

August 30, 2018

Mr. Kevin McDermott
Albemarle County
401 McIntire Road
Charlottesville, Virginia 22902
Phone: (434) 296-5832

Reference: State Farm Boulevard Hotel – Revised Traffic Impact Analysis (TIA)

Dear Mr. McDermott,

Ramey Kemp & Associates, Inc. (RKA) has performed a Traffic Impact Analysis (TIA) for the proposed 130 room hotel located on the northwest side of State Farm Boulevard northeast of Martha Jefferson Drive. The access plan includes two new right-in / right-out driveways on State Farm Boulevard. If approved, the proposed hotel is expected to be built in 2020. Figure 1 shows the site location and study intersections, and Figure 2 shows the preliminary site plan.

The original TIA was submitted on May 30, and this revised TIA is based on VDOT review comments dated July 17. Following is a brief response to those comments:

Comment #1 – the laneage on the northbound State Farm Boulevard approach to U.S. 250 (Richmond Road) was corrected as noted

Comment #2 – the signal timing splits in the AM and PM peak hours are now held constant from existing through build-out instead of optimizing future conditions

Comment #3 – these improvements were analyzed as requested, and the results were added to Table 2

Comment #4 – the ADT value of 6,300 vehicles per day is reported as requested

Comment #5 – understood

Comment #6 – the applicant has agreed to construct a 100 foot southbound right-turn taper on State Farm Boulevard at the North Site Driveway

The purpose of this letter report is to provide the following:

- Trip generation calculations
- Evaluation of turn lane warrants for the proposed driveways
- Capacity and queueing analysis of the study intersections

Existing Roadway Conditions

U.S. 250 (Richmond Road) is a six-lane divided Principal Arterial with a 2018 average daily traffic (ADT) volume of approximately 34,000 vehicles per day (vpd), and a posted speed limit of 45 miles per hour (mph) in the vicinity of the site.

State Farm Boulevard is a four-lane divided local road with a 2018 ADT volume of approximately 6,300 vpd, and a posted speed limit of 35 mph in the vicinity of the site.

Martha Jefferson Drive is a three-lane local road with a 2018 ADT volume of approximately 2,100 vpd, and a posted speed limit of 25 mph in the vicinity of the site.

Figure 3 shows existing lane configuration.

Existing Traffic Volumes

The AM peak hour (7:00 to 9:00 AM) and PM peak hour (4:00 to 6:00 PM) turning movement counts were conducted during the week of April 30th by Peggy Malone & Associates, Inc. at the following intersections:

- U.S. 250 (Richmond Road) and State Farm Boulevard / Luxor Road
- State Farm Boulevard at Martha Jefferson Drive

The traffic count data are enclosed, and the existing 2018 volumes are shown in Figure 4.

Background Traffic Growth

The 2018 peak hour traffic volumes were grown by an annual rate of 2.0% for two years to estimate the 2020 peak hour traffic volumes. Figure 5 shows the estimated 2020 no-build peak hour traffic volumes.

Trip Generation

The trip generation potential of the proposed hotel during a typical weekday, AM peak hour, and PM peak hour was estimated using the methodologies published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual – 10th Edition*. Table 1 summarizes the trip generation calculations.

Table 1
ITE Trip Generation – Weekday – 10th Edition

Land Use (ITE Land Use Code)	Size	Weekday Daily Traffic (vpd)		AM Peak Hour (vph)		PM Peak Hour (vph)	
		Enter	Exit	Enter	Exit	Enter	Exit
Hotel (310)	130 rooms	544	544	36	25	40	38

Site Traffic Distribution

The following site traffic distribution was applied based on a review of the existing traffic volumes, the adjacent roadway network, and engineering judgement:

- 40% to / from the east U.S. 250 (Richmond Road)
- 30% to / from the west on U.S. 250 (Richmond Road)
- 10% to / from the east on Martha Jefferson Drive
- 10% to / from the west on S. Pantops Drive
- 5% to / from the north on Luxor Road
- 5% to / from the west on Hickman Road

Figures 6 and 7 show the site trip distribution and site trip assignment, respectively. Figure 8 shows the projected 2020 build-out peak hour traffic volumes.

VDOT Turn Lane Warrant Analysis

The projected build-out AM and PM peak hour traffic volumes at the proposed hotel driveways were compared to the turn lane warrants in the Virginia Department of Transportation (VDOT) *Access Management Design Standards for Entrances and Intersections*. No right-turn lanes or tapers are warranted at build-out of the hotel, but the applicant has agreed to construct a 100 foot southbound right-turn taper on State Farm Boulevard at the North Site Driveway.

Intersection Spacing Standards

VDOT requires at least 250 feet of separation between partial access driveways and intersections on Collector roadways. The North Site Driveway on State Farm Boulevard will be right-in / right-out, and is approximately 315 feet south of the Virginia High School League driveway. The South Site Driveway on State Farm Boulevard will also be right-in / right-out, and is approximately 300 feet south of the North Site Driveway. Both proposed driveways meet VDOT's minimum intersection spacing standards.

Traffic Capacity Analysis

Traffic capacity analysis for the study intersections was performed using Synchro 9, which is a comprehensive software package that allows the user to model signalized and unsignalized intersections to determine levels-of-service based on the thresholds specified in the 2010 Highway Capacity Manual (HCM).

Table 2 summarizes the capacity analysis results for the signalized intersection of U.S. 250 (Richmond Road) at State Farm Boulevard / Luxor Road, and the Synchro outputs are enclosed for reference.

Table 2
Level-of-Service Summary for U.S. 250 (Richmond Road) at State Farm Boulevard / Luxor Road

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Existing (2018) Traffic Conditions	EBL	E	61.9	86	C (24.9 sec)	E	63.1	84	C (29.3 sec)
	EBT/R	B	17.8	240		C	26.9	539	
	WBL	E	58.4	108		E	55.2	48	
	WBT/R	C	21.3	498		C	21.5	322	
	NBL/T	E	58.7	93		E	64.5	218	
	NBR	A	1.0	0		C	28.3	160	
	SBL/T	E	59.7	220		E	64.2	229	
	SBR	A	0.6	0		A	0.7	0	
No-Build (2020) Traffic Conditions	EBL	E	62.9	88	C (25.6 sec)	E	63.7	86	C (30.6 sec)
	EBT/R	B	18.2	252		C	28.4	574	
	WBL	E	59.3	111		E	55.4	49	
	WBT/R	C	22.2	531		C	22.1	340	
	NBL/T	E	59.1	97		E	65.7	229	
	NBR	A	1.1	0		C	31.8	177	
	SBL/T	E	60.6	230		E	65.6	251	
	SBR	A	0.6	0		A	0.8	0	
Build (2020) Traffic Conditions	EBL	E	63.5	88	C (26.0 sec)	E	63.7	86	C (31.5 sec)
	EBT/R	B	18.4	255		C	29.1	581	
	WBL	E	61.0	120		E	56.4	58	
	WBT/R	C	22.3	531		C	22.4	340	
	NBL/T	E	59.3	108		E	67.6	261	
	NBR	A	1.5	1		C	34.5	200	
	SBL/T	E	60.9	232		E	66.0	255	
	SBR	A	0.6	0		A	0.8	0	
No-Build (2020) Traffic Conditions (With NBL and Concurrent Phasing)	EBL	E	58.2	86	B (18.6 sec)	E	58.1	85	C (20.0 sec)
	EBT/R	B	12.0	210		B	15.0	456	
	WBL	E	55.3	109		D	54.5	49	
	WBT/R	B	13.9	440		B	12.8	280	
	NBL	D	44.0	67		D	54.5	176	
	NBT	D	39.4	31		D	37.4	46	
	NBR	A	0.7	1		C	32.3	187	
	SBL	E	58.9	173		E	58.3	200	
Build (2020) Traffic Conditions (With NBL and Concurrent Phasing)	EBL	E	58.2	86	B (18.8 sec)	E	58.1	85	C (20.7 sec)
	EBT/R	B	12.2	212		B	15.3	460	
	WBL	E	55.6	117		E	55.1	58	
	WBT/R	B	13.9	440		B	12.8	280	
	NBL	D	44.0	76		E	56.9	190	
	NBT	D	38.4	31		D	37.3	48	
	NBR	A	2.2	10		C	34.7	202	
	SBL	E	59.0	173		E	58.3	200	
	SBT/R	C	31.0	88		B	17.4	52	

Capacity analysis indicates that the intersection currently operates at LOS C during the AM and PM peak hours. Under no-build and build conditions, the intersection is expected to continue to operate at LOS C during the AM and PM peak hours. Note that the proposed hotel trips will increase the average delay at this intersection by only 0.4 second in the AM peak hour, and 0.9 second in the PM peak hour. The hotel trips will increase the total approach volume at this intersection by less than 1.5% in the AM and PM peak hours.

No improvements are warranted or recommended at this intersection at build out of the hotel.

At the request of VDOT, this intersection was analyzed with the following improvements:

- Add one northbound left-turn lane on State Farm Boulevard with 200 feet of storage
- Restripe the northbound through-left lane on State Farm Boulevard as a through lane
- Restripe the southbound Luxor Road approach as one left-turn lane and one shared through-right lane
- Change the signal phasing from split phase to running the side street approaches concurrently

If those improvements were constructed, this intersection would be projected to operate at LOS B during the AM peak hour, and LOS C during the PM peak hour.

Table 3 summarizes the capacity analysis results for the unsignalized intersection of State Farm Boulevard at Martha Jefferson Drive, and the Synchro outputs are enclosed for reference.

Table 3
Level-of-Service Summary for State Farm Boulevard at Martha Jefferson Drive

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Existing (2018) Traffic Conditions	WBL ¹	B	12.5	3	N/A ³	B	12.3	3	N/A ³
	WBR ¹	A	8.6	3		A	9.9	13	
	NBU ²	A	8.1	0		A	0	0	
	NBT	-	-	-		-	-	-	
	NBR	-	-	-		-	-	-	
	SBL ²	A	7.6	8		A	8	3	
	SBT	-	-	-		-	-	-	
No-Build (2020) Traffic Conditions	WBL ¹	B	12.7	3	N/A ³	B	12.6	5	N/A ³
	WBR ¹	A	8.6	3		B	10	15	
	NBU ²	A	8.1	0		A	0	0	
	NBT	-	-	-		-	-	-	
	NBR	-	-	-		-	-	-	
	SBL ²	A	7.6	8		A	8	3	
	SBT	-	-	-		-	-	-	
Build (2020) Traffic Conditions	WBL ¹	B	12.6	3	N/A ³	B	13.3	5	N/A ³
	WBR ¹	A	8.6	3		B	10.1	15	
	NBU ²	A	8.1	0		A	0	0	
	NBT	-	-	-		-	-	-	
	NBR	-	-	-		-	-	-	
	SBL ²	A	7.7	10		A	8.7	8	
	SBT	-	-	-		-	-	-	

1. Level of service for minor approach

2. Level of service for major street left-turn movement

3. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections.

Capacity analysis indicates that the minor street left-turn movement currently operates with short delays (less than 25 seconds) during both the AM and PM peak hours. Under no-build conditions, the minor street left-turn movement is expected to continue to operate with short delays (less than 25 seconds) during both peak hours.

Under build conditions, capacity analysis indicates that the minor street left-turn movement is expected to continue to operate with short delays (less than 25 seconds) during the AM and PM peak hour with queue lengths less than one vehicle.

No improvements are warranted or recommended at this intersection at build out of the hotel.

Table 4 summarizes the capacity analysis results for the unsignalized intersection of State Farm Boulevard at North Site Driveway, and the Synchro outputs are enclosed for reference.

Table 4
Level-of-Service Summary for State Farm Boulevard at North Site Driveway

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Build (2020) Traffic Conditions	EBR ¹	A	9.5	3	N/A ²	A	9.0	3	N/A ²
	NBT	-	-	-		-	-	-	
	SBT/R	-	-	-		-	-	-	

1. Level of service for minor approach
2. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections.

Capacity analysis indicates that the minor street right-turn movement is expected to operate with short delays (less than 25 seconds) during the AM and PM peak hours with queue lengths less than one vehicle.

Table 5 summarizes the capacity analysis results for the unsignalized intersection of State Farm Boulevard at South Site Driveway, and the Synchro outputs are enclosed for reference

Table 5
Level-of-Service Summary for State Farm Boulevard at South Site Driveway

CONDITION	LANE GROUP	AM PEAK HOUR				PM PEAK HOUR			
		Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)	Lane LOS	Lane Delay (sec)	Queue (ft)	Overall LOS (Delay)
Build (2020) Traffic Conditions	EBR ¹	A	9.4	3	N/A ²	A	8.9	3	N/A ²
	NBT	-	-	-		-	-	-	
	SBT/R	-	-	-		-	-	-	

1. Level of service for minor approach
2. HCM methodology does not provide lane group or overall LOS, delay, and queue lengths for major street through movements or right turns at unsignalized intersections.

Capacity analysis indicates that the minor street right-turn movement is expected to operate with short delays (less than 25 seconds) during the AM and PM peak hours with queue lengths less than one vehicle.

Recommendations

Based on the trip generation potential of the proposed hotel, the following improvements are recommended:

State Farm Boulevard at North Site Driveway:

- Construct right-in / right-out driveway with one ingress lane and one egress lane
- Construct a 100 foot southbound right-turn taper on State Farm Boulevard

State Farm Boulevard at South Site Driveway:

- Construct right-in / right-out driveway with one ingress lane and one egress lane

Figure 9 shows recommended lane configuration.

We appreciate your attention to this matter. Please contact me at (804) 217-8560 if you have any questions about this report.

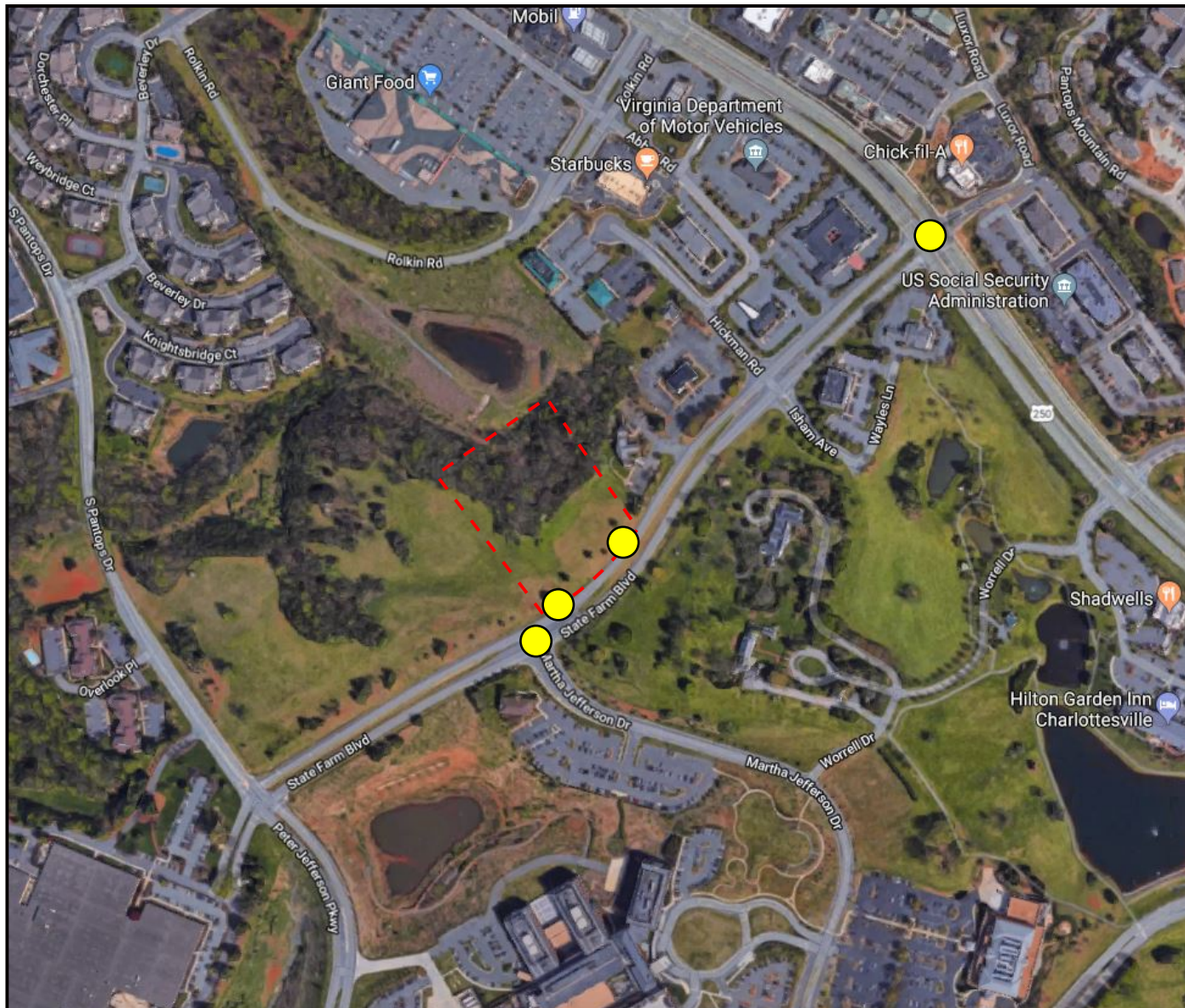
Sincerely yours,
Ramey Kemp & Associates, Inc.



Carl Hultgren, P.E., PTOE
Regional Manager

Enclosures: Figures, VDOT turn lane warrant diagrams, Traffic count data, Synchro output

Copy to: Mr. Adam Moore, P.E., VDOT
Mr. Michael Sweeney, Shamin Hotels
Mr. John Wright, P.E., Bohler Engineering



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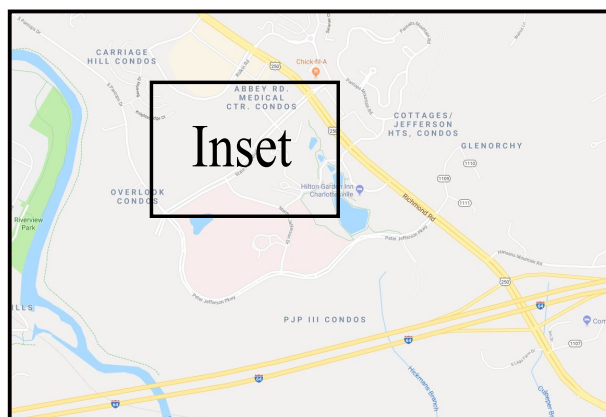
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Study Intersection



Site Boundary



Overview



State Farm Boulevard Hotel
Albemarle County, Virginia

Site Location and
Study Intersections

Scale: Not to Scale

Figure 1

