Report No. D-2011-TAD-001

April 20, 2011

Inspector General

United States Department of Defense

Assessment of BRAC 133 Final Environmental Assessment of July 2008 and Transportation Management Plan of July 2010

Additional Information

The Department of Defense Office of the Deputy Inspector General for Policy and Oversight, prepared this report. If you have questions, contact the signer of the report.

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INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-4704

April 20, 2011

MEMORANDUM FOR AUDITOR GENERAL, DEPARTMENT OF THE ARMY

SUBJECT: Assessment of BRAC 133 Final Environmental Assessment of July 2008 and Transportation Management Plan of July 2010 (Report No. D-2011-TAD-001)

On October 13, 2010, the DoD IG Technical Assessment Directorate initiated a detailed independent engineering assessment of the sufficiency of the Army's Final Environmental Assessment Implementation of 2005 Base Realignment and Closure Recommendation 133, dated July 2008 (BRAC 133 EA), and the Transportation Management Plan for BRAC 133 at the Mark Center, dated July 2010 (BRAC 133 TMP). The assessment was undertaken in response to a requirement of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Section 2704, "Transportation Plan for BRAC 133 Project under Fort Belvoir, Virginia, BRAC Initiative," (Public Law 111-383). The Act directed that the DoD IG "submit to the congressional defense committees a report evaluating the sufficiency and coordination conducted in completing the requisite environmental studies associated with the site selection of the BRAC 133 project." The assessment was contracted to the engineering firm Acelsior, Inc. and its subcontractor, Wight & Company, utilizing their specialized experience in environmental and traffic engineering. We issued a draft report, considered your comments, and are releasing our final findings, recommendations, and report.

As reported in the February 24, 2011 draft, we determined that the proposed traffic mitigations in the BRAC 133 EA may not be sufficient to support the Finding of No Significant Impact (FNSI) and recommended that the Army perform a reassessment of the transportation effects, including a traffic impact analysis and monitoring program. The Army responded to our draft stating that they do not intend to perform any new traffic analyses because recent studies sufficiently support the suggested improvements. However, we found that the recent studies were inadequate to support the FNSI and are standing by our recommendation.

We also found that the 2010 BRAC 133 TMP did not include or sufficiently address several critical travel demand management strategies and recommended that that the Army revise and update the BRAC 133 TMP and conduct a more technically robust, standalone traffic impact analysis. The Army agreed to revise the TMP; but did not agree to conduct a more technically robust traffic impact analysis, stating that more recent traffic studies were sufficient. However, the recent traffic studies did not adequately address existing and projected peak hour traffic volumes; appropriate site variables; and effects of BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 EA and/or TMP study limits. Therefore, we are standing by our recommendations.

Finally, in response to our draft report, the Army recommended that we review its "report to congress on the Transportation Plan for BRAC 133." However, they could not provide the report to us at this time. The Army's report is expected to be released after this OIG assessment report is issued.

DoD Directive 7650.3, "Follow-up on General Accounting Office (GAO), DoD Inspector General (DoD IG), and Internal Audit Reports," requires that recommendations be resolved promptly. The Army's comments to our draft report were not responsive to Recommendations 1 and 2-B. Therefore, we request that additional comments be provided by May 6, 2011.

If possible, send a .pdf file containing your comments to James.Howell@dodig.mil. Copies of your comments must have the actual signature of the authorizing official for your organization. We are unable to accept the /Signed/ symbol in place of the actual signature. If you arrange to send classified comments electronically, you must send them over the SECRET Internet Protocol Router Network (SIPRNET).

We appreciate the courtesies extended to our engineering staff and assessment team. If you have any questions, please contact Mr. James Howell at (703) 604-9096 (DSN 664-9096) or e-mail at James.Howell@dodig.mil.

Randolph R. Stone, SES
Deputy Inspector General
Policy and Oversight

Attachments:
1. Office of the Inspector General Findings, Recommendations, Summaries of Army Responses, and Responses to the Department of the Army's Comments
2. Department of the Army Memorandum Titled "Response to Department of Defense Inspector General (DoD IG) Draft Report of the Independent Engineering Assessment of the Transportation Management Plan and the Final Environmental Assessment Implementation of BRAC 133," March 21, 2011
3. Acelsior's final report "Independent Professional Engineering Assessment of Final Environmental Assessment, dated July 2008, and Transportation Management Plan, dated July 2010, for BRAC 133 at Mark Center," February 14, 2011

cc:
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The Acelsior Report: Independent Professional Engineering Assessment of Final Environmental Assessment, dated July 2008, and Transportation Management Plan, dated July 2010, for BRAC 133 at Mark Center

Attachment 1

Office of the Inspector General Findings, Recommendations, Summaries of Army Responses, and Responses to the Department of the Army's Comments

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Office of Inspector General Findings, Recommendations, Summaries of Army Responses, and Responses to the Department of the Army's Comments

Finding 1

The existing traffic conditions and projections reported in the July 2010 BRAC 133 TMP show greater congestion than predicted in the July 2008 BRAC 133 EA. The BRAC 133 EA used historical traffic data and traffic counts in 2007 and 2008 to describe the existing conditions as well as those anticipated in 2011. Based upon the data, the BRAC 133 EA assumed no change in existing or baseline traffic conditions and volume (without BRAC 133) from 2008 to 2011. When a change in project conditions occurs, such as the traffic congestion increase reported in the 2010 BRAC 133 TMP, then 32 Code of Federal Regulations 651.5(g) requires the Army to reassess the project conditions and their associated environmental effects. The BRAC 133 EA has not been supplemented or reassessed to reflect the documented changes in the projected traffic conditions. Therefore, the proposed traffic mitigations in the BRAC 133 EA may not be sufficient to support the BRAC 133 EA Finding of No Significant Impact (FNSI) conclusion of "long-term negligible to minor, but not significant adverse effects" on transportation.

Army Response to Finding 1

The Army non-concurred with Finding 1. The Army stated, "We acknowledge that the TMP and other studies have shown some increase in traffic volumes and more traffic congestion than the EA analysis at some locations." However, the Army further stated that "the increased current traffic is not reflective of an overall trend, but rather, reflective of local conditions related to the construction workforce."

Additionally, the Army stated that the TMP traffic analysis is "an integral part of the open and interactive process that has been ongoing throughout the project to reassess traffic conditions and mitigations proposed for the project." The Army referred to the four previous BRAC 133-related traffic studies: 1) the April 2009 study prepared by Parsons Brinkerhoff for the Virginia Department of Transportation (VDOT), 2) the November 2009 study by VHB, 3) the December 2009 study prepared by GEC, and 4) the January 2011 study prepared by GEC.

Our Response

The Acelsior report indicated that the existing traffic conditions and projections reported in the July 2010 BRAC 133 TMP show greater congestion than predicted in the July 2008 BRAC 133 EA. The four reports referred to by the Army revealed no substantiation of the Army's claim that traffic increase is caused by the construction workforce. However, the reports did present significantly greater traffic congestions than predicted in the July 2008 BRAC 133 EA. Accordingly, we request that the Army reconsider its position and provide comments on our final finding.

Recommendation 1

We recommend that the Army perform a reassessment of the transportation effects to confirm the FNSI or determine whether additional traffic mitigations are required to maintain the FNSI. The reassessment should be appropriately documented in either a Record of Environmental Consideration or in a Supplemental Environment Assessment. According to Acelsior report, the reassessment should contain a traffic impact analysis and monitoring program, to include a cumulative effects analysis of transportation for past, present, and future traffic conditions; and to confirm the sufficiency of the transportation mitigation measures outlined in the BRAC 133 EA.

This reassessment should also be coordinated with all concerned parties to include VDOT, nearby tenants, and local residents.

Army Response to Recommendation 1

The Army partially concurred with Recommendation 1. The Army agreed to "perform an assessment to ascertain the adequacy of the 2008 EA in light of this new traffic information to determine whether supplementation is required." The Army also agreed to "document its findings in a Record of Environmental Consideration (REC) or in a Supplemental Environmental Assessment if the conclusions reached during the REC indicate that supplementation is required."

Our Response

Although the Army partially concurred with our recommendation and stated that they would perform an assessment to ascertain the adequacy of the 2008 EA and potentially file a REC or Supplemental Environmental Assessment, their response is nonresponsive to the recommendation. The Army's response is nonresponsive because they stated in recommendation 2B that they would not conduct any new traffic analyses. According to the Acelsior report, the FNSI cannot be revalidated without a new Traffic Impact Analysis. Further, the four traffic studies mentioned by the Army do not address our concerns because they reference data from prior reports dating as far back as 2008. Furthermore, the Virginia Department of Transportation, Guidelines for Traffic Impact Analysis, Regulations 24VAC30-155 (p. 61, 62 required elements of a traffic impact analysis), set a standard for the affected area radius to be up to 2 miles. The reports did not contain any data for other intersections within a one to two mile area other then the seven intersections identified in the report. Accordingly, we request that the Army reconsider its position and provide comments on our final recommendation.

In addition, the Army was not responsive to our recommendation for the reassessment to be coordinated with all concerned parties to include VDOT, nearby tenants, and local residents. Accordingly, we request that the Army reconsider its position and provide comments on the final recommendation.

Finding 2

The 2010 BRAC 133 TMP does not include, or sufficiently address, several critical travel demand management strategies. The BRAC 133 TMP does not delineate a program of strategies to encourage the use of planned shuttle services to five Metrorail stations. The travel demand management strategies presented in the BRAC 133 TMP do not effectively address midday travel needs for commuters that will not have a car available and overflow parking. Anticipated Transportation Coordinator staffing appears to be insufficient for the range of services and programs described in the BRAC 133 TMP. Finally, the travel demand management program and its strategies may be misaligned with the employees' needs and preferences. As a result, the goal of achieving a 40-percent reduction in single-occupancy-vehicle trips may not be feasible and may consequently impose further adverse impacts on the roadway network.

Army Response to Finding 2

The Army partially concurred with Finding 2, generally accepting the points made in Finding 2. However, the Army did not agree that "the proposed Transportation Coordinator staffing will be insufficient for the range of services and programs described in the TMP," because the "TMP reflects that there will be a team assigned to the task of transportation coordination" and "the Transportation coordinator will have access to and the support of the Transportation Services office of the Washington Headquarters Services which serves the Pentagon and other DoD facilities in the National Capital Region." The Army also stated that they addressed the midday travel issue in the TMP. The revised TMP will include the midday travel information within the Travel Demand Management section.

Our Response

The Acelsior report stated,

> The NCPC [National Capital Planning Commission] guidebook implementing a successful TMP recommends hiring a Transportation Coordinator as the first step in developing a TMP. In the case of the BRAC 133 TMP, however, the Transportation Coordinator was not a part of the plan development process. The BRAC 133 Travel Demand Management Plan indicates that the Transportation Coordinator will be hired "within 9 months of building operations to manage, operate and maintain the Washington Headquarters Services Transportation Program for BRAC." An interview with USACE and Washington Headquarters Services confirmed that the Transportation Coordinator will be on board by January 2011, and further clarified that the Transportation Coordinator role will be provided by one manager and potentially 1–2 support staff (Page 3-61, the Acelsior report).

The Acelsior report also indicated that the three people assigned to fill these roles with the many anticipated responsibilities may be insufficient particularly given the tight time frame between the hiring of the Transportation Coordinators and the BRAC relocation. Accordingly, we request that the Army reconsider its position and provide comments on our final finding.

Recommendation 2-A
We recommend that the Army revise and update the BRAC 133 TMP to include, or to effectively address, the critical travel demand management strategies discussed in Finding 2.

Army Response to Recommendation 2-A

The Army concurred with Recommendation 2-A. The Army and DoD agreed to revise the BRAC 133 TMP to address the travel demand management strategies.

Our Response

The Army concurred with Recommendation 2-A agreeing to revise the BRAC 133 TMP to address the travel demand management strategies. However, in view of the Army's comments on Finding B, we request that the Army reaffirm in its response to our final recommendation that the revised BRAC 133 TMP will include the following areas of concerns identified by Acelsior report: encouragement of the use of the planned shuttle services to five Metrorail stations, addressing mid-day travel needs, addressing overflow parking, Transportation Coordinator staffing, and aligning the travel management program with employees' needs and preferences.

Recommendation 2-B

We recommend that the Army conduct a more technically robust, standalone traffic impact analysis (see Recommendation 1) to confirm the accuracy of the BRAC 133 TMP's findings; specifically, existing and projected peak hour traffic volumes; appropriate site variables; potential queues caused by the access control facility to the south parking garage; and effects of the BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 EA and/or TMP study limits.

Army Response to Recommendation 2-B

The Army non-concurred with Recommendation 2-B stating that the Army "does not agree and does not intend to perform any new traffic analysis" because "additional traffic studies have been completed since the July 2008 EA" and "these subsequent traffic studies were independently scoped and completed to address the area of focus as determined by the city and VDOT." Thus, the Army concluded that the traffic studies "provide sufficient analysis to support the suggested improvements the Army is pursuing."

Our Response

We reviewed the four reports that the Army purported to satisfy our recommendation. The studies did not adequately address the concerns identified in Acelsior report: existing and projected peak hour traffic volumes, appropriate site variables, potential queues caused by the access control facility to the south parking garage, and effects of BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 EA and/or TMP study limits. While these items are addressed in the four referenced reports, the data used as the basis of the assessments were referenced to reports as far back as 2008. In addition, downstream and upstream traffic effects on I-395 (i.e. one exit before and after the BRAC 133 area) were not reported. Even though the 2011 report stated that it included freeway exits, no data was found

within the report or appendices. Furthermore, the VDOT Guidelines for Traffic Impact Analysis, Regulations 24VAC30-155 (p. 61, 62 required elements of a traffic impact analysis), set a standard for the affected area radius to be up to 2 miles. No data was found within the report for any other intersections within a one to two mile area other than the seven intersections identified in the report. As stated in our response to Recommendation 1, the four reports do not constitute a validation of the FNSI. Accordingly, we request that the Army reconsider its position and provide comments on the final recommendation.

Additional Army Comments on the Acelsior Draft Report

Army Comment #1 on DoD IG Memorandum Page 2 and Page 3-58

The Army stated that the planned DoD Shuttle System routes, schedules, level of service, number of buses, and hours of operation were covered in section 3.5.2. of the TMP, and stated "we did not believe it was necessary to repeat the information in section 5.0." However, in order to ensure clarity, the Army agreed to update the TMP to include this information in section 5.0. as well as information on how the DoD shuttle system and other public transit services are being integrated to optimize service.

Our Response

The shuttle program should have been mentioned in the TDM section 5.0. of the TMP to show the Army's intent and to present a complete transportation picture. We agree with the Army's decision to include the shuttle program data in section 5.0. of the updated TMP.

Army Comment #2 on DoD IG Memorandum Page 2, Finding 2 and Page 3-69

The Army stated that since "the TMP was viewed by WHS as a strategy plan and not an implementation/operations plan, the Planning Team felt that the information (discussion of strategies for encouraging individuals to use the shuttles) would be better suited for the latter." The Army stated that as the TMP is updated, the implemented strategies will be incorporated. The Army also stated the following:

> Over the next several months, the WHS Transportation Planning Team will conduct focus group meetings with the relocating agencies stationed at the BRAC 133 facility for the purpose of informing them about commuter resources, the DoD/BRAC 133 Shuttle Programs, existing transportation providers, and alternative modes of transportation. In addition, our team has developed a Transportation Reference Guide (a TMP suggested element) to provide relocating employees with reference information that will assist them in determining transportation to and from the facility. These efforts will be ongoing before, during and after the tenant relocations to the new BRAC 133 facility and will be a major function or the transportation coordinator and support staff.

Our Response

The discussion of strategies for encouraging individuals to use shuttle services should provide a more detailed plan in TDM and the revised TMP. A detailed plan will provide a better understanding on how the Army plans to meet their transportation goals.

Army Comment #3 on DoD IG Memorandum Page 2, Finding 2 and Page 3-69

The Army stated that the TMP section 3.5.2. adequately discusses the DoD Shuttle Plan designed to provide adequate transportation service for midday trips.

Our Response

We agree that section 3.5.2. discusses the DoD shuttle plan. However, the TDM is inadequate in dealing with midday travel options. The Acelsior report states that the only programmatic elements presented as part of this strategy are "long-term enhancements," which include two action items. First, the Transportation Coordinators will "consider conducting a demand analysis for obtaining additional car-sharing vehicles on-site or within walking distance of BRAC 133," as there currently is one ZipCar®. Second, the Transportation Coordinator will consider conducting a demand analysis for developing a bike-sharing program. The Acelsior report stated, "The description of the strategy belies an otherwise passive approach to midday travel options."

Army Comment #4 on DoD IG Memorandum Page 2, Finding 2

The Army stated that the WHS Transportation Planning Team conducted two online transportation/commuter surveys in 2009 and 2010, which focused on the current and post-relocation employee transportation requirements, in order to gather supporting information on several BRAC 133-related transportation planning exercises. The Army also stated that "as the Travel Demand Management (TMD) Strategies highlighted in the TMP are being implemented, our team is consistently referring to the comprehensive data received from the above surveys."

Our Response

The Acelsior report indicated, "The strategies of the BRAC 133 Travel Demand Management Plan have not yet been aligned with market needs and preferences." Also, on page 4 of the TMP, it states "As BRAC 133 employees have not made final decisions in viable transportation mode choice, specific objectives for target mode shares have not been determined." However, within 6 months of operations, WHS will establish baseline mode splits for BRAC 133 employees through an employee commute survey. This indicates that the TDM may need further refinement to meet the employees' needs.

Army Comment #5 on DoD IG Memorandum Page 2, Finding 2

The Army stated the following: "The TMP states that there will be a team assigned to the task of transportation coordination. WHS is currently developing a Transportation Program Office that will have several members assisting in the transportation efforts of the BRAC-133 TMP implementation. WHS never envisioned that one individual would handle the work load."

Our Response

The Acelsior report and our finding do not state that there is only one Transportation Coordinator employee planned. We found that a Transportation Coordinator and a potential 1-2 man support staff may not be sufficient to support the BRAC 133 transportation needs. The Acelsior report stated:

> The NCPC guidebook implementing a successful TMP recommends hiring a Transportation Coordinator as the first step in developing a TMP. In the case of the BRAC 133 TMP, however, the Transportation Coordinator was not a part of the plan development process. The BRAC 133 Travel Demand Management Plan indicates that the Transportation Coordinator will be hired "within 9 months of building operations to manage, operate and maintain the Washington Headquarters Services Transportation Program for BRAC." An interview with USACE and Washington Headquarters Services confirmed that the Transportation Coordinator will be on board by January 2011, and further clarified that the Transportation Coordinator role will be provided by one manager and potentially 1–2 support staff" (Page 3-61, Acelsior report).

The Acelsior report also indicated that the three individuals assumed to fill this role with the many anticipated responsibilities may be insufficient, particularly given the tight time frame between the hiring of the Transportation Coordinators and BRAC relocation (Page 3-64 of the Acelsior report).

Accordingly, we request that the Army reconsider its position and provide comments on our final finding.

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Attachment 2

"Response to Department of Defense Inspector General (DoD IG) Draft Report of the Independent Engineering Assessment of the Transportation Management Plan and the Final Environmental Assessment Implementation of BRAC 133" (March 21, 2011)

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DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON, DC 20310-0600

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MEMORANDUM FOR Deputy Inspector General (Policy and Oversight), Office of the Inspector General, Department of Defense, 400 Army Navy Drive, Arlington, VA 20301-3010

SUBJECT: Response to Department of Defense Inspector General (DoDIG) Draft Report of the Independent Engineering Assessment of the Transportation Management Plan and the Final Environmental Assessment Implementation of BRAC 133 (Project No. D20I0-DOOOPT-0285)

1. The purpose of this memo is to provide a response to the DoDIG Draft Report, on the "Independent Engineering Assessment of the Transportation Management Plan (TMP) and the Final Environmental Assessment (EA) Implementation of BRAC 133."

2. The Army has reviewed the draft report of the independent engineering assessment of the TMP and EA for BRAC 133. The Army non-concurs with Finding 1 and Recommendation 2.B. The enclosed comments are intended to correct information we believe to be inaccurate, help clarify issues to ensure a mutual understanding, and address our position on each of the findings and recommendations.

3. The Army recommends that DoDIG reviews the Army's report to Congress on the Transportation Plan for BRAC 133, prior to finalizing its assessment of the BRAC 133 EA and TMP.

4. The Army and stakeholders appreciate the opportunity to comment on this draft report.

5. The point of contact is Mr. Ian Thomas, (703) 545-2536, email: ian.thomas@conus.army.mil.

Encl
as

RICK LYNCH
Lieutenant General, GS
Assistant Chief of Staff
for Installation Management

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DoDIG DRAFT REPORT – DATED FEBRUARY 24, 2011
(Project No. D20I0-DOOOPT-0285)

"Independent Engineering Assessment of the Transportation Management Plan and the Final Environmental Assessment Implementation of BRAC 133"

DEPARTMENT OF THE ARMY COMMENTS
TO THE RECOMMENDATIONS

FINDING 1: The DoDIG finds that "the existing traffic conditions and projections reported in the July 2010 BRAC 133 TMP show greater congestion than was predicted in the July 2008 BRAC 133 EA. The BRAC 133 EA used historical traffic data and traffic counts in 2007 and 2008 to describe existing conditions as well as those anticipated in 2011. Based upon these data, the BRAC 133 EA assumed no change in existing or baseline traffic conditions and volume (without BRAC 133) from 2008 to 2011. When such....." (Page 1/DoDIG Memorandum on the Draft Report).

ARMY RESPONSE: Non-concur. We acknowledge that the TMP and other studies have shown an increase in traffic volumes and more traffic congestion than the EA analysis at some locations. However, we believe the increased current traffic is not reflective of an overall trend, but rather, reflective of local conditions related to the construction workforce. It is important to note that subsequent efforts by the Army and others since the EA effectively achieve the intent of Recommendation 1 and we would like to highlight the following:

Traffic impact analysis is not a customary component of a TMP. However, in recognition of the public traffic controversy that followed our BRAC 133 site selection, the Army included a requirement for a robust traffic analysis within our TMP scope of work. Rather than continuing to rely upon the EA analysis as the basis for our discussion of the traffic issue, we asked our TMP consultant to provide an independent analysis of the traffic conditions. As your memorandum noted, this analysis showed current traffic volumes and conditions that were somewhat greater than the EA analysis.

Our TMP traffic analysis became an integral part of the open and interactive process that has been ongoing throughout the project to reassess traffic conditions and mitigations proposed for the project. This process has included the completion of the following additional BRAC 133 related traffic studies: 1) an April 2009 study prepared by Parsons Brinkerhoff for the Virginia Department of Transportation (VDOT) and funded by the Department of Defense (DoD); 2) a November 2009 study by VHB, Inc., fully scoped by and prepared under contract to the City of Alexandria and funded by the Army at the city's request; 3) a December 2009 study prepared by GEC, Inc., under

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contract to VDOT in response to a request by the city; 4) a January 2011 study prepared by GEC under contract to VDOT and split funded 50/50 by the city and DoD.

The Army and DoD have accepted the results of these four analyses and have worked with the stakeholders in the development of an aggressive TMP and additional transportation improvements. The January 2011 VDOT study concluded that a combination of additional transportation improvements (above those improvements in progress as part of the project), if constructed at an estimated cost of $20 million, will significantly improve traffic operations in the Mark Center area. The Department of Defense recently completed a full evaluation of these improvements and determined that a waiver of Defense Access Road (DAR) program criteria is not necessary. We are proposing to fund these improvements within the BRAC 2005 account, and we will soon submit our re-programming notification to Congress.

The Army and DoD have been proactive in addressing the traffic issues at the Mark Center. We also note that the BRAC 133 TMP includes a monitoring plan that contemplates recurring reporting and consultation with the city. Also, the Army and DoD are entering into a letter agreement with the city to establish a consultative process that will be followed before any changes are made to the TMP in the future. These measures will keep sharp focus on the current traffic conditions and the effectiveness of the mitigations and the transportation demand management strategies.

RECOMMENDATION 1: The DoDIG recommends that "the Army perform a reassessment of the transportation effects to confirm the FNSI or determine whether additional traffic mitigations are required to maintain the FNSI. The reassessment should be appropriately documented in either a Record of Environmental Consideration or in a Supplemental Environment Assessment. The reassessment...." (Page 1/DoDIG Memorandum on the Draft Report)

ARMY RESPONSE: Partially concur. The Army will perform an assessment to ascertain the adequacy of the 2008 EA in light of this new traffic information to determine whether supplementation is required. The Army will document its findings in a Record of Environmental Consideration (REC) or in a Supplemental Environmental Assessment if the conclusions reached during the REC indicate that supplementation is required.

FINDING 2: The DoDIG finds that "the 2010 BRAC 133 TMP did not include, or did not sufficiently address, several critical travel demand management strategies. The BRAC 133 TMP did not delineate a program of strategies to encourage the use of planned shuttle service to five Metrorail stations. The travel demand management strategies presented in the BRAC 133 TMP does not effectively address midday travel needs for commuters who will not have a car available and overflow parking. Anticipated

[redacted]

Transportation....." (Page 2/DoDIG Memorandum on the Draft Report)

ARMY RESPONSE: Partially concur (see additional Army/DoD responses on Finding 2 on pages 4-7 of this memorandum). We generally accept the points made in Finding 2. We do not believe, however, that the proposed Transportation Coordinator staffing will be insufficient for the range of services and programs described in the TMP. The TMP commits to a full-time, properly trained and qualified Transportation Coordinator dedicated to the BRAC 133 facility. The TMP reflects that there will be a team assigned to the task of transportation coordination. The Transportation Coordinator will have access to and the support of the Transportation Services Office of the Washington Headquarters Services (WHS) which serves the Pentagon and other DoD facilities in the National Capital Region. Additionally, WHS has consistently indicated that it will monitor the transportation service demands of the BRAC 133 facility and tailor the staff accordingly (see Army/DoD response comment 5 on page 7 of this memorandum). Regarding the mid-day travel issue, we addressed this in the TMP and have provided comments in the additional comments section of this response (see Army/DoD response to comment #3 on pages 5-6). However to ensure clarity within the TMP, it will be revised to include the mid-day travel information within the Travel Demand Management (TDM) section (5.0).

RECOMMENDATION 2.A.: The DoDIG recommends that "the Army revise and update the BRAC 133 TMP to include, or to effectively address, the critical travel demand management strategies discussed in Finding 2." (Page 2/DoDIG Memorandum on the Draft Report)

ARMY RESPONSE: Concur. The Army and DoD will revise the BRAC 133 TMP to address the travel demand management strategies discussed in Finding 2.

RECOMMENDATION 2.B.: The DoDIG recommends that "the Army conduct a more technically robust, standalone traffic impact analysis (see Recommendation 1) to confirm the accuracy of the BRAC 133 TMP's findings; specifically, existing and projected peak hour traffic volumes; appropriate site variables; potential queues caused by the access control facility to the south parking garage; and effects of BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 EA and/or TMP study limits." (Page 2/DoDIG Memorandum on the Draft Report)

ARMY RESPONSE: Non-concur. The Army does not agree and does not intend to perform any new traffic analysis. As indicated in our response to Finding 1, a number of additional traffic studies have been completed since the July 2008 EA. These subsequent traffic studies were independently scoped and completed to address the area of focus as determined by the city and VDOT and we believe they provide sufficient analysis to support the suggested improvements the Army is pursuing.

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Additional Comments on the Draft Report specifically addressing comments made in Finding 2 of the memorandum which are supported by various sections within the report.

Comment 1 (DoDIG Memorandum page 2 and Page 3-58 of the report): The DoD shuttle service is described in other sections of the BRAC 133 TMP, but is not directly included in the Travel Demand Management (TDM) section (5.0) of the TMP.

Army/DoD Response: Section 3.5.2 of the TMP contains information regarding the planned DoD Shuttle System – routes, schedules, level of service, number of buses, and hours of operation. We felt that this coverage and the projected mode split information clearly demonstrated DoD's commitment to this service as a centerpiece of the TMP and we did not believe it was necessary to repeat the information in Section 5.0. However, in order to ensure clarity, we will update the TMP to include this information in Section 5.0 as well as information on how the DoD shuttle system and other public transit services are being integrated to optimize service.

Comment 2 (DoDIG Memorandum page 2, Finding 2 and Page 3-69 of the report): WHS does not discuss its strategies for encouraging individuals to use the shuttles.

Army/DoD Response: As the TMP was viewed by WHS as a strategy plan and not an implementation/operations plan, the Planning Team felt this type of information would be better suited for the latter. Pursuant to the TMP, WHS has developed an implementation timeline for the various TDM Strategies highlighted in Section 5.0. As the TMP is updated, the timeline and implemented strategies will be incorporated. Over the next several months, the WHS Transportation Planning Team will conduct focus group meetings with the relocating agencies stationed at the BRAC 133 facility for the purpose of informing them about commuter resources, the DoD/BRAC 133 Shuttle Programs, existing transportation providers, and alternative modes of transportation. In addition, our team has developed a Transportation Reference Guide (a TMP suggested element) to provide relocating employees with reference information that will assist them in determining transportation to and from the facility. These efforts will be ongoing before, during and after the tenant relocations to the new BRAC 133 facility and will be a major function of the transportation coordinator and support staff.

Comment 3 (DoDIG Memorandum page 2, Finding 2 and Page 3-69 of the Report): The TDM strategies are inadequate in dealing with mid-day travel options for BRAC 133 employees.

Army/DoD Response: As detailed in Section 3.5.2 of the TMP, the DoD Shuttle Plan has been designed to provide adequate transportation service for mid-day trips. Both the Pentagon and King Street Shuttle Routes will operate on 15- and 30-minute frequencies to and from the BRAC 133 facility for mid-day trips. As both Metrorail

[redacted]

stations are considered key transit hubs for connection to various modes of transportation, relocating employees will have the opportunity travel throughout the region during mid-day.

In addition, aspects of the DoD Shuttle Plan have been refined subsequent to NCPC's approval of the TMP. Currently, WHS is working with WMATA and DASH on MOAs for the implementation of peak-hour and off-peak enhanced transit service from the BRAC-133 facility to the aforementioned Metrorail stations, Pentagon (15-minute frequency) and King Street (30-minute frequency). The Agreement with DASH will permit all BRAC 133-stationed DoD employees and contractors to use all DASH routes operating throughout the City of Alexandria, seven days a week. The above Agreements were not included in the TMP as coordination meetings between the various entities had not begun. As previously stated, the TMP is viewed by WHS as a strategy plan and not an implementation/operations plan, which both Agreements are considered an aspect of.

Comment 4 (DoDIG Memorandum page 2, Finding 2): The TDM program may be misaligned with employees' needs and preferences.

Army/DoD Response: In 2009 and 2010, the WHS Transportation Planning Team conducted two online transportation/commuter surveys, which focused on current and post-relocation employee transportation requirements, in order to gather supporting information for several BRAC 133 related transportation planning exercises. As the Travel Demand Management (TDM) Strategies highlighted in the TMP are being implemented, our team is consistently referring to the comprehensive data received from the above surveys. For example, the survey results highlight that, in 2010, six percent of the relocating population selected carpool/vanpool as their future typical transportation method to the BRAC 133 facility. Therefore, our team is working to implement an effective Rideshare Program for relocating employees. Over the next several months, the WHS Transportation Planning Team will conduct carpool/vanpool focused meetings with relocating employees. In addition, our team has developed a Transportation Reference Guide (a TMP suggested element) to provide relocating employees with alternative mode reference information that will assist them in determining transportation to and from the facility. This Guide will not only be disseminated to agency POCs, but will also be posted on the Transportation Program's portion of the BRAC 133 website.

In addition over 50 percent of survey respondents, in 2010, indicated they use public transportation and a majority of that percentage currently uses Springfield-Franconia, Pentagon, and West Falls Church stations to access the Metrorail system. The DoD Shuttle Plan is designed as a multi-route shuttle system with the ability to carry over 5,000 passengers a day from the above Metrorail stations.

[redacted]

Comment 5 (DoDIG Memorandum page 2, Finding 2): One Transportation Coordinator employee is not enough to cover the needs.

Army/DoD Response: The TMP states that there will be a team assigned to the task of transportation coordination. WHS is currently developing a Transportation Program Office that will have several members assisting in the transportation efforts of the BRAC-133 TMP implementation. WHS never envisioned that one individual would handle the workload.

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Attachment 3

"Independent Professional Engineering Assessment of Final Environmental Assessment, dated July 2008, and Transportation Management Plan, dated July 2010, for BRAC 133 at Mark Center"
(February 14, 2011)

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Independent Professional Engineering Assessment of Final Environmental Assessment, dated July 2008, and Transportation Management Plan, dated July 2010, for BRAC 133 at Mark Center

This report was prepared for the Department of Defense Inspector Gen eral (DOD OIG) by Acelsior, Inc., and provides an independent engineering assessment of the adequacy of the Transportation on Management Plan and Environmental Assessment for BRAC 133 at Mark Center. The report is based on our analysis of the information provided in the BRAC 133 EA dated July 2008, the BRAC 133 TMP dated July 2010, documents referenced therein and by the various parties interviewed during the assessment.

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FEBRUARY 14, 2011

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EXECUTIVE SUMMARY

INTRODUCTION

In response to a congressional request, the Department of Defense Office of Inspector General contracted the preparation of this report on September 30, 2010. This report provides a detailed independent engineering assessment of two United States Army Corps of Engineers documents related to the Base Closure and Realignment Commission Recommendation Number 133 (BRAC 133) site selection and implementation process: (1) *Final Environmental Assessment: Implementation of 2005 Base Realignment and Closure Recommendation 133,* dated July 2008 (BRAC 133 EA), and (2) the *Transportation Management Plan for BRAC 133 at Mark Center,* dated July 2010 (BRAC 133 TMP).

BACKGROUND

Implementation of BRAC 133 will consolidate 6,409 employees from various Department of Defense and related agencies into two office towers at the Mark Center office park in Alexandria, Virginia. As mandated by the 2005 BRAC legislation, the relocation will occur by September 15, 2011. Upon completion of construction of the BRAC 133 facilities at the Mark Center, ownership of the facility will be transferred to the Department of Army, and the site will become an annex of Fort Belvoir.

In September 2007 the United States Army Corps of Engineers initiated the environmental assessment (EA) process for BRAC 133. At that time two alternatives were identified: the General Services Administration site in Fairfax County, Virginia, and the Victory Center in Alexandria, Virginia. The Mark Center in Alexandria, Virginia, was subsequently added as a third alternative to the BRAC 133 environmental assessment process on December 14, 2007, after the completion of the Army's evaluation of the public Expression of Interest for possible private sites.

The environmental assessment process for BRAC 133 examined and compared the environmental, socioeconomic, and transportation impacts for the three alternative sites. In July 2008 the *Final Environmental Assessment: Implementation of 2005 Base Realignment and Closure Recommendation 133* (BRAC 133 EA) was available for public review. As an outcome of the environmental assessment process, the requirement for the mitigation of the transportation effects, including the implementation of a transportation management plan, was included in the BRAC 133 EA. In September 2008 a Finding of No Significant Impact (FNSI) was issued for all three sites, and the Mark Center was selected as the preferred alternative.

The United States Army Corps of Engineers, in association with the Washington Headquarters Services, began the development of a transportation management plan for BRAC 133 at the Mark Center in October 2009. The completed *Transportation Management Plan for BRAC 133 at Mark Center* (BRAC 133 TMP), dated July 2010, outlined a specific set of programs and strategies for implementation by the Washington Headquarters Services to ensure achievement of the goal of at least 40 percent of BRAC 133 employees commuting to the Mark Center by means other than single-

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occupancy vehicle. Upon completion of the BRAC 133 TMP, the National Capital Planning Commission granted a conditional approval on September 2, 2010.

OBJECTIVES

The overall objective of this independent engineering assessment was to evaluate the sufficiency and adequacy of the *Final Environmental Assessment: Implementation of 2005 Base Realignment and Closure Recommendation 133,* dated July 2008 (BRAC 133 EA), and the *Transportation Management Plan for BRAC 133 at Mark Center,* dated July 2010 (BRAC 133 TMP). A review of the *Finding of No Significant Impact*, dated September 2008, was also conducted.

BRAC 133 ENVIRONMENTAL ASSESSMENT (BRAC 133 EA)

Environmental assessments are prepared to inform decision makers of the environmental consequences of a proposed project. They characterize the potential magnitude of environmental effects and outline actions to mitigate those effects. The Army and the Council on Environmental Quality have regulations regarding the specific elements required for an environmental assessment. The outcome of an environmental assessment is either a Finding of No Significant Impact or a conclusion that a more detailed analysis (i.e., environmental impact statement) be completed.

The outcome of the July 2008 BRAC 133 EA was the September 2008 Finding of No Significant Impact for the three alternative sites—the General Services Administration site, the Victory Center, and the Mark Center. Based on our technical review of the BRAC 133 EA, we determined that the Finding of No Significant Impact was appropriate, based on the information considered at the time of the environmental assessment. However, we have identified two areas of concern: 1) a change in project conditions subsequent to the BRAC 133 EA and the Finding of No Significant Impact that necessitate a reassessment of traffic effects and 2) procedural and technical weaknesses in the BRAC 133 EA. These concerns are further described below.

1) Change in Conditions
During our engineering assessment, a comparison of the traffic conditions described in the BRAC 133 EA (July 2008) and the conditions outlined in the BRAC 133 TMP (July 2010) was conducted. This comparison indicated that a change in traffic conditions occurred subsequent to the September 2008 issuance of the Finding of No Significant Impact and selection of the Mark Center. This change in traffic conditions needs to be reassessed by the Army to determine if the Finding of No Significant Impact is still valid and if the proposed mitigation of intersection improvements is sufficient per Army regulations (32 Code of Federal Regulations 651.5(g)).

The BRAC 133 EA transportation effects analysis described 2011 traffic conditions with and without BRAC 133 in place. The *Transportation Management Plan for BRAC 133 at Mark Center* (BRAC 133 TMP), dated July 2010, presents different traffic conditions and different level of service impacts at certain intersections and ramps. For example, the BRAC 133 TMP indicates the morning peak hour at the Seminary Road/Mark Center Drive intersection would decline to a level of service approaching unstable, and the North Beauregard Street/Seminary Road intersection and the Seminary Road/I-395

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northbound ramp would each operate at an unacceptable level of service. However, the BRAC 133 EA traffic flow projections for these two intersections indicated a level of service with stable conditions.

Given the discrepancies between the traffic condition information provided in the BRAC 133 TMP and that contained in the BRAC 133 EA, there is sufficient justification to require a reassessment to verify the findings of the transportation impacts described in the BRAC 133 EA. The reassessment can be presented in either a Record of Environmental Consideration or supplemental environmental document.

In particular, the reassessment should include a thorough analysis of the cumulative transportation effects of BRAC 133. It is further recommended that the mitigation measures be reviewed as part of the reassessment to ensure that the goal of maintaining existing level of service and "long-term minor adverse impacts" is achieved.

2) Procedural and Technical Weaknesses

The weaknesses identified in the BRAC 133 EA included incomplete scoping and insufficient public involvement, the absence of mitigation monitoring, and incomplete analysis of cumulative effects and vegetative effects. Additionally, the evaluation of resource impacts for the three alternative sites was not presented in the same level of detail. As part of the Fort Belvoir Final Environmental Impact Statement (FEIS for Fort Belvoir), the General Services Administration site was analyzed in greater detail than either the Victory Center or Mark Center sites.

Scoping and Public Involvement

The BRAC 133 EA scoping process, although discretionary according to Army regulations, was initiated but was incomplete. Local agencies, planning agencies, and the Virginia Department of Transportation were excluded from formal notification/invitation letters before and after the Mark Center site was added to the BRAC 133 EA. In addition, certain federal and state agencies contacted in September 2007 for information were not notified when the Mark Center was added as an alternative in December 2007. This may have limited the information available for assessing the impacts of BRAC 133.

While the BRAC 133 EA met the minimal Army requirements for public involvement, it did not achieve the "spirit" of the Council on Environmental Quality regulations because public involvement was not consistent with the level of public interest. According to the Army, the level of public involvement followed standard procedures for all environmental assessments prepared for the BRAC 2005 program. However, no public involvement plan was created, and no public meetings or public hearings were held for the BRAC 133 EA. Although the Army characterized the level of controversy as little to moderate, the 48 news articles about the BRAC 133 project published during the development of the BRAC 133 EA appear to have warranted additional public involvement. Furthermore, the Virginia Department of Transportation's request for a public meeting was not acknowledged. As a result of minimal public involvement and incomplete scoping, information and input that could have been valuable in assessing environmental effects were not obtained.

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Mitigation Monitoring
Mitigation for transportation effects included engineering solutions, such as intersection improvements, and a requirement for a transportation management plan. The components of the transportation management plan were not defined in the BRAC 133 EA, but the BRAC 133 EA established an aggressive goal of 40-percent reduction in single-occupancy vehicle trips. According to Army regulations, the mitigation measures in the Finding of No Significant Impact became legally binding and must be accomplished as the project is implemented. The intersection improvements are required to be completed prior to occupancy of the Mark Center.

Per Army regulations (32 CFR 651.15 (h)), if the outcome of mitigation measures is uncertain, monitoring can be required to determine the effectiveness of the mitigation. Because there was uncertainty in the achievement of the 40-percent trip reduction and in the effectiveness of the mitigation measures in maintaining traffic flow outlined in the BRAC 133 EA, a commitment to monitoring traffic conditions would have been appropriate to ensure that the impacts of BRAC 133 are minor. Should a reassessment be performed, it should include a commitment to monitoring to verify the finding of "long-term, minor, adverse, not significant" effects.

Cumulative Effects
Cumulative effects are defined in the Council on Environmental Quality regulations as "impacts on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions." Cumulative effects provide an overall picture of conditions in the project area.

The cumulative effects analysis of transportation in the BRAC 133 EA was limited because it lacked a summation of past, present, and future traffic conditions (described either by volumes or levels of service). Additionally, the geographic boundary for transportation was limited to intersections within 0.3 mile of the Mark Center, I-395 queuing was not discussed, and the time frame for reasonably foreseeable future actions was only projected to September 2011.
There was also an unequal assessment of regional traffic effects for the three alternative sites. Because the General Services Administration site was part of the Fort Belvoir Final Environmental Impact Statement, a regional travel demand model was completed for that site; however, similar modeling was not completed for the Victory Center or the Mark Center during the BRAC 133 environmental assessment process.

The weaknesses in the Cumulative Effects section of the BRAC 133 EA may not be sufficient by themselves to require a supplemental environmental assessment. However, if a reassessment of project conditions of the BRAC 133 EA is undertaken, it should include a more thorough analysis of the cumulative effects.

Vegetation Effects
Vegetation effects relating to the removal of eight acres of wooded area at the Mark Center were not completely analyzed. Because there was insufficient information in the BRAC 133 EA to provide an appropriate context for analysis or a threshold level of effect, the finding of "short- and long-term minor adverse effects" is not supported for the vegetation effects. If a reassessment of project conditions is completed, additional analyses should be provided regarding the context and threshold level of effect for vegetation.

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Alternative Identification Process

In addition to the weaknesses outlined above, the alternatives identification process for ascertaining a reasonable range of government-owned and privately owned site alternatives was reviewed.

The Army issued a request for Expression of Interest on October 5, 2007, to identify potential private sites for BRAC 133. This Expression of Interest included the criterion that the BRAC 133 building location be within one mile of a Metro station. Subsequently, on October 23, 2007, the Expression of Interest was reposted with the criterion revised to state that the location within one-mile of any metro station was not a requirement. According to the United States Army Corps of Engineers in an interview on December 3, 2010,

> *The proximity to Metro requirement, as well as the other preliminary screening criteria specified in the Request for Expressions of Interest, was intentionally not stated as a "minimum" requirement. While these requirements clearly expressed a preference by the Government, our intent was to leave enough flexibility in the requirements to permit a wide range of site possibilities for our consideration from an overall best value perspective.*

The two-phase site screening process first reduced the privately owned sites to those that could satisfy the government's site criteria. Then the remaining sites were screened against one another to determine which provided the best value to the government. The Victory Center continued forward in the process, and the Mark Center, which is nearly three miles away from the nearest metro station, was also added to the BRAC 133 environmental assessment as an alternative site. After the two-phase private site analysis, the Mark Center was determined to be the private site with the best value, and it was then compared against the government-owned sites.

The site selection process utilized was appropriate and sufficient to develop a reasonable range of alternatives, and the selected Mark Center alternative met the Purpose and Need of the environmental assessment.

BRAC 133 TRANSPORTATION MANAGEMENT PLAN (BRAC 133 TMP)

A transportation management plan is prepared by a developer or a major employer for the purpose of shaping travel behavior to a worksite in order to minimize use of single-occupancy vehicles. Included are travel demand management programs and strategies to encourage commuting by means other than single-occupancy vehicles (e.g., carpools, vanpools, public transit, shuttles, walking, and/or biking). A transportation management plan also documents how the worksite's travel demand management strategies will be implemented to bring transparency to an employer's approach and level of commitment to encourage non-single-occupancy vehicle use. A transportation management plan is not developed to facilitate travel by single-occupancy vehicles, and it is not a plan for capital (physical) improvements. Roadway improvements are therefore beyond, and may even contradict, the purposes of a transportation management plan.

The BRAC 133 TMP fulfills the purpose of a transportation management plan by presenting a strong variety of direct and indirect travel demand management strategies to enable and encourage

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commuting to BRAC 133 by the presumed non-single-occupant-vehicle modes of travel. The monitoring and evaluation plan clearly describes how Washington Headquarters Services will measure non-single-occupancy-vehicle use to potentially adjust or fine-tune BRAC 133 travel demand management strategies.

The BRAC 133 TMP was developed publicly and was shaped with the input of stakeholders. The document provides adequate and valid information about the Mark Center site, as well as data sources and assumptions regarding anticipated employee mode use. However, the BRAC 133 TMP has the following weaknesses that may compromise the feasibility of achieving a 40-percent reduction in single-occupancy-vehicle trips and may consequently impose further adverse impacts on the roadway network:

- Omission of a travel demand management strategy to implement, facilitate, and encourage use of a planned Department of Defense shuttle service to five Metrorail stations that the BRAC 133 TMP technical analysis assumes will be relied upon by 26 percent of BRAC 133 employees
- Inadequate mid-day transportation strategies to support the mobility needs of approximately 2,300 commuters to BRAC 133 who will not have a car available
- Insufficient parking overflow management strategies to ensure that BRAC 133 employees, particularly single-occupancy-vehicle drivers, do not utilize off-site parking rather than using non-single-occupancy-vehicle modes of travel
- Potentially insufficient Transportation Coordinator staffing, given the time frame of relocation and the range of responsibilities articulated the travel demand management plan
- Potential misalignment of travel demand management program and strategies with employees' needs and preferences

In addition, while the traffic impact analysis undertaken for the BRAC 133 was adequate for the purposes of developing a transportation management plan, a more technically robust stand-alone traffic impact analysis would be needed to confirm the accuracy of the BRAC 133 TMP's findings with respect to

- Existing and projected peak-hour traffic volumes;
- Appropriate site variables (for purposes of accurate modeling);
- Potential queues caused by the access control facility to the south parking garage; and
- Effects of BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 study limits.

OVERALL ASSESSMENT CONCLUSIONS

Based upon information available at the time of the analyses and contained in the BRAC 133 EA, the Finding of No Significant Impact was appropriate. However, procedural and technical weaknesses were identified in the preparation of the BRAC 133 EA that limited the effects analysis presented within it. Of significance is that the project conditions relating to traffic appear to have subsequently changed from those predicted in the BRAC 133 EA. Traffic conditions appear to be more congested,

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and the proposed mitigation may not be sufficient to ensure "long-term minor but not significant effects." Army regulations (32 Code CFR 651.5(g)) require a review if there is a change in project conditions; a reassessment is needed to verify the findings of the BRAC 133 EA. This reassessment would be appropriately documented either in a Record of Environmental Consideration or in a Supplemental Environmental Assessment. The reassessment should also include a traffic impact analysis and monitoring program to confirm the sufficiency of the transportation mitigation measures outlined in the BRAC 133 EA. Furthermore, this information could be used to update the traffic impact analysis section of the BRAC 133 TMP.

The BRAC 133 TMP is adequate and notably strong from the procedural standpoint of implementing a publicly accessible and responsive plan development process. However, the BRAC 133 TMP should be revised and updated to include several critical travel demand management strategies, including the shuttle program, to ensure the achievement of the BRAC 133 TMP's two goals: (1) achieve 40 percent or more non-single-occupancy vehicle trips to the site in order to minimize traffic effects on the neighboring community and (2) facilitate tenant mobility to the site by providing a viable transportation program in order to help employees choose appropriate commute methods for getting to the Mark Center.

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1 INTRODUCTION

1.1 BACKGROUND

On November 9, 2005, the recommendations of the Defense Base Closure and Realignment Commission became law as provided for in the Defense Base Closure and Realignment Act of 1990 (Public Law 101-510, as amended).

One of the Defense Base Closure and Realignment Commission recommendations, known as BRAC Commission Recommendation Number 133 (BRAC 133), consists of relocating various Department of Defense (DOD) and related agencies from leased spaces throughout the National Capital Region to Fort Belvoir, Virginia. A total of 6,409 employees are affected. As mandated by the legislation, the relocation will occur by September 15, 2011.

The United States Army Corps of Engineers (USACE) completed the Final Environmental Impact Statement for Fort Belvoir (FEIS for Fort Belvoir) in June 2007. The FEIS for Fort Belvoirstudied the impacts of the BRAC relocation of up to 22,000 personnel to Fort Belvoir. Due to the significant impacts to Fort Belvoir, a separate environmental assessment was commissioned by the USACE and was completed in July 2008 (BRAC 133 EA) to study multiple locations outside of Fort Belvoir for BRAC 133 operations. The BRAC 133 EA resulted in a Finding of No Significant Impacts (BRAC 133 FNSI), signed on September 25, 2008, for three alternative sites in Virginia: the Mark Center and the Victory Center sites in Alexandria and the General Services Administration site in Fairfax County. The BRAC 133 FNSI includes the decision to select the Mark Center site alternative. The BRAC 133 FNSI also includes a recommendation to prepare a transportation management plan for the Mark Center.

The USACE, in association with the Washington Headquarters Services, began the development of a transportation management plan for BRAC 133 at the Mark Center (BRAC 133 TMP) in October 2009. The BRAC 133 TMP outlined a specific set of programs and strategies to be implemented by the Washington Headquarters Services to ensure meeting the goal of at least 40 percent of BRAC 133 employees commuting to the Mark Center by means other than single-occupancy vehicle. Upon completion of the BRAC 133 TMP, the National Capital Planning Commission granted a conditional approval of the BRAC 133 TMP on September 2, 2010.

Upon completion of construction of the BRAC 133 facilities at the Mark Center, ownership will be transferred to the Army, and the site will become an annex of Fort Belvoir.

In response to a congressional request, the DOD Office of Inspector General contracted the preparation of this report on September 30, 2010. This report provides a detailed assessment of two United States Department of Army (Army) documents related to the Base Closure and Realignment Commission Recommendation Number 133 (BRAC 133) site selection and implementation process: (1) *Final Environmental Assessment: Implementation of 2005 Base Realignment and Closure Recommendation 133,* dated July 2008 (BRAC 133 EA), and (2) the *Transportation Management Plan for BRAC 133 at Mark Center,* dated July 2010 (BRAC 133 TMP).

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1.2 SCOPE

The scope of the independent professional engineering assessment is the review, verification, and validation of the (1) *Final Environmental Assessment: Implementation of 2005 Base Realignment and Closure Recommendation 133,* dated July 2008 (BRAC 133 EA), and (2) the *Transportation Management Plan for BRAC 133 at Mark Center,* dated July 2010 (BRAC 133 TMP). In addition, a review of the *Finding of No Significant Impact*, dated September 2008, was also conducted. The overall objective was to evaluate the sufficiency and the adequacy of the procedures, data, assumptions, and methods used in the development of each report and the conclusions derived thereof.

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2 ASSESSMENT OF JULY 2008 BRAC 133 ENVIRONMENTAL ASSESSMENT (BRAC 133 EA)

2.1 SUMMARY

Based upon information available at the time of the analyses and contained in the BRAC 133 EA, the Finding of No Significant Impact was appropriate. However, procedural and technical weaknesses were identified in the preparation of the BRAC 133 EA that limited the effects analysis presented within it. Of significance is that the project conditions relating to traffic appear to have subsequently changed from those predicted in the BRAC 133 EA. Traffic conditions appear to be more congested, and the proposed mitigation may not be sufficient to ensure "long-term minor but not significant effects." Army regulations (32 Code CFR 651.5(g)) require a review if there is a change in project conditions; a reassessment is needed to verify the findings of the BRAC 133 EA. This reassessment would be appropriately documented either in a Record of Environmental Consideration or in a Supplemental Environmental Assessment. The reassessment should also include a traffic impact analysis and monitoring program to confirm the sufficiency of the transportation mitigation measures outlined in the BRAC 133 EA. Furthermore, this information could be used to update the traffic impact analysis section of the BRAC 133 TMP.

2.2 BACKGROUND

The United States Army Corps of Engineers (USACE) initiated an environmental assessment of the potential environmental and socioeconomic effects associated with implementing Base Realignment and Closure (BRAC) 133 on September 19, 2007. The BRAC 133 EA was available in July 2008 for public comment. Subsequently, the Army issued a Finding of No Significant Impact on September 25, 2008. BRAC 133 required the relocation of 6,409 personnel, consisting of various Department of Defense (DOD), Defense Agency, and Field Activities staff, including Washington Headquarters Services, to Fort Belvoir. Fort Belvoir was defined by the Army for the BRAC 133 EA to include the General Services Administration warehouse site in Springfield, Virginia, or other potential non-contiguous sites for BRAC 133 in the vicinity of Fort Belvoir. *Figure 1: BRAC 133 Alternative Site Location Map* (Source: Page 3-6 of the *BRAC 133 July 2008 EA Report*) depicts the location of the three alternative sites (General Services Administration site, Victory Center, and Mark Center) evaluated.

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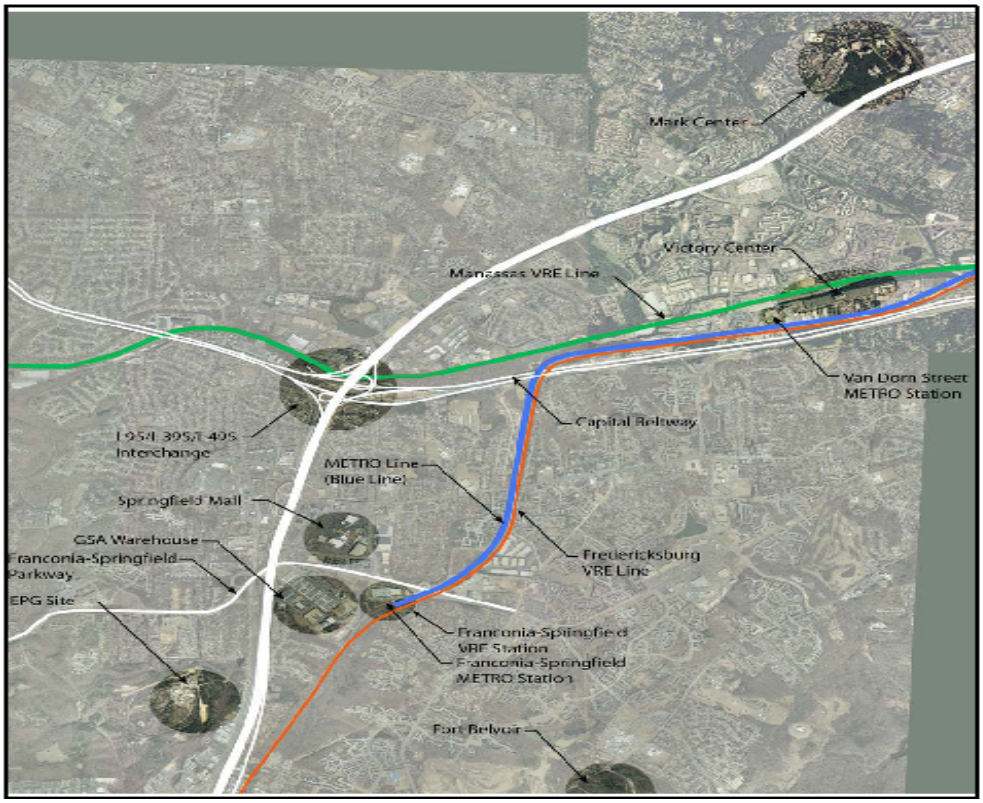

Figure 1: BRAC 133 EA Alternatives Site Location Map

The June 2007 *Final Environmental Impact Statement for Implementation of 2005 Base Realignment and Closure (BRAC) Recommendation and Related Army Actions at Fort Belvoir, Virginia* (FEIS for Fort Belvoir) identified an adverse traffic effect associated with the relocation of 22,000 personnel to Fort Belvoir. To minimize the traffic effect at Fort Belvoir, BRAC 133 was proposed for an offsite location. Two other sites, the Engineer Proving Ground and the Fort Belvoir Main Post, were evaluated in the FEIS for Fort Belvoir and were considered viable alternatives but were not included in the BRAC 133 EA as they had already been environmentally assessed.

The BRAC 133 EA documented the purpose of the proposed project, alternatives that were analyzed, environmental resources in the area, the effects of the alternatives upon these resources, and public involvement. As stated in the BRAC 133 EA, "The purpose of the EA is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives."

As specifically stated in the Army regulations,

> ***32 CFR 651.11(d) Environmental Assessment***
> *Proposed Army actions not covered in the first three categories (paragraphs (a) through (c) of this section) must be analyzed to determine if they could cause significant impacts to the human or natural environment (see §651.39). The EA determines whether possible impacts are significant, thereby warranting an EIS.*

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> *This requires a "hard look" at the magnitude of potential impacts, evaluation of their significance, and documentation in the form of either an NOI [Notice of Intent] to prepare an EIS or an FNSI [Finding of No Significant Impact]. The format (§651.34) and requirements for this analysis are addressed in subpart E of this part (see §651.33 for actions normally requiring an EA). The EA is a valuable planning tool to discuss and document environmental impacts, alternatives, and controversial actions, providing public and agency participation, and identifying mitigation measures.*

At the conclusion of the BRAC 133 EA, a Finding of No Significant Impact was prepared. This document described the reasons for the determination that an environmental impact statement was not needed and was published with the BRAC 133 EA for public comment and review. The specific elements of the Finding of No Significant Impact are 1) name of the action, 2) brief description of the action, 3) short discussion of the anticipated environmental effects, 4) the facts and conclusions that have led to the finding, and 5) a deadline and point of contact for further information or public comments.

The time line of BRAC 133 EA activities provides a perspective to project length and the site selection activities with the environmental assessment process. *Table 1: BRAC 133 EA Timeline of Activities* depicts activities from June 2007, when the FEIS for Fort Belvoir was completed, through early January 2009. The BRAC 133 EA was initiated September 18, 2007, with two alternatives, the GSA site and the Victory Center, under evaluation. In December 2007 the Mark Center was added as the third alternative being evaluated. The BRAC 133 EA issued in July 2008 for public comment and review described all three alternatives as well as the No Action alternative. Subsequently, the BRAC 133 Finding of No Significant Impact was signed September 25, 2008, with the Mark Center identified at that time as the preferred alternative.

This assessment of the BRAC 133 EA encompasses both a review of how well the environmental assessment process conforms to National Environmental Policy Act (NEPA) of 1969 and the Army and Council on Environmental Quality regulations, and an assessment of the evaluation methods used to develop the BRAC 133 EA.

The assessment of the BRAC 133 EA is provided in the following four sections:

1. Assessment of process and procedures
2. Assessment of data and methodologies
3. Assessment of outcomes and conclusions
4. Summary of BRAC 133 EA Results

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Table 1: BRAC 133 EA Timeline of Activities

Activities	Date
Fort Belvoir Final Environmental Impact Statement (FEIS) Signed	June 2007
Fort Belvoir FEIS Record of Decision Signed	August 7, 2007
BRAC 133 Environmental Assessment Initiated with contractor	**Sept. 19, 2007**
Scoping Letters for EA Transmitted to Agencies (with GSA, Victory Center alternatives)	Sept.26, 2007
Source Selection Plan Approved	Oct. 2, 2007
Request for Expression of Interest for BRAC 133 Action	Oct. 4, 2007
Reposting of Expression of Interest with one-mile transit criterion removed	Oct. 23, 2007
Closing Date for Expressions of Interest	Nov. 5, 2007
Proposals Opened	Nov. 5, 2007
Memorandum of Decision identifying Mark Center and Victory Center as selected sites	Dec. 14, 2007
Scoping letters sent to US Fish & Wildlife, Virginia Dept. Game & Inland Fisheries, Virginia Dept. of Historic Resources, and Virginia Dept. Conservation & Wildlife with Mark Center alternative identified	Dec. 31, 2007
New RFP Issued for Mark Center and Victory Center data for BRAC 133 Action	June 6, 2008
Final BRAC 133 Environmental Assessment Signed (July 2008) and placed on public notice with draft Finding of No Significant Impact (FNSI), draft FNSI issued, public comment period begins	**July 14, 2008**
Initial Proposals Received from Private Sites	July 30, 2008
Initial Evaluations of Private Sites	August 2008
Public Comment period for Final EA/draft FNSI closes	August 13, 2008
Site Selection Evaluation and Recommendations	Sept. 2-16, 2008
First Issuance of SSA Decision regarding Site Selection	Sept. 19, 2008
Finding of No Significant Impact for BRAC 133 Signed	**Sept. 25, 2008**
Army notifies Hill of intent to award contract	Nov. 10, 2008
Center for Naval Analysis (CNA) writes various DOD officials and representatives of concerns with project and asks for intervention given pending contract award	Nov. 12, 2008
Asst Sec Eastin tells CNA that CNA must talk to Duke	Nov. 18, 2008
Army awards contract to Duke Realty	Nov. 25, 2008
CNA files suit vs. Army to toll Statute of Limitations	Nov. 25, 2008
Army holds public meeting disclosing details on project	Dec. 4, 2008
Duke Realty conveys property to Army	Dec. 8, 2008
CNA tables proposals to Duke Realty (site mitigation and relocation request) and asks for meeting with the Army	Dec. 9-14, 2008
CNA Serves SECARMY with the lawsuit	Dec. 20, 2008
Suit denuded	Dec. 20, 2008-Jan. 10, 2009

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2.3 ASSESSMENT OF BRAC 133 EA PROCESSES AND PROCEDURES

The process and procedural elements of the BRAC 133 EA must conform to federal regulations, based on the National Environmental Policy Act (NEPA) of 1969. Verifying compliance with the Council on Environmental Quality requirements as stated in 40 *Code of Federal Regulations (CFR) Parts 1500 to 1508* and the DOD requirements as stated in *32 CFR Part 651* is the first step of the procedural analysis. According to *42 USC National Environmental Policy, Section 102(2)(A) Chapter 55*, agencies of the federal government are required to "utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and decision-making which may have an impact on man's environment."
Each element of the BRAC 133 EA was assessed with regards to conformity with and applicability of these regulations. The analysis is presented in the following seven subsections:

1. Scoping/Agency Coordination /Public Involvement
2. Purpose and Need
3. Alternatives Identification
4. Environmental Resource Characterization
5. Environmental Consequences
6. Cumulative Effects
7. Mitigation and Monitoring

To verify that the Council on Environmental Quality and the Army regulations were followed, applicable regulatory requirements were reviewed in the context of information and processes utilized to develop the BRAC 133 EA.

2.3.1 SCOPING/AGENCY COORDINATION/PUBLIC INVOLVEMENT

2.3.1.1 BACKGROUND

Public and agency participation during the environmental assessment process includes scoping activities as well as additional public involvement actions, such as public notices and public meetings. A project is initiated through a scoping process that collects information from agencies, organizations, and individuals regarding the proposed action. The appropriate level of public involvement and agency coordination is dependent upon the specific context and character of the proposed action.

2.3.1.2 SCOPING/AGENCY COORDINATION

Scoping is an early and open process that is implemented to determine the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process, which is discretionary for environmental assessments (per 32 CFR 651.14(d)(4), p. 413), includes inviting the participation of affected federal, state, and local agencies, any affected Indian tribe, the proponent of the action, and other interested persons.

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Scoping activities for the BRAC 133 EA occurred to announce the proposed action and to obtain information. In addition to the two government-owned alternatives identified in the FEIS for Fort Belvoir (i.e., Fort Belvoir Main Post and the Engineer Proving Ground), the Army issued scoping letters in September 2007 stating that three additional alternatives would be considered in the environmental assessment: the GSA site, the privately owned Victory Center site, and No Action alternative. Scoping letters were then sent to eight federal agencies, four state agencies, and three Indian tribes in September 2007.

The September 26, 2007, letter sent to federal and state agencies stated the purpose of BRAC 133 EA is "to inform you of this undertaking and to ask for your input during this process if you choose. If you do so choose, the Army will periodically ask for your review and input as it proceeds with its environmental assessment. The Army is requesting you identify any issues that are likely to have an impact on environmental, sociological, or economic resources or to be controversial during the planning process."

The scoping letters and public announcement in September 2007 did not include the Mark Center alternative, because the Request for Expression of Interest was still in process. Subsequent to the addition of the Mark Center site on December 31, 2007, scoping letters identifying the Mark Center as a new alternative were transmitted to four agencies: the United States Fish and Wildlife Service, Virginia Department of Game and Inland Fisheries, Virginia Department of Historic Resources, and the Virginia Department of Conservation and Recreation. There is no record of formal notification of any other agency.

The public was informed on January 23, 2008, that the Mark Center had been added as a BRAC 133 EA alternative. There was no other scoping activity that occurred.

Formal coordination with City of Alexandria, Fairfax County, the Virginia Department of Transportation, and local planning agencies, such as Metropolitan Washington Council of Governments, did not occur during the evaluation of alternative site selection. However, the Virginia Department of Transportation and Fairfax County provided scoping comments as a result of the public notice process. Fairfax County provided 85 comments regarding a variety of environmental resources; however, these comments were provided prior to the addition of the Mark Center alternative. The Virginia Department of Transportation's comments encouraged the Army to publish a draft document and to hold a public hearing prior to finalizing the environmental assessment.

The Army did solicit input from Fairfax County and the City of Alexandria as the BRAC 133 EA was being developed. A March 2008 draft environmental assessment document was forwarded to both entities for their input. The City of Alexandria did not comment upon this draft. Fairfax County did provide comments on the environmental, transportation, land use, socioeconomic, transit, transportation, and noise aspects, as well as other general comments regarding the draft BRAC 133 EA.

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2.3.1.3 PUBLIC INVOLVEMENT

Army regulations encourage public involvement for all Army Actions, including environmental assessments. Public comments will be invited and two-way communication channels will be kept open. The public involvement approach includes agencies and other public parties with interest in the proposed action. The appropriate public involvement process is defined at the initiation of a project and determined based on the following factors outlined in the Army regulations 32 CFR 651.36(b):

- Magnitude of proposed plan
- Extent of anticipated public interest, based on experience with similar projects
- Urgency of the proposal
- National security classification
- Presence of minority or economically disadvantaged populations

A public notice was posted for the announcement of the development of the BRAC 133 EA. The purpose of the September 18, 2007, BRAC 133 EA public announcement was to obtain comments on the action during this process, to identify any issues that are likely to have an impact on the environment, transportation, or socioeconomic resources, and to identify reasonable alternative sites other than those identified.

No public involvement plan was prepared for the BRAC 133 EA, although a communications plan for internal coordination was developed. There is no record of public meetings or public hearings held in conjunction with the specific development or release of the BRAC 133 EA.

According to the USACE, the standard protocol established for the BRAC 133 EA did not include holding public meetings, and this protocol complied with Army regulations. The only documented public meeting activity in the BRAC 133 Administrative Record was the mention of a table with information regarding BRAC 133 included in a May 28, 2008, public meeting by the Federal Highway Administration (FHWA) pertaining to I-95 ramp improvements. According to the USACE, no public involvement plan was prepared, as the level of public interest was “little to moderate” during the environmental assessment process. The USACE followed article 32 CFR 651.14(b)(2) of Army regulations as the basis for the public notification process. This article requires that the final BRAC 133 EA and draft BRAC 133 FNSI be available for public review for 30 days.

In compliance with Army regulation 32 CFR 651.14(b)(2), USACE posted the Notice of Availability in six local newspapers and on the Internet. In addition, the BRAC 133 EA was placed in 11 local libraries, and copies were distributed to 258 agencies, citizens, and groups. The BRAC 133 EA was also available for direct download from the Army BRAC division website.

Because there were no public meetings for the BRAC 133 EA, the level of public interest can only be assessed according to the responses received during and at completion of the environmental assessment. According to the BRAC 133 Administrative Record, numerous articles were published:

- Twenty-eight articles appeared between September 18, 2007, and December 31, 2007, when the BRAC 133 EA was in process and prior to adding the Mark Center alternative.

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- Fifteen articles appeared between January 1, 2008, and July 14, 2008, when the BRAC 133 EA was released for public comment.
- Five articles appeared between July 15, 2008, and September 25, 2008, when the BRAC 133 Finding of No Significant Impact was signed.

Additionally, 11 agencies or government entities and three members of the public commented on the BRAC 133 EA. There were no other written comments submitted during the 30-day public comment period. The public comment period ended August 13, 2008, prior to the selection of the Mark Center as the preferred alternative.

Based upon the number of news articles contained in the BRAC 133 Administrative Record and generated during the environmental assessment process, there was public interest in the alternatives decision. According to the USACE, the level of public interest increased after the site selection and completion of the environmental assessment process.

2.3.1.4 OBSERVATIONS: SCOPING/AGENCY COORDINATION/PUBLIC INVOLVEMENT

1. Based upon the five factors outlined in 32 CFR 651.36(b), the level of public involvement activities for the BRAC 133 EA was limited. Determining appropriate public involvement is a judgment call based upon the level of public interest or controversy. Public interest, as measured by the number of news articles, appears to have warranted additional public involvement. The BRAC 133 EA met Army requirements, but it did not achieve the "spirit" of the Council on Environmental Quality regulations, as public involvement activities were not consistent with the level of public interest.
2. The draft BRAC 133 FNSI and final BRAC 133 EA were appropriately advertised and available for review per Army Regulation 32 CFR 651.14(b)(2).
3. The scoping process was incomplete. Local agencies, planning agencies, and VDOT were excluded from formal notification/invitation letters before and after the Mark Center site was added to the BRAC 133 EA. In addition, certain federal and state agencies contacted in September 2007 for information were not notified when the Mark Center was added as an alternative in December 2007.
4. The public comment period ended on August 13, 2008, prior to the selection of the preferred alternative, the Mark Center, identified in the BRAC 133 FNSI published on September 25, 2008.

SIGNFICANCE OF OBSERVATIONS

The restricted input from interested neighbors, agencies, and organizations reduced the information used in the BRAC 133 EA analysis. This limitation could have affected the assessment of impacts, especially regarding traffic conditions.

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2.3.2 PURPOSE AND NEED

2.3.2.1 BACKGROUND

The purpose of the BRAC 133 action is to provide administrative space for 6,409 personnel for various units, agencies, and activities by September 15, 2011. The need is to carry out BRAC directives as required by law.

2.3.2.2 OBSERVATIONS: PURPOSE AND NEED

The Purpose and Need were clearly stated in the BRAC 133 EA and were consistent with Army regulation 32 CFR 651.34(b).

2.3.3 ALTERNATIVES IDENTIFICATION

The alternatives development process determines the feasible and reasonable candidates that will accomplish the Purpose and Need while minimizing environmental effects. The process involves identifying a variety of alternatives and then evaluating each for their ability to achieve the Purpose and Need of the proposed action. Alternatives that do not meet the Purpose and Need of the project can be eliminated. Subsequently, other alternatives may be eliminated if their environmental impact is greater than other options that also accomplish the same purpose. The alternatives carried into detailed environmental evaluations must represent a reasonable range of actions. The alternatives identification process, as specified in Army regulation 32 CFR 651.9(c) includes development of a "reasonable range of alternatives" to accomplish purpose and need.

The BRAC 133 EA presented a discussion of the development of a reasonable range of alternatives, during which time the Army was conducting a private site selection process to augment the two government-owned alternatives (Engineer Proving Ground and Fort Belvoir Main Post) that had been identified in the 2007 FEIS for Fort Belvoir.

2.3.3.1 SITE SELECTION PROCESS

The FEIS for Fort Belvoir identified two alternative sites, the Engineer Proving Ground and the Fort Belvoir Main Post, for relocation of employees. To address the adverse transportation impacts of the relocation efforts that were identified in the FEIS for Fort Belvoir, additional sites were considered for the proposed BRAC 133 action. Additional sites private sector and public sector were investigated for inclusion in the BRAC 133 EA.

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2.3.3.1.1 STEP ONE OF PRIVATE SITE SCREENING: ALTERNATIVE IDENTIFICATION AND "DOWN-SELECTION"

The BRAC 133 EA was initiated on September 19, 2007. Subsequently, the Army offered an Expression of Interest solicitation for privately owned sites wishing to be considered for the BRAC 133 action. The original Expression of Interest was published on October 4, 2007, on the Federal Business Opportunities Website (www.fbo.gov) and submittals were accepted from October 5, 2007, to October 25, 2007.

Per the two site selection decision documents, the Army followed a two-step process for private site evaluation to determine which private site(s) to assess in the BRAC 133 EA. In the first step the Army employed a "down-selection" process to narrow the field of alternatives that satisfied the Army's criteria as listed in the Expression of Interest. These site criteria included the following:

- Single or multiple structures supporting 6,409 persons (1.8 million square feet (MSF))
- Remote inspection/delivery facility (minimum 86,000 square feet)
- Parking for 3,845 vehicles
- Security access control points
- Space capable of supporting robust IT requirements
- Sustainable design capable of meeting a Leadership in Energy and Environmental Design (LEED) Silver rating
- In Virginia and within one mile of any Metro station
- Ability to meet Army anti-terrorism/force protection standards of Unified Facilities Criteria 4-010-01

The Army's Expression of Interest provided the following evaluation factors:

- Ability to meet the government's stated requirements for facilities, information technology, amenity, and overall infrastructure
- Overall accessibility of the facility to vehicular traffic and by public transit systems
- Proximity to the Pentagon
- Ability to meet Unified Facilities Criteria (UFC) 4-010-01
- Schedule for completing finished space ready for occupancy
- Character of the neighborhood in terms of compatibility of use and availability of amenities
- For turnkey proposals, financial capability of the offeror to finance and deliver the facilities in accordance with the schedule, as well as experience and technical capabilities to deliver the facilities in accordance with the schedule

The Expression of Interest solicitation was modified by the Army on October 23, 2007, to extend the proposal submittal date to November 5, 2007. The Army reposted the amended solicitation on www.fbo.gov along with responses to the nine questions from interested parties. One question and response related to the Army revision of the criteria regarding site proximity to a transit station.

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On December 3, 2010, the USACE provided follow-up comments regarding the change in the transit requirement per the modified solicitation. The USACE stated, In responses to the initial site selection process, developers asked if transit was a true requirement for the project. Army staff determined that transit access within one mile was not stated as a minimum requirement. Therefore, the Army redeveloped the request for proposal and posted the request for proposal online with the following comment: "While they clearly indicate a preference by the Government, our intent was to leave enough flexibility in the requirements to permit a wide range of possibilities for our consideration from an overall best value perspective." The Army did not want to limit responses to the request for proposal with the inclusion of the transit requirement.

Seven private entities submitted proposals in response to the request for Expression of Interest, and the following entities were identified in Section 2.4 of the BRAC 133 EA:

- Clark Construction Company
- Kettler, Inc.
- VORNADO/Charles E. Smith
- American Building Corporation
- Washington Real Estate Investment Trust
- Duke Realty Corporation (Duke Realty) (Mark Center)
- Jones Lang LaSalle/Prudential Financial (Victory Center)

The site selection governance included the following:

- Site Selection Evaluation Board
- Site Selection Authority
- Site Selection Evaluation Team

The December 14, 2007, *Memorandum of Decision Solicitation No. DACA31-R-08-0034* (AR 228) summarized the request for proposal process, the sites considered, the evaluation process, and the findings of the Step One site evaluations. The memo documents the process by which the Site Selection Evaluation Board reviewed the proposals, in accordance with the source selection plan, site criteria, and site evaluation factors identified in the September 2007 Expression of Interest.

The December 2007 Memorandum of Decision found that two of the seven considered sites represented the best opportunities for success in meeting the BRAC 133 program needs. These sites were the Victory Center (Jones Lang LaSalle/Prudential Financial–Offeror A), which had been previously identified in the September 26, 2007, scoping letters, and a new alternative for consideration, the Mark Center (Duke Realty–Offeror B). These alternatives, in addition to the No Action alternative and the GSA site, were assessed in the BRAC 133 EA. Two other government sites, the Engineer Proving Ground and Fort Belvoir Main Post, previously had undergone environmental analysis in the FEIS for Fort Belvoir.

2.3.3.1.2 STEP TWO OF PRIVATE SITE SCREENING: EVALUATION OF MARK CENTER VS. VICTORY CENTER

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The second step of the private site screening compared the Mark Center and the Victory Center. Both the Mark Center and the Victory Center alternatives were assessed in the BRAC 133 EA during the site selection process. To further evaluate the private sites, the Army issued a second request for proposal in June 2008, requesting that the Mark Center and the Victory Center provide detailed development proposals for evaluation by the SSET for the BRAC 133 action.

According to the 2008 site selection decision document, the private site criteria in the June 6, 2008, request for proposal were modified from the October 2007 criteria and evaluation factors. The June 6, 2008, evaluation factors are summarized as follows:

Factor 1: Project Schedule
Understanding of scope, effectiveness of the proposed schedule management plan, schedule realism, innovation in delivery, proposed duration for substantial completion, and risk management

Factor 2: Traffic Mitigation and Management
Realism and approval of the offeror's traffic improvement and management plan (TIMP), effectiveness of the TIMP to mitigate the effects of construction-related traffic on the local area, traffic within site, future costs associated with the TIMP, effectiveness of the TIMP to accommodate government transportation operations, effect of proposed Anti-Terrorism Force Protection United Facilities Criteria design on the preceding factors, and modes of public transportation that are accessible and the degree of accessibility and operability of these modes to the site

Factor 3: Site Adaptability
Effectiveness, realism, and design approach in satisfying Anti-Terrorism Force Protection United Facilities Criteria requirements; quality of the existing site, nearby amenities and quality of neighborhood; site utilities; quality of site development; and ability to accommodate future expansion and growth

Factor 4: Technical Approach
Anti-Terrorism Force Protection designs' effectiveness while maintaining aesthetics and design flexibility, number of personnel and related parking accommodations, quality of the overall architectural aesthetic, efficiency and flexibility of floor plates and the ability to accommodate changes in personnel requirements, and mechanical/electrical selection of systems and energy conservation

Factor 5: Team Qualifications/Management Approach
Organization, relevant project experience, quality control strategy, past performance, small business utilization, technical approach for design and construction, building information modeling (BIM), and financial information

The Mark Center and the Victory Center were individually rated by the Site Selection Evaluation Team based upon the preceding criteria. The Site Selection Evaluation Board delivered their site recommendations. The September 19, 2008, site selection decision memo determined that the Mark Center would have better value to the government than the Victory Center.

The Victory Center and the Mark Center differed on three evaluation factors: Traffic Mitigation and Management, Site Adaptability, and Technical Approach. The Victory Center was rated higher than

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the Mark Center for Traffic Mitigation and Management although both were acceptable. The Mark Center was rated higher than the Victory Center for Site Adaptability and Technical Approach.

The Site Selection Authority found that the Mark Center, offered by Duke Realty, was "the highest technically rated and lowest priced offer." On September 19, 2008, the Site Selection Authority declared that Duke Realty was the apparent successful offeror.

2.3.3.1.3 STEP THREE: ALTERNATIVES SCREENING: MARK CENTER VS. GOVERNMENT-OWNED SITES

The site selection decision memo issued on September 29, 2008, detailed the next step of the BRAC 133 EA alternatives screening, the assessment of the privately held Mark Center site against the following government sites: GSA site, Engineer Proving Ground site, and Fort Belvoir Main Post site. The Site Selection Evaluation Team evaluated the three government-owned sites and the Mark Center based on four factors:

- Project Schedule
- Traffic Mitigation and Management
- Site Adaptability
- Technical Approach

The results of this screening found the Duke Realty offer of the Mark Center to be the highest technically rated and lowest-priced offer, and thus it was the successful offeror. The assessment found that the government-owned sites would not be able to satisfy the requirement to be ready for occupancy by the target date.

The site evaluation showed that the largest differentiating criterion among the sites was the project schedule. The Mark Center was found to have an equal amount of strengths and weaknesses in this category. All three government sites, however, were found to fail the mandatory minimum requirement of having the facility ready for use by the target date. The site selection decision document states on page 6, "Pursuant to 1.5.5 of the RFP, 'Failure to satisfy all of the mandatory minimum requirements will preclude further evaluation and result in the rejection of the proposal.' If the Government-owned sites were private proposals, they would have been rejected and not considered further."

2.3.3.2 EVALUATION OF ALL REASONABLE ALTERNATIVES

Rigorously exploring and objectively evaluating all reasonable alternatives is an objective of the environmental assessment process. The process requires that the environmental effects of a reasonable range of alternatives be considered in the environmental assessment process. The alternatives studied included the Victory Center and the Mark Center in Alexandria, Virginia, which were not part of the FEIS for Fort Belvoir, and the GSA site, which was included in the FEIS for Fort Belvoir.

2.3.3.3 OBSERVATIONS: ALTERNATIVE IDENTIFICATION

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1. The alternative screening process criteria were clearly stated in the BRAC 133 EA, and a reasonable range of alternatives were carried forward through the site selection process.
2. The evaluation criteria were found to have been modified during the alternatives identification and evaluation process. Most notably, the requirement for a considered site to be within one mile of a Metro station was revised to an assessment of general site accessibility and a review of public transportation options.
3. Per the December 2007 decision memo, the Mark Center and the Victory Center scored highest of the private sites and were carried forward for analysis in the BRAC 133 EA. Subsequently, the Mark Center was found to be of better value to the government than the Victory Center. The Mark Center was also found to be of higher value than the three government-owned sites: GSA, Engineer Proving Ground, and Fort Belvoir Main Post. The major factor in this finding was that the government-owned sites would not be able to satisfy the requirement of being ready for occupancy by the target date, a legislative requirement. This criterion is also part of the Purpose and Need of BRAC 133.
4. For each alternative the environmental resource characteristics and effects were discussed in the BRAC 133 EA. Twelve resource areas (land use, transportation, air quality, noise, geology and soils, aesthetics, utilities, hazardous materials, water resources, biological resources, cultural resources, and socioeconomic resources) were analyzed. The sufficiency of the analysis of each resource is discussed in Section 3.3.

SIGNFICANCE OF OBSERVATIONS

The development of a reasonable range of alternatives and the site selection decision process appear to be appropriate and sufficient per the Army's clearly stated assessment criteria.

2.3.4 ENVIRONMENTAL RESOURCE CHARACTERIZATION

2.3.4.1 BACKGROUND

The BRAC 133 EA described the existing characteristics of 12 environmental resource areas representing both social and natural resources that potentially could be affected by the proposed action. Information on resources was gathered through scoping with federal and state agencies, literature reviews, and data collection from available Internet sources. Information from the FEIS for Fort Belvoir was also used, in conjunction with data provided by local developers, the City of Alexandria, and Fairfax County. Formal scoping activities for the Mark Center did not include local agencies or all federal and state agencies initially contacted for the two alternatives first identified.

2.3.4.2 OBSERVATIONS: ENVIRONMENTAL RESOURCE CHARACTERIZATION

1. The resource areas identified were sufficient and consistent with Council on Environmental Quality and Army regulations.
2. The scoping process was incomplete regarding local agencies and organizations, as discussed in Section 2.3.1.

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SIGNFICANCE OF OBSERVATIONS

The incomplete scoping process potentially affected the collection of resource information from the planning, transportation, and resource agencies and a description of the resources in the BRAC 133 EA.

2.3.5 ENVIRONMENTAL CONSEQUENCES ANALYSIS

2.3.5.1 BACKGROUND

The evaluation of potential environmental effects includes three components: direct effects, indirect effects, and cumulative effects. Direct effects are caused by the proposed action and occur the same time and place where the action occurs. Indirect effects are caused by the action and are reasonably foreseeable but occur later in time or are further removed in distance. Cumulative effects, as discussed in Section 3.2.7 of the BRAC 133 EA, represent the "impact on the environment resulting from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions."

The potential direct effects of the proposed action at the three alternative sites and the No Action alternative were evaluated for each resource area in accordance with Army and Council on Environmental Quality regulations. The significance of these effects was evaluated considering the context and intensity of each effect.

Indirect effects analyses varied according to the resource area being evaluated and were specifically described for socioeconomic resources, historic sites, and transportation. The Army also stated that indirect analyses were completed for air quality and water quality. For example, air emissions associated with building construction and operation were estimated as direct effects, and air emissions associated with traffic were considered indirect effects. For the remaining resource areas, indirect effects were not anticipated.

2.3.5.2 OBSERVATIONS: ENVIRONMENTAL CONSEQUENCES ANALYSIS

The BRAC 133 EA included appropriate discussions of direct, indirect, and cumulative effects, as prescribed by Army regulations. The assessment of methods, assumptions, and data used to evaluate the resource effects is described in Section 2.4 Assessment of Data, Methods, and Assumptions.

2.3.6 CUMULATIVE EFFECTS ANALYSIS

2.3.6.1 BACKGROUND

Cumulative effects are defined as "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

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Cumulative effects are complex issues, and the Army developed a National Environmental Policy Act Analysis Guidance Manual (2007) to support Army impact analysis. "The scoping process should be used to identify possible cumulative impacts," and further, the Army regulations state that all off-post officials, such as tribal, state, county, or local planning officials, should be contacted to identify other actions that should be considered in the cumulative effects analysis.

The cumulative effects analysis identifies the boundaries of each resource category, describes the threshold level of significance, and determines the environmental consequence of the action. The boundaries vary for each resource: for example, a watershed may be the appropriate boundary for water resource evaluation, while air quality may be a regional issue. The time period associated with *reasonably foreseeable*, as mentioned in 40 Code of Federal Regulations 1508.7, has been subject to considerable interpretation in courts, which have defined *reasonably foreseeable* as an action that is "sufficiently likely to occur, that a person of ordinary prudence would take it into account in making a decision." Therefore, the scope of the cumulative effects analysis is broader than that of the direct analysis.

The BRAC 133 EA included a section describing cumulative effects for all 12 resource areas for which direct and indirect effects are assessed. Past actions included a description of the historical development and populations of Fairfax County and City of Alexandria.

For the BRAC 133 EA, future or reasonably foreseeable projects were identified in terms of proximity and time frame. In terms of proximity, the only projects considered had to meet all of the following criteria: a) those "approved or planned" within one mile of each site, b) with proposed buildings whose area consists of more than 100,000 square feet and/or footprint acreages (about two acres), and c) those *not* involving renovation on already impervious surfaces.

The BRAC 133 EA did not provide any rationale for the one-mile limit used to assess the geographic boundary for cumulative effects. The 2007 FEIS for Fort Belvoir utilized a three-mile limit for the cumulative effects analysis; however, no rationale was provided for that geographical boundary either. This boundary is important in describing the proposed action and other conditions affecting both people and resources. The combination of the proposed action with other development can have significant effects on the environment and needs to be discussed in the environmental document. The smaller boundary limits the analysis that is provided regarding potential cumulative effects.

In terms of time frame, then Army stated that, for the BRAC 133 EA, "No distinct period of time was identified to limit reasonably foreseeable activities. Reasonably foreseeable activities were based upon available planning documents at the time, or inherently incorporated into the analysis." Specific projects were identified as reasonably foreseeable, utilizing information from Fairfax County, the Alexandria Economic Development Partnership, and the City of Alexandria Department of Planning and Zoning.

However, according to the Army's National Environmental Policy Act guidance, the time period for Army planning at installations is the "useable life of proposed action" or "lifetime of the proposed action or lifetime of other actions in the Region of Effect (ROE)." This relates to the period of time that the structure or development would be in existence. This assumption was not applied to the BRAC 133 EA, and this limitation in time period does not provide analysis of potential effects after the

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initiation of the BRAC 133 EA. Future planning horizons beyond the construction of an action are typically considered for traffic analysis to provide the public and interested parties with a better understanding of the potential environmental effects of combined actions.

The level of cumulative effects analysis in the BRAC 133 EA varied according to the significance of the effect on a given resource. The level of analysis was commensurate with the low potential for cumulative effects for resources such as noise, hazardous materials, cultural resources, aesthetics, utilities, and geology and soils. All of these resources were evaluated within the one-mile geographic boundary.

Biological Resources
For biological resources, there was no defined threshold of significance provided nor was the definition of *substantial* provided. The cumulative effects on biological resources were not discussed for the Mark Center; this discussion was warranted, given the loss of approximately eight acres of forested areas in the Mark Center and the reasonably foreseeable proposed projects within one mile, which would further disrupt biological resources. There was no description of the geographical boundary for this resource or the availability of this resource within the boundary of analysis. Without this additional information in the BRAC 133 EA, the potential cumulative effect analysis is incomplete.

Water Resources
Cumulative effects on water resources were appropriately considered within the respective watersheds of the proposed alternatives. The cumulative effects analysis did not provide specific information regarding future changes in the impervious area within the Mark Center relative to the watershed. Mitigation measures for storm water were mentioned; however, no reference was provided as to the regulatory requirements that would be utilized to minimize effects of storm water.

Socioeconomic Resources
The socioeconomic analysis considered the region of influence (ROI) based upon the residency distribution of the future employees of BRAC 133. This included the City of Alexandria, Arlington County, Fairfax County (including the cities of Fairfax and Falls Church), and Prince William County (including the cities of Manassas and Manassas Park) in Virginia and Prince George's County in Maryland. The cumulative effects analysis identified a potential adverse effect on low-income housing residents with the redevelopment of the Springfield Mall; however, the same effect was possible due to the projects cited for the Victory Center and the Mark Center. In addition, the tax revenue loss to the City of Alexandria was mentioned but not quantified or assessed regarding its threshold level of significance.

Air Quality
Air quality was evaluated utilizing the "region," which is assumed to be the same as the socioeconomic ROI. The cumulative effects were based on the projects and their emissions that had been incorporated into the Statewide Implementation Plan (SIP). No adverse cumulative effects to air quality were estimated or anticipated.

Transportation

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The cumulative effects of transportation for the Mark Center and Victory Center were described in one sentence as "negligible." This was based on including all large developments occurring within one mile prior to 2011 as part of the No Action alternative. The analysis references the regional travel demand model for assessing future conditions considered to be the year 2011. There is no discussion of the 2011 traffic conditions (either by volume or traffic flow) within one mile of the Mark Center or subregional or regional traffic conditions related to BRAC 133. For transportation, no threshold of significance was identified, and "negligible" effects were also not defined. The cumulative effects for traffic consistent with the No Action discussion of the BRAC 133 EA were not described. The BRAC 133 EA discussed I-395/Seminary Road congestion, and this discussion would also have been appropriate for the cumulative effects analysis but was not included. There was no discussion of past, present, and future trends beyond 2011 in transportation conditions in the project area.

2.3.6.2 OBSERVATIONS: CUMULATIVE EFFECTS

1. Cumulative effects analysis was included and identified "reasonably foreseeable" projects; however, there were weaknesses in the cumulative effects discussion in the BRAC 133 EA.
2. The information for the cumulative effects analysis was obtained from local agencies that were not included in the scoping process; thus, information regarding potential actions of concern might have been limited due to the lack of scoping.
3. Threshold levels of effect were not defined for transportation, socioeconomic tax loss, vegetation, or water resources.
4. The cumulative effects discussion of transportation did not provide information on traffic trends or current and future levels of performance. For the Mark Center, there was no discussion or quantification of the cumulative effect on I-395, as alluded to on page 3-34 of BRAC 133 EA. The queuing of traffic on I-395 is a current and future condition and is a cumulative effect. No discussion of existing or future level of service (LOS) was provided for intersections beyond the six located within a few blocks of the Mark Center.
5. The time frame used in analysis was not specified, and no explanation was provided in the BRAC 133 EA. Conversations with USACE indicated those projects with appropriate planning approvals were considered "reasonably foreseeable." The time frame did not include the "useable life of the proposed action."
6. The geographic boundary for land use and transportation effects was narrowly defined as one mile. There was no justification provided for the boundary for these two resources, which were also affected by the distribution of residents.
7. The cumulative effects analysis of transportation lacked a summation of effects: past, present, and future.

SIGNFICANCE OF OBSERVATIONS

The weaknesses in the cumulative analysis in the BRAC 133 EA limited the information presented to the public and interested agencies and organizations. Limiting the time period, discussion of threshold levels of significance, a context for the analysis, and geographical boundaries of the analysis could have affected the potential magnitude of cumulative impacts described in the BRAC 133 EA. The cumulative effects section should provide full disclosure of potential effects for all resources, including traffic. The weaknesses in the Cumulative Effects section of the BRAC

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133 EA are not sufficient by themselves to require a supplemental environmental assessment; however, if other conditions of the BRAC 133 EA require a reassessment, then the cumulative effects should also be reassessed.

2.3.7 MITIGATION AND MONITORING

The BRAC 133 EA incorporated a list of Best Management Practices and mitigation measures to avoid, minimize, or compensate for adverse environmental effects associated with the various alternatives. Best Management Practices are those measures or actions associated with regulatory or policy requirements to reduce adverse effects on various resources. For example, state and federal regulations require soil erosion control plans during construction to minimize adverse effects on soil and water quality.

Mitigation is defined as those actions that do one of the following: a) avoid the effect by not taking a certain action; (b) minimize the effect by limiting the degree or magnitude of the action and its implementation; (c) rectify the effect by repairing, rehabilitating, or restoring the affected environment; (d) reduce or eliminate the effect over time by reservation and maintenance operations during the life of the action; or (e) compensate for the effect by replacing or providing substitute resources or environments.

Table 2: Summary of Mitigation Measures (as excerpted from 3.14-1 in BRAC 133 EA) identifies the proposed mitigation measures. BMPs were identified for all resource areas; however, mitigation measures were proposed for only air quality and transportation effects.

2.3.7.1 MITIGATION MEASURES EVALUATION

Air Quality
Initially, air quality mitigation measures were only proposed for the GSA site. The Virginia Department of Environmental Quality (VDEQ) objected to the mitigation measures identified in the BRAC 133 EA because the air quality determination in the BRAC 133 EA according to the administrative record contained “insufficient information to support the Army’s consistency determination and a lack of mitigation measures for the non-GSA alternatives.” Thus the mitigation discussion regarding air quality conditions for particulate matter 2.5 microns in size (PM2.5) and relative to the Virginia Coastal Resources Management Program was insufficient. Subsequently, in the BRAC 133 FNSI, the mitigation measures were increased to address the VDEQ concerns, and VDEQ approved the consistency determination.

Transportation
The traffic mitigation measures addressed site access and local improvements for each of the alternatives to maintain the existing levels of service or traffic flow, as described in Section 3.2 of the BRAC 133 EA. In addition, a Transportation Management Plan was required for each alternative to “manage travel demand to the site and encourage use of transit by BRAC 133 personnel.” The mitigation measures identified in the BRAC 133 EA Finding of No Significant Impact become legally binding and must be accomplished as the project is implemented. If any of these mitigation measures do not occur, so that significant adverse effects could be reasonably expected to occur, the proponent

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must publish an Environmental Impact Statement (EIS). There were no specific requirements in the BRAC 133 EA regarding the development or content of a Transportation Management Plan. The plan was required to achieve a 40 percent reduction in single occupancy trips associated with the BRAC 133 personnel. This goal needed to be achieved to maintain a finding of no significant impact due to changes in traffic.

Effects to regional travel patterns were compared to the No Action and current plans for the areas surrounding each site. Regional improvements necessary to maintain the levels of service were not included in mitigation plans as "they are separate actions that would have been generally identified in regional plans before development of the proposed action, and a multitude of existing and proposed developments, in addition to the proposed action, would benefit from the regional improvements."

Identifying these additional regional actions is consistent with Army regulations that require "Potential mitigation measures that appear practical, and are unobtainable within expected Army resources, or that some other agency (including non-Army agencies) should perform, will be identified in the NEPA analysis to the maximum extent practicable." In addition, "the project cannot be undertaken until all required mitigation efforts are fully resourced, or until the lack of funding and resultant effects, are fully addressed in the NEPA analysis."

The BRAC 133 EA acknowledged that under the No Action alternative, there would be failing intersections or congested intersections near the GSA site, needed improvements in traffic signal timing at the Victory Center, and existing congestion on I-395 at the Mark Center; however, the specific effect of not funding regional solutions was not discussed. The ramps at I-395 were described with traffic volumes, but the level of service and any changes to it with and without proposed projects were not discussed. Further information regarding regional improvements, their associated funding, and the possible effects upon traffic flow were not specifically addressed.

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Table 2: Summary of Mitigation Measures

Resource Area	Mitigation
Transportation	**GSA alternative** • Expand Metropolitan Center Drive to four lanes and expand GSA site entrance intersections with Loisdale Road to allow for turn movements. • Construct a direct connection from the Franconia-Springfield Parkway via Spring Mall Drive to the GSA site, which would alleviate congestion on Loisdale Road. • Improve the I-95 northbound to eastbound Fairfax County. Parkway off-ramp/Loisdale Road intersection. • Implement signal and turn lane improvements at surrounding intersections. • Negotiate with adjacent property owners to allow BRAC 133 personnel to use proposed shuttle bus system and pedestrian walkway between Metropolitan Center Drive and Franconia-Springfield Metro station. **Victory Center alternative** • Install a traffic signal for at least one Victory Center driveway location. • Implement traffic signal timing and phasing modifications, along with turn lanes and other minor physical improvements, at intersections adjacent to the site. **Mark Center alternative** • Improve Mark Center Drive to increase capacity. • Construct a third left-turn lane from northbound Seminary Road to westbound Beauregard Street. • Construct a second left-turn lane from westbound Beauregard Street to Mark Center Drive. • Construct a second right-turn lane from Mark Center Drive to southbound Seminary Road. **All alternatives** • Develop and staff a TMP to manage travel demand to the site and encourage use of transit by BRAC 133 personnel. • Encourage alternative transit measures, such as ridesharing, to offset parking space cap on site.
Air Quality	**GSA alternative** • Limit construction on Code Orange, Red, and Purple ozone days. • Limit use of off-road trucks on the project site. • Require all off-road diesel equipment not meeting Tier 2 or better standards be retrofitted with emission control devices. • Implement anti-idling restrictions for both on-road and off-road vehicles and equipment. • Use ultra-low sulfur diesel (ULSD), alternative fuels, or fuel additives. • Meet new engine standards for off-road vehicles.

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2.3.7.2 OBSERVATIONS: MITIGATION AND MONITORING

1. The BRAC 133 EA identified both Best Management Practices and mitigation measures to avoid, minimize, or compensate for adverse effects on the resource areas. Mitigation measures for air quality were revised during the BRAC 133 Finding of No Significant Impact to address concerns by the Virginia Department of Environmental Quality.
2. Mitigation measures for the Transportation Management Plan were not well defined. A requirement for a Transportation Management Plan was included to manage travel demand; however, the components of the BRAC 133 TMP were not defined, and monitoring was not required to assess the success of the mitigation measures proposed for site and local access. The BRAC 133 TMP was an important component of the overall mitigation strategy to aid in achieving a 40-percent reduction in trips to the Mark Center. According to Army regulations, the mitigation measures in the BRAC 133 Finding of No Significant Impact become "legally binding and must be accomplished as the project is implemented. If any of these identified mitigation measures do not occur, so that significant adverse environmental effects could reasonably be expected to result, the proponent must publish an EIS."
3. To that end the Army determines if a monitoring program is needed. The need for monitoring is based upon if there is change in project conditions, if the outcome of the mitigation measure is uncertain, or if there is major environmental controversy associated with the selected alternative (32 CFR 651.15(h)). Monitoring of the Transportation Management Plan goals was not included in the mitigation measures but would provide the information necessary to support the BRAC 133 EA conclusion of "long-term, minor, adverse, not significant" effects.

SIGNIFICANCE OF OBSERVATIONS

As there is uncertainty in the outcome of the mitigation measures, monitoring of traffic conditions to assure that the impacts of BRAC 133 are minor would have been appropriate. The BRAC 133 EA decision to not include monitoring was based upon the traffic impacts available at the time of the BRAC 133 EA. If traffic conditions are reassessed based upon current information, monitoring could be included to support the finding of "long-term, minor, adverse, not significant" effects.

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2.4 ASSESSMENT OF BRAC 133 EA DATA AND METHODOLOGIES

The BRAC 133 EA assessed the potential effects of the proposed action upon the following 12 resource areas:

1. Land Use
2. Transportation
3. Air Quality
4. Noise
5. Geology and Soils
6. Water Resources
7. Biological Resources
8. Cultural Resources
9. Socioeconomic Resources
10. Aesthetics
11. Utilities
12. Hazardous Materials

The significance of the associated environmental effects is defined and interpreted according to Army regulations as follows:

32 CFR 651.39 Significance

b) Significance of impacts is determined by examining both the context and intensity of the proposed action (40 CFR 1508.27). The analysis should establish, by resource category, the threshold at which significance is reached. For example, an action would violate existing pollution standards; cause water, air, noise, soil, or underground pollution; impair visibility for substantial periods; or cause irreparable harm to animal or plant life could be determined significant. Significant beneficial effects also occur and must be addressed, if applicable.

c) The proponent should use appropriate methods to identify and ascertain the "significance" of impacts. The use of simple analytical tools, which are subject to independent peer review, fully documented, and available to the public, is encouraged. In particular, where impacts are unknown or are suspected to be of public interest, public involvement should be initiated early in the EA (scoping) process

The assessment of the resource characterization and effect discussion in the BRAC 133 EA was based on consideration of the following conditions:

- Use of current and complete data
- Availability of data for all resource areas
- Appropriate assumptions for site effect assessment
- Appropriate methodologies for estimating potential effects sufficient to identify the magnitude of potential effects

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- Identification of threshold of significance for adverse effects

2.4.1 LAND USE

2.4.1.1 BACKGROUND

The Army National Environmental Policy Act Guidance Manual states that "land use refers to the planned development of property to achieve its highest and best use and to ensure compatibility among adjacent uses." Activities on land parcels are classified into land use categories and plans that are governed and maintained by local or regional jurisdictions. Comprehensive planning documents and their existing and future land use plans, combined with zoning laws, regulate existing and future development for the public's health, safety, and welfare.

A proposed action's effects on land use are assessed to determine if the proposed action satisfies the land use, development, and zoning regulations of the applicable jurisdiction. The Army Guidance Manual states that the majority of land use analysis in Army National Environmental Policy Act documentation falls under cumulative effects analysis. Environmental documents also assess if proposed federal actions would directly or indirectly affect land use.

The land use descriptions for the GSA alternative in the BRAC 133 EA were based upon the Fairfax County Comprehensive Plan, a listing of proposed projects in the vicinity of Fort Belvoir, and newspaper articles regarding future development near the GSA site. For the Victory Center and the Mark Center alternatives, the site plan information included in the submittals to the Army's RFP provided the land use information.

The three alternatives were characterized according to existing development on the sites and existing development adjacent to the sites. Existing zoning information was included for the Victory Center and the Mark Center. Proposed major developments near the sites were summarized for the GSA site, and major transportation corridors near the sites were listed for the GSA site and the Mark Center.

The land use effects were analyzed in various ways for the three alternatives. For the GSA site, the floor area ratio was calculated and compared to the requirements for the site's zone. In addition, for the GSA site, the amount of proposed development was compared to the type and level of development stated in the appropriate jurisdiction's comprehensive plan. The GSA site was also assessed for modifications to comply with Anti-Terrorism Force Protection requirements. The proposed GSA development's building plan was compared to the character of similar developments in that jurisdiction. For the Victory Center and the Mark Center, the type of development was compared to the sites' current zoning classifications. All three sites were assessed for compliance with the Virginia Coastal Zone Act.

After the issuance of the Finding of No Significant Impact for the BRAC 133 action, the Center for Naval Analyses (CNA) sent a series of letters to the Army, citing concerns with the effects of the Anti-Terrorism Force Protection requirements for the BRAC 133 action at the Mark Center:

- From the November 12, 2008, letter from the Center for Naval Analyses to Secretary of the Army Pete Geren:

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First, certain planned construction threatens the security of the CNA building and the safety of CNA employees. We understand that the Army plans to construct a mail handling facility ("Mail Facility") in very close proximity to CNA's building (see enclosed rendering label "explosive screening area") to screen incoming mail, parcels, and vehicles. We understand the Developer sited the "Mail Facility" to meet Army force protection regulation standards by separating it from the proposed new Army building. The applicable Army standard for construction of mail rooms requires that such a facility be constructed to address chemical, biological, and radiological agents sent through the mail, as well as mail bombs. However, the location of the "Mail Facility" now places the CNA building and the CNA workforce and uniformed military personnel in the unhardened CNA building, within the explosive arc of the "Mail Facility" and in an unacceptably direct line between the proposed road, the new Army buildings, and the "Mail Facility," because of the Developer's proposed siting of facilities and infrastructure.

- The sites' Anti-Terrorism Force Protection assessments did not include a determination of how compliance with these requirements could affect neighboring properties. No public comments were received about this issue from sites near the GSA site or the Victory Center.
- The Army issued an August 12, 2009, letter to Senator Mark Warner, Senator Jim Webb, and Representative James Moran responding to a letter they sent on July 15, 2009. The Army letter states that the congressmen's letter concerned the construction of a remote inspection facility at the BRAC 133 site at the Mark Center. In response the Army stated that the remote inspection facility is critical to the long-term operational efficiency and effectiveness of the BRAC 133 facility because its presence deters potential aggressors and greatly reduces the threat of potential attack on the Mark Center facility and its neighbors. The Army explained that relocating the remote inspection facility would not make the Mark Center or its neighbors safer. The Army stated it had just completed an analysis focused on remote inspection facility effects on the Center for Naval Analyses building immediately adjacent. The Army stated that the Center for Naval Analyses building was 160 feet from the remote inspection facility, a distance that exceeds the minimum stand-off distance required for standard building construction (148 feet) by the Department of Defense. The Army, however, changed the remote inspection facility design to allow blast pressures to escape in directions away from nearby buildings.
- The final site plan for the Mark Center alternative shows that the remote delivery facility was located and constructed immediately west of and adjacent to the Center for Naval Analyses building.

2.4.1.2 OBSERVATIONS: LAND USE

1. Scoping letters were not sent to the following planning agencies during the environmental assessment process:
    a. City of Alexandria Department of Planning and Zoning
    b. Fairfax County
    c. National Capital Planning Commission

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2. The land use assessment did not equally compare the GSA site, the Victory Center, and the Mark Center. More information was provided for the GSA site than for the other alternatives. A comparable level of information was not provided for the Victory Center and Mark Center with respect to their conformity to Alexandria's Comprehensive Plan, the planned development density of the sites, and how those developments would compare to similar types of development in their jurisdictions. These assessments were made for the GSA site and were not discussed for the Victory Center or the Mark Center.
3. The environmental consequences analysis for the Mark Center and the Victory Center used zoning information, while the GSA site's environmental consequences analysis used comprehensive plan information. Therefore the measure of effectiveness was not the same for all alternatives.
4. Potential land use concerns associated with neighboring properties were not included in the BRAC 133 EA because the adjacent neighbors were not informed of the proposed action. The Army continued to work to resolve the concerns after the BRAC 133 EA was completed.

SIGNIFICANCE OF OBSERVATIONS

The land use analysis was sufficient to describe land use changes for the alternatives based upon the information available at the time the BRAC 133 EA was issued. Because the adjacent tenants only became aware of the project either during or after the Notice of Availability of the BRAC 133 EA, the Army needed to continue coordination with adjacent tenants outside of the environmental assessment process to address the tenant concerns.

2.4.2 TRANSPORTATION

2.4.2.1 BACKGROUND

Transportation effects of a proposed action are assessed to ensure the functionality and safety of the transportation system. The BRAC 133 EA assessed proposed federal actions to determine if they would directly, indirectly, or cumulatively affect the transportation system or its components. The BRAC 133 EA also identified the significance of the effects per the Council on Environmental Quality and Army regulations.

The purpose of the traffic analyses in the BRAC 133 EA was to determine the effects of relocating the 6,409 personnel that constitute BRAC 133 to one of the three off site locations (the Mark Center, GSA site, or the Victory Center) and to determine the "need for roadway improvements, including additional access points to the proposed sites." Generally, the transportation analysis consisted of reviews of the alternatives to determine effects of traffic on the transportation system and recommended mitigation strategies. Specifically, the transportation analysis examined three previously completed transportation studies for the three alternatives, conducted additional analyses, and compared the results. According to the BRAC 133 EA, the transportation analysis was completed to a level of detail sufficient to assess the transportation system and potential mitigation.

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The transportation effects of the No Action condition and site alternatives were described in terms of level of service for the roadways by analyzing roadway capacity. To assess site and local transportation effects, the BRAC 133 EA referenced the results of roadway capacity analyses, either as previously completed in the FEIS for Fort Belvoir completed in June 2007 or as traffic studies prepared by Wells & Associates or as updated estimates for the BRAC 133 EA. There were two Wells & Associates studies: *Mark Center Traffic Impact Study and Transportation Management Plan* completed in 2008, *Victory Center Traffic Impact Study and Transportation Management Plan Proposal Clarifications* completed in 2008.

The capacity of a roadway is defined as the maximum hourly rate at which vehicles can reasonably be expected to pass a given point during a specified time period under prevailing roadway, traffic, and control conditions. Roadway capacity analysis is quantified using LOS. This is a typical measure of effectiveness to determine transportation effects of a proposed action.

The BRAC 133 EA states that level of service is a measure by which transportation planners determine the quality of service and characterize the existing operating conditions and conditions from the proposed action in terms of traffic performance measures. These measures include speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Level of service can be calculated at unsignalized intersections, signalized intersections, freeway merge and diverge points, or freeway segments, and is categorized as follows:

A = Free flow
B = Reasonably free flow
C = Stable flow
D = Approaching unstable flow
E = Unstable flow (maximum flow rate or “At capacity”)
F = Forced or breakdown flow (“Stop-and-go” traffic)

The BRAC 133 EA’s assessment of regional transportation effects was limited to travel demand modeling completed for the FEIS for Fort Belvoir. The GSA site was assessed in the FEIS for Fort Belvoir using the Metropolitan Washington Council of Government travel demand model; although no freeway segments were studied. The regional area included the three counties and the communities where employees currently reside. The regional transportation effects beyond the approved development plans of the Victory Center and the Mark Center were not specifically evaluated. The trips shown in Table 3 identify the incremental volumes not included in the regional travel demand model. The BRAC 133 EA stated that the traffic volumes declined by 10 per cent within minutes from each site.

The BRAC 133 EA states (Section 3.2.1.1) that the limits of a traffic impact study with less than 1,000 site-generated peak hour trips should include the evaluation of all facilities within 2,000 feet of the site and any roadway on which 10 percent or more of the new vehicle trips are generated by the proposal, not to exceed two miles. The limits for a traffic impact study with more than 1,000 vehicle trips may encompass a broader study area, to be determined by Virginia Department of Transportation in consultation with the locality. The BRAC 133 EA presented a more detailed assessment of the GSA site and less-intensive, localized studies of the Mark Center and the Victory Center sites. More details of the transportation analysis for each site are included in the following sections.

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2.4.2.2 TRIP GENERATION

The trip generation for all three sites is shown in *Table 3: BRAC 133 Peak-Hour Trip Generation with Transportation Management Program (Source: Table 3.2-1 in BRAC 133 EA)*, which also shows the incremental number of vehicle trips as compared to the No Action alternative. For the GSA site, 1,104 additional trips per day were estimated, and the Victory Center and the Mark Center were associated with increases of 432 and 310 additional vehicle trips, respectively. Table 3 also shows the mode by which employees will reach each site. The same mode split was assumed for all three sites.

The trip generation calculations included the number of employees already present at the site, those already approved by the local jurisdiction, or those who had already been included in the Metropolitan Washington Council of Governments model and accounted for in the No Action alternative at that location shows a single occupancy vehicle trip reduction of 42 percent, which is consistent with the BRAC 133 TMP goal of a 40 percent or more reduction. The Victory Center traffic impact study used a 20 percent reduction in single occupancy trips for the Victory Center while the Mark Center traffic study used a 10 percent reduction in single occupancy vehicle trips for the Mark Center.

Table 3: BRAC 133 Peak-Hour Trip Generation with Transportation Management Program
(Source: Table 3.2-1 in BRAC 133 EA)

AM Peak-Hour Trips	Percent Assumed	GSA	Victory Center	Mark Center
BRAC 133 relocated employees		6,409	6,409	6,409
Approved development expressed as number of employees before BRAC 133		150	4,300	5,050
Net increase in employees at site		6,259	2,109	1,359
Daily reporting employees (assuming 10 percent absent)	*90%*	*5,633*	*1,898*	*1,223*
Daily visitors		*500*	*500*	*500*
Total persons		**6,133**	**2,398**	**1,723**
Peak-hour person trips (assuming percent of total)	30%	1,840	719	517
LOV[a] person trips	58%	1,067	417	300
HOV[a] person trips (carpools)	16%	294	115	83
HOV[a] person trips (slugging)	5%	92	36	26
Shuttle bus/walk to Metro	20%	368	144	103
Other	1%	18	7	5
BRAC 133 Additional Vehicle trips[b]		1,104	432	310
Bus trips (40 passengers per vehicle)		10	4	3

Note: PM peak-hour trip estimation would be approximately the same or slightly lower as some employees may leave early, stay late, etc.
[a] **LOV**: low-occupancy vehicle; **HOV**: high-occupancy vehicle; **slugging**: picking up passengers at designated points to meet HOV requirements
[b] Vehicle trips were calculated by adding LOV, HOV carpool, and HOV slugging person trips, assuming a LOV occupancy of 1.1 persons per vehicle; HOV carpool occupancy of 3.2; and HOV slugging occupancy of 2.2.

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2.4.2.3 GSA SITE ANALYSIS

The transportation analysis of the GSA site was completed in the City Center alternative of the FEIS for Fort Belvoir. The FEIS for Fort Belvoir analysis used the Metropolitan Washington Council of Government's Travel Demand Model Version 2.1, Release D, Edition 50, and the Round 7 Cooperative Land Use Forecast for the travel demand forecasting for the development of the future (2011) volumes. The FEIS for Fort Belvoir analysis assumed that 9,200 employees would be located on the GSA site and a study area that encompassed a radius of four miles. This number of employees was greater than the anticipated BRAC 133 requirement of moving 6,409 employees. The travel demand model analysis completed for the GSA site found that beyond the immediate vicinity of the site, the BRAC actions resulted in minor changes in traffic volumes. *Minor* was defined by the Army in a December 3, 2010, interview as less than 10 percent.

The BRAC 133 EA stated that additional transportation analyses were completed for the GSA site, including a review of travel patterns, site access, and transportation improvements in the immediate area of the site.

According to the BRAC 133 EA, t the proposed GSA alternative would increase trips by 1,104 trips above what was planned, as shown in Table 3. Additional travel demand model runs were developed for the GSA site in the BRAC 133 EA based upon this calculated trip generation information for the site.

The BRAC 133 EA evaluated three scenarios to describe the potential magnitude of transportation impacts. These three conditions included existing 2008 traffic conditions, the projected 2011 traffic conditions without BRAC 133 (which is called No Action),, and 2011 Alternative A, which represented traffic conditions in 2011 with BRAC 133 in place. This third scenario did not include the mitigation measures when depicted in BRAC 133 EA figures. The BRAC 133 EA described the level of service for 11 intersections near the GSA site for AM and PM peak-hour traffic volumes, respectively. One project included in the No Action scenario was the Boston Properties Development. This is one of the planned actions near the GSA site and is identified in the Cumulative Effects section of BRAC 133 EA. This planned development is comprised of 520,000 square feet, and a rezoning application was in process.

The BRAC 133 EA described the level of service for the 11 intersections in three categories: A–C, D–E, and F. No discussion is provided regarding the reason for this aggregation of the level of service values for the effects analysis. The BRAC 133 EA also described the increase in traffic volumes on a number of trips basis and then a percentage of total traffic.

A listing of proposed mitigation improvements needed to maintain the level of service for the GSA alternative was provided in the BRAC 133 EA. The specific level of service attained from building the following site access and local road improvements was proposed to mitigate the projected GSA site traffic and to maintain traffic flow conditions equivalent to the No Action alternative level. The regional improvements were identified but were not included as mitigation measures. No detailed table or figure was presented in the BRAC 133 EA to confirm this statement.

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The following site access and local road improvements to the General Services Administration site alternative were proposed in the BRAC 133 EA:

- Site Access Improvements
  - Four-lane Metropolitan Center Drive
  - Improvements to Loisdale Road intersections
- Local Road Improvements
  - Two-lane Spring Mall Drive connection
  - I-95 northbound to eastbound Fairfax County Parkway off-ramp/Loisdale Road intersection
  - Signal and turn lane improvements at surrounding intersections

The Army also identified regional road improvements; however, these improvements were not included as part of the mitigation for the General Services Administration site:

- Regional Road Improvements
  - Loisdale Road ramp connection at I-95/Fairfax County Parkway interchange
  - Franconia-Springfield Parkway/Neuman Street interchange
  - Extension of Frontier Drive and Franconia-Springfield Parkway /Frontier Drive interchange reconstruction

2.4.2.4 VICTORY CENTER ANALYSIS

For the Victory Center, a traffic impact study completed by Wells & Associates in 2008 was used for the BRAC 133 EA transportation analysis. This traffic impact study assumed the development's opening year was 2009. The Victory Center traffic analysis for the BRAC 133 EA verified that the projections used in the traffic impact analysis were consistent with the growth in the area shown in the regional travel demand model runs. During an interview on December 20, 2010, the Metropolitan Washington Council of Governments indicated that this is an acceptable practice.

The BRAC 133 EA stated the Victory Center had been approved by the Alexandria City Council and was included in the Metropolitan Washington Council of Governments travel demand model with an employment level of approximately 4,300 employees and approximately 3,000 parking spaces, Therefore, BRAC 133 would require accommodating 2,109 more employees than were approved by Alexandria and included in regional travel demand models.

The Victory Center traffic impact analysis assessed six key intersections no farther than 0.70 miles from the Victory Center for existing, 2011 conditions without BRAC, and 2011 traffic conditions with both 1,000 and 2,000 additional trips.

The BRAC 133 EA predicted the AM peak-hour traffic volumes for the 2011 No Action Trips and trips due to the additional 2,109 BRAC 133 employees. There were no volumes included from any other planned actions near the Victory Center, such as was shown for the GSA site.

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The BRAC 133 EA presented the level of service for seven key intersections for the Existing, 2011 No Action, and 2011 Build conditions, also aggregated by A–C, D–E, and F. The level of service estimate assumed a 20 percent reduction in single-occupancy vehicle trips, and two alternative trip generation conditions: 2,000 additional trips and 1000 additional trips. The BRAC 133 EA states that the additional trips generated at the Victory Center to be 430, based on the Victory Center traffic impact analysis. The levels of service estimates shown in the BRAC 133 EA did not account for the completion of the proposed mitigation improvements.

The Victory Center traffic impact study does not include specific level of service information for the key intersections after implementation of the proposed mitigation improvements. The BRAC 133 EA states that the proposed mitigation improvements would maintain the level of service under the No Action alternative. Neither the Victory Center traffic impact study nor the BRAC 133 EA includes level of service information for the recommended regional road improvements.

The following improvements to the Victory Center alternative were proposed in the BRAC 133 EA. The Army identified regional improvements; however, these were not included as part of the mitigation measures for the Victory Center:

- Site Access Improvements
  - Traffic signal and turn lanes at driveway entrance
- Local Road Improvements
  - Contribution to Eisenhower Avenue intersection improvements at Van Dorn Street
- Regional Road Improvements
  - Clermont Avenue extension
  - Van Dorn Street corridor and interchange improvements at Capital Beltway

2.4.2.5 MARK CENTER ANALYSIS

The Mark Center traffic evaluation in the BRAC 133 EA is based upon the Mark Center Traffic Impact Analysis completed by Wells & Associates in 2008). Expansion of the Mark Center site had been approved by the City of Alexandria, with a total of 1,743,116 square feet planned for that location. The BRAC 133 action required an additional 0.375 million square feet of space, in addition to the approved space. The net increase in employees on site above those approved for the site was shown on Table 3 as 1,359 personnel. The Mark Center traffic impact analysis contained traffic capacity analysis reports and level of service or traffic flow information for the Existing conditions in 2008 and Build out of 1,743,116 square feet with Recommended Improvements for the intersections.

The Mark Center traffic impact analysis did not account for the additional incremental traffic associated with BRAC 133. As stated in an interview with the Army on December 3, 2010, this traffic impact analysis was checked against growth in the area as shown in the Metropolitan Washington Council of Government model runs and layered with additional growth. This process was not documented in the BRAC 133 EA for the Mark Center EA assessment. According to the Metropolitan Washington Council of Government staff, this is an acceptable practice.

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As shown in Table 3, the approved trips for the Mark Center site were equivalent to approximately 5,050 employees or 79% of the BRAC 133 employees and this was the number accounted for in the Mark Center traffic impact analysis. Thus, 1,359 additional BRAC 133 employees needed to be included in the BRAC 133 EA traffic analysis. An existing Mark Center tenant, the Institute for Defense Analysis, also had additional development plans. The USACE confirmed that the Institute for Defense Analysis development was included in the prior approval of the Mark Center and therefore was contained in the regional model.

The Mark Center traffic impact analysis only assessed seven intersections, which were no farther than 0.30 miles from the Mark Center.

According to an interview with USACE on December 3, 2010, the BRAC 133 additional trips were checked to determine if the trips increased intersection volumes by over 10%. The USACE stated in the interview that capacity analyses were recalculated for intersections where this occurred. This analysis was not documented in the BRAC 133 EA. The only information USACE could provide regarding this analysis was the Mark Center traffic impact analysis model inputs and outputs. No updated capacity analysis was provided.

In the BRAC 133 EA, traffic flow conditions described by level of service values at the Mark Center were depicted for three conditions: existing peak-hour traffic flow in 2008, projected peak-hour traffic volumes in 2011 prior to the BRAC 133 traffic and without mitigation improvements, and then traffic flow conditions with the BRAC 133 implemented but without any of the mitigation improvements. This did not explicitly include the description of level of service with BRAC 133 mitigation improvements Additionally, the BRAC 133 EA included figures showing the peak-hour trips for slightly different scenarios: trips in 2011 without any development or BRAC 133, trips due to the approved development (described as 1.365 million square feet of space), and trips due to the additional development (0.375 million square feet).

The BRAC 133 EA used historical traffic data and traffic counts in 2007 and 2008 to describe existing conditions as well as those anticipated in 2011 without BRAC 133. Based upon these data, the BRAC 133 EA determined that the existing traffic conditions and traffic volumes were anticipated to remain flat between 2008 and 2011 without BRAC 133. The BRAC 133 EA also estimated the 2011 level of service for seven intersections with BRAC 133 in place. These results indicated that, with specific intersection improvements provided as mitigation, the traffic flow as measured by level of service would be maintained.

The validity of the BRAC 133 EA traffic evaluation was assessed by comparing the traffic flow projections in the BRAC 133 EA to the data generated in *Transportation Management Plan for BRAC 133 at Mark Center,* dated July 2010 (BRAC 133 TMP). We assessed the significance of the traffic volume difference in terms of the level of service or traffic flow.

The level of service values for the intersections identified in the BRAC 133 EA were compared to the BRAC 133 TMP values for two scenarios. One scenario was the estimated traffic flow conditions, as measured by level of service, in 2011 if BRAC 133 were not in place. This is called the No Action condition. *Table 4: Comparison of AM Level of Service (LOS) for the July 2008 BRAC 133 EA and the July 2010 BRAC 133 TMP* summarizes the differences in projected level of service estimated in the

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two documents, BRAC 133 EA and the BRAC 133 TMP. The BRAC 133 EA used the assessment criteria of a decline in level of service by two grades or a level of service "F" as a requirement for mitigation of traffic impacts. We applied these same criteria to current traffic conditions to determine if there were changes in level of service warranting additional review or reassessment.

The 2011 No Action scenario results show that the typical peak-hour AM level of service for the BRAC 133 EA was A-C or free flow , while the BRAC 133 TMP projected level of service ranged from B to E for the same intersections. This comparison indicates that there has been a change in baseline or No Action conditions in the area of the Mark Center. The greatest baseline level of service differences occur at the N. Beauregard/Mark Center intersection, the N. Beauregard/Seminary intersection, the NB ramp off I-395 at Seminary Road, and SB ramp on I-395 at Seminary Road. The BRAC 133 EA estimated that these intersections would function at level of service A-C in the AM while the BRAC 133 TMP estimated a level of service of D and E. The BRAC 133 TMP also stated the free-flow right-turn movements at the southbound off- and on-ramps at Seminary would be operationally constrained; however, the BRAC 133 EA did not study these movements.

We also compared the traffic flow condition after the BRAC 133 action was in place as described in the BRAC 133 EA (July 2008) to more current information obtained from the BRAC 133 TMP (July 2010). The BRAC 133 EA based mitigation improvements on maintaining a level of service comparable to that described in the Mark Center traffic impact analysis, based on the City of Alexandria's approved development. The BRAC 133 EA did not specifically provide the level of service values that would be achieved with the proposed intersection improvements; however, the Army indicated that the values would be consistent with Mark Center traffic impact analysis. Comparing the levels of service between the BRAC 133 TMP and the BRAC 133 EA provides an indication of the current validity of the BRAC 133 EA traffic evaluation. This comparison shown in Table 4 and *Table 5: Comparison of PM Level of Service for the July 2008 BRAC 133 EA and the July 2010 BRAC 133 TMP* indicates that the projections in the BRAC 133 EA for N. Beauregard/Seminary intersection AM and PM traffic, Seminary/Mark Center AM, Seminary/I-395 ramp NB off ramp AM, and Seminary/I-395 SB on ramp AM are not consistent with the current (BRAC 133 TMP) evaluation. For other intersections, such as the N. Beauregard/Mark Center PM and Seminary /I-395 NB on ramp AM ramps, the level of service values were comparable.

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Table 4: Comparison of AM Level of Service (LOS) for the July 2008 BRAC 133 EA and the July 2010 BRAC 133 TMP

	Projected A.M. Peak Hour Level of Service			
	Year 2011 without BRAC 133 and without Traffic Mitigation)		Year 2011 with BRAC 133 and with Traffic Mitigation	
Intersection	Environmental Assessment[1]	Transportation Management Plan[2]	Environmental Assessment[3]	Transportation Management Plan[4]
N. Beauregard Street and Mark Center Drive	A-C	D	D	D
N. Beauregard Street and Seminary Road	A-C	E	C	E
Seminary Road and Mark Center Drive	A-C	C	C	D
I-395 and Seminary Road	See below for LOS of this rotary interchange		See below for LOS of this rotary interchange	
I-395 NB Off Ramp and Seminary Road (SE rotary intersection)	A-C	E	C	E
I-395 NB On Ramp and Seminary Road (NE rotary intersection)	A-C	C	C	C
I-395 SB Off Ramp and Seminary Road (NW rotary intersection)	A-C	B	B	B
I-395 SB Off Ramp to WB Seminary Road (Free right turn)	Not measured	D	Not measured	F
I-395 SB On Ramp and Seminary Road (SW rotary intersection)	A-C	D	A	D
I-395 SB On Ramp from EB Seminary Road (Free right turn)	Not measured	D	Not measured	D

Data Sources:
[1]Final Environmental Assessment, July 2008, Figure 3-12: Mark Center Key Intersections PM Levels of Service
[2]Transportation Management Plan, July 2010, Table 4-18: Comparative Analysis of the Intersection LOS for 2011 Baseline and Projected Morning & Evening Peak Hour Traffic Demand With and Without BRAC 133 and IDA Improvements
[3]Wells & Associates, "Mark Center Exhibit I – Traffic Study", January 2008, Figure 12"Levels of Service"
[4]Transportation Management Plan, July 2010, Table 4-18: Comparative Analysis of the Intersection LOS for 2011 Baseline and Projected Morning & Evening Peak Hour Traffic Demand With and Without BRAC 133 and IDA Improvements

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Table 5: Comparison of PM Level of Service (LOS) for the July 2008 BRAC 133 EA and the July 2010 BRAC 133 TMP

	Projected P.M. Peak Hour Level of Service (LOS)			
	Year 2011 without BRAC 133 and without Traffic Mitigation		Year 2011 with BRAC 133 and with Traffic Mitigation	
Intersection	Environmental Assessment[1]	Transportation Management Plan[2]	Environmental Assessment[3]	Transportation Management Plan[4]
N. Beauregard Street and Mark Center Drive	A-C	C	C	C
N. Beauregard Street and Seminary Road	D-E	E	C	E
Seminary Road and Mark Center Drive	D-E	C	D	D
I-395 and Seminary Road	See below for LOS of this rotary interchange		See below for LOS of this rotary interchange	
I-395 NB Off Ramp and Seminary Road (SE rotary intersection)	A-C	C	C	B
I-395 NB On Ramp and Seminary Road (NE rotary intersection)	A-C	A	C	A
I-395 SB Off Ramp and Seminary Road (NW rotary intersection)	A-C	B	C	B
I-395 SB Off Ramp to WB Seminary Road (Free right turn)	Not measured	D Not	measured	F
I-395 SB On Ramp and Seminary Road (SW rotary intersection)	A-C	A	B	A
I-395 SB On Ramp from EB Seminary Road (Free right turn)	Not measured	E	Not measured	F

Data Sources:
[1]Final Environmental Assessment, July 2008, Figure 3-12: Mark Center Key Intersections PM Levels of Service
[2]Transportation Management Plan, July 2010, Table 4-18: Comparative Analysis of the Intersection LOS for 2011 Baseline and Projected Morning & Evening Peak Hour Traffic Demand With and Without BRAC 133 and IDA Improvements
[3]Wells & Associates, "Mark Center Exhibit I – Traffic Study," January 2008, Figure 12 "Levels of Service"
[4]Transportation Management Plan, July 2010, Table 4-18: Comparative Analysis of the Intersection LOS for 2011 Baseline and Projected Morning & Evening Peak Hour Traffic Demand With and Without BRAC 133 and IDA Improvements

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In the BRAC 133 EA, *Section 3.2.5 Summary and BMPs/Mitigation*, the rationale for improvements is based upon identifying mitigation measures necessary to maintain levels of service comparable to the No Action Alternative. There is a general statement that the improvements would be required to return to and maintain the existing level of service for site access and local improvements. There is no specific level of service information provided or referenced for the regional road improvements.

The following site access and local road improvement projects for the Mark Center site are listed in the July 2008 BRAC 133 EA as mitigation measures:

- Site Access Improvements
  - Mark Center Drive improvements
- Local Road Improvements
  - Intersection improvements at Seminary Road/Beauregard Street
  - (third left turn lane, northbound)
  - Intersection improvements at Beauregard Street/Mark Center Drive
  - (second turn lane westbound)
  - Intersection improvements at Mark Center Drive/Seminary Road
  - (second right turn lane eastbound)

The Army identified regional road improvements; however, these regional road improvements were not included in the proposed mitigation measures for the Mark Center:

- Regional Road Improvements
  - I-395/Seminary Road interchange improvements and HOV access ramp
  - King Street (State Route 7) intersection improvements at Beauregard Street
  - Little River Turnpike intersection improvement at Beauregard Street

The BRAC 133 EA assessed the transportation effects for the Mark Center as "long-term minor but not significant adverse effects" based upon the implementation of the above site access and local improvements. The basis of this determination and definition of "minor" effects was based upon two criteria. First, the Army stated that with BRAC 133 located at the Mark Center that fewer trips will be generated than were contemplated in the approved City of Alexandria plan. Second, the percent of peak-hour traffic shown in the BRAC 133 EA indicated that the incremental BRAC 133 traffic was a small percentage of the total peak-hour traffic flow on the surrounding road network.

Based upon 2010 traffic information contained in the BRAC 133 TMP, we believe the conclusion of "long-term minor but not significant impacts" needs to be reassessed.

Additional input regarding the analysis was provided by Alexandria and Fairfax County. In a December 17, 2010, interview and in an August 13, 2008, letter providing comments on the BRAC 133 EA, the City of Alexandria stated that it is satisfied that the traffic impact analysis studies completed by Wells & Associates for the Mark Center and the Victory Center have "met the City's rigorous standards" and "sufficiently considered the impact of a [Washington Headquarters Services] WHS-sized facility on local roads." The City also stated that the BRAC 133 EA conclusions regarding regional improvements are adequate and do not require additional transportation analysis.

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Additional comments received during the interview process, included comments from Fairfax County on November 19, 2010. Fairfax County indicated that there was a lack of parity in the analysis among the three sites

An additional issue that was not discussed in the BRAC 133 EA but subsequently required coordination was the internal traffic circulation for existing entities in the Mark Center development adjacent to the proposed BRAC 133 site. The traffic impact studies completed for the Mark Center included an internal site traffic analysis. However, the BRAC 133 EA did not include a description of the access conditions for the tenants, adjacent to the proposed site, the Institute of Defense Analysis and the Center for Naval Analyses.

The Center for Naval Analysis (CNA) sent a series of letters to the Army after the issuance of the Finding of No Significant Impacts for the BRAC 133 action, citing concerns regarding site access. The November 12, 2008, letter from Robert Murray of the Center for Naval Analysis to the Secretary of the Army Pete Geren states that "the footprint selected by the Developer closes roads used by CNA personnel and visitors, and will restrict CNA's access into and out of the Mark Center and will hamper CNA's ability to accomplish its mission. It is likely that such a plan will cause significant traffic related delays for CNA personnel and visitors both in the short-term and in the long-term implementation of the footprint selected by the Developer will effectively isolate CNA from another existing tenant located nearby in the Mark Center, the Institute for Defense Analysis (IDA)….a fenced-in Army compound located directly in between CNA and IDA, together with the planned road closures, would cut off access between CNA and IDA and hinder this established collaborative work environment."

As these letters were received after the issuance of the BRAC 133 Finding of No Significant Impact, the BRAC 133 EA did not contain information pertinent to this issue. These could be considered direct impacts of the proposed action, but they were not assessed. The Mark Center traffic impact analysis did not include an assessment of internal intersections with an assumption that the proposed development required fencing and other security measures that could impact access for others.

2.4.2.6 OBSERVATIONS: TRANSPORTATION EFFECTS

The following weaknesses in the methods, data, and assumptions for assessing transportation effects in the BRAC 133 EA were identified:

1. The difference in transportation analysis methods resulted in an unequal assessment of local and regional transportation impacts and cumulative impacts among alternatives. Regional travel demand modeling was completed for the GSA site; these results were used to develop the impact analysis for the GSA site.
    a. The regional travel demand model is a holistic method of projecting traffic volumes throughout a region based on system wide transportation and land use changes.
    b. Transportation impacts of the Victory Center and Mark Center were analyzed by adjusting available traffic impact studies to account for incremental increase in traffic associated with BRAC 133.

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c. These traffic impact studies were developed from localized site traffic data (adjacent street traffic counts) and did not use the regional travel demand model for volume data or future projections. Therefore, the Victory Center and Mark Center data did not include the same level of detail (such as projected land development, proposed road projects, or increased employment) that would have been present in the GSA data from the regional travel demand model.
d. Capacity analysis for the GSA site was completed in the FEIS for Fort Belvoir using information from the regional travel demand model for background traffic; however, the capacity analyses for the Victory Center and Mark Center were completed using traffic counts as background traffic.
e. In addition, nearly four times as many intersections were studied for the City Center Alternative in the FEIS for Fort Belvoir (the alternative that included the GSA site) than the number of intersections each studied for the Victory Center or the Mark Center. The intersections studied for the GSA site included those located far from the site; some were located as far as four miles from the GSA site. The intersections studied for the Victory Center were within 0.70 miles of the site, and the intersections studied for the Mark Center were within 0.30 miles of the site.

The combination of utilizing the approved development traffic numbers and adjusting these volumes with incremental increases due to the proposed action is an acceptable method; however, the three sites should have been evaluated utilizing the same methodology.

2. A comparison of level of service for the BRAC 133 EA and the BRAC 133 TMP indicates that there has been a change in project traffic conditions in the area of the Mark Center. The greatest differences in No Action level of service values occur at the N. Beauregard/Mark Center intersection, the N. Beauregard/Seminary intersection, I-395 northbound off-ramp at Seminary Road and I-395 SB on ramp at Seminary Road intersection. The BRAC 133 EA estimated that these intersections would function at LOS A–C in the AM while the BRAC 133 TMP estimated a LOS of D and E.

3. A change in background traffic conditions and a projected increase in traffic at the Beauregard/Seminary intersection indicate that the traffic conditions described in the BRAC 133 EA have changed and such a change in conditions warrants further study and reassessment per Army regulations 32 CFR 651.5(g).

4. The BRAC 133 EA stated that the improvements identified were intended to maintain level of service. For the Mark Center this meant that level of service with planned development and with improvements identified in the Mark Center traffic analysis would be maintained with the BRAC 133 traffic increase . The BRAC 133 EA statement for the Mark Center is that the proposed improvements will “mitigate traffic impacts and improve levels of service” at three intersections. This result needs to be re-evaluated based upon current information that calls this conclusion into question.

5. Future-year traffic assessment of the area, beyond that of opening day, was not completed for the BRAC 133 EA, and therefore cumulative transportation effects beyond 2011 are not known. The USACE stated that BRAC law requires that that construction for this project will occur in 2011.

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The USACE assumed that anything that would occur past the date of 2011 was speculative and would not be studied in the BRAC 133 EA.

6. There is no information in the BRAC 133 EA assessing potential access impacts associated with integrating the BRAC 133 action with other existing tenants at the Mark Center.

7. Five agency comments regarding BRAC 133's transportation effects were received during the public notice of availability of the final BRAC 133 EA. These agencies included the Virginia Department of Transportation, the National Capital Planning Commission, Fairfax County, the General Services Administration, and Prince William County. These comments requested further clarification or additional transportation analysis. The Army considered these comments; however, no further evaluation was conducted on the BRAC 133 EA based upon the anticipated transportation effects.

8. In an interview on December 3, 2010, the USACE was asked if the transportation improvements needed to provide adequate level of service for the No Action Alternative and the Build Alternatives were included in the travel demand model. The response from the USACE was that all the projects are in the Long Range Transportation Plan. Some of the projects are in the travel demand model for the year 2011. Other regional improvements will not be included until later years, when they are proposed to be constructed or implemented. According to the BRAC 133 EA, traffic conditions on regional roads near the Mark Center would experience no more than a 10 percent increase and these effects would dissipate with distance from any of the alternative sites.

SIGNFICANCE OF OBSERVATIONS

The BRAC 133 EA transportation effects analysis described traffic conditions in 2011 with and without BRAC 133 in place. Other studies conducted after the BRAC 133 EA show different traffic conditions and a different level of impact at certain intersections and ramps. The Army regulations (32 CFR 651.5(g)) require a review of project conditions if there is a change in conditions and a reassessment is needed to verify the findings of the environmental assessment. There is sufficient post-EA information to justify a reassessment of the intersections described in the BRAC 133 EA as well as providing additional analysis regarding the cumulative transportation effects of BRAC 133. The mitigation measures need to be reassessed to insure that the goal of maintaining existing level of service and long-term minor adverse impacts is still achieved.

According to Army regulation 32 CFR 651.5 (g), the "NEPA documentation must be periodically reviewed for adequacy and completeness in light of changes in project conditions." This review requires the Army to determine the adequacy of the previous analysis and if additional environmental documentation is needed. A Record of Environmental Consideration is prepared if the Army determines that there is no need for new or supplemental documentation. The need for reassessment is based upon changes in transportation conditions and the weaknesses in cumulative effects and mitigation/monitoring.

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The effects relating to neighboring tenants were not disclosed in the BRAC 133 EA. The site access effects were not considered a significant adverse effect, and the Army has continued to work with adjacent tenants outside of the environmental assessment process.

2.4.3 AIR QUALITY

The air quality assessment in the BRAC 133 EA consisted of a review of existing air quality conditions, a general conformity analysis, a regulatory review, and a discussion of air emissions resulting from construction of the site and from potential changes in traffic patterns.

Based upon the National Ambient Air Quality Standards, the United States Environmental Protection Agency had designated air quality of Fairfax County and the City of Alexandria to be

- Moderate nonattainment for the 8-hour ozone,
- Nonattainment for the particulate matter 2.5 microns in size (PM2.5),
- Maintenance area for the carbon monoxide (City of Alexandria only), and
- Attainment for all other criteria pollutants (40 CFR 81.347).

For the specific pollutants listed, *attainment* indicates that the ambient air quality standard was achieved; *nonattainment* indicates that it was not achieved. A maintenance area is one previously designated as nonattainment but that has been re-designated attainment for a probationary period through implementation of maintenance plans. These specific designations affect proposed mitigation for the proposed action.

Under existing conditions, the GSA site was shown to be a minor source of air emissions with a facility-wide operating permit. The Mark Center and the Victory Center did not have existing permitted sources of air emissions.

A December 3, 2010, interview with the USACE provided detailed information about the air quality analysis. Air quality modeling of carbon monoxide vehicle emissions was conducted for all three sites, assuming no improvements to the transportation system for the most conservative emissions estimate. According to USACE, peak-hour carbon monoxide vehicle emissions would decline, as the average employee trip would be 3 miles shorter with the Mark Center location. This assumption was based upon the residential distribution of employees that would be traveling to the Mark Center or the Victory Center. With this assumption, the carbon monoxide ambient air quality standards were maintained.

As cited in the BRAC 133 EA, the GSA site estimated air emissions from proposed construction activities, and stationary and mobile sources were analyzed under the City Center Alternative in the Final General Conformity Determination for the FEIS for Fort Belvoir. The conformity determination was conducted as the area is not achieving the ambient air quality standards for various pollutants and the proposed actions are required to be reviewed to assure that the resulting emissions are accounted for in the State Implementation Plan. Under the GSA site alternative being analyzed in the BRAC 133 EA, the building size is smaller and construction schedule is unchanged when compared to the General Conformity Determination in the FEIS for Fort Belvoir. It would be expected that the emissions

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impact associated with this alternative would be less than that described in the General Conformity Determination.

The General Conformity Rules applied to the GSA site with respect to nitrous/nitric oxide; this would primarily result from construction activities. The BRAC 133 EA estimated construction emissions and established mitigation measures.

To determine the applicability of the General Conformity Rules to the Victory Center and Mark Center alternatives, air emissions from construction and proposed stationary and mobile sources were estimated and compared to the appropriate applicability thresholds. The BRAC 133 EA stated that the requirements of the General Conformity Rules were not applicable because the highest total annual direct and indirect emissions from this alternative would not exceed the applicability threshold for any criteria pollutant during any years, and would not be regionally significant.

Appendix C and Section 3.3.3 of the BRAC 133 EA stated that the Mark Center and the Victory Center were unforeseeable alternatives at the time the Fort Belvoir General Conformity Determination was written, but emissions for those two alternatives would not exceed *de minimis* thresholds. Because of this, the Army would not need to implement mitigation measures to reduce air quality effects.

The Virginia Department of Environmental Quality and the Army exchanged a series of communications during the BRAC 133 EA process in order to obtain approval of the air quality assessment and conformity determination. The Virginia Department of Environmental Quality provided the following environmental assessment comments on September 2, 2008:

- The Virginia Department of Environmental Quality's Air Quality Division finds the BRAC 133 EA contains insufficient information to support the Army's consistency determination and a lack of mitigation measures for the non-GSA site alternatives.
- The emission of ozone precursors attributable to the BRAC projects will exceed the general conformity thresholds for the area. Because of this, the air quality measures required for BRAC (per the Final General Conformity Determination for Implementation of the 2005 BRAC Recommendations and Related Army Actions at Fort Belvoir, Virginia) should be applied to each of the alternatives. Therefore, the air quality mitigation measures proposed for the GSA site should also apply to the Victory Center and the Mark Center.

The Virginia Department of Environmental Quality required additional information before concurring with the Army's determination. Follow-up coordination resulted in the Army stating it would extend the mitigation measures outlined in the Final General Conformity Determination for the 2005 FEIS to the Victory Center and Mark Center alternatives. The BRAC 133 indicates that "Construction Performance Plan for the Reduction of Air Emissions for Implementation of 2005 BRAC Recommendations and Related Army Actions at Fort Belvoir, Virginia" would also be included as an attachment to the Finding of No Significant Impact.

The Virginia Department of Environmental Quality then lifted its objection to the federal consistency determination for BRAC 133, and agreed with the Army that the BRAC Recommendation 133 was

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consistent with state requirements. The additions the Army agreed to make to the BRAC 133 Finding of No Significant Impact were incorporated into the document.

2.4.3.1 OBSERVATIONS: AIR QUALITY

1. The Army coordinated with Virginia Department of Environmental Quality, which requested changes to the air quality mitigation based upon assumptions made in the BRAC 133 EA with which they did not agree. While the Virginia Department of Environmental Quality did not concur with the original BRAC 133 EA air quality assessment and conformity determination, it appears that the Army properly coordinated with state to include approved mitigations in the Finding of No Significant Impact.
2. The methods, data, and assumptions are appropriate and sufficient to assess air quality effects. The BRAC 133 EA finding of short-term minor adverse and long-term negligible adverse; not significant effects is appropriate.

2.4.4 NOISE

The final BRAC 133 EA identifies the existing conditions of each of the three alternatives (GSA site, Victory Center, and Mark Center). The existing noise levels represent the pre-build condition. The BRAC 133 EA states that as per the Noise Control Act of 1972 (PL 92.574), federal agencies are to comply with applicable federal, state, interstate, and local noise control regulations. Specifically, it states that the Alexandria City Code and the Fairfax County Code prohibit the creation of sound louder than 55 decibels (dB) in a residential area and 60 dB in a commercial area.

The ambient noise levels were evaluated utilizing the American National Standard Institute (ANSI) methodology that considers the noise sources associated with various land uses. The BRAC 133 EA summarized the existing daytime- and nighttime noise levels for the three alternatives. Construction noise effects are described as well as management practices to reduce these noise effects.

2.4.4.1 OBSERVATIONS: NOISE

1. Based upon the BRAC 133 EA discussion, the federal action will require compliance with local noise control regulations and lists the ordinance for the City of Alexandria and Fairfax County. However, there is no quantitative analysis of the on-site traffic noise generation to determine if noise effects defined by the local ordinances would occur.

2. The BRAC 133 EA finding of short-term minor adverse and long-term negligible noise effects is appropriate regarding noise effects from construction and operation of the proposed action.

2.4.5 GEOLOGY AND SOILS

The general description of soils and geology is provided to assess potential effects of the proposed development upon soils. Sources of information for the evaluation of general topography, soil type, and soil characteristics were varied. The underlying geology of the alternatives was described under the GSA heading. Due to the geographic proximity of the GSA site to the Victory Center and the Mark

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Center, the underlying geology was determined to be "generally similar." The reference for the underlying geology information is incorrectly stated as ATC Associates, Inc. 2005. The underlying geology of the GSA site is correctly presented in the Hill International 1992 (AR 258) report.

The ATC 2005 *Phase I Environmental Site Assessments of 4825, 4830, 4840, 4845, 4860, and 4865 Mark Center Drive* (AR 105) cites the Geologic Map of Virginia as showing the GSA site within the "Coastal Plain Physiographic Province. Specifically, the property is underlain by the Potomac Formation, which is characterized by pebbly, poorly sorted quartzofeldspathic sand interbedded with sandy clay and silt with minor organic rich clay and silt."

The Mark Center is identified as having "short and long-term minor adverse effects on soils", which is an effect that is not stated for the GSA site or the Victory Center. The "long-term minor effect on soils" is not specifically described.

2.4.5.1 OBSERVATIONS: GEOLOGY AND SOILS

1. The evaluation of the geology and soils characterization and effect assessment was based upon both site specific and regional information. The methodology and outcome of the assessment are appropriate and sufficient to characterize geology and soil effects. The BRAC 133 EA finding of minor adverse effects for the alternatives is appropriate.

2.4.6 WATER RESOURCES

2.4.6.1 BACKGROUND

Assessments of existing water resources (Surface Water, Groundwater, Floodplains, and Coastal Zones) were based upon watershed studies, water quality studies, and state and federal information. Agencies with this information include the Virginia Department of Environmental Quality, the Virginia Department of Game and Inland Fisheries, the United States Geological Survey, Federal Emergency Management Agency, Fairfax County, City of Alexandria, and the United States Environmental Protection Agency.

All three alternative sites are located in urbanized watersheds; GSA lies in the Accotink Creek watershed, and the Victory Center and the Mark Center lie within the Cameron Run watershed. The water quality conditions of these watersheds are discussed for all alternatives. According to the BRAC 133 EA, the Victory Center may be subject to the Alexandria Chesapeake Bay Preservation Ordinance. Further information and a specific determination were not included. The City of Alexandria ordinance requires the reduction of impervious areas to meet performance criteria as part of the Alexandria Chesapeake Bay Preservation Ordinance.

Chesapeake Bay Resource Protection Areas (RPA) were identified within the Victory Center and the Mark Center site footprints. The BRAC 133 EA determined that approximately 0.09 acres of the Resource Protection Area at the Victory Center will be affected. The Victory Center discussion includes discussion regarding storm water management methods and the reduction in impervious area within the Resource Protection Area to protect water quality.

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The BRAC 133 EA identifies 1.4 acres of Resource Protection Area associated with an unnamed stream south of the Mark Center within the Mark Center footprint. The BRAC 133 EA is unclear whether there will be effects on this area resulting from the development. For the Mark Center there is no discussion of the Resource Protection Area impacts or measures to minimize specifically within those areas No determination is provided regarding avoidance, minimization, or identification of these effects.

Winkler Botanical Preserve indicated that the island within Winkler Pond becomes submerged during heavy storm events prior to the development of the Mark Center. The BRAC 133 EA states the pond design will handle the increase load and pollutants from additional impervious areas and does not address the comment from the Winkler Botanical Preserve. The Winkler Preserve Pond is an existing feature that was planned to accommodate the drainage of the adjacent development as identified in the February 2008 Environmental Assessment completed by Duke Realty. The pond was also designed to serve as a Best Management Practice (BMP) for water quality issues related to the proposed expansion of the Mark Center. Documentation on the magnitude of the additional impervious areas related to the proposed action was not included in the BRAC 133 EA. The USACE supplied this detailed information during the December 3, 2010, interview. Also, subsequent information provided by USACE indicates additional efforts to minimize development impacts at the Mark Center.

The effect analysis provides the assessment at varying levels of detail for the three sites. For the GSA site water quality modeling was conducted as part of the FEIS for Fort Belvoir, and these results were reported. For the Victory Center, the water quality discussion relies upon the GSA site discussion for general quality effects, but the RPA effects are discussed in detail and the specific reduction in impervious area that can be achieved and as well as BMPs. For the Mark Center, the water quality discussion also refers to the GSA site discussion. For the Mark Center the only discussion concerning mitigating the increase in impervious areas and the resulting additional runoff to the surrounding areas is a reference to the Duke Realty Environmental Assessment. Best Management Practices that will be implemented during construction are described. There is no discussion of potential Resource Protection Area effects or its applicability.

2.4.6.2 OBSERVATIONS: WATER RESOURCES

1. The descriptions of the water resources, including streams, groundwater, floodplain, and coastal management zones, are sufficient for the analysis. In all cases, the BRAC 133 EA documents the various laws and regulations that are currently in place including those related to the Chesapeake Bay protection areas.
2. The methodology of the assessment is sufficient to characterize water resources for the GSA site and the Victory Center. The BRAC 133 EA Mark Center analysis does not provide the same level of detail to support the finding. The USACE provided additional information in follow up interviews to support the finding of long-term minor adverse impact.
3. The discussion of Resource Protection Areas effects was incomplete for the Mark Center. Resource Protection Area effects were avoided at the GSA site and were estimated at less than 0.09 acres for the Victory Center. The 1.2 acres of RPA impact for the Mark Center are not assessed regarding the significance of the impact.

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SIGNFICANCE OF OBSERVATIONS

There are weaknesses in the BRAC 133 EA water resources assessment. These weaknesses do not provide a complete description of the potential effects; however, the conclusion of short and long-term minor impacts appears to be sufficient based upon additional information provided by USACE.

2.4.7 BIOLOGICAL RESOURCES

Vegetation, wildlife, sensitive species, and wetlands were described for each alternative. The GSA and the Victory Center are both developed sites with limited vegetation and wildlife resources. Sensitive species were investigated for all three alternatives; however, no sensitive species of concern were identified for any of the locations.

The Mark Center is the only alternative with existing tracts of wooded areas; approximately eight of the 13 acres of forested area on site were planned for removal. The BRAC 133 EA generally stated the quality of the forested area; however, no detailed information was provided on size and type of trees to be removed. The BRAC 133 EA stated that no permanent loss of a substantial amount of forested areas relative to existing conditions in the region would occur. There is no regional description of forested areas provided to support the conclusion that removal of eight acres was not substantial. Furthermore, there was no identification of local tree ordinances developed by the City of Alexandria or Fairfax County or a tree replacement policy to mitigate for the tree removal. In the interview with USACE personnel, the Winkler Botanical Preserve was mentioned as the mitigation site for development of the Mark Center; however, this information is not available in the BRAC 133 EA.

The three sites considered are located in heavily urbanized areas in which wetland resources are typically few and scattered; however, because wetlands with significant nexus to jurisdictional waters of the United States are regulated under Section 404 of the Clean Water Act (1977), it is the responsibility of the lead federal agency to adequately determine whether wetlands are present on sites being considered for development. Resources used to identify wetlands include the National Wetland Inventory (NWI) maps developed by the United States Fish and Wildlife (USFWS) in conjunction with local agencies. These maps identify areas of potential wetland locations throughout the entire United States. The BRAC 133 EA does not indicate whether these NWI maps were utilized for the assessment of the three alternatives studied. Site visits are usually conducted to verify the accuracy of the NWI map review. A site visit was conducted for the Mark Center, but it appears that this was not completed to assess on-site/off-site wetland resources.

2.4.7.1 OBSERVATIONS: BIOLOGICAL RESOURCES

- The removal of trees eliminates eight acres of potential forested habitat. There is no record of coordination with this adjacent land owner concerning wildlife use of the area. During the interview process, the USACE indicated that there was coordination with the USFWS on wildlife issues, and that this agency did not provide any comment on wildlife, including migratory birds.
- The BRAC 133 EA did not provide a threshold level of significance for the eight acres of forested community affected by the Mark Center development. Although described as not “substantial

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compared to the area," there was no quantitative frame of reference in terms of acres of woodland or other type of measure. There was no discussion on the general overall quality of the wooded area (mature native species or volunteer adventive species), nor the condition of the site.

- The characterization of vegetation is incomplete as presented in the BRAC 133 EA. Analysis of the sensitive species and wildlife is appropriate and sufficient based upon the resources available.

SIGNFICANCE OF OBSERVATIONS

The finding of short- and long-term minor adverse effects is appropriate for sensitive species, wildlife, and wetlands. This same finding is not supported for the vegetation effect as there is not sufficient information to provide a context of the analysis or a threshold level of effect. During the Army's reassessment of project conditions, additional analyses should be provided regarding the context and threshold level of effect for vegetation.

2.4.8 CULTURAL RESOURCES

The historical condition of the GSA site was detailed in the BRAC 133 EA, including the determination by the State Historic Preservation Officer that buildings on site were not eligible for the National Historic Register. The BRAC 133 EA also indicates that there are historic properties within the City of Alexandria Historic District three miles east of the Victory Center and the Mark Center. There were no archaeological sites recorded for the GSA site; the Victory Center had a 2006 archaeological assessment that resulted in a determination that no potential existed at the site due to its heavily disturbed condition. The available archaeological survey for the Mark Center property was completed in 1994. The City of Alexandria indicated that a new survey for archaeological and historic resources be conducted if any development is to occur after 2004 (10 years after the date of the detailed Phase 1 survey). An additional archaeological survey was completed after the BRAC 133 EA was finalized, and one archaeological finding occurred on site. Coordination through the Section 106 process, which is the historical coordination process required for federal actions, has continued since the completion of the BRAC 133 EA.

2.4.8.1 OBSERVATIONS: CULTURAL RESOURCES

1. Based upon the review of the BRAC 133 EA, the analysis conducted for and the finding of "no effect" for cultural resources was sufficient, documenting the studies that had been completed previously and including clearances received for all alternatives from the State Historic Preservation Officer.
2. The supplemental archaeological study was conducted either during the environmental assessment process or after the FNSI but was not disclosed in the BRAC 133 EA.
3. A Section 106 has been processed outside of the BRAC 133 EA.

2.4.9 SOCIOECONOMIC RESOURCES

The socioeconomics assessment was completed for the region of influence of the BRAC 133 action. The BRAC 133 EA states that the residency distribution of the BRAC 133 employees and the location of the BRAC 133 sites determined the socioeconomic region of influence, which included City of

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Alexandria, Arlington County, Fairfax County, and Prince William County in Virginia and Prince George's County in Maryland. This region of influence was assumed to be the same for all three BRAC 133 sites. The baseline data year for the socioeconomic analysis was 2005.

The region of influence was found to have a fast-growing population, growing by nine percent from 2000 to 2005 as well as high housing costs and low vacancy rates. Thirteen of the fourteen block groups studied for the GSA site were found to have a high percentage of minority residents, and one had a high percentage of low-income residents. Seven of the eleven block groups studied for the Victory Center site were found to have a high percentage of minority residents, and one had a high percentage of low-income residents. All six of the block groups studied for the Mark Center was found to have a high percentage of minority residents, and three had high percentages of low-income residents.

The direct and indirect socioeconomic effects of the BRAC 133 sites were developed using the Army's Economic Impact Forecast System (EIFS) model. A change was considered significant if it fell outside the historical range of region of influence economic variation. This was determined by calculating a rational threshold value profile for the region. The edges of the rationale threshold value historical range became the threshold of significance, and any value that fell outside that range was considered significant. This procedure is common among Army socioeconomic analyses for environmental documents.

The Economic Impact Forecast System model found that for all three sites, the BRAC 133 would bring short-term economic benefits of jobs and increased spending during construction. The model did not find significant changes in sales, income, employment, or population in the region of influence with the proposed action. However, the proposed action would shift jobs to and from different locations in the region. The collective BRAC actions would relocate people within the region of influence, but 14,500 jobs were estimated to leave the region of influence with the collective BRAC action. The BRAC 133 EA assumed (as did the FEIS for Fort Belvoir) that 50 percent of BRAC 133 employees would relocate to a new residence within the region due to the BRAC 133 relocation. This would result in minor, but not significant, effects on housing, emergency services, and schools for all three sites. It was determined that no environmental justice or protection of children effects would occur with any of the sites. The No Action alternative was projected to have no effect on socioeconomic resources.

The superintendent of the Fairfax County Public School District (FCPS), Jack Dale, sent a series of letters to the Garrison Commander of Fort Belvoir to discuss the school district's disagreement with the Army's findings of no significant effect upon the Fairfax County Public Schools with the overall Fort Belvoir and the BRAC 133 actions. In the letter sent to the Army for the BRAC 133 action dated August 7, 2009, the school district stated that it believed that a higher proportion of relocated employees would move to Fairfax County than the BRAC 133 EA assumed. The district also stated that the BRAC 133 EA's assumption that 20 percent of school-aged children would be educated outside of the public school system was not accurate, and this percentage was actually nine percent. The school district's specific environmental assessment comments included the following:

1. The draft BRAC 133 Finding of No Significant Impact appears to be based upon the lower school effect assessment contained in BRAC 133 EA. Regardless, FCPS requested all

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references to the latter and information estimates of total effect cited, which were not previously contained in the body of the FEIS for Fort Belvoir and Record of Decision, be removed from the BRAC 133 EA.

2. A more complete analysis of effects should be undertaken that would include consideration of spin-off jobs in addition to the direct effect of personnel movements due to BRAC 2005 directly affecting Fort Belvoir, of which the personnel changes identified in the draft environmental assessment are but a subset.
3. All data or information from the Army Directive 5410.12 should be provided to Fairfax County Public Schools in a reasonable and agreed to electronic format with documentation identifying the contents and its limitations.

The BRAC 133 EA contained a response letter prepared for the FEIS for Fort Belvoir that described the assumptions and methods used to determine the potential effect upon the school system. The use of the region of influence and accounting for movement in the region of influence was the basis of the effect assessment. This method and analysis was sufficient to assess the potential effect of the proposed action upon this resource.

The Finding of No Significant Impact stated that Fairfax County submitted comments on the project. During a December 3, 2010, interview, the USACE stated that the Fairfax County School District comments were taken into account in the development of the BRAC 133 Finding of No Significant Impact.

2.4.9.1 OBSERVATIONS: SOCIOECONOMIC RESOURCES

1. The BRAC 133 EA finding of short- and long-term minor adverse effects for various categories of socioeconomic resources appear to be sufficient and appropriate.

2.4.10 AESTHETICS AND VISUAL RESOURCES

The aesthetics and visual resources are the natural and man-made features of a landscape. These include cultural and historic landmarks, landforms of particular beauty or significance, water surfaces, and vegetation. All of these features form the overall impression that a viewer receives of a landscape.

The aesthetics and visual resources of the proposed action were not always evaluated equally across the alternative sites. The aesthetics and visual resources were evaluated using the Scenic Integrity Definition defined in the BRAC 133 EA. A detailed description of aesthetic and visual resources was given for the GSA site. The architecture style/type and the aesthetic quality of the surrounding land use in each direction were also provided for the GSA site. The aesthetic quality/scenic integrity of adjacent land use for the Victory Center and the Mark Center is generalized.

2.4.10.1 OBSERVATIONS: AESTHETICS AND VISUAL RESOURCES

The additional information provided for the GSA site did not alter the evaluation of effects. The short-term aesthetic effects of construction activities and the long-term aesthetic effects of additional

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buildings and parking structures from surrounding areas were sufficiently and appropriately evaluated for each alternative.

2.4.11 UTILITIES

Utility services included potable water supply, sanitary sewage collection, electricity, natural gas, communications, and municipal solid waste collection. For each of the alternatives, the utility services were described in the BRAC 133 EA.

Potable water sampling was only conducted at selected buildings at the GSA site. Additional information regarding water quality at the Victory Center and the Mark Center was not included. A mathematical model for the demand of water and sanitary sewer services based upon the per capita number for the "net increase of 6,259 personnel" was only completed for the GSA site. The use the mathematical model based upon per capita water consumption and sanitary sewer was not stated as being used for the "estimated" supply and distribution capability of the Victory Center and the Mark Center.

The stated current power consumption and the estimated demand for electricity are given in several different units. Anticipated demand for electricity and natural gas was quantified for the GSA site, while electricity demand was "estimated to be sufficient" at the Victory Center and was not stated for the Mark Center. Water and energy saving devices are mentioned as part of the Victory Center and the Mark Center only. Water and energy saving devices were not evaluated equally for each of the three alternatives.

2.4.11.1 OBSERVATIONS: UTILITIES

1. The evaluation of utilities available at the alternative sites was not described in a consistent manner. That is, a more detailed description and analysis of utility resources was given for the GSA site; however, all types of utilities for each alternative were evaluated. The availability of utilities was described for each alternative.
2. The BRAC 133 EA finding of short-term minor effects was appropriate for the utility effects analysis of all alternatives.

2.4.12 HAZARDOUS AND TOXIC MATERIALS

Hazardous and toxic materials of the proposed action were evaluated equally; however, the level of information provided for each alternative was greater for the GSA site. Discussions of mold, asbestos, and lead-based paint are provided for the GSA site due to background information on the topic, including applicable laws and regulations.

In addition, radon, lead-based paint, and asbestos-containing material (ACM) surveys were assessed for the GSA building and the Victory Center. The types of pesticides and general information of how they are used are presented in greater detail for the GSA site.

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Soil borings at the Victory Center during the Phase I Environmental Site Assessment (ESA) found "oil staining and arsenic and lead concentrations above Commonwealth of Virginia Voluntary Remediation Plan (VRP) Tier III Screening levels."

2.4.12.1 OBSERVATIONS: HAZARDOUS AND TOXIC MATERIALS

The BRAC 133 EA finding of no effect is appropriate and sufficient for all alternatives.

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2.5 ASSESSMENT OF BRAC 133 EA OUTCOMES AND CONCLUSIONS

The BRAC 133 EA was prepared to assess the environmental consequences of a reasonable range of alternatives. The BRAC 133 EA concluded with a Finding of No Significant Impact for the selection of the Mark Center. Our assessment consisted of an evaluation of the BRAC 133 EA's conformity with the environmental assessment process outlined in the Army and Council on Environmental Quality regulations as well as assessment of the methods, assumptions, and data utilized in the BRAC 133 EA.

2.5.1 FINDING OF NO SIGNIFICANT IMPACT (FNSI)

At the conclusion of the BRAC 133 EA, the level of environmental effects (after mitigation) was reviewed. Because the proposed action did not result in a significant effect upon the environment, a Finding of No Significant Impact was prepared. This Finding of No Significant Impact described the reasons for the determination that an environmental impact statement was not needed and was published with the BRAC 133 EA for public comment and review. The specific elements of the Finding of No Significant Impact are 1) name of the action, 2) brief description of the action, 3) short discussion of the anticipated environmental effects, 4) the facts and conclusions that have led to the FNSI, and 5) a deadline and point of contact for further information or public comments. The BRAC 133 draft FNSI was available to the public for a 30-day period from July 14 to August 13, 2008.

The resource effects were summarized in *Table 6: Summary of Potential Environmental and Socioeconomic Consequences (Source BRAC 133 EA, Table 4-1, p.4-2,3).* The No Action alternative did not have any effects for any resource and is not included in Table 6. The Finding of No Significant Impact indicated that no significant adverse effects would occur for any resource and that all three proposed actions were acceptable. The Mark Center was selected as the preferred alternative.

2.5.1.1 OBSERVATIONS: FINDING OF NO SIGNIFICANT IMPACT

1. The Finding of No Significant Impact was appropriately published and distributed during the Notice of Availability.
2. The conclusion of the BRAC 133 Finding of No Significant Impact is appropriate for the land use, air quality, noise, geology and soils, biological resources, water resources, cultural resources, socioeconomic resources, aesthetics, utilities, and hazardous materials.
3. Based upon the assessment of the BRAC 133 EA, the FNSI was appropriate for the conditions identified at the time of the analysis. However, there were elements of the BRAC 133 EA process and assessment that contained weaknesses. In addition, the change in project conditions between 2008 when the BRAC 133 EA was published and July 2010 when the BRAC 133 TMP was published indicates a reassessment of transportation effects is needed to confirm the FNSI.

SIGNFICANCE OF OBSERVATIONS

According to Army regulation 32 CFR 651.5 (g), the “NEPA documentation must be periodically reviewed for adequacy and completeness in light of changes in project conditions.” This review

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requires the Army to determine the adequacy of the previous analysis and if additional environmental documentation is needed. A Record of Environmental Consideration is prepared if the Army determines that there is no need for new or supplemental documentation. The need for reassessment is based upon changes in transportation conditions and the weaknesses in cumulative effects and mitigation/monitoring as described in this report.

Table 6: Summary of Potential Environmental and Socioeconomic Consequences

Resource Area	GSA Site	Victory Center	Mark Center
Land Use	Long-term negligible to minor adverse and beneficial; not significant	No effects	No effects
Transportation	Long-term minor adverse; not significant	Long-term minor adverse; not significant	Long-term minor adverse; not significant
Air Quality	Short- and long-term minor adverse; not significant	Short- and long-term minor adverse; not significant	Short- and long-term minor adverse; not significant
Noise	Short-term minor adverse and long-term negligible adverse; not significant	Short-term minor adverse and long-term negligible adverse; not significant	Short-term minor adverse and long-term negligible adverse; not significant
Geology and Soils			
Geology/Topography	No effects	No effects	No effects
Soils	Short-term minor adverse	Short-term minor adverse	Short- and long-term minor adverse; not significant
Prime Farmland	No effects	No effects	No effects
Water Resources			
Surface Water and Groundwater	Short-term minor adverse and long-term minor beneficial	Short-term minor adverse and long-term minor beneficial	Short- and long-term minor adverse; not significant
Floodplains, Coastal Zone	Short-term minor adverse and long-term minor beneficial	Short-term minor adverse and long-term minor beneficial	Short- and long-term minor adverse; not significant
Biological Resources			
Vegetation	No effects	No effects	Long-term minor adverse; not significant
Wildlife	Short- and long-term negligible adverse;	Short- and long-term negligible adverse;	Short- and long-term negligible to minor

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Threatened and Endangered Species *Wetlands*	not significant No effects No effects	not significant No effects No effects	adverse; not significant No effects No effects
Cultural Resources	No effects	No effects	No effects
Socioeconomic Resources *Economic Development* *Housing* *Law Enforcement, Fire Protection, and Medical Services* *Schools* *Services, Shops, and Recreation* *Environmental Justice* *Protection of Children*	Short- and long-term minor beneficial Short-term minor adverse Short-term minor adverse Short- and long-term minor adverse; not significant Short-term minor adverse Short-term minor adverse No effects	Short- and long-term minor beneficial Short-term minor adverse Short-term minor adverse Short- and long-term minor adverse; not significant Short-term minor adverse Short-term minor adverse No effects	Short- and long-term minor beneficial Short-term minor adverse Short-term minor adverse Short- and long-term minor adverse; not significant Short-term minor adverse Short-term minor adverse No effects
Aesthetics	Short-term minor adverse and long-term minor beneficial	Short-term minor adverse and long-term minor beneficial	Short- and long-term minor adverse
Utilities	Short-term minor adverse	Short-term minor adverse	Short-term minor adverse
Hazardous and Toxic Materials	No effects	No effects	No effects

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2.5.2 SUMMARY OF BRAC 133 EA PROCESSES AND PROCEDURES

The process and procedural elements of the BRAC 133 EA must conform to federal regulations based on the NEPA of 1969. Verifying compliance with Council on Environmental Quality Title 40 Code of Federal Regulations *(CFR) Parts 1500 to 1508* and Army regulations *32 CFR Part 651* was the first step of the procedural analysis. Each element of the BRAC 133 EA was assessed with regards to conformity with and applicability of these regulations. Our analysis was divided into the following subsections:

1. Scoping/Agency Coordination /Public Involvement
2. Purpose and Need
3. Alternatives Identification
4. Environmental Resource Characterization
5. Environmental Consequences
6. Cumulative Effects
7. Mitigation and Monitoring

To verify that the Council on Environmental Quality and the Army regulations were followed, those applicable regulatory requirements were reviewed in the context of information and processes utilized to develop the BRAC 133 EA.

1. Public Involvement/Scoping/Agency Coordination

The public involvement and scoping process was minimal. Based upon Army regulations, the extent of public involvement is variable depending upon the level of public interest. “Limited” public interest was the basis of the decision to not prepare a public involvement plan or to hold public meetings or hearing. However, our review of 48 news articles from the period of the BRAC 133 EA development indicated there was public interest in BRAC 133 EA. The Army complied with the minimum requirements according to the regulations but did not meet the spirit of the Council on Environmental Quality and Army regulations.

Scoping was conducted but was incomplete. Local agencies were excluded from notifications during the process, and several state and federal agencies notified prior to the addition of the Mark Center were not re-notified when this alternative was added. The scoping process was not sufficient for the BRAC 133 EA development.

2. Purpose and Need

The development of the Purpose and Need was appropriate and sufficient.

3. Alternatives Identification

The alternatives identification process included a site selection process for identifying a reasonable range of alternatives. The initial FEIS for Fort Belvoir alternatives for the BRAC 133 action were expanded in the BRAC 133 EA to evaluate other sites off base that would reduce adverse traffic effects as identified in the FEIS for Fort Belvoir. The process to identify sites that met the Purpose and Need of the project and the Army criteria involved an open solicitation. The seven sites submitted in response to the October 2007 RFP were then analyzed using the site evaluation criteria as listed in the

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RFP. The two-phase site screening process first reduced the privately owned sites to those that could satisfy the government's site criteria. Then, the remaining sites were screened against each other to determine which provided the most value to the government. After the two-phase private site analysis, the private site determined to be the best was then compared against the government-owned sites.

Two criteria were changed substantially between the October 2007 Request for Expression of Interest/ December 2007 Memorandum of Decision and the September 19, 2008, and September 29, 2008, site selection decisions. First, the October 2007 Expression of Interest stated the project's location would be in Virginia, within 1 mile of any Metro station. The September 19, 2008, and September 29, 2008, selection documents removed that requirement from the criteria and required that access to public transportation be considered, but not required. Second, the October 2007 Expression of Interest required "a high-level traffic plan which demonstrates successful integration of the site to existing transportation systems." The September 29, 2008, selection document revised that requirement to require that the site's effect on local area traffic only be studied and mitigated. The development of a reasonable range of alternatives was appropriate and sufficient utilizing the site selection process. The selected alternative met the Purpose and Need of the project.

4. Environmental Resource Characterization

The environmental resources identified in the BRAC 133 EA were appropriate and sufficient.

5. Environmental Consequences

The BRAC 133 EA identified the direct and indirect effects of the environmental resources. This identification of consequences was appropriate and sufficient. The content of the effect analysis was evaluated in Section 3.3 of this report.

6. Cumulative Effects

Cumulative effects were assessed within the context of each resource area; however, there were weaknesses in the analysis. Threshold levels of impact were not defined for transportation, socioeconomic tax loss, vegetation, or water resources. The cumulative effects of transportation do not provide sufficient information regarding regional traffic trends or current and future LOS within a few blocks of the Mark Center. For example, queuing of traffic on I-395 is a current condition, identified in the direct effect section. This condition is not described or assessed for cumulative effects. There is no discussion of past, present, or future traffic conditions beyond six intersections.

7. Mitigation and Monitoring

The mitigation measures identified included both engineering solutions as well as a transportation management plan. The proposed transportation management plan is required to achieve a 40 percent reduction in employee trips. The BRAC 133 EA's finding of minor adverse effects is based upon the implementation of all mitigation measures including the trip reduction results of a TMP. The BRAC 133 EA did not require or recommend monitoring to review the success of the BRAC 133 EA mitigation measures. Monitoring should be included when the outcome is uncertain and a significant adverse effect could reasonably be expected to result if the mitigation measures do not occur. As additional traffic studies were planned and the TMP goal of 40 percent was an aggressive goal, the requirement for monitoring would have been appropriate.

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2.5.3 ASSESSMENT OF DATA, METHODS, AND ASSUMPTIONS FOR THE BRAC 133 EA

The BRAC 133 EA evaluated 12 resource areas, evaluated for cumulative effects, and recommended mitigation measures for three alternatives plus the No Action alternative. The GSA site had been evaluated as part of the earlier FEIS for Fort Belvoir such that information presented was consistent with the level of detail necessary for an environmental impact statement. This resulted in an unbalanced assessment because the methods and detail provided for other two alternatives, the Victory Center and the Mark Center, were generally appropriate for an environmental assessment level of analysis. The BRAC 133 EA assessment of impacts is sufficient with the following exceptions: transportation, vegetation, and cumulative effects.

The BRAC 133 EA transportation effects analysis described traffic conditions in 2011 with and without BRAC 133 in place. Other studies conducted after the BRAC 133 EA show different traffic conditions and a different level of impact at certain intersections and ramps. The Army regulations (32 CFR 651.5(g)) require a review of project conditions if there is a change in conditions and a reassessment is needed to verify the findings of the environmental assessment. There is sufficient post-EA information to justify a reassessment of the intersections described in the BRAC 133 EA as well as providing additional analysis regarding the cumulative transportation effects of BRAC 133. The mitigation measures need to be reassessed to insure that the goal of maintaining existing level of service and long-term minor adverse impacts is still achieved.

Regional effects were not addressed in the BRAC 133 EA as those effects were estimated to dissipate within short distances of the site. Congestion on the I-395 ramps is noted, but the cumulative effects discussion does not address these issues or describe them. The regional effects analysis is incomplete in the BRAC 133 EA.

The BRAC 133 EA finding of short- and long-term minor adverse effects is not supported for the vegetation effect as there is not sufficient information to provide a context of the analysis or a threshold level of effect. During the Army's reassessment of project conditions, additional analyses should be provided regarding the context and threshold level of effect for vegetation.

According to Army regulation 32 CFR 651.5 (g), the "NEPA documentation must be periodically reviewed for adequacy and completeness in light of changes in project conditions." This review requires the Army to determine the adequacy of the previous analysis and if additional environmental documentation is needed. A Record of Environmental Consideration is prepared if the Army determines that there is no need for new or supplemental documentation. The need for reassessment is based upon changes in transportation conditions and the weaknesses in cumulative effects, vegetation effects, and mitigation/monitoring

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2.6 BRAC 133 EA SUMMARY OF RESULTS

Environmental assessments are prepared to inform decision makers of the environmental consequences of a proposed project. They characterize the potential magnitude of environmental effects and outline actions to mitigate those effects. The Army and the Council on Environmental Quality have regulations regarding the specific elements required for an environmental assessment. The outcome of an environmental assessment is either a Finding of No Significant Impact or a conclusion that a more detailed analysis (i.e., environmental impact statement) be completed.

The outcome of the July 2008 BRAC 133 EA was the September 2008 Finding of No Significant Impact for the three alternative sites—the General Services Administration site, the Victory Center, and the Mark Center. Based on our technical review of the BRAC 133 EA, we determined that the Finding of No Significant Impact was appropriate, based on the information considered at the time of the environmental assessment. However, we have identified two areas of concern: 1) a change in project conditions subsequent to the BRAC 133 EA and the Finding of No Significant Impact that necessitate a reassessment of traffic effects and 2) procedural and technical weaknesses in the BRAC 133 EA. These concerns are further described below.

1) Change in Conditions
During our engineering assessment, a comparison of the traffic conditions described in the BRAC 133 EA (July 2008) and the conditions outlined in the BRAC 133 TMP (July 2010) was conducted. This comparison indicated that a change in traffic conditions occurred subsequent to the September 2008 issuance of the Finding of No Significant Impact and selection of the Mark Center. This change in traffic conditions needs to be reassessed by the Army to determine if the Finding of No Significant Impact is still valid and if the proposed mitigation of intersection improvements is sufficient per Army regulations (32 Code of Federal Regulations 651.5(g)).

The BRAC 133 EA transportation effects analysis described 2011 traffic conditions with and without BRAC 133 in place. The *Transportation Management Plan for BRAC 133 at Mark Center* (BRAC 133 TMP), dated July 2010, presents different traffic conditions and different level of service impacts at certain intersections and ramps. For example, the BRAC 133 TMP indicates the morning peak hour at the Seminary Road/Mark Center Drive intersection would decline to a level of service approaching unstable, and the North Beauregard Street/Seminary Road intersection and the Seminary Road/I-395 northbound ramp would each operate at an unacceptable level of service. However, the BRAC 133 EA traffic flow projections for these two intersections indicated a level of service with stable conditions.

Given the discrepancies between the traffic condition information provided in the BRAC 133 TMP and that contained in the BRAC 133 EA, there is sufficient justification to require a reassessment to verify the findings of the transportation impacts described in the BRAC 133 EA. The reassessment can be presented in either a Record of Environmental Consideration or supplemental environmental document.

In particular, the reassessment should include a thorough analysis of the cumulative transportation effects of BRAC 133. It is further recommended that the mitigation measures be reviewed as part of

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the reassessment to ensure that the goal of maintaining existing level of service and "long-term minor adverse impacts" is achieved.

2) Procedural and Technical Weaknesses

The weaknesses identified in the BRAC 133 EA included incomplete scoping and insufficient public involvement, the absence of mitigation monitoring, and incomplete analysis of cumulative effects and vegetative effects. Additionally, the evaluation of resource impacts for the three alternative sites was not presented in the same level of detail. As part of the Fort Belvoir Final Environmental Impact Statement (FEIS for Fort Belvoir the General Services Administration site was analyzed in greater detail than either the Victory Center or Mark Center sites.

Scoping and Public Involvement

The BRAC 133 EA scoping process, although discretionary according to Army regulations, was initiated but was incomplete. Local agencies, planning agencies, and the Virginia Department of Transportation were excluded from formal notification/invitation letters before and after the Mark Center site was added to the BRAC 133 EA. In addition, certain federal and state agencies contacted in September 2007 for information were not notified when the Mark Center was added as an alternative in December 2007. This may have limited the information available for assessing the impacts of BRAC 133.

While the BRAC 133 EA met the minimal Army requirements for public involvement, it did not achieve the "spirit" of the Council on Environmental Quality regulations because public involvement was not consistent with the level of public interest. According to the Army, the level of public involvement followed standard procedures for all environmental assessments prepared for the BRAC 2005 program. However, no public involvement plan was created, and no public meetings or public hearings were held for the BRAC 133 EA. Although the Army characterized the level of controversy as little to moderate, the 48 news articles about the BRAC 133 project published during the development of the BRAC 133 EA appear to have warranted additional public involvement. Furthermore, the Virginia Department of Transportation's request for a public meeting was not acknowledged. As a result of minimal public involvement and incomplete scoping, information and input that could have been valuable in assessing environmental effects were not obtained.

Mitigation Monitoring

Mitigation for transportation effects included engineering solutions, such as intersection improvements, and a requirement for a transportation management plan. The components of the transportation management plan were not defined in the BRAC 133 EA, but the BRAC 133 EA established an aggressive goal of 40-percent reduction in single-occupancy vehicle trips. According to Army regulations, the mitigation measures in the Finding of No Significant Impact became legally binding and must be accomplished as the project is implemented. The intersection improvements are required to be completed prior to occupancy of the Mark Center.

Per Army regulations (32 CFR 651.15 (h)), if the outcome of mitigation measures is uncertain, monitoring can be required to determine the effectiveness of the mitigation. Because there was uncertainty in the achievement of the 40-percent trip reduction and in the effectiveness of the mitigation measures in maintaining traffic flow outlined in the BRAC 133 EA, a commitment to

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monitoring traffic conditions would have been appropriate to ensure that the impacts of BRAC 133 are minor. Should a reassessment be performed, it should include a commitment to monitoring to verify the finding of "long-term, minor, adverse, not significant" effects.

Cumulative Effects
Cumulative effects are defined in the Council on Environmental Quality regulations as "impacts on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions." Cumulative effects provide an overall picture of conditions in the project area.

The cumulative effects analysis of transportation in the BRAC 133 EA was limited because it lacked a summation of past, present, and future traffic conditions (described either by volumes or levels of service). Additionally, the geographic boundary for transportation was limited to intersections within 0.3 mile of the Mark Center, I-395 queuing was not discussed, and the time frame for reasonably foreseeable future actions was only projected to September 2011.
There was also an unequal assessment of regional traffic effects for the three alternative sites. Because the General Services Administration site was part of the Fort Belvoir Environmental Impact Statement a regional travel demand model was completed for that site; however, similar modeling was not completed for the Victory Center or the Mark Center during the BRAC 133 environmental assessment process.

The weaknesses in the Cumulative Effects section of the BRAC 133 EA may not be sufficient by themselves to require a supplemental environmental assessment. However, if a reassessment of project conditions of the BRAC 133 EA is undertaken, it should include a more thorough analysis of the cumulative effects.

Vegetation Effects
Vegetation effects relating to the removal of eight acres of wooded area at the Mark Center were not completely analyzed. Because there was insufficient information in the BRAC 133 EA to provide an appropriate context for analysis or a threshold level of effect, the finding of "short- and long-term minor adverse effects" is not supported for the vegetation effects. If a reassessment of project conditions is completed, additional analyses should be provided regarding the context and threshold level of effect for vegetation.

<u>Alternative Identification Process</u>
In addition to the weaknesses outlined above, the alternatives identification process for ascertaining a reasonable range of government-owned and privately owned site alternatives was reviewed.

The Army issued a request for Expression of Interest on October 5, 2007 to identify potential private sites for BRAC 133. This Expression of Interest included the criterion that the BRAC 133 building location be within one mile of a Metro station. Subsequently, on October 23, 2007, the Expression of Interest was reposted with the criterion revised to state that the location within one-mile of any metro station was not a requirement. According to the United States Army Corps of Engineers in an interview on December 3, 2010,

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> *The proximity to Metro requirement, as well as the other preliminary screening criteria specified in the Request for Expressions of Interest, was intentionally not stated as a "minimum" requirement. While these requirements clearly expressed a preference by the Government, our intent was to leave enough flexibility in the requirements to permit a wide range of site possibilities for our consideration from an overall best value perspective.*

The two-phase site screening process first reduced the privately owned sites to those that could satisfy the government's site criteria. Then the remaining sites were screened against one another to determine which provided the best value to the government. The Victory Center continued forward in the process and the Mark Center, which is nearly three miles away from the nearest metro station, was also added to the BRAC 133 environmental assessment as an alternative site. After the two-phase private site analysis, the Mark Center was determined to be the private site with the best value, and it was then compared against the government-owned sites.

The site selection process utilized was appropriate and sufficient to develop a reasonable range of alternatives, and the selected Mark Center alternative met the Purpose and Need of the environmental assessment.

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3 ASSESSMENT OF JULY 2010 BRAC 133 TRANSPORTATION MANAGEMENT PLAN (BRAC 133 TMP)

3.1 SUMMARY

The BRAC 133 TMP is adequate and notably strong from the procedural standpoint of implementing a publicly accessible and responsive plan development process. However, the BRAC 133 TMP should be revised and updated to include several critical travel demand management strategies, including the shuttle program, to ensure the achievement of the BRAC 133 TMP's two goals: (1) achieve 40 percent or more non-single-occupancy vehicle trips to the site in order to minimize traffic effects on the neighboring community and (2) facilitate tenant mobility to the site by providing a viable transportation program in order to help employees choose appropriate commute methods for getting to the Mark Center.

The BRAC 133 TMP includes a traffic impact analysis that was adequate for the purposes of developing a transportation management plan. However, a more technically robust, stand-alone traffic impact analysis would be needed to confirm the accuracy of the BRAC 133 TMP's findings, as well as to determine the potential effects of BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 TMP study limits.

3.2 BACKGROUND

The BRAC 133 Mark Center property was purchased by the Department of the Army (Army) from Duke Realty Corporation (Duke Realty) in December 2008, after completion of the 2008 Base Realignment and Closure 133 Environmental Assessment (BRAC 133 EA) and site selection process to accommodate 6,409 Department of Defense (DOD) personnel realigning to Fort Belvoir. The United States Army Corps of Engineers (USACE) is responsible for managing the construction of the BRAC 133 buildings. The Washington Headquarters Services will be responsible for managing the buildings, when they become operational. Subsequent to the completion of the BRAC 133 EA, the Army issued a Finding of No Significant Impact (FNSI) that included a recommendation to prepare a transportation management plan (TMP) for BRAC 133 as a transportation impact mitigation measure.

Cognizant of the potential effects of BRAC 133 on the neighboring community and to facilitate tenant mobility, USACE met with the City of Alexandria in early 2009 and agreed to develop a TMP for BRAC 133 at the Mark Center (BRAC 133 TMP). USACE led the development of the BRAC 133 TMP in close coordination with Washington Headquarters Services, which will be responsible for implementing and monitoring the overall effectiveness of the BRAC 133 TMP.

USACE engaged planning and engineering firm The Benham Companies, LLC, a subsidiary of Science Applications International Corporation (SAIC) to develop the BRAC 133 TMP. As requested, The Benham Companies is referred to as SAIC throughout this assessment report. In addition to providing technical services and developing the BRAC 133 TMP, SAIC played a role in coordinating

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with the City of Alexandria and the National Capital Planning Commission (NCPC) on the BRAC 133 TMP document in terms of progress and content. SAIC also met with other stakeholder agencies for the purpose of obtaining data and other information relevant to the BRAC 133 TMP. Stakeholder coordination beyond the collection of information related to the BRAC 133 TMP was undertaken directly by USACE and Washington Headquarters Services.

The City of Alexandria formally established the BRAC 133 Advisory Group on February 12, 2009. The Advisory Group was created as a forum for "developing ideas and recommendations relating to transportation improvements and other issues associated with the BRAC 133 office building, as well as to serve as a communications forum among all parties." *Table 7: BRAC 133 TMP Time Line of Activities* shows key dates for the development of the BRAC 133 TMP, including the Advisory Group meetings.

The following assessment of the BRAC 133 TMP contains four sections:

1. Assessment of BRAC 133 TMP Processes and Procedures
2. Assessment of BRAC 133 TMP Data and Methodologies
3. Assessment of BRAC 133 TMP Outcomes and Conclusions
4. BRAC 133 TMP Summary of Results

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Table 7: BRAC 133 TMP Timeline of Activities

Activity	*Date*
BRAC 133 at the Mark Center property conveyed to Army	Dec. 8, 2008
NCPC approval of location and concept design	Feb. 5, 2009
BRAC 133 Advisory Group established by City of Alexandria	**Feb. 12, 2009**
USACE meets with City of Alexandria, commits to new TMP	March 1, 2009
BRAC 133 Advisory Group meeting	March 11, 2009
BRAC 133 Advisory Group meeting	April 13, 2009
BRAC 133 Advisory Group meeting	May 13, 2009
BRAC 133 Advisory Group meeting	June 17, 2009
BRAC 133 Advisory Group meeting	July 15, 2009
BRAC 133 Advisory Group meeting	Aug. 19, 2009
BRAC 133 Advisory Group meeting	Sept. 16, 2009
NCPC consultation (staff)	Sept. 24, 2009
BRAC 133 TMP Kick-Off Meeting	**Oct. 1, 2009**
BRAC 133 Advisory Group meeting	Oct. 21, 2009
NCPC consultation (staff)	Nov. 16, 2009
BRAC 133 Advisory Group meeting	Nov. 18, 2009
Preliminary/Interim draft BRAC 133 TMP	**Dec. 10, 2009**
BRAC 133 Advisory Group meeting	Dec. 16, 2009
NCPC approval of final site and building plans; TMP required	**Jan. 7, 2010**
BRAC 133 Advisory Group meeting	Feb. 17, 2010
NCPC consultation (staff)	Feb. 18, 2010
BRAC 133 Advisory Group meeting	March 1, 2010
Transit roundtable meeting	**March 10, 2010**
BRAC 133 Advisory Group meeting – TMP status update	Apr. 21, 2010
Draft final BRAC 133 TMP – 1st draft	**May 14, 2010**
BRAC 133 Advisory Group meeting – TMP status update	May 19, 2010
Draft final BRAC 133 TMP – 2nd draft	**May 27, 2010**
Draft final BRAC 133 TMP – Public review draft	**June 2, 2010**
BRAC 133 Advisory Group meeting – TMP presentation	June 16, 2010
BRAC 133 Ad Hoc Subcommittee first meeting	June 23, 2010
BRAC 133 Ad Hoc Subcommittee meeting	July 1, 2010
Public Hearing	**July 15, 2010**
BRAC 133 Ad Hoc Subcommittee meeting	July 19, 2010
BRAC 133 Advisory Group meeting	July 21, 2010
NCPC consultation (staff)	July 23, 2010
Final BRAC 133 TMP (July 2010)	July 30, 2010
Final BRAC 133 TMP submitted to NCPC	July 30, 2010
BRAC 133 Ad Hoc Subcommittee meeting	Aug. 25, 2010
NCPC Approval – Final BRAC 133 TMP (July 2010)	**Sept. 2, 2010**
BRAC 133 Ad Hoc Subcommittee meeting	Sept. 21, 2010
BRAC 133 Advisory Group meeting	Sept. 23, 2010
BRAC 133 Advisory Group meeting	Sept. 15, 2010
BRAC 133 Ad Hoc Subcommittee meeting	Oct. 13, 2010
Updated final BRAC 133 TMP (Oct 2010)	Oct. 15, 2010

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3.3 ASSESSMENT OF BRAC 133 TMP PROCESSES AND PROCEDURES

Unlike the BRAC 133 EA, there is no federal requirement or regulatory procedural guidance for the development of a transportation management plan. Instead, the procedural assessment of the BRAC 133 TMP required considerable investigation and assimilation of federal, state and local laws, policies and procedures that apply to a transportation management plan and specifically, to a transportation management plan prepared by the Army in implementing a BRAC recommendation. The BRAC 133 TMP development process was then assessed for consistency with applicable legal and policy requirements with respect to the following procedural elements that generally apply to a transportation planning process:

1. Conformity
2. Consultation
3. Public Involvement
4. 3-C Planning (comprehensive, cooperative, and continuing)

3.3.1 CONFORMITY

In the general context of transportation and comprehensive planning, the term *conformity* means that a plan, program, or project is in accordance with a specific standard or authority. A determination that one plan conforms to another indicates that the requirements of the higher authority have been met.

The more specific term *transportation conformity* refers to regional transportation plans with air quality goals. The regional air quality–related meaning does *not* apply to the development of the BRAC 133 TMP. The air quality–related meaning refers to the Clean Air Act Amendment (42 U.S.C. 7506(c)) and associated transportation conformity rule (40 CRF part 93), which mandate that regional transportation plans and programs do not exceed the region's motor vehicle emissions budgets (i.e., air quality goals) in order to be eligible for federal funding and approval.

Municipal governments do not have legal authority over federally owned property. Therefore, the BRAC 133 TMP is not required to conform to the City of Alexandria's ordinances, codes, or local comprehensive plan. However, the BRAC 133 TMP states that "the DOD has aligned the BRAC 133 TMP with the format and specifications of the City [TMP] ordinance to ensure proper alignment with future development plans in this area," reflecting a cooperative but nonmandatory effort by USACE to achieve consistency with local plans and regulations.

The only conformity requirement affecting the BRAC 133 TMP is with respect to the National Capital Planning Commission (NCPC). NCPC is a planning agency with specific responsibility for, and authorities related to, the development plans of the federal government in the National Capital Region. These responsibilities include the development of a Comprehensive Plan for the District of Columbia and its environs and also include the review of federal development plans for conformity with NCPC's own Comprehensive Plan. The Mark Center project is located in the "environs" of the National Capital region where NCPC's role is advisory and is limited to review and recommendation of development

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plans during successive stages. This is in contrast to proposed federal development in the District of Columbia, for which NCPC's approval is required to move forward.

3.3.1.1 CONFORMITY WITH NCPC'S COMPREHENSIVE PLAN

NCPC is unique to the Washington, D.C., metropolitan area and as such, warrants further explanation. The following description of NCPC's role and authority was prepared by NCPC's General Counsel for the BRAC 133 TMP Assessment Team in November 2010:

> *The National Capital Planning Commission ("NCPC" or "Commission") is the federal planning agency for the Federal Government in the National Capital. The National Capital is defined as the District of Columbia and the territory the Federal Government owns in the environs. The environs are defined as the territory surrounding the District of Columbia included in the National Capital region. The National Capital region includes the District of Columbia; Montgomery and Prince George's Counties in Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties in Virginia; and all cities in Maryland or Virginia in the geographic area bounded by the outer boundaries of the combined area of the aforementioned listed Counties.*
>
> *The Commission is charged with preparing and adopting a comprehensive plan ("Comprehensive Plan" or "Plan") for the National Capital. The Comprehensive Plan consists of two parts: the Commission's recommendations for federal developments or projects in the environs ("Federal Elements") and District of Columbia elements ("District Elements") that are prepared by the District of Columbia Office of Planning, adopted by the District of Columbia City Council, and reviewed and commented upon by the Commission as to their impact on the interests or functions of the federal government in the National Capital. Once the Plan is adopted by the Commission, the Commission is legally required to determine the compliance of a proposed project or development proposal with the Plan.*
>
> *The principal duties of the National Capital Planning Commission include among others reviewing development plans and programs of Federal agencies to determine consistency with the Comprehensive Plan. The TMP, which is only one aspect of a project, is evaluated for conformity with the Transportation Element of the Federal Comprehensive Plan.*

NCPC also provides detailed guidance for the plan/project review process. The NCPC *Submission Guidelines, Site Plans & Development Projects* require that applicants submit a TMP for any project that will increase the number of employees on a site to 500 or more (including both existing and proposed additional employees). Applicants are advised to include the following in their TMP:

- Stated goals for trip reduction, mode split, and vehicle occupancy
- Firm commitments to strategies to minimize vehicle work trips and discourage single-occupant travel during peak and off-peak hours
- Description of measures to monitor achievement of goals and to adjust trip reduction strategies as needed
- Description of existing and projected peak-hour traffic by mode and a summary of existing and proposed parking by type of assignment (official cars, vanpools/carpools, single-occupancy vehicles, handicapped persons, visitors, etc.)

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- Evaluation of projected transportation impacts and description of proposed mitigation measures
- A summary of the relationship of the TMP provisions to transportation management requirements of local, state, and regional agencies, including provisions for working cooperatively with affected agencies to address those requirements

The NCPC *Submission Guidelines* further states that "the format and content of each TMP may vary on a case by case basis, according to transportation management requirements of local jurisdictions and specific details of the project and site. The Commission staff is available to facilitate coordination of a sponsoring agency's transportation management planning with the Metropolitan Washington Council for Governments Transportation Planning Board, affected local officials, and the General Services Administration. A transportation management strategies handbook will be available through this coordination."

The BRAC 133 TMP indicates that USACE and Washington Headquarters Services considered guidance from the National Capital Planning Commission through discussions and information available in its document, *Implementing a Successful TMP*. The BRAC 133 TMP does not mention NCPC's *Comprehensive Plan: Federal Elements* or NCPC's *Submission Guidelines*, and it does not appear that these documents served as a resource for USACE to ensure conformity. However, in reviewing the BRAC 133 TMP development process with respect to conformity, it is clear that USACE pursued NCPC's review and approval of the BRAC 133 TMP, but perhaps not as a specific matter of conformity with the NCPC's *Comprehensive Plan: Federal Elements*.

One week prior to the BRAC 133 TMP project kick-off meeting, USACE, SAIC, and Duke Realty met with NCPC staff to discuss continued coordination with the City of Alexandria, design changes, compliance status, and I-395 slip-ramp status.

A consultation with NCPC was also held on November 16, 2009, approximately six weeks into the BRAC 133 TMP development process. At this point, data collection for the BRAC 133 TMP was underway, but the December 10, 2009, preliminary/interim draft had not yet been developed. Discussion included upcoming submissions for final approval and coordination between the BRAC 133 project and a Fort Belvoir Master Plan. (Note: NCPC indicated that no Master Plan for Fort Belvoir had been submitted to NCPC as of November 18, 2010.)

The preliminary and final site and building plans for BRAC 133 at the Mark Center were submitted by USACE in late 2009 and were formally reviewed by the NCPC on January 7, 2010. The NCPC found the Mark Center project consistent with the Comprehensive Plan (at this stage) and offered advice and conditional requirements for approval. As a condition of approval, NCPC required USACE to "complete and submit a final transportation management plan (TMP) that demonstrates how the proposed modal split will be achieved". This language documenting the official NCPC action varies from that contained in the related Executive Directors Report (EDR) dated December 30, 2009. The recommended requirement as presented in the EDR was to "complete and submit a final transportation management plan (TMP) and include how it will meet the proposed parking ratio of 1:1.64."

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Transcripts from the January 7, 2010, NCPC meeting do not indicate that an amendment was offered to alter the language contained in the EDR recommendation.

On February 18, 2010, USACE, SAIC and Duke Realty again consulted with NCPC staff. Primary discussion items included an outline of and time line for the BRAC 133 TMP, as well as the status of ongoing coordination of USACE and Washington Headquarters Services with the City of Alexandria. The submittal of the BRAC 133 TMP to NCPC was scheduled for June 2010. At this point in the plan development process, the technical work and analyses were well underway, although a complete review draft had not been developed.

In April 2010 USACE and Washington Headquarters Services revised the submittal schedule for NCPC's review of the BRAC 133 TMP, due to additional requests for coordination meetings by the BRAC 133 TMP stakeholders. The revised submittal date of July 30, 2010, was presented at the April 21, 2010, BRAC 133 Advisory Group meeting in a Transportation Management Plan update presentation provided by USACE/ Washington Headquarters Services.

USACE engaged in a third consultation with NCPC staff on July 23, 2010, to discuss the conclusions of the BRAC 133 TMP and the status of ongoing coordination with the City of Alexandria. This meeting took place after comments had been received on the June 2, 2010, public review draft of the BRAC 133 TMP and prior to finalization and publication on July 30, 2010.

USACE finalized and submitted the BRAC 133 TMP to NCPC shortly after the staff-level consultation. The NCPC formally reviewed and approved the BRAC 133 TMP on September 2, 2010, with the following required conditions:

- Washington Headquarters Services must submit quarterly reports to the NCPC and NCPC staff during the first year of Mark Center occupancy to determine whether revisions to the [BRAC 133] TMP are necessary.
- Within six months, Washington Headquarters Services must update NCPC staff and the City of Alexandria on the progress of discussions with bus providers.
- A contingent future submission may be necessary, should an amendment be included in the final version of the Fiscal Year 2011 National Defense Authorization Act and become law. In this event, Washington Headquarters Services or USACE will need to prepare a new [BRAC 133] TMP to address the legislative provisions that (1) limit the parking space to 1,000 spaces and (2) demonstrate how the Army will maintain the current level of service for the adjacent roadways and intersections.

As of January 22, 2011, the fiscal year 2011 National Defense Authorization Act had not passed and the current version does not include a 1,000-space parking limit.

In approving the BRAC 133 TMP, the NCPC also included the following request in response to a letter dated August 24, 2010, from the Mayor of the City of Alexandria to the NCPC: that the Army consider the use of police officers at key intersections for the first year of operation; explore how the City of Alexandria's transportation demand management program "Local Motion" can be used to

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reduce single-occupancy vehicle trips; and develop a process to update the BRAC 133 TMP in the future.

3.3.1.2 CONSISTENCY WITH ALEXANDRIA'S TMP ORDINANCE

The City of Alexandria does not have authority over TMPs related to proposed development by the federal government within its municipal boundaries. Therefore, compliance with *City of Alexandria Zoning Ordinance, Article XI, Division B, Development Approvals, Section 11-700 – Transportation Management Special-Use Permits* does not apply to the BRAC 133 TMP. However, the BRAC 133 TMP states that the DOD has aligned the BRAC 133 TMP with the format and specifications of the City's TMP ordinance. This voluntary alignment with the local ordinance is therefore considered a matter of voluntary consistency, rather than conformity, for this assessment.

The referenced City of Alexandria ordinance requires the submission of the following two items as part of a special-use permit application under Section 11-700:

- A traffic impact study of the proposed use
- A TMP for the proposed use

The ordinance enumerates specific content to be included in each of the above two items. A separate companion document presents the Administrative Guidelines for Ordinance 3204. The Administrative Guidelines explain the requirements and procedures for preparing traffic impact studies and TMPs, as part of the City of Alexandria's special-use permit process.

Prior to the plan development process, USACE decided to include a traffic impact analysis in the BRAC 133 TMP based on discussions with City of Alexandria staff. The inclusion of a traffic impact analysis within the BRAC 133 TMP addresses both of the submittal items that Alexandria's requires under *Section 11-700 – Transportation Management Special-Use Permits*. The traffic impact analysis was not a requirement of NCPC, nor is it a recommended BRAC 133 TMP component per the regional guidance provided by *Implementing a Successful TMP*.

The effort to align the BRAC 133 TMP with the local ordinance was a cooperative rather than required action. The BRAC 133 TMP was not reviewed by the Alexandria City Council for consistency with, or conformity to, the specifications of the local zoning ordinance. Whether City of Alexandria staff specifically evaluated the contents of the BRAC 133 TMP for consistency with Ordinance No. 3204 and associated Administrative Guidance was not established as part of this BRAC 133 TMP Assessment; however, the following excerpt from the City of Alexandria's Administrative Guidelines for Ordinance No. 3204 describes the two standards that are considered by City staff in evaluating TMPs with respect to the ordinance:

> *Staff's evaluation of the special use permit is based on the merits of the Transportation Management Plan proposed for the development for which approval is sought and the likelihood that the plan will be effective in achieving increased use of travel modes other than the single occupant vehicle.*

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The goal of the TMP ordinance is to reduce the use of single occupant vehicles during the peak hour. Accordingly, the ordinance establishes two standards for measuring the effectiveness of a TMP proposal.

The first standard relates to the percentage of single occupant vehicles as a proportion of total travel demand generated by a building or project during the peak hour. The ordinance states that during the peak hour the TMP should result in 10 percent-30 percent of the person trips generated by a development proposal using means of travel other than the single occupant vehicle.
The range 10 percent-30 percent for non-SOV travel is directly related to transit proximity. If your project is near a transit station, then the TMP should seek to achieve 30 percent non-SOV use during the peak hour. If your development has good bus access 20-25 percent non-SOV use would be the appropriate measure of effectiveness. If your site is not well served by bus routes it may be that the TMP should include improved bus service to the site. With improved transit service the non-SOV goal may be 20 percent.

The second standard relates to when single occupant vehicles arrive at the job site. Although the City prefers that commuters carpool, use transit or walk/bicycle to work, the ordinance does recognize that peak hour congestion can be reduced by people arriving or leaving work during nonpeak hours. The standard is that no more than 40 percent of the single occupant vehicles arrive or leave work during the AM or PM hours. Although this standard may seem easier to meet than getting drivers out of their cars, this may not be the case. Employers may not always allow their employees to arrive after 9:30 or to have the flexibility to stagger their work schedules. An applicant is rarely in a position to guarantee that a future tenant would agree to a condition requiring off-peak travel. Nevertheless, staggered work hours are a legitimate mitigation method. However, the burden is upon the applicant to convince the City that this method is likely to be successful.

3.3.1.3 OBSERVATIONS: CONFORMITY

1. The only conformity requirement to which the BRAC 133 TMP is subject is the conformity of the BRAC 133 TMP to NCPC's Comprehensive Plan and, specifically, consistency with the Transportation section of the *Comprehensive Plan: Federal Elements*. USACE effectively pursued consultation with NCPC staff and implemented guidance provided by both NCPC staff and the NCPC throughout the BRAC 133 TMP development process to achieve conformity with NCPC's standards and authority. NCPC's finding of conformity was determined on September 2, 2010.

2. The NCPC's conformity approval of the BRAC 133 TMP was conditioned on the following three future actions by USACE/Washington Headquarters Services, the implementation of which is not within the purview and/or time frame of this assessment to establish:

    - Washington Headquarters Services must submit quarterly reports to the NCPC and NCPC staff during the first year of Mark Center occupancy to determine whether revisions to the BRAC 133 TMP are necessary.
    - Within six months, Washington Headquarters Services must update NCPC staff and the City of Alexandria on the progress of discussions with bus providers.

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- A contingent future submission may be necessary, should an amendment be included in the final version of the Fiscal Year 2011 National Defense Authorization Act and become law.

3. The statement in the BRAC 133 TMP that the USACE aligned the BRAC 133 TMP with the format and specifications of the City of Alexandria's ordinance was confirmed through a review of the City of Alexandria's TMP Ordinance (Ordinance No. 3204) and the corresponding Administrative Guidance for Ordinance No. 3204. USACE included a traffic impact analysis within the BRAC 133 TMP to address the City of Alexandria's ordinance requirements for both of these items.

4. An examination of the two standards that the City of Alexandria reviews for formal approval of these items indicates that the BRAC 133 TMP would meet both standards, in that

   - The BRAC 133 TMP goal of achieving 40 percent or more non-single-occupancy trips to the BRAC 133 site significantly exceeds the range of 10–30 percent required by the City of Alexandria's Transportation Management Plan ordinance; and
   - The BRAC 133 TMP projection of hourly single-occupancy-vehicle trip distribution during both the AM peak period (6:00–9:00 AM) and the PM peak period (3:00–6:00 pm) varies between 21 percent and 39 percent during any given hour; thus, meeting the City of Alexandria's standard of no more than 40 percent of the single-occupancy vehicles arriving or leaving work during the AM or PM hours.

It is unclear whether the BRAC 133 TMP would be technically out of conformance with NCPC's *Comprehensive Plan* should one or all of the conditional future actions not be taken; however, if the conditional actions are not pursued, the Army (or USACE, Washington Headquarters Services, etc., on the Army's behalf) would be legally required to appear before the NCPC to explain why it disagrees with the NCPC.

3.3.2 CONSULTATION

The term *consultation* refers to the process of obtaining, exchanging, and considering views, ideas, and information about an issue, project, plan, or program. Consultation typically takes place between a lead agency and various units or levels of government and may also include nongovernment parties as well.

The purpose of consultation is to achieve constructive input, dialogue, and discussion. Consultation may occur at several points in a planning process to effectively discuss and address successive issues.

Specific definitions of *consultation* vary slightly among federal, state, and local laws and regulations. The following two definitions of *consultation* are the basis for this assessment:

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> *Consultation* means that one or more parties confer with other identified parties in accordance with an established process and, prior to taking action(s), considers the views of the other parties and periodically informs them about action(s) taken.
>
> *Consultation*. Explaining and discussing an issue, considering objections, modifications, and alternatives; but without a requirement to reach agreement.

40 USC § 8722(b)(1) requires federal agencies to advise and consult with the NCPC on federally proposed developments or projects in the National Capital region "environs." NCPC further requires federal agencies undertaking a project that increases a work site population to 500 or more employees to

- Consult at an early date with NCPC staff about applicable NCPC policies and guidelines, and arrange for early consultation with local governments and regional agencies; and
- Consult with local jurisdiction planning and transportation officials that would be affected by the development to identify current plans and programs, available congestion mitigation/travel management techniques, and any required TMP-related implementation commitments.

Consultation was also required by Public Law (P.L.) 109-163. A direct excerpt of this law is included in the Department of Defense's *Base Redevelopment and Realignment Manual* under section C9.2 Planning for Growth:

> ***Public Law 109-163 Sections 2835.*** *Required consultation with State and local entities on issues related to increase in number of military personnel at military installations: "If the base closure and realignment decisions of the 2005 round of base closures and realignments under the Defense Base Closure and Realignment Act of 1990 (part A of title XXIX of Public Law 101-510; 10 U.S.C. 2687 note) or the Integrated Global Presence Basing Strategy would result in an increase in the number of members of the Armed Forces assigned to a military installation, the Secretary of Defense, during the development of the plans to implement the decisions or strategy with respect to that installation, shall consult with the appropriate State and local entities to ensure that matters affecting the community, including requirements for transportation, utility infrastructure, housing, education, and family support activities are considered.*

Executive Order 12372, Intergovernmental Review of Federal Programs, also appears to require consultation with elected officials of state and local governments "directly affected by […] direct Federal development." Specifically, the Executive Order states that

> *Federal agencies shall provide opportunities for consultation by elected officials of those State and local governments that would provide the nonfederal funds for, or that would be directly affected by, proposed Federal financial assistance or direct Federal development.*

The frequency and extent of required consultation are not prescribed by NCPC or by any other identified law or policy. USACE did not develop a consultation policy, plan, or strategy for the

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development of the BRAC 133 TMP. Nevertheless, considerable consultation occurred in the course of the plan's development.

An interview with NCPC staff confirmed that during the BRAC 133 TMP development process, consultation between USACE and NCPC occurred as follows:

- November 16, 2009: NCPC staff and key project individuals (USACE, USACE consultant, developer) met to discuss the Fort Belvoir Master Plan, upcoming submissions of project for final approval, and coordination between Fort Belvoir Master Plan and BRAC 133/Mark Center project
- February 18, 2010: NCPC staff and key project individuals (USACE, USACE consultant, developer) met to discuss the outline of and time line for the BRAC 133 TMP and the status of ongoing coordination between the Army and the City of Alexandria
- July 23, 2010: NCPC staff and key project individuals (USACE, USACE consultant, developer) met to discuss the conclusions of the BRAC 133 TMP and the status of ongoing coordination between the Army and the City of Alexandria

The NCPC reviewed and approved the preliminary and final site and building plans on January 7, 2010, and reviewed the BRAC 133 TMP on September 2, 2010.

Consultation with Washington Headquarters Services occurred frequently and continually throughout the BRAC 133 TMP development process. Consultation with Washington Headquarters Services was viewed by USACE as critical to the plan's ultimate success, as Washington Headquarters Services will be the primary implementer of the BRAC 133 TMP. Consultation between the two entities directly influenced the BRAC 133 TMP's technical analysis, Travel Demand Management (TDM) Plan, and monitoring and evaluation plan.

USACE served on and utilized the BRAC Advisory Group as an ongoing avenue for informal consultation with the City of Alexandria, Washington Headquarters Services, Duke Realty, and neighborhood groups. The BRAC Advisory Group met on a monthly basis throughout the duration of the project to receive information and discuss issues on a progressive and timely basis. While no other local or state government bodies were represented on the BRAC Advisory Group, the participation of other government entities attending the meetings was welcome. USACE also directly consulted with the City of Alexandria and Alexandria Transit Company, in addition to the BRAC Advisory Group.

At least one consultation with the following entities took place in the process of developing the July 2010 BRAC 133 TMP:

Federal

- Washington Headquarters Services
- Pentagon Force Protection Agency
- NCPC

State

- Virginia Department of Transportation

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- Virginia Department of Rail and Public Transportation

Local Governments

- City of Alexandria (City: BRAC Advisory Group; BRAC 133 Ad Hoc Subcommittee)

Mark Center

- Center for Naval Analyses
- Duke Realty
- Institute for Defense Analyses

Transit-Providing Governmental and Nongovernmental Entities

- Alexandria Transit Company (DASH)
- Arlington Transit
- Dillon (provider of commuter bus)
- Fairfax Connector
- Loudoun County
- Martz
- Maryland Transit Administration
- Potomac and Rappahannock Transportation Commission (PRTC) [Note: Omni ride is PRTC's commuter bus service]
- Quick's Bus
- Virginia Railway Express
- Washington Metropolitan Area Transit Authority

Consultation with transit-related entities largely occurred on March 10, 2010, when USACE held a transit agency roundtable with area transit entities potentially impacted by the BRAC 133 development and related TMP. Two transit agencies were unable to attend the transit roundtable and were consulted through alternative methods: Arlington Transit was consulted through an in-person meeting, and Virginia Railway Express was consulted via teleconference. Of the transit entities listed, only Alexandria Transit Company and Washington Metropolitan Area Transit Authority are confirmed to have had additional consultation with USACE or SAIC during the planning process of the BRAC 133 TMP.

3.3.2.1 OBSERVATIONS: CONSULTATION

1. The overall consultation during the BRAC 133 TMP development process of USACE was adequate with respect to consultation requirements. NCPC noted that consultation should have been initiated *prior* to BRAC 133 site acquisition but confirmed that consultation was appropriately underway for the development of the BRAC 133 TMP.

2. Multiple parties, including NCPC, noted that the BRAC 133 Advisory Group had a significant effect on BRAC 133 TMP development. The Advisory Group appears to have

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been an effective avenue for USACE consultation, and it has continued to meet on a monthly basis since the BRAC 133 TMP was developed.

3. The frequency and timing of consultation varied considerably by government entity. During the 10-month BRAC 133 TMP development process, direct consultation occurred as follows: most frequently with Washington Headquarters Services; at several points with NCPC; and with increasing frequency with the City of Alexandria, as findings and draft reports for discussion became available.

4. Intergovernmental consultation with USACE was "appropriate and meaningful" to many of those consulted, although not to all. The Virginia Department of Transportation and Fairfax County were notably dissatisfied with the opportunities for consultation availed to them.

5. There was notable weakness in the USACE TMP consultation process with respect to the impacted transit agencies. Transit agencies were not extended early, frequent, or formative consultation during the development of the BRAC 133 TMP. However, consultation with transit agencies on public transit service and capacity issues has occurred since the July 2010 final report and is continuing into January 2011. The ongoing consultation with transit agencies indicates increased communication with public transit service providers, which may lead to a more effective use of public transit services and transit facilities to address the mobility needs of BRAC 133 employees.

3.3.3 PUBLIC INVOLVEMENT

Public involvement is the process by which government agencies and other officials give notice and information to the public and use public input as a factor in decision making.

The Transportation Research Board publication *State of the Practice: White Paper on Public Involvement* describes the purpose and benefits of public involvement in transportation planning processes as follows:

- **Efficient implementation of transportation decisions:** Decision makers understand the concerns of the public and can be more sensitive to those concerns in the implementation process. The model strives to reduce the risks of litigation and avoid revisiting decisions, thereby significantly reducing costs.
- **Public ownership of policies/sustainable and supportable decisions:** By involving citizens in the assessment of needs and solutions and identifying troublesome issues early, public involvement can promote citizen "ownership" of policies. Although most transportation projects have some negative effects, citizens are more willing to accept these when they accept the need for the policy or project, participate in developing the alternatives, and understand the technical and regulatory constraints. To the extent that citizens are involved in the decision, their support will be sustained over time.
- **Decisions that reflect community values:** The public involvement model involves consultation with many segments of the community. Because this is a more collaborative

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process, decisions inevitably are more reflective of community values.

- **Enhanced agency credibility:** The process of public involvement often transforms agency culture by forcing agency decision makers to interact with their constituents. As a result, transportation stakeholders develop a better understanding of agency operations, and agency officials have a better understanding of public thinking. This mutual education improves the agency's relationship with the public.

Research and interviews identified no applicable federal, state, or local legal requirement for public involvement to which the BRAC 133 TMP development process was subject. As a policy matter, the Department of Defense's *Base Redevelopment and Realignment Manual* provides the following guidance for coordinating participation of local governments and members of the public for BRAC Actions Causing Growth:

> *In base realignments, a single local organization is essential for the coordination of a diverse array of actions and the participation of local governmental bodies and members of the public. Such an organization has historically been an ad hoc advisory council or steering committee.*

In the BRAC 133 TMP development process, the primary avenue for public involvement was through direct participation or other attendance of the BRAC Advisory Group. On February 12, 2009, the City of Alexandria City Council passed Resolution No. 2322 establishing the BRAC Advisory Group to serve as a forum for developing ideas and recommendations relating to transportation improvements and other issues associated with the BRAC 133 office building, as well as to serve as a communications forum among all parties. The resolution established a roster and directed that "the Advisory Group shall meet periodically, as it deems necessary, with its meetings open to the public." The Advisory Group met monthly throughout the duration of the project (October 1, 2009–July 30, 2010), with the exception of January 2010, when no meeting was held, and March 2010, when two meetings were held. Two presentations were provided by Washington Headquarters Services to the Advisory Group. Meeting minutes document that members of the public regularly provided comment at these meetings.

The public was also provided an opportunity for input during the BRAC 133 TMP development process at the City of Alexandria's Transportation Commission meetings on April 7, June 2, and July 15, 2010, as well as at deliberative meetings of NCPC on January 7, 2010, and September 2, 2010, the latter date being that on which the BRAC 133 TMP was formally considered for approval.

The City of Alexandria held a Public Hearing on the June 2 draft BRAC 133 TMP report before the Transportation Commission on July 15, 2010. Comments from three members of the public were heard.

USACE's acceptance of and responsiveness to input is evidenced by the substantial published comments and responses that appear in the appendix of the BRAC 133 TMP. Many changes and clarifications appear to have been made based on comments received on the June 2 public review version, including revised wording of the BRAC 133 TMP goals, greater detail on the DOD shuttle plan, and the inclusion of an implementation time line.

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3.3.3.1 OBSERVATIONS: PUBLIC INVOLVEMENT

1. While not required, a strong element of public involvement was incorporated into the BRAC 133 TMP development process by Washington Headquarters Services/USACE, largely through partnership with the City of Alexandria. Outreach and coordination efforts by USACE and others appear to have provided continual and regular opportunity for public involvement in the plan development process. Public involvement meaningfully and significantly contributed to the BRAC 133 TMP, particularly through the BRAC 133 Advisory Group and through public comment on the June 2, 2010, draft.

2. USACE and Washington Headquarters Services did not engage the biggest stakeholders of the BRAC 133 TMP—the relocating employees—in the TMP development process. Washington Headquarters Services surveyed the relocating employees on their anticipated travel modes but did not present the DOD shuttle plan or engage the employees or other supporting staff in developing the shuttle service or travel demand management strategies contained in the BRAC 133 TMP. Therefore, the potential exists that the travel demand management strategies and the shuttle services presented in the BRAC 133 TMP do not suitably reflect the mobility needs and preferences of BRAC 133 employees and may need to be adjusted in the future to ensure that the TMP goals are met.

3.3.4 3-C PLANNING

3-C Planning is a process framework through which transportation plans and programs are developed. Federal legislation requires that state and metropolitan planning organizations follow a **comprehensive, cooperative**, and **continuing** (3-C) planning process for projects to be eligible for federal funding. The 3-C planning requirement has been in place since the 1962 Federal-Aid Highway Act and has been continued over successive authorization cycles, including the current six-year federal transportation bill: the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

The SAFETEA-LU 3-C planning requirement technically applies only to state and metropolitan planning processes. However, the 3-C planning framework is a long-standing directive for transportation planning processes and is accepted and practiced by all levels of government. For example, at the federal level, the United States Department of Transportation embraces the 3-C framework for transportation planning studies that need to be integrated into environmental and National Environmental Policy Act (NEPA) analysis:

> *FHWA [Federal Highway Administration] and FTA [Federal Transit Administration] must be able to stand behind the overall soundness and credibility of analysis conducted and decisions made during the transportation planning process if these decisions are incorporated into a NEPA document, directly or by reference. Transportation planning processes and their products are greatly improved when implemented through a comprehensive, cooperative, and continuous approach—the "3-C planning principles."*

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At the local level, a relevant example of a municipality instituting the 3-C planning process is found in the City of Alexandria's Administrative Guidelines for Ordinance 3204 (TMP ordinance) for Transportation Management Special-Use permits, as follows:

> *The TMP is a comprehensive, coordinated and continuously operated program to encourage the use of travel modes other than single occupancy vehicles, and to reduce peak hour traffic impacts anticipated to be generated by a development project. The TMP is comprehensive in that it should consider all reasonable methods for reducing auto use and traffic generation; it is coordinated in that all mitigation methods employed should interrelate, should serve traffic mitigation objectives and should be linked to ongoing City programs; it is continuous in that the plan must operate for the life of the building or project.*

The City of Alexandria's 3-C framework substitutes *coordinated* for *cooperative*, and the 3-C guidelines have been instituted to apply the three Cs to the resulting plan or program of transportation-related strategies, rather than to the process through which the TMP is developed; however, modification and/or further definition to suit the specific intent or circumstance of an instituting entity is common when the 3-C framework is instituted by a government body for reasons other than statewide and metropolitan-level planning.

At least two DOD policies contained in the *Base Redevelopment and Realignment Manual* directly support the cooperative aspect of 3-C planning in preparing for realignment: (1) Collaborate effectively with the local community and (2) work with communities to address growth.

Assessing the planning process of the BRAC 133 TMP from a 3-C framework is unavoidably qualitative and subjective. While SAFETEA-LU mandates a 3-C process framework, the legislation and corresponding regulations neither define nor provide explicit criteria against which to evaluate, the three Cs.

To facilitate this assessment, the following key aspects for each of the three Cs were defined by the BRAC 133 TMP Assessment Team based on inferred intent of the SAFETEA-LU 3-C requirement and taking into account (from a process standpoint) the City of Alexandria's application of the three Cs:

Comprehensive: Consideration of a variety of data sources and information; collection of needed alternative or additional data; consideration and inclusion of a wide range of travel demand management strategies; planning for implementation; consideration of potential outcomes and planning for remediation, if needed.

Cooperative: Coordination with other governmental agencies on related programs and projects; provision of opportunities to hear from a wide variety of perspectives; responsiveness to inquiries and external input during plan development; willingness to adjust assumptions or to modify anticipated direction to address concerns and interests of others; convenient and timely availability of plan development materials.

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Continuous: Acknowledgement and integration of preceding TMPs in the plan development process; development of successive and increasingly detailed review drafts; and the consideration of and provision for future updates.

3.3.4.1 COMPREHENSIVE

According to the BRAC 133 TMP document, the purpose of a TMP is "to establish a plan to promote more efficient employee commuting patterns by minimizing single occupancy vehicle (SOV) trips to a work location." The document notes that TMP guidelines jointly published by the General Services Administration, Metropolitan Washington Council of Governments, and the National Capital Planning Commission (NCPC) suggest that "a TMP include goals for single occupancy vehicle (SOV) trip reduction, transportation mode split, and vehicle occupancy, strategies to minimize SOV work trips and to discourage SOV travel during peak and off-peak hours, measures to monitor achievement of goals and to adjust SOV trip reduction strategies as needed, as well as a description of existing and projected peak hour traffic by mode." USACE's engagement of consulting firm SAIC expanded USACE's capacity to accomplish the BRAC 133 TMP's purpose and to develop the full content suggested by the referenced guidelines.

The BRAC 133 TMP development process included the collection and review of socioeconomic, site, and traffic data, and at least 13 prior reports and studies. This information was obtained from local, regional, and state sources, as well as nonprofit and private sector entities. With USACE's assistance, SAIC effectively collected all desired information, and did so by utilizing a variety of avenues, from passive Web site downloading to in-person meetings.

SAIC also analyzed the survey results recently collected by Washington Headquarters Services to establish employee relocation and travel characteristics. This added considerably to an understanding of likely employee travel patterns and anticipated means of travel (carpool, bus, etc.) or "mode splits" to BRAC 133. There is no way to verify the accuracy of the resulting employee mode splits until after relocation has occurred and actual travel information is available; however, the monitoring and evaluation plan includes the periodic collection of such survey data, post-relocation.

While a variety of on-site and external traffic studies were reviewed, the plan development process included an original traffic impact analysis to incorporate adjusted mode splits; to reflect existing and planned access opportunities; and to ensure that current and planned transit services, vehicle flows, and vehicle interactions were reasonably reflected within the roadway network.

In the context of the BRAC 133 TMP to encourage non-single-occupancy-vehicle travel, the primary role of the traffic impact analysis was two-fold: (1) to understand the existing and baseline traffic conditions as context for developing proposed travel demand management strategies and (2) to understand how the roadway network will perform when proposed travel demand management strategies are put in place. SAIC looked comprehensively at the traffic impact analysis results, and identified and addressed intersections with deteriorated level of service. SAIC developed, considered,

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and suggested roadway and intersection improvements for potential further review and analysis by others in the future. This effort to identify potential improvements for further review and analysis was undertaken to address the broader transportation interests of the BRAC 133 Advisory Group.

A summary of concerns raised by citizen and neighborhood associations and by BRAC 133 employees as identified in the Washington Headquarters Services survey concludes the traffic impact analysis section of the BRAC 133 TMP. The BRAC 133 TMP also identifies transportation improvements that have been or are being made by the Army that may address the concerns raised.

The plan development process included the consideration of a broad range of potential travel demand management strategies initially developed by SAIC. The proposed strategies were revised—some eliminated, some modified, and others further developed—through conversation with USACE and Washington Headquarters Services. The travel demand management strategies are detailed in Section 5 of the BRAC 133 TMP.

The BRAC 133 TMP indicates that the strategies were developed taking into consideration

- 2003 Mark Center Transportation Management Plan,
- Analysis of employee commute patterns and needs,
- DOD transportation protocol,
- Research on Army transportation program needs, and
- Best practices and case studies in travel demand management.

A "consolidated" travel demand management implementation schedule was developed for the BRAC 133 TMP. The implementation schedule was provided in response to comments received on the June 2, 2010, public review version of the BRAC 133 TMP.

A monitoring and evaluation plan was developed by Washington Headquarters Services/USACE and SAIC and was included in the public review version of the BRAC 133 TMP. The monitoring and evaluation plan describes

- Anticipated content of a survey tool for monitoring the effectiveness of strategies,
- Anticipated content of an evaluation report,
- Anticipated performance measures to determine the effectiveness of the strategies,
- Examples of actions Washington Headquarters Services will take with respect to underperforming strategies, and
- An internal development and review process for potential future BRAC 133 TMP amendments.

The BRAC 133 TMP does not include information regarding costs and/or programmed funding commitments to implement the travel demand management strategies contained therein, nor does it contain detailed information regarding shuttle service and BRAC 133 facility operations. However, Washington Headquarters Services has clarified that the BRAC 133 TMP is a supplement to a separate Operations Plan, which is an internal document to the DOD.

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3.3.4.2 COOPERATIVE

Cooperation between USACE and Washington Headquarters Services is highly evident in the continuous coordination of these two entities throughout the duration of the BRAC 133 TMP development process. USACE and Washington Headquarters Services appear to have worked cooperatively on all elements of the plan, including public presentations, deliberations over consultant work product, and response to public and other external input.

Cooperation with the City of Alexandria is evidenced by

- Pre-plan development and sustained, frequent informal consultation throughout the TMP development process;
- USACE/Washington Headquarters Services' participation in the City of Alexandria's BRAC 133 Advisory Group and Ad Hoc Subcommittee;
- USACE/Washington Headquarters Services attendance at Transportation Commission meetings on April 7, June 2, and July 15 of 2010; and
- The City of Alexandria's assumed role in providing stakeholder outreach, providing public notice of meetings and holding a hearing on the public review version of the document.

The City of Alexandria provided timely and public availability of project materials through a designated Web page on the City of Alexandria's Web site. The City received and compiled public comments and forwarded the coordinated input to USACE. USACE responded to all of the City of Alexandria's comments and requests and incorporated many in the TMP. Comments and USACE's written responses to comments are included as appendices in successive versions of the BRAC 133 TMP, including the July 2010 version under assessment. Post–BRAC 133 TMP publication, USACE/Washington Headquarters Services and the City of Alexandria continue to work cooperatively through both discussion and negotiation on several outstanding issues.

USACE and SAIC initiated individual meetings with transit services to obtain transit-service related information for the development of the BRAC 133 TMP. At Fairfax County's urging, a transit roundtable was held by USACE on March 10, 2010, so that affected transit providers could collectively and cooperatively share information about potential service changes independently under consideration by their respective agencies, which could potentially effect BRAC 133 TMP assumptions and outcomes. As the BRAC 133 TMP took shape in May and June, additional communication with transit agencies was initiated by USACE. Coordination with transit providers, in particular with the Alexandria Transit Company and with the Washington Metropolitan Area Transit Agency (the provider of Metrorail and Metrobus), increased considerably in June 2010 and has continued since the July 2010 publication. With respect to the transit agencies, coordination appears to be more focused on implementing the BRAC 133 TMP and integrating public transit services with the planned DOD shuttle services, as opposed to developing the TMP itself.

USACE took a relatively more passive approach to ensuring cooperation with the Virginia Department of Transportation (VDOT) and Fairfax County. VDOT attended several BRAC 133 Advisory Group

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meetings, primarily to present and share information about a separate and ongoing I-395 Interchange Justification Report analysis to the Advisory Group. Fairfax County first learned of the TMP development process through a contact made by SAIC to the County's bus service personnel (Fairfax Connector). The respective BRAC Coordinators of VDOT and Fairfax County were not proactively contacted by USACE; rather, the City of Alexandria, acting in the assumed role of BRAC 133 public outreach coordinator, served as the intermediary and provided the draft BRAC 133 TMP to these key government units and collected comment from them. USACE's practiced policy with respect to intergovernmental coordination is clarified as follows:

> *It is the recommendation of the DOD and [Washington Headquarters Services] that any coordination with other jurisdictions be done through the City of Alexandria. WHS is coordinating with Fairfax County on transit and shuttle route planning. Implementation and monitoring of the TMP will be handled by DOD in coordination with the City of Alexandria.*

The preceding USACE response is consistent with the following policy contained in the DOD's *Base Redevelopment and Realignment Manual*:

> *In base realignments, a single local organization is essential for the coordination of a diverse array of actions and the participation of local governmental bodies and members of the public. Such an organization has historically been an ad hoc advisory council or steering committee. Members come from the public and private sector, plus installation representatives. Sometimes State representatives are involved, especially if school capital budgets for construction come from the State.*

The monthly meetings of the BRAC 133 Advisory Group served as the primary avenue through which elected officials, government agencies, and private entities could raise concerns and ideas to USACE and Washington Headquarters Services. Following is a partial list of BRAC 133 Advisory Group meeting attendees to illustrate the range of parties who ultimately utilized the Advisory Group as an avenue to share their interests and/or concerns:

- State Senator Ticer (District 30)
- U.S. Senator Mark Warner
- Congressman James Moran
- Virginia Department of Transportation
- Fairfax County
- Mayor of the City of Alexandria and various councilors
- Southern Towers
- Palisades Homeowners Association
- Institute for Defense Analyses
- Center for Naval Analyses

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3.3.4.3 CONTINUING

The previously approved TMP for the Mark Center site is acknowledged on the first page of the BRAC 133 TMP document. The previous TMP, called the *Mark Center Parcel 1A and 1B Traffic Impact Study and Transportation Management Plan*, was prepared in March 2003 for the Mark Winkler Company (now Duke Realty Corporation) by Wells & Associates, and was approved by the City of Alexandria in conjunction with the issuance of a special-use permit. The travel demand management strategies presented in the 2003 TMP are fully addressed in the travel demand management section of the 2010 BRAC 133 TMP.

SAIC obtained and reviewed a 2008 update to the original TMP, entitled *Transportation Improvement Management Plan*, that was also prepared by Wells & Associates for Washington Headquarters Services and Duke Realty Corporation. The 2008 *Transportation Improvement Management Plan* took into account specific BRAC 133 requirements of the proposed Washington Headquarters Services development at the Mark Center site and was developed during the BRAC 133 EA when the Mark Center was one of three potential site locations under consideration for BRAC 133. SAIC used the existing intersection turning movements from the 2008 *Transportation Improvement Management Plan* for traffic simulation, although SAIC used more recent data and studies for traffic volumes and site condition assumptions.

The plan development process included the production of successive draft documents for internal and external review. The successive versions were produced with increasing detail and specificity. An draft TMP was issued on December 10, 2009; the preliminary draft was not reviewed for this TMP assessment and was not a public review document.

During May and June of 2010, three successive draft final reports were published (May 14, 27, and June 2). The June 2, 2010, version (third draft version) was provided to the City of Alexandria and to the Advisory Group and served as the official public review draft. An Ad Hoc Subcommittee to the BRAC 133 Advisory Group was established to "identify what is needed to add to and modify in the draft TMP."

The final version of the BRAC 133 TMP incorporated and addressed public comment on the June 2010 draft and was the document submitted to NCPC for review and approval. The June and July 2010 versions of the document were made publicly available on the City of Alexandria's Web site. The BRAC 133 TMP was subsequently updated in October 2010.

3.3.4.4 OBSERVATIONS: 3-C PLANNING

1. Overall, the planning process employed by USACE and SAIC for developing the BRAC 133 was appropriately comprehensive, cooperative, and continuous, as defined for the purposes of this assessment.

2. While USACE's coordination with Washington Headquarters Services and the City of Alexandria were quite strong, the heavy reliance on the City of Alexandria and the BRAC 133

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Advisory Group to serve as the primary avenue for the Virginia Department of Transportation and county officials to provide input may not have been the most effective approach for ensuring close coordination and mutual support of interrelated programs and projects in the development of the BRAC 133 TMP. However, the development of other avenues of communication with these two parties may contradict DOD BRAC implementation policy (previously cited in this assessment) for reliance on a single, local organization for the coordination and participation of local governmental bodies and members of the public, depending upon the Department of Defense's interpretation of *local governmental bodies*. The interpretation of this phrase was not pursued in this assessment.

3. Cooperation and coordination with other governmental bodies and stakeholders regarding the BRAC 133 TMP appears to have continued and expanded since the July 2010 publication. USACE and Washington Headquarters Services have participated in monthly BRAC 133 Ad Hoc Subcommittee meetings in addition to BRAC 133 Advisory Group meetings and have participated in four transportation provider meetings since August 2010. Additional coordination meetings have also taken place with respect to the following:

    - Northern Virginia Regional Commission
    - United States General Services Administration
    - Columbia Pike Transit Study
    - Beauregard Corridor Plan
    - Ballston Station Multi-Model Study
    - Zip Car
    - Congressman James Moran's Town Hall Meeting

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3.4 ASSESSMENT OF BRAC 133 TMP DATA AND METHODOLOGIES

3.4.1 PROJECTED EMPLOYEE MODE SPLITS

Mode split is a transportation term used to describe the percentage of commuters likely to choose a particular type, or mode, of transportation. Mode splits are used to determine how trips will be proportionately distributed across different modes of transportation that are available to access a site.

The four-step Regional Travel Forecasting Model of the Metropolitan Washington Council of Governments assigns mode choice based upon the relative availability and attractiveness of each mode. The factors that Metropolitan Washington Council of Governments considers in the attractiveness of the mode choice include

- Accessibility of mass transit,
- Automobile ownership,
- Proximity to carpool lanes,
- Costs required to use the mode, and
- Time required to use the mode.

The *Transit Capacity and Quality of Service Manual (TCQSM),2nd Edition*, published by the Transportation Research Board, also cites many of these same factors affecting mode choice as it relates to public transit. The *Transit Capacity and Quality of Service Manual* indicates that transit availability, comfort, and convenience heavily influence mode choices. Availability factors that influence a rider's decision are proximity of service, transit schedule, availability of information, and transit capacity. Comfort and convenience factors include reliability of service, comfort of the trip, cost of the trip, how many transfers are required for the trip, and how long the total trip will take relative to other modes.

A summary of previous Mark Center traffic impact studies is presented as Table 2-2 in the July 2010 BRAC 133 TMP report. The table indicates that the estimated single-occupancy vehicle mode split varies among these prior studies, ranging from 58 to 60 percent; the July 2010 BRAC 133 TMP estimates 57 percent. Rideshare mode splits were found to range between 12 and 21 percent in the previous studies; the BRAC 133 TMP assumes 11 percent. Metrorail use varies between 15 and 20 percent; the BRAC 133 TMP assumes 23 percent. Bus transit varies between 0 and 5 percent; the BRAC 133 TMP estimates 5 percent. For walkers and bikers, the previous studies assume between 1 and 3 percent, while the BRAC 133 TMP estimates 2 percent. No slugging (a form of carpooling) mode split was estimated in the previous studies; slugging use is estimated at 3 percent in the BRAC 133 TMP.

In establishing the projected employee mode splits to BRAC 133, SAIC analyzed zip code data of relocating employees, including origin locations, zip code clusters, existing travel patterns, adjacent transit corridors, and ride sharing prospects. SAIC also analyzed the Washington Headquarters Services commuter survey data results to determine travel characteristics of the employees relocating

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to BRAC 133. SAIC compared the available data and established the projected mode splits for the BRAC 133 TMP as shown in *Figure 2: Projected Mode Splits of the BRAC 133 TMP*.

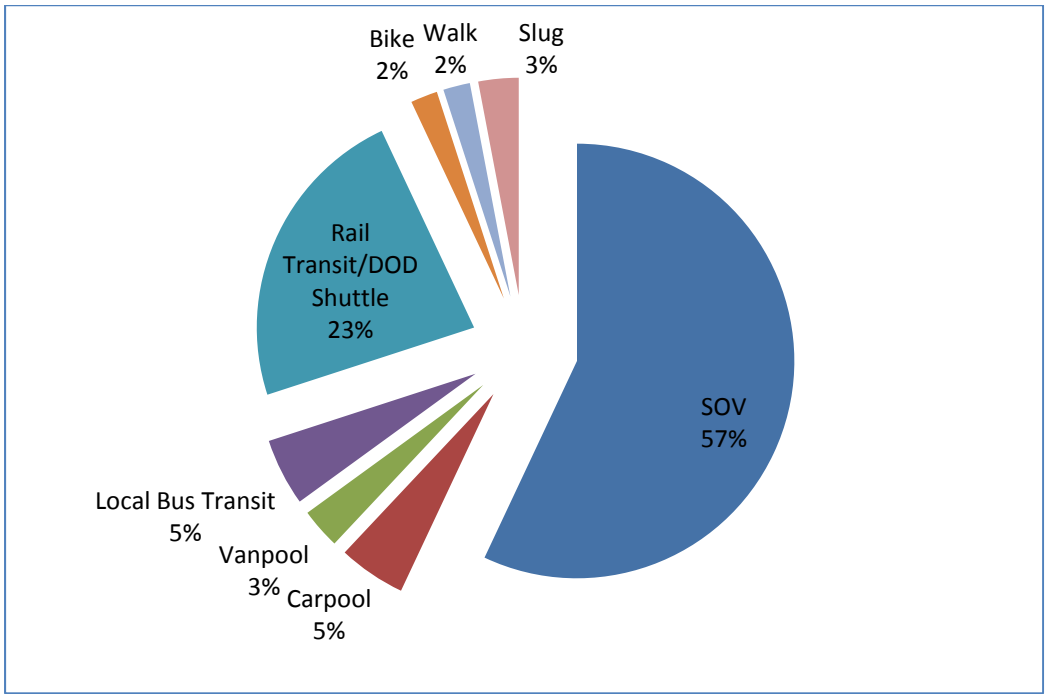

Figure 2: Projected Mode Splits of the BRAC 133 TMP

These projected primary mode splits in the BRAC 133 TMP were developed as follows:

Single-Occupancy Vehicle (SOV) – Projected mode share: 57 Percent
The single-occupancy vehicle (SOV) mode split was established in consideration of Army Regulation Design Standards and BRAC legislation that restrict parking for BRAC projects to 60 percent of employee population. The specific mode split of 57 percent was established by subtracting the combined projected non-SOV mode splits (which total a 43-percent non-SOV mode share) from 100 percent. The various non-SOV mode splits are further described below.

Slugs – Projected mode share: 3 Percent
Slugging, also called *casual carpooling,* involves picking up passengers at designated points to meet high-occupancy vehicle (HOV) lane use requirements. Slugging is a phenomenon that has risen in popularity since the advent of HOV lanes in the Washington, D.C., and northern Virginia area.

Slugging is anticipated to account for 3 percent of the employees at BRAC 133, consistent with the share of current percent of relocating BRAC 133 employees who reported slugging as their sole commute mode in the 2009 Washington Headquarters Services survey. The BRAC 133 TMP notes that slugging trips to the Pentagon represent 33 percent of all slug trips made throughout the

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Washington, D.C., region, and that Prince William County, Fairfax County, Stafford County, and the City of Fredericksburg, home to the greatest number of sluggers, are also where many BRAC 133 employees live.

Slugging does not necessarily reduce single-occupancy vehicle trips to a final destination if the employee is the driver instead of a passenger. For daily trip generation purposes, Section 2.3.3 of the BRAC 133 TMP describes the 3-percent slugging mode share as three BRAC 133 employees traveling together to BRAC 133. However, for modeling purposes of the traffic impact analysis, the BRAC 133 TMP altered this assumption to reflect that all of the slugging to BRAC 133 employees would initially carpool to the Pentagon and take the DOD shuttle to the Mark Center on opening day in 2011. SAIC indicated in an interview that their rationale for this different modeling assumption was to better reflect that it may take sluggers some time to figure out the best way to take advantage of this mode choice to BRAC 133.

Local Bus Transit – Projected mode share: 5 percent
The local bus transit mode split was determined based upon comparing existing bus routes that serve the Mark Center with the origin zip codes from the employee survey. While employee zip codes indicate that many of the commuters choosing this mode of travel will have to walk a significant distance, the BRAC 133 TMP points out that a 2007 commute survey showed that 51 percent of regional commuters who use alternate modes travel up to a mile from their home to the alternate mode meeting point.

There are currently two Alexandria Transit Company bus routes operating in the vicinity of the Mark Center that access four Metrorail stations, including Eisenhower Avenue, Braddock Road, Van Dorn Street, and King Street. Metrobus, operated by Washington Metropolitan Area Transit Authority, operates 10 bus routes near the Mark Center, and provides access to five Metrorail stations, including the Pentagon, Ballston, Van Dorn Street, West Falls Church, and King Street.

Rail Transit/DOD Shuttle – Projected mode share: 23 percent
The BRAC 133 TMP indicated that a higher percentage of employees will take rail transit than was observed in the 2009 commuter survey; this is due to the express shuttle service planned by DOD to directly serve the Mark Center from nearby Metrorail stations with frequent headways. The BRAC 133 TMP also notes that employees were not fully informed of the proposed shuttle plan when the survey was conducted. As stated in Section 2.3.3 of the BRAC 133 TMP, commuters may use the DOD shuttle in ways not anticipated that could reduce single-occupancy vehicle trips to BRAC 133. For instance, a commuter could drive to a Metrorail station, park, and ride the DOD shuttle to BRAC 133.

The rail transit/DOD shuttle mode split accounts for more than half of the reduction in single-occupancy vehicle trips projected by the BRAC 133 TMP. In reviewing the factors that the Metropolitan Washington Council of Governments considers when developing mode splits for their regional model, two factors stand out: (1) the accessibility of mass transit and (2) the time required to use the mode. The relevancy of these two factors to the projected mode splits is further described below.

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Upon reviewing the Washington Metropolitan Area Transit Authority report *Transit Service Impacts of the Base Realignment and Closure Recommendations in the Metropolitan Washington Region,* the stations that the BRAC 133 TMP identifies as proposed locations for DOD shuttle pick-up of BRAC 133 employees are at capacity with respect to bus access and may not be able to accommodate the additional shuttles planned by DOD. The Washington Metropolitan Area Transit Authority report states, "Several Metrorail stations would serve as primary transfer points for proposed services, though some of these stations are already facing bus bay shortages, especially during peak-hour periods."

BRAC 133 at the Mark Center is located between 3.0 and 8.5 miles from the Metrorail stations from which DOD shuttle service is planned to provide direct services. The BRAC 133 TMP does not address the in-vehicle transit time that it will take a commuter to utilize the DOD shuttles from respective Metrorail stations to the BRAC 133 Transportation Center.

Walking – Projected mode share: 2 percent and Bicycling – Projected mode share: 2 percent
According to the BRAC 133 TMP, over 100 (or 1.5 percent) of the relocating employees live within one mile of the Mark Center and over 500 (or 7.8 percent) live within 2 miles. The average commute for walkers is 1.42 miles, and the average commute distance of bikers is 8.17 miles, although no citation is given in the BRAC 133 TMP to document the origin of these statistics. The BRAC 133 TMP notes that a July 2006 study conducted by Metropolitan Washington Council of Governments found that nearly 4 percent of Alexandrians walk to work and over 0.5 percent bike to work.

Based on the number of employees within walking and biking distance to BRAC 133, interest shown in commuter surveys, and the amenities being provided, the BRAC 133 TMP anticipates a 2 percent mode share for walking and 2 percent for bicycling. Amenities available for walkers and bikers include bike racks, showers, and lockers. DOD policy does not allow monetary incentives to encourage use of these nonmotorized modes of travel.

Carpool – Projected mode share: 5 percent and Vanpool – Projected mode share: 3 percent
The Washington Headquarters Services commuter survey conducted in August 2009 found that 6.2 percent of the BRAC 133 employees that will be relocated to the Mark Center currently carpool or vanpool as their exclusive mode of transportation, and an additional 10.5 percent rideshare occasionally. The BRAC 133 TMP assumes that rideshare to the Mark Center will be 8 percent, based on several factors, including the number of employees that are familiar with ridesharing, the restrictive number of parking stalls, the allotment of carpool/vanpool parking spaces, and the density maps generated from the zip code analysis, which show high densities of origin zip codes located within close proximity in southern suburbs along I-395 in Virginia (counties that have traditionally high percentages of ridesharing.)

3.4.1.1 OBSERVATIONS: PROJECTED EMPLOYEE MODE SPLITS

1. Overall, the data and methodologies used to develop the projected employee mode splits are reasonable in light of information available from prior studies and the BRAC 133 employee survey responses regarding current and anticipated commute modes. The mode splits will need to be adjusted in the future to reflect actual behavior; however, this can only occur after

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relocation, when employees have established a regular commuting pattern and mode of travel to the BRAC 133 facilities.

2. The current and anticipated mode use information collected from the August 2009 Washington Headquarters Services survey of employees relocating to BRAC 133 is based on a response rate of 44 percent. While a 44-percent response rate is generally considered a high return for a survey, it is possible that the respondents do not accurately reflect the universe of relocating BRAC 133 employees. The BRAC 133 TMP gives no indication that an effort was made to validate whether the survey respondents reflect the broader universe of BRAC 133 in terms of socioeconomics, gender, age, residential location, or other factors that may affect mode choice. The lack of validation means that employee responses regarding anticipated mode use therefore may be skewed, and the extent to which is unknown; however, the stated anticipated mode choice was only one of several factors considered in developing the mode splits, so the impact on the final mode splits may be negligible.

3. No specific information is provided for the formulation of the slugging mode split. Based upon information supplied in the BRAC 133 TMP and additional information acquired through the interview processes, the validity of a 3-percent single-occupancy vehicle reduction through the use of slugging cannot be confirmed. The summary table provided in the BRAC 133 TMP provides mode splits for the various traffic studies and TMPs that have been performed for the Mark Center. None of the previous reports included slugging as a viable mode split to reduce single-occupancy vehicle trips to the Mark Center. This calls into question the 3-percent slugging non-single-occupancy vehicles mode split. However, if the sluggers opt for organized carpools or transit services over single-occupancy vehicles to achieve benefits that are similar to slugging, there would be no impact on the overall mode split.

4. The rail transit/DOD shuttle mode split does not address the available capacity of bus bays and parking at Metrorail facilities nor the attractiveness of the rail/shuttle combination in consideration of shuttle time to get from the station to BRAC 133 and total trip time (including initial transit access wait time, in-vehicle travel time for all trip segments, and transfer times). Until these issues are examined, the feasibility and the desirability of the rail transit/DOD shuttle combination are uncertain.

3.4.2 TRIP GENERATION

Trip generation is the actual or predicted number of vehicles originating at, or destined for, a proposed development. Trip generation information is used to establish the anticipated number of vehicle trips that a planned development is likely to produce, based upon the use (i.e., retail, office, etc.) and the size of the proposed development.

The Institute of Transportation Engineers report entitled *Trip Generation* is a standard resource for transportation and planning professionals. The report provides trip generation rates for land uses by

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detailed category, based upon more than 4,800 trip generation studies submitted to Institute of Transportation Engineers by public agencies, universities and colleges, developers, associations, and local Institute of Transportation Engineers organizations.

3.4.2.1 PERSON TRIPS

Prior to the Mark Center being identified as the location for BRAC 133 realignment, traffic studies for parcel development relied on standard trip generation rates from the Institute of Transportation Engineers manuals. Once the Mark Center was selected as the site for BRAC 133, Washington Headquarters Services determined the actual number of employees being relocated to the site. Washington Headquarters Services reviewed manpower documents for all of the agencies relocating to BRAC 133, resulting in a total maximum number of employees of 6,409. The buildings being constructed to accommodate BRAC 133 employees were likewise programmed for a maximum workforce of 6,409.

SAIC further developed trip generation for BRAC 133 by estimating visitor trips and near-term expansion of the Institute for Defense Analyses. SAIC also examined previous traffic studies and trip generation methodologies summarized in *Table 2-2: Comparisons of Projected Mode Splits and Site Generated Peak Hour Trips from Prior Mark Center Studies* in the BRAC 133 TMP.

Visitor trips to BRAC 133 were initially estimated and modeled by SAIC at 500 trips per day. After the modeling was completed, results from a Washington Headquarters Services survey of similar office complexes managed by Washington Headquarters Services established that BRAC 133 would likely generate 239 daily visitors, a figure commensurate with 5 percent of employees (or one visitor per 20 employees). However, the traffic simulation model was not rerun in light of time and resource impacts, given that the original estimate of 500 produced a more conservative outcome.

3.4.2.2 PRIMARY MODE SPLIT TRIP REDUCTIONS

Once the total number of employee and visitor daily trips were generated for the site, trip reduction factors were applied to the total daily employee trips generated by the site to account for employee attendance on a typical work day and to account for trips made by single-occupancy vehicles versus those made by non-single-occupancy vehicles.

On-site attendance refers to the number (or percent) of employees that are present at the worksite on a typical day. Not all employees are present at work every day due to many factors including vacation, illness, travel, flexible work schedule, and telecommuting. Of the 6,409 employees relocating to BRAC 133, 90 percent were assumed to be present on a typical work day. This reduced the expected number of total daily employee trips from 6,409 to 5,768.

It should be noted that previous traffic studies cited in the BRAC 133 TMP indicate that on-site attendance assumptions for BRAC 133 range between 75 and 90 percent. After modeling was complete, information was provided to SAIC from a Washington Headquarters Services survey of attendance at similar offices managed by Washington Headquarters Services. The survey found

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employee attendance to be approximately 75 percent. The decision was made by USACE and Washington Headquarters Services not to reduce the 10-percent trip generation reduction factor in consideration of time and resource requirements, given that the 90-percent was more conservative.

The primary mode splits of 57 percent and 43 percent between single-occupancy vehicles and non-single-occupancy vehicles respectively were then applied to the anticipated daily attendance rate of 5,758, resulting in the generation of 3,288 daily single-occupancy-vehicle trips and 2,476 person trips taken by other modes, including carpools, vanpools, slugs, local bus transit, rail/DOD shuttle service, walking, and biking.

3.4.2.3 VEHICLE OCCUPANCY RATES

Vehicle occupancy rates were developed to determine the estimated vehicle-trip generation (versus person-trip generation) of employees traveling by carpool, vanpool, and slug to BRAC 133. An average rate of 2.3 persons per vehicle (PPV) was applied to the estimated 5-percent mode share of employee carpooling (288 employees), resulting in the generation of 125 daily vehicle trips by carpool. The vehicle occupancy rate for carpooling was developed based on the anticipated reliance on both the I-395 high-occupancy vehicle lanes, which require minimum vehicle occupancy of 3 PPV, and the I-66 high-occupancy vehicle lanes, which require minimum vehicle occupancy of 2 PPV. SAIC confirmed that the rate of 2.3 is in line with information contained in *Technical Memorandum, Task 4.1: Analysis of Existing and Potential Transit Demand,* published by Washington Metropolitan Area Transit Authority in January 2010 as an appendix of the *Transit Service Impacts of the Base Realignment and Closure Recommendations in the Metropolitan Washington Region Final Report,* published by Washington Metropolitan Area Transit Authority in June 2010. The report appendices were not reviewed for this assessment.

An average occupancy rate of 7.0 PPV was assumed for vanpools, based on a report entitled *Vanpool Programs: Implementing Commuter Benefits under the Commuter Choice Leadership Initiative,* published by the United States Environmental Protection Agency. The report indicated that vanpools nationwide typically carry anywhere from 7 to 15 passengers per vehicle. A review of the report confirmed the cited range. The vehicle occupancy rate was applied to the 3-percent mode share of employees expected to travel to BRAC 133 by vanpool (173 employees), resulting in a daily generation rate of 25 vanpool vehicle trips.

With the consideration that all slug vehicles would seek to meet the I-395 high-occupancy-vehicle lane occupancy requirements, each slug was assumed to represent three employees. The slug vehicle occupancy rate was applied to the 3-percent mode share of employees expected to travel to BRAC 133 by slug (173 employees), resulting in a daily generation rate of 58 slug vehicle trips.

3.4.2.4 OBSERVATIONS: TRIP GENERATION

- The data and methodologies used by SAIC to determine the daily anticipated trip generation of BRAC 133 as background information to the traffic impact analysis are reasonable.

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- A 90-percent on-site attendance assumption is notably conservative relative to assumptions included in prior studies, as well as the findings from Washington Headquarters Services' surveys of offices they manage. Further, the lower employee attendance of 75 percent identified by the Washington Headquarters Services' survey rate is also supported by the survey findings that flexible work week, compressed work week, and telecommuting are currently utilized by the employees who will be relocating to BRAC 133; the employee surveys indicate that currently 25 percent of respondents participate in flexible work weeks, 15 percent in compressed work weeks, and less than 2 percent telecommute. Therefore, BRAC 133 could reasonably be expected to generate *fewer* trips on a daily basis than was incorporated into and modeled in the traffic impact analysis.

3.4.3 EMPLOYEE AND VISITOR PARKING

Parking operations and policies determine the allocation of available parking spaces among categories of potential users. Employee and visitor parking policies for BRAC 133 are heavily influenced by the 2005 BRAC legislation enacted by Congress. The BRAC legislation restricted parking at realigned base locations to 60 percent of the employee population. The total number of general purpose parking stalls is further reduced by special-use parking requirements such as disabled parking, carpool/vanpool parking, alternative fuel and low-/no-emission vehicle parking, government vehicles, and visitor parking.

The Pentagon Force Protection Agency will be responsible for parking management at BRAC 133. The agency will allocate and issue parking permits to the various BRAC 133 tenant agencies, monitor parking space utilization, and enforce parking rules and regulations. Each tenant organization located at BRAC 133 will be issued a specific number of employee parking spaces according to the percent of the total employee population that the organization employs at BRAC 133. The tenant organization will be responsible for distributing the general purpose permits based upon employee applications and whether they meet certain criteria (i.e., does not desire to receive a mass transit benefit subsidy). Pentagon Force Protection Agency will be responsible for resolving permit issues including towing of unauthorized vehicles or those who do not have their permit properly displayed.

Parking for BRAC 133 will be provided by two garages, with the north garage containing 2,032 parking stalls and located outside the secure perimeter, and the south garage housing 1,715 parking stalls and located within the secure perimeter. All vehicles accessing the south garage within the secure perimeter will have to pass through an access control point. Planned access control at this location includes an active vehicle barrier and a passive vehicle barrier system that work sequentially to provide security to the site.

Wells & Associates included the access control operations for the south garage in the *Washington Headquarters Services Internal Roadway Network Traffic Analysis,* dated April 15, 2009, and updated August 20, 2009. The queue analysis of the access control point performed by Wells & Associates utilized 2008 traffic volumes and assumed 505 vehicles would be processed during the peak hour. The analysis demonstrated that anticipated queues generated by the access control point should not impact the function of the adjacent roundabout. However, the BRAC 133 TMP states that 550 vehicles are

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anticipated to be processed during the peak hour based upon 2009 traffic data, which may affect queue lengths and negatively impact downstream traffic operations. An updated analysis of the access control point was not performed for the BRAC 133 TMP; therefore, the assumed impact of the access control point on queue lengths and the traffic operations is unknown.

The total number of parking spaces available at BRAC 133 is 3,747. Government vehicles will be allocated 150 of the available parking stalls, and 67 spaces will be reserved for visitors. Other parking that will be designated for special uses includes accessible parking (48 stalls), rideshare priority parking (320 potential stalls), and alternate fuel or no-/low-emission vehicle priority parking (192 potential stalls).

The required minimum number of accessible parking stalls is established by the Americans with Disabilities Act. Section 4.1.2 of the Americans with Disabilities Act Guidelines for Buildings and Facilities requires that facilities providing at least 1001 parking stalls provide 20 stalls, plus 1 stall for every 100 parking spaces over 1000. A total of 48 stalls for accessible parking are planned for BRAC 133, which meets the Americans with Disabilities Act requirements.

Priority parking for vanpool and carpool users is identified as a rideshare strategy in the BRAC 133 TMP's Travel Demand Management Plan. A total of 320 stalls are allocated for carpools/vanpools, although the trip projections of BRAC 133 employees with proposed mode splits indicate only 208 daily rideshare vehicle trips are projected, including vanpools, carpools, and slugs. And as noted previously in this assessment, the traffic impact analysis assumed that all sluggers would initially terminate their vehicle trip at Pentagon station and take the DOD shuttle to BRAC 133. This traffic impact analysis assumption would reduce the number of shared use vehicles spaces requiring parking at BRAC 133 It could not be determined from the BRAC 133 TMP how the number of potential rideshare priority parking stalls was established.

Alternate fuel or no-/low-emission vehicle priority parking is a requirement for the Leadership in Energy and Environmental Design (LEED) certification that the Army is pursuing for BRAC 133. The LEED-New Construction Application Guide states that for Credit 4.3 the applicant must provide parking for alternative-fuel, low-emission and/or fuel-efficient vehicles for 3 percent of the full-time employees in the building and must provide preferred parking and access to a fueling station for alternative fuel. Three percent of 6,409, or 192, is the number of parking stalls that are designated for alternative-fuel or low-emission vehicles.

Interviews conducted with Duke Realty and the Center for Naval Analyses indicate that there exists unassigned paid visitor parking at Mark Center that could be accessed by BRAC 133 employees or visitors, should demand for parking exceed capacity. The BRAC 133 TMP suggests the following strategies to avoid or mitigate BRAC 133 parking overflow issues for the potential pursuit of Washington Headquarters Services and area businesses:

- Installation of parking garage barrier gates and/or staffing by parking management personnel at surrounding Mark Center properties with commercial parking capacity
- Increasing the price of nonvalidated parking

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- Limiting guest parking to four hours and implementing a towing program for violators, and allowing employees or tenants of the commercial properties to use parking permits or register their vehicles with their parking management organization to avoid towing
- Issuing resident and guest parking permits to residential community members and implementing a strict towing policy

BRAC 133 visitor parking is very limited, at only 67 spaces. The BRAC 133 facilities include a conference center that can accommodate approximately 400 persons. Visitors attending a conference will either have to register for one of the available visitor stalls, or Pentagon Force Protection Agency - Parking Management Branch (PFPA-PMB) will designate a Metrorail station from which attendees must access the DOD shuttle. All visitors will have to check in with PFPA-PMB 24 hours ahead of the time that they will be arriving to the site so PFPA-PMB will be able to control visitor attendance and plan accordingly based upon parking availability

The BRAC 133 TMP notes that employees of BRAC 133 will be able to utilize park-and-ride lots located in and around Alexandria to take advantage of the DOD shuttles or to congregate for carpool/vanpools. The BRAC 133 TMP addresses the current total capacity of the surrounding park-and-ride lots and Metrorail stations; however, it does not provide the utilization rates of the particular lots mentioned in the BRAC 133 TMP.

3.4.3.1 OBSERVATIONS: EMPLOYEE AND VISITOR PARKING

1. The queue analysis performed by Wells & Associates for the access control point is not indicative of more recent traffic conditions. Updated traffic analysis would be needed to verify that any queuing caused by the access control point would not affect traffic operations or the function of the adjacent roundabout.

2. The parking standards and methodologies used to calculate the special-use parking, such as accessible and alternative-fuel/low-emission parking, are adequate and appropriate for the BRAC 133 TMP. However, the methodologies for determining the allocation of visitor parking is unclear, and the spaces allocated are less than the estimated average daily demand. The parking policies requiring 24-hour advance notification by visitors may minimize excess demand for constrained visitor parking; however, visitor parking allocations may be considerably inadequate on days when the BRAC 133 conference facilities are in full use, should the conferences draw external guests.

3. The availability of paid daily parking at other Mark Center tenant sites and from Duke Realty may draw overflow from BRAC 133 visitors, as well as employees. The BRAC 133 TMP suggests strategies that area businesses and Mark Center tenants could implement to mitigate BRAC 133 overflow traffic from BRAC 133, such as installing barrier gates, hiring parking management personnel, parking, and enforcing strict towing policies. The BRAC 133 TMP does not address how or who will pay for implementation of overflow parking mitigation strategies or the impact on the mode split goals of the BRAC 133 TMP if no action is taken.

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3.4.4 MULTI-MODAL SITE ACCESS

Site access is the entries and paths to reach a destination. Site access is typically analyzed when new or expanded development is expected to generate additional traffic to that site. Typically, the governmental entity with jurisdiction over the site will require a traffic access and impact analysis to verify that access to the site is adequate and that negative traffic impacts are identified and mitigated. The Institute of Transportation Engineers' guidelines indicate that the purpose of requiring traffic access and impact analysis is to provide guidance for short- and long-range planning of site access, for on-site circulation and the interface between on-site and off-site traffic, and for off-site improvements needed to permit the roadway system to function satisfactorily so as to accommodate site and nonsite traffic.

The overall Mark Center site includes the Institute for Defense Analyses building, the Center for Naval Analyses building, the 4900 N. Seminary Road building and its parking garage; BRAC 133 North Campus, which includes the north parking garage and the Transportation Center; and the South Campus, which includes the east and west towers, south parking garage, Visitor Center, remote inspection facility, and remote delivery facility.

The BRAC 133 TMP identifies the following modes of transportation that BRAC 133 will utilize to access the Mark Center site:

- Vehicular: including single-occupancy vehicle and ride share
- Pedestrian and bicycle
- Mass transit

3.4.4.1 VEHICULAR ACCESS

Vehicular access to the Mark Center site is attained by an external roadway system that includes an interstate freeway, arterial roadways, and collector streets. The interstate access to the site is via I-395 with an interchange at Seminary Road. This interchange is the primary access for regional travel to Mark Center from the north and south. While there is no direct high-occupancy vehicle access from I-395 northbound to Seminary Road, there is ramp access to northbound I-395 from Seminary Road during the morning peak travel time and ramp access to Seminary Road from southbound I-395 during the evening peak-hour period. During the morning peak-hour period, the nearest I-395 high-occupancy vehicle access points to the Mark Center site are at the Springfield exit south of the site and the Pentagon exit north of the site.

The BRAC 133 TMP addresses planned roadway access, including four "interim roadway improvements" that are assumed to be constructed by September 2011. The interim roadway improvements were a required condition of the approved special-use permit held by the Mark Winkler Company (later Duke Realty) for developing the BRAC 133 property. The requirement and responsibility to implement the four interim roadway improvements prior to the use of the property

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was transferred (proffered) to the Army upon acquisition of the Mark Center property. The proffered interim roadway improvements are as follows:

- Construction of a third left-turn lane from westbound Seminary Road to southbound N. Beauregard Street
- Construction of a second southbound to eastbound left-turn lane at N. Beauregard Street at Mark Center Drive intersection
- Installation of a new traffic signal at the Mark Center Drive and Institute for Defense Analyses Drive on-site intersection
- Installation of a physical barrier to prevent I-395 ramp traffic from accessing Mark Center via the intersection of Seminary Road and Mark Center Drive.

The first three interim roadway improvements were identified as capacity and traffic control improvements in the *2003 Mark Center Parcel 1A and 1B Traffic Impact Study and Transportation Management Plan*, Wells & Associates, March 31, 2003. The BRAC 133 TMP indicates that the fourth off-site interim roadway improvement was recommended as a safety improvement to eliminate weaving maneuvers from traffic exiting I-395 and making a left turn onto Mark Center Drive.

The BRAC 133 TMP also addresses internal site access. There are two ways to access the site: one from N. Beauregard Street at Mark Center Drive and one from Seminary Road at Mark Center Drive. The BRAC 133 TMP indicates that the existing Mark Center Drive, which runs in an east-west direction, will be widened to four lanes and will serve as a loop road providing access to both the north and south parking garages, the visitor parking area, and the Institute for Defense Analyses building.

Internal access assumptions also include a two-lane roundabout at the intersection of Washington Headquarters Services Circle/Institute for Defense Analyses Drive and the north parking garage. The north parking garage has two access points: one from the Washington Headquarters Services Circle (one inbound lane and one outbound lane) and the other from the internal loop road (two inbound lanes and one outbound lane). Separate access for visitors at the north parking garage will be provided via one inbound lane and one outbound lane. Access to the south parking garage is designed as a “T” intersection, with one inbound lane and one outbound lane. A third reversible lane will provide access in accordance with directional peak-hour period access demand. The BRAC 133 TMP relies upon *Washington Headquarters Services Internal Roadway Network Traffic Analysis*, Wells & Associates, August 20, 2009, as the source of information for internal site access.

The BRAC 133 TMP notes that visitor traffic entering the site will be strictly controlled and managed by the Pentagon Force Protection Agency. All trucks needing to access the remote delivery facility located adjacent to the south parking garage will be screened in a secure area at the remote inspection facility located near the existing Center for Naval Analyses building and the parking garage for 4900 N. Seminary Road building.

With respect to Access Control Facilities, section 3.2.5 of the BRAC 133 TMP indicates an hourly demand of 550 vehicles entering the south parking garage that will be met by two inbound lanes. Based on information from *Washington Headquarters Services Internal Roadway Network Traffic*

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Analysis, Wells & Associates, August 20, 2009, and from the *Main Vehicle Access Control Point (ACP) Active Vehicle Barrier (AVB) Traffic Issue Memorandum*, Department of the Army, August 26, 2009, each lane can process 350 vehicles per hour, equating to a capacity of 700 vehicles per hour at the south parking garage.

Conclusions from the Wells and Associates *Washington Headquarters Services Internal Roadway Network Study* report indicate that the internal roadway network will operate well during the AM and PM peak hours, and that the roundabout at the Washington Headquarters Services Circle/Institute for Defense Analyses Drive–north garage intersection will distribute delay and access for Mark Center users. Although the methodologies of the Wells study itself were not verified or evaluated as part of the BRAC 133 TMP assessment, the traffic projections have increased since the original study, and the conclusions may no longer be valid.

3.4.4.2 PEDESTRIAN AND BICYCLE ACCESS

Section 3.2.4 of the BRAC 133 TMP describes that there is a continuous walkway system along Seminary Road, Beauregard Street, and Mark Center Drive; however, improvements need to be made, such as creating new or improved pedestrian paths, both external and internal at the site; and pedestrian crossings at the intersections of Seminary Road and Beauregard Street, Beauregard Street at Mark Center Drive, and at Seminary Road at Mark Center Drive; and improving pedestrian pushbuttons at the signalized crossing to meet Americans with Disabilities Act standards and optimization of the traffic signals for pedestrians. The BRAC 133 TMP cites the source of this information as *Seminary/Beauregard Street Corridor(s) Traffic Study*, Wilbur Smith Associates, dated January 19, 2007.

Additionally, the BRAC 133 TMP indicates that in response to citizens and neighborhood concerns, the Army is making or has made the following related transportation improvements:

- Pedestrian circulation and sidewalk plan to improve existing substandard sidewalks
- Ramps and cross walks to meet Americans with Disabilities Act guidelines
- Continuity to existing sidewalk system and connectivity to major activity centers
- A pedestrian bridge to connect the north and south campuses
- On-site bike racks and shower facilities with lockers

The BRAC 133 TMP indicates that over 500 employees live within 2 miles of BRAC 133, 100 of which reside within one mile of the site. The BRAC 133 TMP further indicates that 4 percent of City of Alexandria residents walk to work, with an average distance of 1.42 miles, and 0.5 percent bike to work, with an average distance of 8.17 miles. The BRAC 133 TMP estimates a more modest rate of pedestrian and bicycling due to real or perceived inhospitable conditions or lack of nonmotorized access from areas surrounding Mark Center.

3.4.4.3 TRANSIT ACCESS

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Information on existing transit routes serving the Mark Center was collected by SAIC from various transit provider Web sites. Existing public bus transit service serving the Mark Center is provided by Alexandria Transit Company and the Washington Metropolitan Area Transit Authority and is described in the BRAC 133 TMP. Information from the Washington Metropolitan Area Transit Authority indicates that additional clarifications and/or corrections are needed to the presentation of route information in the BRAC 133 TMP, including trip counts and line names. For example, it was clarified that only Routes 7A and 7F operate on Mark Center Drive; 7W and 7X operate via Southern Towers and Beauregard Street and 7B, D and E start at Southern Towers and operate north to the Pentagon via various routes. There was also a correction on the trip counts for Route 25 B from six runs to five runs and for Route 28G, and there are seven runs instead of eight in the PM peak southbound direction. Route 28A's line name was corrected to say *Leesburg Pike Line* instead of *Alexandria-Tysons Center Line*.

Alexandria Transit Company bus routes provide access to and from four Metro rail stations (Eisenhower Avenue, Braddock Road, Van Dorn Street, and King Street Metrorail stations). The Washington Metropolitan Area Transit Authority bus routes provide access to and from five Metrorail stations (Pentagon, Ballston, Van Dorn Street, West Falls Church, and King Street Metrorail stations). Bus stops for these existing services are currently not planned at the transportation center; however, the Army is engaged in discussions with Washington Metropolitan Area Transit Authority and Alexandria Transit Company for this modification.

The BRAC 133 TMP also indicates that Quick's Bus Service, a privately operated commuter bus service from Fredericksburg, Virginia, has one bus route that stops at the Mark Center, proximate to the two buildings immediately adjacent to BRAC 133 (4900 Seminary Road and the Institute for Defense Analyses at 4850 Mark Center Drive). The bus runs only once in the AM and PM peak-hour periods, arriving at Mark Center at 6:00 AM and leaving Mark Center at 3:20 PM. Quick's is equipped to accept federal transit vouchers through the DOD National Capital Region Mass Transit Benefit Program.

The BRAC 133 TMP anticipates that DOD shuttles will be provided to serve BRAC 133 Metrorail users to/from five key Metrorail stations: Pentagon, King Street, Ballston, West Falls Church, and Franconia-Springfield. Service will operate Monday through Friday from 5:30 AM to 7:30 PM. The shuttles will operate every 10 minutes, except for the Wells Falls Church, which will operate every 15 minutes, and the Franconia-Springfield, which will operate every 30 minutes during peak hours (6:30 AM to 9:30 AM, 3:30 PM to 6:30 PM) and will provide direct service from the Metrorail stations to the transportation center at the Mark Center.

3.4.4.4 TRANSPORTATION CENTER

BRAC 133 at Mark Center will include a publicly accessible transportation center attached to the north parking garage located on Mark Center Drive west of Seminary Road The transportation center is designed as an open-air facility with overhead protection to shield travelers from elements, with a restroom for bus operators and benches for public use. An area will be available for agencies to post transit schedules and route information and overhead signage to announce bus arrivals. Five bus bays

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at the transportation center will be available for shared use by any public or private transit provider interested in providing service to Mark Center BRAC 133. Adjacent to the transportation center is a slug area with a slug lane and pedestrian refuge for casual carpooling and taxis.

3.4.4.5 ACCESS FOR THE DISABLED

Parking that meets requirements of the Americans with Disabilities Act is primarily located at the ground level of the south garage; in addition, there will be three Americans with Disabilities Act parking spaces at the north garage.

3.4.4.6 OBSERVATIONS: MULTI-MODAL SITE ACCESS

1. The data used with respect to the roadway network are adequate, as are the data and methods for accommodating and improving pedestrian and bicycle access.

2. Conclusions from the Wells & Associates *Washington Headquarters Services Internal Roadway Network Study* report indicate that the internal roadway network will operate well during the AM and PM peak hours and that the roundabout at the Washington Headquarters Services Circle/Institute for Defense Analyses Drive–north garage intersection will distribute delay and access for Mark Center users. However, the methodologies of the Wells study itself were not verified or evaluated as part of the BRAC 133 TMP assessment. The assumed TMP traffic volumes indicate that traffic projections have increased since the original study; therefore, the conclusions of the Wells study may no longer be valid.

3. The description of site access to accommodate and improve transit access to the BRAC 133 site requires further clarification or modification to correctly reflect bus routes, number of runs, and line name. Discussions between USACE/Washington Headquarters Services and various transit providers are ongoing in terms of modifications to existing services, or adding new ones, that may necessitate further revisions to the BRAC 133 TMP.

3.4.5 TRAFFIC IMPACT ANALYSIS

A traffic impact analysis assesses the adequacy of the existing or future transportation system to accommodate additional traffic generated by a proposed development, redevelopment or land rezoning. Most traffic impact analyses utilize micro-computer simulation (traffic models) to predict potential future impacts of additional traffic. The results of the modeling (model output) identify the characteristics, location, and likely magnitude of negative impact on interior, adjacent, and nearby road systems. These results are critical to develop appropriate solutions that will sustain the roadway network's performance, or level of service.

Not all developments require a traffic impact analysis. The Institute of Transportation Engineers' general recommended threshold for undertaking a traffic impact analysis is any proposed site plan or subdivision plan that would be expected to generate over 100 directional trips during the peak hour of the traffic generator or the peak hour of adjacent streets, or over 750 trips in an average day.

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The City of Alexandria's Ordinance 3204, TMP Special-Use Permit, states that buildings subject to a special-use permit and requiring a traffic impact analysis are as follows:

Single-Use Buildings

- Office – 50,000 or more square feet of usable space
- Retail – 40,000 or more square feet of usable retails sales space
- Industrial – 150,000 or more square feet of usable industrial space
- Residential – 250 or more dwelling units

The traffic impact analysis included as Section 4.0 of the BRAC 133 TMP the Mark Center utilized the data and information previously discussed in this report.

3.4.5.1 STUDY AREA

The study area as described in the BRAC 133 traffic impact analysis includes the following adjacent and internal roadway network intersections and interchanges:

- Seminary Road/Library Lane
- Seminary Road/Kenmore Avenue
- I-395 Northbound Ramps/Seminary Road
- I-395 Southbound Ramps/Seminary Road
- Seminary Road/Mark Center Drive
- N. Beauregard Street/Seminary Road
- N. Beauregard Street/Mark Center Drive
- Mark Center Drive signalized intersection (internal)
- Washington Headquarters Services Circle/Institute for Defense Analyses Drive - north parking garage roundabout (internal)

The Virginia Department of Transportation's (VDOT) *Traffic Impact Analysis Regulations Administrative Guidelines*, 24VAC30-155, June 2010, indicates that for 500 to 999 site-generated trips, the study area shall be within 2,000 feet of the site and shall include any roadway on which 10 percent or more of the new vehicle trips generated by the proposal are distributed, not to exceed two miles. The *Guidelines* indicate that for site-generated trips of 1000 or more, the study area is to be determined by VDOT in consultation with the locality. VDOT indicated that for sites similar to the BRAC 133 at the Mark Center, their "rule of thumb" is to develop a traffic impact analysis study area to include one interchange upstream and downstream of the interchange adjacent to the site and a minimum of two intersections upstream and downstream of the intersections adjacent to the site. The traffic impact analysis indicates that site-generated trips for BRAC 133 exceed 1000 trips.

The City of Alexandria's Ordinance 3204, TMP Special-Use Permit, also requires the inclusion of streets and intersections in the study for which at least 10 percent of the traffic generated by the project

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could be reasonably assigned. USACE is not subject to the requirements of the City of Alexandria or VDOT, but their requirements are useful for comparison purposes.

Based on the projections of peak employee and visitor single-occupancy vehicle and rideshare trips contained in the traffic impact analysis, 10 percent of the BRAC 133 peak-hour trips is approximately 139 AM trips and 132 PM trips. BRAC 133 TMP *Figure 4-6: BRAC & Institute for Defense Analyses Generated Peak-Hour Trips* indicates the peak-hour intersection traffic movements. The total peak-hour BRAC 133 trips entering and exiting the intersections and interchange at the periphery of the study area all exceed the 10 percent threshold, as follows:

- N. Beauregard Street south of Mark Center Drive – 313 AM trips and 294 PM trips
- N. Beauregard Street north of Seminary Road – 157 AM trips and 148 PM trips
- Seminary Road west of N. Beauregard Street – 269 AM trips and 255 PM trips
- Seminary Road east of Library Lane – 302 AM trips and 284 PM trips
- I-395 north of Seminary Road – 414 AM trips and 381 PM trips
- I-395 south of Seminary Road – 567 AM trips and 536 PM Trips

SAIC indicated via a phone interview with the assessment team that their initial proposal for the development of traffic model was to extend the study area to the I-395 Duke Street interchange to the west and King Street interchange to the east. SAIC was advised by USACE not to expand the study area so as not to duplicate a separate and ongoing analysis effort of the Virginia Department of Transportation.

3.4.5.2 TRAFFIC VOLUME

Traffic volume is a quantitative determination of the number of vehicle traveling on a roadway network, and existing traffic volumes can be determined by using machine counting methods and manual counting methods.

Traffic volumes are evaluated as average daily traffic, hourly volume, and peak-hour volume. Average daily traffic is the estimated number of vehicles that passes through a study section in one 24-hour period and is reported in units of vehicles per day. Hourly volume is the number of vehicles that pass through a study section in an hour and is reported in units of vehicles per hour. Peak-hour volume is the maximum number of vehicles that passes through a study section in any one hour. The peak-hour volume is reported in units of vehicles per hour.

<u>Existing Peak-Hour Volume (2009)</u>
Section 4.3.1 of the BRAC 133 TMP indicates that SAIC used the existing intersection turning movements from the *Washington Headquarters Services Transportation Improvement and Management Plan*, Wells & Associates, July 30, 2008, for Duke Realty; the traffic data from the *Mark Center (BRAC 133) Transportation Study*, Vanasse Hangen Brustlin, Inc., November 2, 2009, for the City of Alexandria; and, for the existing traffic volumes along I-395 main line and ramps, SAIC used data from the *Mark Center (BRAC 133) Access Study*, Virginia Department of Transportation,

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February 10, 2010. The various traffic data sources were combined and balanced, and were used as the 2009 existing traffic volumes.

Baseline Peak-Hour Volume (2011)
The baseline peak-hour volume is the projected peak-hour volume for 2011 (after the September opening of BRAC 133 at the Mark Center) and does *not* include the projected traffic growth from the BRAC 133. Based on travel demand models developed by Metropolitan Washington Council of Governments, the annual traffic growth factor for the local road network within the study area between 2010 and 2020 was estimated to be 0.5 percent growth per year. This annual growth factor was applied to the existing 2009 peak-hour volume baseline traffic to develop the baseline 2011 peak-hour volume without the projected BRAC 133 growth.

Projected Peak-Hour Volume (2011)
The projected AM and PM peak-hour volume is based on the employee and visitor trip generation assumptions. The BRAC 133 TMP estimated 90 percent of the BRAC 133 6,409 employees to be on-site per day during normal operations, equating to 5,768 BRAC 133 employees accessing the Mark Center site daily. The BRAC 133 TMP analysis also estimated the anticipated mode of transportation that each employee and visitor would use to access the site. The single-occupancy and rideshare AM and PM trips to and from BRAC 133 determined from this analysis was distributed over the morning peak-hour period of 6:00 AM to 9:00 AM and over the evening peak-hour period of 3:00 AM to 6:00 AM, based on the travel patterns of the BRAC 133 employees derived from the fall 2009 Washington Headquarters Services employee commute survey. The highest hour of demand during the peak-hour period was used in the BRAC 133 traffic impact analysis as the BRAC 133 site-generated employee- and visitor-projected peak-hour volume.

The traffic impact analysis determined the number of vehicles entering and leaving the Mark Center site for both AM and PM projected peak-hour volume. The anticipated percentage of vehicles entering and exiting the site in the AM and PM was consistent with Institute of Transportation Engineers' guidance. The BRAC 133 peak-hour volume trips were combined with the proposed Institute for Defense Analyses building peak-hour volume trips for the overall projected peak-hour volume in and out of the Mark Center site.

3.4.5.3 TRAFFIC OPERATIONS

Traffic operational analyses and microscopic (micro) simulation modeling are used to understand or predict how traffic is currently operating and how traffic will operate under modified conditions, including the varied traffic volumes. Traffic operational analyses and micro simulation modeling is used to determine the performance of the existing roadway system and potential improvements of the roadway network being studied.

For the BRAC 133, SAIC used Corridor Simulation (CORSIM) Version 6.2, an industry-standard, micro simulation model package. CORSIM applies interval-based simulation to describe traffic operations. In the model, each vehicle is individually tracked through the network, and operational measures of effectiveness are collected on every vehicle. Driver behavior characteristics are assigned

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to each vehicle. The variation of each vehicle's behavior is simulated in a manner reflecting real-world operations. CORSIM is an accepted micro simulation model software by Virginia Department of Transportation and the Federal Highway Administration (FHWA). CORSIM is directly referred to in the FHWA's *Traffic Analysis Toolbox Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software* dated July 2004; the FHWA's *Traffic Analysis Toolbox Volume IV: Guidelines for Applying CORSIM Microsimulation Modeling Software*, dated January 2007; and the Virginia Department of Transportation's *traffic impact analysis Regulations Administrative Guidelines*, 24VAC30-155, June 2010.

The BRAC 133 traffic impact analysis also references the use of Synchro, developed by Trafficware, Ltd., which is a macroscopic traffic signal design software based on the Transportation Research Board's *Highway Capacity Manual* and its recommended guidelines for signalized intersection. This is a location-based analysis tool that models traffic arriving or present at the intersection approaches. It does not account for traffic flow conditions.

Traffic Model Development Process

The development of a CORSIM model requires the compilation and input of available data, the coding of the existing roadway network conditions for various analysis scenarios, the calibration of the micro simulation model, and development of alternatives analysis.

The input data includes the traffic volumes previously discussed; roadway cross section information; dimensions of the roadways, including lane dimension, lengths of auxiliary turn lanes, and distances between intersections; operations of the traffic signal systems in the study area; and other data about the roadway system being analyzed. These data are then entered or coded into the base simulation model.

CORSIM has a set of user-adjustable parameters for calibrating the software to better match the specific study area conditions. These parameter adjustments are necessary to try to replicate the existing conditions that might affect capacity and traffic operations. Micro simulation model calibration "involves the selection of a few parameters for calibration and the repeated operation of the model to identify the best values for those parameters. This can be a time-consuming process. It should be well documented so that later reviewers of the model can understand the rationale for the various parameter changes made during calibration."

The traffic impact analysis indicated that site observations were conducted and the CORSIM defaults modified to ensure the base model matched the actual conditions occurring in the field. A follow-up phone interview with SAIC on November 12, 2010, indicated that SAIC performed several field observations of the roadway network to verify that the base modeling matched actual conditions of the study area. Other means of data collection to calibrate data, such as floating car runs for point-to-point travel time data and intersection delay, and electronic measuring equipment for point speed and flow data, were not used.

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For the surrounding roadway network analysis, the traffic impact analysis included existing bus transit and shuttle bus service within the study in the simulation model to reflect the vehicle flow and vehicle interactions within the study area.

The refined CORSIM base model was then used to develop the following simulation models for the surrounding roadway network analysis:

- A baseline traffic model for 2011 without the interim improvements along Seminary Road and along N. Beauregard Street
- A projected traffic model for 2011 with the interim improvements completed along Seminary Road and along N. Beauregard Street

3.4.5.4 OPERATIONAL ANALYSIS: LEVEL OF SERVICE AND ROADWAY CONDITIONS—ADJACENT ROADWAY NETWORK

The traffic impact analysis examined the projected level of service of the roadway network for both a 2011 Baseline Scenario (without BRAC and Institute for Defense Analyses traffic, with interim roadway improvements) and a 2011 Projected Scenario (with projected BRAC and Institute for Defense Analyses traffic and with interim roadway improvements) to compare the effect of BRAC 133 on the surrounding road segments and intersections.

Level of service (or LOS) is a measure by which transportation planners determine the quality of service and characterize the existing operating conditions and conditions from the proposed action in terms of traffic performance measures. These measures include speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Level of service can be calculated at unsignalized intersections, signalized intersections, freeway merge and diverge points, or freeway segments, and is categorized as follows:

A = Free flow
B = Reasonably free-flow
C = Stable flow
D = Approaching unstable flow
E = Unstable flow (maximum flow rate or “At capacity”)
F = Forced or breakdown flow (“Stop-and-go” traffic)

For this analysis, measures of effectiveness tables for AM and PM peak-hour traffic were developed from the output results of the CORSIM model. The measures of effectiveness values obtained from CORSIM output reports were correlated with the range of recommended threshold values of the Institute of Transportation Engineers Highway Capacity Manual to determine level of service and operational conditions for the I-395 mainline, I-395 ramps, and arterial roadways in the study area. The analysis was performed for both AM and PM peak-hour period conditions.

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The operational analysis of the baseline condition (without BRAC 133 traffic) was based on analysis of existing geometric roadway conditions as identified in the BRAC 133 TMP.

The baseline analysis utilized the 2011 traffic volumes previously described in this section and optimized signal timing and coordination plans. Ten model runs were made and evaluated for both the AM and PM peak hours to determine baseline conditions.

The traffic simulation model of the 2011 baseline conditions (without the proposed BRAC and Institute for Defense Analyses peak-hour trips) resulted in a finding that the following intersections, intersection approaches, and free-flow right turns are anticipated to operate at an unacceptable level of service (LOS) (E or F) by 2011:

Intersections

- I-395 northbound off-ramp and Seminary Road (southeast rotary intersection) – AM: LOS E
- N. Beauregard Street and Seminary Road – AM: LOS E, PM: LOS E

Intersection Approaches

- I-395 northbound off-ramp and Seminary Road (southeast rotary intersection), eastbound approach – AM: LOS E
- I-395 southbound off-ramp and Seminary Road (northwest rotary intersection), southbound approach – AM: LOS E
- I-395 southbound on-ramp and Seminary Road (southwest rotary intersection), westbound approach – AM: LOS E
- Seminary Road at Mark Center Drive, southbound approach – AM: LOS F
- Seminary Road at N. Beauregard Street, northbound approach – AM: LOS F, PM: LOS F
- Seminary Road at N. Beauregard Street, southbound approach – PM: LOS E
- N. Beauregard Street at Mark Center Drive, eastbound approach – AM: LOS E, PM: LOS E
- N. Beauregard Street at Mark Center Drive, northbound approach – AM: LOS E

Free-Flow Right-Turn Lanes

- I-395 southbound off-ramp – AM: LOS D, PM LOS D
- I-395 southbound on-ramp – AM: LOS D, PM LOS E

The operational analysis of 2011 Projected Conditions with BRAC 133 traffic was based on analysis of 2011 baseline traffic volumes plus the projected BRAC 133 and Institute for Defense Analyses trips and included the four interim roadway improvements assumed to be completed by September 15, 2011:

- Construction of a third left-turn lane from westbound Seminary Road to southbound N. Beauregard Street

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- Construction of a second southbound-to-eastbound left-turn lane at the N. Beauregard Street and Mark Center Drive intersection.
- Installation of a new traffic signal at the Mark Center Drive and Institute for Defense Analyses Drive on-site intersection.
- Installation of a physical barrier to prevent I-395 ramp traffic from accessing the Mark Center via the intersection of Seminary Road and Mark Center Drive. Traffic approaching the site from Seminary Road or from Southern Towers will still be able to access the site from this location.

The traffic impact analysis also indicated that the simulation model incorporated an improvement to the rotary interchange, including the delineation of the existing island and the restriping of lanes to improve capacity at this node.

The projected conditions analysis utilized the 2011 traffic volumes in conjunction with the proposed BRAC 133 and Institute for Defense Analyses peak-hour trips previously described in this section and optimized signal timing and coordination plans. Ten model runs were made and evaluated to determine AM and PM conditions.

The traffic simulation model of the 2011 projected conditions (with the proposed BRAC 133 and Institute for Defense Analyses peak-hour trips) resulted in a finding that the following intersections, intersection approaches, and free-flow right-turns are anticipated to operate at an unacceptable level of service (LOS) E or F in 2011:

<u>Intersections</u>

- I-395 northbound off-ramp/Seminary Road (southeast rotary intersection) – AM: LOS E
- N. Beauregard Street and Seminary Road – AM: LOS E, PM: LOS E

<u>Intersection approaches</u>

- I-395 northbound off-ramp/Seminary Road (southeast rotary intersection), northbound approach – AM: LOS E
- I-395 northbound off-ramp/Seminary Road (southeast rotary intersection), eastbound approach – AM: LOS F
- I-395 southbound off-ramp/Seminary Road (northwest rotary intersection), southbound approach – AM: LOS E
- I-395 southbound on-ramp/Seminary Road, westbound approach – AM: LOS E
- Seminary Road at Mark Center Drive, westbound approach – AM: LOS F
- Seminary Road at Mark Center Drive, eastbound approach – PM: LOS F
- Seminary Road at Mark Center Drive, southbound approach – AM: LOS F, PM: LOS E
- Seminary Road at N. Beauregard Street, northbound approach – AM: LOS F, PM: LOS F
- Seminary Road at N. Beauregard Street, eastbound approach – PM: LOS F

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- Seminary Road at N. Beauregard Street, southbound approach – AM: LOS F, PM: LOS F
- N. Beauregard Street at Mark Center Drive, northbound approach – AM: LOS E

Free-Flow Right-Turn Lanes

- I-395 southbound off-ramp – AM: LOS F, PM LOS F
- I-395 southbound on-ramp – AM: LOS D, PM LOS F

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3.4.5.5 OPERATIONAL ANALYSIS: LEVELS OF SERVICE AND ROADWAY CONDITIONS—INTERNAL ROADWAY NETWORK

The traffic impact analysis utilized CORSIM models for the proposed internal signalized intersection at Mark Center Drive and for the roundabout at Washington Headquarters Services Circle/Institute for Defense Analyses Drive—north parking garage. Since CORSIM does not directly model roundabouts, the model was coded in a way to represent circulating movements controlled by yield signs. An analysis of the roundabout was performed in a Wells & Associates memorandum to Duke Realty, dated April 15, 2009, updated August 20, 2009, re: Washington Headquarters Services Internal Roadway Network. The roundabout analysis used SIDRA Intersection software developed by Akcelik & Associates to determine delay and queue at the roundabout. SIDRA Intersection software is a micro-analytical evaluation tool that employs lane-by-lane and vehicle drive cycle models. It is used for intersection capacity and level of service and performance analysis and is one of many roundabout software packages mentioned in the FHWA's publication titled, *Roundabouts: An Informational Guide*, Report No. FHWA-RD-00-067, dated June 2000. Wells & Associates used the peak-hour traffic data from the July 30, 2008, *Traffic Improvement and Management Plan* by Wells & Associates, for Duke Realty, which varies from the peak-hour traffic in the BRAC 133 TMP/traffic impact analysis from +88 percent to -10 percent for AM peak hour and from +23 percent to -30 percent for the PM peak hour. The Wells & Associate's analysis of the proposed roundabout determined that it will operate at LOS A for all movements.

The operational analysis of the internal signalized intersection at Mark Center Drive indicates the intersection will operate at LOS B for both AM and PM peak-hour periods.

The traffic impact analysis referenced the access control facility at the south garage and indicated that this node would experience less peak-hour traffic than that of the maximum capacity of the facility.

3.4.5.6 IDENTIFICATION OF PROBLEM AREAS

The traffic operational analysis for the projected AM and PM peak conditions identifies locations of concern along the roadway network indicating extensive traffic queues and spillovers. The delay experienced by drivers at these locations deteriorated to unacceptable levels of service E and LOS F where traffic demand exceeds the capacity of the node. These locations included:

<u>Interstate Mainline and Ramps</u>

- I-395 northbound general purpose lanes south of Seminary Road interchange and the Seminary Road exit ramp section
- I-395 southbound general purpose lanes north of Seminary Road interchange and the Seminary Road exit ramp section
- Seminary Road entrance ramp section to the southbound I-395 general purpose lanes

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Traffic queue spillback along southbound I-395 extends past the King Street interchange affecting the ramp operations and weave section maneuvers from King Street. The northbound queue spillback impacts were not evaluated for the I-395 and Duke Street and the I-395 and Seminary Road operations.

Arterial Streets and Intersections

- Southeast rotary intersection (I-395 northbound exit ramp)—Primary cause of projected traffic congestion along southbound I-395 and eastbound Seminary Road
- N. Beauregard Street and Seminary Road intersection—The heavy left-turn movements from conflicting intersection approaches use a larger amount of the allotted green time which affects the operations and capacity of the intersection
- Eastbound Seminary Road queue spillback—Due to traffic operations at the southeast rotary intersection

Several additional traffic operational problem areas are listed in the BRAC 133 TMP on pp. 93–94.

3.4.5.7 SUGGESTED IMPROVEMENTS FOR FURTHER REVIEW AND ANALYSIS

Given the failing or poor performance of some areas of the transportation network, SAIC considered and developed potential transportation improvements. A list of "Suggested Improvements for Further Review and Analysis" is presented at the end of the traffic impact analysis section of the BRAC 133 TMP. Ideas from the BRAC Advisory Group were among the numerous improvements considered. The suggested improvements included roadway, intersection, traffic control, and internal circulation improvements. These transportation improvements were recommended for additional study and were not assumed to be operational by 2011.

3.4.5.8 INTERSECTIONS OF SPECIAL INTEREST

The BRAC 133 TMP notes that, as of the time of publication, language contained in a pending Fiscal Year 2011 Defense Authorization Bill would limit parking at BRAC 133 and that should such language be included in the final version of the legislation that is passed by Congress, Washington Headquarters Services will supplement the TMP accordingly.

Further, in approving the BRAC 133 TMP pursuant to 40 USC § 8722(b)(1) on September 2, 2010, the National Capital Planning Commission included the following language in the Commission Action:

> *Notes that if the Fiscal Year 2011 Defense Authorization Budget becomes law, and includes the amendment introduced by Congressman James Moran, then a new transportation management plan is necessary to understand how the Army will address the legislation's provisions that (1) limit the parking space to 1,000 spaces and (2) demonstrate how the Army will maintain the current level of service for the adjacent roadways and intersections.*

Attachment 1 of the Commission Action presents the referenced amendment entitled *Subtitle B-Other Matters Sec. 2711. Transportation Plan for BRAC 133 Project under Fort Belvoir, Virginia, BRAC*

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Initiative. The following two subparts of Subtitle B Sec. 1 correspond to the provisions enumerated by NCPC:

(a) Limitation on Project Implementation
(b) Viability of Transportation Plan

The referenced amendment would have limited the Secretary of the Army to taking "beneficial occupancy" of more than 1,000 parking spaces for the use of BRAC 133 until (1) a viable transportation plan [TMP] was submitted to the congressional defense committee and (2) certification was provided to the congressional defense committee that construction has been completed to provide adequate ingress and egress from the business from the Mark Center business park. Subpart (b) describes that, to be considered a "viable transportation plan" under subsection (a)(1) the TMP must provide for ingress and egress to and from the BRAC 133 site without reducing the level of service at six specific intersections. However, as of January 22, 2011, the current language of the fiscal year 2011 Defense Authorization Bill no longer includes reference to the 1,000 parking space limitation.

The results of the BRAC 133 TMP traffic impact analysis were reviewed for the six intersections identified by the legislative amendment. The six intersections are presented in the table below, along with the projected level of service (LOS) for both the AM and PM peak periods, as well as for the two modeled 2011 scenarios: (1) 2011 without (w/o) BRAC 133 and Institute for Defense Analyses (IDA) traffic and (2) 2011 with (w/) BRAC 133 and Institute for Defense Analyses traffic.

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Table 8: Projected Year 2011 Level of Service (LOS) for Intersections of Special Interest in the AM and PM Peak Hour

	AM Peak Hour LOS		PM Peak Hour LOS	
Intersection	Year 2011 Without BRAC 133 and IDA Traffic	Year 2011 With BRAC 133 and IDA Traffic	Year 2011 Without BRAC 133 and IDA Traffic	Year 2011 With BRAC 133 and IDA Traffic
N. Beauregard Street and Mark Center Drive	D	D	C	C
N. Beauregard Street and Seminary Road	E	E	E	E
Seminary Road and Mark Center Drive	C	D	C	D
Seminary Road and the northbound on-ramp to I-395 (Northeast rotary intersection)	C	C	A	A
Seminary Road and the northbound off-ramp from I-395 (Southeast rotary intersection)	E	E	C	B
Seminary Road and the southbound off-ramp from I-395 (Northwest rotary intersection)	B	B	B	B

Data source: Transportation Management Plan, July 2010, Table 4-18: Comparative Analysis of the Intersection LOS for 2011 Baseline and Projected Morning and Evening Peak Hour Traffic Demand With and Without BRAC 133 and IDA Improvements, p. 90
A = Free flow; B = Reasonably free-flow; C = Stable flow; D = Approaching unstable flow; E = Unstable flow (maximum flow rate or "at capacity"); F = Forced or breakdown flow

The modeled 2011 scenario "with BRAC 133 and Institute for Defense Analyses (IDA) traffic" assumes implementation of the BRAC 133 TMP. As can be seen in *Table 8: 2011 Projected LOS for Intersections of Special Interest in the AM and PM Peak Hour,*

- Two intersections are expected to operate at unacceptable conditions, *with or without BRAC 133 traffic* (LOS E or F); and
- The *addition of BRAC and Institute for Defense Analyses traffic* will cause one of the six intersections, namely Seminary Road and Mark Center Drive, to degrade by at least one level of service.

3.4.5.9 OBSERVATIONS: TRAFFIC IMPACT ANALYSIS

As a whole, the development of the traffic impact analysis was adequate for the purposes of developing a TMP; however, a more technically robust, stand-alone traffic impact analysis would be needed to confirm the accuracy of findings, based on the following observations:

1. The use of the existing 2009 peak-hour volume, baseline 2011 peak-hour volume (without BRAC 133 traffic growth) and projected peak-hour volume (with BRAC 133 traffic growth) meets the City of Alexandria's requirements for Contents of a traffic impact analysis.

2. SAIC obtained existing 2009 peak-hour volume from numerous sources. There was no indication in the traffic impact analysis that any attempt was made to verify the existing

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2009 traffic data. Because existing traffic volume is the basis of the analysis, it is possible that the traffic projections are inaccurate.

3. The assessment of the traffic operational analyses and microscopic (micro) simulation modeling met the standards of the various FHA *Traffic Analysis Toolbox Volumes* publications, with the exception of the field data collection for determining site variables. SAIC's determination of these variables was based on visual site inspections over the course of the analysis. There were no other field data collected or analytical methods used to properly calibrate these variables.

4. The traffic impact analysis did not fully model the access control facility to the south parking garage. The analysis assumed that the proposed traffic would always be less than the capacity of the facility. There were other studies cited in the traffic impact analysis that analyzed this facility using peak-hour traffic from Washington Headquarters Services' Transportation Improvement and Management Plan and using the *Traffic and Safety Engineering for Better Entry Control Facilities*, published by the Surface Deployment and Distribution Command Transportation Engineering Agency (SDDCTEA). The access control facility was not analyzed using the SDDCTEA's requirements, or similar guidelines, to identify the possible queues created by the delay of this site with the most current available traffic data.

5. The study area was limited to the roadway network adjacent to the BRAC 133 Mark Center site. Based on data presented in the analysis, more than 10 percent of the peak-hour trips associated with BRAC 133 will be accessing the traffic impact analysis study area from outside the study area. A larger study area may have been merited to ensure that peak-hour trips associated with BRAC 133 do not negatively affect additional intersections and interchanges.

With respect to six intersections of interest that are identified in pending Defense Reauthorization legislation,

1. Two intersections are expected to operate at an unacceptable level of service of LOS E (unstable flow) *with or without* BRAC 133 and the BRAC 133 TMP:
    a. N. Beauregard Street and Seminary Road; and
    b. Seminary Road and the northbound off-ramp from I-395 (southeast rotary intersection); and
2. One intersection is expected to decline in the level of service of from an acceptable LOS C (stable flow) to LOS D (approaching unstable flow) due to the combined effect of BRAC 133 and Institute for Defense Analyses expansion traffic:
    a. Seminary Road and Mark Center Drive.

The traffic impact analysis results indicate that the remaining three intersections of interest are expected to continue to operate at an acceptable level of service of LOS C, or better.

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The immediate funding and implementation of some or all of the "Suggested Roadway and Intersection Improvements for Further Analysis" presented in BRAC 133 TMP Section 4.4.9, and the recommended "Short- and Medium-Term Improvements" announced by the Virginia Department of Transportation in November 2010, may mitigate the projected congestion in the vicinity of Mark Center; however, an engineering assessment of the suggested improvements for further analysis and the Virginia Department of Transportation's proposed improvements were not within the scope of this report.

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3.5 ASSESSMENT OF BRAC 133 TMP OUTCOMES AND CONCLUSIONS

3.5.1 TRAVEL DEMAND MANAGEMENT PLAN

The Travel Demand Management Plan for BRAC 133 is the primary outcome of the BRAC 133 TMP development process and is presented as Chapter 5 of the BRAC 133 TMP. The BRAC 133 Travel Demand Management Plan presents the specific program of strategies and policies that Washington Headquarters Services will implement to achieve the following two goals of the BRAC 133 TMP:

- Achieve 40 percent or more non-single-occupancy vehicle trips to the site in order to minimize traffic effects on the neighboring community
- Facilitate tenant mobility to the site by providing a viable transportation program in order to help employees choose appropriate commute methods for getting to the Mark Center

The NCPC's guidebook *Implementing a Successful TMP* defines travel demand management as a set of policies, programs, and actions to

- Increase the use of high-occupancy vehicles (e.g., public transit, carpooling, and vanpooling), cycling and walking;
- Encourage commuting outside congested time periods; and
- Encourage telecommuting as an alternative to driving.

The guidebook provides information and guidance in selecting travel demand management strategies for a TMP; however, NCPC does not prescribe a particular set of travel demand management strategies to include in a TMP "due to the diverse nature of each worksite's operating environment and business requirements." The guidebook further cautions that "mixes of strategies and pricing levels can have dramatically different results in different combinations and locations, which reinforces the need for an iterative and responsive TMP process."

The City of Alexandria's TMP ordinance and corresponding administrative guidelines also provide flexibility in travel demand management strategy selection. The ordinance requires that a TMP include a "reasonable and effective combination of some or all of [a list of potential strategies] as appropriate to the size, scale and location of the proposed use." While not bound by local ordinance, the BRAC 133 TMP's Travel Demand Management Plan does include many of the potential strategies listed therein.

The Travel Demand Management Plan indicates that the selection of strategies reflects consideration of the following:

- *Mark Center Plaza 1A and 1B TMP*, (existing 2003 Mark Center TMP)
- Analysis of employee commute patterns and needs
- DOD transportation protocol
- Research on Army transportation program needs
- Best practices and case studies in travel demand management

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Interviews undertaken as part of the BRAC 133 TMP assessment process established that the strategies included in the BRAC 133 Travel Demand Management Plan were initially proposed by SAIC and then selected and further modified in close coordination with USACE and Washington Headquarters Services. DOD and Washington Headquarters Services policies considerably influenced, and in some cases limited, travel demand management strategy options.

For example, DOD policy prevents charging employees to park and is the reason that parking pricing strategies are not included in the BRAC 133 Travel Demand Management Plan; however, it was also noted that the federal government is not specifically prohibited from charging for parking. During the development of the BRAC 133 TMP, Washington Headquarters Services questioned whether a public transit agency could provide services for BRAC 133 without a competitive bidding process; however, since the completion of the BRAC 133 TMP, it has been clarified that such an arrangement can proceed through an intergovernmental agreement. Discussion with Alexandria Transit Company on potentially providing some of the shuttle service is underway. Finally, the Army's decision to pursue a LEED Gold rating for BRAC 133 resulted in a significant parking set-aside for no-/low-emission vehicles: 192 spaces, irrespective of vehicle occupancy.

3.5.1.1 STRATEGIES CONSIDERED FROM EXISTING TMPS

The first two pages of the BRAC 133 Travel Demand Management Plan acknowledge the four major travel demand management strategies of the *Mark Center Plaza 1A and 1BTMP*, a 2003 TMP for the Mark Center development prepared by Mark Winkler Realty (now Duke Realty) and approved by Alexandria in 2004 as part of a special-use permit application. The BRAC 133 property constitutes a portion of the overall Mark Center development; therefore the predecessor TMP affecting the BRAC 133 property was for a broader development, including both the Center for Naval Analyses and Institute for Defense Analyses buildings.

Although Section 5.1 of the BRAC 133 TMP states "The following section outlines the four major travel demand management strategies adopted as part of the 2003 Mark Center TMP and demonstrates the Army's commitment to including these strategies at a minimum, while building upon these strategies and incorporating additional strategies within the BRAC 133 TMP," the strategy of Reserved Flex-Time Employee Parking is not continued in the Travel Demand Management Plan of the BRAC 133 TMP. The following are the four major travel demand management strategies of the 2003 Mark Center TMP, as well as how/in what way each is being carried forward in the BRAC 133 Travel Demand Management Plan:

1. Designation of a Transportation Management Plan Coordinator (TMPC)
   The BRAC 133 TMP will tie all of the responsibilities of the TMPC into the roles and responsibilities of a BRAC 133 Transportation Coordinator, in addition to other responsibilities.
2. Shuttle Service to Pentagon Metrorail Station

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The BRAC 133 TMP includes the management of a free shuttle service for its employees to five Metrorail stations, including Pentagon.

3. Reserved Flex-Time Employee Parking
   The BRAC 133 TMP will not guarantee flex-time parking for employees, due to an already high (40 percent+) participation rate and a goal to increase participation by an additional 25 percent.
4. Reserved Carpool and Vanpool Parking
   The BRAC 133 TMP will uphold the 2003 Mark Center TMP's 5-percent parking allocation for carpools and vanpools; however, unlike the Mark Center TMP, no time limits will be placed on the parking.

3.5.1.2 SELECTED TRAVEL DEMAND MANAGEMENT STRATEGIES

The organization of the BRAC 133 Travel Demand Management Plan does not easily lend to determining where the planned strategies begin and what heading level constitutes a strategy. The plan states, "The following Travel Demand Management Plan describes further the strategies of the BRAC 133 Travel Demand Management Plan and corresponding details of its various programmatic elements." This language was interpreted to mean that the eight headers of sections 5.2–5.9 of the BRAC 133 TMP constitute the strategies of the BRAC 133 Travel Demand Management Plan and the subheaded items represent the "programmatic elements."

The BRAC 133 Travel Demand Management Plan provides a narrative summary for some of the strategies, or in some cases, just the programmatic elements. The following outline provides an overview of the selected travel demand management strategies to achieve the BRAC 133 TMP's two goals, as well as the programmatic elements within each strategy:

1. Management Organization and Personnel
   a. Managing Organizations (Washington Headquarters Services and Pentagon Force Protection Agency–Parking Management Branch)
   b. Transportation Coordinator
2. Pre-Relocation Outreach
   a. Marketing
   b. Employee Orientation
   c. Survey
   d. Washington Headquarters Services TMP and Employee Enrollment
3. Parking Management
   a. Permitting
   b. Priority Parking
   c. Overflow Management
   d. Special Events Protocol
4. Public Transit Program
   a. Subsidies

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   b. Onsite Transit Pass Sales
   c. Marketing
   d. Long-Term Enhancements
5. Rideshare Program
   a. Carpools
   b. Vanpools
   c. Slug Lines
   d. Guaranteed Ride Home
   e. Long-Term Enhancements
6. Mid-day Travel Options
   a. Long-Term Enhancements
7. Variable Work Hours/Flex Time
   a. Flexible Work Week
   b. Compressed Work Week
   c. Telecommuting
8. Bicycle and Pedestrian Program
   a. Paths and Walkways
   b. Bicycle Parking, Showers and Storage Facilities
   c. Marketing
   d. Long-Term Enhancements

Some observations on the outline of strategies and elements include the following:

- Notably absent from the BRAC 133 Travel Demand Management Plan is the DOD shuttle program as either a strategy with accompanying programmatic elements, or as a programmatic element to the Public Transit Program (strategy 4, above). The most significant mention of the shuttle program is as one of 15 listed responsibilities of the Transportation Coordinator, under the Managing Organizations strategy.
- The Pre-Relocation Outreach (strategy 2) and corresponding programmatic elements are exclusively focused on the time period leading up to BRAC 133 relocation and shortly thereafter. There is no companion Outreach strategy for the post-relocation and new employees; presumably Outreach will be assumed by the Transportation Coordinator.
- The Overflow Management element under Parking Management (strategy 3) clearly anticipates that demand will exceed supply; however, Parking Pricing as a potential strategic element to reduce demand is not included in the BRAC 133 Travel Demand Management Plan.
- The strategies representing programs for alternative transportation modes all include an element called “Long-Term Enhancements,” while the other strategies do not have such an element.
- Long-Term Enhancements is the only programmatic element under Mid-day Travel Options (strategy 6); no programs to support Mid-day Travel Options are anticipated for initial implementation in the BRAC 133 Travel Demand Management Plan.

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- Rather than selecting Marketing as a strategy with specific, coordinated programmatic elements, Marketing is included in the BRAC 133 Travel Demand Management Plan as a programmatic element for each of the following three strategies: Pre-Location Outreach, Public Transit Program and the Bicycle and Pedestrian Program (strategies 2, 4, and 8).

3.5.1.3 DIRECT VERSUS INDIRECT STRATEGIES

The BRAC 133 Travel Demand Management Plan reflects a combination of direct and indirect travel demand management strategies, as recommended by NCPC's *Implementing a Successful TMP* guidebook. NCPC defines direct strategies as those that could reduce single-occupancy-vehicle trips even if implemented as *stand-alone* strategies, and NCPC defines "indirect" strategies as supporting strategies that will not by themselves reduce single-occupancy-vehicle trips. A middle category, "potentially direct," may or may not reduce single-occupancy-vehicle trips. NCPC's three classifications of travel demand management strategies follows, along with a brief discussion of corresponding strategies contained in the BRAC 133 Travel Demand Management Plan.

<u>Direct Strategies: Alternative Modes of Travel That Directly Reduce Single-Occupancy-Vehicle Trips</u>
Examples include

- Carpool Programs,
- Vanpool Programs,
- Transit Service/Shuttle Service, and
- Bicycle/Pedestrian Facilities and Site Improvements.

The BRAC 133 Travel Demand Management Plan includes comprehensive carpool and vanpool programs as two elements of the broader rideshare program strategy. The carpool program focuses on the provision of software that employees can use to alert colleagues to their interest in ridesharing and conducting a ride matching activity at an annual Transportation Fair. With respect to the vanpool program, the Transportation Coordinator will be directly responsible for coordinating vanpool formation and/or seat filling of vanpools. The Transportation Coordinator will develop both short- and long-distance-oriented vanpool program and conduct vanpool seminars, "lunch and learns" and will work with vanpool providers to recruit employees potentially interested in vanpooling. A third rideshare program element contained in the BRAC 133 Travel Demand Management Plan is slug lines; however, the BRAC 133 Travel Demand Management Plan outlines only passive educational support for this element and only during the pre-relocation time period. For context, the respective mode share estimated by the BRAC 133 TMP for these three alternative modes is as follows:

- Carpool: 5 percent
- Vanpool: 3 percent
- Slugs: 3 percent

The BRAC 133 TMP document notes "the projected mode split percentages are not explicit goals, but rather they together achieve the *overall* goal of 40 percent or greater of non-single-occupancy vehicle

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mode use."Mode-specific goals may be developed in the future, after relocation has occurred and actual baseline mode split percentages can be developed. However, the projected mode shares can be viewed as an order-of-magnitude indicator of the anticipated contribution of each mode to the overall single-occupancy vehicles reduction goal. The demonstrated commitment of corresponding strategies indicates that the Transportation Coordinator will be more directly weighted to encouraging use of relatively high occupancy vanpools than lower occupancy carpools.

The BRAC 133 Travel Demand Management Plan also includes a public transit program that mainly consists of indirect programmatic elements (e.g., subsidies, on-site transit pass sales and marketing). However the programmatic element "Long-Term Enhancements" includes examining the coordination of the DOD shuttle program with the development of improved public transit services. This long-term enhancement is already underway; DOD and Washington Headquarters Services are currently in discussion with Alexandria Transit Company (better known as DASH) on improved service integration, coordination, and the potential provision of shuttle services by DASH.

The presumed DOD shuttle service is described in other sections of the BRAC 133 TMP, but it is not directly included as a strategy or a programmatic element of the public transit program within the BRAC 133 Travel Demand Management Plan. The methods that Washington Headquarters Services intends to implement to encourage use of the shuttles are not known. However, the shuttle service is clearly an essential strategy to enable and attract employees to use rail services.

The BRAC 133 Travel Demand Management Plan also includes the direct strategy of a bicycle and pedestrian program. This strategy includes the provision of on-site amenities including showers, storage, and bike parking facilities. The Transportation Coordinator will also organize a walk-buddy program, pairing employees interested in walking and providing them with safe routes between home and work. For context, the respective mode share estimated by the BRAC 133 TMP of these alternative modes is shown in *Figure 3: Projected Mode Splits of the BRAC 133 TMP*.

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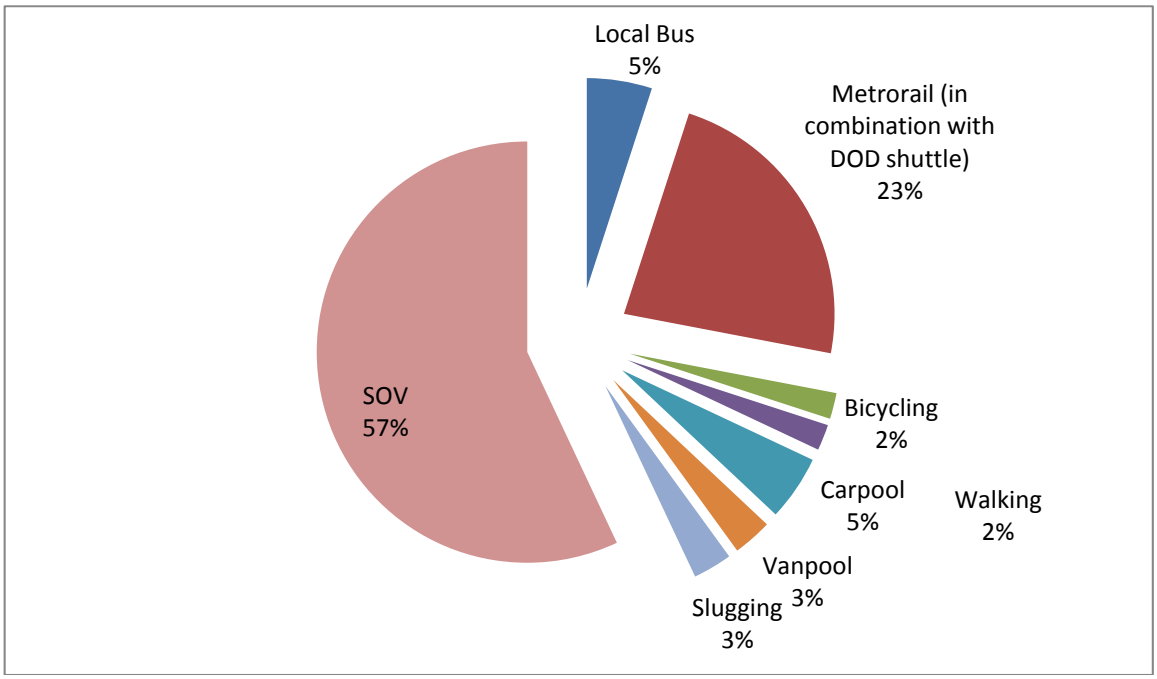

Figure 3: Projected Mode Splits of the BRAC 133 TMP

<u>Potentially Direct: Alternative Work Arrangements That May or May Not Directly Reduce Single-Occupancy-Vehicle Trips</u>

- Variable Work Hours
- Flex-time
- Compressed work week
- Staggered work hours
- Telecommuting

The BRAC 133 Travel Demand Management Plan includes all of the above except staggered work hours within the strategy Variable Work Hours/Flex Time: flexible work week, compressed work week, and telecommuting. This strategy and its corresponding programmatic elements already generate considerable participation among relocating BRAC 133 employees; however, the BRAC 133 Travel Demand Management Plan presents aggressive goals for increasing the participation rate within one year of BRAC 133 relocation. *Table 9: Participation in Variable Work Hours/Flex Time* shows the current participation rate and the "target" participation rate within one year of BRAC 133 relocation for each element in the Variable Work Hours/Flex Time strategy:

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	Current Participation	Target Participation
Flexible Work Week	25%	40%
Compressed Work Week	15%	25%
Telecommuting	2%	20%

Table 9: Participation in Variable Work Hours/Flex Time

The Compressed Work Week and Telecommuting elements directly reduce work trips, although the impact on single-occupancy vehicle travel depends upon the regular travel mode of the employee participating in the program. The Flexible Work Week spreads peak-hour travel across or outside of the peak-hour period, potentially reducing congestion during the current peak hours of 7:00 AM–8:00 AM and 4:00 PM–5:00 PM. Likewise, the Flexible Work Week may spread shuttle use across the peak-hour period, as well. Participation in Variable Work Hours/Flex time programs do not appear to have been taken into account in the traffic impact analysis of the BRAC 133 TMP; a statement on page 19 of the BRAC 133 TMP supports this conclusion by indicating "travel demand management strategies of telecommuting, flex time, and compressed work week when successfully implemented by the tenant agencies, will decrease the total number of site-generated trips."

Indirect Strategies: Incentives and Disincentives That Do Not Reduce Single-Occupancy-Vehicle Trips by Themselves

- Economic Incentives (Subsidies and Travel Allowance)
- Parking Management
- Employer Complementary Support Measurements (Guaranteed Ride Home, Commuter Center, and Sales Outlet)

The remaining four strategies of the BRAC 133 Travel Demand Management Plan are indirect, or supporting, strategies:

- Management Organization and Personnel
- Pre-Relocation Outreach
- Parking Management and Mid-day Travel Options

These indirect strategies are in addition to the previously discussed programmatic elements that support the Public Transit Program:

- Subsidies
- On-site Transit Pass Sales
- Guaranteed Ride Home

The main objectives of the Transportation Coordinator, an element under the Management Organization and Personnel strategy, are to (1) encourage employees to utilize alternative modes of transportation to the site and (2) provide personalized commute assistance to employees. The Transportation Coordinator will be on site and be available as a resource to employees during normal business hours and will manage, operate and maintain the Washington Headquarters Services BRAC 133 TMP (Note: This is essentially the implementation of the BRAC 133 Travel Demand Management

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Plan). The responsibilities of this position include program development, shuttle service management, branding and marketing, governmental relations, survey and data collection, development of educational and informational materials, program assessment, providing personalized commute assistance, acquisition of transportation and community information, management of the Mark Center Transportation Center, transit schedule maintenance, developing and implementing the ride matching program and walking-buddy program, conducting two annual events, coordinating with Pentagon Force Protection Agency Parking Management Branch office, and other tasks.

The NCPC guidebook *Implementing a Successful TMP* recommends hiring a Transportation Coordinator as the first step in developing a TMP. In the case of the BRAC 133 TMP, however, the Transportation Coordinator was not a part of the plan development process. The BRAC 133 Travel Demand Management Plan indicates that the Transportation Coordinator will be hired "within 9 months of building operations to manage, operate and maintain the Washington Headquarters Services Transportation Program for BRAC." An interview with USACE and Washington Headquarters Services confirmed that the Transportation Coordinator will be on board by January 2011, and further clarified that the Transportation Coordinator role will be provided by one manager and potentially 1–2 support staff.

Pre-Relocation Outreach is essentially presented as a marketing and information strategy, intended to educate relocating employees about transportation options in advance of Opening Day in September 2011 to ease the transition. Six months prior to relocation, Washington Headquarters Services will develop a BRAC 133 Employee Orientation Handbook to address relocation procedures, Codes of Conduct, travel demand management program details and registration information, the role of the Transportation Coordinator and contact information, transportation amenities site map, and parking permit protocol.

The parking management strategy and its four programmatic elements will significantly constrain single-occupancy-vehicle parking and manage the presence of other personal vehicles through parking space allocations, permits, and monitoring. The constrained single-occupancy-vehicle parking will not reduce demand for parking, but it will reduce supply. Single-occupancy-vehicle drivers may still find parking, although the parking may not be free, and it may not be as convenient as the BRAC 133 tenant parking. The potential off-site parking cost and distance/inconvenience factors are the true disincentives of the parking management strategy of the BRAC 133 Travel Demand Management Plan. The overflow management element does not include any monitoring of non-BRAC 133 parking. Parking for alternative modes will be designated in marginally more proximate locations to office buildings and will be similarly free for the driver.

A mid-day travel options strategy will support all non-single-occupancy-vehicle modes of travel. The significance of this strategy is heightened under the BRAC 133 TMP's aggressive goal of 40-percent non-single-occupancy-vehicle use for a development of 6,409 employees (40 percent = more than 2,500 employees). The description of this strategy recognizes the dual role of mid-day travel options in addressing the sustenance (lunch) needs of the BRAC 133 community, as well as mid-day mobility needs for business-related travel. However, the only programmatic element presented for this strategy is "long-term enhancements," which include two action items. First, the Transportation Coordinators

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will "consider conducting a demand analysis for obtaining additional car-sharing vehicles on-site or within walking distance of BRAC 133," as there currently is one ZipCar® located at 2001 N. Beauregard Street within walking distance of BRAC 133. Second, the Transportation Coordinator "will consider conducting a demand analysis for developing a bike-sharing program." The description of the strategy belies an otherwise passive approach to mid-day travel options, listing the following options for dual-purposed, mid-day trips without the use of a personal vehicle:

- On-site government vehicles
- DOD shuttle bus to Metrorail stations
- DASH and Metrobus at 30–60 minute headways accessed from areas outside of Mark Center
- Taxi stands at the Transportation Center and the Hilton Alexandria Mark Center Hotel
- On-site amenities for errands, fitness, or lunch
- Off-site amenities in walking distance (including restaurants, a bank, coffee shops, a grocery store, and other services)
- One Zipcar® in walking distance
- On-site video-conferencing facilities

3.5.1.4 IMPLEMENTATION SCHEDULE

An Implementation Schedule is included in the BRAC 133 TMP that presents a timetable by fiscal quarter, outlining tasks or commitments to reach the BRAC 133 TMP goals. The BRAC 133 TMP presents an implementation schedule for each of two phases: Pre-plan Implementation (FY 2010–period from October 1, 2009, to September 30, 2010; and FY 2011–period from October 1, 2010, to September 30, 2011) and Post-Plan Implementation FY 2012–period from October 1, 2011 to September 30, 2012).

Individual activities are color coded according to one of the following five categories:

- **Stakeholder Coordination** – Quarterly Tenant Focus Groups, Monthly Tenant Meetings, Monthly BRAC Advisory Group Meeting, eight meetings with the City of Alexandria),
- **Transit/Shuttle Plan Coordination** – Meeting with Washington Metropolitan Area Transit Authority and the City of Alexandria, Transit Roundtable, three Meetings with Transit Providers, Meeting with Arlington County, Meeting with Virginia Railway Express, Transit Agency Coordination, Contracting Process, Run Bus Schedules and Alignments and Develop Bus Schedule
- **Employee Transportation Surveys**
- **Evaluation Report Released**
- **BRAC 133 Travel Demand Management Plan Implementation**

The individual activities are assigned broadly to one or more fiscal quarters. Activity descriptions and responsible entities are not included in the BRAC 133 TMP Implementation Schedule; however, activities related to BRAC 133 Travel Demand Management Plan Implementation are described in detail in the preceding section of the BRAC 133 Travel Demand Management Plan.

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3.5.1.5 OBSERVATIONS: TRAVEL DEMAND MANAGEMENT PLAN

The BRAC 133 Travel Demand Management Plan has numerous strengths; however, two major deficiencies are observed:

1. The omission of the DOD shuttle program as a BRAC 133 Travel Demand Management Plan strategy
2. Inadequacy of the mid-day travel options strategy

Throughout the BRAC 133 TMP, a planned DOD shuttle service is assumed in order to provide employees connectivity to the BRAC 133 site from five Metrorail stations. The shuttle program, however, is not included in the BRAC 133 Travel Demand Management Plan, either as a strategy unto itself or as a programmatic element of another strategy (e.g., the Public Transit Program). The omission of the shuttle program from the BRAC 133 Travel Demand Management Plan is notably inconsistent with the *inclusion* of mode-oriented travel demand management strategies to support non-single-occupancy-vehicle goal attainment: public transit program, rideshare program (with distinct programmatic elements for carpools, vanpools, and slug lines), and the bicycle and pedestrian program.

The shuttle service described in the BRAC 133 TMP and the technical analysis of the BRAC 133 TMP incorporate operational specifications of a DOD shuttle program. The mode splits underpinning the traffic impact analysis model simulations assume 25 percent of the BRAC 133 employees will commute by a combination of rail and DOD shuttle and 3 percent by a combination of slugging (to Pentagon) and shuttle. The shuttle service is crucial for the BRAC 133 employees who commute by rail, and it is presumed that those slugging to BRAC 133 from the Pentagon will rely on shuttle service as well. The absence of a defined travel demand management shuttle strategy in the BRAC 133 Travel Demand Management Plan therefore calls into question the feasibility of achieving 28 percent of the total assumed (modeled) non-single-occupancy-vehicle mode share split to BRAC 133. The inclusion of a defined shuttle service strategy in the BRAC 133 Travel Demand Management Plan is needed to ensure a logical nexus between the BRAC 133 TMP single-occupancy-vehicle-reduction goals, the projected mode splits of the BRAC 133 TMP's technical analysis, and the content of the BRAC 133 Travel Demand Management Plan.

The approach to the mid-day travel options strategy may not support the potential magnitude of BRAC 133 commuters who will not have a personal vehicle available during the mid-day time period. During the mid-day period, only the driver of carpools (1 of 2.3 carpoolers) and vanpools (1 of 7 vanpoolers) will have access to the vehicles in which the group commuted. Based on the BRAC 133 TMP, and extracting the driver of assumed carpools and vanpools, the mid-day travel options strategy must effectively address a potential daily demand of 2,330 employees at a 90-percent on-site attendance level (and 1,941 employees at a lower 75 percent attendance level). The single programmatic element within this strategy, long-term enhancements, is "to consider conducting analyses to/that…" The Travel Demand Management Plan communicates only a passive commitment to addressing the mid-day mobility needs of approximately one-third of the BRAC 133 employee population.

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In addition, the following BRAC 133 Travel Demand Management Plan programmatic elements raise concerns:

1. Transportation Coordinator. The responsibilities described for the Transportation Coordinator position are varied, time intensive, and go beyond the two main objectives of the position presented in the BRAC 133 Travel Demand Management Plan. The monitoring and evaluation plan in Chapter 6 of the BRAC 133 TMP adds further responsibilities. The three persons assumed to fill this role and the many anticipated responsibilities may be insufficient, particularly given the tight time frame between the hiring of the Transportation Coordinators and BRAC relocation.

2. [Parking] Overflow Management. The described approach of encouraging neighboring tenants and community areas to address potential BRAC 133 parking overflow issues may not be effective. The consequences of an ineffective policy toward parking overflow are (1) the further degradation of the roadway level of service and (2) the failure to achieve the following two goals of the BRAC 133 TMP:

    - Achieve 40 percent or more non-single-occupancy-vehicle trips to the site in order to minimize traffic effects on the neighboring community
    - Facilitate tenant mobility to the site by providing a viable transportation program in order to help employees choose appropriate commute methods for getting to the Mark Center

3. Survey. The strategies of the BRAC 133 Travel Demand Management Plan have not yet been aligned with market needs and preferences. The DOD shuttle program and the BRAC 133 travel demand management strategies have not been shared with the relocating BRAC 133 employees. On page 110 of the BRAC 133 TMP, the narrative indicates "at this point in time, the [BRAC 133] TMP and the corresponding Travel Demand Management Plan has not yet been circulated to employees, nor have the details of the Transportation Management Program been announced, thus the results may not be precise. Therefore, Washington Headquarters Services will conduct a resurvey in the winter of 2010. Both federal and nonfederal employees will then be further informed about the travel demand management strategies that will be employed at BRAC 133 and the various events and programs that will be available to them."

Overall, the BRAC 133 Travel Demand Management Plan contains a strong mix of direct and indirect travel demand management strategies as recommended in the *Guide to Implementing a Successful TMP*. The BRAC 133 Travel Demand Management Plan provides sufficient detail to understand Washington Headquarters Services' anticipated approach and level of commitment with respect to the eight strategies and programmatic elements presented.

The implementation schedule is adequate in providing a general idea of staged activities to implement the BRAC 133 TMP, although the general assignment of activities by fiscal quarter obscures actual start dates and the specific duration of each activity and may limit the schedule's effectiveness in communicating activities that require coordinated action by others (e.g., transit service providers, Alexandria) to implement the travel demand management strategies.

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3.5.2 MONITORING AND EVALUATION PLAN

Monitoring and evaluation is a means for determining the progress, successes, and failures of a plan, program, or project. The purpose of a monitoring and evaluation plan in the context of a TMP is to present a program for effectively measuring how well the TMP is meeting its intended goals and objectives.

The monitoring and evaluation plan is the second outcome of the BRAC 133 TMP; it presents the steps, tools, and performance measures that will be used by Washington Headquarters Services to evaluate the success of the travel demand management strategies in achieving the two goals of the BRAC 133 TMP, as well as a process for amending the BRAC 133 TMP.

The NCPC, Metropolitan Washington Council of Governments, and General Services Administration document, *Implementing a Successful TMP*, states that successful plan evaluation methodology will use procedures that determine one or more of the following:

- Extent to which the program has achieved its stated objectives
- Extent to which the accomplishment of the objectives can be attributed to the program (direct and indirect effects)
- Degree of consistency between program implementation and the plan (relationship of planned activities to actual activities)
- Relationship of different tasks to the effectiveness of the program (productivity)

During an interview with NCPC on November 18, 2010, NCPC staff further indicated that TMP sponsors are advised to include a description of measures to monitor achievement of goals and to adjust trip reduction strategies as necessary, an evaluation of projected transportation impacts, and a description of proposed mitigation measures.

The City of Alexandria requires the submission of a TMP annual report that describes activities carried out during the year, gives a summary of the survey, and indicates what activities are planned for the coming year. Washington Headquarters Services and USACE are not subject to the City of Alexandria's ordinance; however, as part of the NCPC action to approve the BRAC 133 TMP on September 2, 2010, NCPC required that the Army submit quarterly reports in conjunction with meetings with the NCPC staff and the City of Alexandria for the first year of operation to demonstrate whether alterations to the BRAC 133 TMP are necessary.

The NCPC guidelines followed by Washington Headquarters Services and USACE in developing the TMP recommend updating the TMP at least every two years to reflect the most current employee information.

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3.5.2.1 PROGRESS MONITORING AND ANNUAL SURVEY

An extensive survey of both federal and nonfederal BRAC 133 employees will serve as the primary tool for monitoring and evaluating the effectiveness of the BRAC 133 TMP. The survey will be conducted by the Transportation Coordinator six months after relocation, one year after relocation, and annually thereafter. The survey results will be compiled and analyzed by the Transportation Coordinator. The survey will measure BRAC 133 TMP progress in meeting its goals and objectives, as well as to determine the effectiveness of the BRAC 133 TMP program.

The monitoring and evaluation plan indicates that the survey will include the following topics, at a minimum:

- Employee information
- Primary mode of transportation
- Secondary form of transportation
- Work schedule
- Participation in alternative work schedule and telecommuting
- Satisfaction rating scale for each of the programs and incentives offered under the BRAC 133 TMP
- Interest rating scale to gauge interests in new programs or program modifications
- Use of the DOD shuttle program
- Satisfaction rating scale for the shuttle program
- Marketing effectiveness rating scale
- Participation in mass transit benefit program
- Parking permit type (if applicable)
- Metro boardings and alightings information
- Bus transit provider and route information
- Mode shift as a result of the BRAC 133 TMP anticipated or planned mode for the next year
- Employee satisfaction to measure attitudes toward current program elements, including marketing and educational tools

In addition to the survey, the monitoring and evaluation plan states that the Transportation Coordinator "will work with traffic engineers to conduct vehicle and trip counts at major intersections, parking counts at both garages and other necessary traffic assessments on a biannual basis to determine infrastructure operability over time." The results of both the survey and traffic counts will serve as inputs to an evaluation report for the BRAC 133 TMP.

3.5.2.2 EVALUATION REPORT

The monitoring and evaluation plan indicates that the results of the survey and traffic counts will be analyzed by the Transportation Coordinator(s) for the development of a Washington Headquarters Services Transportation Management Program Evaluation Report. The evaluation report will "detail

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the progress of the BRAC 133 Transportation Management Program, describe program successes, and define areas for program restructuring."

The monitoring and evaluation plan further states that the BRAC 133 TMP Evaluation Report will outline

- Progress the program has made in achieving the goals and various specific programs of the BRAC 133 TMP;
- Program strengths and areas of improvements or restructuring;
- Employee satisfaction with the program and reaction to new proposed program elements;
- Roadway infrastructure operations information; and
- Parking utilization.

The monitoring and evaluation plan describes the following three specific performance measures and how they will be used to evaluate the effectiveness of the BRAC 133 TMP: (1) average vehicle ridership, (2) parking utilization, and (3) mode split. The monitoring and evaluation plan further indicates that in the future, the Transportation Coordinator may set goals for each mode, and may propose modification to the DOD shuttle program to best suit ridership needs.

3.5.2.3 BRAC 133 TMP UPDATES

The monitoring and evaluation plan describes a formal process that Washington Headquarters Services and the Transportation Coordinator(s) will follow for initiating and approving BRAC 133 TMP amendments. It is unclear whether any and all changes to the BRAC 133 TMP will require a formal amendment, or if the BRAC 133 TMP amendment process only applies to certain types of changes. If the latter, the BRAC 133 TMP and any language or information contained therein will presumably be updated here forward only on an annual basis and in conjunction with potential amendments resulting from a review of the evaluation reports.

The BRAC 133 TMP indicates that, upon review of the Washington Headquarters Services TMP evaluation report, the Transportation Coordinator will present to Washington Headquarters Services proposed amendments to the BRAC 133 TMP to best reflect current conditions, new and/or revised BRAC 133 TMP goals, BRAC 133 TMP performance and program restructuring based upon employee satisfaction and interests. In the event amendments to the program are necessary as a result of not meeting the BRAC 133 TMP goals, Washington Headquarters Services will re-examine program elements and make adjustments. The following examples are offered to demonstrate the actions that might be taken to adjust the BRAC 133 TMP: if transit ridership goals are not met, Washington Headquarters Services will analyze transit program utilization and shuttle plan efficiency in order to adjust program elements, such as onsite fare dispersal frequency, improve transit schedule information dissemination; alter shuttle schedule, headways, service providers, etc. in order to increase ridership.

The process for amending the BRAC 133 TMP may apply to the revisions contained in October 2010 version of the document. However, the BRAC 133 TMP addresses "TMP amendments," as opposed to

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"TMP updates." It is not clear if such a distinction was intended to allow an alternative process to be followed for document updates.

3.5.2.4 OBSERVATIONS: MONITORING AND EVALUATION PLAN

Overall, the monitoring and evaluation plan is adequate but has the following weaknesses:

1. The anticipated traffic count activities will not be undertaken until after the buildings are occupied. Traffic counts should also be undertaken prior to BRAC 133 opening, to allow for before-after analysis.
2. The anticipated evaluation report and associated performance measures do not include a means to assess off-site capacity issues, including capacity for DOD shuttles at Metro stations.
3. The survey discussion does not mention collecting demographic or socioeconomic information from employees for cross tabulation purposes that may improve marketing strategies and provide insight to potential program refinements.
4. The evaluation and amendment processes do not seek input from coordinating agencies, including City of Alexandria, Alexandria Transit Company, and Washington Metropolitan Area Transit Authority.
5. The monitoring and evaluation plan indicates that Washington Headquarters Services will provide a copy of the evaluation report to the City of Alexandria six months after building operations, after one year of operations and annually thereafter. This would seem to reflect the same schedule for administering the BRAC 133 employee survey; therefore the first evaluation report will not reflect the results of an employee survey and the reports received by the City of Alexandria on an annual basis will reflect survey results from an entire year prior.
6. The monitoring and evaluation plan does not reflect the NCPC requirement for submitting quarterly reports to the Commission and NCPC staff during the first year of Mark Center occupancy to determine whether revisions to the BRAC 133 TMP are necessary.

As of December 31, 2010, the City of Alexandria and DOD are currently in the process of clarifying expectations regarding Alexandria's review of potential TMP amendments. The ongoing discussions may result in a memorandum of understanding external to the BRAC 133 TMP document that clarifies the expectation and roles of both parties.

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3.6 BRAC 133 TMP SUMMARY OF RESULTS

A transportation management plan is prepared by a developer or a major employer for the purpose of shaping travel behavior to a worksite in order to minimize use of single-occupancy vehicles. Included are travel demand management programs and strategies to encourage commuting by means other than single-occupancy vehicles (e.g., carpools, vanpools, public transit, shuttles, walking, and/or biking). A transportation management plan also documents how the worksite's travel demand management strategies will be implemented to bring transparency to an employer's approach and level of commitment to encourage non-single-occupancy vehicle use. A transportation management plan is not developed to facilitate travel by single-occupancy vehicles, and it is not a plan for capital (physical) improvements. Roadway improvements are therefore beyond, and may even contradict, the purposes of a transportation management plan.

The BRAC 133 TMP fulfills the purpose of a transportation management plan by presenting a strong variety of direct and indirect travel demand management strategies to enable and encourage commuting to BRAC 133 by the presumed non-single-occupant-vehicle modes of travel. The monitoring and evaluation plan clearly describes how Washington Headquarters Services will measure non-single-occupancy-vehicle use to potentially adjust or fine-tune BRAC 133 travel demand management strategies.

The BRAC 133 TMP was developed publicly and was shaped with the input of stakeholders. The document provides adequate and valid information about the Mark Center site, as well as data sources and assumptions regarding anticipated employee mode use. However, the BRAC 133 TMP has the following weaknesses that may compromise the feasibility of achieving a 40-percent reduction in single-occupancy-vehicle trips and may consequently impose further adverse impacts on the roadway network:

- Omission of a travel demand management strategy to implement, facilitate, and encourage use of a planned Department of Defense shuttle service to five Metrorail stations that the BRAC 133 TMP technical analysis assumes will be relied upon by 26 percent of BRAC 133 employees
- Inadequate mid-day transportation strategies to support the mobility needs of approximately 2,300 commuters to BRAC 133 who will not have a car available
- Insufficient parking overflow management strategies to ensure that BRAC 133 employees, particularly single-occupancy-vehicle drivers, do not utilize off-site parking rather than using non-single-occupancy-vehicle modes of travel
- Potentially insufficient Transportation Coordinator staffing, given the time frame of relocation and the range of responsibilities articulated the travel demand management plan
- Potential misalignment of travel demand management program and strategies with employees' needs and preferences

In addition, while the traffic impact analysis undertaken for the BRAC 133 was adequate for the purposes of developing a transportation management plan, a more technically robust stand-alone

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traffic impact analysis would be needed to confirm the accuracy of the BRAC 133 TMP's findings with respect to

- Existing and projected peak-hour traffic volumes;
- Appropriate site variables (for purposes of accurate modeling);
- Potential queues caused by the access control facility to the south parking garage; and
- Effects of BRAC 133 traffic on additional intersections and interchanges beyond the narrowly defined BRAC 133 study limits.

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APPENDIX

OVERVIEW: METHODOLOGY OF THIS ENGINEERING ASSESSMENT

This report includes an independent professional engineering assessment of the *Final Environmental Assessment for Implementation of 2005 Base Realignment and Closure Recommendation 133 at Fort Belvoir, Virginia*, dated July 2008 (BRAC 133 EA) and the *Transportation Management Plan for BRAC 133 at Mark Center*, dated July 2010 (BRAC 133 TMP).

The BRAC 133 EA represents a formal level of analysis within a federally required and regulated environmental assessment process. The BRAC 133 TMP is a locally required transportation plan that is primarily concerned with the development of strategies and policies to achieve a desired set of goals, with technical analysis playing a key role in the development of the strategies and resulting plan document.

BRAC 133 EA was reviewed by environmental engineers and scientists. BRAC 133 TMP was reviewed by transportation planners and traffic engineers. The assessments were simultaneously performed from October 2010 through January 2011, resulting in the development of this engineering assessment report. The BRAC 133 EA and BRAC 133 TMP were assessed with respect to the following three objectives:

1. **To assess the processes and procedures** undertaken by respective lead agencies in developing the BRAC 133 EA and BRAC 133 TMP. To accomplish this objective, the following were reviewed: foundational documents and records of official actions taken; relevant federal legislation, regulations and guidance provided by federal and local governments; and relevant DOD-, Army-, and BRAC-related policies. Administrative records and public comments were reviewed and interviews of stakeholders were conducted to establish procedural steps taken, time frames, and results.
2. **To assess the data and methodologies** employed in technical analysis. To accomplish this objective reviews were conducted of relevant background data and documentation, background technical documentation, and applicable industry standards and best practices. The quality of the data was also verified through interviews with agency officials and professional staff.
3. **To assess the outcomes and conclusions** of the BRAC 133 EA and BRAC 133 TMP. To accomplish this objective, the correspondence of respective document outcomes and conclusions with the document purpose and the technical analyses contained therein were examined.

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DETAILED METHODOLOGIES OF THE BRAC 133 EA ASSESSMENT

The BRAC 133 EA documented the purpose of the proposed project, alternatives that were analyzed, environmental resources in the area, and the effects of the alternatives upon these resources and public involvement. The assessment methodology encompasses review of the BRAC 133 EA's processes and procedures, data and methodologies, and conclusions.

ASSESSMENT OF PROCESSES AND PROCEDURES OF BRAC 133 EA

The process and procedural elements of the BRAC 133 EA must conform to federal regulations, based on the National Environmental Policy Act (NEPA) of 1969. Verifying compliance with the Council on Environmental Quality requirements as stated in 40 *Code of Federal Regulations (CFR) Parts 1500 to 1508* and the DOD requirements as stated in *32 CFR Part 651* is the first step of the procedural analysis. According to *42 USC National Environmental Policy, Section 102(2)(A) Chapter 55*, agencies of the federal government are required to "utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design arts in planning and decision-making which may have an impact on man's environment." Each element of the BRAC 133 EA was assessed with regards to conformity with and applicability of these regulations. The analysis is presented in this report based on following seven subsections:

- Purpose and Need
- Scoping/Agency Coordination/Public Involvement
- Alternatives Screening
- Environmental Resource Characterization
- Environmental Consequences
- Cumulative Effects
- Mitigation and Monitoring

To verify that the NEPA process was followed, the regulatory requirements applicable to each of the major elements were compared to the BRAC 133 EA and the associated BRAC 133 Administrative Record. Per the Army's NEPA glossary, the administrative record is "a record of all documents (i.e., hard copies, electronic files, briefing charts, files, photographs, or other documents and records) relied upon in preparing a NEPA document. The administrative record documents the proponent's consideration of all relevant and reasonable factors and should include evidence of diverging opinions and criticisms of the proposed action or its reasonable alternatives. Overall, the administrative record should demonstrate and document that the Army took a "hard look" at the proposed action and its reasonable alternatives as required by law."

In addition to documents in the BRAC 133 Administrative Record, the following documents were also utilized to conduct procedural review of the BRAC 133 EA:

- *Army NEPA Guidance Manual* (U.S. Army Environmental Command, May 2007)

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- *Base Redevelopment and Realignment Manual* (Office of the Deput y under Secretary of Defense, March 1, 2006)
- *Guidance on Compiling an Administrative Record* (United States Fish and Wildlife Services, January 7, 2000)
- Correspondence between United States Army Corps of Engineers and the Center for Naval Analyses, 2008
- Comments from Fairfax County, Virginia, on the 2007 Fort Belvoir Environmental Impact Statement (October 15, 2007)

Additionally, various local, state, and federal agencies were contacted to verify the types and levels of agency coordination, assumptions, alternatives screening, analysis, findings, and other actions that occurred during the development of the BRAC 133 EA. The following organizations were contacted:

- Center for Naval Analyses – *adjacent Mark Center tenant*
- City of Alexandria, Virginia – *municipal jurisdiction of the Victory Center and the Mark Center*
- County of Fairfax, Virginia – *county jurisdiction of the General Services Administration site*
- Metropolitan Washington Council of Governments – *metropolitan planning organization and owner/maintainer of regional travel demand forecasting model*
- United States Army Corps of Engineers – *preparer of BRAC 133 EA*
- Virginia Department of Transportation – *transportation agency responsible for the state and interstate highway system in Virginia, including I-395.*
- The National Capital Planning Commission

ASSESSMENT OF DATA AND METHODOLOGIES OF BRAC 133 EA

The approach to verifying the BRAC 133 EA data and methodologies, including the assumptions and evaluation methods used, consisted of evaluating 12 resource areas as outlined in Section 3.3 of this report.

The evaluation of each resource area considered the data sources utilized, the methods and assumptions used to assess environmental effects, and the completeness of the evaluations. The determination of threshold levels of significance and the magnitude of impacts for direct, indirect, and cumulative effects were investigated for each environmental resource.

The following supplemental documents (in addition to those available in the BRAC 133 Administrative Record and interviews) were utilized in the assessment of data and methodologies:

- Biological Data Collection: *Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States* (United States Fish and Wildlife Service, July 2009)

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- Land Use Assessment and Agency Coordination Requirements: *Real Property Master Planning for Army Installations,* Army Regulation 210–20 (Department of the Army, May 16, 2005)
- Transportation Data and Methodologies: *Transportation Management Plan for BRAC 133 at Mark Center* (United States Army Corps of Engineers, July 2010)
- Direct, Indirect, and Cumulative Impact Assessments: *Army NEPA Guidance Manual* (United States Army Environmental Command, May 2007)

ASSESSMENT OF OUTCOMES AND CONCLUSIONS OF BRAC 133 EA

The assessment of the BRAC 133 EA and the Finding of No Significant Impact conclusions determine the sufficiency and accuracy of the action's environmental findings and the subsequent conclusions made by the Army in the NEPA documentation. The assessment of the BRAC 133 EA was developed using the data, methodologies, analyses, and other information presented in the BRAC 133 EA and environmental assessment-referenced documents. The conclusions assessment included a comprehensive study of all stages of the environmental assessment analysis.

The Army determined that the BRAC 133 action would have no significant impacts and would not need to be assessed further in an environmental impact statement. This determination by the Army was based upon the environmental resource effects found and proposed mitigation listed in individual sections of the BRAC 133 EA. The assessment of the BRAC 133 EA evaluated if the potential environmental effects described are consistent with the Finding of No Significant Impact or if additional analysis or assessment is warranted.

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DETAILED METHODOLOGIES OF THE BRAC 133 TMP ASSESSMENT

A transportation management plan (TMP) is a type of transportation plan that is prepared by a developer or a major employer for the purpose of influencing travel behavior to a worksite in order to minimize use of single-occupancy vehicles. A transportation management plan identifies travel demand management programs and strategies to encourage commuting by means other than single-occupancy vehicles (e.g., carpools, vanpools, public transit, shuttles, walking and/or biking). A transportation management plan documents how the worksite's travel demand management strategies will be implemented and brings transparency to the developer's or employer's approach and level of commitment to encouraging non-single-occupancy vehicle use. A transportation management plan is not concerned with improving travel by single-occupancy vehicle, and it is not a plan for capital (physical) roadway improvements. Roadway improvements generally make travel easier for single-occupancy vehicle commuters and other roadway users that are not commuters to a worksite (e.g., trucks, commercial vehicles, pass-through traffic, and emergency vehicles). Roadway improvements are therefore beyond, and may even contradict, the purposes of a transportation management plan.

The BRAC 133 TMP assessment examined the sufficiency of the transportation management plan development process, the validity of the data and methods used for the technical analysis, and whether the travel demand management plan and monitoring and evaluation plan were logical and sufficient outcomes that take into account the goals and the technical analysis contained in preceding sections of the BRAC 133 TMP.

As part of the BRAC 133 TMP assessment process, various organizations were contacted in order to clarify legal requirements, oversight authority, agency coordination, public involvement, technical data, and methodologies; and to establish an overall timeline of transportation management plan development activities. Following is a list of organizations that were contacted:

- Alexandria Transit Company – *transit provider (DASH bus services)*
- Center for Naval Analyses – *adjacent Mark Center tenant and employee shuttle service provider*
- City of Alexandria – *municipal jurisdiction of the Mark Center*
- County of Fairfax – *neighboring county jurisdiction and transit provider (Fairfax Connector)*
- Duke Realty Corporation – *the Mark Center owner/developer and Mark Center tenant shuttle service provider*
- Institute for Defense Analyses – *adjacent Mark Center tenant and employee shuttle service provider*
- Metropolitan Washington Council of Governments – *metropolitan planning organization and owner/maintainer of regional travel demand forecasting model*
- National Capital Planning Commission – *federally established planning oversight/review authority for federal development projects in the National Capital Region*

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- Pentagon Force Protection Agency – *entity responsible for BRAC 133 parking management, monitoring and enforcement*
- The Benham Companies, LLC, a subsidiary of Science Applications International Corporation – *private firm that developed the BRAC 133 TMP for United States Army Corps of Engineers and Washington Headquarters Services, including the traffic impact analysis and related modeling*
- United States Army Corp of Engineers – *lead agency for the development of the BRAC 133 TMP*
- Virginia Department of Transportation – *transportation agency responsible for the state and interstate highway system in Virginia, including I-395*
- Virginia Department of Rail and Public Transportation – *transportation agency that provides grant funding for local and regional public transportation services*
- Virginia Railway Express – *transit provider (Virginia Railway Express commuter rail service)*
- Washington Headquarters Service – *coordinating agency with United States Army Corps of Engineers in the development of the BRAC 133 TMP and the lead agency for the implementation and monitoring of the BRAC 133 TMP*
- Washington Metropolitan Area Transit Authority – *transit provider (Metrorail and Metrobus)*

ASSESSMENT OF PROCESSES AND PROCEDURES OF BRAC 133 TMP

Unlike environmental assessments such as the BRAC 133 EA, there is no federal requirement or regulatory procedural guidance for the development of a TMP. Instead, the procedural assessment of the BRAC 133 TMP required considerable investigation and assimilation of federal, state, and local laws, policies and procedures that apply to a TMP and specifically, to a TMP prepared by the Army in implementing a BRAC recommendation. The BRAC 133 TMP development process was then assessed for consistency with applicable legal and policy requirements with respect to the following procedural elements that generally apply to a transportation planning process:

- Conformity
- Consultation
- Public Involvement
- 3-C Planning (comprehensive, cooperative, and continuing)

To address conformity, United States Army Corps of Engineers' procedures were assessed for compliance with the review authority of the National Capital Planning Commission and the Commission's *Submission Guidelines, Site Plans & Development Projects*. The conformity assessment also includes an examination of the consistency of the BRAC 133 TMP with the City of Alexandria's TMP evaluation criteria.

With respect to consultation, the extent and timing of consultation per National Capital Planning Commission requirements, as well as adherence to DOD BRAC implementation policies were assessed.

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Interviews were the primary source of information to confirm the extent, timing, and result of consultation activities.

An assessment of the adequacy of the public involvement process of the BRAC 133 TMP was performed based on the policy directives of the *Base Redevelopment and Realignment Manual*, Office of the Deputy Undersecretary of Defense, Installations, and Environment, March 1, 2006. The number and timing of opportunities provided for public comment, public availability of review materials, and comments received, and the lead agencies' responses were considered in the assessment.

The 3-C planning framework (comprehensive, cooperative, and continuing) is a long-standing requirement for the transportation plan development processes of state and metropolitan planning organizations (MPOs). The 3-C framework has been adopted by local and federal governments as the accepted standard for transportation plan development processes. The Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) 3-C requirement was reviewed for intent, as was the 3-C requirement in Alexandria's TMP Ordinance. Based on a review of these two documents, a definition for each of the 3-Cs was uniquely developed for the purposes of assessing the BRAC 133 TMP.

The following documents were reviewed for the BRAC 133 TMP assessment of process and procedures:

- *Implementing a Successful TMP* (General Services Administration/Metropolitan Washington Council of Governments/National Capital Planning Commission, May 2008)
- *NCPC Submission Guidelines, Site Plans & Development Projects*
- *Comprehensive Plan: Federal Element*s (National Capital Planning Commission, August 2004)
- *Commission Action*, National Capital Planning Commission File No. 6903, January 7, 2010
- *Commission Action*, National Capital Planning Commission File No. 6903, September 2, 2010
- *City of Alexandria Zoning Ordinance*, Article XI, Division B, Development Approvals, Section 11-700–Transportation Management Special Use Permits
- *Base Redevelopment and Realignment Manual* (Office of the Deputy Undersecretary of Defense, Installations, and Environment, March 1, 2006)
- BRAC-133 Advisory Group minutes and meeting materials (multiple)
- *State of the Practice: White Paper on Public Involvement* (A1D04: Committee on Public Involvement in Transportation, 2000)
- *The Transportation Planning Process: Key Issues, A Briefing Book for Transportation Decision Makers, Officials, and Staff* (A Publication of the Transportation Planning Capacity Building Program, Federal Highway Administration and Federal Transit Administration, Publication Number: FHWA-HEP-07-039, September 2007)
- *Mark Center Parcel 1A and 1B Traffic Impact Study and TMP* (Wells & Associates for Mark Winkler Company, March 2003)
- *Transportation Improvement and Management Plan (TIMP)* (Wells & Associates for Washington Headquarters Services and Duke Realty, July 2008)

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- *TMP for BRAC 133 at Mark Center* (Science Applications International Corporation (Final Submission), October 2010)

ASSESSMENT OF DATA AND METHODOLOGIES OF BRAC 133 TMP

Data and methodologies of the technical analysis were assessed to verify that professional standards were followed, that the most current and reasonably available data (i.e., at the time of the analysis) were used, whether any additionally needed data were collected, if assumptions made were reasonable from a professional standpoint, and whether the technical tools (and how they were used) were appropriate for the analysis purposes of the BRAC 133 TMP.

Interviews with Science Applications International Corporation (SAIC), United States Army Corps of Engineers, Washington Headquarters Services, Metropolitan Washington Council of Governments, Center for Naval Analyses, Institute for Defense Analyses, and the Pentagon Force Protection Agency helped clarify the reasonableness of mode splits and projected daily site-generated employee and visitor trips. In addition, the following resources were reviewed:

- ITE Trip Generation, 7th Edition, (Institute of Transportation Engineers, January, 2003)
- TCRP 100 Report: Transit Capacity and Quality of Service Manual, 2nd Edition (Transportation Research Board, 2003)
- Transit Service Impacts of the Base Realignment and Closure Recommendations in the Metropolitan Washington Region Final Report (Washington Metropolitan Area Transit Authority, June 2010)
- Vanpool Programs: Implementing Commuter Benefits under the Commuter Choice Leadership Initiative (United States Environmental Protection Agency, September 2001)
- 2007 State of the Commute Survey Report from the Metropolitan Washington DC Region (Metropolitan Washington Council of Governments Commuter Connections, June 2008)

Site access conditions, on-site facilities for various transport modes, parking allocations for special uses and disabled access were determined through site visits and review of site plans, interviews of transit providers, as well as through the following documents:

- Transit Service Impacts of BRAC Recommendations (Washington Metropolitan Area Transit Authority, June 2010)
- Technical Memorandum, Task 4.2: Development of Transit Service Plan (Washington Metropolitan Area Transit Authority, January 2010)
- Detailed Site, Access and Internal Circulation Plans for BRAC 133-Mark Center
- Washington Headquarters Services Internal Roadway Network Traffic Analysis (Wells and Associates, August 2009)
- LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects (October 2005)
- Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities
- Memorandum – Mark Center Transit Center (Wells & Associates, April 2009)

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- Mark Center (BRAC) Transportation Study, Technical Memorandum (Parsons Brinkerhoff, April 2009)
- I-95/I-395 TRANSIT/TDM Study (Transportation Demand Management Technical Committee, Virginia Department of Rail and Public Transportation, February 2008)
- I-95/I-395 High-Occupancy Vehicle/Bus/High-Occupancy Toll Lanes Interchange Justification Report (HNTB, Jan 2009)

To clarify the data and methodologies employed for establishing projected traffic volumes and the traffic impact analysis, the following persons and/or organizations were interviewed: the project manager and the lead modeler of Science Applications International Corporation, United States Army Corps of Engineers, Washington Headquarters Services, City of Alexandria, Metropolitan Washington Council of Governments, and the Virginia Department of Transportation. In addition, the following documents were reviewed:

- Mark Center (BRAC 133) Transportation Study (Vanasse Hangen Brustlin, Inc., November 2009)
- Metropolitan Washington Council of Governments (website http://www.mwcog.org/transportation/activities/models/4step/4_step.asp, accessed 12/5/10)
- Washington Headquarters Services Transportation Improvement and Management Plan (Wells & Associates, July, 2008)
- Technical Memorandum, Task 4.1: Analysis of Existing and Potential Transit Demand (Washington Metropolitan Area Transit Authority, January 2010)
- Washington Headquarters Services Internal Roadway Network Traffic Analysis (Wells & Associates, August 2009)
- Technical Memorandum, Task 4.2: Development of Transit Service Plan (Washington Metropolitan Area Transit Authority, January 2010)
- Transit Service Impacts of BRAC Recommendations (Washington Metropolitan Area Transit Authority, June 2010)
- Mark Center (BRAC) Transportation Study, Technical Memorandum (Parsons Brinkerhoff, April 2009)

ASSESSMENT OF OUTCOMES AND CONCLUSIONS IN BRAC 133 TMP

The two primary outputs of the BRAC 133 TMP are the travel demand management plan and monitoring and evaluation plan. These plans are presented as chapters five and six, respectively, of the BRAC 133 TMP dated July 20, 2010.

To assess the overall suitability/reasonableness of the travel demand management plan, a comparison of the travel demand management plan with the BRAC 133 TMP's goals and the findings of the technical analyses were completed to establish a rational nexus. The National Capital Planning Commission submission guidelines and Alexandria's transportation management plan ordinance guidelines were also examined for minimum requirements and recommended strategies. The types and

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variety of the travel demand management strategies included in the BRAC 133 TMP were considered in relation to guidance provided in the National Capital Planning Commission's *Implementing a Successful TMP* document. The travel demand management implementation schedule was also reviewed for comprehensiveness and transparency.

The monitoring and evaluation plan was examined for comprehensiveness and utility in measuring the full range of planned travel demand management strategies, as well as the inclusion and clarity of a process to update the BRAC 133 TMP.

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ACRONYMS

3-C planning – comprehensive, cooperative, and continuing
ACM asbestos-containing material
ADT average daily traffic
ACP access control point
ACSIM Assistant Chief of Staff for Installation Management
ADA Americans with Disabilities Act of 1990
AEDP Alexandria Economic Development Partnership
ANSI American National Standards Institute
AR administrative record
ART Arlington Transit
Army Department of Army
ATFP Anti-Terrorism Force Protection
AVB active vehicle barrier
BIM building information modeling
BMP Best Management Practices
BRAC Base Realignment and Closure
FEIS for Fort Belvoir *Final Environmental Impact Statement for Implementation of 2005 Base Realignment and Closure (BRAC) Recommendations and Related Army Actions at Fort Belvoir, Virginia*, dated June 2007
BRAC 133 EA *Final Environmental Assessment: Implementation of 2005 Base Realignment and Closure Recommendation 133,* dated July 2008
BRAC 133 TMP *Transportation Management Plan for BRAC 133 at Mark Center,* dated July 2010
CEQ Council on Environmental Quality
CFR Code of Federal Regulations
CNA Center for Naval Analyses
CO carbon monoxide
CORSIM Corridor Simulation
CWW Compressed Work Week
DASH Alexandria Transit Company
DEQ Department of Environmental Quality
DOD Department of Defense
DOD-OIG Department of Defense – Office of Inspector General
EDR Executive Directors Report
EIFS Economic Impact Forecast System
EIS Environmental Impact Statement
EPG Engineer Proving Grounds
ESA Environmental Site Assessment
FAR floor area ratio
FBMP Fort Belvoir Main Post
FCPS Fairfax County Public School District
FEMA Federal Emergency Management Agency

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FHWA Federal Highway Administration
FNSI Finding of No Significant Impact
FWW flexible work week
GCD General Conformity Determination
GCR General Conformity Rules
GSA General Services Administration
HOV high-occupancy vehicle
HV hourly volume
IJR Interchange Justification Report
IDA Institute for Defense Analyses
ITE Institute of Transportation Engineers
LBP [undefined]
LEED Leadership in Energy and Environmental Design
LEED-NC New Construction
LID low-impact development
LOS level of service
LOV low-occupancy vehicle
LRTP Long-Range Transportation Plan
M&E monitoring and evaluation
MC TIA/TMP Mark Center Traffic Impact Analysis/Transportation Management Plan
MOE measures of effectiveness
MOU Memorandum of Understanding
MPO(s) Metropolitan Planning Organization(s)
MSDS material safety data sheets
MSF million square feet
MTA Maryland Transit Administration
MTBP Mass Transit Benefit Program
MWCOG Metropolitan Washington Council of Governments
NAAQS National Ambient Air Quality Standard
NCPC National Capital Planning Commission
NCR National Capital Region
NEPA National Environmental Policy Act
NOI Notice of Intent
NO_x nitrous oxide
NPDES national pollutant discharge elimination system
NWI National Wetland Inventory
NVRC Northern Virginia Regional Commission
ODASA (I&H) Office of the Deputy Assistant Secretary of the Army for Installation and Housing
PCBs polychlorinated biphenyls
PFPA-PMB Pentagon Force Protection Agency—Parking Management Branch
PHV peak-hour volume
PM2.5 particulate matter 2.5 microns in size
PPV persons per vehicle
PRTC Potomac and Rappahannock Transportation Commission

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PVB passive vehicle barrier
RDF remote delivery facility
RFP request for proposal
RIF remote inspection facility
ROD record of decision
ROE region of effect
ROI region of interest
RPA Resource Protection Area
RTV rational threshold value
SAIC Science Applications International Corporation
SAFETEA-LU Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SDDCTEA Surface Deployment and Distribution Command Transportation Engineering Agency
SECARMY Secretary of the Army
SHPO State Historic Preservation Officer
SIP statewide implementation plan
SOV single-occupancy vehicle
SSA Site Selection Authority
SSEB Site Selection Evaluation Board
SSET Site Selection Evaluation Team
SWPPP Storm water pollution prevention plan
TCQSM Transit Capacity and Quality of Service Manual
TDM Travel demand management
TIA traffic impact analysis
TIMP Transportation Improvement and Management Plan
TMP Transportation Management Plan
TMPC Transportation Management Plan Coordinator
TRB Transportation Research Board
UFC United Facilities Criteria
ULSD ultra-low sulfur diesel
USACE United States Army Corps of Engineers
USC U.S. Code or United States Code
USDOT United States Department of Transportation
USEPA United States Environmental Protection Agency
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geological Survey
VA DRPT Virginia Department of Rail and Public Transportation
VA Virginia
VDEQ Virginia Department of Environmental Quality
VDOT Virginia Department of Transportation
VRE Virginia Railway Express
VRP Voluntary Remediation Plan
WEBA West End Business Association
WHS Washington Headquarters Services
WMATA Washington Metropolitan Area Transit Authority

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