



February 20, 2007

Allandale Neighborhood Association
Austin, Texas

Re: Proposed Northcross Mall Redevelopment (Project) – Austin, Texas, Traffic Impact Study (TIS) Peer Review

Dear Allandale Neighborhood Association:

VRPA Technologies, as requested, has reviewed the Traffic Impact Study (TIS), prepared for the proposed Northcross Mall Redevelopment (Project) bounded by Anderson Lane on the north and Burnet Road on the east. WHM Transportation Engineering (consultant) prepared the TIS in October 2005. Based upon our peer review, VRPA Technologies has prepared the following detailed comments.

- ◆ **Traffic Counts/Projections:** As stated in the TIS, traffic counts were taken under the direction of the consultant in October 2005. The times and dates of the counts are not documented in the portion of the TIS provided to VRPA; and the accuracy of the counts cannot be confirmed since count details were not provided to us, such as might be available in an appendix.

Traffic projections were derived based on a 2.0% annual growth rate and include estimated traffic generated from several proposed developments. The TIS does not explicitly indicate the number of trips produced by these proposed developments. A 2.0% growth rate is typically used in areas that are already built-up and do not expect much more growth or expansion. For areas that are still growing, a minimum 3.0% growth rate should be applied. The 2.0% annual growth rate applied in the TIS may not be adequate. The future traffic volumes may be underestimated.

- ◆ **Trip Generation - Project:** Based upon review of the TIS, the development consists of a free-standing discount superstore (206,325 square feet), specialty retail center (36,000 square feet), shopping center (158,019 square feet), recreation community center (17,835 square feet), and an ice skating rink (23,500 square feet). It is the understanding of VRPA that the 206,325 square feet of free-standing discount superstore is a Super Wal-Mart Center.

In order to estimate project trip generation, the consultant indicated that the microcomputer program "Trip Generation" by Microtrans Corporation was utilized. VRPA is unfamiliar with this program, and estimated the project trip generation by utilizing the ITE Trip Generation Manual, 7th Edition and the August 2006 ITE Journal Article titled, "Trip Generation Characteristics of Free-Standing Discount Superstores." VRPA only estimated project trip generation for the Super Wal-Mart. The trip generation for the other uses at the project site appears adequate.

In the Reference section of the TIS, several trip generation publications were cited. Two of these publications have been superseded by more recent editions. These include:

- ***Trip Generation, An Informational Report, Sixth Edition, Institute of Transportation Engineers, Washington, D.C., 1997.***
- ***Trip Generation Handbook, An ITE Proposed Recommended Practice, Institute of Transportation Engineers, Washington, D.C., October 1998.***

The Trip Generation Manual was updated in a Seventh Edition in 2003. "An ITE Proposed Recommended Practice" was replaced by "An ITE Recommended Practice" in November 2000. These more recent publications should have been utilized in the trip generation estimation in this TIS.

In most recent TISs conducted for Wal-Mart Super Centers, the ITE Trip Generation Handbook rate of 3.82 per 1,000 square feet for a free-standing discount superstore (FSDS) is applied or that of a shopping center is applied to the entire development. In the case of this development, the TIS consultant used a rate from the ITE trip generation program of 3.87.

During the summer of 2003, VRPA Technologies conducted a study of five free standing discount superstores (FSDS) to identify if that currently utilized ITE Trip Generation Handbook Rate was an accurate rate given the specifications of the typical free standing discount superstore being proposed and built today. VRPA Technologies' study considered Wal-Mart Superstores that fit the ITE definition of a free standing discount superstore in the states of Oklahoma and Texas. Results of this study were published in the August 2006 ITE Journal and was titled, "Trip Generation Characteristics of Free-Standing Discount Superstores."

Trip generation analysis conducted by VRPA Technologies for the Wal-Mart sites utilized the average peak hour (4:30 – 5:30 PM) counts and the square footage of each Wal-Mart Superstore to determine the trips per 1,000 square feet during the PM Peak Hour. Traffic counts at each driveway for each Wal-Mart Superstore were conducted on two typical weekdays (Tuesday, Wednesday and/or Thursday) from 4:00 PM – 6:00 PM. The first weekday count was taken in July 2003 and the second in October 2003. It should be noted that no inclement weather occurred during either count period and that the counts were not taken during a holiday week or season.

The study concluded that a new ITE land use category is needed. This category would be defined as a "Large Free-Standing Discount Superstore (greater than 200,000 square feet)." The average trip generation rate used in the PM peak hour should be 5.50.

Based upon the VRPA Technologies study, all sites surveyed concluded higher trip generation rates for the PM Peak Hour (between 4.04 and 7.19 per 1,000 square feet); therefore the study rate displayed in Table 1 of 5.50 should be the preferred choice of agencies when calculating trip generation for a Wal-Mart Superstore. Since the Wal-Mart Super Center proposed in the City of Austin fits the characteristics of the Super Centers studied in 2003, VRPA Technologies believes the 5.50 rate for the 206,325 square feet designated as the Wal-Mart Super Center is more accurate for traffic impact analysis.

The TIA Consultant did not consider weekend trip generation or impacts as part of its analysis. However, most of the trip generation for a Super Wal-Mart or any type of super center occurs during the weekend. This is important to consider because the turning lanes into the proposed Center must be of an appropriate length to accommodate vehicles desiring to access the center. During holidays, the need to estimate pocket length becomes even more critical if the trips that occur during that time or on a typical weekend day begin to stack into the through lanes of traffic causing a safety concern.

➤ ***Pass by Trips***

The consultant assumed the pass-by reductions of 17% for the free-standing discount superstore and 34% for the shopping center and specialty retail. Based on the lack of documentation provided, VRPA could not determine the accuracy of these assumptions.

➤ ***Captured Trips***

The consultant assumed a 15% internal capture rate, however there was no information provided to indicate the reason for determining this percentage. Based on the lack of documentation provided, VRPA could not determine the accuracy of this assumption.

TABLE 1
PROJECT TRIP GENERATION COMPARISON
 City of Austin
 Use of ITE Trip Generation Rates VS
 VRPA Rate for Wal-Mart Superstores &
 Use of ITE Rates for Other Uses

Trip Generation Comparison	Project Sq. Footage in 1,000s	Daily Trip Rate	Daily Trips	AM Peak Hour Trip Rate	AM Peak Hour Trips	PM Peak Hour Trip Rate	PM Peak Hour Trips
VRPA Trip Generation Using New Rate for Wal-Mart Superstore & Other ITE Rates (7th Edition)							
Large Free-Standing Discount Superstore	206.325	73.75	15,216	1.84	380	5.50	1,135
Specialty Retail Center	36.000	44.33	1,596	0.00	0	2.72	98
Shopping Center	158.019	81.41	12,864	1.93	305	7.47	1,180
Recreation Community Center	17.835	22.88	408	1.63	29	1.68	30
Ice Skating Rink	23.500	24.94	586	0.00	0	2.38	56
Total			30,670		714		2,499
WHM Transportation Engineering Traffic Impact Study							
Large Free-Standing Discount Superstore	206.325	49.21	10,153	1.84	380	3.87	798
Specialty Retail Center	36.000	44.33	1,596	0.00	0	2.72	98
Shopping Center	158.019	81.41	12,864	1.93	305	7.47	1180
Recreation Community Center	17.835	22.88	408	1.63	29	1.68	30
Ice Skating Rink	23.500	24.94	586	0.00	0	2.38	56
Total			25,607		714		2,162

➤ **Results**

As seen in Table 1, the use of the VRPA Technologies study free standing discount superstores rate of 5.50 results in 1,135 PM Peak Hour trips compared to the TIS generated trips of 798, or 337 additional PM Peak Hour trips. Based upon our engineering judgment and practice elsewhere in the State, a 5% increase in traffic or 50 Peak Hour trips can cause the level of service (LOS) at studied intersections to degrade to the next LOS.

➤ **Conclusion**

Referencing Table 1, the VRPA Technologies weekday trip rate for the Wal-Mart Super center is 49.9% higher than the rate applied by the TIS consultant from ITE. This percentage difference is considered significant and clearly indicates that using the ITE trip generation rate for a free standing discount superstore severely underestimates the number of trips that will be generated by proposed Wal-Mart Super Centers. Further, weekend trips should have been considered given the potential constraints with the turn lanes that would provide access to the proposed site. Finally, the actual traffic impacts and required mitigation measures that should be applied to the proposed development will be understated if the ITE rate continues to be applied.

The ITE rate for Free Standing Discount Superstores is based upon superstores with up to 154,000 square feet. Stores of this size are not comparable to today's superstores or super centers, which average 200,000 square feet or larger. VRPA Technologies has conducted a "factual" study of trip generation associated with super center stores averaging 200,000 square feet or larger which was published in the August 2006 ITE Journal.

The information contained in the ITE Manual was prepared years ago and for stores that do not share the characteristics similar if not identical to the proposed project.

Wal-Mart must know that its super centers are generating greater numbers of trips than those generated using the ITE Trip Generation Manual given the numbers of super centers that it has developed and continues to operate nationwide.

- ◆ **Trip Generation – Cumulative Projects:** The consultant considered trip impacts from two (2) approved projects including:
 - ***the Rockwood Business Plaza;***
 - ***and the Tetco Store #75***

No further information regarding the characteristics or locations of these developments were provided to VRPA. This information is not present in the portion of the TIS provided. Therefore, no comments can be made regarding the validity of the estimated number of cumulative project trips or their trip distribution.

- ◆ ***Trip Distribution/Assignment to Adjacent Street and Road System and Project Driveways/Access Points:*** Project trips were distributed using existing traffic flow patterns, location of the project site, and engineering judgment. Table 9 in the consultant's Report indicates the trip distribution percentages applied to distribute project generated trips to the street and highway system. These percentages seem reasonable based on our limited knowledge of the study area. It should be noted however, that VRPA Technologies is not able to fully identify how the trips were distributed based upon the percentages in Table 9 due to the lack of information and figures clearly showing distribution at each study intersection and driveway, and due to the lack of information regarding the cumulative projects.

As a result of the above, it is not possible to verify the trip assignments associated with the proposed Project. Figures should be included to specifically show the trip distribution percentage and resulting "Project Only" trip assignments along the street and highway system and at each local intersection and at each driveway.

- ◆ **Level of Service Results - Intersections:** The TIS traffic level of service (LOS) analysis is based upon the microcomputer program "Synchro 6.0".

Due to the fact that the Synchro worksheets were not provided to VRPA, the LOS results for each study intersection could not be verified. However, using the available intersection data and analyzing it with the 2000 Highway Capacity Manual (HCM) methodology and Software Program (HCS), rough LOS estimates were determined. A comparison of the LOS estimates is shown in Table 2.

VRPA's level of service analysis made several assumptions. For signalized intersections, a cycle length of 120 seconds was input for each intersection because it is a conservative estimate as well as the highest reasonable cycle length that should be assumed. A yellow timing length of 4.0 seconds was input for each signal phase as the default value. The green timing length for each signal phase varies for each scenario and was chosen based on whichever time produced the optimum LOS during that scenario. A peak hour factor of 0.9 was input for each turning movement.

Unfortunately, VRPA Technologies, using the HCS program could not replicate the resulting LOS for the study intersections studied by the consultant. SYNCHRO contains two different LOS calculation programs – one using HCM-based methods, and one using linked signal analysis, which is not HCM-based. Referencing pages 11 and 13 of the TIS for the Project, the consultant states that "Analysis was performed using the microcomputer program "Synchro 6.0" by the Trafficware, which is based on the procedures contained in the HCM." This statement then assumes that levels of service were calculated for the study using the HCM methodologies contained in the SYNCHRO analysis software.

Based upon the above statement, the mitigation proposed by the consultant may not be sufficient to address the LOS deficiencies at each of the intersections studied and additional mitigation will likely be required.

Regardless of the recommendation made above, it is important to recognize the recommended uses for the SYNCHRO software program. The SYNCHRO User Guide indicates that:

"For projects where exact HCM results are required, we recommend using the HCS (HCM Software Package) to printout the final reports. SYNCHRO can be used to optimize the timings and then the data can be exported to the HCS. When to use HCS for Results:

- ***Traffic Impact Studies***
- ***Planning Applications***
- ***Capacity Related Design Decisions***

The HCS should be used when an officially accepted procedure is required for policy-making decisions.

When to use SYNCHRO Reports:

- ***Signal Timing and Operations***
- ***Coordination***
- ***Area wide studies when some areas are above capacity.”***

Based upon the above statement by the developers of SYNCHRO software, SYNCHRO should not have been used to develop the LOS estimates in the TIS. HCM's HCS software program should have been applied to assess the LOS at each of the signalized intersections.

- ◆ **Level of Service Results - Segment Analysis:** Based upon the information provided in the TIS, segment analysis was not conducted. The lack of such analysis makes it very difficult to determine whether or not additional travel lanes would be required between intersections within the Project study area.

To determine whether additional lanes would be required, the TIS consultant can apply the HCM-Based Arterial Level of Service Tables (Florida Tables).

- ◆ **Street and Signal Improvements:** Based upon the results of the intersection analysis referenced in the TIS, street improvements were identified. Signal warrants were not included in the TIS, but appear necessary for several of the unsignalized intersections that are currently operating at unacceptable levels of service.
- ◆ **Left Turn Pocket Length Analysis:** As referenced earlier, it is important to assess the left turn pocket length requirements for vehicles entering the proposed Wal-Mart Super center to determine if enough storage is available. If left turn lanes are identified in the project site plan, a left turn pocket storage analysis should be provided to determine what the pocket lengths must be to accommodate trips generated by the proposed project.

Table 2
LOS COMPARISON
 City of Austin
 Use of HCS 200 VS Synchro 6.0

INTERSECTION	PEAK HOUR	2005 EXISTING		2007 FORECASTED		2007 SITE PLUS FORECASTED	
		WHM	VRPA	WHM	VRPA	WHM	VRPA
Burnet Road / Anderson Lane ⁽¹⁾	AM	D	D	D	E	D	E
	PM	D	E	D	F	D	F
Burnet Road / Northcross Drive ⁽¹⁾	AM	B	C	B	D	B	D
	PM	B	C	B	D	B	D
Burnet Road / Richcreek Road ⁽¹⁾	AM	A	C	A	C	A	C
	PM	A	C	A	C	A	C
Northcross Drive / Anderson Lane ⁽¹⁾	AM	A	B	A	B	A	B
	PM	B	C	B	C	B	C
Rockwood Lane / Anderson Lane ⁽¹⁾	AM	B	C	B	C	B	C
	PM	B	B	B	C	B	C
Driveway B / Anderson Lane ⁽¹⁾	AM	A	B	A	B	A	B
	PM	A	C	A	C	B	D
Driveway A / Anderson Lane ⁽²⁾	AM	A	C	A	C	A	D
	PM	A	F	A	F	B	F
Burnet Road / Driveway C ⁽²⁾	AM	A	F	A	F	A	F
	PM	A	F	A	F	A	F
Burnet Road / Driveway D ⁽²⁾	AM	A	F	A	F	D	F
	PM	A	F	A	F	B	F
Driveway E / Northcross Drive ⁽²⁾	AM	A	A	A	A	A	A
	PM	A	A	A	A	A	A
Northcross Drive / Foster Lane-Driveway F ⁽³⁾	AM	A	A	A	A	A	A
	PM	A	B	B	B	B	B

LOS = Level of Service

- (1) signalized intersection
- (2) unsignalized two-way stop controlled intersection
- (3) unsignalized all-way stop controlled intersection

Findings/Conclusions

- ◆ The annual growth rate should be reexamined to ensure that future traffic projections are not underestimated.
- ◆ The trip generation should have been estimated using the most recently accepted publications available.
- ◆ Trip generation rates that are more appropriate for the major anchor proposed on the project site (Wal-Mart Superstore) should be applied for purposes of the TIS versus the rates applied for a free standing discount superstore.

The ITE PM Peak Hour trip generation rate of 3.87 applied by the TIS consultant is significantly lower than the actual trip generation rate identified by VRPA Technologies (5.50) through its study of five (5) Wal-Mart Superstores in Oklahoma and Texas which is published in the August 2006 ITE Journal. As a result, the trip generation estimated for the proposed project could potentially result in impacts that will not be expected until the proposed project is operating. This will further result in the inability of the City to require appropriate mitigation measures to address such impacts.

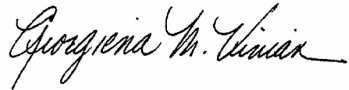
- ◆ Copies of the count data should be incorporated into the report, if not already present in the appendices, to determine accuracy and appropriateness.
- ◆ The intersection analysis should be revised to be consistent with HCM methodologies. This revision will likely result in the requirement for additional mitigation at a number of the intersections studied by the consultant.
- ◆ Segment analysis must be conducted to determine whether additional lane improvements will be required between the major intersections affected by the project.
- ◆ The Left Turn Lane (LTL) requirements for all intersections affected by project trips should be included in the TIS.

Based upon our firm's peer review, the TIS should be revised and should not be approved until the items listed above are corrected or incorporated into the TIS.

Allandale Neighborhood Association
February 20, 2007
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Should you have any further questions or need further information, please contact me at 559 271-1200 (office) or 559 259-9257 (cellular).

Sincerely,

A handwritten signature in cursive script that reads "Georgiena M. Vivian".

Georgiena M. Vivian, Vice President
VRPA TECHNOLOGIES

GV/et