

APPENDIX:

Fairfax County Department of Transportation

&

Virginia Department of Transportation (VDOT)

Comments on

Chapter 527 Transportation Impact Analysis for

BRAC APR 08-IV-9S as part of the Davison Airfield Cluster



County of Fairfax, Virginia

MEMORANDUM

DATE: May 11, 2009

TO: Lindsay Mason
Policy and Plan Development Branch, DPZ

FROM: Nick Perfili
Transportation Planning Section, TPD, DOT

SUBJECT: BRAC APR #08-IV-2LP and 9S, Davison Airfield Cluster

The Department of Transportation offers the following comments regarding the proposed changes to the Comprehensive Plan indicated in the subject Area Plan Review (APR) nominations:

- Primary consolidated site access points should be to and from Telegraph Road. Internal collector roads should distribute trips within the subject sites. FCDOT does not recommend allowing 9S “main entry” access to and from Cinder Bed Road due to roadway geometric and storage capacity limits on the Backlick Road stub (which connects Cinder Bed Road to VA-7100) and the one-lane Newington Road railroad underpass east of Loisdale Road. FCDOT is concerned about further congestion and service degradation at the Newington Rd/I-95/VA-7100 interchange intersection.
- The 2LP nomination contains language noting the developer will offer a shuttle between the subject site, the Lorton Virginia Railway Express (VRE) station, and Fort Belvoir; and possibly the Fort Belvoir Environmental Proving Grounds (EPG) location. Should this nomination be approved, the plan should contain language requiring such shuttle service to manage transportation demand to and from the location. In addition, FCDOT recommends shuttle service be provided to and from the proposed DeWitt hospital and US Army Museum sites at Fort Belvoir and to the Franconia-Springfield Metro station. The nominator notes the proposed hotel could accommodate visitors to the Army Museum – shuttle service to the Franconia-Springfield Metro station would allow for a connection to the Metro system to and from the Army museum and other visitor attractions hotel guests could visit.
- Tables below outline existing and future intersection level of service for intersections near the Davison Airfield Cluster and trip generation estimates. All 2030 intersection values assume build-out of the CLRP transportation network.

INTERSECTION LEVEL OF SERVICE

Intersection	2008 Existing	2030 Comp. Plan	2030 2LP Nomntn	2030 Cluster Cmltv
RICHMOND HWY/ LORTON RD	AM - B PM - B	AM - F PM - D	AM - F PM - D	AM - F PM - E
RICHMOND HWY/ LORTON RD (1)			AM - E PM - D	AM - F PM - E
RICHMOND HWY/ POHICK RD	AM - C PM - B	AM - E PM - C	AM - F PM - D	AM - F PM - E
RICHMOND HWY/ TELEGRAPH RD	AM - D PM - E	AM - F PM - F	AM - F PM - F	AM - F PM - F
TELEGRAPH RD/ VA-7100 SB	AM - C PM - C	AM - C PM - F	AM - C PM - F	AM - F PM - F
TELEGRAPH RD/ VA-7100 SB (2)			AM - C PM - C	AM - C PM - D
TELEGRAPH RD/ VA-7100 NB	AM - B PM - C	AM - B PM - E	AM - B PM - F	AM - B PM - F
TELEGRAPH RD/ VA-7100 NB (3)			AM - B PM - E	AM - B PM - F

- (1) With AM and PM signal office and timing modification; PM cycle modification
- (2) Addition of a dual right turn lane on SB VA-7100 and PM signal timing adjustments
- (3) With PM signal timing adjustment

TRIP GENERATION – 2LP AND 9S NOMINATIONS (EST. NET NEW TRIPS)

NOMINATION	AM PEAK	PM PEAK	DAILY	NET NEW DAILY TRIPS
08-IV-2LP	1,359	1,469	12,992	75 PCT
08-IV-9S	600	650	4,450	25 PCT
TOTAL TRIPS	1,959	2,119	17,442	

- 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.
- Long term improvements to the transportation system should be based on capacity and operations improvements as opposed to short term improvements.
- The Comprehensive Plan shows a future grade-separated interchange at the intersection of Telegraph Road and Richmond Highway and improvements to Old Colchester Road south/southwest of Richmond Highway. 2030 level of service at the Richmond Hwy/Telegraph Rd intersection is projected to be LOS F in both the AM and PM peak, affirming the need for the interchange at this location.
- Intersection LOS worsens at Richmond Hwy/Lorton Rd and Richmond Hwy/Pohick Rd when the 2LP nomination traffic is added, to LOS F from LOS B and C, respectively, in

the AM peak. Further intersection congestion is assumed when both 2LP and 9S traffic is traveling within the intersections. Grade-separated interchanges are not shown on the Transportation Plan at the Richmond Hwy intersections with Lorton and Pohick roads.

- Existing intersection cross-sections along Richmond Hwy (to demonstrate the existing relatively wide width of these intersections):
 - Richmond Hwy/Telegraph Rd: 9 lanes wide (Richmond Hwy); 8 lanes wide (Telegraph Rd)
 - Richmond Hwy/Pohick Rd: 9 lanes wide (Richmond Hwy); 5 lanes wide (Pohick Rd)
 - Richmond Hwy/Lorton Rd: 7 lanes wide (Richmond Hwy); 6 lanes wide (Lorton Rd)
- Intersection LOS worsens at Telegraph Road and the NB and SB VA-7100 ramps. Service degrades from existing LOS C to LOS E (with improvements) and LOS F, with the 2LP nomination and cluster nominations, respectively. The Telegraph Road bridge over VA-7100 is six lanes wide; all lanes are used (two through and two dedicated left turn (four total) for NB traffic; two through for SB traffic).
- Additional development above existing conditions will further deteriorate the operation of the I-95 northbound to VA-7100 ramp intersection with Newington Road. Trip distribution from both the 2LP and 9S sites indicates traffic will pass through this location. With existing conditions, this intersection operates at level of service D in the AM peak and at level of service E in the PM peak. Even in 2030 with existing Comp. Plan land use and CLRP transportation improvements assumed, the intersection operates at LOS F in the AM and PM peak periods. The congested operation of this intersection limits flow along all segments.
- Transportation concerns related to 9S are more focused on roadway geometrics such as access limitations to Cinder Bed Road from Newington Road and VA-7100, and lack of additional intersection capacity at the Newington Rd/I-95/VA-7100 interchange intersection, especially during peak travel periods as opposed to trip generation. (This comment applies only if the 9S site contains a large parcel shipping distribution center (UPS or Federal Express, or similar) which would generate less peak traffic than an office building. It was indicated during a meeting with a representative of the nominator that a large parcel shipping distribution center was to be constructed.)

RECOMMENDATIONS

Future improvements would need to be added to the Comp. Plan Transportation Map to support further development in the vicinity of the Davison Airfield cluster at the intersections and along the roadway segments noted above.

- For both nominations, Telegraph Road would need, at a minimum, an additional travel lane in each direction between Richmond Hwy and VA-7100 as the existing facility would operate beyond capacity. Two lanes would be needed to accommodate peak period traffic volumes. The volume/capacity ratio for Telegraph Road south of the Fairfax County Parkway exceeds 1.7 with the existing facility, affirming the need for expansion. Land fronting Telegraph Road at both 2LP and 9S should be preserved for future Telegraph Road right-of-way.
- For both nominations, intersection improvements, from signal timing and modification to additional turn lanes, would need further study at rezoning at the following locations:
 - Richmond Hwy/Lorton Rd
 - Richmond Hwy/Pohick Rd
 - Richmond Hwy/Telegraph Rd
 - Telegraph Rd/VA-7100 ramps
 - VA-7100/Terminal Rd and Backlick Rd (service drive access point)
 - Newington Rd/I-95 off ramp/VA-7100 intersection
 - Signal modification recommendations should be reviewed from a network optimization perspective as opposed to a single intersection perspective
- Site development on the 9S parcels should have the prominent or “main entrance” access point to and from Telegraph Road. Prominent or “main entrance” access should not be allowed via Cinder Bed Road due to roadway and geometric constraints at VA-7100 and the one-lane Newington Rd railroad bridge underpass.
- Information contained within the Davison Airfield Cluster Chapter 527 report affirms the need for construction of an interchange at the Richmond Hwy/Telegraph Rd intersection to handle future traffic volumes. The findings in the Davison Airfield Cluster report are consistent with recommendations noted on the County Transportation Plan.

Should the nominations be approved, it is recommended that future development at 2LP and 9S be phased as transportation improvements are identified and constructed (or operated for transit).

Please contact Nick Perfili, Transportation Planner, at nicholas.perfili@fairfaxcounty.gov or 703-877-5685 should you need further information or clarification of these comments.

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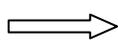
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Leonard Wolfenstein, Transportation
Dan Rathbone, Transportation
Angela Rodeheaver, Transportation

Review of APR Nomination BRAC #08-IV-2LP - Northern Virginia Industrial Park (part of Davison Airfield Cluster)

Note: BRAC APR Nomination 08-IV-9S did not require Chapter 527 review, however the nomination was considered by VDOT as part of the Davison Airfield Cluster. Sections related to 08-IV-9S and/or cluster analysis are highlighted and marked with an arrow.

INTRODUCTION

In preparation for review of BRAC-related APR applications, Fairfax County staff completed several efforts that became the starting point for applicants' subsequent Traffic Impact Analyses (TIA). These efforts included:



- **Grouping of applications.** Applications were grouped into “clusters” based on professional judgment of the common transportation network elements impacted by the proposals. All applicants were required to assess the impact of their individual site, as well as the cumulative impact of their cluster, on common road network elements identified by County staff in the vicinity of the cluster.
- **Traffic counts.** Turning volume traffic counts were conducted by Fairfax County during 2008 at approximately 40 intersections throughout the area of the applications, and were used as the basis for the County’s future projections. Traffic count information was also made available to applicants to conduct their existing conditions operational and link capacity analyses.
- **Traffic Projections of Year 2030 “Background” Traffic.** The methodology used by Fairfax County to derive the projections is an important element of the overall process since these projections are part of the input applicants used to complete their analyses. Summary of our understanding of the methodology used, and brief comments, are included below. Year 2030 “Background” traffic conditions are those that would occur in the year 2030 with the existing Comprehensive Plan land use, and before consideration of the subject nominations. County guidelines to the BRAC APR applicants required analysis by each application of Existing Conditions, as well as the following three year-2030 scenarios: 2030 “Background” Conditions, 2030 Conditions with APR nominated site, 2030 Conditions with all APR-nominated sites in the cluster.
- **Planning-level Capacity Determinations.** Fairfax County Department of Transportation (FCDOT) recently developed New Capacity Level-Of-Service (LOS) boundaries for 7 facility types, for use in planning analysis of BRAC-related Comprehensive Plan amendments. Applicants used these capacities in their assessment of volume-capacity (v/c) conditions along specific road segments, for each of the four scenarios required by the County guidelines, listed above. Overview of the new planning-level capacities used in this process is included in the next section.

OVERVIEW OF INPUT DATA DEVELOPMENT

- 1. Traffic Projections of Year 2030 “Background” Traffic.** Fairfax County staff developed background 2030 traffic forecasts for the BRAC APR analyses, and provided these forecasts to applicants’ representatives to maintain consistency in the forecasting process and analysis. For this land development stage (Comprehensive Plan Amendment), the focus was to produce reasonable link volumes (needed for capacity evaluations), rather than exact 2030 turn volumes. Since County staff also desired limited operational analysis of selected intersections, estimates of turn volumes were also derived for use by applicants in their TIAs.

Each cluster’s existing AM and PM traffic counts (turns) were factored to 2030 by individual approach growth factors. The growth factors were applied only to approach volumes, and not the departure end. Estimates of future turn volumes were rounded.

The Fairfax County travel demand model was used to derive growth factors. This model is based on the MWCOG/ TPB travel demand model, with additional detail for both road network and analysis zones (Fairfax County model has approximately 5 times the number of Traffic Analysis Zones, or TAZs, that the TPB model has). Growth factors were developed by comparing link volumes under 2 scenarios: “Existing” conditions (year 2008) and “2030” conditions. County staff used the latest information available at the time the process was initiated, and incorporated detailed data from recent subarea studies. The basic land use version used was modified 7.0, with data adjustments and enhancements derived from studies such as the Springfield Area Study (Huntington cluster area) and BRAC EIS (Fairfax Co. Parkway and Backlick Rd. area).

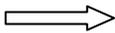
Based on the information provided to date by County staff, we believe the above steps represent a reasonable methodology to estimate future 2030 traffic turning volumes, based on the information available to staff, adjusted with local detail from recent previous analyses, along with combined very experienced professional judgment.

- 2. Planning Level Capacity Determinations.** As indicated in the 6/30/08 report *TPB Travel Forecasting Model, Version 2.2: Specification, Validation, and User’s Guide*, the TPB Travel Forecasting Model uses **area type codes**, ranging from 1 (very dense) to 7 (less dense), based on both population density and employment density within 1 mile of a given traffic analysis zone (TAZ). Thus the area type code represents both the intensity of land use development and mix of home and job locations. This variable is also used as a basis for **highway link capacities for each roadway facility type**. For example, LOS E Capacity of a Major Arterial ranges from a low of 800 passenger vehicles per hour per lane (vphpl) in the densest area type (AT=1), to a high of 1,260 vphpl in the more rural areas (AT=7); the equivalent values for a Collector are 300 to 800 vphpl.

Fairfax County Department of Transportation (FCDOT) recently developed New Capacities – Level of Service (LOS) boundaries for 7 facility types, for use in planning analysis of the BRAC-related Comprehensive Plan amendments. A review of mid LOS E values suggests that the capacities assumed by FCDOT, compared to TPB’s for the corresponding area types, may be relatively high for Freeways and Arterials, but similar or even slightly low for Collectors. For purposes of Comprehensive Plan Amendment applications, we believe the capacity and LOS values provided by FCDOT to the BRAC- APR applicants are a reasonable approximation for planning analysis. Volume/capacity ratios are used as one of the factors indicative of impact of traffic generation and potential need for mitigation and/or

improvements. Additional care should be exercised when evaluating the performance of specific arterial road segments when results indicate the road is at/near capacity, as defined by FCDOT: the combination of capacity definition, underestimated trip generation, and/or trip distribution assumptions, may all combine to obscure overall impact on road segments operating near their capacity threshold. For more detailed analysis and improvement decisions, these values should not substitute for capacities established based on more detailed and localized engineering analysis.

OVERVIEW OF KEY FINDINGS --CUMULATIVE IMPACT OF BRAC #08-IV-2LP AND DAVISON AIRFIELD CLUSTER



1. Summary of Application and the Cluster:

Nominations in Davison Airfield Cluster				
BRAC Nomination #08-IV-	Location of Development	Land Use Ex. Comp. Plan	Land Use Prop. Comp. Plan	Trips: AM/ PM/ ADT Existing Comp. Plan (Prop. Comp. Plan) <i>Net New Trips</i>
2LP Northern Virginia Industrial Park (69 acres)	Telegraph Rd.; N of US 1, S of Ffx. Co. Pkwy.	1,046,791 SF office	1,933,925 SF office 96,696 SF retail 120,875 SF hotel (300 rooms) 241,741 SF industrial 24,174 SF rec. center	1,908/ 1,881 / 13,491 (3,267/ 3,350 / 26,483) 1,359/ 1,469/ 12,992
9S Scannell Properties	Fairfax County Pkwy. @ Telegraph Rd. (SW quadrant)	409,320 SF Wareh.	196,660 SF Wareh. 589,980 SF Office	226/ 199 / 1,857 (911/ 852 / 6,307) 685/ 653 / 4,450
Net New Cluster Trips (Prop. Comp. Plan – Existing Comp. Plan) >>>>>				2,044/ 2,122 / 17,445

This application will generate approximately 1,900 additional weekday PM peak hour trips (total, both directions). From a very broad perspective, with all access to the site based from Telegraph Road, this volume is approximately equivalent to the **capacity of almost 2 additional lanes of an arterial roadway** (1 lane in each direction). For the Davison Airfield Cluster, the proposed Comprehensive Plan Amendments will generate approximately 2,100 new vehicle trips during the weekday PM peak hour (total, both directions); this volume is proportionally equivalent to the capacity of over 2 additional lanes of an arterial roadway (one lane in each direction). This broad comparison represents a measure of the substantial cumulative impact of the nomination to the surrounding local road network.

2. Impact on Selected Elements of Transportation System

More specifically, the trips generated by the proposed APR nomination 2LP are noted to have significant impact in 2030 on the following intersections and road segments:

- Intersections (Table 4-12 in TIS report; operational analysis):
 - o US 1 @ Lorton Road: very poor 2030 AM Peak signal operation under Existing Comp. Plan conditions (181 seconds, 3 times the LOS F threshold) deteriorates more than 50% to delays over 270 seconds with subject nomination, over 330 seconds with both nominations in cluster. To mitigate this very high congestion, the report includes proposed modifications of the signal timing and cycle length. It should be

- noted that 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). The feasibility and performance of any proposed signal modification would need further evaluation as part of the overall network.
- US 1 @ Telegraph Road: substantial Existing Comp. Plan delays (over 115 seconds) deteriorate 80% to over 200 seconds with the proposed nomination, and more than doubles with both nominations in the cluster.
 - US 1 @ Pohick Road: AM Peak Hour LOS E deteriorates to F with nomination
 - Telegraph Rd. @ VA 7100 ramps: PM Peak Hour LOS E deteriorates to F with nomination (almost 40% and 80% delay increases at the Fairfax County Parkway southbound and northbound ramp intersections, respectively). The applicant proposes a second right turn lane on the southbound off-ramp (analysis supports this recommendation) and PM signal timing modifications.
- Road Segments (capacity analysis):
- Telegraph Road, which provides the only access to the APR nominated site 2LP, is the most affected by the proposed development, particularly in the southbound direction: in the PM peak hour the segment north of US 1 experiences v/c deterioration of approximately 30% (from 0.97 to almost 1.3, and over 1.4 with the addition of site 9S), while the segment south of VA 7100 reaches even more highly congested conditions (v/c about 1.7) with the added site(s). These preliminary results of the 2030 link analysis support the need for widening Telegraph Road between US 1 and Fairfax County Parkway (VA 7100): this potential improvement should be considered in detail in conjunction with other improvements mentioned in the report, as a way to address the congestion resulting from the site's trips. This widening is not envisioned in the current adopted Fairfax County Comprehensive Plan or the MWCOG's Constrained Long Range Plan (CLRP).

In very broad terms, the findings in the subject study (failing intersections in 2030, particularly with the proposed development) are generally consistent with the improvement concepts in the County Transportation Plan (Telegraph Road full interchanges at US 1 and VA7100). Decisions related to interchanges need to consider in detail several inter-related components of the transportation system in the area (including Telegraph Road widening mentioned above).

Trips generated by site 2LP (and this cluster's trips) potentially have substantial impact on the nearby Fairfax County Parkway. However, this road link was not analyzed in the report.

3. Additional Recommendations

The subject APR nomination proposes to provide a **shuttle service** to the "adjacent rail stations" as well as to the military base and offices in the immediate area. Reliable shuttle services can provide multimodal connectivity and extend the reach of public transit; transit and Transportation Demand Management (TDM) measures which reduce auto dependence should be pursued where they are likely to provide long-term reductions of auto trips from a site. Trip reductions however should not be assumed in traffic impact analyses unless connecting systems exist or are programmed, and there is a mechanism in place to insure continuity of the trip reduction benefits.

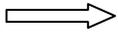
For any approved nomination, it is anticipated that a more detailed analysis will be submitted at the rezoning stage, which will provide a full impact assessment, and identify location and phasing of specific mitigation measures, improvements to impacted road elements, and general right-of-way considerations.

TIS TECHNICAL REVIEW ELEMENTS

- Summary of requested changes to the Comprehensive Plan (section 1.2) refers to proposed uses as all non-residential (office, retail, hotel, industrial and rec. center uses). Section 1.4 refers to “additional residential uses” which could be removed. It is not clear whether/ how residential use applies.
- Figure 4-1 (Existing Lane Use and Traffic Control) is identical to Figure 4-2 (2030 Lane Use). Suggest explaining in the text the source of 2030 Lane Use and how this relates to the MWCOG Constrained Long Range Plan (CLRP) and Fairfax County’s Transportation Plan improvements.
- Site Trip Distribution. The Impact Assessment Section (4.4) indicates that new site-generated trips were “assigned to the roadway network based on the existing site access system, current and forecasted travel patterns, and engineering judgment.” These distribution assumptions may be subject to additional review and revision in subsequent development phases.
- Site Trip Generation. Spot review indicates trip generation volumes may be somewhat underestimated for some proposed land uses in Table 4.4:
 - o Hotel volumes are low for AM Peak Hour (123 vs. 168)
 - o Industrial Park volumes appear slightly low
 - o Applied internal capture trip reduction to both Office and hotel (Ch 527 guidelines, p. 61, clarify for hotel with office use “use the smaller of 10% of the hotel/motel traffic OR [accent added] the office traffic”.
- Net New Trips. Spot review indicates some of the assigned volumes (Figure 4-6) are low (e.g. PM Peak Hour southbound Route 1 left turn at Lorton Road). To the extent these volumes are used to estimate link volumes, the analysis on affected link(s) may underestimate the impact of the proposal (however, for the example given, Lorton Road’s 2030 link analysis indicates a good level of service with all APR nominated sites in the cluster, and the “missing trips” would not affect the overall conclusion).

TIS FINDINGS AND RECOMMENDATIONS

- Review of 2030 Intersection LOS with All APR Nominations in Cluster (Table 4-12) reveal the following items of note:
 - o US 1/ Lorton Road intersection: very poor 2030 AM Peak signal operation (delays over 270 seconds with subject nomination, over 330 seconds with both nominations in cluster). To mitigate this high congestion, the report includes proposed modifications of the signal timing and cycle length. Please refer to section on “Overview of Key Findings” for comments on VDOT’s signal networks operations. The feasibility and performance of the proposed signal modifications will need further evaluation, particularly during subsequent intersection analyses performed in conjunction with more detailed rezoning reviews.



- **Telegraph Road:** As a result of the additional trips generated by the subject application (2LP) all 3 signalized intersections analyzed (US 1, Fairfax County Parkway southbound and northbound ramps) show substantial deterioration of operations, from marginal and poor under 2030 Existing Comp. Plan conditions, to very poor with the trips added by the proposal (such as delays over 200 seconds at the intersection with US 1/ Old Colchester Road, almost 40% and 80% delay increases at the Fairfax County Parkway off-ramp and on-ramp intersections, respectively). **This situation is aggravated with the addition of the trips generated by Scannell Properties (site 9S), included in the subject study** (VDOT did not receive a Chapter 527 application for site 9S, hence we were not able to verify trip generation estimates or distribution assumptions). The Fairfax County Transportation Plan (element of Comprehensive Plan) indicates several improvements associated with Telegraph Road (these are not listed under MWCOG's Constrained Long Range Plan Major projects):
 - At intersection at US 1/ Colchester Road: full interchange (study required), improvements along Old Colchester Road (Virginia Byway) as well as possible future LRT/BRT Station.
 - At intersection with Fairfax County Parkway: full interchange (study required) to replace existing diamond interchange.

In very broad terms, the findings in the subject study (failing intersections in 2030, particularly with the proposed development) are generally consistent with the concepts in the County Transportation Plan. Decisions related to interchanges need to consider many inter-related components of the transportation system (road widening, parallel corridors, multimodal elements), in addition to operational performance of intersections.

- Review of 2030 Link Analyses (Tables 4-7, 4-10 and 4-13) revealed the following:
 - Link Level of Service (as expressed by volume to capacity or v/c ratio) deterioration is mild to severe as a result of the APR nominated site (2LP).
 - The most dramatic deterioration due to the proposed site's trips is noted along southbound Telegraph Road, north of US 1, where v/c worsens approximately 30% in the PM peak hour, from 0.97 to almost 1.3 (and over 1.4 with the addition of site 9S). During the same period, the southbound segment of Telegraph Road just south of Fairfax County Parkway experiences a milder v/c degradation but, since conditions are already saturated even before the contribution of the site's trips (v/c 1.58), results in even more highly congested conditions (v/c about 1.7) with the added site(s).
 - Trips generated by site 2LP (and this cluster's trips) are anticipated to have noticeable impact on the nearby Fairfax County Parkway and its ramps. However, these road links are not analyzed in the report. Significant deterioration in ramp intersection delays, and proposed improvements, were discussed above.