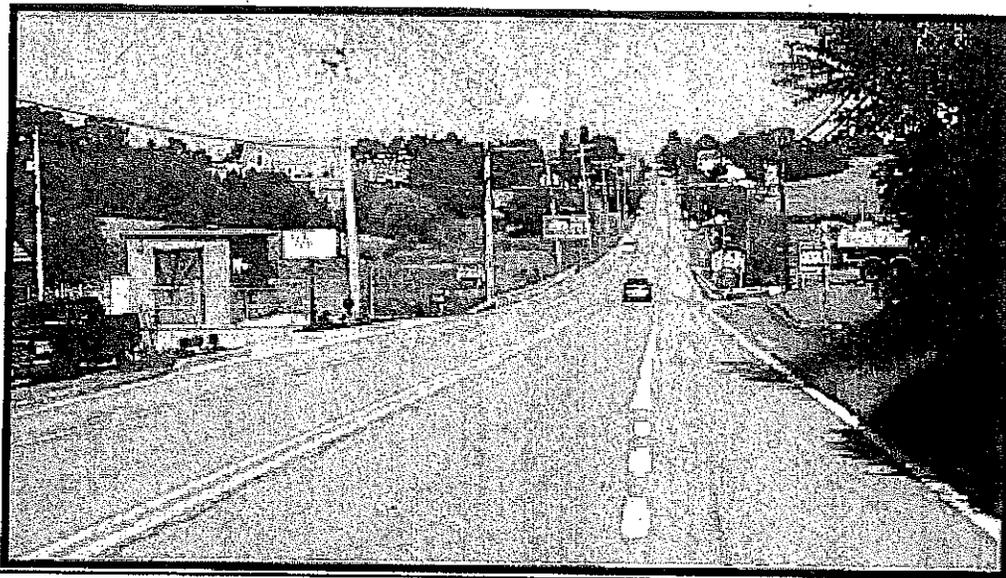


EXHIBIT 25



October 2006
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Traffic Impact Study



Manchester (Northeast) High School
Carroll County, Maryland

Prepared by:



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Traffic Impact Study
Manchester (Northeast) High School

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EXECUTIVE SUMMARY

The proposed Manchester High School (a.k.a. Northeast High School) development, located in the Manchester area of Carroll County, Maryland, was analyzed for future traffic impacts along MD 30 (Main St. / Hanover Pike). The three study intersections along MD 30 include MD 30 @ Maple Grove Rd., MD 30 @ Charmil Dr., and MD 30 @ York / Westminster St. Analyses at the intersection of Maple Grove Rd. @ Basler Rd. was also included in this study.

The existing conditions identify the location of the study intersections and describe details of the intersections, corridors, and the surrounding area. Field observations of the intersections during peak periods were performed to evaluate the geometrics, existing conditions and traffic characteristics of the study intersections.

An evaluation of the intersection site distances and stopping site distances were performed to identify potential visual conflicts. No sight distance limitations were observed at any of the study intersections.

Accident data was obtained to analyze accident patterns that occurred along the MD 30 and Maple Grove Rd corridors, within the study area. The accident data indicates a prevalence of rear-end, fixed object, and angle collisions due to failure to pay full attention.

Three-hour morning weekday and five-hour evening weekday peak period turning movement counts were conducted to obtain current traffic volumes and to analyze the existing capacity and operations of the intersection. The peak periods and the highest volume movements were identified, and Critical Lane and Highway Capacity Manual analyses for signalized and unsignalized intersections were performed to identify the level of service of the study intersections. Currently, all of the intersections operate at acceptable Levels of Service during the morning and evening peak hours.

The background traffic volumes, which are based on future 2016 design year non-site conditions, for the four study intersections were formulated by applying an annual growth rate to the existing traffic volumes and adding four known developments that will impact traffic through the study area. Critical Lane and Highway Capacity Manual analyses for signalized and unsignalized intersections were performed on the background volumes to identify the level of service of the study intersections.

The site generated traffic volumes, which are the future trips that will enter and exit the Northeast High School entrance, were formulated by using the Institute of Transportation Engineers (ITE) Trip Generation Manual Code 530 for a High School.

The trip generation per 1000 SF of gross floor area method was used, and the volumes were distributed throughout the three study intersections based on the existing directional distribution for each intersection approach. In addition, the study incorporates analyses that redistributes the existing students that currently attend the North Carroll High School which will attend the new Northeast High School once it is completed.

The total future traffic volumes for the study intersections were determined by adding the site generated traffic to the background traffic. Critical Lane and Highway Capacity Manual analyses for signalized and unsignalized intersections were performed on the total future volumes to identify the level of service of the study intersections





A. INTRODUCTION

As requested by the Carroll County Bureau of Engineering, Wallace, Montgomery & Associates, LLP (WM&A) is hereby providing the results of a comprehensive traffic impact study for the proposed Northeast High School located in Manchester, Maryland. A thorough review of impacts associated with the additional vehicular trips generated by a proposed development must be performed and potential negative impacts to the safety and operations of the transportation network be identified and mitigated. The study area consists of three study intersections along MD 30 and one intersection along Maple Grove Road that were evaluated for future 2009 impacts due to the generated vehicular trips to/from the new school.

Specifically, this study addresses the following items:

- Intersection geometrics and traffic control measures
- Sight distances
- Accident history
- Existing traffic volumes
- Background non-site future traffic volumes
- Site trip generation and distribution
- Total future traffic volumes
- Intersection capacity analyses
- Signal warrant analyses
- Recommendations for improvements

B. SITE DESCRIPTION

1. Location

The proposed Manchester High School will be located in the northeast corner of the MD 30 and Maple Grove Rd intersection in Carroll County, Maryland, within the Manchester area limits. The study area limits include the following four study intersections:

- MD 30 (Main St. / Hanover Pike) at Charmil Dr.
- MD 30 (Main St. / Hanover Pike) at Maple Grove Rd.
- MD 30 (Main St. / Hanover Pike) at York St. / Westminster St.
- Maple Grove Rd. at Basler Rd.

The entrance to Manchester High School will be along Maple Grove Road, east of MD 30. **Figure 1** provides the study area location and surrounding areas.

MD 30 is a State maintained highway, classified as an Urban Other Principle Arterial, serving as an North-South highway, connecting MD 27 to MD 482. Maple Grove Road, Basler Road, York Street, and Charmil Drive are local roads that connect residential neighborhoods to MD 30. Westminster Street is a local road that connects MD 27 to MD 30. The land uses within the area consist of mostly residential and agricultural development with some commercial development to the north.



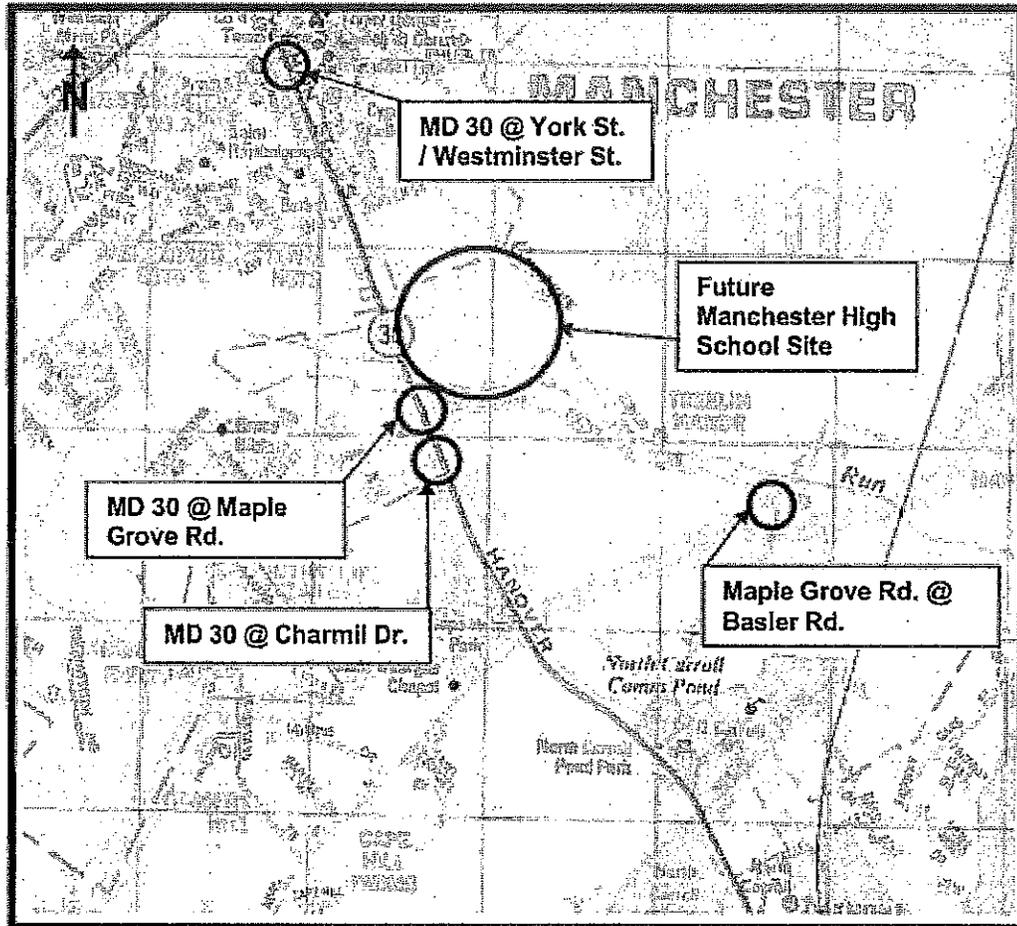


Figure 1. Project Location Map (ADC No. 20502110)

2. Intersection Geometry and Control

The study intersections consist of one four-legged signalized intersection (MD 30 @ York St. / Westminster St.), and three three-legged intersections (MD 30 @ Maple Grove Rd., MD 30 @ Charmil Dr., and Maple Grove @ Basler Rd). MD 30 serves as a mainline roadway along the study corridor, and is an open section roadway delineated by a double yellow center line, and white edge lines between Charmil Dr. and the town limits of Manchester. MD 30 then becomes a closed section roadway within the town limits of Manchester with on-street parking along both the Northbound and Southbound lanes. Maple Grove Rd., Basler Rd., and Charmil Dr. are all open section roadways delineated by double yellow center lines. The lane widths along MD 30 are 12 feet with 10 foot shoulders along both sides of the roadway, lane widths vary between 10 feet and 11 feet along the minor streets. Appendix A provides photos of all of the study intersection.





3. Speed Limits

MD 30 has a posted speed limit of 40 mph between Charmil Drive and the Manchester town limits. The speed limit is then reduced to 30 mph throughout the town of Manchester. Charmil Drive, Westminster Street and York Street have posted speed limits of 25 mph, and Maple Grove Road and Basler Road have a posted speed limit of 30 mph.

4. Signing

Signing at the MD 30 / York St. / Westminster St. study intersection consists of route marker assemblies (guiding traffic to MD 30 North and South), lane control and road name signs on the traffic signal mast arms, and speed limit signs. Signing along the Maple Grove Road, Basler Road, and Charmil Drive study intersections consist of stop signs, road name signs, speed limit signs, and intersection warning signs. **Appendix A** provides photographs of the signing for the study intersections.

5. Lighting

Standard cobra-head lighting is provided at the MD 30 / York St. / Westminster St. study intersection, corridor lighting is also provided along MD 30 throughout the town limits of Manchester.

6. Intersection Conditions

The approach roadways to all the study intersections are rolling in grade. The Basler Road approach to the Maple Grove Road/ Basler Road intersection enters the intersection on a down hill grade. The Charmil Drive approach of the MD 30 / Charmil Drive intersection also enters at a significant downhill grade.

The pavement surface within the study area is in generally good condition with minor cracking and/or rutting found in localized areas. The existing signs and pavement markings at all the study intersections are in good condition, with minimal fading.

7. Field Observations

Observations of the study intersections were performed during evening and weekend peak periods, specifically focusing on driver behavior, traffic patterns, roadway geometry, and overall traffic operations. The following information summarizes the observations:

- a. Excessive queues were observed at the MD 30 at York Street / Westminster Street intersection approaches due to the existing on-street parking limiting by-pass movements around left turning vehicles.
- b. Motorists failed to come to a complete stop, or did not stop at all, along the Basler Road approach when making a right turn onto Maple Grove Road.





C. SITE DISTANCE EVALUATION

1. Intersection Sight Distance

Intersection and stopping sight distance was reviewed at the study intersections, in accordance with AASHTO sight distance criteria. AASHTO sight distance criteria are based on the design speed of the subject roadway. For the purpose of this analysis, a design speed of 50 mph was assumed for MD 30 at the study intersections. All the study intersections exceed the minimum requirements set forth by AASHTO for intersection sight distance. **Appendix A** includes digital photographs of all sight-lines reviewed.

D. ACCIDENT DATA ANALYSIS

Accident data was requested and provided by the State Highway Administration (SHA) for the years of 2003 through 2005. A review of the data indicates that a total of 26 accidents were reported by police along MD 30 within the study area (from Charmil Drive to York Street) and a total of 4 accidents were reported along Maple Grove Rd (from Basler Road to MD 30) during the same time period. Detailed accident data is included in **Appendix B**. The following statistics highlight the most notable trends:

- The annual number of accidents along MD 30 decreased from 14 in 2003 to 3 in 2004 but increased to 9 in 2005. In addition, along the Maple Grove Road study corridor there was 1 accident in 2003, 1 in 2004, and 2 in 2005.
- Accident severity mainly consisted of property damage which accounted for 19 of the 30 (63%) accidents, along both corridors. The remaining accidents were personal injury, including one fatality at MD 30/Charmil Dr.
- The collisions were distributed as follows 9 **Rear-end collisions**, 8 **Fixed object collisions**, 4 **Angle collisions**, 4 **Other**, 2 **Left Turn collisions**, 2 **Parked Vehicles**, and 1 **Side Swipe Collision**.
- Of the 8 **Fixed Object** collisions 4 involved utility poles.
- The predominant cause of the accidents was **Failure to Give Full Attention**, which accounted for 9 of the 30 (30%) accidents.
- Most of the accidents (21 of 30, 70%) occurred during day light hours.
- Most of the accidents along the MD 30 corridor occurred within the corporate limits of Manchester. This could be attributed to on street parking and limited sight distance from side streets along MD 30 within the town limits of Manchester.
- Another concentrated area for accidents is at the MD 30/Charmil Road intersection. There were 8 accidents over the 3 study years, one of which was a fatality from a northbound left turning vehicle being struck by a southbound through vehicle. The majority of the 8 accidents were rear end accidents.

E. EXISTING TRAFFIC CONDITIONS

1. Traffic Data Collection

Three-hour weekday morning (6 AM to 9 AM) and a five-hour afternoon-evening (2 PM to 7 PM) peak period vehicular turning movement counts were conducted at the four study intersections.





The counts were performed on Thursday, September 7, 2006. Carroll County Schools were in session at the time of the turning movement counts. The weekday morning peak hour measured at all of the study intersections occurred at 6:45-7:45 AM, and the evening peak hours occurred at 5:15-6:15 PM at the MD 30 / York St. / Westminster St., MD 30 / Maple Grove Rd., and MD 30 / Charmil Dr. intersections. The Maple Grove Rd. / Basler Rd. evening peak hour occurred at 5:30-6:30 PM.

Figure 2 summarizes the existing individual peak hour movements, and Appendix C includes a copy of all turning movement counts. As shown in Figure 2, the predominant traffic movements during the peak hours are the MD 30 through movements.

2. Capacity Analyses

Capacity analyses were performed on the morning, afternoon, and evening peak hour volumes in accordance with the SHA recommended Critical Lane Analysis Technique (CLA). In addition, operational analyses were developed using the Highway Capacity Manual Technique (HCM) for both unsignalized and signalized intersections. These results are summarized in Table 1 and detailed in Appendix D. According to both analysis techniques all four study intersections operate at an acceptable Level of Service during all peak periods, under existing conditions.

TABLE 1. Existing Capacity Analyses

Site	Peak Period	CLA Analysis	HCM Analysis				
			LOS				
		LOS	NB	SB	EB	WB	Total
MD 30 @ York St. / Westminster St.	AM	B	B	C	E	E	D
	MID	A	B	B	E	E	C
	PM	C	C	C	F	E	D
MD 30 @ Maple Grove Rd.	AM	A	A	B	-	B	B
	MID	A	A	A	-	C	C
	PM	A	A	A	-	C	C
MD 30 @ Charmil Dr.	AM	A	A	A	C	-	C
	MID	A	A	A	C	-	C
	PM	A	A	A	C	-	C
Maple Grove Rd. @ Basler Rd.	AM	A	A	-	A	A	A
	MID	A	A	-	A	A	A
	PM	A	A	-	A	A	A





F. BACKGROUND TRAFFIC CONDITIONS

1. Traffic Volume Growth

The background traffic volumes are based on future design year non-site conditions. The existing 2006 traffic volumes were increased to 2009 traffic volumes, because the total build-out of the Manchester High School is expected to be completed by that time. In addition to applying a nominal annual growth rate to model regional growth in the area, traffic generated from known and approved near-term developments was added to the background volume.

As directed by Carroll County Bureau of Engineering, the regional growth rate applied to the existing volumes were 4.9% along Maple Grove Road, and Basler Road. A rate of 3.0% was applied along Charmil Drive, York Street, and Westminster Street, and a 4.0% growth rate was used along mainline MD 30. Figure 3 provides the resultant 2009 traffic volumes with the applied growth rates.

Discussions with Carroll County Bureau of Engineering resulted in a list of four approved nearby developments that would be completed by the time the new High School opens. These four developments are:

- Wal-Mart Expansion
- Hampstead Market Place
- Manchester Farms (Section 5)
- St. Bartholomews Catholic Church

Site generated trips and trip distribution figures for each of the respective proposed developments were provided by the Carroll County Bureau of Engineering (see Appendix E). Trips generated by all four developments were added together. Figure 4 shows the total traffic generated by the four developments within the study area.

The total 2009 background traffic volumes were compiled by adding the volumes in Figure 3 to the volumes in Figure 4. Figure 5 summarizes the total 2009 background traffic volumes.

2. Capacity Analyses

Capacity analyses were performed on the morning, afternoon, and evening peak hour background volumes in accordance with the SHA recommended Critical Lane Analysis Technique (CLA) and the Highway Capacity Manual Technique (HCM) for both unsignalized and signalized intersections. These results are summarized in Table 2 and detailed in Appendix F.

As summarized in Table 2, the MD 30/York St./Westminster St. study intersection will operate unacceptably under 2009 background conditions. The MD 30 approaches would have to be modified to provide separate (opposing) left-turn lanes, the eastbound approach would also have to be modified to provide a separate (opposing) left-turn lane, thereby allowing the minor street split phase operation to be revised to concurrent operation (exclusive/permissive left turns).





The proposed improvements could be accommodated with minor geometric improvements, however, on-street parking within the vicinity of the intersection would have to be disallowed to provide for the left-turn lanes. The resultant intersection would operate at a level of service 'C' during the morning peak hour, and a LOS 'D' during the evening peak hour.

Additionally, the Highway Capacity Technique indicates that the MD 30/Charmil Drive study intersection will operate at unacceptable levels of service during the evening peak hour due to the delay incurred by the eastbound left-turn movement. The MD 30 mainline volumes and the corresponding limited available gaps for eastbound left-turn movements into the northbound traffic stream is the source for the unacceptable level of service. A signal at the study intersection would alleviate the minor street delay, however minor street volumes are not sufficient to warrant the installation of a traffic signal.

All remaining study intersections will operate at acceptable levels of service according to both analysis techniques.

TABLE 2. Background Capacity Analyses

Site	Peak Period	CLA Analysis	HCM Analysis				
			LOS				
		LOS	NB	SB	EB	WB	Total
MD 30 @ York St. / Westminster St.	AM	D	B	D	E	E	D
	MID	C	C	C	E	E	D
	PM	F	F	F	F	E	F
MD 30 @ Maple Grove Rd.	AM	B	A	A	-	C	C
	MID	A	A	A	-	C	C
	PM	C	B	A	-	D	D
MD 30 @ Charmil Dr.	AM	C	B	B	D	-	D
	MID	A	A	A	E	-	C
	PM	C	A	A	F	-	F
Maple Grove Rd. @ Basler Rd.	AM	A	A	-	A	A	A
	MID	A	A	-	A	A	A
	PM	A	A	-	A	A	A



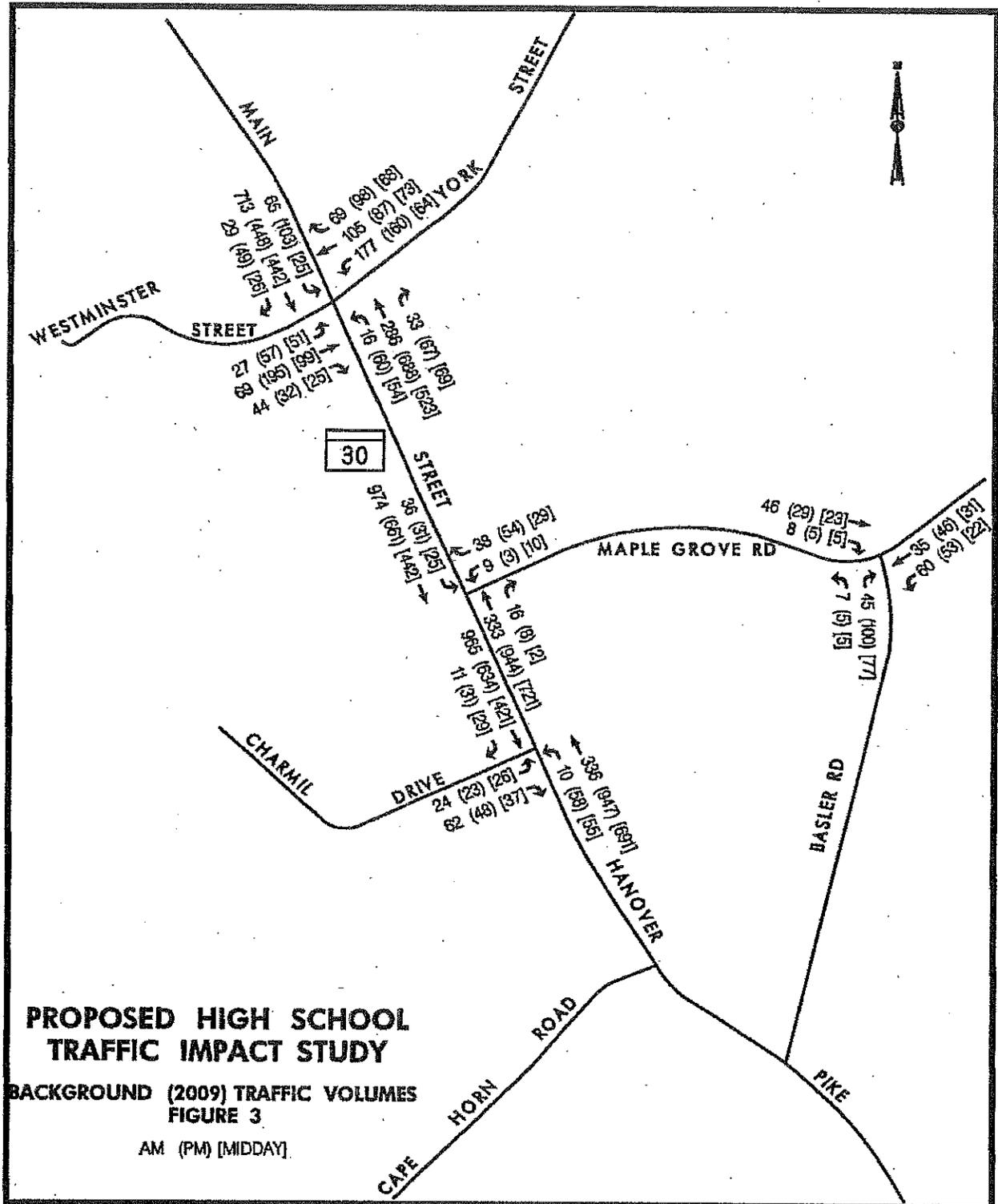


Figure 3. Background Peak Hour Volume Map (2009)



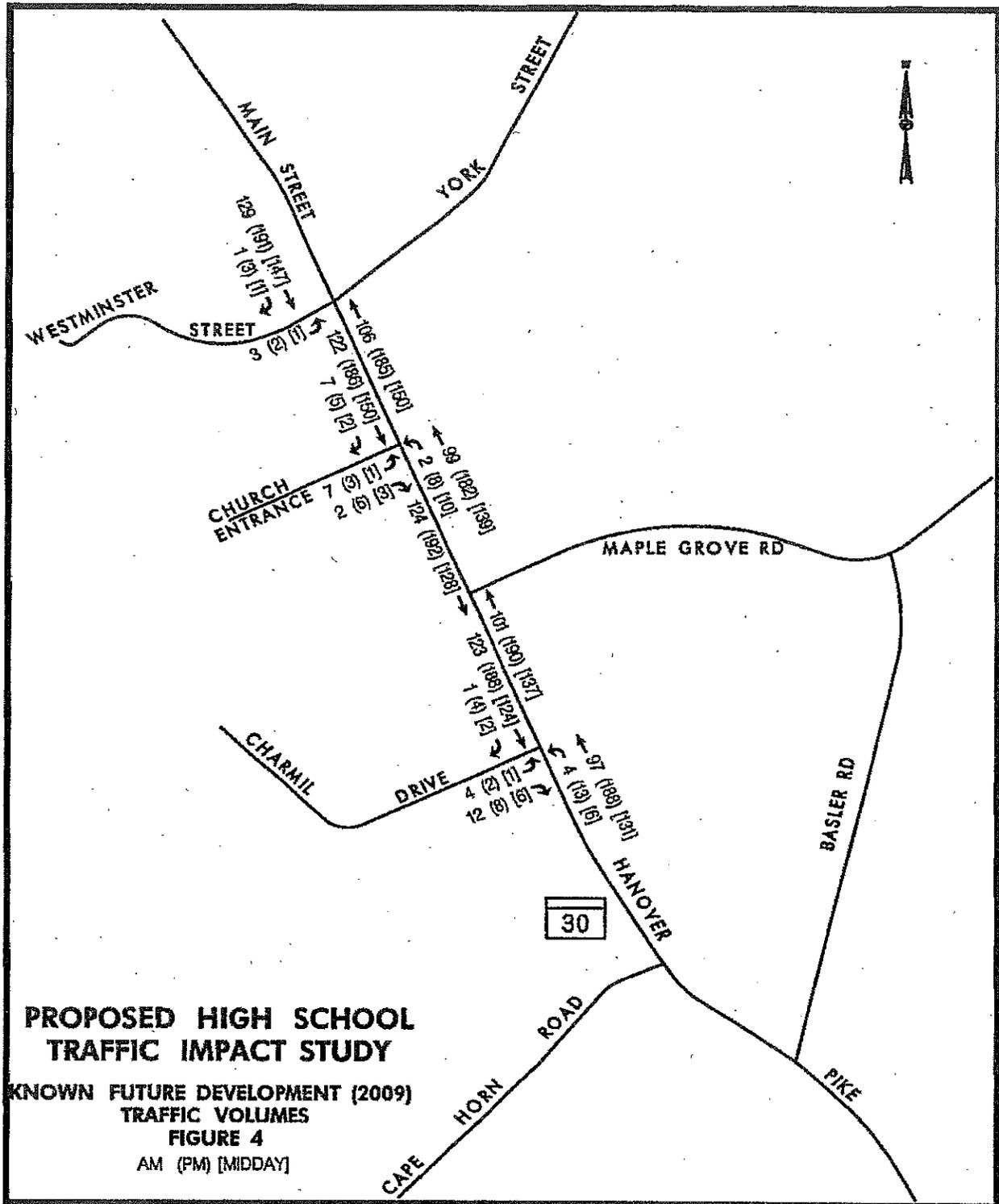


Figure 4. Known Development during Peak Hour Volume Map (2009)



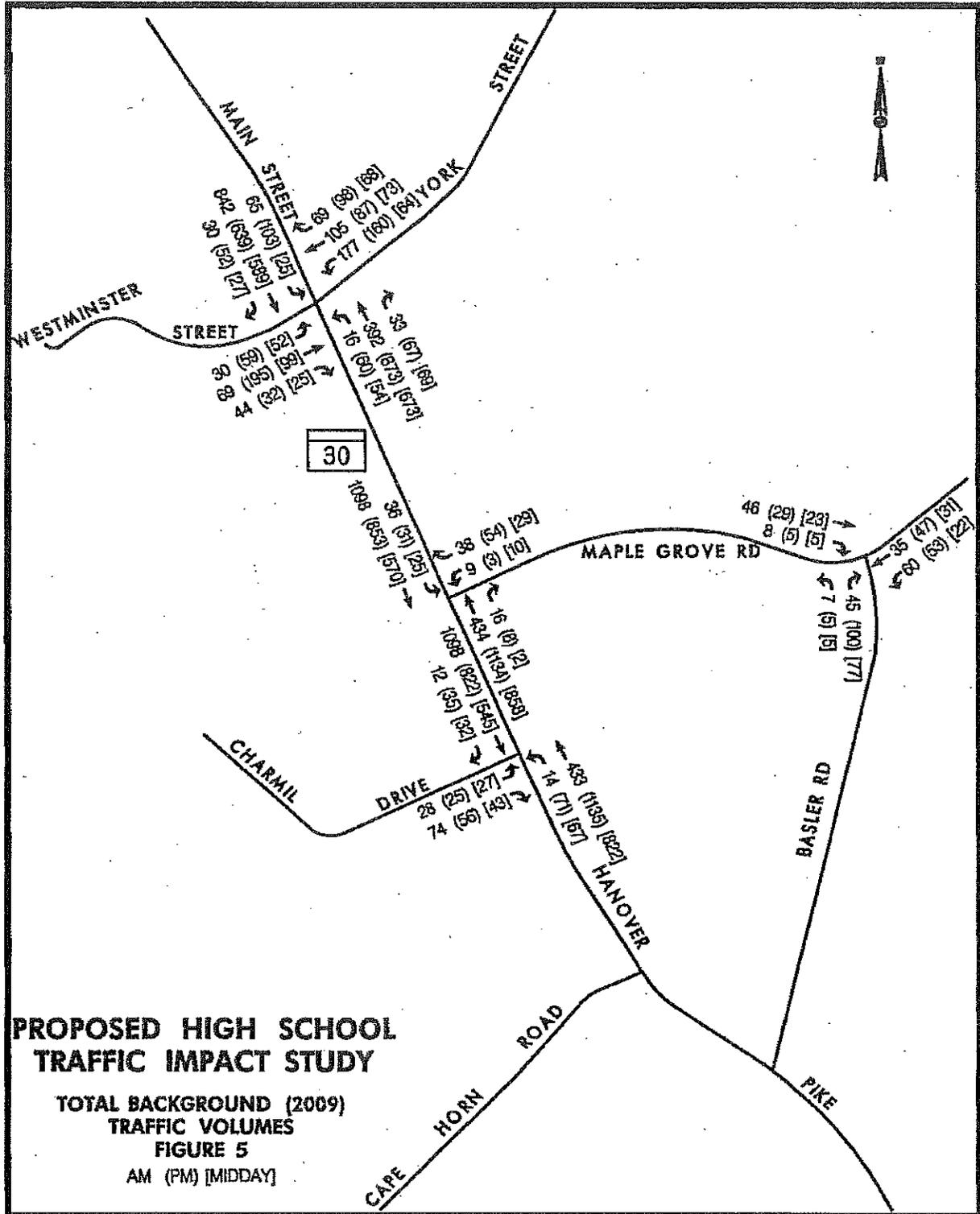


Figure 5. Total Background Peak Hour Volume Map (2009)





G. TOTAL FUTURE TRAFFIC CONDITIONS

1. Site Trip Generation

The generated traffic volumes for the proposed Manchester High School were developed by utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. The document provides data for High Schools (Code 530) and supplies formulas to calculate generated trips.

When completed, the new Manchester High School will be able to accommodate approximately 1,200 students in a 217,000 square foot building.

The ITE Trip Generation Manual provides trip generation rates and associated directional splits (# Enter vs. # Exit) for a proposed high school based on number of students, and square foot of building area. Table 3 below summarizes the trips generated by the new school building, based on both analysis techniques.

TABLE 3. Generated Trips

Method	Weekday AM		Weekday Afternoon		Weekday PM	
	Trips	Enter/Exit	Trips	Enter/Exit	Trips	Enter/Exit
ITE 530 (Trips per 217,000 SF floor area)	664	471/193	460	143/317	210	113/97
ITE 530 (Trips per 1200student)	469	324/145	346	111/235	168	79/89

As noted in Table 3, the trips generated based on the square foot of floor area are higher than the trips generated based on the 1200 students. Therefore, to model a worst case scenario, the trips generated by the square foot of floor area method were implemented in the analyses.

2. Site Trip Distribution

A meeting with the director of transportation for Carroll County Public Schools (CCPS) provided information on future trip distribution for the new high school. The new Manchester High School shall serve the northern area of the school district. Therefore, the vast majority of students will be coming from, and going to, the north along MD 30.

For the purpose of this report, CCPS agreed that an estimated 90% of the proposed high school traffic would be coming from and going to the north (along MD 30), 5% from/to the east (along Maple Grove Road), and the remaining 5% from/to the south (along MD 30). Figure 6A summarizes the generated high school trips distributed throughout the study network.

3. Reallocation of Existing School Traffic

During the meeting with the director of transportation for Carroll County Public Schools, it was made clear that the existing North Carroll High School currently accommodates the students from the entire northern portion of the school district. Therefore, the day the new High School opens in 2009 a portion of the existing students at the North Carroll High School will instead travel to the new Manchester High School. According to CCPS, a total of 850 students would be relocated to the new high school from the existing North Carroll High School.





Therefore, it is inaccurate to assume that the trips generated by the new 1200 student capacity Manchester High School will be all new trips, when in fact the trips generated by 850 students are already in the MD 30 traffic stream. 850 of the 1200 student capacity has to be reallocated (or redistributed) to the new Manchester High School.

Since Figure 6A shows the trip distribution for the total 1200 students, the trips generated by the 850 reallocated students has to be subtracted from the MD 30 traffic. The same trip distribution assumption of 90% of the trips coming from, or going to, the north along MD 30 was applied. Table 4 below summarized the trips generated by the 850 students, and Figure 6B depicts the subtraction of the traffic generated by the 850 students.

TABLE 4. Generated Trips

Method	Weekday AM		Weekday Afternoon		Weekday PM	
	Trips	Enter/Exit	Trips	Enter/Exit	Trips	Enter/Exit
ITE 530 (Trips per 850student)	359	248/111	279	89/190	119	56/63

4. Future Traffic Volumes

The total future traffic volumes for the study intersections were determined by adding the site generated traffic to the background traffic (Figure 5 + Figure 6A + Figure 6B). Figure 7 summarizes the individual total future peak hour movements for all study intersections.

5. Capacity Analyses

Capacity analyses of the existing lane configurations were performed on the weekday morning, afternoon, and evening peak hour total future volumes in accordance with the SHA recommended Critical Lane Analysis Technique (CLA) and the Highway Capacity Manual Technique (HCM) for both unsignalized and signalized intersections. These results are summarized in Table 5 and detailed in Appendix G.





TABLE 5. Total Future Capacity Analyses

Site	Peak Period	CLA Analysis	HCM Analysis				
			LOS				
		LOS	NB	SB	EB	WB	Total
MD 30 @ York St. / Westminster St.	AM	E	B	F	E	E	E
	MID	D	E	C	E	E	D
	PM	F	F	F	F	E	F
MD 30 @ Maple Grove Rd.	AM	B	A	A	-	C	C
	MID	C	A	A	-	F	F
	PM	D	A	B	-	E	E
MD 30 @ Charmil Dr.	AM	A	A	A	D	-	C
	MID	A	A	A	D	-	C
	PM	B	A	A	F	-	E
Maple Grove Rd. @ Basler Rd.	AM	A	A	-	A	A	A
	MID	A	A	-	A	A	A
	PM	A	A	-	A	A	A
Manchester High School	AM	A	-	B	A	A	B
	MID	A	-	B	A	A	B
	PM	A	-	A	A	A	A

As summarized in Table 5, the MD 30/York St./Westminster St. study intersection will operate unacceptably under 2009 total future conditions. The improvements recommended under the no-build 2009 background conditions (separate opposing left-turn lanes along MD 30, a separate opposing left-turn lane along eastbound, and the removal of the split phasing) will not provide sufficient mitigation to alleviate total future conditions. A double left-turn along westbound York Street would have to be added to provide acceptable levels of service.

The proposed improvements would require significant geometric improvements, and the resultant intersection would operate at a level of service 'C' during the morning peak hour, and a LOS 'D' during the evening peak hour.

Similar to the background conditions, the Highway Capacity Technique indicates that the MD 30/Charmil Drive study intersection will operate at unacceptable levels of service during the evening peak hour due to the delay incurred by the eastbound left-turn movement. The MD 30 mainline volumes and the corresponding limited available gaps for eastbound left-turn movements into the northbound traffic stream is the source for the unacceptable level of service. A signal at the study intersection would alleviate the minor street delay, however minor street volumes are not sufficient to warrant the installation of a traffic signal.

The Highway Capacity Technique was used to analyze the existing and proposed configurations of the MD 30/Maple Grove Road intersection utilizing the total future traffic volumes. With the existing intersection configuration MD 30 at Maple Grove Road will operate at unacceptable levels of service during the midday and evening peak hours due to the delay incurred along





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westbound Maple Grove Road traffic. The proposed lane configuration (separate left and right turn lanes along westbound Maple Grove Road) improves the level of service to an acceptable level of "D".

All remaining study intersections will operate at acceptable levels of service according to both analysis techniques



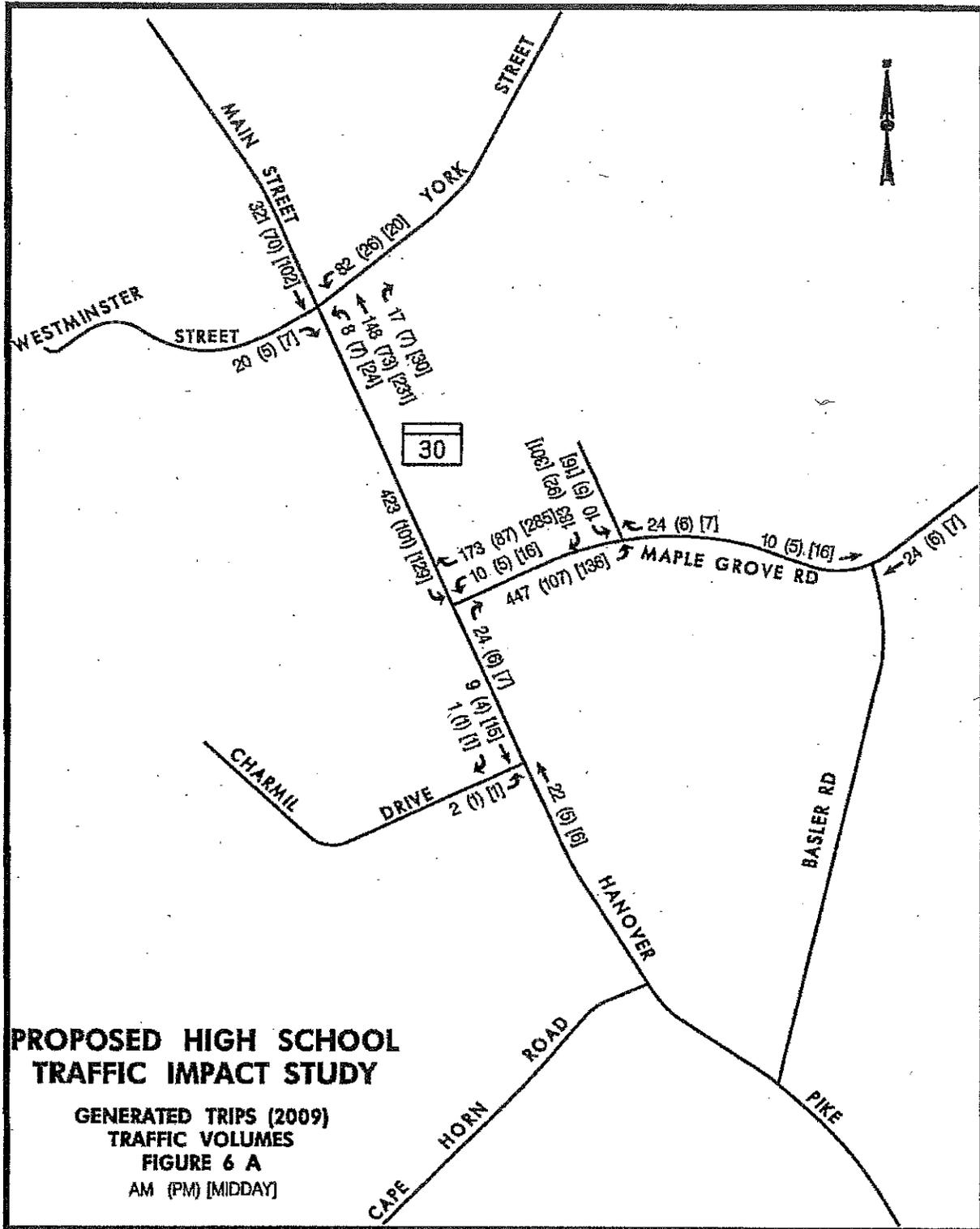


Figure 6 A. Site Generated Volume Map (2009)



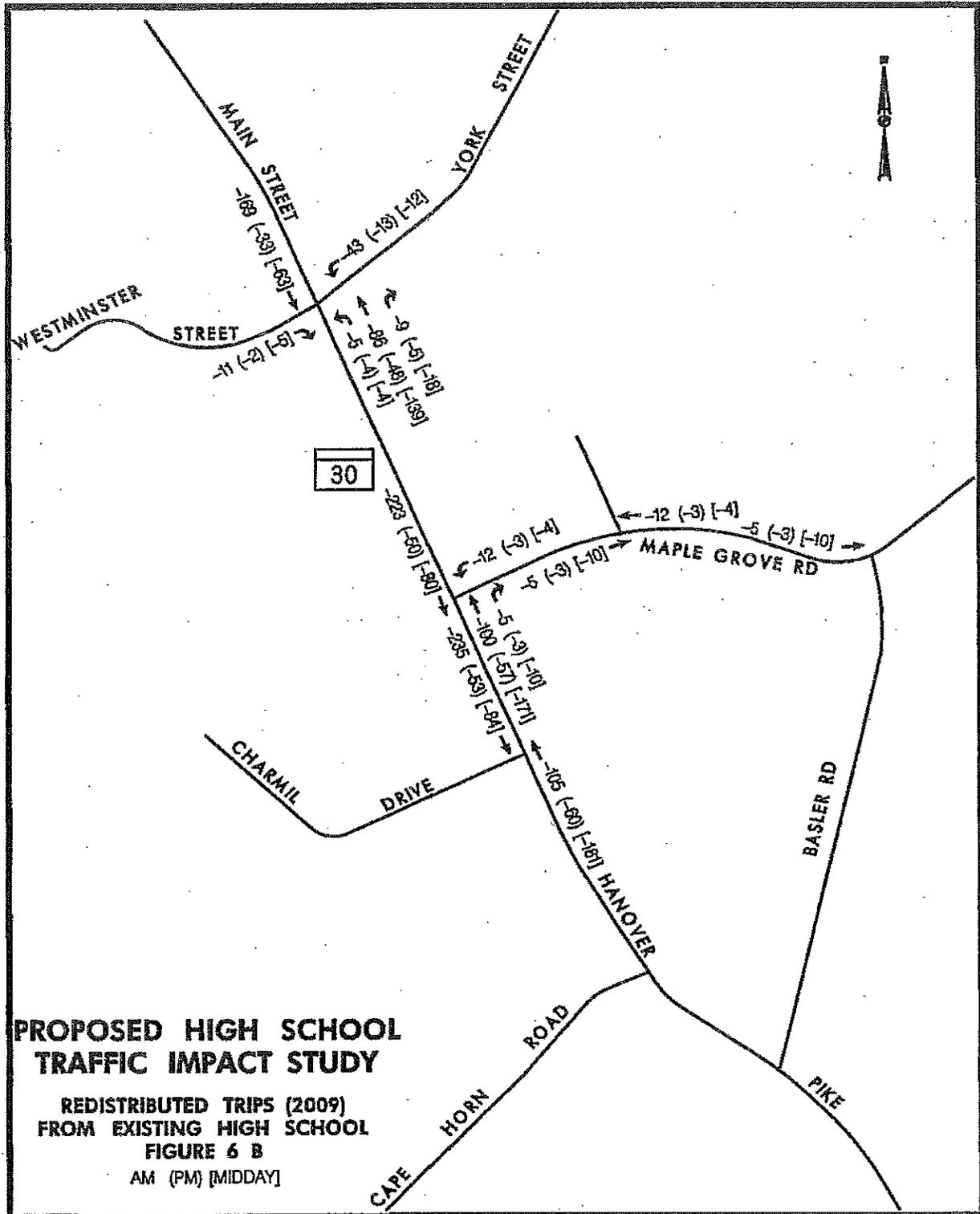


Figure 6 B. Redistributed Trip Peak Hour Volume Map (2009)



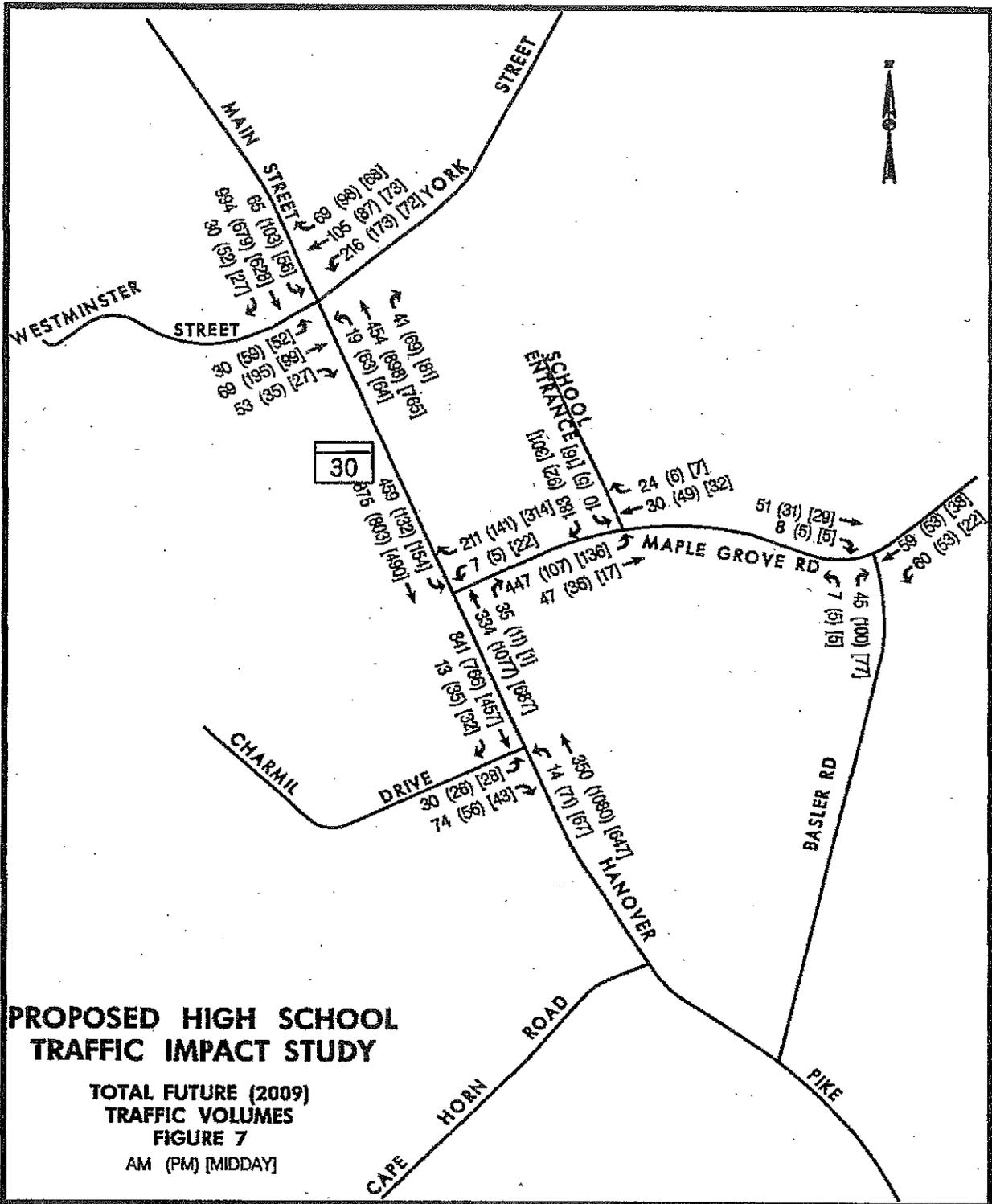


Figure 7. Total Future Peak Hour Volume Map





H. SUMMARY AND RECOMMENDATIONS

The future Manchester (Northeast) High School, located in Manchester, Maryland, will not adversely impact the future traffic patterns of the study intersections in the immediate vicinity of the proposed school. The MD 30/Maple Grove Road intersection, where all traffic to/from the new school will be accessing the school property, will operate at a level of service 'B' during the A.M. peak period, level of service 'C' during the midday peak period, and level of service 'D' during the P.M. peak period. The addition of the school generated traffic to the already congested MD 30/York Street intersection in Manchester will require the addition of a second left-turn lane along westbound York Street (above and beyond the improvements needed along MD 30 under no-build conditions). The improvements recommended herein at the MD 30/York Street intersection under Total Future and No-Build Background conditions may not be geometrically feasible. A detailed geometric analysis, including right-of-way investigation, would be required to clearly determine the feasibility.

The Carroll County Bureau of Engineering has requested that the feasibility of a traffic signal at the MD 30/Maple Grove Road intersection be determined, to aid with the ingress and egress of school traffic. The traffic volumes along westbound Maple Grove Road, approaching the MD 30 intersection, are insufficient to meet the warrant requirements for the installation of a traffic signal, as stipulated by the Manual on Uniform Traffic Control Devices (MUTCD). Although the westbound right-turn traffic is significant, right-turn volumes are not affected by the installation of a traffic signal, as these volumes will be given a free-right-turn-on-red movement. The westbound left-turn volumes are insufficient to meet the signal warrant requirements.

The proximity of the two intersections (MD 30/Maple Grove Road and Maple Grove Road/School Access Drive-way) to each other has necessitated a detailed review of queue lengths to ensure that eastbound left-turn queues along Maple Grove Road (into the school) will not negatively affect westbound left-turns along Maple Grove Road (at the MD 30 intersection) if they are aligned in-line with each other.

Queue analyses were performed in accordance with SHA approved guidelines. The analyses showed that the westbound left-turn queue along Maple Grove Road at the MD 30 intersection will require a total left turn lane of 150 feet (= 50 ft queue + 100 ft taper). The eastbound left-turn queue along Maple Grove Road at the School Access driveway will require a total left turn lane of 550 to 675 feet (= 450 to 575 ft queue + 100 ft taper). There is insufficient distance between the two intersections to have back-to-back left-turns. Therefore, the eastbound Maple Grove Road lane configuration should provide two receiving lanes at the MD 30 intersection, and the left-most lane will become the left-turn lane into the school. The westbound Maple Grove Road approach to the MD 30 intersection should provide a 150 ft left-turn bay and a separate right-turn lane. The resultant lane configuration will require a four-lane cross section along Maple Grove Road between MD 30 and the High School access driveway.

Along northbound MD 30, the existing right turn lane onto Maple Grove Road will need to be upgraded to accommodate the new traffic pattern. A proper deceleration lane length of 200 ft with a taper length of 100 ft must be provided in accordance with the State Highway Access Manual released by the Access Permits division of SHA. In addition the acceleration lane from Maple Grove Road onto Northbound MD 30 will also have to be upgraded to the proper lengths set forth in the AASHTO Highway and Streets Design manual (Approximately 750 ft acceleration lane with 100 ft taper section). See the MD 30 Roadway Striping Concept in Appendix H.





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The southbound MD 30 approach should be upgraded to provide a separate left-turn lane. The southbound left-turn movement is the highest during the morning peak hour at 459 vehicles. The 459 southbound left-turn volume will require a 575 ft queue length, plus a 320 ft deceleration length, and a 100 ft taper length.

WM&A has also conducted a safety review of the Maple Grove Road and Basler Road intersection, and we are recommending revising this intersection to an all way stop condition. The limited sight distance along Maple Grove Road due to the geometric alignment of the roadway at the intersection of Basler Road makes it difficult for motorists to execute a left onto Basler Road from westbound Maple Grove Road.

The intersection of MD 30 and Charmil Drive currently operates at a LOS "C" in the A.M. and Midday peak periods and at a LOS "E" during the P.M. peak period. The unacceptable LOS during the evening peak period is due to the left turning motorists from Charmil Drive not having sufficient gaps in the traffic flow along MD 30 to execute the maneuver. The addition of a signal at MD 30/Maple Grove Road will not alleviate this problem because of the high volume of northbound traffic during the P.M. peak period. The queuing of cars along northbound MD 30 could extend beyond the intersection of MD 30 and Charmil Drive not allowing vehicles to make the left turn maneuver.

