



MEMORANDUM

TO: George Phillips Loudoun County

CC: Blair Hansen Broad Run Contracting, LLC
Dave Boeing, P.E. Dewberry

FROM: Christopher Tacinelli, P.E.
Tushar Awar, P.E.
Anushree Goradia

DATE: March 17, 2010

SUBJECT: Dulles Trade Center West-Lot 12 – Traffic Assessment Memorandum

INTRODUCTION

This memorandum presents the findings of a traffic assessment for a Special Exception application for the proposed Dulles Trade Center West Lot 12 development located in Loudoun County, Virginia. The site is located along Trade West Drive to the west of Arcola Road. The subject property consists of approximately 4.14 acres. The site is currently zoned as PD-GI (Planned Development-General Industrial).

A special exception is being called for the construction of a storage facility for empty solid waste vehicles and containers on the property. A scoping agreement between Loudoun County OTS staff and Gorove/Slade was reached regarding the contents of this traffic memorandum. Based on the components included in the signed scoping agreement, this memorandum provides a general overview of the existing and future roadway infrastructure in the vicinity of the site and presents the trip generation comparison between the approved and proposed use. The signed scoping document is attached in the Appendix section of the report.

Figures 1A and 1B on the next page show the location of the site.

Figure 1A: Area Map

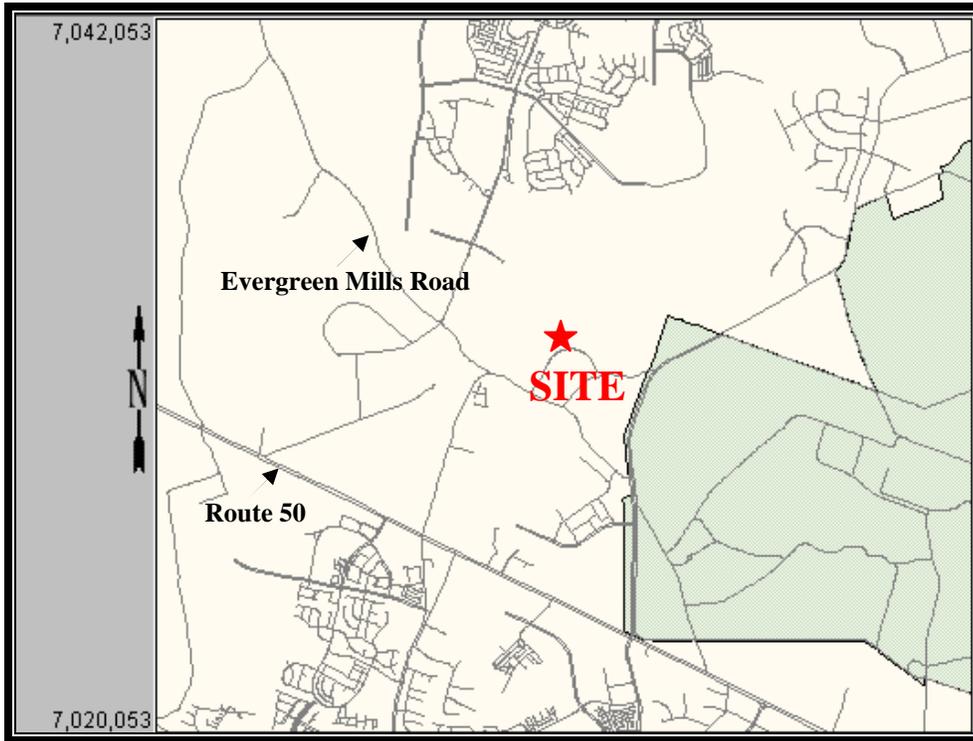
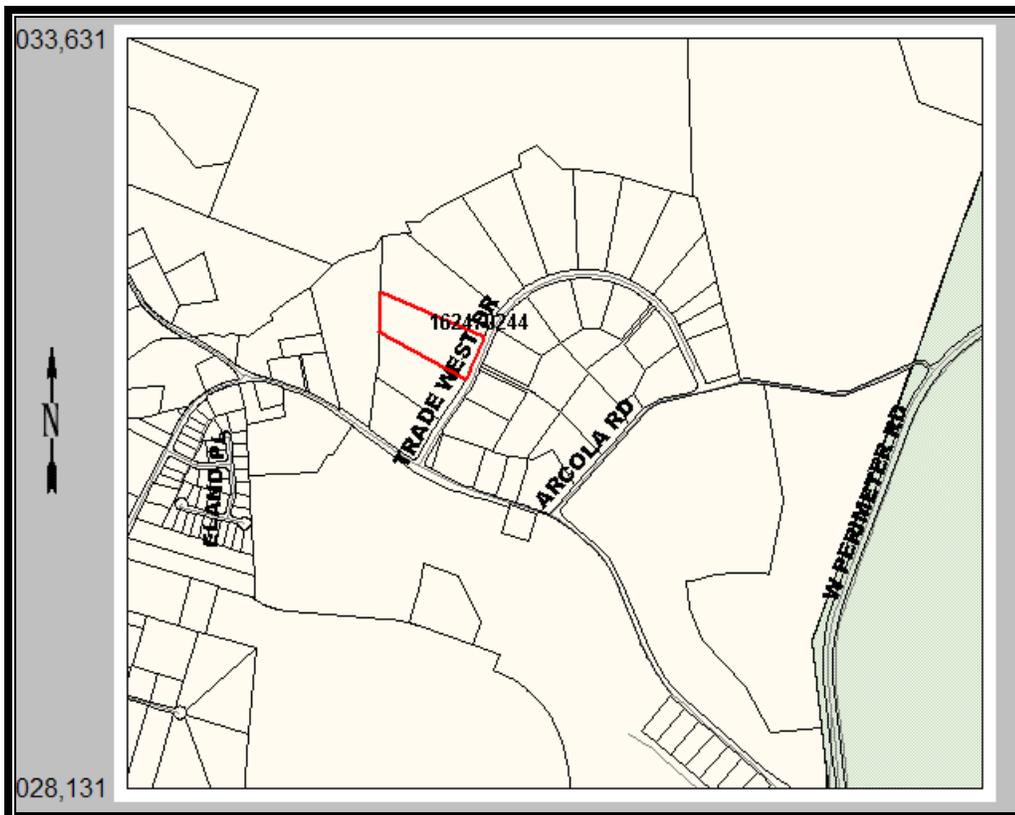


Figure 1B: Site Location Map



EXISTING AND PLANNED ROADWAY IMPROVEMENTS

Existing Roadway Conditions

Evergreen Mills Road (Route 621) is a two-lane, local access, undivided rural major collector road with right turn lanes at major intersections. The current posted speed limit is 35 mph.

Arcola Road (Route 842) is a two-lane, local access, undivided, unpaved road that runs east/west from Evergreen Mills Road to Loudoun County Parkway within the vicinity of the site. No posted speed limit sign is currently installed on this road.

Trade West Drive is a four-lane, undivided local access loop road connecting Evergreen Mills Road to Arcola Road. Currently, the access from Trade West Drive to Arcola Road is not open for traffic and is chained. No posted speed limit sign is currently installed on this road.

Planned Improvements

Based on Loudoun County’s recent Revised Countywide Transportation Plan Evergreen Mills Road (Route 621) is planned to be a four-lane undivided minor urban collector in the vicinity of the site with left and right turn lanes at major intersections.

No other roadway improvements are planned in the vicinity of the proposed site.

Existing Vehicles Per Day Projections from VDOT

Based on VDOT’s “Daily Traffic Volume Estimates” the Average Annual Daily Traffic Estimates for the surrounding roadways was found to be as follows:

Table 1: VDOT Historical Data

Roadway Segment	From	To	2005	2006	2007	2008	Comparison		
			AAADT	AAADT	AAADT	AAADT	2005-2008	2006-2008	2007-2008
Evergreen Mills Road	Old Ox Road	Arcola Road	11,000	11,000	12,000	11,000	0%	0%	-8%
Evergreen Mills Road	Arcola Road	Gum Spring Road	11,000	11,000	12,000	11,000	0%	0%	-8%
Arcola Road	Evergreen Mills Road	Old Ox Road	340	--	--	--	--	--	--

As shown in Table 1 above, no growth was observed on Evergreen Mills Road and on Arcola Road in the recent years.

HAZARDOUS LOCATION

No hazardous locations were found in the vicinity of the site.

EXISTING TRAFFIC VOLUMES

Existing Volumes

As requested by the OTS staff, the existing weekday peak hour turning movement traffic volumes information was extracted from the latest “Dulles Trade Center West Lot 6” TIA dated November 20, 2008 prepared by Gorove Slade Associates. The peak hour traffic counts were conducted on February 20, 2008 at the following intersections:

1. Evergreen Mills Road and Arcola Road; and
2. Evergreen Mills Road and Trade West Drive

Figure 2 on next page shows the latest existing turning movement counts along with the existing level of service for the two intersections listed above. The level of service information for these intersections was also extracted from the Dulles Trade Center West Lot 6 traffic study and is presented in Table 2 below:

Table 2: Existing (2008) Level of Service

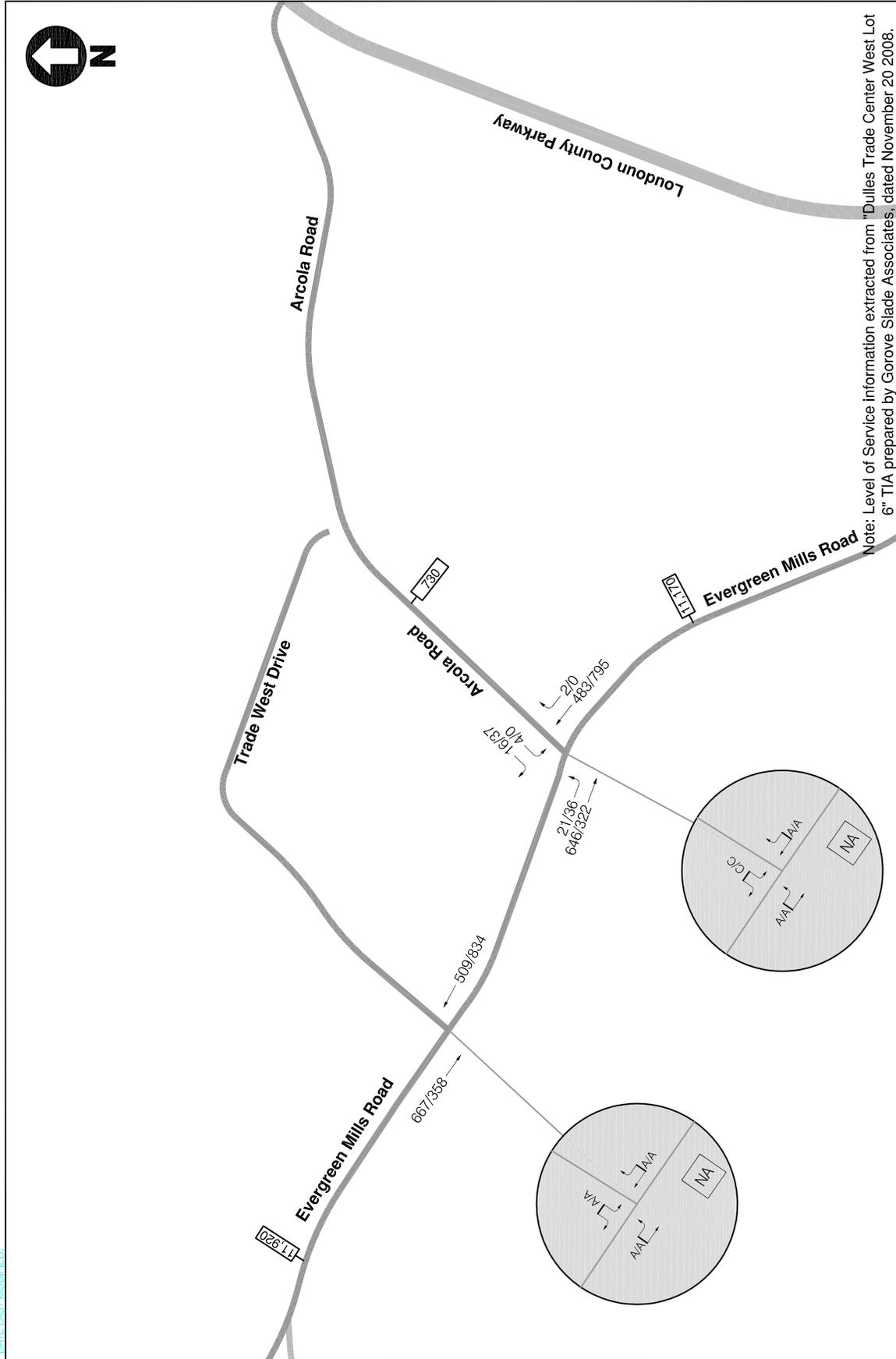
Intersection (Approach)	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
1. Evergreen Mills Road and Arcola Road				
Overall (Unsignalized)	N/A	N/A	N/A	N/A
Eastbound Left Turn Movement	A	0.8	A	4.1
Southbound Approach	C	21.8	C	16.7
2. Evergreen Mills Road and Trade West Drive				
Overall (Unsignalized)	N/A	N/A	N/A	N/A
Eastbound Left Turn Movement	A	0.0	A	0.0
Southbound Approach	A	0.0	A	0.0

FUTURE TRAFFIC VOLUME PROJECTIONS (2010)

As discussed in the scoping agreement, future traffic projections were also extracted from the above mentioned “Dulles Trade Center West Lot 6” TIA dated November 20, 2008 prepared by Gorove Slade Associates. The TIA included the following two approved developments and the proposed development as part of the future projections:

1. Arcola Center - The Shops
2. Dulles Landing
3. Dulles Trade Center West Lot 6 (Approved SPEX development)

In addition to the traffic generated by the two background developments, a 2% regional inherent growth per year over 2 years, for a total of a 4.04% growth of existing volumes, was applied on Evergreen Mills Road. Figure 3 on next page shows the future traffic projections and level of service for the intersections listed above.



Legend

- Existing Roadway Network
- Peak Hour Level of Service (Overall Intersection)
- Peak Hour Level of Service (By Intersection Approach)
- Peak Hour Traffic Volumes
- Peak Hour Level of Service (By Intersection Approach)

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Figure 2
Existing Traffic Volumes and Level of Service (2008)

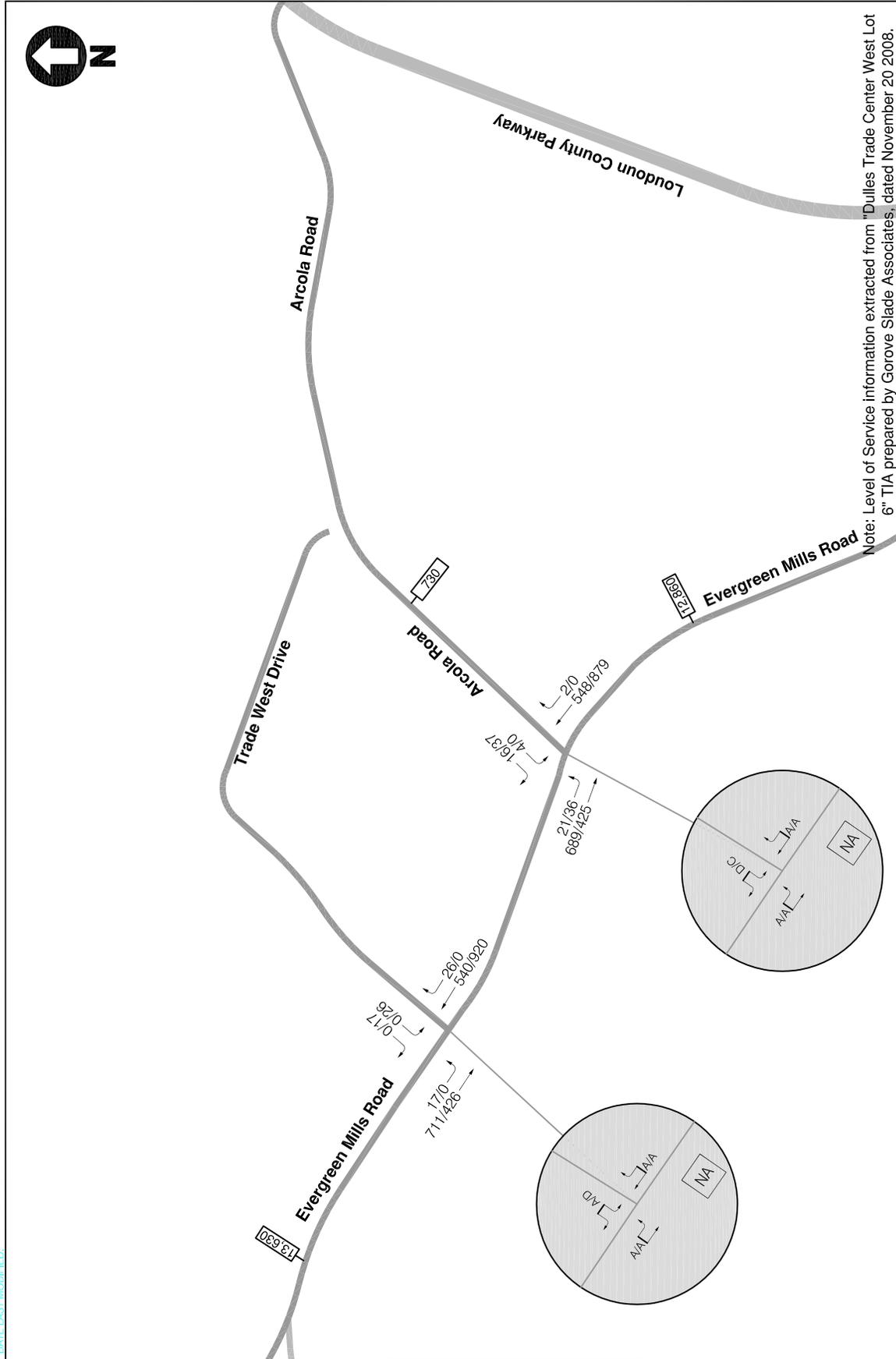


Figure 3
Future Traffic Volumes and Level of Service (2010)

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PROPOSED SPEX DEVELOPMENT:

Site Description and Site Access

The site is located along Trade West Drive to the west of Arcola Road in Loudoun County, Virginia. The subject property consists of approximately 4.14 acres. The site is currently zoned as PD-GI (Planned Development-General Industrial). Currently the site is approved for Flex-Industrial use with a 0.4 FAR. A special exception is being called for storage of empty solid waste vehicles and containers on the property. Access to the proposed development will be via one full movement driveway on Trade West Drive.

Trip Generation Comparison (Proposed SPEX Vs. Current Plan)

As mentioned earlier, a special exception is being called for storage of empty solid waste vehicles and containers on the property. Based on the information provided by the Applicant (Broad Run Contracting LLC), approximately 30 employees and 30 trucks will serve the proposed facility. The subject property consists of approximately 4.14 acres and is currently approved for Flex-Industrial use with a 0.4 FAR. A trip generation comparison between the approved and proposed use was conducted using ITE’s Trip Generation, 8th Edition and is shown in Table 3 below.

Table 3: Trip Generation Comparison between Approved and Proposed Plan

Land Use	ITE Code	Size	----- Week day -----							
			AM Peak Hour			PM Peak Hour			Daily Total	
			In	Out	Total	In	Out	Total		
APPROVED										
<i>Flex Industrial</i>										
Manufacturing	140	36.8 ksf	22	5	27	10	17	27	79	
Office	710	35.3 ksf	49	6	55	10	43	53	390	
Total		72.1 ksf	71	11	82	20	60	80	469	
PROPOSED- Storage of Empty Solid Waste Containers and Vehicles										
Office	710	30.0 Employees	14	1	15	3	11	14	100	
Truck Traffic*		30.0 Trucks	0	23	23	23	0	23	60	
Total			14	24	38	26	11	37	160	
Difference (Approved - Proposed)			-57	13	-45	6	-49	-44	-309	

*Approximately 30 trucks will serve the facility. To be conservative, it was assumed that 75% of the truck traffic will enter or leave the facility during the peak hour

As shown in Table 1 above, ITE does not provide trip rates for the storage facility described above. Hence, to be conservative, the ‘Office’ category was used to evaluate the trip generation for 30 employees anticipated to serve the proposed facility.

Table 1 shows that the proposed use will generate approximately 45 fewer AM peak hour, 44 fewer PM peak hour, and 309 fewer daily trips than the approved Flex-Industrial use for this property.

Trip Distribution

The inbound and outbound trips calculated for the morning and afternoon peak hours were routed in the roadway network based on the location of the proposed site and the existing traffic data. The assumptions are shown in Table 4.

Table 4: Direction of Approach Assumption

Approach	Direction of Approach
To and from west by Evergreen Mills Road	40%
To and from east by Evergreen Mills Road	60%
TOTAL	100%

This information was extracted from the previously cited “Dulles Trade Center West Lot 6” TIA dated November 20, 2008 prepared by Gorove Slade Associates. The site traffic assignment for the weekday morning and afternoon peak hours along with the distribution of site trips are illustrated in Figure 4.

Total Future Volumes with Proposed SPEX Development

The proposed site trips were added to the future projections (2010) volumes in order to establish the future with development traffic volumes as shown in Figure 5. Intersection capacity analyses were performed using *Synchro version 7.0* to determine the operational levels of service of the studied intersections for the future with development conditions. The results of the intersection analyses for the future conditions without development are summarized in Table 5. The detailed analyses worksheets are provided in the Technical Appendix.

Table 5: Total Future (2010) Level of Service

Intersection (Approach)	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	Level of Service	Delay (sec/veh)	Level of Service
1. Evergreen Mills Road and Arcola Road				
Overall (Unsignalized)	N/A	N/A	N/A	N/A
Eastbound Left Turn Movement	A	0.9	A	4.3
Southbound Approach	D	26.1	C	18.9
2. Evergreen Mills Road and Trade West Drive				
Overall (Unsignalized)	N/A	N/A	N/A	N/A
Eastbound Left Turn Movement	A	0.6	A	0.4
Southbound Approach	C	21.3	D	27.1

Table 5 shows the level of service results for the future conditions with development scenario. According to the Loudoun County guidelines, it is desirable to achieve a level of service (LOS) D or better per approach at each intersection. The results presented in Table 5 show that all intersections within the study

area will operate at acceptable levels of service. Therefore, no roadway improvement was considered as mitigation measures in the future with development conditions analysis. The results of the intersection capacity analyses are also shown in Figure 5.

CONCLUSIONS

This memorandum has presented the findings of a traffic impact analysis for a Special Exception application for the proposed Dulles Trade Center West Lot 12 development located in Loudoun County, Virginia. The site is located along Trade West Drive to the west of Arcola Road. The subject property consists of approximately 4.14 acres. The site is currently zoned as PD-GI (Planned Development-General Industrial). A special exception is being called for the construction of a storage facility for empty solid waste vehicles and containers on the property. Access to the proposed development will be via one full movement driveway on Trade West Drive.

The analysis presented in this report supports the following major conclusions:

Existing Conditions (2008)

Based on the latest traffic study data, all the study intersections operate under acceptable levels of service. Therefore, no roadway improvement was considered as mitigation measures in the existing conditions analysis.

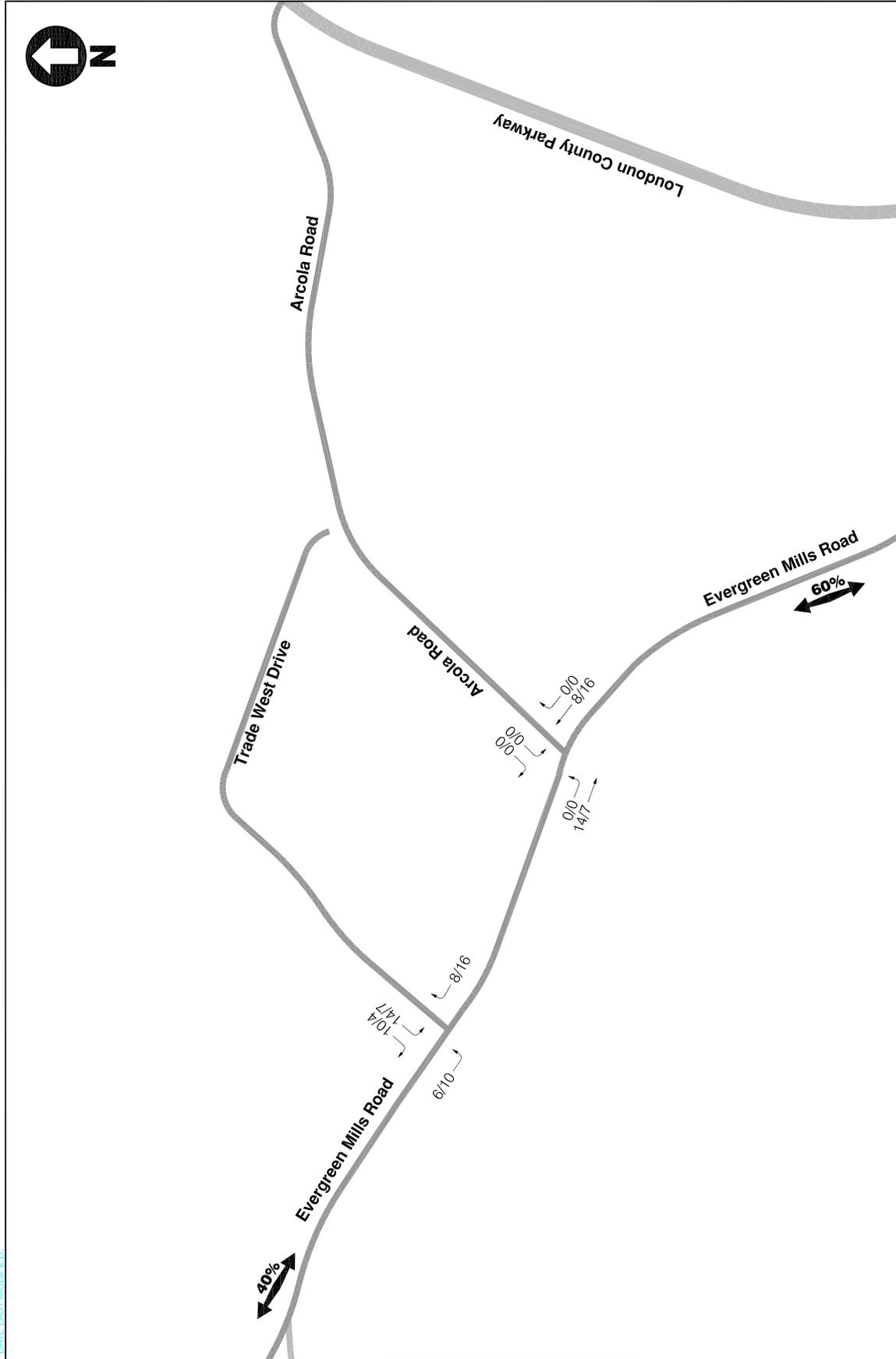
Future Conditions (2010)

Based on the latest traffic study data, all the study intersections operate under acceptable levels of service. Therefore, no roadway improvement was considered as mitigation measures in the future without development conditions analysis.

Future Conditions with proposed SPEX Development

The current zoning (PD-GI) for the site allows for approximately 72,000 square feet (0.4 FAR) of Flex-Industrial development which would generate approximately 82 trips in the morning peak hour and 80 trips in the evening peak hour. A special exception is being called for storage of empty solid waste vehicles and containers on the property. The proposed development will generate approximately 38 trips in the weekday morning peak hour and approximately 37 trips during weekday afternoon peak hour. The proposed SPEX development generates 45 less trips (54% reduction) in the morning peak hour and 44 less trips (54% reduction) in the afternoon peak hour than the trips generated under the current zoning.

All the study intersections operate under acceptable levels of service per the standard set forth under the Loudoun County Guidelines. Therefore, no roadway improvement was considered as mitigation measures in the future with development conditions analysis.



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Figure 4
Site Generated Traffic Volumes And Direction of Approach

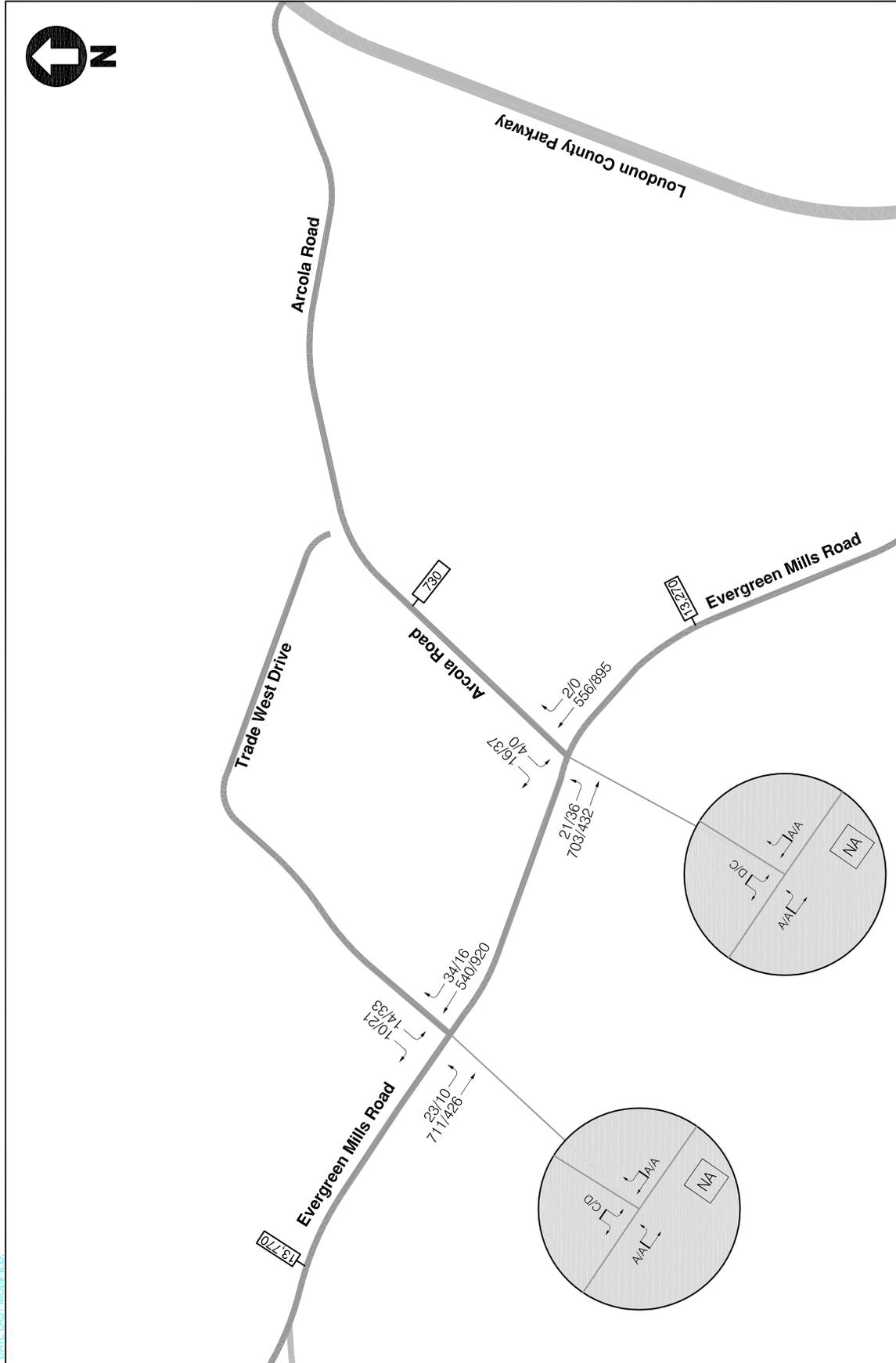


Figure 5
 Future with SPEX Development Traffic Volumes
 and Peak Hour Levels of Service

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APPENDIX



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APPENDIX A

SCOPING DOCUMENT

F.S.M. Traffic Study Guidelines (12/07)
Traffic Study Scoping Meeting Notes
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Loudoun County Virginia
Office of Transportation Services

Application Name: Dulles Trade Center West – Lot 12

Date: 03/08/2010

Application Type: Special Exception

Attendees: Via Email

- (1) **Study Area:** Roadways internal or adjacent to the development site shall be included in the traffic study. The study area should be defined at the scoping meeting and as a guideline should include other external roads to the extent that the project's generated traffic is anticipated to exceed 10 percent of the road's current/existing traffic volumes (at the time of application).

Comments: The property is currently located in Arcola, VA. The property is currently zoned as PD-GI and is located along Trade West Drive, west of Arcola Road and north of Evergreen Mills Road. Attached Figure on the last page shows the exact location of the subject property.

- (2) **Traffic Count Locations:** Traffic counts are required on the adjacent roads, the adjacent intersections beyond the project's frontage on adjacent roads in the study area. The AM/PM peak period traffic counts shall not be more than twelve (12) months old at the time of the application submission. Twenty-four (24) hour weekday traffic counts are also required for roadway segments.

Comments: Traffic projections for roadways surrounding the property from traffic studies conducted in the area will be reported. VDOT's traffic data will also be documented. Current traffic volumes and LOS at Evergreen Mills Road/Trade Drive West and Evergreen Mills Road/Loudoun County Parkway will be reported. The status of Trade Drive West/Arcola Road intersection will be reported with LOS info if it is a full access entrance.

- (3) **Trip Generation:** As a general guide to vehicle trip generation, the latest edition of the Institute of Transportation Engineer's (I.T.E.). Trip Generation Report shall be used. These rates may be supplemented by additional information provided by the County. If the applicant chooses to use different rates, they shall be documented and agreed to at the scoping meeting prior to their use in the traffic analyses. Primary trip reductions associated with passby trips and methodologies for trip reductions associated with passby trips shall be discussed and agreed upon at the scoping meeting.

Comments: The subject property is approx. 4.14 acres and is zoned PD-GI. The approved use for the property is Flex-Industrial with a 0.4 FAR. The proposed SPEX calls for 'Storage of Empty Solid Waste Vehicles and Containers'. Based on the information provided by the Applicant (Broad Run Contracting LLC), approximately 30 employees and 30 trucks will serve the proposed facility. A trip generation comparison between the approved and proposed use shows that the proposed use will generate less trips than the proposed use. The trip generation comparison table is attached at the back of this memorandum and will be documented with the traffic memo.

Of note, ITE does not provide trip rates for the storage facility described above. Hence, to be conservative, the 'Office' category was used to evaluate the trip generation for 30 employees anticipated to serve the proposed facility.

from recent studies
JAP

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- (4) **Traffic Volume Projections**: The traffic study shall include an agreed upon build out year and provide existing and projected traffic volumes, with and without the subject project, for Average Daily Traffic (ADT), as well as AM and PM peak hours. The peak hour of the project/individual land use(s) (as given in the ITE Trip Generation Report) should be added to the corresponding AM/PM existing peak hour of the adjacent roadway traffic volumes (to show the worst case scenario), if the peak hour of the project/individual land use(s) for the generator is greater than the peak hour of the adjacent roadway (per ITE Trip Generation Report). The existing peak hour of traffic on the roads adjacent to the subject project site shall be identified. These traffic volumes shall be provided at roadway intersections and commercial or private accessways/entrances.

Comments: Traffic projections for roadways surrounding the property from traffic studies conducted in the area will be reported.

- (5) **LOS Analysis**: Level of Service (LOS) calculations for existing and projected conditions, with and without the subject project, for highway segments, intersection legs, and entrances shall be provided. Calculations shall be in accordance with the Highway Capacity Manual (HCM) and/or the Highway Capacity Software (HCS), or as may be agreed at the scoping meeting. Traffic volumes and LOS information shall be provided for each phase of development, to include conditions at date of project completion. Projections shall also be made for date of completion plus ten (10) years or to an agreed upon forecast year.

Comments: Please see #(2).

- (6) **Minimum Roadway/Intersection LOS Standards**: Recommendations for phased improvements to the road network links in order to maintain an acceptable LOS (minimum LOS "D") shall be provided. For each phase up to and including buildout, a minimum approach and overall LOS "D" at intersections shall apply.

Comments: N/A.

F.S.M. Traffic Study Guidelines (12/07)
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- (7) **Background Traffic Assumptions**: Assumptions, which determine projected background traffic, including through traffic growth rate to be applied on roadway links, shall be confirmed at the scoping meeting. Specific other approved development names and respective development square footage or residential units in the study shall be provided.

Comments: Planned roadway improvements and developments will be documented in the traffic memorandum.

- (8) **Traffic/Trip Distribution**: Directional trip distribution information shall be provided for project entrances and collector and arterial intersections within the study area for the phases and categories (e.g., residential, office, retail, industrial and institutional) of development.

Comments: Will be provided.

- (9) **LOS Calculations Assumptions**: Traffic counts and LOS worksheets and projected traffic volume LOS analyses, using agreed upon analysis techniques, including existing AM/PM peak hour signal timing, shall be included as a part of the traffic study.

Comments: N/A.

- (10) **Mode Choice**: Modal split information shall be provided for the phases of the analysis, with sources of information identified (e.g., COG model).

Comments: N/A

F.S.M. Traffic Study Guidelines (12/07)
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- (11) **Safety Locations**: Road safety hazards, as identified by the ISTEA set-aside funding criteria and/or as identified by the County at the scoping meeting, within the study area shall be analyzed for all roadway links and intersections in the traffic study.

Comments: Will Provide.

- (12) **Traffic Mitigation Measures**: If trip reduction factors are used in the study, measures necessary to implement the reduction must be specified, with supporting documentation.

Comments: N/A .

- (13) **Bicycle & Pedestrian Accommodations**: When bicycle and pedestrian accommodations are used to reduce anticipated traffic volumes, a description of the physical and functional characteristics of the proposed bicycle and pedestrian accommodations shall be provided. If such separate bicycle accommodations (e.g., striped lanes or multi-purpose trails) are anticipated, they shall also be identified. A description of the functional characteristics shall be provided to identify the transportation options that these accommodations provide (e.g., pedestrian access to retail center, safe bicycle route to elementary school, inter-parcel connections to adjacent neighborhoods, access to W&OD trail, etc.)

Comments: N/A

Staff Signature: George R. P. [Signature] 3/10/10

Traffic Consultant Signature: Tushar Awar 03/03/2010

SITE LOCATION



TRIP GENERATION COMPARISON

Land Use	ITE Code	Size	AM Peak Hour			Weekday			Daily Total
			In	Out	Total	In	Out	Total	
APPROVED									
<i>Flex Industrial</i>									
Manufacturing	140	36.8 ksf	22	5	27	10	17	27	79
Office	710	35.3 ksf	49	6	55	10	43	53	390
Total		72.1 ksf	71	11	82	20	60	80	469
PROPOSED - Storage of Empty Solid Waste Containers and Vehicles									
Office	710	30.0 Employees	14	1	15	3	11	14	100
<i>Truck Traffic*</i>		30.0 Trucks	0	23	23	23	0	23	60
Total			14	24	38	26	11	37	160
Difference (Approved - Proposed)			-57	13	-45	6	-49	-44	309

*Approximately 30 trucks will serve the facility. To be conservative, it was assumed that 75% of the truck traffic will enter or leave the facility during the peak hour



APPENDIX B

LEVEL OF SERVICE DEFINITIONS



LEVEL OF SERVICE DEFINITIONS

All capacity analyses are based on the procedures specified by the Transportation Research Board, Special Report 209: *Highway Capacity Manual (HCM)*, 2000. Levels of service (LOS) range from A to F. A brief description of each level of service for signalized and unsignalized intersections is provided below.

Signalized Intersections: Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The levels of service for signalized intersections are defined below:

- Level of Service A describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.
 - Level of Service B describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
 - Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.
 - Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.
 - Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences. LOS E has been set as the limit of acceptable conditions.
 - Level of Service F describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-
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saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection. It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

Unsignalized Intersections: At an unsignalized intersection, the major street through traffic and right turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicates worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

- Level of Service A. Describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.
 - Level of Service B. Describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.
 - Level of Service C. Describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.
 - Level of Service D. Describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.
 - Level of Service E. Describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.
 - Level of Service F. Describes operations with average total delay of 50 seconds per vehicle. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal driver behavior.
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APPENDIX C

INTERSECTION CAPACITY ANALYSIS RESULTS – FUTURE CONDITIONS
WITH PROPOSED SPEX DEVELOPMENT

HCM Unsignalized Intersection Capacity Analysis
3: Evergreen Mills Rd. & Arcola Road

Dulles Trade Center West Lot 12
TF with SPEX Development



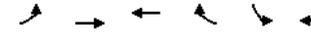
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Volume (veh/h)	21	703	556	2	4	16
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.71	0.82	0.83	0.35	0.31	0.92
Hourly flow rate (vph)	30	857	670	6	13	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	676			1589	673	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676			1589	673	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	97			89	96	
cM capacity (veh/h)	916			115	455	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	887	676	30
Volume Left	30	0	13
Volume Right	0	6	17
cSH	916	1700	201
Volume to Capacity	0.03	0.40	0.15
Queue Length 95th (ft)	3	0	13
Control Delay (s)	0.9	0.0	26.1
Lane LOS	A		D
Approach Delay (s)	0.9	0.0	26.1
Approach LOS			D

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization	63.9%		ICU Level of Service B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
140: Evergreen Mills Rd. & Trade West Drive

Dulles Trade Center West Lot 12
TF with SPEX Development



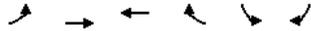
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Volume (veh/h)	23	711	540	34	14	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	23	711	540	34	14	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	574				1314	557
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	574				1314	557
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				92	98
cM capacity (veh/h)	999				170	530

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	734	574	14	10
Volume Left	23	0	14	0
Volume Right	0	34	0	10
cSH	999	1700	170	530
Volume to Capacity	0.02	0.34	0.08	0.02
Queue Length 95th (ft)	2	0	7	1
Control Delay (s)	0.6	0.0	28.0	11.9
Lane LOS	A		D	B
Approach Delay (s)	0.6	0.0	21.3	
Approach LOS			C	

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization	66.0%		ICU Level of Service C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Evergreen Mills Rd. & Arcola Road

Dulles Trade Center West Lot 12
TF with SPEX Development



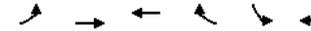
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Volume (veh/h)	36	432	895	0	0	37
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.29	0.82	0.94	1.00	1.00	0.66
Hourly flow rate (vph)	124	527	952	0	0	56
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	952				1727	952
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	952				1727	952
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	83				100	82
cM capacity (veh/h)	722				81	315

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	651	952	56
Volume Left	124	0	0
Volume Right	0	0	56
cSH	722	1700	315
Volume to Capacity	0.17	0.56	0.18
Queue Length 95th (ft)	15	0	16
Control Delay (s)	4.3	0.0	18.9
Lane LOS	A		C
Approach Delay (s)	4.3	0.0	18.9
Approach LOS			C

Intersection Summary			
Average Delay		2.3	
Intersection Capacity Utilization		62.5%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
140: Evergreen Mills Rd. & Trade West Drive

Dulles Trade Center West Lot 12
TF with SPEX Development



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Volume (veh/h)	10	426	920	16	33	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	426	920	16	33	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	936				1374	928
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	936				1374	928
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				79	94
cM capacity (veh/h)	732				158	325

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	436	936	33	21
Volume Left	10	0	33	0
Volume Right	0	16	0	21
cSH	732	1700	158	325
Volume to Capacity	0.01	0.55	0.21	0.06
Queue Length 95th (ft)	1	0	19	5
Control Delay (s)	0.4	0.0	33.6	16.8
Lane LOS	A		D	C
Approach Delay (s)	0.4	0.0	27.1	
Approach LOS			D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		59.4%	ICU Level of Service B
Analysis Period (min)		15	