



July 20, 2023

Leslie Herring
City Administrator
City of Westwood, KS

Re: Traffic Memo for Westwood Village Redevelopment

BHC has been asked to review the traffic impact of a proposed redevelopment located in the southwest corner of 50th Street and Rainbow Boulevard. The site includes Joe D. Dennis Park and the former Westwood View Elementary School.

Westwood View Elementary School operations have relocated to the northeast corner of 50th Street and Belinder Avenue, approximately 500 feet west of this site. For the 2023-2024 school year, Rushton Elementary School operations will utilize the original Westwood View Elementary School while their school is being rebuilt. After the school year, the proposed development would demo the site for a proposed mixed-use site consisting of 98,750 square feet of general office buildings and 36,300 square feet of retail.

This traffic memo provides a traffic distribution, and trip generation for the proposed development that projects AM and PM peak hour traffic volumes resulting from the redevelopment. It also compares the projected development trip generation with the trip generation for the original Westwood Elementary School at the same location.

Traffic counts have been scheduled for four intersections around the site; however, that data is not available at the time of this Traffic Memo. A follow up Traffic Study will be provided in the coming weeks that will evaluate the operational analysis of the study intersections for existing, existing+development and future conditions.

EXISTING CONDITIONS

The location currently includes Joe D. Dennis Park and the former Westwood View Elementary School. Rainbow Boulevard (169 Highway) is a 35-mph 4-lane road that runs along the eastern side of the site. Rainbow Boulevard provides access to Shawnee Mission Parkway approximately 1000' to the south, and I-35 approximately 2.5 miles to the north.

The intersection of Rainbow Boulevard and 50th Street is a signalized 4-leg intersection with 50th Street being offset by approximately 70 feet. 50th Street runs along the northern side of the site and is a 25-mph 2-lane minor collector street connecting Mission Road to State Line Road.

51st Street is a 25-mph 2-lane residential street along the southern side of the site that connects Rainbow Boulevard to 51st Terrace. 51st Street forms a T-intersection with Rainbow Boulevard that is Stop-sign controlled for 51st Street.

The existing street network along with the proposed site may be seen in Figure 1.

EXISTING CONDITIONS (continued)



Figure 1: Project Location



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PROPOSED CONDITIONS

The proposed mixed-use site will consist of 98,750 square feet of general office building and 36,300 square feet of retail.

Along the eastern side of the site (Rainbow Boulevard), a new access driveway is proposed that would align itself directly across from 50th Terrace.

Along the northern side of the site (50th Street), the eastern driveway (aligning with Adams Street) would be extended across the site to provide access between 50th Street and 51st Street. This will not be a public street.

Along the southern side of the site (51st Street), the drive aligning with Adams Street would remain a private driveway that T-intersects with 51st Street roughly 80 feet east of the existing rear-driveway to the former school. For exhibit purposes, we have labeled that southern driveway as Adams Street, but it would not be a public street. A second T-intersecting driveway with 51st Street is proposed approximately 70 feet west of Rainbow Boulevard.

The proposed site layout may be seen in Figure 2.

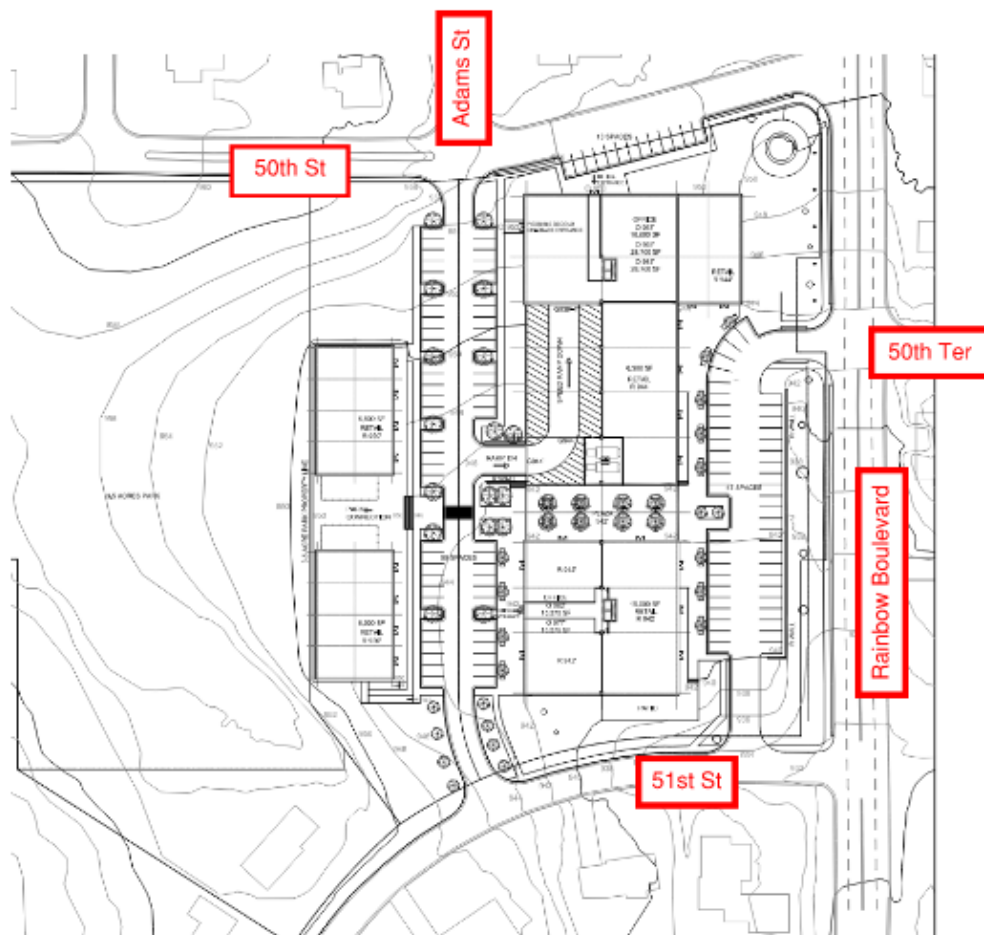


Figure 2: Proposed Site Layout



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TRIP DISTRIBUTION

The project is situated within a well-established neighborhood. Rainbow Boulevard is anticipated to carry a larger percentage of the proposed site-related traffic due to the nature of a mixed-use site as opposed to a centrally located community elementary school. It is also assumed that a notable percentage of the retail traffic is expected to be pass-by and/or internal capture trips already on the surrounding roadway network. To account for this, an acceptable ITE pass-by percentage will be applied to the retail portion of the trip generation.

A review of the surrounding population centers, existing roadway network, and recent traffic count at 47th Street and Rainbow Boulevard was completed to estimate a reasonable trip distribution. Several assumptions were made for the distribution and are outlined below.

- 1) 45% of site generated traffic is expected to originate from Shawnee Mission Parkway and Rainbow Boulevard south of the site. Most of that traffic is expected to turn left onto 51st Street.
- 2) 40% of site generated traffic will originate from Rainbow Boulevard from the north. Most of that southbound traffic will make a right-turn into the site at 50th Terrace.
- 3) 15% of site generated traffic will originate from points west of the site via 50th Street and 51st Terrace.

Figure 3 illustrates the entering (blue numbers) and exiting (red numbers) trip distribution percentage selected based on these assumptions. The numbers in orange represent the directional distributions outlined above.



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TRIP DISTRIBUTION (continued)

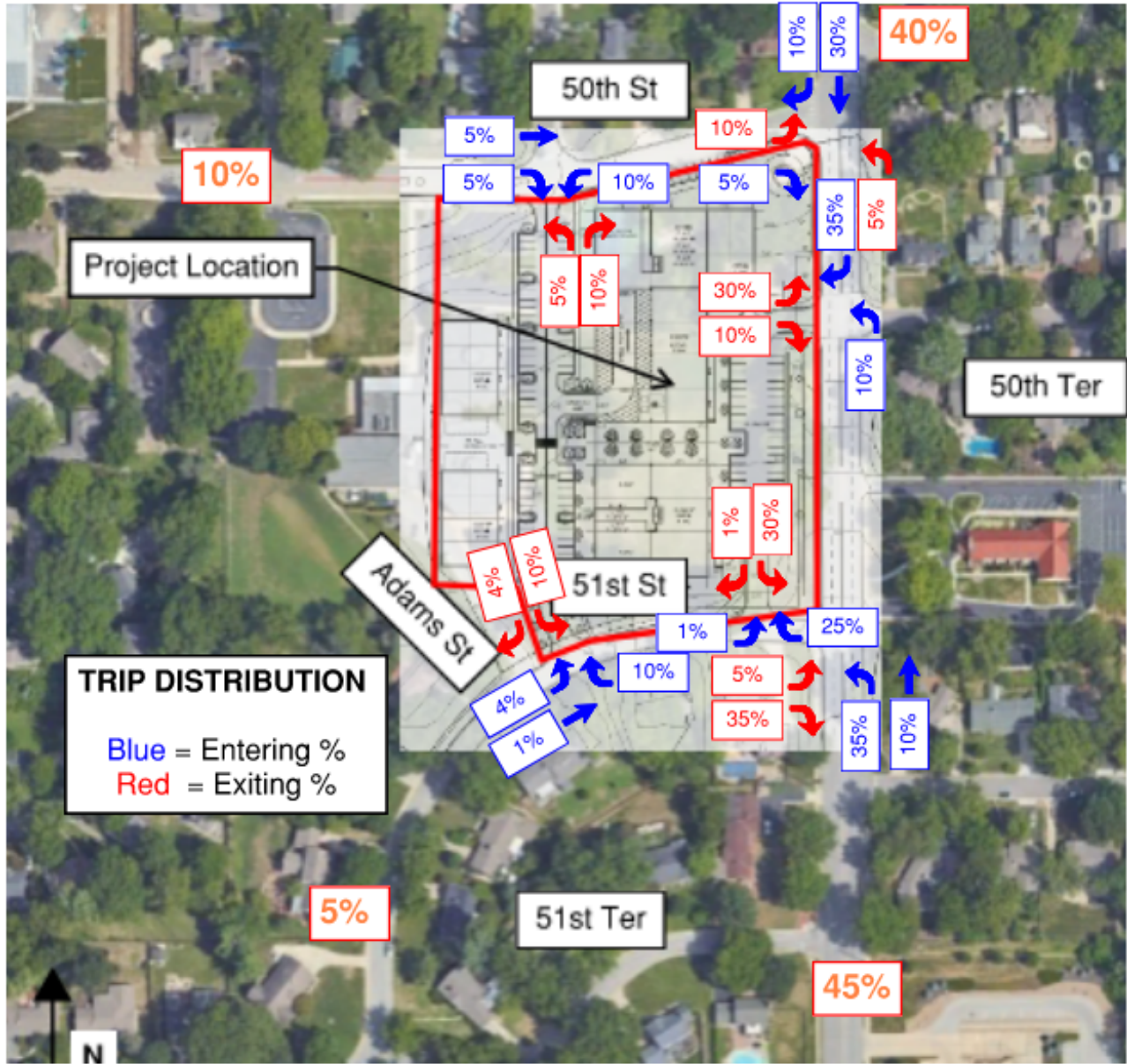


Figure 3: Proposed Trip Distribution

TRIP GENERATION

A trip generation analysis was performed using the ITE TripGen web-based app. The 11th edition of the ITE Trip Generation Manual was used. The land use codes used for the proposed site was 710 – General Office Building, and 822 – Strip Retail Plaza (<40k).

The ITE Average Rate was used for General Office Building, and the ITE Fitted Curve Equation was used for the Strip Retail Plaza. The fitted curve equation was chosen as a better fit for the ITE data points collected for a Strip Retail Plaza site (the proposed retail is 36,300 square feet which is close to the 40,000 square foot threshold).

The number of trips generated may be seen in Table 1 for the AM peak hour, PM peak hour, and weekday total.

Table 1 – Trip Generation						
ITE Code	Land Use	1000 SF	Avg. Rate	Trips Generated		
				Total	Enter	Exit
AM Peak Hour (7-9 AM)						
710	General Office Building	98.75	1.52	150	132	18
822	Strip Retail Plaza (<40k)	36.3	2.36*	67	40	27
Total AM Peak Hour				217	172	45
PM Peak Hour (4-6 PM)						
710	General Office Building	98.75	1.44	142	24	118
822	Strip Retail Plaza (<40k)	36.3	6.59*	194	97	97
Total PM Peak Hour				336	121	215
Weekday Total						
710	General Office Building	98.75	10.84	1070	535	535
822	Strip Retail Plaza (<40k)	36.3	54.45*	1762	881	881
Total Weekday				2832	1416	1416

- *ITE Average Rate shown, ITE Fitted Curve Equation used*

Pass-By Assumption

Not all traffic entering or exiting a site driveway is necessarily new traffic added to the roadway network. The actual amount of new traffic is dependent upon the purpose of the trip and route used from its origin to its destination. For example, retail-oriented developments such as shopping centers, restaurants, service stations, and convenience markets are often located adjacent to busy roads with the intent of attracting motorists already on the roadway network. These developments attract a portion of their trips from existing traffic passing the site. Thus, these “pass-by” trips do not add new traffic and may be reduced from the total external trips generated by a study site.

Considering the proposed Strip Retail Plaza land use, an average pass-by percentage reduction of 30% is an acceptable practice. ITE indicates that the average pass-by rate for a Shopping Plaza is 40%. This study will stay conservative by using 25%.

TRIP GENERATION (continued)

The result of applying a 25% pass-by reduction rate to the trip ends shown in Table 1 may be seen in Table 2.

Table 2 – Proposed Trip Generation (Pass-By Applied)							
ITE Code	Land Use	1000 SF	Avg. Rate	Pass By	Trip Ends		
					Total	Enter	Exit
Saturday Peak Hour							
822	Strip Retail Plaza (<40k)	36.3	2.36*		67	40	27
	(Pass-By Reduction)			25%			
			Total Trips		50	30	20
PM Peak Hour							
822	Strip Retail Plaza (<40k)	36.3	6.59*		194	97	97
	(Pass-By Reduction)			25%			
			Total Trips		146	73	73

- ITE Average Rate shown, ITE Fitted Curve Equation used

The reduced trips in Table 2 have been copied into the original values in Table 1 to provide a revised Trip Generation Table 3. The trips in Table 3 will be applied to the surrounding roadway network by using the proposed trip distributions in Figure 3. The results may be seen in Figure 4 on the following page.

Table 3 – Trip Generation (with Pass-By)						
ITE Code	Land Use	1000 SF	Avg. Rate	Trips Generated		
				Total	Enter	Exit
AM Peak Hour (7-9 AM)						
710	General Office Building	98.75	1.52	150	132	18
822	Strip Retail Plaza (<40k)	36.3	2.36*	50	30	20
			Total AM Peak Hour	200	162	38
PM Peak Hour (4-6 PM)						
710	General Office Building	98.75	1.44	142	24	118
822	Strip Retail Plaza (<40k)	36.3	6.59*	146	73	73
			Total PM Peak Hour	288	97	191
Weekday Total						
710	General Office Building	98.75	10.84	1070	535	535
822	Strip Retail Plaza (<40k)	36.3	54.45*	1762	881	881
			Total Weekday	2832	1416	1416



TRIP GENERATION (continued)

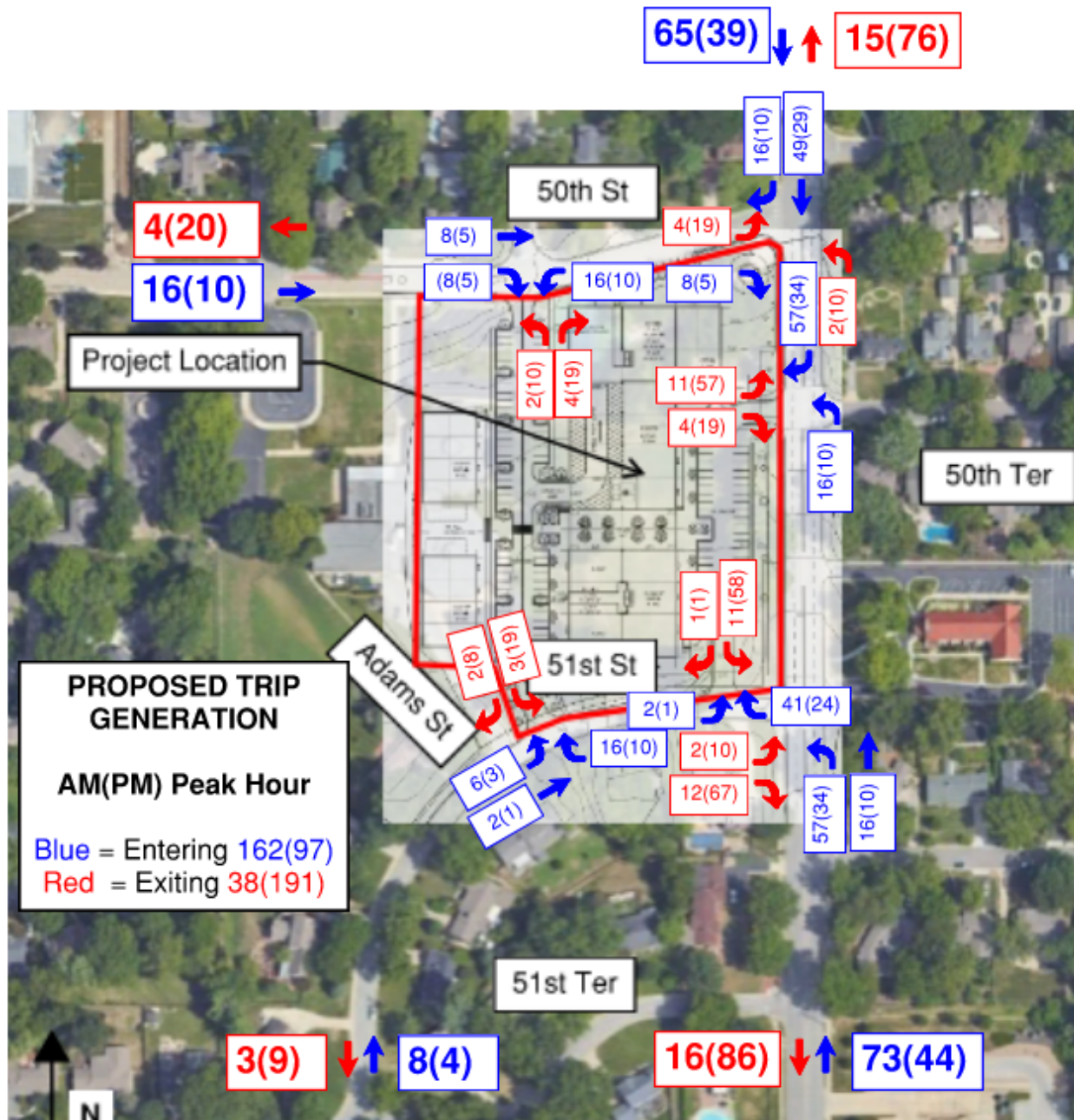


Figure 4: Proposed Trip Generation

TRIP GENERATION (continued)

Figure 4 represents the peak hour traffic increases associated with the site and the trip distribution assumptions. The information in Figure 4 helps identify intersections where projected left-turn movement increases could impact intersection operations.

The highest left-turn volume increase in Figure 4 is the southbound left-turn from the proposed eastern site driveway onto 51st Street in the PM peak with 58 vehicles (if backups occur here, they would occur on the site and not the public street network). The second highest left-turn volume increase is the northbound left-turn from Rainbow Boulevard to 51st Street in the AM peak hour with 57 vehicles (which will be evaluated from an operational standpoint in the upcoming Traffic Impact Study). The eastbound left-turn volume from the site onto Rainbow Boulevard also indicates 57 vehicles in the PM peak hour (which also would occur on the site and not on the public street network). It is important to note these numbers are over a 60-minute time period which corresponds to roughly one-vehicle per minute over the course of an hour.

For the adjacent intersections to the site, minimal operational impacts are anticipated. The pending traffic count data will be used to verify this position in the upcoming Traffic Impact Study.



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TRIP GENERATION (continued)

Comparison of Former Westwood View Elementary School -vs- Proposed Development

For comparison purposes, Table 4 shows the ITE Trip Generation numbers for a 300-student elementary school (former Westwood View Elementary site).

Table 4 – Trip Generation for Elementary School with 400-students						
ITE Code	Land Use	Students	Avg. Rate	Trips Generated		
				Total	Enter	Exit
AM Peak Hour of Generator						
520	Elementary School	300	0.75	225	122	103
Total AM Peak Hour				225	122	103
PM Peak Hour of Generator						
520	Elementary School	300	0.45	135	62	73
Total PM Peak Hour				135	62	73

Table 5 illustrates the difference between the peak hour trip generations for the proposed site versus the original school site (Table 4 versus Table 3).

Table 5 – Trip Generation Comparison for Former Westwood View Elementary -vs- Proposed Development			
	Trips Generated		
	Total	Enter	Exit
AM Peak Period			
Former Elementary School	225	122	103
Proposed Site	200	162	38
Difference	-25	+40	-65
PM Peak Period			
Former Elementary School	135	62	73
Proposed Site	288	97	191
Difference	+153	+35	+118

Table 5 illustrates the difference in traffic generations between the proposed site and the original Westwood View Elementary School. Less traffic is expected to occur from the proposed site than the former school during the AM Peak Period (-25 total trips). More traffic is expected to occur from the proposed site than the former school during the PM Peak Period (+153 total trips).



CONCLUSION

This traffic memo has provided a traffic distribution, and trip generation for the proposed development that projects AM and PM peak hour traffic volumes. It also compared the projected development trip generation with the trip generation for the original Westwood Elementary School at the same location.

Intersection operational analyses will be conducted once the traffic count data is processed. Minimal adjacent intersection level of service decreases are anticipated in the AM peak period as the projected proposed site trip generation is comparable to the original Westwood View Elementary School site. The operational analyses for the PM peak period may indicate some decreases in intersection level of service. The intersections of interest would be Rainbow Boulevard with 50th Street and 51st Street. It is believed that the operation of the signalized intersection of 50th Street and Rainbow Boulevard will not significantly change but will decrease as a result of the proposed development.

The traffic impact study is on track to be completed in the coming weeks and will utilize the counts conducted this week. BHC recommends that traffic counts be reconducted at the intersections of 50th Street and Rainbow, and 51st Street and Rainbow two weeks after school returns in the fall. An addendum to the Traffic Impact Study should then be completed to verify the intersection levels of service while both Westwood View Elementary and Rushton Elementary are in session.

The final traffic impact study will need to be presented to KDOT for review. KDOT will need to approve the change in access along Rainbow Boulevard resulting from the newly proposed driveway access at 50th Terrace.

If there are any questions regarding this traffic memo, please contact me at your convenience at 913-663-1900 or mark.sherfy@ibhc.com.

Sincerely,



Mark Sherfy, P.E., PTOE
Traffic Engineer
BHC

