



Area Plans Review
2008-2009 North County

A P P E N D I X :

Fairfax County Department of Transportation

&

Virginia Department of Transportation (VDOT)

Comments on

Chapter 527 Transportation Impact Analysis for

APR# 08-III-6DS



County of Fairfax, Virginia

MEMORANDUM

DATE: November 6, 2009

TO: Bernard Suchicital
Policy and Plan Development Branch, FCDPZ

FROM: Leonard Wolfenstein, Chief
Transportation Planning Section, TPD, FCDOT *L.W.*

SUBJECT: North County APR #08-III-6DS, Middleton Farms

The Fairfax County Department of Transportation (FCDOT) offers the following comments regarding the traffic impact study submitted per the Chapter 527 requirements regarding the proposed changes to the Comprehensive Plan indicated in the subject Area Plan Review (APR) nomination. VDOT has prepared comments, which have been acknowledged in this memo and are attached to the final staff report. FCDOT's comments are as follows:

Current Comprehensive Plan Guidelines and Background Information

- Many of the road improvements identified on the Fairfax County Transportation Plan Map have not been constructed in the immediate area the nominations. The only road that has been constructed to the level shown on the Map is northbound Sunrise Valley Drive to the future Route 28 Metrorail station. There are two interchange improvements shown on the Map. One is at Route 28 and McLearen Road and the other is located at Route 28 and Frying Pan Road. The interchange at Route 28 and McLearen has been constructed while the interchange at Route 28 and Frying Pan Road is currently under construction and should be completed by the end of 2009. Centreville Road is shown as a six lane improved road from Route 50 to the Town of Herndon but the only segment that has been improved to 6 lanes is the segment north of Frying Pan. Construction is currently on going to improve the road to four lanes from West Ox Road north to Frying Pan. Additionally, right-of-way is being preserved from West Ox to Frying Pan to build the road to the ultimate six lane section as shown on the Transportation Plan Map. Centreville Road is currently two or four lanes from West Ox south towards Route 50. McLearen Road is only 4 lanes and is shown to be improved to 6 lanes. Frying Pan is also shown to be improved to 6 lanes but it is only two or four lanes. The Plan also shows a new four lane collector road to be constructed on the nominator's site.
- Road improvements are not the only transportation improvements identified for the site and the area. Stream valley trails along Frying Pan Branch and Horse Pen Run are also identified. These are critical elements that should be constructed along with other improvements on the site. These trails provide for other means of access to and from the site from the surrounding residential neighborhoods, other nearby non-residential

development, and to the future Route 28 Metrorail station located approximately one mile from the site.

- Fairfax Connector bus Route 929 currently provides service to the southern portion of the site on Park Center Road with the ultimate destination being the Herndon-Monroe Park and Ride. The route runs every 30 minutes and only during the peak periods on weekdays. Fairfax Connector Route 927 runs north of the site but turns down Coppermine Road, which is a little over a quarter mile from the northern most point of the site. It also runs every 30 minutes to the Herndon-Monroe Park and Ride. The County has a Draft Transit Development Plan (TDP), which is a comprehensive 10-year plan for bus service (Fairfax Connector and Metrobus) throughout the entire County. The draft plan recommends increased service on Routes 927 and 929 from every 30 minutes to every 15 minutes during the peak period. As shown in the draft TDP, the 929 route will be modified to go down Route 28 with the ultimate destination being the future Route 28 Metrorail station. With the new collector constructed on the nominator's site, this will allow bus service to traverse through the site and provide a valuable and direct connection from this site to the Metrorail station. There is no planned modification to the 927 route but it will serve two Metrorail stations (Route 28 and Herndon-Monroe) in the future.
- To achieve the current maximum of 0.35 FAR in the Comprehensive Plan, the developer should provide a transit stop in addition to constructing the new four lane road. While at first envisioned to be a bus form of transit, the developer should not preclude other forms of transit from being utilized as the need may arise.

Traffic Impact Analysis Results from the 3DS Traffic Study (Includes FCDOT Comments)

- Trip reductions are assumed in the traffic impact analysis. The trip reductions are for retail pass-by, internal capture, and transit. They are as follows:
 - Transit – 5% (office and hotel)
 - Internal Capture – 10% (office and hotel)
 - Retail Pass-by – 25% (retail only)
- Tables 1-3 below outline intersection level of service, road segment congestion, and total trips for the proposed density. All 2030 values assume build-out of the Constrained Long Range Plan (CLRP) transportation network. The analysis also assumed additional transportation improvements associated with the 2030 background because of proffers from nearby developments. The trips from these developments were also included into the 2030 background traffic. The proffers were not attached to the traffic impact analysis; therefore, they have not been verified for accuracy by FCDOT.

Table 1
Intersection Level of Service (LOS) – With the Proposed Density of 0.40 FAR

#	Intersection	2008 Existing	2030 Comp Plan	2030 with APR 6DS	2030 with 6DS & improvements **
(1)	Sunrise Valley Drive/ Frying Pan Road *	AM - C/F PM - C/F	AM - D PM - C	AM - D PM - C	AM - D PM - C
(2)	Centreville Road/ Frying Pan Road (1)	AM - D PM - E	AM - F PM - E	AM - F PM - E	AM - F PM - E
(3)	Towerview Road/ McLearen Road (1)	AM - A PM - A	AM - C PM - C	AM - C PM - C	AM - C PM - C
(4)	Centreville Road/ McLearen Road	AM - D PM - D	AM - F PM - F	AM - F PM - F	AM - F PM - F

* Non-signalized only for existing conditions

** Improvements are only intersection improvements

(1) Signal timing adjustments

- As shown in Table 1 two of the intersections (Centreville Road/Frying Pan Road and Centreville Road/McLearen Road) fail during both the morning and afternoon peak hour. The overall level of service at Centreville Road/Frying Pan Road during the AM peak hour is equivalent to about three minutes of delay and about one minute of delay during the afternoon PM peak hour. The nomination would increase the delay at Centreville Road/Frying Pan Road by 10 seconds in the AM hour (5% increase) and 2.5 seconds in the PM peak hour (4% increase). There are several approaches that fail but the major one is the AM left turn from eastbound Frying Pan to northbound Centreville Road. This could be due to vehicles accessing non-residential development, such as offices, south of the Dulles Toll Road or vehicles heading towards the Route 28 Metrorail station park and ride garage.
- According to the traffic study, the studied intersection with the worst delay is Centreville Road/McLearen Road. The overall delay is equivalent to six minutes in the AM peak hour and more than four minutes in the PM peak hour. The nomination increases the delay by approximately a half second in the AM peak hour and one second in the PM peak hour. This road has several approaches that are failing considerably. While the study shows that this increase in density would add a very minimal amount of traffic to this intersection, any increase would only exacerbate the problem in 2030.
- Additionally, the analysis did not include the new road through the site as shown on the Transportation Plan Map and therefore potentially underestimates the trips heading south out of the site. The more detailed traffic analysis required at the time of rezoning should examine the effect of this new road on the Centreville Road/Frying Pan Road and Centreville Road/McLearen Road intersections.

- Signal timing is the only improvement suggested by the nominator. Signal timing and modifications was offered as a mitigation measure at select intersections within the study area. It should be noted that VDOT operates traffic signals in networks where signal cycles are determined to allow for network optimization (as opposed to a single intersection). The feasibility of signal modifications would need to be evaluated as part of a network and not a single intersection.

Table 3
2030 Link Analysis – With the Proposed Density of 0.40 FAR

Roadway	Section	AM/PM Peak Hour	Existing	2030 Comp Plan V/C Ratio	2030 APR 6DS V/C Ratio
NB Sully Road (28)	North of Frying Pan	AM	0.61	0.52	0.52
SB Sully Road (28)	North of Frying Pan	AM	1.34	1.13	1.14
NB Sully Road (28)	South of McLearen	AM	0.72	0.60	0.61
SB Sully Road (28)	South of McLearen	AM	0.69	0.58	0.58
EB Frying Pan Rd	East of Sunrise Valley	AM	0.81	2.07	2.08
WB Frying Pan Rd	East of Sunrise Valley	AM	0.99	1.85	1.94
NB Centreville Rd	North of Frying Pan	AM	0.59	1.10	1.11
SB Centreville Rd	North of Frying Pan	AM	0.40	0.41	0.42
NB Centreville Rd	South of McLearen	AM	0.94	2.40	2.41
SB Centreville Rd	South of McLearen	AM	0.39	0.77	0.77
EB McLearen Rd	East of Towerview	AM	0.61	0.90	0.90
WB McLearen Rd	East of Towerview	AM	0.59	0.95	0.95
NB Sully Road (28)	North of Frying Pan	PM	1.11	0.95	0.95
SB Sully Road (28)	North of Frying Pan	PM	1.28	1.08	1.08
NB Sully Road (28)	South of McLearen	PM	0.64	0.54	0.54
SB Sully Road (28)	South of McLearen	PM	0.82	0.69	0.69
EB Frying Pan Rd	East of Sunrise Valley	PM	0.83	2.08	2.17
WB Frying Pan Rd	East of Sunrise Valley	PM	1.72	1.92	1.94
NB Centreville Rd	North of Frying Pan	PM	0.37	0.55	0.57
SB Centreville Rd	North of Frying Pan	PM	0.97	0.98	0.99
NB Centreville Rd	South of McLearen	PM	0.57	1.31	1.32
SB Centreville Rd	South of McLearen	PM	0.87	1.61	1.61
EB McLearen Rd	East of Towerview	PM	0.74	1.07	1.08
WB McLearen Rd	East of Towerview	PM	0.55	0.65	0.65

- FCDOT requested that the nominator provide a link capacity analysis on Centreville Road and Sully Road north and south of the site. The segments on Centreville Road and Sully Road between Frying Pan Road and McLearen Road were not included because the traffic between Frying Pan and McLearen would not be destined to the site. A volume to capacity ratio above 1.0 means that the roads are saturated with vehicles. The link analysis shows that five of twelve links in the AM peak hour and six of twelve links in the PM peak hour all experience a v/c ratio above 1.0. The link capacity analysis looks at

all vehicle movement on a specific road and not just through traffic. In this instance, many of the links, such as Centreville Road south of McLearen Road and Frying Pan Road east of Sunrise Valley Drive fail because of vehicles turning left or right at the intersection. Therefore, many of the links experiencing high volume to capacity ratio could probably not be mitigated solely through road widenings but by improving the intersections.

- The traffic study suggested possible improvements to the road network that could be needed as a result of the current Comprehensive Plan. The Plan Amendment traffic increase is marginal compared to what is estimated in 2030. The study suggested possibly improving Frying Pan Road and McLearen Road to eight lanes and Centreville Road to ten lanes as part of the County's Transportation Plan Update. Both the study and VDOT comments regarding these improvements state that any potential widening beyond what is currently shown on the Transportation Plan Map should be evaluated only after Phase 2 of the Dulles Metro silver line extension to Loudoun County is operational. FCDOT concurs with VDOT that any road improvements beyond what is shown on the Map should only be examined after rail is operational.
- The new collector road through the site could also help alleviate additional vehicle traffic on Centreville Road north of Frying Pan Road associated with this development as well as other nearby developments. The new road would provide a parallel facility to Route 28 and Centreville Road that would connect to Sunrise Valley Drive linking directly to the future Route 28 Metrorail station.
- The traffic analysis submitted only looked at the 0.40 FAR option. The middle option was not included; therefore, all transportation recommendations are to amend the highest option in the Comprehensive Plan from a 0.35 FAR to a 0.40 FAR.
- Refer to VDOT's memorandum dated October 16, 2009 for additional technical information regarding the traffic impact analysis conducted for this APR nomination. All of the recommendations from VDOT have been evaluated and incorporated into this memo where appropriate.

Table 5
Trip Generation – Comprehensive Plan vs. Proposed Density Increase
(Includes Trip Reductions)

Nomination	AM Peak	PM Peak	Daily	Percent Inc. Daily Trips
Comp Plan	1,328	1,542	12,904	---
0.40 FAR	1,488	1,729	14,300	11%
Trip Increase	160	187	1,396	

- The table above shows trip generation estimates that could be generated from the density increase. It also shows the daily percentage increase above the highest option in the current Comprehensive Plan.

RECOMMENDATIONS

- The new four lane collector road should be constructed prior to any development beyond the current Comprehensive Plan base density of 0.15 FAR.
- This development can be accommodated from a transportation perspective as it will add a new link that provides a parallel facility to Route 28 and Centreville Road. This road can be a major benefit by providing a direct connection from the future Route 28 Metrorail station to McLearen Road for pedestrians, bicycles, vehicles, and buses.
- The traffic analysis assumed two turn right-turn lanes, a through-left lane, and a left turn lane exiting the site north to Frying Pan Road. The more detailed analysis at rezoning should evaluate two dedicated through lanes on this northbound approach as shown on the Transportation Plan Map. Additionally, two southbound lanes should also be included on this new road. Northbound Sunrise Valley Drive has the required number of lanes to receive traffic from the site; however, southbound Sunrise Valley Drive does not. When the new road is constructed, southbound Sunrise Valley Drive should be restriped and/or improved so that there are two through lanes in addition to the needed right and left turn lanes.
- Right-of-way should be dedicated on the north side of the property to widen eastbound Frying Pan Road from two lanes to three lanes. A right turn lane on eastbound Frying Pan Road into the site should also be included in the dedication.
- It is recommended that any development beyond the current the Comprehensive Plan base of 0.15 FAR be phased as transportation improvements are identified and constructed. This includes improvements to the roads and intersections on the road network surrounding the Middleton Farms site.
- Additionally, as development occurs a network of pedestrian and bicycles trails should be developed on site and integrated with the larger area.
- A TDM program must also be established and include FCDOT-approved TDM measures. Fairfax County's Draft Transit Development Plan (TDP) shows enhanced bus service adjacent to the site connecting directly to the Route 28 and Herndon-Monroe Metrorail stations. The Middleton Farms site should contribute to the increase headways on Fairfax Connector Routes 927 and 929.
- The Comprehensive Plan calls for a transit stop on this site. The type of stop should be determined upon a more detailed traffic analysis and in consultation with the Fairfax Connector and/or the Washington Metropolitan Area Transit Authority (WMATA).

Please contact Mike Garcia at Michael.Garcia3@fairfaxcounty.gov or 703-877-5673 should you need further information or clarification of these comments.

cc: Dan Rathbone, FCDOT

Bernard Suchicital
November 6, 2009
Page 7 of 7

Angela Rodeheaver, FCDOT
Dan Southworth, FCDOT
Mike Garcia, FCDOT

W:\mgarc8\North County APR 2008-09\VDOT\Middleton Farms (III-6DS)\08-III-6DS TTA Comments.doc

October 16, 2009

Ms. Regina Coyle
 Director of Zoning Evaluation
 Department of Planning and Zoning
 12055 Government Center Parkway, Suite 801
 Fairfax, Virginia 22035-5511

Re: Middleton Farms
 Evaluation Report of Traffic Impact Analysis
 APR 08-III-6DS

The subject property is located in western portion of Potomac Planning District of Fairfax County, Virginia. The site is approximately 74.3 acres in area. The details of land uses within the subject property under existing and proposed comprehensive plan along with the trips involved are presented in Table 1 below:

Table 1: APR Nomination – 08-III-DS – Middleton Farms – Land Use and Trip Summary				
Nomination (lot size)	Location of Development	Land Use Existing Comp. Plan (SF, # units, etc)	Land Use Proposed Comp. Plan By Applicant (SF, # units, etc)	Trips: AM / PM / ADT - Existing Comp. Plan (Proposed Comp. Plan) <i>Difference</i>
APR 08-III-6DS 74.3 Acres / (3,236,508 Sq. Ft)	East of Sully Road (Route 28), West of Frying Pan Branch Stream Valley Park, North of Land Unit D-2, and South of Frying Pan Road (Route 608) In Fairfax County, VA	917,550 SF of General Office Uses, 435-room Hotel, and 46,274 SF of Retail	1,050,463 SF of General Office Uses, 500-room Hotel, and 50,000 SF of Retail	1,328 / 1,542 / 12,904 (1,488 / 1,729/ 14,300) 160 / 187 / 1,396

In summary, the proposed property will generate a significant volume of traffic: 1,488 / 1,729 additional AM / PM weekday peak hour trips (total, both directions). These volumes are significant; approximately equivalent to the capacity* of up to 2 new lanes on a Major or Minor arterial. However, the majority of these trips (1,328 / 1,542) are already reflected in the existing comprehensive plan. The proposed changes to the comprehensive plan associated with this application would only generate approximately 160 /187 additional weekday AM / PM peak hour trips (total, both directions). Nonetheless, even with the roadway improvements identified in the Constrained Long Range Plan (CLRP), numerous roadway links and multiple intersections within the study area will fail (LOS F; v/c ratio > 1.0) in 2030 with the traffic generated by the Existing Comprehensive Plan. The proposed APR Nomination would add a relatively small volume of additional traffic to these failing roads and intersections. While additional capacity improvements are recommended in the study, none are proffered.

STUDY AREA:

The study intersections and roadway links analyzed in the study and approved by Fairfax County Department of Transportation (FCDOT) are presented below (*as shown in Page #13 in the TIA Report*). AM and PM peak periods were analyzed for this study.

Four (4) Study Intersections:

- Frying Pan Road / Sunrise Valley Road – Unsignalized

- Frying Pan Road / Centreville Road – Signalized
- McLearen Road /Towerview Road – Signalized
- Centreville Road /McLearen Road – Signalized

Six (6) Study Roadway Segments:

- Sully Road north of Frying Pan Road (6-lane divided highway)
- Sully Road south of McLearen Road (6-lane divided highway)
- Frying Pan Road east of Sunrise Valley Drive and west of Centreville Road (2-lane divided highway)
- Centreville Road north of Frying Pan Road (6-lane divided highway)
- McLearen Road east of Towerview Road and west of Centreville Road (4-lane divided highway)
- Centreville Road south of McLearen Road (4-lane divided highway)

STUDY DATA:

- Existing year of the analysis Year 2009 –Traffic Counts for AM and PM peak hours were performed by the Consultant.
- Traffic Signal Timings: VDOT signal timings were used for the analysis
- Roadway Segment Level of Service Volumes: FCDOT provided LOS - Volume boundary information. These are being reviewed separately by VDOT.
- Future year of analysis: Year 2030
- Future Year Traffic Volumes: FCDOT provided the 2030 travel demand forecasts which were based on MWCOG/TPB's 2030 Constrained Long Range Plan (CLRP). To those volumes, the applicant added traffic associated with the subject nomination, as well as one out-of-turn nomination (see below).
- Out-of-Turn-Nomination: The Rocks Property, E. Sunrise Valley Road, W. Centreville Road.
- Scenarios Analyzed:
 - 2009 Existing Conditions
 - 2030 Future Conditions (Existing Comprehensive Plan) with Out-of-Turn Nominations
 - 2030 Future Conditions with Out-of-Turn Nominations and Subject Nomination
 - 2030 Future Conditions with Out-of-Turn Nominations and Subject Nomination with Recommended Improvements. (Only for Intersection capacity analysis).
- Future Network - Proffered/planned Improvements: All applicable improvements listed in the CLRP and other proffered improvements by Arrowbrook, Dulles Station, Dulles Corner, Coppermine Crossing, and The Three Party Agreement developments were included in the analysis (Page #14 in the TIA Report).

ASSUMPTIONS OF THE STUDY (As APPROVED BY FCDOT, included in Pre-Scope of work Form–Appendix A):

- Internal Capture: 10% reduction for Hotel and Office land uses.
- Pass-by Trips: 25% reduction for Retail land use only.
- Transit Trips: 5% reduction for Office land use. Note: Chapter 527 guidelines call for VDOT's approval of any non-auto trip reductions; these in turn require

submission of backup-up information. The report refers to bus trips to the current Herndon/ Monroe Park & Ride station, which provides transfer to the West Falls Church Metro Station. These patterns will likely be revised when the Dulles Metrorail project is implemented. Sites in relative proximity to the future Dulles Metrorail Project should support and participate in bus/shuttle route implementation, intended to serve their occupants and reduce auto trips. In addition, as stated in the report (p. 41), comprehensive transportation demand management (TDM) programs should be planned and implemented for developments in the area.

- Heavy Vehicles Percentage: Based on VDOT traffic count data or existing year count data.
- Peak hour factors (PHF): Field measured PHF will be used when, $0.85 < PHF < 0.92$; If field measured $PHF < 0.85$, then 0.85 will be used; and, if field measured $PHF > 0.92$, then 0.92 will be used;

OVERVIEW OF KEY FINDINGS

1. Summary of Application

Table 2 presents the summary of the trips generated under the existing Comp plan and the proposed Comp plan. (Based on Tables 4-5 and 4-6 of the TIA Report.)

Table 2: APR Nomination – 08-III-DS – Middleton Farms – Trip Summary							
	Net New Trips						
	AM Peak Hour			PM Peak Hour			ADT
	IN	OUT	TOTAL	IN	OUT	TOTAL	TOTAL
Existing Comprehensive Plan							
Total External Site Trips	1,101	227	1,328	427	1,115	1,542	12,904
Proposed Comprehensive Plan							
Total External Site Trips	1,232	256	1,488	475	1,254	1,729	14,300
New External Site Trips	131	29	160	48	139	187	1,396

In total, the proposed comprehensive plan associated with this application would result in 1,488 / 1,729 additional AM / PM weekday peak hour trips (total, both directions). These volumes are significant; approximately equivalent to the capacity* of up to 2 new lanes on a Major or Minor arterial and up to 4 new lanes on a collector road.

The majority of these trips (1,328 / 1,542) are already reflected in the existing comprehensive plan, provided certain conditions are met. Therefore, compared to the Existing Comprehensive Plan, this application will generate approximately 160 / 187 additional weekday AM / PM peak hour trips (total, both directions). These volumes are relatively small; approximately equivalent to the capacity* of one third of a single lane on a collector road. These broad comparisons represent a planning level measure of the impact of the nomination to the surrounding local road network.

**Capacity is defined by Fairfax County DOT as vehicles per hour (vph) representing the following LOS D/E boundaries: 1,200 vph for a Major arterial, 750-900 vph for a Minor Arterial and 500 vph for a Collector Road. Although these broad capacity estimates may be somewhat high, this application adds a relatively small proportion of trips to the road network, compared with those in the current Comprehensive Plan and the conclusions about overall impact in this review are applicable.*

2. Assumed Transportation Network Improvements

The application identifies seven (7) roadway improvements that are listed in the Fairfax County Transportation Plan within the limits of the study area. However, the only improvements assumed complete and available for use by the public in 2030 were those contained within the Constrained Long Range Plan (CLRP), which included just three (3) roadway improvement projects.

- Widening of Sully Road to an 8-lane section south of the Dulles Toll Road
- Widening of McLearn Road to a 6-lane section between Sully and Centerville Roads
- Construction of a grade-separated interchange at the Sully Road/Frying Pan Road intersection (note: the planned improvement consists of construction of a trumpet-style interchange and a 2-lane bridge carrying Frying Pan Road over VA 28, currently scheduled for completion in Fall 2009).

3. Impact on Selected Elements of Transportation System

The trips generated by the Middleton Farms development (and one other out-of turn nomination; The Rocks Property) are noted to have significant impact in the year 2030 on several elements of the surrounding road system, even with the planned improvements listed in the CLRP. However, the impact due to the proposed Comprehensive Plan Amendment is quite small when compared to the Existing Comprehensive Plan.

- Intersections (Tables 4-1, 4-4, and 4-9, Results of Intersection Analysis in the TIA Report):
 - Frying Pan Road / Sunrise Valley Drive: This unsignalized intersection is currently operating at an unacceptable level of service. As part of the proffered improvements in the study area, a traffic signal is planned at this intersection (*as shown in Page #14 in the TIA Report*). Although the year of implementing the signal is not mentioned in the current TIA, this intersection was analyzed as a signalized intersection under all future scenarios. This assumption is reasonable; however it is noted that VDOT requires a signal warrant study before implementation of any new traffic signal. With signalization, this intersection is projected to operate acceptably (LOS D or better) with the Middletown Farms development traffic, as defined by the existing Comprehensive Plan. Likewise, with the additional traffic associated with the proposed Comprehensive Plan Amendment would also result in acceptable operations at this intersection.
 - Frying Pan Road / Centreville Road: This intersection currently operates at LOS D/E in the AM/PM peak hours. In 2030, with the Out-of-Turn Nomination and the Middletown Farms development, as defined by the existing Comprehensive Plan, the overall level of service of the intersection is projected to degrade to LOS F during the AM peak hour, primarily as a result of extensive delay (over 600 seconds per vehicle) for the eastbound left turn. However, the additional degradation of intersection operation as a result of the Proposed Nomination is minimal. Per 527 guidelines, since there is no deterioration in the intersection Level of Service with the addition of proposed nomination, the only improvement recommended in the application for this intersection is modification to the intersection's signal timings, while retaining the same cycle length. It should be noted that Table 5-1 actually shows the intersection operation degrading further,

from LOS F with 190 seconds of delay per vehicle with existing signal timings to LOS F with 199 seconds of delay per vehicle with the “improved” signal timings. Please note signal timing modification comment at the end of this section.

- McLearen Road / Towerview Road: This intersection is projected to operate acceptably under all scenarios. No improvements are necessary.
- Centreville Road / McLearen Road: This intersection currently operates at LOS D/D in the AM/PM peak hours. In 2030, with the Out-of-Turn Nomination and the Middletown Farms development, as defined by the existing Comprehensive Plan, the overall level of service of the intersection is projected to degrade to LOS F during both peak hours, with extensive delays of over 4 minutes of delay per vehicle. However, the additional degradation of intersection operation as a result of the Proposed Nomination is minimal. Per 527 guidelines, since there is no deterioration in the intersection Level of Service with the addition of proposed nomination, no intersection modifications are recommended in the study.

Signal Timing Modifications may be acceptable for short and medium term improvements on a case by case basis but are not by themselves an adequate or sufficient mitigation recommendation at the comprehensive plan stage. Comprehensive plans are based on predicted future (long term) requirements of the street network. Therefore, the long term improvements to the system should be based on capacity improvements and not shorter term improvements. VDOT generally operates signals within networks where cycle lengths and progressions are determined by optimizing the performance of the network (rather than of individual signals). Optimizing the signal timing of the whole network might yield better operations network-wide, particularly for vehicles on a major corridor, but potentially not as great as might be achieved at an individual intersection analyzed in isolation. The feasibility and performance of any proposed signal timing modification would need further evaluation as part of the overall network. Subsequent analysis performed in conjunction with more detailed rezoning analyses should recognize these network characteristics.

- Road Segments (Table 4-2: Summary of V/C Ratios in the TIA Report):

Six (6) roadway links were analyzed based on Fairfax County link capacity estimates. Currently, only two (2) of the six (6) roads operate acceptably (v/c ratios < 0.9) in both directions during both peak hours. The remaining four (4) either fail (v/c ratio >1.0) or are on the verge of failure (v/c ratio between 0.9 and 1.0) in at least one peak period. In 2030, even with the assumed roadway improvements, with just the Out-of-Turn Nomination and the Middletown Farms development, as defined by the existing Comprehensive Plan, the v/c ratios on four of the six links will deteriorate further, in some cases significantly. Combined, there would be 11 sections of failing roadway (v/c ratio > 1.0) in 2030 with the existing comprehensive plan land use compared to just 4 under existing conditions (Page 44 in the TIA Report).

	<u>Currently Failing</u>	<u>Failing in 2030 w/ Existing Comp Plan land use (CLRP network)</u>
<ul style="list-style-type: none"> ● Sully Road north of Frying Pan Road 	NB: PM SB: AM &	SB: AM & PM

	PM	
<ul style="list-style-type: none"> Frying Pan Road east of Sunrise Valley Drive and west of Centreville Rd 	WB: PM	EB: AM & PM WB: AM & PM
<ul style="list-style-type: none"> Centreville Road north of Frying Pan Road 	None	NB: AM
<ul style="list-style-type: none"> McLearen Road east of Towerview Road, west of Centreville Rd 	None	EB: PM
<ul style="list-style-type: none"> Centreville Road south of McLearen Road 	None	NB: AM & PM SB: PM

However, the additional degradation of these links as a result of the additional trips generated by the APR nomination is very small, with 11 sections of roadway continuing to fail in 2030.

4. Improvements / Recommendations

In addition to the proposed improvements in the current CLRP, the following roadway improvements are recommended in the application's report for consideration (but not proffered) to accommodate the 2030 future traffic. The study notes that these additional capacity improvements are not needed specifically as a result of the proposed nomination (which results in fewer than 200 additional peak hour trips), but to accommodate the projected traffic associated with the existing comprehensive plan land use (*Page 40 in the TIA Report*)

- Centreville Road north of Frying Pan Road: 8 lanes (instead of 6 lanes proposed in the
- McLearen Road between Towerview Road and Centerville Road: 8 lanes instead of 6 lanes
- Centreville Road South of McLearen Road: 10 lanes instead of 6 lanes

Following are additional comments and suggestions:

- Providing a 10-lane section of Centreville Road in the study area compared to the 6-lane section under the current comp plan is a drastic modification. However, the applicant's report indicates that, since rail implementation will likely cause traffic pattern revisions, proposed Plan language should include a provision for widening projects to be reevaluated after rail is operational.
- The study did not include an analysis of Centreville Road between Frying Pan Road and McLearen Road. This 2-lane section of road is projected to carry more than 1,900 vehicles per hour per direction in 2030, yet no improvements were recommended. Based on Fairfax County link capacity estimates, this section of road should be widened from 2 to 4 lanes.
- It is not specified how these changes would be incorporated at the two poorly operating intersections along Centreville Road (at Frying Pan Road and at McLearen Road). Both of those intersections have multiple movements expected to experience major delays in the future with or without the comp plan revision.
- The interchange under construction at Sully Road / Frying Pan Road would likely improve operations along Frying Pan Road and in conjunction with the significant amount of delay projected at the Frying Pan Road / Centreville Road intersection

- (notably the EB left turn) could result in a different distribution of traffic along Frying Pan Road than analyzed; more traffic from the development may gain access to/from the north by way of Sully Drive than Centerville Road.
- Similarly, the projected amount of peak hour delay at the McLearen Road/Centerville Road intersection may result in more development traffic from the APR nominated site gaining access to/from the south by way of Sully Drive as motorists attempt to find their route with the least delay.
 - Sites in relative proximity to the future Dulles Metrorail Project should support and participate in bus/shuttle route implementation, intended to serve their occupants and reduce auto trips. In addition, as stated in the report (p. 41), comprehensive transportation demand management (TDM) programs should be planned and implemented for developments in the area.

TIS TECHNICAL REVIEW ELEMENTS

The level of detail of proposed recommendations is adequate for the APR Nomination application. However, further explanation, revision, or greater analysis during subsequent stages of the Chapter 527 process is anticipated should the proposed nomination be approved and the application proceed to the Rezoning Traffic Impact Analysis phase. VDOT reserves the right to recommend modifications to assumptions used in these analyses.

- Study Area Definition: The study boundaries considered for this study are Frying Pan Road (on the North), McLearnen Road (on the South), Centerville Road (on the East), and (Sully Road on the West). The intersection of Centerville Road / Ox Road would have been a good addition to the study intersections, since it is within the study boundaries. Similarly, given the proximity to the subject site, it would be informative to analyze the operation of the interchange ramp junctions along Sully Rd (Route 28) at the existing McLearen Road interchange and the proposed Frying Pan Road interchange. It would also have been helpful to include a link analysis of Centerville Road between Frying Pan Road and McLearen Road. This 2-lane section of road is projected to carry more than 1,900 vehicles per hour per direction in 2030, yet it was not analyzed.
- Peak Hour Factors (PHF): Field measured peak hour factors for each approach were used in the analysis. However, when the field measured PHF values were less than 0.85, then 0.85 was assumed. Similarly when PHF values were greater than 0.92, then 0.92 was assumed. All calculations were checked and no errors were found. All assumptions were consistent with the approved assumptions by FCDOT and appear reasonable.
- Trip Distribution and Trip Assignment: The trip distribution for the net new trips associated with the Comp Plan revision was “based on the existing travel patterns to minimize commutes, as approved by FCDOT”. The distributed trips were spot-checked and appeared reasonable. However, as noted previously, the study assumed a large portion of traffic would arrive and depart to/from the north and east through the intersection of Frying Pan Road and Centerville Road, and a smaller volume of traffic to/from the south through the Centerville Road/McLearen Road intersection. These two intersections are projected to fail in 2030 with lengthy average delays of over 3 minutes per vehicle. Without significant capacity improvements at these intersections,

it is possible that motorists would seek routes with less congestion, potentially increasing the volume of traffic on Sully Road (Route 28).

- Planned improvements: The planned improvements assumed for the study are consistent with the Fairfax County Transportation Plan and the Constrained Long Range Plan. The lane configurations were checked in the figures against the text in the report and were found consistent. However, the dates of the planned/ proffered improvements were not listed in the report and could not be verified.
- Existing Conditions analysis:
 - The existing Synchro files were checked against the VDOT Signal timing information sheets provided in Appendix F. No errors were found in the input values except for the intersection of McLearen Road at Tower View Drive during PM peak, the cycle length of 111.5 sec was used instead of 150sec. However, the intersection would operate at acceptable levels of service as reported even with 150 sec cycle length.
 - Existing volumes and lane configuration used for Synchro analysis were also checked against the count information in Appendix E and existing lane configuration (Figure 4-1) and no errors were found.
 - Two intersections (out of 4 intersections analyzed) are failing under existing PM peak conditions: Frying Pan Road/Sunrise Valley Drive ; Centerville Road/Frying Pan Road.
 - The roadway links that are failing under existing conditions are:
 - Sully Road – north of Frying Pan Road (NB) is failing under AM peak condition
 - Sully Road – north of Frying Pan Road (both NB and SB) is failing under PM peak
 - Frying Pan Road – East of Sunrise Valley Drive and West of Centerville Road.
- Future Background and Total Traffic Volumes:
 - The 2030 traffic volumes used in the study were provided by Fairfax County and were based on MWCOG/TPB's 2030 CLRP improvements. To those forecasts, the applicant indicated that they added the site generated trips for the entire subject property (see page 21, section 4.4.1). However, the trip distribution and turn-by-turn volumes associated with this step were not provided in the study. A comparison of the volumes in Figure 4-3 (existing traffic) and Figure 4-5 (2030 Traffic with Existing Comp Plan Land Use) appear to indicate that the total volume entering and leaving the site in the peak hours is less than the projected site trips (Table 4-6). For example, in the PM peak, the Figures show 1,005 vehicles leaving the site (assuming no other growth on Towerview Road). However, Table 4-6 shows 1,115 vehicles departing the site. As a result, the capacity analyses provided in the study may not reflect the full impact of the Middleton Farms development, either as currently shown in the Comprehensive Plan, or with the proposed comp plan modification.
 - A single Out-of-Turn Nomination (background condition) was identified in the study: a modification to the approved development of the Rocks Property, north of the Middleton Farms property. Table 4-3 in the study summarizes the trip generation associated with the property (*it should be noted that the last line in the*

table contains incorrect information; it appears to be copied from Table 4-5 erroneously, however, the information used in the analysis is consistent with the data shown in Appendix J). Similar to the previous comment, it appears that the volumes assumed in the study are less than shown in the trip generation table (Table 4-3) for this site. For example, in the PM peak hour, Table 4-3 shows 464 vehicles entering the site. However, Figure 4-7 only shows 199 vehicles entering the site via Sunrise Valley Drive – the only apparent access to the site. As a result, the capacity analyses provided in the study may not reflect the full impact of the Middleton Farms development, either as currently shown in the Comprehensive Plan, or with the proposed comp plan modification.

- The issues noted above notwithstanding, the background future volumes used for Synchro were checked against the traffic volumes in Figure 4-7 of the TIA report, and no problems were identified.
- The annual growth rate of the roadway links were calculated comparing the existing and background roadway link volumes from the forecasting model volumes provided by FCDOT under both AM and PM peak periods. The AM and PM growth rates of each roadway link were found to be relatively consistent (within 0.5% per year) except for the following links; WB Frying Pan Road, NB Centreville Road, and WB McLearen Road, where there is a difference of more than 1.5% per year between the AM and PM peak hours. The annual growth rates calculated in each scenario are summarized in Table 4 below.

Road Section		2009	Back ground 2030	Annual Growth Rate (%)	Future Build 2030	Annual Growth Rate (%)	2009	Back ground 2030	Annual Growth Rate (%)	Future 2030	Annual Growth Rate (%)
		AM									
Sully Rd N. of Frying Pan Rd	NB	3503	3948	0.6	3961	0.6	6347	7207	0.6	7248	0.6
	SB	7631	8602	0.6	8644	0.6	7283	8173	0.6	8192	0.6
Sully Rd S. of Frying Pan Rd	NB	4081	4596	0.6	4613	0.6	3672	4114	0.5	4119	0.5
	SB	3961	4429	0.5	4431	0.5	4661	5226	0.5	5245	0.6
Frying Pan Rd	EB	611	1550	4.5	1561	4.6	623	1558	4.5	1628	4.7
	WB	746	1390	3.0	1453	3.2	1289	1436	0.5	1457	0.6
Centreville Rd N. Frying Pan Rd	NB	1601	2979	3.0	2987	3.0	1003	1477	1.9	1526	2.0
	SB	1081	1097	0.1	1141	0.3	2617	2653	0.1	2668	0.1
McLearen Rd	EB	1104	2428	3.8	2430	3.8	1338	2897	3.7	2908	3.8
	WB	1066	2555	4.3	2565	4.3	996	1759	2.7	1762	2.8
Centreville Rd S. of McLearen Rd	NB	1698	4325	4.6	4335	4.6	1034	2364	4.0	2367	4.0
	SB	701	1386	3.3	1388	3.3	1570	2894	3.0	2905	3.0

- Analysis of future background with and without site. Table 4 shows the degradation in the levels of service of all the study intersections for all analysis scenarios. From

the results, there is no degradation in level of service of the overall intersection as a result of the Comp Plan Amendment.

Description of LOS and Delay	2009 Existing		2030 Exist. Comp Plan + Out of Turn Nomination		2030 Prop. Comp Plan		2030 Prop. Comp Plan with Imp	
	AM	PM	AM	PM	AM	PM	AM	PM
Frying Pan Road /Sunrise	F*	F*	D	C	D	C	D	C
Frying Pan Road / Centreville	D	E	F	E	F	E	F	E
McLearen Road /Towerview	A	C	C	C	C	C	C	C
Centreville Road /McLearen	D	D	F	F	F	F	F	F

*- Unsignalized intersection, LOS shown is for the worst approach.

- **Capacity:** As shown in Tables 5 and 6, there is little additional degradation in operation (LOS) as a result of the proposed comprehensive plan modification. Numerous intersection approaches and roadway links will already be operating under failing conditions within the study area:
 - Two of the four study intersections are projected to operate quite poorly (average delay of 3 to 6 minutes per vehicle) with or without the proposed modification
 - Of the six links analyzed, five would fail (v/c ratio > 1.0) in 2030 in at least one direction in either the AM or PM peak hour. This would occur with or without the proposed comp plan modification.
 - As noted on the previous page, as a result of potential issues identified with the future background volume projection methodology, it is possible that the future operation of all four (4) study intersections, and the six (6) roadway links summarized in the previous bullets may not reflect the full build out of the nomination site, or the out-of-turn nomination (The Rocks) to the north.

SUMMARY OF SELECTED RESULTS

Intersection Capacity Analysis: Four key intersections were analyzed to determine capacity under four scenarios. Table 5 presents the summary of the results based on the LOS information. Based on the results, there are no significant additional delay problems due to the proposed Comp Plan Amendment. However, the difference between the existing and future conditions is significant, with many individual lane groups experiencing major delays by 2030, with or without the proposed Comp Plan Amendment.

Description of LOS and Delay	2009 Existing		2030 Exist. Comp Plan + Out of Turn Nomination		2030 Prop. Comp Plan		2030 Prop. Comp Plan with Imp	
	AM	PM	AM	PM	AM	PM	AM	PM
No. of Intersections at LOS "A" –	3	2	2	2	2	2	2	2
No. of Intersections at LOS "E"	0	1	0	1	0	1	0	1
No. of Intersections at LOS "F"	1*	1*	2	1	2	1	2	1
Number of Lane Groups with major Control Delays (i.e. Delay > 180sec)	0	1	7	5	7	5	7	5

Roadway Link Analysis: Six roadway segments were analyzed to determine capacity under three scenarios. Table 6 presents the summary of the results based on the V/C ratios. Based on the results, there are no significant additional capacity problems due to the proposed Comp Plan amendment. However, the difference between the existing and future conditions is significant, with several more roadway links operating beyond capacity with or without the proposed Comp Plan amendment.

Description	2009 Existing		2030 Exist. Comp Plan		2030 Prop. Comp Plan	
	AM	PM	AM	PM	AM	PM
No. of Links at v/C ratio ≤ 0.9	9	8	6	4	6	4
No. of Links at v/C ratio < 0.9 and ≤ 1.0	2	1	1	2	1	2
No. of Links at v/C ratio > 1.0	1	3	5	6	5	6

The list of the failing roadway links are summarized below for each of the three scenarios:

	<u>Currently Failing</u>	<u>Failing in 2030 w/ Existing Comp Plan</u>	<u>Failing in 2030 w/ Proposed Comp Plan</u>
• Sully Road north of Frying Pan Road	NB: PM SB: AM & PM	SB: AM & PM	← Same
• Frying Pan Road east of Sunrise Valley Drive and west of Centerville Rd	WB: PM	EB: AM & PM WB: AM & PM	
• Centerville Road north of Frying Pan Road	None	NB: AM	
• McLearen Road east of Towerview Road and west of Centerville Rd	None	EB: PM	
• Centerville Road south of McLearen Road	None	NB: AM & PM SB: PM	

If you have any questions, please call me at (703) 383-2059.

Sincerely,

Peter K. Gerner, P.E.
Transportation Engineer

cc: Angela Rodeheaver
Michael Garcia