

**LOCAL AREA TRANSPORTATION REVIEW
WOODWARD HIGH SCHOOL
MONTGOMERY COUNTY, MARYLAND**

**Prepared For:
Montgomery County Public Schools**

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STS Job No.: 6671

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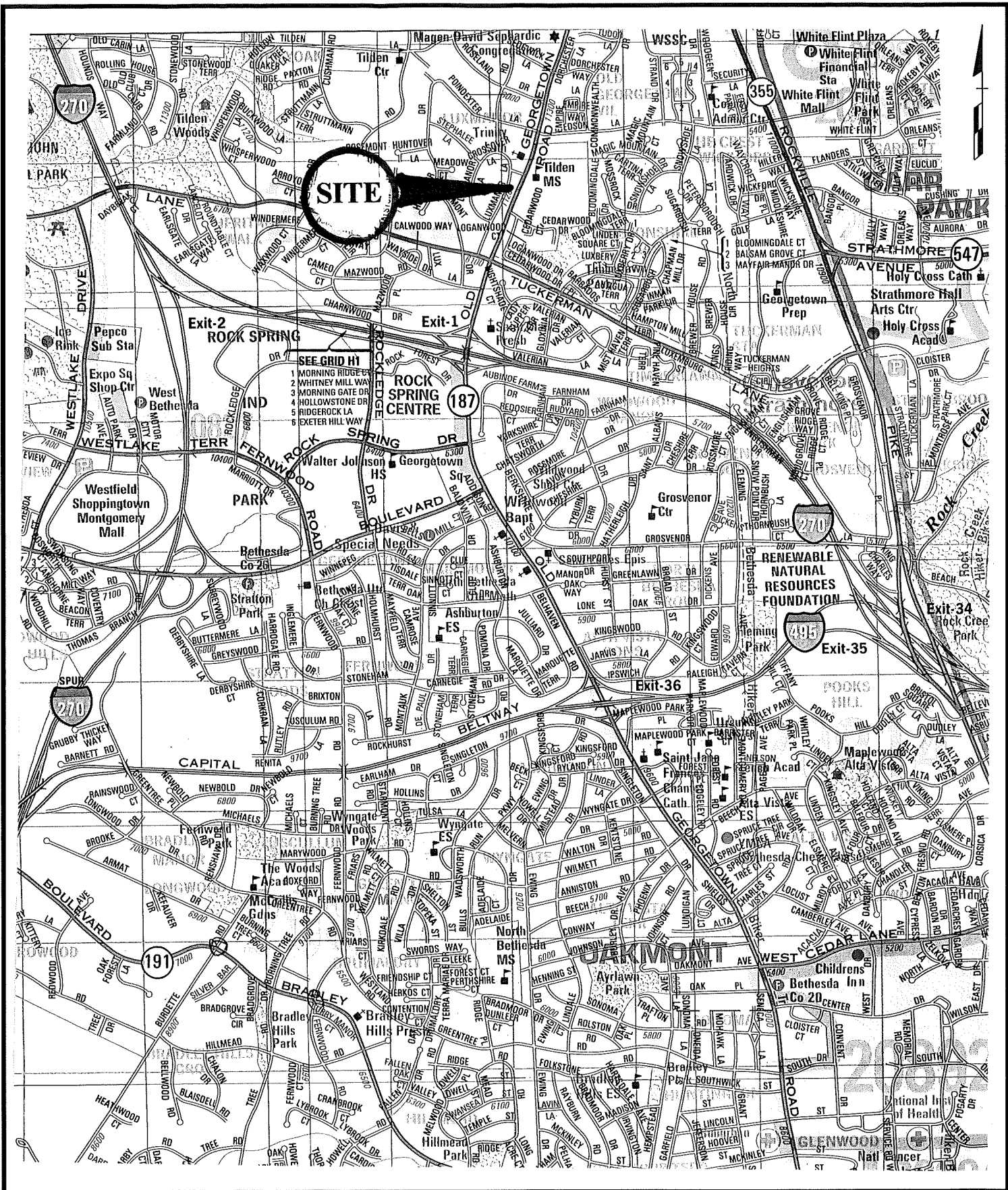
INTRODUCTION

Montgomery County Public Schools (MCPS) is proposing to replace the existing Tilden Middle School located at 11211 Old Georgetown Road with a 2,700 student high school. The existing middle school has an enrollment of 947 students for the current 2018-19 academic year. MCPS has a project which will relocate Tilden Middle School to a site located at the Tilden Lane/Marcliff Road intersection. Once the existing middle school has been relocated the site will be cleared and a new 2,700 student high school will be constructed. Initially the school will be used as a holding school for the Northwood High School while that existing school undergoes a major renovation. Once the Northwood High School project has been completed a decision will be made regarding the future use of the Woodward High School site. It could be used as a new high school to relieve crowding at nearby high schools or it could be used as a county wide magnet school. In any event, the school will have a core capacity of approximately 2,700 students. The school site is shown on Exhibit 1.

Street Traffic Studies, Ltd. has been retained to undertake the required traffic study under the provisions of the *Local Area Transportation Review and Transportation Policy Area Review Guidelines* for a site generating more than 50 peak hour person trips.

The purpose of the traffic study is to evaluate the adequacy of the transportation facilities that are available to serve the site in accordance with the procedures outlined in the *Local Area Transportation Review and Transportation Policy Area Review Guidelines* as adopted by the Planning Board. Current traffic data was acquired at seven (7) intersections in the vicinity of the site including the school driveways. The North Bethesda policy area is within the Orange category and consequently the Highway Capacity Manual and Critical Lane Volume procedures were used to evaluate intersection levels of service. The Traffic Study Scope of Work Agreement is contained in Appendix A.

Since this project is being built solely as a public facility by the Montgomery County government it is not required to pay a transportation impact tax.



SITE

SCALE: 1" = 2000'

EXHIBIT 1
SITE LOCATION

EXISTING CONDITIONS

Roadway System Elements

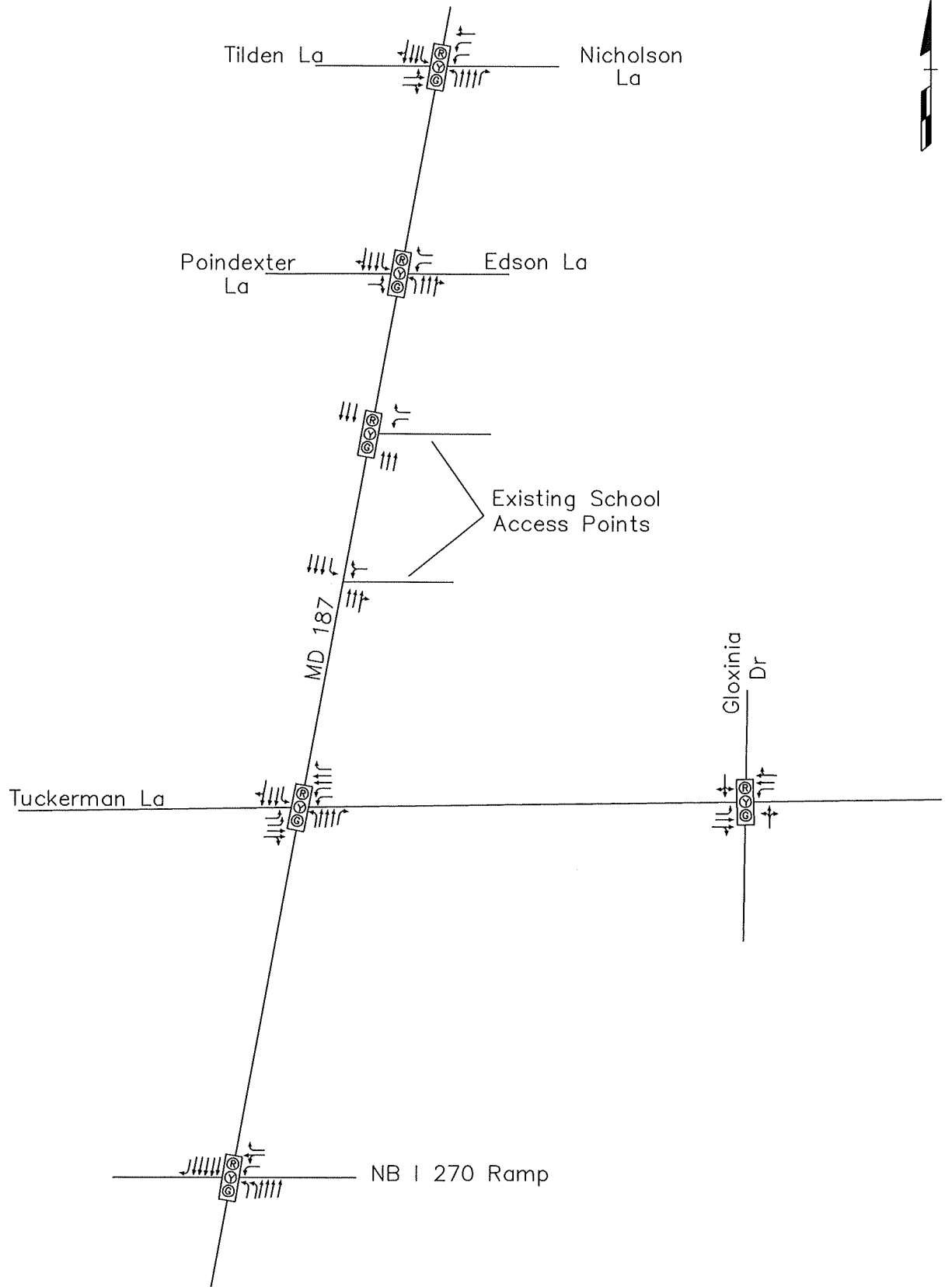
The existing Tilden Middle School site is located along in the east side of MD 187 just north of Tuckerman Lane. The site is currently served by two (2) access points on MD 187. The north access is restricted to exit only and is controlled with a traffic signal. The south access is a full movement access controlled with a STOP sign and while outbound movements at this access are permitted; they are restricted to right turns only between the hours of 7:15 to 8:15 AM and 2:30 to 3:30 PM. With the construction of the high school it is anticipated that the north access will remain signalized; although it will be moved south to provide more stacking area for the southbound left turn movement. This access will serve as the main access/egress to the site. The south access will serve the bus loop and will be unsignalized. Additionally a right in/right out access is proposed near the northern boundary of the school.

The approach lanes and traffic controls at the existing intersections analyzed as the basis for this study are shown in Exhibit 2.

Old Georgetown Road (MD 187) is a six lane divided major highway in the vicinity of the site. It has a posted speed limit of 40 MPH and it is classified as a Major Highway. Five (5) foot wide concrete sidewalks are provided along both sides of MD 187.

Existing Traffic Volumes

Manual turning movement traffic counts were conducted by Street Traffic Studies, Ltd. in February 2019 at the intersections that were agreed upon with staff. The counts were conducted between 6:30 AM and 9:30 AM in the morning and between 2:00 PM and 5:00 PM in the evening. The summarized data for these intersections are included in Appendix B.



NO SCALE

Based on the counts conducted at similar high schools within Montgomery County, the peak hour for high schools in the morning is between 7:00 and 8:00 AM and the evening peak hour for the school was between 2:15 and 3:15 PM. For the purposes of this analyses, the morning peak hour at the study intersection was analyzed and the evening peak hour was assumed to be 2:15 to 3:15 PM The peak one hour traffic flows at the study intersections are shown in Exhibit 3. The existing pedestrian and bicycle peak hour volumes are shown in Exhibits 4 and 5.

The existing peak hour traffic volumes shown in Exhibit 3 were subjected to a capacity analysis procedure using the Highway Capacity Manual technique and the Critical Lane Volume technique as described in M-NCPPC's *LATR/TPAR Guidelines*. The results of the analysis are set forth in Tables 1 and 2 and the worksheets and signal timing sheets from which they are derived are in Appendix C.

TABLE 1
HCM CAPACITY ANALYSES RESULTS
(EXISTING PEAK HOUR VOLUMES)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>EVENING PEAK HOUR</u>	<u>CONGESTION STANDARD</u>
MD 187 @ I 270 NB Ramp	(38.3)	(21.6)	71 sec/veh
MD 187 @ Tuckerman La	(55.1)	(35.1)	71 sec/veh
MD 187 @ Edson La-Poindexter La	(8.6)	(13.1)	71 sec/veh
MD 187 @ Nicholson La-Tilden La	(35.6)	(22.7)	71 sec/veh
Tuckerman La @ Gloxinia Dr	(36.7)	(41.6)	71 sec/veh

(0000) - (Delay in sec/veh)

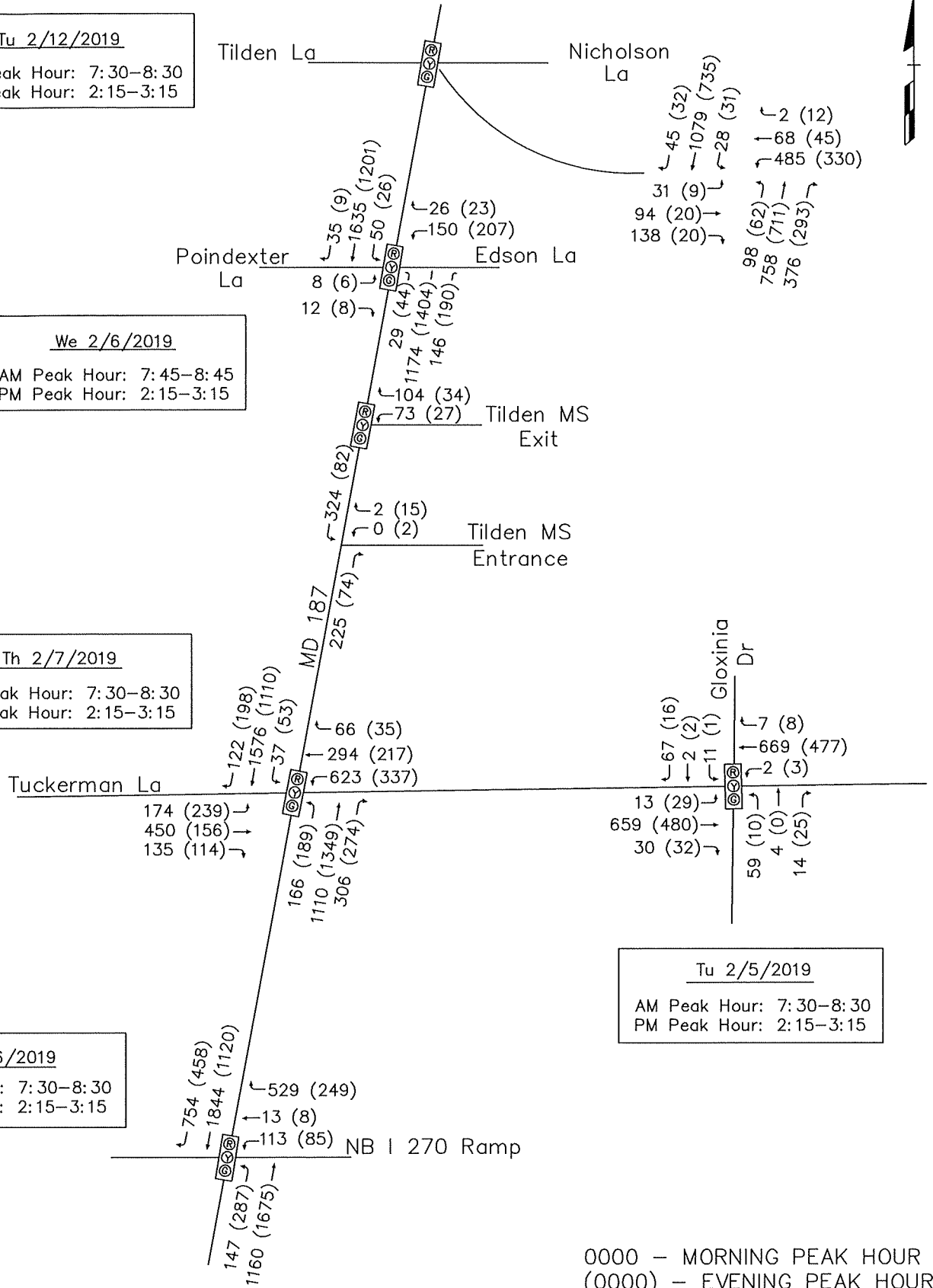
Tu 2/12/2019
 AM Peak Hour: 7:30-8:30
 PM Peak Hour: 2:15-3:15

We 2/6/2019
 AM Peak Hour: 7:45-8:45
 PM Peak Hour: 2:15-3:15

Th 2/7/2019
 AM Peak Hour: 7:30-8:30
 PM Peak Hour: 2:15-3:15

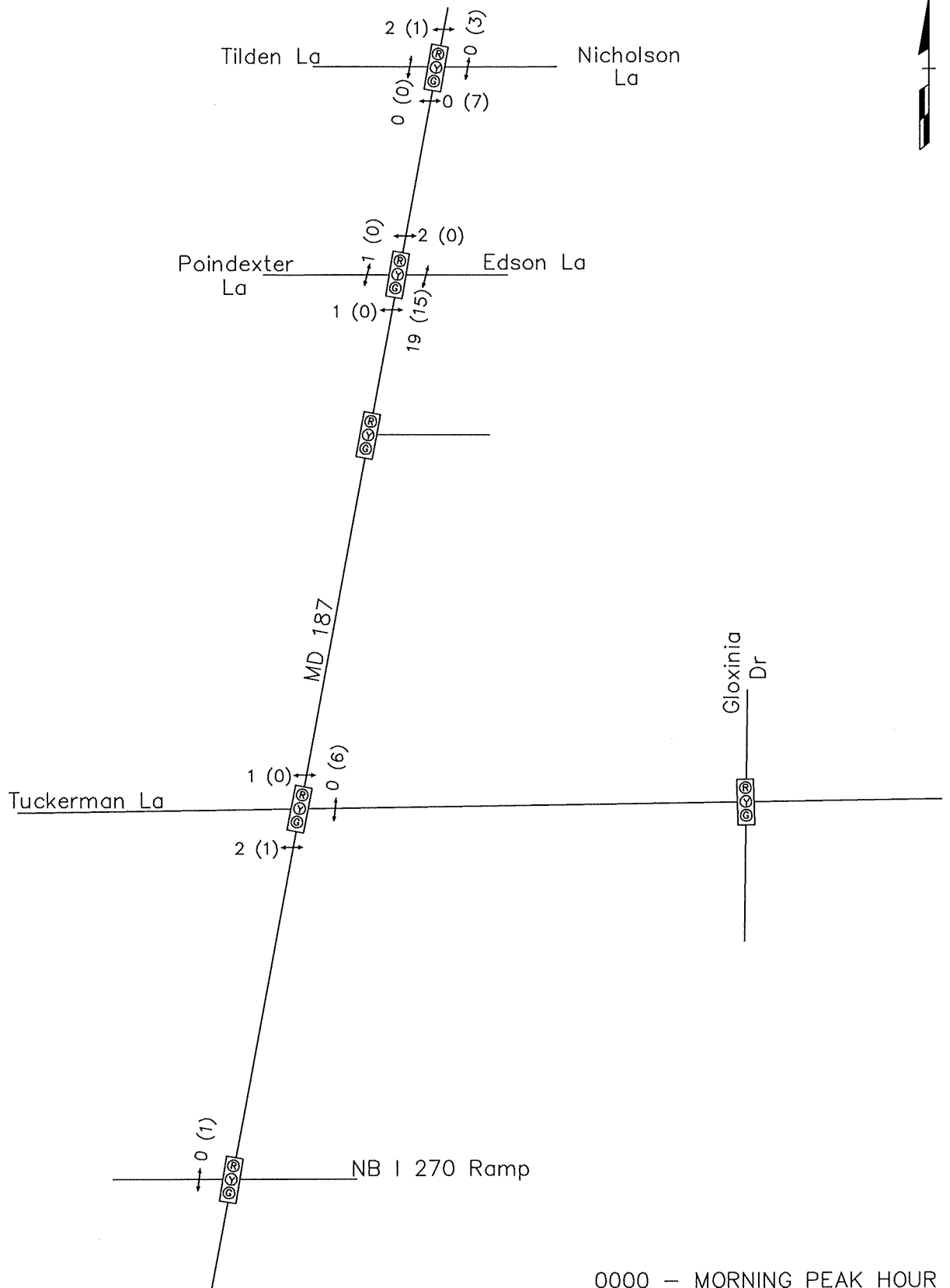
Tu 2/26/2019
 AM Peak Hour: 7:30-8:30
 PM Peak Hour: 2:15-3:15

Tu 2/5/2019
 AM Peak Hour: 7:30-8:30
 PM Peak Hour: 2:15-3:15



NO SCALE

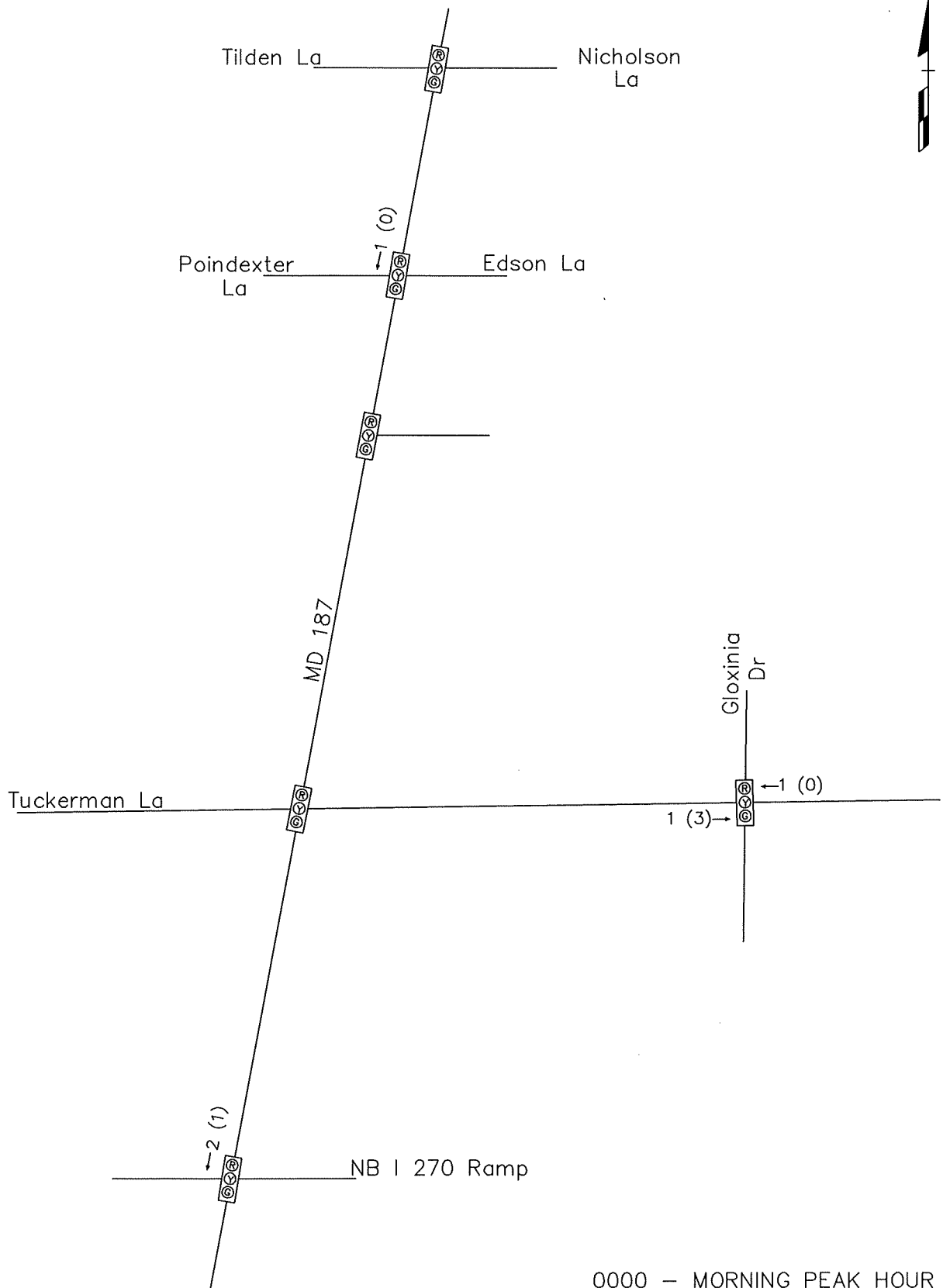
0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR



NO SCALE

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

EXHIBIT 4
 EXISTING PEDESTRIAN VOLUMES



NO SCALE

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

8 EXHIBIT 5
 EXISTING BICYCLE VOLUMES

TABLE 2
CLV CAPACITY ANALYSES RESULTS
(EXISTING PEAK HOUR VOLUMES)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>EVENING PEAK HOUR</u>	<u>CONGESTION STANDARD</u>
MD 187 @ I 270 NB Ramp	(616)	(552)	1550
MD 187 @ Tuckerman La	(1478)	(1018)	1550
MD 187 @ Edson La-Poindexter La	(820)	(837)	1550
MD 187 @ Nicholson La-Tilden La	(944)	(632)	1550
Tuckerman La @ Gloxinia Dr	(511)	(323)	1550

(0000) - (Critical Lane Volume)

As shown in Tables 1 and 2, all of the critical intersections currently operate within acceptable levels during both the morning and evening peak hours.

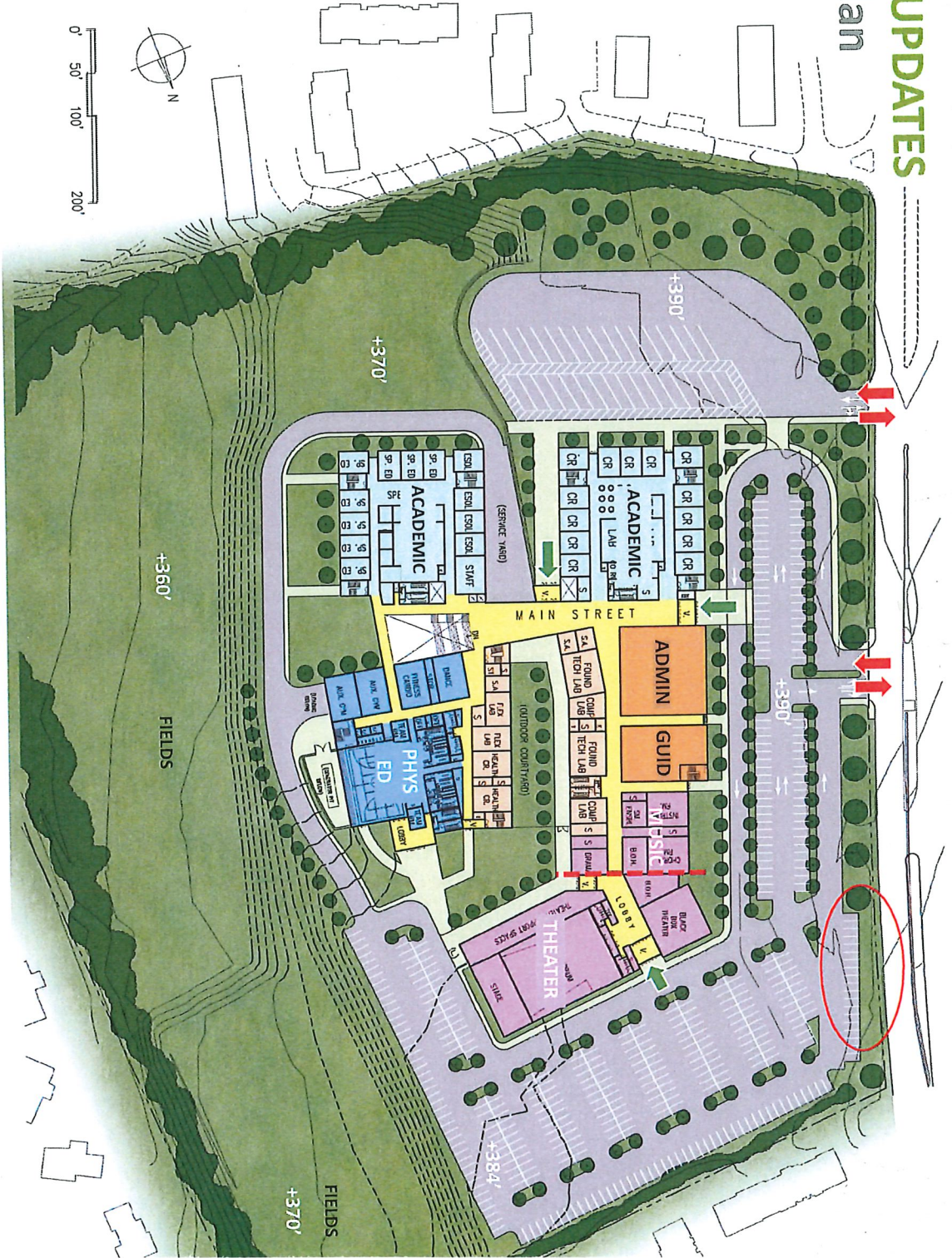
School Traffic Circulation and Queuing

Existing operations at the Tilden Middle School operate smoothly and efficiently with the exception of an approximately 15 minute time frame during the morning arrival and afternoon dismissal periods.

The proposed construction will relocate the existing signalized egress point further south to increase the separation between this signal and the existing signal at the Poindexter Lane-Edson Lane intersection. The southern access will primarily serve the school bus loop and will remain unsignalized. Additionally a right in/right out access is proposed near the northern boundary of the school. The Proposed Concept Plan is shown in Exhibit 6.

PLAN UPDATES

Site Plan



NO SCALE

BACKGROUND TRAFFIC ANALYSIS

As indicated in the correspondence between the consultant and the staff at M-NCPPC included in Appendix D, there are 13 background developments in the general vicinity of the site that needed to be analyzed as a part of this study. The details regarding each of these developments are discussed below.

Planned Developments

In accordance with procedures established by the LATR guidelines, the analysis of the traffic impact of proposed development must include traffic projections for other planned developments in the "vicinity" of the site. The listing of planned developments are shown in Table 3.

**TABLE 3
BACKGROUND DEVELOPMENT**

<u>DEVELOPMENT</u>	<u>LAND USE</u>	<u>DENSITY</u>
1. Pike & Rose	Retail Office High-rise apts	143,835 s.f 682,691 s.f. 734 du's
2. N Bethesda Center	Retail Office Mid-rise apts	152,791 s.f 809,338 s.f. 697 du's
3. 6111 Executive Blvd	Lab R&D	17,475 s.f 11,647 s.f.
4. Gables @ White Flint	Retail High-rise apts	20,890 s.f 476 du's

TABLE 3
BACKGROUND DEVELOPMENT

<u>DEVELOPMENT</u>	<u>LAND USE</u>	<u>DENSITY</u>
5. 6000 Executive Blvd	Retail Office Senior apts	9,300 s.f. 305,641 s.f. 365 du's
6. North Bethesda Market II	Mid-rise apts Retail	470 du's 103,735 s.f.
7. North Bethesda Gateway	Mid-rise apts Retail	614 du's 35,500 s.f.
8. The Saul Centers	Mid-rise apts Office	655 du's 136,950 s.f.
9. Luxmanor ES	Elementary School	316 students
10. Rock Terrace/Tilden MS	Elementary/Middle School	
11. Alef Bet Montessori School	Private School (K-8)	90 students
12. Wildwood Residential	Mid-rise apts Retail	60 du's 11,000 s.f.
13. Rock Spring Center	Mid-rise apts Hotel Office Retail Movie theater	844 du's 200 rooms 549,900 s.f. 210,000 s.f. 90,000 s.f.

Trip Generation

To determine the traffic associated with each of the background developments, trip generation rates were taken from the ITE Trip Generation publication, 10th Edition. The trip rates for the Luxmanor Elementary School, the Rock Terrace/Tilden Middle School, Wildwood Residential and the Rock Spring Center were taken from earlier studies. The relative sheets from these studies are included in Appendix D.

The trip rates used for the developments not taken from earlier studies are shown in Table 4.

**TABLE 4
TRIP GENERATION RATES**

<u>LAND USE</u>	<u>MORNING PEAK HOUR</u>			<u>EVENING PEAK HOUR</u>		
	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
Retail (820)	T = 0.50(X) + 151.78 62% 38% 100%			Ln(T)=0.74Ln(X)+2.89 48% 52% 100%		
Office (710)	T = 0.94(X) + 26.49 86% 14% 100%			Ln(T)=0.95Ln(X)+0.36 16% 84% 100%		
R & D Center (760)	0.32	0.10	0.42	0.32	0.10	0.42
	75%	25%	100%	15%	85%	100%
Multifamily mid-rise (221)	Ln(T)=0.98Ln(X)-0.98 26% 74% 100%			Ln(T)=0.96Ln(X)-0.63 61% 39% 100%		
Multifamily high-rise (222)	T = 0.28(X) + 12.86 24% 76% 100%			T = 0.34(X) + 8.56 61% 39% 100%		
Sr Housing Attached (252)	T = 0.20(X) - 0.18 35% 65% 100%			T = 0.24(X) + 2.26 55% 45% 100%		
Private School (534)	T = 0.85(X) + 22.17 55% 45% 100%			0.12	0.14	0.26
				46%	54%	100%

The trips generated are shown in Table 5.

TABLE 5
BACKGROUND TRIP GENERATION

<u>DEVELOPMENT</u>	<u>MORNING PEAK HOUR</u>			<u>EVENING PEAK HOUR</u>		
	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
1. Pike & Rose						
Trips/143,835 sf retail	139	85	224	341	370	711
Less 34% Passby	0	0	0	-116	-126	-242
Trips/682,691 sf office	574	94	668	113	593	706
Trips/734 du's	<u>52</u>	<u>166</u>	<u>218</u>	<u>157</u>	<u>101</u>	<u>258</u>
Total Trips	765	345	1110	495	938	1433
Less 50% ¹	383	172	555	248	469	717
2. N Bethesda Center						
Trips/152,791 sf retail	141	87	228	357	387	744
Less 34% Passby	0	0	0	-121	-132	-253
Trips/697 du's	60	169	229	174	112	286
Trips/809,338 sf office	<u>677</u>	<u>110</u>	<u>787</u>	<u>133</u>	<u>697</u>	<u>830</u>
Total Trips	878	366	1244	543	1064	1607
Less 50%	439	183	622	272	532	804
3. 6111 Executive Blvd						
Trips/29,122 sf R&D	9	3	12	5	29	34
Less 50%	5	1	6	3	14	17
4. Gables at White Flint						
Trips/476 du's	35	111	146	104	66	170
Trips/20,890 sf retail	100	62	162	82	89	171
Less 34% Passby	<u>0</u>	<u>0</u>	<u>0</u>	<u>-28</u>	<u>-30</u>	<u>-58</u>
Total Trips	135	173	308	158	125	283
Less 50%	67	87	154	79	63	142
5. 6000 Executive Blvd						
Trips/305,641 sf office	270	44	314	53	276	329
9,300 sf retail ⁹⁷	59	156	45	49	94	
Less 34% Passby	0	0	0	-15	-17	-32
Trips/365 Sr apts	<u>26</u>	<u>47</u>	<u>73</u>	<u>50</u>	<u>40</u>	<u>90</u>
Total Trips	393	150	543	133	348	481
Less 50%	197	75	272	67	174	241

¹ Consistent with the traffic statements prepared for development projects with the White Flint sector, the trips generated were reduced by 50%.

TABLE 5
BACKGROUND TRIP GENERATION

<u>DEVELOPMENT</u>	<u>MORNING PEAK HOUR</u>			<u>EVENING PEAK HOUR</u>		
	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
6. N Bethesda Market II						
Trips/470 du's	41	115	156	120	76	196
Trips/103,735 sf retail	126	78	204	268	290	558
Less 34% Passby	<u>0</u>	<u>0</u>	<u>0</u>	<u>-91</u>	<u>-99</u>	<u>-190</u>
Total Trips	167	193	360	297	267	564
Less 50%	83	97	180	149	133	282
7. N Bethesda Gateway						
Trips/614 du's	53	150	203	154	99	253
Trips/35,500 sf retail	105	65	170	121	132	253
Less 34% Passby	<u>0</u>	<u>0</u>	<u>0</u>	<u>-41</u>	<u>-45</u>	<u>-86</u>
Total Trips	158	215	373	234	186	420
Less 50%	79	108	187	117	93	210
8. Saul Center						
Trips/655 du's	56	160	216	164	105	269
Trips/136,950 sf office	<u>133</u>	<u>22</u>	<u>155</u>	<u>24</u>	<u>129</u>	<u>153</u>
Total Trips	189	182	371	188	234	422
Less 50%	95	91	186	94	117	211
Total White Flint Trips	1348	814	2162	1029	1595	2624
9. Luxmanor E.S.						
Trips/316 students	144	110	254	48	58	106
10. Rock Terrace/Tilden MS						
Trips/	235	173	408	70	121	191
11. Alef Bet Montessori School						
Trips/90 students	54	45	99	11	12	23
12. Wildwood Center						
Net change in trips	-33	+10	-23	+14	-11	+3

TABLE 5
BACKGROUND TRIP GENERATION

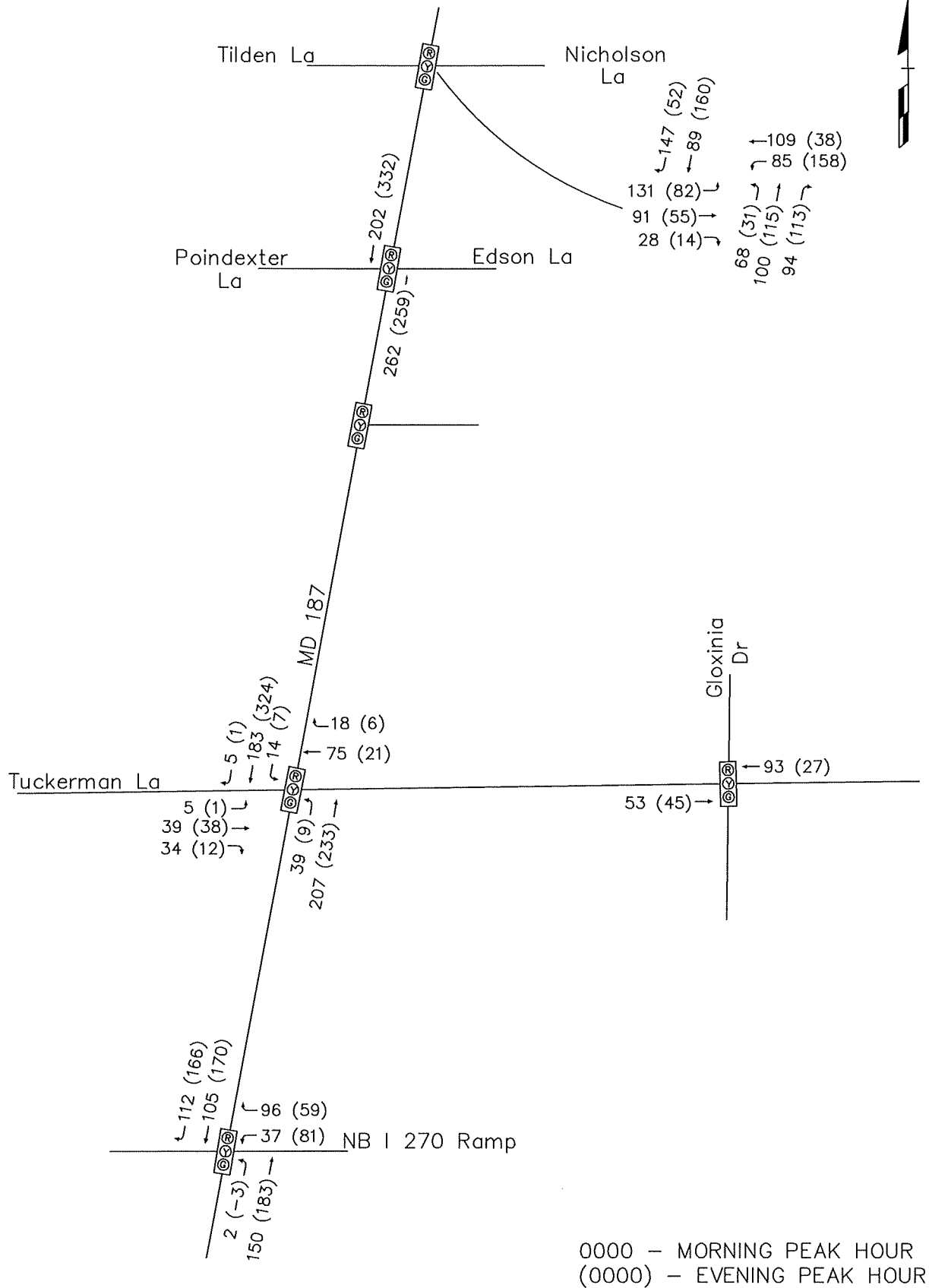
<u>DEVELOPMENT</u>	<u>MORNING PEAK HOUR</u>			<u>EVENING PEAK HOUR</u>		
	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
13. Rock Spring Center ²						
Trips/844 du's	59	170	229	173	111	284
Trips/549,900 sf office	405	66	471	80	420	500
Trips/210,000 sf retail	112	67	179	320	347	667
Less 34% Passby	0	0	0	109	118	227
Trips/200 room hotel	46	32	78	52	50	102
Trips/90,000 sf theater	<u>10</u>	<u>10</u>	<u>20</u>	<u>521</u>	<u>33</u>	<u>554</u>
Total Trips	632	345	977	1037	843	1880

Trip Distribution

The trip distribution for the planned projects was derived through information provided by the M-NCPPC for the Rockville/North Bethesda super district. The total trips generated by the planned developments are shown in Exhibit 7. Adding these trips to the Existing Traffic Volumes yield the Background Traffic Volumes as shown in Exhibit 8.

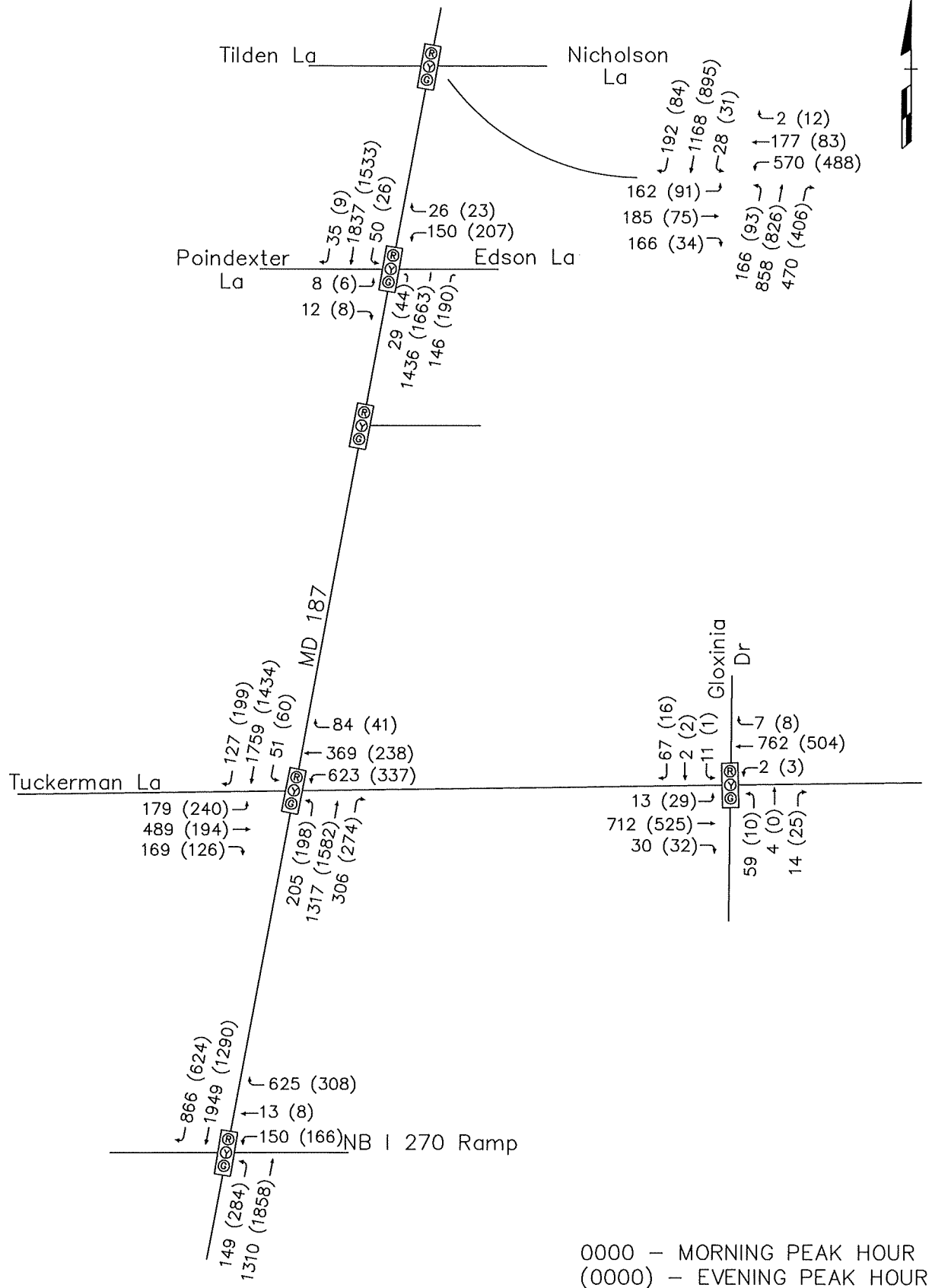
The background peak hour traffic volumes shown in Exhibit 5 were subjected to the same capacity analyses procedures using the Highway Capacity Manual technique and the Critical Lane Volume technique as described in M-NCPPC's *LATR/TPAR Guidelines*. The results of the analysis are set forth in Tables 6 and 7. The capacity worksheets are contained in Appendix E.

² Trip generation numbers were taken from the June 27, 2018 LATR study prepared for the Wildwood Manor Shopping Center. The relevant pages are contained in Appendix D.



NO SCALE

EXHIBIT 7
TRIPS GENERATED BY PLANNED DEVELOPMENTS



NO SCALE

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

EXHIBIT 8
 BACKGROUND TRAFFIC VOLUMES

TABLE 6
HCM CAPACITY ANALYSES RESULTS
(BACKGROUND PEAK HOUR VOLUMES)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>EVENING PEAK HOUR</u>	<u>CONGESTION STANDARD</u>
MD 187 @ I 270 NB Ramp	(45.7)	(28.6)	71 sec/veh
MD 187 @ Tuckerman La	(67.6)	(38.6)	71 sec/veh
MD 187 @ Edson La-Poindexter La	(8.5)	(12.6)	71 sec/veh
MD 187 @ Nicholson La-Tilden La	(51.4)	(33.4)	71 sec/veh
Tuckerman La @ Gloxinia Dr	(34.7)	(41.2)	71 sec/veh

(0000) - (Delay in sec/veh)

TABLE 7
CLV CAPACITY ANALYSES RESULTS
(BACKGROUND PEAK HOUR VOLUMES)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>EVENING PEAK HOUR</u>	<u>CONGESTION STANDARD</u>
MD 187 @ I 270 NB Ramp	(662)	(649)	1550
MD 187 @ Tuckerman La	(1626)	(1174)	1550
MD 187 @ Edson La-Poindexter La	(892)	(933)	1550
MD 187 @ Nicholson La-Tilden La	(1283)	(868)	1550
Tuckerman La @ Gloxinia Dr	(561)	(337)	1550

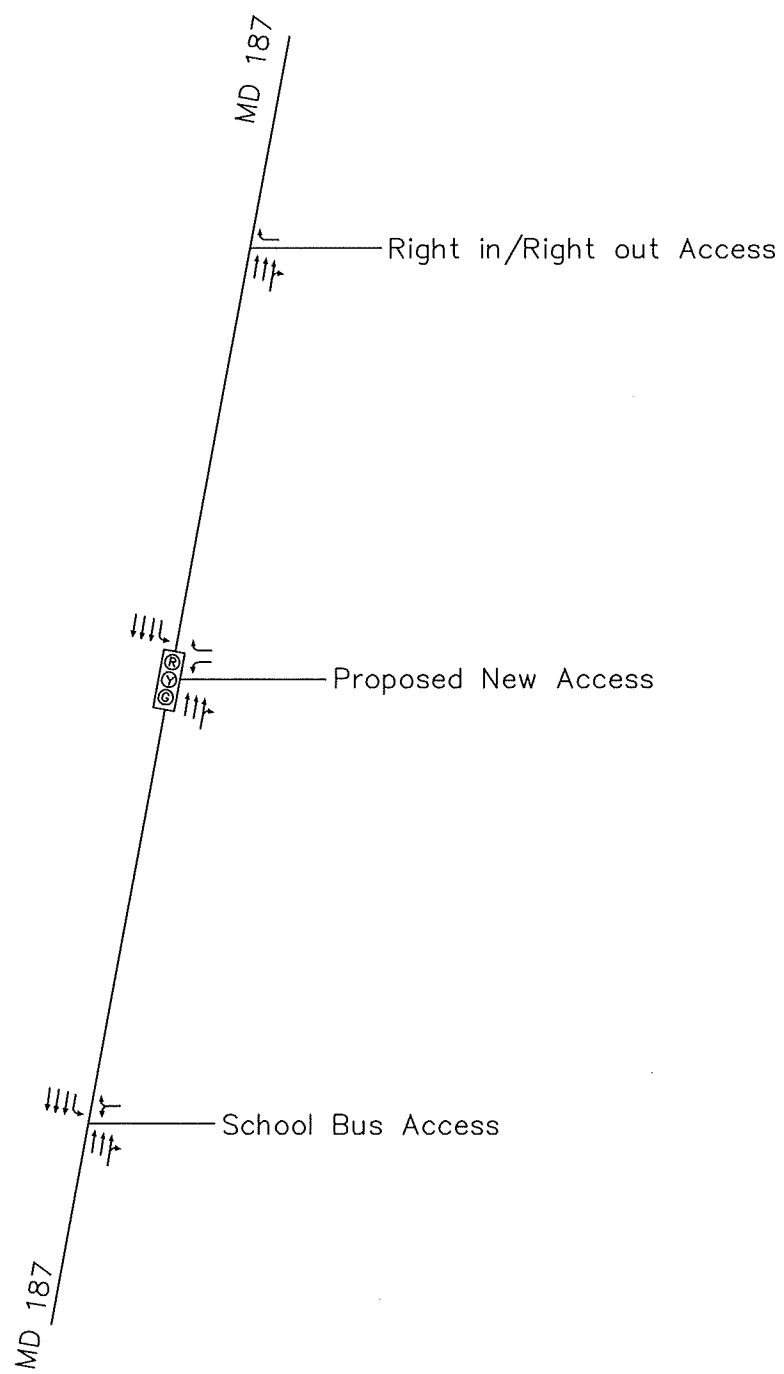
(0000) - (Critical Lane Volume)

As shown in Tables 6 and 7, the MD 187/Tuckerman Lane intersection is projected to operate at unacceptable levels during the morning peak hour under Background Traffic Conditions. All of the remaining intersections are projected to operate at acceptable levels of service under Background Traffic Conditions.

SITE TRAFFIC ANALYSIS

Montgomery County Public Schools (MCPS) is proposing to replace the existing Tilden Middle School located at 11211 Old Georgetown Road with a 2,700 student high school. The existing middle school has an enrollment of 947 students for the current 2018-19 academic year. MCPS has a project which will relocate Tilden Middle School to a site located at the Tilden Lane/Marcliff Road intersection. Once the existing middle school has been relocated the site will be cleared and a new 2,700 student high school will be constructed. Initially the school will be used as a holding school for the Northwood High School while that existing school undergoes a major renovation. Once the Northwood High School project has been completed a decision will be made regarding the future use of the Woodward High School site. It could be used as a new high school to relieve crowding at nearby high schools or it could be used as a county wide magnet school. In any event, the school will have a core capacity of approximately 2,700 students.

The existing Tilden Middle School site is located along in the east side of MD 187 just north of Tuckerman Lane. The site is currently served by two (2) access points on MD 187. The north access is restricted to exit only and is controlled with a traffic signal. The south access serves inbound movements; however outbound movements are also allowed. With the construction of the high school it is anticipated that the north access will remain signalized; although it will be moved south to provide more stacking area for the southbound left turn movement. This access will serve as the main access/egress to the site. The south access will serve the bus loop and will be unsignalized. An additional right in/right out access is proposed onto MD 187 near the northern boundary of the site. The proposed lane use at the school access points are shown in Exhibit 9.



NO SCALE

Trip Generation Analysis

To determine the traffic impacts of the proposed change; the existing driveway volumes were counted and trips were generated for the proposed 2,700 student high school. The existing trips were then subtracted from the trip generated for the 2,700 student high school to determine the new trips generated by this proposal. The results of the trip generation analysis are shown in Table 8.

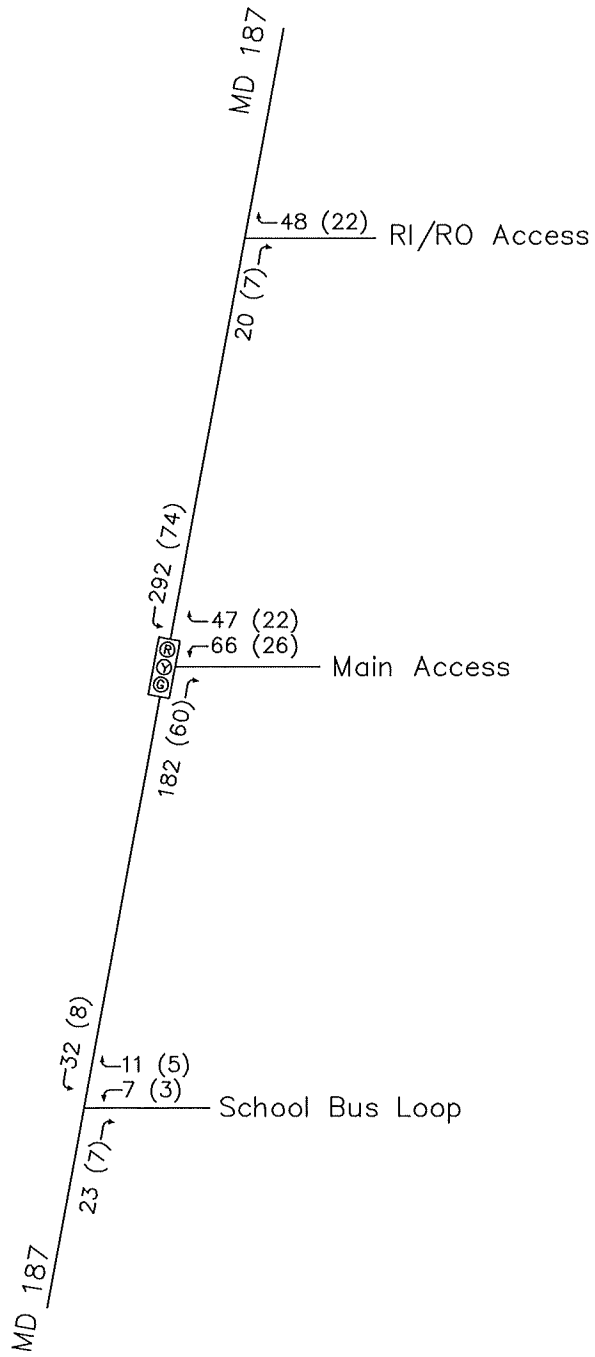
**TABLE 8
TRIP GENERATION
WOODWARD HIGH SCHOOL**

<u>LAND USE</u>	<u>MORNING PEAK HOUR</u>			<u>AFTERNOON PEAK HOUR</u>		
	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
Existing School Trips/Site	549	179	728	156	78	234
High School (530)						
Trips/Student	$\text{Ln}(T)=0.67\text{Ln}(X)+1.72$			$\text{Ln}(T)=0.69\text{Ln}(X)+1.07$		
Trips/2,700 Students	<u>756</u>	<u>356</u>	<u>1,112</u>	<u>218</u>	<u>462</u>	<u>680</u>
Net Increase	207	177	384	62	384	446

The existing driveway volumes were adjusted to reflect the revised access to the site. These adjustments are shown in Exhibit 10. The new trips were assigned to the road network based on the existing school boundary for the Tilden Middle School and the net increase in trips are shown in Exhibit 11. These trips were then combined with the Background Traffic Volumes (Exhibit 8) resulting in the Total Traffic Volumes as shown in Exhibit 12. The total traffic volumes were then evaluated using the same methodology as for the previous step. The results of the analyses are shown in Tables 9 and 10. The driveway counts at the existing Tilden Middle School are contained in Appendix F.



PEAK HOUR TRIPS
 IN: 549 (156)
 OUT: 179 (78)



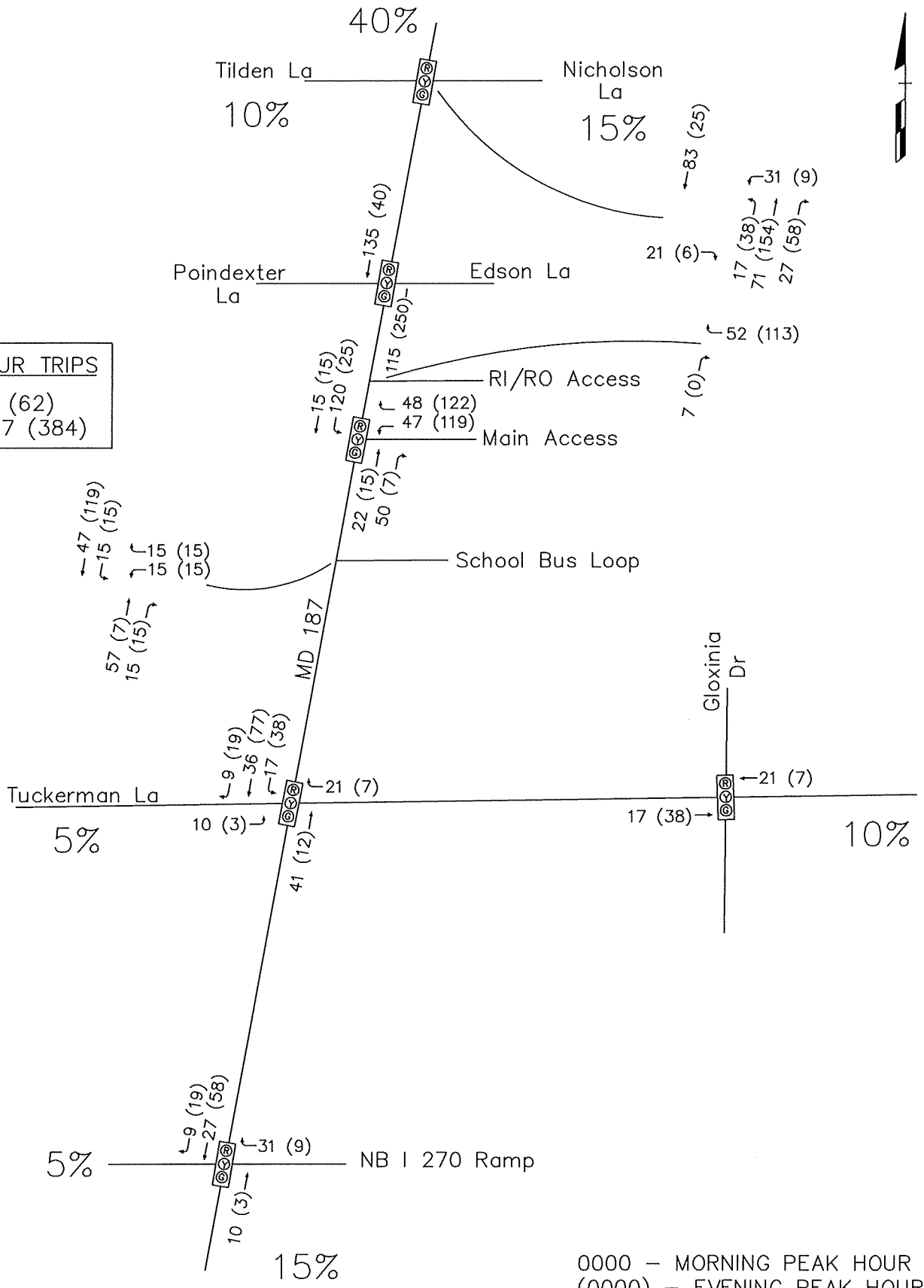
NO SCALE

0000 – MORNING PEAK HOUR
 (0000) – EVENING PEAK HOUR

EXHIBIT 10
 REVISED EXISTING TRAFFIC VOLUMES



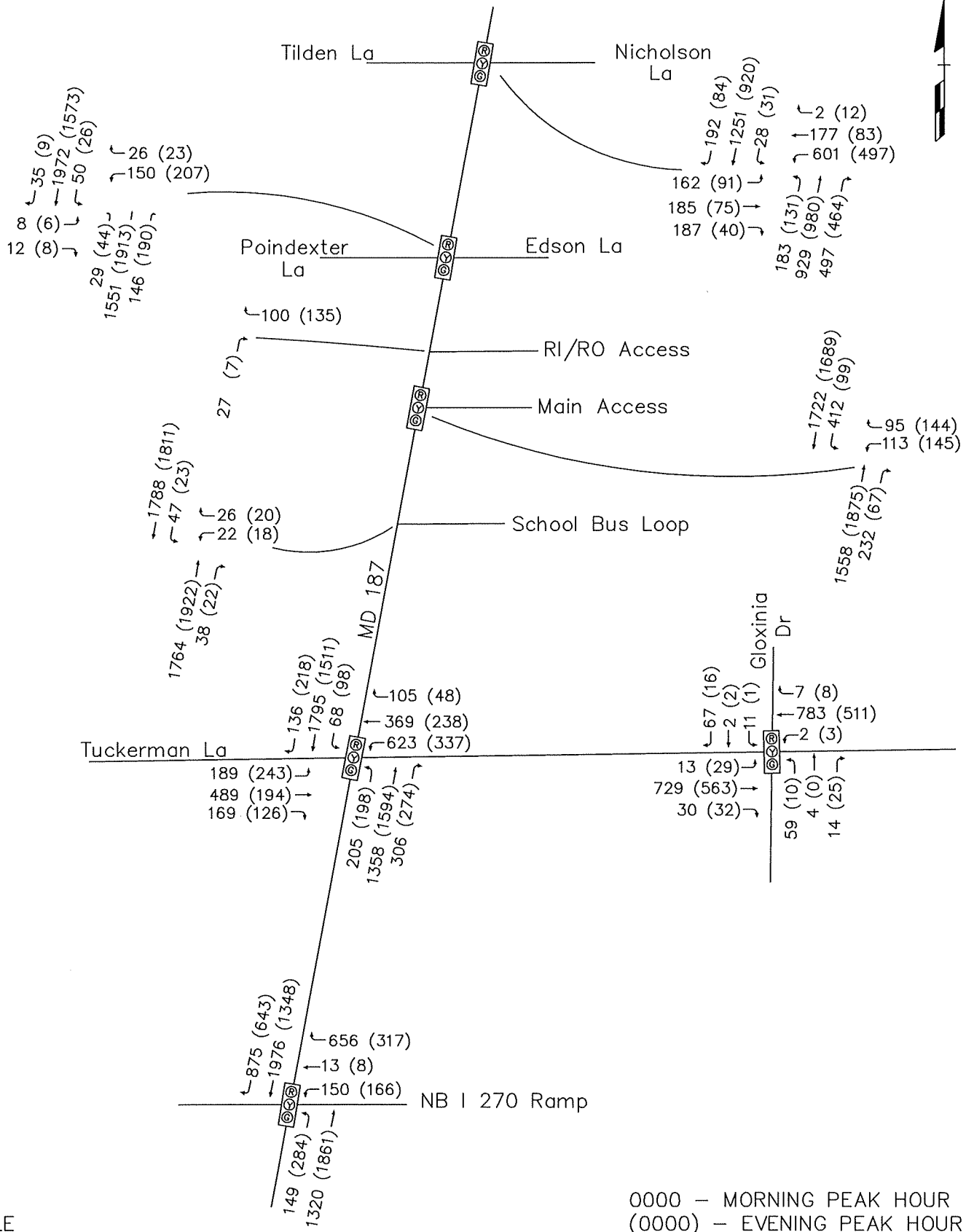
PEAK HOUR TRIPS
 IN: 207 (62)
 OUT: 177 (384)



NO SCALE

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

EXHIBIT 11
 24 NEW SITE GENERATED TRIPS



NO SCALE

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

TABLE 9
HCM CAPACITY ANALYSES RESULTS
(TOTAL PEAK HOUR VOLUMES)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>AFTERNOON PEAK HOUR</u>	<u>CONGESTION STANDARD</u>
MD 187 @ I 270 NB Ramp	(61.2)	(29.4)	71 sec/veh
MD 187 @ Tuckerman La	(69.4)	(40.1)	71 sec/veh
MD 187 @ Edson La-Poindexter La	(8.6)	(13.6)	71 sec/veh
MD 187 @ Nicholson La-Tilden La	(56.2)	(34.4)	71 sec/veh
Tuckerman La @ Gloxinia Dr	(34.3)	(40.6)	71 sec/veh
MD 187 @ Main Access	(19.6)	(11.2)	71 sec/veh
MD 187 @ Bus Loop	(0.5)	(0.4)	71 sec/veh

(0000) - (Delay in sec/veh)

TABLE 10
CLV CAPACITY ANALYSES RESULTS
(TOTAL PEAK HOUR VOLUMES)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>AFTERNOON PEAK HOUR</u>	<u>CONGESTION STANDARD</u>
MD 187 @ I 270 NB Ramp	(669)	(650)	1550
MD 187 @ Tuckerman La	(1642)	(1210)	1550
MD 187 @ Edson La-Poindexter La	(942)	(1025)	1550
MD 187 @ Nicholson La-Tilden La	(1361)	(957)	1550
Tuckerman La @ Gloxinia Dr	(572)	(355)	1550
MD 187 @ Main Access	(1187)	(963)	1550
MD 187 @ Bus Loop	(736)	(760)	1550

(0000) - (Critical Lane Volume)

As shown in Table 9 all of the critical intersections are projected to operate within the congestion threshold for this policy area. Table 10 shows that the CLV at the MD 187/Tuckerman Lane intersection is above the congestion standard for this policy area; however the congestion standard is the applicable threshold and as a result this intersection is considered to be operating at acceptable levels during both peak hours.

Queuing Analyses

A queuing analyses was performed at the school access points along MD 187 to insure that sufficient storage is provided for the southbound left turn movements. At the MD 187/Main Access intersection the 412 left turns projected under total traffic conditions would require 402 feet of storage ($(412 \times 100/3600) \times 1.4 \times 25 = 402$) assuming the same 100 second cycle length that currently operates at the signalized intersection. The MD 187/Bus Loop intersection will remain unsignalized and the storage requirements at this location is 59 feet ($47 \times 1.25 = 59$). The MSHA suggested that a SimTraffic analyses would provide a more accurate projection of future queue conditions at this location and requested a SimTraffic analyses be performed. During the peak demand period (AM peak hour) SimTraffic projects that the 95th percentile queue for southbound left turns to be 272 feet. This distance is well within the available distance between the access and Edson Lane-Poindexter Lane.

The SimTraffic worksheet is contained in Appendix H.

PEDESTRIAN/BICYCLE/TRANSIT SYSTEM ADEQUACY

Based on the Tenth Edition ITE trip rates for high schools and the existing trips generated by the site, the increase in trips associated with this proposal is 446 trips during the evening peak hour. The school is in Policy Area 22 so the ITE generated trips were adjusted by the rate adjustment factor for the policy area and as a result the adjusted trip generation is 366 trips ($446 \times 82\% = 366$). The mode split adjustments for the policy area are shown below in Table 11.

TABLE 11
MODE SPLIT ADJUSTMENTS FOR POLICY AREA 3

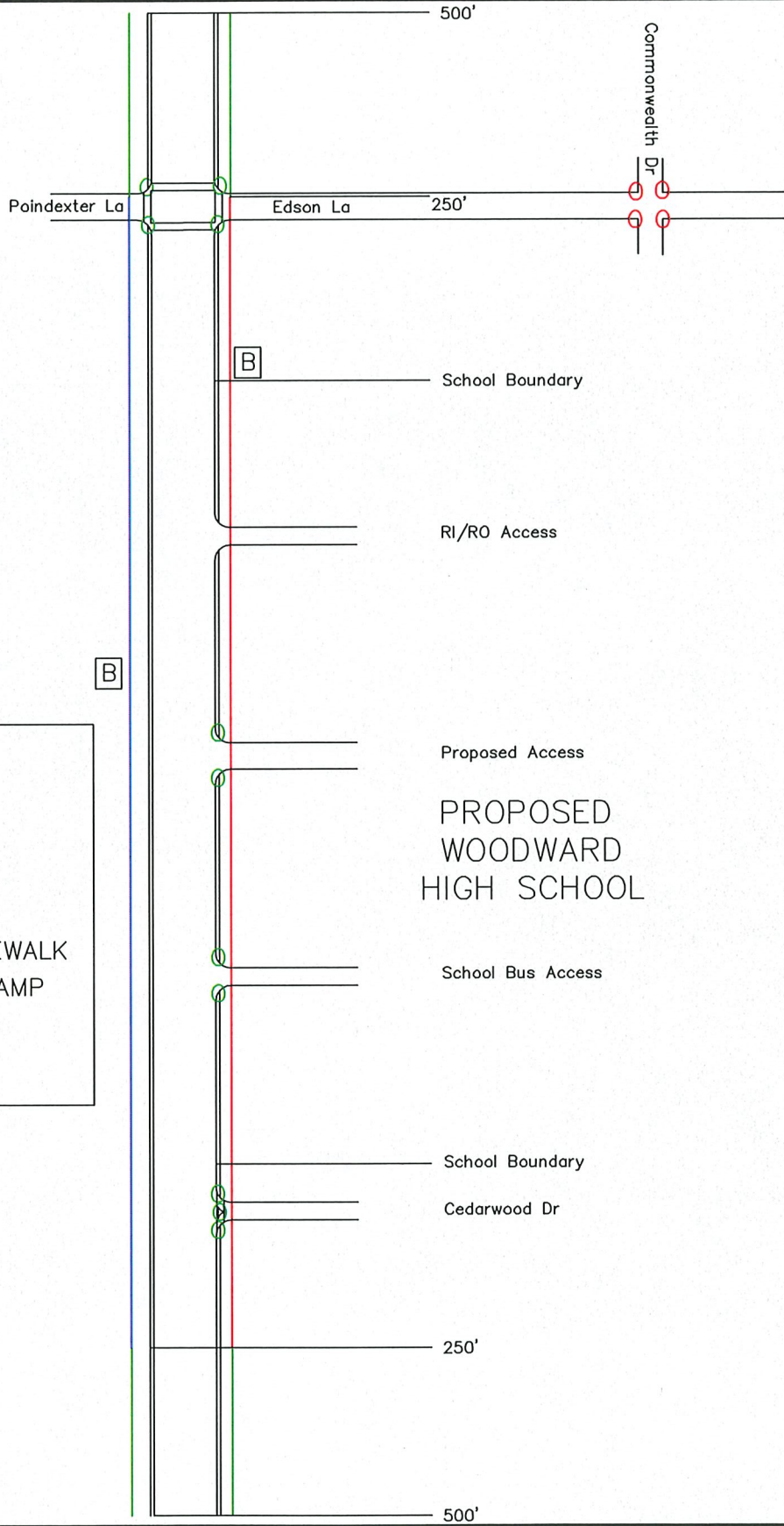
Total Person Trips	Auto Driver	Auto Passenger	Transit	Pedestrian (Transit + Non-Motorized)	Bicycle (Non-motorized)
100%	62.4%	19.5%	9.4%	9.4%+8.7%	8.7%
587	366	114	55	106	51

Pedestrian System Adequacy

The number of non-motorized trips totals 60 and is greater than the threshold of 50 so a quantitative pedestrian/bicycle analyses is required.

Based on the MCDOT’s guidance as outlined in their April 3, 2018 memorandum, the three (3) tiers of ADA facilities for the school are defined as follows and shown on Exhibit 13.

1. Establish evaluation tiers. The project specific tiers should be confirmed at the scoping state by the Planning Department, in consultation with MCDOT, before any assessment is done. The following guidance is provided for determining the tiers.
 - a. Tier 1 - Primary sidewalk
 - i. The public or private street frontage of the project.
 - ii. The same side of the street up to the nearest public street intersection, or a maximum distance of 250 feet from the project boundary, measured along the street.
 - iii. Approximately 25 feet along each intersecting street within 1.a.i and 1.a.ii.



KEY

- TIER 1
- TIER 2
- TIER 3

- X - CRACKED/UNEVEN SIDEWALK
- - NONCOMPLIANT ADA RAMP
- - ADA COMPLIANT RAMP
- ⓑ - BUS STOP

PROPOSED
WOODWARD
HIGH SCHOOL

NO SCALE

- b. Tier 2 - Connected sidewalk
 - i. The same side of the street as the project between the first public road intersection and 250 feet (if applicable), measured along the fronting street.
 - ii. The corresponding opposite side of the street as in 1.a.ii and 1.b.i.
 - iii. Approximately 25 feet along each intersecting street within 1.b.i, and 1.b.ii.

- c. Tier 3 - Network connections
 - i. Between 250 feet and 500 feet, measuring along the fronting street.
 - ii. The corresponding opposite side of the street.
 - iii. Along both sides of each intersecting street in 1.a and 1.b, up to the next public road intersection or a maximum distance of 500 feet from the project boundary, measured along the street.
 - iv. Approximately 25 feet further along each intersecting street identified in 1.c.iii.

2. Adequacy Determination

- a. Tier 1
 - i. The applicant should identify and fix ADA non-compliance issues with sidewalk, ramps, traffic signals, significant trip hazards, cross slope deviations, and broken, missing, structurally failing sidewalks.
 - ii. Beyond the site frontage, the applicant is not required to relocate utilities or traffic signal cabinets, reconstruct utility vaults, relocate fire hydrants, relocate street trees or relocate manhole covers.

- b. Tier 2
 - i. The applicant should identify and fix ADA non-compliance issues with sidewalk ramps, traffic signals, significant trip hazards, and missing or structurally failing sidewalks.

- ii. A minimum recommended contribution of \$100,000 toward ADA compliance may satisfy this requirement.
 - c. Tier 3
 - i. The applicant should identify and fix ADA non-compliance issues with sidewalk ramps, traffic signals, significant trip hazards, and missing or structurally failing sidewalks.
 - ii. A minimum recommended contribution of \$50,000 toward ADA compliance may satisfy this requirement.
- 3. For applicants to comply with the pedestrian system adequacy test, the contributions should be placed into a CIP fund for the relevant policy area (if applicable) or the countywide ADA Compliance Transportation CIP (P509325).

The following pedestrian features are present at the study intersections:

ADA Noncompliance Issues

Tier 1 Sidewalks - a five (5) foot wide concrete sidewalk is provided along the east side of MD 187 across the frontage of the school and for a distance of 250 feet, north and south, beyond the property boundary of the school. This width satisfies current ADA standards.

Tier 1 Curb ramps - the ramps at the Cedarwood Drive intersection are ADA compliant. The ramps at the existing school access points are compliant as well. The ramps at the Edson Lane intersection have recently been reconstructed and they are now ADA compliant. The ramps at the Edson Lane/Commonwealth Drive intersection are not ADA compliant. The curb ramp survey sheets are contained in Appendix I.

Tier 2 and 3 Sidewalks and ramps - there are no additional sidewalks or ramps within the Tier 2 and Tier 3 portion of the study area.

Pedestrian features at each study intersection are discussed below.

MD 187 @ Nicholson Lane-Tilden Lane - crosswalks are provided across all four legs of this signalized intersection. The crosswalks are supplemented with APS pedestrian signals with count down displays. Ride-On bus route 26 runs along MD 187 in this area and bus stops are located on both sides of MD 187 south of the intersection. Street lights are provided at this intersection.

MD 187 @ Edson Lane-Poindexter Lane - crosswalks are provided across all four legs of this signalized intersection. The crosswalks are supplemented with APS pedestrian signals with count-down displays. Ride-On bus route 26 runs along MD 187 in this area and bus stops are located on east side of MD 187 south of Edson Lane and on the west side of MD 187 north of Poindexter Lane. Street lights are provided at this intersection.

MD 187 @ Tuckerman Lane - crosswalks are provided across the south leg of MD 187 and both legs of Tuckerman Lane at this signalized intersection. The crosswalks are supplemented with APS signals with count-down displays. Ride-On bus route 26 runs along MD 187 in this area and Ride-On bus routes 37 and 96 run along Tuckerman Lane. Bus stops are located on the east side of MD 187 north of Tuckerman Lane and on the west side south of Tuckerman Lane. Street lights are provided at this intersection.

MD 187 @ NBI 270 Ramp - crosswalks are provided across the east and west legs of this signalized intersection. The crosswalks are supplemented with APS signals with count-down displays. No bus stops are located in the vicinity of this intersection. Street lights are provided at this intersection.

Tuckerman Lane @ Gloxinia Drive - crosswalks are provided across all legs of this signalized intersection. All crosswalks are supplemented with APS pedestrian signals with

count down displays. Ride-On bus routes 37 and 96 run along this section of Tuckerman Lane. Bus stops are located on both sides of Tuckerman Lane west of Gloxinia Drive. Street lights are provided along MD 188 in this area.

In addition to the vehicular capacity analyses shown in Tables 9 and 10, crosswalk levels of service at the critical intersections needed to be evaluated to ensure that the crosswalk level of service was D or higher. The results of the crosswalk level of service evaluations are shown in Table 12.

**TABLE 12
CROSSWALK EVALUATION**

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>EVENING PEAK HOUR</u>
MD 187 @ Tilden La		
North Leg	C	C
South Leg	C	C
East Leg	B	B
West Leg	B	B
MD 187 @ Edson La		
North Leg	C	C
South Leg	C	C
East Leg	B	B
West Leg	A	A
MD 187 @ Tuckerman La		
South Leg	D	C
East Leg	C	C
West Leg	C	B
MD 187 @ NB I 270 Ramp		
East Leg	B	B
West Leg	B	B

TABLE 12
CROSSWALK EVALUATION
(CON'T.)

<u>INTERSECTION</u>	<u>MORNING PEAK HOUR</u>	<u>EVENING PEAK HOUR</u>
MD 188 @ Bradley Blvd		
North Leg	A	A
South Leg	A	A
East Leg	B	B
West Leg	B	B

The capacity worksheets are contained in Appendix J.

TABLE 13
PEDESTRIAN CROSSING TIMING EVALUATION

<u>INTERSECTION</u>	<u>WIDTH</u>	<u>AVAILABLE TIME</u>	<u>DESIRED TIME</u>
MD 187 @ Edson La			
N leg of MD 187	85 feet	24.5	24.2
S leg of MD 187	85 feet	24.5	24.2
E leg of Edson La	50 feet	15.0	14.3
W leg of Poindexter La	43 feet	15.0	12.3
MD 187 @ Tilden Dr			
N leg of MD 187	108 feet	39.0	30.9
S leg of MD 187	100 feet	39.0	28.6
E leg of Nicholson La	89 feet	32.5	25.4
W leg of Tilden La	65 feet	32.5	18.6
MD 187 @ Tuckerman La			
N leg of MD 187	94 feet	39.5	26.9
S leg of MD 187	113 feet	39.5	32.3
E leg of Tuckerman La	110 feet	37.5	31.4
W leg of Tuckerman La	89 feet	37.5	25.4
MD 187 @ NB I 270 Ramp			
E leg of I 270 Ramp	31 feet	16.5	8.9
W leg of I 270 Ramp	31 feet	16.5	8.9

TABLE 13
PEDESTRIAN CROSSING TIMING EVALUATION

<u>INTERSECTION</u>	<u>WIDTH</u>	<u>AVAILABLE TIME</u>	<u>DESIRED TIME</u>
Tuckerman La @ Gloxinia Dr			
N leg of Gloxinia Dr	29 feet	16.0	8.3
S leg of Gloxinia Dr	29 feet	16.0	8.3
E leg of Tuckerman La	53 feet	16.0	15.1
W leg of Tuckerman La	53 feet	16.0	15.1

The pedestrian crossing timing analyses shows that the available signal timings are adequate.

The average delay experienced by pedestrians at the study intersections was determined using the formulas found in the 2010 HCM. The results of the analyses are shown in Table 14.

TABLE 14
SUMMARY OF PEDESTRIAN ANALYSES
AVERAGE PEDESTRIAN DELAY (sec)

Intersection	Leg	Ped Volume	Cycle Length	Effective Walk Time	Average Delay at Respective Leg	Less Weighted by Pedestrians	Average Intersection Delay (Pedestrians)
		from count	reference only	reference only	$dp = (C - gwalk, mi) / 2 / 2C$	column C multiplied by column F	sum of all legs
MD 187 @ NB I 270	North	0(0)	150	NA	NA	0(0)	0(17.3)
	South	0(0)	150	NA	NA	0(0)	
	East	0(0)	150	78	17.3	0(0)	
	West	0(1)	150	78	17.3	0(17.3)	

TABLE 14
SUMMARY OF PEDESTRIAN ANALYSES
AVERAGE PEDESTRIAN DELAY (sec)
(Con't)

Intersection	Leg	Ped Volume	Cycle Length	Effective Walk Time	Average Delay at Respective Leg	Less Weighted by Pedestrians	Average Intersection Delay (Pedestrians)
		from count	reference only	reference only	$dp = (C - gwalk, mi) / 2C$	column C multiplied by column F	sum of all legs
MD 187 @ Tuckerman Lane	North	0(0)	150	NA	NA	0(0)	11.4(22.9)
	South	2(1)	150	91.5	11.4	11.4(1.6)	
	East	0(6)	150	63.5	24.9	0(21.3)	
	West	0(0)	150	63.5	24.9	0(0)	

TABLE 14
SUMMARY OF PEDESTRIAN ANALYSES
AVERAGE PEDESTRIAN DELAY (sec)
(Con't)

Intersection	Leg	Ped Volume	Cycle Length	Effective Walk Time	Average Delay at Respective Leg	Less Weighted by Pedestrians	Average Intersection Delay (Pedestrians)
		from count	reference only	reference only	$dp = (C - gwalk, mi) / 2 / 2C$	column C multiplied by column F	sum of all legs
MD 187 @ Edson-Poindexter Lane	North	2(0)	150	61	26.4	2.3(0)	18.2(17.5)
	South	1(0)	150	86	13.7	0.6(0)	
	East	19(15)	150	77.5	17.5	14.5(17.5)	
	West	1(0)	150	77.5	17.5	0.8(0)	

TABLE 14
SUMMARY OF PEDESTRIAN ANALYSES
AVERAGE PEDESTRIAN DELAY (sec)
 (Con't)

Intersection	Leg	Ped Volume	Cycle Length	Effective Walk Time	Average Delay at Respective Leg	Less Weighted by Pedestrians	Average Intersection Delay (Pedestrians)
		from count	reference only	reference only	$dp = (C - gwalk, mi) / 2C$	column C multiplied by column F	sum of all legs
MD 187 @ Tilden-Nicholson Lane	North	2(1)	150	92	11.2	11.2(1.0)	11.2(14.1)
	South	0(7)	150	92	11.2	0(7.1)	
	East	0(3)	150	68.5	22.1	0(6.0)	
	West	0(0)	150	68.5	22.1	0(0)	

TABLE 14
SUMMARY OF PEDESTRIAN ANALYSES
AVERAGE PEDESTRIAN DELAY (sec)
(Con't)

Intersection	Leg	Ped Volume	Cycle Length	Effective Walk Time	Average Delay at Respective Leg	Less Weighted by Pedestrians	Average Intersection Delay (Pedestrians)
		from count	reference only	reference only	$dp = (C - gwalk, mi) / 2C$	column C multiplied by column F	sum of all legs
Tuckerman Lane @ Gloxinia Drive	North	11(8)	100	28	25.9	10.2(13.0)	19.3(20.5)
	South	2(1)	100	28	25.9	1.9(1.6)	
	East	3(1)	100	48	13.5	1.4(0.8)	
	West	12(6)	100	48	13.5	5.8(5.1)	

Bicycle System Adequacy

Since this proposed expansion will generate more than 50 bicycle peak hour trips a bicycle analysis is required. The level of traffic stress (LTS) for bicyclists along MD 187 in the vicinity and along Edson Lane is Red or high stress level. The County Master Plan for Bikes addresses this stress level via shared roadway routes along Luxmanor Road and separated bikeways along the east side of MD 187 and along Edson Lane. Given the nature of MD 187 as a Major Highway in this area, this is an appropriate plan and MCPS supports this. MCPS will construct the bikeway across the frontage of the site along MD 187.

Transit System Adequacy

For traditional land uses the number of transit trips would be more than the threshold of 50 a quantitative transit analysis would be required. However since the proposed use is a public school and the majority of the users would be eligible for free public transit (school buses) it was determined that a more appropriate measure of this sites transit impact should be tied to staff levels rather than the total number of trips generated by the site.

The school will employ 212 teachers/staff. Nearly all of these employees will be on-site before the morning peak hour (7:30 to 8:30 AM) and will remain on-site until after the evening peak hour (2:15 to 3:15 PM). However, to present a very conservative projection of transit impacts, it was assumed that 30% of the staff would arrive during the peak hours. This would translate to 64 staff members per peak hour. Once again if all of these 64 staff members were converted to person trips, the 9.4% transit rate for this policy area would equate to 6 transit trips which is far below the 50 trip threshold for a quantitative transit analyses.

The nearest bus stops to the site are located along the east side of MD 187 at the northern property boundary and on the west side of MD 187 opposite of the school. The stops serve Ride On route 26. The information for Ride On route 26 is enclosed in Appendix L.

CONCLUSIONS

A traffic impact study was prepared in accordance with the guidelines published by M-NCPPC for Mandatory Referrals, for projects undertaken by public agencies. The proposed conversion of the Tilden Middle School to the Woodward High School falls within the parameters of these guidelines.

After collecting current traffic count data at 7 intersections including the existing access points to the Tilden Middle School, it was determined that under existing traffic volumes all of the intersections that were analyzed as part of the LATR study operate within the Congestion Standard for the North Bethesda Policy Area of 71 seconds of vehicle delay or less during the peak hours of school traffic.

The analysis then proceeded to generate trips for planned developments and the trips generated by the conversion of the middle school to a high school. The results of the analyses demonstrate, as shown in Table 9, that all of the critical intersections are projected to continue to operate within the 71 second threshold permitted by the Congestion Standard for the Policy Area during the peak hours.

As required by the *LATR/TPAR Guidelines*, pedestrian facilities in the area were also evaluated. The area in which the school is located is a mature neighborhood with continuous sidewalks along the majority of the area roadways to encourage pedestrian traffic to the school. The signalized intersections in the study area are equipped with push-button controlled pedestrian signals to cross the major roadways. There were some ADA deficient intersections within a 500 foot radius of the school boundary and these will be addressed with the existing CIP fund designed to fund improvements associated with public schools.

APPENDIX A

TRAFFIC STUDY SCOPE OF WORK AGREEMENT

Local Area Transportation Review

TRANSPORTATION IMPACT STUDY SCOPE OF WORK AGREEMENT

Contact Information			
Transportation Consultant (company, contact name, email, and phone number)	Mike Nalepa Street Traffic Studies mnalepa@streettrafficstudies.com 410 590 5500		
Name of Applicant / Developer	Montgomery County Public Schools		
Project Information <i>Include Tables/Graphics, As Needed</i>			
Project Name (include plan no. if known)	Woodward High School		
Project Location (include address if known)	11211 Old Georgetown Road, Rockville, MD 20852		
Policy Area(s) (subdivision staging policy map)	North Bethesda	Master Plan(s) / Sector Plan Area(s)	
Application Type(s)	<input type="checkbox"/> Preliminary Plan	<input type="checkbox"/> Site Plan	<input type="checkbox"/> Sketch/Concept/Pre- Preliminary (Optional)
	<input type="checkbox"/> Conditional Use (formerly special exception)	<input type="checkbox"/> Local Map Amendment	<input type="checkbox"/> Amendment <input checked="" type="checkbox"/> Other: ___MR___
Project Description & Previous Approvals (proposed land uses, zoning, no. of units, square footage, construction phasing, prior approvals and proposals, existing uses, site operations, year built, status of Adequate Public Facilities [APF], other relevant info)	<p>The existing Tilden Middle School currently occupies the site. This school is being relocated to a new facility and Woodward High School will be constructed on the site. Tilden Middle School has a current enrollment of 947 students and the proposed Woodward High School will have a core capacity of 2,700 students.</p> <p>Currently the school is served by two access points on Old Georgetown Road. This proposal will add a third access point on Old Georgetown Road.</p> <p>This project is in the preliminary concept phase and a detailed concept plan is not available. It is the intent of the traffic study to identify traffic issues and address them in the detailed concept phase.</p>		
1.Site Access (proposed access location(s), existing/adjacent/opposite curb cuts, interparcel connections, access configurations and restrictions, internal circulation, private roads, parking/loading areas, other relevant info)	It is anticipated that the existing signal controlled access to the Tilden Middle School will be relocated to the southernmost access for the Woodward High School. Other access changes will be identified thru the traffic study.		

2. Transportation Analysis Requirement	<input checked="" type="checkbox"/> Transportation Impact Study Generates <u>50 or more</u> total weekday peak hour person trips (vehicular, transit, bicycle, and/or pedestrian) with no reductions other than a credit for existing developments over 12 years old, AND is outside of the White Flint and White Oak Policy Areas. Fill out remainder of this form and include in transportation impact study appendix.		<input type="checkbox"/> Transportation Study Exemption Statement Generates <u>49 or fewer</u> total weekday peak hour person trips (vehicular, transit, bicycle, and/or pedestrian) with no reductions other than a credit for existing developments over 12 years old, OR within White Flint and White Oak Policy Areas. Fill out PAR and trip generation sections below, and include with exemption statement.														
3. Policy Area Review (PAR) Only for projects filed before 1/1/17	<input type="checkbox"/> TPAR (1/1/13 – 12/31/16) 0, 25, 50%: _____ (TPAR = Transportation Policy Area Review)	<input type="checkbox"/> PAMR (11/15/07 - 12/31/12) 0-50%: _____ (PAMR = Policy Area Mobility Review)	<input type="checkbox"/> Exempt (no square footage increase or fewer than 3 new trips) or 1/1/17 or later) <input type="checkbox"/> No PAR (7/1/03 – 11/14/07) <input type="checkbox"/> PATR (before 6/30/03) (PATR = Policy Area Transportation Review)														
4. Transportation Mitigation Agreement (TMAg) Required?	<input type="checkbox"/> No	<input type="checkbox"/> Yes (25+ Employees and in Transportation Management District [TMD])		<input type="checkbox"/> Amend Existing TMAg													
5. Established Transportation Management District (TMD)?	<input type="checkbox"/> No	<input type="checkbox"/> Yes TMD Name: _____															
Transportation Impact Study Assumptions <i>Include Tables/Graphics, As Needed</i>																	
6. Study Years / Phases	Existing Year: 2018		Phases / Build-out Year(s): 2021														
7. Study Periods	<input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> PM <input type="checkbox"/> Mid-day <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday <input type="checkbox"/> Other: _____																
8. Study Intersections (For projects generating 50 or more person trips, list all signalized & significant unsignalized intersections, and site driveways traffic counts must be collected within 12-months of completed and accepted application)	# of tiers of intersections to study (refer current LATR Guidelines): <u>2</u> <i>For the purpose of determining the number of tiers of study intersections, trip calculation for the subject site should also include nearby unbuilt properties in common ownership. No trip reductions should be taken in this calculation other than a credit for existing developments over 12 years old.</i> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">1) MD 187 @ Tilden La</td> <td style="width: 50%;">7) Tuckerman La @ Gloxinia Dr</td> </tr> <tr> <td>2) MD 187 @ Poindexter La</td> <td>8)</td> </tr> <tr> <td>3) MD 187 @ North Tilden MS Driveway</td> <td>9)</td> </tr> <tr> <td>4) MD 187 @ South Tilden MS Driveway</td> <td>10)</td> </tr> <tr> <td>5) MD 187 @ Tuckerman La</td> <td>11)</td> </tr> <tr> <td>6) MD 187 @ Northbound I 270 Ramp</td> <td>add more rows if necessary</td> </tr> </table>					1) MD 187 @ Tilden La	7) Tuckerman La @ Gloxinia Dr	2) MD 187 @ Poindexter La	8)	3) MD 187 @ North Tilden MS Driveway	9)	4) MD 187 @ South Tilden MS Driveway	10)	5) MD 187 @ Tuckerman La	11)	6) MD 187 @ Northbound I 270 Ramp	add more rows if necessary
1) MD 187 @ Tilden La	7) Tuckerman La @ Gloxinia Dr																
2) MD 187 @ Poindexter La	8)																
3) MD 187 @ North Tilden MS Driveway	9)																
4) MD 187 @ South Tilden MS Driveway	10)																
5) MD 187 @ Tuckerman La	11)																
6) MD 187 @ Northbound I 270 Ramp	add more rows if necessary																
9. Trip Generation (clearly cite sources and methodology including use of average rates vs. equation; include trip generation for existing site, current approvals, proposed uses, and net changes)	Total Person Trips 366	Vehicle Trips* (Auto Driver) 587	Transit Trips* 55	Walking Trips* (non-motorized + transit) 106	Bicycling Trips* (non-motorized) 51												
<i>* Only required if total peak hour person trips are 50 or more in either the AM or PM peak hour. Sum of all vehicle, transit, and non-motorized trips shall be the equivalent of total person trips. Use table at the end of the form to show all calculations and assumptions for mode breakout.</i>																	

<p>10. Trip Reductions</p> <p>(include justification and supporting documentation for internal capture, pass-by, diverted, Transportation Demand Management)</p>	<p>None</p>
<p>11. Trip Distribution %</p> <p>(include a map of the proposed project in addition to a list or table)</p>	<p>Based on the existing volumes and the attached service area map for Walt Whitman High School, we propose the following trip distributions:</p> <ul style="list-style-type: none"> 40% N on MD 187 10% W on Tilden Lane 15% E on Nicholson La 10% E on Tuckerman La 5% W on Tuckerman La 15% S on MD 187 5% N on I 270
<p>12. Pipeline Developments to be considered as background traffic</p> <p>(include name, plan #, land uses, and sizes for approved but unbuilt developments or concurrently pending applications; info can be obtained from the M-NCPPC Pipeline website: - website is updated quarterly)</p>	<p>Pipeline development data will be updated and provided by the M-NCPPC.</p>
<p>13. Pipeline Transportation Projects to be considered as background condition</p> <p>(fully funded for construction in County Capital Improvement Program, State Consolidated Transportation Program, developer projects, etc. within the next 6 years)</p>	<p>None</p>

Preliminary Mitigation Analysis		<i>*Refer to the LATR Guidelines for details on how to mitigate</i>	
14.Vehicular Analysis	<input checked="" type="checkbox"/> Vehicular Analysis Anticipated (Vehicular mitigation to be determined after study)	<ul style="list-style-type: none"> TEST: HCM Analysis is required to be provided for all intersections analyzed in studies for: 1) "Red & Orange" policy areas, and 2) intersections with a CLV of more than 1,350 in "Yellow & Green" policy areas. 3) CLV analysis required for all intersections regardless of policy area. CLV assessment and signal timing worksheets are to be included in the study appendix. MITIGATION: Required if HCM delay analyses exceed policy area standard 	
15.Pedestrian Analysis	<input checked="" type="checkbox"/> Pedestrian Mitigation Anticipated	<ul style="list-style-type: none"> TEST: If the plan generates 50 or more pedestrian peak hour trips, mitigation of surrounding pedestrian conditions is required MITIGATION: Required if ADA non-compliance issues within 500 foot radius of site boundary and if pedestrian crosswalk delay at LATR intersections within 500 feet of site boundary is lower than Level of Service (LOS) D 	
16.Bicycle Analysis	<input checked="" type="checkbox"/> Bicycle Mitigation Anticipated	<ul style="list-style-type: none"> TEST: If the plan generates 50 or more bicycle peak hour trips and is within 0.25 miles of an existing educational institution or existing/planned bikeshare station, mitigation of surrounding bicycle conditions is required MITIGATION: Required to make improvements to provide a low Level of Traffic Stress to any existing similar facility within 750 feet of the site boundary; Alternatively, project may provide a master planned improvement that provides an equivalent improvement in the level of traffic stress for cyclists 	
17.Transit Analysis	<input checked="" type="checkbox"/> Transit Mitigation Anticipated	<ul style="list-style-type: none"> TEST: If the plan generates 50 or more transit peak hour trips and the peak load of bus routes at bus stops within 1,000 feet of site boundary exceeds (or is worse than) peak load of LOS D (1.25 transit riders per seat during the peak period in the peak direction), mitigation of transit conditions is required MITIGATION: Required to provide or fund improvements that would mitigate the trips exceeding the standard that are attributable to the development 	
Additional Analysis or Software Required	<input type="checkbox"/> Queuing Analysis <input type="checkbox"/> Signal Warrant Analysis <input type="checkbox"/> Weaving/Merge Analysis	<input type="checkbox"/> Accident Analysis <input type="checkbox"/> Synchro <input type="checkbox"/> SIDRA	<input type="checkbox"/> VISSIM <input type="checkbox"/> CORSIM <input type="checkbox"/> Other

M-NCPPC Clarifications

- Transportation impact study will comply with all other requirements of the LATR Guidelines not listed on this form.
- If physical improvements are proposed as mitigation, the transportation impact study will demonstrate feasibility with regards to right-of-way and utility relocation (at a minimum).
- In the event that the development proposal significantly changes after this transportation impact study scope has been agreed to, the Applicant will work with M-NCPPC staff to amend the scope to accurately reflect the new proposal.
- A receipt from MCDOT showing that the transportation impact study review fee has been paid will be provided to M-NCPPC DARC at the time the development application is submitted.
- Minimum of seven paper copies (more if near the County line or an incorporated City) and two PDF copies of the transportation impact study and appendices will be provided.

Additional Assumptions / Special Circumstances for Discussion

Site Trip Generation Estimate Worksheet				
Step 1: Vehicle Trips				
ITE Land use Code	530			
Development Size				
ITE trip generation estimate formula/rate* AM		Total AM Vehicle Trips	384	
ITE Trip generation estimate formula/rate* PM		Total PM Vehicle Trips	446	
Step 2: Policy Area Conversion				
Policy Area # & Name	22 N Bethesda	Trip Adjustment Factor	82 %	
Applied Policy Area Adjusted Value AM				
Applied Policy Area Adjusted Value PM	366			
Step 3: Mode Split			AM	PM
Auto Driver	62.4%	Results	587	
Auto Passenger	19.5%	Results	114	
Transit	9.4 %	Results	55	
Walking (transit + non-motorized)	18.1%	Results	106	
Bicycling (non-motorized)	8.7%	Results	51	

Complete one of these tables for EACH use included in the application. Enter results into "Transportation Impacts Analysis" section of the form.

High School (530)

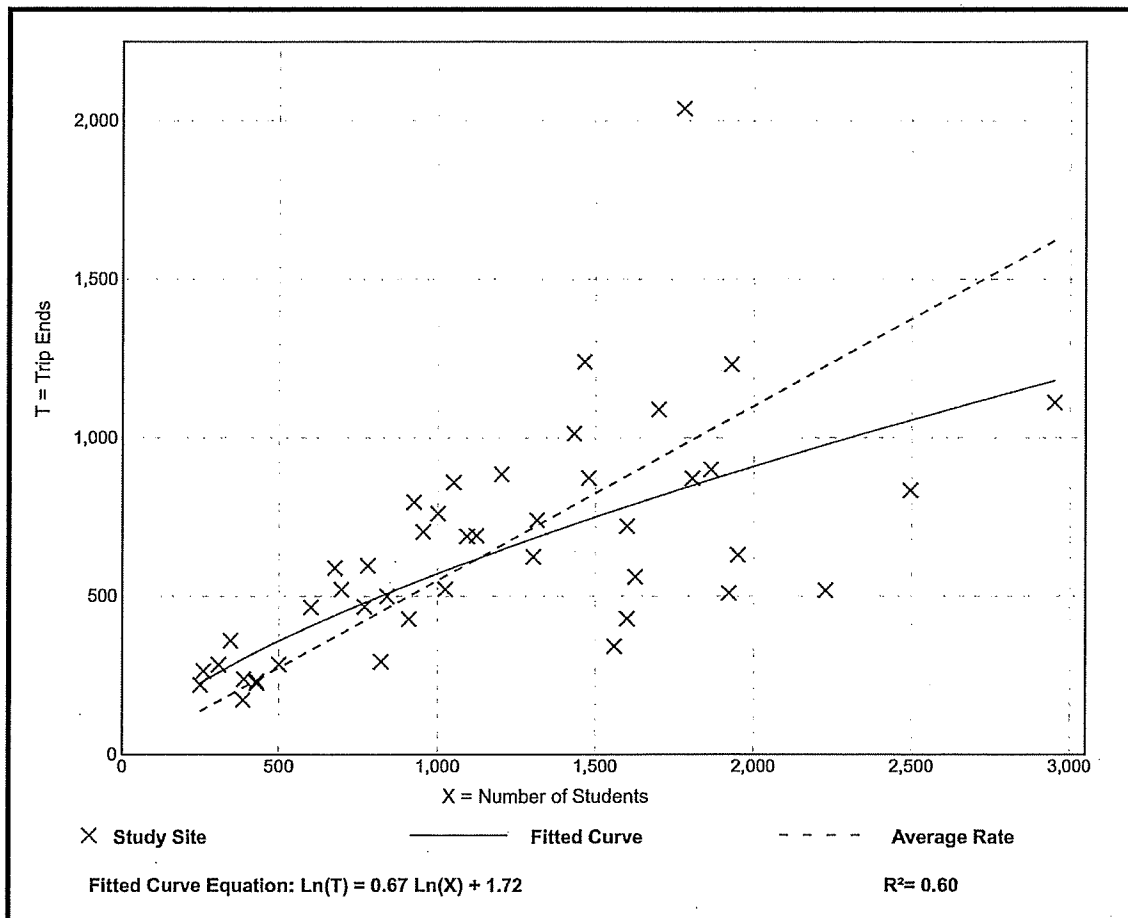
Vehicle Trip Ends vs: Students
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 44
 Avg. Num. of Students: 1177
 Directional Distribution: 68% entering, 32% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.55	0.22 - 1.15	0.23

Data Plot and Equation



High School (530)

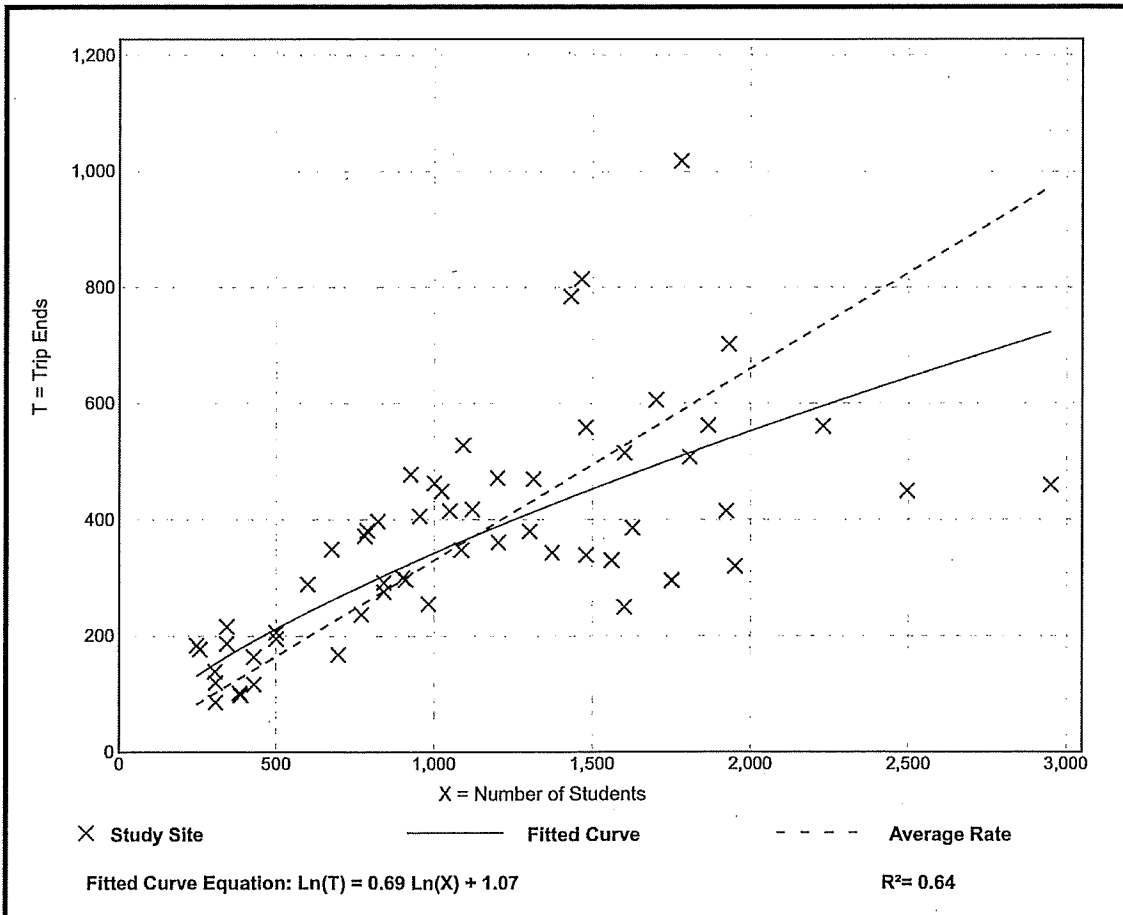
Vehicle Trip Ends vs: Students
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 58
 Avg. Num. of Students: 1127
 Directional Distribution: 32% entering, 68% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.33	0.16 - 0.74	0.13

Data Plot and Equation



Tilden Middle School - #232

Cluster Name: Walter Johnson

11211 Old Georgetown Road Rockville, MD 20852

Office Phone: (301) 230-5930

School Hours: 8:15 - 3:00

www.montgomeryschoolsmd.org/schools/tildenms/

Fax Number: (301) 230-5991

Feeder Schools: Farmland, Garrett Park, Luxmanor

Receiving Schools: Walter Johnson

2017-2018 Enrollment = 947													
	% Total	% Gender		% Racial/Ethnic Composition ^{1 2}							Enrollment by Grade		
		Female	Male	AM	AS	BL	HI	PI	WH	MU		Number	Percent
All Students		46.8	53.2	≤5.0	16.9	11.1	18.2	≤5.0	47.7	5.7	Grade 6	309	32.6
ESOL	11.3	5.4	5.9	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	Grade 7	325	34.3
FARMS	12.1	6.1	6.0	≤5.0	≤5.0	≤5.0	5.5	≤5.0	≤5.0	≤5.0	Grade 8	313	33.1
SPED	15.5	≤5.0	11.2	≤5.0	≤5.0	≤5.0	≤5.0	≤5.0	8.0	≤5.0	Total	947	

¹ Racial/ethnic composition figures reflect MSDE abbreviations: American Indian or Alaskan Native (AM); Asian (AS); Black or African American (BL); Hispanic/Latino (HI); Native Hawaiian or Other Pacific Islander (PI); White (WH); Two or More (Multiple) Races (MU).

Students with Disabilities Least Restrictive Environment (LRE)			
Percent of Instructional Time Inside a General Education Class			
	80% or More	Between 40% and 79%	Less than 40%
All SPED Students	40.8	38.8	20.4

Other Participation	
Students now or have in the past received FARMS ² = 22.5%	Attendance Rate ^{2 3} = ≥95.0%
Mobility Rate (Entrants + Withdrawals) ^{2 3} = 11.1%	Suspension Rate ^{2 3 4} = ≤3.0%

School Programs	
Adapted Physical Education	Study Circles
Alternative Level I	Teaching Tolerance Mix It Up
Autism - Asperger's	Visitor Management System
Character Education Programs	
Collaborative Problem Solving (CPS)	
Counseling Programs/Groups	
Hours Based Staffing - Middle	
Learning for Independence (LFI)	
Mentoring Programs	
Red Ribbon Anti-Substance Abuse Program	
Speech Resource K-12	
Student Ambassador Program	

Staff Diversity							
	% Racial/Ethnic Composition ¹					% Gender	
	AS	BL	HI	WH	MU	Female	Male
Professional	8.0	10.7	4.0	74.7	2.7	66.7	33.3
Supporting Services	23.7	21.1	18.4	36.8	0.0	65.8	34.2

Classes Taught by Highly Qualified (HQ) Teachers ²		
Number of Classes	% HQ	% Not HQ
Data are not available for 2016 - 2017 school year.		

Student/Instructional Staff Ratio	Average Class Size
11.4	English = 16.4 Other = 17.0

Years Experience of Professional Personnel		
% Less Than 5 Years	% 5-15 Years	% More Than 15 Years
18.7	36.0	45.3

² To comply with federal requirements, any percentage rates greater than or equal to 95.0% or less than or equal to 5.0% (3% for suspensions) will be noted as ≥95.0 or ≤5.0 (≤3.0 for suspensions), respectively.

³ Outcome data reflect 2016-2017 school year.

⁴ Results are not reported (--) for groups with fewer than ten students enrolled.

APPENDIX B

VEHICLE TURNING MOVEMENT COUNTS

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY
 Intersection of: Old Georgetown Rd
 and: I-270 Northbound Ramps
 Counted by: CB/ET

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 Location : Montgomery County
 Date : 02/26/2019
 Weather : Clear
 Entered by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD
 STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: I 270 NB On Ramp				TRAFFIC FROM EAST on: I 270 NB Off Ramp				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	45	230	0	275	13	79	0	92	0	0	0	0	13	0	41	54	421
45-00	84	312	0	396	16	111	0	127	0	0	0	0	18	0	53	71	594
07:00-15	142	396	0	538	13	144	0	157	0	0	0	0	25	2	61	88	783
15-30	198	458	0	656	15	194	0	209	0	0	0	0	37	1	95	133	998
30-45	231	504	0	735	33	305	0	338	0	0	0	0	33	4	118	155	1228
45-00	156	449	0	605	32	302	0	334	0	0	0	0	36	2	164	202	1141
08:00-15	183	450	0	633	45	301	0	346	0	0	0	0	20	6	148	174	1153
15-30	184	441	0	625	37	252	0	289	0	0	0	0	24	1	99	124	1038
30-45	185	448	0	633	38	258	0	296	0	0	0	0	54	0	135	189	1118
45-00	182	425	0	607	47	307	0	354	0	0	0	0	66	7	80	153	1114
09:00-15	192	389	0	581	33	261	0	294	0	0	0	0	25	2	82	109	984
15-30	179	384	0	563	46	267	0	313	0	0	0	0	43	4	81	128	1004
AM 3 HOUR TOTALS	1961	4886	0	6847	368	2781	0	3149	0	0	0	0	394	29	1157	1580	11576
1 HOUR TOTALS																	
630-730	469	1396	0	1865	57	528	0	585	0	0	0	0	93	3	250	346	2796
645-745	655	1670	0	2325	77	754	0	831	0	0	0	0	113	7	327	447	3603
07-08	727	1807	0	2534	93	945	0	1038	0	0	0	0	131	9	438	578	4150
715-815	768	1861	0	2629	125	1102	0	1227	0	0	0	0	126	13	525	664	4520
730-830	754	1844	0	2598	147	1160	0	1307	0	0	0	0	113	13	529	655	4560
745-845	708	1788	0	2496	152	1113	0	1265	0	0	0	0	134	9	546	689	4450
08-09	734	1764	0	2498	167	1118	0	1285	0	0	0	0	164	14	462	640	4423
815-915	743	1703	0	2446	155	1078	0	1233	0	0	0	0	169	10	396	575	4254
830-930	738	1646	0	2384	164	1093	0	1257	0	0	0	0	188	13	378	579	4220
PEAK HOUR 730-830	754	1844	0	2598	147	1160	0	1307	0	0	0	0	113	13	529	655	4560
PM																	
02:00-15	106	286	0	392	38	248	0	286	0	0	0	0	8	0	51	59	737
15-30	116	258	0	374	51	330	0	381	0	0	0	0	26	1	60	87	842
30-45	110	293	0	403	75	475	0	550	0	0	0	0	23	2	60	85	1038
45-00	101	266	0	367	77	431	0	508	0	0	0	0	16	4	60	80	955
03:00-15	131	303	0	434	84	439	0	523	0	0	0	0	20	1	69	90	1047
15-30	111	318	0	429	83	516	0	599	0	0	0	0	16	1	89	106	1134
30-45	97	319	0	416	122	490	0	612	0	0	0	0	23	5	76	104	1132
45-00	79	255	0	334	130	529	0	659	0	0	0	0	7	2	67	76	1069
04:00-15	122	290	0	412	132	617	0	749	0	0	0	0	23	0	52	75	1236
15-30	106	256	0	362	128	611	0	739	0	0	0	0	6	0	50	56	1157
30-45	112	277	0	389	95	624	0	719	0	0	0	0	12	6	67	85	1193
45-00	116	271	0	387	95	656	0	751	0	0	0	0	14	2	89	105	1243
PM 3 HOUR TOTALS	1307	3392	0	4699	1110	5966	0	7076	0	0	0	0	194	24	790	1008	12783
1 HOUR TOTALS																	
02-03	433	1103	0	1536	241	1484	0	1725	0	0	0	0	73	7	231	311	3572
215-315	458	1120	0	1578	287	1675	0	1962	0	0	0	0	85	8	249	342	3882
230-330	453	1180	0	1633	319	1861	0	2180	0	0	0	0	75	8	278	361	4174
245-345	440	1206	0	1646	366	1876	0	2242	0	0	0	0	75	11	294	380	4268
03-04	418	1195	0	1613	419	1974	0	2393	0	0	0	0	66	9	301	376	4382
315-415	409	1182	0	1591	467	2152	0	2619	0	0	0	0	69	8	284	361	4571
330-430	404	1120	0	1524	512	2247	0	2759	0	0	0	0	59	7	245	311	4594
345-445	419	1078	0	1497	485	2381	0	2866	0	0	0	0	48	8	236	292	4655
04-05	456	1094	0	1550	450	2508	0	2958	0	0	0	0	55	8	258	321	4829
PEAK HOUR 04-05	456	1094	0	1550	450	2508	0	2958	0	0	0	0	55	8	258	321	4829

PHF
0.93

PHF
0.93

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STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: Old Georgetown Rd
 and: I-270 NB Ramps
 Counted by: CB/ET bikes only

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

Location : Montgomery County
 Date : 02/26/2019
 Weather : Clear
 Entered by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD

Day: Tuesday

STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: I-270 N On Ramp				TRAFFIC FROM EAST on: I-270 N Off Ramp				TOTAL N+S + E+W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
07:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
30-45	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
45-00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
45-00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
09:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM 3 HOUR TOTALS	0	4	0	4	0	2	0	2	0	0	0	0	0	0	0	0	6
1 HOUR TOTALS																	
630-730	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
645-745	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	3
07-08	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
715-815	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
730-830	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
745-845	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
08-09	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
815-915	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
830-930	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
PEAK HOUR 645-745	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	3
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 3 HOUR TOTALS	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
1 HOUR TOTALS																	
02-03	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
215-315	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
230-330	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
245-345	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
03-04	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
315-415	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR 245-345	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

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STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: Old Georgetown Rd
 and: Tuckerman Ln
 Counted by: ET/CB

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

Location : Montgomery County
 Date : 02/07/2019
 Weather : Sunny
 Entered by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD

Day: Thursday

STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: Tuckerman Ln				TRAFFIC FROM EAST on: Tuckerman Ln				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
	AM																
06:30-45	26	214	2	242	17	87	17	121	11	24	22	57	42	14	4	60	480
45-00	31	294	8	333	30	123	30	183	25	40	12	77	66	26	6	98	691
07:00-15	13	352	6	371	26	103	37	166	22	58	25	105	105	28	7	140	782
15-30	25	384	7	416	37	176	59	272	31	81	21	133	132	46	5	183	1004
30-45	23	423	11	457	40	292	88	420	38	96	22	156	167	68	11	246	1279
45-00	37	373	3	413	37	297	91	425	26	105	55	186	148	75	26	249	1273
08:00-15	31	388	16	435	48	266	63	377	34	133	51	218	153	82	17	252	1282
15-30	31	392	7	430	41	255	64	360	37	116	46	199	155	69	12	236	1225
30-45	27	406	3	436	41	308	45	394	49	101	50	200	136	40	10	186	1216
45-00	32	400	10	442	37	346	40	423	36	72	53	161	135	42	7	184	1210
09:00-15	38	403	8	449	27	312	51	390	37	46	44	127	124	48	12	184	1150
15-30	38	305	5	348	42	291	54	387	30	65	70	165	104	61	6	171	1071
AM 3 HOUR TOTALS	352	4334	86	4772	423	2856	639	3918	376	937	471	1784	1467	599	123	2189	12663
1 HOUR TOTALS																	
630-730	95	1244	23	1362	110	489	143	742	89	203	80	372	345	114	22	481	2957
645-745	92	1453	32	1577	133	694	214	1041	116	275	80	471	470	168	29	667	3756
07-08	98	1532	27	1657	140	868	275	1283	117	340	123	580	552	217	49	818	4338
715-815	116	1568	37	1721	162	1031	301	1494	129	415	149	693	600	271	59	930	4838
730-830	122	1576	37	1735	166	1110	306	1582	135	450	174	759	623	294	66	983	5059
745-845	126	1559	29	1714	167	1126	263	1556	146	455	202	803	592	266	65	923	4996
08-09	121	1586	36	1743	167	1175	212	1554	156	422	200	778	579	233	46	858	4933
815-915	128	1601	28	1757	146	1221	200	1567	159	335	193	687	550	199	41	790	4801
830-930	135	1514	26	1675	147	1257	190	1594	152	284	217	653	499	191	35	725	4647
PEAK HOUR 730-830	122	1576	37	1735	166	1110	306	1582	135	450	174	759	623	294	66	983	5059
PM	0.92	0.93	0.58		0.86	0.93	0.84		0.89	0.85	0.79		0.93	0.90	0.63		
02:00-15	50	271	10	331	45	242	55	342	26	38	52	116	74	45	6	125	914
15-30	53	280	11	344	45	267	58	370	32	40	53	125	80	51	9	140	979
30-45	52	277	12	341	43	326	78	447	28	37	63	128	79	48	7	134	1050
45-00	54	269	9	332	46	380	75	501	25	33	54	112	77	50	10	137	1082
03:00-15	39	284	21	344	55	376	63	494	29	46	69	144	101	68	9	178	1160
15-30	66	296	9	371	59	370	89	518	27	41	57	125	74	63	10	147	1161
30-45	58	304	12	374	60	392	91	543	27	40	66	133	91	48	6	145	1195
45-00	50	285	10	345	57	429	91	577	32	59	71	162	76	54	19	149	1233
04:00-15	70	302	11	383	40	414	91	545	25	45	72	142	81	66	10	157	1227
15-30	82	319	17	418	51	448	108	607	30	66	66	162	76	60	17	153	1340
30-45	82	314	14	410	64	448	122	634	25	51	67	143	77	78	7	162	1349
45-00	72	320	13	405	56	509	136	701	24	68	84	176	82	87	8	177	1459
PM 3 HOUR TOTALS	728	3521	149	4398	621	4601	1057	6279	330	564	774	1668	968	718	118	1804	14149
1 HOUR TOTALS																	
02-03	209	1097	42	1348	179	1215	266	1660	111	148	222	481	310	194	32	536	4025
215-315	198	1110	53	1361	189	1349	274	1812	114	156	239	509	337	217	35	589	4271
230-330	211	1126	51	1388	203	1452	305	1960	109	157	243	509	331	229	36	596	4453
245-345	217	1153	51	1421	220	1518	318	2056	108	160	246	514	343	229	35	607	4598
03-04	213	1169	52	1434	231	1567	334	2132	115	186	263	564	342	233	44	619	4749
315-415	244	1187	42	1473	216	1605	362	2183	111	185	266	562	322	231	45	598	4816
330-430	260	1210	50	1520	208	1683	381	2272	114	210	275	599	324	228	52	604	4995
345-445	284	1220	52	1556	212	1739	412	2363	112	221	276	609	310	258	53	621	5149
04-05	306	1255	55	1616	211	1819	457	2487	104	230	289	623	316	291	42	649	5375
PEAK HOUR 04-05	306	1255	55	1616	211	1819	457	2487	104	230	289	623	316	291	42	649	5375

PNF
0.99

PNF
0.92

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: Old Georgetown Rd
 and: Tuckerman Ln
 Counted by: ET/CB bikes only

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

Location : Montgomery County
 Date : 02/07/2019
 Weather : Sunny
 Entered by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD

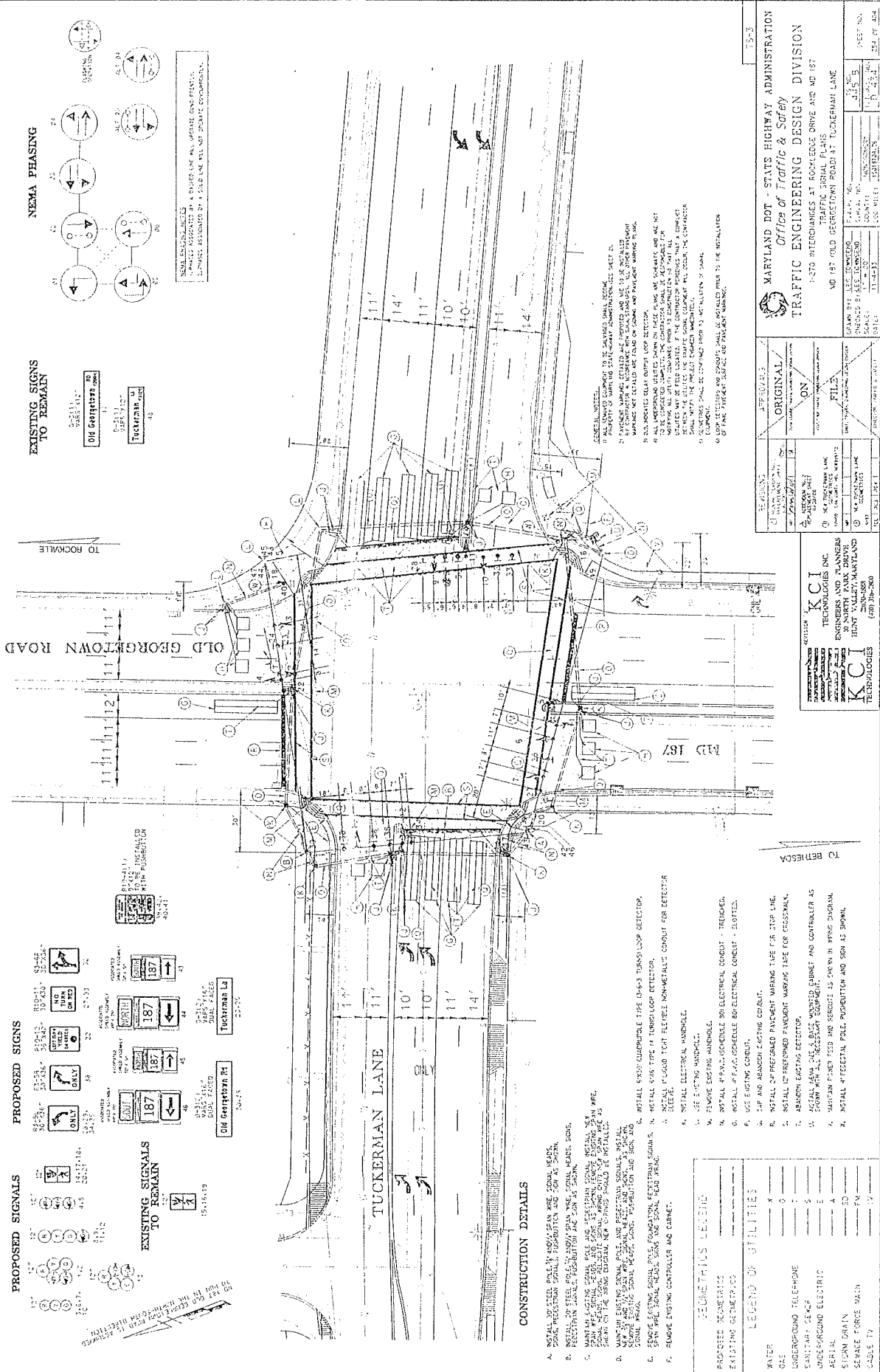
Day: Thursday
 STREET TRAFFIC STUDIES LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: Tuckerman Ln				TRAFFIC FROM EAST on: Tuckerman Ln				TOTAL N+S + E+W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
AM																	
3 HOUR																	
TOTALS	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	1	3
1 HOUR																	
TOTALS																	
630-730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645-745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715-815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730-830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
745-845	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
08-09	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
815-915	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
830-930	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	1	3
PEAK HOUR																	
830-930	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	1	3
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
PM																	
3 HOUR																	
TOTALS	0	1	0	1	0	0	2	2	0	0	0	0	0	3	0	3	6
1 HOUR																	
TOTALS																	
02-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215-315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230-330	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
245-345	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
03-04	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
315-415	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
330-430	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	3
345-445	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	3
04-05	0	1	0	1	0	0	1	1	0	0	0	0	0	2	0	2	4
PEAK HOUR																	
04-05	0	1	0	1	0	0	1	1	0	0	0	0	0	2	0	2	4

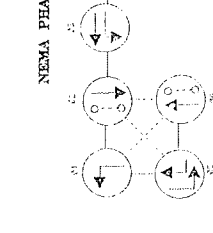
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STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

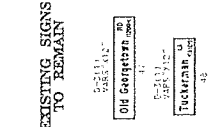
STSLTD STSLTD STSLTD STSLTD STSLTD



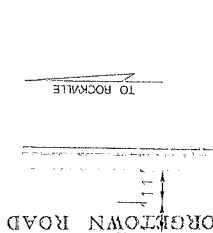
PROPOSED SIGNALS



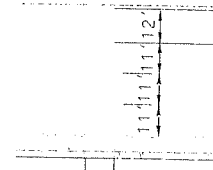
EXISTING SIGNALS TO REMAIN



PROPOSED SIGNS



EXISTING SIGNS TO REMAIN



NEMA PHASING



CONSTRUCTION DETAILS

1. INSTALL 60 KILOVOLT POLYMER CORE SIGNAL HEADS.
2. SIGNAL HEADS SHALL BE MOUNTED ON 10' HIGH POLES.
3. PROTECTIVE SHALL BE PROVIDED FOR ALL SIGNAL HEADS.
4. MAINLINE EXISTING SIGNAL POLE AND SUPPORT SHALL REMAIN. INSTALL NEW SIGNAL HEADS ON EXISTING POLE AND SUPPORT. EXISTING SIGNAL POLE SHALL BE REMOVED AND RELOCATED TO THE INTERSECTION.
5. MAINLINE EXISTING SIGNAL POLE AND SUPPORT SHALL REMAIN. INSTALL NEW SIGNAL HEADS ON EXISTING POLE AND SUPPORT. EXISTING SIGNAL POLE SHALL BE REMOVED AND RELOCATED TO THE INTERSECTION.
6. MAINLINE EXISTING SIGNAL POLE AND SUPPORT SHALL REMAIN. INSTALL NEW SIGNAL HEADS ON EXISTING POLE AND SUPPORT. EXISTING SIGNAL POLE SHALL BE REMOVED AND RELOCATED TO THE INTERSECTION.
7. REMOVE EXISTING CONTROLLER AND CABINET.

GEOMETRICS LEGEND

PROPOSED GEOMETRICS	EXISTING GEOMETRICS
WATER	X
GAS	0
UNDERGROUND TELEPHONE	T
ELECTRIC	E
UNDERGROUND ELECTRIC	E
AERIAL	A
STORM DRAIN	DM
SEWER FORCE MAIN	FM
CABLE TV	TV

CONSTRUCTION DETAILS

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PROPOSED GEOMETRICS	EXISTING GEOMETRICS
WATER	X
GAS	0
UNDERGROUND TELEPHONE	T
ELECTRIC	E
UNDERGROUND ELECTRIC	E
AERIAL	A
STORM DRAIN	DM
SEWER FORCE MAIN	FM
CABLE TV	TV

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GEOMETRICS LEGEND

PROPOSED GEOMETRICS	EXISTING GEOMETRICS
WATER	X
GAS	0
UNDERGROUND TELEPHONE	T
ELECTRIC	E
UNDERGROUND ELECTRIC	E
AERIAL	A
STORM DRAIN	DM
SEWER FORCE MAIN	FM
CABLE TV	TV

MARYLAND DOT - STATE HIGHWAY ADMINISTRATION
Office of Traffic & Safety
TRAFFIC ENGINEERING DESIGN DIVISION

1-370 INTERCHANGES AT ROCKLEDGE DRIVE AND MD 187
 TRAFFIC SIGNAL PLAN
 MD 187 OLD GEORGETOWN ROAD AT TUCKERMAN LANE

DATE: 11-22-23
 SCALE: 1"=40'
 SHEET NO. 13-3

KCI TECHNOLOGIES INC.
 10000 WOODBURN ROAD
 SUITE 100
 JUPITER, FL 33458
 (561) 741-1111

KCI TECHNOLOGIES
 10000 WOODBURN ROAD
 SUITE 100
 JUPITER, FL 33458
 (561) 741-1111

CONSTRUCTION DETAILS

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7. REMOVE EXISTING CONTROLLER AND CABINET.

GEOMETRICS LEGEND

PROPOSED GEOMETRICS	EXISTING GEOMETRICS
WATER	X
GAS	0
UNDERGROUND TELEPHONE	T
ELECTRIC	E
UNDERGROUND ELECTRIC	E
AERIAL	A
STORM DRAIN	DM
SEWER FORCE MAIN	FM
CABLE TV	TV

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY
 Intersection of: Old Georgetown Rd
 and: Poindexter Ln
 Counted by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 Location : Montgomery County
 Date : 02/06/2019 Day: Wednesday
 Weather : Cloudy/Some Rain
 Entered by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD
 STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: Poindexter Ln				TRAFFIC FROM EAST on: Edson Ln				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	5	154	3	162	4	107	7	118	0	0	0	0	9	0	1	10	290
45-00	1	293	12	306	1	122	16	139	2	0	1	3	14	0	2	16	464
07:00-15	0	371	8	379	2	119	19	140	4	0	0	4	30	0	3	33	556
15-30	9	467	4	480	10	176	16	202	4	0	3	7	43	0	5	48	737
30-45	14	416	12	442	9	236	28	273	1	0	2	3	33	0	5	38	756
45-00	14	421	13	448	4	295	43	342	3	0	4	7	33	0	12	45	842
08:00-15	13	417	10	440	10	309	45	364	2	0	1	3	39	0	7	46	853
15-30	7	389	17	413	9	283	21	313	1	0	1	2	35	0	5	40	768
30-45	1	408	10	419	6	287	37	330	6	0	2	8	43	0	2	45	802
45-00	1	374	6	381	10	299	54	363	1	0	6	7	53	0	14	67	818
09:00-15	1	338	19	358	10	338	60	408	1	0	4	5	37	0	7	44	815
15-30	5	326	16	347	4	278	42	324	0	0	4	4	34	0	3	37	712
AM 3 HOUR TOTALS	71	4374	130	4575	79	2849	388	3316	25	0	28	53	403	0	66	469	8413
1 HOUR TOTALS																	
630-730	15	1285	27	1327	17	524	58	599	10	0	4	14	96	0	11	107	2047
645-745	24	1547	36	1607	22	653	79	754	11	0	6	17	120	0	15	135	2513
07-08	37	1675	37	1749	25	826	106	957	12	0	9	21	139	0	25	164	2891
715-815	50	1721	39	1810	33	1016	132	1181	10	0	10	20	148	0	29	177	3188
730-830	48	1643	52	1743	32	1123	137	1292	7	0	8	15	140	0	29	169	3219
745-845	35	1635	50	1720	29	1174	146	1349	12	0	8	20	150	0	26	176	3265
08-09	22	1588	43	1653	35	1178	157	1370	10	0	10	20	170	0	28	198	3241
815-915	10	1509	52	1571	35	1207	172	1414	9	0	13	22	168	0	28	196	3203
830-930	8	1446	51	1505	30	1202	193	1425	8	0	16	24	167	0	26	193	3147
PEAK HOUR 745-845	35	1635	50	1720	29	1174	146	1349	12	0	8	20	150	0	26	176	3265
PM																	
02:00-15	1	290	4	295	0	215	27	242	2	0	1	3	42	0	8	50	590
15-30	3	291	4	298	5	288	38	331	2	0	2	4	48	0	3	51	684
30-45	2	289	4	295	9	326	43	378	1	0	1	2	51	0	9	60	735
45-00	2	327	10	339	16	416	46	478	1	0	3	4	39	0	4	43	864
03:00-15	2	294	8	304	14	374	63	451	4	0	0	4	69	0	7	76	835
15-30	2	250	4	256	14	318	35	367	1	0	1	2	64	0	3	67	692
30-45	3	264	7	274	9	426	39	474	1	0	1	2	61	0	3	64	814
45-00	3	258	9	270	10	436	45	491	3	0	4	7	48	0	10	58	826
04:00-15	9	324	12	345	10	402	24	436	2	0	2	4	52	0	5	57	842
15-30	6	329	9	344	10	464	61	535	5	0	2	7	45	0	0	45	931
30-45	2	321	11	334	10	438	53	501	4	0	2	6	47	0	8	55	896
45-00	0	317	6	323	14	455	64	533	1	0	1	2	34	0	6	40	898
PM 3 HOUR TOTALS	35	3554	88	3677	121	4558	538	5217	27	0	20	47	600	0	66	666	9607
1 HOUR TOTALS																	
02-03	8	1197	22	1227	30	1245	154	1429	6	0	7	13	180	0	24	204	2873
215-315	9	1201	26	1236	44	1404	190	1638	8	0	6	14	207	0	23	230	3118
230-330	8	1160	26	1194	53	1434	187	1674	7	0	5	12	223	0	23	246	3126
245-345	9	1135	29	1173	53	1534	183	1770	7	0	5	12	233	0	17	250	3205
03-04	10	1066	28	1104	47	1554	182	1783	9	0	6	15	242	0	23	265	3167
315-415	17	1096	32	1145	43	1582	143	1768	7	0	8	15	225	0	21	246	3174
330-430	21	1175	37	1233	39	1728	169	1936	11	0	9	20	206	0	18	224	3413
345-445	20	1232	41	1293	40	1740	183	1963	14	0	10	24	192	0	23	215	3495
04-05	17	1291	38	1346	44	1759	202	2005	12	0	7	19	178	0	19	197	3567
PEAK HOUR 04-05	17	1291	38	1346	44	1759	202	2005	12	0	7	19	178	0	19	197	3567

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STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

STSLTD STSLTD STSLTD STSLTD STSLTD

PNP
96
PNP
0.90

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: **Old Georgetown Rd**
 and: **Poindexter Ln**
 Counted by: **SKN bikes only**

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

Location : **Montgomery County**
 Date : **02/06/2019** Day: **Wednesday**
 Weather : **Cloudy/Some Rain**
 Entered by: **SKN**

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STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: Poindexter Ln				TRAFFIC FROM EAST on: Edson Ln				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-15	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
15-30	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-15	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
09:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM																	
3 HOUR																	
TOTALS	0	4	0	4	0	1	0	1	0	0	1	1	0	1	0	1	7
1 HOUR																	
TOTALS																	
630-730	0	2	0	2	0	0	0	0	0	0	1	1	0	1	0	1	4
645-745	0	2	0	2	0	0	0	0	0	0	1	1	0	1	0	1	4
07-08	0	2	0	2	0	0	0	0	0	0	1	1	0	1	0	1	4
715-815	0	2	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
730-830	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
745-845	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08-09	0	2	0	2	0	1	0	1	0	0	0	0	0	0	0	0	3
815-915	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
830-930	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
PEAK HOUR																	
645-745	0	2	0	2	0	0	0	0	0	0	1	1	0	1	0	1	4
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00-15	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM																	
3 HOUR																	
TOTALS	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
1 HOUR																	
TOTALS																	
02-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215-315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230-330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245-345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315-415	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
330-430	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
345-445	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
04-05	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
PEAK HOUR																	
330-430	0	1	0	1	0	0	0	1	0	0	0	0	0	1	0	1	2

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: Old Georgetown Rd
 and: Nicholson Ln
 Counted by: ET/CB

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Location : Montgomery County
 Date : 02/12/2019
 Weather : Rain
 Entered by: SKN

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Day: Tuesday
 STREET TRAFFIC STUDIES LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: Tilden Ln				TRAFFIC FROM EAST on: Nicholson Ln				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	1	128	7	136	1	46	16	63	5	4	1	10	43	1	2	46	255
45-00	7	199	5	211	2	56	34	92	10	7	4	21	73	2	1	76	400
07:00-15	3	234	7	244	3	70	37	110	38	15	1	54	67	5	2	74	482
15-30	2	284	3	289	8	107	65	180	52	11	3	66	115	11	1	127	662
30-45	6	282	8	296	14	159	83	256	30	23	7	60	122	10	1	133	745
45-00	12	271	5	288	27	178	116	321	42	22	7	71	128	21	0	149	829
08:00-15	13	286	8	307	36	217	90	343	32	23	6	61	120	20	0	140	851
15-30	14	240	7	261	21	204	87	312	34	26	11	71	115	17	1	133	777
30-45	6	244	12	262	6	205	84	295	26	12	5	43	107	16	0	123	723
45-00	8	251	10	269	16	183	104	303	19	16	7	42	89	17	1	107	721
09:00-15	8	235	11	254	16	230	74	320	19	17	7	43	97	21	1	119	736
15-30	3	210	6	219	9	175	65	249	22	17	9	48	74	10	1	85	601
AM 3 HOUR TOTALS	83	2864	89	3036	159	1830	855	2844	329	193	68	590	1150	151	11	1312	7782
1 HOUR TOTALS																	
630-730	13	845	22	880	14	279	152	445	105	37	9	151	298	19	6	323	1799
645-745	18	999	23	1040	27	392	219	638	130	56	15	201	377	28	5	410	2289
07-08	23	1071	23	1117	52	514	301	867	162	71	18	251	432	47	4	483	2718
715-815	33	1123	24	1180	85	661	354	1100	156	79	23	258	485	62	2	549	3087
730-830	45	1079	28	1152	98	758	376	1232	138	94	31	263	485	68	2	555	3202
745-845	45	1041	32	1118	90	804	377	1271	134	83	29	246	470	74	1	545	3180
08-09	41	1021	37	1099	79	809	365	1253	111	77	29	217	431	70	2	503	3072
815-915	36	970	40	1046	59	822	349	1230	98	71	30	199	408	71	3	482	2957
830-930	25	940	39	1004	47	793	327	1167	86	62	28	176	367	64	3	434	2781
PEAK HOUR 730-830	45	1079	28	1152	98	758	376	1232	138	94	31	263	485	68	2	555	3202
PM																	
02:00-15	9	197	8	214	6	176	60	242	3	6	2	11	77	10	5	92	559
15-30	9	192	8	209	7	146	71	224	4	3	0	7	94	14	4	112	552
30-45	8	179	5	192	16	172	58	246	4	2	6	12	83	5	2	90	540
45-00	8	181	11	200	24	199	86	309	10	3	2	15	90	14	2	106	630
03:00-15	7	183	7	197	15	194	78	287	2	12	1	15	63	12	4	79	578
15-30	10	185	9	204	12	190	90	292	4	14	5	23	92	24	3	119	638
30-45	7	198	10	215	18	218	99	335	5	7	1	13	83	6	5	94	657
45-00	14	198	8	220	14	220	113	347	2	2	3	7	103	20	3	126	700
04:00-15	11	209	4	224	25	211	86	322	2	2	0	4	121	31	0	152	702
15-30	18	217	3	238	27	238	103	368	6	2	4	12	84	16	2	102	720
30-45	12	246	9	267	17	254	88	359	3	4	2	9	111	32	0	143	778
45-00	12	207	9	228	15	248	109	372	1	2	0	3	94	20	2	116	719
PM 3 HOUR TOTALS	125	2392	91	2608	196	2466	1041	3703	46	59	26	131	1095	204	32	1331	7773
1 HOUR TOTALS																	
02-03	34	749	32	815	53	693	275	1021	21	14	10	45	344	43	13	400	2281
215-315	32	735	31	798	62	711	293	1066	20	20	9	49	330	45	12	387	2300
230-330	33	728	32	793	67	755	312	1134	20	31	14	65	328	55	11	394	2386
245-345	32	747	37	816	69	801	353	1223	21	36	9	66	328	56	14	398	2503
03-04	38	764	34	836	59	822	380	1261	13	35	10	58	341	62	15	418	2573
315-415	42	790	31	863	69	839	388	1296	13	25	9	47	399	81	11	491	2697
330-430	50	822	25	897	84	887	401	1372	15	13	8	36	391	73	10	474	2779
345-445	55	870	24	949	83	923	390	1396	13	10	9	32	419	99	5	523	2900
04-05	53	879	25	957	84	951	386	1421	12	10	6	28	410	99	4	513	2919
PEAK HOUR 04-05	53	879	25	957	84	951	386	1421	12	10	6	28	410	99	4	513	2919

PHF
0.94

PHF
0.91

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: Old Georgetown Rd
 and: Nicholson Ln
 Counted by: ET/CB bikes only

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Location : Montgomery County
 Date : 02/12/2019 Day: Tuesday
 Weather : Rain
 Entered by: SKN

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STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on: Tilden Ln				TRAFFIC FROM EAST on: Nicholson Ln				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM																	
3 HOUR																	
TOTALS	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
1 HOUR																	
TOTALS																	
630-730	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
645-745	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07-08	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
715-815	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
730-830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
745-845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
815-915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
830-930	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR																	
645-745	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM																	
3 HOUR																	
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 HOUR																	
TOTALS																	
02-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215-315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230-330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245-345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315-415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR																	
04-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

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Intersection of: **Tuckerman Ln**
 and: **Gloxinia Dr**
 Counted by: **SKN**

Location : **Montgomery County**
 Date : **02/05/2019** Day: **Tuesday**
 Weather : **Sunny**
 Entered by: **SKN**

STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Gloxinia Dr				TRAFFIC FROM SOUTH on: Gloxinia Dr				TRAFFIC FROM WEST on: Tuckerman Ln				TRAFFIC FROM EAST on: Tuckerman Ln				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	7	0	1	8	2	0	0	2	5	58	0	63	3	54	0	57	130
45-00	15	0	2	17	4	0	2	6	3	82	0	85	1	76	0	77	185
07:00-15	18	0	5	23	11	0	1	12	1	97	1	99	1	89	7	97	231
15-30	7	1	1	9	6	0	0	6	2	68	2	72	1	85	5	91	178
30-45	21	1	6	28	22	1	4	27	18	175	4	197	0	179	3	182	434
45-00	7	0	1	8	5	0	2	7	3	149	2	154	2	107	0	109	278
08:00-15	18	0	3	21	18	0	2	20	7	174	5	186	0	200	1	201	428
15-30	21	1	1	23	14	3	6	23	2	161	2	165	0	183	3	186	397
30-45	17	1	1	19	10	0	3	13	6	143	5	154	1	146	2	149	335
45-00	14	2	1	17	10	0	1	11	3	81	3	87	1	101	2	104	219
09:00-15	17	0	5	22	13	4	4	21	6	105	1	112	2	156	7	165	320
15-30	14	0	0	14	7	0	1	8	4	75	4	83	14	100	2	116	221
AM 3 HOUR TOTALS	176	6	27	209	122	8	26	156	60	1368	29	1457	26	1476	32	1534	3356
1 HOUR TOTALS																	
630-730	47	1	9	57	23	0	3	26	11	305	3	319	6	304	12	322	724
645-745	61	2	14	77	43	1	7	51	24	422	7	453	3	429	15	447	1028
07-08	53	2	13	68	44	1	7	52	24	489	9	522	4	460	15	479	1121
715-815	53	2	11	66	51	1	8	60	30	566	13	609	3	571	9	583	1318
730-830	67	2	11	80	59	4	14	77	30	659	13	702	2	669	7	678	1537
745-845	63	2	6	71	47	3	13	63	18	627	14	659	3	636	6	645	1438
08-09	70	4	6	80	52	3	12	67	18	559	15	592	2	630	8	640	1379
815-915	69	4	8	81	47	7	14	68	17	490	11	518	4	586	14	604	1271
830-930	62	3	7	72	40	4	9	53	19	404	13	436	18	503	13	534	1095
PEAK HOUR 730-830	67	2	11	80	59	4	14	77	30	659	13	702	2	669	7	678	1537
PM																	
02:00-15	6	1	0	7	1	0	8	9	8	80	4	92	0	98	10	108	216
15-30	3	2	0	5	1	0	6	7	6	84	1	91	0	115	1	116	219
30-45	3	0	1	4	1	0	8	9	9	147	10	166	0	89	1	90	269
45-00	5	0	0	5	8	0	5	13	6	134	11	151	3	144	2	149	318
03:00-15	5	0	0	5	0	0	6	6	11	115	7	133	0	129	4	133	277
15-30	6	0	0	6	1	0	5	6	6	122	14	142	2	121	2	125	279
30-45	8	0	1	9	1	0	8	9	9	129	7	145	0	105	3	108	271
45-00	10	2	3	15	0	1	2	3	8	142	11	161	3	129	2	134	313
04:00-15	7	0	2	9	3	2	12	17	9	132	13	154	6	142	6	154	334
15-30	7	0	2	9	1	0	12	13	16	151	8	175	2	151	2	155	352
30-45	6	1	3	10	3	3	5	11	12	178	20	210	2	170	4	176	407
45-00	7	2	0	9	3	1	6	10	16	199	14	229	2	147	5	154	402
PM 3 HOUR TOTALS	73	8	12	93	23	7	83	113	116	1613	120	1849	20	1540	42	1602	3657
1 HOUR TOTALS																	
02-03	17	3	1	21	11	0	27	38	29	445	26	500	3	446	14	463	1022
215-315	16	2	1	19	10	0	25	35	32	480	29	541	3	477	8	488	1083
230-330	19	0	1	20	10	0	24	34	32	518	42	592	5	483	9	497	1143
245-345	24	0	1	25	10	0	24	34	32	500	39	571	5	499	11	515	1145
03-04	29	2	4	35	2	1	21	24	34	508	39	581	5	484	11	500	1140
315-415	31	2	6	39	5	3	27	35	32	525	45	602	11	497	13	521	1197
330-430	32	2	8	42	5	3	34	42	42	554	39	635	11	527	13	551	1270
345-445	30	3	10	43	7	6	31	44	45	603	52	700	13	592	14	619	1406
04-05	27	3	7	37	10	6	35	51	53	660	55	768	12	610	17	639	1495
PEAK HOUR 04-05	27	3	7	37	10	6	35	51	53	660	55	768	12	610	17	639	1495

PHF
0.89

PHF
0.85

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

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Intersection of: **Tuckerman Ln**
 and: **Gloxinia Dr**
 Counted by: **SKN** **bikes only**

Location : **Montgomery County**
 Date : **02/05/2019** Day: **Tuesday**
 Weather : **Sunny**
 Entered by: **SKN**

STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Gloxinia Dr				TRAFFIC FROM SOUTH on: Gloxinia Dr				TRAFFIC FROM WEST on: Tuckerman Ln				TRAFFIC FROM EAST on: Tuckerman Ln				TOTAL N+S + E+W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
09:00-15	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM 3 HOUR TOTALS	0	0	0	0	0	0	0	0	0	3	0	3	0	3	0	3	6
1 HOUR TOTALS																	
630-730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645-745	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07-08	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
715-815	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
730-830	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
745-845	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
08-09	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
815-915	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
830-930	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4
PEAK HOUR 815-915	0	0	0	0	0	0	0	0	0	2	0	2	0	3	0	3	5
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
15-30	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
03:00-15	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
15-30	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
30-45	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	2
45-00	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	2	3
04:00-15	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
15-30	0	0	0	0	0	2	0	2	0	1	0	1	0	2	0	2	5
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
45-00	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	3
PM 3 HOUR TOTALS	1	0	0	1	1	3	0	4	0	7	0	7	0	12	0	12	24
1 HOUR TOTALS																	
02-03	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	2	4
215-315	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
230-330	0	0	0	0	0	0	0	0	0	3	0	3	0	1	0	1	4
245-345	0	0	0	0	1	1	0	2	0	3	0	3	0	1	0	1	6
03-04	1	0	0	1	1	1	0	2	0	2	0	2	0	3	0	3	8
315-415	1	0	0	1	1	1	0	2	0	2	0	2	0	5	0	5	10
330-430	1	0	0	1	1	3	0	4	0	2	0	2	0	6	0	6	13
345-445	1	0	0	1	0	2	0	2	0	2	0	2	0	7	0	7	12
04-05	0	0	0	0	0	2	0	2	0	3	0	3	0	7	0	7	12
PEAK HOUR 330-430	1	0	0	1	1	3	0	4	0	2	0	2	0	6	0	6	13

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APPENDIX C

CAPACITY WORKSHEETS - EXISTING CONDITIONS




















HCM Signalized Intersection Capacity Analysis
 19: MD 187 & NB I 270 Ramp

Existing Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	113	13	529	147	1160	0	0	1844	754
Future Volume (vph)	0	0	0	113	13	529	147	1160	0	0	1844	754
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.86			0.81	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Fl _t Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1702	1583	3433	6408			7544	1583
Fl _t Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1702	1583	3433	6408			7544	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	122	14	569	158	1247	0	0	1983	811
RTOR Reduction (vph)	0	0	0	0	0	44	0	0	0	0	0	409
Lane Group Flow (vph)	0	0	0	67	69	525	158	1247	0	0	1983	402
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				54.2	54.2	54.2	10.6	81.8			64.7	64.7
Effective Green, g (s)				54.2	54.2	54.2	10.6	81.8			64.7	64.7
Actuated g/C Ratio				0.36	0.36	0.36	0.07	0.55			0.43	0.43
Clearance Time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				607	614	571	242	3494			3253	682
v/s Ratio Prot							c0.05	0.19			c0.26	
v/s Ratio Perm				0.04	0.04	c0.33						0.25
v/c Ratio				0.11	0.11	0.92	0.65	0.36			0.61	0.59
Uniform Delay, d ₁				31.9	31.9	45.8	67.9	19.3			32.9	32.5
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.01	1.61
Incremental Delay, d ₂				0.1	0.1	19.9	6.2	0.3			0.4	1.5
Delay (s)				31.9	32.0	65.7	74.1	19.5			33.5	54.0
Level of Service				C	C	E	E	B			C	D
Approach Delay (s)		0.0			59.2			25.7			39.4	
Approach LOS		A			E			C			D	
Intersection Summary												
HCM 2000 Control Delay			38.3	HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			150.0	Sum of lost time (s)				20.5				
Intersection Capacity Utilization			72.1%	ICU Level of Service				C				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
19: MD 187 & NB I 270 Ramp

Existing Traffic Volumes
Evening Peak Hour
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	85	8	249	287	1675	0	0	1120	458
Future Volume (vph)	0	0	0	85	8	249	287	1675	0	0	1120	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.86			0.81	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1700	1583	3433	6408			7544	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1700	1583	3433	6408			7544	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	91	9	268	309	1801	0	0	1204	492
RTOR Reduction (vph)	0	0	0	0	0	57	0	0	0	0	0	212
Lane Group Flow (vph)	0	0	0	50	50	211	309	1801	0	0	1204	280
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				25.3	25.3	25.3	18.8	110.7			85.4	85.4
Effective Green, g (s)				25.3	25.3	25.3	18.8	110.7			85.4	85.4
Actuated g/C Ratio				0.17	0.17	0.17	0.13	0.74			0.57	0.57
Clearance Time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				283	286	266	430	4729			4295	901
v/s Ratio Prot							c0.09	c0.28			0.16	
v/s Ratio Perm				0.03	0.03	c0.13						0.18
v/c Ratio				0.18	0.17	0.79	0.72	0.38			0.28	0.31
Uniform Delay, d1				53.4	53.4	59.8	63.1	7.2			16.6	16.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			0.84	1.53
Incremental Delay, d2				0.3	0.3	14.8	5.7	0.2			0.1	0.7
Delay (s)				53.7	53.7	74.6	68.7	7.4			14.1	26.6
Level of Service				D	D	E	E	A			B	C
Approach Delay (s)		0.0			68.9			16.4			17.7	
Approach LOS		A			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary
14: MD 187 & Tuckerman La

Existing Traffic Volumes
Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	450	135	623	294	66	166	1110	306	37	1576	122
Future Volume (veh/h)	174	450	135	623	294	66	166	1110	306	37	1576	122
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	176	455	136	629	297	67	168	1121	309	37	1592	123
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	610	478	142	677	696	311	194	2169	675	193	1844	142
Arrive On Green	0.18	0.18	0.18	0.20	0.20	0.20	0.07	0.43	0.43	0.03	0.38	0.38
Sat Flow, veh/h	3442	2693	799	3442	3539	1583	1774	5085	1583	1774	4816	372
Grp Volume(v), veh/h	176	298	293	629	297	67	168	1121	309	37	1120	595
Grp Sat Flow(s),veh/h/ln	1721	1770	1722	1721	1770	1583	1774	1695	1583	1774	1695	1797
Q Serve(g_s), s	6.7	25.0	25.3	26.9	11.0	5.3	8.4	24.3	20.9	1.9	45.7	45.8
Cycle Q Clear(g_c), s	6.7	25.0	25.3	26.9	11.0	5.3	8.4	24.3	20.9	1.9	45.7	45.8
Prop In Lane	1.00		0.46	1.00		1.00	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	610	314	305	677	696	311	194	2169	675	193	1299	688
V/C Ratio(X)	0.29	0.95	0.96	0.93	0.43	0.22	0.87	0.52	0.46	0.19	0.86	0.86
Avail Cap(c_a), veh/h	610	314	305	688	708	317	214	2169	675	214	1299	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	61.0	61.2	59.2	52.8	50.5	34.6	31.6	30.7	27.9	42.6	42.7
Incr Delay (d2), s/veh	0.3	37.4	40.7	13.1	0.3	0.2	27.5	0.9	2.2	0.5	7.7	13.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	15.5	15.5	14.1	5.4	2.4	5.5	11.6	9.5	0.9	22.7	25.2
LnGrp Delay(d),s/veh	53.8	98.4	101.9	72.3	53.1	50.7	62.2	32.5	32.9	28.4	50.4	56.2
LnGrp LOS	D	F	F	E	D	D	E	C	C	C	D	E
Approach Vol, veh/h		767			993			1598				1752
Approach Delay, s/veh		89.5			65.1			35.7				51.9
Approach LOS		F			E			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.4	70.5		33.1	16.9	64.0		36.0				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	5.7	61.7		26.6	12.2	55.2		30.0				
Max Q Clear Time (g_c+I1), s	3.9	26.3		27.3	10.4	47.8		28.9				
Green Ext Time (p_c), s	0.0	11.8		0.0	0.1	5.7		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay				55.1								
HCM 2010 LOS				E								




















HCM 2010 Signalized Intersection Summary
 14: MD 187 & Tuckerman La

Existing Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	239	156	114	337	217	35	189	1349	274	53	1110	198
Future Volume (veh/h)	239	156	114	337	217	35	189	1349	274	53	1110	198
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	260	170	124	366	236	38	205	1466	298	58	1207	215
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	216	148	443	456	204	297	2848	887	205	2265	403
Arrive On Green	0.11	0.11	0.11	0.13	0.13	0.13	0.07	0.56	0.56	0.03	0.52	0.52
Sat Flow, veh/h	3442	2007	1382	3442	3539	1583	1774	5085	1583	1774	4343	774
Grp Volume(v), veh/h	260	149	145	366	236	38	205	1466	298	58	942	480
Grp Sat Flow(s),veh/h/ln	1721	1770	1619	1721	1770	1583	1774	1695	1583	1774	1695	1726
Q Serve(g_s), s	10.9	12.3	13.2	15.6	9.3	3.2	7.9	26.7	15.3	2.3	27.6	27.6
Cycle Q Clear(g_c), s	10.9	12.3	13.2	15.6	9.3	3.2	7.9	26.7	15.3	2.3	27.6	27.6
Prop In Lane	1.00		0.85	1.00		1.00	1.00		1.00	1.00		0.45
Lane Grp Cap(c), veh/h	370	190	174	443	456	204	297	2848	887	205	1768	900
V/C Ratio(X)	0.70	0.78	0.84	0.83	0.52	0.19	0.69	0.51	0.34	0.28	0.53	0.53
Avail Cap(c_a), veh/h	424	218	200	562	578	259	455	2848	887	229	1768	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.65	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.6	65.2	65.6	63.7	61.0	58.3	19.8	20.4	17.9	17.4	23.8	23.8
Incr Delay (d2), s/veh	4.4	14.8	23.0	5.3	0.6	0.3	2.9	0.7	1.0	0.7	1.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	6.8	7.0	7.7	4.6	1.4	4.1	12.7	7.0	1.1	13.2	13.8
LnGrp Delay(d),s/veh	69.0	80.0	88.7	69.0	61.6	58.6	22.6	21.1	18.9	18.2	24.9	26.0
LnGrp LOS	E	F	F	E	E	E	C	C	B	B	C	C
Approach Vol, veh/h		554			640			1969			1480	
Approach Delay, s/veh		77.1			65.7			20.9			25.0	
Approach LOS		E			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	90.5		22.6	16.8	84.7		25.8				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	6.6	74.4		18.5	23.7	57.3		24.5				
Max Q Clear Time (g_c+I1), s	4.3	28.7		15.2	9.9	29.6		17.6				
Green Ext Time (p_c), s	0.0	18.2		0.9	0.5	12.1		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			35.1									
HCM 2010 LOS			D									

HCM Signalized Intersection Capacity Analysis
 8: MD 187 & Poindexter La/Edson La




















Existing Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	12	150	0	26	29	1174	146	50	1635	35
Future Volume (vph)	8	0	12	150	0	26	29	1174	146	50	1635	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor		1.00		1.00		1.00	1.00	0.91		1.00	0.91	
Fr't		0.92		1.00		0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.98		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1675		1770		1583	1770	5001		1770	5070	
Flt Permitted		0.98		0.74		1.00	0.11	1.00		0.17	1.00	
Satd. Flow (perm)		1675		1385		1583	210	5001		325	5070	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	0	12	156	0	27	30	1223	152	52	1703	36
RTOR Reduction (vph)	0	18	0	0	0	23	0	7	0	0	1	0
Lane Group Flow (vph)	0	3	0	156	0	4	30	1368	0	52	1738	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.3		22.3		22.3	116.2	116.2		116.2	116.2	
Effective Green, g (s)		22.3		22.3		22.3	116.2	116.2		116.2	116.2	
Actuated g/C Ratio		0.15		0.15		0.15	0.77	0.77		0.77	0.77	
Clearance Time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		249		205		235	162	3874		251	3927	
v/s Ratio Prot								0.27			c0.34	
v/s Ratio Perm		0.00		c0.11		0.00	0.14			0.16		
v/c Ratio		0.01		0.76		0.02	0.19	0.35		0.21	0.44	
Uniform Delay, d1		54.5		61.3		54.5	4.4	5.2		4.5	5.8	
Progression Factor		1.00		1.00		1.00	1.00	1.00		0.52	0.61	
Incremental Delay, d2		0.0		15.3		0.0	2.5	0.3		1.6	0.3	
Delay (s)		54.5		76.6		54.5	7.0	5.5		4.0	3.9	
Level of Service		D		E		D	A	A		A	A	
Approach Delay (s)		54.5			73.3			5.5			3.9	
Approach LOS		D			E			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.6									A
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			150.0							11.5		
Intersection Capacity Utilization			65.3%									C
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 8: MD 187 & Poindexter La/Edson La

Existing Traffic Volumes
 Evening Peak Hour






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	8	207	0	23	44	1404	190	26	1201	9
Future Volume (vph)	6	0	8	207	0	23	44	1404	190	26	1201	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor		1.00		1.00		1.00	1.00	0.91		1.00	0.91	
Frt		0.92		1.00		0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.98		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684		1770		1583	1770	4994		1770	5080	
Flt Permitted		0.98		0.75		1.00	0.17	1.00		0.10	1.00	
Satd. Flow (perm)		1684		1392		1583	326	4994		190	5080	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	0	9	230	0	26	49	1560	211	29	1334	10
RTOR Reduction (vph)	0	13	0	0	0	21	0	8	0	0	0	0
Lane Group Flow (vph)	0	3	0	230	0	5	49	1763	0	29	1344	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		30.5		30.5		30.5	108.0	108.0		108.0	108.0	
Effective Green, g (s)		30.5		30.5		30.5	108.0	108.0		108.0	108.0	
Actuated g/C Ratio		0.20		0.20		0.20	0.72	0.72		0.72	0.72	
Clearance Time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		342		283		321	234	3595		136	3657	
v/s Ratio Prot								c0.35			0.26	
v/s Ratio Perm		0.00		c0.17		0.00	0.15			0.15		
v/c Ratio		0.01		0.81		0.02	0.21	0.49		0.21	0.37	
Uniform Delay, d1		47.7		57.0		47.8	6.9	9.1		6.9	8.0	
Progression Factor		1.00		1.00		1.00	1.00	1.00		0.72	0.78	
Incremental Delay, d2		0.0		16.1		0.0	2.0	0.5		3.5	0.3	
Delay (s)		47.7		73.1		47.8	8.9	9.6		8.5	6.5	
Level of Service		D		E		D	A	A		A	A	
Approach Delay (s)		47.7			70.6			9.6			6.6	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group






















HCM 2010 Signalized Intersection Summary
 3: MD 187 & Tilden La/Nicholson La

Existing Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	94	138	485	68	2	98	758	376	28	1079	45
Future Volume (veh/h)	31	94	138	485	68	2	98	758	376	28	1079	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	33	100	147	516	72	2	104	806	400	30	1148	48
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	150	172	593	311	9	290	1859	832	268	2540	106
Arrive On Green	0.11	0.11	0.11	0.17	0.17	0.17	0.04	0.53	0.53	0.02	0.51	0.51
Sat Flow, veh/h	457	1383	1583	3442	1804	50	1774	3539	1583	1774	5007	209
Grp Volume(v), veh/h	133	0	147	516	0	74	104	806	400	30	777	419
Grp Sat Flow(s),veh/h/ln	1840	0	1583	1721	0	1854	1774	1770	1583	1774	1695	1826
Q Serve(g_s), s	10.4	0.0	13.7	21.9	0.0	5.2	4.2	21.0	24.1	1.2	22.0	22.0
Cycle Q Clear(g_c), s	10.4	0.0	13.7	21.9	0.0	5.2	4.2	21.0	24.1	1.2	22.0	22.0
Prop In Lane	0.25		1.00	1.00		0.03	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	200	0	172	593	0	320	290	1859	832	268	1720	926
V/C Ratio(X)	0.67	0.00	0.85	0.87	0.00	0.23	0.36	0.43	0.48	0.11	0.45	0.45
Avail Cap(c_a), veh/h	245	0	211	837	0	451	376	1859	832	291	1720	926
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.2	0.0	65.7	60.4	0.0	53.5	18.3	21.9	22.6	18.0	23.6	23.6
Incr Delay (d2), s/veh	4.9	0.0	23.7	7.2	0.0	0.4	0.7	0.7	2.0	0.2	0.9	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	7.1	11.0	0.0	2.7	2.1	10.5	11.0	0.6	10.5	11.5
LnGrp Delay(d),s/veh	69.1	0.0	89.4	67.6	0.0	53.9	19.0	22.6	24.6	18.2	24.5	25.2
LnGrp LOS	E		F	E		D	B	C	C	B	C	C
Approach Vol, veh/h		280			590			1310			1226	
Approach Delay, s/veh		79.8			65.9			22.9			24.6	
Approach LOS		E			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	85.3		22.3	11.8	82.6		33.4				
Change Period (Y+Rc), s	5.5	6.5		6.0	5.5	6.5		7.5				
Max Green Setting (Gmax), s	5.5	62.5		20.0	13.5	54.5		36.5				
Max Q Clear Time (g_c+I1), s	3.2	26.1		15.7	6.2	24.0		23.9				
Green Ext Time (p_c), s	0.0	8.7		0.6	0.1	9.8		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			35.6									
HCM 2010 LOS			D									




















HCM 2010 Signalized Intersection Summary
 3: MD 187 & Tilden La/Nicholson La

Existing Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	20	20	330	45	12	62	711	293	31	735	32
Future Volume (veh/h)	9	20	20	330	45	12	62	711	293	31	735	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	10	22	22	363	49	13	68	781	322	34	808	35
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	19	42	42	435	179	48	477	2296	1027	372	3212	139
Arrive On Green	0.03	0.03	0.03	0.13	0.13	0.13	0.03	0.65	0.65	0.03	0.64	0.64
Sat Flow, veh/h	643	1411	1393	3442	1420	377	1774	3539	1583	1774	4999	216
Grp Volume(v), veh/h	28	0	26	363	0	62	68	781	322	34	547	296
Grp Sat Flow(s),veh/h/ln	1831	0	1617	1721	0	1796	1774	1770	1583	1774	1695	1825
Q Serve(g_s), s	2.3	0.0	2.3	15.5	0.0	4.7	1.9	14.9	13.5	1.0	10.3	10.4
Cycle Q Clear(g_c), s	2.3	0.0	2.3	15.5	0.0	4.7	1.9	14.9	13.5	1.0	10.3	10.4
Prop In Lane	0.35		0.86	1.00		0.21	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	55	0	48	435	0	227	477	2296	1027	372	2178	1172
V/C Ratio(X)	0.52	0.00	0.53	0.84	0.00	0.27	0.14	0.34	0.31	0.09	0.25	0.25
Avail Cap(c_a), veh/h	232	0	205	769	0	401	545	2296	1027	416	2178	1172
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.7	0.0	71.7	64.0	0.0	59.3	8.7	11.9	11.6	9.1	11.4	11.4
Incr Delay (d2), s/veh	7.5	0.0	8.7	4.3	0.0	0.6	0.1	0.4	0.8	0.1	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.2	7.6	0.0	2.4	1.0	7.4	6.1	0.5	4.9	5.3
LnGrp Delay(d),s/veh	79.2	0.0	80.4	68.3	0.0	59.9	8.8	12.3	12.4	9.2	11.7	12.0
LnGrp LOS	E		F	E		E	A	B	B	A	B	B
Approach Vol, veh/h		54			425			1171			877	
Approach Delay, s/veh		79.8			67.1			12.1			11.7	
Approach LOS		E			E			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	103.8		10.5	10.2	102.9		26.4				
Change Period (Y+Rc), s	5.5	6.5		6.0	5.5	6.5		7.5				
Max Green Setting (Gmax), s	7.5	64.5		19.0	10.5	61.5		33.5				
Max Q Clear Time (g_c+I1), s	3.0	16.9		4.3	3.9	12.4		17.5				
Green Ext Time (p_c), s	0.0	8.2		0.2	0.1	6.7		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			22.7									
HCM 2010 LOS			C									



















HCM 2010 Signalized Intersection Summary
 17: Gloxinia Dr & Tuckerman La

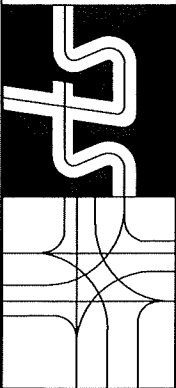
Existing Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	659	30	2	669	7	59	4	14	11	2	67
Future Volume (veh/h)	13	659	30	2	669	7	59	4	14	11	2	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	15	740	34	2	752	8	66	4	16	12	2	75
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	142	952	44	124	940	10	658	44	147	132	45	750
Arrive On Green	0.02	0.28	0.28	0.00	0.26	0.26	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	1774	3446	158	1774	3587	38	1059	78	260	167	80	1324
Grp Volume(v), veh/h	15	380	394	2	371	389	86	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1835	1774	1770	1856	1397	0	0	1572	0	0
Q Serve(g_s), s	0.7	21.8	21.8	0.1	21.5	21.5	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	21.8	21.8	0.1	21.5	21.5	2.4	0.0	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.02	0.77		0.19	0.13		0.84
Lane Grp Cap(c), veh/h	142	489	507	124	464	486	850	0	0	928	0	0
V/C Ratio(X)	0.11	0.78	0.78	0.02	0.80	0.80	0.10	0.00	0.00	0.10	0.00	0.00
Avail Cap(c_a), veh/h	257	869	901	265	869	911	850	0	0	928	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.0	36.7	36.7	31.6	37.9	37.9	10.8	0.0	0.0	10.9	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.7	1.6	0.1	3.2	3.1	0.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	10.9	11.3	0.0	10.9	11.4	1.3	0.0	0.0	1.3	0.0	0.0
LnGrp Delay(d),s/veh	31.2	38.4	38.3	31.7	41.1	41.0	11.1	0.0	0.0	11.1	0.0	0.0
LnGrp LOS	C	D	D	C	D	D	B			B		
Approach Vol, veh/h		789			762			86			89	
Approach Delay, s/veh		38.2			41.0			11.1			11.1	
Approach LOS		D			D			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		68.3	5.3	36.4		68.3	6.8	34.8				
Change Period (Y+Rc), s		6.0	5.0	6.0		6.0	5.0	6.0				
Max Green Setting (Gmax), s		30.0	9.0	54.0		30.0	9.0	54.0				
Max Q Clear Time (g_c+I1), s		4.4	2.1	23.8		4.8	2.7	23.5				
Green Ext Time (p_c), s		0.4	0.0	5.4		0.5	0.0	5.3				
Intersection Summary												
HCM 2010 Ctrl Delay			36.7									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary
17: Gloxinia Dr & Tuckerman La

Existing Traffic Volumes
Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	480	32	3	477	8	10	0	25	1	2	16
Future Volume (veh/h)	29	480	32	3	477	8	10	0	25	1	2	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	34	565	38	4	561	9	12	0	29	1	2	19
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	761	51	131	720	12	296	21	664	57	112	851
Arrive On Green	0.03	0.23	0.23	0.01	0.20	0.20	0.61	0.00	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1774	3366	226	1774	3565	57	413	35	1082	37	182	1386
Grp Volume(v), veh/h	34	297	306	4	278	292	41	0	0	22	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1823	1774	1770	1853	1529	0	0	1605	0	0
Q Serve(g_s), s	1.7	17.1	17.2	0.2	16.4	16.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	17.1	17.2	0.2	16.4	16.4	1.1	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.12	1.00		0.03	0.29		0.71	0.05		0.86
Lane Grp Cap(c), veh/h	162	400	412	131	357	374	982	0	0	1020	0	0
V/C Ratio(X)	0.21	0.74	0.74	0.03	0.78	0.78	0.04	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	287	869	895	300	869	909	982	0	0	1020	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.4	39.6	39.6	35.6	41.6	41.6	8.4	0.0	0.0	8.3	0.0	0.0
Incr Delay (d2), s/veh	0.6	2.4	2.4	0.1	3.7	3.6	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	8.7	9.0	0.1	8.4	8.8	0.5	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	35.0	42.0	42.0	35.7	45.3	45.1	8.5	0.0	0.0	8.3	0.0	0.0
LnGrp LOS	C	D	D	D	D	D	A			A		
Approach Vol, veh/h		637			574			41				22
Approach Delay, s/veh		41.6			45.1			8.5				8.3
Approach LOS		D			D			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		73.6	5.6	30.9		73.6	8.2	28.2				
Change Period (Y+Rc), s		6.0	5.0	6.0		6.0	5.0	6.0				
Max Green Setting (Gmax), s		28.0	11.0	54.0		28.0	11.0	54.0				
Max Q Clear Time (g_c+I1), s		3.1	2.2	19.2		2.6	3.7	18.4				
Green Ext Time (p_c), s		0.2	0.0	4.1		0.1	0.0	3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			41.6									
HCM 2010 LOS			D									



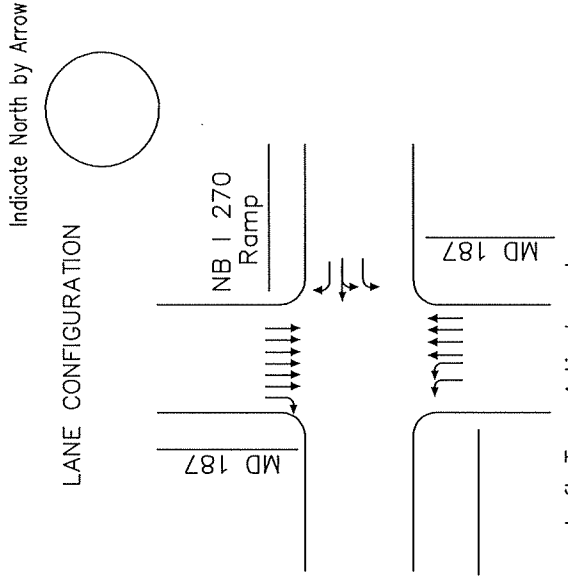
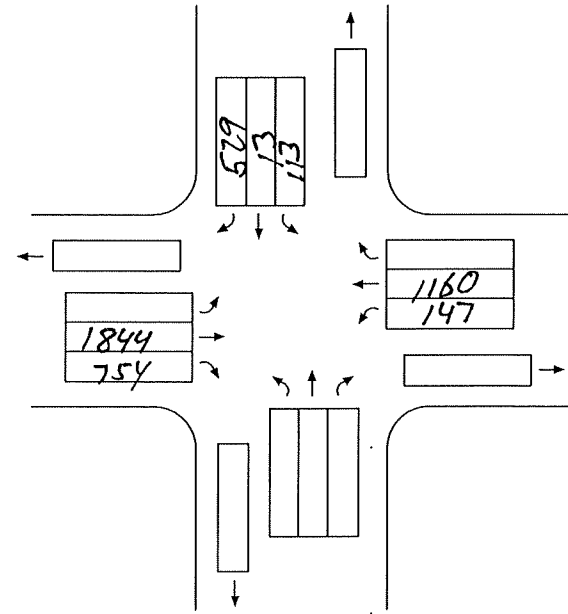
TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: Tu 2/26/19
Conditions/ Design Year: Existing Traffic Volumes
Computed By: MN Date: _____

Location: MD 187 @
NB I 270 Ramp

Morning Peak Hour 7:30 / 8:30 AM

Evening Peak Hour 2:15 / 3:15 PM



Indicate North by Arrow

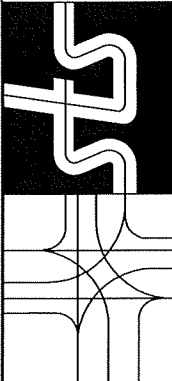
LANE CONFIGURATION

Left Turn Adjustments

Phasing	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Through and Right-Turn Volume		Passenger Car Equivalent	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume	Service Level	Critical Lane Vol. Tot.
					0 to 199	200 to 599									
	NB	1160	0.3	348			1.1	NB	1675	0.3	503	-	503	A	1000 or Less
	SB	1844	0.25	461	1472.6	88	2.0	SB	1120	0.25	280	287+76	452	B	1000 to 1150
	WB	13+113	0.53	67	-	-	3.0	WB	8485	0.53	49	-	49	C	1150 to 1300
							4.0							D	1300 to 1450
							5.0							E	1450 to 1600
							1000+							F	Greater than 1600

∅	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume	Service Level	Critical Lane Volume
	NB	1675	0.3	503	-	503	A	503
	SB	1120	0.25	280	287+76	452	B	452
	WB	8485	0.53	49	-	49	C	49
							D	
							E	
							F	

Remarks:		* critical volume	TOTAL	LEVEL OF SERVICE
		616	552	V/C



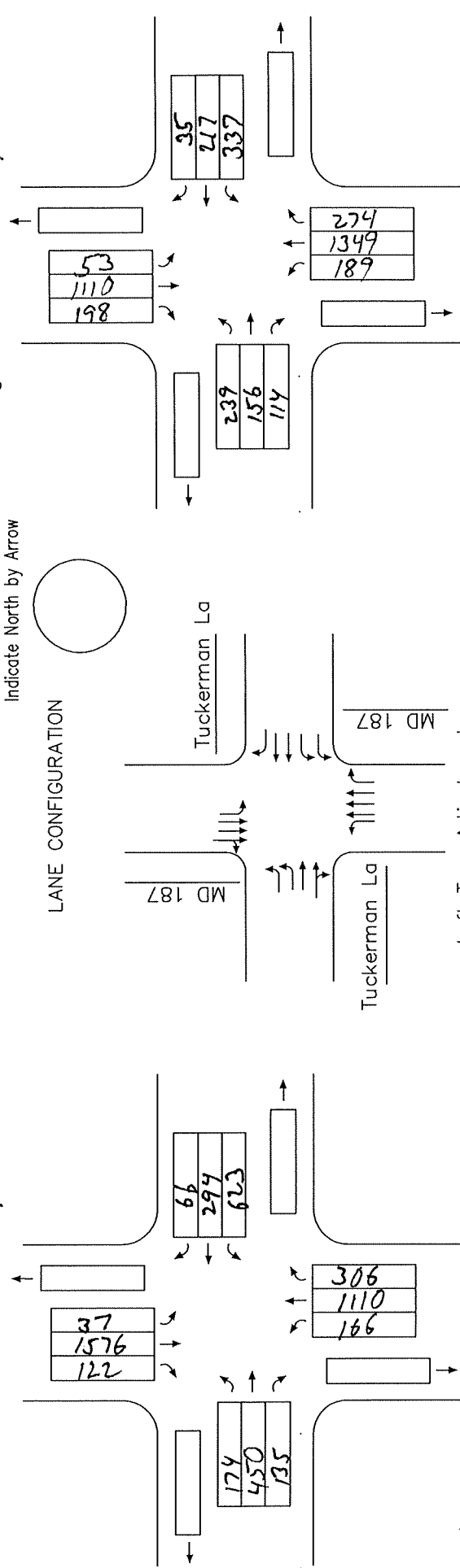
TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: Thurs 2/7/19
 Conditions/ Design Year: Existing Traffic Volumes
 Computed By: MN Date: _____

Location: MD 187 @ Tuckerman La

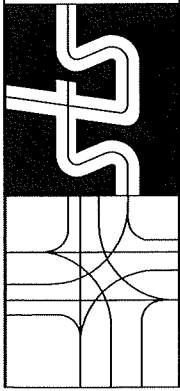
Morning Peak Hour 7:30 / 8:30 AM

Evening Peak Hour 2:15 / 3:15 PM



Phasing Split \emptyset on Tuckerman La

Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)x(2)	Opposing Right-Turn Volume	Passenger Car Equivalent	Movement	Volume (1)	Lane Use Factor (2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume	*	LEVEL OF SERVICE	
													* critical volume	TOTAL
NB	1110	0.37	411	37	NB	1349	0.37	499	53	552				
SB	1576+122	0.37	628	166	SB	1110+198	0.37	484	189	673	✓			
EB	450+135	0.53	310	-	EB	239+156+114	0.53	193	-	193	✓			
WB	623	0.53	374	-	WB	337	0.53	202	-	202	✓			
Remarks:												* critical volume	TOTAL	LEVEL OF SERVICE
Remarks:												* critical volume	TOTAL	LEVEL OF SERVICE
Remarks:												* critical volume	TOTAL	LEVEL OF SERVICE



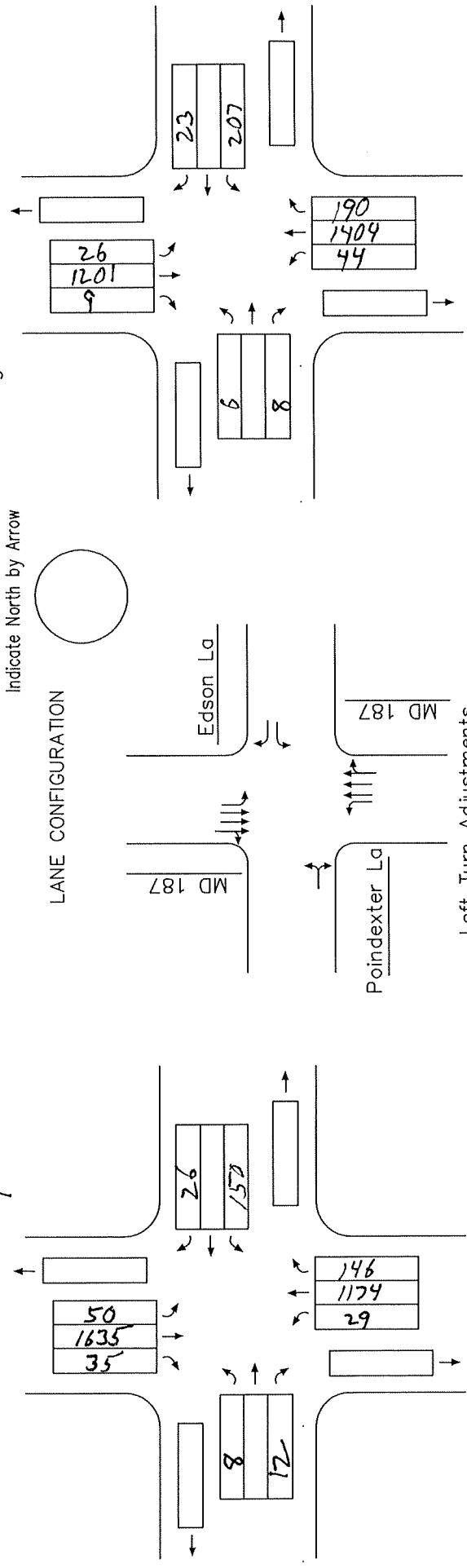
TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: Mo 2/6/19
 Conditions/ Design Year: Existing Traffic Volumes
 Computed By: MN Date: _____

Location: MD 187 @
Poindexter La-Edson La

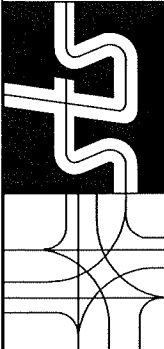
Morning Peak Hour 7:45/8:45 AM

Evening Peak Hour 2:15/3:15 PM



Left Turn Adjustments

Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Right-Turn Volume	Passenger Car Equivalent	Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume	Critical Lane Volume *	Service Level	Critical Lane Vol. Tot.			
																	No. of Lanes	Lane Use Factor	Volume(1)
	NB	1794+146	0.37	488	50	1.1		NB	1404+190	0.37	590	26	616	✓	A	1000 or Less			
	SB	1635+35	0.37	618	29	2.0		SB	1201+9	0.37	448	44	492		B	1000 to 1150			
	EB	8+12	1.0	20	153	3.0		EB	6+8	1.0	14	207	221	✓	C	1150 to 1300			
	WB	150	1.0	150	8	4.0		WB	207	1.0	207	6	213		D	1300 to 1450			
						5.0									E	1450 to 1600			
						1000+									F	Greater than 1600			
Remarks: * critical volume TOTAL 820														LEVEL OF SERVICE		TOTAL 837		V/C	
Remarks: V/C														LEVEL OF SERVICE		TOTAL 837		V/C	



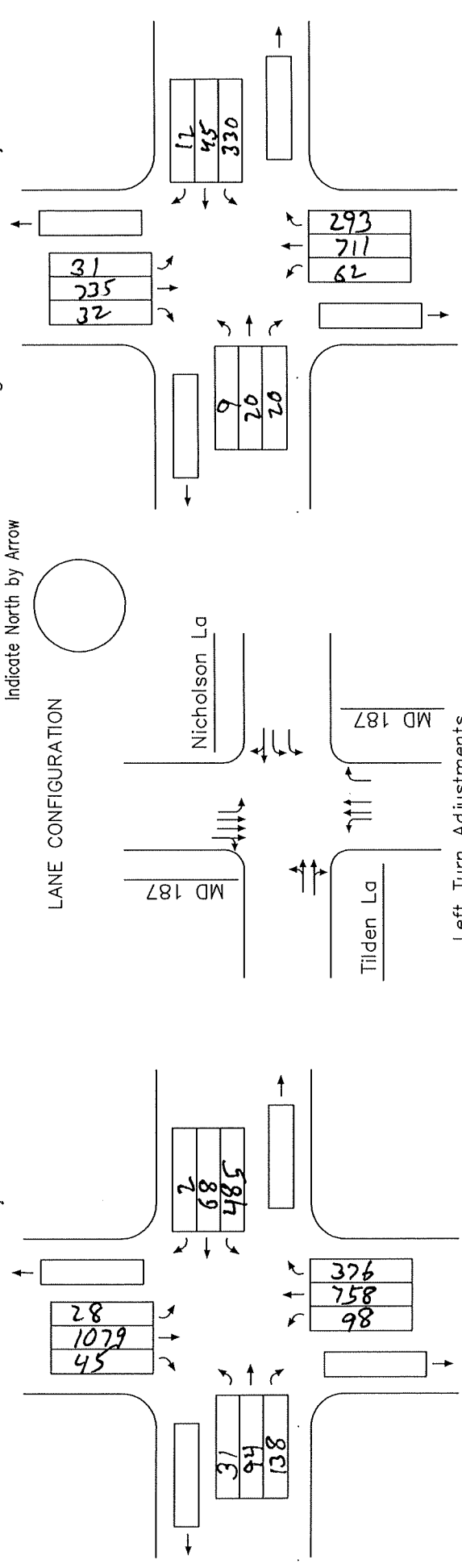
TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: Tu 2/12/19
 Conditions/ Design Year: Existing Traffic Volumes
 Computed By: MN Date: _____

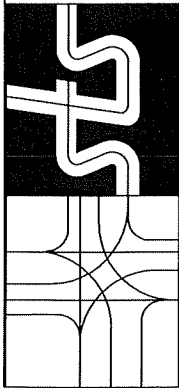
Location: MD 187 @
Tilden La-Nicholson La

Morning Peak Hour 7:30/8:30 AM

Evening Peak Hour 2:15/3:15 PM



Ø	Movement	Lane Volume		Passenger Car Equivalent	Ø	Movement	Volume(1)	Lane Use Factor(2)	Critical Lane Volume *	Opposing Lefts	Right-Turn Volume	Left Turn Adjustments	No. of Lanes	Lane Use Factor	Service Level	Critical Lane Vol. Tot.	Critical Lane Volume *	
		Volume(1)	Factor(2)															Volume(1)
	NB	758	0.37	402		NB	711	0.37	430	28	0 to 199		1	1.00	A	1000 or Less	408	
	SB	1079+45	0.37	416		SB	735+32	0.37	514	98	200 to 599		2	.53	B	1000 to 1150	346	
	EB	31+94+138	0.53	139		EB	9+20+20	0.53	139	-	600 to 799		3	.37	C	1150 to 1300	26	
	WB	485	0.6	291		WB	330	0.6	291	-	800 to 999		4	.30	D	1300 to 1450	198	
											1000+		5	.25	E	1450 to 1600		
															F	Greater than 1600		
Remarks: * critical volume										TOTAL	949		V/C		TOTAL		632	V/C
Remarks: LEVEL OF SERVICE										TOTAL	LEVEL OF SERVICE		LEVEL OF SERVICE		LEVEL OF SERVICE		LEVEL OF SERVICE	



TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: TR 2/5/19
Conditions/ Design Year: Existing Traffic Volumes
Computed By: MN Date: _____

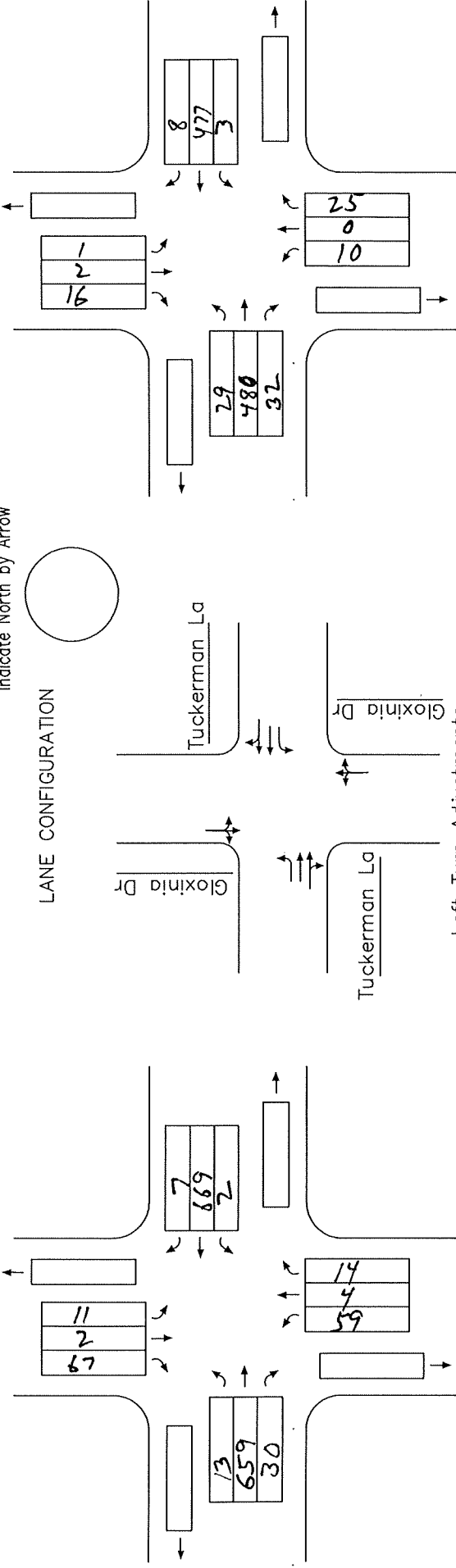
Location: Tuckerman La @
Gloxinia Dr

Morning Peak Hour 7:30/8:30 AM

Evening Peak Hour 2:15/3:15 PM

Indicate North by Arrow

LANE CONFIGURATION



Phasing

Left Turn Adjustments

Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Right-Turn Volume	Passenger Car Equivalent	Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume *	Service Level	Critical Lane Vol. Tot.	Critical Lane Volume *
	NB	65+4+14	1.0	83	0 to 199	1.1		NB	11+25	1.0	36	1	37	A = 1000 or Less	37	✓
	SB	12+2+67	1.0	81	200 to 599	2.0		SB	1+2+16	1.0	19	10	29	B = 1000 to 1150	29	
	EB	659+30	0.53	365	600 to 799	3.0		EB	480+32	0.53	271	3	274	C = 1150 to 1300	274	
	WB	669+7	0.53	358	800 to 999	4.0		WB	477+8	0.53	257	29	286	D = 1300 to 1450	286	✓
					1000+	5.0								E = 1450 to 1600		
														F = Greater than 1600		

Remarks:

Remarks:

* critical volume	TOTAL	V/C	* critical volume	TOTAL	V/C
	511			323	
LEVEL OF SERVICE			LEVEL OF SERVICE		

APPENDIX D

PLANNED DEVELOPMENT DATA

Mike Nalepa

From: Axler, Ed <ed.axler@montgomeryplanning.org>
Sent: Wednesday, January 16, 2019 9:53 AM
To: Mike Nalepa
Cc: Reed, Patrick; Yearwood, Nkosi; Sturgeon, Nancy
Subject: FW: Woodward High School scope - background developments
Attachments: Woodward HS background dev. map.pdf

Mike

As we spoke last week. below is a list of the background developments whose site-generated traffic impact the studied intersections (refer to the attached map for the development's location):

Background developments impacting the MD 187/Tilden Lane-Nicholson Lane intersection:

- 1) Pike & Rose/Mid Pike Center Phases I & II #12012002A, #82012002B & #82012002C for approved & unbuilt 734 (from 1,603 approved) high-rise apts. and unbuilt 682,691 sq. ft. office & 143,835 sq. ft. retail (from the approved 816,6275 sq. ft. office, 371,600 sq. ft. retail, 121,750 sq. ft. restaurant, 285,500 sq. ft. hotel/motel, 31,600 sq. ft. health club, & 61,700 sq. ft. cultural/entertainment/recreation space)
 - o For Phase I approval #82012002A was for 1,142 apts. & 636,200 sq. ft. of commercial space plus 1,000 sq. ft. of additional general retail space.
 - o For Phase II approval #82013012C was for (original 368 – 38 amend. C=) 330 apts. & (original 202,115 + 255 amend. C=) 202,370 sq. ft. of commercial space.
- 2) North Bethesda (Town) Center/LCOR #12004049A for 697 unbuilt apts. From the approved for 1,350 mid-rise apartments and unbuilt 809,338 sq. ft. office & 152,791 sq. ft. retail (from the approved 202,037 square feet of retail space, 1,148,000 square feet of office space, and 80,000 square feet of cultural, entertainment/recreation space)
- 3) 6111 Executive Boulevard/Kaiser Foundation Health/Washington Science Center Parcel F concurrently pending amendment to APF201601 for 17,475-? sq. ft. of existing lab space, 11,647-? sq. ft. of (general or R&D ??) office, & 38,800-? sq. ft. of new lab space
- 4) Gables at White Flint #120150010 & #82015001A for 476 high-rise apts. & unbuilt 20,890 sq. ft. retail (from approved 31,000 sq. ft. retail space)
- 5) Washington Science Center/6000 Executive Boulevard concurrently pending #120190070, #820180060, & #81973005B+C for 305,641 sq. ft. office, 9,300 sq. ft. retail, 365-unit active senior mid-rise apts. Which includes retaining the existing 21,700 sq. ft. of office space
- 6) Saul Centers White Flint #120160080 for 655 mid-rise apts., unbuilt 136,950 sq. ft. office (from approved 204,000 sq. ft.)
- 7) North Bethesda Market II #120120060 & #82012004A for approved & yet to be built 470 mid-rise apts., unbuilt 103,753 sq. ft. retail (from approved 44,840 sq. ft. office, 13,500 sq. ft. restaurant, & 108,000 sq. ft. retail spaces)
- 8) (East Village) North Bethesda Gateway #120140240 & #820140100 for 614 mid-rise apts. & 35,500 sq. ft. retail

- 9) Luxmanor Elementary School Expansion #MR2018022 for an expansion from 467 to a core capacity of 745 students
- 10) Tilden Middle/Rock Terrace Schools, #MR2014048 to convert a MCPS training center to a core capacity of 1,600 students ---refer to DAIC's page for MR20117014 document, "Transportation Street Traffic Study Report" and the staff memo for the 11/9/17-MCPB hearing: http://montgomeryplanningboard.org/wp-content/uploads/2017/10/november9_MR2017014_Tilden-FINAL-avlb.pdf.

Background developments impacting the MD 187/Tuckerman Lane intersection:

- 11) Alef Bet Montessori School #APF201802 for 90-students K-8th private school (40 students approved & 50 students concurrently pending)

Background developments impacting the MD 187/NB I-270 ramp intersection:

- 12) Wildwood residential #11989271C and #82008024B -- amended to a maximum of 60 mid-rise apartments, 11,000 square feet of retail space that replaces 30,00 sq. ft. of general office with two existing previously approved land uses 1) 36,423 square feet of medical office space and 2) 3,470 square feet of the bank with three drive-through windows
- 13) Rock Spring Center #11998092B for 844 unbuilt of the approved 1,250 mid-rise apts. & not built all of the non-residential land uses (i.e., 90,000 sq. ft. "cultural/entertainment/recreation space, 200,000 sq. Ft. hotel/motel, 549,900 sq. ft. office, 30,000 sq. ft. public use, & 210,000 sq. ft. retail spaces)

Please note that North Bethesda is an "orange policy area that requires a HCM Analysis. Also, regarding the background developments considered too "small" are the CRI Building & Goddard School and development yet to file preliminary plan is White Flint Mall.

If you have any questions , feel free to contact us. After February 15th ,please work with Patrick Reed.

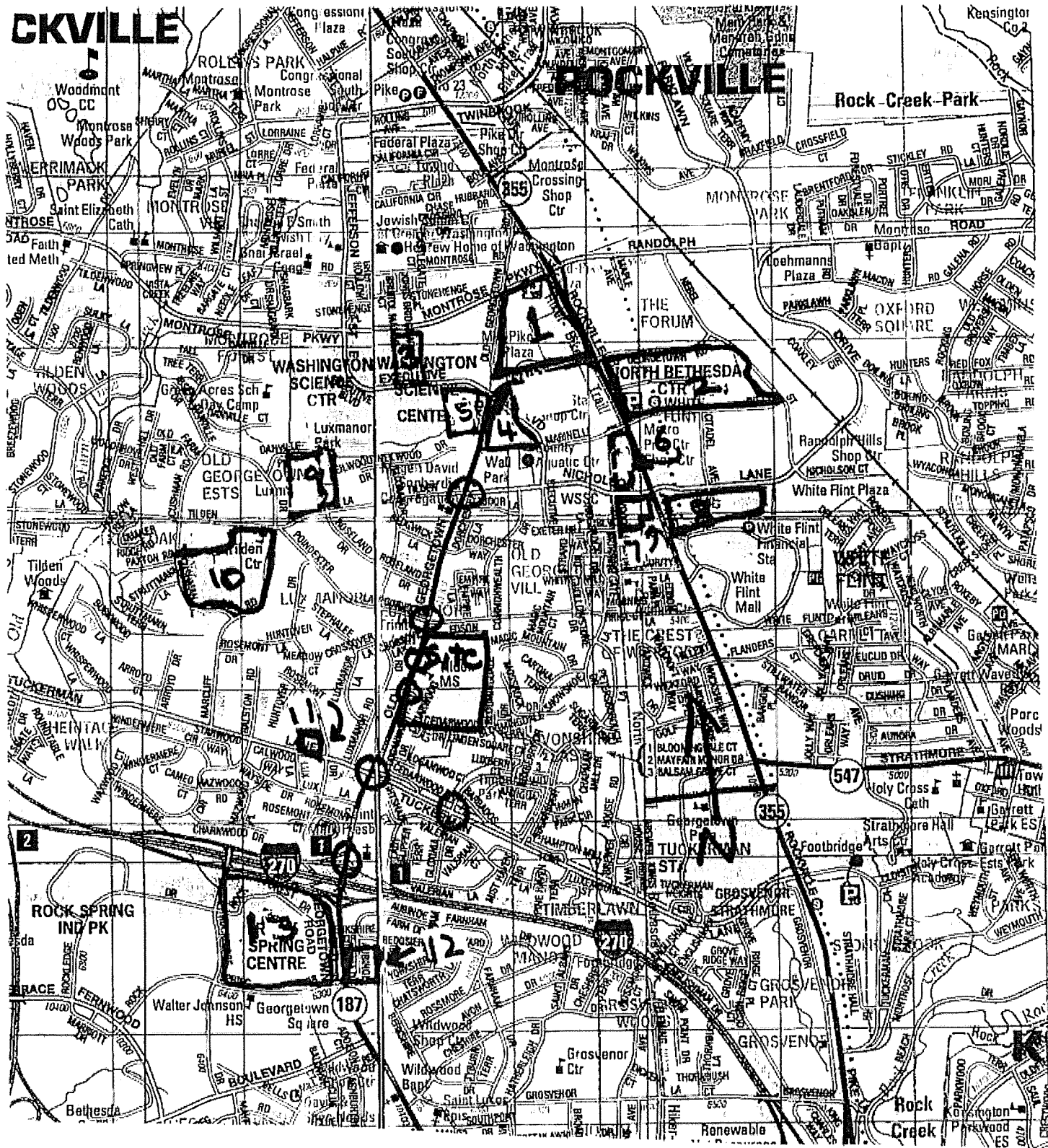
Ed
Ed Axler
Transportation Master Planner
Area 2 Division, Montgomery County Planning Department, M-NCPPC
8787 Georgia Ave, Silver Spring, MD 20910-3760
voice=301-495-4536

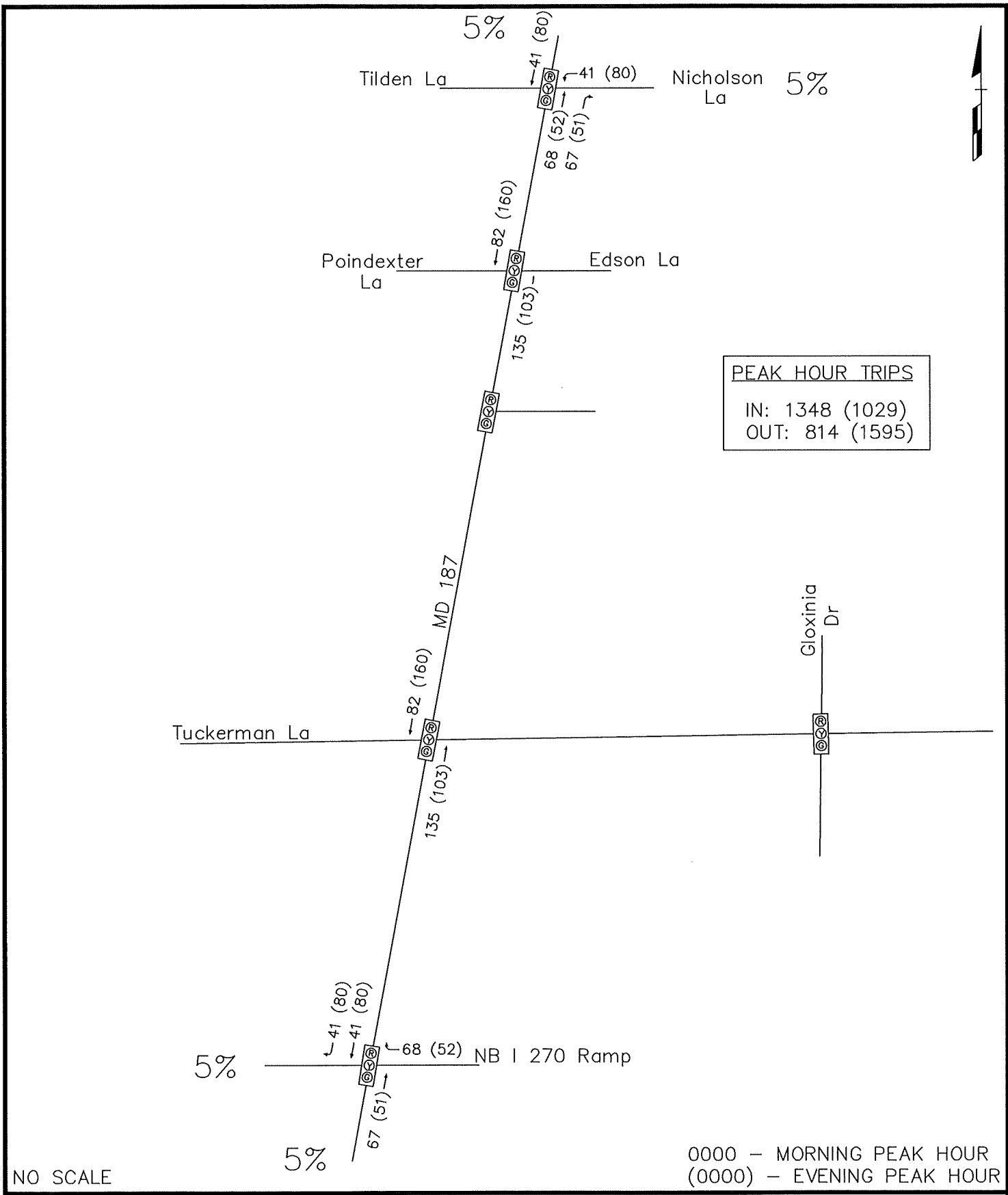
Patrick
Patrick Reed, AICP | Transportation Planner Coordinator
Montgomery County Planning Department | Planning Area 2
301.495.4538 | patrick.reed@montgomeryplanning.org

CKVILLE

ROCKVILLE

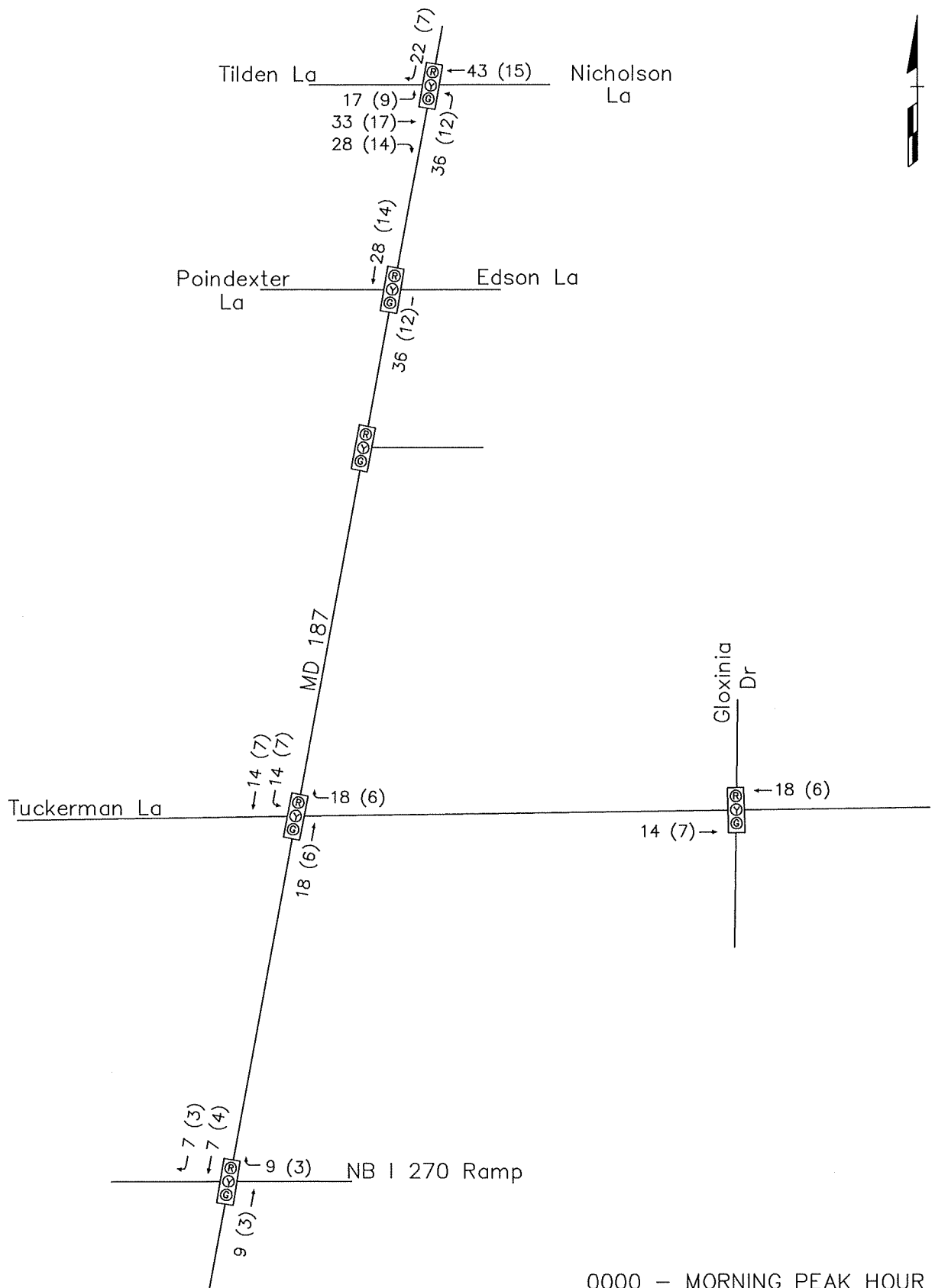
Rock Creek-Park





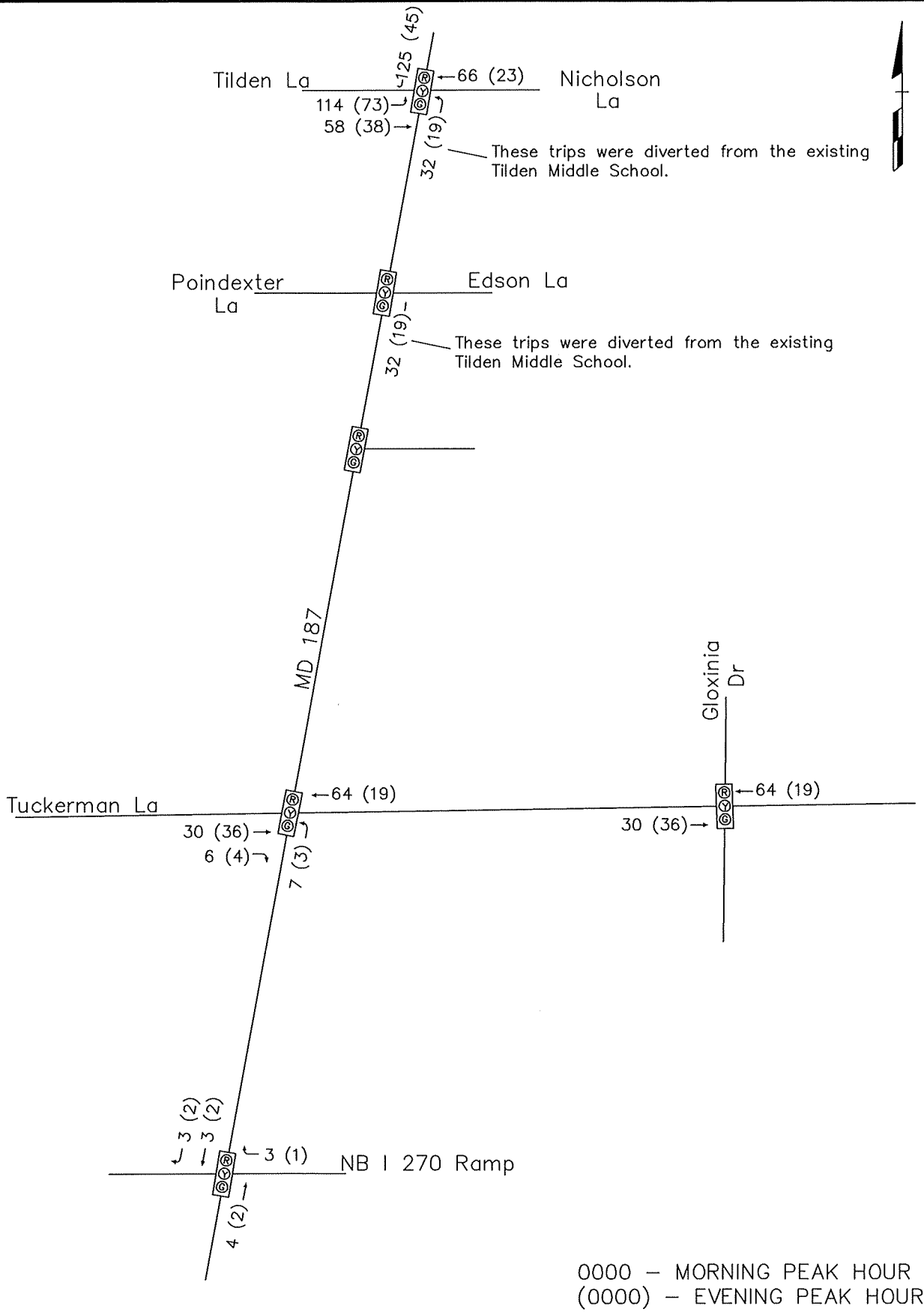
NO SCALE

Trips Generated from Developments within the White Flint sector

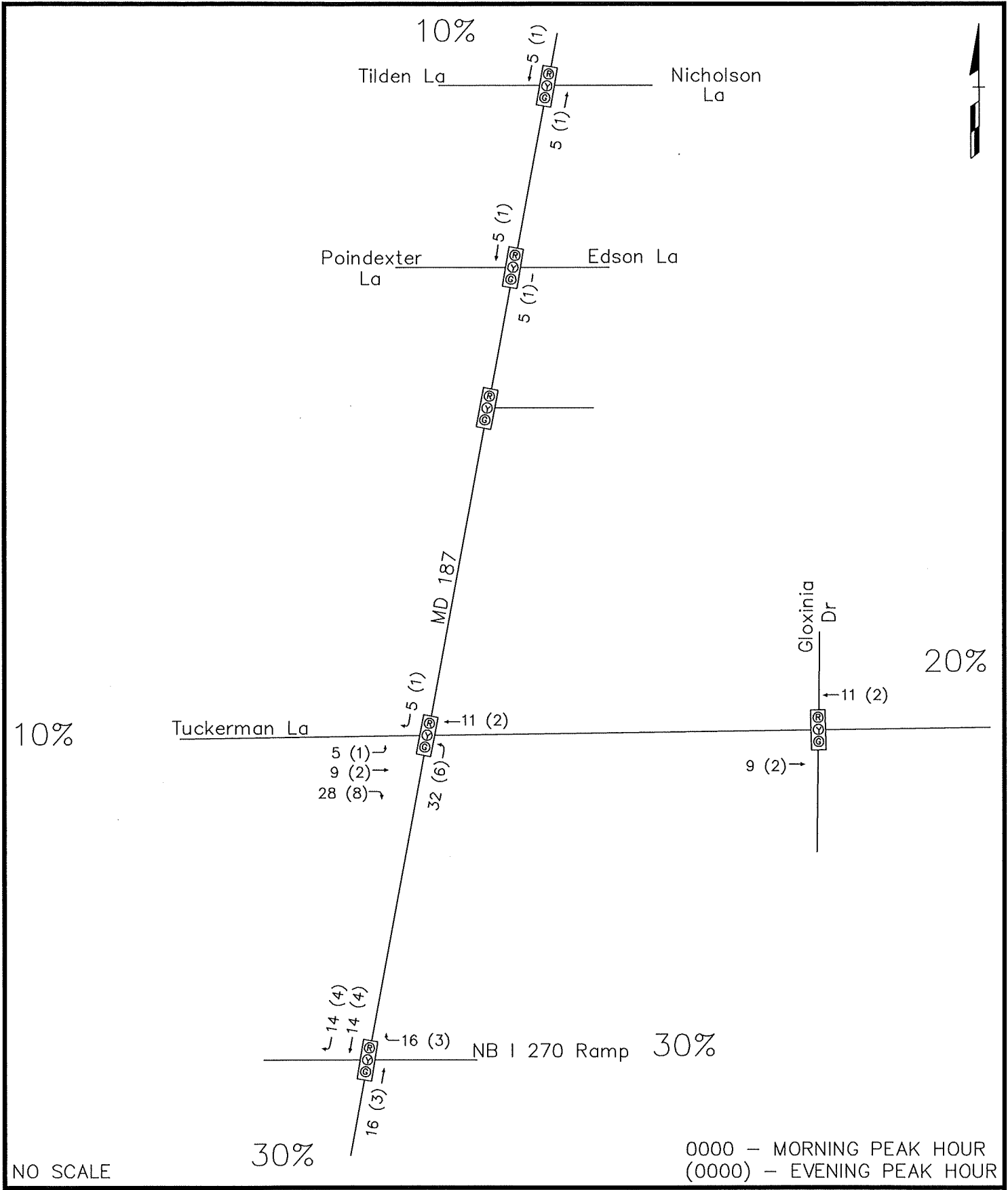


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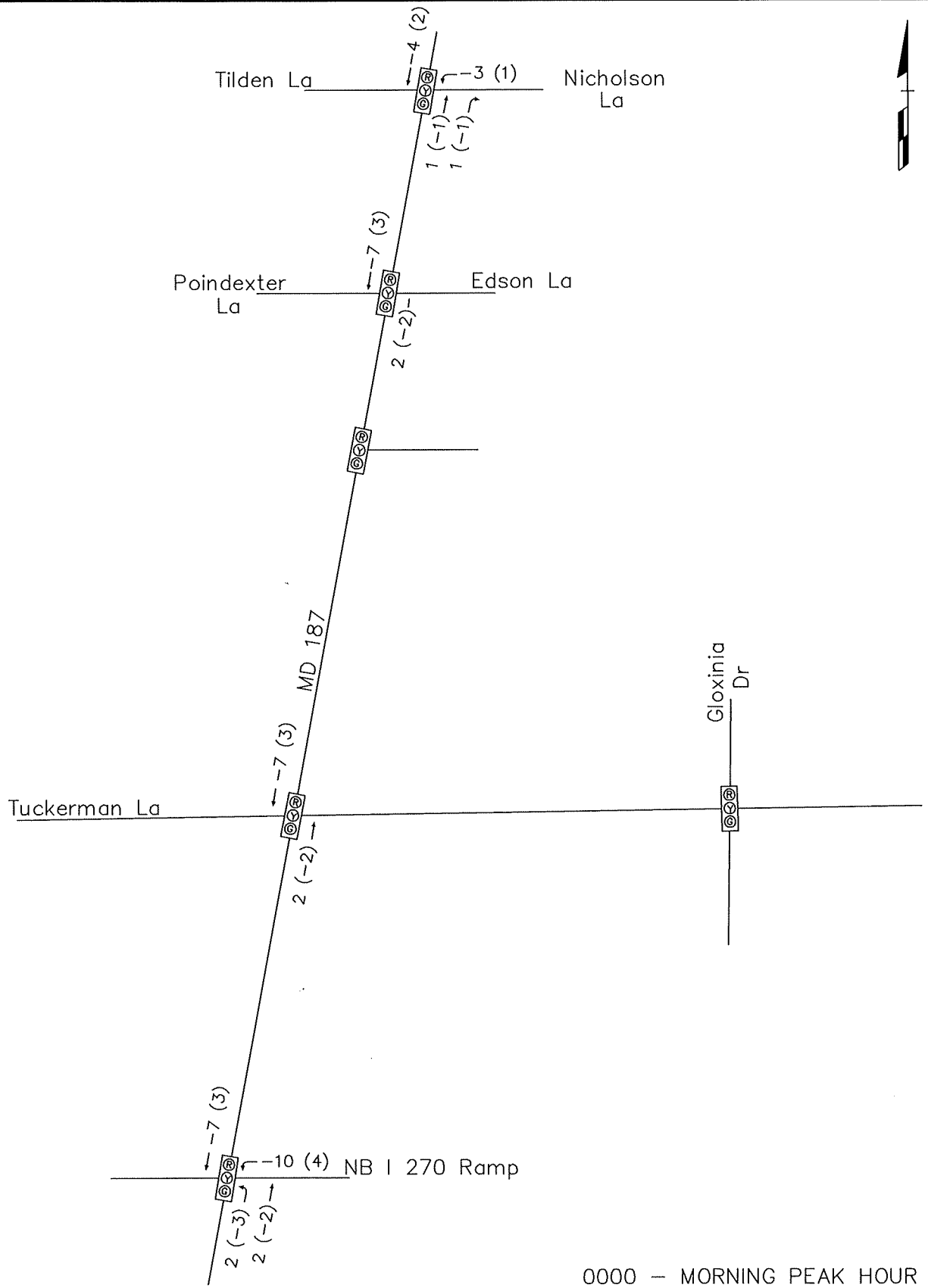
Trips Generated by Luxmanor ES



Trips Generated by the Rock Terrace ES/Tilden MS



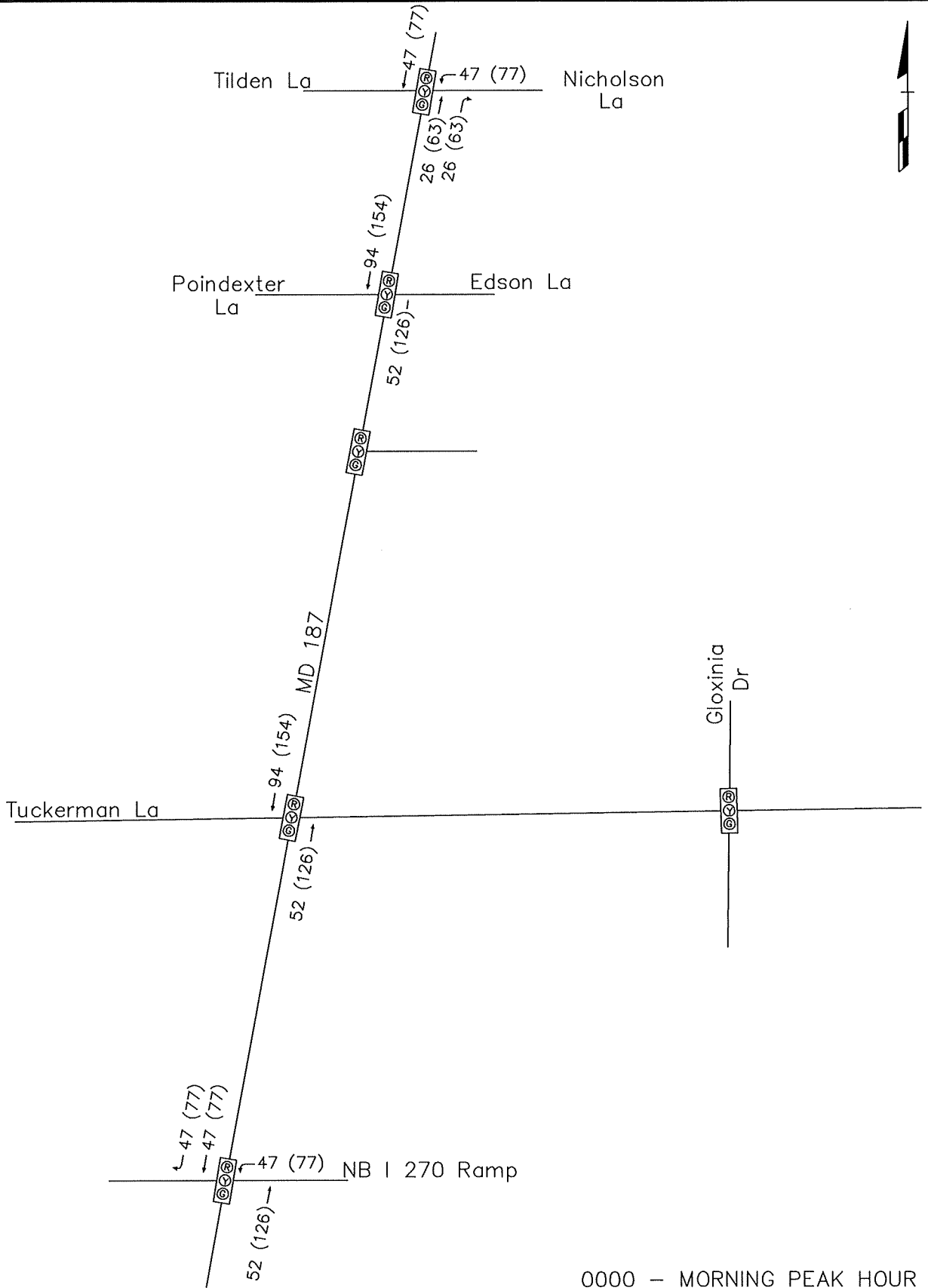
Trips Generated by Alef Bet Montessori School



NO SCALE

0000 – MORNING PEAK HOUR
 (0000) – EVENING PEAK HOUR

Trips Generated by Wildwood Residential



NO SCALE

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

Trips Generated by Rock Spring Center

**TABLE 5
TRIP GENERATION
EXISTING TILDEN MIDDLE SCHOOL/TILDEN HOLDING CENTER**

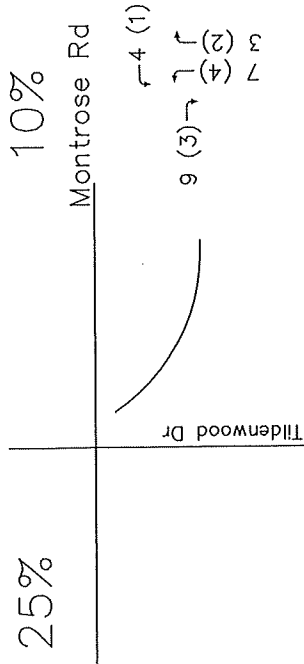
<u>LAND USE</u>	<u>MORNING PEAK HOUR</u>			<u>EVENING PEAK HOUR</u>		
	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>	<u>IN</u>	<u>OUT</u>	<u>TOTAL</u>
Existing MS Trips						
Trips/797 Students	292	224	516	105	140	245
Trips/Student	0.37	0.28	0.65	0.13	0.18	0.31
Trips/1600 Students	592	448	1040	208	288	496
Rock Terrace School						
Trips/100 Students	37	28	65	13	18	31
Tilden Middle School						
Trips/1500 Students	555	420	975	195	270	465
Less Ex Tilden Ctr Trips	-28	-23	-51	-20	-9	-29
Less Ex Tilden MS Trips	<u>-292</u>	<u>-224</u>	<u>-516</u>	<u>-105</u>	<u>-140</u>	<u>-245</u>
Net New Trips	235	173	408	70	121	191

The above trips were generated during the peak hours analyzed for this use, 7:30 to 8:30 AM and 2:30 to 3:30PM.

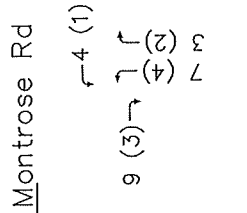
As noted earlier, there are existing turn restrictions in place at the Tilden Lane/Marcliff Road-Danville Drive and Tuckerman Lane/Marcliff Road intersections. With the development of this project it is recommended that the restrictions be removed to provide easy access to the schools. However if the restrictions are not removed, adjustments to the assignments will be necessary. Therefore, trips were assigned to the road network under both scenarios. Exhibits 6 and 6A show the trips generated by the Rock Terrace School, Exhibits 7 and 7A show the new trips generated by the Tilden Middle School and Exhibits 8 and 8A show the reassignment of the existing trips generated by the Tilden Middle School along MD 187.

These trips were added to the Background Traffic Volumes resulting in the Total Traffic Volumes as shown in Exhibits 9 and 9A. The total traffic volumes at the school access points are shown in Exhibits 9 and 9A. The total traffic volumes were then evaluated using the same methodology as for the previous step. The results of the analyses are shown in Table 6.

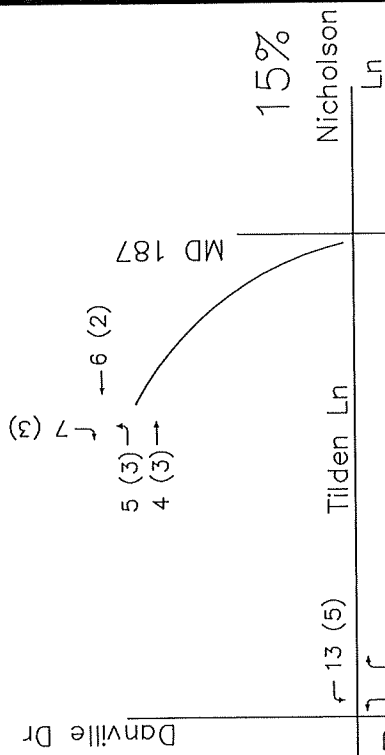
25%



10%



20%



15%

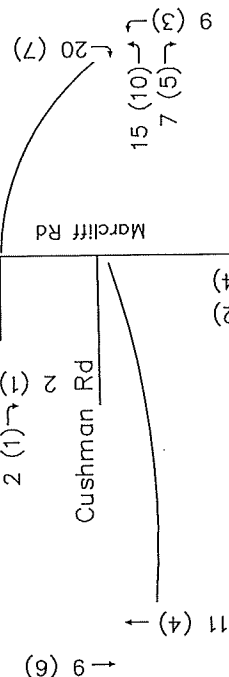


ASSUMES THAT THE EXISTING TURN RESTRICTIONS AT THE TILDEN LANE/MARCLIFF ROAD-DANVILLE DRIVE INTERSECTION HAVE BEEN REMOVED.

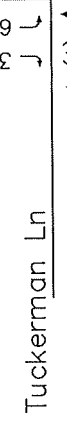
Site

TOTAL TRIPS GENERATED BY ROCK TERRACE			
AM PEAK HOUR		PM PEAK HOUR	
IN	OUT	IN	OUT
37	28	65	13
18	31		

School Driveways



10%



20%

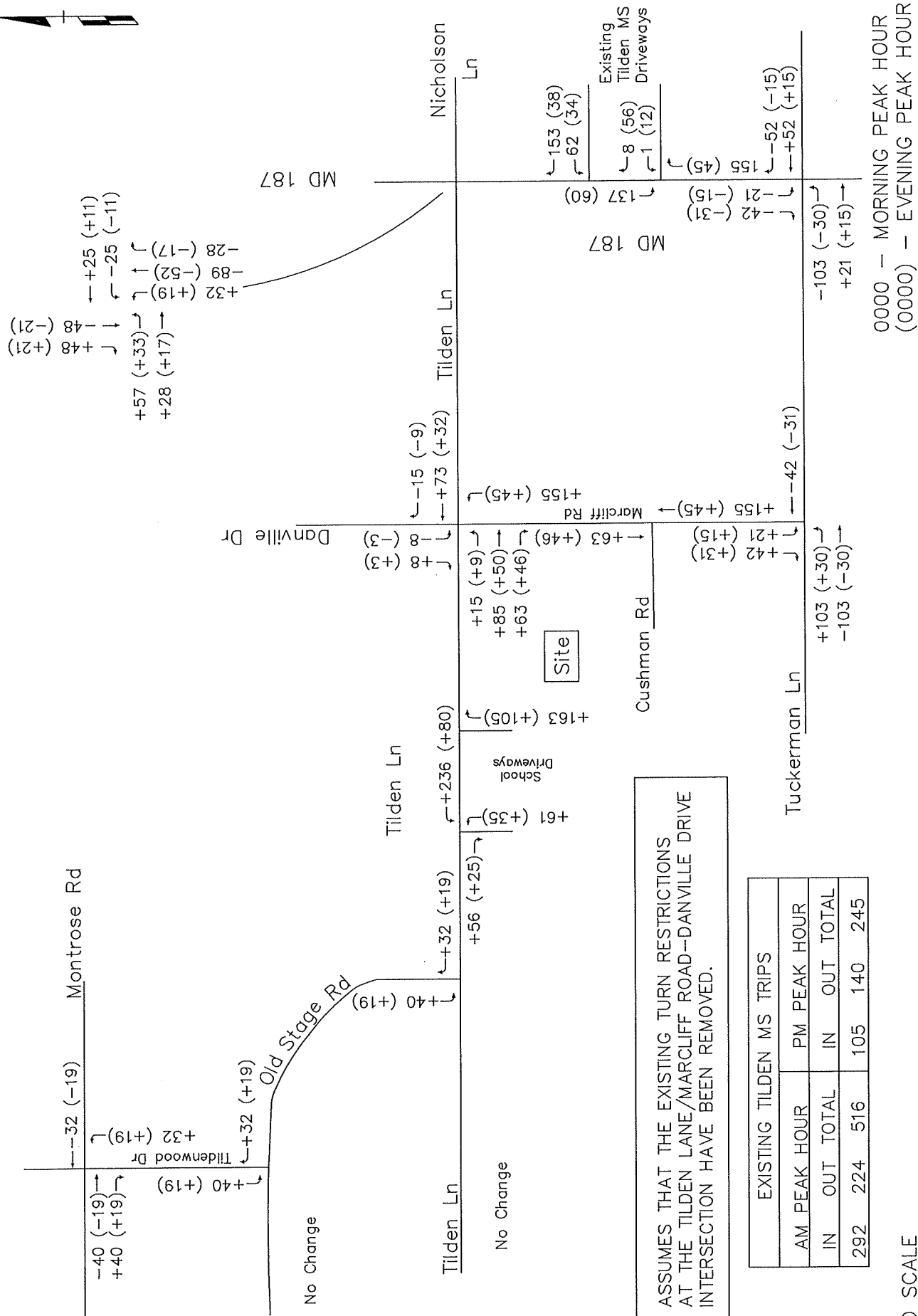
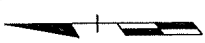


0000 - MORNING PEAK HOUR
(0000) - EVENING PEAK HOUR

NO SCALE

EXHIBIT 6

TRIPS GENERATED BY THE ROCK TERRACE SCHOOL



+25 (+11)
 -25 (-11)
 -28 (-17)
 -89 (-52)
 +32 (+19)
 +57 (+33)
 +28 (+17)
 +48 (+21)
 -48 (-21)

+155 (+45)
 +155 (+45)
 +155 (+45)
 +155 (+45)

+8 (+3)
 -8 (-3)
 +15 (+9)
 +85 (+50)
 +63 (+46)

+32 (+19)
 +40 (+19)
 +32 (+19)
 +32 (+19)
 +56 (+25)
 +61 (+35)
 +163 (+105)

+42 (+31)
 +21 (+15)
 +63 (+46)

+103 (+30)
 -103 (-30)

-103 (-30)
 +21 (+15)

-15 (-9)
 +73 (+32)
 -137 (60)
 -52 (-15)
 +52 (+15)

153 (38)
 62 (34)
 8 (56)
 1 (12)

ASSUMES THAT THE EXISTING TURN RESTRICTIONS AT THE TILDEN LANE/MARCLIFF ROAD-DANVILLE DRIVE INTERSECTION HAVE BEEN REMOVED.

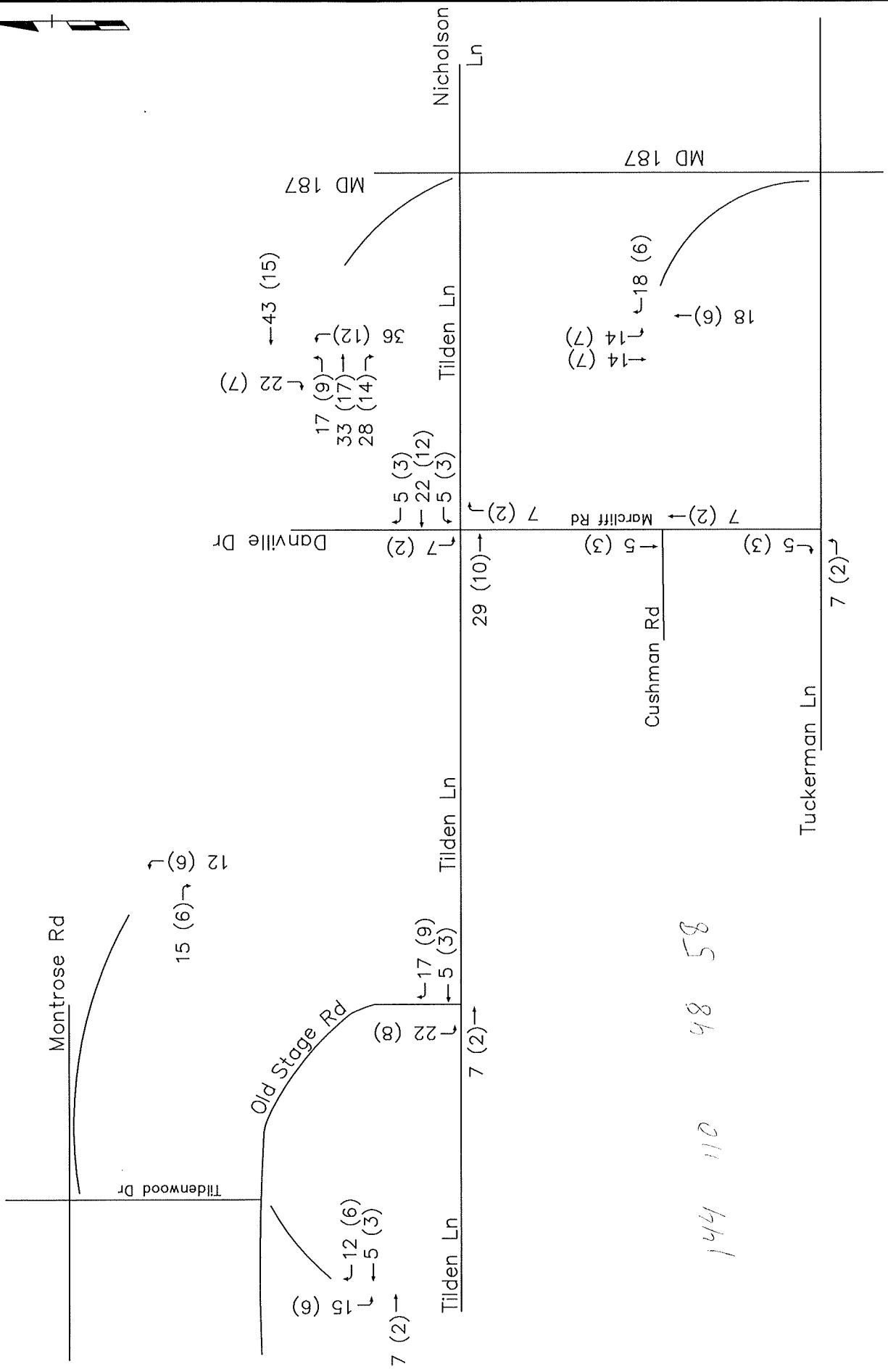
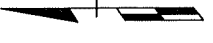
EXISTING TILDEN MS TRIPS			
AM PEAK HOUR	PM PEAK HOUR		
IN	OUT	TOTAL	
292	224	516	105 140 245

0000 - MORNING PEAK HOUR
 (0000) - EVENING PEAK HOUR

NO SCALE

EXHIBIT 8

TRIP ADJUSTMENTS DUE TO THE PROPOSED SCHOOL RELOCATION



144 110 48 58

NO SCALE

Trips Generated by Luxmanor Elementary School

15%

← 119 (243) Montrose Rd

← 189 (197)

Tildenwood Dr

Old Stage Rd

Tilden Ln

Tilden Ln

Tilden Ln

Nicholson Ln

← 40 (81)
← 63 (66)
← 63 (65)
← 39 (81)

Danville Dr

Marcliff Rd

Cushman Rd

Tuckerman Ln

← 79 (162)

← 126 (131)

MD 187

MD 187

5%

5%

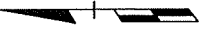
10%

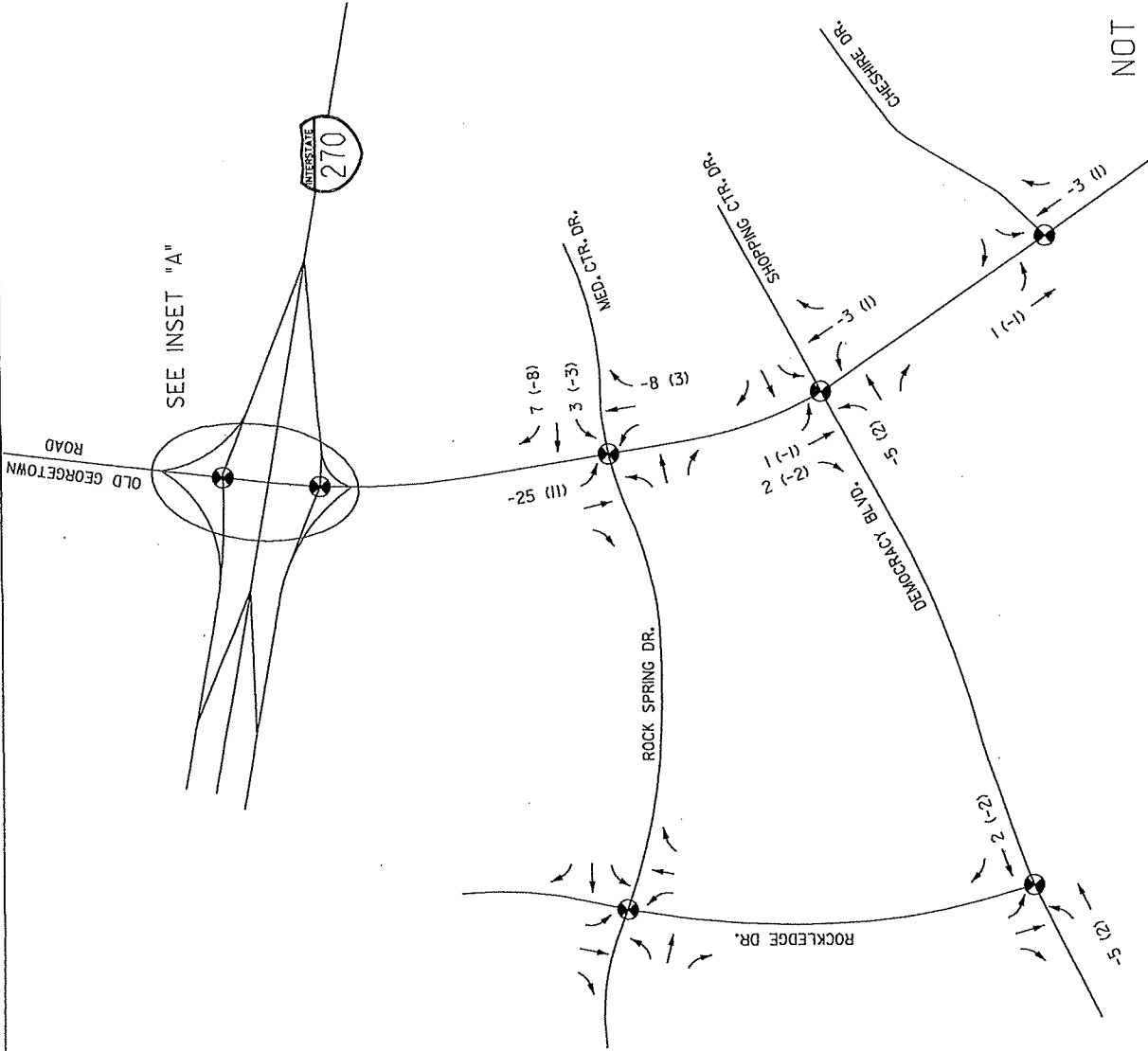
0000 - MORNING PEAK HOUR
(0000) - EVENING PEAK HOUR

NO SCALE

Trips Generated by Developments within the White Flint Sector

1348 814 = 182 1029 1595 2624





NOT TO SCALE

INSET "A"

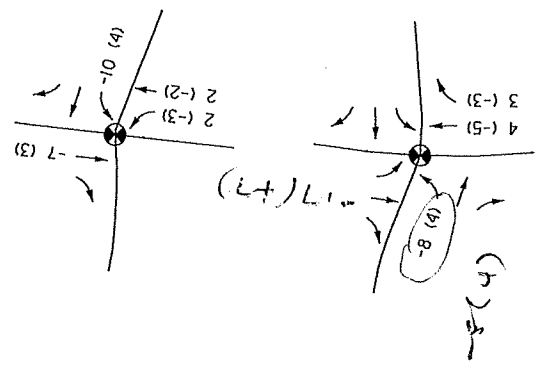


EXHIBIT 7
SITE GENERATED TRAFFIC

WILDWOOD MANOR SHOPPING CENTER
PRELIMINARY PLAN
AMENDMENT NO. 11989271C

STREET TRAFFIC STUDIES, LTD.
 400 Capital Park, N.W.
 Atlanta, GA 30309
 Phone: (404) 592-5500
 Fax: (404) 592-6627

TABLE 4
BACKGROUND TRIP GENERATION

<i>Development</i>	<i>Morning Peak Hour</i>			<i>Evening Peak Hour</i>		
	<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>
Rock Spring Trips/60 Townhouses	6	18	24	19	12	31
Rock Spring Center Trips/844 Mid Rise APTS	59	170	229	173	111	284
Trips/549,900 SF Office	405	66	471	80	420	500
Trips/210,000 SF Retail (34% PM Intercept)	112	67	179	320	347	667
Net New Trips				109	118	127
Trips/200 Room Hotel	46	32	78	211	229	440
Trips/90,000 Movie Theater	10	10	20	52	50	102
				521	33	554
Wildwood Residential Trips/30,000 SF Office	41	7	48	5	26	31
5400 Grosvenor Trips/67 Townhomes	6	22	28	22	12	34
Brightview Grosvenor Trips/104 Assisted Living	11	6	17	8	14	22
WMAL Trips/150 Townhomes	13	45	58	44	27	71
Trips/159 SFD	25	73	98	83	48	131
Wildwood Shopping Center Trips/3,692 sit down restaurant	20	17	37	22	14	36

should be 227

TABLE 3
BACKGROUND DEVELOPMENT

<i>Development</i>	<i>Land Use</i>	<i>Density</i>
1. Rockspring	Townhomes	168 DU's approved 60 DU'S unbuilt
2. Rock Spring Center	Mid Rise Residential General Office General Retail Hotel Community Center Movie Theater	844 DU's 549,900 SF 210,00 SF 200 Rooms 30,000 SF 90,000 SF
3. Wildwood Residential	General Office	30,000 SF
4. 5400 Grosvenor	Townhomes Single Family DU Community Office	143 DU's (67 DU's unbuilt) 12 DU's - Complete 31,931 SF - Complete
5. Brightview Grosvenor	Assisted Living	140 beds
6. WMAL	Townhomes Single Family DU	150 DU's 159 SFD
7. Wildwood Shopping Center	Retail	88,430 SF Approved 3,692 Unbuilt

Trip Generation

To determine the traffic associated with each of the background developments, trip generation rates were taken from the ITE Trip Generation publication, 10th Edition, with copies of specific worksheets in Appendix D. The resulting trips will adjusted based on the applicable factors contained in the LATR guidelines for land uses in North Bethesda.

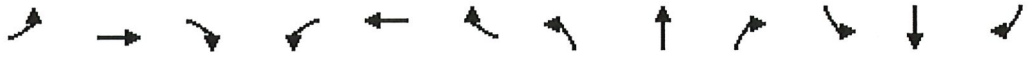
The trips generated are shown in Table 4.

APPENDIX E

CAPACITY CALCULATIONS - BACKGROUND CONDITIONS

HCM Signalized Intersection Capacity Analysis
 19: MD 187 & NB I 270 Ramp

Background Traffic Volumes
 Morning Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	150	13	625	149	1310	0	0	1949	866
Future Volume (vph)	0	0	0	150	13	625	149	1310	0	0	1949	866
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.86			0.81	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1698	1583	3433	6408			7544	1583
Flt Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1698	1583	3433	6408			7544	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	161	14	672	160	1409	0	0	2096	931
RTOR Reduction (vph)	0	0	0	0	0	41	0	0	0	0	0	470
Lane Group Flow (vph)	0	0	0	87	88	631	160	1409	0	0	2096	461
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				61.8	61.8	61.8	8.7	74.2			59.0	59.0
Effective Green, g (s)				61.8	61.8	61.8	8.7	74.2			59.0	59.0
Actuated g/C Ratio				0.41	0.41	0.41	0.06	0.49			0.39	0.39
Clearance Time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				692	699	652	199	3169			2967	622
v/s Ratio Prot							c0.05	0.22			0.28	
v/s Ratio Perm				0.05	0.05	c0.40						c0.29
v/c Ratio				0.13	0.13	0.97	0.80	0.44			0.71	0.74
Uniform Delay, d1				27.3	27.3	43.1	69.8	24.6			38.2	39.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.03	1.65
Incremental Delay, d2				0.1	0.1	27.2	20.5	0.5			0.7	4.0
Delay (s)				27.4	27.4	70.3	90.3	25.0			39.9	68.2
Level of Service				C	C	E	F	C			D	E
Approach Delay (s)		0.0			61.5			31.7			48.6	
Approach LOS		A			E			C			D	




















Intersection Summary

HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 19: MD 187 & NB I 270 Ramp

Background Traffic Volumes
 Evening Peak Hour

































												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	166	8	308	284	1858	0	0	1290	624
Future Volume (vph)	0	0	0	166	8	308	284	1858	0	0	1290	624
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.86			0.81	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Fl _t Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1693	1583	3433	6408			7544	1583
Fl _t Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1693	1583	3433	6408			7544	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	178	9	331	305	1998	0	0	1387	671
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	0	317
Lane Group Flow (vph)	0	0	0	93	94	277	305	1998	0	0	1387	354
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				31.9	31.9	31.9	18.5	104.1			79.1	79.1
Effective Green, g (s)				31.9	31.9	31.9	18.5	104.1			79.1	79.1
Actuated g/C Ratio				0.21	0.21	0.21	0.12	0.69			0.53	0.53
Clearance Time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				357	360	336	423	4447			3978	834
v/s Ratio Prot							c0.09	c0.31			0.18	
v/s Ratio Perm				0.06	0.06	c0.17						0.22
v/c Ratio				0.26	0.26	0.82	0.72	0.45			0.35	0.42
Uniform Delay, d ₁				49.2	49.2	56.4	63.3	10.2			20.5	21.6
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.01	2.40
Incremental Delay, d ₂				0.4	0.4	15.0	6.0	0.3			0.2	1.0
Delay (s)				49.6	49.6	71.3	69.2	10.5			20.8	52.9
Level of Service				D	D	E	E	B			C	D
Approach Delay (s)		0.0			63.5			18.3			31.3	
Approach LOS		A			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary
 14: MD 187 & Tuckerman La

Background Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 	 		  	 		  	
Traffic Volume (veh/h)	179	489	169	623	369	84	205	1317	306	51	1759	127
Future Volume (veh/h)	179	489	169	623	369	84	205	1317	306	51	1759	127
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	181	494	171	629	373	85	207	1330	309	52	1777	128
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	608	457	157	608	625	280	213	2257	703	176	1857	133
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.09	0.44	0.44	0.03	0.38	0.38
Sat Flow, veh/h	3442	2586	890	3442	3539	1583	1774	5085	1583	1774	4843	348
Grp Volume(v), veh/h	181	337	328	629	373	85	207	1330	309	52	1243	662
Grp Sat Flow(s),veh/h/ln	1721	1770	1706	1721	1770	1583	1774	1695	1583	1774	1695	1801
Q Serve(g_s), s	6.9	26.5	26.5	26.5	14.5	7.0	12.9	29.5	20.2	2.7	53.5	53.8
Cycle Q Clear(g_c), s	6.9	26.5	26.5	26.5	14.5	7.0	12.9	29.5	20.2	2.7	53.5	53.8
Prop In Lane	1.00		0.52	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	608	313	301	608	625	280	213	2257	703	176	1300	691
V/C Ratio(X)	0.30	1.08	1.09	1.03	0.60	0.30	0.97	0.59	0.44	0.30	0.96	0.96
Avail Cap(c_a), veh/h	608	313	301	608	625	280	213	2257	703	202	1300	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.59	0.59	0.59	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	61.7	61.8	61.7	56.8	53.7	46.2	31.4	28.8	28.3	45.0	45.1
Incr Delay (d2), s/veh	0.3	73.4	77.3	37.4	0.9	0.4	52.7	1.1	2.0	0.9	16.5	25.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	19.3	18.9	15.7	7.2	3.1	11.7	14.0	9.2	1.3	28.0	31.6
LnGrp Delay(d),s/veh	53.9	135.2	139.1	99.1	57.8	54.1	99.0	32.6	30.8	29.3	61.5	70.7
LnGrp LOS	D	F	F	F	E	D	F	C	C	C	E	E
Approach Vol, veh/h		846			1087			1846			1957	
Approach Delay, s/veh		119.3			81.4			39.7			63.8	
Approach LOS		F			F			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.9	73.1		33.0	20.0	64.0		33.0				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	6.7	64.3		26.5	13.5	57.5		26.5				
Max Q Clear Time (g_c+I1), s	4.7	31.5		28.5	14.9	55.8		28.5				
Green Ext Time (p_c), s	0.0	14.2		0.0	0.0	1.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			67.6									
HCM 2010 LOS			E									

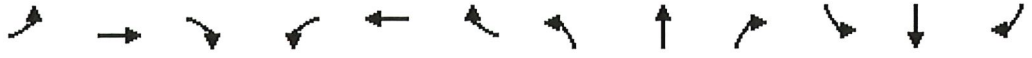
HCM 2010 Signalized Intersection Summary
14: MD 187 & Tuckerman La

Background Traffic Volumes
Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	240	194	126	337	238	41	198	1582	274	60	1434	199
Future Volume (veh/h)	240	194	126	337	238	41	198	1582	274	60	1434	199
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	261	211	137	366	259	45	215	1720	298	65	1559	216
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	410	250	155	432	445	199	243	2801	872	171	2303	318
Arrive On Green	0.12	0.12	0.12	0.13	0.13	0.13	0.07	0.55	0.55	0.03	0.51	0.51
Sat Flow, veh/h	3442	2098	1304	3442	3539	1583	1774	5085	1583	1774	4518	625
Grp Volume(v), veh/h	261	176	172	366	259	45	215	1720	298	65	1169	606
Grp Sat Flow(s),veh/h/ln	1721	1770	1633	1721	1770	1583	1774	1695	1583	1774	1695	1753
Q Serve(g_s), s	10.8	14.6	15.5	15.6	10.4	3.8	8.4	34.4	15.6	2.6	38.7	38.9
Cycle Q Clear(g_c), s	10.8	14.6	15.5	15.6	10.4	3.8	8.4	34.4	15.6	2.6	38.7	38.9
Prop In Lane	1.00		0.80	1.00		1.00	1.00		1.00	1.00		0.36
Lane Grp Cap(c), veh/h	410	211	194	432	445	199	243	2801	872	171	1728	893
V/C Ratio(X)	0.64	0.84	0.88	0.85	0.58	0.23	0.88	0.61	0.34	0.38	0.68	0.68
Avail Cap(c_a), veh/h	424	218	201	493	507	227	357	2801	872	221	1728	893
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.0	64.7	65.0	64.2	61.9	59.0	28.6	22.9	18.6	20.3	27.5	27.6
Incr Delay (d2), s/veh	3.0	23.4	32.9	8.0	0.9	0.4	16.2	1.0	1.1	1.4	2.1	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	8.5	8.8	7.9	5.1	1.7	5.8	16.3	7.0	1.3	18.5	19.7
LnGrp Delay(d),s/veh	66.0	88.0	97.9	72.2	62.7	59.4	44.8	23.9	19.7	21.7	29.7	31.7
LnGrp LOS	E	F	F	E	E	E	D	C	B	C	C	C
Approach Vol, veh/h		609			670			2233				1840
Approach Delay, s/veh		81.4			67.7			25.3				30.0
Approach LOS		F			E			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.2	89.1		24.4	17.3	83.0		25.3				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	8.9	75.1		18.5	20.5	63.5		21.5				
Max Q Clear Time (g_c+I1), s	4.6	36.4		17.5	10.4	40.9		17.6				
Green Ext Time (p_c), s	0.0	21.0		0.3	0.4	14.0		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			38.6									
HCM 2010 LOS			D									

HCM Signalized Intersection Capacity Analysis
 8: MD 187 & Poindexter La/Edson La

Background Traffic Volumes
 Morning Peak Hour






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕		↕	↕	↑↑↑		↕	↑↑↑	
Traffic Volume (vph)	8	0	12	150	0	26	29	1436	146	50	1837	35
Future Volume (vph)	8	0	12	150	0	26	29	1436	146	50	1837	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor		1.00		1.00		1.00	1.00	0.91		1.00	0.91	
Fr _t		0.92		1.00		0.85	1.00	0.99		1.00	1.00	
Fl _t Protected		0.98		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1675		1770		1583	1770	5015		1770	5071	
Fl _t Permitted		0.98		0.74		1.00	0.09	1.00		0.13	1.00	
Satd. Flow (perm)		1675		1385		1583	161	5015		235	5071	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	0	12	156	0	27	30	1496	152	52	1914	36
RTOR Reduction (vph)	0	18	0	0	0	23	0	6	0	0	1	0
Lane Group Flow (vph)	0	3	0	156	0	4	30	1642	0	52	1949	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.2		22.2		22.2	116.3	116.3		116.3	116.3	
Effective Green, g (s)		22.2		22.2		22.2	116.3	116.3		116.3	116.3	
Actuated g/C Ratio		0.15		0.15		0.15	0.78	0.78		0.78	0.78	
Clearance Time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		247		204		234	124	3888		182	3931	
v/s Ratio Prot								0.33			c0.38	
v/s Ratio Perm		0.00		c0.11		0.00	0.19			0.22		
v/c Ratio		0.01		0.76		0.02	0.24	0.42		0.29	0.50	
Uniform Delay, d ₁		54.5		61.4		54.6	4.7	5.6		4.9	6.1	
Progression Factor		1.00		1.00		1.00	1.00	1.00		0.61	0.62	
Incremental Delay, d ₂		0.0		15.6		0.0	4.6	0.3		2.2	0.2	
Delay (s)		54.6		77.0		54.6	9.2	6.0		5.1	4.0	
Level of Service		D		E		D	A	A		A	A	
Approach Delay (s)		54.6				73.7		6.0			4.1	
Approach LOS		D				E		A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 8: MD 187 & Poindexter La/Edson La

Background Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	8	207	0	23	44	1663	190	26	1533	9
Future Volume (vph)	6	0	8	207	0	23	44	1663	190	26	1533	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor		1.00		1.00		1.00	1.00	0.91		1.00	0.91	
Frt		0.92		1.00		0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.98		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684		1770		1583	1770	5007		1770	5081	
Flt Permitted		0.98		0.75		1.00	0.11	1.00		0.07	1.00	
Satd. Flow (perm)		1684		1392		1583	205	5007		129	5081	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	0	9	230	0	26	49	1848	211	29	1703	10
RTOR Reduction (vph)	0	13	0	0	0	20	0	7	0	0	0	0
Lane Group Flow (vph)	0	3	0	230	0	6	49	2052	0	29	1713	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		30.2		30.2		30.2	108.3	108.3		108.3	108.3	
Effective Green, g (s)		30.2		30.2		30.2	108.3	108.3		108.3	108.3	
Actuated g/C Ratio		0.20		0.20		0.20	0.72	0.72		0.72	0.72	
Clearance Time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		339		280		318	148	3615		93	3668	
v/s Ratio Prot								c0.41			0.34	
v/s Ratio Perm		0.00		c0.17		0.00	0.24			0.22		
v/c Ratio		0.01		0.82		0.02	0.33	0.57		0.31	0.47	
Uniform Delay, d1		47.9		57.3		48.0	7.6	9.8		7.5	8.7	
Progression Factor		1.00		1.00		1.00	1.00	1.00		0.60	0.63	
Incremental Delay, d2		0.0		17.3		0.0	5.9	0.7		7.7	0.4	
Delay (s)		47.9		74.6		48.0	13.5	10.5		12.2	5.9	
Level of Service		D		E		D	B	B		B	A	
Approach Delay (s)		47.9				71.9		10.5			6.0	
Approach LOS		D				E		B			A	
Intersection Summary												
HCM 2000 Control Delay			12.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			11.5			
Intersection Capacity Utilization			63.4%			ICU Level of Service				B		
Analysis Period (min)			15									

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 3: MD 187 & Tilden La/Nicholson La

Background Traffic Volumes
 Morning Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	185	166	570	177	2	166	858	470	28	1168	192
Future Volume (veh/h)	162	185	166	570	177	2	166	858	470	28	1168	192
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	172	197	177	606	188	2	177	913	500	30	1243	204
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	215	203	671	359	4	232	1550	693	182	1712	281
Arrive On Green	0.17	0.17	0.17	0.19	0.19	0.19	0.07	0.44	0.44	0.02	0.39	0.39
Sat Flow, veh/h	1053	1242	1171	3442	1840	20	1774	3539	1583	1774	4403	723
Grp Volume(v), veh/h	296	0	250	606	0	190	177	913	500	30	957	490
Grp Sat Flow(s),veh/h/ln	1810	0	1656	1721	0	1859	1774	1770	1583	1774	1695	1735
Q Serve(g_s), s	24.2	0.0	22.1	25.8	0.0	13.7	8.7	29.3	38.9	1.5	36.1	36.1
Cycle Q Clear(g_c), s	24.2	0.0	22.1	25.8	0.0	13.7	8.7	29.3	38.9	1.5	36.1	36.1
Prop In Lane	0.58		0.71	1.00		0.01	1.00		1.00	1.00		0.42
Lane Grp Cap(c), veh/h	314	0	287	671	0	362	232	1550	693	182	1318	675
V/C Ratio(X)	0.94	0.00	0.87	0.90	0.00	0.52	0.76	0.59	0.72	0.16	0.73	0.73
Avail Cap(c_a), veh/h	314	0	287	732	0	395	293	1550	693	200	1318	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.3	0.0	60.4	59.0	0.0	54.1	31.7	31.9	34.6	28.1	39.0	39.0
Incr Delay (d2), s/veh	35.9	0.0	24.0	13.9	0.0	1.2	8.8	1.6	6.4	0.4	3.5	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	0.0	12.0	13.6	0.0	7.2	4.8	14.7	18.2	0.8	17.5	18.5
LnGrp Delay(d),s/veh	97.2	0.0	84.4	72.9	0.0	55.3	40.5	33.6	41.0	28.5	42.5	45.7
LnGrp LOS	F		F	E		E	D	C	D	C	D	D
Approach Vol, veh/h		546			796			1590			1477	
Approach Delay, s/veh		91.3			68.7			36.7			43.3	
Approach LOS		F			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	72.2		32.0	16.4	64.8		36.7				
Change Period (Y+Rc), s	5.5	6.5		6.0	5.5	6.5		7.5				
Max Green Setting (Gmax), s	5.1	61.5		26.0	16.1	50.5		31.9				
Max Q Clear Time (g_c+I1), s	3.5	40.9		26.2	10.7	38.1		27.8				
Green Ext Time (p_c), s	0.0	8.8		0.0	0.2	7.6		1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			51.4									
HCM 2010 LOS			D									



















HCM 2010 Signalized Intersection Summary
 3: MD 187 & Tilden La/Nicholson La

Background Traffic Volumes
 Evening Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	75	34	488	83	12	93	826	406	31	895	84
Future Volume (veh/h)	91	75	34	488	83	12	93	826	406	31	895	84
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	100	82	37	536	91	13	102	908	446	34	984	92
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	126	111	51	617	286	41	330	1925	861	248	2506	234
Arrive On Green	0.08	0.08	0.08	0.18	0.18	0.18	0.04	0.54	0.54	0.03	0.53	0.53
Sat Flow, veh/h	1551	1362	624	3442	1595	228	1774	3539	1583	1774	4733	442
Grp Volume(v), veh/h	115	0	104	536	0	104	102	908	446	34	704	372
Grp Sat Flow(s),veh/h/ln	1785	0	1753	1721	0	1823	1774	1770	1583	1774	1695	1785
Q Serve(g_s), s	9.5	0.0	8.7	22.7	0.0	7.4	3.9	23.6	26.8	1.3	18.5	18.6
Cycle Q Clear(g_c), s	9.5	0.0	8.7	22.7	0.0	7.4	3.9	23.6	26.8	1.3	18.5	18.6
Prop In Lane	0.87		0.36	1.00		0.13	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	145	0	143	617	0	327	330	1925	861	248	1795	945
V/C Ratio(X)	0.79	0.00	0.73	0.87	0.00	0.32	0.31	0.47	0.52	0.14	0.39	0.39
Avail Cap(c_a), veh/h	238	0	234	860	0	456	396	1925	861	268	1795	945
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.6	0.0	67.3	59.8	0.0	53.6	16.2	21.0	21.7	16.8	21.0	21.0
Incr Delay (d2), s/veh	9.3	0.0	6.9	7.0	0.0	0.6	0.5	0.8	2.2	0.2	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	4.5	11.4	0.0	3.8	1.9	11.7	12.2	0.6	8.8	9.4
LnGrp Delay(d),s/veh	76.9	0.0	74.2	66.8	0.0	54.1	16.7	21.8	23.9	17.1	21.6	22.2
LnGrp LOS	E		E	E		D	B	C	C	B	C	C
Approach Vol, veh/h		219			640			1456			1110	
Approach Delay, s/veh		75.6			64.8			22.1			21.7	
Approach LOS		E			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	88.1		18.2	11.5	85.9		34.4				
Change Period (Y+Rc), s	5.5	6.5		6.0	5.5	6.5		7.5				
Max Green Setting (Gmax), s	5.5	61.5		20.0	11.5	55.5		37.5				
Max Q Clear Time (g_c+l1), s	3.3	28.8		11.5	5.9	20.6		24.7				
Green Ext Time (p_c), s	0.0	10.1		0.7	0.1	8.9		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			33.4									
HCM 2010 LOS			C									



















HCM 2010 Signalized Intersection Summary
 17: Gloxinia Dr & Tuckerman La

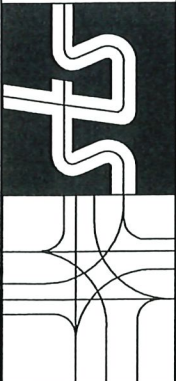
Background Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	712	30	2	762	7	59	4	14	11	2	67
Future Volume (veh/h)	13	712	30	2	762	7	59	4	14	11	2	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	15	800	34	2	856	8	66	4	16	12	2	75
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	1070	45	137	1061	10	623	42	139	125	44	707
Arrive On Green	0.02	0.31	0.31	0.00	0.30	0.30	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1774	3459	147	1774	3593	34	1060	79	260	165	82	1325
Grp Volume(v), veh/h	15	409	425	2	422	442	86	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1837	1774	1770	1857	1400	0	0	1572	0	0
Q Serve(g_s), s	0.6	22.9	22.9	0.1	24.2	24.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	22.9	22.9	0.1	24.2	24.2	2.6	0.0	0.0	3.0	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.02	0.77		0.19	0.13		0.84
Lane Grp Cap(c), veh/h	143	547	568	137	522	548	805	0	0	876	0	0
V/C Ratio(X)	0.11	0.75	0.75	0.01	0.81	0.81	0.11	0.00	0.00	0.10	0.00	0.00
Avail Cap(c_a), veh/h	226	901	935	245	901	945	805	0	0	876	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.48	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.0	34.1	34.1	29.2	35.9	35.9	12.6	0.0	0.0	12.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.0	1.0	0.0	3.0	2.9	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	11.3	11.7	0.0	12.3	12.8	1.3	0.0	0.0	1.4	0.0	0.0
LnGrp Delay(d),s/veh	29.1	35.1	35.1	29.3	38.9	38.7	12.8	0.0	0.0	12.9	0.0	0.0
LnGrp LOS	C	D	D	C	D	D	B			B		
Approach Vol, veh/h		849			866			86				89
Approach Delay, s/veh		35.0			38.8			12.8				12.9
Approach LOS		D			D			B				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		64.7	5.3	40.0		64.7	6.8	38.5				
Change Period (Y+Rc), s		6.0	5.0	6.0		6.0	5.0	6.0				
Max Green Setting (Gmax), s		30.0	7.0	56.0		30.0	7.0	56.0				
Max Q Clear Time (g_c+l1), s		4.6	2.1	24.9		5.0	2.6	26.2				
Green Ext Time (p_c), s		0.4	0.0	6.0		0.5	0.0	6.2				
Intersection Summary												
HCM 2010 Ctrl Delay			34.7									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
 17: Gloxinia Dr & Tuckerman La

Background Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	525	32	3	504	8	10	0	25	1	2	16
Future Volume (veh/h)	29	525	32	3	504	8	10	0	25	1	2	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	34	618	38	4	593	9	12	0	29	1	2	19
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	800	49	126	757	11	291	21	653	56	110	837
Arrive On Green	0.03	0.24	0.24	0.01	0.21	0.21	0.60	0.00	0.60	0.60	0.60	0.60
Sat Flow, veh/h	1774	3388	208	1774	3569	54	412	35	1082	36	182	1386
Grp Volume(v), veh/h	34	323	333	4	294	308	41	0	0	22	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1826	1774	1770	1853	1530	0	0	1605	0	0
Q Serve(g_s), s	1.6	18.7	18.8	0.2	17.3	17.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	18.7	18.8	0.2	17.3	17.3	1.1	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.03	0.29		0.71	0.05		0.86
Lane Grp Cap(c), veh/h	162	418	431	126	375	393	966	0	0	1004	0	0
V/C Ratio(X)	0.21	0.77	0.77	0.03	0.78	0.78	0.04	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	288	869	896	294	869	910	966	0	0	1004	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.7	39.2	39.3	35.0	40.9	40.9	8.8	0.0	0.0	8.7	0.0	0.0
Incr Delay (d2), s/veh	0.5	2.5	2.5	0.1	3.6	3.5	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	9.4	9.7	0.1	8.8	9.2	0.5	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	34.2	41.7	41.7	35.1	44.6	44.4	8.9	0.0	0.0	8.8	0.0	0.0
LnGrp LOS	C	D	D	D	D	D	A			A		
Approach Vol, veh/h		690			606			41				22
Approach Delay, s/veh		41.4			44.4			8.9				8.8
Approach LOS		D			D			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		72.4	5.6	32.0		72.4	8.2	29.3				
Change Period (Y+Rc), s		6.0	5.0	6.0		6.0	5.0	6.0				
Max Green Setting (Gmax), s		28.0	11.0	54.0		28.0	11.0	54.0				
Max Q Clear Time (g_c+I1), s		3.1	2.2	20.8		2.6	3.6	19.3				
Green Ext Time (p_c), s		0.2	0.0	4.5		0.1	0.0	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay			41.2									
HCM 2010 LOS			D									



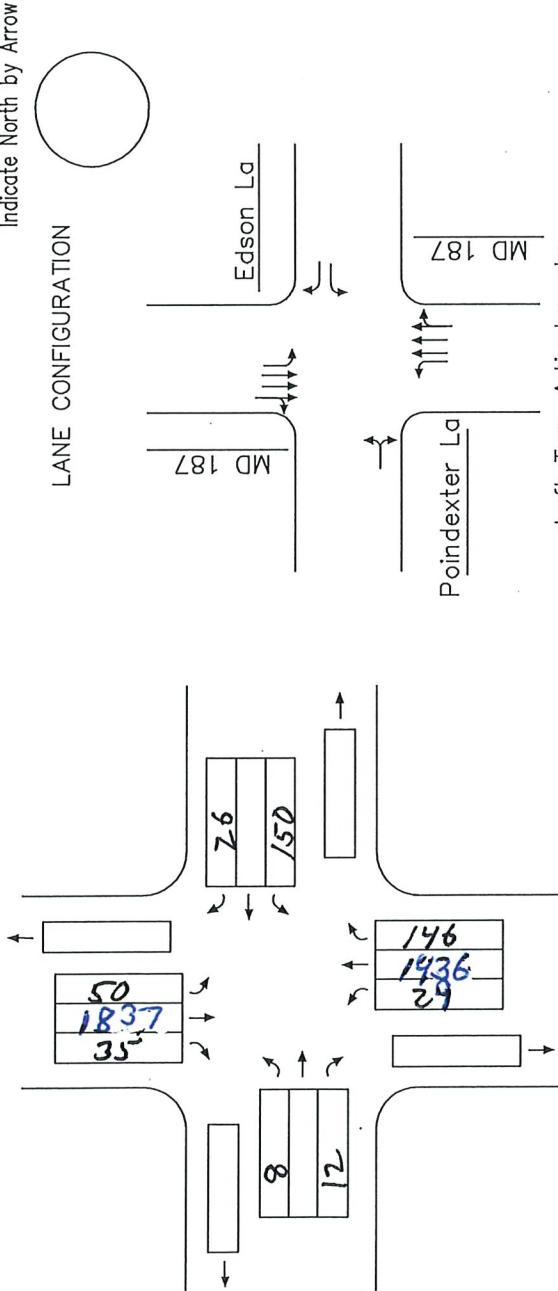
TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: NA
Conditions/Design Year: Background Traffic Volumes
Computed By: MN Date: _____

Location: MD 187 @
Poindexter La-Edson La

Morning Peak Hour _____

Evening Peak Hour _____



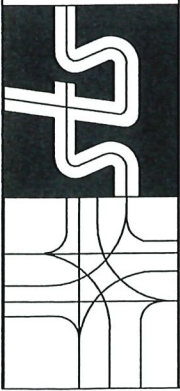
Left Turn Adjustments

Key	Opposing Through and Right-Turn Volume	Passenger Car Equivalent
1	0 to 199	1.1
2	200 to 599	2.0
3	600 to 799	3.0
4	800 to 999	4.0
5	1000+	5.0

No. of Lanes	Lane Use Factor
1	= 1.00
2	= .53
3	= .37
4	= .30
5	= .25

Service Level	Critical Lane Vol. Tot.
A =	1000 or Less
B =	1000 to 1150
C =	1150 to 1300
D =	1300 to 1450
E =	1450 to 1600
F =	Greater than 1600

Phasing <input checked="" type="checkbox"/>	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume	*	Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume	*
	NB	1436+146	0.37	585	50	635			NB	163+190	0.37	686	26	712	✓
	SB	1837+35	0.37	693	29	722	✓		SB	133+9	0.37	571	44	615	
	EB	8+12	1.0	20	150	170	✓		EB	6+8	1.0	14	207	221	✓
	WB	150	1.0	150	8	158			WB	207	1.0	207	6	213	
Remarks: * critical volume TOTAL 892 892 V/C															
Remarks: * critical volume TOTAL 933 V/C															
LEVEL OF SERVICE															

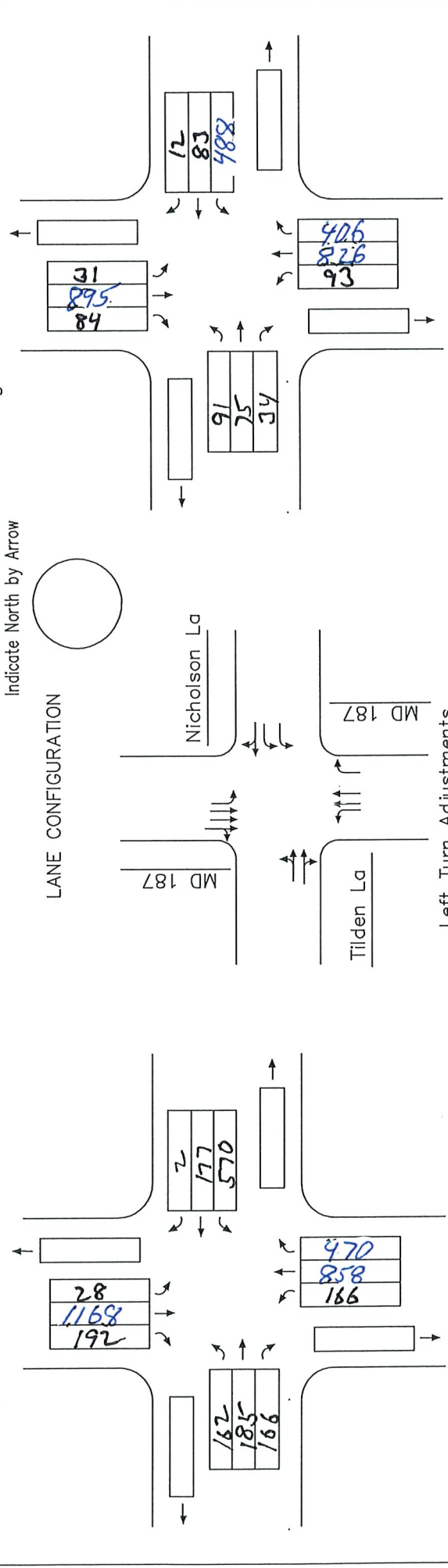


TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE

Count Date: NA Location: MD 187 @
 Conditions/ Design Year: Background Traffic Volumes
 Computed By: MN Date: _____
Tilden La-Nicholson La

Morning Peak Hour _____

Evening Peak Hour _____



Left Turn Adjustments

Phasing <input checked="" type="checkbox"/>	Opposing Through and Right-Turn Volume	Passenger Car Equivalent	No. of Lanes	Lane Use Factor	Service Level	Critical Lane Vol. Tot.
1	0 to 199	1.1	1 = 1.00	A = 1000 or Less	A	1000 or Less
2	200 to 599	2.0	2 = .53	B = 1150 to 1300	B	1150 to 1300
3	600 to 799	3.0	3 = .37	C = 1300 to 1450	C	1300 to 1450
4	800 to 999	4.0	4 = .30	D = 1450 to 1600	D	1450 to 1600
5	1000+	5.0	5 = .25	E = Greater than 1600	E	Greater than 1600

Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume *
	NB	858	0.37	317.53		NB	826	0.37	305.62	81	469
	SB	1168+192	0.37	503		SB	895+84	0.37	362	93	455
	EB	162+185+166	0.53	272		EB	91+75+34	0.53	106	-	106
	WB	570	0.6	342		WB	488	0.6	293	-	293

Remarks: _____

* critical volume	TOTAL	1283	V/C
* critical volume	TOTAL	868	V/C
LEVEL OF SERVICE			

APPENDIX F

TILDEN MIDDLE SCHOOL COUNTS

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 VEHICLE TURNING MOVEMENT COUNT - SUMMARY
 Intersection of: **Old Georgetown Rd**
 and: **Tilden Middle School Exit**
 Counted by: **ET**

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 Location : **Montgomery County**
 Date : **01/09/2019** Day: **Wednesday**
 Weather : **Fair**
 Entered by: **SKN**

STSLTD STSLTD STSLTD STSLTD STSLTD
 STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on:				TRAFFIC FROM EAST on: Tilden Middle School				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	270	0	270	0	111	0	111	0	0	0	0	0	0	0	0	381
45-00	0	306	0	306	0	133	0	133	0	0	0	0	0	0	0	0	439
07:00-15	0	415	0	415	0	150	0	150	0	0	0	0	0	0	8	8	573
15-30	0	504	0	504	0	225	0	225	0	0	0	0	0	0	0	0	729
30-45	0	423	0	423	0	328	0	328	0	0	0	0	2	0	1	3	754
45-00	0	494	0	494	0	311	0	311	0	0	0	0	32	0	55	87	892
08:00-15	0	469	0	469	0	338	0	338	0	0	0	0	30	0	41	71	878
15-30	0	439	0	439	0	344	0	344	0	0	0	0	9	0	7	16	799
30-45	0	416	0	416	0	361	0	361	0	0	0	0	3	0	3	6	783
45-00	0	455	0	455	0	421	0	421	0	0	0	0	3	0	5	8	884
09:00-15	0	392	0	392	0	372	0	372	0	0	0	0	1	0	5	6	770
15-30	0	327	0	327	0	345	0	345	0	0	0	0	0	0	1	1	673
AM 3 HOUR TOTALS	0	4910	0	4910	0	3439	0	3439	0	0	0	0	80	0	126	206	8555
1 HOUR TOTALS																	
630-730	0	1495	0	1495	0	619	0	619	0	0	0	0	0	0	8	8	2122
645-745	0	1648	0	1648	0	836	0	836	0	0	0	0	2	0	9	11	2495
07-08	0	1836	0	1836	0	1014	0	1014	0	0	0	0	34	0	64	98	2948
715-815	0	1890	0	1890	0	1202	0	1202	0	0	0	0	64	0	97	161	3253
730-830	0	1825	0	1825	0	1321	0	1321	0	0	0	0	73	0	104	177	3323
745-845	0	1818	0	1818	0	1354	0	1354	0	0	0	0	74	0	106	180	3352
08-09	0	1779	0	1779	0	1464	0	1464	0	0	0	0	45	0	56	101	3344
815-915	0	1702	0	1702	0	1498	0	1498	0	0	0	0	16	0	20	36	3236
830-930	0	1590	0	1590	0	1499	0	1499	0	0	0	0	7	0	14	21	3110
PEAK HOUR 745-845	0	1818	0	1818	0	1354	0	1354	0	0	0	0	74	0	106	180	3352
PM																	
02:00-15	0	385	0	385	0	305	0	305	0	0	0	0	0	0	6	6	696
15-30	0	336	0	336	0	326	0	326	0	0	0	0	5	0	1	6	668
30-45	0	381	0	381	0	419	0	419	0	0	0	0	1	0	2	3	803
45-00	0	329	0	329	0	423	0	423	0	0	0	0	6	0	4	10	762
03:00-15	0	388	0	388	0	487	0	487	0	0	0	0	15	0	27	42	917
15-30	0	335	0	335	0	471	0	471	0	0	0	0	7	0	6	13	819
30-45	0	375	0	375	0	525	0	525	0	0	0	0	4	0	4	8	908
45-00	0	356	0	356	0	484	0	484	0	0	0	0	2	0	5	7	847
04:00-15	0	428	0	428	0	497	0	497	0	0	0	0	3	0	3	6	931
15-30	0	388	0	388	0	539	0	539	0	0	0	0	12	0	30	42	969
30-45	0	389	0	389	0	522	0	522	0	0	0	0	4	0	15	19	930
45-00	0	373	0	373	0	525	0	525	0	0	0	0	5	0	6	11	909
PM 3 HOUR TOTALS	0	4463	0	4463	0	5523	0	5523	0	0	0	0	64	0	109	173	10159
1 HOUR TOTALS																	
02-03	0	1431	0	1431	0	1473	0	1473	0	0	0	0	12	0	13	25	2929
215-315	0	1434	0	1434	0	1655	0	1655	0	0	0	0	27	0	34	61	3150
230-330	0	1433	0	1433	0	1800	0	1800	0	0	0	0	29	0	39	68	3301
245-345	0	1427	0	1427	0	1906	0	1906	0	0	0	0	32	0	41	73	3406
03-04	0	1454	0	1454	0	1967	0	1967	0	0	0	0	28	0	42	70	3491
315-415	0	1494	0	1494	0	1977	0	1977	0	0	0	0	16	0	18	34	3505
330-430	0	1547	0	1547	0	2045	0	2045	0	0	0	0	21	0	42	63	3655
345-445	0	1561	0	1561	0	2042	0	2042	0	0	0	0	21	0	53	74	3677
04-05	0	1578	0	1578	0	2083	0	2083	0	0	0	0	24	0	54	78	3739
PEAK HOUR 04-05	0	1578	0	1578	0	2083	0	2083	0	0	0	0	24	0	54	78	3739

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD

STSLTD STSLTD STSLTD STSLTD STSLTD

Intersection of: **Old Georgetown Rd**
 and: **Tilden Middle School Exit**
 Counted by: **ET** **bikes only**

Location : **Montgomery County**
 Date : **01/09/2019** Day: **Wednesday**
 Weather : **Fair**
 Entered by: **SKN**

STREET
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 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on:				TRAFFIC FROM EAST on: Tilden Middle School				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-15	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
09:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM																	
3 HOUR																	
TOTALS	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
1 HOUR																	
TOTALS																	
630-730	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
645-745	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
07-08	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
715-815	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
730-830	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
745-845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-09	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
815-915	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
830-930	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
PEAK HOUR																	
645-745	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00-15	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM																	
3 HOUR																	
TOTALS	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
1 HOUR																	
TOTALS																	
02-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215-315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230-330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245-345	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03-04	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
315-415	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
330-430	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
345-445	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04-05	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
PEAK HOUR																	
315-415	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2

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F.R.A. STATE RECORD NO.	3	F.R.A. PROJECT NO.		SHEET NO.	
	MD				

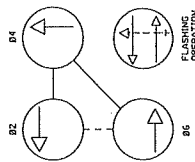
SIGNALS



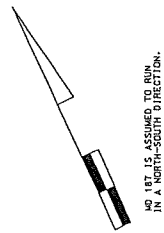
SIGNS



NEMA PHASING

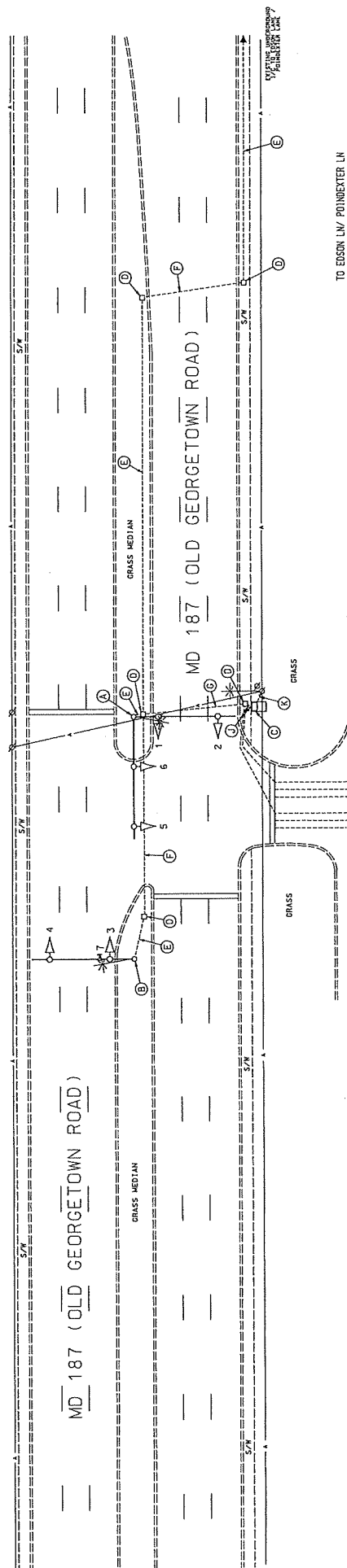


INSTALLATION NOTES
 1. PHASE ASSOCIATED BY A DASHED LINE WILL OPERATE DISJOINTLY
 2. PHASE ASSOCIATED BY A SOLID LINE WILL NOT OPERATE DISJOINTLY



MD 187 IS ASSUMED TO RUN IN A NORTH-SOUTH DIRECTION.

TO TUCKERMAN LANE



TO EDSON LAY POUNDKETER LN

- EQUIPMENT DETAILS**
- A. 27" steel pole with 48"/40" mast arms, traffic signal heads, one 30" lighting arm with 2 20W-type lamps, one 12" sign arm with 2 20W-type lamps (Note 1-2).
 - B. 27" steel pole with 40" mast arm, traffic signal heads, sign and 30" lighting arm with 2 20W-type lamps (Note 1-2).
 - C. NEMA 8" or 6" size base mounted cabinet and controller (Note 1-2).
 - D. 1/2" x 1/2" x 90 degree polyvinyl chloride (Schedule 40) bend, and 1/2" x 1/2" x 90 degree polyvinyl chloride (Schedule 40) bend.
 - E. 2" polyvinyl chloride conduit (Schedule 40).
 - F. 2" polyvinyl chloride conduit (Schedule 80).
 - G. 4" polyvinyl chloride conduit (Schedule 80).
 - H. 8" x 30" loop detector encased in 1/4" flexible tubing quadruple type (2-4-2).
 - J. 4" polyvinyl chloride conduit (Schedule 40).
 - K. Existing underground electrical service by PEPCO.

GENERAL NOTES:

1. This plan reflects only those underground utilities shown on the utility maps. It is the responsibility of the contractor to verify the location and depth of all underground utilities in the area.
2. Any modification to this subject signal should be prepared by a thorough identification of all existing utilities.

TILDEN MIDDLE SCHOOL

UTILITY LEGEND

— G —	GAS MAIN
— W —	WATER MAIN
— S —	SEWER MAIN
— E —	ELECTRIC CABLES
— A —	AERIAL CABLES
— T —	TELEPHONE CABLES

REVISION "K"

STREET TRAFFIC STUDIES, LTD.
 1325 Gateway International
 Unit 1000, Maryland 20900
 (410) 659-9555

3183.00N

REVISIONS

NO.	DATE	DESCRIPTION
1	1-20-96	AS BUILT
2	1-20-96	AS BUILT
3	1-20-96	AS BUILT

APPROVALS

DESIGNER	DRANK BY: S. BLISS
CHECKER	DES. BY: T. ZANDEL
ENGINEER	CHK. BY:
CONTRACTOR	
OWNER	

MDOT - STATE HIGHWAY ADMINISTRATION
 Office of Traffic and Safety
 TRAFFIC ENGINEERING DESIGN DIVISION

PROJECT NO. **MD 187 (OLD GEORGETOWN ROAD) AND TILDEN MIDDLE SCHOOL**
 COUNTY **MONTGOMERY**

DATE: **1-20-96** F.A.P. NO. **STP-00053381E** TS/STD. NO. **3663 A** SHEET NO. **OF**
 SCALE: **1"=80'** S.H.A. NO. **AM-791-501-985**

694 OLD GEORGETOWN ROAD (MD 187) & TILDEN MIDDLE SCHOOL DRIVEWAY
 SB - MD 187 WB - TILDEN MS DRWY NB - MD 187

PHASE	1	2	3	4	5	6	7	8
MIN GRN	1	5	0	3	0	5	0	0
BK MGRN	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0
WALK	0	0	0	0	0	0	0	0
WALK2	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0
PED CLR	0	0	0	0	0	0	0	0
PD CLR2	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0
VEH EXT	0	0	0	3	0	0	0	0
VH EXT2	0	0	0	0	0	0	0	0
MAX1	0	80	0	20	0	80	0	0
MAX2	0	60	0	40	0	60	0	0
MAX3	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0
DYM STP	0	0	0	0	0	0	0	0
YELLOW	3	4	3	4	3	4	3	3
RED CLR	1	1.5	1	2	1	1.5	1	1
RED MAX	0	0	0	0	0	0	0	0
RED RVT	2	5	2	5	2	5	2	2
ACT B4	0	0	0	0	0	0	0	0
SEC/ACT	0	0	0	0	0	0	0	0
MAX.INT	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0
STPTDUC	0	0	0	0	0	0	0	0
TTREDUC	0	0	0	0	0	0	0	0
MIN GAP	0	0	0	0	0	0	0	0

USE SPLIT PATTERN	AM	Mid	PM	PHASE	1	2	3	4	5	6	7	8
CYCLE	100	120		SPLIT 1	0	58	0	42	0	58	0	0
OFFSET VAL	55	0		COORD		X		NONE	NONE	X		NONE
				PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
				PHASE	1	2	3	4	5	6	7	8
				SPLIT 2	0	65	0	55	0	65	0	0
				COORD		X		NONE	NONE	X		NONE
				PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
				PHASE	1	2	3	4	5	6	7	8
				SPLIT 3	0	0	0	0	0	0	0	0
				COORD		X		NONE	NONE	X		NONE
				PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Signal is in morning operation from 7:50AM to 8:15AM weekdays
 Signal is in afternoon operation from 2:55PM to 3:25PM weekdays
 Signal is in flash operation at all other times

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

STSLTD STSLTD STSLTD STSLTD STSLTD STSLTD
 Location : Montgomery County
 Date : 01/09/2019
 Weather : Fair
 Entered by: SKN

STSLTD STSLTD STSLTD STSLTD STSLTD
 Day: Wednesday
 STREET
 TRAFFIC
 STUDIES
 LTD

Intersection of: Old Georgetown Rd
 and: Tilden Middle School Entrance
 Counted by: RJ

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST				TRAFFIC FROM EAST on: Tilden Middle School				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	270	0	270	0	111	0	111	0	0	0	0	1	0	0	1	382
45-00	0	295	11	306	0	133	4	137	0	0	0	0	3	0	1	4	447
07:00-15	0	395	20	415	0	150	20	170	0	0	0	0	0	0	0	0	585
15-30	0	470	34	504	0	225	32	257	0	0	0	0	0	0	0	0	761
30-45	0	386	39	425	0	328	25	353	0	0	0	0	0	0	0	0	778
45-00	0	389	137	526	0	311	97	408	0	0	0	0	0	0	0	0	934
08:00-15	0	415	84	499	0	338	46	384	0	0	0	0	0	0	1	1	884
15-30	0	384	64	448	0	344	57	401	0	0	0	0	0	0	1	1	850
30-45	0	359	60	419	0	361	45	406	0	0	0	0	0	0	0	0	825
45-00	0	437	21	458	0	421	25	446	0	0	0	0	0	2	1	1	905
09:00-15	0	361	32	393	0	372	17	389	0	0	0	0	0	0	1	1	783
15-30	0	314	13	327	0	345	10	355	0	0	0	0	0	0	0	0	682
AM 3 HOUR TOTALS	0	4475	515	4990	0	3439	378	3817	0	0	0	0	4	0	5	9	8816
1 HOUR TOTALS																	
630-730	0	1430	65	1495	0	619	56	675	0	0	0	0	4	0	1	5	2175
645-745	0	1546	104	1650	0	836	81	917	0	0	0	0	3	0	1	4	2571
07-08	0	1640	230	1870	0	1014	174	1188	0	0	0	0	0	0	0	0	3058
715-815	0	1660	294	1954	0	1202	200	1402	0	0	0	0	0	0	1	1	3357
730-830	0	1574	324	1898	0	1321	225	1546	0	0	0	0	0	0	2	2	3446
745-845	0	1547	345	1892	0	1354	245	1599	0	0	0	0	0	0	2	2	3493
08-09	0	1595	229	1824	0	1464	173	1637	0	0	0	0	0	0	3	3	3464
815-915	0	1541	177	1718	0	1498	144	1642	0	0	0	0	0	0	3	3	3363
830-930	0	1471	126	1597	0	1499	97	1596	0	0	0	0	0	0	2	2	3195
PEAK HOUR 745-845	0	1547	345	1892	0	1354	245	1599	0	0	0	0	0	0	2	2	3493
PM																	
02:00-15	0	381	4	385	0	298	6	304	0	0	0	0	1	0	7	8	697
15-30	0	335	6	341	0	325	6	331	0	0	0	0	2	0	1	3	675
30-45	0	381	1	382	0	419	1	420	0	0	0	0	0	0	0	0	802
45-00	0	303	32	335	0	417	20	437	0	0	0	0	0	0	6	6	778
03:00-15	0	360	43	403	0	479	47	526	0	0	0	0	0	0	8	8	937
15-30	0	319	23	342	0	471	16	487	0	0	0	0	0	0	0	0	829
30-45	0	363	16	379	0	514	10	524	0	0	0	0	0	0	11	11	914
45-00	0	352	6	358	0	484	67	551	0	0	0	0	0	0	0	0	909
04:00-15	0	416	15	431	0	495	22	517	0	0	0	0	2	0	2	4	952
15-30	0	348	52	400	0	510	48	558	0	0	0	0	0	0	29	29	987
30-45	0	353	40	393	0	506	22	528	0	0	0	0	0	0	16	16	937
45-00	0	375	3	378	0	525	0	525	0	0	0	0	0	0	0	0	903
PM 3 HOUR TOTALS	0	4286	241	4527	0	5443	265	5708	0	0	0	0	5	0	80	85	10320
1 HOUR TOTALS																	
02-03	0	1400	43	1443	0	1459	33	1492	0	0	0	0	3	0	14	17	2952
215-315	0	1379	82	1461	0	1640	74	1714	0	0	0	0	2	0	15	17	3192
230-330	0	1363	99	1462	0	1786	84	1870	0	0	0	0	0	0	14	14	3346
245-345	0	1345	114	1459	0	1881	93	1974	0	0	0	0	0	0	25	25	3458
03-04	0	1394	88	1482	0	1948	140	2088	0	0	0	0	0	0	19	19	3589
315-415	0	1450	60	1510	0	1964	115	2079	0	0	0	0	2	0	13	15	3604
330-430	0	1479	89	1568	0	2003	147	2150	0	0	0	0	2	0	42	44	3762
345-445	0	1469	113	1582	0	1995	159	2154	0	0	0	0	2	0	47	49	3785
04-05	0	1492	110	1602	0	2036	92	2128	0	0	0	0	2	0	47	49	3779
PEAK HOUR 345-445	0	1469	113	1582	0	1995	159	2154	0	0	0	0	2	0	47	49	3785

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 VEHICLE TURNING MOVEMENT COUNT - SUMMARY

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Intersection of: **Old Georgetown Rd**
 and: **Tilden Middle School Entrance**
 Counted by: **RJ** **bikes only**

Location : **Montgomery County**
 Date : **01/09/2019** Day: **Wednesday**
 Weather : **Fair**
 Entered by: **SKN**

STREET
 TRAFFIC
 STUDIES
 LTD

TIME	TRAFFIC FROM NORTH on: Old Georgetown Rd				TRAFFIC FROM SOUTH on: Old Georgetown Rd				TRAFFIC FROM WEST on:				TRAFFIC FROM EAST on: Tilden Middle School				TOTAL N + S + E + W
	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	RIGHT	THRU	LEFT	TOTAL	LEFT	THRU	RIGHT	TOTAL	
AM																	
06:30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM																	
3 HOUR																	
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 HOUR																	
TOTALS																	
630-730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645-745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715-815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
730-830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
745-845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
815-915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
830-930	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR																	
645-745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM																	
02:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45-00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM																	
3 HOUR																	
TOTALS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 HOUR																	
TOTALS																	
02-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215-315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230-330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245-345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315-415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330-430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345-445	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR																	
315-415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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APPENDIX G

CAPACITY CALCULATIONS - TOTAL CONDITIONS

HCM Signalized Intersection Capacity Analysis
 19: MD 187 & NB I 270 Ramp

Total Traffic Volumes
 Morning Peak Hour






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖	↖	↖↗	↑↑↑			↑↑↑↑	↖
Traffic Volume (vph)	0	0	0	150	13	656	149	1320	0	0	1976	875
Future Volume (vph)	0	0	0	150	13	656	149	1320	0	0	1976	875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.86			0.81	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Fl _t Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1698	1583	3433	6408			7544	1583
Fl _t Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1698	1583	3433	6408			7544	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	161	14	705	160	1419	0	0	2125	941
RTOR Reduction (vph)	0	0	0	0	0	39	0	0	0	0	0	589
Lane Group Flow (vph)	0	0	0	87	88	666	160	1419	0	0	2125	352
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				65.5	65.5	65.5	8.7	70.5			55.3	55.3
Effective Green, g (s)				65.5	65.5	65.5	8.7	70.5			55.3	55.3
Actuated g/C Ratio				0.44	0.44	0.44	0.06	0.47			0.37	0.37
Clearance Time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				734	741	691	199	3011			2781	583
v/s Ratio Prot							c0.05	0.22			c0.28	
v/s Ratio Perm				0.05	0.05	c0.42						0.22
v/c Ratio				0.12	0.12	0.96	0.80	0.47			0.76	0.60
Uniform Delay, d ₁				25.1	25.1	41.1	69.8	27.1			41.6	38.5
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.09	3.67
Incremental Delay, d ₂				0.1	0.1	25.4	20.5	0.5			1.0	2.2
Delay (s)				25.2	25.2	66.5	90.3	27.6			46.1	143.4
Level of Service				C	C	E	F	C			D	F
Approach Delay (s)		0.0			58.3			33.9			76.0	
Approach LOS		A			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	61.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 19: MD 187 & NB I 270 Ramp
























Total Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	166	8	317	284	1861	0	0	1348	643
Future Volume (vph)	0	0	0	166	8	317	284	1861	0	0	1348	643
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	1.00	0.97	0.86			0.81	1.00
Fr _t				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Fl _t Protected				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1693	1583	3433	6408			7544	1583
Fl _t Permitted				0.95	0.96	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1693	1583	3433	6408			7544	1583
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	178	9	341	305	2001	0	0	1449	691
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	0	329
Lane Group Flow (vph)	0	0	0	93	94	287	305	2001	0	0	1449	362
Turn Type				Perm	NA	Perm	Prot	NA			NA	Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				32.7	32.7	32.7	18.2	103.3			78.6	78.6
Effective Green, g (s)				32.7	32.7	32.7	18.2	103.3			78.6	78.6
Actuated g/C Ratio				0.22	0.22	0.22	0.12	0.69			0.52	0.52
Clearance Time (s)				8.0	8.0	8.0	6.5	6.0			6.0	6.0
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				366	369	345	416	4412			3953	829
v/s Ratio Prot							c0.09	c0.31			0.19	
v/s Ratio Perm				0.06	0.06	c0.18						0.23
v/c Ratio				0.25	0.25	0.83	0.73	0.45			0.37	0.44
Uniform Delay, d ₁				48.6	48.6	56.0	63.6	10.6			21.0	22.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.02	2.48
Incremental Delay, d ₂				0.4	0.4	15.6	6.6	0.3			0.2	1.0
Delay (s)				48.9	48.9	71.6	70.1	10.9			21.5	55.5
Level of Service				D	D	E	E	B			C	E
Approach Delay (s)		0.0			63.6			18.7			32.5	
Approach LOS		A			E			B			C	
Intersection Summary												
HCM 2000 Control Delay			29.4	HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			150.0	Sum of lost time (s)				20.5				
Intersection Capacity Utilization			69.8%	ICU Level of Service				C				
Analysis Period (min)			15									

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary
 14: MD 187 & Tuckerman La

Total Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	189	489	169	623	369	105	205	1358	306	68	1795	136
Future Volume (veh/h)	189	489	169	623	369	105	205	1358	306	68	1795	136
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	191	494	171	629	373	106	207	1372	309	69	1813	137
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	1	3	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	608	457	157	613	630	282	210	2222	692	177	1843	139
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.09	0.44	0.44	0.04	0.38	0.38
Sat Flow, veh/h	3442	2586	890	3442	3539	1583	1774	5085	1583	1774	4825	364
Grp Volume(v), veh/h	191	337	328	629	373	106	207	1372	309	69	1272	678
Grp Sat Flow(s),veh/h/ln	1721	1770	1706	1721	1770	1583	1774	1695	1583	1774	1695	1799
Q Serve(g_s), s	7.3	26.5	26.5	26.7	14.5	8.8	13.3	31.2	20.5	3.5	55.7	56.0
Cycle Q Clear(g_c), s	7.3	26.5	26.5	26.7	14.5	8.8	13.3	31.2	20.5	3.5	55.7	56.0
Prop In Lane	1.00		0.52	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	608	313	301	613	630	282	210	2222	692	177	1295	687
V/C Ratio(X)	0.31	1.08	1.09	1.03	0.59	0.38	0.99	0.62	0.45	0.39	0.98	0.99
Avail Cap(c_a), veh/h	608	313	301	613	630	282	210	2222	692	220	1295	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.59	0.59	0.59	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	61.7	61.8	61.7	56.6	54.3	47.9	32.6	29.5	28.8	45.9	46.0
Incr Delay (d2), s/veh	0.3	73.4	77.3	35.0	0.9	0.5	58.5	1.3	2.1	1.4	21.2	31.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	19.3	18.9	15.7	7.2	3.9	12.0	14.9	9.3	1.8	29.8	33.8
LnGrp Delay(d),s/veh	54.1	135.2	139.1	96.6	57.5	54.8	106.4	33.9	31.6	30.2	67.0	77.1
LnGrp LOS	D	F	F	F	E	D	F	C	C	C	E	E
Approach Vol, veh/h		856			1108			1888			2019	
Approach Delay, s/veh		118.6			79.5			41.5			69.1	
Approach LOS		F			E			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.8	72.0		33.0	20.0	63.8		33.2				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	8.9	61.9		26.5	13.5	57.3		26.7				
Max Q Clear Time (g_c+11), s	5.5	33.2		28.5	15.3	58.0		28.7				
Green Ext Time (p_c), s	0.0	13.9		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			69.4									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary
 14: MD 187 & Tuckerman La

Total Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	194	126	337	238	48	198	1594	274	98	1511	218
Future Volume (veh/h)	243	194	126	337	238	48	198	1594	274	98	1511	218
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	264	211	137	366	259	52	215	1733	298	107	1642	237
Adj No. of Lanes	2	2	0	2	2	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	410	250	155	427	439	196	240	2751	857	187	2270	326
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.08	0.54	0.54	0.04	0.51	0.51
Sat Flow, veh/h	3442	2098	1304	3442	3539	1583	1774	5085	1583	1774	4493	646
Grp Volume(v), veh/h	264	176	172	366	259	52	215	1733	298	107	1237	642
Grp Sat Flow(s),veh/h/ln	1721	1770	1633	1721	1770	1583	1774	1695	1583	1774	1695	1749
Q Serve(g_s), s	11.0	14.6	15.5	15.6	10.4	4.5	9.4	35.6	16.0	4.4	42.7	43.0
Cycle Q Clear(g_c), s	11.0	14.6	15.5	15.6	10.4	4.5	9.4	35.6	16.0	4.4	42.7	43.0
Prop In Lane	1.00		0.80	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	410	211	194	427	439	196	240	2751	857	187	1713	884
V/C Ratio(X)	0.64	0.84	0.88	0.86	0.59	0.26	0.90	0.63	0.35	0.57	0.72	0.73
Avail Cap(c_a), veh/h	424	218	201	470	484	216	331	2751	857	264	1713	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.0	64.6	65.0	64.4	62.1	59.5	32.9	24.0	19.5	22.6	28.9	29.0
Incr Delay (d2), s/veh	3.2	23.3	32.9	9.8	1.1	0.5	20.4	1.1	1.1	2.8	2.7	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	8.5	8.8	8.0	5.1	2.0	10.1	17.0	7.2	2.3	20.6	21.9
LnGrp Delay(d),s/veh	66.2	88.0	97.9	74.2	63.2	60.0	53.4	25.1	20.6	25.3	31.6	34.2
LnGrp LOS	E	F	F	E	E	E	D	C	C	C	C	C
Approach Vol, veh/h		612			677			2246			1986	
Approach Delay, s/veh		81.4			68.9			27.2			32.1	
Approach LOS		F			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.9	87.6		24.4	18.2	82.3		25.1				
Change Period (Y+Rc), s	6.5	6.5		6.5	6.5	6.5		6.5				
Max Green Setting (Gmax), s	12.9	72.1		18.5	19.5	65.5		20.5				
Max Q Clear Time (g_c+I1), s	6.4	37.6		17.5	11.4	45.0		17.6				
Green Ext Time (p_c), s	0.1	19.9		0.3	0.4	13.9		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			40.1									
HCM 2010 LOS			D									

HCM Signalized Intersection Capacity Analysis
 8: MD 187 & Poindexter La/Edson La

Total Traffic Volumes
 Morning Peak Hour






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕		↕	↕	↑↑↑		↕	↑↑↑	
Traffic Volume (vph)	8	0	12	150	0	26	29	1551	146	50	1972	35
Future Volume (vph)	8	0	12	150	0	26	29	1551	146	50	1972	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor		1.00		1.00		1.00	1.00	0.91		1.00	0.91	
Frt		0.92		1.00		0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1675		1770		1583	1770	5020		1770	5072	
Flt Permitted		0.98		0.74		1.00	0.07	1.00		0.11	1.00	
Satd. Flow (perm)		1675		1385		1583	135	5020		203	5072	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	0	12	156	0	27	30	1616	152	52	2054	36
RTOR Reduction (vph)	0	18	0	0	0	23	0	6	0	0	1	0
Lane Group Flow (vph)	0	3	0	156	0	4	30	1762	0	52	2089	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		22.1		22.1		22.1	116.4	116.4		116.4	116.4	
Effective Green, g (s)		22.1		22.1		22.1	116.4	116.4		116.4	116.4	
Actuated g/C Ratio		0.15		0.15		0.15	0.78	0.78		0.78	0.78	
Clearance Time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		246		204		233	104	3895		157	3935	
v/s Ratio Prot								0.35			c0.41	
v/s Ratio Perm		0.00		c0.11		0.00	0.22			0.26		
v/c Ratio		0.01		0.76		0.02	0.29	0.45		0.33	0.53	
Uniform Delay, d1		54.6		61.5		54.7	4.8	5.8		5.1	6.4	
Progression Factor		1.00		1.00		1.00	1.00	1.00		0.66	0.65	
Incremental Delay, d2		0.0		15.6		0.0	6.9	0.4		2.4	0.2	
Delay (s)		54.6		77.0		54.7	11.7	6.2		5.7	4.4	
Level of Service		D		E		D	B	A		A	A	
Approach Delay (s)		54.6			73.8			6.3			4.4	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 8: MD 187 & Poindexter La/Edson La

Total Traffic Volumes
 Evening Peak Hour






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	8	207	0	23	44	1913	190	26	1573	9
Future Volume (vph)	6	0	8	207	0	23	44	1913	190	26	1573	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Lane Util. Factor		1.00		1.00		1.00	1.00	0.91		1.00	0.91	
Fr _t		0.92		1.00		0.85	1.00	0.99		1.00	1.00	
Fl _t Protected		0.98		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684		1770		1583	1770	5016		1770	5081	
Fl _t Permitted		0.98		0.75		1.00	0.11	1.00		0.05	1.00	
Satd. Flow (perm)		1684		1392		1583	196	5016		88	5081	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	0	9	230	0	26	49	2126	211	29	1748	10
RTOR Reduction (vph)	0	13	0	0	0	20	0	7	0	0	0	0
Lane Group Flow (vph)	0	3	0	230	0	6	49	2330	0	29	1758	0
Turn Type	Perm	NA		Perm		Perm	Perm	NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		29.0		29.0		29.0	109.5	109.5		109.5	109.5	
Effective Green, g (s)		29.0		29.0		29.0	109.5	109.5		109.5	109.5	
Actuated g/C Ratio		0.19		0.19		0.19	0.73	0.73		0.73	0.73	
Clearance Time (s)		5.0		5.0		5.0	6.5	6.5		6.5	6.5	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		325		269		306	143	3661		64	3709	
v/s Ratio Prot								c0.46			0.35	
v/s Ratio Perm		0.00		c0.17		0.00	0.25			0.33		
v/c Ratio		0.01		0.86		0.02	0.34	0.64		0.45	0.47	
Uniform Delay, d ₁		48.9		58.5		49.0	7.3	10.2		8.2	8.4	
Progression Factor		1.00		1.00		1.00	1.00	1.00		0.79	0.81	
Incremental Delay, d ₂		0.0		22.3		0.0	6.4	0.9		19.2	0.4	
Delay (s)		48.9		80.8		49.0	13.7	11.1		25.6	7.2	
Level of Service		D		F		D	B	B		C	A	
Approach Delay (s)		48.9				77.6		11.1			7.5	
Approach LOS		D				E		B			A	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group






















HCM 2010 Signalized Intersection Summary
 3: MD 187 & Tilden La/Nicholson La

Total Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	185	187	601	177	2	183	929	497	28	1251	192
Future Volume (veh/h)	162	185	187	601	177	2	183	929	497	28	1251	192
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	172	197	199	639	188	2	195	988	529	30	1331	204
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	197	210	693	370	4	229	1551	694	166	1703	261
Arrive On Green	0.17	0.17	0.17	0.20	0.20	0.20	0.08	0.44	0.44	0.02	0.38	0.38
Sat Flow, veh/h	1008	1183	1261	3442	1840	20	1774	3539	1583	1774	4451	682
Grp Volume(v), veh/h	309	0	259	639	0	190	195	988	529	30	1014	521
Grp Sat Flow(s),veh/h/ln	1812	0	1640	1721	0	1859	1774	1770	1583	1774	1695	1742
Q Serve(g_s), s	25.0	0.0	23.4	27.3	0.0	13.6	9.7	32.6	42.3	1.5	39.5	39.5
Cycle Q Clear(g_c), s	25.0	0.0	23.4	27.3	0.0	13.6	9.7	32.6	42.3	1.5	39.5	39.5
Prop In Lane	0.56		0.77	1.00		0.01	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	302	0	273	693	0	374	229	1551	694	166	1297	667
V/C Ratio(X)	1.02	0.00	0.95	0.92	0.00	0.51	0.85	0.64	0.76	0.18	0.78	0.78
Avail Cap(c_a), veh/h	302	0	273	723	0	390	272	1551	694	184	1297	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.5	0.0	61.8	58.8	0.0	53.3	33.1	32.8	35.5	29.0	40.8	40.8
Incr Delay (d2), s/veh	58.0	0.0	40.1	17.0	0.0	1.1	19.5	2.0	7.8	0.5	4.7	8.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.4	0.0	13.7	14.7	0.0	7.1	6.0	16.4	20.0	0.8	19.3	20.6
LnGrp Delay(d),s/veh	120.5	0.0	102.0	75.7	0.0	54.4	52.6	34.8	43.3	29.5	45.5	49.6
LnGrp LOS	F		F	E		D	D	C	D	C	D	D
Approach Vol, veh/h		568			829			1712			1565	
Approach Delay, s/veh		112.1			70.8			39.5			46.6	
Approach LOS		F			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.1	72.2		31.0	17.4	63.9		37.7				
Change Period (Y+Rc), s	5.5	6.5		6.0	5.5	6.5		7.5				
Max Green Setting (Gmax), s	5.1	62.9		25.0	15.5	52.5		31.5				
Max Q Clear Time (g_c+I1), s	3.5	44.3		27.0	11.7	41.5		29.3				
Green Ext Time (p_c), s	0.0	9.1		0.0	0.2	7.3		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			56.2									
HCM 2010 LOS			E									



















HCM 2010 Signalized Intersection Summary
 3: MD 187 & Tilden La/Nicholson La

Total Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	75	40	497	83	12	131	980	464	31	920	84
Future Volume (veh/h)	91	75	40	497	83	12	131	980	464	31	920	84
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	100	82	44	546	91	13	144	1077	510	34	1011	92
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	3	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	108	59	624	289	41	335	1914	856	202	2438	221
Arrive On Green	0.08	0.08	0.08	0.18	0.18	0.18	0.05	0.54	0.54	0.03	0.51	0.51
Sat Flow, veh/h	1502	1308	714	3442	1595	228	1774	3539	1583	1774	4746	431
Grp Volume(v), veh/h	119	0	107	546	0	104	144	1077	510	34	722	381
Grp Sat Flow(s),veh/h/ln	1788	0	1737	1721	0	1823	1774	1770	1583	1774	1695	1787
Q Serve(g_s), s	9.8	0.0	9.0	23.2	0.0	7.4	5.7	30.1	32.7	1.4	19.7	19.8
Cycle Q Clear(g_c), s	9.8	0.0	9.0	23.2	0.0	7.4	5.7	30.1	32.7	1.4	19.7	19.8
Prop In Lane	0.84		0.41	1.00		0.13	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	148	0	144	624	0	330	335	1914	856	202	1741	918
V/C Ratio(X)	0.80	0.00	0.74	0.88	0.00	0.31	0.43	0.56	0.60	0.17	0.41	0.42
Avail Cap(c_a), veh/h	215	0	208	815	0	431	402	1914	856	222	1741	918
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.6	0.0	67.2	59.8	0.0	53.3	17.0	22.7	23.3	18.8	22.5	22.6
Incr Delay (d2), s/veh	13.2	0.0	8.1	8.5	0.0	0.5	0.9	1.2	3.0	0.4	0.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	4.7	11.7	0.0	3.8	2.8	15.0	15.0	0.7	9.4	10.1
LnGrp Delay(d),s/veh	80.8	0.0	75.3	68.2	0.0	53.9	17.9	23.9	26.4	19.2	23.3	23.9
LnGrp LOS	F		E	E		D	B	C	C	B	C	C
Approach Vol, veh/h		226			650			1731			1137	
Approach Delay, s/veh		78.2			65.9			24.2			23.4	
Approach LOS		E			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	87.6		18.4	13.3	83.6		34.7				
Change Period (Y+Rc), s	5.5	6.5		6.0	5.5	6.5		7.5				
Max Green Setting (Gmax), s	5.5	65.5		18.0	13.5	57.5		35.5				
Max Q Clear Time (g_c+I1), s	3.4	34.7		11.8	7.7	21.8		25.2				
Green Ext Time (p_c), s	0.0	12.4		0.6	0.2	9.3		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			34.4									
HCM 2010 LOS			C									



















HCM 2010 Signalized Intersection Summary
 17: Gloxinia Dr & Tuckerman La

Total Traffic Volumes
 Morning Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	729	30	2	783	7	59	4	14	11	2	67
Future Volume (veh/h)	13	729	30	2	783	7	59	4	14	11	2	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	15	819	34	2	880	8	66	4	16	12	2	75
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	1097	46	138	1088	10	616	42	137	124	44	697
Arrive On Green	0.02	0.32	0.32	0.00	0.30	0.30	0.53	0.53	0.53	0.53	0.53	0.53
Sat Flow, veh/h	1774	3463	144	1774	3594	33	1060	80	261	164	83	1325
Grp Volume(v), veh/h	15	418	435	2	433	455	86	0	0	89	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1837	1774	1770	1857	1401	0	0	1572	0	0
Q Serve(g_s), s	0.6	23.3	23.3	0.1	24.9	24.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	23.3	23.3	0.1	24.9	24.9	2.6	0.0	0.0	3.0	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.02	0.77		0.19	0.13		0.84
Lane Grp Cap(c), veh/h	143	560	582	138	536	562	795	0	0	864	0	0
V/C Ratio(X)	0.10	0.75	0.75	0.01	0.81	0.81	0.11	0.00	0.00	0.10	0.00	0.00
Avail Cap(c_a), veh/h	226	901	935	246	901	945	795	0	0	864	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.48	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.6	33.6	33.6	28.7	35.4	35.4	13.0	0.0	0.0	13.1	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.0	0.9	0.0	3.0	2.8	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	11.5	12.0	0.0	12.6	13.2	1.4	0.0	0.0	1.4	0.0	0.0
LnGrp Delay(d),s/veh	28.7	34.6	34.6	28.8	38.4	38.2	13.3	0.0	0.0	13.3	0.0	0.0
LnGrp LOS	C	C	C	C	D	D	B			B		
Approach Vol, veh/h		868			890			86				89
Approach Delay, s/veh		34.5			38.3			13.3				13.3
Approach LOS		C			D			B				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		63.9	5.3	40.8		63.9	6.8	39.3				
Change Period (Y+Rc), s		6.0	5.0	6.0		6.0	5.0	6.0				
Max Green Setting (Gmax), s		30.0	7.0	56.0		30.0	7.0	56.0				
Max Q Clear Time (g_c+I1), s		4.6	2.1	25.3		5.0	2.6	26.9				
Green Ext Time (p_c), s		0.4	0.0	6.2		0.5	0.0	6.4				
Intersection Summary												
HCM 2010 Ctrl Delay			34.3									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary
 17: Gloxinia Dr & Tuckerman La

Total Traffic Volumes
 Evening Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	563	32	3	511	8	10	0	25	1	2	16
Future Volume (veh/h)	29	563	32	3	511	8	10	0	25	1	2	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	34	662	38	4	601	9	12	0	29	1	2	19
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	169	834	48	121	789	12	287	21	644	56	109	825
Arrive On Green	0.03	0.25	0.25	0.01	0.22	0.22	0.60	0.00	0.60	0.60	0.60	0.60
Sat Flow, veh/h	1774	3403	195	1774	3569	53	412	36	1082	36	183	1386
Grp Volume(v), veh/h	34	344	356	4	298	312	41	0	0	22	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1828	1774	1770	1853	1530	0	0	1605	0	0
Q Serve(g_s), s	1.6	20.0	20.1	0.2	17.3	17.4	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	20.0	20.1	0.2	17.3	17.4	1.1	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.03	0.29		0.71	0.05		0.86
Lane Grp Cap(c), veh/h	169	434	448	121	391	410	953	0	0	989	0	0
V/C Ratio(X)	0.20	0.79	0.79	0.03	0.76	0.76	0.04	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	294	901	931	257	869	910	953	0	0	989	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	32.9	38.9	38.9	34.4	40.1	40.1	9.2	0.0	0.0	9.1	0.0	0.0
Incr Delay (d2), s/veh	0.5	2.7	2.6	0.1	3.1	3.0	0.1	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	10.1	10.4	0.1	8.8	9.2	0.5	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	33.4	41.6	41.5	34.5	43.2	43.1	9.3	0.0	0.0	9.2	0.0	0.0
LnGrp LOS	C	D	D	C	D	D	A			A		
Approach Vol, veh/h		734			614			41				22
Approach Delay, s/veh		41.2			43.1			9.3				9.2
Approach LOS		D			D			A				A
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		71.5	5.6	33.0		71.5	8.2	30.3				
Change Period (Y+Rc), s		6.0	5.0	6.0		6.0	5.0	6.0				
Max Green Setting (Gmax), s		28.0	9.0	56.0		28.0	11.0	54.0				
Max Q Clear Time (g_c+I1), s		3.1	2.2	22.1		2.6	3.6	19.4				
Green Ext Time (p_c), s		0.2	0.0	4.9		0.1	0.0	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay			40.6									
HCM 2010 LOS			D									

HCM Signalized Intersection Capacity Analysis
 24: MD 187 & Main Access

Total Traffic Volumes
 Morning Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	113	95	1558	232	412	1722
Future Volume (vph)	113	95	1558	232	412	1722
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	5.5		4.5	5.5
Lane Util. Factor	1.00	1.00	0.91		1.00	0.91
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	4986		1770	5085
Flt Permitted	0.95	1.00	1.00		0.08	1.00
Satd. Flow (perm)	1770	1583	4986		154	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	123	103	1693	252	448	1872
RTOR Reduction (vph)	0	90	18	0	0	0
Lane Group Flow (vph)	123	13	1927	0	448	1872
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	11.8	11.8	44.0		70.6	70.6
Effective Green, g (s)	11.8	11.8	44.0		70.6	70.6
Actuated g/C Ratio	0.13	0.13	0.47		0.75	0.75
Clearance Time (s)	6.0	6.0	5.5		4.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	222	198	2336		496	3823
v/s Ratio Prot	c0.07		0.39		c0.21	0.37
v/s Ratio Perm		0.01			c0.47	
v/c Ratio	0.55	0.07	0.82		0.90	0.49
Uniform Delay, d1	38.6	36.2	21.6		27.3	4.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.0	0.1	3.5		19.6	0.5
Delay (s)	41.6	36.3	25.1		46.9	5.0
Level of Service	D	D	C		D	A
Approach Delay (s)	39.2		25.1			13.1
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay		19.6	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio		0.88	
Actuated Cycle Length (s)		93.9	Sum of lost time (s) 16.0
Intersection Capacity Utilization		77.7%	ICU Level of Service D
Analysis Period (min)		15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 23: MD 187 & Main Access

Total Traffic Volumes
 Evening Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	145	144	1875	67	99	1689
Future Volume (vph)	145	144	1875	67	99	1689
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.91		1.00	0.91
Fr _t	1.00	0.85	0.99		1.00	1.00
Fl _t Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	5059		1770	5085
Fl _t Permitted	0.95	1.00	1.00		0.05	1.00
Satd. Flow (perm)	1770	1583	5059		102	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	157	2038	73	108	1836
RTOR Reduction (vph)	0	136	3	0	0	0
Lane Group Flow (vph)	158	21	2108	0	108	1836
Turn Type	Prot	Perm	NA		pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	15.3	15.3	76.7		89.6	89.6
Effective Green, g (s)	15.3	15.3	76.7		89.6	89.6
Actuated g/C Ratio	0.13	0.13	0.67		0.79	0.79
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	237	212	3406		203	4000
v/s Ratio Prot	c0.09		c0.42		0.04	c0.36
v/s Ratio Perm		0.01			0.38	
v/c Ratio	0.67	0.10	0.62		0.53	0.46
Uniform Delay, d ₁	46.9	43.3	10.4		14.7	4.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d ₂	6.9	0.2	0.9		2.7	0.4
Delay (s)	53.8	43.5	11.3		17.3	4.4
Level of Service	D	D	B		B	A
Approach Delay (s)	48.6		11.3			5.2
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay		11.2	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio		0.62	
Actuated Cycle Length (s)		113.9	Sum of lost time (s) 13.5
Intersection Capacity Utilization		62.5%	ICU Level of Service B
Analysis Period (min)		15	

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
7: MD 187 & School Bus Loop

Total Traffic Volumes
Morning Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	22	26	1764	38	47	1788
Future Volume (Veh/h)	22	26	1764	38	47	1788
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	28	1917	41	51	1943
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	1164			311		
pX, platoon unblocked	0.84	0.76			0.76	
vC, conflicting volume	2687	660			1958	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1159	0			1173	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	97			89	
cM capacity (veh/h)	140	828			452	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	24	28	767	767	424	51	648	648	648
Volume Left	24	0	0	0	0	51	0	0	0
Volume Right	0	28	0	0	41	0	0	0	0
cSH	140	828	1700	1700	1700	452	1700	1700	1700
Volume to Capacity	0.17	0.03	0.45	0.45	0.25	0.11	0.38	0.38	0.38
Queue Length 95th (ft)	15	3	0	0	0	9	0	0	0
Control Delay (s)	35.9	9.5	0.0	0.0	0.0	14.0	0.0	0.0	0.0
Lane LOS	E	A				B			
Approach Delay (s)	21.7		0.0			0.4			
Approach LOS	C								

Intersection Summary		
Average Delay		0.5
Intersection Capacity Utilization	49.1%	ICU Level of Service
Analysis Period (min)		15

$$(22 \times 35.9) + (26 \times 9.5) + (47 \times 14) / 3685$$

$$789.8 + 247 + 658 / 3685$$

$$1694.8 / 3685 = 0.5 \text{ sec}$$

HCM Unsignalized Intersection Capacity Analysis
 24: MD 187 & School Bus Loop

Total Traffic Volumes
 Evening Peak Hour

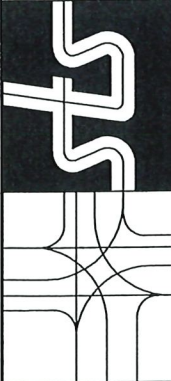


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵	↵	↑↑↑		↵	↑↑↑
Traffic Volume (veh/h)	18	20	1922	22	23	1811
Future Volume (Veh/h)	18	20	1922	22	23	1811
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	22	2089	24	25	1968
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)			1151		323	
pX, platoon unblocked	0.81	0.75			0.75	
vC, conflicting volume	2807	708			2113	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1387	0			1307	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	97			94	
cM capacity (veh/h)	101	811			393	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4
Volume Total	20	22	836	836	442	25	656	656	656
Volume Left	20	0	0	0	0	25	0	0	0
Volume Right	0	22	0	0	24	0	0	0	0
cSH	101	811	1700	1700	1700	393	1700	1700	1700
Volume to Capacity	0.20	0.03	0.49	0.49	0.26	0.06	0.39	0.39	0.39
Queue Length 95th (ft)	17	2	0	0	0	5	0	0	0
Control Delay (s)	49.0	9.6	0.0	0.0	0.0	14.8	0.0	0.0	0.0
Lane LOS	E	A				B			
Approach Delay (s)	28.3		0.0			0.2			
Approach LOS	D								

Intersection Summary		
Average Delay	0.4	
Intersection Capacity Utilization	47.6%	ICU Level of Service A
Analysis Period (min)	15	

$$\begin{aligned}
 &(18 + 49) + (20 \times 9.6) + (23 \times 14.8) / 3816 \\
 &882 + 192 + 340.4 / 3816 \\
 &1414.4 / 3816 \approx 0.4 \text{ sec}
 \end{aligned}$$



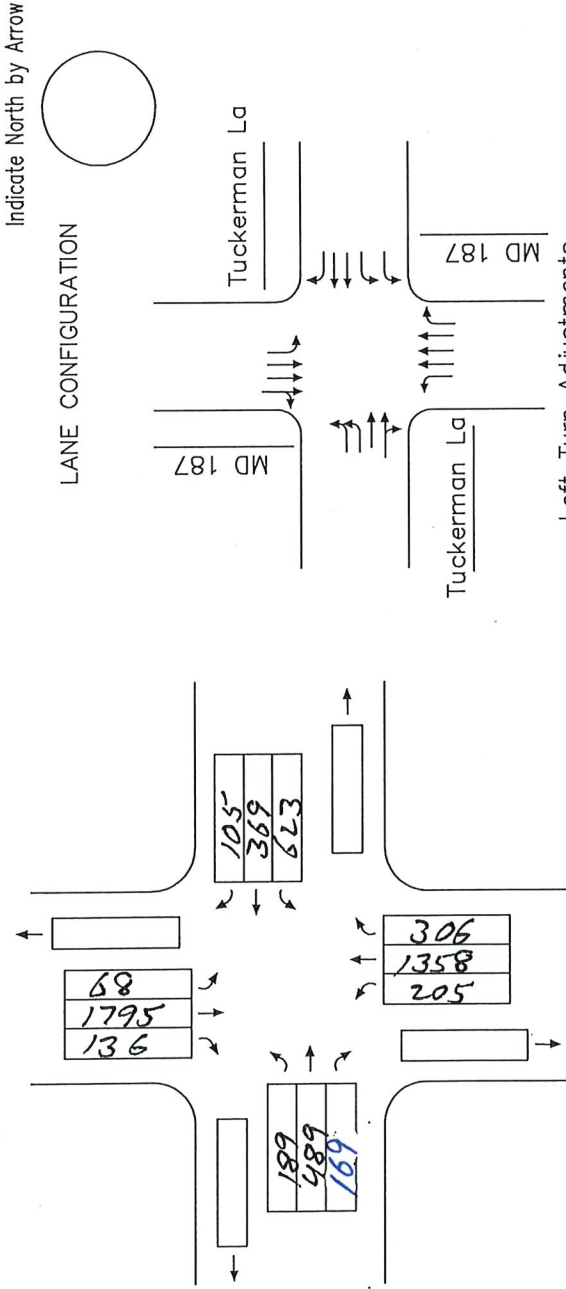
TURNING MOVEMENT SUMMARY AND LEVEL OF SERVICE

Count Date: NA
 Conditions/Design Year: Total Traffic Volumes
 Computed By: MN Date: _____

Location: MD 187 @
 Tuckerman La

Morning Peak Hour _____

Evening Peak Hour _____

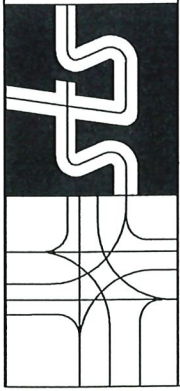


Left Turn Adjustments

Phasing Split of ex Tuckerman La

Key	Opposing Through and Right-Turn Volume	Passenger Car Equivalent
1	0 to 199	1.1
2	200 to 599	2.0
3	600 to 799	3.0
4	800 to 999	4.0
5	1000+	5.0

Ø	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume *	Ø	Movement	Passenger Car Equivalent	No. of Lanes	Lane Use Factor	Lane Volume (1)x(2)	Opposing Lefts	Critical Lane Volume *
	NB	1338	0.37	502	68	570		NB	1.1	1594	0.37	590	98	688
	SB	1795+136	0.37	714	205	919		SB	2.0	1511+1218	0.37	640	198	838
	EB	489+169	0.53	349	-	349		EB	3.0	194+126	0.53	170	-	170
	WB	623	0.6	374	-	374		WB	4.0	337	0.6	202	-	202
Remarks: * critical volume TOTAL 1692 V/C LEVEL OF SERVICE TOTAL 1210 V/C LEVEL OF SERVICE														

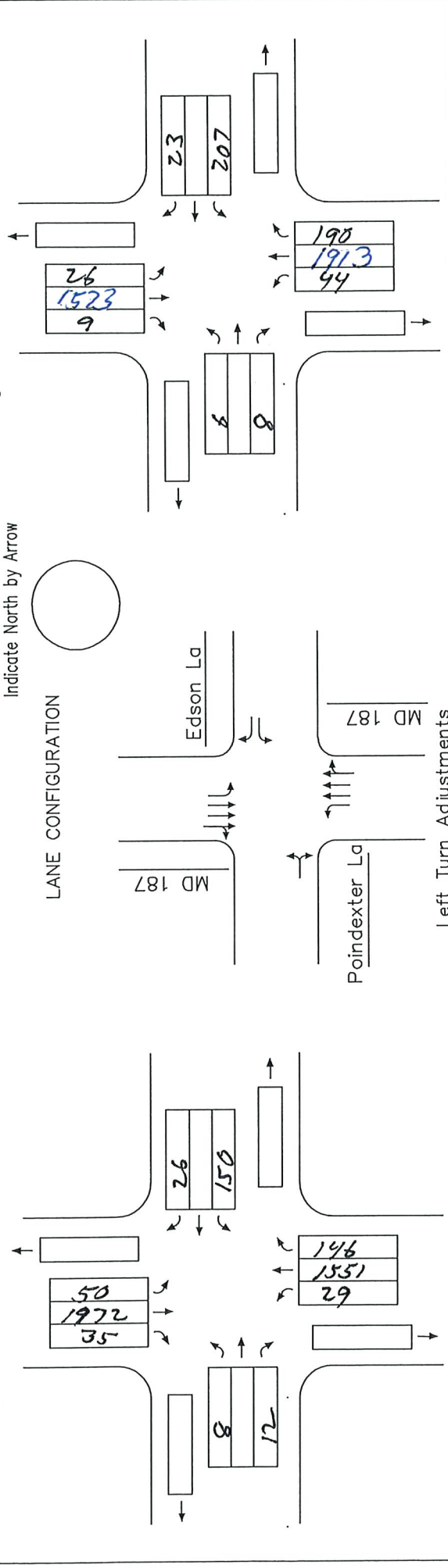


TURNING MOVEMENT SUMMARY AND LEVEL OF SERVICE

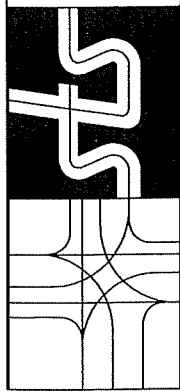
Count Date: NA Location: MD 187 @
 Conditions/Design Year: Total Traffic Volumes Poindexter La-Edson La
 Computed By: MN Date: _____

Morning Peak Hour _____

Evening Peak Hour _____



Phasing <input checked="" type="checkbox"/>	Opposing Through and Right-Turn Volume		Passenger Car Equivalent	Movement	No. of Lanes	Lane Use Factor	Lane Use Volume (1) x (2)	Lane Use Factor (2)	Service Level	Critical Lane Vol. Tot.
	Opposing Lefts	Critical Lane Volume								
Ø	Ø	Ø	Ø	Ø	1 = 1.00 2 = .53 3 = .37 4 = .30 5 = .25	A = 1000 or Less B = 1000 to 1150 C = 1150 to 1300 D = 1300 to 1450 E = 1450 to 1600 F = Greater than 1600				
NB	50	628	1.1	NB	1913+190	0.37	778	0.37	A	809
SB	29	743	2.0	SB	1523+9	0.37	567	0.37	B	611
EB	150	20	3.0	EB	6+8	1.0	14	1.0	C	221
WB	8	150	4.0	WB	207	1.0	207	1.0	D	213
			5.0						E	
			1000+						F	
Remarks:	* critical volume	TOTAL	Remarks:		* critical volume	TOTAL	LEVEL OF SERVICE		LEVEL OF SERVICE	
		942					1025		V/C	

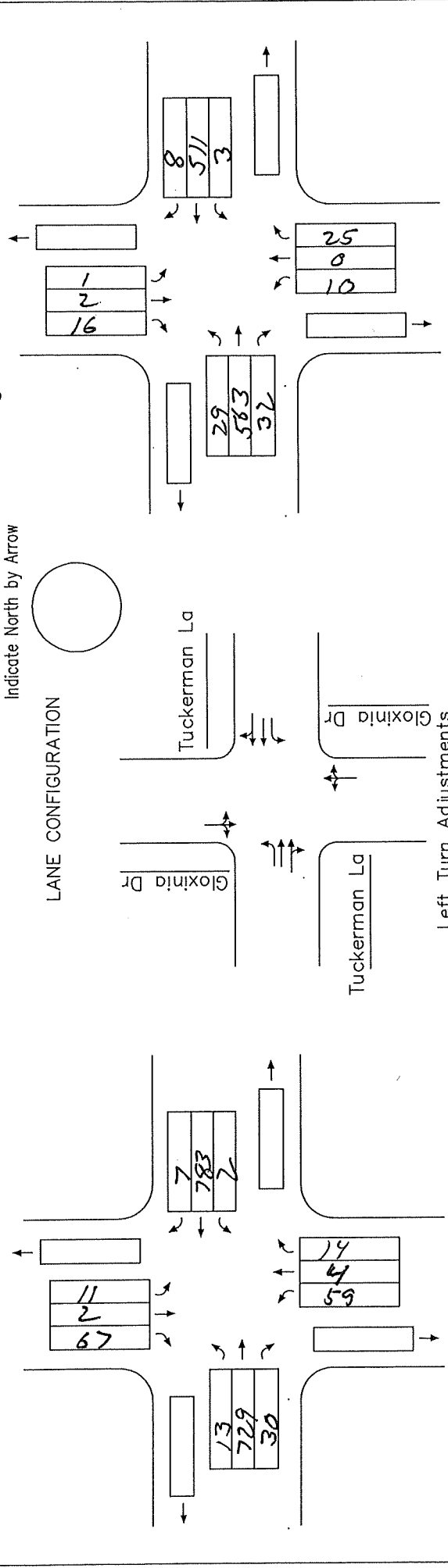


**TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE**

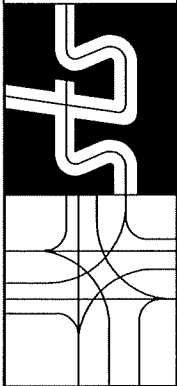
Count Date: NA Location: Tuckerman La @
 Conditions/ Design Year: Total Traffic Volumes Gloxinia Dr
 Computed By: MN Date: _____

Morning Peak Hour _____

Evening Peak Hour _____



Phasing <input checked="" type="checkbox"/>	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Through and Right-Turn Volume	Passenger Car Equivalent	No. of Lanes	Lane Use Factor	Service Level	Critical Lane Vol. Tot.	Critical Lane Volume *	Remarks:		
												Opposing Lefts	TOTAL	* critical volume
	NB	65 + 9 + 14	1.0	83	0 to 199	1.1	1	1.00	A	1000 or Less	94	11	572	V/C
	SB	12 + 2 + 67	1.0	81	200 to 599	2.0	2	.53	B	1000 to 1150	140	59	572	V/C
	EB	789 + 30	0.53	402	600 to 799	3.0	3	.37	C	1150 to 1300	404	2	402	V
	WB	783 + 7	0.53	419	800 to 999	4.0	4	.30	D	1300 to 1450	432	13	432	V
					1000+	5.0	5	.25	E	1450 to 1600				
									F	Greater than 1600				
Remarks:											* critical volume	TOTAL	572	V/C
											* critical volume	TOTAL	355	V/C
											LEVEL OF SERVICE			



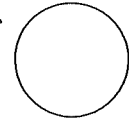
**TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE**

Count Date: NA Location: MD 187 @
 Conditions/ Design Year: Total Traffic Volumes Main Access
 Computed By: MN Date: _____

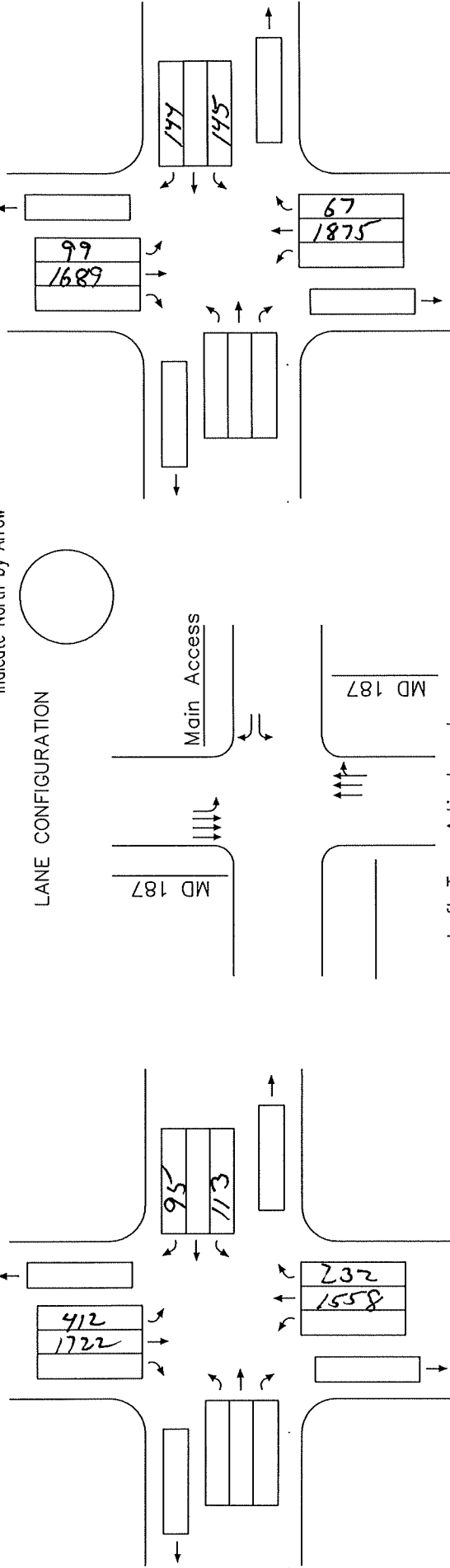
Morning Peak Hour _____

Evening Peak Hour _____

Indicate North by Arrow



LANE CONFIGURATION

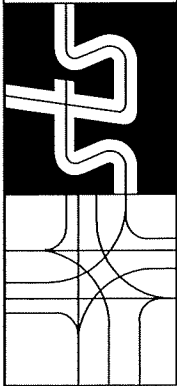


Left Turn Adjustments

Phasing <input checked="" type="checkbox"/>	Opposing Through and Right-Turn Volume		Passenger Car Equivalent	No. of Lanes	Lane Use Factor	Service Level	Critical Lane Vol. Tot.
	0 to 199	200 to 599					
∅	Volume(1)	Lane Use Factor(2)	∅	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Critical Lane Volume
NB	1558+232	0.37	NB	1875+67	0.37	719	818
SB	1722	0.37	SB	1689	0.37	625	625
WB	113	1.0	WB	145	1.0	145	145
* critical volume TOTAL 1187 V/C * critical volume TOTAL 963 V/C LEVEL OF SERVICE							

Remarks:

Remarks:



**TURNING MOVEMENT SUMMARY
AND
LEVEL OF SERVICE**

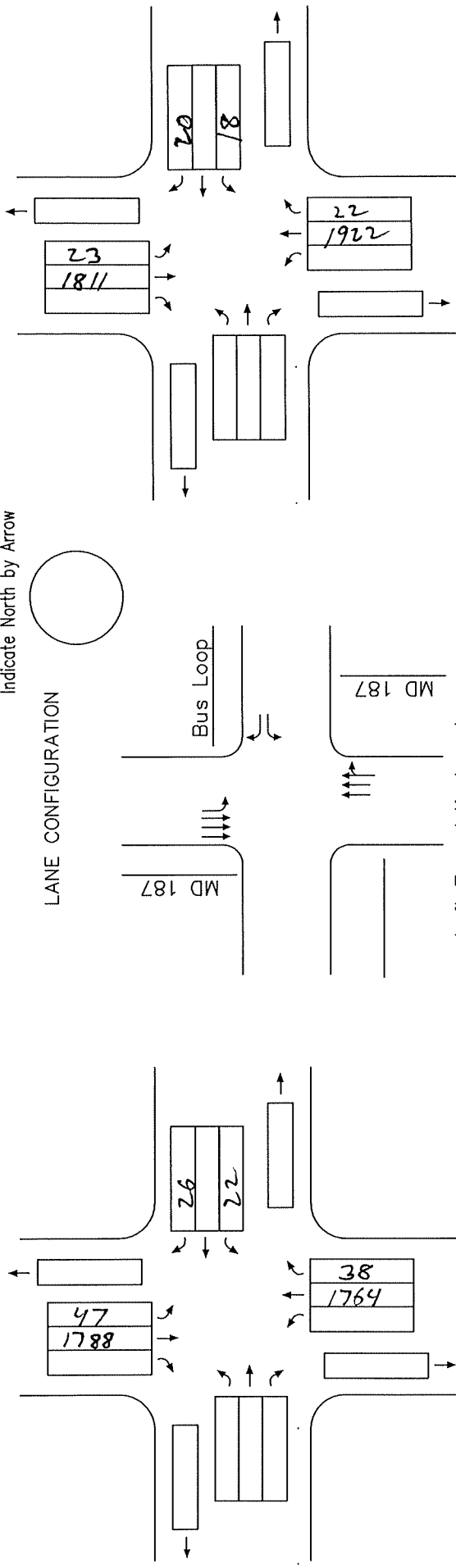
Count Date: NA Location: MD 187 @
 Conditions/Design Year: Total Traffic Volumes Bus Loop
 Computed By: MN Date: _____

Morning Peak Hour _____

Evening Peak Hour _____

Indicate North by Arrow

LANE CONFIGURATION



Left Turn Adjustments

Phasing <input checked="" type="checkbox"/>	Movement	Volume(1)	Lane Use Factor(2)	Lane Volume (1)x(2)	Opposing Right-Turn Volume	Passenger Car Equivalent	No. of Lanes	Lane Use Factor	Service Level	Critical Lane Vol. Tot.	Critical Lane Volume	Opposing Lefts	Critical Lane Volume *
	NB	1764+38	0.37	667	47	NB	1922+22	0.37	719	23	742	23	742
	SB	1788	0.37	662	-	SB	1811	0.37	670	-	670	-	670
	WB	22	1.0	22	-	WB	18	1.0	18	-	18	-	18
Remarks: * critical volume TOTAL 736 V/C LEVEL OF SERVICE													
Remarks: * critical volume TOTAL 760 V/C LEVEL OF SERVICE													

APPENDIX H

SimTraffic WORKSHEET

Queuing and Blocking Report
Baseline

01/14/2020

Intersection: 24: MD 187 & Main Access

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	T	T	TR	L	T	T	T
Maximum Queue (ft)	136	70	250	253	249	249	143	278	319
Average Queue (ft)	82	43	173	178	187	217	92	179	221
95th Queue (ft)	139	70	317	326	311	272	167	295	342
Link Distance (ft)	121	121	244	244	244		636	636	636
Upstream Blk Time (%)	1		2	4	7				
Queuing Penalty (veh)	0		11	21	42				
Storage Bay Dist (ft)						500			
Storage Blk Time (%)									
Queuing Penalty (veh)									

APPENDIX I
CURB RAMP SURVEY SHEETS

NOTICE

Portions of this appendix may not fully reflect the current ADA regulations. The regulation implementing title II of the ADA was revised as recently as 2016. Revised ADA Standards for Accessible Design (2010 Standards) were issued on September 15, 2010 and went into effect on March 15, 2012.

Additional related information can be found in the Department of Justice/Department of Transportation joint 2013 publication and 2015 publication.

Curb Ramps

Construction/Alteration Date (circle one):

Before 1/26/92

After 1/26/92

Facility Name/Address:	Date: 7/23/19
Location: MO 187 @ Cedarwood Dr	Surveyors: MW

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable). (A circled "N" signifies a violation).

Describe each curb ramp's location: SEE SKETCH	Curb Ramp D:
Curb Ramp A:	Curb Ramp E:
Curb Ramp B:	Curb Ramp F:
Curb Ramp C:	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A		Curb Ramp B		Curb Ramp C		Curb Ramp D		Curb Ramp E		Curb Ramp F		Curb Ramp G	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N
		" 48		" 48		" 48		" 84		"		"		"	
2	Does CR have a running slope of 8.33% or less?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		% 4.8		% 0.5		% 0.5		% 5.6		%		%		%	
3	Does CR have a cross slope of 2% or less?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		% 1.8		% 1.0		% 1.0		% 1.7		%		%		%	
4	Does CR have a gutter slope of 5% or less?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		% 3.0		% 2.0		% 1.8		% 2.5		%		%		%	
5	Are transitions on and off CR flush and free of abrupt level changes? Record the height of any level changes.	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		"		"		"		"		"		"		"	
6	Does CR have detectable warnings?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
7	Can CR be blocked by legally parked cars?	Y	(N)	Y	(N)	Y	(N)	Y	(N)	Y	N	Y	N	Y	N
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		"		"		"		"		"		"		"	
9	Does CR have flared sides? If yes, answer one of the next two questions. If not, skip to question 10.	(Y)	n/a	(Y)	n/a	(Y)	n/a	(Y)	n/a	Y	n/a	Y	n/a	Y	n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		% 1.3		% 1.0		% 1.0		% 0.9		%		%		%	
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
		%		%		%		%		%		%		%	
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? If the CR has flared sides, skip this question.	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
11	If CR is built-up to the curb, is it outside the path of cars? If CR is not built-up to curb, skip this question.	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
Answer the last two questions only if the CR is located at a marked crossing:															
12	Is ramp of CR contained in markings?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? If not corner-type CR, skip this question.	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
		"		"		"		"		"		"		"	

Comments:

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Curb Ramps

Construction/Alteration Date (circle one):

Before 1/26/92

After 1/26/92

Facility Name/Address:	Date: 7/23/19
Location: MO 187 @ School DRIVEWAY (STOP)	Surveyors: MN

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable). (A circled "N" signifies a violation).

Describe each curb ramp's location: SEE SKETCH	Curb Ramp D:
Curb Ramp A:	Curb Ramp E:
Curb Ramp B:	Curb Ramp F:
Curb Ramp C:	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N " 48"	(Y) N " 48"	Y N	Y N	Y N	Y N	Y N
2	Does CR have a running slope of 8.33% or less?	(Y) N % 4.8	(Y) N % 3.5	Y N	Y N	Y N	Y N	Y N
3	Does CR have a cross slope of 2% or less?	(Y) N % 1.8	(Y) N % 1.1	Y N	Y N	Y N	Y N	Y N
4	Does CR have a gutter slope of 5% or less?	(Y) N % 2.0	(Y) N % 1.3	Y N	Y N	Y N	Y N	Y N
5	Are transitions on and off CR flush and free of abrupt level changes? Record the height of any level changes.	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
6	Does CR have detectable warnings?	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y N	Y N	Y N	Y N	Y N
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
9	Does CR have flared sides? If yes, answer one of the next two questions. If not, skip to question 10.	(Y) n/a	(Y) n/a	Y n/a	Y n/a	Y n/a	Y n/a	Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y) N % 2.6	(Y) N % 4.4	Y N	Y N	Y N	Y N	Y N
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N	Y N	Y N	Y N	Y N	Y N	Y N
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? If the CR has flared sides, skip this question.	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11	If CR is built-up to the curb, is it outside the path of cars? If CR is not built-up to curb, skip this question.	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N

Answer the last two questions only if the CR is located at a marked crossing:

12	Is ramp of CR contained in markings?	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? If not corner-type CR, skip this question.	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N

Comments:

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Curb Ramps

Construction/Alteration Date (circle one):

Before 1/26/92

After 1/26/92

Facility Name/Address:	Date: 7/23/19
Location: MD 187 e Schaal Drive Way (Signal)	Surveyors: MN

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable). (A circled "N" signifies a violation).

Describe each curb ramp's location: SEE SKETCH	Curb Ramp D:
Curb Ramp A:	Curb Ramp E:
Curb Ramp B:	Curb Ramp F:
Curb Ramp C:	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N " 48"	(Y) N " 48"	Y N	Y N	Y N	Y N	Y N
2	Does CR have a running slope of 8.33% or less?	(Y) N % 4.9	(B) N % 6.7	Y N	Y N	Y N	Y N	Y N
3	Does CR have a cross slope of 2% or less?	(Y) N % 1.1	(B) N % 1.3	Y N	Y N	Y N	Y N	Y N
4	Does CR have a gutter slope of 5% or less?	(Y) N % 2.8	(Y) N % 3.1	Y N	Y N	Y N	Y N	Y N
5	Are transitions on and off CR flush and free of abrupt level changes? Record the height of any level changes.	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
6	Does CR have detectable warnings?	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y N	Y N	Y N	Y N	Y N
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
9	Does CR have flared sides? If yes, answer one of the next two questions. If not, skip to question 10.	(Y) n/a	(Y) n/a	Y n/a	Y n/a	Y n/a	Y n/a	Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y) N % 2.2	(Y) N % 4.4	Y N	Y N	Y N	Y N	Y N
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N	Y N	Y N	Y N	Y N	Y N	Y N
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? If the CR has flared sides, skip this question.	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11	If CR is built-up to the curb, is it outside the path of cars? If CR is not built-up to curb, skip this question.	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
Answer the last two questions only if the CR is located at a marked crossing:								
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? If not corner-type CR, skip this question.	(Y) N	(Y) N	Y N	Y N	Y N	Y N	Y N

Comments:

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Curb Ramps

Construction/Alteration Date (circle one):

Before 1/26/92

After 1/26/92

Facility Name/Address:	Date: 7/23/19
Location: MO 187 @ Edison LA - Poinciana LA	Surveyors: MN

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable). (A circled "N" signifies a violation).

Describe each curb ramp's location: SEE SKETCH	Curb Ramp D:
Curb Ramp A:	Curb Ramp E:
Curb Ramp B:	Curb Ramp F:
Curb Ramp C:	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G	
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	H
		" 86 "	" 77 "	" 90 "	" 72 "	" 82 "	" 81 "	" 84 "	83
2	Does CR have a running slope of 8.33% or less?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
		% 0.6	% 0.9	% 0.2	% 0.9	% 1.1	% 1.0	% 0.5	1.6
3	Does CR have a cross slope of 2% or less?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
		% 0.6	% 0.5	% 0.2	% 1.0	% 0.7	% 0.2	% 0.5	0.2
4	Does CR have a gutter slope of 5% or less?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
		% 2.5	% 1.0	% 0.8	% 1.2	% 3.1	% 0.9	% 1.6	2.4
5	Are transitions on and off CR flush and free of abrupt level changes? Record the height of any level changes.	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
		"	"	"	"	"	"	"	
6	Does CR have detectable warnings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	(N)
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
		"	"	"	"	"	"	"	
9	Does CR have flared sides? If yes, answer one of the next two questions. If not, skip to question 10.	(Y) n/a	(Y) n/a	Y n/a	Y n/a	Y n/a	Y n/a	Y n/a	
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
		% 3.7	% 2.1	% 1.8	%	%	% 4.3	% 3.7	3.3
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N	Y N	Y N	Y N	Y N	Y N	Y N	
		%	%	%	%	%	%	%	
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? If the CR has flared sides, skip this question.	Y N	Y N	Y N	(Y) N	(Y) N	Y N	Y N	
11	If CR is built-up to the curb, is it outside the path of cars? If CR is not built-up to curb, skip this question.	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y)
Answer the last two questions only if the CR is located at a marked crossing:									
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? If not corner-type CR, skip this question.	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	
		"	"	"	"	"	"	"	

Comments:

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Curb Ramps

Construction/Alteration Date (circle one):

Before 1/26/92

After 1/26/92

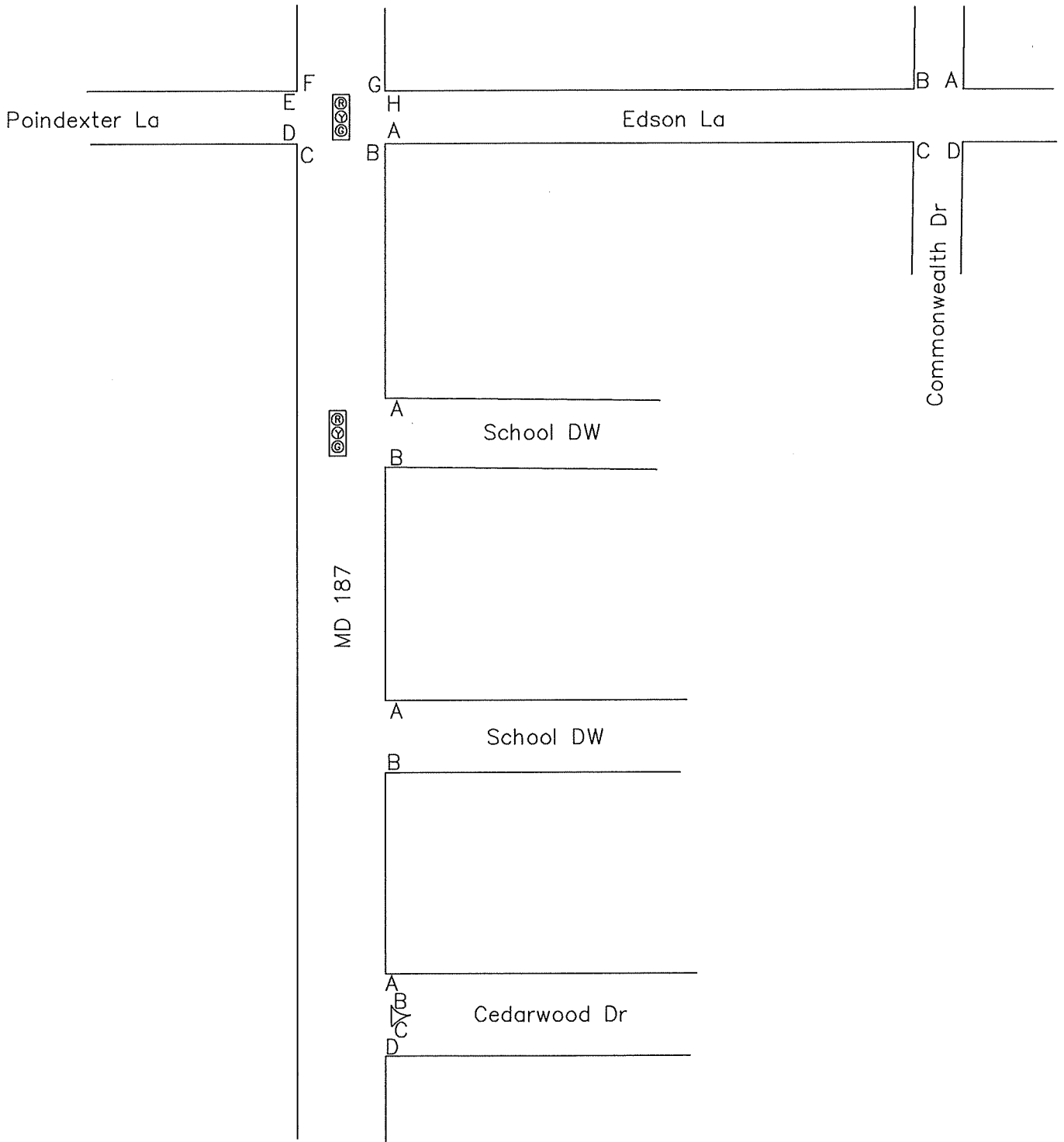
Facility Name/Address:	Date: 7/23/19
Location: Edson LA @ Commonwealth Dr	Surveyors: MN

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable). (A circled "N" signifies a violation).

Describe each curb ramp's location: SEE SKETCH	Curb Ramp D:
Curb Ramp A:	Curb Ramp E:
Curb Ramp B:	Curb Ramp F:
Curb Ramp C:	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		" 48	" 47	" 48	" 48	"	"	"
2	Does CR have a running slope of 8.33% or less?	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		% 0.3	% 7.5	% 6.2	% 1.4	%	%	%
3	Does CR have a cross slope of 2% or less?	<input type="radio"/> Y <input checked="" type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		% 4.3	% 6.5	% 1.2	% 1.2	%	%	%
4	Does CR have a gutter slope of 5% or less?	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		% 2.6	% 3.8	% 4.4	% 1.7	%	%	%
5	Are transitions on and off CR flush and free of abrupt level changes? Record the height of any level changes.	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		"	"	"	"	"	"	"
6	Does CR have detectable warnings?	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
7	Can CR be blocked by legally parked cars?	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input checked="" type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
8	Is the sidewalk at the "top" of CR at least 36" wide?	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		"	"	"	"	"	"	"
9	Does CR have flared sides? If yes, answer one of the next two questions. If not, skip to question 10.	<input checked="" type="radio"/> Y n/a	<input checked="" type="radio"/> Y n/a	<input checked="" type="radio"/> Y n/a	<input checked="" type="radio"/> Y n/a	<input type="radio"/> Y n/a	<input type="radio"/> Y n/a	<input type="radio"/> Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		% 5.6	% 5.3	% 6.4	% 3.0	%	%	%
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		%	%	%	%	%	%	%
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? If the CR has flared sides, skip this question.	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
11	If CR is built-up to the curb, is it outside the path of cars? If CR is not built-up to curb, skip this question.	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
Answer the last two questions only if the CR is located at a marked crossing:								
12	Is ramp of CR contained in markings?	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? If not corner-type CR, skip this question.	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
		"	"	"	"	"	"	"

Comments:



NO SCALE

CURB RAMP LOCATIONS

APPENDIX J
CROSSWALK EVALUATIONS

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	67.0	64.3	108.8	83.2
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	3	5	8	6
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.38	2.64	3.25	2.93
Pedestrian Crosswalk LOS	B	B	C	C

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	67.0	64.3	108.8	83.2
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	3	5	8	6
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.16	2.57	3.14	2.84
Pedestrian Crosswalk LOS	B	B	C	C

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	34.6	39.2	85.3	85.1
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	7	7
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	0
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.79	2.10	3.22	3.18
Pedestrian Crosswalk LOS	A	B	C	C

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	34.6	39.2	85.3	85.1
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	3	7	7
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	0
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	1.78	2.13	3.20	3.15
Pedestrian Crosswalk LOS	A	B	C	C

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	78.3	86.1	132.3	84.2
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	6	7	11	7
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.77	2.93	3.54	3.19
Pedestrian Crosswalk LOS	C	C	D	C

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	78.3	86.1	132.3	84.2
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	6	7	11	7
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.70	2.81	3.49	3.18
Pedestrian Crosswalk LOS	B	C	C	C

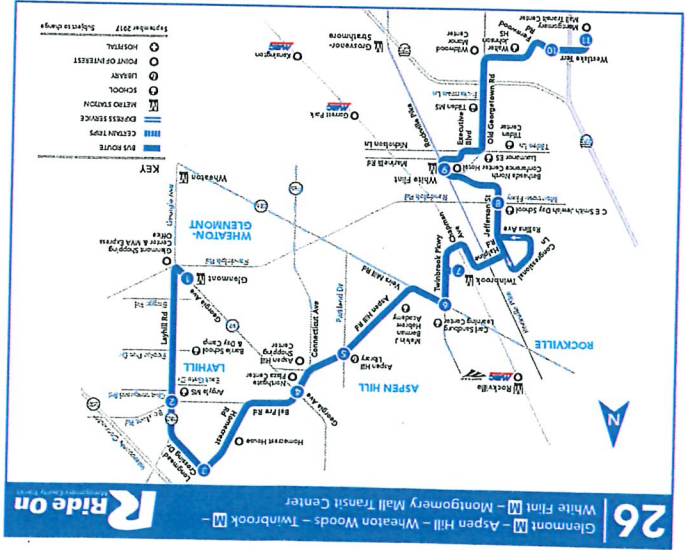
Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.0	24.6	133.3	144.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	11	10
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.29	2.17	3.45	3.51
Pedestrian Crosswalk LOS	B	B	C	D

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	24.0	24.6	133.3	144.0
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	2	2	11	10
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	0	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	75.0	75.0	75.0	75.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.22	2.01	3.46	3.43
Pedestrian Crosswalk LOS	B	B	C	C

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	72.0	71.8	24.6	24.3
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	5	5	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	55.0	55.0	55.0	55.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.68	2.65	1.79	1.79
Pedestrian Crosswalk LOS	B	B	A	A

Approach	EB	WB	NB	SB
Crosswalk Length (ft)	72.0	71.8	24.6	24.3
Crosswalk Width (ft)	12.0	12.0	12.0	12.0
Total Number of Lanes Crossed	5	5	2	2
Number of Right-Turn Islands	0	0	0	0
Type of Control	None	None	None	None
Corresponding Signal Phase	6	2	4	8
Effective Walk Time (s)	0.0	0.0	0.0	0.0
Right Corner Size A (ft)	9.0	9.0	9.0	9.0
Right Corner Size B (ft)	9.0	9.0	9.0	9.0
Right Corner Curb Radius (ft)	0.0	0.0	0.0	0.0
Right Corner Total Area (sq.ft)	81.00	81.00	81.00	81.00
Ped. Left-Right Flow Rate (p/h)	0	0	0	0
Ped. Right-Left Flow Rate (p/h)	0	0	0	0
Ped. R. Sidewalk Flow Rate (p/h)	0	0	0	0
Veh. Perm. L. Flow in Walk (v/h)	0	0	0	0
Veh. Perm. R. Flow in Walk (v/h)	0	0	0	0
Veh. RTOR Flow in Walk (v/h)	0	0	0	0
85th percentile speed (mph)	30	30	30	30
Right Corner Area per Ped (sq.ft)	0.0	0.0	0.0	0.0
Right Corner Quality of Service	-	-	-	-
Ped. Circulation Area (sq.ft)	0.0	0.0	0.0	0.0
Crosswalk Circulation Code	-	-	-	-
Pedestrian Delay (s/p)	55.0	55.0	55.0	55.0
Pedestrian Compliance Code	Poor	Poor	Poor	Poor
Pedestrian Crosswalk Score	2.57	2.56	1.77	1.76
Pedestrian Crosswalk LOS	B	B	A	A

APPENDIX K
BUS ROUTE INFORMATION



26 Glenmont M - Aspen Hill - Wheaton Woods - Twinbrook M - White Flint M - Montgomery Mall Transit Center

26 to Montgomery Mall Transit Center
SEE TIMEPOINT LOCATION ON ROUTE MAP

1	2	3	4	5	6	7	8	9	10	11
5:12	5:16	5:20	5:27	5:30	5:36	5:40	5:48	5:53	5:59	6:01
6:52	6:56	7:00	7:07	7:10	7:16	7:20	7:28	7:33	7:39	7:41
8:42	8:46	8:50	8:57	9:00	9:06	9:10	9:18	9:23	9:29	9:31
10:12	10:16	10:20	10:27	10:30	10:36	10:40	10:48	10:53	10:59	11:01
12:42	12:46	12:50	12:57	13:00	13:06	13:10	13:18	13:23	13:29	13:31
1:12	1:16	1:20	1:27	1:30	1:36	1:40	1:48	1:53	1:59	2:01
3:42	3:46	3:50	3:57	4:00	4:06	4:10	4:18	4:23	4:29	4:31
5:12	5:16	5:20	5:27	5:30	5:36	5:40	5:48	5:53	5:59	6:01
6:52	6:56	7:00	7:07	7:10	7:16	7:20	7:28	7:33	7:39	7:41
8:42	8:46	8:50	8:57	9:00	9:06	9:10	9:18	9:23	9:29	9:31
10:12	10:16	10:20	10:27	10:30	10:36	10:40	10:48	10:53	10:59	11:01
12:42	12:46	12:50	12:57	13:00	13:06	13:10	13:18	13:23	13:29	13:31
1:12	1:16	1:20	1:27	1:30	1:36	1:40	1:48	1:53	1:59	2:01
3:42	3:46	3:50	3:57	4:00	4:06	4:10	4:18	4:23	4:29	4:31

NOTE: Please arrive at your stop several minutes ahead of your bus' scheduled arrival. Since auto service is a priority at Ride On, buses may be delayed due to traffic or weather.

SEE REVERSE FOR MONDAY - FRIDAY SERVICE
SEE REVERSE FOR SATURDAY SERVICE

26 to Glenmont
SEE TIMEPOINT LOCATION ON ROUTE MAP

1	2	3	4	5	6	7	8	9	10	11
6:15	6:19	6:23	6:30	6:33	6:39	6:43	6:51	6:56	7:02	7:04
7:55	7:59	8:03	8:10	8:13	8:19	8:23	8:31	8:36	8:42	8:44
9:35	9:39	9:43	9:50	9:53	9:59	10:03	10:11	10:16	10:22	10:24
11:55	11:59	12:03	12:10	12:13	12:19	12:23	12:31	12:36	12:42	12:44
1:25	1:29	1:33	1:40	1:43	1:49	1:53	2:01	2:06	2:12	2:14
3:55	3:59	4:03	4:10	4:13	4:19	4:23	4:31	4:36	4:42	4:44
5:35	5:39	5:43	5:50	5:53	5:59	6:03	6:11	6:16	6:22	6:24
7:55	7:59	8:03	8:10	8:13	8:19	8:23	8:31	8:36	8:42	8:44
9:35	9:39	9:43	9:50	9:53	9:59	10:03	10:11	10:16	10:22	10:24
11:55	11:59	12:03	12:10	12:13	12:19	12:23	12:31	12:36	12:42	12:44
1:25	1:29	1:33	1:40	1:43	1:49	1:53	2:01	2:06	2:12	2:14
3:55	3:59	4:03	4:10	4:13	4:19	4:23	4:31	4:36	4:42	4:44

NOTE: Please arrive at your stop several minutes ahead of your bus' scheduled arrival. Since auto service is a priority at Ride On, buses may be delayed due to traffic or weather.

SEE REVERSE FOR MONDAY - FRIDAY SERVICE
SEE REVERSE FOR SATURDAY SERVICE

EFFECTIVE: SEPTEMBER 17, 2017

WELCOME TO RIDE ON
RIDE ON is a community bus service operated by Montgomery County Department of Transportation. RIDE ON operates over 35 routes that serve all 13 Montgomery County MetroRail stations and 7 MARC stations. For detailed information, or to have timetables mailed, call 311. Outside Montgomery County, call 246-777-6311.

Visit our web site at: www.rideonbus.com

Real Time information is available at: www.rideonrealtime.com

Regular Mailing Address: Division of Transit Services, 101 Monroe Street, 5th Floor, Rockville, MD 20850

HOLIDAY SCHEDULE

New Year's Day, King, Jr. Day, Memorial Day, Independence Day, Columbus Day, Thanksgiving Day, Christmas Day, Veterans Day, White Flint M, Roddage & Rock Spring Dr, Montgomery Mall Transit Center

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