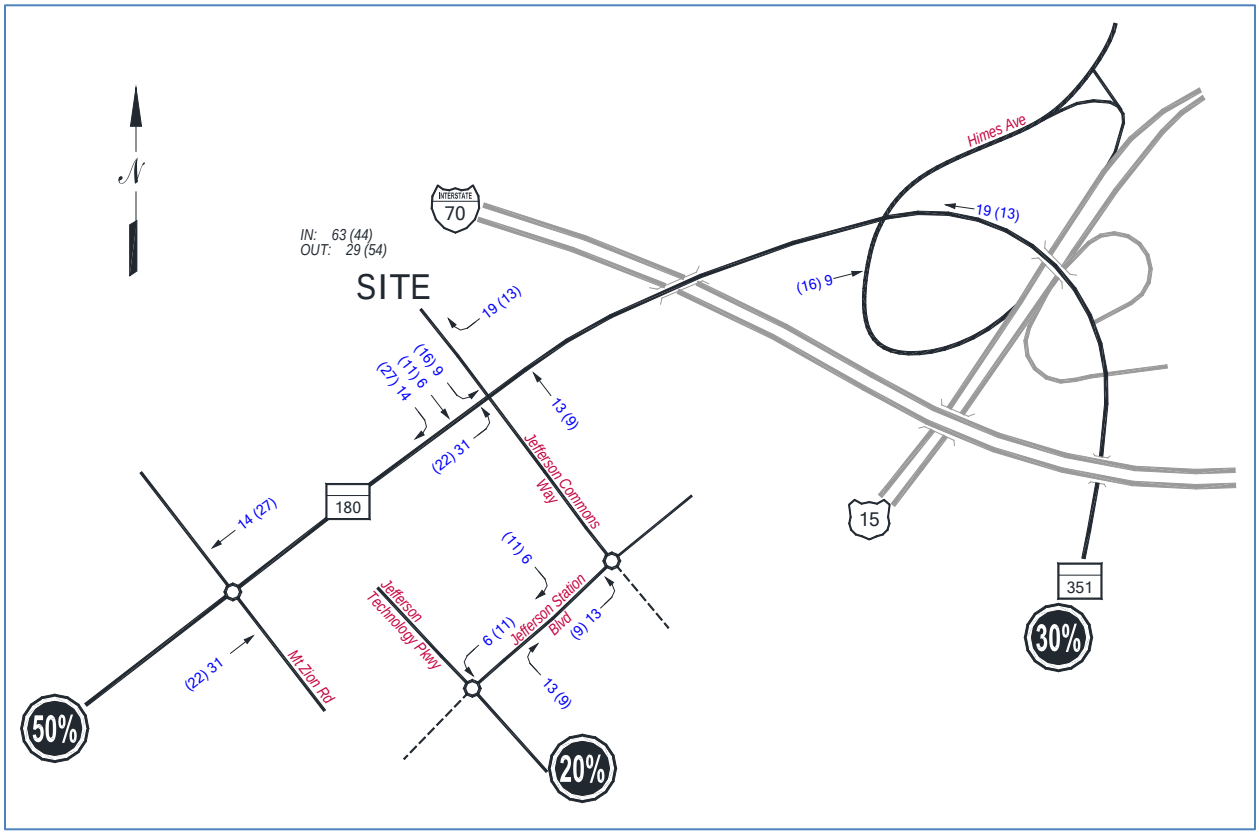
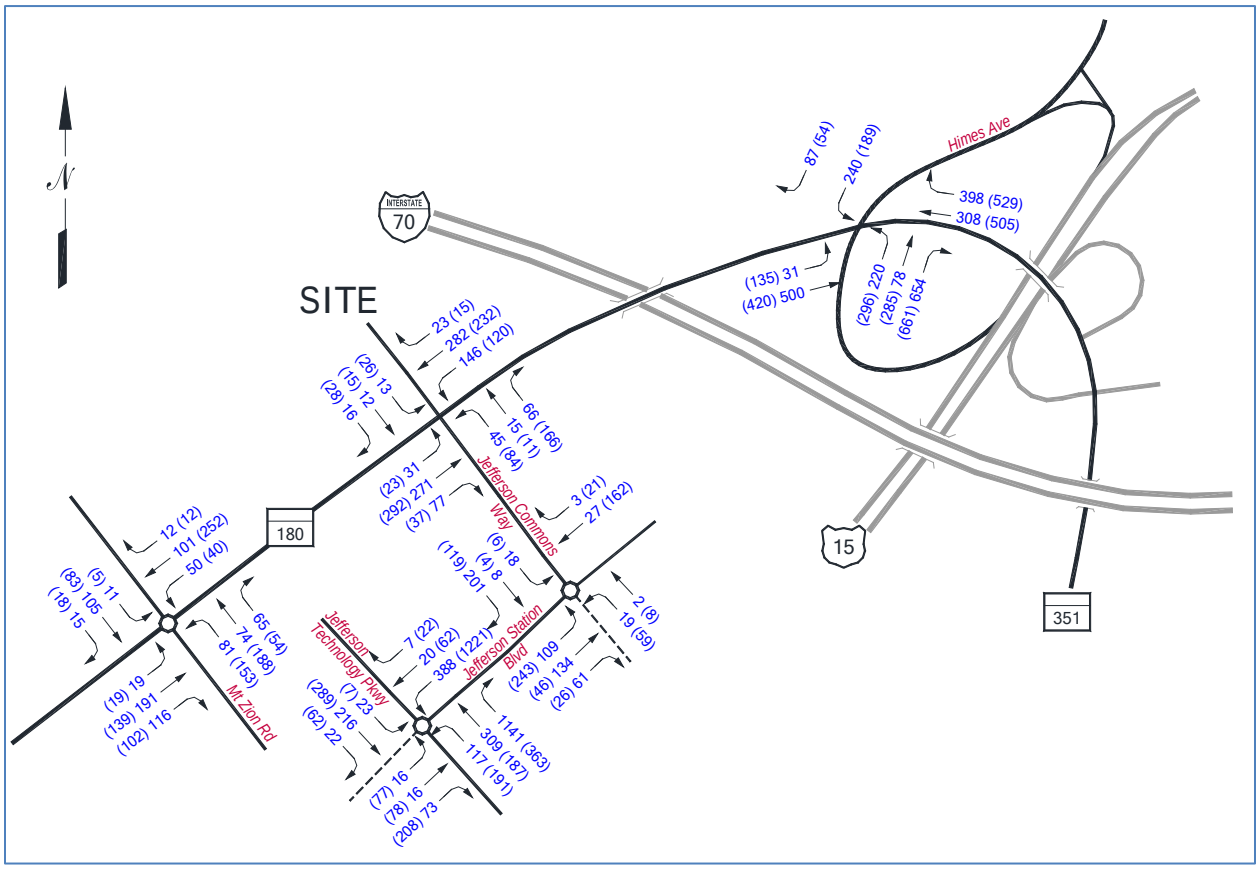


Figure 9. 2027 Total Peak Hour Traffic Volumes



Analysis of Total Traffic Conditions

Intersection Capacity Analyses were undertaken at each of the study intersections based on total traffic conditions using the MDOT SHA CLV, HCM, and SIDRA Methodologies. The results can be found in Tables 3, 4, and 5, respectively.

A review of Table 3 indicates that each signalized intersection is projected to exhibit acceptable LOS "A" based on CLV during the weekday morning and evening peak hours under both scenarios.

As shown in Table 4, the HCM Unsignalized Methodology, the results indicate that all movements are projected to operate at acceptable levels of service during the weekday morning and evening peak hours. A review of Table 5 also indicates that the roundabouts are projected to operate at acceptable LOS "D" or better based on the SIDRA Methodology during the morning and evening peak hours.

Table 3. Results of Intersection Capacity Analyses (CLV)

CLV Methodology	Existing Traffic	2027	
		Background Traffic	Total Traffic
Morning Peak Hour Traffic	**LOS / CLV**	**LOS / CLV**	**LOS / CLV**
1. MD 180 & Himes Ave / US 15 SB Off Ramp	A / 743	A / 809	A / 818
Evening Peak Hour Traffic			
1. MD 180 & Himes Ave / US 15 SB Off Ramp	A / 749	A / 880	A / 894

Table 4. Results of Intersection Capacity Analyses (HCM)

HCM Unsignalized Intersection Methodology	Existing Traffic	2027	
		Background Traffic	Total Traffic
Morning Peak Hour Traffic	**LOS / DELAY (sec.)**		
2. MD 180 & Jefferson Commons Way			
EB (MD 180) left	A / 7.7	A / 7.9	A / 8.0
WB (MD 180) left turn	A / 8.1	A / 8.6	A / 8.6
NB (Jefferson Commons Way) left/thru	C / 16.9	D / 27.6	E / 38.6
NB (Jefferson Commons Way) right	B / 10.3	B / 10.4	B / 10.4
SB (Site Access) left/thru/right	C / 15.3	C / 22.8	C / 24.5
Evening Peak Hour Traffic			
2. MD 180 & Jefferson Commons Way			
EB (MD 180) left	A / 7.5	A / 7.7	A / 7.8
WB (MD 180) left turn	A / 7.7	A / 8.3	A / 8.3
NB (Jefferson Commons Way) left/thru	B / 12.5	C / 23.3	D / 30.6
NB (Jefferson Commons Way) right	A / 9.1	B / 11.3	B / 11.3
SB (Site Access) left/thru/right	B / 12.6	C / 22.8	C / 20.9

Table 5. Results of Roundabout Capacity Analysis (Sidra)

Sidra	Existing Traffic	2027 Background Traffic	2027 Total Traffic
Morning Peak Hour Traffic	**LOS / DELAY (sec.)**		
3. MD 180 & Mt. Zion Road	A / 5.8	A / 7.0	A / 7.4
4. Jefferson Station Blvd & Jefferson Commons Way	A / 3.8	A / 5.0	A / 5.1
5. Jefferson Station Blvd & Jefferson Technology Pkw	A / 3.5	A / 5.5	A / 5.3
Evening Peak Hour Traffic			
3. MD 180 & Mt. Zion Road	A / 6.7	A / 8.5	A / 8.9
4. Jefferson Station Blvd & Jefferson Commons Way	A / 3.8	A / 5.5	A / 5.5
5. Jefferson Station Blvd & Jefferson Technology Pkw	A / 2.6	D / 26.3	D / 27.0

Queuing Analyses for all intersections were conducted based on the MDOT SHA's 95th Percentile Methodology, and the results can be found in Table 6. As shown, all queues can be accommodated within the existing storage areas at all intersections during the morning and evening peak hours.

Complete capacity worksheets for all analyses can be found in Appendix B.

Table 6. Results of Intersection Queuing Analysis (MDOT SHA Methodology and Sidra)

SHA Methodology	*Available storage length (ft.)*	Existing Traffic	2027	
			Background Traffic	Total Traffic
Morning Peak Hour Traffic		95th percentile queue length (ft)		
1. MD 180 & Himes Ave / US 15 SB Off Ramp				
EB (MD 180) left turn	*1000+*	25	50	50
EB (MD 180) thru	*1000+*	300	325	325
WB (MD 180) thru	*1000+*	100	125	150
NB (US 15 SB Off Ramp) left turn	*800*	175	175	175
NB (US 15 SB Off Ramp) thru	*1000+*	75	75	75
SB (Himes Ave) left turn	*1000+*	175	200	200
SB (Himes Ave) right turn	*1000+*	25	100	100
2. MD 180 & Jefferson Commons Way				
EB (MD 180) left	*200*	<25	<25	50
WB (MD 180) left turn	*300*	50	125	125
NB (Jefferson Commons Way) left/thru	*200*	50	50	75
NB (Jefferson Commons Way) right	*500+*	50	75	75
SB (Site Access) left/thru/right	*500+*	25	25	50
Evening Peak Hour Traffic				
1. MD 180 & Himes Ave / US 15 SB Off Ramp				
EB (MD 180) left turn	*1000+*	25	125	125
EB (MD 180) thru	*1000+*	250	325	325
WB (MD 180) thru	*1000+*	200	225	225
NB (US 15 SB Off Ramp) left turn	*800*	225	250	250
NB (US 15 SB Off Ramp) thru	*1000+*	225	250	250
SB (Himes Ave) left turn	*1000+*	175	175	175
SB (Himes Ave) right turn	*1000+*	<25	75	75
2. MD 180 & Jefferson Commons Way				
EB (MD 180) left	*200*	<25	<25	25
WB (MD 180) left turn	*300*	75	125	125
NB (Jefferson Commons Way) left/thru	*200*	25	100	100
NB (Jefferson Commons Way) right	*500+*	50	150	150
SB (Site Access) left/thru/right	*500+*	25	25	75

Table 6. Results of Intersection Queuing Analysis (MDOT SHA Methodology and Sidra), Cont'd

Sidra	*Available storage length (ft.)*	Existing Traffic	2027 Background Traffic	2027 Total Traffic
Morning Peak Hour Traffic		95th percentile queue length (ft)		
3. MD 180 & Mt. Zion Road				
Eastbound MD 180	*1000+*	<25	44	50
Westbound MD 180	*1000+*	<25	<25	<25
Northbound Mt. Zion Road	*1000+*	<25	30	31
Southbound Mt. Zion Road	*1000+*	<25	<25	<25
4. Jefferson Station Blvd & Jefferson Commons Way				
Eastbound Jefferson Station Blvd	500+	<25	<25	<25
Westbound Jefferson Station Blvd	200+	<25	<25	<25
Northbound Jefferson Commons Way	500+		<25	<25
Southbound Jefferson Commons Way	200+	<25	<25	<25
5. Jefferson Station Blvd & Jefferson Technology Pkwy				
Eastbound Jefferson Station Blvd	500+		<25	<25
Westbound Jefferson Station Blvd	600+	<25	<25	<25
Northbound Jefferson Technology Pkwy	200+	<25	85	87
Southbound Jefferson Technology Pkwy	500+	<25	<25	<25
Evening Peak Hour Traffic				
3. MD 180 & Mt. Zion Road				
Eastbound MD 180	*1000+*	<25	29	32
Westbound MD 180	*1000+*	<25	46	60
Northbound Mt. Zion Road	*1000+*	51	60	61
Southbound Mt. Zion Road	*1000+*	<25	<25	<25
4. Jefferson Station Blvd & Jefferson Commons Way				
Eastbound Jefferson Station Blvd	500+	<25	28	29
Westbound Jefferson Station Blvd	200+	<25	<25	<25
Northbound Jefferson Commons Way	500+		<25	<25
Southbound Jefferson Commons Way	200+	<25	<25	<25
5. Jefferson Station Blvd & Jefferson Technology Pkwy				
Eastbound Jefferson Station Blvd	500+		54	57
Westbound Jefferson Station Blvd	600+	<25	282	525
Northbound Jefferson Technology Pkwy	200+	<25	40	40
Southbound Jefferson Technology Pkwy	500+	<25	51	61

TRANSPORTATION SYSTEM APPROVAL CRITERIA

For the Rezoning of this property, we need to prepare an analysis based on the Approval Criteria, §1-19-10.500.3.(E), which states, "The Transportation System is or will be made adequate to serve the proposed development in addition to existing and pipeline uses in the area. Factors to be evaluated include roadway capacity, level of service and safety, on-street parking impacts, access requirements, neighborhood and natural resource impacts, projected construction schedule of planned improvements, pedestrian and bicycle safety, and results of travel demand modeling assessing the change in future daily travel volumes, with and without the proposed development."

Evaluated Factors

Roadway Capacity/Levels of Service/Safety – Based on the analysis results in Tables 3, 4, and 5, the capacity and levels of service are acceptable per Frederick County Guidelines. Safety is further addressed below in the other factors.

On-Street Parking Impacts – Parking spaces will be available on site and there will not be on-street parking impacts.

Neighborhood and Natural Resource Impacts – This development is consistent with the approved commercial development of Jefferson Technology Park just to the south and is situated in close proximity to I-70, US 340/US 15 and multiple interchanges. It is our opinion that impacts are minimal.

Projected Construction Schedule of Planned Improvements – There were many improvements in the area to include the following:

- (Completed) MDOT SHA completed a project to enhance safety and increase capacity on more than one-half mile of MD 180 (Jefferson Pike) between Swallowtail Drive and the I-70 ramps. This $19M Project included:
    - A new bridge to join the existing MD 180 bridge over US 15 to carry additional travel lanes;
    - A second left turn lane at Solarex Court; and
    - Widened shoulders and included a designated bike lane.
- (Completed) Closure of Butterfly Lane at MD 180 and an extension of Himes Avenue from Butterfly Lane to MD 180 with a new Traffic Signal.
- (Completed) New Roundabout at the intersection of MD 180 @ Mt. Zion Road.

- Jefferson Park West Frontage Improvements are under construction to include the extension of Jefferson Technology Park from the existing roundabout at Jefferson Station Boulevard to MD 180. This includes the frontage improvements along MD 180, and we anticipate that these improvements will be completed within 2 years.

All of these improvements will enhance the capacity, operations, and safety within this area.

Pedestrian and Bicycle Safety – MD 180 has existing sidewalks and bicycle lanes in this area constructed by Jefferson Technology Park and will have connections and future improvements by Jefferson Park West. This includes sidewalks throughout the communities. We anticipate that similar improvements would be requested for the Kenel Development within the site and along MD 180.

Travel Demand Modeling – Travel Demand Modeling Traffic Volumes were requested and provided by Frederick County for the years 2017 and 2040, and these Average Daily Traffic (ADT) Volumes can be found in Appendix D. When determining the peak hour volumes, a typical rate of 8 to 10% of the ADT is utilized for analyses. For this area, the projected peak hour traffic volumes from the Model are less than the 2027 total traffic volumes found in this Traffic Impact Analysis. Therefore, a second analysis using the Model's traffic volumes was not conducted since our traffic volumes in the Traffic Impact Analysis are more conservative. Additionally, there are some inconsistencies with the Travel Demand Model as it relates to a link from MD 180 to Mt. Zion Road from Jefferson Technology Park, since it is not in the Comprehensive Plan. Therefore, we believe we meet this Evaluation Factor within the Traffic Impact Analysis.

Based on the review of all these factors, it is our opinion that we meet the Transportation System Approval Criteria for Rezoning.

RESULTS, RECOMMENDATIONS, AND CONCLUSIONS

Study Purpose

The Traffic Group, Inc. has prepared this Revised Traffic Impact Analysis to determine the impact of the proposed rezoning of the existing Creative Landscapes Development from Agriculture to MXD for the Kenel Development on the roadway network. The Kenel Development is generally located along the north side of MD 180 (Jefferson Pike), just south of I-70 in Frederick County, Maryland.

This development is now proposed with a 275,000-square foot Business Park (old TIS was with 179,160 square feet) with access proposed at the existing property location directly across from Jefferson Commons Way and is expected to be built out within 5 years (2027).

Study Criteria/Methodology

The Scope of Work for this Traffic Impact Analysis was determined by Frederick County and can be found in Appendix A. This Traffic Impact Analysis was prepared in accordance with Frederick County's APFO.

Based on the Rezoning, this Traffic Impact Analysis was also prepared based on the Approval Criteria, §1-19-10.500.3.(E), which states, "The Transportation System is or will be made adequate to serve the proposed development in addition to existing and pipeline uses in the area. Factors to be evaluated include: roadway capacity, level of service and safety, on-street parking impacts, access requirements, neighborhood and natural resource impacts, projected construction schedule of planned improvements, pedestrian and bicycle safety, and results of travel demand modeling assessing the change in future daily travel volumes, with and without the proposed development."

Summary of Findings and Recommendations

The results of the Traffic Impact Analysis indicate that all study intersections are operating at acceptable levels of service and will continue to operate with acceptable levels of service during each of the peak periods using the CLV, HCM, and SIDRA Methodologies. Additionally, all queues can be accommodated within the existing storage areas at all intersections during the morning and evening peak hours. Additionally, we reviewed and evaluated the factors outlined in the Transportation System Approval Criteria, and it is our opinion that all factors are acceptable.

Therefore, it is our opinion that the Kenel Development meets the Transportation System Approval Criteria and would also meet the requirements of Frederick County's APFO for approval with the necessary pro rata contributions to the local escrow accounts.

APPENDIX A

Correspondence,

Intersection Turning Movement Counts,

and Aerial Photos

Frederick County
Planning & Permitting Division

Draft TIA Scoping Proposal
Kenel (Creative Landscapes) Rezoning

1. LOCATION: North of MD 180, with site access opposite Jefferson Commons Way

2. EXISTING USE: Built: Wholesale Landscaping

3. PROPOSED USE:
   a. 179,160 sq ft of Business Park (ITE 770)

4. CIP/CTP ASSUMED IMPROVEMENTS: TBD County

5. OTHER IMPROVEMENTS: TBD County

6. BACKGROUND GROWTH & DEVELOPMENT: Increase arterial flows 1% per year for 5 years based on 5 year life of preliminary plan of subdivision. Account for the following projects:
   a. Unbuilt Jefferson Technology Park
   b. Unbuilt Jefferson Park West
   c. Jefferson Village

7. EXISTING TRAFFIC: Traffic counts less than two years old may be used or older counts can be factored with 1% annual growth. New counts may be collected and adjusted accordingly based on the availability of existing pre-pandemic counts for comparison (County/Consultant discussion if necessary).

8. TRIP GENERATION: ITE Rates from the 10th Edition will be used for all uses. The overall site, with existing office uses, would generate approximately 72 am and 75 pm peak hour trips. The net additional site peak hour trips, once removing the existing wholesale landscaping (18am and 18pm) is 54 am and 57 pm peak hour trips.

9. TRIP DISTRIBUTION: (trip assignments to be discussed with TE consultant):
   a. MD 180 East – 30%
   b. MD 180 West – 50%
   c. Jefferson Commons Way – 20%

10. ANALYSIS: (traditional weekday am and pm peak hours)
    a. CLV (SHA Method) & 95% Queues
       i. MD 180/Himes Avenue/Ramp
       HCM Un-signalized Analysis
       ii. Site Access/MD 180/Jefferson Commons Way
    b. Roundabout Analysis
       i. Jefferson Technology Parkway/Jefferson Station Boulevard
       ii. Jefferson Station Boulevard/Jefferson Commons Way
       iii. MD 180/Mt. Zion Road
    c. Queuing Analysis per SHA procedures

*Escrow contributions may extend beyond the study area.

Mark Mishler
Transportation Engineering Supervisor
Frederick County Government
Division of Permitting and Development Review (DPDR)
30 North Market Street
Frederick, MD 21701
717-387-3235 phone
301-600-1645 facsimile

MMishler@FrederickCountyMD.gov

Qiang Tian

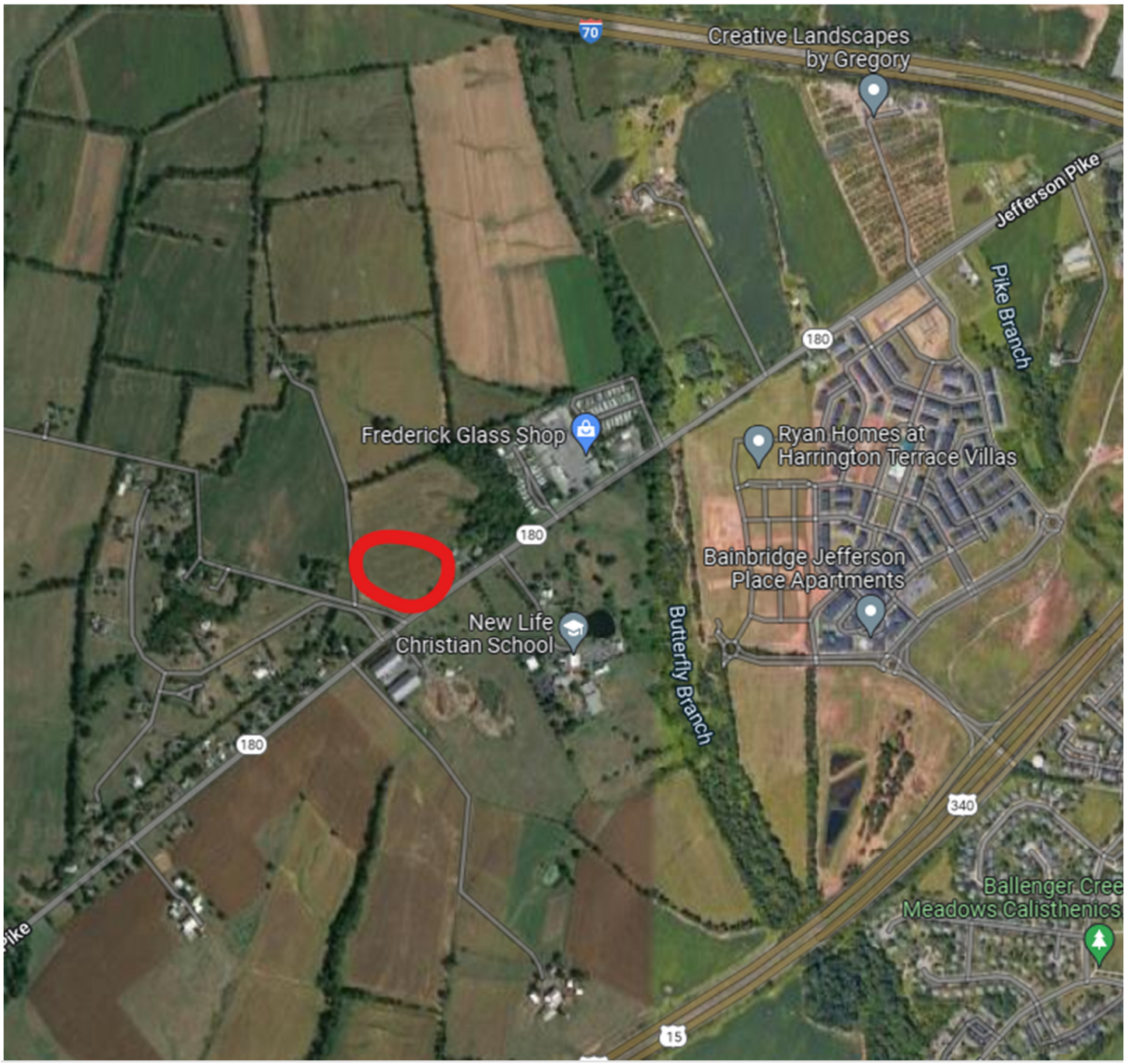
To: Joe Caloggero
Subject: RE: Traffic Counts

From: Mishler, Mark <MMishler@FrederickCountyMD.gov>
Sent: Wednesday, February 23, 2022 8:32 AM
To: Joe Caloggero <jcaloggero@trafficgroup.com>
Subject: RE: Traffic Counts

Jefferson Tech Park: 1,317AM and 1,788PM Unbuilt per attached trip scorecard update

JTP West:
Phase I: 133AM and 142PM for 235 residential (171 built, 64 remaining) 64/235* trips = 37AM and 39PM Unbuilt
Phase II: 185AM and 223PM Unbuilt
Phase III: 325AM and 268PM Unbuilt
547AM and 530PM Unbuilt

Jefferson Village: 16AM and 16PM (small Commercial/Residential) all unbuilt – see the red dot



From: Joe Caloggero <jcaloggero@trafficgroup.com>
Sent: Tuesday, February 22, 2022 9:09 PM
To: Mishler, Mark <MMishler@FrederickCountyMD.gov>
Subject: RE: Traffic Counts

[EXTERNAL EMAIL]

Thanks! I need the following please – as best you can…

1. BACKGROUND GROWTH
a. Unbuilt Jefferson Technology Park – do we know how much is built?
b. Unbuilt Jefferson Park West – do we know how much is built?
c. Jefferson Village – need development and how much is built?

Thanks!

Joe Caloggero, P.E, PTOE, PTP
Vice President
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9900 Franklin Square Dr. - Suite H
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T 410.931.6600
Cell 410.446.0618
F 410.931.6601
jcaloggero@trafficgroup.com
www.trafficgroup.com

Merging Innovation and Excellence®

From: Mishler, Mark <MMishler@FrederickCountyMD.gov>
Sent: Tuesday, February 22, 2022 7:32 PM
To: Joe Caloggero <jcaloggero@trafficgroup.com>
Subject: RE: Traffic Counts

Scope is good for now. If any edits are needed we can take care of it after the first review cycle.

Mark

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Counted by: VCU

Intersection of: MD 180 | Date: February 17, 2022 | Thursday

and: Himes Avenue - US 15 - US 340 Off Ramp | Weather: Sunny/Cool

Location: Frederick County, Maryland | Entered by: SN | Star Rating: 4

TIME	TRAFFIC FROM NORTH on: Himes Avenue					TRAFFIC FROM SOUTH on: US 15 - US 340 SB Off Ramp					TRAFFIC FROM EAST on: MD 180					TRAFFIC FROM WEST on: MD 180					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
7:00 - 7:15	0	0	57	0	57	121	18	17	0	156	33	19	0	0	52	0	59	2	0	61	326
7:15 - 7:30	0	0	54	0	54	119	10	25	0	154	27	25	0	0	52	0	86	1	0	87	347
7:30 - 7:45	0	0	58	0	58	156	9	31	0	196	41	51	0	0	92	0	103	3	0	106	452
7:45 - 8:00	2	0	61	0	63	164	18	46	0	228	54	39	0	0	93	0	80	1	0	81	465
8:00 - 8:15	1	0	45	0	46	154	20	90	0	264	52	59	0	0	111	0	120	1	0	121	542
8:15 - 8:30	1	0	51	0	52	164	19	48	0	231	32	46	0	0	78	0	132	3	0	135	496
8:30 - 8:45	4	0	71	0	75	140	17	25	0	182	45	45	0	0	90	0	109	2	0	111	458
8:45 - 9:00	0	0	63	0	63	148	15	32	0	195	65	46	0	0	111	0	91	1	0	92	461
2 Hr Totals	8	0	460	0	468	1166	126	314	0	1606	349	330	0	0	679	0	780	14	0	794	3547
1 Hr Totals																					
7:00 - 8:00	2	0	230	0	232	560	55	119	0	734	155	134	0	0	289	0	328	7	0	335	1590
7:15 - 8:15	3	0	218	0	221	593	57	192	0	842	174	174	0	0	348	0	389	6	0	395	1806
7:30 - 8:30	4	0	215	0	219	638	66	215	0	919	179	195	0	0	374	0	435	8	0	443	1955
7:45 - 8:45	8	0	228	0	236	622	74	209	0	905	183	189	0	0	372	0	441	7	0	448	1961
8:00 - 9:00	6	0	230	0	236	606	71	195	0	872	194	196	0	0	390	0	452	7	0	459	1957
PEAK HOUR																					
7:45 - 8:45	8	0	228	0	236	622	74	209	0	905	183	189	0	0	372	0	441	7	0	448	1961
PM																					
4:00 - 4:15	2	0	49	0	51	148	60	72	0	280	75	91	0	0	166	0	84	4	0	88	585
4:15 - 4:30	3	0	42	0	45	146	57	60	0	263	100	130	0	0	230	0	79	1	0	80	618
4:30 - 4:45	0	0	48	0	48	156	59	74	0	289	107	112	0	0	219	0	81	4	0	85	641
4:45 - 5:00	0	0	54	0	54	152	74	66	0	292	101	110	0	0	211	0	72	8	0	80	637
5:00 - 5:15	3	0	35	0	38	153	70	66	0	289	95	115	0	0	210	0	68	1	0	69	606
5:15 - 5:30	0	0	43	0	43	168	68	76	0	312	124	107	0	0	231	0	77	4	0	81	667
5:30 - 5:45	1	0	49	0	50	148	67	80	0	295	102	113	0	0	215	0	62	7	0	69	629
5:45 - 6:00	2	0	56	0	58	168	47	69	0	284	91	86	0	0	177	0	58	1	0	59	578
2 Hr Totals	11	0	376	0	387	1239	502	563	0	2304	795	864	0	0	1659	0	581	30	0	611	4961
1 Hr Totals																					
4:00 - 5:00	5	0	193	0	198	602	250	272	0	1124	383	443	0	0	826	0	316	17	0	333	2481
4:15 - 5:15	6	0	179	0	185	607	260	266	0	1133	403	467	0	0	870	0	300	14	0	314	2502
4:30 - 5:30	3	0	180	0	183	629	271	282	0	1182	427	444	0	0	871	0	298	17	0	315	2551
4:45 - 5:45	4	0	181	0	185	621	279	288	0	1188	422	445	0	0	867	0	279	20	0	299	2539
5:00 - 6:00	6	0	183	0	189	637	252	291	0	1180	412	421	0	0	833	0	265	13	0	278	2480
PEAK HOUR																					
4:30 - 5:30	3	0	180	0	183	629	271	282	0	1182	427	444	0	0	871	0	298	17	0	315	2551

MD 180 & Himes Avenue/ I-15 SB Off Ramp
Legend
2011-0313
Untitled Polygon
Jefferson Pike
Himes Ave
180
340
15
11
Google Earth
300 ft
N

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Counted by: VCU

Intersection of: MD 180 | Date: February 17, 2022 | Thursday

and: Jefferson Commons Way | Weather: Sunny/Cool

Location: Frederick County, Maryland | Entered by: SN | Star Rating: 4

TIME	TRAFFIC FROM NORTH on: Driveway					TRAFFIC FROM SOUTH on: Jefferson Commons Way					TRAFFIC FROM EAST on: MD 180					TRAFFIC FROM WEST on: MD 180					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
7:00 - 7:15	0	3	0	0	3	5	0	0	0	5	2	11	4	1	18	1	26	0	0	27	53
7:15 - 7:30	0	5	1	0	6	8	0	2	0	10	0	18	5	0	23	1	34	0	0	35	74
7:30 - 7:45	2	0	1	0	3	10	1	4	0	15	0	20	15	0	35	4	29	0	0	33	86
7:45 - 8:00	0	6	3	0	9	8	1	6	0	15	4	39	6	0	49	2	27	0	0	29	102
8:00 - 8:15	0	0	0	0	0	10	0	12	0	22	0	76	8	0	84	8	78	0	0	86	192
8:15 - 8:30	0	0	0	0	0	10	0	8	0	18	0	37	9	0	46	8	77	0	0	85	149
8:30 - 8:45	1	0	0	0	1	12	0	1	0	13	0	20	6	0	26	3	33	0	0	36	76
8:45 - 9:00	0	0	1	0	1	7	0	2	0	9	2	19	11	0	32	0	37	0	0	37	79
2 Hr Totals	3	14	6	0	23	70	2	35	0	107	8	240	64	1	313	27	341	0	0	368	811
1 Hr Totals																					
7:00 - 8:00	2	14	5	0	21	31	2	12	0	45	6	88	30	1	125	8	116	0	0	124	315
7:15 - 8:15	2	11	5	0	18	36	2	24	0	62	4	153	34	0	191	15	168	0	0	183	454
7:30 - 8:30	2	6	4	0	12	38	2	30	0	70	4	172	38	0	214	22	211	0	0	233	529
7:45 - 8:45	1	6	3	0	10	40	1	27	0	68	4	172	29	0	205	21	215	0	0	236	519
8:00 - 9:00	1	0	1	0	2	39	0	23	0	62	2	152	34	0	188	19	225	0	0	244	496
PEAK HOUR																					
7:30 - 8:30	2	6	4	0	12	38	2	30	0	70	4	172	38	0	214	22	211	0	0	233	529
PM																					
4:00 - 4:15	0	0	2	0	2	7	2	6	1	16	2	32	15	0	49	5	36	1	0	42	109
4:15 - 4:30	0	2	6	0	8	9	0	1	0	10	0	39	15	0	54	3	34	0	0	37	109
4:30 - 4:45	1	2	2	0	5	8	0	5	0	13	0	31	28	0	59	4	30	0	0	34	111
4:45 - 5:00	0	0	0	0	0	13	0	3	0	16	0	33	20	0	53	3	32	0	0	35	104
5:00 - 5:15	0	0	0	0	0	7	1	2	0	10	2	32	14	1	49	0	36	0	0	36	95
5:15 - 5:30	0	0	2	0	2	11	0	0	0	11	2	31	19	0	52	2	44	0	0	46	111
5:30 - 5:45	0	0	3	0	3	12	0	4	0	16	0	35	25	0	60	3	21	0	0	24	103
5:45 - 6:00	0	1	0	0	1	9	0	1	0	10	2	32	22	0	56	5	27	0	0	32	99
2 Hr Totals	1	5	15	0	21	76	3	22	1	102	8	265	158	1	432	25	260	1	0	286	841
1 Hr Totals																					
4:00 - 5:00	1	4	10	0	15	37	2	15	1	55	2	135	78	0	215	15	132	1	0	148	433
4:15 - 5:15	1	4	8	0	13	37	1	11	0	49	2	135	77	1	215	10	132	0	0	142	419
4:30 - 5:30	1	2	4	0	7	39	1	10	0	50	4	127	81	1	213	9	142	0	0	151	421
4:45 - 5:45	0	0	5	0	5	43	1	9	0	53	4	131	78	1	214	8	133	0	0	141	413
5:00 - 6:00	0	1	5	0	6	39	1	7	0	47	6	130	80	1	217	10	128	0	0	138	408
PEAK HOUR																					
4:00 - 5:00	1	4	10	0	15	37	2	15	1	55	2	135	78	0	215	15	132	1	0	148	433

MD 180 & Jefferson Commons Way
Legend
2011-0313
Untitled Polygon
180
Jefferson Pike
Jefferson Commons Way
Krantz Dr
Google Earth
200 ft
N

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Counted by: VCU

Intersection of: MD 180 | Date: February 17, 2022 | Thursday

and: Mt Zion Road | Weather: Sunny/Cool

Location: Frederick County, Maryland | Entered by: SN | Star Rating: 5

TIME	TRAFFIC FROM NORTH on: Mt Zion Road					TRAFFIC FROM SOUTH on: Mt Zion Road					TRAFFIC FROM EAST on: MD 180					TRAFFIC FROM WEST on: MD 180					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
7:00 - 7:15	4	30	0	0	34	8	5	22	0	35	0	5	9	0	14	32	11	3	0	46	129
7:15 - 7:30	6	16	1	0	23	2	7	18	0	27	0	4	4	0	8	40	15	3	0	58	116
7:30 - 7:45	3	25	2	0	30	11	12	18	0	41	3	6	11	0	20	23	12	6	0	41	132
7:45 - 8:00	2	27	4	0	33	8	20	24	0	52	1	13	3	0	17	33	12	3	0	48	150
8:00 - 8:15	2	21	2	0	25	30	18	16	0	64	2	13	14	0	29	29	24	4	1	58	176
8:15 - 8:30	7	27	2	0	36	9	20	18	1	48	5	17	16	0	38	25	12	4	0	41	163
8:30 - 8:45	5	23	4	0	32	3	6	23	0	32	1	7	8	0	16	21	6	1	0	28	108
8:45 - 9:00	2	13	1	0	16	9	10	27	0	46	5	7	4	0	16	16	12	1	0	29	107
2 Hr Totals	31	182	16	0	229	80	98	166	1	345	17	72	69	0	158	219	104	25	1	349	1081
1 Hr Totals																					
7:00 - 8:00	15	98	7	0	120	29	44	82	0	155	4	28	27	0	59	128	50	15	0	193	527
7:15 - 8:15	13	89	9	0	111	51	57	76	0	184	6	36	32	0	74	125	63	16	1	205	574
7:30 - 8:30	14	100	10	0	124	58	70	76	1	205	11	49	44	0	104	110	60	17	1	188	621
7:45 - 8:45	16	98	12	0	126	50	64	81	1	196	9	50	41	0	100	108	54	12	1	175	597
8:00 - 9:00	16	84	9	0	109	51	54	84	1	190	13	44	42	0	99	91	54	10	1	156	554
PEAK HOUR																					
7:30 - 8:30	14	100	10	0	124	58	70	76	1	205	11	49	44	0	104	110	60	17	1	188	621
PM																					
4:00 - 4:15	6	8	1	0	15	14	41	44	0	99	6	13	4	1	24	23	9	4	0	36	174
4:15 - 4:30	8	15	3	0	26	10	51	32	0	93	2	22	7	1	32	20	7	1	0	28	179
4:30 - 4:45	4	15	1	0	20	9	50	27	0	86	5	15	12	1	33	26	8	2	0	36	175
4:45 - 5:00	5	24	0	0	29	9	43	37	0	89	1	20	6	0	27	18	8	6	0	32	177
5:00 - 5:15	5	20	1	1	27	18	39	35	0	92	4	17	8	0	29	29	13	5	0	47	195
5:15 - 5:30	3	20	2	0	25	12	47	47	0	106	1	23	7	0	31	24	10	5	0	39	201
5:30 - 5:45	3	16	2	0	21	19	39	36	0	94	3	20	8	0	31	10	4	5	0	19	165
5:45 - 6:00	4	12	0	0	16	7	32	34	0	73	6	11	7	0	24	20	8	2	0	30	143
2 Hr Totals	38	130	10	1	179	98	342	292	0	732	28	141	59	3	231	170	67	30	0	267	1409
1 Hr Totals																					
4:00 - 5:00	23	62	5	0	90	42	185	140	0	367	14	70	29	3	116	87	32	13	0	132	705
4:15 - 5:15	22	74	5	1	102	46	183	131	0	360	12	74	33	2	121	93	36	14	0	143	726
4:30 - 5:30	17	79	4	1	101	48	179	146	0	373	11	75	33	1	120	97	39	18	0	154	748
4:45 - 5:45	16	80	5	1	102	58	168	155	0	381	9	80	29	0	118	81	35	21	0	137	738
5:00 - 6:00	15	68	5	1	89	56	157	152	0	365	14	71	30	0	115	83	35	17	0	135	704
PEAK HOUR																					
4:30 - 5:30	17	79	4	1	101	48	179	146	0	373	11	75	33	1	120	97	39	18	0	154	748

MD 180 & Mt. Zion Road
Legend
Mt Zion Rd
Jefferson Pike
180
Yukon Ct
Google Earth
300 ft
N

TOTALS TURNING MOVEMENT COUNT - SUMMARY

Counted by: VCU

Intersection of: Jefferson Commons Way — Date: February 23, 2022 — Wednesday

and: Jefferson Station Boulevard — Weather: Sunny/Cool

Location: Frederick County, Maryland — Entered by: SN — Star Rating: 4

TIME	TRAFFIC FROM NORTH on: Jefferson Commons Way					TRAFFIC FROM SOUTH on:					TRAFFIC FROM EAST on: Construction Access					TRAFFIC FROM WEST on: Jefferson Station Boulevard					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
7:00 - 7:15	11	0	0	0	11	0	0	0	0	0	0	0	0	1	1	0	3	3	0	6	18
7:15 - 7:30	14	0	0	0	14	0	0	0	0	0	0	0	0	2	2	0	4	4	0	8	24
7:30 - 7:45	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	3	12	0	15	30
7:45 - 8:00	10	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	1	15	0	16	26
8:00 - 8:15	15	0	0	0	15	0	0	0	0	0	0	1	0	0	1	0	0	18	1	19	35
8:15 - 8:30	18	0	0	0	18	0	0	0	0	0	0	1	0	0	1	0	0	13	0	13	32
8:30 - 8:45	18	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	22
8:45 - 9:00	4	0	0	0	4	0	0	0	0	0	0	3	0	0	3	0	0	6	0	6	13
2 Hr Totals	105	0	0	0	105	0	0	0	0	0	0	5	0	3	8	0	11	75	1	87	200
1 Hr Totals																					
7:00 - 8:00	50	0	0	0	50	0	0	0	0	0	0	0	0	3	3	0	11	34	0	45	98
7:15 - 8:15	54	0	0	0	54	0	0	0	0	0	0	1	0	2	3	0	8	49	1	58	115
7:30 - 8:30	58	0	0	0	58	0	0	0	0	0	0	2	0	0	2	0	4	58	1	63	123
7:45 - 8:45	61	0	0	0	61	0	0	0	0	0	0	2	0	0	2	0	1	50	1	52	115
8:00 - 9:00	55	0	0	0	55	0	0	0	0	0	0	5	0	0	5	0	0	41	1	42	102
PEAK HOUR																					
7:30 - 8:30	58	0	0	0	58	0	0	0	0	0	0	2	0	0	2	0	4	58	1	63	123
PM																					
4:00 - 4:15	5	0	0	0	5	0	0	0	0	0	0	1	0	0	1	0	0	12	0	12	18
4:15 - 4:30	9	0	0	0	9	0	0	0	0	0	0	4	0	0	4	0	0	14	0	14	27
4:30 - 4:45	14	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	1	7	1	9	23
4:45 - 5:00	10	0	0	0	10	0	0	0	0	0	2	2	0	0	4	0	1	14	2	17	31
5:00 - 5:15	12	0	0	0	12	0	0	0	0	0	0	5	0	0	5	0	1	15	1	17	34
5:15 - 5:30	19	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12	31
5:30 - 5:45	9	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	17	0	17	26
5:45 - 6:00	16	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	20	1	21	37
2 Hr Totals	94	0	0	0	94	0	0	0	0	0	2	12	0	0	14	0	3	111	5	119	227
1 Hr Totals																					
4:00 - 5:00	38	0	0	0	38	0	0	0	0	0	2	7	0	0	9	0	2	47	3	52	99
4:15 - 5:15	45	0	0	0	45	0	0	0	0	0	2	11	0	0	13	0	3	50	4	57	115
4:30 - 5:30	55	0	0	0	55	0	0	0	0	0	2	7	0	0	9	0	3	48	4	55	119
4:45 - 5:45	50	0	0	0	50	0	0	0	0	0	2	7	0	0	9	0	2	58	3	63	122
5:00 - 6:00	56	0	0	0	56	0	0	0	0	0	0	5	0	0	5	0	1	64	2	67	128
PEAK HOUR																					
5:00 - 6:00	56	0	0	0	56	0	0	0	0	0	0	5	0	0	5	0	1	64	2	67	128

Jefferson Station Boulevard & Jefferson Commons Way
Legend
Jefferson Commons Way
Ritter Dr
Ritter Dr
Leben Dr
Leben Dr
Jefferson Station Blvd
Jefferson Station Blvd
Google Earth
200 ft
N

TOTALS TURNING MOVEMENT COUNT - SUMMARY

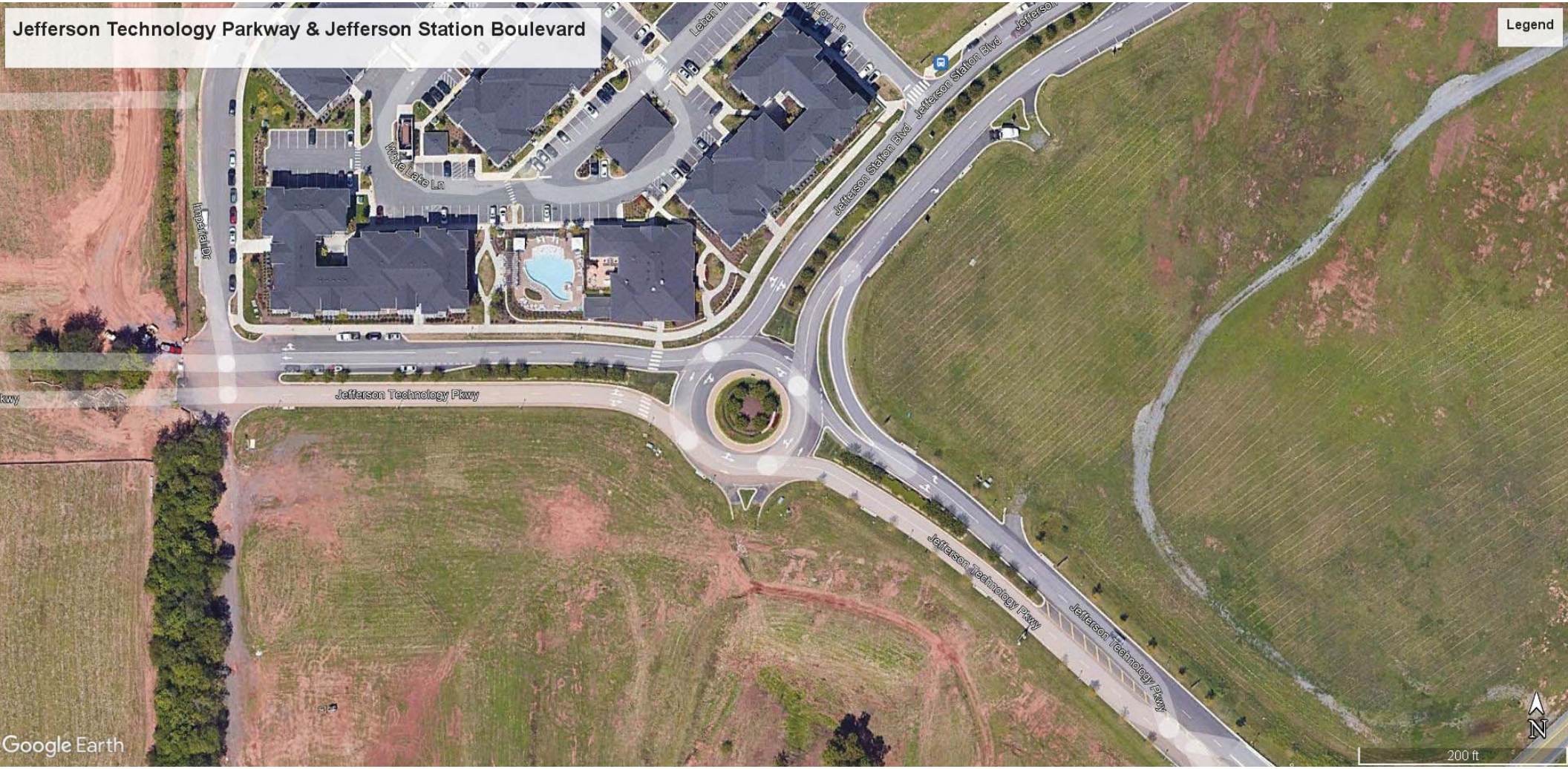
Counted by: VCU

Intersection of: Jefferson Station Boulevard — Date: February 17, 2022 — Thursday

and: Jefferson Technology Boulevard — Weather: Sunny/Cool

Location: Frederick County, Maryland — Entered by: SN — Star Rating: 5

TIME	TRAFFIC FROM NORTH on: Jefferson Station Boulevard					TRAFFIC FROM SOUTH on:					TRAFFIC FROM EAST on: Jefferson Technology Boulevard					TRAFFIC FROM WEST on: Jefferson Technology Boulevard					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
7:00 - 7:15	0	0	52	0	52	0	0	0	0	0	7	8	0	0	15	0	11	0	0	11	78
7:15 - 7:30	0	0	32	0	32	0	0	0	0	0	16	3	0	0	19	0	6	0	0	6	57
7:30 - 7:45	1	0	39	1	41	0	0	0	0	0	10	8	0	1	19	0	11	2	0	13	73
7:45 - 8:00	1	0	36	1	38	0	0	0	0	0	18	11	0	0	29	0	17	1	0	18	85
8:00 - 8:15	1	0	35	0	36	0	0	0	0	0	27	5	0	0	32	0	15	0	0	15	83
8:15 - 8:30	1	0	40	0	41	0	0	0	0	0	14	10	0	1	25	0	11	2	0	13	79
8:30 - 8:45	1	0	30	2	33	0	0	0	0	0	7	4	0	0	11	0	8	0	0	8	52
8:45 - 9:00	0	0	21	1	22	0	0	0	0	0	16	5	0	0	21	0	10	1	0	11	54
2 Hr Totals	5	0	285	5	295	0	0	0	0	0	115	54	0	2	171	0	89	6	0	95	561
1 Hr Totals																					
7:00 - 8:00	2	0	159	2	163	0	0	0	0	0	51	30	0	1	82	0	45	3	0	48	293
7:15 - 8:15	3	0	142	2	147	0	0	0	0	0	71	27	0	1	99	0	49	3	0	52	298
7:30 - 8:30	4	0	150	2	156	0	0	0	0	0	69	34	0	2	105	0	54	5	0	59	320
7:45 - 8:45	4	0	141	3	148	0	0	0	0	0	66	30	0	1	97	0	51	3	0	54	299
8:00 - 9:00	3	0	126	3	132	0	0	0	0	0	64	24	0	1	89	0	44	3	0	47	268
PEAK HOUR																					
7:30 - 8:30	4	0	150	2	156	0	0	0	0	0	69	34	0	2	105	0	54	5	0	59	320
PM																					
4:00 - 4:15	2	0	23	1	26	0	0	0	0	0	41	6	0	0	47	0	4	0	1	5	78
4:15 - 4:30	0	0	26	0	26	0	0	0	0	0	38	4	0	0	42	0	5	0	0	5	73
4:30 - 4:45	1	0	25	0	26	0	0	0	0	0	39	13	0	2	54	0	6	1	0	7	87
4:45 - 5:00	0	0	22	0	22	0	0	0	0	0	33	10	0	0	43	0	6	2	0	8	73
5:00 - 5:15	0	0	18	0	18	0	0	0	0	0	24	5	0	0	29	0	7	0	0	7	54
5:15 - 5:30	0	0	20	1	21	0	0	0	0	0	30	11	0	0	41	0	13	1	0	14	76
5:30 - 5:45	0	0	14	1	15	0	0	0	0	0	33	14	0	0	47	0	5	0	0	5	67
5:45 - 6:00	1	0	16	0	17	0	0	0	0	0	32	17	0	1	50	0	6	1	0	7	74
2 Hr Totals	4	0	164	3	171	0	0	0	0	0	270	80	0	3	353	0	52	5	1	58	582
1 Hr Totals																					
4:00 - 5:00	3	0	96	1	100	0	0	0	0	0	151	33	0	2	186	0	21	3	1	25	311
4:15 - 5:15	1	0	91	0	92	0	0	0	0	0	134	32	0	2	168	0	24	3	0	27	287
4:30 - 5:30	1	0	85	1	87	0	0	0	0	0	126	39	0	2	167	0	32	4	0	36	290
4:45 - 5:45	0	0	74	2	76	0	0	0	0	0	120	40	0	0	160	0	31	3	0	34	270
5:00 - 6:00	1	0	68	2	71	0	0	0	0	0	119	47	0	1	167	0	31	2	0	33	271
PEAK HOUR																					
4:00 - 5:00	3	0	96	1	100	0	0	0	0	0	151	33	0	2	186	0	21	3	1	25	311


Jefferson Technology Parkway & Jefferson Station Boulevard
Legend
Jefferson Station Blvd
Jefferson Station Blvd
Jefferson Technology Pkwy
Jefferson Technology Pkwy
Jefferson Technology Pkwy
Imperial Dr
White Lake Ln
Google Earth
200 ft
N

APPENDIX B

Intersection Capacity Analysis Worksheets

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Frederick County

E/W Road: MD 180 **Date of Count:** 2/17/2022

N/S Road: Himes Avenue/Us 15 - US 340 SB Off Ramp **Day of Count:** Thursday

Conditions: Existing Traffic **Analyst:** Qiang Tian

Peak: 7:45 -8:45

Peak: 4:30 -5:30

HIMES AVENUE

3	0	180	**PM**
8	0	228	**AM**
R	**T**	**L**	

MD 180

R L

R	183	427
T	189	444
L	0	0
	AM	**PM**

FR

T

T

PM	AM	
17	7	**L**
298	441	**T**
0	0	**R**

L

T

MD 180

L T FR

	L	T	R
AM	209	74	622
PM	282	271	629

US 15 - US 340 SB OFF RAMP

Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	74	1.00	74	228	1.00	228	302
SB	1	1.00	1	209	1.00	209	
EB	441	1.00	441	0	0.00	0	441
WB	189	0.55	104	7	1.00	7	

CLV TOTAL= **743**

Level of Service (LOS)= **A**

AM V/C =0.46

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	271	1.00	271	180	1.00	180	451
SB	0	0.00	0	282	1.00	282	
EB	298	1.00	298	0	0.00	0	298
WB	444	0.55	244	17	1.00	17	

CLV TOTAL= **749**

Level of Service (LOS)= **A**

PM V/C =0.47

Scenario ID - EXIST1

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Frederick County

E/W Road: MD 180 **Date of Count:** 2/17/2022

N/S Road: Himes Avenue/Us 15 - US 340 SB Off Ramp **Day of Count:** Thursday

Conditions: Background Traffic **Analyst:** Qiang Tian

Peak: 7:45 -8:45

Peak: 4:30 -5:30

HIMES AVENUE

	R	T	L
PM	54	0	189
AM	87	0	240

MD 180

R L

R	398	529
T	289	492
L	0	0
	AM	PM

FR

T

T

	PM	AM
L	135	31
T	404	491
R	0	0

L

T

MD 180

L T FR

	L	T	R
AM	220	78	654
PM	296	285	661

US 15 - US 340 SB OFF RAMP

Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	78	1.00	78	240	1.00	240	318
SB	56	1.00	56	220	1.00	220	
EB	491	1.00	491	0	0.00	0	491
WB	289	0.55	159	31	1.00	31	

CLV TOTAL= **809**

Level of Service (LOS)= **A**

AM V/C =0.51

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	285	1.00	285	189	1.00	189	474
SB	0	0.00	0	296	1.00	296	
EB	404	1.00	404	0	0.00	0	406
WB	492	0.55	271	135	1.00	135	

CLV TOTAL= **880**

Level of Service (LOS)= **A**

PM V/C =0.55

Scenario ID - BACK1

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Frederick County

E/W Road: MD 180 **Date of Count:** 2/17/2022

N/S Road: Himes Avenue/Us 15 - US 340 SB Off Ramp **Day of Count:** Thursday

Conditions: Existing Traffic **Analyst:** Qiang Tian

Peak: 7:45 -8:45

Peak: 4:30 -5:30

HIMES AVENUE

R	T	L	
3	0	180	PM
8	0	228	AM

MD 180

R L

	R	L
FR	183	427
T	189	444
T	0	0
	AM	PM

PM	AM	
17	7	L
298	441	T
0	0	R

L —

T —

MD 180

L T FR

	L	T	R
AM	209	74	622
PM	282	271	629

US 15 - US 340 SB OFF RAMP

Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	74	1.00	74	228	1.00	228	302
SB	1	1.00	1	209	1.00	209	
EB	441	1.00	441	0	0.00	0	441
WB	189	0.55	104	7	1.00	7	
						CLV TOTAL=	**743**
						Level of Service (LOS)=	**A**

Scenario ID - EXIST1 AM V/C =0.46

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	271	1.00	271	180	1.00	180	451
SB	0	0.00	0	282	1.00	282	
EB	298	1.00	298	0	0.00	0	298
WB	444	0.55	244	17	1.00	17	
						CLV TOTAL=	**749**
						Level of Service (LOS)=	**A**

PM V/C =0.47

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Frederick County

E/W Road: MD 180 **Date of Count:** 2/17/2022

N/S Road: Himes Avenue/Us 15 - US 340 SB Off Ramp **Day of Count:** Thursday

Conditions: Background Traffic **Analyst:** Qiang Tian

Peak: 7:45 -8:45

Peak: 4:30 -5:30

HIMES AVENUE

54	0	189	**PM**
87	0	240	**AM**
R	**T**	**L**	

MD 180

R L

FR

T

T

R	398	529
T	289	492
L	0	0
	AM	**PM**

PM	**AM**	
135	31	**L**
404	491	**T**
0	0	**R**

L

T

MD 180

L T FR

	L	**T**	**R**
AM	220	78	654
PM	296	285	661

US 15 - US 340 SB OFF RAMP

Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	78	1.00	78	240	1.00	240	318
SB	56	1.00	56	220	1.00	220	
EB	491	1.00	491	0	0.00	0	491
WB	289	0.55	159	31	1.00	31	

CLV TOTAL= **809**

Level of Service (LOS)= **A**

AM V/C =0.51

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	285	1.00	285	189	1.00	189	474
SB	0	0.00	0	296	1.00	296	
EB	404	1.00	404	0	0.00	0	406
WB	492	0.55	271	135	1.00	135	

CLV TOTAL= **880**

Level of Service (LOS)= **A**

PM V/C =0.55

Scenario ID - BACK1

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Frederick County

E/W Road: MD 180 **Date of Count:** 2/17/2022

N/S Road: Himes Avenue/Us 15 - US 340 SB Off Ramp **Day of Count:** Thursday

Conditions: Total Traffic **Analyst:** Qiang Tian

Peak: 7:45 -8:45

Peak: 4:30 -5:30

HIMES AVENUE

54	0	189	**PM**
87	0	240	**AM**
R	**T**	**L**	

MD 180

R L

R	398	529	— FR
T	308	505	— T
L	0	0	— T
	AM	**PM**	

PM	**AM**	
135	31	**L**
420	500	**T**
0	0	**R**

L —

T —

MD 180

L T FR

	L	**T**	**R**
AM	220	78	654
PM	296	285	661

US 15 - US 340 SB OFF RAMP

Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	78	1.00	78	240	1.00	240	318
SB	56	1.00	56	220	1.00	220	
EB	500	1.00	500	0	0.00	0	500
WB	308	0.55	169	31	1.00	31	

CLV TOTAL= **818**

Level of Service (LOS)= **A**

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	285	1.00	285	189	1.00	189	474
SB	0	0.00	0	296	1.00	296	
EB	420	1.00	420	0	0.00	0	420
WB	505	0.55	278	135	1.00	135	

CLV TOTAL= **894**

Level of Service (LOS)= **A**

Scenario ID - TOT1

AM V/C =0.51

PM V/C =0.56

HCS7 Two-Way Stop-Control Report

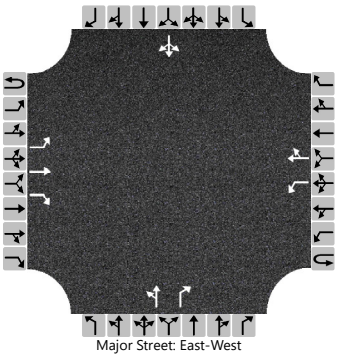
General Information

Analyst	QT
Agency/Co.	TTG, Inc.
Date Performed	2/28/2022
Analysis Year	2022
Time Analyzed	Existing AM
Intersection Orientation	East-West
Project Description	Kenel (Creative Landscapes)

Site Information

Intersection	MD 180 & Jefferson Common
Jurisdiction	Frederick County, MD
East/West Street	MD 180
North/South Street	Jefferson Common Way/ Acc
Peak Hour Factor	0.69
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

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	1	0	1	1	0		0	1	1		0	1	0
Configuration		L	T	R		L		TR		LT		R			LTR	
Volume (veh/h)		0	211	22		38	172	4		30	2	38		4	6	2
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No								No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
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)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				55				46		55			17	
Capacity, c (veh/h)		1310				1222				348		734			366	
v/c Ratio		0.00				0.05				0.13		0.08			0.05	
95% Queue Length, Q_{95} (veh)		0.0				0.1				0.5		0.2			0.1	
Control Delay (s/veh)		7.7				8.1				16.9		10.3			15.3	
Level of Service (LOS)		A				A				C		B			C	
Approach Delay (s/veh)	0.0				1.4				13.3				15.3			
Approach LOS									B				C			

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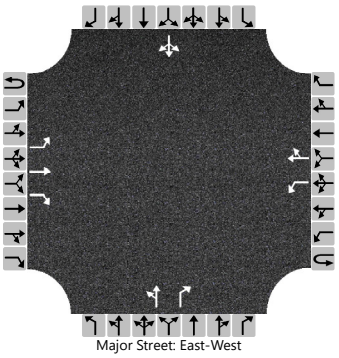
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	QT	Intersection	MD 180 & Jefferson Common
Agency/Co.	TTG, Inc.	Jurisdiction	Frederick County, MD
Date Performed	2/28/2022	East/West Street	MD 180
Analysis Year	2022	North/South Street	Jefferson Common Way/ Acc
Time Analyzed	Existing PM	Peak Hour Factor	0.98
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Kenel (Creative Landscapes)		

Lanes



Major Street: East-West

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	1	0	1	1	0		0	1	1		0	1	0
Configuration		L	T	R		L		TR		LT		R			LTR	
Volume (veh/h)		1	132	15		78	135	2		16	2	37		8	4	1
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No								No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
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)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				80				18		38			13	
Capacity, c (veh/h)		1444				1431				501		914			488	
v/c Ratio		0.00				0.06				0.04		0.04			0.03	
95% Queue Length, Q_{95} (veh)		0.0				0.2				0.1		0.1			0.1	
Control Delay (s/veh)		7.5				7.7				12.5		9.1			12.6	
Level of Service (LOS)		A				A				B		A			B	
Approach Delay (s/veh)	0.1				2.8				10.2				12.6			
Approach LOS									B				B			

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HCS7 Two-Way Stop-Control Report

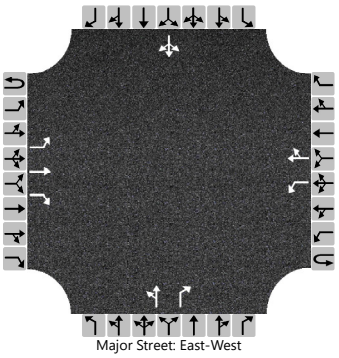
General Information

Analyst	QT
Agency/Co.	TTG, Inc.
Date Performed	2/28/2022
Analysis Year	2027
Time Analyzed	Background AM
Intersection Orientation	East-West
Project Description	Kenel (Creative Landscapes)

Site Information

Intersection	MD 180 & Jefferson Common
Jurisdiction	Frederick County, MD
East/West Street	MD 180
North/South Street	Jefferson Common Way/ Acc
Peak Hour Factor	0.90
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

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	1	0	1	1	0		0	1	1		0	1	0
Configuration		L	T	R		L		TR		LT		R			LTR	
Volume (veh/h)		0	271	77		146	282	4		45	2	66		4	6	2
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No								No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
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)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				162				52		73			13	
Capacity, c (veh/h)		1242				1172				211		739			215	
v/c Ratio		0.00				0.14				0.25		0.10			0.06	
95% Queue Length, Q_{95} (veh)		0.0				0.5				0.9		0.3			0.2	
Control Delay (s/veh)		7.9				8.6				27.6		10.4			22.8	
Level of Service (LOS)		A				A				D		B			C	
Approach Delay (s/veh)	0.0				2.9				17.6				22.8			
Approach LOS									C				C			

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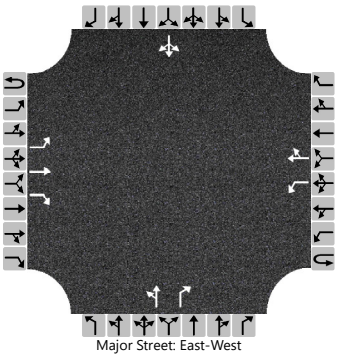
HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	QT	Intersection	MD 180 & Jefferson Common
Agency/Co.	TTG, Inc.	Jurisdiction	Frederick County, MD
Date Performed	2/28/2022	East/West Street	MD 180
Analysis Year	2027	North/South Street	Jefferson Common Way/ Acc
Time Analyzed	Background PM	Peak Hour Factor	0.98
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Kenel (Creative Landscapes)		

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	1	0	1	1	0		0	1	1		0	1	0
Configuration		L	T	R		L		TR		LT		R			LTR	
Volume (veh/h)		1	292	37		120	232	2		84	2	166		10	4	1
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No								No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
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)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				122				88		169			15	
Capacity, c (veh/h)		1328				1224				283		742			218	
v/c Ratio		0.00				0.10				0.31		0.23			0.07	
95% Queue Length, Q_{95} (veh)		0.0				0.3				1.3		0.9			0.2	
Control Delay (s/veh)		7.7				8.3				23.3		11.3			22.8	
Level of Service (LOS)		A				A				C		B			C	
Approach Delay (s/veh)	0.0				2.8				15.4				22.8			
Approach LOS									C				C			

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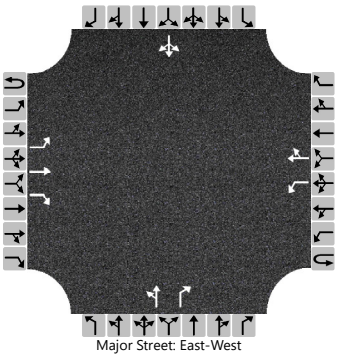
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	QT	Intersection	MD 180 & Jefferson Common
Agency/Co.	TTG, Inc.	Jurisdiction	Frederick County, MD
Date Performed	2/28/2022	East/West Street	MD 180
Analysis Year	2027	North/South Street	Jefferson Common Way/ Acc
Time Analyzed	Total AM	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Kenel (Creative Landscapes)		

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	1	0	1	1	0		0	1	1		0	1	0
Configuration		L	T	R		L		TR		LT		R			LTR	
Volume (veh/h)		31	271	77		146	282	23		45	15	66		13	12	16
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No								No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
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)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		34				162				67		73			46	
Capacity, c (veh/h)		1220				1172				172		739			230	
v/c Ratio		0.03				0.14				0.39		0.10			0.20	
95% Queue Length, Q_{95} (veh)		0.1				0.5				1.7		0.3			0.7	
Control Delay (s/veh)		8.0				8.6				38.6		10.4			24.5	
Level of Service (LOS)		A				A				E		B			C	
Approach Delay (s/veh)	0.7				2.8				23.8				24.5			
Approach LOS	A				A				C				C			

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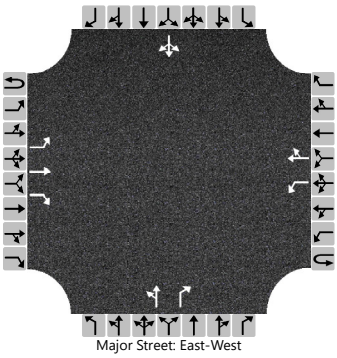
HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	QT	Intersection	MD 180 & Jefferson Common
Agency/Co.	TTG, Inc.	Jurisdiction	Frederick County, MD
Date Performed	2/28/2022	East/West Street	MD 180
Analysis Year	2027	North/South Street	Jefferson Common Way/ Acc
Time Analyzed	Total PM	Peak Hour Factor	0.98
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Kenel (Creative Landscapes)		

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	1	0	1	1	0		0	1	1		0	1	0
Configuration		L	T	R		L		TR		LT		R			LTR	
Volume (veh/h)		23	292	37		120	232	15		84	11	166		26	15	28
Percent Heavy Vehicles (%)		2				2				2	2	2		2	2	2
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized	No								No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.12				7.12	6.52	6.22		7.12	6.52	6.22
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)		2.22				2.22				3.52	4.02	3.32		3.52	4.02	3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		23				122				97		169			70	
Capacity, c (veh/h)		1313				1224				235		742			296	
v/c Ratio		0.02				0.10				0.41		0.23			0.24	
95% Queue Length, Q_{95} (veh)		0.1				0.3				1.9		0.9			0.9	
Control Delay (s/veh)		7.8				8.3				30.6		11.3			20.9	
Level of Service (LOS)		A				A				D		B			C	
Approach Delay (s/veh)	0.5				2.7				18.3				20.9			
Approach LOS	A				A				C				C			

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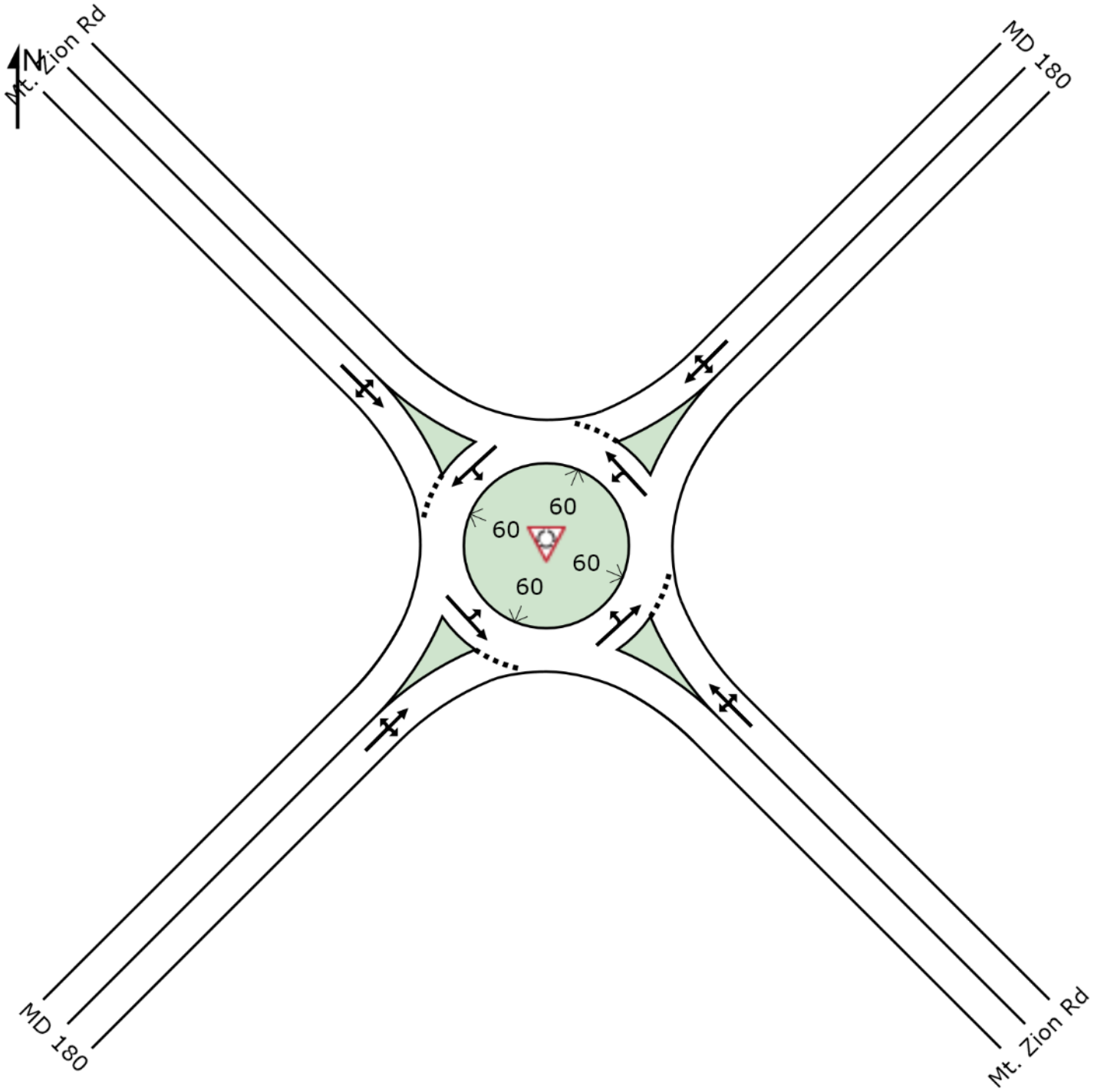
SITE LAYOUT

Site: EA

MD 180 at Mt. Zion Rd
Existing AM Peak
Roundabout



MOVEMENT SUMMARY

Site: EA

MD 180 at Mt. Zion Rd
Existing AM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Mt. Zion Rd											
3x	L2	87	2.0	0.233	5.9	LOS A	1.0	24.5	0.25	0.14	32.8
8x	T1	80	2.0	0.233	5.9	LOS A	1.0	24.5	0.25	0.14	32.9
18x	R2	66	2.0	0.233	5.9	LOS A	1.0	24.5	0.25	0.14	32.2
Approach		233	2.0	0.233	5.9	LOS A	1.0	24.5	0.25	0.14	32.7
NorthEast: MD 180											
1x	L2	50	2.0	0.129	5.2	LOS A	0.5	12.0	0.32	0.21	33.0
6x	T1	56	2.0	0.129	5.2	LOS A	0.5	12.0	0.32	0.21	33.1
16x	R2	13	2.0	0.129	5.2	LOS A	0.5	12.0	0.32	0.21	32.4
Approach		118	2.0	0.129	5.2	LOS A	0.5	12.0	0.32	0.21	33.0
NorthWest: Mt. Zion Rd											
7x	L2	11	2.0	0.155	5.5	LOS A	0.6	14.7	0.33	0.23	33.6
4x	T1	114	2.0	0.155	5.5	LOS A	0.6	14.7	0.33	0.23	33.7
14x	R2	16	2.0	0.155	5.5	LOS A	0.6	14.7	0.33	0.23	33.0
Approach		141	2.0	0.155	5.5	LOS A	0.6	14.7	0.33	0.23	33.6
SouthWest: MD 180											
5x	L2	20	2.0	0.231	6.2	LOS A	0.9	23.6	0.34	0.23	33.2
2x	T1	68	2.0	0.231	6.2	LOS A	0.9	23.6	0.34	0.23	33.4
12x	R2	125	2.0	0.231	6.2	LOS A	0.9	23.6	0.34	0.23	32.6
Approach		214	2.0	0.231	6.2	LOS A	0.9	23.6	0.34	0.23	32.9
All Vehicles		706	2.0	0.233	5.8	LOS A	1.0	24.5	0.31	0.20	33.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: EP

MD 180 at Mt. Zion Rd
Existing PM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Mt. Zion Rd											
3x	L2	157	2.0	0.388	7.6	LOS A	2.0	50.2	0.25	0.12	31.9
8x	T1	192	2.0	0.388	7.6	LOS A	2.0	50.2	0.25	0.12	32.1
18x	R2	52	2.0	0.388	7.6	LOS A	2.0	50.2	0.25	0.12	31.4
Approach		401	2.0	0.388	7.6	LOS A	2.0	50.2	0.25	0.12	31.9
NorthEast: MD 180											
1x	L2	37	2.0	0.170	6.5	LOS A	0.6	15.6	0.46	0.40	32.6
6x	T1	81	2.0	0.170	6.5	LOS A	0.6	15.6	0.46	0.40	32.8
16x	R2	12	2.0	0.170	6.5	LOS A	0.6	15.6	0.46	0.40	32.1
Approach		129	2.0	0.170	6.5	LOS A	0.6	15.6	0.46	0.40	32.7
NorthWest: Mt. Zion Rd											
7x	L2	5	2.0	0.130	5.6	LOS A	0.5	11.8	0.39	0.30	33.6
4x	T1	85	2.0	0.130	5.6	LOS A	0.5	11.8	0.39	0.30	33.7
14x	R2	18	2.0	0.130	5.6	LOS A	0.5	11.8	0.39	0.30	33.0
Approach		109	2.0	0.130	5.6	LOS A	0.5	11.8	0.39	0.30	33.6
SouthWest: MD 180											
5x	L2	19	2.0	0.170	5.3	LOS A	0.7	16.6	0.27	0.16	33.6
2x	T1	42	2.0	0.170	5.3	LOS A	0.7	16.6	0.27	0.16	33.8
12x	R2	104	2.0	0.170	5.3	LOS A	0.7	16.6	0.27	0.16	33.0
Approach		166	2.0	0.170	5.3	LOS A	0.7	16.6	0.27	0.16	33.3
All Vehicles		804	2.0	0.388	6.7	LOS A	2.0	50.2	0.30	0.20	32.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: BA

MD 180 at Mt. Zion Rd
Back'd AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Mt. Zion Rd											
3x	L2	92	2.0	0.281	7.0	LOS A	1.2	29.9	0.40	0.30	32.3
8x	T1	84	2.0	0.281	7.0	LOS A	1.2	29.9	0.40	0.30	32.4
18x	R2	74	2.0	0.281	7.0	LOS A	1.2	29.9	0.40	0.30	31.7
Approach		250	2.0	0.281	7.0	LOS A	1.2	29.9	0.40	0.30	32.1
NorthEast: MD 180											
1x	L2	57	2.0	0.196	5.9	LOS A	0.8	19.2	0.35	0.25	32.9
6x	T1	107	2.0	0.196	5.9	LOS A	0.8	19.2	0.35	0.25	33.0
16x	R2	14	2.0	0.196	5.9	LOS A	0.8	19.2	0.35	0.25	32.3
Approach		177	2.0	0.196	5.9	LOS A	0.8	19.2	0.35	0.25	32.9
NorthWest: Mt. Zion Rd											
7x	L2	13	2.0	0.174	6.0	LOS A	0.7	16.6	0.39	0.30	33.3
4x	T1	119	2.0	0.174	6.0	LOS A	0.7	16.6	0.39	0.30	33.5
14x	R2	17	2.0	0.174	6.0	LOS A	0.7	16.6	0.39	0.30	32.7
Approach		149	2.0	0.174	6.0	LOS A	0.7	16.6	0.39	0.30	33.4
SouthWest: MD 180											
5x	L2	22	2.0	0.367	8.0	LOS A	1.7	43.2	0.41	0.30	32.4
2x	T1	182	2.0	0.367	8.0	LOS A	1.7	43.2	0.41	0.30	32.5
12x	R2	132	2.0	0.367	8.0	LOS A	1.7	43.2	0.41	0.30	31.8
Approach		335	2.0	0.367	8.0	LOS A	1.7	43.2	0.41	0.30	32.2
All Vehicles		911	2.0	0.367	7.0	LOS A	1.7	43.2	0.39	0.29	32.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: BP

MD 180 at Mt. Zion Rd
Back'd PM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: Mt. Zion Rd											
3x	L2	165	2.0	0.448	9.1	LOS A	2.3	59.6	0.41	0.28	31.3
8x	T1	202	2.0	0.448	9.1	LOS A	2.3	59.6	0.41	0.28	31.4
18x	R2	58	2.0	0.448	9.1	LOS A	2.3	59.6	0.41	0.28	30.8
Approach		425	2.0	0.448	9.1	LOS A	2.3	59.6	0.41	0.28	31.3
NorthEast: MD 180											
1x	L2	43	2.0	0.399	10.0	LOS A	1.8	45.3	0.56	0.55	31.3
6x	T1	242	2.0	0.399	10.0	LOS A	1.8	45.3	0.56	0.55	31.5
16x	R2	13	2.0	0.399	10.0	LOS A	1.8	45.3	0.56	0.55	30.8
Approach		298	2.0	0.399	10.0	LOS A	1.8	45.3	0.56	0.55	31.4
NorthWest: Mt. Zion Rd											
7x	L2	5	2.0	0.163	6.9	LOS A	0.6	14.7	0.49	0.46	32.9
4x	T1	89	2.0	0.163	6.9	LOS A	0.6	14.7	0.49	0.46	33.1
14x	R2	19	2.0	0.163	6.9	LOS A	0.6	14.7	0.49	0.46	32.3
Approach		114	2.0	0.163	6.9	LOS A	0.6	14.7	0.49	0.46	32.9
SouthWest: MD 180											
5x	L2	20	2.0	0.266	6.4	LOS A	1.1	28.6	0.31	0.20	33.1
2x	T1	126	2.0	0.266	6.4	LOS A	1.1	28.6	0.31	0.20	33.3
12x	R2	110	2.0	0.266	6.4	LOS A	1.1	28.6	0.31	0.20	32.5
Approach		256	2.0	0.266	6.4	LOS A	1.1	28.6	0.31	0.20	32.9
All Vehicles		1092	2.0	0.448	8.5	LOS A	2.3	59.6	0.44	0.35	31.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [TA (Site Folder: General)]

MD 180 at Mt. Zion Rd
Total AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
SouthEast: Mt. Zion Rd														
3x	L2	81	2.0	92	2.0	0.292	7.4	LOS A	1.2	30.9	0.43	0.34	0.43	32.1
8x	T1	74	2.0	84	2.0	0.292	7.4	LOS A	1.2	30.9	0.43	0.34	0.43	32.2
18x	R2	65	2.0	74	2.0	0.292	7.4	LOS A	1.2	30.9	0.43	0.34	0.43	31.5
Approach		220	2.0	250	2.0	0.292	7.4	LOS A	1.2	30.9	0.43	0.34	0.43	32.0
NorthEast: MD 180														
1x	L2	50	2.0	57	2.0	0.205	6.0	LOS A	0.8	20.3	0.35	0.25	0.35	32.8
6x	T1	101	2.0	115	2.0	0.205	6.0	LOS A	0.8	20.3	0.35	0.25	0.35	33.0
16x	R2	12	2.0	14	2.0	0.205	6.0	LOS A	0.8	20.3	0.35	0.25	0.35	32.3
Approach		163	2.0	185	2.0	0.205	6.0	LOS A	0.8	20.3	0.35	0.25	0.35	32.9
NorthWest: Mt. Zion Rd														
7x	L2	11	2.0	13	2.0	0.176	6.0	LOS A	0.7	16.7	0.39	0.31	0.39	33.3
4x	T1	105	2.0	119	2.0	0.176	6.0	LOS A	0.7	16.7	0.39	0.31	0.39	33.4
14x	R2	15	2.0	17	2.0	0.176	6.0	LOS A	0.7	16.7	0.39	0.31	0.39	32.7
Approach		131	2.0	149	2.0	0.176	6.0	LOS A	0.7	16.7	0.39	0.31	0.39	33.3
SouthWest: MD 180														
5x	L2	19	2.0	22	2.0	0.405	8.6	LOS A	2.0	50.0	0.43	0.32	0.43	32.1
2x	T1	191	2.0	217	2.0	0.405	8.6	LOS A	2.0	50.0	0.43	0.32	0.43	32.2
12x	R2	116	2.0	132	2.0	0.405	8.6	LOS A	2.0	50.0	0.43	0.32	0.43	31.6
Approach		326	2.0	370	2.0	0.405	8.6	LOS A	2.0	50.0	0.43	0.32	0.43	32.0
All Vehicles		840	2.0	955	2.0	0.405	7.4	LOS A	2.0	50.0	0.41	0.31	0.41	32.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [TP (Site Folder: General)]

MD 180 at Mt. Zion Rd
Total PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
SouthEast: Mt. Zion Rd														
3x	L2	153	2.0	165	2.0	0.458	9.4	LOS A	2.4	60.9	0.44	0.33	0.44	31.1
8x	T1	188	2.0	202	2.0	0.458	9.4	LOS A	2.4	60.9	0.44	0.33	0.44	31.3
18x	R2	54	2.0	58	2.0	0.458	9.4	LOS A	2.4	60.9	0.44	0.33	0.44	30.6
Approach		395	2.0	425	2.0	0.458	9.4	LOS A	2.4	60.9	0.44	0.33	0.44	31.1
NorthEast: MD 180														
1x	L2	40	2.0	43	2.0	0.438	10.7	LOS B	2.4	59.9	0.58	0.62	0.71	31.1
6x	T1	252	2.0	271	2.0	0.438	10.7	LOS B	2.4	59.9	0.58	0.62	0.71	31.2
16x	R2	12	2.0	13	2.0	0.438	10.7	LOS B	2.4	59.9	0.58	0.62	0.71	30.5
Approach		304	2.0	327	2.0	0.438	10.7	LOS B	2.4	59.9	0.58	0.62	0.71	31.1
NorthWest: Mt. Zion Rd														
7x	L2	5	2.0	5	2.0	0.168	7.2	LOS A	0.6	15.1	0.51	0.48	0.51	32.8
4x	T1	83	2.0	89	2.0	0.168	7.2	LOS A	0.6	15.1	0.51	0.48	0.51	32.9
14x	R2	18	2.0	19	2.0	0.168	7.2	LOS A	0.6	15.1	0.51	0.48	0.51	32.2
Approach		106	2.0	114	2.0	0.168	7.2	LOS A	0.6	15.1	0.51	0.48	0.51	32.8
SouthWest: MD 180														
5x	L2	19	2.0	20	2.0	0.290	6.7	LOS A	1.3	32.1	0.32	0.21	0.32	33.0
2x	T1	139	2.0	149	2.0	0.290	6.7	LOS A	1.3	32.1	0.32	0.21	0.32	33.1
12x	R2	102	2.0	110	2.0	0.290	6.7	LOS A	1.3	32.1	0.32	0.21	0.32	32.4
Approach		260	2.0	280	2.0	0.290	6.7	LOS A	1.3	32.1	0.32	0.21	0.32	32.8
All Vehicles		1065	2.0	1145	2.0	0.458	8.9	LOS A	2.4	60.9	0.46	0.39	0.50	31.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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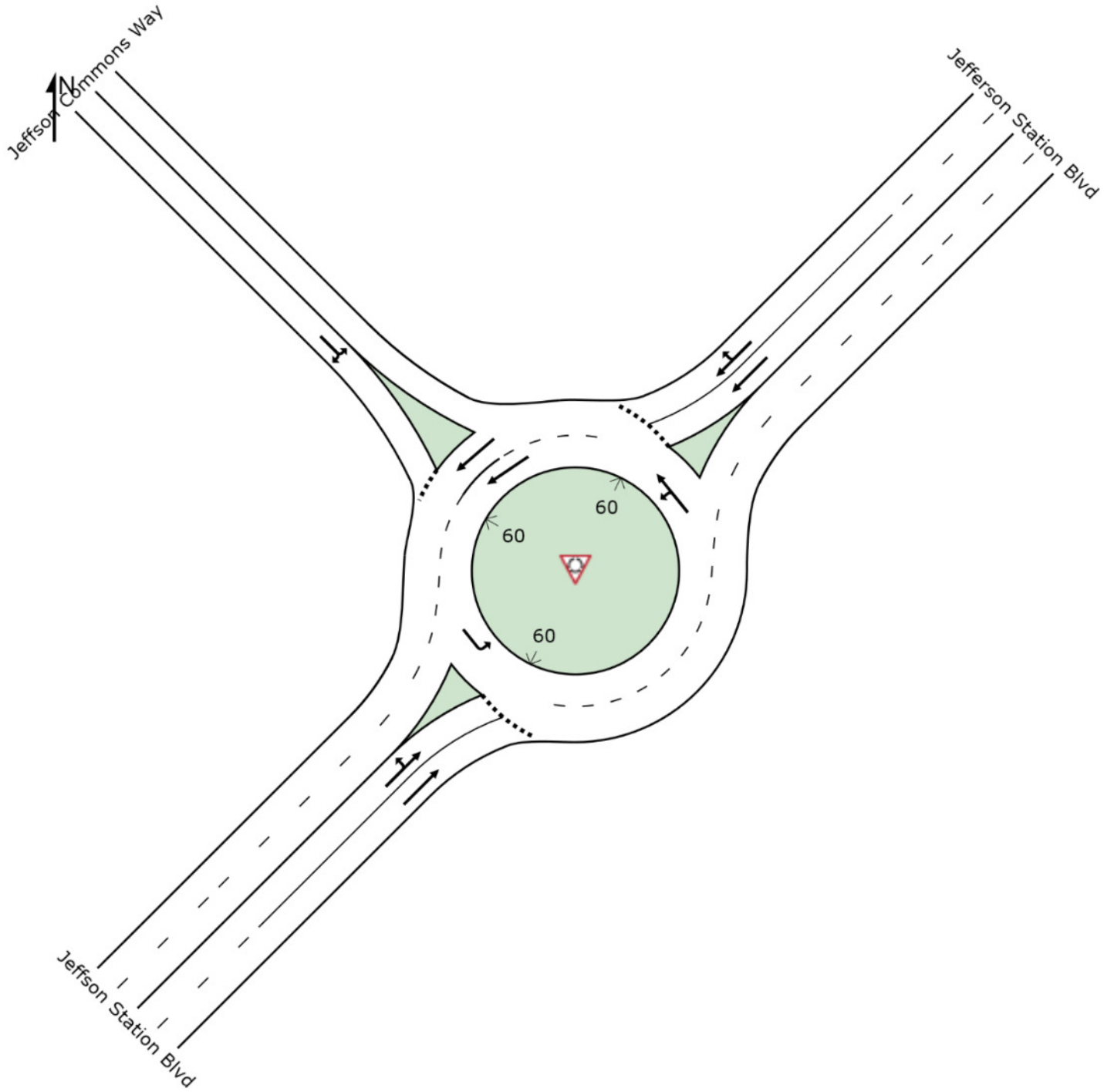
SITE LAYOUT

Site: EA

Jeffson Commons Way at Jeffson Station Blvd
Exist AM Peak
Roundabout



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MOVEMENT SUMMARY

Site: EA

Jeffson Commons Way at Jeffson Station Blvd
Exist AM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
NorthEast: Jefferson Station Blvd											
6x	T1	2	2.0	0.002	3.5	LOS A	0.0	0.1	0.16	0.05	34.9
16x	R2	1	2.0	0.002	3.5	LOS A	0.0	0.1	0.16	0.05	34.0
Approach		3	2.0	0.002	3.5	LOS A	0.0	0.1	0.16	0.05	34.6
NorthWest: Jeffson Commons Way											
7x	L2	1	2.0	0.061	3.8	LOS A	0.1	3.8	0.02	0.00	34.7
14x	R2	66	2.0	0.061	3.8	LOS A	0.1	3.8	0.02	0.00	34.0
Approach		67	2.0	0.061	3.8	LOS A	0.1	3.8	0.02	0.00	34.0
SouthWest: Jeffson Station Blvd											
5x	L2	67	2.0	0.061	3.8	LOS A	0.2	5.4	0.02	0.00	32.5
2x	T1	1	2.0	0.001	3.3	LOS A	0.0	0.1	0.01	0.00	35.0
Approach		68	2.0	0.061	3.8	LOS A	0.2	5.4	0.02	0.00	32.6
All Vehicles		139	2.0	0.061	3.8	LOS A	0.2	5.4	0.02	0.00	33.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: EP

Jeffson Commons Way at Jeffson Station Blvd
Exist PM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
NorthEast: Jefferson Station Blvd											
6x	T1	6	2.0	0.003	3.5	LOS A	0.0	0.3	0.17	0.06	34.9
16x	R2	1	2.0	0.003	3.5	LOS A	0.0	0.3	0.17	0.06	34.0
Approach		7	2.0	0.003	3.5	LOS A	0.0	0.3	0.17	0.06	34.7
NorthWest: Jeffson Commons Way											
7x	L2	1	2.0	0.060	3.8	LOS A	0.1	3.8	0.03	0.00	34.7
14x	R2	65	2.0	0.060	3.8	LOS A	0.1	3.8	0.03	0.00	34.0
Approach		66	2.0	0.060	3.8	LOS A	0.1	3.8	0.03	0.00	34.0
SouthWest: Jeffson Station Blvd											
5x	L2	77	2.0	0.069	3.8	LOS A	0.2	6.2	0.02	0.00	32.5
2x	T1	1	2.0	0.001	3.3	LOS A	0.0	0.1	0.01	0.00	35.0
Approach		78	2.0	0.069	3.8	LOS A	0.2	6.2	0.02	0.00	32.5
All Vehicles		151	2.0	0.069	3.8	LOS A	0.2	6.2	0.03	0.01	33.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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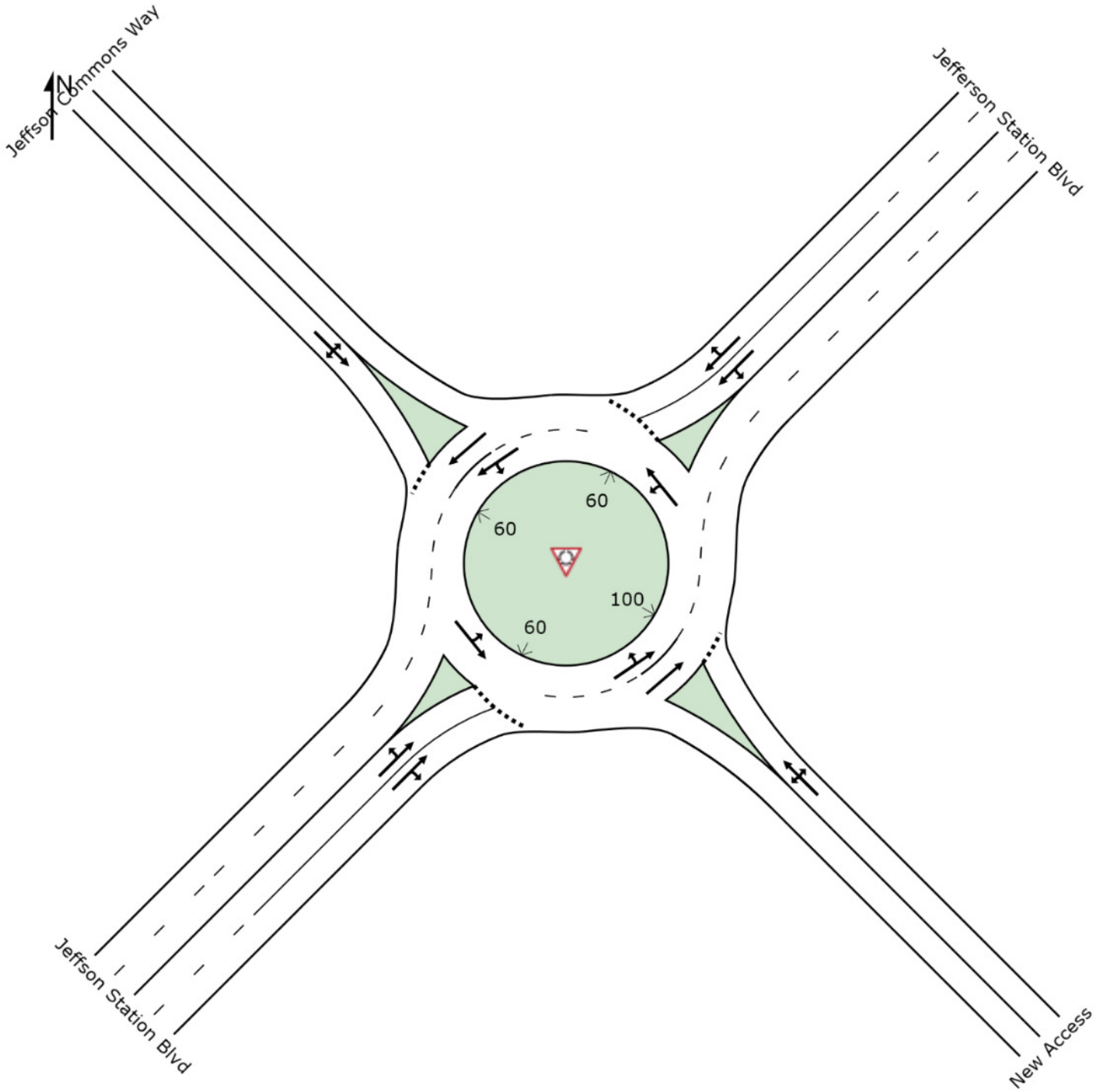
SITE LAYOUT

Site: BA

Jeffson Commons Way at Jeffson Station Blvd
Back'd AM Peak
Roundabout



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MOVEMENT SUMMARY

Site: BA

Jeffson Commons Way at Jeffson Station Blvd
Back'd AM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: New Access											
3x	L2	22	2.0	0.028	4.2	LOS A	0.1	1.7	0.26	0.17	32.8
8x	T1	2	2.0	0.028	4.2	LOS A	0.1	1.7	0.26	0.17	33.0
18x	R2	1	2.0	0.028	4.2	LOS A	0.1	1.7	0.26	0.17	32.4
Approach		25	2.0	0.028	4.2	LOS A	0.1	1.7	0.26	0.17	32.8
NorthEast: Jefferson Station Blvd											
1x	L2	1	2.0	0.018	3.9	LOS A	0.1	1.5	0.24	0.12	34.4
6x	T1	31	2.0	0.018	3.9	LOS A	0.1	1.5	0.24	0.12	34.6
16x	R2	3	2.0	0.018	3.9	LOS A	0.1	1.5	0.24	0.12	33.8
Approach		35	2.0	0.018	3.9	LOS A	0.1	1.5	0.24	0.12	34.5
NorthWest: Jeffson Commons Way											
7x	L2	20	2.0	0.236	5.6	LOS A	0.7	17.9	0.13	0.06	33.9
4x	T1	9	2.0	0.236	5.6	LOS A	0.7	17.9	0.13	0.06	33.7
14x	R2	222	2.0	0.236	5.6	LOS A	0.7	17.9	0.13	0.06	32.9
Approach		251	2.0	0.236	5.6	LOS A	0.7	17.9	0.13	0.06	33.0
SouthWest: Jeffson Station Blvd											
5x	L2	109	2.0	0.154	4.7	LOS A	0.6	15.1	0.12	0.04	33.1
2x	T1	152	2.0	0.154	4.7	LOS A	0.6	15.1	0.12	0.04	34.2
12x	R2	69	2.0	0.154	4.7	LOS A	0.6	15.1	0.12	0.04	33.5
Approach		331	2.0	0.154	4.7	LOS A	0.6	15.1	0.12	0.04	33.7
All Vehicles		642	2.0	0.236	5.0	LOS A	0.7	17.9	0.13	0.06	33.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: BP

Jeffson Commons Way at Jeffson Station Blvd
Back'd PM Peak
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: New Access											
3x	L2	69	2.0	0.091	5.0	LOS A	0.2	5.9	0.30	0.24	32.5
8x	T1	9	2.0	0.091	5.0	LOS A	0.2	5.9	0.30	0.24	32.6
18x	R2	1	2.0	0.091	5.0	LOS A	0.2	5.9	0.30	0.24	32.0
Approach		79	2.0	0.091	5.0	LOS A	0.2	5.9	0.30	0.24	32.5
NorthEast: Jefferson Station Blvd											
1x	L2	1	2.0	0.138	6.1	LOS A	0.5	12.5	0.43	0.36	33.4
6x	T1	188	2.0	0.138	6.1	LOS A	0.5	12.5	0.43	0.36	33.6
16x	R2	24	2.0	0.138	6.1	LOS A	0.5	12.5	0.43	0.36	32.7
Approach		214	2.0	0.138	6.1	LOS A	0.5	12.5	0.43	0.36	33.5
NorthWest: Jeffson Commons Way											
7x	L2	7	2.0	0.149	5.3	LOS A	0.4	10.2	0.28	0.21	34.1
4x	T1	5	2.0	0.149	5.3	LOS A	0.4	10.2	0.28	0.21	33.9
14x	R2	126	2.0	0.149	5.3	LOS A	0.4	10.2	0.28	0.21	33.1
Approach		137	2.0	0.149	5.3	LOS A	0.4	10.2	0.28	0.21	33.2
SouthWest: Jeffson Station Blvd											
5x	L2	272	2.0	0.249	5.6	LOS A	1.1	27.5	0.08	0.02	31.9
2x	T1	53	2.0	0.077	3.9	LOS A	0.3	6.9	0.07	0.01	35.2
12x	R2	30	2.0	0.077	3.9	LOS A	0.3	6.9	0.07	0.01	33.9
Approach		356	2.0	0.249	5.2	LOS A	1.1	27.5	0.08	0.02	32.5
All Vehicles		786	2.0	0.249	5.5	LOS A	1.1	27.5	0.23	0.17	32.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [TA (Site Folder: General)]

Jeffson Commons Way at Jeffson Station Blvd
Total AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
SouthEast: New Access														
3x	L2	19	2.0	22	2.0	0.028	4.3	LOS A	0.1	1.7	0.27	0.18	0.27	32.8
8x	T1	2	2.0	2	2.0	0.028	4.3	LOS A	0.1	1.7	0.27	0.18	0.27	33.0
18x	R2	1	2.0	1	2.0	0.028	4.3	LOS A	0.1	1.7	0.27	0.18	0.27	32.3
Approach		22	2.0	25	2.0	0.028	4.3	LOS A	0.1	1.7	0.27	0.18	0.27	32.8
NorthEast: Jefferson Station Blvd														
1x	L2	1	2.0	1	2.0	0.018	3.9	LOS A	0.1	1.6	0.25	0.13	0.25	34.5
6x	T1	27	2.0	31	2.0	0.018	3.9	LOS A	0.1	1.6	0.25	0.13	0.25	34.7
16x	R2	3	2.0	3	2.0	0.018	3.9	LOS A	0.1	1.6	0.25	0.13	0.25	33.8
Approach		31	2.0	35	2.0	0.018	3.9	LOS A	0.1	1.6	0.25	0.13	0.25	34.6
NorthWest: Jeffson Commons Way														
7x	L2	18	2.0	20	2.0	0.242	5.7	LOS A	0.7	18.5	0.13	0.06	0.13	33.9
4x	T1	8	2.0	9	2.0	0.242	5.7	LOS A	0.7	18.5	0.13	0.06	0.13	33.8
14x	R2	201	2.0	228	2.0	0.242	5.7	LOS A	0.7	18.5	0.13	0.06	0.13	33.0
Approach		227	2.0	258	2.0	0.242	5.7	LOS A	0.7	18.5	0.13	0.06	0.13	33.1
SouthWest: Jeffson Station Blvd														
5x	L2	109	2.0	124	2.0	0.161	4.8	LOS A	0.6	15.9	0.12	0.04	0.12	32.9
2x	T1	134	2.0	152	2.0	0.161	4.8	LOS A	0.6	15.9	0.12	0.04	0.12	34.1
12x	R2	61	2.0	69	2.0	0.161	4.8	LOS A	0.6	15.9	0.12	0.04	0.12	33.4
Approach		304	2.0	345	2.0	0.161	4.8	LOS A	0.6	15.9	0.12	0.04	0.12	33.5
All Vehicles		584	2.0	664	2.0	0.242	5.1	LOS A	0.7	18.5	0.14	0.06	0.14	33.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [TP (Site Folder: General)]

Jeffson Commons Way at Jeffson Station Blvd
Total PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
SouthEast: New Access														
3x	L2	59	2.0	69	2.0	0.091	5.0	LOS A	0.2	5.9	0.31	0.25	0.31	32.5
8x	T1	8	2.0	9	2.0	0.091	5.0	LOS A	0.2	5.9	0.31	0.25	0.31	32.6
18x	R2	1	2.0	1	2.0	0.091	5.0	LOS A	0.2	5.9	0.31	0.25	0.31	32.0
Approach		68	2.0	79	2.0	0.091	5.0	LOS A	0.2	5.9	0.31	0.25	0.31	32.5
NorthEast: Jefferson Station Blvd														
1x	L2	1	2.0	1	2.0	0.139	6.2	LOS A	0.5	12.6	0.44	0.37	0.44	33.4
6x	T1	162	2.0	188	2.0	0.139	6.2	LOS A	0.5	12.6	0.44	0.37	0.44	33.6
16x	R2	21	2.0	24	2.0	0.139	6.2	LOS A	0.5	12.6	0.44	0.37	0.44	32.7
Approach		184	2.0	214	2.0	0.139	6.2	LOS A	0.5	12.6	0.44	0.37	0.44	33.5
NorthWest: Jeffson Commons Way														
7x	L2	6	2.0	7	2.0	0.163	5.5	LOS A	0.4	11.2	0.28	0.22	0.28	34.1
4x	T1	4	2.0	5	2.0	0.163	5.5	LOS A	0.4	11.2	0.28	0.22	0.28	33.9
14x	R2	119	2.0	138	2.0	0.163	5.5	LOS A	0.4	11.2	0.28	0.22	0.28	33.2
Approach		129	2.0	150	2.0	0.163	5.5	LOS A	0.4	11.2	0.28	0.22	0.28	33.2
SouthWest: Jeffson Station Blvd														
5x	L2	243	2.0	283	2.0	0.258	5.7	LOS A	1.1	28.9	0.08	0.02	0.08	31.8
2x	T1	46	2.0	53	2.0	0.077	3.9	LOS A	0.3	6.9	0.07	0.01	0.07	35.1
12x	R2	26	2.0	30	2.0	0.077	3.9	LOS A	0.3	6.9	0.07	0.01	0.07	33.9
Approach		315	2.0	366	2.0	0.258	5.3	LOS A	1.1	28.9	0.08	0.02	0.08	32.4
All Vehicles		696	2.0	809	2.0	0.258	5.5	LOS A	1.1	28.9	0.23	0.17	0.23	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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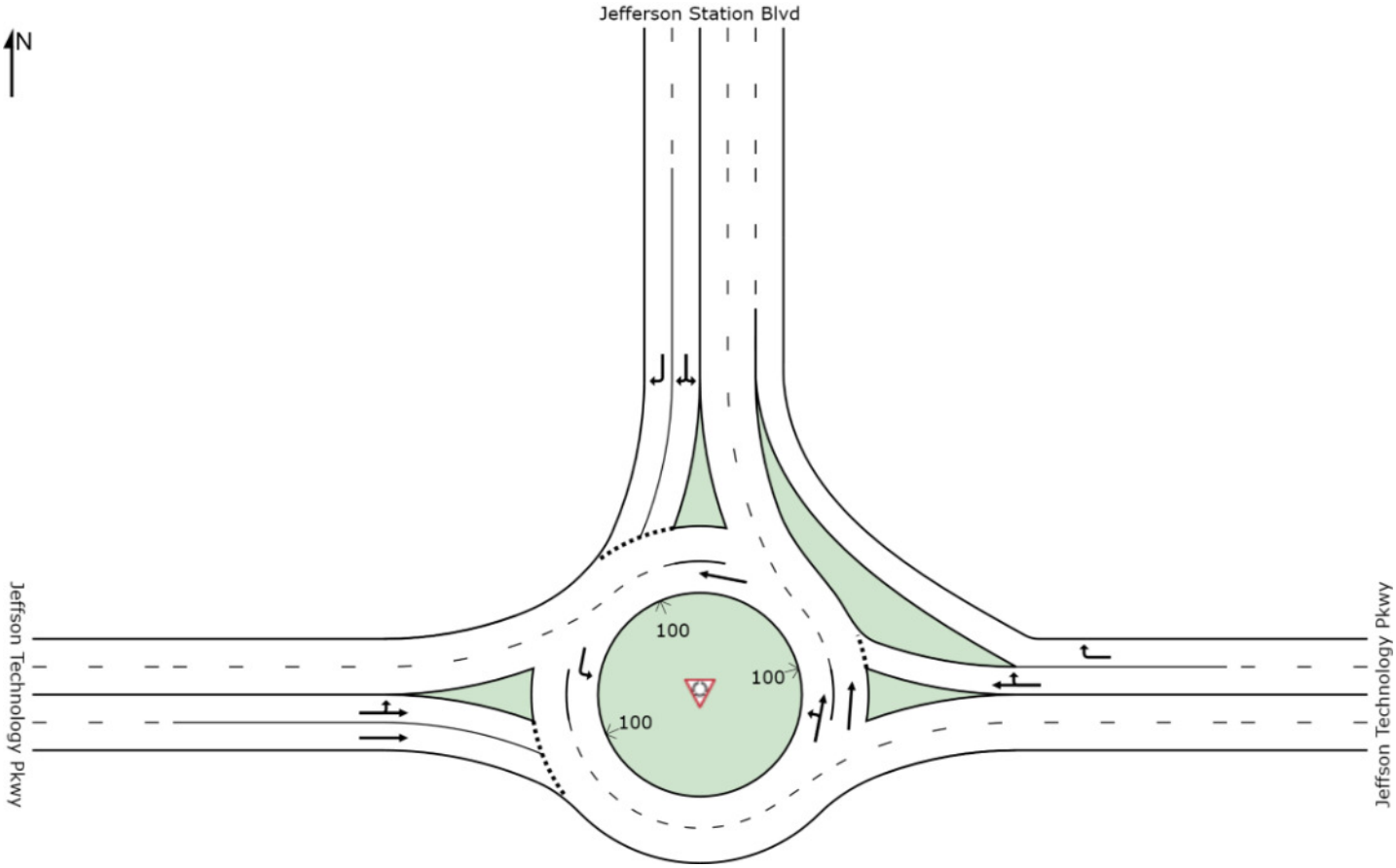
SITE LAYOUT

Site: EA

Jefferson Station Blvd at Jefferson Technology Pkwy
Existing AM Peak
Roundabout



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MOVEMENT SUMMARY

Site: EA

Jefferson Station Blvd at Jefferson Technology Pkwy
Existing AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: Jeffson Technology Pkwy											
6	T1	38	2.0	0.041	3.6	LOS A	0.1	2.5	0.03	0.00	36.1
16	R2	73	2.0	0.041	0.3	LOS A	0.1	2.5	0.00	0.00	37.1
Approach		112	2.0	0.041	1.5	LOS A	0.1	2.5	0.01	0.00	36.8
North: Jefferson Station Blvd											
7	L2	162	2.0	0.150	4.7	LOS A	0.4	10.3	0.09	0.03	32.8
14	R2	4	2.0	0.004	3.4	LOS A	0.0	0.3	0.09	0.02	34.9
Approach		166	2.0	0.150	4.6	LOS A	0.4	10.3	0.09	0.03	32.9
West: Jeffson Technology Pkwy											
5	L2	5	2.0	0.032	4.0	LOS A	0.1	2.1	0.21	0.11	35.5
2	T1	57	2.0	0.032	3.9	LOS A	0.1	2.1	0.20	0.11	35.6
Approach		63	2.0	0.032	3.9	LOS A	0.1	2.1	0.20	0.11	35.6
All Vehicles		340	2.0	0.150	3.5	LOS A	0.4	10.3	0.09	0.04	34.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: EP

Jefferson Station Blvd at Jefferson Technology Pkwy
Existing PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: Jeffson Technology Pkwy											
6	T1	39	2.0	0.076	3.9	LOS A	0.2	4.8	0.02	0.00	36.0
16	R2	170	2.0	0.076	1.0	LOS A	0.2	4.8	0.01	0.00	36.7
Approach		209	2.0	0.076	1.6	LOS A	0.2	4.8	0.01	0.00	36.5
North: Jefferson Station Blvd											
7	L2	109	2.0	0.101	4.2	LOS A	0.3	6.6	0.09	0.03	33.0
14	R2	3	2.0	0.003	3.4	LOS A	0.0	0.2	0.09	0.02	34.9
Approach		112	2.0	0.101	4.2	LOS A	0.3	6.6	0.09	0.03	33.1
West: Jeffson Technology Pkwy											
5	L2	4	2.0	0.014	3.7	LOS A	0.0	0.9	0.16	0.07	35.2
2	T1	24	2.0	0.014	3.6	LOS A	0.0	0.9	0.16	0.07	35.7
Approach		28	2.0	0.014	3.6	LOS A	0.0	0.9	0.16	0.07	35.6
All Vehicles		349	2.0	0.101	2.6	LOS A	0.3	6.6	0.05	0.02	35.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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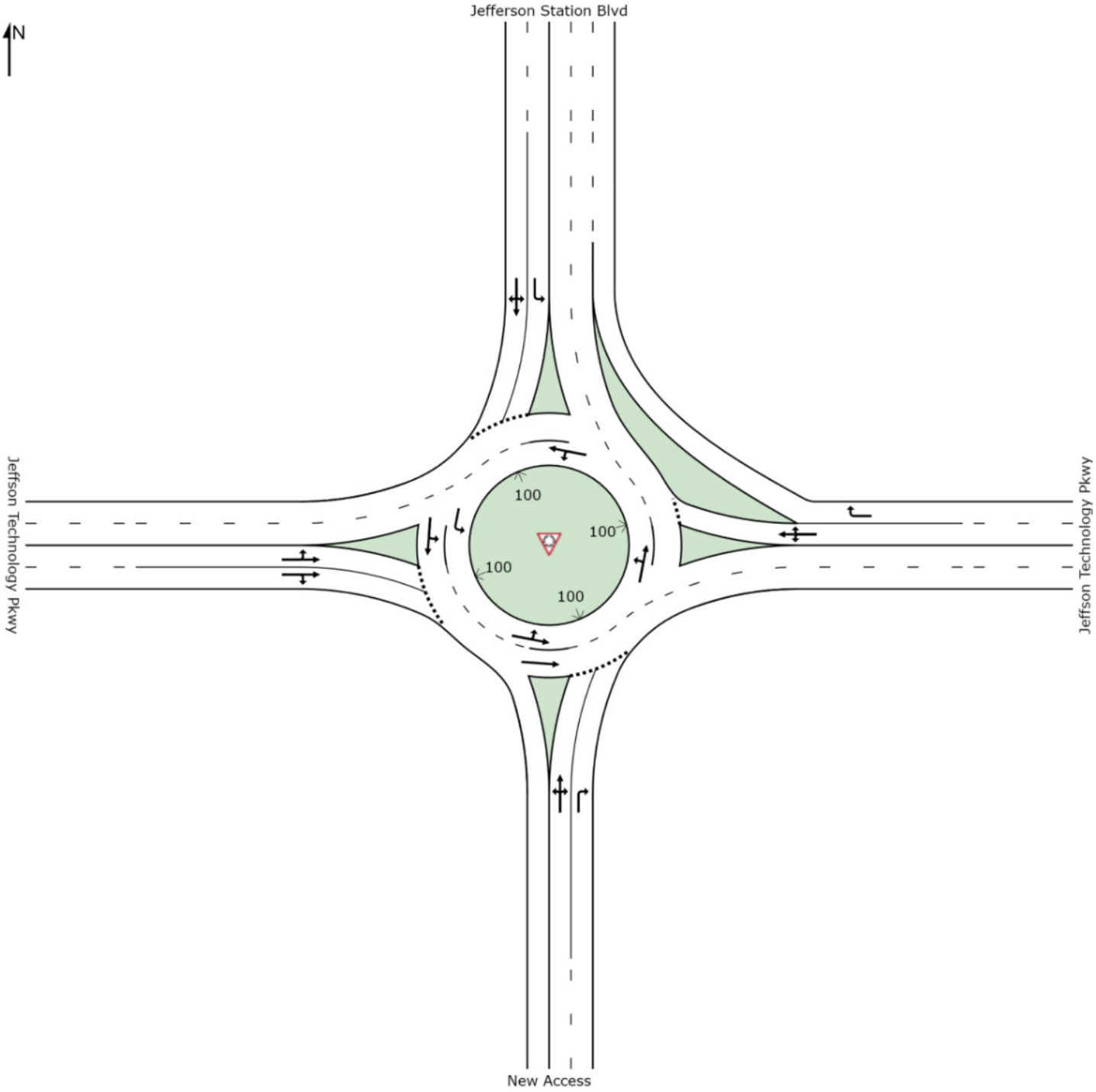
SITE LAYOUT

Site: BA

Jefferson Station Blvd at Jefferson Technology Pkwy
Back'd AM Peak
Roundabout



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MOVEMENT SUMMARY

Site: BA

Jefferson Station Blvd at Jefferson Technology Pkwy
Back'd AM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: New Access											
3	L2	17	2.0	0.082	6.3	LOS A	0.2	5.5	0.44	0.44	33.8
8	T1	17	2.0	0.082	6.3	LOS A	0.2	5.5	0.44	0.44	33.7
18	R2	78	2.0	0.082	6.1	LOS A	0.2	5.5	0.43	0.42	33.2
Approach		112	2.0	0.082	6.2	LOS A	0.2	5.5	0.43	0.42	33.4
East: Jeffson Technology Pkwy											
1	L2	124	2.0	0.611	11.6	LOS B	3.3	84.9	0.25	0.12	31.7
6	T1	329	2.0	0.611	11.6	LOS B	3.3	84.9	0.25	0.12	31.6
16	R2	1200	2.0	0.611	2.0	LOS A	3.3	84.9	0.04	0.02	35.9
Approach		1653	2.0	0.611	4.7	LOS A	3.3	84.9	0.10	0.05	34.6
North: Jefferson Station Blvd											
7	L2	406	2.0	0.278	7.8	LOS A	0.9	22.0	0.43	0.43	31.6
4	T1	21	2.0	0.278	7.7	LOS A	0.8	20.9	0.42	0.42	31.7
14	R2	7	2.0	0.278	7.7	LOS A	0.8	20.9	0.42	0.42	30.8
Approach		435	2.0	0.278	7.8	LOS A	0.9	22.0	0.43	0.43	31.6
West: Jeffson Technology Pkwy											
5	L2	24	2.0	0.188	7.0	LOS A	0.5	13.8	0.44	0.44	33.8
2	T1	230	2.0	0.188	7.0	LOS A	0.5	13.8	0.43	0.43	34.0
12	R2	23	2.0	0.188	6.9	LOS A	0.5	13.1	0.42	0.42	33.2
Approach		278	2.0	0.188	7.0	LOS A	0.5	13.8	0.43	0.43	33.9
All Vehicles		2478	2.0	0.611	5.5	LOS A	3.3	84.9	0.21	0.17	33.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: BP

Jefferson Station Blvd at Jefferson Technology Pkwy
Back'd PM Peak
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: New Access											
3	L2	84	2.0	0.597	29.9	LOS D	2.1	53.7	0.86	0.95	24.9
8	T1	85	2.0	0.597	29.9	LOS D	2.1	53.7	0.86	0.95	24.9
18	R2	226	2.0	0.597	28.0	LOS D	2.1	53.7	0.84	0.94	25.1
Approach		395	2.0	0.597	28.8	LOS D	2.1	53.7	0.85	0.94	25.0
East: Jeffson Technology Pkwy											
1	L2	208	2.0	0.421	8.4	LOS A	1.6	39.4	0.31	0.23	32.3
6	T1	203	2.0	0.421	8.4	LOS A	1.6	39.4	0.31	0.23	32.2
16	R2	385	2.0	0.234	0.0	LOS A	0.0	0.0	0.00	0.00	37.3
Approach		796	2.0	0.421	4.4	LOS A	1.6	39.4	0.16	0.12	34.5
North: Jefferson Station Blvd											
7	L2	1315	2.0	0.915	38.1	LOS E	11.1	281.8	0.95	1.22	22.4
4	T1	67	2.0	0.915	37.7	LOS E	10.7	272.1	0.94	1.20	22.5
14	R2	24	2.0	0.915	37.7	LOS E	10.7	272.1	0.94	1.20	22.1
Approach		1407	2.0	0.915	38.0	LOS E	11.1	281.8	0.95	1.21	22.4
West: Jeffson Technology Pkwy											
5	L2	8	2.0	0.569	27.3	LOS D	2.0	50.4	0.84	0.93	26.3
2	T1	314	2.0	0.569	26.5	LOS D	2.0	50.4	0.84	0.92	26.4
12	R2	67	2.0	0.569	25.5	LOS D	1.9	49.4	0.83	0.91	26.1
Approach		389	2.0	0.569	26.4	LOS D	2.0	50.4	0.83	0.92	26.4
All Vehicles		2986	2.0	0.915	26.3	LOS D	11.1	281.8	0.71	0.85	25.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [TA (Site Folder: General)]

Jefferson Station Blvd at Jefferson Technology Pkwy
Total AM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: New Access														
3	L2	16	2.0	17	2.0	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.6
8	T1	16	2.0	17	2.0	0.046	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.5
18	R2	73	2.0	78	2.0	0.046	2.4	LOS A	0.1	3.1	0.17	0.16	0.17	35.1
Approach		105	2.0	112	2.0	0.046	1.6	LOS A	0.1	3.1	0.12	0.11	0.12	35.8
East: Jeffson Technology Pkwy														
1	L2	117	2.0	124	2.0	0.616	11.8	LOS B	3.4	86.6	0.25	0.12	0.25	31.6
6	T1	309	2.0	329	2.0	0.616	11.8	LOS B	3.4	86.6	0.25	0.12	0.25	31.5
16	R2	1141	2.0	1214	2.0	0.616	2.0	LOS A	3.4	86.6	0.04	0.02	0.04	35.7
Approach		1567	2.0	1667	2.0	0.616	4.8	LOS A	3.4	86.6	0.10	0.05	0.10	34.5
North: Jefferson Station Blvd														
7	L2	388	2.0	413	2.0	0.282	7.8	LOS A	0.9	22.4	0.43	0.43	0.43	31.6
4	T1	20	2.0	21	2.0	0.282	7.7	LOS A	0.8	21.3	0.42	0.42	0.42	31.7
14	R2	7	2.0	7	2.0	0.282	7.7	LOS A	0.8	21.3	0.42	0.42	0.42	30.8
Approach		415	2.0	441	2.0	0.282	7.8	LOS A	0.9	22.4	0.43	0.43	0.43	31.6
West: Jeffson Technology Pkwy														
5	L2	23	2.0	24	2.0	0.189	7.1	LOS A	0.5	13.8	0.44	0.44	0.44	33.8
2	T1	216	2.0	230	2.0	0.189	7.0	LOS A	0.5	13.8	0.43	0.43	0.43	34.0
12	R2	22	2.0	23	2.0	0.189	6.9	LOS A	0.5	13.1	0.42	0.42	0.42	33.2
Approach		261	2.0	278	2.0	0.189	7.0	LOS A	0.5	13.8	0.43	0.43	0.43	33.9
All Vehicles		2348	2.0	2498	2.0	0.616	5.3	LOS A	3.4	86.6	0.20	0.16	0.20	33.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: Not Saved

MOVEMENT SUMMARY

Site: 101 [TP (Site Folder: General)]

Jefferson Station Blvd at Jefferson Technology Pkwy
Total PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: New Access														
3	L2	77	2.0	84	2.0	0.602	30.4	LOS D	2.4	60.5	0.86	1.03	1.55	24.8
8	T1	78	2.0	85	2.0	0.602	30.4	LOS D	2.4	60.5	0.86	1.03	1.55	24.7
18	R2	208	2.0	226	2.0	0.602	28.5	LOS D	2.4	60.5	0.85	1.01	1.53	25.0
Approach		363	2.0	395	2.0	0.602	29.3	LOS D	2.4	60.5	0.85	1.02	1.54	24.9
East: Jeffson Technology Pkwy														
1	L2	191	2.0	208	2.0	0.421	8.4	LOS A	1.6	39.4	0.31	0.23	0.31	32.3
6	T1	187	2.0	203	2.0	0.421	8.4	LOS A	1.6	39.4	0.31	0.23	0.31	32.2
16	R2	363	2.0	395	2.0	0.240	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	37.3
Approach		741	2.0	805	2.0	0.421	4.3	LOS A	1.6	39.4	0.16	0.12	0.16	34.5
North: Jefferson Station Blvd														
7	L2	1221	2.0	1327	2.0	0.923	39.4	LOS E	20.7	525.3	0.96	1.74	3.21	22.2
4	T1	62	2.0	67	2.0	0.923	39.0	LOS E	20.7	525.3	0.95	1.74	3.22	22.2
14	R2	22	2.0	24	2.0	0.923	39.0	LOS E	20.7	525.3	0.95	1.74	3.22	21.8
Approach		1305	2.0	1418	2.0	0.923	39.3	LOS E	20.7	525.3	0.96	1.74	3.21	22.2
West: Jeffson Technology Pkwy														
5	L2	7	2.0	8	2.0	0.574	27.8	LOS D	2.2	56.6	0.85	1.00	1.47	26.1
2	T1	289	2.0	314	2.0	0.574	27.0	LOS D	2.2	56.6	0.84	0.99	1.47	26.3
12	R2	62	2.0	67	2.0	0.574	25.9	LOS D	2.2	56.2	0.83	0.98	1.46	25.9
Approach		358	2.0	389	2.0	0.574	26.8	LOS D	2.2	56.6	0.84	0.99	1.46	26.2
All Vehicles		2767	2.0	3008	2.0	0.923	27.0	LOS D	20.7	525.3	0.72	1.12	1.95	25.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 2010). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: Not Saved

1. MD 180 @ Himes Ave / US 15 SB Off Ramp

Maryland State Highway Administration Queuing Analysis Formula

Queue Length (feet) =

If Average No. of Vehicle (Specific Movement) per Cycle <= 20: Poisson Distribution Maximum No. of Vehicles per Cycle x 25 Feet per Vehicle

If Average No. of Vehicle (Specific Movement) per Cycle > 20: $\frac{\text{Turning Volume (veh per hour) x Lane Use Factor x Cycle Length (Seconds)}}{\text{3600 (Seconds per hour)}}$ x 25 Feet per Vehicle x 1.4 Surge Factor

Existing Traffic	Available Storage (feet)	Queue Length (feet)	Veh / Hour	Lane Use Factor	Cycle Length (seconds)	Average No. of Vehicle per Cycle	Is Average No. of Vehicle (Specific Movement) per Cycle <= 20?	Poisson Distribution Maximum No. of Vehilce per Cycle
AM Peak Hour								
EB (MD 180) left turn	*1000+*	25	7	1	60	0.1	Yes	1
EB (MD 180) thru	*1000+*	300	441	1	60	7.4	Yes	12
WB (MD 180) thru	*1000+*	100	189	0.55	60	1.7	Yes	4
NB (US 15 SB Off Ramp) left turn	*800*	175	209	1	60	3.5	Yes	7
NB (US 15 SB Off Ramp) thru	*1000+*	75	74	1	60	1.2	Yes	3
SB (Himes Ave) left turn	*1000+*	175	228	1	60	3.8	Yes	7
SB (Himes Ave) right turn	*1000+*	25	8	1	60	0.1	Yes	1
PM Peak Hour								
EB (MD 180) left turn	*1000+*	25	17	1	70	0.3	Yes	1
EB (MD 180) thru	*1000+*	250	298	1	70	5.8	Yes	10
WB (MD 180) thru	*1000+*	200	444	0.55	70	4.7	Yes	8
NB (US 15 SB Off Ramp) left turn	*800*	225	282	1	70	5.5	Yes	9
NB (US 15 SB Off Ramp) thru	*1000+*	225	271	1	70	5.3	Yes	9
SB (Himes Ave) left turn	*1000+*	175	180	1	70	3.5	Yes	7
SB (Himes Ave) right turn	*1000+*	0	3	1	70	0.1	Yes	0
2027 Background Traffic								
AM Peak Hour								
EB (MD 180) left turn	*1000+*	50	31	1	60	0.5	Yes	2
EB (MD 180) thru	*1000+*	325	491	1	60	8.2	Yes	13
WB (MD 180) thru	*1000+*	125	289	0.55	60	2.6	Yes	5
NB (US 15 SB Off Ramp) left turn	*800*	175	220	1	60	3.7	Yes	7
NB (US 15 SB Off Ramp) thru	*1000+*	75	78	1	60	1.3	Yes	3
SB (Himes Ave) left turn	*1000+*	200	240	1	60	4.0	Yes	8
SB (Himes Ave) right turn	*1000+*	100	87	1	60	1.5	Yes	4
PM Peak Hour								
EB (MD 180) left turn	*1000+*	125	135	1	70	2.6	Yes	5
EB (MD 180) thru	*1000+*	325	404	1	70	7.9	Yes	13
WB (MD 180) thru	*1000+*	225	492	0.55	70	5.3	Yes	9
NB (US 15 SB Off Ramp) left turn	*800*	250	296	1	70	5.8	Yes	10
NB (US 15 SB Off Ramp) thru	*1000+*	250	285	1	70	5.5	Yes	10
SB (Himes Ave) left turn	*1000+*	175	189	1	70	3.7	Yes	7
SB (Himes Ave) right turn	*1000+*	75	54	1	70	1.1	Yes	3

1. MD 180 @ Himes Ave / I-15 SB Off Ramp

Maryland State Highway Administration Queuing Analysis Formula

Queue Length (feet) =

If Average No. of Vehicle (Specific Movement) per Cycle <= 20:	Poisson Distribution Maximum No. of Vehicles per Cycle	x 25 Feet per Vehicle
If Average No. of Vehicle (Specific Movement) per Cycle > 20:	Turning Volume (veh per hour) x Lane Use Factor x Cycle Length (Seconds) / 3600 (Seconds per hour)	x 25 Feet per Vehicle x 1.4 Surge Factor

	Available Storage (feet)	Queue Length (feet)	Veh / Hour	Lane Use Factor	Cycle Length (seconds)	Average No. of Vehicle per Cycle	Is Average No. of Vehicle (Specific Movement) per Cycle <= 20?	Poisson Distribution Maximum No. of Vehilce per Cycle
2027 Total Traffic								
AM Peak Hour								
EB (MD 180) left turn	***1000+***	50	31	1	60	0.5	Yes	2
EB (MD 180) thru	***1000+***	325	500	1	60	8.3	Yes	13
WB (MD 180) thru	***1000+***	150	308	0.55	60	2.8	Yes	6
NB (US 15 SB Off Ramp) left turn	***800***	175	220	1	60	3.7	Yes	7
NB (US 15 SB Off Ramp) thru	***1000+***	75	78	1	60	1.3	Yes	3
SB (Himes Ave) left turn	***1000+***	200	240	1	60	4.0	Yes	8
SB (Himes Ave) right turn	***1000+***	100	87	1	60	1.5	Yes	4
PM Peak Hour								
EB (MD 180) left turn	***1000+***	125	135	1	70	2.6	Yes	5
EB (MD 180) thru	***1000+***	325	420	1	70	8.2	Yes	13
WB (MD 180) thru	***1000+***	225	505	0.55	70	5.4	Yes	9
NB (US 15 SB Off Ramp) left turn	***800***	250	296	1	70	5.8	Yes	10
NB (US 15 SB Off Ramp) thru	***1000+***	250	285	1	70	5.5	Yes	10
SB (Himes Ave) left turn	***1000+***	175	189	1	70	3.7	Yes	7
SB (Himes Ave) right turn	***1000+***	75	54	1	70	1.1	Yes	3

The Traffic Group

MD SHA QUEUING ANALYSIS
1. MD 180 @ HIMES AVE / I-15 SB OFF RAMP

Qt, 220222\REV1\Queuesnew.xls-1 (T), F05/05/22

2. MD 180 @ Jefferson Commons Way

Maryland State Highway Administration Queuing Analysis Formula

Queue Length (feet) =

If Average No. of Vehicle (Specific Movement) per Cycle <= 20: Poisson Distribution Maximum No. of Vehicles per Cycle x 25 Feet per Vehicle

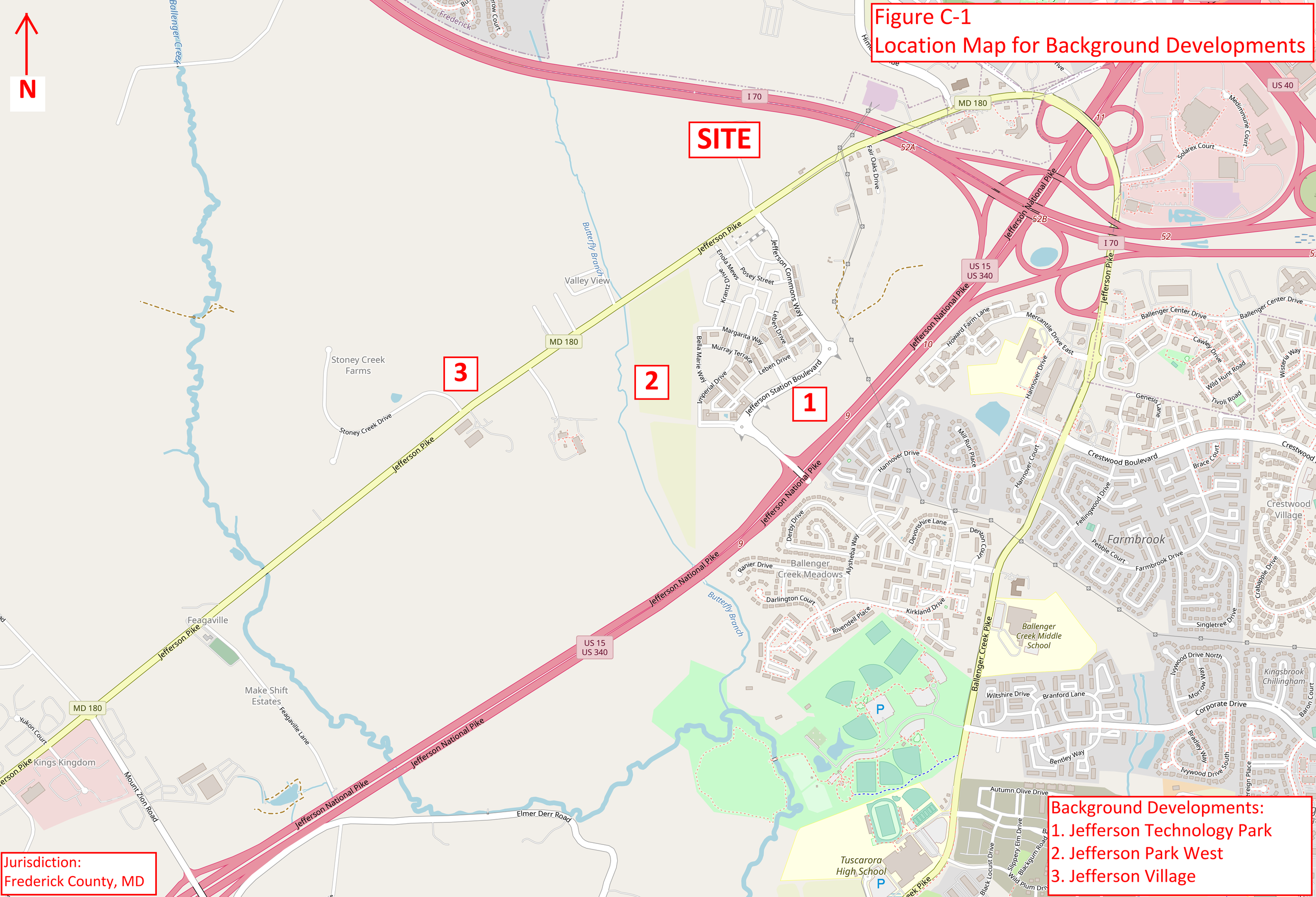
If Average No. of Vehicle (Specific Movement) per Cycle > 20: $\frac{\text{Turning Volume (veh per hour) x Lane Use Factor x Cycle Length (Seconds)}}{\text{3600 (Seconds per hour)}}$ x 25 Feet per Vehicle x 1.4 Surge Factor

Existing Traffic	Available Storage (feet)	Queue Length (feet)	Veh / Hour	Lane Use Factor	Cycle Length (seconds)	Average No. of Vehicle per Cycle	Is Average No. of Vehicle (Specific Movement) per Cycle <= 20?	Poisson Distribution Maximum No. of Vehilce per Cycle
AM Peak Hour								
EB (MD 180) left	***200***	0	0	1	60	0.0	Yes	0
WB (MD 180) left turn	***300***	50	38	1	60	0.6	Yes	2
NB (Jefferson Commons Way) left/thru	***200***	50	32	1	60	0.5	Yes	2
NB (Jefferson Commons Way) right	***500+***	50	38	1	60	0.6	Yes	2
SB (Site Access) left/thru/right	***500+***	25	12	1	60	0.2	Yes	1
PM Peak Hour								
EB (MD 180) left	***200***	0	1	1	60	0.0	Yes	0
WB (MD 180) left turn	***300***	75	78	1	60	1.3	Yes	3
NB (Jefferson Commons Way) left/thru	***200***	25	18	1	60	0.3	Yes	1
NB (Jefferson Commons Way) right	***500+***	50	37	1	60	0.6	Yes	2
SB (Site Access) left/thru/right	***500+***	25	13	1	60	0.2	Yes	1
2027 Background Traffic								
AM Peak Hour								
EB (MD 180) left	***200***	0	0	1	60	0.0	Yes	0
WB (MD 180) left turn	***300***	125	146	1	60	2.4	Yes	5
NB (Jefferson Commons Way) left/thru	***200***	50	47	1	60	0.8	Yes	2
NB (Jefferson Commons Way) right	***500+***	75	66	1	60	1.1	Yes	3
SB (Site Access) left/thru/right	***500+***	25	12	1	60	0.2	Yes	1
PM Peak Hour								
EB (MD 180) left	***200***	0	1	1	60	0.0	Yes	0
WB (MD 180) left turn	***300***	125	120	1	60	2.0	Yes	5
NB (Jefferson Commons Way) left/thru	***200***	100	86	1	60	1.4	Yes	4
NB (Jefferson Commons Way) right	***500+***	150	166	1	60	2.8	Yes	6
SB (Site Access) left/thru/right	***500+***	25	15	1	60	0.3	Yes	1
2027 Total Traffic								
AM Peak Hour								
EB (MD 180) left	***200***	50	31	1	60	0.5	Yes	2
WB (MD 180) left turn	***300***	125	146	1	60	2.4	Yes	5
NB (Jefferson Commons Way) left/thru	***200***	75	60	1	60	1.0	Yes	3
NB (Jefferson Commons Way) right	***500+***	75	66	1	60	1.1	Yes	3
SB (Site Access) left/thru/right	***500+***	50	41	1	60	0.7	Yes	2
PM Peak Hour								
EB (MD 180) left	***200***	25	23	1	60	0.4	Yes	1
WB (MD 180) left turn	***300***	125	120	1	60	2.0	Yes	5
NB (Jefferson Commons Way) left/thru	***200***	100	95	1	60	1.6	Yes	4
NB (Jefferson Commons Way) right	***500+***	150	166	1	60	2.8	Yes	6
SB (Site Access) left/thru/right	***500+***	75	69	1	60	1.2	Yes	3

APPENDIX C

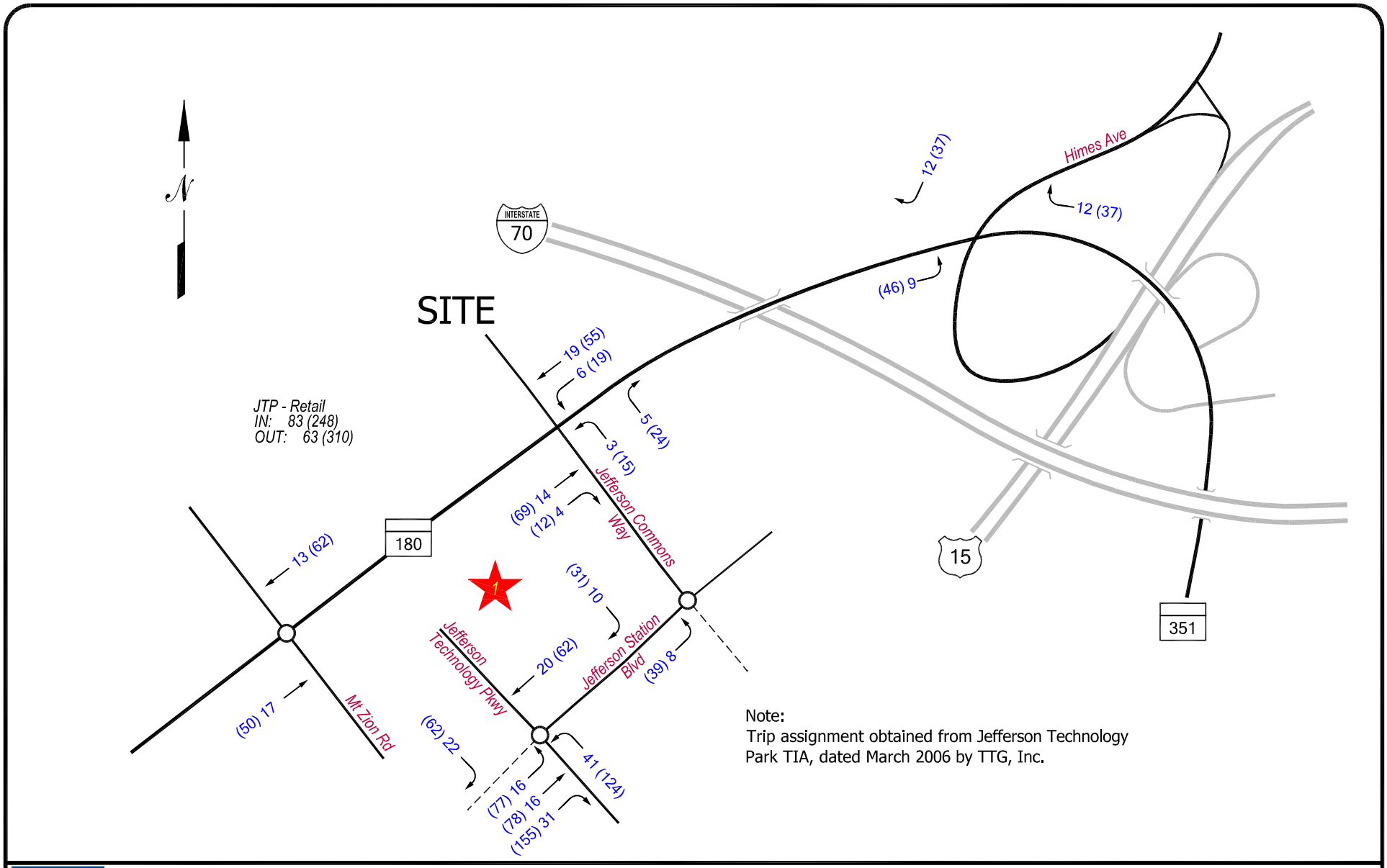
Trip Assignment for Approved Developments

Figure C-1
Location Map for Background Developments



Jurisdiction:
Frederick County, MD

Background Developments:
1. Jefferson Technology Park
2. Jefferson Park West
3. Jefferson Village



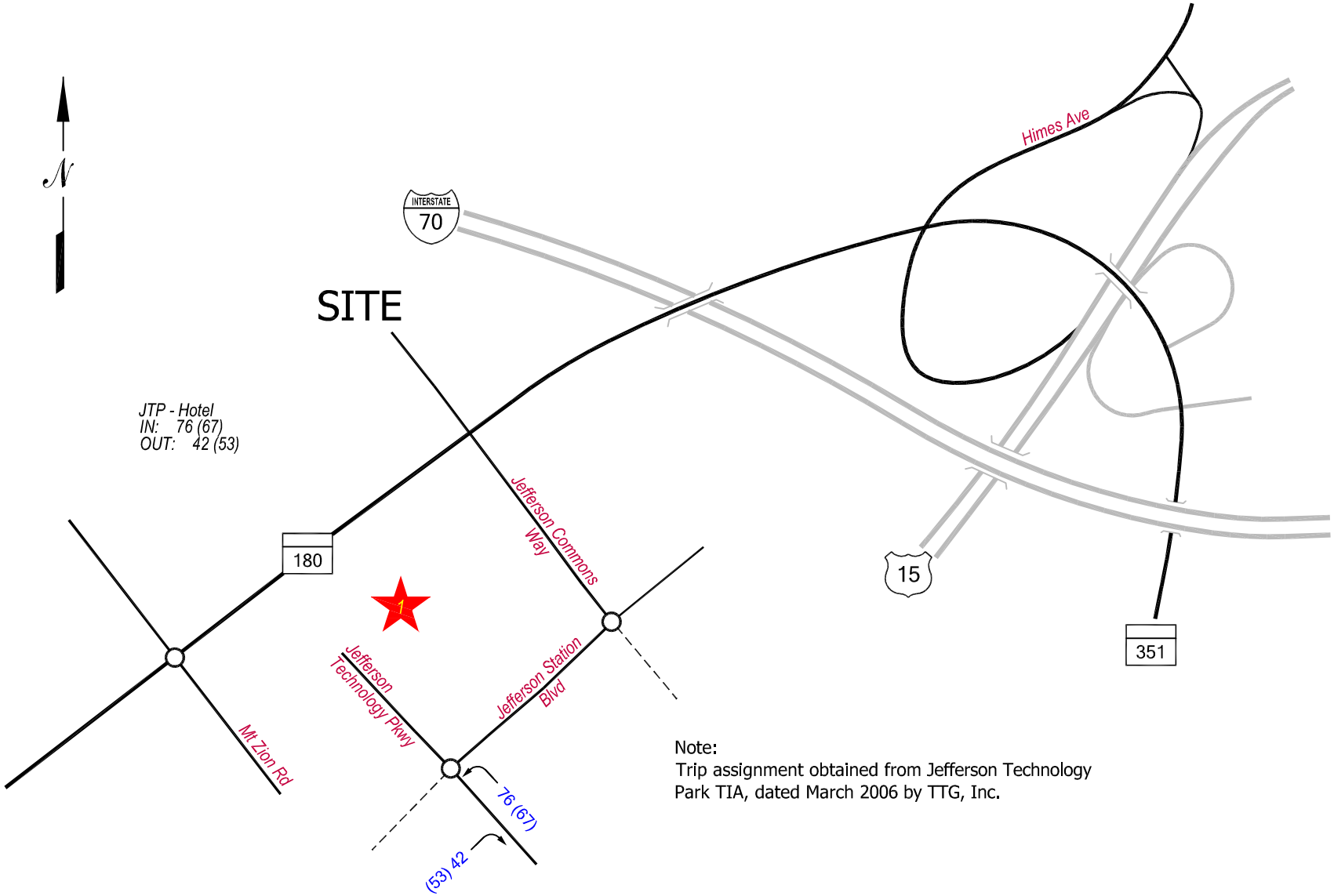
Note:
Trip assignment obtained from Jefferson Technology Park TIA, dated March 2006 by TTG, Inc.

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-2A
TRIP ASSIGNMENT - #1
JEFFERSON TECHNOLOGY PARK - RETAIL

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-1a, f3/1/2022



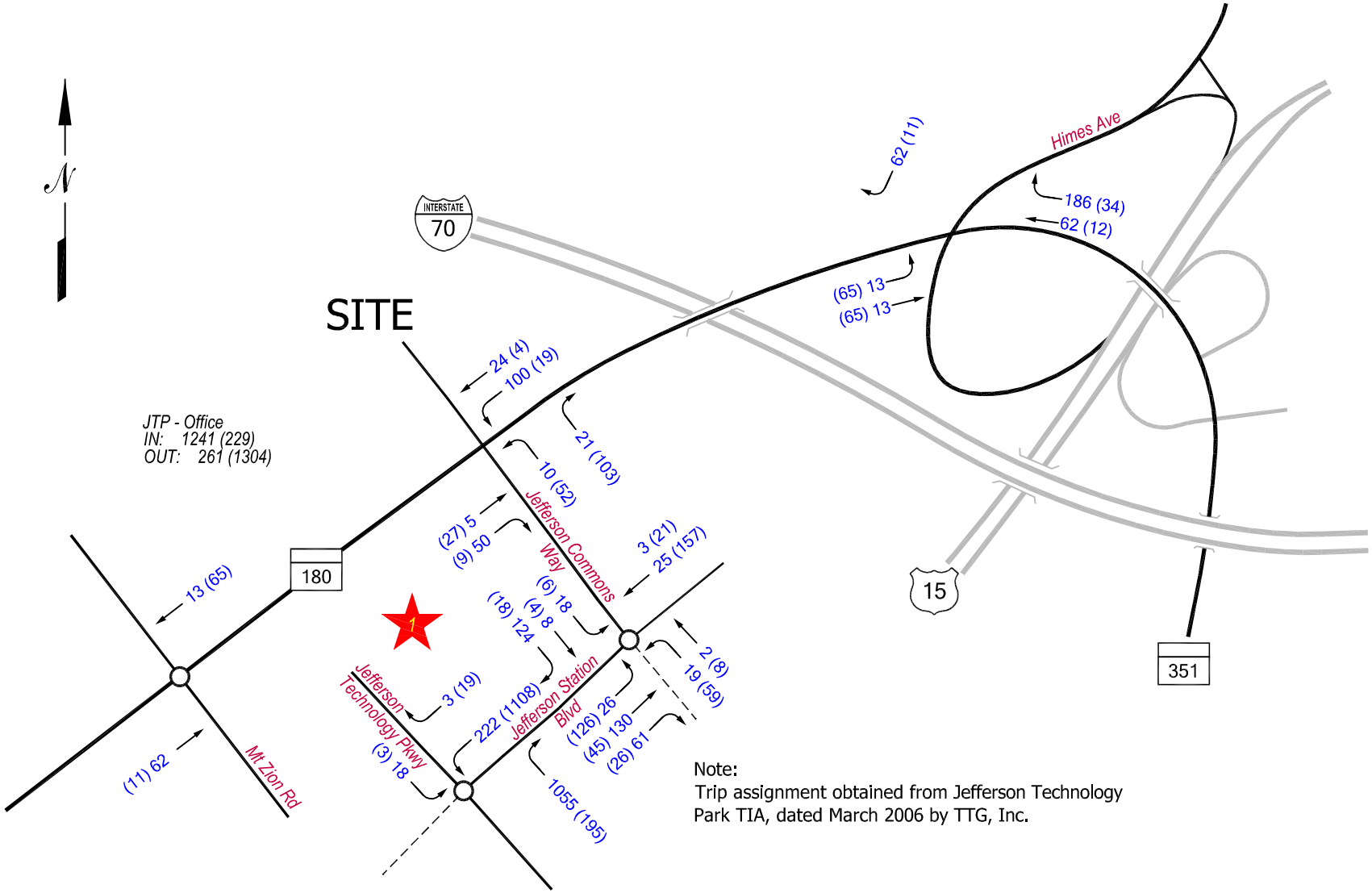
Note:
Trip assignment obtained from Jefferson Technology Park TIA, dated March 2006 by TTG, Inc.

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-2B
TRIP ASSIGNMENT - #1
JEFFERSON TECHNOLOGY PARK - HOTEL

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-1b, f3/1/2022



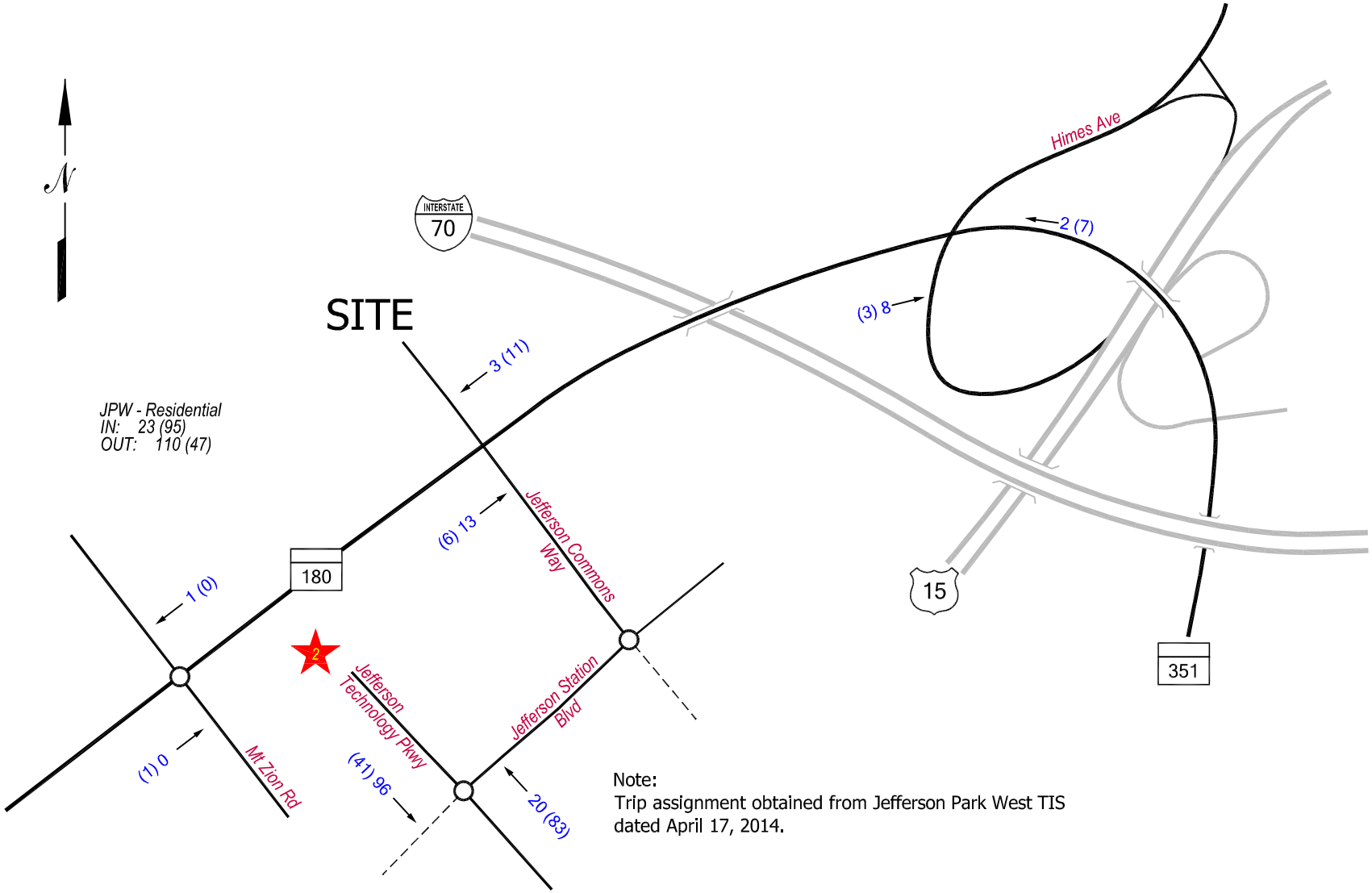
Note:
Trip assignment obtained from Jefferson Technology Park TIA, dated March 2006 by TTG, Inc.

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-2C
TRIP ASSIGNMENT - #1
JEFFERSON TECHNOLOGY PARK - OFFICE

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-1c, f3/1/2022



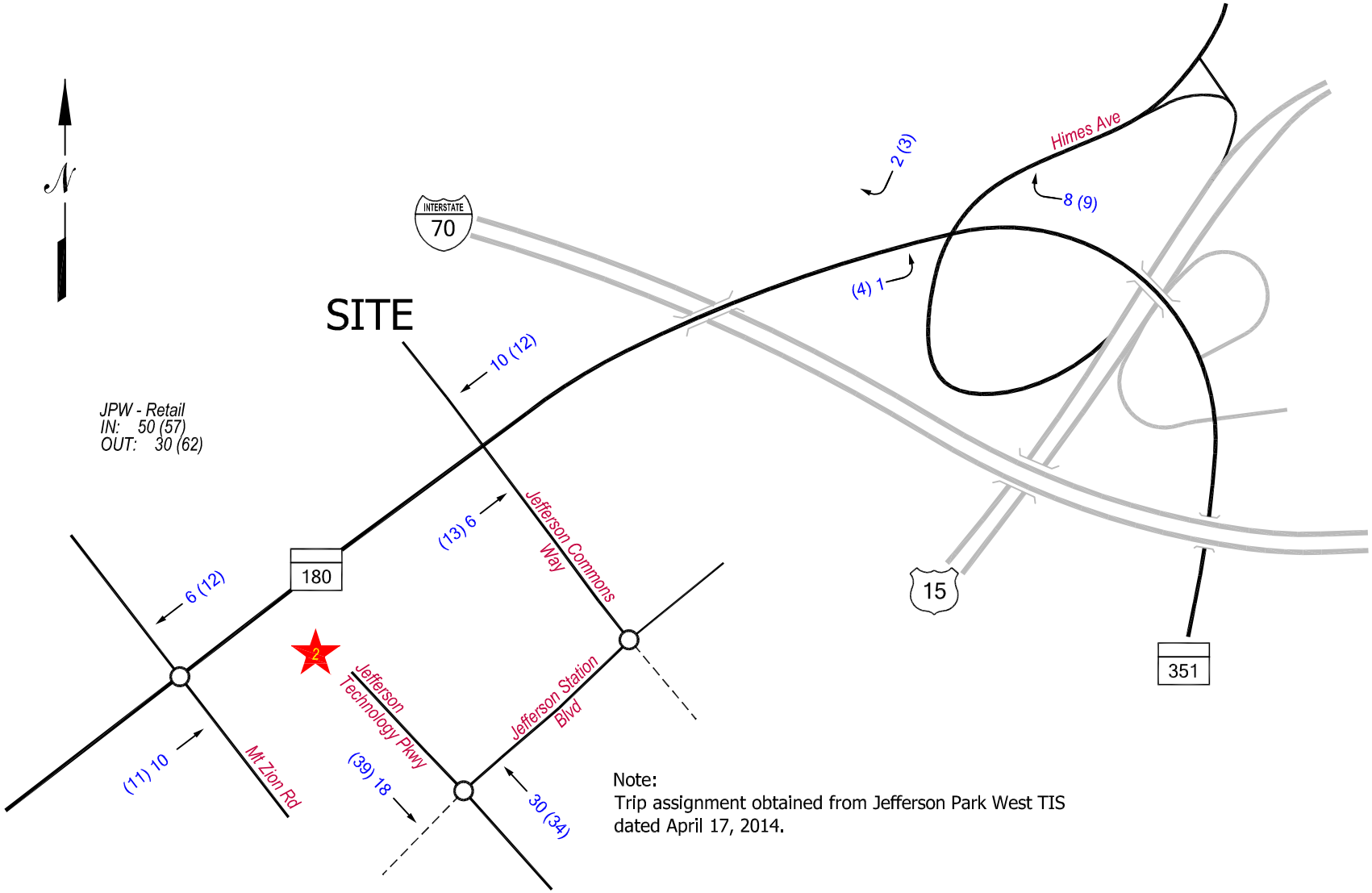
Note:
Trip assignment obtained from Jefferson Park West TIS dated April 17, 2014.

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-3A
TRIP ASSIGNMENT - #2
JEFFERSON PARK WEST
(RESIDENTIAL)

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-2a, f3/1/2022



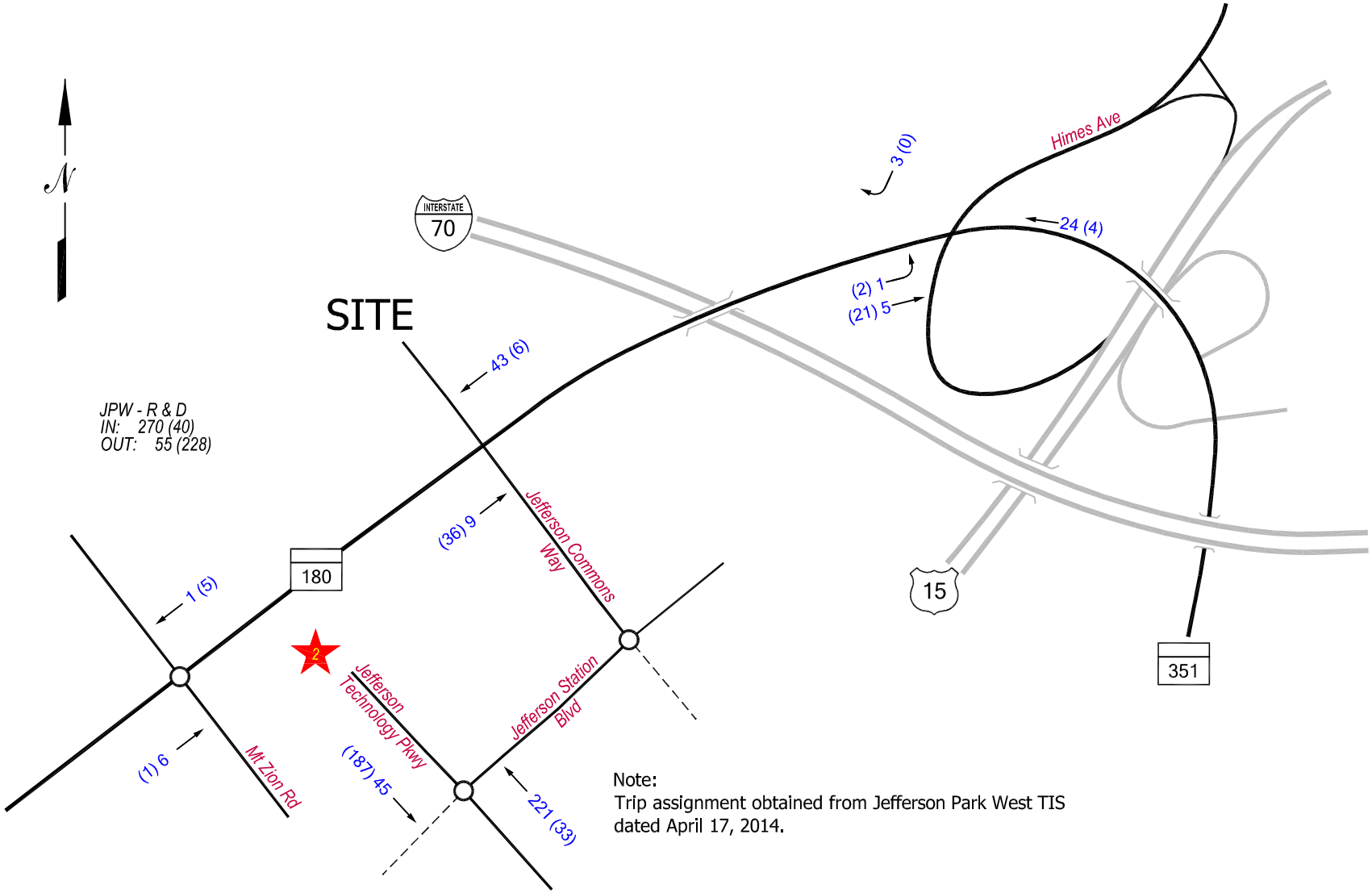
Note:
Trip assignment obtained from Jefferson Park West TIS dated April 17, 2014.

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-3B
TRIP ASSIGNMENT - #2
JEFFERSON PARK WEST
(RETAIL)

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-2b, f3/1/2022



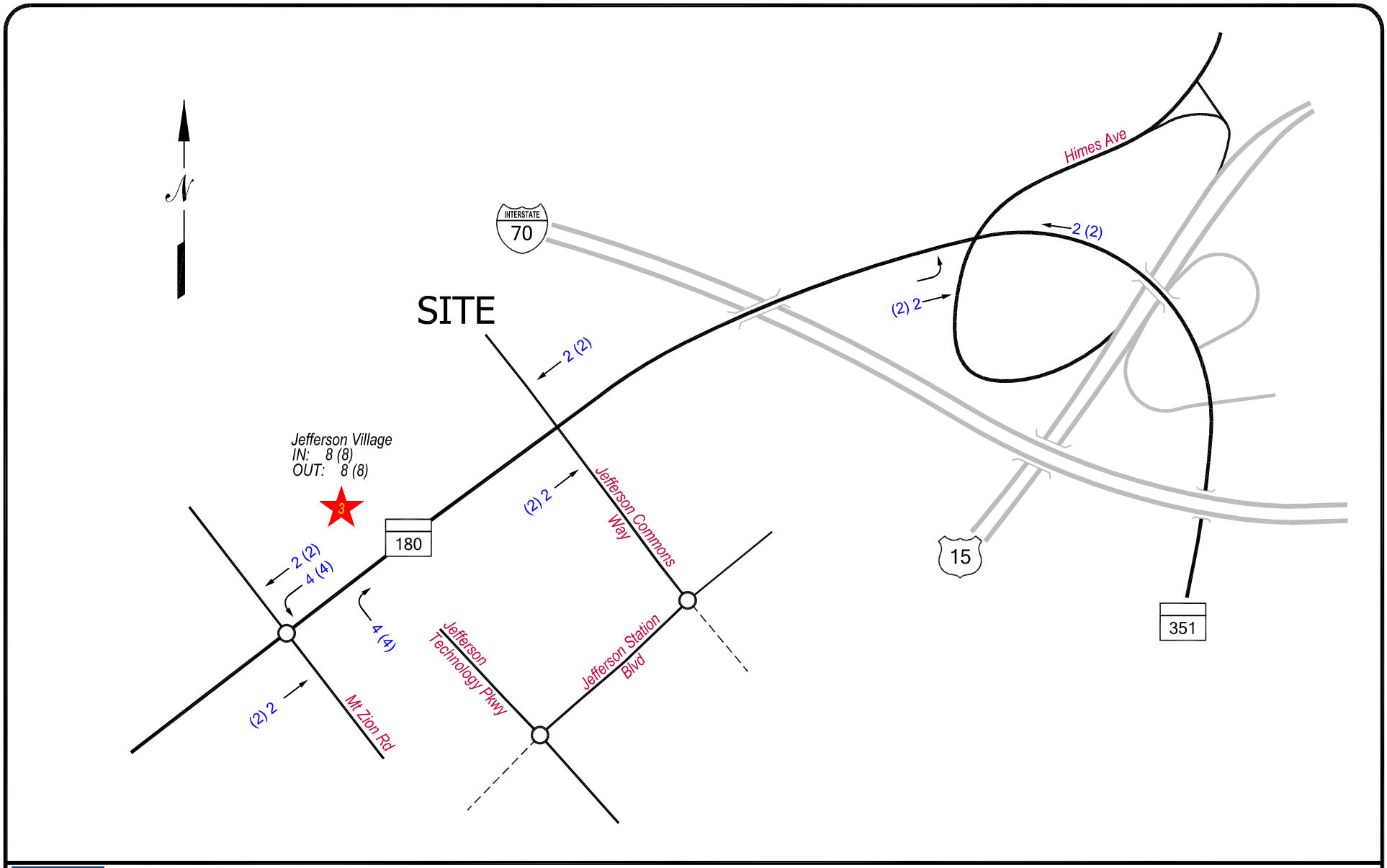
Note:
Trip assignment obtained from Jefferson Park West TIS dated April 17, 2014.

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-3C
TRIP ASSIGNMENT - #2
JEFFERSON PARK WEST
(R & D)

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-2c, f3/1/2022



NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

FIGURE C-4
TRIP ASSIGNMENT - #3
JEFFERSON VILLAGE

qt, 220222_kenel (creative landscapes)p\initial\figure.dwg-3, f3/1/2022

Background Development Information

TRIP GENERATION FOR SUBJECT SITE

	MORNING PEAK HOUR			EVENING PEAK HOUR		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Land Use A - Residential						
Apartment Units (ITE-220, Units)						
577 Apartment units	57	229	286	218	117	335
Townhouse Units (ITE-230, Units)						
248 Townhouse Units	18	89	107	85	42	127
Total Trips	**75**	**318**	**393**	**303**	**159**	**462**
Internal Trips	**-6**	**-80**	**-86**	**-51**	**-31**	**-82**
Net External Trips	**69**	**238**	**307**	**252**	**128**	**380**
Land Use B - Retail/Commercial						
Shopping Center (ksf, ITE-820)						
125,000 sf Shopping Center	109	70	179	348	377	725
Internal Trips	**-26**	**-7**	**-33**	**-100**	**-67**	**-167**
Net External Trips	**83**	**63**	**146**	**248**	**310**	**558**
Pass-by Trips (AM 0%; PM 0%)	**0**	**0**	**0**	**0**	**0**	**0**
New Trips	***83***	***63***	***146***	***248***	***310***	***558***
Land Use C - Hotel						
Hotel Rooms (ITE-310)						
250 Hotel Rooms	77	50	127	78	70	148
Internal Trips	**-1**	**-8**	**-9**	**-11**	**-17**	**-28**
Net External Trips	**76**	**42**	**118**	**67**	**53**	**120**
Land Use D - Office						
Research & Dev. Center (ksf, ITE-760)						
200,000 sf Research & Dev. Center	212	43	255	35	200	235
General Office Buildings (ksf, ITE-710)						
1,150,000 sf General Office	1098	225	1323	205	1162	1367
Internal Trips	**-69**	**-7**	**-76**	**-11**	**-58**	**-69**
Net External Trips	**1241**	**261**	**1502**	**229**	**1304**	**1533**

Total Pass-by Trips	**0**	**0**	**0**	**0**	**0**	**0**
Total New Trips	**1469**	**604**	**2073**	**796**	**1795**	**2591**

Notes:

1. Trip rates derived from *ITE Trip Generation*, 7th Ed., 2003.
2. Net External Trips calculated using worksheets in Appendix C: Total AM Peak = 9%; Total PM Peak = 12%.
3. Pass-by trips percentage derived from *ITE Trip Generation Handbook*, 2nd Ed., 2004, are 33% & 43% for AM & PM peak, respectively. MD SHA requested no pass-by trips be utilized.

The Traffic Group

EXHIBIT 8a
TRIP GENERATION RATES AND TOTALS
FOR JEFFERSON TECHNOLOGY PARK

mg, 040822\jul05\sitetrips.xls-site, 07/15/05

		MORNING PEAK HOUR			EVENING PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Land Use A - 825 Residential Units (2007 - 2011)							
Net External Trips	100%	**69**	**238**	**307**	**252**	**128**	**380**
Phase I - 700 residential units	85%	59	202	261	214	109	323
Phase II - 125 residential units	15%	10	36	46	38	19	57
Land Use B - 125,000 sq.ft. Retail/Commercial (2008 or 2009 completion)							
Net External Trips	100%	**83**	**63**	**146**	**248**	**310**	**558**
Phase I - 125,000 sq.ft. retail	100%	83	63	146	248	310	558
Phase II - 0 sq.ft. retail	0%	0	0	0	0	0	0
Land Use C - 250 Room Hotel (2008 completion)							
Net External Trips	100%	**76**	**42**	**118**	**67**	**53**	**120**
Phase I - 250 hotel rooms	100%	76	42	118	67	53	120
Phase II - 0 hotel rooms	0%	0	0	0	0	0	0
Land Use D - 1,350,000 sq.ft. Office (2007 - 2014)							
Net External Trips	100%	**1241**	**261**	**1502**	**229**	**1304**	**1533**
Phase I - 850,000 sq.ft. office space	63%	782	164	946	144	822	966
Phase II - 500,000 sq.ft. office space	37%	459	97	556	85	482	567

	AVG.						
PHASE I - Net External Trips	**74%**	**1000**	**471**	**1471**	**673**	**1294**	**1967**
PHASE II - Net External Trips	**26%**	**469**	**133**	**602**	**123**	**501**	**624**
TOTAL - Net External Trips	**100%**	**1469**	**604**	**2073**	**796**	**1795**	**2591**

Notes:

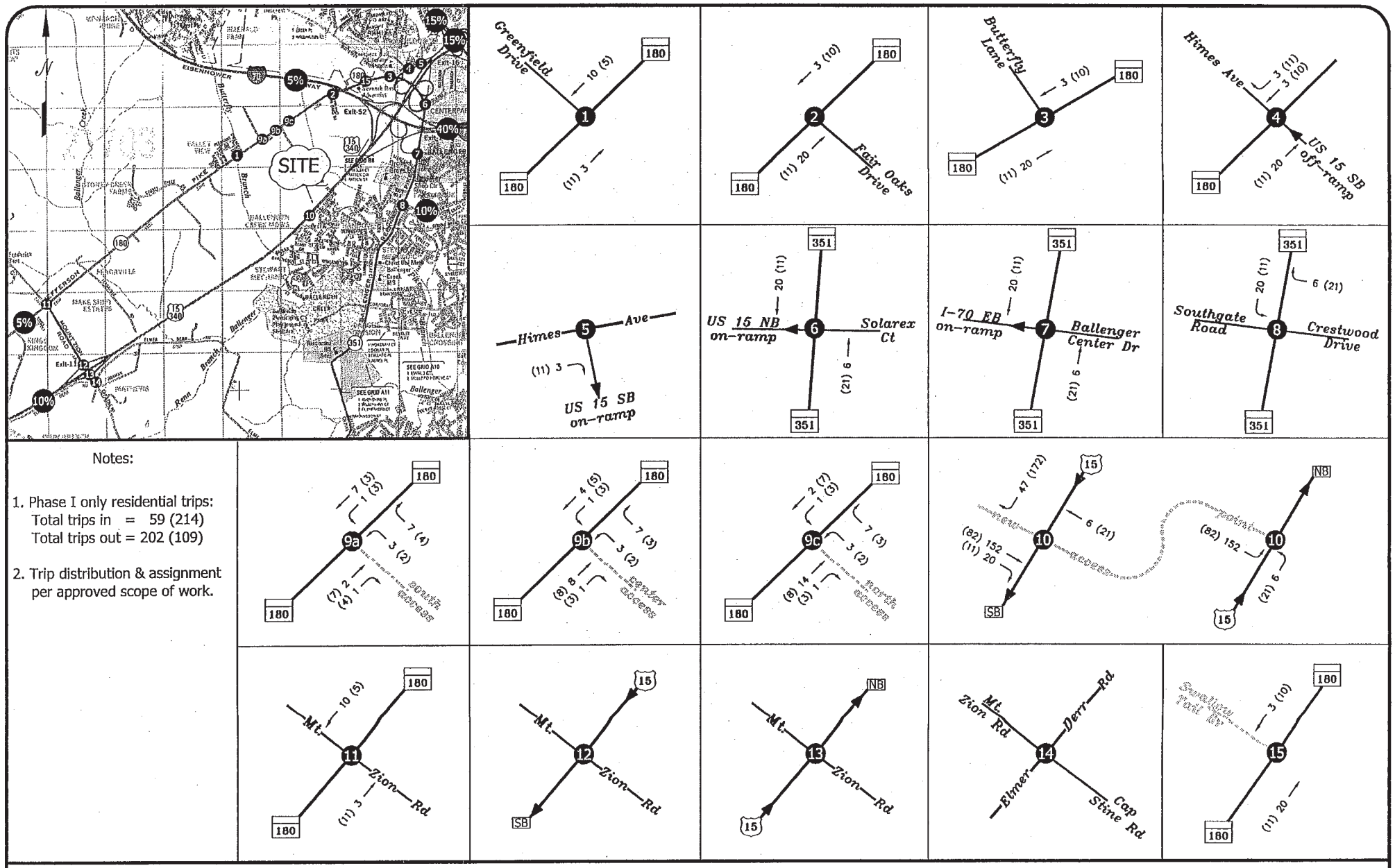
1. Phase I period starts Year 2006 and extends to the end of Year 2010.
2. Phase II period starts Year 2011 and extends to the end of Year 2015.
3. Phasing information provided is based upon a timetable of probable land use component completion.

The Traffic Group

EXHIBIT 8b
PHASE I & II TRIP GENERATION TOTALS
FOR JEFFERSON TECHNOLOGY PARK

mg, 040822\jul05\sitetrips.xls-phases, 08/17/05

mg, 040822\jul05\jul05.dwg-5a, 08/22/05



Notes:

1. Phase I only residential trips:
   Total trips in = 59 (214)
   Total trips out = 202 (109)

2. Trip distribution & assignment per approved scope of work.

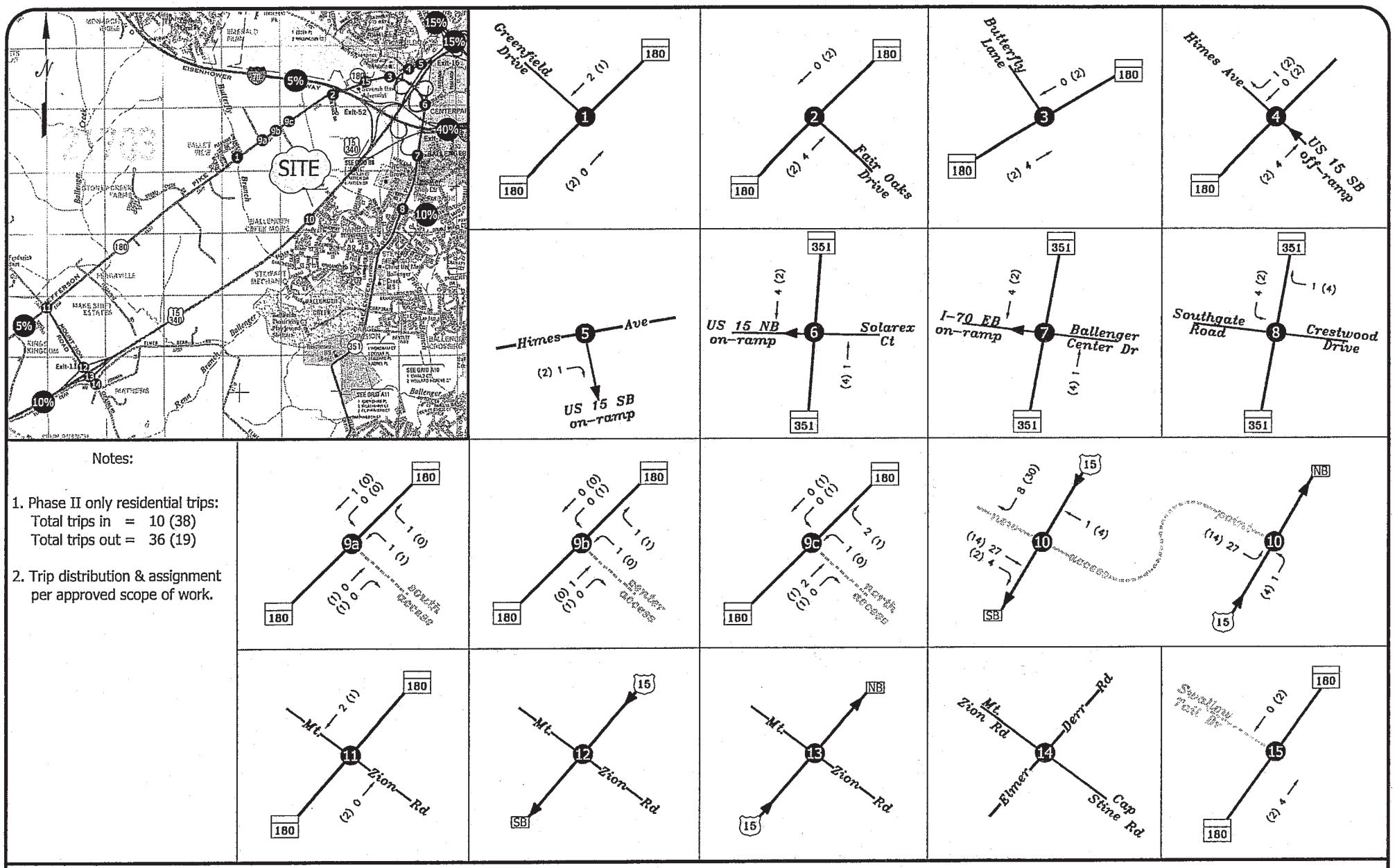
The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-5a
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
RESIDENTIAL PHASE I - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-5b, 08/22/05



Notes:

1. Phase II only residential trips:
   Total trips in = 10 (38)
   Total trips out = 36 (19)

2. Trip distribution & assignment per approved scope of work.

The Traffic Group

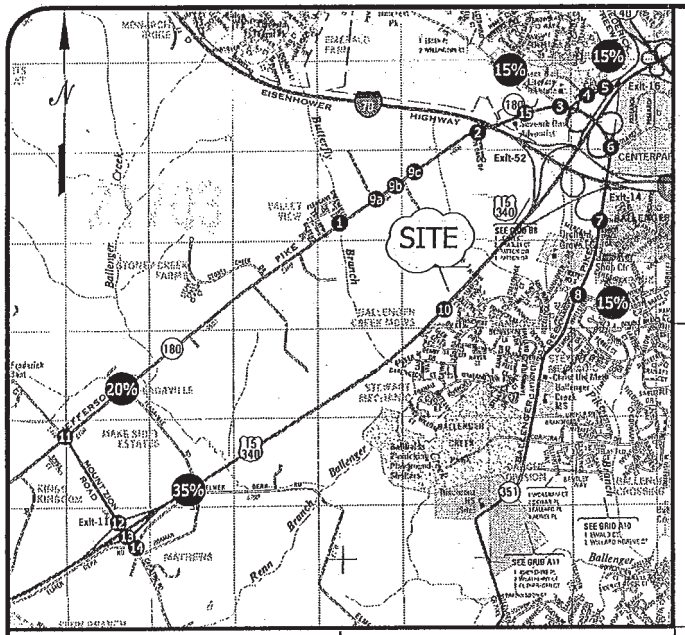
NOT TO SCALE

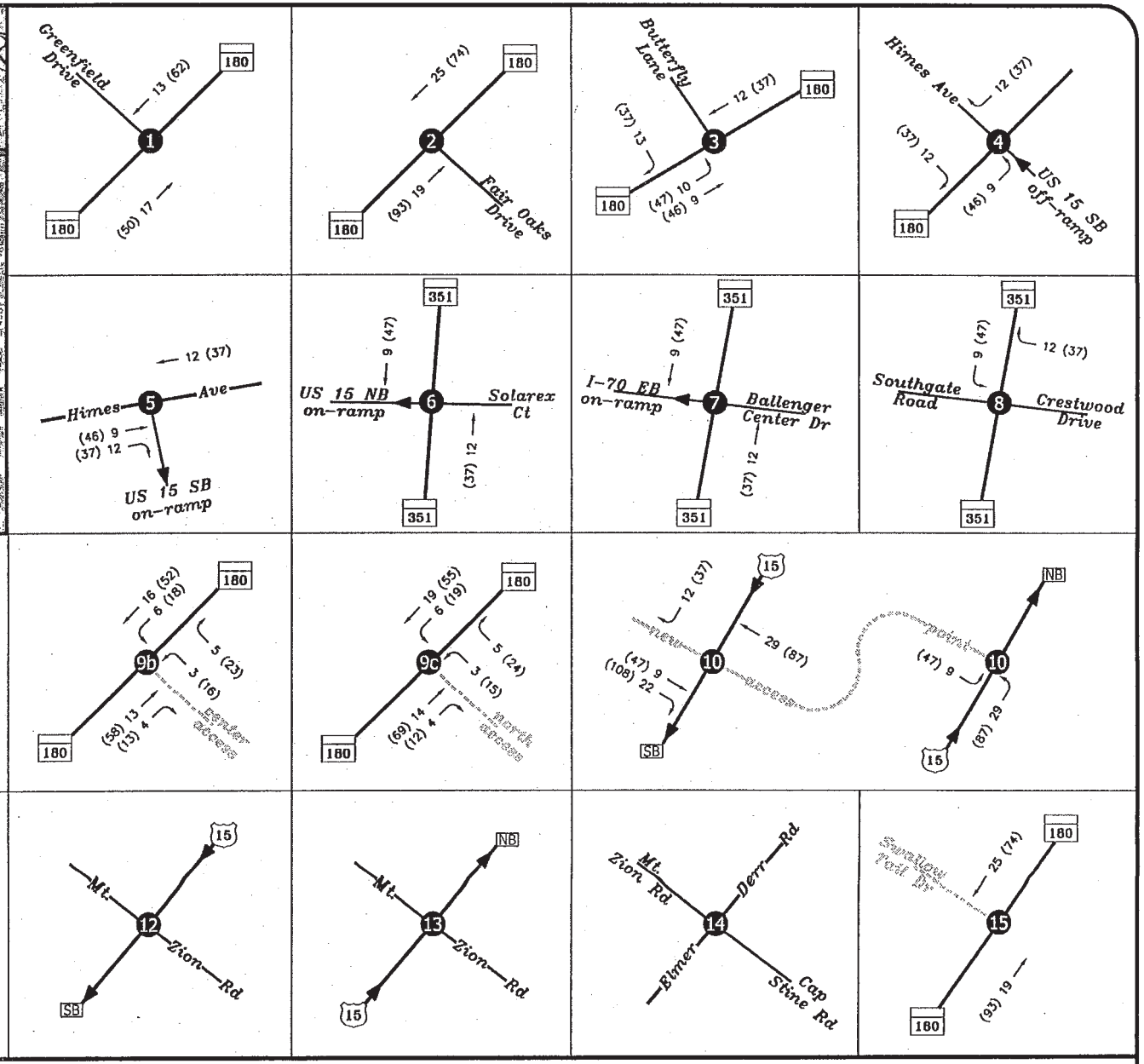
00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-5b

TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
RESIDENTIAL PHASE II - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-6a, 08/22/05





Notes:

1. Total retail trips:
   Total trips in = 83 (248)
   Total trips out = 63 (310)

2. Trip distribution & assignment per approved scope of work.

3. Passby Trips were not used per the MD SHA. ITE allows passby peak hour rates of AM - 26% and PM - 36%.

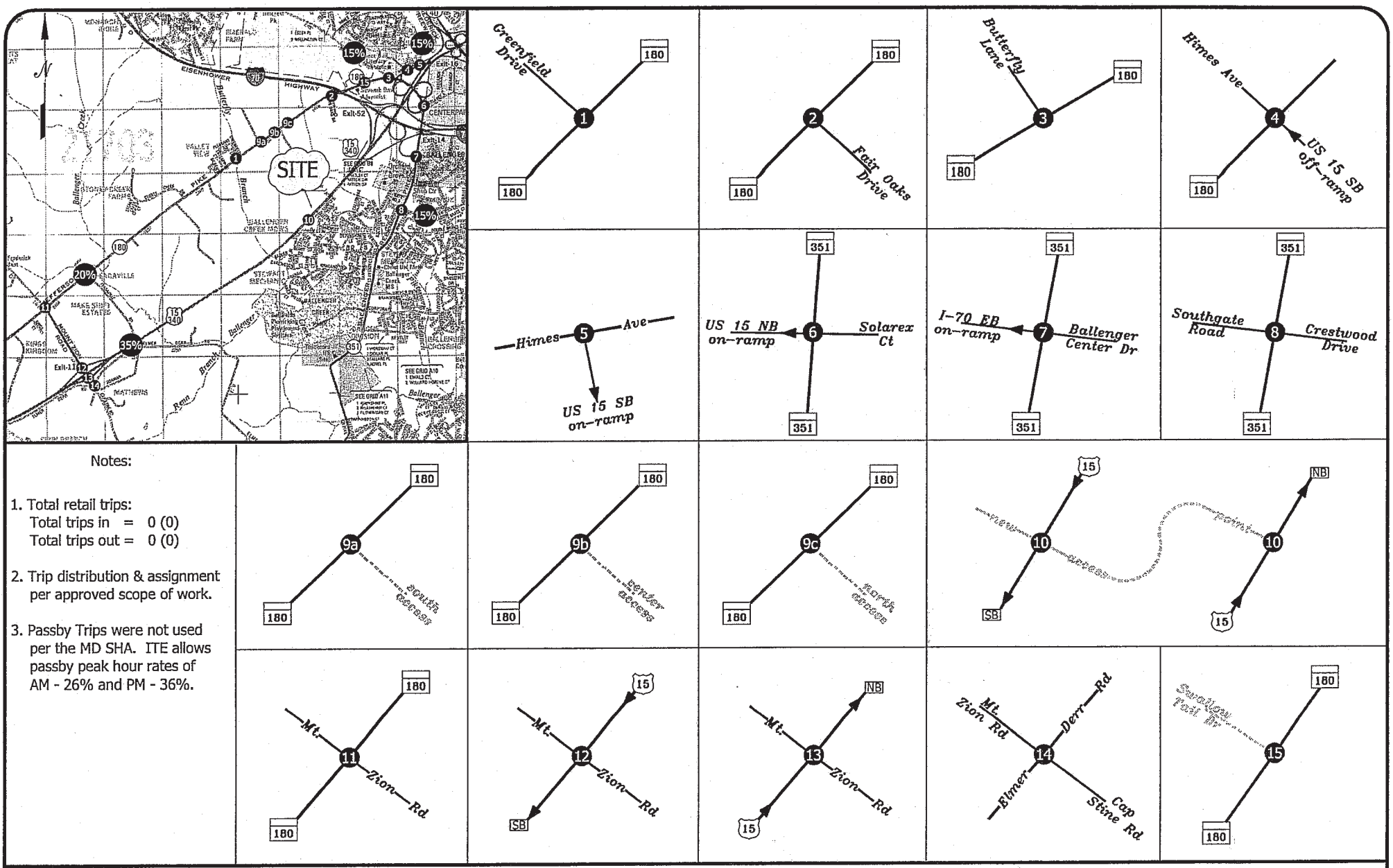
The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-6a
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
RETAIL PHASE I - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-6b, 08/22/05



Notes:

1. Total retail trips:
   Total trips in = 0 (0)
   Total trips out = 0 (0)

2. Trip distribution & assignment per approved scope of work.

3. Passby Trips were not used per the MD SHA. ITE allows passby peak hour rates of AM - 26% and PM - 36%.

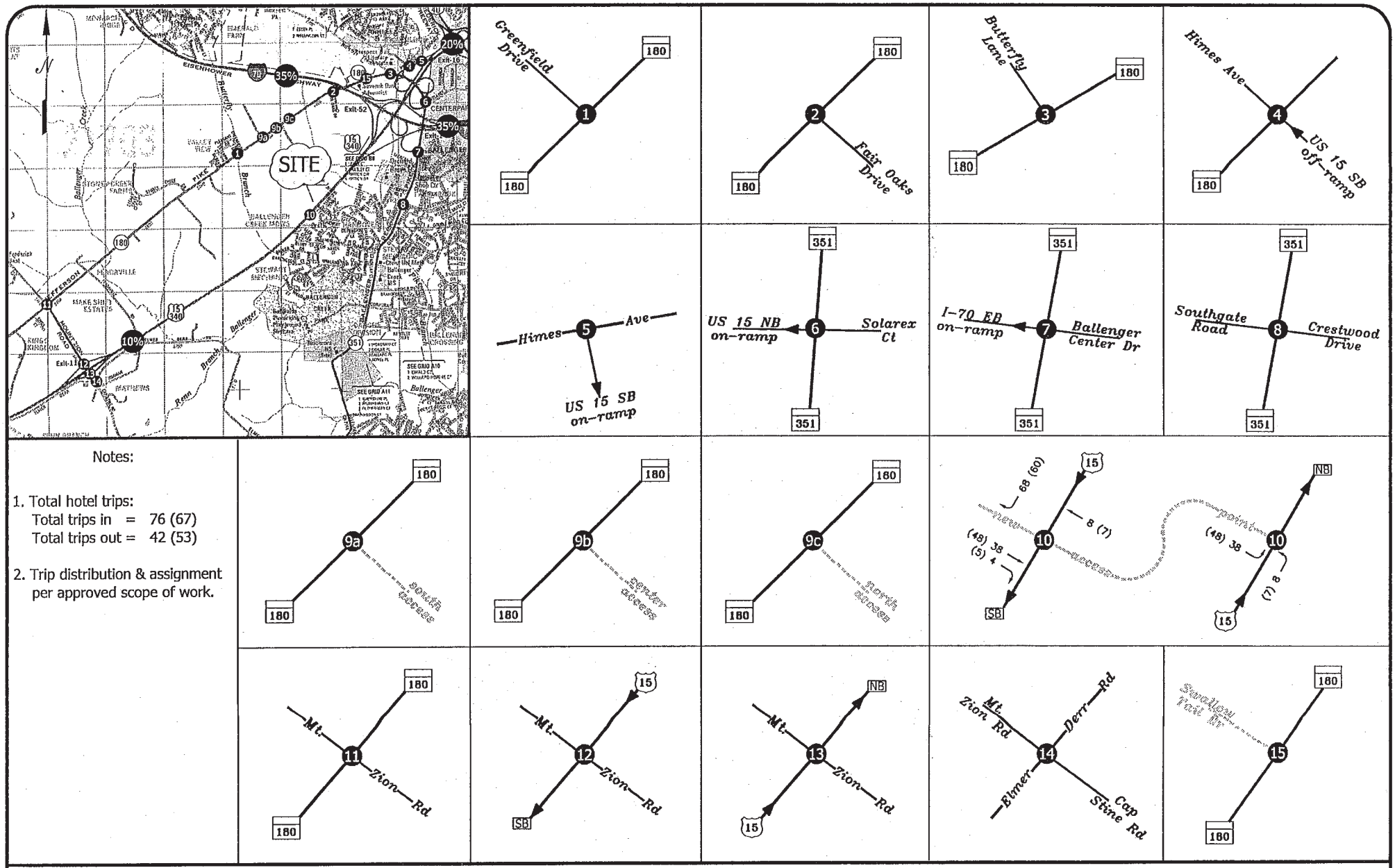
The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-6b
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
RETAIL PHASE II - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-7a, 08/22/05



Notes:

1. Total hotel trips:
   Total trips in = 76 (67)
   Total trips out = 42 (53)

2. Trip distribution & assignment per approved scope of work.

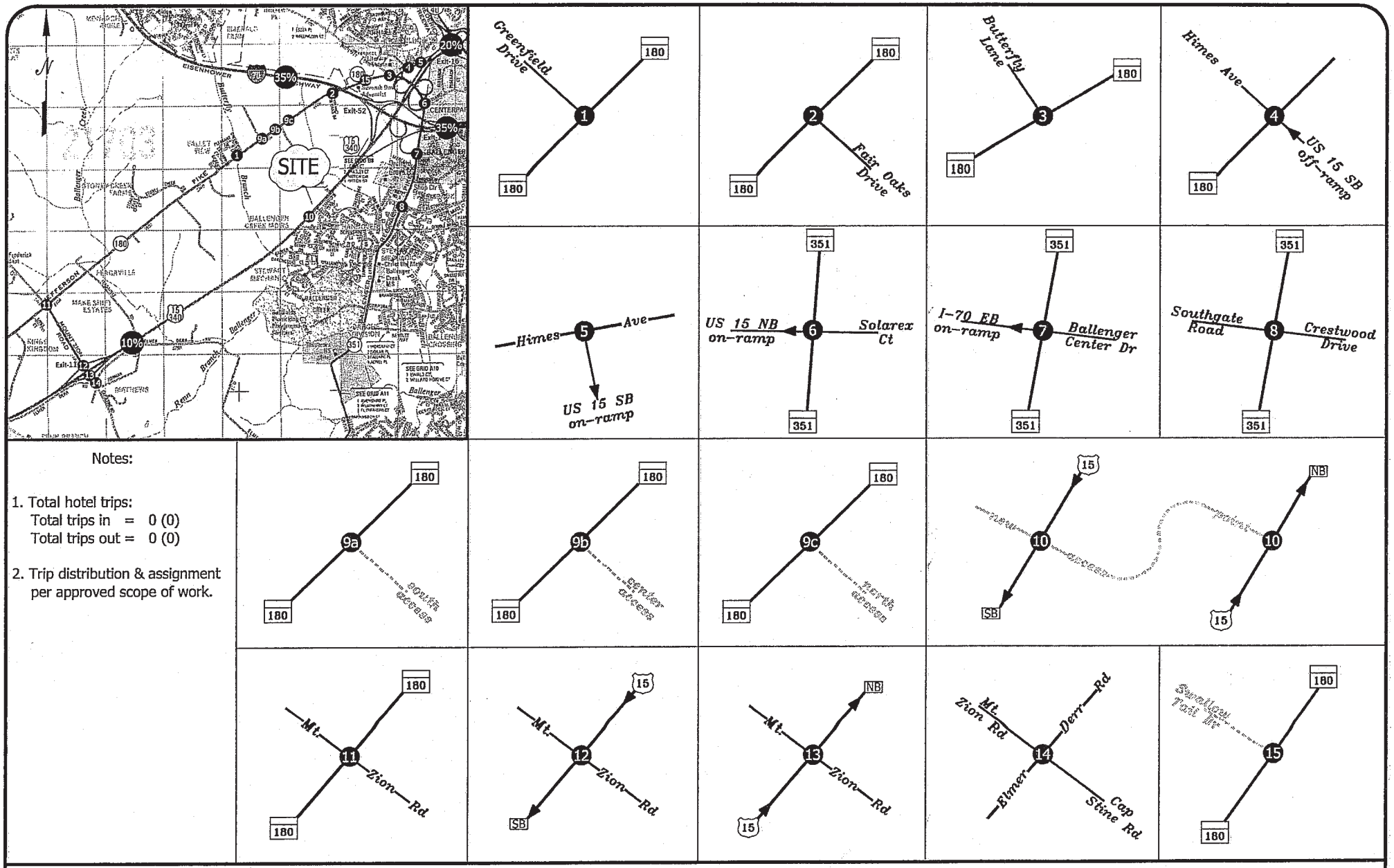
The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-7a
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
HOTEL PHASE I - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-7b, 08/22/05



Notes:

1. Total hotel trips:
   Total trips in = 0 (0)
   Total trips out = 0 (0)

2. Trip distribution & assignment per approved scope of work.

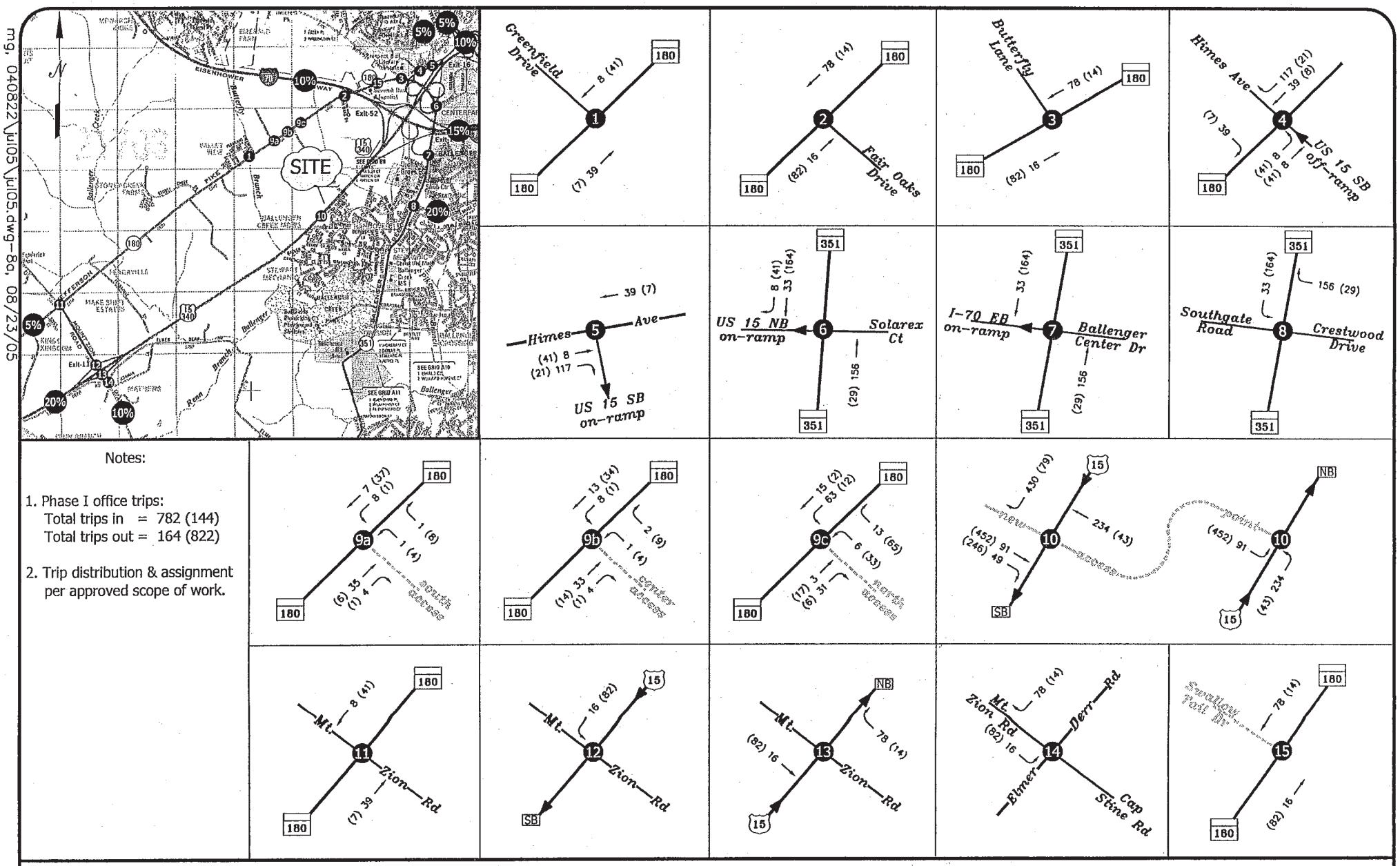
The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-7b
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
HOTEL PHASE II - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-8a, 08/23/05



Notes:

1. Phase I office trips:
   Total trips in = 782 (144)
   Total trips out = 164 (822)

2. Trip distribution & assignment per approved scope of work.

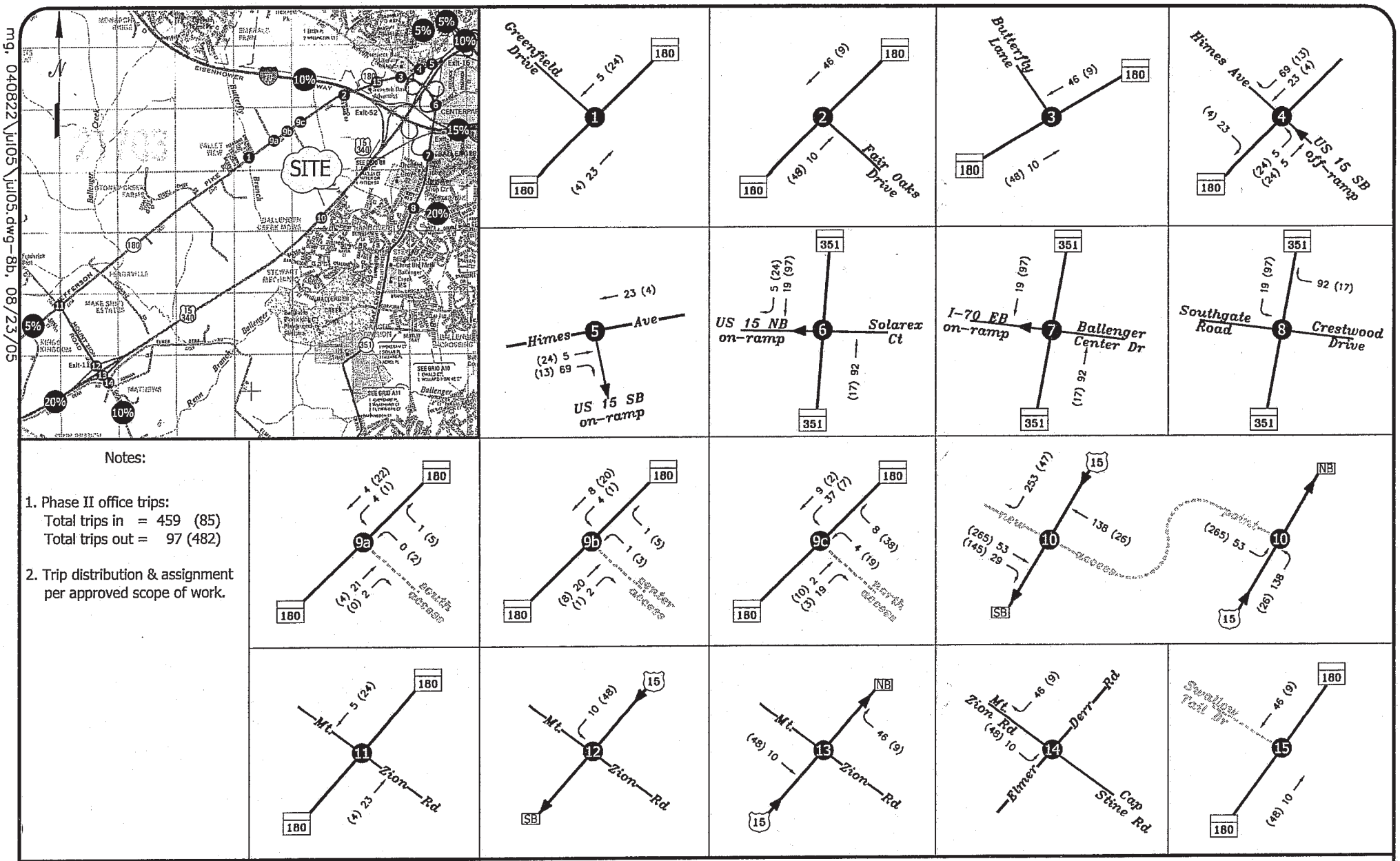
The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-8a
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
OFFICE PHASE I - PEAK HOUR TRAFFIC VOLUMES

mg, 040822\jul05\jul05.dwg-8b, 08/23/05



Notes:

1. Phase II office trips:
   Total trips in = 459 (85)
   Total trips out = 97 (482)

2. Trip distribution & assignment per approved scope of work.

The Traffic Group

NOT TO SCALE

00 – MORNING PEAK HOUR
(00) – EVENING PEAK HOUR

EXHIBIT C-8b
TRIP ASSIGNMENT - JEFFERSON TECHNOLOGY PARK
OFFICE PHASE II - PEAK HOUR TRAFFIC VOLUMES

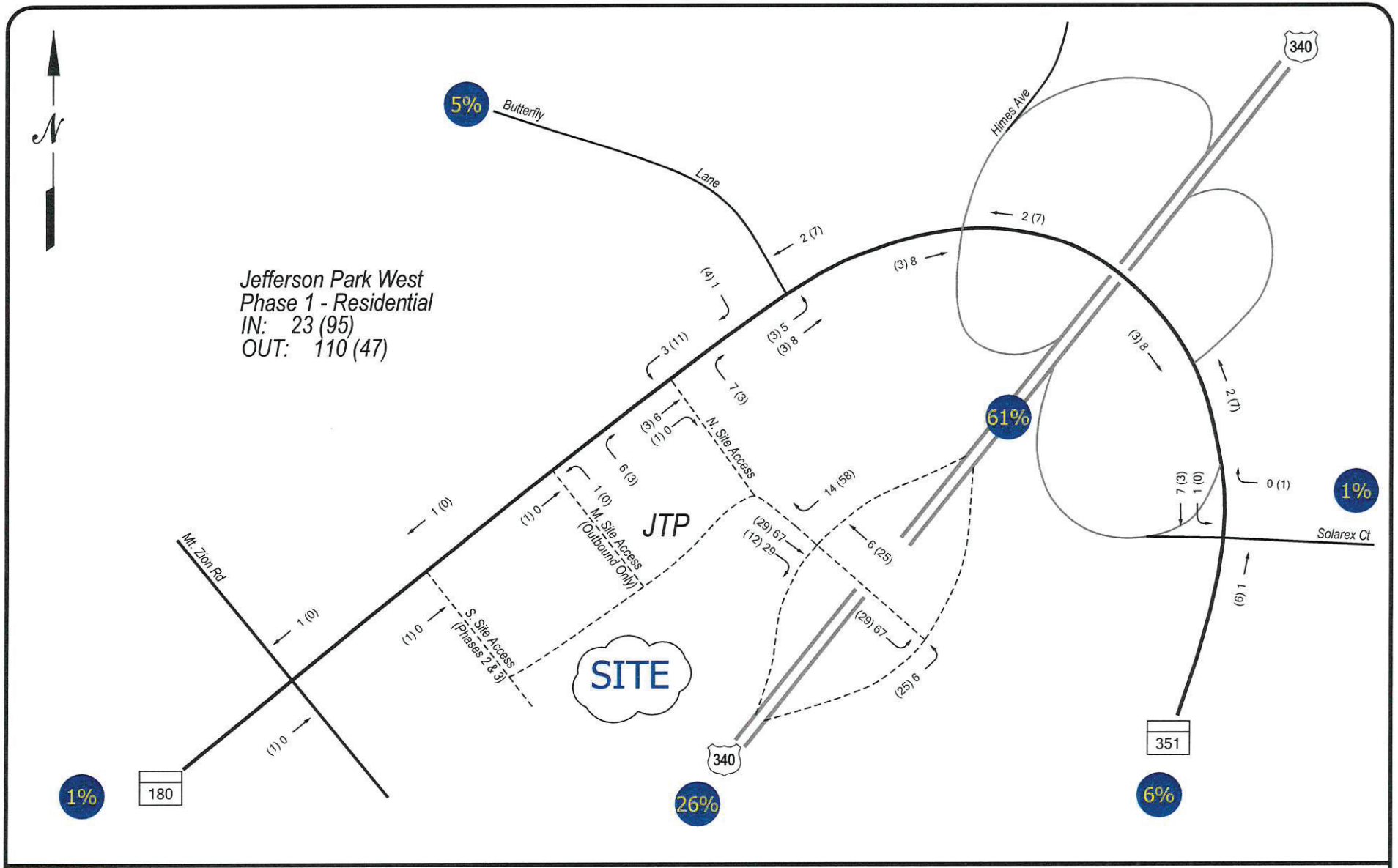
TRIP GENERATION TOTALS

		MORNING PEAK HOUR			EVENING PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Jefferson Park West							
Phase 1							
325	Townhouse/Condo Units	23	110	133	106	52	158
	Internal Trips (PM 10%)				-11	-5	-16
	Net External Trips	***23***	***110***	***133***	***95***	***47***	***142***
Phases 1 & 2							
325	Townhouse/Condo Units	23	110	133	106	52	158
	Internal Trips (PM 10%)				-11	-5	-16
	Net External Trips	***23***	***110***	***133***	***95***	***47***	***142***
33,539	sq.ft. Shopping Center	50	30	80	138	150	288
	Internal Trips (PM 10%)				-14	-15	-29
	Net External Trips	***50***	***30***	***80***	***124***	***135***	***259***
	Pass-by Trips (54%)				-67	-73	-140
	Net New Trips	**50**	**30**	**80**	**57**	**62**	**119**
85,968	sf R & D Center	87	18	105	17	99	116
	Internal Trips (PM 10%)				-2	-10	-12
	Net External Trips	***87***	***18***	***105***	***15***	***89***	***104***
	Total New Trips	***160***	***158***	***318***	***167***	***198***	***365***
Phases 1, 2, & 3							
325	Townhouse/Condo Units	23	110	133	106	52	158
	Internal Trips (PM 10%)				-11	-5	-16
	Net External Trips	***23***	***110***	***133***	***95***	***47***	***142***
33,539	sq.ft. Shopping Center	50	30	80	138	150	288
	Internal Trips (PM 10%)				-14	-15	-29
	Net External Trips	***50***	***30***	***80***	***124***	***135***	***259***
	Pass-by Trips (54%)				-67	-73	-140
	Net New Trips	**50**	**30**	**80**	**57**	**62**	**119**
266,412	sf R & D Center	270	55	325	45	253	298
	Internal Trips (PM 10%)				-5	-25	-30
	Net External Trips	***270***	***55***	***325***	***40***	***228***	***268***
	Total New Trips	***343***	***195***	***538***	***192***	***337***	***529***

The Traffic Group

EXHIBIT 9 CONT'D
TRIP GENERATION RATES AND TOTALS
FOR SUBJECT SITE

qt, 060332\14jan\tgen_14apr.xls-site3, f04/04/14

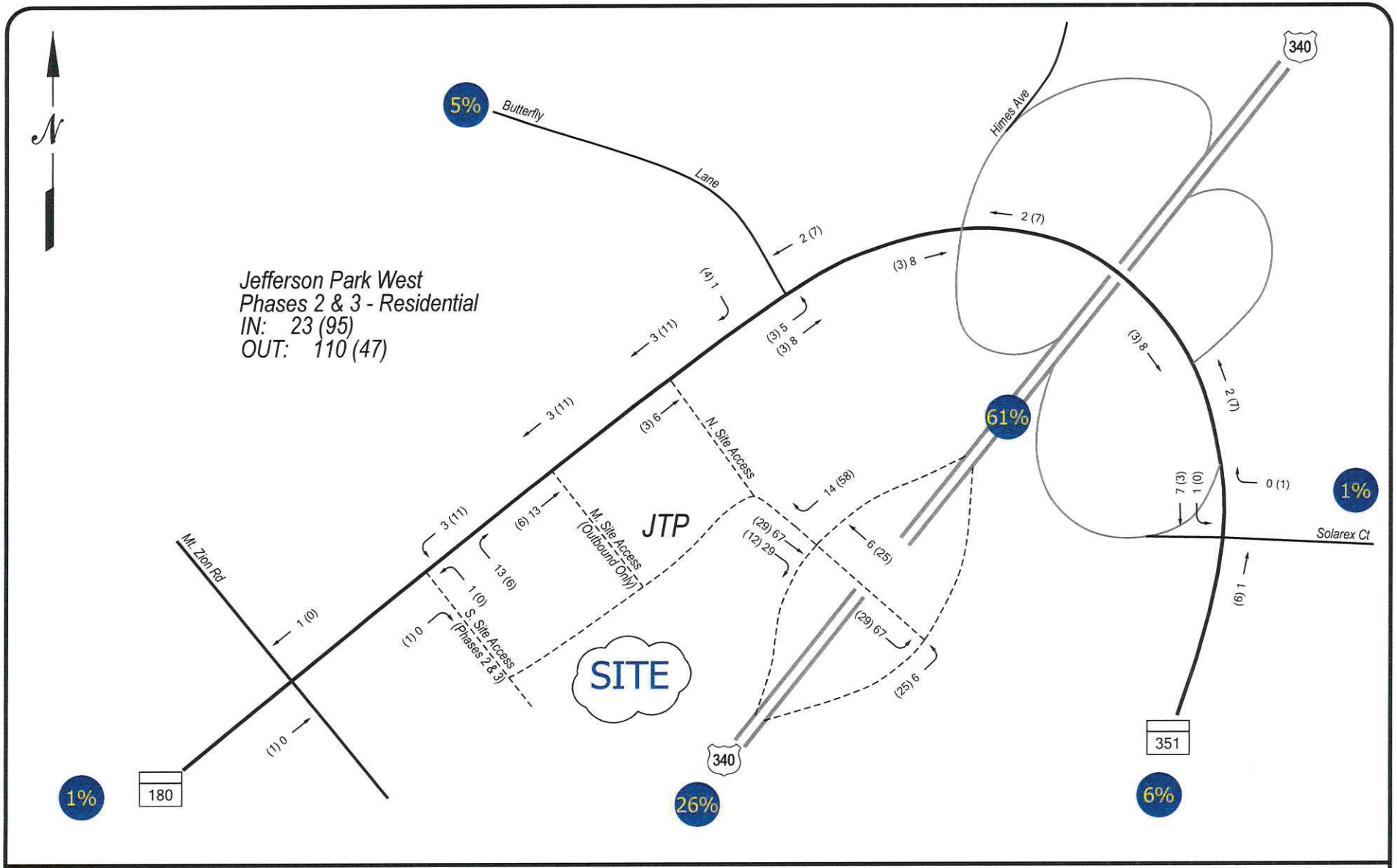


NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 10A
TRIP ASSIGNMENT FOR
JEFFERSON PARK WEST
PHASE 1 - RESIDENTIAL

qt, 060332\14jan\ex.dwg-stn1-residential, f4/7/2014



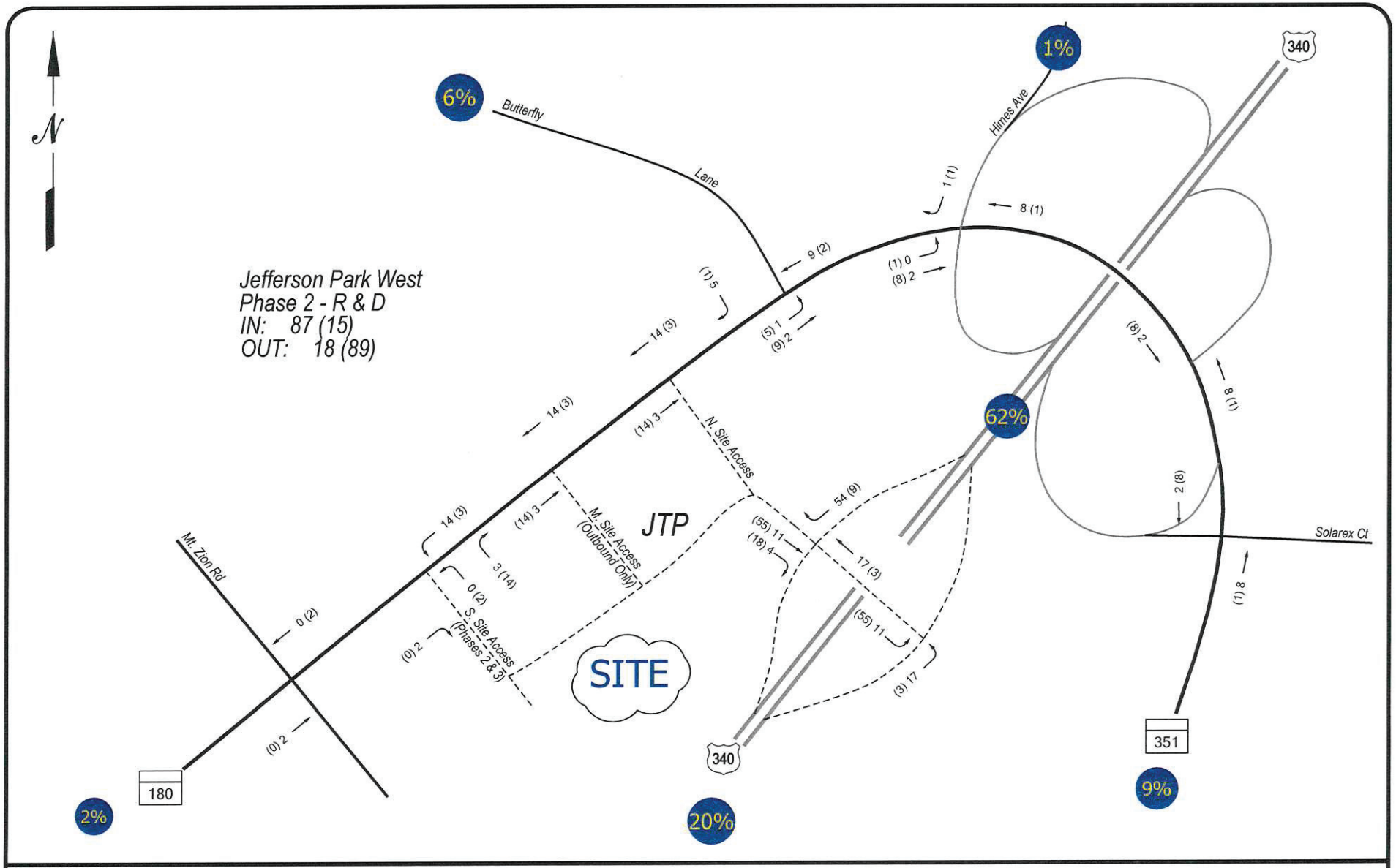
NOT TO SCALE

Note:
South Site Access will be built under Phase 2.

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 10B
TRIP ASSIGNMENT FOR
JEFFERSON PARK WEST
PHASES 2 & 3 - RESIDENTIAL

qt, 060332\14jan\ex.dwg-stn2-residential, f4/7/2014

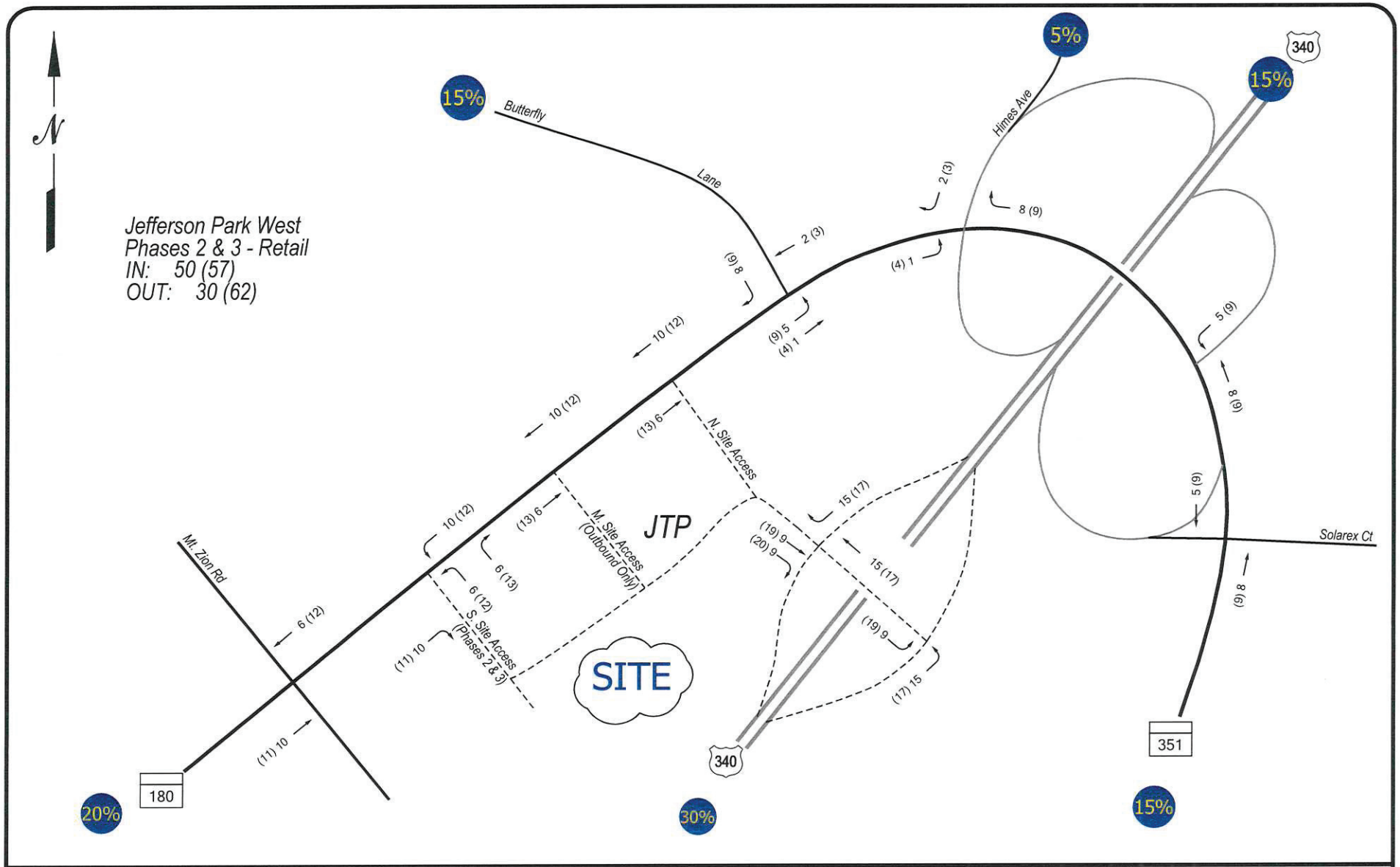


NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 10C
TRIP ASSIGNMENT FOR
JEFFERSON PARK WEST
PHASE 2 - R & D

qt, 060332\14jan\ex.dwg-stn2-office, f4/7/2014

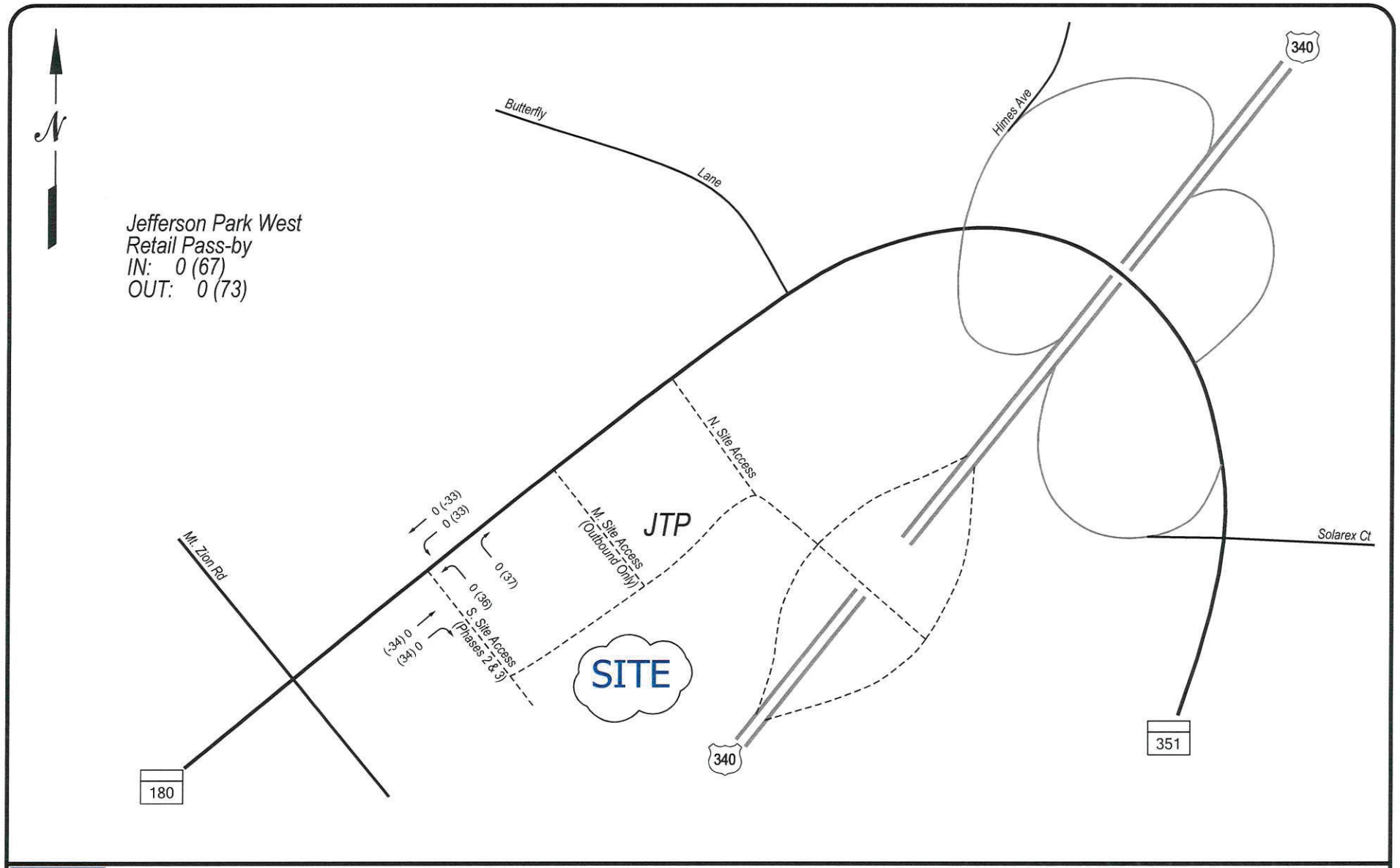


NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 10D-1
TRIP ASSIGNMENT FOR
JEFFERSON PARK WEST
PHASES 2 & 3 - RETAIL

qt, 060332\14jan\ex.dwg-stn2-retail, f4/7/2014

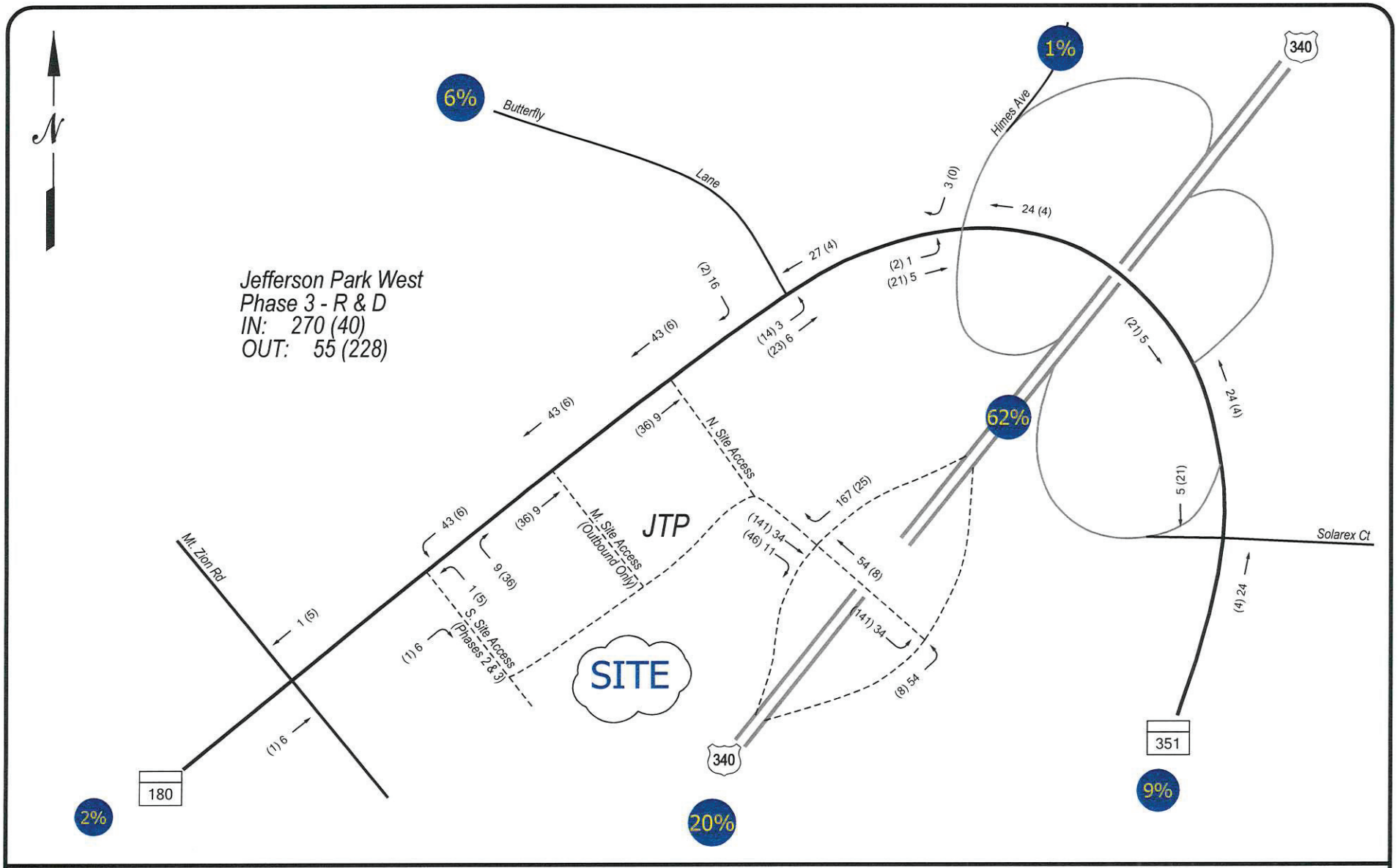


NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 10D-2
PASS-BY TRIP ASSIGNMENT FOR
JEFFERSON PARK WEST
PHASES 2 & 3 - RETAIL

qt, 060332\14jan\ex.dwg-stn2-retail-passby, f4/7/2014



NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

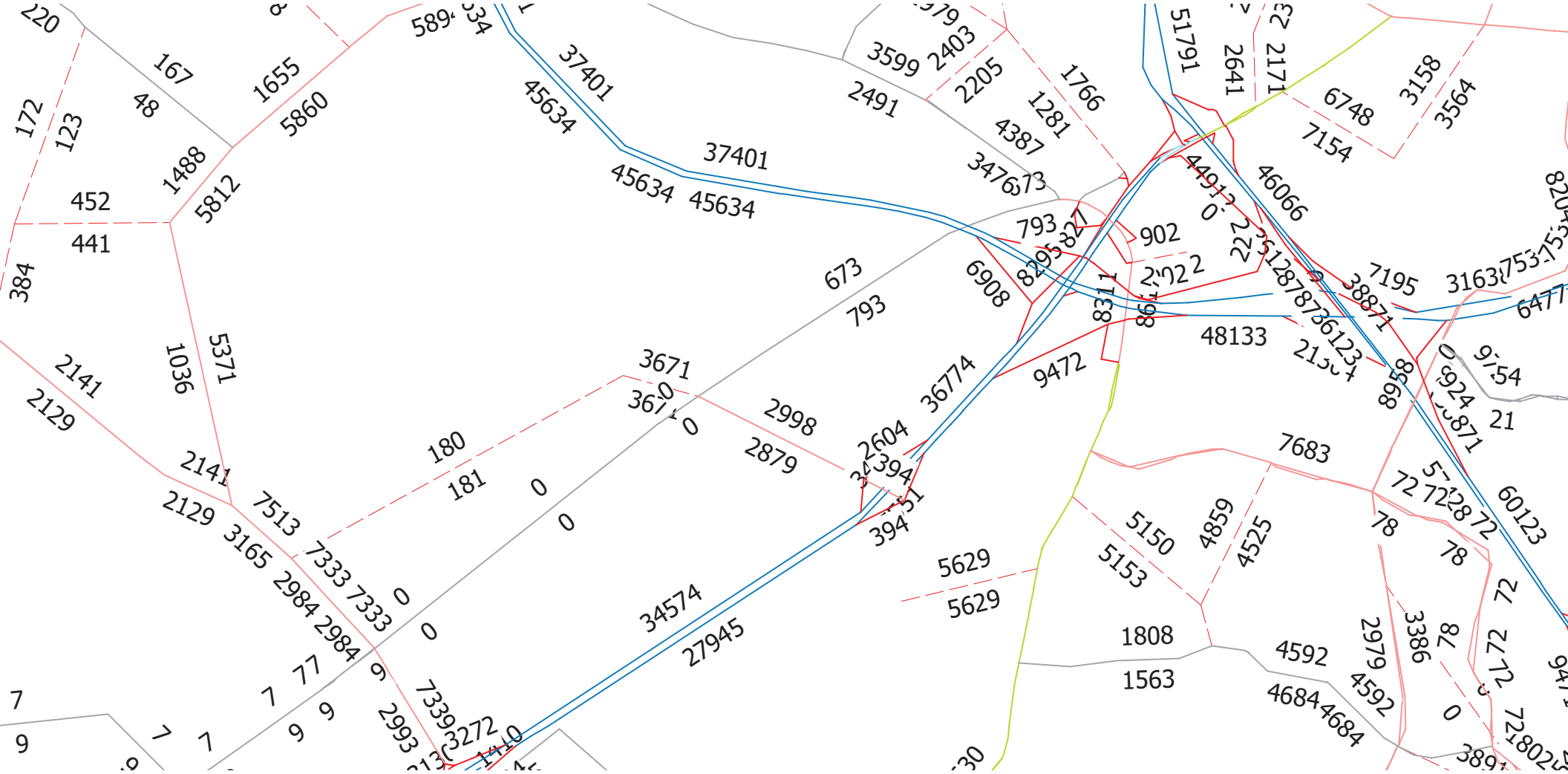
EXHIBIT 10E
TRIP ASSIGNMENT FOR
JEFFERSON PARK WEST
PHASE 3 - R & D

qt, 060332\14jan\ex.dwg-stn3-office, f4/7/2014

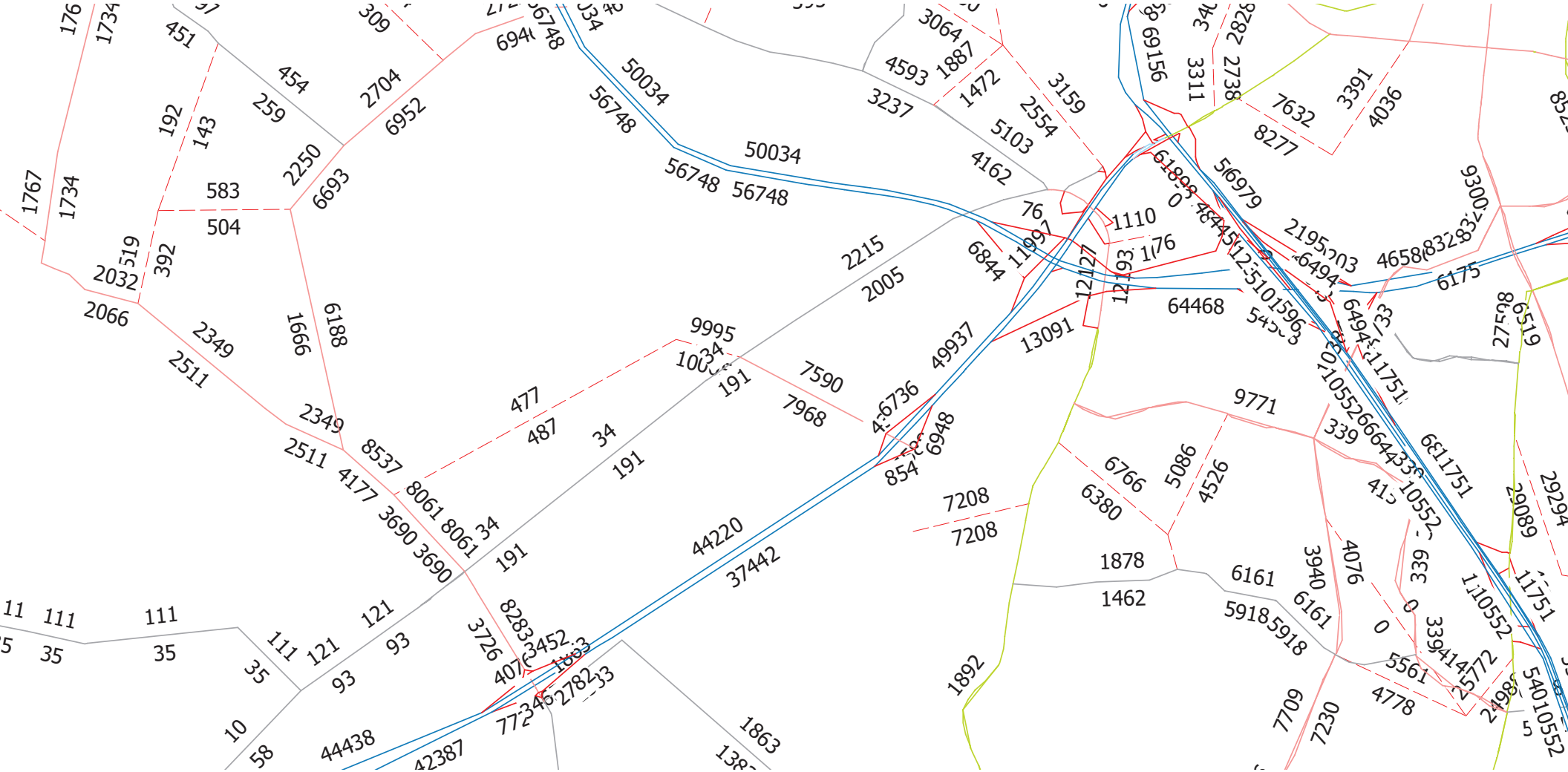
APPENDIX D

Transportation System

Approval Criteria



2017 Loaded Network - Daily Volumes
WRA - October 4, 2019



2040 Loaded Network - Daily Volumes
WRA - October 4, 2019