Department of the Army
US Army Garrison Fort Belvoir
October 2012

Environmental Assessment

Expansion of U.S. Army Intelligence & Security Command Headquarters Facilities

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ENVIRONMENTAL ASSESSMENT

EXPANSION OF U.S. ARMY INTELLIGENCE & SECURITY COMMAND HEADQUARTERS FACILITIES

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Finding of No Significant Impact

Expansion of U.S. Army Intelligence and Security Command Headquarters Facilities
U.S. Army Garrison Fort Belvoir
Fort Belvoir, Virginia

Description of Proposed Action

The Army proposes to renovate and expand the Intelligence and Security Command's (INSCOM) headquarters (HQINSCOM) on US Army Garrison Fort Belvoir, Virginia. The Proposed Action would include: renovating the 234,000-square-foot Nolan Building; constructing a 382,000-square-foot addition to the Nolan Building; constructing a new multi-storied 1,420-space parking garage; reconfiguring surface parking lots, landscaping, walkways, and roadways; and adding new utilities infrastructure, including stormwater management measures. The purpose of the Proposed Action is to provide increased space for personnel and equipment in order to address the need to consolidate personnel for mission effectiveness and enhanced security. These changes would allow INSCOM to consolidate personnel now scattered among buildings both on Fort Belvoir (255) and near Fort Belvoir (575). Personnel on the HQINSCOM site would increase from approximately 1,650 to a total of 2,540, which includes room for 80 more staff in the future. HQINSCOM also provides training and would be able to accommodate several hundred out-of-town staff attending conferences and training on a daily basis.

The Environmental Assessment (EA) evaluated the impacts of implementing the Proposed Action and No Action Alternatives. The Army considered three other approaches to consolidating and providing more space for existing and future HQINSCOM employees: 1) building a completely new headquarters facility elsewhere on Fort Belvoir, which is problematic because of substantially greater costs and environmental impacts; 2) making minor renovations to the current HQINSCOM building, which is not reasonable because the capacity of the Nolan Building has already been exceeded, and the changes would not provide sufficient space to accommodate all HQINSCOM personnel in a manner that contributes to mission effectiveness; and, 3) leasing long-term space off-Post for personnel who cannot be accommodated in the existing Nolan Building, which would not meet the need to consolidate personnel for more efficient and secure operations. None of these alternatives were considered reasonable, and they were not evaluated further in the EA. The EA evaluated taking no action, which, while it would not address the project's purpose and need, would provide a baseline against which the impacts of the Proposed Action can be evaluated.

Environmental Consequences

The EA concluded that there would no impact or negligible impacts on land use plans, air quality, utilities, cultural resources, socioeconomics (including environmental justice and the protection of children), hazardous wastes and materials, and community facilities and services as a result of the proposed action. The EA identified and evaluated the following potential impacts:

- **Transportation and Traffic:** Upon completion of INSCOM's expansion in 2018, traffic volumes and delays would increase above current and 2018 No-Build levels at three intersections – Fairfax County Parkway/John J. Kingman Road, John J. Kingman Road/Beulah Street, and Telegraph Road/Beulah Street. Despite the increases, all three intersections would continue to operate overall at acceptable levels of service in 2018 during the morning and evening peak periods. No mitigation is necessary.

- **Natural Resources:** Construction of the building addition, parking garage, and roadways would cover 4.3 additional acres of permeable soils with pavement or other impermeable surfaces and require clearing and grading. The proposed emergency access road for the expanded building would encroach on the Chesapeake Bay Resource Protection Area (RPA) associated with the small pond near the existing building by approximately 1,672 square feet. The discussion below under Coastal Zone Management describes the actions the Army will take to address RPA encroachment. The Virginia Department of Conservation and Recreation (VDCR) – Division of Natural Heritage (DNH) and the US Fish and Wildlife Service indicated that the project was unlikely to impact any protected plant or animal species or natural area preserve. Surveys of the site conducted by Fort Belvoir for the protected small whorled pogonia and the wood turtle support these findings. The project would remove approximately 4.68 acres of forest, of which 0.34 acres is along the edge of the dedicated Fort Belvoir Forest and Wildlife Corridor (FWC). The project would impact approximately 3.26 acres of breeding habitat for two Partners-in-Flight Neotropical migrant bird species: scarlet tanager and wood thrush. Mitigation actions will be taken as described below.

- **Coastal Zone Management:** The Army concluded in a Federal Coastal Consistency Determination included as an appendix to the EA that the project was consistent to the maximum extent practicable with the federally-approved enforceable policies of Virginia's Coastal Zone Management Program (VCP). The Virginia Department of Environmental Quality(VDEQ), which administers the VCP, concurred with this assessment provided that the proposal complies with all applicable permits, approvals, and conditions, including demonstrating that the proposed emergency access road that would impinge on the RPA meets the following specific conditions: VDCR finds that there are no reasonable alternatives to aligning the road through the RPA; the alignment and design of the road are optimized to minimize RPA encroachment and adverse effects on water quality; a water quality impact assessment is submitted; and VDCR reviews the plans for the road. The Army will comply with these conditions.

- **Cumulative Impacts:** The construction of a number of projects on-Post and off-Post at the same time as construction of the proposed project could lead to increases in vehicle traffic, air emissions, and noise, but these effects would be short-term and minor. Major projects on or through the Post that are likely to overlap with construction of the Proposed Action include the ongoing construction of the new Post Exchange and Commissary, construction of the National Museum of the U.S. Army, and widening of US Route 1. A number of off-Post projects are also being planned but would have negligible impacts when considered with the Proposed Action. No mitigation is necessary.

Mitigation

Mitigation actions can reduce, avoid, and compensate for significant adverse effects. While the Proposed Action would not generate any significant adverse effects on human health or the environment, the Army will implement mitigation actions to minimize adverse impacts:

- To control soil erosion and stormwater runoff during construction, the Army will prepare and implement an erosion and sediment control plan employing soil best management practices and a Virginia Stormwater Management Program plan. The design of the project incorporates a number of long-term stormwater management features.

- To mitigate the loss of forest habitat and land now part of the Fort Belvoir FWC, the Army will: restore an equivalent area of the FWC by removing pavement from, grading, and planting the

northeast corner of an existing HQINSCOM parking lot; remove asphalt pavement from, add topsoil to, and plant shrubs and trees on several sites at or in the vicinity of HQINSCOM; and remove invasive foreign vegetation from the FWC adjacent to the project area.

Public Review

The EA and draft Finding of No Significant Impact (FNSI) were available for public review and comment for 31 days from August 2 to September 2, 2012. Compact disc copies of the EA and draft FNSI were mailed to public agencies and elected officials. Fort Belvoir's list of interested parties were sent letters that announced the availability of the EA, included a copy of the draft FNSI, gave the website address where the EA could be downloaded, and gave contact information and the period within which comments on the EA and draft FNSI could be provided. Display advertisements announcing the availability of the EA and draft FNSI for review, the website address where they could be viewed, and information to submit comments were published on August 1 and 2, 2012 in the: *Mount Vernon Voice, Mount Vernon Gazette, Springfield Connection,* and *Fairfax Station/Lorton Connection.* Copies of the EA and draft FNSI were provided to the following libraries to facilitate public review: Fort Belvoir Van Noy, Lorton Branch, John Marshall Branch, Sherwood Regional Branch, and Kingstowne Branch. Copies of the EA and draft FNSI were also made available for review on the Fort Belvoir website's Environmental Documents page at www.belvoir.army.mil/environdocssection2.asp.

Written comments were received from the: federal Natural Resources Conservation Service; Virginia Department of Historic Resources; VDEQ's VCP, Office of Pollution Prevention, Northern Regional Office, Air Quality Division, and Division of Land Protection and Revitalization; VDCR's Division of Stormwater Management and DNH; Virginia Department of Game and Inland Fisheries; Virginia Department of Health; Virginia Department of Forestry; Virginia Department of Transportation (VDOT); and the County of Fairfax, Virginia. Many of the comments noted permitting and regulatory requirements for construction and operation of the new facilities. Both VDOT and Fairfax County raised questions about the traffic impact analysis; further information and clarifications were provided to resolve these questions. The only unresolved issue is the incursion into the RPA described under Natural Resources and Coastal Zone Management. The Army will fulfill the conditions set forth by VDEQ and VDCR for approval of the Federal Consistency Determination in the final design stage of Phase 2 of the project before proceeding with implementation of the action.

Conclusion

Based on the analysis and conclusions in the EA and on the comments received, the Installation Commander at Fort Belvoir concludes that the Proposed Action would not have a significant effect on the human or natural environment. Therefore, preparation of an environmental impact statement is not required before implementing the Proposed Action.

Stephen M. Rourke, Deputy — 11/7/2012

FOR GREGORY D. GADSON
Colonel, US Army
Garrison Commander

Date

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Executive Summary

The US Army Intelligence and Security Command (INSCOM) proposes to renovate and expand its headquarters on US Army Garrison Fort Belvoir, Virginia. The Proposed Action would include: renovating and adding to the existing HQINSCOM building; erecting a new multi-storied parking garage; reconfiguring surface parking lots, landscaping, walkways, and roadways; and adding new utilities infrastructure, including stormwater management. Fort Belvoir has prepared this environmental assessment (EA) to publicly document the environmental consequences of the proposed action. The EA has been prepared pursuant to the Council on Environmental Quality (CEQ) regulations in 40 Code of Federal Regulations (CFR) Part 1500-1508, AR 200-2 and 32 CFR Part 651.

The purpose of the proposed action is to provide increased space for personnel and equipment performing INSCOM Headquarters (HQINSCOM) intelligence missions. The need for the project is to: consolidate headquarters personnel now located in commercial rental space off of Fort Belvoir or in other facilities on Fort Belvoir to increase security and efficiency; provide increased and more flexible space for personnel and equipment performing headquarters intelligence missions to relieve current overcrowding; and ensure that the facilities meet current anti-terrorism/force protection (AT/FP) standards.

ES.1 Alternatives

INSCOM considered the following alternative approaches to providing more space for existing and future HQINSCOM employees:

- Implementing the Proposed Action.
- Building a completely new headquarters facility somewhere else on Fort Belvoir.
- Making minor renovations to the current HQINSCOM Nolan Building.
- Leasing long-term space off-Post.
- Doing nothing (“the No Action” alternative).

Of these alternatives, only the Proposed Action would meet INSCOM’s needs in a reasonable manner. The No Action Alternative is not reasonable and would not meet INSCOM’s needs, but it is addressed in this EA because it provides a baseline against which to compare the impacts of the Proposed Action.

ES.2 Proposed Action

Implementing the Proposed Action would add approximately 890 workers to the HQINSCOM building, increasing workers from approximately 1,650 to a total of approximately 2,540. Approximately 575 of the personnel to be relocated are currently in leased space about four miles from Fort Belvoir in Springfield, Virginia. Another 255 are working on Fort Belvoir in three different buildings. Additionally, the new space would accommodate 80 full-time personnel in the future as INSCOM's mission expands. The Proposed Action would also accommodate personnel who attend training and conferences at HQINSCOM.

The Proposed Action includes:

- Renovating the existing 234,000-square-foot HQINSCOM Nolan Building.
- Constructing a new 382,000-square-foot addition to the existing HQINSCOM Nolan Building.
- Constructing a 1,420-space parking structure.
- Reconfiguring and reconstructing the surface parking lots, landscaping, roadways, and sidewalks on site. Surface parking would total 586 spaces.
- Constructing new utilities and a new stormwater management/best management practice pond.

The long-term reconfiguration of the surface parking lots at HQINSCOM would result in 2,006 parking spaces onsite, including 1,524 employee, 446 visitor and student, and 36 government surface parking spaces.

ES.3 Land Use

The new, denser complex would be consistent with the existing pattern of clustered development and land uses that characterize Fort Belvoir's upper North Post. The Proposed Action would have a target Leadership in Energy and Environmental Design (LEED) goal of silver. The ratio of employee parking spaces to employees, projected to be 60 percent, would be better than the National Capital Planning Commission's (NCPC) target parking goal of 67 percent, and consistent with the US Army's goal of 60 percent. The proposed action would be consistent to the maximum extent possible with the Virginia Coastal Resources Management Program. The Virginia Department of Environmental Quality (VDEQ) conditionally concurs provided the proposal complies with all applicable permits, approvals and conditions. The condition, which the Army will address during the final design of the project's second phase is to: demonstrate that there is no alternative to the location of an emergency access road that would encroach on 1,672 square feet of a Chesapeake Bay Resource Protection Area (RPA) associated with a small pond near the existing building; prepare a water quality impact assessment (WQIA); show that encroachment and adverse effects on water quality are minimized; and give the plan for the road to the Virginia Department of Conservation and Recreation (VDCR) to review. Fort Belvoir has prepared a preliminary WQIA, discussed this issue with VDCR, and obtained preliminary

approval that the minor encroachment is exempted and the project is consistent with the CZMA. The final design will include a final WQIA and will be submitted to VDCR for review.

The expansion areas would largely be confined to the existing footprint of the complex. An exception is along the eastern edge and the southeastern corner of the site where the new building addition and emergency access road would project into forested area designated as "natural constraints" because it is part of the Fort Belvoir Forest and Wildlife Corridor. To mitigate this change, INSCOM would remove the pavement and invasive vegetation from an equivalent area (0.34 acres) at the northeast corner of the project site, and plant native trees. The Army would then designate this restored area as part of the Forest and Wildlife Corridor.

ES.4 Transportation and Traffic

When fully implemented in 2018, the Proposed Action would contribute to an increase in traffic volumes and delays near HQINSCOM as more personnel commute to the site. However, the levels-of-service (LOS) for the three nearby intersections studied are today and would remain acceptable after implementation of the Proposed Action. Analysis of 2018 traffic conditions assumed a reduction in single-occupant vehicle use by Fort Belvoir's commuters from 85 percent to 75 percent in line with Fort Belvoir's draft Transportation Management Program. The Fairfax County Parkway / John J. Kingman Road / Farrar Road intersection currently operates at LOS C in the morning peak period and LOS D in the evening peak. Under both 2018 No Build (2018 conditions without the Proposed Action) and Build (with the Proposed Action) conditions, morning and peak periods would operate at LOS D with increased delays averaging less than five seconds. The Farrar Road leg of the intersection would be most affected because the lower volume of traffic commands less green time. The Telegraph Road/Beulah Street intersection, currently LOS C in the morning peak and LOS D in the evening peak, would improve to LOS C in both peaks under both 2018 No Build and Build conditions because the intersection will be improved to accommodate the new Hilltop Village Center (traffic from the center was not factored into this analysis but is not expected to affect the outcome). The John J. Kingman / Beulah Street intersection, more lightly used but closest to HQINSCOM, currently operates at LOS B in both periods. In 2018 in both periods under both the Build and No Build conditions, it would operate at LOS C. No mitigation is necessary.

ES.5 Air Quality and Utilities

Construction and operation of the expansion would generate air emissions, but these would be minor for both the short and long term. Similarly, the Proposed Action would increase the demand for utilities, but the increase is well within the capacity of the existing infrastructure with a few improvements/modifications (e.g., the existing sanitary lift stations, pumps, and lines and potable water lines would be upgraded and/or relocated to handle the additional demand). Stormwater from the northern parking lots that is presently flowing to Mason Run without the benefit of retention and treatment would be captured and treated in a new stormwater management pond.

ES.6 Socioeconomics, Environmental Justice and the Protection of Children

The Proposed Action would have no effect on area or regional populations – 255 of the personnel already work in other buildings on Fort Belvoir, and the 575 personnel moving from leased space in Springfield already live in the area. Therefore, the move would not affect their current place of residence. The Proposed Action has little potential to disproportionately affect minority or low income populations, or populations of children – there are no residential areas near the HQINSCOM compound and no concentrations of children.

ES.7 Natural Resources

Construction of the parking garage and additional roadways would cover 4.3 acres of permeable soils with pavement or other impermeable surfaces. Clearing and grading for construction would cause short-term erosion and sedimentation and minor localized changes in soil infiltration rates and surface runoff patterns. An erosion and sediment control plan employing soil best management practices, and a Virginia Stormwater Management Program permit would be required for the clearing and grading activities.

Construction would affect 4.6 acres of forest habitat, of which 0.34 acres is part of the Fort Belvoir Forest and Wildlife Corridor which connects natural areas within and beyond the Post. The building itself would not intrude into the corridor, but the perimeter road would intrude as would grading along the eastern edge of the site. The project would impact approximately 3.26 acres of breeding habitat – mainly forest but some grassland – for Partners in Flight (PIF) bird species. INSCOM has made every effort to limit these impacts, and would restore an equivalent area of the FWC by removing pavement from, grading, and planting the northeast corner of the existing parking lot. INSCOM will also remove asphalt pavement from, add topsoil, and plant trees on several sites at or in the vicinity of INSCOM, as well as remove invasive foreign vegetation from the FWC adjacent to the project area. These actions would also replace PIF habitat.

With respect to protected species, Fort Belvoir has conducted recent surveys for the small whorled pogonia (*Isotria medeoloides)* and wood turtle (*Glyptemys insculptata*) on and near the site. None were found. The Virginia Department of Conservation and Recreation, Division of Natural Heritage (VDCR-DNH), by letter dated November 17, 2009, indicated that the project was unlikely to impact any protected plant or animal species or natural area preserves. The US Fish and Wildlife Service (USFWS), by letter dated December 22, 2009, indicated the same. Because several years have passed since this previous coordination, Fort Belvoir sent new coordination letters to these agencies, as well as to the Virginia Department of Game and Inland Fisheries (VDGIF). VDGIF responded that due to staffing limitations, it was unable to review or provide an assessment of the project. No further responses were received from VDCR-DNH or the USFWS.

As described in Section ES.3, the proposed emergency access road for the expanded building would encroach on the Chesapeake Bay RPA associated with the small pond near the existing building by approximately 1,672 square feet. VDCR has indicated preliminary concurrence if during final design the Army demonstrates that there are no alternatives to aligning a road through the RPA, prepares a water quality impact assessment, shows that encroachment and adverse effects on water quality are minimized, and gives the plan for the road to the Virginia Department of Conservation and Recreation to review. During the final design of project's second phase, the Army will meet this condition.

ES.8 Cumulative Impacts

The Department of Defense Base Realignment and Closure (BRAC) 2005 agency and personnel realignments at Fort Belvoir involved approximately 20 construction projects and 12,800 workers being realigned to Fort Belvoir between 2008 and 2011. The 2005 BRAC realigned approximately 19,000 workers to Fort Belvoir, but approximately 6,200 of those 19,000 workers were moved to a new office building on Seminary Road in Alexandria, Virginia. The cumulative impacts of these projects and personnel moves were addressed in the 2007 Fort Belvoir BRAC EIS and Record of Decision (ROD) (USACE 2007, College 2007).

Concurrent construction projects in the same area of the Post could lead to increases in vehicle traffic, air emissions, and noise from the various construction activities. Three projects in proximity to the HQINSCOM site and likely to overlap in time are: the ongoing construction of the new Post Exchange and Commissary along Gunston Road, scheduled for completion in 2013 and 2016; construction of the National Museum of the US Army off the Fairfax County Parkway, just north of its intersection with John J. Kingman Road (including the construction of several new holes for the North Post Golf course to replace holes that are being impacted by construction of the NMUSA); and, the widening of Route 1 from Telegraph Road through the installation to the Mount Vernon Memorial Highway. This project, which is being done by the Federal Highway Administration's Eastern Federal Lands Team in cooperation with Fort Belvoir and the Virginia Department of Transportation (VDOT), is currently being bid, and is scheduled to be completed in 2016. The cumulative impacts of the proposed action when considered with these other three projects would be both short-term and long-term, but would be minor.

Plans and/or rezoning applications have been approved or are in process for:

- A proposed plan to construct up to 470 multi-family and single-family housing units; up to 55,000 sq ft of retail space; and up to 16,000 sq ft of office space at the current location of Accotink Village.
- Expansion of the Belvoir Business Park on Lorton Station Boulevard near the northwestern corner of the Post to include office and/or industrial use.
- The proposed Hilltop Village Center mixed use development at the intersection of Beulah Street and Telegraph Road, potentially including a 150,000 SF grocery story; 94,000 SF of specialty retail and banks; over 100,000 SF of office space; and parking.

- The redevelopment of the Northern Virginia Industrial Park on Telegraph Road West as a mixed use development. A Fairfax County Comprehensive Plan Amendment allows the land to become a mix of office, hotel, retail, civic, and light industrial uses.

The County Board also amended the Transportation Plan to show Telegraph Road planned for six lanes (formerly four-lanes) from Richmond Highway to Fairfax County Parkway. Together these projects have the potential to add to local traffic congestion over the short and long term, but impacts would be minor.

ES.9 Resources Not Evaluated in This Environmental Assessment

Consistent with 40 CFR 1501.7(a)(3), the following resources were not considered in depth in this EA because the proposed action would have no or negligible potential impact on them:

- Cultural Resources: There are no historic architectural resources on the INSCOM compound, and the two archaeological sites (44FX1095 and 44FX1275) identified are not eligible for listing on the National Register of Historic Places.
- Wetlands: The only wetland on the site is a small forested wetland adjacent to the perennial stream that exits the existing pond south of the existing building. The project would not impact this area.
- Floodplains: There are no 100-year floodplains on the site.
- Noise: Long-term operation of the facility would have little if any impact on the noise environment at Fort Belvoir.
- Community Facilities: Because the proposed action is unlikely to cause an influx of new residents, the Army has not addressed impacts on schools or hospital services in this EA.

ES.10 Conclusion

In summary, this EA describes and identifies the potential impacts of the Proposed Action Alternative and the No Action Alternative. The Proposed Action would not have a significant impact on the quality of the human environment and an environmental impact statement (EIS) is not needed.

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1 PURPOSE AND NEED

US Army Intelligence and Security Command (INSCOM) proposes to renovate and expand its headquarters facilities (HQINSCOM) on US Army Garrison Fort Belvoir, Virginia. INSCOM plans to:

- Build a new multi-storied parking garage.
- Build an addition to the existing HQINSCOM building.
- Renovate the HQINSCOM building.
- Reconfigure existing surface parking lots, landscaping, walkways, and roadways.
- Build new utilities infrastructure and a new stormwater management/best management practice (SWM/BMP) pond.

INSCOM is a major Army command, responsible for conducting intelligence, security, and information operations for military commanders and national decision makers. INSCOM conducts a wide range of intelligence production activities and has major responsibilities in the areas of counterintelligence and force protection, electronic warfare and information warfare, and support to force modernization and training.

1.1 Purpose and Need for the Proposed Action

The purpose of the proposed action is to provide increased space for personnel and equipment performing INSCOM intelligence missions. In addition to relieving overcrowding of the current workforce at HQINSCOM, and allowing consolidation of workers from HQINSCOM elements that are presently in leased space, the proposed action would enable HQINSCOM to accommodate a projected increase in staff.

The renovation of the existing building is needed not only to provide new space for incoming personnel, but also to provide for more flexible working space. INSCOM needs to be able to reconfigure work stations as mission and personnel team needs change. The HQINSCOM building was constructed in 1989 using now-outdated interior design criteria. For example, eight (8)-inch (in) concrete walls were used to partition interior space into various secure areas, and drywall partitions were used to separate work stations. This type of construction does not allow for efficient reconfiguration as needs change.

The renovation would provide fewer permanent private offices and fewer permanently-partitioned spaces. The expansion and renovation would reclaim space required for circulation among offices and other workspace, and would free up space for conference and training areas adjacent to personnel work stations. It would also restore the loading dock – now obstructed – to its primary function.

The proposed renovations would upgrade the HQINSCOM building and site to meet the most recent antiterrorism/force protection (AT/FP) standards, including increasing standoff distances and ensuring that all windows, metal-framed skylights, and entryways are equipped with AT/FP-compliant glazing systems.

Expansion would also allow certain INSCOM elements to move from leased space outside of Fort Belvoir and elements located in other facilities on Fort Belvoir to join other personnel currently at the HQINSCOM building. Without consolidation, the currently disjointed operations will continue to impede Army-wide information operations. The continued high cost of leasing off-Post space will continue to impose a burden on INSCOM's resources and tax dollars. Personnel will remain in overcrowded conditions that lower performance and efficiency, and INSCOM will be unable to implement the latest technology and achieve the full potential of its capabilities (USAINSCOM, 2006). In addition, moving all personnel on-Post would increase their security.

In compliance with the National Environmental Policy Act (NEPA) of 1969, Fort Belvoir has prepared this environmental assessment (EA) to publicly document the environmental consequences of the proposed action. The EA has been prepared pursuant to the Council on Environmental Quality (CEQ) regulations in 40 Code of Federal Regulations (CFR) Part 1500-1508, 32 CFR Part 651, and Army Regulations AR 200-2.

1.2 Location and Background

Fort Belvoir is located in southeastern Fairfax County, Virginia, approximately 18 miles (mi) southwest of Washington, DC (Figure 1, Location of Fort Belvoir). Fort Belvoir includes the 7,682-acre (ac) Main Post and the 807-ac North Area (FBNA, formerly called the Engineer Proving Ground) (Figure 2, Fort Belvoir). Fort Belvoir Main Post lies between Interstate-95 and Pohick Bay and Gunston Cove on the Potomac River. US Route 1 divides Main Post into North Post and South Post.

In recent years, Fort Belvoir has functioned as an administrative and logistics support center for the Department of Defense (DoD) and the Army and as a host for over 140 tenant organizations. Fort Belvoir also provides support services (hospital, dental, recreational, etc.) for over 200,000 military personnel, dependents, and retirees in the region. Implementation of the DoD's Base Realignment and Closure (BRAC) 2005 realignment actions at Fort Belvoir has resulted in a number of new facilities and new personnel. Personnel working on Fort Belvoir's Main Post and North Area currently total approximately 39,000. About 7,000 residents live on the Post.

HQINSCOM is located on Fort Belvoir's North Post, southeast of the intersection of John J. Kingman Road and Beulah Street. The HQINSCOM site covers approximately 45 ac, of which approximately 23 ac are developed.

Location of Fort Belvoir

Fort Belvoir
Limited Access
Highway
Major Road
Major Railroad Lines

N

0 5 10 20 Miles

Source: ESRI Data & Maps 2006.

Figure 1

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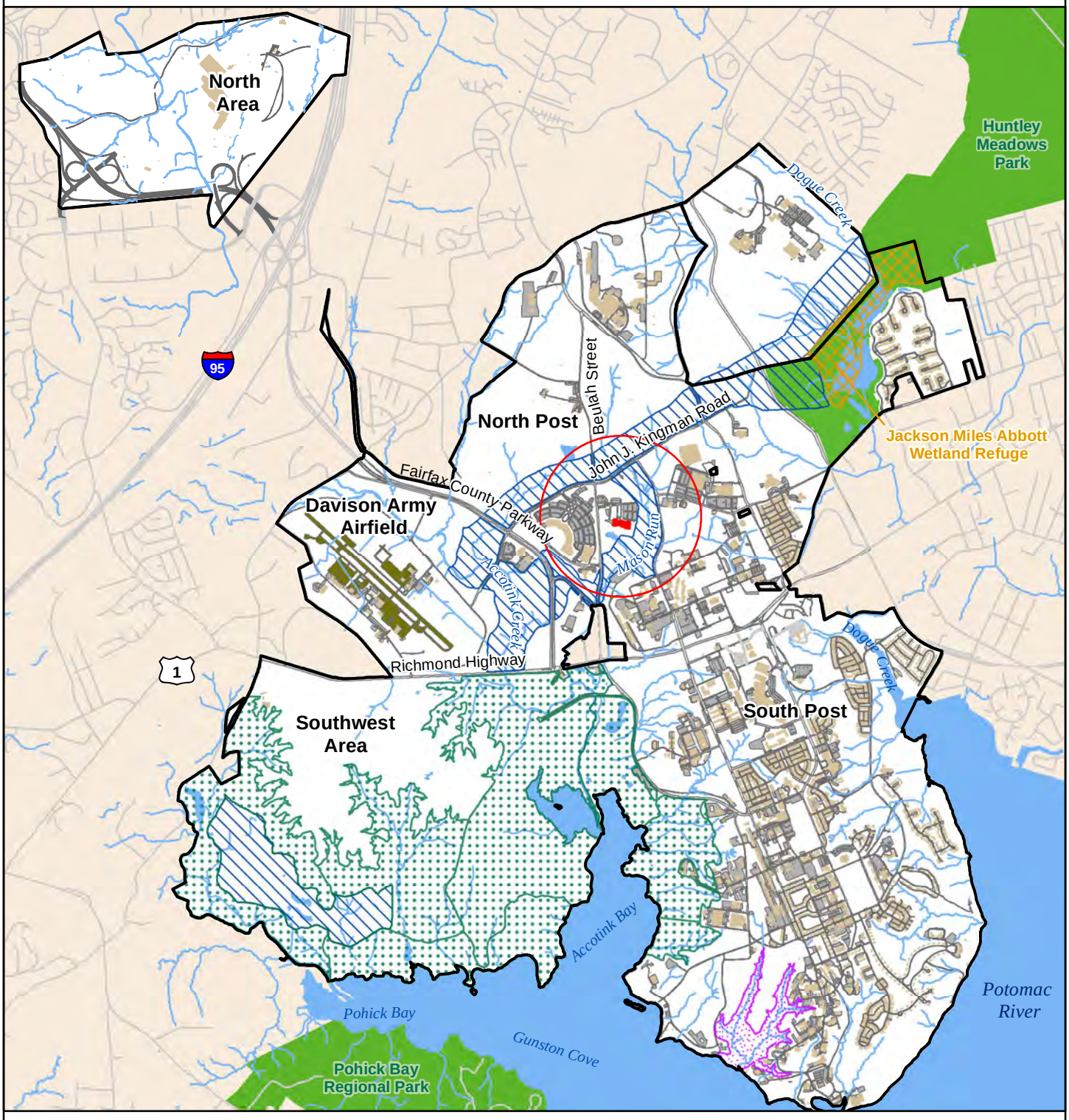
Fort Belvoir



Source: Fort Belvoir GIS

Figure 2

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1.3 The NEPA Process

NEPA provides for the consideration of environmental issues in federal agency planning and decision-making. Under NEPA and 32 CFR Part 651, the Army must prepare an environmental impact statement (EIS) or an EA for any federal action, except those actions that are determined to be exempt by law, "emergencies," or "categorically excluded." An EIS is prepared for those federal actions that may significantly affect the quality of the human environment. An EA is a concise public document that provides sufficient evidence and analysis for determining whether to prepare an EIS. The EA includes a brief discussion of:

- The need for the proposal.
- The alternatives (as required under Section 102 (2)(E) of NEPA).
- The environmental, social, and economic impacts of the proposed action and alternatives.
- A listing of agencies and persons consulted.

The EA results in either a Finding of No Significant Impact (FNSI) or a Notice of Intent (NOI) to prepare an EIS. An evaluation of the environmental consequences of the proposed action and alternatives includes direct, indirect, and cumulative effects as defined at 40 CFR 1508.7 and 1508.8, as well as qualitative and quantitative (where possible) assessment of the level of significance of these effects. If Fort Belvoir determines that the proposed action may have a significant impact on the quality of the human environment, then an EIS will be prepared.

1.4 Resources Not Evaluated in This Environmental Assessment

Consistent with 40 CFR 1501.7(a)(3), the following resources are not considered further in this EA because the proposed action would have no potential impact on them:

- **Cultural Resources:** Section 106 of the National Historic Preservation Act (NHPA), as amended, requires federal agencies to integrate consideration of historic preservation issues into the early stages of their planning projects. There are no historic architectural resources on the INSCOM compound – the existing HQINSCOM building was constructed in 1989 and does not qualify for listing under the criteria in 36 CFR 60.4. At that time, most of the site was disturbed by construction and paved or covered with structures. Nonetheless, two archaeological sites are present at the edge of the HQINSCOM site (44FX1095 and 44FX1275). The Virginia State Historic Preservation Office (SHPO) concurred in letters dated July 20, 2005 and May 30, 2006, and by e-mail dated April 3, 2012 that these sites are not eligible for listing on the National Register of Historic Places. Fort Belvoir also coordinated the project with the Catawba Indian Nation Tribal Historic Preservation Office, who replied by letter dated April 11, 2012, that the Tribe had no immediate concerns with regard to traditional cultural properties, sacred sites, or Native American archaeological sites within the boundaries of the proposed project area, but asked to be contacted if Native American artifacts or human remains were encountered during ground disturbance for this project. Copies of these

letters/emails are in Appendix B. Therefore, no significant cultural resources occur on the HQINSCOM site.

- **Floodplains:** The National Flood Insurance Act of 1968, the Flood Disaster Protection Act of 1973, and Executive Order 11988, *Floodplain Management* – administered by the Federal Emergency Management Agency (FEMA) – set forth the responsibilities of federal agencies in reducing the risk of flood loss or damage to personal property, minimizing the impact of flood loss, and restoring the natural and beneficial functions of floodplains. There are no floodplains designated on FEMA's National Flood Insurance Program mapping on the site. The nearest mapped floodplain is immediately east of the site adjacent to Mason Run, at the base of the steep slopes which separate the HQINSCOM site from the stream.

- **Wetlands:** Wetlands are regulated by the US Army Corps of Engineers (USACE), the US Environmental Protection Agency (USEPA), and state agencies as "waters of the US" under Sections 402 and 404 of the Clean Water Act. Fort Belvoir conducted a wetland delineation of the HQINSCOM site (Paciulli, Simmons & Associates, Ltd., 2011). The only vegetated wetland within the limits of disturbance is a small forested wetland adjacent to the perennial stream that exits the existing pond on the south part of the site. The project would not impact this area.

- **Noise:** The Noise Control Act of 1972 (PL 92-574) directs federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. The Fairfax County Code prohibits the creation of sound louder than 55 decibels (dB) in a residential area, and 60 dB in a commercial area. It also prohibits the creation of any excessive noise on any street adjacent to any school, institution of learning, court, or hospital that interferes with its function (Fairfax County Code Section 108-4-1). Construction and demolition activities are, however, exempt from the Fairfax County ordinance provided they occur between 7:00 a.m. and 9:00 p.m. The construction and renovation activities would require use of heavy equipment that would generate short-term increases in noise at the HQINSCOM site. However, this area of the Post is 2,000 feet from the nearest residential area (Accotink Village) and is already dominated by noise from aircraft overflights from the Davison Army Airfield. The short-term increases in noise from construction machinery would not be noticed off-site. Long-term operation of the facility would have little if any impact on the noise environment at Fort Belvoir. Fairfax County Code does not specifically address occasional noise sources such as emergency generators. However, the distance from the nearest residential area and the sporadic and short-term nature of the generators' use would generate minimal impacts.

- **Community Facilities:** Because the proposed action is unlikely to cause an influx of new residents moving into the area, the Army has not addressed impacts on schools or hospital services in this EA. Personnel moving to the HQINSCOM site either already work in buildings other than HQINSCOM on Fort Belvoir or work 10 mi away in leased space. Few of these personnel are likely to change their place of residence based on these relatively small changes in their commuting trip to and from their place of work.

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

CEQ's *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* establish a number of policies for federal agencies, including "…using the NEPA process to identify and assess the reasonable alternatives to the proposed action that will avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2 [e]). INSCOM has considered the following alternative approaches to providing more space for existing and future HQINSCOM employees:

- Implementing the Proposed Action to renovate and add space to the HQINSCOM's Nolan Building and to add parking.
- Building a complete new headquarters facility somewhere else on Fort Belvoir.
- Making minor renovations to the current HQINSCOM Nolan Building.
- Leasing long-term space off-Post.
- Doing nothing ("the No Action" Alternative).

In order for an alternative to be reasonable, it must fulfill the purpose and need for the Proposed Action. For this Proposed Action, the purpose is to provide increased space for personnel and equipment performing INSCOM intelligence missions. The Proposed Action is driven by the need to:

- Provide sufficient space to accommodate recent increases in HQINSCOM personnel and to allow them to carry out their mission effectively.
- Accommodate all HQINSCOM personnel in one building in order to optimize efficiency and functional relationships among user groups and minimize security risks.
- Ensure that HQINSCOM facilities meet current anti-terrorism/force protection (AT/FP) standards.

Only those alternatives that are reasonable and able to fulfill the purpose and need for the action warrant a detailed environmental analysis.

2.1 Proposed Action

The Proposed Action is a multi-year construction project programmed to occur from Fiscal Years (FY) 2012 to 2018. The project accommodates the consolidation and expansion of current and future INSCOM personnel and missions. Once the final phase of the project has been completed in FY 2018, the number of INSCOM personnel working in the Nolan Building would have increased by approximately 890 workers – from approximately 1,650 (including 175 shift

workers who work evenings and weekends) at present to a total of approximately 2,540 in FY18. The new space would accommodate approximately 575 personnel currently working in leased space at Metro Park in Springfield, VA about four mi from Fort Belvoir and approximately 255 personnel who are working elsewhere on Fort Belvoir. HQINSCOM also currently has the capacity to accommodate up to 350 personnel for training at any one time, and this capacity would be replicated in the new space.

Figure 3 (HQINSCOM – Existing Site Layout) shows the existing conditions at the HQINSCOM site. Figure 4 (HQINSCOM – Proposed Expansion) shows the conceptual plan for the Proposed Action. Figures 4a through 4d show the Proposed Action's four construction phases. The Proposed Action's construction phases would include:

- Phase 1: constructing a five-story parking structure with up to 1,420 spaces, access roads, sidewalks, a stormwater retention pond, retaining walls (along the north side of the proposed parking structure and around the retention pond), and reconfiguring existing surface parking areas and landscaping.

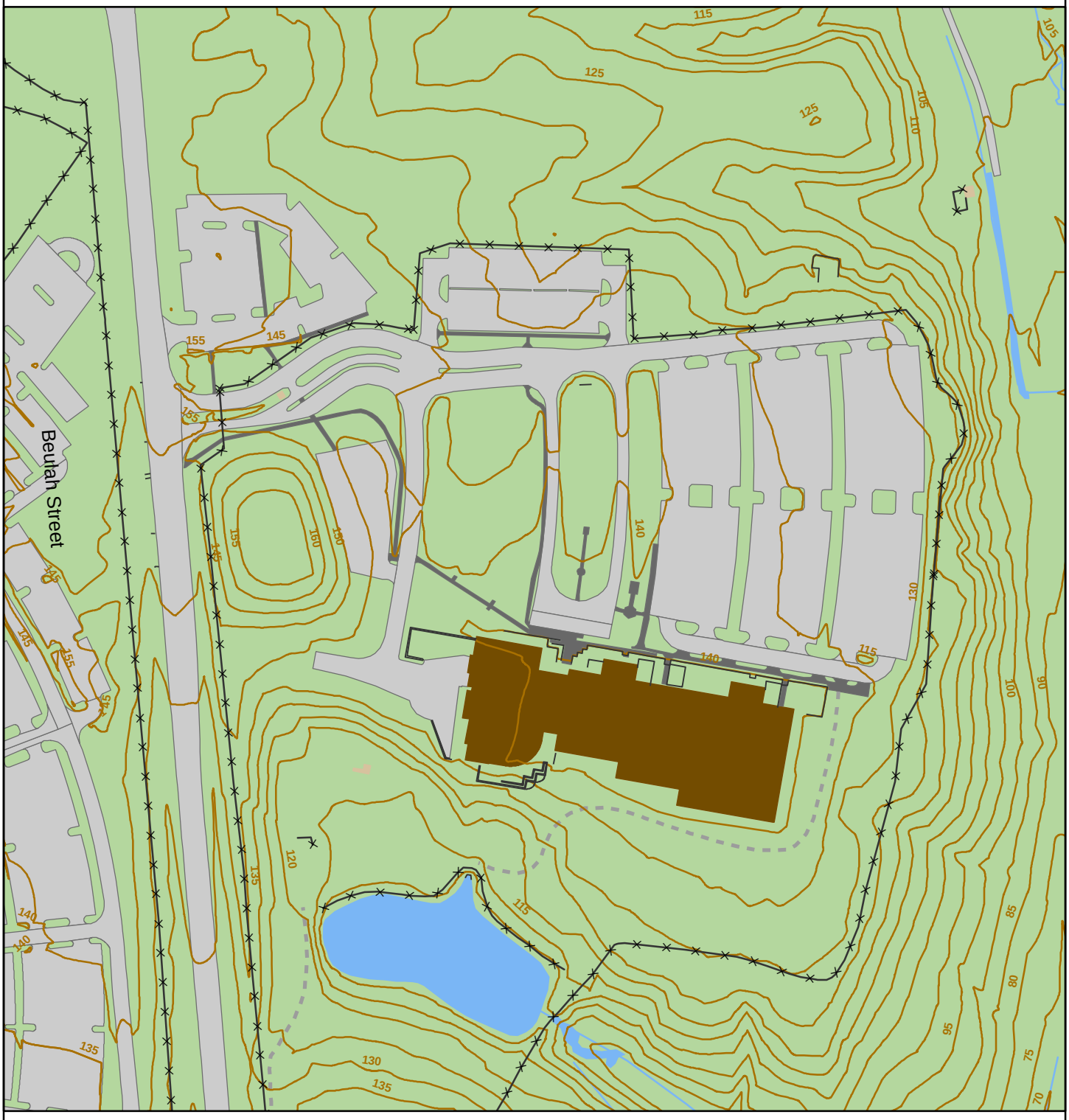
  During construction, about half the existing surface parking area between the Nolan Building and the proposed parking structure would be needed for staging construction equipment and materials. INSCOM would construct a temporary parking area onsite (on landscaped areas north and west of the Nolan Building), and the Post would provide temporary parking at other locations on the Post to compensate for lost spaces. Shuttle buses would ferry employees between these parking areas and the Nolan Building. The temporary parking locations would most likely include:

  - The Mosby Center on North Post (approximately 120 spaces).
  - The North Post Chapel (approximately 58 spaces).
  - The vacant lot next to the North Post Chapel (approximately 28 spaces).
  - Approximately 106 spaces at the McRee Barracks (North Post) main parking lot.
  - Up to 65 spaces in the Army and Air Force Exchange Service parking lot, near where the Car Care Center (CCC) will be located, with the exact number dependent on when the CCC opens.

  These temporary parking spaces would be used while Phase 1 is under construction, until early 2015.

  Phase 1 would also include construction of a central utility building located with the proposed new parking garage, a construction entrance, installation of traffic control devices within the HQINSCOM roadway network, as needed; reconfiguration of the main entrance road; and, demolition of site features such as the parking area where the proposed parking structure would be located, and curbs and gutters as needed to provide construction access.

HQINSCOM - Existing Site Layout



Source: Fort Belvoir GIS

Figure 3

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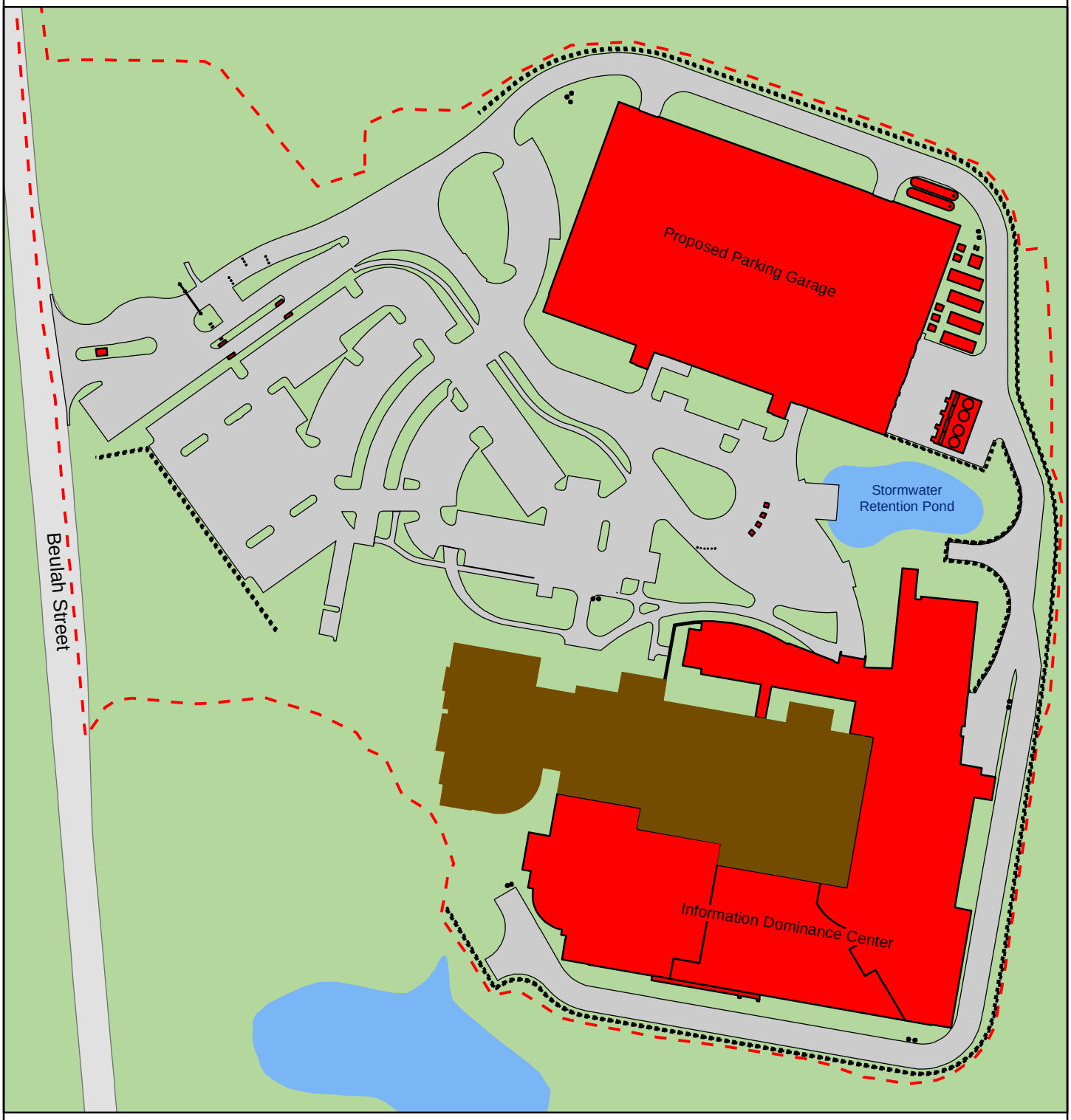
HQINSCOM - Proposed Expansion



Retaining Wall
Limit of Disturbance
Waterbody
Existing INSCOM Building
Proposed New Building
Proposed New Paved Area
Existing Road

N

0 80 160 320 Feet

Source: Fort Belvoir CAD and GIS

Figure 4

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Proposed Project Construction Phases 1 & 2

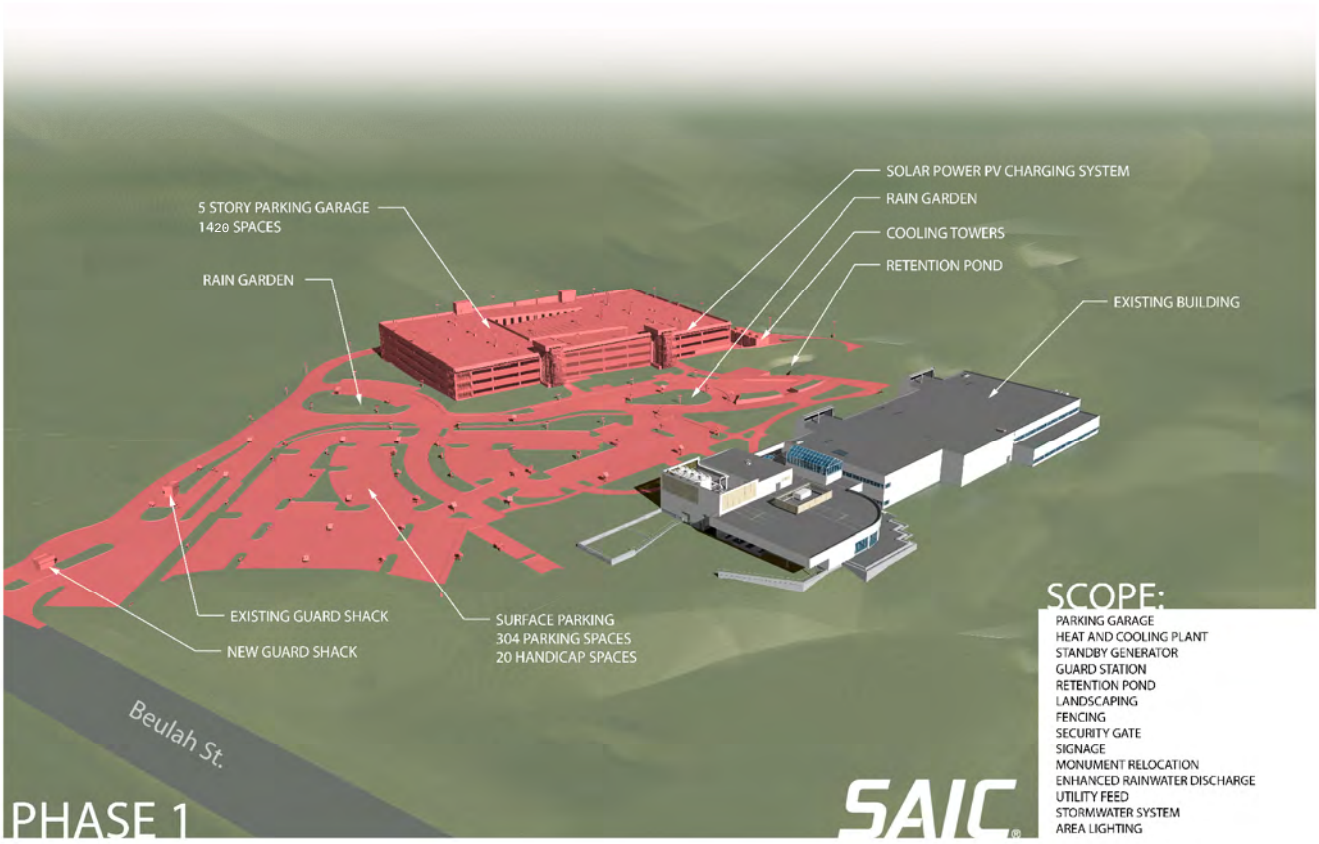

Figure 4a

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Proposed Project Construction Phases 3 & 4

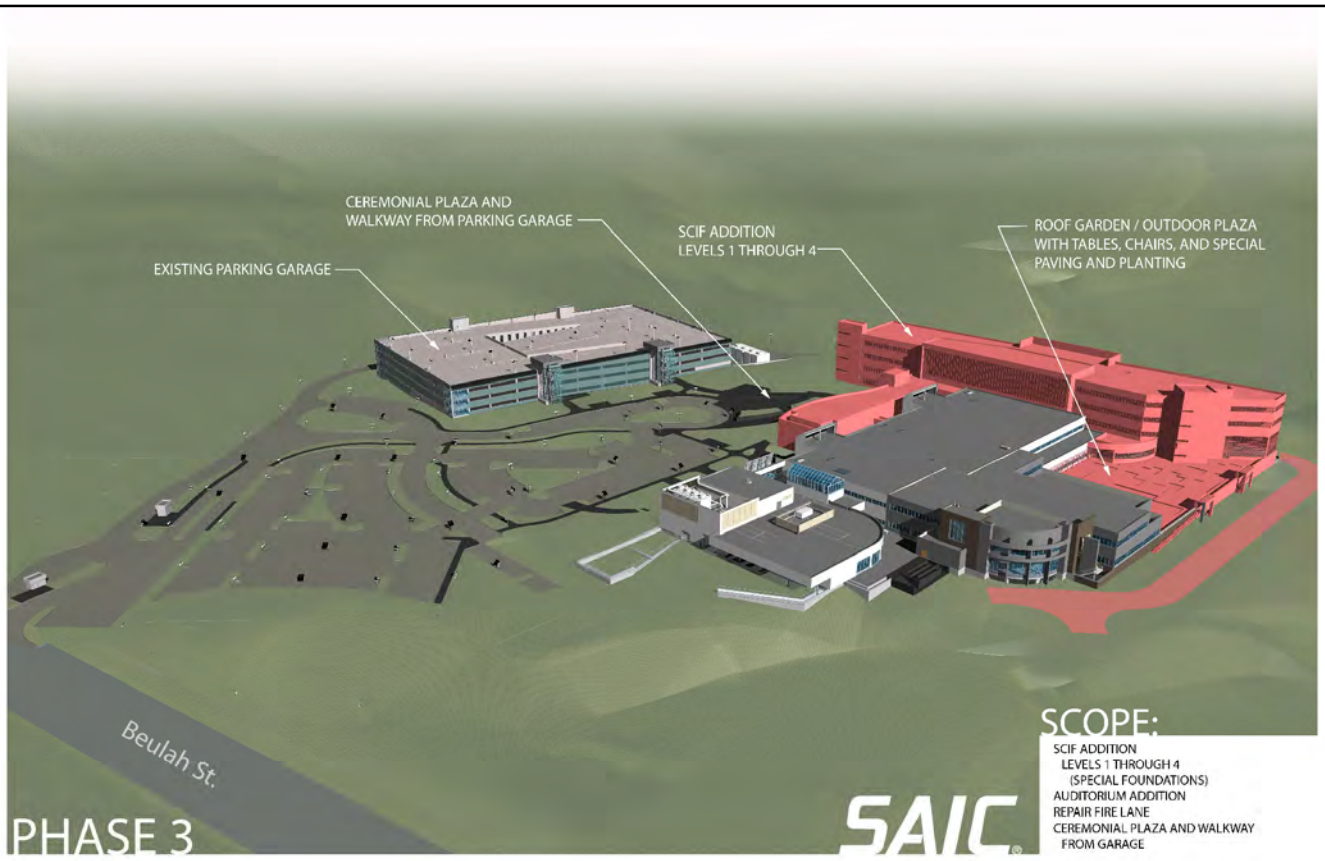

Figure 4b

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- Phase 2: constructing two basement levels and the ground level for a new addition to the Nolan Building. The addition would be approximately 188,000 square feet, and include a sensitive compartmented intelligence facility (SCIF), administrative areas, specialized operations space, special equipment storage, a server room, and a generator.

- Phase 3: constructing three more levels (approximately 194,000 square feet) of the building addition, including the SCIF, administrative area, classrooms, a server room, a wellness center, a shower, and a cafeteria. Approximately 30 percent of the new building will be equipped with a green roof, and another 30 percent with a roof top garden.

- Phase 4: renovating the existing 234,000-square-foot Nolan Building and completing any remaining site work.

Site work such as reconfiguring and reconstructing the surface parking lots, landscaping, roadways, sidewalks, utilities and stormwater management best management practices would proceed as needed during the first three phases. A turning lane would be constructed on Beulah Street from the site entrance to John J. Kingman Road during Phase 1 to accommodate traffic as workers are moved from leased space off-Post and other parts of the Post to the site.

The long-term reconfiguration of the surface parking lots at HQINSCOM would result in 2,006 parking spaces onsite, including 1,524 employee, 446 visitor and student, and 36 government surface parking spaces.

The new addition and the renovated, existing Nolan Building would function as a single building (throughout this document, the addition is referenced as the "new building," "proposed building," or "addition.") This approach would not only optimize the functional relationships among all HQINSCOM groups, but also would allow phased moves of personnel and equipment from the existing building into the new building and the incremental remodeling of the existing building. There would be minimal disruption of operations.

The proposed building addition would include operations space, special equipment storage areas, classrooms, office and administrative space, a server room, a wellness room and showers, and a cafeteria. Working space would extend two floors below grade, requiring excavation.

In the old building, concrete walls used to partition the interior space into secure areas and drywall partitions would be demolished and replaced by fewer partitioned areas and fewer private offices. In addition to replacing windows, skylights, and glassed entryways with blast-resistant AT/FP glazing, air intake systems would be protected. Intrusion and access control features would be incorporated into the design. The new structure would incorporate non-progressive collapse design, and window, entrance and curtain-wall reinforcement. The reconfiguration of access roads and parking lots would increase the clear zone between vehicles and the buildings for blast protection, and include vehicle entry control.

The new building would receive emergency back-up power from two new energy efficient 2,250-kilowatt generators (most likely employing Open Loop Selective Catalytic Reduction), with one generator to be installed during Phase I and one generator installed as part of Phase 2.

In addition, the generators providing back-up power for the existing Nolan Building would be replaced with Open Loop Selective Catalytic Reduction or similarly-efficient generators during Phases 3 and 4 of the project. The generators for the new building would be located in the new central utility building to be co-located with the proposed parking structure.

Consistent with Army policy, the new INSCOM facilities will achieve the Leadership in Energy and Environmental Design-New Construction (LEED-NC) silver rating criteria for sustainable design. In addition to incorporating energy efficient strategies into the overall design, the designers are examining ways to incorporate low impact design (LID) measures into the site design.

The project has been designed to comply to the maximum extent possible with Executive Order 13514, *Federal Leadership in Environment, Energy, and Economic Performance,* which directs federal agencies to "lead by example" in addressing a wide range of environmental issues. The current DoD criterion is that buildings be constructed to consume 40 percent less energy than the baseline consumption rate of a building constructed in accordance with American Society for Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE) Standard 90.1-2007. This project would fall short of those goals because of the nature of the INSCOM mission, which requires more power consumption for computer equipment than a normal building (INSCOM, 2011a). As a result, the project will require Army approval as an exception to the energy standard. In the meantime, INSCOM is evaluating strategies to further reduce energy consumption. For example, solar radiation would be used to heat a substantial portion of the new and renovated buildings. However, this measure alone would not be sufficient, and supplemental heating sources would be needed.

Implementation of the Proposed Action Alternative would meet all project requirements listed on page 2-1. Therefore, this alternative meets the purpose and need for the project and is a reasonable alternative.

2.2 Alternatives Considered but Dismissed

2.2.1 Build New Facility on Fort Belvoir

INSCOM considered constructing a completely new headquarters facility, including buildings, parking, and utilities on a different Fort Belvoir site. While this alternative would meet the project requirements listed on page 2-1, the alternative presented the following difficulties:

- The scarcity of sites on Fort Belvoir large enough to accommodate a complex of this size, able to accommodate 2,540 workers, and consistent with the approved Real Property Master Plan Long-Range Component (Subchapter 3.1.1). Most developable land with no environmental constraints on Fort Belvoir has already been developed or is being planned for future development as part of the current Real Property Master Plan process (Subchapter 3.9).

- An increase in overall cost of at least 65 to 70 percent to build anew on an undeveloped site. Even if a site of sufficient size exists, the construction of a completely new facility could cause far greater environmental impacts if, unlike the INSCOM site, the new site is presently undisturbed.
- If a redevelopment site of sufficient size were used, an even greater cost would be likely – the site would require demolition of existing buildings and potential remediation measures.

For these reasons, INSCOM dropped the concept of constructing a new complex on Fort Belvoir from further consideration, and this alternative is not considered further in this EA.

2.2.2 Minor Renovations of HQINSCOM Nolan Building

INSCOM also considered making minor modifications to improve space utilization within the existing Nolan Building on the HQINSCOM site. It would be a "quick fix" attempt to accommodate more personnel in the building by:

- Adding, moving, and removing wall partitions.
- Reducing the size of workstations and office areas to increase the number of personnel that could be accommodated.
- Converting meeting rooms and common areas into workstation areas.
- Increasing the capacity of infrastructure, especially utility systems, to accommodate added workstations and mission equipment.

This alternative is not reasonable because the capacity of the Nolan Building is already being exceeded, and the changes would not provide sufficient space to accommodate all HQINSCOM personnel and equipment, let alone in one building in a manner that contributes to mission effectiveness. This alternative would not meet the purpose and need for the proposed action and is not considered further in this EA.

2.2.3 Long-Term Lease Off-Post

INSCOM currently leases commercial space in Alexandria on a temporary basis. This alternative would increase the amount of commercial space needed on a long-term basis to accommodate the increase in personnel and equipment, while still maintaining most personnel in the current Nolan Building. To meet the increasingly stringent AT/FP, physical security, access control, and communications infrastructure requirements, this alternative would require a commercial venture to construct a new facility or extensively renovate an existing facility. Constructing such a secure, fenced facility on commercial real estate in the Washington DC metropolitan area is cost prohibitive. Because of the nature of much of its mission, INSCOM's space requirements preclude leasing most typical existing commercial spaces without costly modifications to ensure protection of classified information.

Given the commercial market right now (2012), there is probably plenty of commercial space available and many owners who would be willing to make the modifications. However, it is also likely that the building owner/manager would require a long-term lease (ten years or more), and this might make it difficult to accommodate future mission and/or personnel changes. This alternative would not meet the need to reduce costs of leasing or to consolidate personnel for more efficient and secure operations. Personnel in the leased space would continue to be separated from the personnel in the HQINSCOM Nolan Building and work in a less secure setting. Information security would be more difficult to maintain. Therefore, this alternative is not considered further in this EA.

2.2.4 No Action Alternative

The No Action Alternative represents the status quo. Under this alternative, the HQINSCOM Nolan Building would not be renovated other than for routine maintenance, an addition to the building would not be built, AT/FP elements would not be upgraded, HQINSCOM personnel would remain separated in two different facilities, and personnel now working in the Nolan Building would continue to work in cramped conditions that affect their ability to carry out their mission.

This alternative does not meet any of the requirements for this project articulated on page 2-1 and would not meet the purpose or need for the proposed action. Nevertheless, the No Action alternative is evaluated in this EA in accordance with CEQ guidance to serve as a baseline against which to measure impacts.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

The CEQ regulations implementing NEPA (40 CFR Part 1500) require documentation succinctly describing the environment of the area(s) to be affected by the alternatives under consideration, as well as a discussion of the impacts in proportion to their significance. The affected environment under the Proposed Action Alternative(s) ranges from site-specific physical and natural resources to broader regional concerns (i.e., air quality variables, noise, infrastructure, socioeconomic conditions, community facilities and services, transportation and traffic).

3.1 Land Use, Plans, and Coastal Zone Management

3.1.1 Land Use

Existing Conditions: Fort Belvoir is approximately 8,500 acres in size; approximately 65 percent of this land is undeveloped, much of it due to environmental constraints. The Post is divided into five areas: North Post, South Post, the Southwest Area, the Davison Army Airfield, and the Fort Belvoir North Area (FBNA - formerly called the Engineer Proving Ground). The North and South Posts are separated by US Route 1, which bisects the Post and is a major transportation corridor in this part of Virginia. The North and South Posts contain most of the development at Fort Belvoir.

Figure 5 (Land Use) shows Fort Belvoir's designated land use categories on and surrounding the HQINSCOM site. The HQINSCOM site is located in the upper part of North Post. Development in the upper North Post is clustered and of moderate to low density. Because of the presence of numerous environmental constraints, developed areas are not contiguous, and occur in the form of separate, fenced compounds or campuses, with associated support structures such as parking lots and parking garages. The HQINSCOM site is presently designated for professional/ institutional land use, as are the Defense Threat Reduction Agency (DTRA) and the Defense Logistics Agency (DLA) immediately west of Beulah Street.

The HQINSCOM site is bounded by a forested valley to the north and steep-sided, forested stream valleys associated with Mason Run to the east and south. Mason Run and its associated wetlands and Chesapeake Bay Resource Protection Area (RPA; described in Section 3.7.6) and the Fort Belvoir Forest and Wildlife Corridor (FWC) (described in Section 3.7.4) (Figure 6, Natural Constraints on Development) are designated in the Fort Belvoir Real Property Master Plan as "natural constraints on development." These protected areas separate the HQINSCOM site from John J. Kingman Road to the north, Keene Road (a little-used dirt road) and Gunston Road to the east, and Abbot and Stuart Roads to the south. Another small gravel access road south of the existing building currently intrudes into the Chesapeake Bay RPA.

The HQINSCOM compound is located within the Building Height Restriction Zone associated with Davison Army Airfield. The height restriction in this area is 216 feet (ft) absolute elevation. The existing HQINSCOM building does not exceed this threshold.

Impacts of No Action: The No Action Alternative would have no impact on current land uses on the Post. Existing conditions at the HQINSCOM compound would continue for the foreseeable future.

Impacts of the Proposed Action / Mitigation: The Proposed Action would rearrange the configuration of buildings, parking, roadways and other features on site, but no new functions or uses would be introduced at the site. The expansion areas would largely be confined to the existing footprint of the complex except for the proposed parking garage and a proposed access road along the east and south sides of the new building. These facilities would encroach on forested habitat, the FWC, and the Chesapeake Bay RPA to varying degrees, with the largest encroachment on forested habitat and the smallest encroachment on the Chesapeake Bay RPA. These impacts are addressed in Subchapter 3.7, and shown in Figures 6 and 16. Otherwise, the denser, new complex would be consistent with the existing pattern of clustered development that characterizes the upper North Post, and the Proposed Action would have no impact on existing land use. The proposed new structures would not exceed the threshold height of 216 feet (absolute elevation).

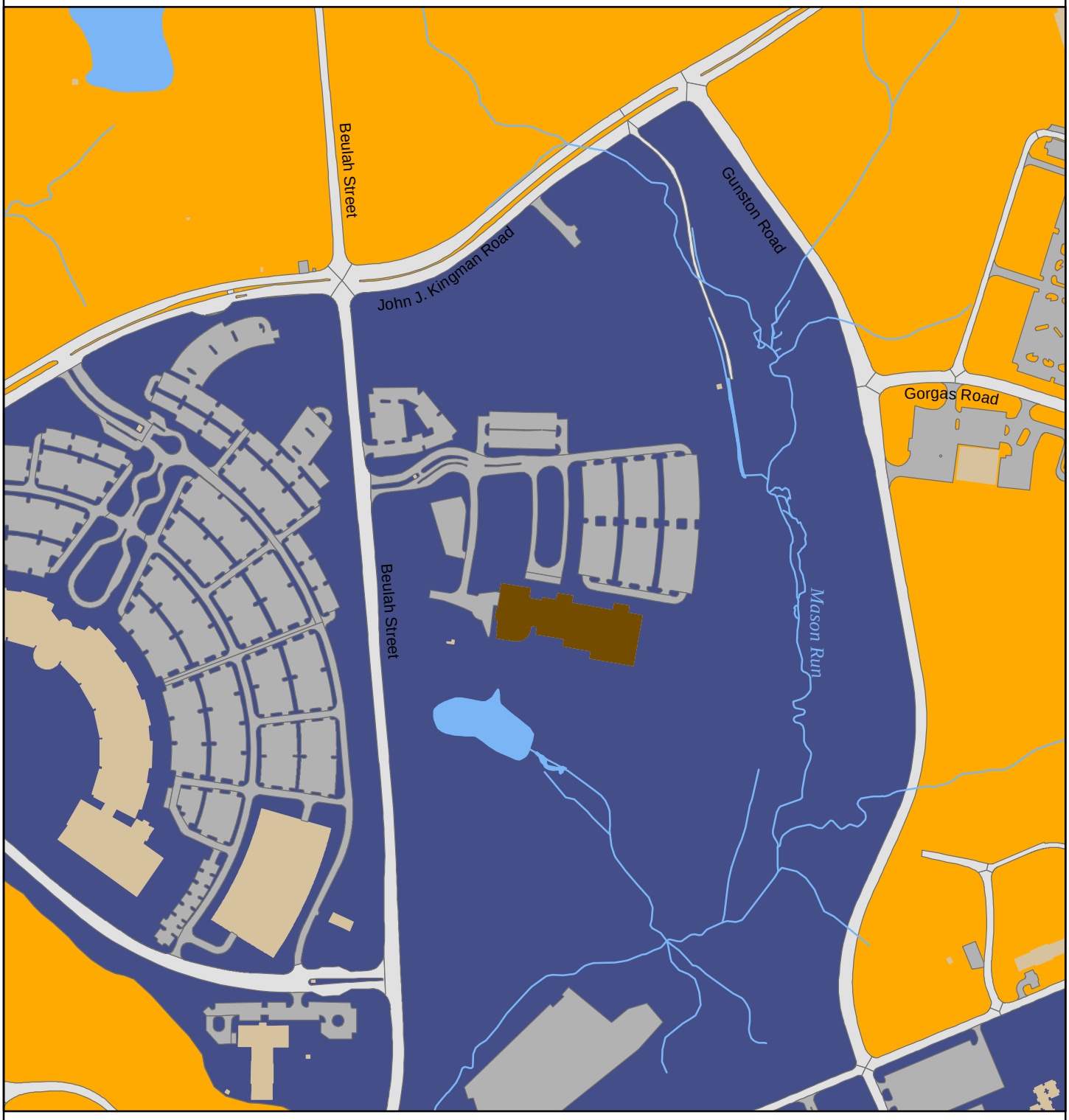
3.1.2 Plans

3.1.2.1 Fort Belvoir Real Property Master Plan

Existing Conditions: In 2007 in response to the 2005 Base Realignment and Closure (BRAC) process, the Army updated and amended the land use plan in Fort Belvoir's 1993 Real Property Master Plan. The *Final Environmental Impact Statement for the Implementation of the 2005 Base Realignment and Closure Recommendations and Related Army Actions at Fort Belvoir* addressed the adoption of the amended land use plan as well as BRAC realignment plans (US Army Corps of Engineers, 2007). The Army is currently in the process of preparing an update of the Real Property Master Plan to address future growth on the garrison through 2030. The HQINSCOM site is designated as professional/institutional under both the 2007 land use plan, which is currently in effect, as well as the land use plan being proposed as part of the update of the Real Property Master Plan.

Impacts of No Action: The No Action Alternative would have no impact on land use plans.

Land Use



Source: Fort Belvoir GIS

Figure 5

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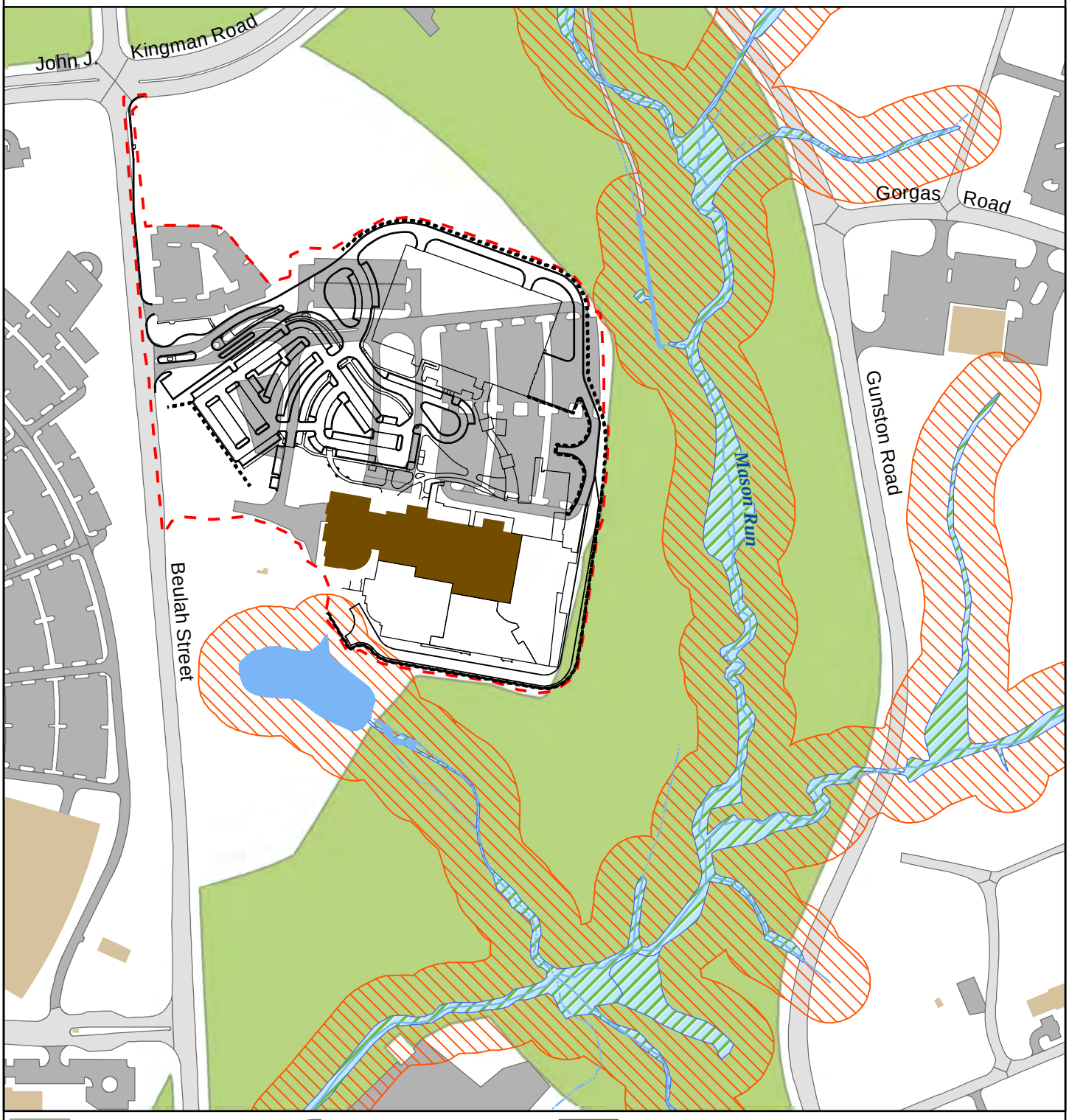
Natural Constraints on Development



Source: Fort Belvoir CAD and GIS

Figure 6

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Impacts of the Proposed Action / Mitigation: The Proposed Action would be consistent with both the approved land use plan and the plan proposed as part of the update of the Real Property Master Plan: both designate the HQINSCOM site for professional/institutional uses. The proposed intensification of the development on the site, keeping within already-developed areas to the greatest extent possible, and reuse of surface parking lots for a parking structure are in line with development parcel planning strategies proposed in the update of the Real Property Master Plan.

The Proposed Action would require a small (0.34 acre) incursion into the FWC (an overlay area designated as "natural constraints to development" under the existing and proposed plans), which would represent an irretrievable commitment of natural resources. INSCOM would convert part of the developed area back into a natural area as mitigation. INSCOM would remove pavement from a 0.34-acre section of the current surface parking lot, grade it, seed it, and plant native trees to replace the portion of the FWC affected. The Proposed Action is otherwise unlikely to affect any land that would be designated for a different use, and would not likely preclude any options under the continuing master planning process. No other mitigation is necessary.

3.1.2.2 National Capital Planning Commission

Existing Conditions: Federal actions in the National Capital Region must be reviewed by the National Capital Planning Commission (NCPC). NCPC prepares the *Federal Elements of the Comprehensive Plan for the National Capital*. One element of the Comprehensive Plan, *Federal Workplace: Location, Impact, and the Community*, lists policies for building and development codes, energy efficiency, working environment, and physical security. Policies applicable to the proposed action include:

National Capital Planning Commission

NCPC is the central planning agency for the federal government in the National Capital Region, which includes the District and several counties in Maryland and Northern Virginia.

- Using innovative energy conserving techniques such as High Performance and Sustainable Building, Low Impact Building, Leadership in Energy and Environmental Design (LEED) strategies and requirements of the Energy Policy Act of 2005.
- Planning employee support through child-care among other considerations.
- Designing security barriers and checkpoints at vehicular entry points on federal installations to accommodate vehicular queuing on site, and to avoid adverse effects on adjacent public roadways operations and safety (NCPC, August 2004).

A second element of the NCPC Comprehensive Plan, *Transportation*, lists federal parking policies and associated parking ratios to address the area's traffic congestion and poor air quality. For suburban federal facilities located more than 2,000 feet away from a Metrorail Station (about a ten-minute walk), which is the situation for all of Fort Belvoir, the parking ratio should reflect a phased approach linked to planned improvements over time. Federal facilities served by high occupancy vehicle (HOV) lanes are expected to achieve a parking ratio of one space per two employees. Federal facilities not served by HOV lanes, which is the situation at Fort Belvoir, are expected to achieve a parking ratio of one space for every 1.5 employees (0.67 spaces per

person). The U.S. Army has its own, stricter standard of 0.6 spaces per person which is equivalent to one space for every 1.67 employees.

NCPC guidance mandates that federal agencies develop a transportation management program (TMP) when preparing a master plan or requesting site plan approval and anticipating an increase in personnel. The goal of preparing a TMP is to foster more efficient employee commuting patterns by minimizing "single occupant vehicle" (SOV) trips related to federal agency worksites. This is mandated by federal air quality regulation, local trip reduction ordnances, and NCPC planning requirements. Fort Belvoir is in the process of preparing an installation-wide TMP to support the update of the Real Property Master Plan. INSCOM has prepared a TMP specifically for this Proposed Action, as described in Sections 3.2.1 and 3.2.2.

Impacts of No Action: The No Action Alternative would have no impact on current plans or the ongoing planning process.

Impacts of the Proposed Action / Mitigation: The expanded and renovated INSCOM facility would achieve LEED-NC silver criteria. INSCOM does not propose to have a child care facility on the site. However, the Army recently completed construction of two child development centers on the South Post, is in the process of building two new centers on the FBNA, and plans to build another on North Post in the next year to service incoming workers associated with BRAC 2005 and other realignments. These centers will increase the capacity to provide child care on Fort Belvoir by 874 children.

The access control point would not be modified. Vehicle queuing at HQINSCOM's entrance is not presently an issue because Beulah Street "dead-ends" south of the site. Reconfiguration of the surface parking lots and the new parking garage would provide 2,006 parking spaces on the INSCOM site: 446[1] spaces reserved for visitors and students, 36 spaces reserved for government-stored vehicles, and the remaining 1,524 for INSCOM employees. The ratio of employee parking spaces to employees would be approximately 1 space per 1.67 employees (0.60 spaces per employee) which is lower than but consistent with the NCPC recommendations for federal facilities not served by a high occupancy vehicle (HOV) lane, and also meets the Army's standard of 0.60 spaces per employee (INSCOM, 2012).

NCPC will be given the opportunity to review this EA, assess the proposed action's compatibility with federal planning goals, guidelines, and initiatives, and provide comments before the decision is made to proceed with the action.

The expansion has been designed to fit as much within the area that has already been disturbed to the extent practicable. No additional mitigation is proposed.

[1] This number includes 141 informal parking spaces along Beulah Street. Parking along Beulah Street is discussed further in Section 3.2.1.

3.1.3 Coastal Zone Management

Existing Conditions: The Coastal Zone Management Act (CZMA) of 1972 (16 USC § 1451, et seq., as amended) provides assistance to the states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. Section 307(c)(1) of the Coastal Zone Management Act Reauthorization Amendment (CZMARA) stipulates that federal projects that affect land uses, water uses, or coastal resources of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of that state's federally-approved coastal management plan. The Commonwealth of Virginia has developed and implemented a federally-approved Coastal Resources Management Program (CRMP) describing current coastal legislation and enforceable policies. There are enforceable policies for: Fisheries Management, Subaqueous Lands Management; Wetlands Management; Dune Management; Non-point Source Pollution Control; Point Source Pollution Control; Shoreline Sanitation; Air Pollution Control; and Coastal Lands Management.

Virginia's coastal zone includes all of Fairfax County, including Fort Belvoir; therefore, federal actions at Fort Belvoir are subject to federal consistency requirements. The Virginia Department of Environmental Quality (VDEQ) serves as the lead agency for consistency reviews.

Impacts of No Action: The No Action Alternative would have no impact on the Virginia coastal zone or future implementation of the CRMP.

Impacts of the Proposed Action / Mitigation: Fort Belvoir has determined that the proposed action is consistent, to the maximum extent practicable, with the Commonwealth of Virginia CRMP's enforceable policies, as described in Appendix E, Coastal Consistency Determination. In a response dated October 11, 2012 contained in Appendix E, the Virginia Department of Environmental Quality (VDEQ) conditionally concurred with this determination provided the proposal complies with all applicable permits, approvals and conditions. The one condition, which the Army will address during the final design of the second project phase, is that the Army demonstrate that there are no alternatives to aligning an emergency access road through a Resource Protection Area (RPA) (see discussion in Section 3.7.6), that encroachment and adverse effects on water quality are minimized, a water quality impact assessment is performed, and the Virginia Department of Conservation and Recreation (VDCR) reviews the plan for the road. Fort Belvoir has prepared a preliminary water quality impact assessment, discussed this issue with VDCR, and obtained preliminary approval that the minor encroachment is exempted and the project is consistent with the CZMA.

3.2 Traffic and Transportation Networks

3.2.1 Transportation Network

Existing Conditions: Four principal roadways define the Northern Virginia highway system in the vicinity of the site (Figure 7, Transportation Network in the Vicinity of HQINSCOM): Interstate (I)-95, Fairfax County Parkway (Virginia Route [VR] 7100), Richmond (Jefferson

Davis) Highway (US 1), and Telegraph Road (VR 611). I-95 is the major north-south travel route for traffic traveling along the East Coast through Northern Virginia. US 1 is a major four-lane north-south transportation arterial that parallels I-95 in Northern Virginia and serves regionally as an alternate corridor to I-95, connecting the City of Alexandria with points south, including Fort Belvoir, Lorton Road, and the Fairfax County Parkway. Route 1 passes through Fort Belvoir, while I-95 is located over two miles west of the project area.

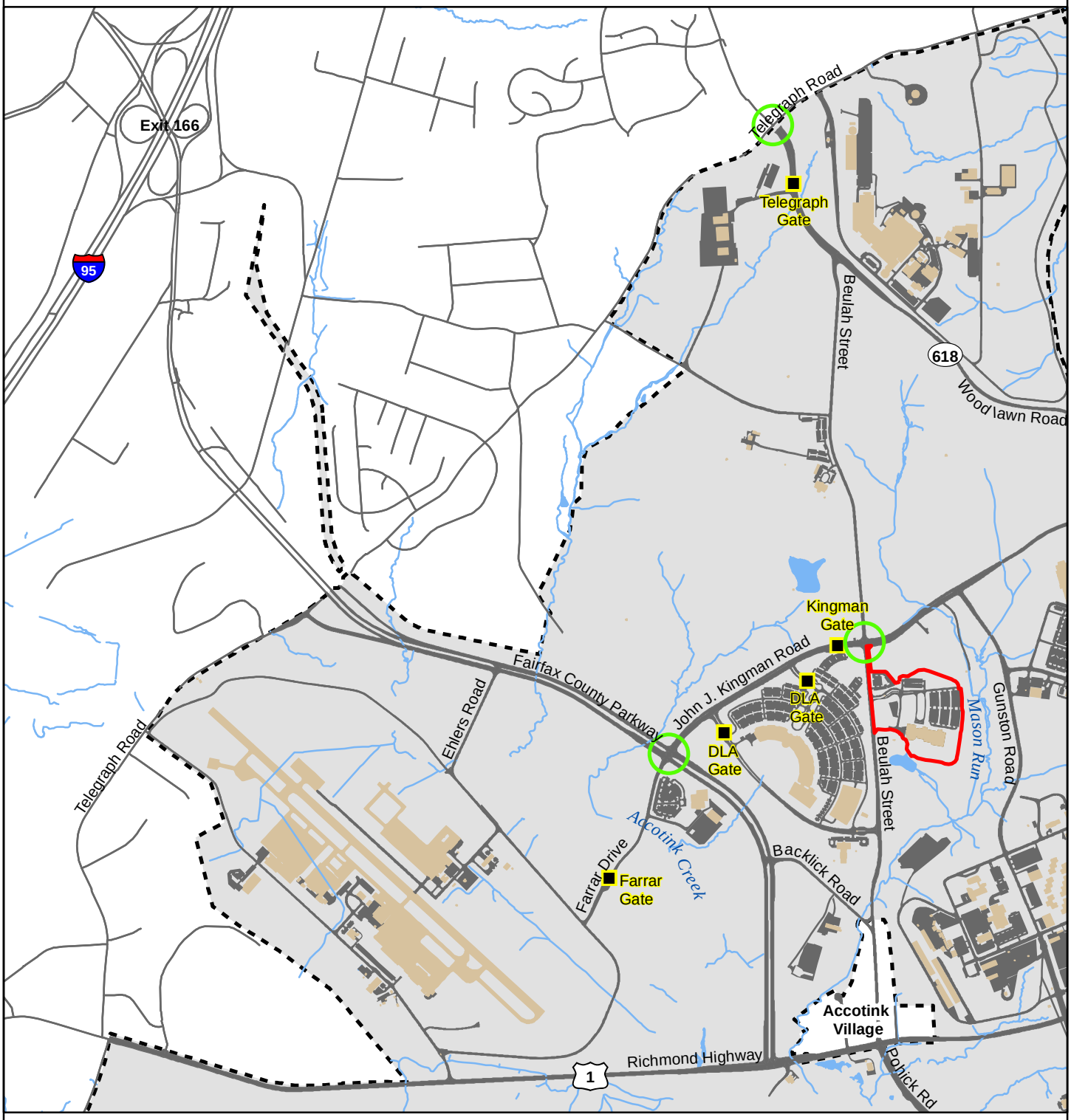
Direct access to Fort Belvoir from I-95 is primarily via the Fairfax County Parkway (Route 7100 via Exit 166) with alternate access points at Lorton Road (Exit 163) and US 1 (Exit 161). The Fairfax County Parkway is a divided four-lane limited access highway that links Fort Belvoir with not only I-95, but the northern and western parts of Fairfax County. It connects with Route 1 approximately 0.8 miles southwest of the INSCOM site. For North Post destinations, Telegraph Road is another public roadway that provides direct access to the northern boundary of North Post and intersects with Fairfax County Parkway.

As shown on Figure 7, two gates control access to North Post: the Kingman Gate, which controls access from the Fairfax County Parkway and the Telegraph Gate, which controls access from Telegraph Road and Beulah Street. Based on a commuter survey of INSCOM personnel, 65 percent of INSCOM commuters use Kingman Gate and 23 percent use Telegraph Gate to access the site in the morning (the remainder used South Post gates or lived on Fort Belvoir). Kingman Gate is the closest gate to INSCOM, located only 0.3 miles away (the intersection of Kingman Road and Fairfax County Parkway is approximately 0.75 miles away). The Telegraph Gate is approximately 1.3 miles away. All visitors to the installation, including to INSCOM, must use Tulley Gate, accessible from Route 1 and located approximately 3.1 miles away from the site (INSCOM, 2012).

Within North Post, the INSCOM site is primarily served by three installation roadways:

- Beulah Street is a north-south road that provides access to North Post from Telegraph Road (through Telegraph Gate). The INSCOM site is located directly off of Beulah Street, south of Kingman Road. At this location, Beulah Street is two lanes and dead-ends after the access to INSCOM and a seldom-used back gate to the DLA facility (Atkins, 2012).
- John J. Kingman Road (Kingman Road) is an east-west roadway that provides direct access to North Post from the Fairfax County Parkway (via Kingman Gate). As the primary access to North Post, it sees heavy traffic during peak periods. It is a four-lane divided roadway for most of its extent, but becomes a two-lane undivided road east of Gunston Road.
- Gunston Road is the Installation's major north-south roadway that provides the only connection between North and South Posts via a grade-separated crossing over Route 1. Gunston Road does not directly access the INSCOM site, but is the main roadway that serves North Post in general.

Transportation Network in the Vicinity of HQINSCOM



Study Intersection
Gate
INSCOM Site
Waterbody
Pavement
Existing INSCOM Building
Existing Building
Installation Boundary

N

0 885 1,770 3,540 Feet

Source: Fort Belvoir GIS

Figure 7

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Currently, there are 951 parking spaces within the INSCOM compound to accommodate personnel and visitors. The number of visitors to the site fluctuates and can be considerable. Current parking demand outstrips the supply of parking spaces, which can result in up to approximately 141 additional vehicles parking along the shoulders of Beulah Street, creating a traffic safety problem. On some days parking demand exceeds even what can be accommodated along the shoulders of Beulah Street, and employees and visitors must park wherever they can find space, spilling over onto lawns and other green space. The ratio of parking spaces to employees is discussed in Section 3.1.2.2.

Commuter transit services to the part of the Post where INSCOM is located are not immediately adjacent and are inconvenient. Fairfax Connector Route 171 buses (all-day service) connect INSCOM commuters with the Virginia Railway Express (VRE) Lorton Station, three mi southwest of the INSCOM site. Fairfax Connector Routes 333/334 (all-day service) and 335 (express, peak hour; the "Belvoir Eagle") buses connect commuters directly to the Franconia/Springfield Metrorail Station/VRE Station, approximately three mi north of the INSCOM site. However, the buses do not directly serve the INSCOM site, and the nearest bus stop, for Route 335 and an internal Belvoir peak hour shuttle, is located at the intersection of John J. Kingman Road/Beulah Street, about 1,700 ft from the entrance to the Nolan Building or about a five-minute walk. Bus stops for Routes 33/334 and 171 are located on the DLA site, which requires a greater-than-five-minute walk to access the stops indirectly through a DLA gate (INSCOM, 2012).

As part of an installation-wide Transportation Management Program (TMP) process, Fort Belvoir initiated a commuter survey in October 2011 to gather information on current travel activities between home and work for all personnel, and to understand employee demographics and attitudes toward commuting choices. The survey included all INSCOM personnel, both at Fort Belvoir and Metro Park. Of the 274 INSCOM respondents, 0.5 percent used bus services; 4.0 percent used the Virginia Railway Express (VRE); 5.0 percent used vanpools/carpools; 2.0 percent rode motorcycles; 1.0 percent either walked or rode bicycles; and 87.0 percent drove alone to work (INSCOM, 2012).

Impacts of No Action: The No Action Alternative assumes that while INSCOM would not expand, other short-range projects proposed for Fort Belvoir's North Post and the Davison Army Airfield would be implemented by 2018 (IMCOM, 2012). These other projects include improvements to Fort Belvoir's streets and roads, as well as improvements to the Fairfax County Parkway, John J. Kingman Road, and Farrar Drive intersection and to the Kingman Gate to facilitate traffic flow. Other major transportation improvements on Fort Belvoir include the planned widening of US Route 1 from four to six lanes and the completion of Mulligan Road, which will connect US Route 1 with Telegraph Road through Fort Belvoir. Additional lanes are being added to the Telegraph Road and Beulah Street intersection by the new shopping center being built in the northwest quadrant of the intersection. Together these projects will improve traffic flows on, through, and near Fort Belvoir.

Improving commuting choices to and within Fort Belvoir and decreasing single-occupant (SOV) use is the objective of an installation-wide TMP that is currently in preparation as well as an INSCOM-specific TMP (INSCOM, 2012). The goal of the INSCOM TMP is to achieve a

maximum of 60 percent of the commuting workforce driving alone with 40 percent using other means as ridesharing, transit, walking and biking, or working at home or at satellite facilities. Implementing the TMP commitments will reduce the impact of Fort Belvoir personnel on area roads.

Impacts of the Proposed Action and Mitigation: The Proposed Action would add a lane to Beulah Street from HQINSCOM's entrance to the John J. Kingman and Beulah Street intersection to facilitate turns at that intersection as well as site entry and egress during peak periods. This would minimize traffic delays in the future. As stated in Section 3.1.2.2, the 141 informal parking spaces along Beulah Street would remain following implementation of the proposed action and would be utilized as visitor/student parking on days when parking needs on the INSCOM site exceed capacity The proposed action does not include changes to the existing transit system, but as described above under the discussion of No Action Alternative impacts, INSCOM is committing to implementing a TMP for the future that aims to reduce SOV use in favor of other modes of travel or working at home/satellite offices. By intentionally constraining the amount of parking available in the future under the Proposed Action to 0.60 spaces per employee, INSCOM is indicating its commitment to meeting the Army's goal of having 40 percent of the workforce commuting by means other than SOVs. INSCOM's TMP commitments will reduce the impact of an increased number of INSCOM personnel on area roads.

3.2.2 Traffic

Existing Conditions: Traffic turning movement counts were collected at the three intersections closest to the HQINSCOM site and most likely to be affected by future increases in personnel on October 25 and 26, 2011 in the morning and afternoon peak periods:

- John J. Kingman Road and Beulah Street.
- Telegraph Road and Beulah Street (north of the Telegraph Gate)
- Fairfax County Parkway and John J. Kingman Road (west of the Kingman Gate).

Figure 7 shows the location of the three intersections, all of which are signalized. Automatic traffic recorder tube counts were also taken for 24 hours on Beulah Street just south of the intersection with John J. Kingman Road and at the HQINSCOM driveways, east of Beulah Street between October 24 and November 7, 2011.

Dewberry & Davis's traffic engineers used the collected traffic data and the intersection turning movement geometry as inputs to the *Synchro 8 Traffic Signal Timing Analysis Software* program to analyze the traffic operations at the three key intersections. The program calculates a series of parameters that describe the characteristics of the operation of the intersection, including the average delay per vehicle for each intersection turning and non-turning movement, for each overall approach, and for the overall intersection. These average delay values were then used to determine the level of service (LOS) for each movement, the

LOS	Signalized Intersections
A	≤10 seconds
B	10-20 seconds
C	20-35 seconds
D	35-55 seconds
E	55-80 seconds
F	≥80 seconds

overall approach, and the overall intersection. Turning movement counts, average delays, and levels of service at the three intersections are shown in Table 1 of Appendix A, *Traffic Assessment, U.S. Army Intelligence and Security Command (INSCOM), Fort Belvoir, Fairfax County, Virginia*. Intersection turning movements are illustrated in Figures 8 and 9 in Appendix A.

Traffic "Level of Service"

There are six ranges for classifying the Level-of-Service (LOS) at an intersection – "A" through "F". The LOS at an intersection is based on average control delay, with LOS "A" representing the best operating condition and LOS "F" the worst. Level of Service "D" is considered acceptable in most jurisdictions. Generally, this condition corresponds to a steady traffic flow, where most vehicles crossing through the intersection pass through during a green cycle. Some minor delays or queues may form at intersections if they do not have dedicated lanes to store vehicles awaiting an opening in the opposing traffic stream to make turns onto side streets or driveways.

All three intersections operate as LOS B, C, or D during the AM (6-9 AM) and PM peak hours (3-6 PM). Figure 8 (Existing Overall Intersection Levels of Service) depicts the overall existing key intersection LOSs. LOS B, C, and D are generally considered acceptable for the congested peak hours. Within these overall acceptable operations, several of the intersection movements and approaches operate at LOS E or F, which are indicated in Table 1 in Appendix A in red. Farrar Drive, which is the west leg of the Fairfax County Parkway and John J. Kingman Road intersection, for example, operates at LOS E and F in both peak periods. Farrar Drive is the least-used roadway at that busy intersection and gets the least green light time. While LOS of E and F are undesirable, they are deemed to be tolerable as long as the overall LOS for the intersection as a whole is LOS D or better.

Impacts of the No Action Alternative: Traffic volumes for 2018 (the "build" year when the Proposed Action would be complete) without expansion of INSCOM were estimated by applying growth factors to the existing traffic volume data. Traffic growth that would occur even if HQINSCOM were not expanded include normal background traffic growth of two percent per year for six years (2012-2018) plus the growth in traffic entering and leaving North Post and Davison Army Airfield resulting from the implementation of Fort Belvoir's programmed short-range projects anticipated by 2018 as part of the current Real Property Master Plan process (IMCOM, 2012). Traffic growth factors are described in more detail in Appendix A.

The resulting 2018 No Action (No-Build) Alternative traffic volumes were then reduced/adjusted downward to reflect the anticipated implementation of an installation-wide Transportation Management Program now being prepared for Fort Belvoir. As part of the overall effort to moderate the growth of traffic generated by Fort Belvoir, the commanders of the Post have made a commitment to support a Transportation Management Program that will encourage personnel to reduce single occupant vehicle (SOV) use by carpooling, working at home, using transit, commuting by bicycle, etc. It is anticipated that by 2018 SOV use will be reduced from approximately 85 percent to 75 percent installation-wide (Dewberry, 2012).

Figure 9 (2018 No Build Overall Intersection Levels of Service) depicts the LOS at the three key intersections in 2018, assuming that HQINSCOM would not be expanded but that other planned projects on Fort Belvoir would be implemented and that there would be growth in traffic from

residential and commercial developments in the area. Tables 5, 6, and 7 in Appendix A give the volumes, delay, and LOS for the "INSCOM No-Build" future conditions.

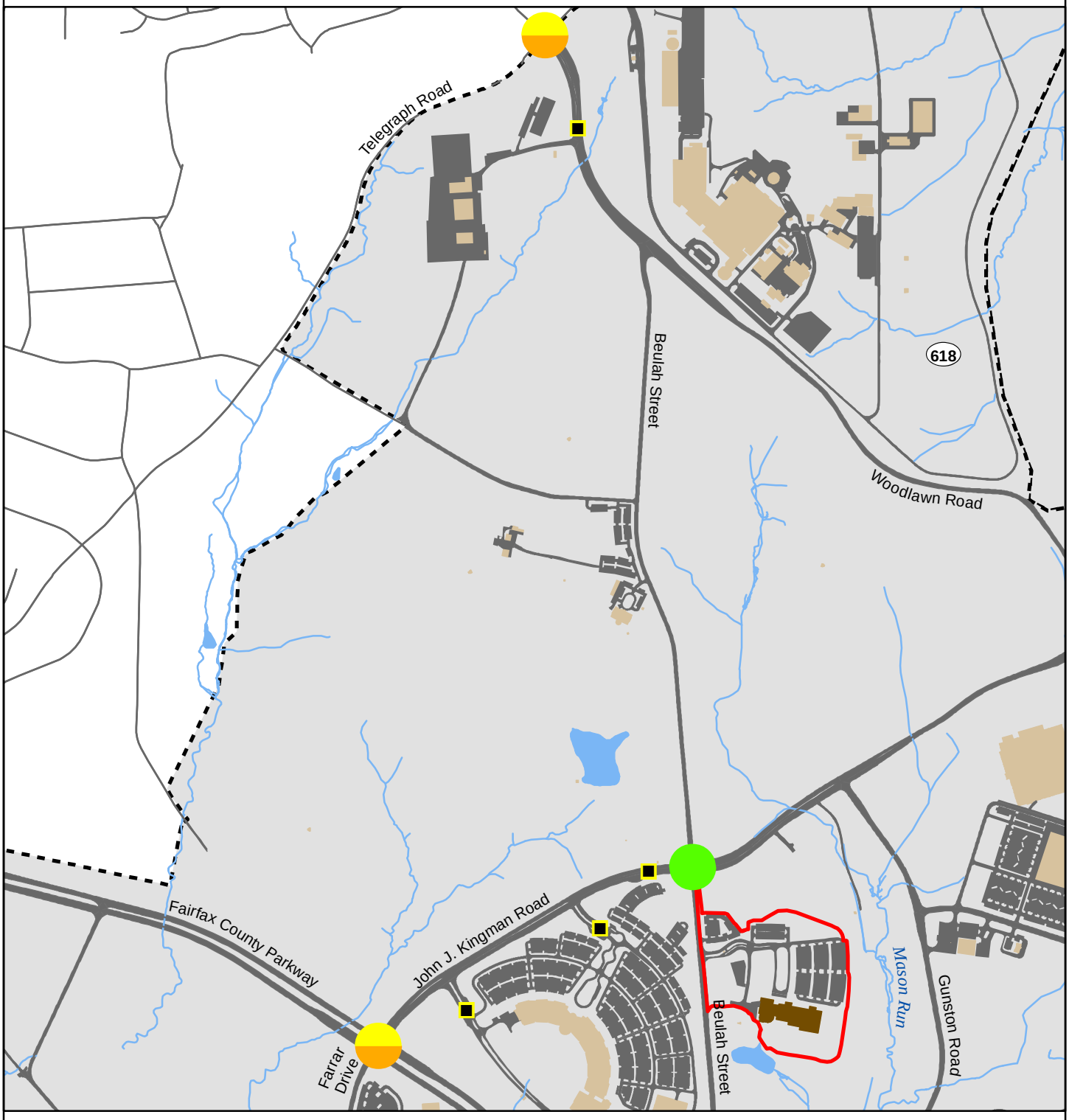
All overall intersection LOSs would be acceptable, although delays would increase compared to current conditions. The Fairfax County Parkway, John. J. Kingman Road, and Farrar Drive intersection would operate at LOS D in both periods. The Telegraph Road and Beulah Street intersection would operate at LOS C in both periods (it will be upgraded as a requirement of the construction of a new shopping center off-Post). The more lightly-used John J. Kingman Road and Beulah Street intersection would function at LOS C in both peak periods.

Impacts of the Proposed Action / Mitigation: The effects of expanding the number of HQINSCOM personnel on traffic conditions in the "build" year of 2018 were estimated. Trip generation based on the increase in the size of the facility was used to estimate future trips, which were then added to the 2018 No-Build traffic volumes resulting from applying the growth factors and reductions described above. This process is described in more detail in Appendix A. Figure 10 (2018 Proposed Action (Build) Overall Intersection Levels of Service) illustrates the overall LOS for each of the three key intersections.

All overall intersection LOSs would be acceptable, although delays would increase compared to current conditions and also compared to 2018 No Action estimates. For the Fairfax County Parkway, John J. Kingman Road, and Farrar Road intersection, the average increase in delay per vehicle from future No Build to Build conditions would be less than five seconds. The Farrar Road leg of the intersection would be most affected because the lower volume of traffic commands less green time. For the Telegraph Road and Beulah Street intersection, the average increase in delay would be only about one second. The LOS and average delays at the Telegraph Road and Beulah Street intersection are expected to degrade when the new Hilltop Village Center, featuring 150,000 sq ft of grocery store and retail/office space with approximately 1,000 parking spaces is completed; however, the impact of the Build Alternative, which did not include the Hilltop Village Center in the analysis, is expected to remain minor. All three intersections would continue to operate at acceptable LOSs. Appendix A's Tables 5, 6, and 7 give the resulting volumes, average delays, and LOS for each of the three intersections in the AM and PM peak periods.

Because all three key intersections near HQINSCOM would continue to function at acceptable traffic service levels after INSCOM's personnel are consolidated following building expansion and renovation, there would be no need for mitigation of traffic impacts.

Existing Overall Intersection Levels of Service



Source: Fort Belvoir GIS

Figure 8

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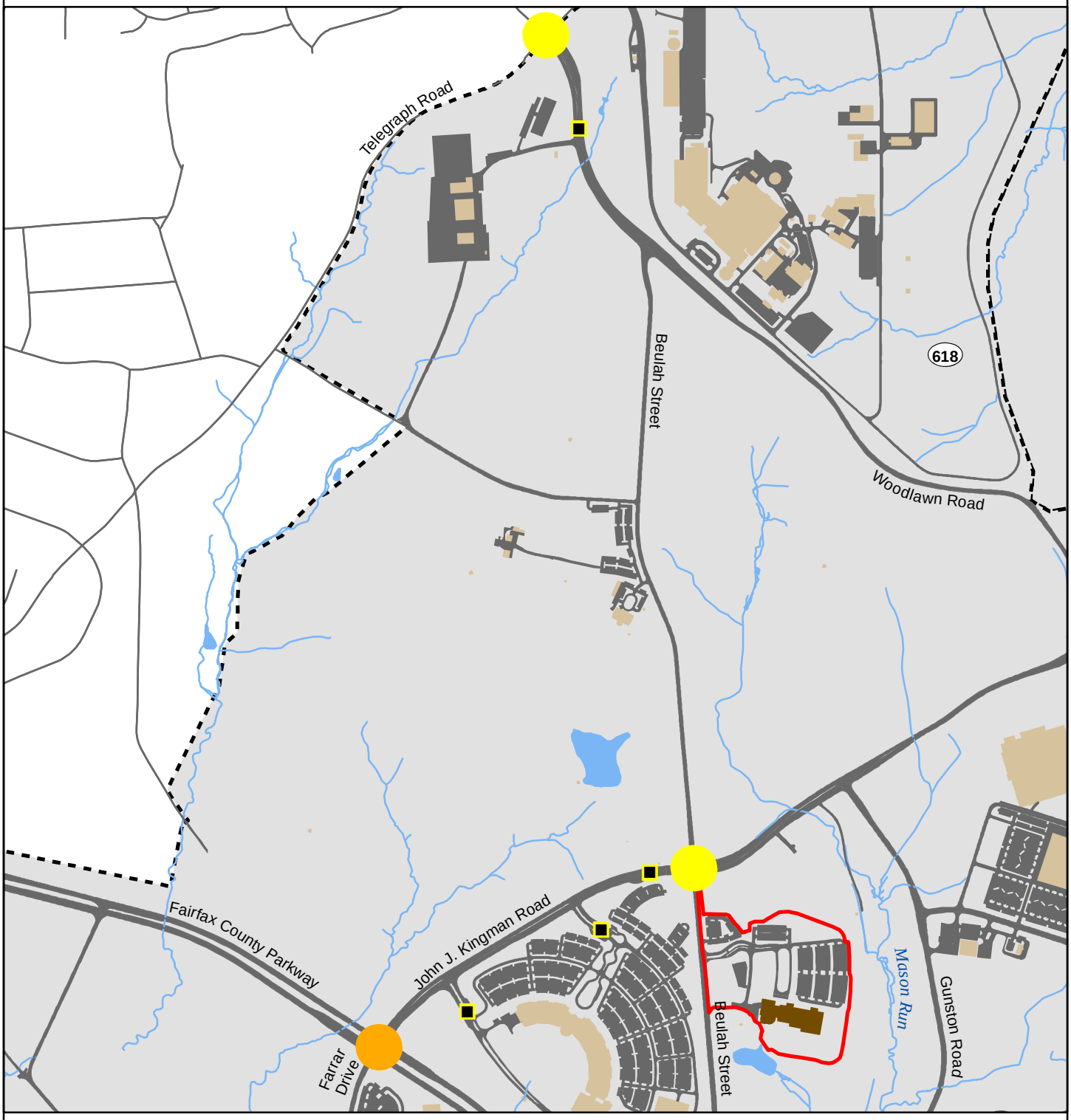
2018 No Build Overall Intersection Levels of Service



Source: Fort Belvoir GIS

Figure 9

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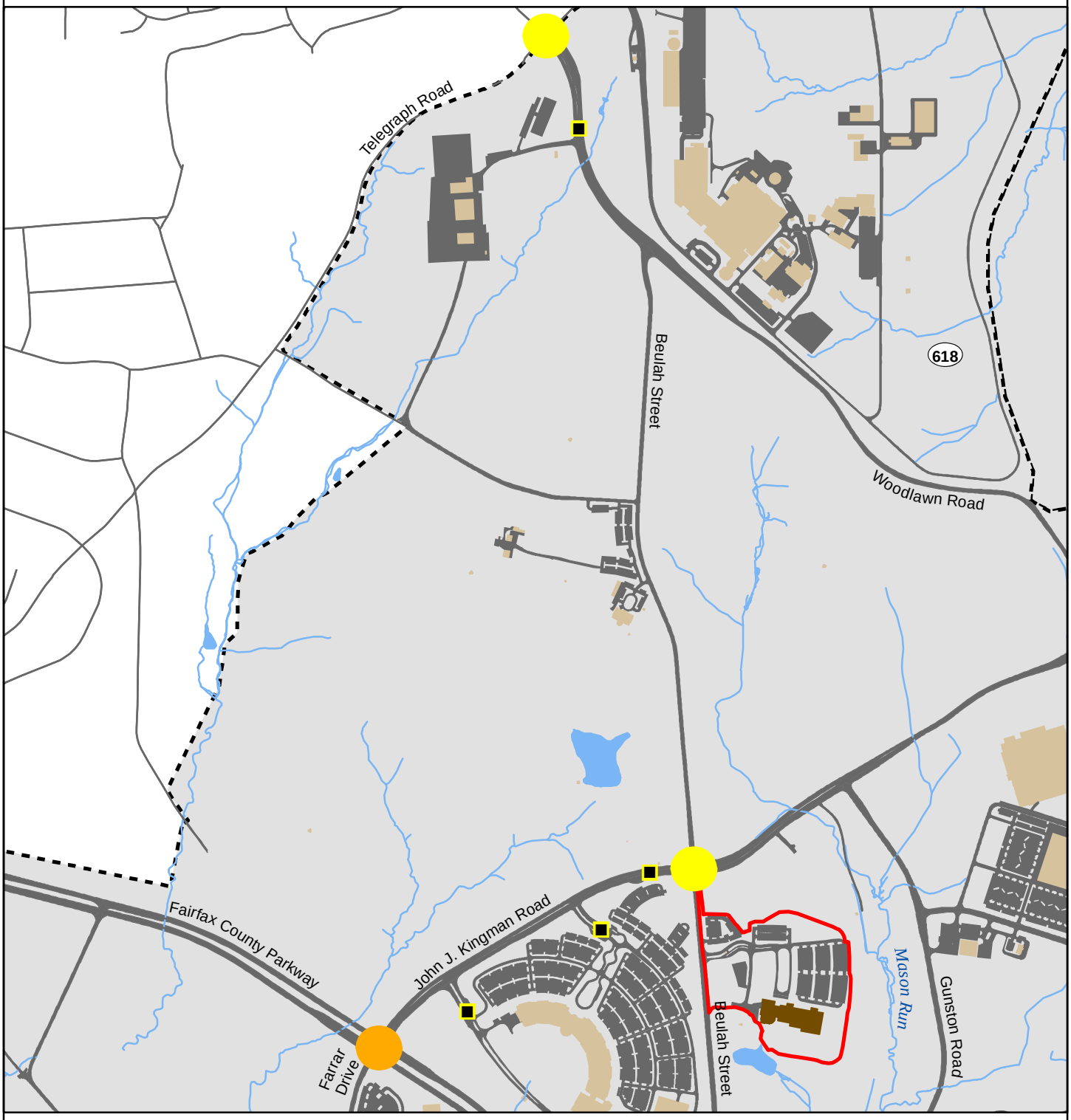
2018 Proposed Action (Build) Overall Intersection Levels of Service



Source: Fort Belvoir GIS

Figure 10

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3.3 Air Quality

Existing Conditions: The USEPA Region 3 and the VDEQ regulate air quality in Virginia. The Clean Air Act (42 U.S.C. 7401-7671q), as amended, gives the USEPA responsibility to establish primary and secondary National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants: particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), carbon monoxide (CO), nitrous oxides (NOx), ozone (O_3), and lead. Short-term NAAQS (1-, 8-, and 24-hour periods) have been established for pollutants contributing to acute health effects, while long-term NAAQS (annual averages) have been established for pollutants contributing to chronic health effects. While each state has the authority to adopt standards stricter than those established under the Federal program, the Commonwealth of Virginia accepts the Federal standards.

Federal regulations designate Air Quality Control Regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below the NAAQS as *attainment* areas. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme. Fairfax County (and therefore Fort Belvoir) is within the National Capital Interstate AQCR (AQCR 47) (40 CFR 81.12). AQCR 47 is in the O_3 transport region that includes 12 states and Washington, DC. The USEPA has designated Fairfax County as the following:

$PM_{2.5}$ Precursors

VOCs and ammonia were also identified as potential $PM_{2.5}$ precursors. However, neither Virginia nor USEPA has found that ammonia contributes to $PM_{2.5}$ problems in AQCR 47 or other downwind areas. Therefore, ammonia was not carried forward for detailed analysis, while the VOC emissions are addressed as a precursor to O_3.

- Marginal nonattainment for the 8-hour O_3 NAAQS.
- Nonattainment for the $PM_{2.5}$ NAAQS.
- Attainment for all other criteria pollutants (40 CFR 81.347).

Fort Belvoir holds a Title V operating permit (No. NVRO70550) that is pending renewal (VDEQ 2011). The permit requirements include annual periodic inventory for all significant stationary sources of air emissions and also covers monitoring, recordkeeping, and reporting requirements. Fort Belvoir's 2010 installation-wide air emissions for all significant stationary sources are tabulated below (Table 1).

Table 1: Existing Air Emissions for Fort Belvoir

	Annual Emissions (Tons per Year)
Criteria Pollutants	**Emissions (tons/year)[a]**
Volatile organic compounds (VOCs)	2.7
Nitrogen oxides (NO_X)	43.1
Sulfur dioxide (SO_2)	9.3
Carbon monoxide (CO)	22.0
Fine particulate matter (PM_{10})	2.0
Very fine particulate matter ($PM_{2.5}$)	2.0
Carbon monoxide (CO)	22.0

[a] Source: US Army Fort Belvoir 2011

Existing ambient air quality conditions near Fort Belvoir can be estimated from measurements conducted at nearby air quality monitoring stations. Table 2 outlines recent available data at nearby monitors that can be used to describe the existing ambient air quality conditions.

Greenhouse Gases and Climate Change. Greenhouse gases (GHGs) are components of the atmosphere that trap heat relatively near the surface of the earth, and therefore, contribute to the greenhouse effect and climate change. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to add carbon dioxide (CO_2), methane, nitrous oxide, and other greenhouse (or heat-trapping) gases to the atmosphere. Whether or not rainfall will increase or decrease remains difficult to project for specific regions (USEPA 2012c, IPCC 2007).

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* outlines policies intended to ensure that Federal agencies evaluate climate-change risks and vulnerabilities, and to manage the short- and long-term effects of climate change on their operations and mission. The EO specifically requires the Army to measure, report, and reduce their GHG emissions from both their direct and indirect activities. The Department of Defense has committed to reduce GHG emissions from non-combat activities 34 percent by 2020 (DOD 2010). In addition, the CEQ recently released draft guidance on when and how Federal agencies should consider GHG emissions and climate change in NEPA analyses. The draft guidance includes a presumptive effects threshold of 27,563 tons per year (25,000 metric tons per year) of CO_2 equivalent emissions from a Federal action (CEQ 2010).

Table 2: Local Ambient Air

Pollutant	Air Quality Standards	Monitored Data near Fort Belvoir [a]
CO		
1-Hour Maximum[b] (ppm)	35	1.3
8-Hour Maximum[b](ppm)	9	0.8
O_3		
8-Hour Maximum[c](ppm)	0.075	0.086
SO_2		
1-Hour Maximum[c](ppm)	75	12
24-Hour Maximum[c](ppm)	140	4
$PM_{2.5}$		
24-Hour Maximum[d] (µg/m3)	35	27
Annual Arithmatic Mean[e] (µg/m3)	15	11.8
PM_{10}		
24-Hour Maximum[b] (µg/m^3)	150	25

a - Source: USEPA 2012b
b - Not to be exceeded more than once per year
c- The 3-year average of the fourth highest daily maximum 8-hour average O3 concentrations over each year must not exceed 0.075 ppm.
d - The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor must not exceed 35 ug/m3.
e - The 3-year average of the weighted annual mean PM2.5 concentrations from must not exceed 15.0 ug/m3.
ppm = parts per million
µg/m3 = micrograms per cubic meter

Impacts of No Action: The No Action Alternative would result in no impact to ambient air-quality conditions. No construction would be undertaken and no changes in operations or traffic would be expected. Ambient air-quality conditions would remain as described in this section.

Impacts of the Proposed Action / Mitigation: Short- and long-term minor adverse effects would be expected. Air quality impacts would be considered minor unless the emissions would be greater than the General Conformity Rule applicability threshold, exceed the GHG threshold in the draft CEQ guidance, or contribute to a violation of any Federal, state, or local air regulation.

The General Conformity Rule specifies threshold emissions levels by pollutant to determine the applicability of conformity requirements for a project. For an area in moderate nonattainment for the 8-hour O_3 NAAQS within the O_3 transport region, the applicability criterion is 100 tons per year (tpy) for NO_x and 50 tpy for VOCs. For an area in nonattainment for the $PM_{2.5}$ NAAQS, the applicability criterion is 100 tpy for $PM_{2.5}$, NO_x, and SO_2 (40 CFR 93.153). Construction emissions were estimated for fugitive dust, on- and off-road diesel equipment and vehicles, worker trips, architectural coatings, and paving off-gasses. Operational emissions would be due to boilers, back-up generators and employee vehicle trips. Table 3 shows that the General Conformity Rule requirements would not be applicable because the highest total direct and indirect emissions from the Proposed Action would not exceed the applicability threshold for any nonattainment pollutants or their precursors. A project of this size and type would be *de minimis* (e.g. of minimal importance), and not interfere with the Commonwealth's timely attainment of the NAAQS. Detailed emission calculations and a Record of Non-Applicability (RONA) are provided in Appendix B.

Table 3: Total Estimated Emissions Compared to Applicability Thresholds

	Estimated Emissions (tpy)			
Year	**NO_x**	**VOC**	**$PM_{2.5}$**	**SO_2**
Phase 1	10.9	3.5	0.4	1.5
Phase 2	3.7	1.1	0.2	0.5
Phase 3	3.4	1.1	0.1	0.5
Phase 4	3.2	1.0	0.1	0.5
Operational Emissions	13.0	4.0	1.6	16.3
Applicability Threshold	100	50	100	100
Exceeds Threshold?	No	No	No	No

For analysis purposes, it was assumed that each phase would be compressed into a single year. Therefore, regardless of the ultimate implementation schedule, annual emissions would be less than those shown herein. Small changes in the site design,, the building design, and moderate changes in the quantity and types of equipment used would not have a substantial influence on the emission estimates and would not change the determination under the General Conformity Rule or level of effects under NEPA.

Regulatory Review. New sources of emissions may also be subject to both Federal and state permitting requirements. These requirements include, but would not be limited to, new source review for sources in nonattainment areas, prevention of significant deterioration (PSD) for sources in attainment areas, and new source performance standards (NSPS) for selected categories of industrial sources. In addition, under the National Emission Standards for Hazardous Air Pollutants (NESHAP), new and modified stationary sources of air emissions may be subject to Maximum Achievable Control Technology requirements if their potential to emit Hazardous Air Pollutants (HAPs) exceeds either 10 tpy of a single HAP, or 25 tpy of all regulated HAPs.

The proposed addition would be equipped with two (2) 2,250 kW emergency back-up generators with selective catalytic reduction to reduce NO_x emissions, and would have combustion based sources of heating for the facility. Therefore, Federal and state air permitting regulations would apply, and all new combustion units would be included in Fort Belvoir's Title V annual emissions statement (Table 4).

Table 4: Air Quality Regulatory Review for Proposed Stationary Sources

Regulation	Project Status
New Source Review	The emissions would not exceed NSR threshold and would be exempt from NSR permitting requirements. It is possible that a minor NSR permit would be required for any boilers or back-up generators at the site.
Prevention of Significant Deterioration	Potential emissions would not exceed the 250-tpy PSD threshold. Therefore, the project would not be subject to PSD review.
Title V Permitting	Fort Belvoir is a major source of air emissions under the Title V provisions. The combustion units would have to be recorded and included in Fort Belvoir's Title V annual emissions statement.
National Emission Standards for Hazardous Air Pollutants	Potential HAP emissions would not exceed NESHAP thresholds. Therefore, the use of Maximum Achievable Control Technology would not be required.
New Source Performance Standards	Emergency generators would have to comply with NSPS. Any boilers rated greater than one million BTUs installed would have to comply with NSPS.

In addition, best management practices (BMPs) would be required and implemented for activities associated with the Proposed Action. The construction would be accomplished in full compliance with current Virginia regulatory requirements, with compliant practices and/or products. These requirements include:

- Open burning (9VAC5-130)
- Visible emissions (9VAC5-45-790)
- Fugitive dust/emissions (9VAC5-45-800)
- Asphalt paving operations (9VAC5-45-760–850)

- Portable fuel containers (9VAC5-45-60–270)
- Architectural and industrial maintenance coatings (9VAC5-45-520–610)
- Consumer products (9VAC5-45-280–510)

This listing is not all-inclusive; the Army and any contractors would comply with all applicable air pollution control regulations. Outside of these BMPs, no mitigation measures would be required for the Proposed Action.

Greenhouse Gases and Climate Change. Operation of all stationary sources combined would generate approximately 4,587 tons (4,170 metric tons) per year of CO_2. Hence, the GHG emissions associated with the Proposed Action fall well below the CEQ threshold for additional quantitative analysis. By using new heating and cooling systems and centrally locating the INSCOM activities at Fort Belvoir the Army is taking steps to help the DOD reach their GHG reduction goals in accordance with EO 13514.

Cumulative Effects. By directly inventorying all emissions in a nonattainment region and monitoring concentrations of criteria pollutants in attainment regions, the Commonwealth of Virginia takes into account the effects of all past and present emissions in their state. This is done by putting a regulatory structure in place designed to prevent air quality deterioration for areas that are in attainment with the NAAQS and to reduce common or criteria pollutants emitted in nonattainment areas to levels that will achieve compliance with the NAAQS. This structure of rules and regulations applies either specifically or indirectly to all activities in the region and all activities associated with the Proposed Actions. No other large-scale projects or proposals have been identified that, when combined with the Proposed Action, would threaten the attainment status of the region, would have substantial GHG emissions, or would lead to a violation of any Federal, state, or local air regulation. Therefore, the Proposed Action would not contribute significantly to adverse cumulative effects to air quality.

Mitigation. No mitigation measures for air quality would be required. The direct, indirect, and cumulative effects associated with air quality would be minor. No activities outside compliance with existing regulations, permits, and plans would be required to reduce the level of effect to less than significant.

3.4 Infrastructure and Utilities

3.4.1 Potable Water Supply

Existing Conditions: American Water owns, operates, and maintains the on-Post water supply and distribution system. Fairfax Water (formerly Fairfax County Water Authority) provides potable water for Fort Belvoir through three entry locations, namely Pole Road, Telegraph Road, and Beulah Street. Demand for potable water at Fort Belvoir ranged from 1.8 to 2.2 million gallons per day (gpd) in 2005 and 2006 with a recorded peak demand record of 3.044 million gpd (Betts, 2007, in US Army Corps of Engineers, 2007). Fort Belvoir's water system has a storage capacity of 2.3 million gallons. The system encompasses 78 mi of more-than-6 inch (in)

diameter water main pipes, two pumping stations and four storage tanks (three elevated, free-standing aboveground tanks and one at ground-level).

HQINSCOM is served by a 10-in main that connects to Fort Belvoir's water distribution system off of Beulah Road and loops around the site. Assuming an average rate of 15 gallons per day (gpd) per worker (Virginia Department of Health, as per Betts, 2010), the HQINSCOM workforce presently generates a potable water demand of approximately 24,750 gpd. Field investigation and hydraulic modeling of water pressure on the HQINSCOM site in 2006 found that the system pressure dropped below the recommended minimum of 40 pounds per square inch at a number of nodes under conditions of average day use, peak day water demand, and peak day water demand with fire flow (EA, 2006). The operation of several chillers utilizes an additional 24,000 gpd.

Impacts of No Action: The No Action Alternative would have no impact on potable water infrastructure nor increase the demand for potable water at Fort Belvoir.

Impacts of the Proposed Action/ Mitigation: Implementation of the Proposed Action Alternative would cause short-term disconnections of potable water lines. In the short term, some potable water would be required for the mixing of cement, mortar, washing and dust suppression during the expansion of the HQINSCOM building. The long-term demand for potable water would increase to about 38,000 gpd, which is a minor amount compared to the demand from existing and proposed development at Fort Belvoir. This increase is well within the capacity of Fairfax Water to supply. However, Fort Belvoir would need to negotiate a change in its contract with Fairfax Water for additional supply.

A new 16-inch line was installed in 2011, extending from the Gunston Road / Abbott Road intersection north and then west to the John J. Kingman Road / Beulah Road intersection. This was to help alleviate pressure problems in the DLA / INSCOM area, to provide higher fire flow rates and to improve the overall reliability of supply to the domestic, fire and emergency water systems at the HQINSCOM building. No mitigation would be required.

3.4.2 Sanitary Sewer

Existing Conditions: American Water owns, operates and maintains the on-Post sanitary sewer system, which includes 39 sewage pumping/lift stations and two main pumping stations. In fiscal years 2001 through 2003, the installation discharged an average of between 1.1 and 1.4 million gpd, with a maximum daily peak flow to the Fairfax County system of 6.0 million gpd (US Army Corps of Engineers, 2007). The closest sewage lift station (PS #2454) is located approximately 250 ft northeast of the property.

The HQINSCOM building is currently connected to the existing gravity sewer system. Sanitary sewer lines run from two locations along the north side of the HQINSCOM building, north beneath the parking lots, and east to PS#2454, then to a 12-in sewer line. The HQINSCOM

workforce presently generates approximately 20,000 gpd of sanitary sewage (approximately 12 gpd per person).

Impacts of No Action: The No Action Alternative would have no impact on sanitary sewer infrastructure nor increase the demand for potable water at Fort Belvoir.

Impacts of the Proposed Action / Mitigation: The Proposed Action would cause short-term disconnections of sanitary sewer lines. The volume of effluent discharged from the INSCOM site would increase by approximately 52 percent of the current level (by 10,480 gpd). The existing lift stations, pumps, and lines (e.g., PS #2454 and possibly some of the vitrified clay lines) need to be studied for adequacy and may need to be upgraded and/or relocated to handle the additional effluent. This increase in demand is well within the capacity of Fairfax County to treat. The capacity of the Noman Cole Wastewater Treatment Plant, which receives and treats effluent from Fort Belvoir, is 67 MGD. That plant is currently treating 50 million gpd (McGettigan, March 2010). However, the Fort Belvoir contract covers a discharge of 3.0 million gpd. Fort Belvoir is presently discharging 1.2 million gpd (2.4 percent of effluent currently treated by the Noman Cole Plant) to Fairfax County, and within the next few years, that number is likely to rise to 2.2 million gpd (4.4 percent of the total effluent treated) with implementation of the currently programmed projects (BRAC and non-BRAC). Fort Belvoir may need to contract with Fairfax County for more treatment capacity.

3.4.3 Stormwater

Existing Conditions: Section 402 of the Clean Water Act (CWA) established requirements for discharges of industrial and sanitary wastewater effluents and stormwater through the National Pollutant Discharge Elimination System permit program. The Virginia Department of Conservation and Recreation (VDCR) is responsible for enforcing the requirements of both the federal stormwater permit program and the state's own Stormwater Management Law (Title 10.1, Chapter 6, Article 1.1 of the Code of Virginia) and regulations (4VAC3-20 et seq.).

VDCR has issued Fort Belvoir a small municipal separate storm sewer system (MS-4) discharge general permit for ongoing discharges from the stormwater system. Stormwater from construction sites is managed through the Virginia Stormwater Management Program (VSMP). Any construction activity such as clearing, grading, and excavation that is greater than 2,500 sq ft requires a VSMP permit.

Also applicable, Section 438 of the 2007 Energy Independence and Security Act (EISA) requires federal development projects with a footprint exceeding 5,000 square feet to include site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. The USEPA *Technical Guidance for Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA December 2009) requires every technically feasible measure to maintain pre-development site hydrology by retaining rainfall onsite through evaporation/transpiration, infiltration, and re-use. INSCOM is evaluating LID measures such as

pervious pavements, rain gardens, vegetated swales, and rainwater harvesting devices as potential methods to restore the site to pre-development hydrology. About 30 percent of the new building would provide stormwater retention with a green roof.

Fort Belvoir also complies with the Executive Council of the Chesapeake Bay Program Directive 01-1, *Managing Stormwater on State, Federal and District-owned Lands and Facilities* to control nutrient, sediment, and chemical contaminants in runoff from its developed sites. Fort Belvoir does this by following to the extent practicable the Fairfax County Chesapeake Preservation Ordinance at Chapter 118 of the Fairfax County Code.

Fort Belvoir's stormwater system consists predominately of open channels that receive sheet flow. HQINSCOM's stormwater is removed from the project site via two drainage systems. Stormwater from the northern parking lots flows north to a forested swale. The swale drains east to Mason Run and then to the Potomac River. Stormwater from the remainder of the site flows into the existing stormwater pond south of the HQINSCOM building, then southeast to Mason Run.

Impacts of No Action: The No Action Alternative would have no impact on the amount or quality of stormwater runoff from the site. It would, however, obviate the opportunity to treat stormwater from the northern parking lots that is presently flowing to Mason Run via a swale without the benefit of retention and treatment.

Impacts of the Proposed Action / Mitigation: The increase in pavement and other hard surfaces would increase the amount and rate of stormwater runoff from the INSCOM site. To comply with EISA 438, state stormwater management requirements, and the Chesapeake Bay Preservation Area ordinance, INSCOM is in the process of evaluating various LID measures to reduce runoff. The green roof on one section of the new building is one example, and vegetated swales would be used between parking areas to also detain and reduce runoff. INSCOM would also construct a new stormwater management/best management practice feature (a retention pond) to treat and store excess runoff that cannot practicably be managed through LID practices from the northern part of the development. As a result, the Proposed Action would have minimal adverse effect on stormwater quantity leaving the site or on stormwater quality.

3.4.4 Natural Gas

Existing Conditions: Fort Belvoir's natural gas system is owned and operated by Washington Gas. As of 2000, natural gas was distributed to the Post through 25 mi of main gas line and 11 mi of service lines mostly servicing the family housing areas (US Army Corps of Engineers, 2007). However, the proposed project site is not currently serviced by natural gas. The nearest existing gas line is located approximately 750 ft south of the site.

At present INSCOM does not use natural gas as a heating source; rather, it uses oil delivered by a vendor. Heating requirements are minimized through use of a radiant heating system coating on the windows.

Impacts of No Action: The No Action Alternative would require no changes to the natural gas lines servicing this part of Fort Belvoir, nor would it increase the demand for natural gas at Fort Belvoir.

Impacts of the Proposed Action / Mitigation: If required, the proposed HQINSCOM expansion could be serviced by natural gas. The natural gas distribution system serving Fort Belvoir has the capability to support the system. A new gas main would have to be constructed to service the facility and existing heating equipment would need to be converted to gas. Capacity requirements would be determined by coordination with the Fort Belvoir Public Works Department.

3.4.5 Electricity

Existing Conditions: Fort Belvoir owns and Dominion Virginia Power manages the on-Post electrical system, including the distribution feeder system. There are two 84 megavolt transformers at Dominion's Fort Belvoir substation. Power is transferred from the substation to a switching station and distributed to the Post via four 34.5 kilovolt distribution circuits, 78 miles of overhead wires, and 83 miles of underground wires. Ten substations are located throughout the installation to transform power to lower voltage. Main Post consumes approximately 157 million kilowatt hours of electricity annually. Meter information from Dominion indicated in 2007 that incoming feeders were operating at about 50 percent of capacity (US Army Corps of Engineers, 2007).

The proposed project site is currently serviced by above- and underground electrical distribution systems. The nearest transformer substation is located approximately 800 ft north of the property.

Impacts of No Action: The No Action Alternative would require no changes to the electrical system servicing this part of Fort Belvoir, nor would it increase the demand for electricity at Fort Belvoir.

Impacts of the Proposed Action / Mitigation: The current copper and fiber-optic lines would be sufficient to accommodate the proposed expansion and the increase in power usage. New transformers may be needed to handle the increased power requirement. To minimize the use of electricity, the proposed HQINSCOM expansion would use natural lighting and solar heating, energy efficient lighting, and computerized power management systems to the maximum extent practicable. INSCOM proposes to use energy-efficient Open Loop Selective Catalytic Reduction generators for both the new building and to replace the generators in the existing Nolan Building. It is also evaluating other methods to attain the goals set by DoD.

Current DOD Criteria requires this facility to have an energy performance better than the current building standard developed by ASHRAE 90.1-2007 by 40 percent. However, the ASHRAE 90.1-2007 standard itself has been raised since the original design schematic phase was completed more than five years ago, effectively raising the DoD standard.

Standard 90.1 was written as a minimum standard for the design of energy efficient buildings. Over the years, Standard 90.1 has been increased in its stringency, and the 2007 revision's most significant change as it relates to this project was the requirement that all internal electrical, heating and cooling loads should be included in the energy modeling for the purposes of comparison with the ASHRAE Standard Energy Building Performance model. Because computer usage would dominate the energy load (approximately 43.5 percent or 707.8 tons), only 56.5 percent of the load relates to the building envelope, ventilation, lighting, infiltration, and HVAC equipment performance.

Because ASHRAE 90.1 does not allow deduction of the computer load from the overall building energy model, the DoD standard would require an energy reduction of over 89.0 percent, which was not possible with current technologies. The designers evaluated a number of additional alternative systems as part of the life cycle cost analysis. The INSCOM mission dictates the need for this computer load (INSCOM, 2011a).

3.4.6 Communications

Existing Conditions: Fort Belvoir owns the entire communications system, including copper and fiber-optic cables, utility poles, and computerized switchboard systems. Most distribution cable is carried overhead on utility poles, while most fiber-optic cable is carried through underground duct banks, along with some conventional cable. A major telecommunications trunk line provides commercial and secure military communications and data lines to the existing facility. Verizon Communications provides telephone service (US Army Corps of Engineers, 2007).

Impacts of No Action: The No Action Alternative would require no changes to the communications system servicing this part of Fort Belvoir, nor would it increase the need for communications infrastructure at Fort Belvoir.

Impacts of the Proposed Action / Mitigation: The existing telecommunications service to the proposed HQINSCOM expansion would largely be adequate for the expansion. INSCOM would provide an additional connection from the trunk line along John J. Kingman Boulevard, north of the existing connection that services the Nolan Building, as well as some additional internal wiring to service the addition.

3.4.7 Solid Waste

Existing Conditions: Fort Belvoir has a mandatory Post-wide Qualified Recycling Program (QRP) that collects white paper, colored paper, newspaper, aluminum cans, tin/steel cans, scrap metal, cardboard, glass bottles, plastic containers, and toner cartridges. Controlled non-regulated solid waste such as tires, used oil, paint and fluorescent lighting, batteries, pesticides, thermostats, mercury-containing equipment and scrap metal, is handled through the Environmental and Natural Resource Division in accordance with the national Resource Conservation and Recovery Act (40 CFR 273).

Fort Belvoir generates about 6,694 tons of municipal solid waste annually, which is disposed of off-Post by a contract hauler. Approximately 2,719 tons of the total municipal solid waste is recycled (Brooks *in* US Army Corps of Engineers, 2007).

Assuming an average rate of 4.5 lbs per day per worker (Central Virginia Waste Management Authority Website, 2006), the HQINSCOM workforce presently generates approximately 7,400 lbs of solid waste per day.

Impacts of No Action: The No Action Alternative would result in no additional waste being generated or transported.

Impacts of the Proposed Action / Mitigation: The construction activity would generate construction and demolition debris containing small sections of pavement, office partitions and a small amount of the building façade. The building debris would not contain hazardous substances such as asbestos or lead paint, since the building was constructed in 1989. The debris would be removed from the site and disposed of at an approved facility. Army policy requires that 50 percent of the construction waste be diverted from landfills. Soils excavated during the construction of building addition would be used as fill for the parking lot expansion or properly disposed of.

In the long term, the increase in workforce would increase the rate of solid waste generated by approximately 4,000 lbs daily – a small amount compared to the entire Fort Belvoir workforce. Non-hazardous wastes would continue to be collected by private contractor and transported to the COVANTA Energy Recovery facility nearby in Lorton, Virginia. Recyclable wastes would be separated for pickup in accordance with the Fort Belvoir Qualified Recycling Program. Fort Belvoir, in an effort to meet Department of Army waste diversion standards, requests monthly reports by item description and weight of any materials removed for recycling or reuse by the contractor.

3.5 Socioeconomics

3.5.1 Demographics

Existing Conditions: Fort Belvoir is located in Fairfax County, Virginia, within the Washington, DC, Metropolitan Area with a 2010 population of nearly 5.6 million people (George Mason University Center for Regional Analysis, 2011). The counties of Prince William, Fauquier, Stafford, King George, Loudoun, and Arlington, and the city of Alexandria in Virginia; the counties of Montgomery, Prince George's, and Charles in Maryland; and the District of Columbia are within a 30-mi (48 km) radius of Fort Belvoir. Fairfax County is the region's most populous jurisdiction. In 2010, approximately 1.08 million people lived in Fairfax County (US Census Bureau Website, 2012, Census 2010, P12 Sex by Age 2010). The population along Northern Virginia's I-95 corridor (comprising Arlington County, Alexandria City, Fairfax County, Fairfax City, Falls Church City, Prince William County, Manassas City, Manassas Park City, and Stafford County) was about 2.05 million in 2010.

In 2012, following full implementation of the BRAC 2005 recommendations, Fort Belvoir has a working population of about 43,000 persons and supports 2,156 family housing units, including 50 excess units to be removed through attrition and renovation efforts (the actual number of residents occupying family housing units varies over time).

Impacts of No Action: The No Action Alternative would have no impact on area population levels.

Impacts of the Proposed Action / Mitigation: The purpose of the Proposed Action is to expand workspace for the 1,650 overcrowded workers presently working onsite, and to move 575 additional workers from leased space in the vicinity of Fort Belvoir as well as 255 workers who already work in other buildings on Fort Belvoir.

This move is not expected to cause any of the affected employees to move their residence; the relatively small difference in commuting distance and time is not likely to induce many personnel to leave the community they are living in now to move closer to Fort Belvoir. Also, surveys done in the past of where personnel who work at Fort Belvoir live have indicated that many live south of the Post. Therefore, moving personnel now working north of the Post to the Post may actually decrease commuting distances and times and remove any incentive to move their residence. Therefore, the Proposed Action would have no effect on area or regional populations.

The increase in the working population at Fort Belvoir as a result of the proposed action would represent approximately 1.3 percent of the current workforce at Fort Belvoir. The impact of the proposed action on the Fort Belvoir working population would be minor, and no mitigation is needed.

3.5.2 Age, Race, and Ethnicity

Existing Conditions: Table 5 provides data from the 2000 US Census on race and ethnicity for Fort Belvoir, the Accotink Village enclave (Figure 11, Accotink Village), the surrounding Fairfax County, and the Commonwealth of Virginia as a whole. Table 6 provides comparable data for 2010. For Tables 5 and 6, the "Fort Belvoir Census Designated Place" is Fort Belvoir itself. Accotink Village is a small, non-military residential area clustered near the intersection of Backlick Road and US Route 1 near Tulley Gate, and surrounded by Fort Belvoir.

Census Designated Place

A CDP is a non-incorporated area identifiable by name with sufficient density of population to justify recognition for census purposes.

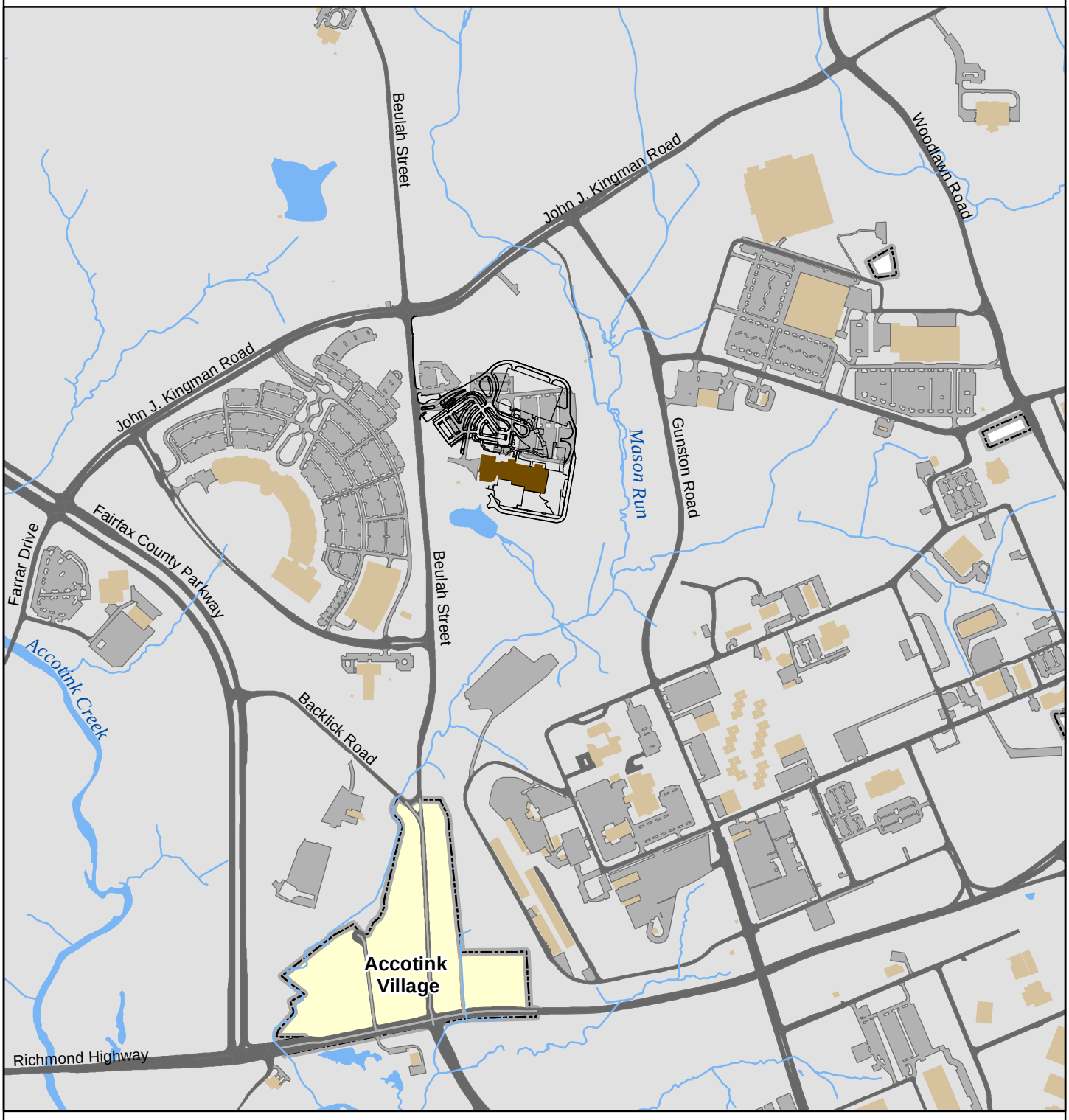
Tables 5 and 6 show that changes that occurred in the racial and ethnic distribution of Virginia and Fairfax County between 2000 and 2010, with the proportion of white residents decreasing substantially in both the state and the county, as well as in Accotink Village. The tables also show that both Fairfax County and Accotink Village are more ethnically diverse than the state as a whole.

Table 5: Race and Ethnic Distribution for 2000 Census (Percent)

Jurisdiction	White	Black[1]	Other Non-White	Two or More Races	Total Non-White	Hispanic[2]
Fort Belvoir CDP	55.7	31.8	8.2	4.3	44.3	10.5
Accotink Village[3]	46.2	37.4	12.1	4.3	53.8	7.9
Fairfax County	69.9	8.6	17.9	3.7	30.1	11
Commonwealth of Virginia	72.3	19.6	6.1	2.0	27.7	4.7

Source: *US Census Bureau in: US Army Corps of Engineers, Baltimore District*, October 2008
[1] Having origins in any black racial groups of Africa.
[2] Hispanic origin, may be of any race.
[3] Block group 2 of 2000 census tract 4220.

Accotink Village



Source: Fort Belvoir CAD and GIS

Figure 11

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Table 6: Race and Ethnic Distribution for 2010 Census (Percent)

Jurisdiction	White	Black[1]	Other Non-White	Two or More Races	Total Non-White	Hispanic[2]
Fort Belvoir CDP	57.4	20.4	3.4	5.7	23.7	13.2
Accotink Village[3]	34.9	42.0	9.8	4.1	51.8	9.2
Fairfax County	54.6	8.9	18.0	2.9	26.9	15.6
Commonwealth of Virginia	64.8	19.0	6.0	2.3	25.0	7.9

Source: *US Census Bureau Website, 2012, Census 2010, P9 Hispanic or Latino, and Not Hispanic or Latino by Race 2010*

[1] Having origins in any black racial groups of Africa.

[2] Hispanic origin, may be of any race.

[3] Block group 3 of 2010 census tract 4219.

Population data are important in determining the presence of "Environmental Justice" populations. Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs all federal departments and agencies to incorporate environmental justice considerations in achieving their mission. Each federal department or agency is to accomplish this by conducting programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude communities from participation in, deny communities the benefits of, nor subject communities to discrimination under such actions because of their race, color, or national origin.

Environmental Justice Populations

CEQ guidance on EO 12898, "minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. Low-income populations in an affected area should also be identified using the annual statistical poverty thresholds from the Bureau of the Census."

Accotink Village and Fairfax County are home to proportionately more non-white and Hispanic minorities than the state as a whole. More than half of the population of Accotink Village (206 out of 338 residents) belongs to a racial or ethnic minority. Therefore, Accotink Village qualifies as an Environmental Justice community on the basis of racial or ethnic criteria.

Similar to EO 12898, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires government agencies to recognize that children may suffer more than adults from environmental health and safety risks. (Children are more apt to ingest or touch items that contain contaminants, e.g., lead paint on window sills). This EO directs federal agencies to

identify and assess such risks, and to ensure that its policies, programs, activities, and standards address effects on children.

Table 7 shows the proportion of persons under the age of 18 living in the Fort Belvoir CDP, Accotink Village, Fairfax County, and Virginia in 2010. The Fort Belvoir CDP had a higher proportion of under-18 residents than the state as a whole, reflecting the presence of many military families housed on the Post.

Table 7: Under-18 Population in 2010

Jurisdiction	Population (%)
Fort Belvoir CDP	44.7
Accotink Village[1]	16.9
Fairfax County	24.3
Commonwealth of Virginia	23.2

Source: *US Census Bureau Website, 2012, Census 2010, P12 Sex by Age 2010*

[1]Block group 3 of 2010 census tract 4219

Impacts of No Action: The No Action Alternative would result in no adverse impacts on Environmental Justice communities or populations of children.

Impacts of the Proposed Action / Mitigation: The Proposed Action has no potential to disproportionately affect the residents of Accotink Village. Because of the closure some years ago of Beulah Street just north of the village, access to HQINSCOM is from the north using John J. Kingman Road. Employees are unlikely to drive through Accotink Village on the way to and from work. Also, the village is too distant (approximately 2,000 feet) and at a lower elevation from the HQINSCOM compound to experience more than minor, short-term construction-related air and noise impacts. Therefore, the inhabitants of Accotink Village would not be disproportionately affected by the proposed action.

The Proposed Action would not disproportionately affect children. While the resident population of Fort Belvoir includes a high proportion of children, there are no residential areas near the HQINSCOM compound. The Child Development Center associated with the DLA complex, across Beulah Street from INSCOM, is too far (approximately 1,500 feet from the project site) to experience more than minor short-term noise or air quality impacts during construction.

3.5.3 Employment and Income

Existing Conditions: Based on 2006-2010 American Community Survey five-year estimates, 3.1 percent of the population within the Fort Belvoir CDP was living in poverty in 2010 (Table 8). However, military personnel salaries do not necessarily reflect benefits such as on-Post housing (or off-Post housing allowances), Army-provided medical care, or the ability to purchase goods at lower prices at the Post Exchange. Therefore, income alone is not a good metric for poverty level when considering a military community.

No 2006-2010 American Community Survey poverty estimates are available for Accotink Village alone. However, income data from 1999 indicate that the median household income in Accotink Village at that time was $31,696, as opposed to $81,050 for Fairfax County and $46,677 for Virginia as a whole (US Census Bureau Website, 2005 and 2008 in: US Army Corps of Engineers, Baltimore District, October 2008). Thus, Accotink Village was significantly poorer than the surrounding jurisdictions, and qualifies as an Environmental Justice community on the basis of income, as well as race and ethnicity. Fairfax County, on the other hand, is one of the most prosperous jurisdictions in the Washington, DC area, and even in the United States.

The Virginia Employment Commission reported Fairfax County's average employment in March 2012 to be 619,477 out of a total civilian labor force of 645,656 or 95.9 percent. The number for Virginia as a whole was 4,080,943 out of a labor force of 4,328,420 or 94.3 percent. Fairfax County accounted for 15.2 percent of statewide employment. Unemployment in Fairfax County in March 2012 was 4.1 percent, as compared with 5.7 percent for Virginia and 8.4 percent for the United States as a whole (Virginia Workforce Connection Website, May 2012).

Table 8: Median Income and Poverty Estimates for 2010

Jurisdiction	Median Household Income ($)	Median Family Income ($)	Persons Living in Poverty (Percent)
Fort Belvoir CDP	73,648	73,919	3.1
Fairfax County	105,416	124,316	5.1
Commonwealth of Virginia	61,406	73,514	10.3

Source: *US Census Bureau Website, 2012, American Community Survey, DP03 Selected Economic Characteristics 2010 ACS 5-year estimates*

Impacts of No Action: The No Action Alternative would result in no change in employment or income. It would forego the temporary jobs and secondary benefits generated by the construction activity.

Impacts of the Proposed Action / Mitigation: Construction of the proposed HQINSCOM building addition and associated structures would generate direct economic benefits for the contractors performing the job and their employees, as well as indirect benefits to the communities in which the contractors are based. This is because the additional earnings generated by the work would be felt further down the line as these earnings are spent in the local

economy. Overall, however, these positive impacts would be relatively small compared to the levels of employment in Fairfax County and nearby jurisdictions and would be temporary. There would be no income or employment impacts on the inhabitants of Accotink Village. No mitigation is needed.

3.6 Community Facilities and Services

3.6.1 Services

Existing Conditions: Safety and security issues at Fort Belvoir are handled by the Directorate of Emergency Services which includes the Army's Military Police and Fire and Emergency Medical Services. The Military Police headquarters is located on Abbot Road, on the North Post, to the southeast of the HQINSCOM building. There are three fire stations on Fort Belvoir. Five fire companies (three engine companies, one ladder truck company, and one airport crash company), with a total staff of 66 firefighters, staff these stations. At least 21 firefighters are on duty 24 hours a day. The closest fire station to HQINSCOM is located on Abbot Road (Station 63). Additionally, Fort Belvoir has mutual aid police and fire service agreements with Fairfax County. The stations closest to the site are Fairfax County Fire Station 37 at 7936 Telegraph Road, and the Franconia Police Department at 6121 Franconia Road (Fairfax County Geographic Information Systems Website, May 2008 in: US Army Corps of Engineers, Baltimore District, October 2008).

Medical needs of military personnel and their dependents (and, in an emergency, civilian personnel) at Fort Belvoir are served by the Fort Belvoir Community Hospital located near Pence Gate on South Post. The recently-constructed hospital serves up to 130 inpatients, and is expected to become a major outpatient facility. Currently, three dispensaries are also located at Fort Belvoir; two near the residential areas and a third at Davison Army Airfield. The nearest off-Post hospital to Fort Belvoir is INOVA Mount Vernon Hospital, a 232-bed facility about 5 mi (8 km) to the northeast.

Impacts of No Action: The No Action Alternative would have no impacts on community services.

Impacts of the Proposed Action / Mitigation: While the additional working population at the HQINSCOM compound could potentially generate more fire and rescue calls on Fort Belvoir, the proposed action is unlikely to generate any increase in demand for these services off the Post. The 575 workers already working within 10 miles in Springfield and particularly the 255 already working on Fort Belvoir are generating a demand for these services. On Fort Belvoir, the increase in demand would be small and is not expected to overtax the emergency services of either Fort Belvoir or Fairfax County. No mitigation is needed.

3.6.2 Recreation

Existing Conditions: Fort Belvoir offers 1,006 acres of recreational areas that are convenient to the population they serve. Facilities include two 18-hole golf courses, officers and non-commissioned officers clubs, tennis courts, swimming pools, softball and soccer fields, etc. In addition, the Dogue Creek Marina rents boats and slips and dry-storage facilities. Some of Fort Belvoir's undeveloped areas are open to recreational use: two wildlife refuges; fishing at Mulligan Pond and along Gunston Cove, Accotink Creek, Dogue Creek, and Pohick Creek; bow hunting in designated areas; bird watching, hiking, nature photography, environmental education programs at the Accotink Bay Wildlife Refuge Education Center; and 10 mi (16.1 km) of trails. A multi-purpose trail runs in a north-south direction just east of the HQINSCOM compound; the trail provides access to the Fort Belvoir Forest and Wildlife Corridor along John J. Kingman Road and Mason Run.

Impacts of No Action: The No Action Alternative would have no impacts on community recreational facilities.

Impacts of the Proposed Action / Mitigation: The additional workers on Fort Belvoir might make use of the Post's recreational facilities, particularly the multi-use trail east of the compound. Construction of the proposed addition to the HQINSCOM building would not directly affect the trail. The impacts on the Post's recreational facilities would be minor and no mitigation is required. The Proposed Action is unlikely to generate any increase in demand for, or adverse effects to, recreational facilities off-Post because these workers would be unlikely to move their place of residence. No mitigation is needed.

3.7 Natural Resources

3.7.1 Geology and Topography

Existing Conditions: Most of Fort Belvoir lies in the Coastal Plain Physiographic Province. The Fall Line, which forms the northeast-southwest boundary between the resistant, metamorphic rocks of the Piedmont Plateau on the west and the softer, sedimentary rocks of the Coastal Plain Province, is located in the vicinity of I-95. There are several geologic formations associated with the Coastal Plain Physiographic Province including the Potomac Formation, Bacons Castle Formation, Shirley Formation, and Tertiary Alluvium. The major geologic unit in the Fort Belvoir area is the Potomac Formation, a seaward-thickening wedge of inter-layered unconsolidated sediments such as sand, silt, and clay (Larson and Froelich, 1977, as cited in US Army Garrison Fort Belvoir, 1993).

Land features on Fort Belvoir range from smooth uplands to bluffs and V-shaped stream valleys (ravines) that rise abruptly from floodplains to lowlands and valley bottoms that are underlain with alluvium. The elevation of the Main Post ranges from approximately mean sea level (msl) along the Potomac River to approximately 230 ft above msl at the Beulah Street and Woodlawn Road intersection.

The HQINSCOM site is located at the edge of a plateau. It is nearly level, with steep slopes along its northern, eastern, and southern boundaries. The existing parking areas on the northern part of the site slope downward to a swale that drains to Mason Run. To the east, the plateau slopes downward toward the major stream valley of Mason Run. To the south, the site slopes downward to an existing retention pond that discharges eastward to Mason Run. The western portion of the site slopes slightly toward the existing DTRA and DLA headquarters buildings. The elevation of the site, inside the fence, ranges from approximately 100 to 150 ft msl.

Impacts of No Action: The No Action Alternative would have no impacts on site geology and topography.

Impacts of the Proposed Action / Mitigation: Fill would be needed along the top of the northern, eastern, and southern slopes, to even out topography in the immediate area of construction. This impact would be greatest in the northeastern corner where the parking garage would be constructed. With the exception of steep slopes, there are no unique or sensitive landforms or rock foundations at the site, and previous uses of the site have already altered much of its geomorphology and soils. By limiting the expansion to the area already altered by previous construction as much as possible and thereby minimizing encroachment on steep slopes, INSCOM would minimize alteration of surface features, especially steep slopes. Therefore, the impacts would not be significant.

3.7.2 Soils

Existing Conditions: The Natural Resources Conservation Service (NRCS) mapped soils at the project site as Dumfries sandy loam, Beltsville silt loam, Mattapex silt loam, and Urban built up (Figure 12, Soils):

- Dumfries sandy loam is a strongly-sloping to steep, very deep well-drained soil. It is not ponded, flooded, or hydric (wet or typical of wet areas). It is classified as hydrologic group B (moderately rapid permeability). Although hydrologic group B is normally well-suited for low impact development (LID; stormwater retention) measures, the steep slope on which the soil is located reduces its suitability.
- Beltsville silt loam is gently-sloping to moderately-sloping, very deep moderately well-drained soil. It is classified as hydrologic group C, which is generally not suitable for LID infiltration measures. A fragipan (a dense, hard soil layer) causes slow to very slow permeability in surface layers, but permeability is moderate to moderately rapid below the fragipan. This soil is not ponded, flooded, or hydric.
- Mattapex silt loam is a nearly-level to moderately-sloping, very deep, moderately well-drained soil. It is also classified as hydrologic group C, and its permeability is moderate. This soil is not flooded, ponded or hydric.
- Urban land consists of areas where more than 70 percent of the land is covered by asphalt, concrete, buildings, or other impervious surfaces. Included are small areas, generally less than 2 acres, of undisturbed soils (for example, between streets and sidewalks) (US Army Garrison Fort Belvoir, 2001b).

Mixed alluvial soils occur outside the project area, along the Mason Run stream valley. Mixed alluvial soils are nearly-level to gently-sloping, frequently-flooded, poorly-drained soils that occur where streams and rivers are depositing or have deposited sediments. Mixed alluvial soils on Fort Belvoir are classified as hydrologic group D. Their slowest permeability is moderate, but they are normally found in stream bottoms and valleys where the surface water table is near the ground surface. While not always hydric, it is possible that these soils are hydric where surface water table is normally high

Impacts of No Action: The No Action Alternative would have no impacts on soils.

Impacts of the Proposed Action / Mitigation: Long-term impacts to soils would result from excavation of the basement for the proposed building expansion, and construction of the parking garage and additional roadways that would cover an additional 4.3 acres of permeable soils with pavement or other impermeable surfaces.

The new building would be constructed largely on Beltsville silt loam, while the parking garage would be constructed on Urban land and Beltsville silt loam. Smaller elements of Dumfries sandy loam and Mattapex silt loam would be impacted: for Mattapex, where these soils remain under the current development; for Dumfries, where these soils form the upper edge of steep slopes on the north and south side of the project area.

Clearing and grading for construction would cause short-term erosion and sedimentation, and minor localized changes in soil infiltration rates and surface runoff patterns. Mattapex and Beltsville soils have poor infiltration rates, and these make up the bulk of the affected area. However, the loss of small areas of Dumfries soils would reduce the infiltration capacity of the site by only a small amount. Because pockets of Dumfries soils occupy less than 6 to 8 percent of the site, then infiltration would be reduced by this amount or less.

Because the proposed project would affect more than 2,500 sq ft, an erosion and sediment control (ESC) plan employing soil best management practices, and a Virginia Stormwater Management Program (VSMP) permit would be required for the clearing and grading activities. The ESC plan would include strict measures consistent with the *Virginia Erosion and Sediment Control Handbook* to minimize ESC impacts. No additional mitigation would be needed.

3.7.3 Surface and Ground Water Resources

Existing Conditions: Figure 13 (Waterways and Wetlands) shows waterways and wetlands in the vicinity of the HQINSCOM site, based on a field delineation (Paciulli, Simmons & Associates, Ltd., 2011). Wetlands are addressed in Section 3.1.3. Surface waters are regulated by both the federal and state governments. Most waterways and wetlands are regulated by the US Army Corps of Engineers (USACE) and US Environmental Protection Agency (USEPA) as "waters of the US" under Sections 402 and 404 of the Clean Water Act. The Commonwealth of Virginia also asserts jurisdiction over wetlands and waterways within its boundaries. "State waters" are regulated by the Virginia Department of Environmental Quality (VDEQ) under their

Water Protection Permit Program. Whereas "waters of the US" do not typically include isolated wetlands or the extreme upper headwaters of streams, state waters do include these areas.

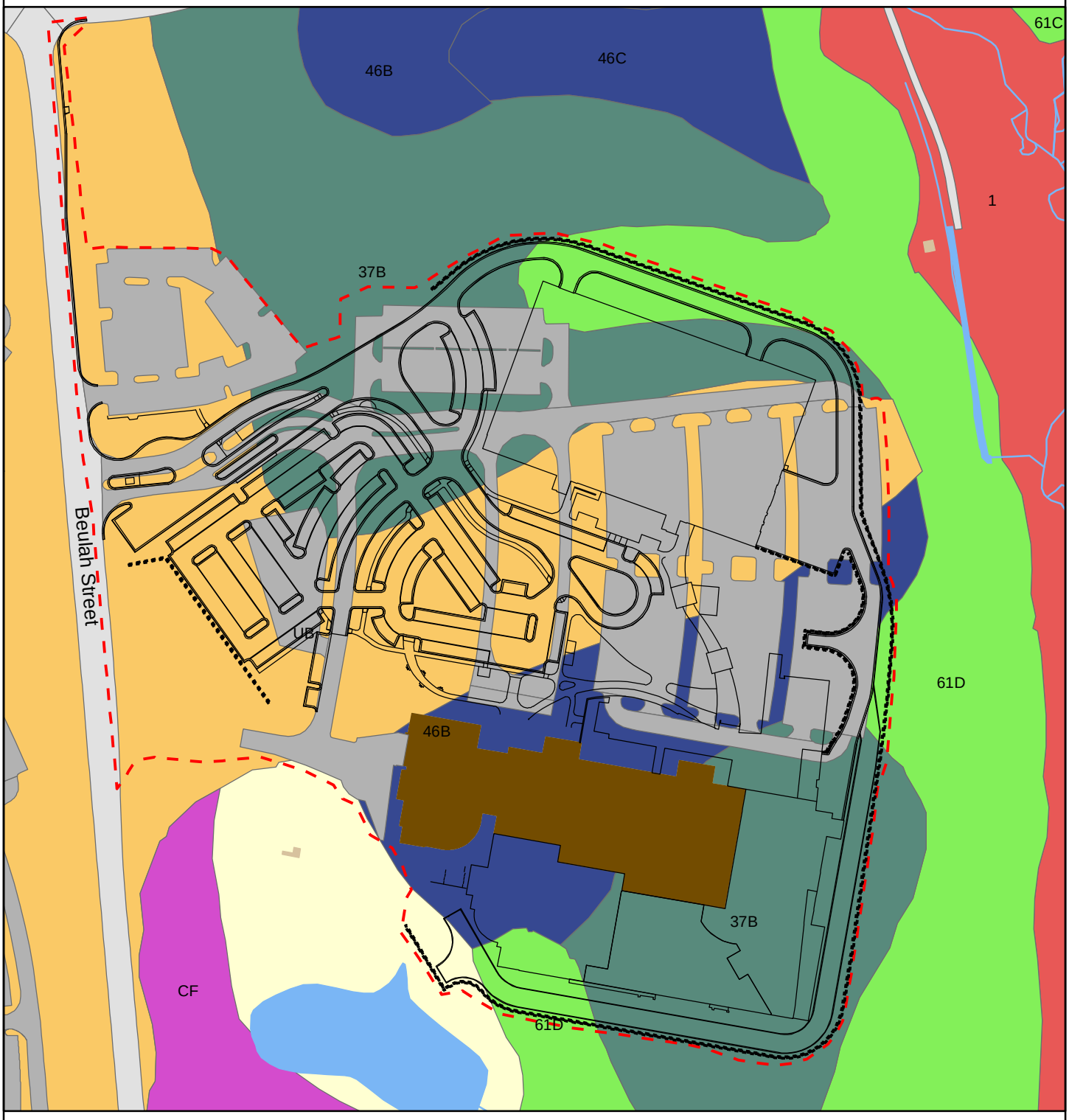
The project is located in the Mason Run subwatershed that flows to Accotink Creek and the Potomac River. At approximately 650 acres, this is the third largest subwatershed on Post. The predominant surface water bodies in the vicinity of the INSCOM site are: Mason Run located approximately 500 ft east of the current HQINSCOM building; an unnamed perennial tributary stream that discharges from a culvert at the terminus of Keene Road, flows south approximately 175 feet northeast of the project site, then east to Mason Run; and the stormwater retention pond located approximately 200 feet south of the existing building and its outfall. The pond appears to be a reconfiguration of two smaller manmade ponds that existed on the site before the HQINSCOM building was constructed.

Sheet flow from a large portion of the parking lots currently flows north into a swale and has caused considerable erosion and undercutting of the ravine. The swale presently has problems (e.g., scour holes) near where it flows into Mason Run. Mason Run below the project area also has problems (e.g., scour holes, erosion) due to excessive storm flows (Landgraf, 1999).

Fairfax County is underlain by three main groundwater aquifers: Bacons Castle Formation (not present at Fort Belvoir) and the Lower and Middle Potomac Formations. Potable water below Fort Belvoir is found predominantly in the Lower Potomac Formation, which is recharged by vertical movement from overlying, water-bearing strata (US Army Garrison Fort Belvoir, 2001b). In this aquifer, the groundwater flows southeast and is recharged by precipitation in the western part of Fort Belvoir, as well as areas north and west of the Post (Grogin and Widdowson, 1998, in US Army Garrison Fort Belvoir, 2001a). Three groundwater wells located at the North Post Golf Course are used for irrigation. One additional well located on the Defense Logistics Agency site, to the west of INSCOM, is used for irrigation and pond-filling.

The surface aquifer (surface water table) has localized flows, originating from various recharge areas on the installation and draining to nearby streams, creeks, and large surface water bodies (US Army Garrison Fort Belvoir, 2001b). The water table may occur at or near the surface at locations adjacent to streams or in seeps, indicating that shallow groundwater flow relates to surface drainage features (US Army Garrison Fort Belvoir, 2001b).

Soils



Beltsville Silt Loam
Cut and Fill
Dumfries Sandy Loam
Mixed Alluvium
Mattapex Silt Loam
Urban Land
Wehadkee
Existing INSCOM Building
Proposed New Construction
Retaining Wall
Limit of Disturbance
Stream
Waterbody
Existing Building
Existing Road
Existing Parking Lot

N

0 100 200 400 Feet

Source: Fort Belvoir CAD and GIS

Figure 12

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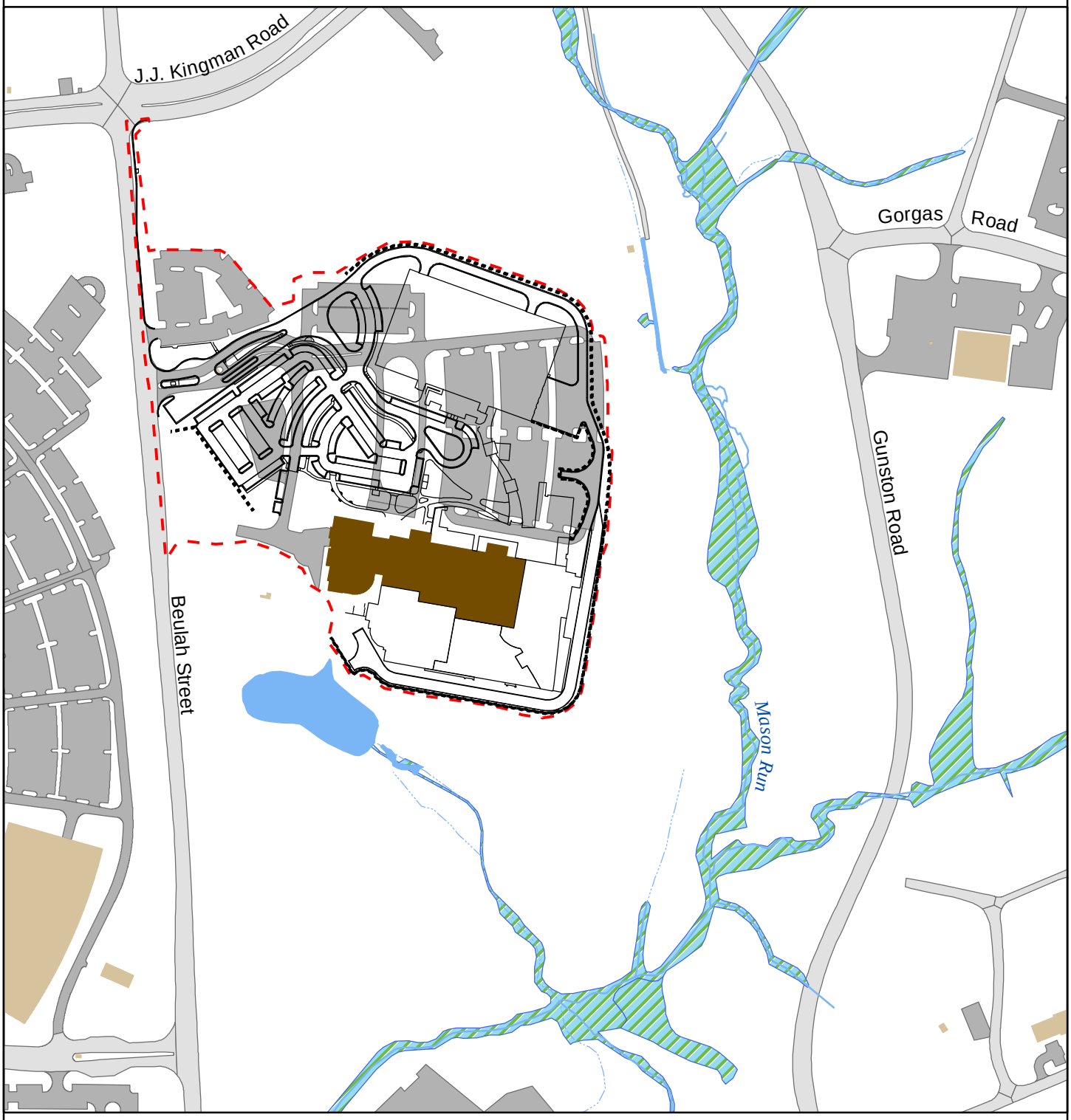
Waterways and Wetlands



Source: Fort Belvoir CAD and GIS

Figure 13

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Impacts of No Action: The No Action Alternative would have no new impacts on surface or groundwater. However, it would miss the opportunity to correct untreated stormwater flows from the existing north parking lots to Mason Run.

Impacts of the Proposed Action / Mitigation: Implementation of the Proposed Action would have minor indirect effects on streams or other surface waters. The nearest water features are the current stormwater retention pond located in the southern portion of the site, the unnamed perennial stream northeast of the existing parking lot, and Mason Run east of the project site.

At this time, INSCOM does not anticipate any alterations of the existing stormwater retention pond. It is possible during the detailed design process that they may need to direct runoff from some portion of the site to this pond, although the present concept is to construct a pond between the proposed building expansion and the proposed parking garage. If directing flows to the existing pond becomes necessary, INSCOM would obtain any necessary permits / authorizations from USACE and VDEQ.

The new stormwater retention pond would be designed to comply with the Virginia Stormwater Management Regulations and the Fairfax County Chesapeake Bay Preservation Area regulations (Chapter 118 of the Fairfax County Code). Compliance with these regulations would ensure that the impacts on the water quality of Mason Run would be minimized. Stormwater would be discharged to Mason Run after treatment (sediment settling out) in these ponds.

The Proposed Action would have a minor impact on the overall availability or quality of groundwater and surface water resources. The increase in impermeable surfaces onsite would reduce infiltration of stormwater to groundwater resources. Use of low impact development (LID) practices, such as installing vegetated swales between parking lots instead of curb and gutter, and constructing a rain garden near the western entrance to the parking garage (on Dumfries soils), would help to mitigate this impact. The proposed site is not near any recharge areas for the Lower Potomac Formation, so impacts would be minor and restricted to the surface water table. No withdrawal of groundwater would be necessary for the proposed action, as potable water is supplied by Fairfax Water.

3.7.4 Vegetation and Wildlife

Existing Conditions: Within Fort Belvoir's Main Post, areas of native vegetation occur in large blocks, aligned from the northeast to the southwest near and within the Jackson Miles Abbott Wetland Refuge, the Forest and Wildlife Corridor (FWC), the Accotink Bay Wildlife Refuge, and the T-17 Refuge (Figure 2). This configuration affords a continuous band of wildlife habitat through the installation, and provides for connection with wildlife habitat areas outside the installation, notably Huntley Meadows Park and Pohick Bay Regional Park. Vegetation cover in the remaining 30 percent of Fort Belvoir consists primarily of the improved and semi-improved grounds associated with the installation's developed land uses (US Army Garrison Fort Belvoir, 2001a).

An installation-wide vegetation study of Fort Belvoir (Paciulli, 1998a, in: US Army Garrison Fort Belvoir, 2001a) identified 17 plant community types, four of which possess species with state conservation rankings of rare or very rare. These 17 types are included in the broader categories of mixed hardwood forests, pine forests, floodplain hardwood forests, wetlands, old-field grasslands and urban land (US Army Garrison Fort Belvoir, 2001a). An updated forest stand delineation (Paciulli, Simmons & Associates, Ltd., 2011a) was conducted for the 44.6-acre HQINSCOM site in 2011, and the surveyors identified five different forest stands. These include:

- Forest Stand 1, mixed oak/pine (8.9 acres) in the northern portion of the project area. It is a mixed forest approximately 40 to 50 years in age, dominated by red oak (*Quercus rubra*), white oak (*Quercus alba*) and Virginia pine (*Pinus virginiana*). Additional tree species include American beech (*Fagus grandifolia*), red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*).
- Forest Stand 2, oak-beech-poplar (4.4 acres) along the eastern facing slope, with slopes ranging from 15 percent to 35 percent, where the Fort Belvoir Wildlife Corridor intersects with the study area. It is characterized by northern red oak, white oak, beech, and tulip tree *(Liriodendron tulipifera*). The average diameter breast height (dbh) of American beech is only *6 inches, but the specie*s accounts for 42 percent of the trees in Forest Stand 2. Forest Stand 2 is approximately 60 to 70 years in age.
- Forest Stand 3, oak-sweetgum (2.0 acres) in the southeastern portion of the study area, between the existing fence line and the INSCOM facility building. It is characterized by northern red oak, white oak, and sweetgum.
- Forest Stand 4, Virginia pine (*Pinus virginiana*) (3.5 acres) in the southwestern portion of the study area. No other tree species were observed in this densely-forested area. Sparse populations of common greenbrier (*Smilax rotundifolia*) and oak seedlings were observed. Forest Stand 4 is approximately 15 to 25 years in age.
- Forest Stand 5, oak (0.76 acres) consists primarily of northern red oak and pin oaks (*Quercus palustris*) planted on a small hilltop, east of Beulah Street and west of a parking lot serving the INSCOM facility. The trees have been planted approximately 10 feet on center and range in size from 2 to 6 inches dbh.

Figure 14 (Vegetation) shows the distribution of these forest stands on and around the HQINSCOM subarea. The present HQINSCOM development (urban built-up areas) covers 18.5 acres.

Fort Belvoir is home to numerous wildlife species. Based on information from installation-wide surveys, the Post contains potential habitat for 43 species of mammals, 274 species of birds, 32 species of reptiles, 27 species of amphibians and 60 species of fish (Ernst and Miller, 1997; Ernst and Belfit, 1997, as cited in US Army Garrison Fort Belvoir, 2001a). Many of the species that occur on Fort Belvoir in forests can be found near the proposed project site, due to the pond in the southern portion of the site and the presence of Mason Run and its adjacent wetlands and other riparian habitats. The variety of forest types on three sides of the site provide a broad variety of potential habitats and food sources, increasing both the diversity of species likely to be found on or near the site and the total populations of each species.

Vegetation

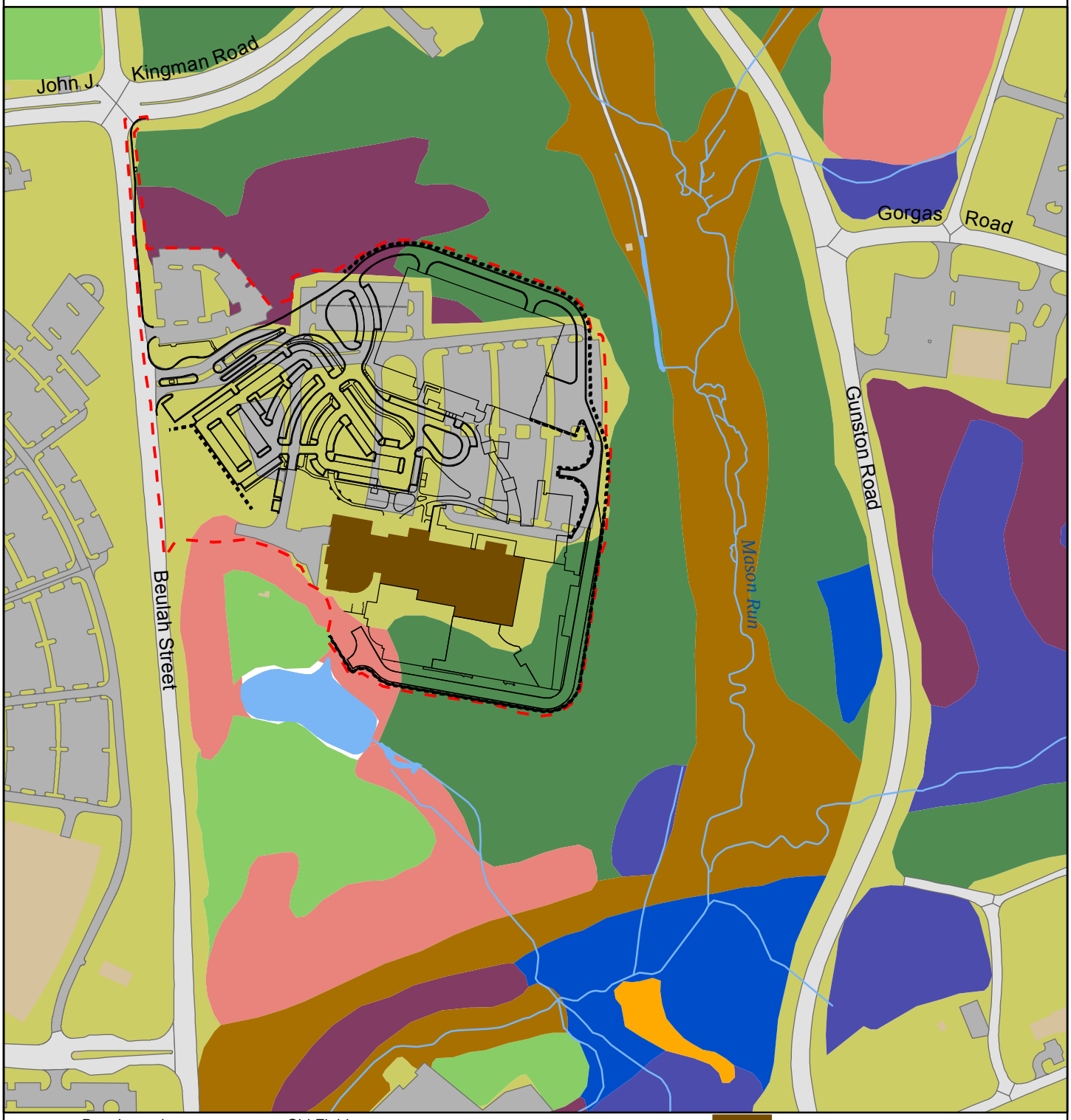

Figure 14

Source: Fort Belvoir CAD and GIS

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Fort Belvoir has developed its Integrated Natural Resources Management Plan (INRMP) to embrace the principles of ecosystem management to preserve native biodiversity. Through the INRMP, Fort Belvoir aims neither to manage for single species nor to increase the number of species or communities on-Post (US Army Garrison Fort Belvoir, 2001a). Over 2,500 acres of land has been set aside on Fort Belvoir for wildlife, including the Accotink Bay Wildlife Refuge, the Jackson Miles Abbott Wildlife Refuge, and the Forest & Wildlife Corridor (FWC). These areas, as well as undeveloped stream valleys and slopes, provide habitat for numerous wildlife species.

The forested areas to the east and south of the proposed project site are part of the FWC (see Figures 2, 6, and 16). The corridor was established as a mitigation measure under the EIS for the 1992 BRAC actions at Fort Belvoir. The 500+/-ft wide corridor provides a band of undeveloped natural habitat for the movement of wildlife species between the larger wildlife habitats in this part of Northern Virginia. On Post, it connects the Jackson Miles Abbott Wildlife Refuge with the Accotink Bay Wildlife Refuge, but also maintains a connection to the wider regional network that links to Huntley Meadows Park to the northeast and the Mason Neck peninsula (e.g., Pohick Bay Regional Park, Gunston Hall Plantation, Mason Neck State Park and Mason Neck National Wildlife Refuge) to the southwest. Despite the roads that transverse the FWC, wildlife, particularly birds and deer, migrate along the corridor and cross the roads to access food and shelter (USAINSCOM, 2006).

Fort Belvoir participates in the Partners in Flight (PIF) program. Based on Fort Belvoir's GIS map data, there are three priority bird species for the Mid-Atlantic Coastal Plain Region that occur in the vicinity of the HQINSCOM building (Figure 15, Partners in Flight [PIF] Bird Habitat). According to the GIS, the forest riparian corridor (Section 3.7.6) associated with the FWC and areas north and south of the HQINSCOM site provide suitable breeding habitat for the wood thrush (*Hylocichla mustelina*), scarlet tanager (*Piranga olivaceae*), and hooded warbler (*Wilsonia citrina)* (US Army Garrison Fort Belvoir GIS, 2010). Figure 15 shows buffers for surveyed PIF breeding points and that the buffer overlaps the proposed addition. A field inspection by a Fort Belvoir wildlife biologist in September 2010 found suitable breeding habitat for scarlet tanager and wood thrush, but no suitable habitat for the hooded warbler was identified on or near the INSCOM site (pers. comm. K. Walter, September 14, 2010).

Partners in Flight

The international **Partners in Flight** (PIF) is a cooperative, non-advocacy partnership among federal, state and local government agencies, philanthropic foundations, professional organizations, conservation groups, industry, the academic community, and private individuals. Department of Defense (DoD) bird conservation programs are a vital part of this initiative. The DoD PIF Program supports and enhances the military mission while it works to develop cooperative programs and projects with PIF partner organizations ensuring a focused and coordinated approach for the conservation of resident and migratory birds and their habitats. The Partners in Flight mission has three basic priorities: helping species at risk; keeping common birds common; and voluntary partnerships for birds, habitats, and people (DoD, 2009).

Impacts of No Action: The No Action Alternative would cause no short or long-term adverse impact on vegetation and wildlife habitat.

Impacts of the Proposed Action / Mitigation: Construction would affect approximately 4.68 acres of forest habitat within the construction boundaries of the proposed project. The project would also impact approximately 3.26 acres of potential buffer for the scarlet tanager and 1.78 acres for the wood thrush (which overlaps habitat for the scarlet tanager).

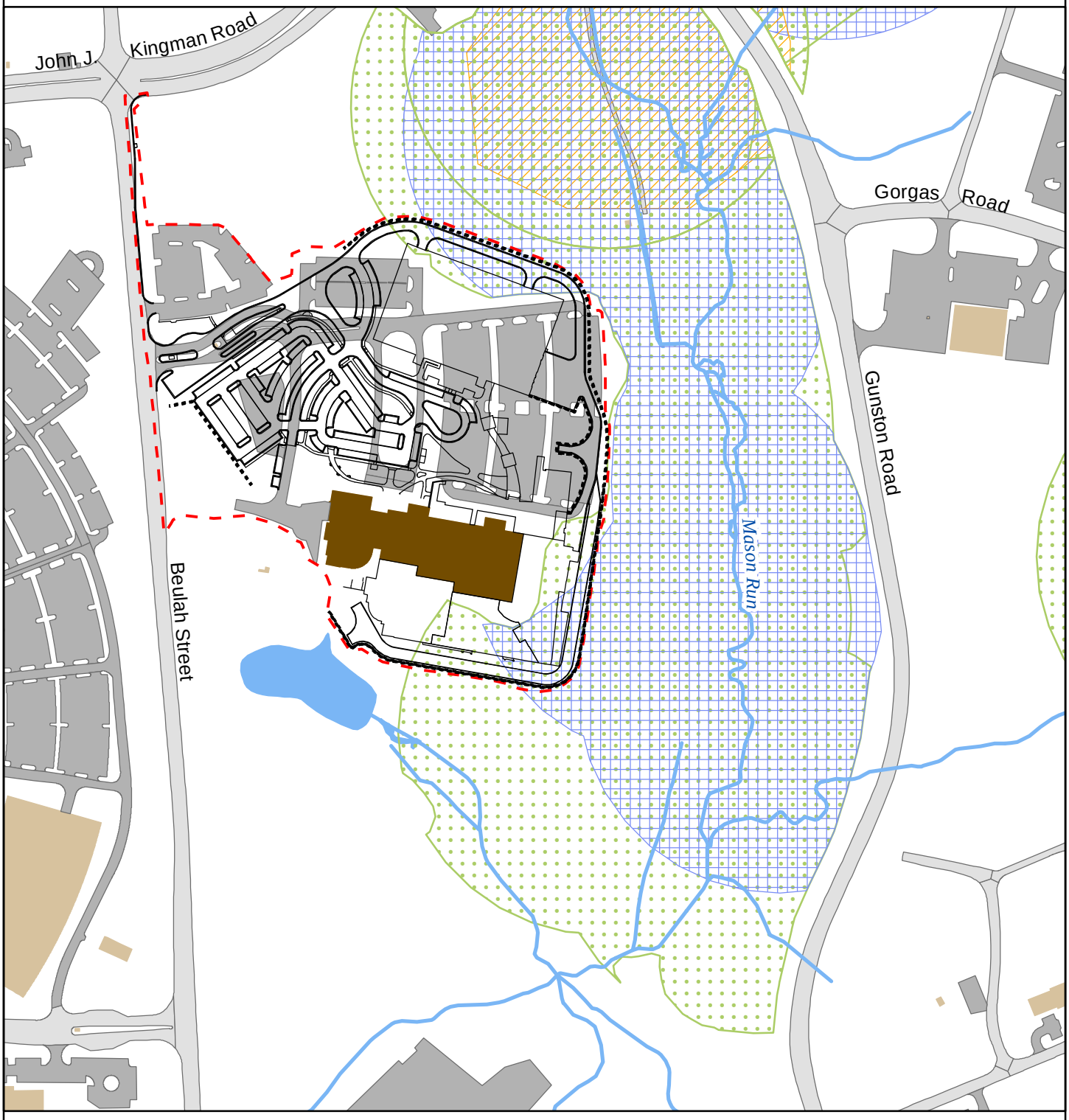
Construction would intrude into approximately 0.34 acres of the FWC along the eastern edge of the site (Figure 16, Forest and Forest and Wildlife Corridor Impacts), with most of the intrusion occurring east and southeast of the proposed building expansion.

INSCOM is making every effort to minimize the extent of the impact on the surrounding forest, the FWC, and potential PIF habitat through adjustments in the site plan for the project. However, the area available for construction on the plateau is small in relation to the size of the project and is constrained by forested valleys to the north, east, and south and Beulah Street to the west. INSCOM has minimized the amount of forested habitat that would be affected by using retaining walls along the perimeter road to avoid slopes that would have required further tree cutting, moving emergency generators that would have intruded into the FWC away from the edge of the site, and by opting for a parking garage to accommodate much of the parking that would otherwise have necessitated a larger site.

Fort Belvoir's *Tree Removal and Protection Plan* (US Army Garrison Fort Belvoir. 2001a) outlines the criteria for tree protection and replacement. This policy promotes site-planning techniques and construction practices that maximize the retention and protection of existing trees. It requires that all proposed tree and shrub removals, as well as construction and excavation activities that may impact the growth and survival of trees, be approved by the Department of Public Works. The policy also requires that two new trees be planted for each tree four inches and larger in diameter that is removed through construction on Fort Belvoir.

Fort Belvoir's Environmental and Natural Resources Division has reviewed the site plan for the proposal and have calculated the tree loss by forest stand that would occur if the Proposed Action is implemented. The total number of trees (>4 inches dbh) to be removed is approximately 800, which under the 2:1 replacement policy requires 1,600 trees to be replanted. After accounting for the onsite tree plantings performed as part of the project's landscape design, and crediting costs for asphalt removal and topsoil addition against the number of trees being required using current industry costs, offsite locations and alternative measures would be needed to meet requirements due to the small area available for planting on site. These locations are shown in Figure 17 (Mitigation Sites), and include: the 0.34 acre area of INSCOM parking lot being restored as FWC; the area around the existing INSCOM stormwater management pond; an abandoned segment of Keene Road trail segment east of the INSCOM site; and the abandoned Lacy Cemetery parking lot on the other side of Mason Run. An additional mitigation measure would be to remove invasive vegetation from the FWC adjacent to the INSCOM site. All the above measures would provide mitigation for the loss of forest, FWC, and combined PIF habitat.

Partners In Flight (PIF) Bird Habitat



Partners In Flight:
- Hooded Warbler
- Scarlet Tanager
- Wood Thrush

- Proposed New Construction
- Retaining Wall
- Limit of Disturbance
- Stream
- Waterbody

- Existing INSCOM Building
- Existing Building
- Existing Road
- Existing Parking Lot

N

0 175 350 700 Feet

Source: Fort Belvoir CAD and GIS

Figure 15

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Forest & Wildlife Corridor and Forest Impacts

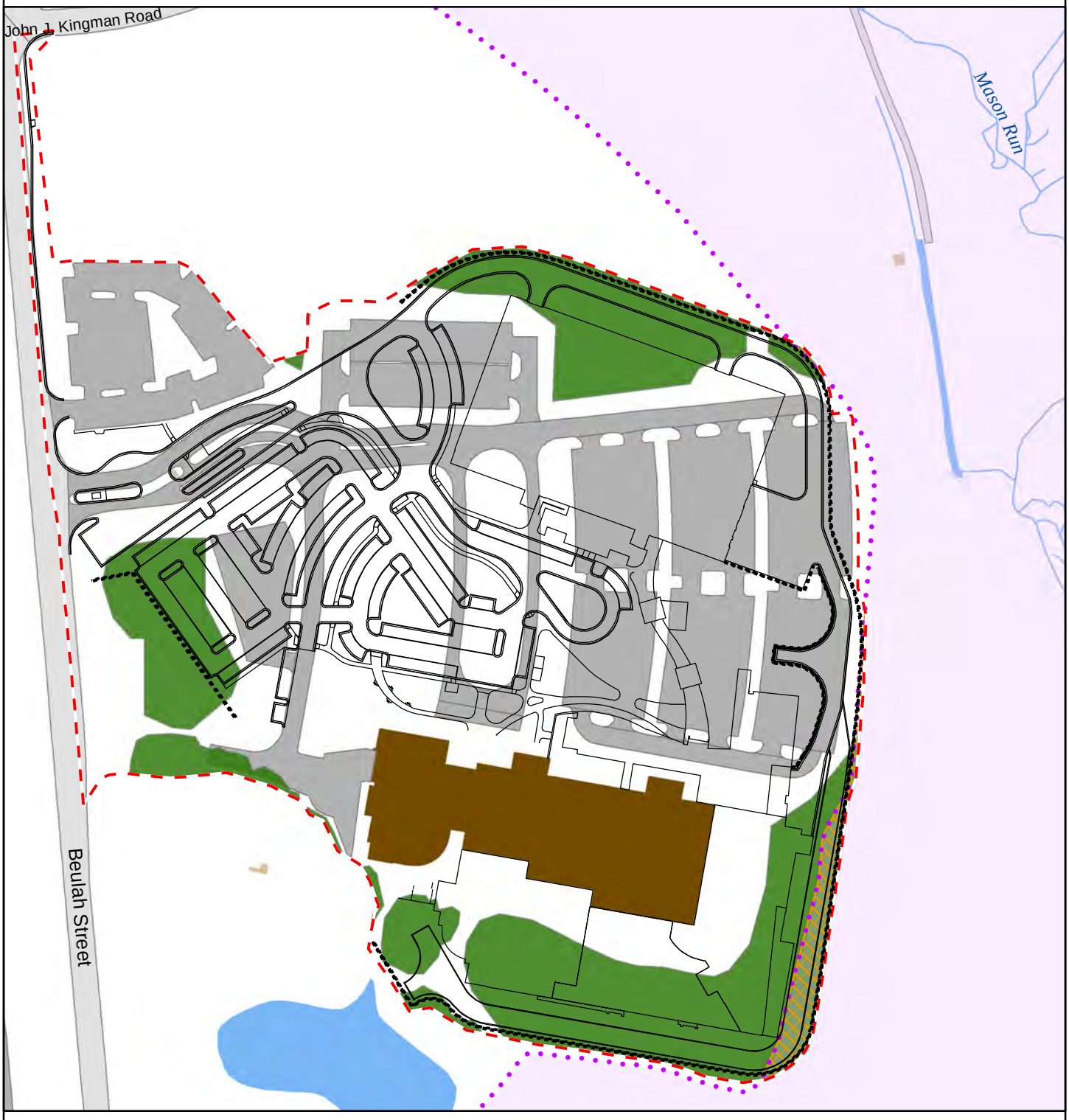

Figure 16

Source: Fort Belvoir CAD and GIS

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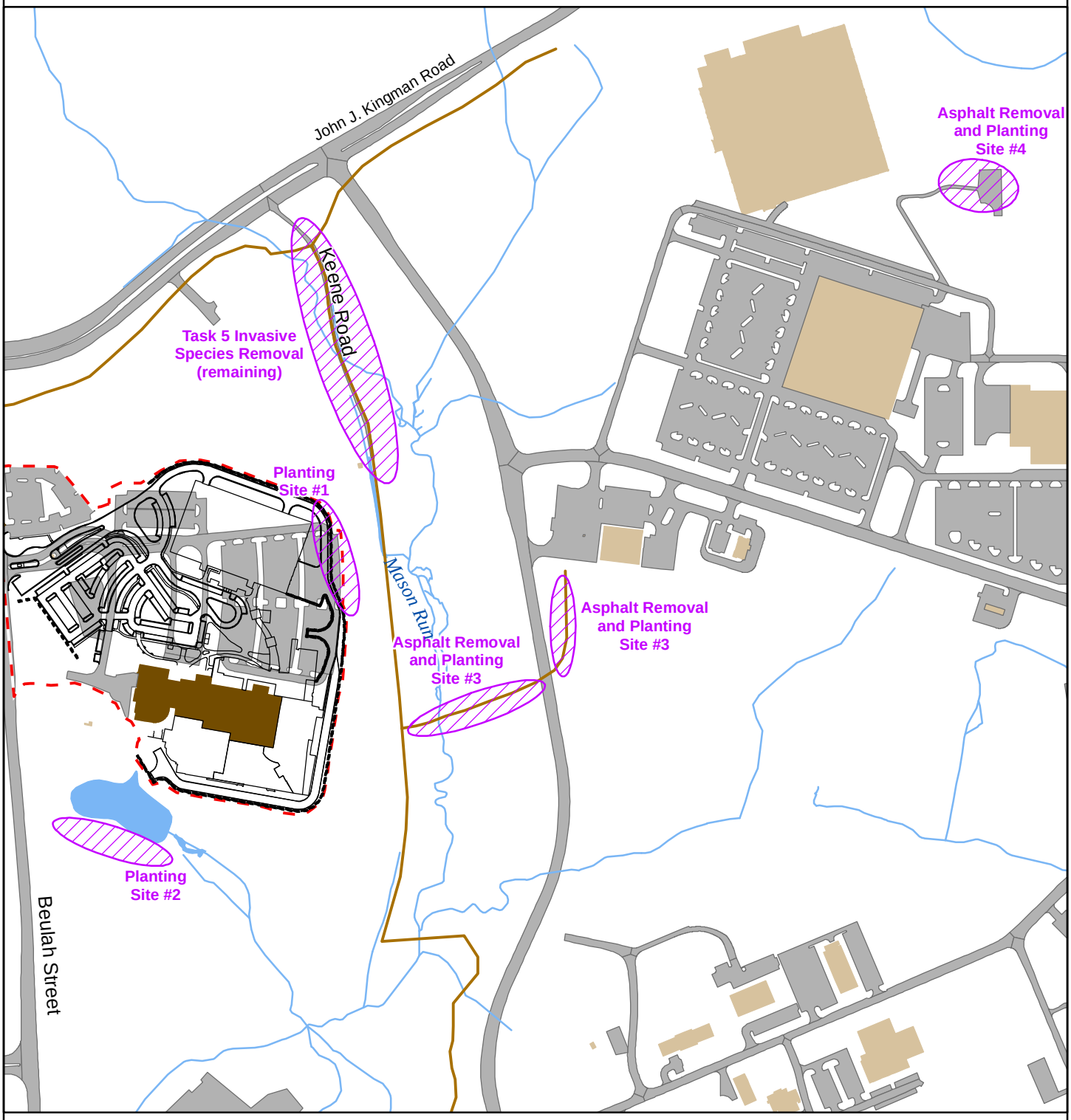
Mitigation Sites



Source: Fort Belvoir CAD and GIS

Figure 17

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In general, the small, short-term reduction in overall forest habitat would have a minor, short-term adverse effect on the carrying capacity of the forest habitats for sustaining wildlife populations. By implementing the mitigation measures to restore and improve wildlife habitat on and at the edges of the site and at other locations, short-term impacts to wildlife would be blunted; and in the long run, the quality of wildlife habitat would be improved. By limiting the project's intrusion to the already-developed top of the plateau as much as possible, and minimizing intrusion into the stream valleys associated with Mason Run, INSCOM would limit its impacts on wildlife, particularly PIF bird and other species. Fort Belvoir's use of Integrated Pest Management methods would also limit any indirect adverse effects that might result from chemical contamination of soils and water bodies adjacent to the site.

An important consideration is that INSCOM would maintain continuity between wet habitats throughout this part of the installation. Amphibian survival depends on continuity among wet habitats as well as between upland and wet habitats. INSCOM would also limit intrusion into wood turtle habitat. Short term impacts from construction would be controlled through compliance with ESC and VSMP requirements.

3.7.5 Threatened and Endangered Species

Existing Conditions: Under the Endangered Species Act (ESA) of 1973, plant and animal species in danger of extinction throughout all or a part of their range are listed as endangered. Species that are likely to become endangered within the foreseeable future throughout all or a significant part of their range are listed as threatened. Endangered and threatened listings impart protective status to the listed species and their habitats. Additional designations under the ESA are proposed endangered and proposed threatened, for species awaiting additional data to determine the need for listing; candidate where the data support a species listing, but the listing procedure has been delayed. States frequently have similar programs which list and protect species vulnerable to extinctions at the state level.

Natural heritage resources include habitats for rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations. State Natural Heritage Programs maintain listings and conservation rankings of rare plant and animal species that occur within their state, and ecological communities. Unlike endangered and threatened listings, rare species listings and their rankings are not legal designations, and do not provide any protective status. They are used to prioritize resources for conservation. The Virginia's Department of Conservation and Recreation, Division of Natural Heritage Division of Natural Heritage (DCR-DNH) manages the Virginia National Heritage Program.

Fort Belvoir has three state-listed animal species that occur on-Post on a regular basis: the state-listed endangered bald eagle (*Haliaeetus leucocephalus*), the state-listed threatened wood turtle (*Clemmys insculpta*), and the state-listed endangered peregrine falcon (*Falco peregrinus* – during fall migration). The closest regular habitat to the HQINSCOM site for bald eagles is at the Dogue and Accotink Creek shorelines (US Army Garrison Fort Belvoir, 2001a), approximately 1.51 and 0.8 mi away, respectively. The wood turtle is found in mesic deciduous woodlands in or within 300 ft of clear brooks and streams. While wood turtles are terrestrial, they typically

remain in moist areas. A survey conducted in April through June, 2002, concluded that Mason Run, because it does not have enough natural pools, is not suitable habitat for the wood turtle. That survey was updated for the project area in November 2010 (Mitchell, 2010). The conclusions of that survey effort confirmed the 2002 survey: Mason Run and its primary tributary in the INSCOM area do not provide sufficient shelter that would allow successful hibernation for the wood turtle because the few pools present are too shallow and have limited size and depth in the undercut banks. The vegetation in the associated floodplains is limited in diversity and sparse. This species rarely, if ever, would occur in this portion of the Post. Accotink Creek does provide suitable habitat (Mitchell and Akre, 2002) and is thus the closest habitat (0.8 miles from the HQINSCOM site).

The peregrine falcon has been regularly recorded on Fort Belvoir as it migrates through the area and takes advantage of foraging habitat along the Accotink Stream / Accotink Bay stream corridor (US Army Garrison Fort Belvoir, 2001a).

In addition, the Northern Virginia well amphipod (*Stygobromus phreaticus*) was collected at Fort Belvoir's T-17 training area in 1996 (VDCR - DNH, June 2003, in US Army Corps of Engineers, Baltimore District, October 2008) – one of only three records of collection since 1922. While not state or federally-listed as threatened or endangered, this critically imperiled amphipod (MACTEC Engineering and Consulting, of Georgia, Inc., June 2003, in US Army Corps of Engineers, Baltimore District, October 2008) is considered to be a species of special concern. It is a subterranean crustacean limited to groundwater seeps.

Finally, the small whorled pogonia (*Isotria medeoloides*), an orchid found in deciduous woods, can occur in this part of Fairfax County. It is considered threatened throughout its range by the US Fish and Wildlife Service, and endangered in the state of Virginia (VDCR-DNH, April 2009). It has been found in Fort Belvoir's North Area (formerly the Engineer Proving Ground) but not on Main Post. Fort Belvoir contracted a survey of the project site in July, 2011 (Rouse Environmental Services, 2011). The majority of the site (inside the perimeter fence) is developed with buildings, parking lots, and landscaped areas, and would not be suitable for the small whorled pogonia. Areas of limited potential habitat were observed on wooded, colluvial slopes in association with unnamed drainageways near the northern end of the study area. Despite systematic search efforts of these areas, no individuals were observed. Remaining forested sections near the eastern boundary of the study area are characterized by slopes that would be considered too steep to support the small whorled pogonia.

Impacts of No Action: The No Action Alternative would cause no short or long-term adverse impact on threatened or endangered species, their habitat, or other Natural Heritage resources.

Impacts of the Proposed Action and Mitigation: VDCR-DNH, by letter dated November 17, 2009, indicated that it had searched its Biotics Data System for occurrences of natural heritage resources for the project area. The files do show occurrences of heritage resources in the project area, but due to the scope of the activity and the distance to these resources, it does not anticipate any adverse impacts. VDCR-DNH also indicated that they did not identify the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity. The US Fish and Wildlife Service, by letter dated December 22, 2009, indicated the same. Both letters are

included in Appendix C. Because several years have passed since the 2009 coordination, Fort Belvoir sent new coordination letters to the US Fish and Wildlife Service, VDCR-DNH and to the Virginia Department of Game and Inland Fisheries (VDGIF) in June 2012. VDGIF responded that due to staffing limitations, it was unable to review or provide an assessment of the project. No further responses were received from VDCR-DNH or the US Fish and Wildlife Service.

3.7.6 Forest Riparian Buffers/ Chesapeake Bay Resource Protection Areas

Existing Conditions: Fort Belvoir undertakes actions that are consistent to the maximum extent practicable with the Chesapeake Bay Preservation Act (CBPA), Sections 10.1-2100, et seq., of the Code of Virginia (VAC). The purpose of the Chesapeake Bay Act is to reduce the amount of sediment and attached nutrients in stormwater runoff before runoff and nutrients can be transported to Chesapeake Bay.

Chesapeake Bay Resource Protection Areas (RPAs)

RPA "core components" include streams with perennial and tidal waters, wetlands contiguous to perennial streams and tidal waters, and a 100-foot buffer. The landward limit of the RPA is the 100-foot buffer or the 100-year floodplain, whichever is greater.

RPAs in the vicinity of the HQINSCOM building (Figure 6) include: Mason Run; the unnamed perennial stream discharging from the culvert at the terminus of Keene Road; and the small stormwater retention pond located approximately 200 feet south of the existing building and the outfall from that pond, as well as any wetlands contiguous to these areas, and a 100-foot buffer from either the streams, pond, or the wetlands. Figure 6 is based on a site-specific investigation and perennial flow determination conducted in November, 2011 (Paciulli Simmons & Associates, Ltd., 2011a and 2011b). Under the CBPA, construction within the RPA is largely restricted to water dependent activities, public utilities and roadways, passive recreation, water wells, and historic preservation. Development is allowed in resource management areas (RMAs) adjacent to RPAs, but the development must meet performance criteria for nutrient reduction, including construction of best management practices (BMPs). Compliance with these RMA standards is generally incorporated into the design of stormwater management/best management practices (SWM/BMPs).

As a matter of policy, Fort Belvoir also limits development within a 35-foot riparian buffer along its intermittent streams. There are no intermittent streams; and, therefore, no riparian buffers within the project area.

Impacts of No Action: The No Action Alternative would have no impacts on Chesapeake Bay RPAs or RMAs.

Impacts of the Proposed Action and Mitigation: Impacts of the Proposed Action and Mitigation: Although INSCOM has developed the Proposed Action plan to avoid RPAs as much as practicable, the proposed emergency access road for the expanded building would encroach on approximately 1,672 sq ft of the RPA associated with the small pond near the southwest corner of the building (Figure 6). Under 9VAC10-120-130 1(d), roads are allowed within an RPA

provided they meet certain conditions. This road is for emergency vehicle access only, and no other alternative exists. Fort Belvoir is engaged in the design process and will approve the final design, which will minimize adverse effects on water quality by considering using permeable materials for the roadway. The final design will include a water quality impact assessment (WQIA). and VDCR will review the plan for the road. This satisfies the conditions for encroachment into the RPA. Fort Belvoir has prepared a preliminary WQIA, discussed this issue with VDCR, and obtained preliminary approval that the minor encroachment is exempted and the project is consistent with the CZMA.

To offset impacts on forested habitat and on the RPA, INSCOM will plant native trees and shrubs, or remove invasive vegetation to release existing native trees and shrubs (Figure 17). Site 2 (13,650 sq ft) and Site 3 (approximately 6,000 sq ft) are within the RPA buffer for Mason Run and one of its tributaries, while Site 1 (0.34 ac) directly abuts the RPA buffer for Mason Run. Site 5, where INSCOM will remove invasive vegetation, also lies within the RPA buffer for Mason Run. A preliminary WQIA with a buffer impact analysis indicates that the proposed mitigation would be more than sufficient to offset the loss of 1,672 sq ft of RPA. The WQIA and buffer impact analysis will be refined as the site plan is finalized and the planting plans are developed more completely.

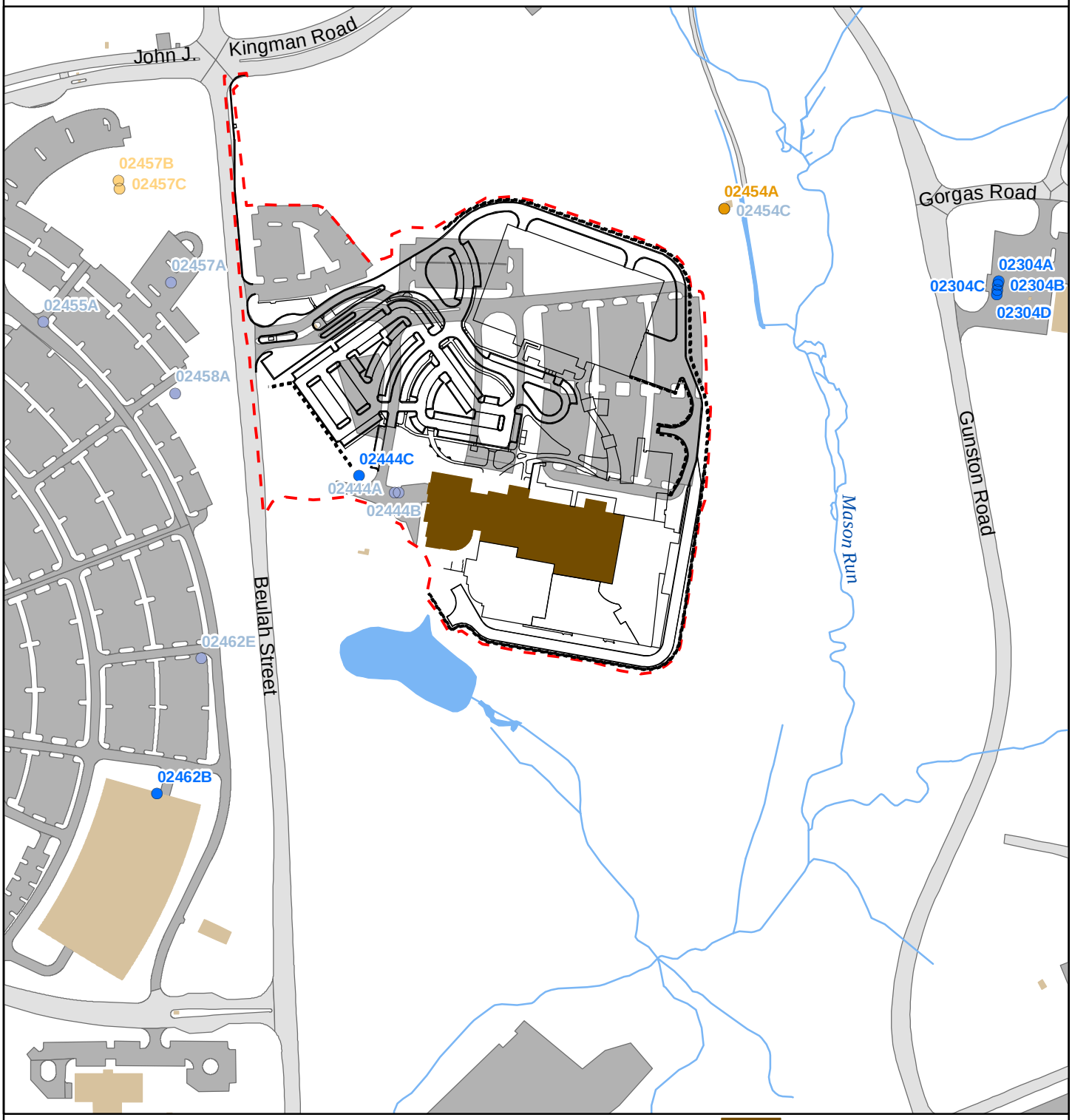
3.8 Hazardous Materials/Hazardous Wastes

Existing Conditions: Fort Belvoir conducts its hazardous waste management program in compliance with the Resource Conservation and Recovery Act (RCRA). It has a Hazardous Waste Management/ Waste Minimization (HWMP) Plan and a Master Spill Plan. Fort Belvoir participates in the "Greening of Government" program (EO 13101, *"Greening" the Government through Waste Prevention*) that promotes the purchase of products to reduce solid and hazardous waste through implementation of a centralized system for tracking procurement, distribution, and management of toxic or hazardous materials. In addition, the cleaning and maintenance departments have replaced toxic and hazardous materials with environmentally-friendly chemicals, and adhere to an Integrated Pest Management Plan. Fort Belvoir ENRD also files annual hazardous material and toxic chemical reports in compliance with the Emergency Planning and Community Right-to-Know Act (EPCRA).

Current and former hazardous waste permitted facilities present potential constraints to future development, in that closure of such sites is required prior to reuse. There are no hazardous waste accumulation sites within the immediate vicinity of the proposed site.

A preliminary assessment/site inspection conducted in 1982 for the Installation Restoration Program indicated that there were no Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites identified on Fort Belvoir (US Army Garrison Fort Belvoir, 2000a). There are also no known hazardous waste contaminated sites close to the proposed site.

Fuel Tanks



Source: Fort Belvoir CAD and GIS

Figure 18

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There is one active fuel tank on the INSCOM site: a 25,000- gallon diesel underground storage tank (UST) (02444C) located west of the HQINSCOM building (Figure 18, Fuel Tanks). A release of diesel fuel from this UST was reported to VDEQ in September 2000. The Fort Belvoir Fire Department responded to the spill, but a majority of the diesel fuel traveled via stormwater drains to the retention pond south of the HQINSCOM building. Diesel fuel was skimmed from the stormwater retention pond surface and a dual-phase extraction system was installed in June 2003 to extract residual diesel fuel and vapors from the ground and monitoring wells installed. The DPE system was cleaned and removed in 2006. The remedial endpoints identified in the Corrective Action Plan submitted to the VDEQ were met after 3.5 years of remediation. At that time the DPE system was turned off, and then the endpoints were monitored and maintained for six months, prior to petitioning the VDEQ for case closure. The VDEQ closure letter for this case, PC#2001-3108, was issued April 27, 2007. Movement or removal of tanks to accommodate construction must be coordinated with Ben Wallen, Petroleum Program Manager.

Fort Belvoir removed two out-of-service 15,000-gallon USTs (02444A and 02444B) that had been located west of the HQINSCOM building in October 1997. At the time, petroleum-impacted soils were observed, and approximately 292 cubic yards of soils were removed and disposed of.

There were two small, 250-gallon diesel USTs (02454A and 02454C) approximately 231 feet from the northeast corner of the proposed parking garage. The March 1999 Underground Storage Tank Activity Report for Building 2454 prepared by Sub-Tech, Inc. documents the removal of a 250 gallon No. 2 fuel oil UST (02454C) in April 1998 along with eight cubic yards of contaminated soil. No spills from the UST had been documented. AST 02454A is an active above-ground tank that supplies an emergency generator.

Impacts of No Action: Under the No Action Alternative, there would be no short or long-term adverse increase in the production of hazardous substances or waste.

Impacts of the Proposed Action and Mitigation: The construction activity would cause a short-term increase in the use of fuels, oils, asphalt substances, fertilizers, and sanitary waste. These substances could be considered toxic or hazardous if accidentally released in high quantities. The contractor would be required to use control measures to minimize such releases.

Any hazardous substance or petroleum contaminated soils encountered during construction (for example, from the former UST basin or the former diesel spill location) would be disposed of in accordance with state and federal regulations.

While the majority of petroleum-impacted soils were removed from the area of USTs 02444A and 02444B, there is the potential for additional contaminated soils to remain outside the zone that was excavated. The contractor would be required to specify a site Health and Safety Plan, to ensure the safety of the construction workers at the construction site. UST 02454A would also likely have to be removed to make way for the parking garage; if removed, it would be replaced by a new UST.

The expansion of the HQINSCOM building may require the installation of new emergency generators, which may require the installation of additional USTs to fuel the generators. All state and local requirements would be followed to ensure the safe storage and transfer of this fuel. If such a spill were to occur, ENRD would be notified and the Fort Belvoir Master Spill Plan would be followed. Any hazardous substance, petroleum contaminants, or contaminated soils would be disposed of in accordance with state and federal regulations. Movement or removal of tanks to accommodate construction must be coordinated with Ben Wallen, Petroleum Program Manager. A Fort Belvoir DPW Tank Activity Permit would be required as the first step to adding any fuel tank to Fort Belvoir.

3.9 Cumulative Impacts

Cumulative impacts are "… the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Concurrent construction projects in the same area of the Post or immediately outside the Post could lead to increases in vehicle traffic, air emissions, and noise from the various construction activities. Two projects likely to overlap in time and are in proximity to the HQINSCOM site: The new Post Exchange and Commissary located at John J. Kingman Road and Gunston Road; and construction of the National Museum of the Army (NMUSA) off the Fairfax County Parkway, just north of its intersection with John J. Kingman Road, and construction of several new holes for the North Post Golf course (to replace holes that are being impacted by construction of the NMUSA).

The schedule for widening of Route 1 between Telegraph Road and the Mount Vernon Memorial Highway is being moved up and construction of these improvements would likely overlap with the schedule for the Proposed Action. This project is being managed by the Federal Highway Administration's Eastern Federal Lands Division in cooperation with Fort Belvoir and the Virginia Department of Transportation.

A number of private projects off-Post have been approved by Fairfax County or are pending site plan approval. (The Village of Accotink and the Northern Virginia Industrial Park have not yet been rezoned by the county.) These include:

- The Village of Accotink, which includes 27 acres located on U.S. Route 1 and Pohick Road. The proposed plan includes redevelopment of Accotink Village with up to 470 multi-family units with some single-family attached; retail use up to 55,000 sq ft; and up to 16,000 sq ft in office space. Future redevelopment would require right-of-way dedication to support the planned widening of US Route 1 from four to six lanes.

- The Belvoir Business Park on Cinder Bed Road near the northwestern corner of the Post, which contains a major Federal Express distribution facility. A portion of the site is planned for office and/or industrial use.
- The Hilltop Village Center, a 33-acre site at the intersection of Beulah Street and Telegraph Road, which was rezoned in 2008. Current plans propose a 150,000 sq ft grocery story; 94,000 sq ft of specialty retail, banks; office space totaling over 100,000 SF; and 953 parking spaces. The site is planned as an integrated mixed-use development.
- The Northern Virginia Industrial Park. A Fairfax County Comprehensive Plan Amendment allows 69 acres of land on Telegraph Road West to become a mix of office, hotel, retail, civic, and light industrial uses.
- The Fairfax County Board also amended the county's Transportation Plan to show Telegraph Road planned for six lanes (formerly four-lanes) from Richmond Highway to Fairfax County Parkway.

These projects have the potential to add to local traffic congestion over the short and long term. The cumulative impacts of the proposed action when considered with these other projects would be both short term and long term, but would be minor. Cumulative impacts on traffic and air quality have been assessed as part of the traffic and air quality analysis for this project.

3.10 Conclusion

The anticipated consequences of the Proposed Action Alternative and No Action Alternative are summarized in Table 9. These impacts represent a subjective rating that is representative of:

- Quality/uniqueness of the resources affected.
- Intensity and duration of the impact.
- Potential to minimize the impact through mitigation.

In summary, this EA described and identified the potential impacts of the Proposed Action Alternative and the No Action Alternative. The Proposed Action would not have a significant impact on the quality of the human environment and an environmental impact statement (EIS) is not needed.

Table 9: Summary of Impacts of the Proposed Action and No Action Alternatives

Resources	Proposed Action Alternative	No Action
Land Use		
Land Use	0	0
Plans	1	0
Transportation & Traffic		
Network	0	0
Traffic	1	0
Air Quality	1	0
Infrastructure		
Potable Water	1	0
Sanitary Sewer	1	0
Stormwater	1	0
Natural Gas	1	0
Electricity	1	0
Communications	1	0
Solid Waste	1	0
Socioeconomics		
Demographics	0	0
Environmental Justice	0	0
Employment & Income	1	0
Community Facilities & Services	1	0
Natural Resources		
Geology and Topography	1	0
Soils	1	0
Surface & Groundwater	1	0
Vegetation and Wildlife	1	0
Threatened and Endangered Species	1	0
Forest Riparian Buffers & Chesapeake Bay RPAs	1	0
Hazardous Substances	0	0

3 = High Impact 2 = Moderate impact 1 = Minor impact 0 = No or Negligible Impact

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- Scarlet Tanager
  http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=101306&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=101306&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=101306
- Hooded warbler
  http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report

.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=105404&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=105404&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=105404

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6 Acronyms

ac	acres
ABWR	Accotink Bay Wildlife Refuge
ACQR	Air Quality Control Region
AM	12 Midnight to 12 Noon
AR	Army Regulation
AST	Above ground storage tank
ASTM	American Standards Testing and Measurements
AT/FP	antiterrorism / force protection
BMPs	best management practices
BRAC	Defense Base Closure and Realignment Commission
^{o}C	degrees Centigrade
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAMA	Coastal Area Management Act
CARB	California Air Resources Board
CBLAD	Chesapeake Bay Local Assistance Department
CBPA	Chesapeake Bay Preservation Act
CBPO	Chesapeake Bay Preservation Ordinance
CCC	Car Care Center
CDP	Census Designated Place
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm	centimeters
CO	Carbon monoxide
$CO^{2.}$	Carbon dioxide
CRMP	Coastal Resources Management Plan
CWA	Clean Water Act
CX	Categorical exclusion
CZMP	Coastal Zone Management Program
CZMA	Coastal Zone Management Act
CZMARA	Coastal Zone Management Act Reauthorization Amendments
DA	Department of the Army
dB	Decibel
DC	District of Columbia

DCEETA	Defense Communications Electronics Evaluation and Testing Activity
DCR	Department of Conservation and Recreation
DCR-DNH	Department of Conservation and Recreation, Division of Natural Heritage
de minimis	of minimal importance
DEIS	Draft EIS
DLA	Defense Logistics Agency
DNH	Division of Natural Heritage
DoD	Department of Defense
DTRA	Defense Threat Reduction Agency
DVP	Dominion Virginia Power
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
ENRD	Environmental Natural Resources Division
EO	Executive Order
ERPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
ESC	erosion and sediment control
^{0}F	degrees Fahrenheit
FBNA	Fort Belvoir North Area
FEIS	Final EIS
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FNSI	Finding of no significant impact
FR	Federal Register
ft	feet
FW	Fairfax Water
FWC	Forest Wildlife Corridor
FY	Fiscal year
gal	gallon
GHG	Greenhouse gas
GIS	Geographic Information System
gpd	gallons per day
HAP	Hazardous Air Pollutant
HQINSCOM	Headquarters US Army Intelligence and Security Command
HOV	High Occupancy Vehicle

HWMP	Hazardous Waste Management / Waste Minimization Plan
I-95	Interstate-95
ICPRB	Interstate Commission on the Potomac River Basin
in	inch
INCMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
INSCOM	US Army Intelligence and Security Command
IPM	Integrated Pest Management
IRP	Installation Restoration Program
JMAWR	Jackson Miles Abbott Wildlife Refuge
kpy	Kilograms per year
kV	Kilovolts
$L_{eq}[h]$	Hourly A-weighted sound level
LAER	Lowest Achievable Emissions Rate
LEED-NC	Leadership in Energy and Environmental Design-New Construction
LID	low impact development
LOS	Level of Service
lpd	Liters per day
m	meters
m^2	Square meters
MDW	Military District of Washington
MGD	Million gallons per day
mi	miles
mm	millimeter
mph	Miles per hour
MS-4	small municipal separate storm sewer system
MSATs	Mobile Source Air Toxics
msl	Mean sea level
MWAQC	Metropolitan Washington Air Quality Committee
MWCOG	Metropolitan Washington Council of Governments
NAAQS	NO_2 National Ambient Air Quality Standards
NAC	Noise Ambient Criteria
NAWQA	National Water Quality Assessment
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NCPC	National Capital Planning Commission
NCR	National Capital Region
NHP	National Heritage Program
NHPA	National Historic Preservation Act

NO_2	Nitrogen dioxide
NO_x	Nitrogen oxide
NOA	Notice of availability
NOI	Notice of intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
O_3	Ozone
OTR	Ozone transport region
Pb	Lead
PIF	Partners in Flight
PM	12 Noon to 12 midnight
$PM_{2.5}$	fine particulate matter
PM_{10}	Particulate matter - 10 microns or less
ppm	Parts per million
PSD	prevention of significant deterioration
QRP	Qualified Recycling Program
RCRA	Resource Conservation and Recovery Act
REC	Record of environmental consideration
RMA	Resource Management Area
ROD	Record of Decision
RONA	Record of Non-Applicability
RPA	Resource Protection Area
RPMP-LRC	Real Property Master Plan-Long Range Component
R/W	Right-of-Way
SA	Secretary of the Army
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_x	Oxides of sulfur
sq	Square
sq ft	Square foot/feet
SWM	stormwater management
SWMU	Solid Waste Management Unit
T&Es	Threatened and endangered species
TMH	Transportation Management Plan

TPM	Total particulate matter
tpy	Tons per year
TSP	Total suspended particulate matter
US 1	U.S. Route 1, Jefferson Davis Highway (Richmond Highway)
USACE	US Army Corps of Engineers
USBEA	US Bureau of Economic Analysis
USBLS	US Bureau of Labor Statistics
USC	United States Code
USDA	US Department of Agriculture
USDOE	US Department of Energy
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
UST	Underground storage tank
V/C	Volume to capacity ratio
VAC	Code of Virginia
VCP	Virginia Coastal Management Program
VDACS	Virginia Department of Agriculture and Consumer Services
VDCR	Virginia Department of Conservation and Recreation
VDCR-DNH	Virginia Department of Conservation and Recreation – Division of Natural Heritage
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDHR	Virginia Department of Historic Resources
VDOT	Virginia Department of Transportation
VDWM	Virginia Department of Waste Management
VEDP	Virginia Economic Development Partnership
VMT	Vehicle miles traveled
VOC	Volatile organic compound
VPDES	Virginia Pollutant Discharge Elimination System
VR	Virginia Regulation
VRE	Virginia Railway Express
VSMP	Virginia Stormwater Management Program
WMATA	Washington Metropolitan Area Transit Authority
WQIA	Water Quality Impact Assessment

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Appendix A

Traffic Assessment

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TRAFFIC ASSESMENT

U. S. ARMY INTELLIGENCE AND SECURITY COMMAND (INSCOM)

Fort Belvoir

Fairfax County, Virginia

DRAFT MEMORANDUM

Existing Conditions

Build vs. No-Build Comparison

Prepared by:

Dewberry & Davis LLC

June 11, 2012

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1. Introduction and Summary

The site consists of an existing building, the HQINSCOM, with an area of 234,000 square feet and an existing parking lot with a total of 951 parking spaces inside and outside the gates. The existing transportation network includes highways, principal and minor arterials, and local streets. An existing bus service from Metro and VRE stations is in place and it provides some access to the site. The proposed improvements of the site will include an expansion of the existing building by 382,000 square feet and the renovation of the existing building.

The existing overall Level of Service (LOS) at the three key intersections analyzed in this study is C or D during the AM and PM peak hours which are generally considered acceptable. While the overall intersection LOS levels are at an acceptable level, several movements and approaches at the Fairfax County Parkway and Kingman Road intersection operate at LOS E or F. These LOS levels are deemed tolerable as long as the overall LOS for the respective intersection is D or better.

The analysis of the future LOS in 2018 was performed as a comparison of the No-Build and Build alternatives. The 2018 traffic volumes for these conditions were derived using a series of growth rates for thru traffic on public roadways (12.6% = 2% per annum for 6 years), for trips to and from the North Post (21.6%), and trips to and from Davison Airfield (8.2%) These trips to and from the North Post and Davison Airfield are based on changes in personnel indicated by the Short Range Component of the Fort Belvoir Master Plan. The growth rate for INSCOM under the Build condition is 2.63, which is based on the ratio of the SF of the future facility to the existing facility (616,00SF/234,00SF). Future traffic growth for all Fort Belvoir installation is moderated by TMP reduction factors (7% for most locations, 16% for INSCOM).

Because of the moderating effect of the TMP Program which applies to both the new and existing trips to and from HQINSCOM, the inbound AM Peak Hour volume is expected to increase by approximately 400 vehicles more under the Build alternative than the No-Build alternative during the AM Peak Hour, i.e.: less than 7 vehicles per minute.

Levels of Service and delays for the 2018 No-Build and Build alternatives were determined using the SYNCHRO traffic Signal Timing and Analysis Program. The LOS analysis provided the following results:

- The overall LOS for the Fairfax County Parkway and John J. Kingman intersection remains at LOS D overall during both AM and PM Peak Hour for the No-Build and Build alternatives.

The average increase in delay per vehicle is less than 5 seconds more in the Build alternative than the No-Build alternative.

- The overall LOS for the John J. Kingman Road at Beulah Street intersection changes from LOS B to LOS C in the AM Peak Hour and it remains unchanged in the PM Peak Hour at LOS C for both alternatives.
- The overall LOS at the Telegraph Road at Beulah Street intersection remains unchanged in the AM and PM Peak Hour at LOS C with a change in average delay per vehicle of about a second per vehicle. The LOS and average delays are expected to degrade when the new Hilltop Village Center, however the impact of the Build alternative is expect to remain minor.

1.1. Purpose of Report

This report provides the results of a traffic assessment in support of the US Army Intelligence and Security Command (INSCOM) proposed renovation and expansion of its headquarters facilities (HQINSCOM) on US Garrison Fort Belvoir, Virginia.

1.2. Study Objectives

The study was conducted as a comparison of "No-Build" and "Build" alternatives, and has the following objectives:

- To conduct existing baseline traffic counts at selected intersections during weekday peak hours.
- To estimate future traffic volumes in 2018 generated by HQINSCOM.
- To estimate future Levels of Service (LOS) in 2018 for selected intersections based on a No-Build alternative, and a Build alternative reflecting the expansion of HQINSCOM.

1.3 Description of the Study Area

Fort Belvoir is located in southeastern side of Fairfax County, Virginia, approximately 18 miles southwest of Washington DC, as depicted in Figure 1, and it is considered the US army's premier installation in the Northeast Region. Fort Belvoir is comprised of the Main Post with an area of 7,862 acres and the North Area (previously called the Engineering Proving Ground) with an area of 807 acres. The Main Post is situated between Interstate-95 and Pohick Bay and Gunston Cove on the Potomac River. It has a current daytime population of more than 39,000 people, plus approximately 7,000 residents. The Main Post is divided into the North Post and South Post by US Route 1. As shown in Figure 2, the development is of moderate to low density because of the environmental constraints. The study intersections includes the roads within the Post that are immediately adjacent to INSCOM and the adjacent intersections on John J. Kingman Road at Fairfax County Parkway, and Beulah Street at Telegraph Road that are part of the public roadway network.

Figure 1 – Location of Fort Belvoir

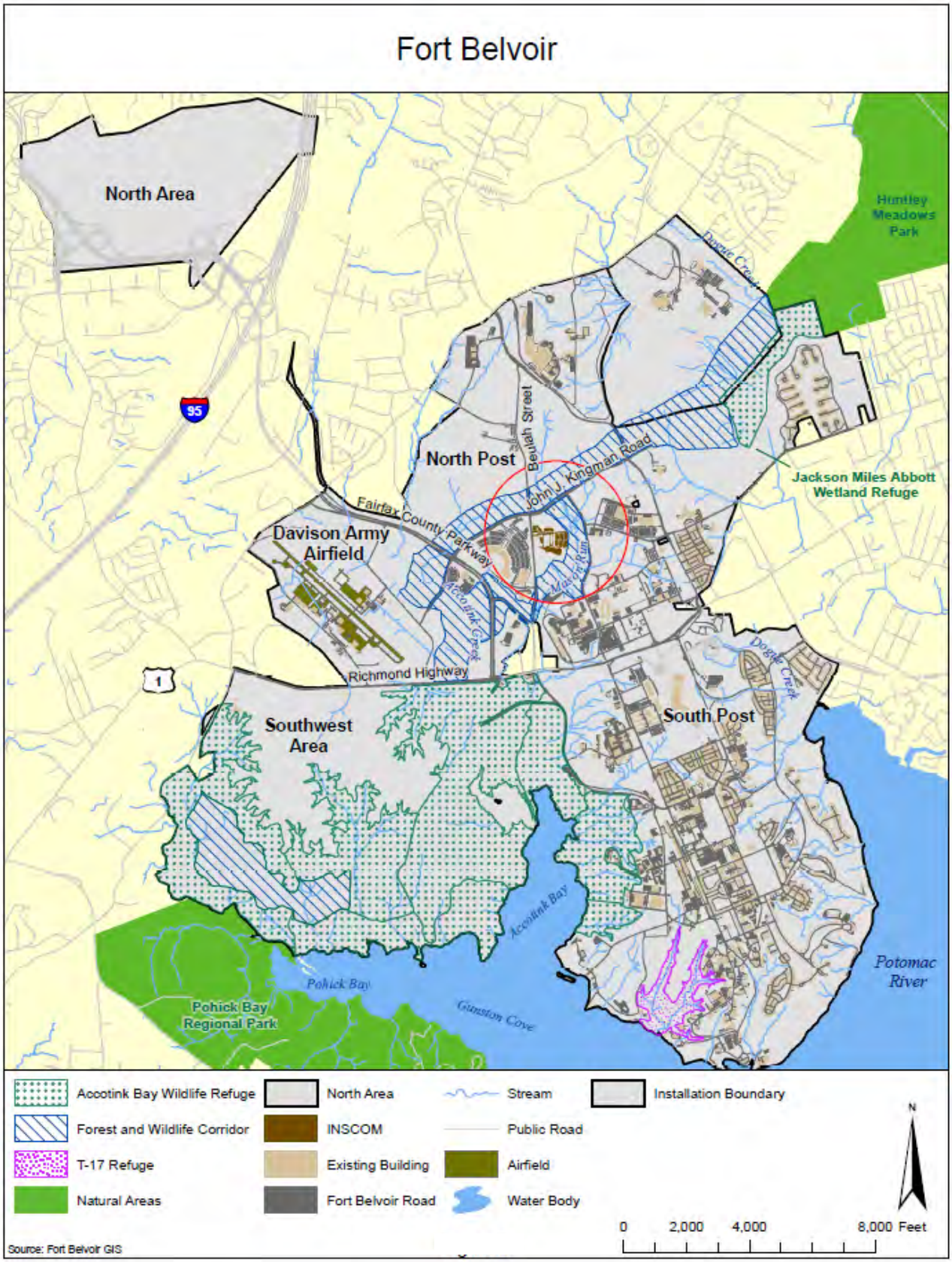

Figure 2 – Fort Belvoir

1.4. Description of the Proposed Development

The HQINSCOM building is located within the North Post between John J. Kingman Road, Gunston Road and Beulah Street. The Army proposes to renovate and expand the INSCOM headquarters on US Army Garrison Fort Belvoir, Virginia as follows:

- Building of a 382,000-square-foot addition to the existing HQINSCOM building.
- Renovation of the existing 234,000-square-foot HQINSCOM building.
- Building of a new multilevel parking garage with approximately 1,420 spaces.
- Reconfiguration of the existing parking lots, landscaping, walkways and roadways.
- Building of new utilities infrastructure and a new storm water management/best management practice (SWM/BMP) pond.

The proposed improvements will provide increased space for approximately 850 additional INSCOM personnel performing intelligence missions, expanded training, and required equipment. The new facilities will accommodate personnel currently located in different buildings both on and off Fort Belvoir thus increasing security and efficiency.

Figure 3, HQINSCOM Existing Layout depicts the existing facilities.

Figure 4, HQINSCOM Proposed Layout depicts the proposed facilities and improvements.

1.5. Description of the HQINSCOM Site

The HQINSCOM site is situated in the North Post in an area near the Fairfax County Parkway. As shown in Figure 5 the site is bounded by extensive area of tree growth. There is a forested valley to the north and steep-sided, forested stream valleys associated with Mason Run to the east and south. The areas east and south of the site consisting of Mason Run and associated wetlands are part of the Chesapeake Bay Resource Protection Area (RPA). These areas and the Fort Belvoir Forest and Wildlife Corridor are designated in the Fort Belvoir Real Property Master Plan as natural areas to be preserved and are considered constraints on development. These environmental constraints areas separate HQINSCOM from the area east of Gunston Road designated for Community Land Use, which includes the Post Exchange and other community support services.

Figure 3 – HQINSCOM Existing Layout

Figure 4 – HQINSCOM Proposed Layout

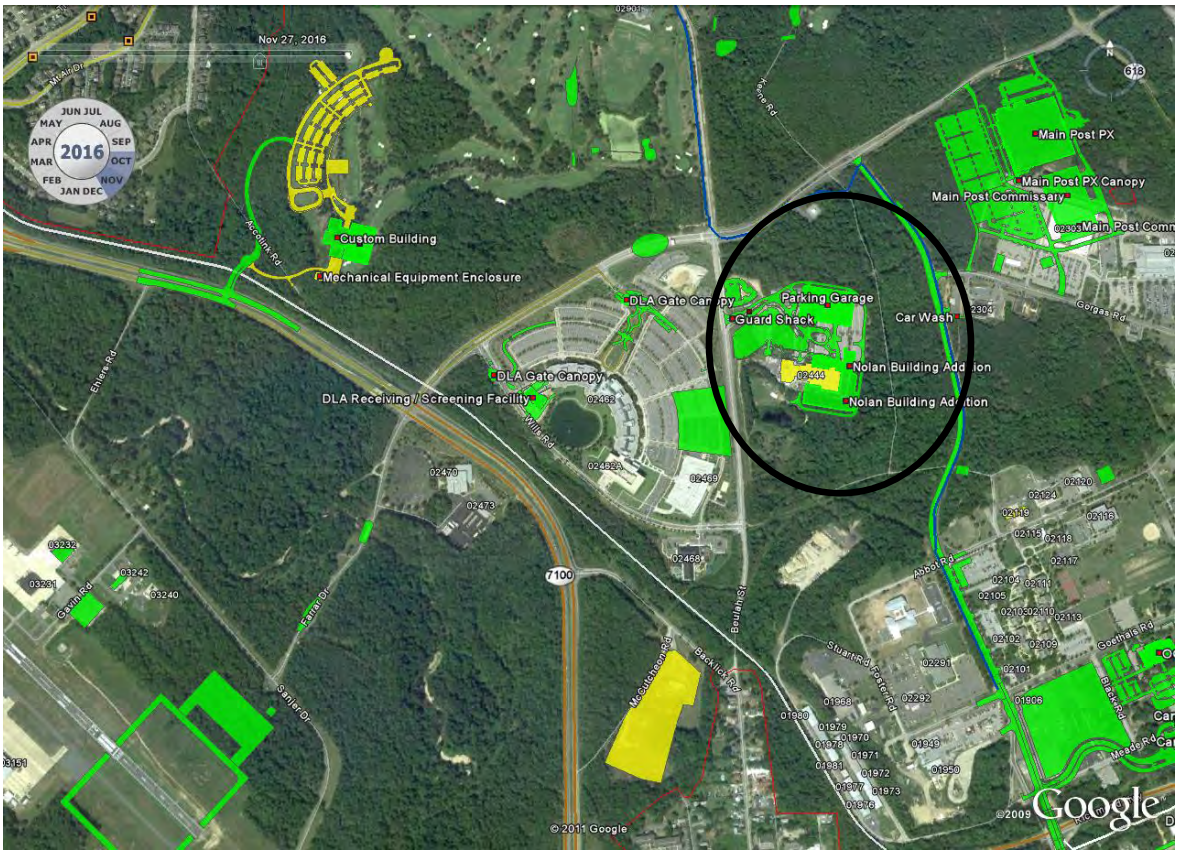

Figure 5 – Aerial View of Existing Site

The site itself is designated for professional/institutional land use, as is the Defense Threat Reduction Agency (DTRA) and the Defense Logistics Agency (DLA) immediately west of Beulah Street. The overall designated land uses in the immediate vicinity of the HQINSCOMN site are indicated in Figure 6.

An additional constraint on the development of the site exists because the HQINSCOM is located within the Building Height Restriction Zone associated with Davison Airfield. The height restriction in this area is 216 feet absolute elevation. The existing HQINSCOM building is within this height limit.

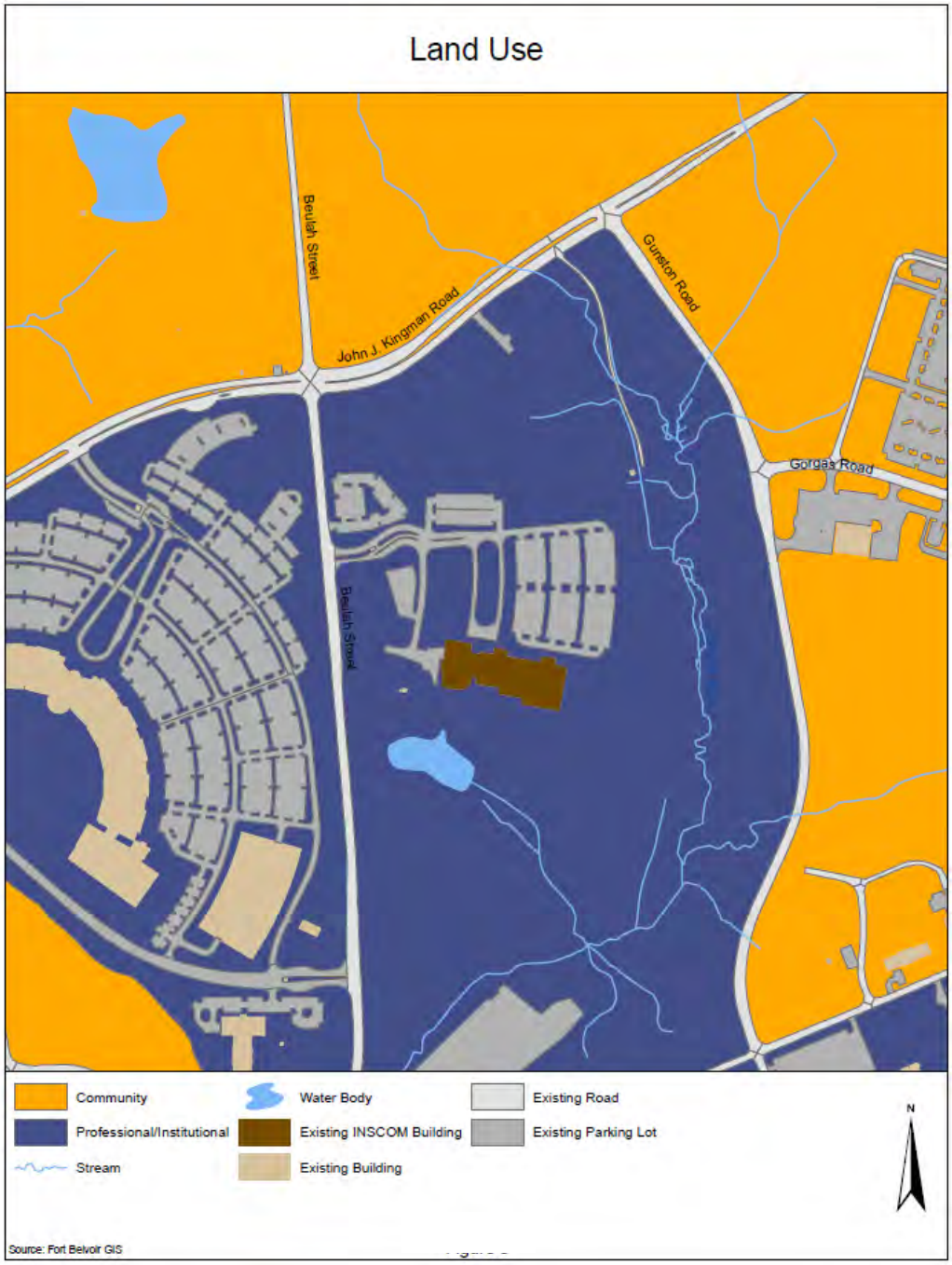

Figure 6 – Land Use

2. Existing Transportation Network

2.1 Public Roadways

The existing roadways that define the highway system in the vicinity of the site, as depicted in Figure 7, is comprised of four major roadways: Interstate 95 (I-95), Fairfax County Parkway (Virginia Route [VR] 7100), Richmond (Jefferson Davis) Highway – US 1 and Telegraph Road (VR 611).

- I-95 is the major North-South thoroughfare for the East Coast. It is located approximately two miles northwest of Fort Belvoir.
- US 1 parallels I-95 and serves regionally as an alternate corridor to I-95. It is a four lane undivided principal arterial with a north-south orientation; however, it runs in an east-west direction across Fort Belvoir. US 1 passes through Fort Belvoir and it divides it into the North Post and the South Post. Entrance gates to the Fort Belvoir South Post are located at Belvoir Road (Pence Gate) and Pohick Road (Tulley Gate). There are no access or egress gates between the North Post and US 1. The Woodlawn Gate and Lieber Gate which previously provided direct access to the North Post from US 1 have been closed for several years.[1]
- Fairfax County Parkway provides direct access to Fort Belvoir North Post via the Kingman Gate. The Parkway is a divided four-lane limited access highway that links Fort Belvoir with I-95 and the northern and western parts of Fairfax County.
- Telegraph Road is a four-lane arterial road that runs along the northern boundary of Fort Belvoir North Post. There is an entrance to the North Post at Telegraph Road at Beulah Street (Telegraph Gate).

2.2 Roadways within Fort Belvoir

The vast majority of the roads within Fort Belvoir are two lane two way roadways that were constructed to serve the lower level of development that existed prior to BRAC. The principal roadways that serve HQINSCOM are described in the following paragraphs.

- Beulah Street is a two-lane north-south road that provides access to the North Post from Telegraph Road. Beulah Street ends south of John J. Kingman Road. This section provides access to HQINSCOM and a seldom used back gate to DLA.
- John J. Kingman Road is an east-west minor arterial within the North Post that provides access between Fairfax County Parkway, the Kingman gate and the Community Support Center (CSC).

[1] Meeres Road gate is closed to all incoming traffic. Survey data indicate it is used by less than 1% of the exiting vehicles.

It is a four-lane divided roadway for most of its extent, but becomes a two-lane undivided road east of Gunston Road.

- Gunston Road is a major north-south arterial roadway connecting the North and South Posts. It is grade separated over US 1. A construction project to widen Gunston Road to a four-lane divided arterial between Kingman Road in the North Post and 12th street in the South Post will be completed in 2012. This project includes the widening of the bridge over US 1.

2.3 Transit, Rail and Bus Service

Transit and Rail service is not conveniently located for use by HQINSCOM staff. The Franconia Springfield Metro station is located 3.3 miles away from the HQINSCOM gate. (Actual distance on roadways is slightly over 4 miles.) This is the terminal station on the WMATA "Blue" line.

The VRE Fredericksburg Line also provides general service to the area with stops at the Lorton and the Franconia-Springfield Metro Stations. Normal weekday service consists of six northbound trains in the morning and seven southbound trains in the afternoon and early evening[2]. The Lorton Station is located approximately 3 miles south-west of the HQINSCOM (4.5 driving miles). The VRE Station at the Franconia Springfield Metro station is approximately 3 miles away as previously indicated.

Bus service from the Metrorail and VRE stations is provided by several lines.

- Fairfax Connector Bus 171 links the Lorton VRE station with DLA. In the morning buses leave at 20 minute intervals from the Lorton Station, the terminal point for this route. The scheduled running time between the Lorton Station and the DLA entrance is 12 to 18 minutes between 6 AM and 9 AM. In the evening the bus headways vary between 20 and 30 minutes and the scheduled running times from DLA to Lorton vary from 13 to 16 minutes. It is important to note that these southbound trips originate at the Huntington Metro station near I-95. These southbound buses travel 40 to 50 minutes on-route before reaching DLA. This extended time on route can introduce significant deviation in the actual arrival time at the DLA.

Fairfax Connector buses 333, 334, and 335 all connect the North Post to the Franconia-Springfield Metro Station.

- Fairfax Connector buses 333 and 334 are paired, covering a "loop" route in opposite directions. DLA is the point furthest away from the Metro station and the travel times to it on either bus are similar: In the morning the 333 travel times to DLA vary between 34 and 41 minutes, and the 334 travel times to DLA vary from 25 to 35 minutes. Buses serving the 333 and 334 routes have alternating departures on 15 minute headways in the morning. In the afternoon and evening the 333 route has the faster travel times from DLA to the Metro with 18 to 21 minute travel times.

[2] As of January 20, 2012

The route followed by the 334 bus in the evening results in a travel time between 29 to 32 minutes. Departure headways from DLA for the 333/334 pair vary between 5 and 25 minutes in the evening.

- Fairfax Connector Bus 335, known as the Eagle Express, is a relatively new bus route that provides express bus service from the Franconia-Springfield Station to a series of bus stops within Fort Belvoir during the morning and evening peak periods. This bus enters and leaves the Post via the Telegraph Gate and makes five (5) stops within the Post. The last stop is the New Community Hospital, where it turns and then re-traces the route back to the Metro station. The first stop after entering the Post, and the last stop before leaving, is the intersection of Beulah Street at John. J. Kingman Road. In the morning buses depart from the station at approximate 25 minute headways and travel to the Beulah/Kingman intersection in 9 minutes. In the evening buses are scheduled to arrive at the Beulah/Kingman intersection at 20 to 25 minute headways with a posted running time of 13 minutes back to the station. The cost of this premium service is $3.65 with a Smart-trip Metrocard and $3.85 if paid with cash. (Proposals have been made to reduce the fare to $1.50. The reduced fair rates and changes to the schedules will service passengers travelling outside Fort Belvoir in the non-peak hours and are expected to bolster ridership. The reduced fair, schedule changes and on-post bus service extensions will coincide with Office of Administrative Assistant to the Secretary of the Army ceasing its Route 17 shuttle bus.)

In addition to these formal bus services there are two other group ride services worth mentioning:

- Quick's Bus Company provides charter bus service to a series of bus stops in the North Post and South Post once a day from the commuter park and ride lots in Stafford County near the I-95 interchanges with Route 17 and Route 630.
- There are also four vanpools operating to DLA and DTRA from various locations in Fredericksburg and Stafford County.

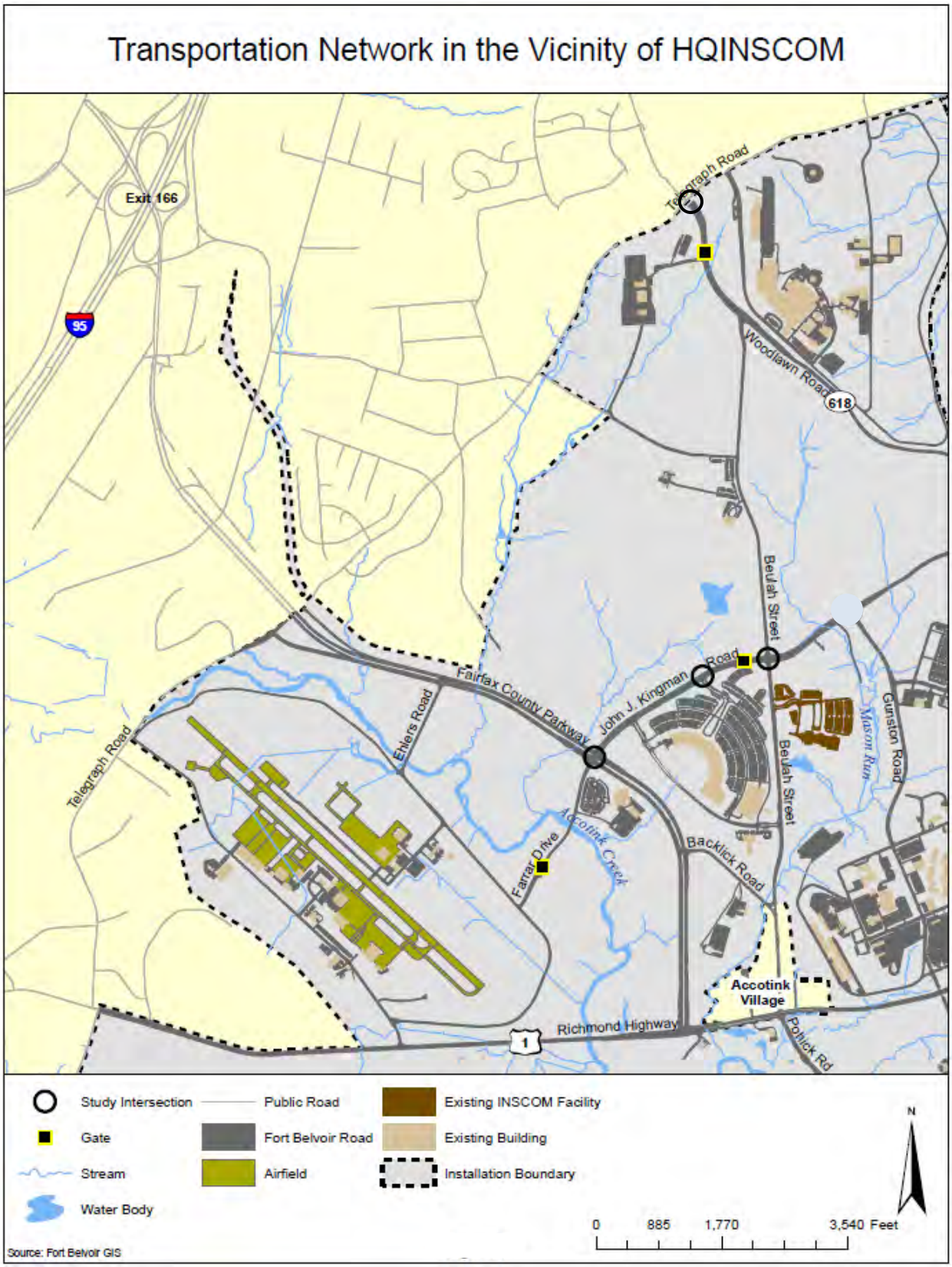

Figure 7 – Transportation Network in the Vicinity of HQINSCOM

3. Analysis of Existing Conditions

3.1 Existing Traffic Volumes at Key Intersections

The field data used in this report was collected during the months of October and November 2011. Two data collecting methods were used: Turning Movement Counts (TMC) and Automatic Traffic Recorder (ATR) tube counts. Traffic data for TMCs were collected on two consecutive days: October 25th and 26th, 2012 between 6:00 and 9:00 AM and 3:00 and 6:00 PM. The intersections where the TMCs were performed included: Beulah Street at Telegraph Road, Beulah Street at John J Kingman Road, and Fairfax County Parkway at John J Kingman Road.

Twenty-Four hour ATR counts of traffic volumes were collected between October 24th and November 7th, 2011 at two locations. The first collection point was situated on Beulah Street just south of the intersection with John J. Kingman Road. There were separate counts collected for the Northbound and Southbound directions. The second data collection point was situated at the HQINSCOM driveways, east of Beulah Street. Counts for the Eastbound (entrance) and Westbound (exit) were collected separately. The data collected is included in Appendix A. It shows the hourly and daily volumes and the calculation of the peak hour volumes.

Figure 7 (on the preceding page) shows the existing road network with circles indicating the locations of the TMCs.

Figure 8 shows the lane utilization at these intersections. It will be noted that the left turn lane is also used for U turning movements, and that the center lane on westbound John J. Kingman Road, at Fairfax County Parkway, may be used for either left, thru or right turning movements.

Figure 9 illustrates the AM and PM peak hour volumes per movement. The peak hour was determined by comparing the 15 minute interval volumes and selecting the four greatest consecutive 15 minute intervals. The data from both days was averaged in this computation. Given the preponderance of automobiles all vehicles are assumed to be passenger cars.

The data in Figure 9 were used as inputs to the Synchro 8 Traffic Signal Timing Analysis Software program to analyze the traffic operation at the selected intersections in the vicinity of HQINSCOM. The program calculates a series of parameters that describe the characteristics of the operation of the intersection, including the average delay per vehicle for each intersection turning and non-turning movement, for each overall approach, and for the overall intersection. These average delay values are then used to determine the Level of Service for each movement, the overall approach and the overall intersection.

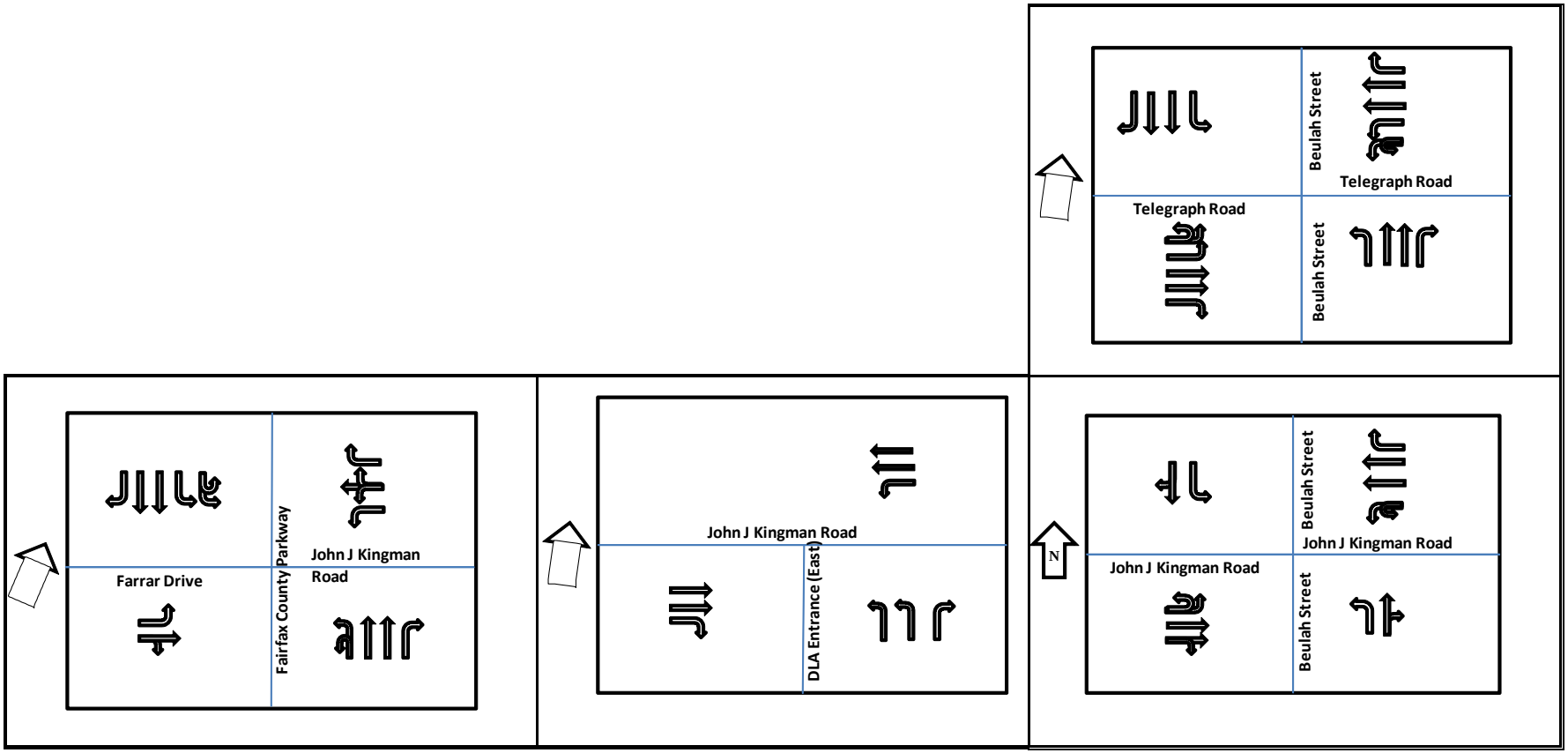

Figure 8 – Existing Lane Geometry (October 2011)

Note: all intersections are signalized

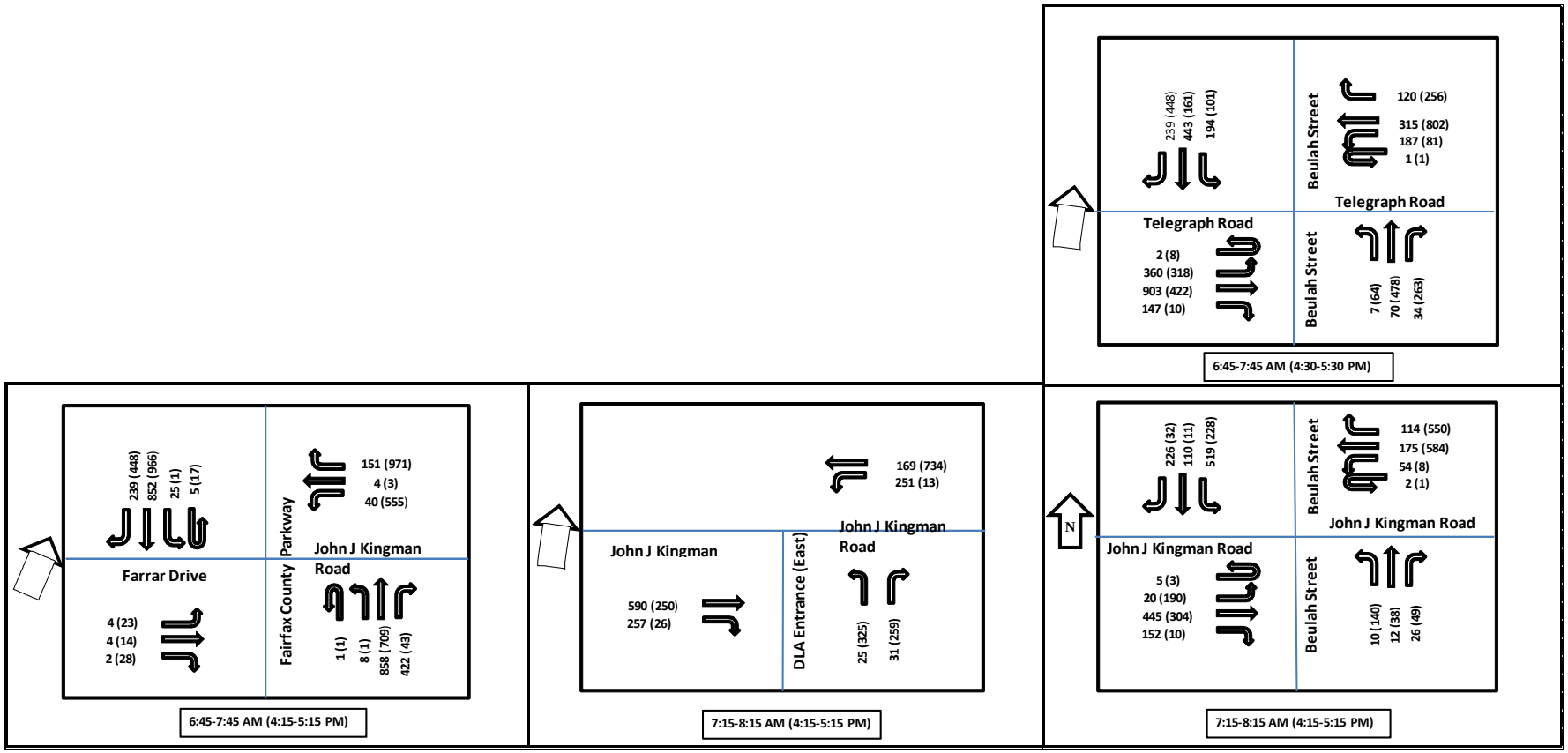

Figure 9 – Existing Traffic Conditions –Peak Hour Turning Movements (October 2011)

Note: all intersections are signalized

Table 1 – Existing Volumes, Average Delays, and Levels of Service at Key Intersections

Beulah St at Telegraph Rd								
Approach	Move-ment	AM Peak: Existing Cond.				PM Peak: Existing Cond.		
		Volume (veh/hr)	Avg Delay (sec/veh)	LOS		Volume (veh/hr)	Avg Delay (sec/veh)	LOS
Eastbound Telegraph Rd	L	362	58.1	E		326	66.5	E
	T	903	24.9	C		422	21.0	C
	R	147	18.1	B		10	18.1	B
Overall Approach		1412	32.7	C		758	40.5	D
Westbound Telegraph Rd	L	188	57.8	E		82	67.4	E
	T	315	22.5	C		802	32.3	C
	R	120	21.1	C		256	26.3	C
Overall Approach		623	32.9	C		1140	33.4	C
Northbound Beulah St	L	7	51.4	D		64	41.6	D
	T	70	53.4	D		478	57.4	E
	R	34	52.1	D		263	47.9	D
Overall Approach		111	52.9	D		805	53.0	D
Southbound Beulah St	L	194	40.5	D		101	41.7	D
	T	443	46.5	D		161	46.4	D
	R	239	8.6	A		448	11.6	B
Overall Approach		876	34.8	C		710	23.8	C
Overall Intersection		**3022**	**34.1**	**C**		**3413**	**37.6**	**D**

John J Kingman Rd and Farrar Dr at Fairfax County Pkwy								
Approach	Move-ment	AM Peak: Existing Cond.				PM Peak: Existing Cond.		
		Volume (veh/hr)	Avg Delay (sec/veh)	LOS		Volume (veh/hr)	Avg Delay (sec/veh)	LOS
Northbound Fairfax County Pkwy	L	8	51.8	E		2	82.6	F
	T	858	37.8	D		709	43.7	D
	R	442	29.0	C		43	32.4	C
Overall Approach		1308	35.7	D		754	43.2	D
Southbound Fairfax County Pkwy	L	1093	49.0	D		240	66.0	E
	T	852	7.4	A		966	34.6	C
	R	25	5.2	A		1	22.6	C
Overall Approach		1970	30.5	C		1207	40.9	D
Eastbound Farrar Dr	L	4	68.9	E		23	99.7	F
	T	4	69.0	E		14	76.2	E
	R	2	69.0	E		28	76.2	E
Overall Approach		10	69.0	E		65	84.6	F
Westbound Kingman Rd	L	40	48.8	D		555	54.9	D
	T	4	47.2	D		3	41.1	D
	R	151	46.6	D		971	38.4	D
Overall Approach		195	47.3	D		1529	44.1	D
Overall Intersection		**3483**	**33.5**	**C**		**3555**	**43.8**	**D**

John J Kingman Rd at Beulah St								
Approach	Move-ment	AM Peak: Existing Cond.				PM Peak: Existing Cond.		
		Volume (veh/hr)	Avg Delay (sec/veh)	LOS		Volume (veh/hr)	Avg Delay (sec/veh)	LOS
Eastbound Kingman Rd	L	25	12.2	B		193	3.3	A
	T	445	26.2	C		304	2.1	A
	R	152	26.2	C		10	2.1	A
Overall Approach		622	25.6	C		507	2.5	A
Westbound Kingman Rd	L	56	10.8	B		9	16.3	B
	T	175	9.2	A		584	19.3	B
	R	114	4.9	A		550	4.4	A
Overall Approach		345	8.1	A		1143	12.1	B
Northbound Beulah St	L	10	7.9	A		140	21.0	C
	T	12	8.1	A		38	18.3	B
	R	26	8.1	A		49	18.3	B
Overall Approach		48	8.1	A		227	20.0	C
Southbound Beulah St	L	519	20.4	C		228	25.1	C
	T	110	11.7	B		11	18.4	B
	R	226	11.7	B		32	18.4	B
Overall Approach		855	17.0	B		271	24.1	C
Overall Intersection		**1870**	**18.0**	**B**		**2148**	**12.2**	**B**

These values are shown in Table 1 for the three key intersections of concern for this study: John J. Kingman Road at Fairfax County Parkway; John J. Kingman Road at Beulah Street; and Beulah Street at Telegraph Road. The complete Synchro input and output data files are contained in Appendix B.

As shown in Table 1, the overall Level of Service at all three intersections (which have been highlighted in yellow) operate at a Level of Service B, C or D during the AM and PM Peak Hours. These LOS are generally considered acceptable in peak hours. Within this overall acceptable operation closer examination reveals that the existing condition does have several movements and approaches which operate at LOS E or F. For example: the left turn from Northbound Fairfax County Parkway into Farrar Drive operates at LOS E in the AM Peak Hour and F in the PM Peak Hour, and all of the exiting movements from Farrar Drive operate at LOS E or F during both the AM and PM Peak Hours. While the LOS for these movements is undesirable, they are deemed to be tolerable as long as the overall LOS for the intersection as a whole is LOS D or better.

3.2 Existing HQINSCOM Traffic Volumes

The ATR tube count data has been analyzed to determine the trip making characteristics of the vehicles traveling both ways on Beulah Street South of the intersection with John J. Kingman Road. All traffic volume south of this intersection was assumed to be INSCOM related. The assumption is based on the fact that no other entrances are accessible from Beulah Street and the street dead ends just south of the DLA entrance currently closed for access.

As previously described, data were collected at two locations: northbound and southbound data were collected at approximately 50' south of the Kingman Road intersection, eastbound and westbound volumes were collected at the HQINSCOM entrance gate. These data were collected for a continuous two week period. The initial analyses of the northbound and southbound data used all ten weekdays; however examination of the total daily trips on four of these days indicated a significant disparity between the northbound and southbound daily totals.[3] The data from these days has been excluded and the analyses are based on the six good weekdays of ATR data. Figure 10 shows the distributions of daily arrivals and departures based on northbound and southbound data. The figure also includes the minimum and maximum volumes at the peak hours and at 11 AM and 12 PM.

[3] The source of this disparity is believed to be vehicles that traveled in the "wrong" lane when entering or leaving the southern leg of the intersection.

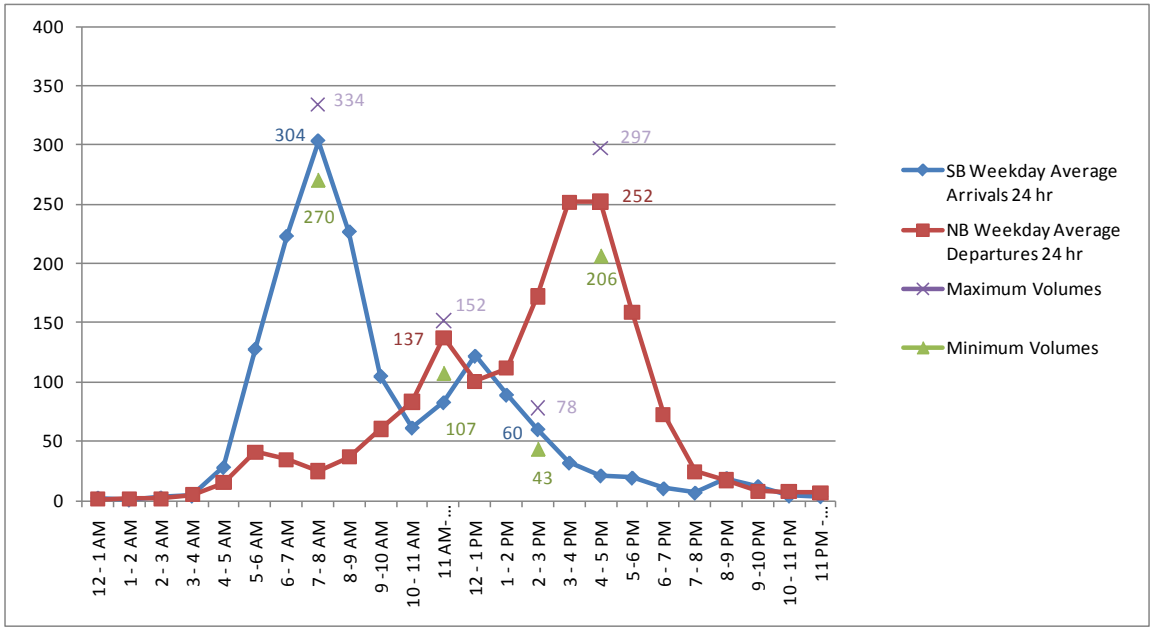

Figure 10 – Distribution of Daily Arrivals and Departures based on NB and SB Data

Table 2 summarizes the peak hour and 24 hour daily totals of trips to and from the HQINSCOM facility based on the average of the data collected by the ATRs on Beulah Street.

Table 2 – HQINSCOM Peak Hour and 24 Hour Traffic Volumes

AM Peak Volume			PM Peak Volume			24 Hour Total	
IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT
304	25	329	21	252	273	1569	1626

It will be noted that these peak volumes from the ATR average data are slightly different from the peak hour TMC volumes at the John J. Kingman and Beulah Street intersection. (The inbound AM peak hour volume is higher in the intersection counts and the outbound PM peak hour volume is higher in the average ATR counts.) For purposes of the future traffic analysis it was determined that the turning movement counts would be used since this time slice represented the overall maximum traffic flow conditions at the intersections.

4. Analysis of Future Conditions

The expansion of the existing traffic volumes to 2018 traffic volumes has been estimated using a series of basic growth factors applied to Fort Belvoir traffic and thru traffic on public roads, and TMP reduction factors that are applied to Fort Belvoir traffic . The basic growth factors increase the volumes, and the TMP reduction factors reduce this growth to various degrees based on the effectiveness of Transportation Management Plan programs that will reduce the number of Single Occupant vehicles. The derivation and values of these factors is discussed in the next series of subsections.

4.1. HQINSCOM Growth Factor

Future HQINSCOM trip generation will increase because of the growth of this facility. Two methods of estimating these future trips were investigated: trip generation based on personnel increase, and trip generation based on facility size increase. The initial efforts were focused on estimating trip generation on the basis of personnel. Approximately 1650 people are currently assigned to HQINSCOM and this is scheduled to grow to a total of 2500 people. Based on a ratio of future staffing to current staffing the number of trips would multiply by a factor of 1.52. However, the existing HQINSCOM traffic volumes could not be reconciled with the presence of 1650 people in the building. (Although about 1600 vehicles travel to or from HQINSCOM during the day, only half of these vehicles stay at the facility for the entire workday.).

An alternate trip generation approach of basing the number of trips on the square footage of the building was then investigated. The initial data compared the square footage of the building (~234,000 SF) with the current number of trips. A comparison of the trip generation by HQINSCOM and several other types of building is shown in Table 3. Trip generation from these other building was taken from regression data provided in the Trip Generation 7th Edition[4]

Table 3 – Comparison of Trip Generation Based on Building Square Footage

Site Trip Generation	ITE Code	Size	Units	AM Peak Hour			PM Peak Hour		
				IN	OUT	Total	IN	OUT	Total
INSCOM	**-**	**234**	**KSF**	**304**	**25**	**329**	**21**	**252**	**273**
R&D Center	760	234	KSF	237	48	285	37	213	250
General Office	710	234	KSF	319	44	363	59	289	349

As can be seen in this table there is good conformance between the trip generation produced by HQINSCOM and trip generation by an R&D Center that would also be expected to have restrictions on the number of visitors

[4] *Trip Generation – 7th Edition*: Institute of Transportation Engineers; Washington, DC, 2003

entering the building. The table also shows that there are higher trip generation rates for a General Office where more visitors would be expected. This table is provided as validation that the approach of basing trip generation from HQINSCOM on the square footage of the facility is a reasonable approach. The growth factor of 2.63 used in this approach is the ratio of the final building size to the existing building size (616,000 SF/ 234,000 SF). This growth factor is greater than the growth factor of 1.52 that is based on personnel assignment and is therefore the more conservative approach to determining the future trip generation to and from the facility.

4.2. Other Basic Growth Factors

Three other growth factors are used to expand existing traffic volumes to 2018 volumes:

- A growth factor for thru traffic on the public roadways,
- A growth factor for traffic entering and leaving the North Post of Fort Belvoir due to growth of Fort Belvoir anticipated in the Short Range Component (SRC) of the Master Plan, and
- A growth factor for traffic entering and leaving Davison Airfield due to growth of Fort Belvoir anticipated in the Short Range Component of the Master Plan

In a mature area where most of the land has already been developed, (which characterizes the area surrounding Fort Belvoir) the background traffic growth is normally considered to be 2 % per year. The recent recession has moderated this to some degree, but it is a reasonable value for use as a growth factor for traffic on public roads that will be applied to both the Build and No-Build alternatives. The resulting growth factor for 2 % annual growth compounded for six years is 12.6%.

The growth factor for traffic entering and leaving the North Post was based on the increase in personnel assigned to the North Post anticipated in the SRC.[5] This increase will raise the current personnel assignment of 10,057 to 12,232 if there is no new construction at INSCOM. Overall this is a 21.6% basic growth factor for this traffic.

The growth factor of 8.2% for Davison Airfield reflects the increased personnel assignment from 1394 existing personnel to 1509 personnel in the SRC.

4.3. Traffic Management Plan (TMP) Reduction Factors

As part of the overall effort to moderate the growth of traffic generated by Fort Belvoir, the commanders of the post have made a commitment to support a Traffic Management Plan that will encourage personnel to fulfill their duties without driving to Fort Belvoir in a Single Occupant Vehicle (SOV) every day. (There are a wide range of TMP actions and activities that will reduce the number of SOVs, including: working at home or satellite facilities, carpooling, use of transit, commuting by walking and bicycles, etc. These actions and activities are described in

[5] This includes Traffic Analysis Zones (TAZ) 1560-A, 1560-B, 1560-B, 1560-E and 1560-E.

other documents. [6]) The 2011 Fort Belvoir Employee Transportation Survey indicated that the TMP efforts to date have reduced the percentage of single occupant vehicles to 85%[7]. It is anticipated that by 2018 the SOV use will be reduced to 75% overall in Fort Belvoir. This represents a 7% reduction in the existing SOV use through TMP activities. (Every carpool formed by two SOV drivers reduces traffic volume by one vehicle. This 7% TMP factor assumes a 10% reduction in SOV drivers [a 5% volume reduction], plus a 2% volume reduction from other TMP actions.) It is assumed that this reduction would also apply to INSCOM traffic and other Fort Belvoir traffic in the No-Build alternative.

INSCOM has pledged an even greater reduction in SOV use if they are granted the necessary approvals to expand their facility. Their actions in the Build alternative will take the existing 85% SOV rate to 60%. A 16% reduction in the current traffic volume is based on a 20% reduction in SOV drivers (a 10% volume reduction) and a 6% volume reduction through other TMP actions and activities.

4.4. Future Traffic Volume Derivation

The 2018 Traffic volumes for the No-Build and Build alternatives are derived by multiplying the existing volumes by the appropriate growth factors and TMP reduction factors. A sample of the application of these factors is shown in Table 4 for the Fairfax County Parkway Intersection with Kingman Road during the AM Peak Hour. In the No-Build alternative all of the future traffic volumes to and from Fort Belvoir are reduced by 7% because of the TMP actions.

Table 4 also shows the adjustments to the volumes for the various movements that would take place for the INSCOM Build alternative. As indicated in the table the adjustments only affect the movements entering and leaving INSCOM. The number of existing INSCOM vehicles associated with these movements are taken from the turning movements at the Kingman Road and Beulah Street intersection, and then proportionally applied to the movements at Fairfax County Parkway. These existing volumes are modified by the INSCOM growth factor and TMP reduction factor of 16% to determine the additional volume for each movement resulting from the Build alternative. The INSCOM Build alternative volumes in the final column are the sums of the No-Build alternative volumes and the additional INSCOM volumes. All future volumes are estimates and are shown as rounded values.

Appendix 2 contains the full series of the derivations of the 2018 traffic volumes for the AM and PM peak hours at the intersections of Fairfax County Parkway at Kingman Road, Kingman Road at Beulah Street, and Beulah Street at Telegraph Road.

[6] *2011 Fort Belvoir Commuter Survey*
[7] The actual survey result is 81%, however, due to the small sample size and disproportionate amount of BRAC respondents we are adjusting this to 85% for existing, new and INSCOM personnel for traffic analysis purposes to be more conservative.

Table 4 – Derivation of 2018 No-Build and Build Traffic Volumes –

Fairfax County Parkway at Kingman Road AM Peak Hour

Approach	Movement	AM Peak: INSCOM No Build					AM Peak: INSCOM Build					
		Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)	Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Northbound Fairfax Cnty Pkwy	L	8	8.20%	7%	8	10					8	10
	T	858	12.60%		966	975					966	975
	R	442	21.60%	7%	500	500	44	2.63	16%	53	553	550
Overall Approach		1308			1474	1485					1527	1535
Southbound Fairfax Cnty Pkwy	L	1093	21.60%	7%	1236	1225	108	2.63	16%	131	1367	1375
	T	852	12.60%		959	950					959	950
	R	25	8.20%	7%	25	25					25	25
Overall Approach		1970			2221	2200					2351	2350
Eastbound Farrar Dr	L	4	8.20%	7%	4	5					4	5
	T	4	8.20%	7%	4	5					4	5
	R	2	8.20%	7%	2	0					2	0
Overall Approach		10			10	10					10	10
Westbound Kingman Rd	L	40	21.60%	7%	45	45	4	2.63	16%	5	50	50
	T	4	21.60%	7%	5	5					5	5
	R	151	21.60%	7%	171	175	13	2.63	16%	16	186	175
Overall Approach		195			221	225					241	230
Overall Intersection		3483			3925	**3920**	169			204	4130	**4125**

Notes:

1. Existing volumes from prior INSCOM traffic counts.
2. Growth factors from additional PN assignments in Short Range Component of Master Plan: Davison Airfield 8.2%; Traffic on Public Roads 2% annual growth compounded for 6 years = 12.6%; North Post west of Woodlawn Road = 21.6%.
3. TMP reduction based on actions to reduce SOV use. Every carpool formed by 2 SOV drivers reduces volume by 1 vehicle. The 7% TMP factor assumes 10% reduction in SOV drivers (5% volume reduction) plus 2% reduction from other TMP actions.
4. Existing volumes from prior study proportionally allocated to NB & SB Turns from/to Fairfax County Parkway.
5. INSCOM growth factor based on expansion from 234,000 SF to 616,000 SF.
6. TMP reduction based on actions to reduce SOV use. Every carpool formed by 2 SOV drivers reduces volume by 1 vehicle. The 16%% TMP factor assumes 20% reduction in SOV drivers (10% volume reduction) plus 6% reduction from other TMP actions.
7. No-Build Volumes adjusted for additional INSCOM volume growth.
8. Values < 100 rounded to nearest multiple of 5. Values > 100 rounded to nearest multiple of 25.

4.5 Future Levels of Service for No-Build and Build Alternatives

Tables 5 thru 7 provide a comparison of the Levels of Service under the No-Build and Build conditions at the key intersections of John J. Kingman Road at Fairfax Parkway, John J. Kingman Road at Beulah Street, and Beulah Street at Telegraph Road. These tables show the average delay per vehicle and the Level of Service for each movement, each overall approach (in essence the average for the individual movements that comprise the approach) and the overall values for the intersection as a whole when the increased volumes to and from HQINSCOM are added to the existing volumes.

As will be seen in Table 5 the Overall LOS for the Fairfax County Parkway at John J. Kingman Road remains at LOS D in both the AM and PM Peak Hours for both the No-Build and Build alternatives. As previously discussed an overall Intersection LOS of D or better is considered acceptable. Overall the average increase in delay is 5 seconds per vehicle in the AM Peak Hour and 4 seconds per vehicle in the PM Peak Hour. Closer review of the individual approaches and movements reveals that during the AM Peak Hour the LOS for the northbound right turn from Fairfax County Parkway changes from D to E in the Build alternative because of an increase in the average delay per vehicle for this movement that exceeds 11 seconds. During the PM Peak Hour all northbound movements on Fairfax County Parkway experience an average of 6.5 seconds of additional delay and the operation changes from LOS D to LOS E because of additional vehicles leaving Fort Belvoir under the Build alternative.

The intersection of Kingman Road at Beulah Street is the least heavily traveled of the three selected intersections. The LOS, delays and volumes for this intersection are shown in Table 6. All movements at this intersection operate at LOS C or better in both the No-Build and build alternatives. In comparing the No-Build and Build alternatives, the average increase in delay per vehicle is less than 5 seconds in the AM Peak Hour, and less than 1 second in the PM Peak Hour in the Build alternative.

Table 7 contains the data for the Telegraph Road at Beulah Street intersection. Like the preceding intersection, there is no change in the overall LOS in going from the No-Build to the Build condition; it remains at LOS C in both the AM and PM Peak Hours. With the exception of one movement with LOS D (the westbound through movement on Telegraph Road, in the PM Peak Hour), all of the movements are shown with LOS C or better. It is worth noting that the analysis of this intersection reflects additional lanes that are being added by the new shopping center in the northwest quadrant of the intersection. Although the impact of this shopping center is expected to be greater than the 12.6% growth rate indicated on other public roads, the relative difference between the No-Build and Build alternatives is expected to be the same.

Table 5 –Level of Service and Average Delays per Vehicle – Fairfax County Parkway at Kingman Road

Approach	Movement	AM Peak: INSCOM No Build			AM Peak: INSCOM Build				PM Peak: INSCOM No Build			PM Peak: INSCOM Build		
		Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS		Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS
Northbound Fairfax County Pkwy	L	10	91.2	F	10	94.3	F		0	0.0	A	0	0.0	A
	T	975	47.2	D	975	52.9	D		800	55.6	E	800	62.3	E
	R	500	44.6	D	550	56.2	E		50	39.8	D	50	43.5	D
Overall Approach		1485	46.6	D	1535	54.3	D		850	54.7	D	850	61.2	E
Southbound Fairfax County Pkwy	L	1225	62.0	E	1375	65.6	E		275	66.7	E	275	71.1	E
	T	950	7.3	A	950	6.8	A		1100	33.6	C	1100	38.4	D
	R	25	5.3	A	25	4.9	A		0	33.6	C	0	38.4	D
Overall Approach		2200	37.7	D	2350	41.2	D		1375	40.2	D	1375	44.9	D
Eastbound Farrar Dr	L	5	85.0	F	5	88.2	F		25	79.2	E	25	83.4	F
	T	5	84.8	F	5	87.9	F		15	76.8	E	15	80.8	F
	R	0	84.8	F	0	87.9	F		30	76.8	E	30	80.8	F
Overall Approach		10	84.9	F	10	88.0	F		70	77.6	E	70	81.7	F
Westbound Kingman Rd	L	45	80.6	F	50	92.5	F		625	61.9	E	700	66.0	E
	T	5	77.3	E	5	81.8	F		0	49.4	D	5	53.6	D
	R	175	27.2	C	175	25.7	C		1100	31.2	C	1200	31.7	C
Overall Approach		225	57.6	E	230	61.7	E		1725	47.3	D	1905	50.4	D
Overall Intersection		**3920**	**42.4**	**D**	**4125**	**47.3**	**D**		**4020**	**47.0**	**D**	**4200**	**51.3**	**D**

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Table 6 – Level of Service and Average Delays per Vehicle - Kingman Road at Beulah Street

Approach	Movement	AM Peak: INSCOM No Build			AM Peak: INSCOM Build			PM Peak: INSCOM No Build			PM Peak: INSCOM Build		
		Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS
Eastbound Kingman Rd	L	30	14.1	B	25	13.6	B	225	16.3	B	225	16.9	B
	T	500	32.8	C	500	29.1	C	350	9.8	A	350	10.0	A
	R	150	32.8	C	325	29.1	C	10	9.8	A	20	10.0	A
Overall Approach		680	32.0	C	850	28.6	C	585	12.3	B	595	12.6	B
Westbound Kingman Rd	L	55	14.2	B	125	30.9	C	10	20.0	C	20	20.5	C
	T	200	12.4	B	200	11.1	B	650	24.7	C	650	24.9	C
	R	125	7.9	A	125	2.4	A	625	38.8	D	625	37.2	D
Overall Approach		380	11.2	B	450	14.2	B	1285	31.5	C	1295	30.8	C
Northbound Beulah St	L	10	7.2	A	20	11.7	B	150	21.8	C	300	29.3	C
	T	10	7.6	A	25	10.6	B	40	18.0	B	85	19.9	B
	R	25	7.6	A	55	10.6	B	50	18.0	B	100	19.9	B
Overall Approach		45	7.5	A	100	10.8	B	240	20.4	C	485	25.7	C
Southbound Beulah St	L	575	21.4	C	575	38.4	D	250	28.6	C	250	30.5	C
	T	100	10.9	B	250	18.5	B	10	19.6	B	25	19.3	B
	R	250	10.9	B	250	18.5	B	35	19.6	B	35	19.3	B
Overall Approach		925	17.4	B	1075	29.2	C	295	27.2	C	310	28.4	C
Overall Intersection		**2030**	**20.9**	**C**	**2475**	**25.5**	**C**	**2405**	**25.2**	**C**	**2685**	**25.6**	**C**

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Table 7 – Level of Service and Average Delays per Vehicle – Telegraph Road at Beulah Street

Approach	Movement	AM Peak: INSCOM No Build			AM Peak: INSCOM Build			PM Peak: INSCOM No Build			PM Peak: INSCOM Build		
		Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS	Volume (veh/hr)	Avg Delay (sec/veh)	LOS
Eastbound Telegraph Rd	L	400	15.2	B	400	15.6	B	375	17.8	B	375	18.6	B
	T	1025	31.1	C	1025	32.6	C	475	21.2	C	475	21.8	C
	R	175	16.7	B	200	17.9	B	10	16.1	B	10	16.1	B
Overall Approach		1600	25.5	C	1625	26.6	C	860	19.6	B	860	20.3	C
Westbound Telegraph Rd	L	225	23.9	C	250	23.3	C	95	18.3	B	100	18.3	B
	T	350	24.5	C	350	24.2	C	900	36.6	D	900	36.6	D
	R	125	16.2	B	125	16.5	B	300	21.2	C	300	21.3	C
Overall Approach		700	22.8	C	725	22.5	C	1295	31.7	C	1300	31.7	C
Northbound Beulah St	L	10	22.4	C	10	22.5	C	70	24.3	C	75	23.3	C
	T	75	27.1	C	90	26.8	C	550	34.0	C	575	33.6	C
	R	50	22.5	C	45	21.4	C	300	23.3	C	300	22.7	C
Overall Approach		135	25.0	C	145	24.8	C	920	29.8	C	950	29.4	C
Southbound Beulah St	L	225	20.2	C	225	20.6	C	125	22.6	C	125	22.6	C
	T	500	29.0	C	575	30.1	C	175	25.1	C	200	25.4	C
	R	275	17.8	B	275	17.8	B	500	21.0	C	500	21.4	C
Overall Approach		1000	23.9	C	1075	25.0	C	800	22.2	C	825	22.6	C
Overall Intersection		**3435**	**24.5**	**C**	**3570**	**25.2**	**C**	**3875**	**26.6**	**C**	**3935**	**26.7**	**C**

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5. Comments on Mode Split at INSCOM

It should be noted that the Trip Generation, Future and Level of Service Analyses are based on the current mode split of employees and visitors to the INSCOM facility. A driveway vehicle occupancy survey was conducted at the HQINSCOM entrance gate on November 2, 2011 between 6:00 AM and 9:00 AM. During the survey interval a total of 554 vehicles were counted. During this survey, 9 vehicles had two people, resulting in an average auto occupancy rate of 1.02. There were also 7 motorcycles, one bicycle and 9 pedestrians seen walking south on Beulah from the Bus Stop at Kingman Road. These data provide an overall Single Occupancy Vehicle (SOV) use of 96%. (The data collected is included in Appendix D.) This overall SOV use is significantly higher than the data reported in the personnel survey, which has been estimated at 85%, however it is recognized that this sample does not include personnel working off-site. It is suspected that many INSCOM personnel are carpooling to Fort Belvoir in a vehicle that has people going to several destinations within the Post who are dropped off before the vehicle parks at INSCOM, thus these drivers were recorded as an SOV trip in the vehicle occupancy survey when in fact they participate in a rideshare program.

6. Conclusions

The site consists of an existing building, the HQINSCOM, with an area of 234,000 square feet and an existing parking lot with a total of 951 parking spaces inside and outside the gates. The existing transportation network includes highways, principal and minor arterials, and local streets. An existing bus service from Metro and VRE stations is in place and it provides some access to the site. The proposed improvements of the site will include an expansion of the existing building by 382,000 square feet and the renovation of the existing building.

The existing overall LOS at the three key intersections analyzed in this study is C or D during the AM and PM peak hours which are generally considered acceptable. While the overall intersection LOS levels are at an acceptable level, several movements and approaches at the Fairfax County Parkway and Kingman Road intersection operate at LOS E or F. These LOS levels are deemed tolerable as long as the overall LOS for the respective intersection is D or better.

The analysis of the future LOS in 2018 was performed as a comparison of the No-Build and Build alternatives. The 2018 traffic volumes for these conditions were derived using a series of growth rates for thru traffic on public roadways (12.6% = 2% per annum for 6 years) , for trips to and from the North Post (21.6%), and trips to and from Davison Airfield (8.2%) These trips to and from the North Post and

Davison Airfield are based on changes in personnel indicated by the Short Range Component of the Fort Belvoir Master Plan. The growth rate for INSCOM under the Build condition is based on the ratio of the SF of the future facility to the existing facility (61600SF/234,00SF). Future traffic growth for all Fort Belvoir installation is moderated by TMP reduction factors (7% for most locations, 16% for INSCOM).

Because of the moderating effect of the TMP Program which applies to both the new and existing trips to and from HQINSCOM, the inbound AM Peak Hour volume is expected to increase by approximately 400 vehicles during the AM Peak Hour under the Build alternative, i.e.: less than 7 vehicles per minute.

Levels of Service and delays for the 2018 No-Build and Build alternatives were determined using the SYNCHRO traffic Signal Timing and Analysis Program. The LOS analysis provided the following results:

- The overall LOS for the Fairfax County Parkway and John J. Kingman intersection remains at LOS D overall during both AM and PM Peak Hour for the No-Build and Build alternatives. The average increase in delay per vehicle is less than 5 seconds greater in the Build alternative than the No-Build alternative.
- The overall LOS for the John J. Kingman Road at Beulah Street intersection changes from LOS B to LOS C in the AM Peak Hour and it remains unchanged in the PM Peak Hour at LOS C for both alternatives.
- The overall LOS at the Telegraph Road at Beulah Street intersection remains unchanged in the AM and PM Peak Hour at LOS C with a change in average delay per vehicle of about a second per vehicle. The LOS and average delays are expected to degrade when the new Hilltop Village Center, featuring 150,000 SF grocery store and retail/office uses with approximately 1,000 parking spaces is completed, however the impact of the Build alternative is expect to remain minor.

Appendices on the following pages

Appendix A TMC and ATR volumes

Appendix B Derivation of Future Volumes for the No-Build and Build Alternatives

Appendix C Synchro Version 8 Reports

Appendix C Occupancy Study

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APPENDIX A:

TMC AND ATR VOLUMES

Type of peak hour being reported: Intersection Peak

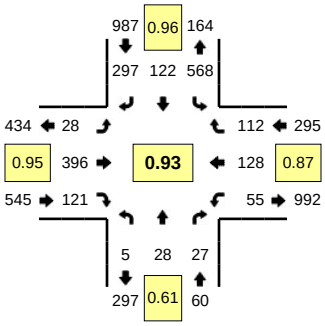
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- John J Kingman Rd

QC JOB #: 10673113

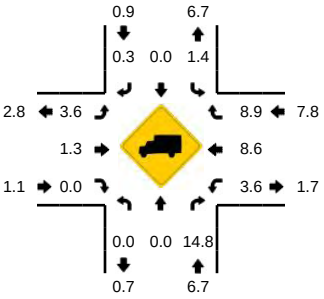
CITY/STATE: Fort Belvoir, VA

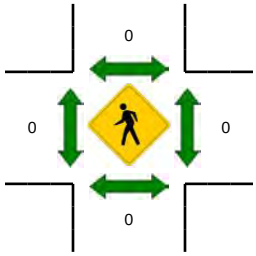
DATE: Tue, Oct 25 2011

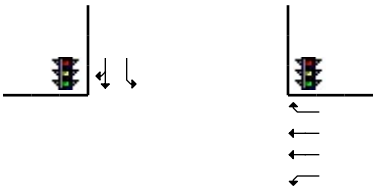


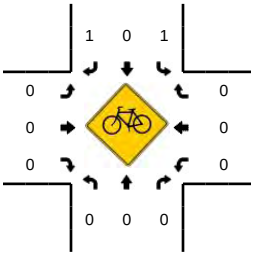
Peak-Hour: 8:00 AM -- 9:00 AM

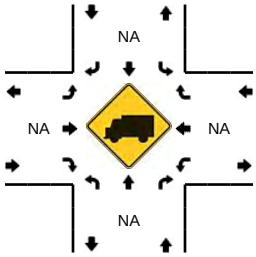
Peak 15-Min: 8:30 AM -- 8:45 AM

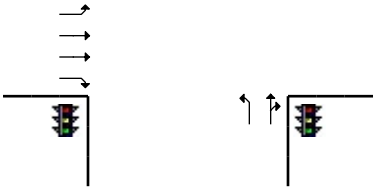


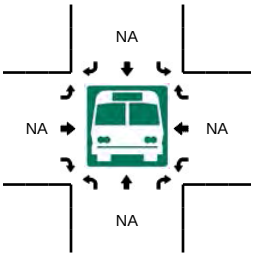












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	5	7	14	0	45	6	13	0	0	100	21	1	6	25	14	0	257	
6:15 AM	4	5	6	0	62	10	21	0	4	104	42	0	8	38	20	1	325	
6:30 AM	2	3	2	0	64	12	33	0	1	136	27	2	11	47	24	1	365	
6:45 AM	2	4	9	0	111	14	45	0	3	118	52	1	9	37	30	1	436	1383
7:00 AM	1	0	1	0	90	15	34	0	3	122	47	0	11	33	24	0	381	1507
7:15 AM	3	1	6	0	126	19	54	0	1	75	35	1	12	51	24	0	408	1590
7:30 AM	5	6	5	0	137	31	75	0	7	68	27	1	16	47	34	0	459	1684
7:45 AM	3	6	9	0	145	36	83	0	4	57	27	1	9	43	29	0	452	1700
8:00 AM	0	2	4	0	129	40	78	0	5	67	29	0	11	37	23	1	426	1745
8:15 AM	2	7	3	0	139	35	84	0	5	76	25	0	14	33	26	0	449	1786
8:30 AM	1	12	9	0	149	22	78	0	6	115	37	2	15	32	32	0	510	1837
8:45 AM	2	7	11	0	151	25	57	0	8	138	30	2	14	26	31	0	502	1887

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	48	36	0	596	88	312	0	24	460	148	8	60	128	128	0	2040
Heavy Trucks	0	0	0		20	0	4		0	8	0		4	4	8		48
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		1	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

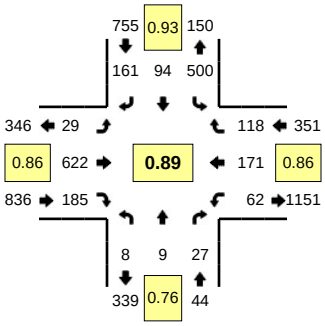
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- John J Kingman Rd

QC JOB #: 10673114

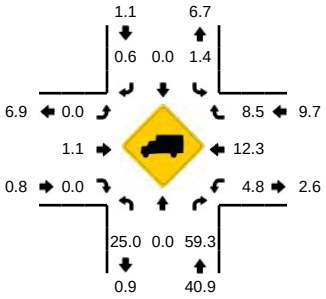
CITY/STATE: Fort Belvoir, VA

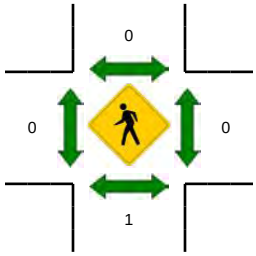
DATE: Wed, Oct 26 2011

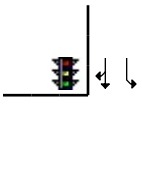


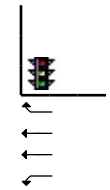
Peak-Hour: 7:15 AM -- 8:15 AM

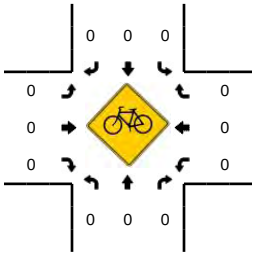
Peak 15-Min: 7:30 AM -- 7:45 AM

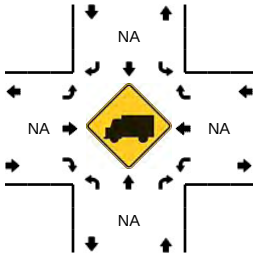


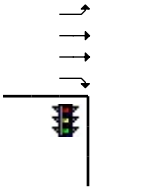


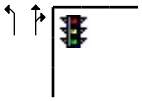


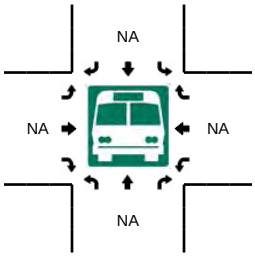












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	10	0	5	0	45	6	14	0	2	83	22	0	10	31	21	0	249	
6:15 AM	1	2	1	0	58	8	23	0	1	115	30	0	6	38	18	1	302	
6:30 AM	1	1	1	0	60	7	20	0	1	111	26	1	16	41	33	0	319	
6:45 AM	1	1	2	0	106	23	34	0	6	136	39	2	2	33	20	0	405	1275
7:00 AM	1	1	7	0	97	12	27	0	1	124	65	0	11	27	29	0	402	1428
7:15 AM	1	2	11	0	138	21	36	0	4	157	45	1	13	36	22	0	487	1613
7:30 AM	0	3	4	0	124	26	52	0	11	174	55	2	27	48	31	0	557	1851
7:45 AM	2	0	4	0	143	22	35	0	1	140	55	1	13	43	36	0	495	1941
8:00 AM	5	4	8	0	95	25	38	0	7	151	30	2	7	44	29	2	447	1986
8:15 AM	0	1	9	0	102	15	19	0	4	141	41	0	11	43	30	1	417	1916
8:30 AM	2	3	7	0	75	15	13	0	6	166	24	1	13	35	23	0	383	1742
8:45 AM	2	1	16	0	92	13	15	0	7	138	28	5	19	43	33	1	413	1660

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	12	16	0	496	104	208	0	44	696	220	8	108	192	124	0	2228
Heavy Trucks	0	0	0		0	0	0		0	12	0		4	28	12		56
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

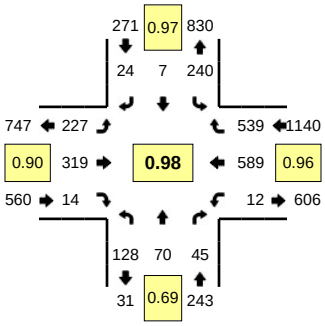
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- John J Kingman Rd

QC JOB #: 10673115

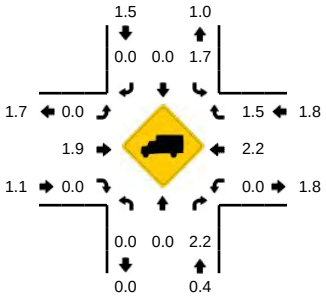
CITY/STATE: Fort Belvoir, VA

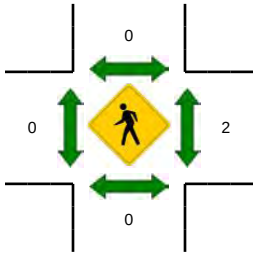
DATE: Tue, Oct 25 2011

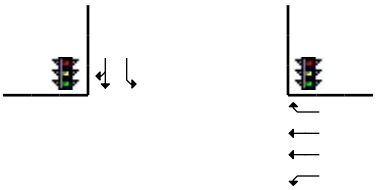


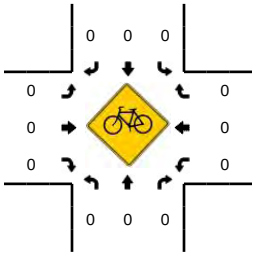
Peak-Hour: 4:30 PM -- 5:30 PM

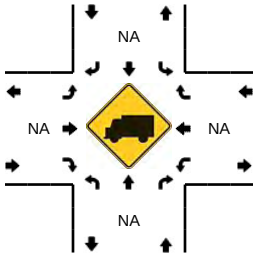
Peak 15-Min: 5:00 PM -- 5:15 PM

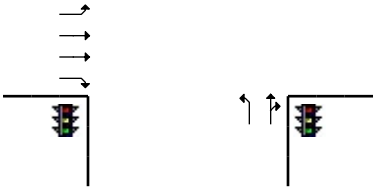


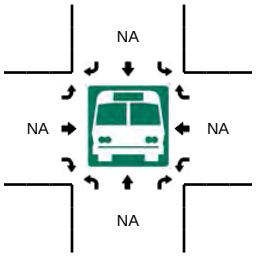












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	44	25	7	0	36	9	10	0	21	62	3	0	6	109	74	1	407	
3:15 PM	37	19	13	0	43	4	3	0	19	61	0	0	5	141	70	0	415	
3:30 PM	37	17	10	0	47	4	5	0	28	67	5	1	3	133	98	0	455	
3:45 PM	30	16	6	0	48	2	5	0	34	70	1	1	4	142	103	0	462	1739
4:00 PM	58	33	18	0	44	3	5	0	54	63	7	3	4	140	107	0	539	1871
4:15 PM	39	18	14	0	54	1	8	0	40	70	2	0	2	149	129	0	526	1982
4:30 PM	34	22	8	0	47	4	4	0	58	95	2	1	1	155	126	0	557	2084
4:45 PM	30	13	12	0	67	1	3	0	49	81	7	2	3	147	146	1	562	2184
5:00 PM	38	20	15	0	60	1	9	0	70	69	2	3	2	144	129	1	563	2208
5:15 PM	26	15	10	0	66	1	8	0	44	74	3	0	4	143	138	0	532	2214
5:30 PM	26	14	4	0	64	1	9	0	35	63	5	1	5	150	129	0	506	2163
5:45 PM	22	10	8	0	63	0	9	0	33	48	0	2	3	135	141	0	474	2075

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	152	80	60	0	240	4	36	0	280	276	8	12	8	576	516	4	2252
Heavy Trucks	0	0	0		4	0	0		0	0	0		0	12	4		20
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

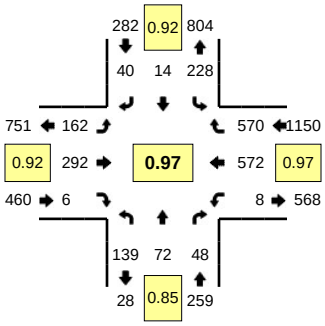
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- John J Kingman Rd

QC JOB #: 10673116

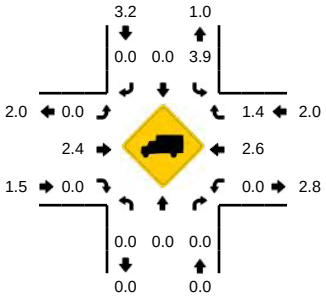
CITY/STATE: Fort Belvoir, VA

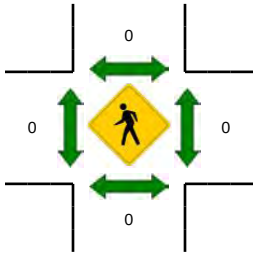
DATE: Wed, Oct 26 2011

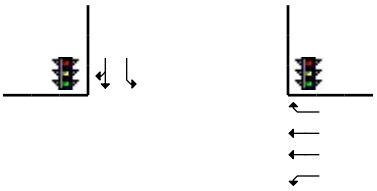


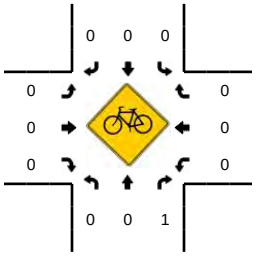
Peak-Hour: 4:15 PM -- 5:15 PM

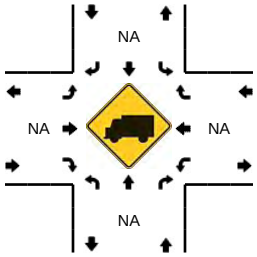
Peak 15-Min: 4:15 PM -- 4:30 PM

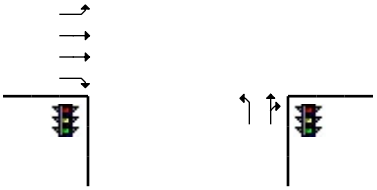


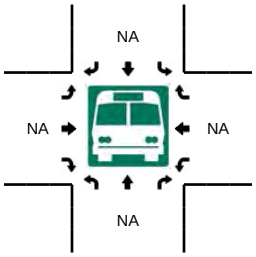












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	51	21	13	0	37	1	4	0	22	61	4	0	2	130	78	0	424	
3:15 PM	37	15	18	0	45	4	7	0	22	53	3	0	6	119	69	0	398	
3:30 PM	38	20	5	0	47	2	13	0	30	55	3	0	2	144	90	0	449	
3:45 PM	28	12	7	0	38	2	6	0	19	75	1	0	3	161	102	0	454	1725
4:00 PM	46	21	15	0	53	0	14	0	39	55	2	0	8	141	113	0	507	1808
4:15 PM	45	22	13	0	55	5	18	0	38	65	0	0	4	149	142	0	556	1966
4:30 PM	38	16	11	0	53	6	9	0	48	68	1	0	1	148	132	0	531	2048
4:45 PM	27	14	12	0	71	3	6	0	33	79	3	0	1	136	159	0	544	2138
5:00 PM	29	20	12	0	49	0	7	0	43	80	2	0	2	139	137	0	520	2151
5:15 PM	30	10	10	0	69	1	4	0	30	45	3	0	3	144	146	0	495	2090
5:30 PM	21	16	9	0	61	0	5	0	28	67	2	0	5	146	121	0	481	2040
5:45 PM	23	12	10	0	41	1	3	0	21	45	1	0	5	143	111	0	416	1912

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	180	88	52	0	220	20	72	0	152	260	0	0	16	596	568	0	2224
Heavy Trucks	0	0	0		24	0	0		0	8	0		0	8	0		40
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

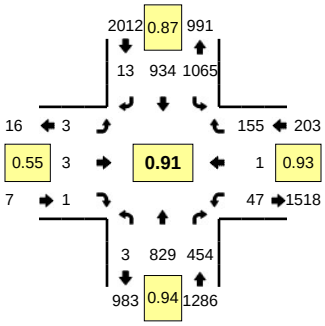
Method for determining peak hour: Total Entering Volume

LOCATION: Fairfax County Pkwy -- John J Kingman Rd

QC JOB #: 10673105

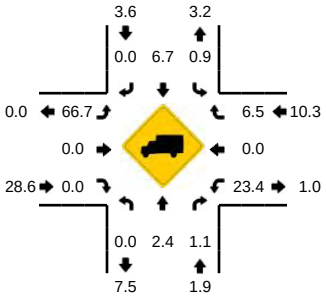
CITY/STATE: Fort Belvoir, VA

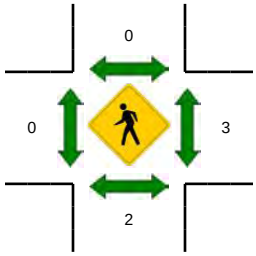
DATE: Tue, Oct 25 2011

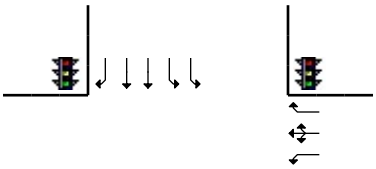


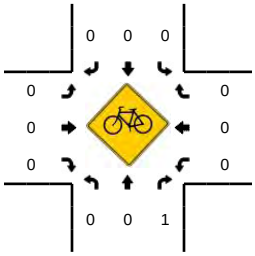
Peak-Hour: 6:15 AM -- 7:15 AM

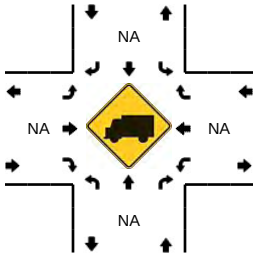
Peak 15-Min: 6:45 AM -- 7:00 AM

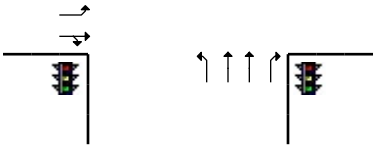


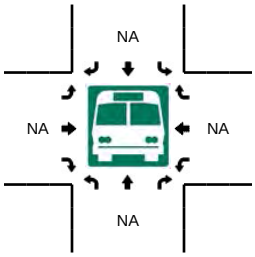












15-Min Count Period Beginning At	Fairfax County Pkwy (Northbound)				Fairfax County Pkwy (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	169	109	0	182	169	4	0	0	1	0	0	9	0	34	0	677	
6:15 AM	0	217	103	0	232	205	2	1	1	0	0	0	9	0	40	0	810	
6:30 AM	0	178	123	0	282	290	5	1	0	0	1	0	13	0	43	0	936	
6:45 AM	0	235	110	0	312	258	3	2	1	0	0	0	15	0	30	0	966	3389
7:00 AM	2	199	118	1	235	181	3	0	1	3	0	0	10	1	42	0	796	3508
7:15 AM	4	211	115	0	165	96	2	1	0	0	0	0	5	1	55	0	655	3353
7:30 AM	2	217	86	0	165	95	6	1	1	0	0	0	17	0	34	0	624	3041
7:45 AM	5	228	89	0	169	106	5	3	1	3	1	0	18	0	43	0	671	2746
8:00 AM	6	226	94	2	163	86	4	2	0	1	0	0	7	1	38	0	630	2580
8:15 AM	6	178	82	0	183	124	8	3	2	1	0	0	11	6	29	0	633	2558
8:30 AM	5	177	67	0	309	221	19	2	1	1	0	0	20	3	30	0	855	2789
8:45 AM	2	243	77	0	329	259	7	0	0	0	4	0	14	4	29	0	968	3086

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	940	440	0	1248	1032	12	8	4	0	0	0	60	0	120	0	3864
Heavy Trucks	0	36	8		4	76	0		0	0	0		16	0	4		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	1		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

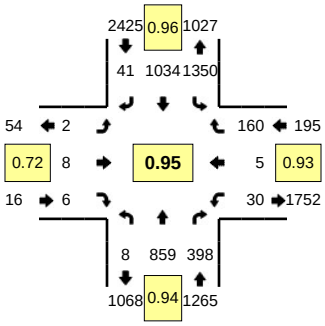
Method for determining peak hour: Total Entering Volume

LOCATION: Fairfax County Pkwy -- John J Kingman Rd

QC JOB #: 10673106

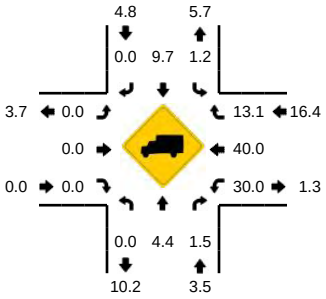
CITY/STATE: Fort Belvoir, VA

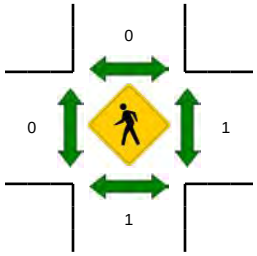
DATE: Wed, Oct 26 2011

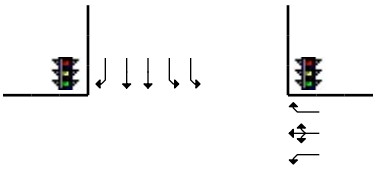


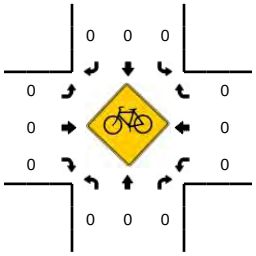
Peak-Hour: 7:00 AM -- 8:00 AM

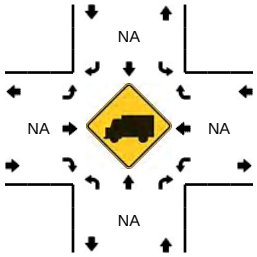
Peak 15-Min: 7:15 AM -- 7:30 AM

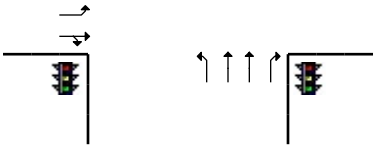


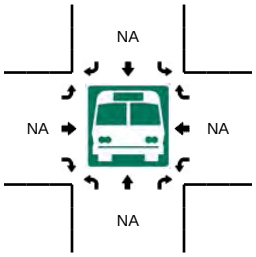












15-Min Count Period Beginning At	Fairfax County Pkwy (Northbound)				Fairfax County Pkwy (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	1	157	90	0	187	182	1	0	0	0	0	0	10	1	30	0	659	
6:15 AM	0	232	101	0	211	215	2	0	0	0	0	0	3	0	44	0	808	
6:30 AM	1	183	109	0	254	261	4	2	0	0	2	0	12	0	44	0	872	
6:45 AM	1	225	105	0	300	264	4	0	2	0	0	0	12	1	24	0	938	3277
7:00 AM	3	168	109	0	323	285	7	1	2	0	1	0	5	2	31	0	937	3555
7:15 AM	1	233	116	0	340	277	11	2	0	1	0	0	5	1	42	0	1029	3776
7:30 AM	2	228	85	0	346	247	14	3	0	4	3	0	10	2	43	0	987	3891
7:45 AM	2	230	88	0	335	225	9	0	0	3	2	0	8	0	44	2	948	3901
8:00 AM	9	234	85	0	251	212	16	2	0	2	1	0	10	1	45	0	868	3832
8:15 AM	4	212	88	0	216	201	10	1	5	0	3	0	6	3	42	0	791	3594
8:30 AM	6	190	59	0	220	234	13	3	3	0	1	0	13	3	44	0	789	3396
8:45 AM	5	188	74	0	219	228	4	1	0	1	0	0	14	0	43	0	777	3225

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	932	464	0	1360	1108	44	8	0	4	0	0	20	4	168	0	4116
Heavy Trucks	0	48	12		12	60	0		0	0	0		8	0	20		160
Pedestrians		0				0				0				4			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

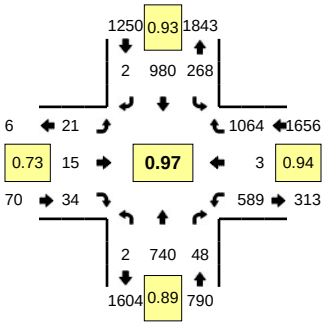
Method for determining peak hour: Total Entering Volume

LOCATION: Fairfax County Pkwy -- John J Kingman Rd

QC JOB #: 10673107

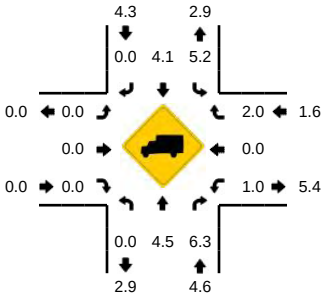
CITY/STATE: Fort Belvoir, VA

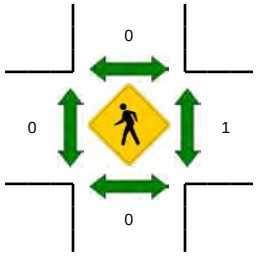
DATE: Tue, Oct 25 2011

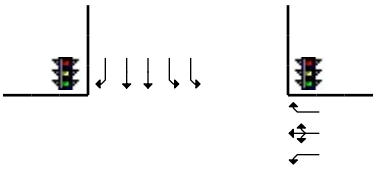


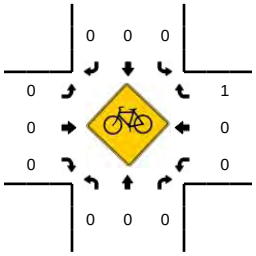
Peak-Hour: 4:15 PM -- 5:15 PM

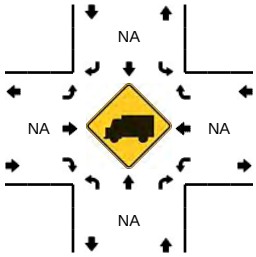
Peak 15-Min: 5:00 PM -- 5:15 PM

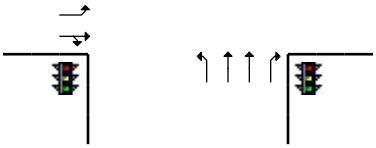


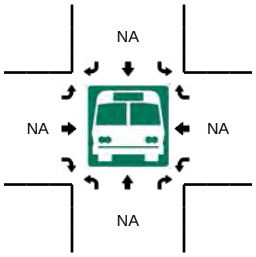












15-Min Count Period Beginning At	Fairfax County Pkwy (Northbound)				Fairfax County Pkwy (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	1	205	21	0	54	173	0	3	1	0	3	0	122	2	188	0	773	
3:15 PM	0	246	23	0	55	223	0	2	3	2	1	0	87	1	147	0	790	
3:30 PM	0	235	15	0	66	195	1	0	2	1	1	0	166	0	244	0	926	
3:45 PM	0	195	20	1	50	211	0	3	0	2	3	0	134	0	189	0	808	3297
4:00 PM	0	154	19	1	38	188	0	5	5	1	5	0	171	0	271	0	858	3382
4:15 PM	0	185	11	0	54	255	1	4	4	1	6	0	134	2	250	0	907	3499
4:30 PM	0	161	8	0	75	232	0	5	7	6	11	0	165	1	256	0	927	3500
4:45 PM	1	202	16	0	75	234	1	5	4	2	10	0	137	0	272	0	959	3651
5:00 PM	0	192	13	1	46	259	0	4	6	6	7	0	153	0	286	0	973	3766
5:15 PM	0	163	18	0	56	296	0	0	4	1	1	0	132	0	231	0	902	3761
5:30 PM	1	157	16	0	51	276	0	4	7	1	6	0	103	0	237	0	859	3693
5:45 PM	1	183	7	0	39	198	1	2	4	0	4	0	99	0	208	0	746	3480

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	768	52	4	184	1036	0	16	24	24	28	0	612	0	1144	0	3892
Heavy Trucks	0	56	0		8	56	0		0	0	0		4	0	20		144
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

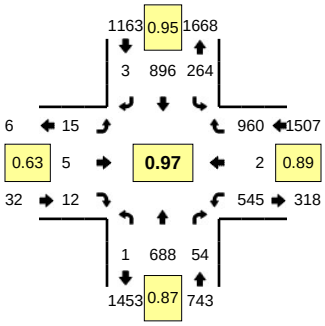
Method for determining peak hour: Total Entering Volume

LOCATION: Fairfax County Pkwy -- John J Kingman Rd

QC JOB #: 10673108

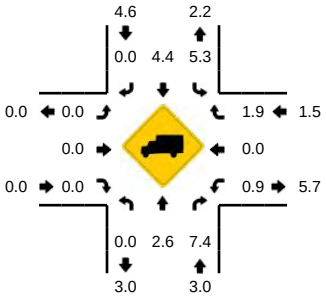
CITY/STATE: Fort Belvoir, VA

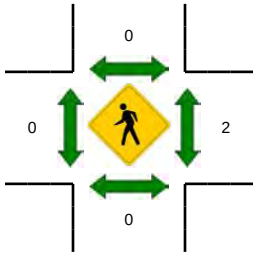
DATE: Wed, Oct 26 2011

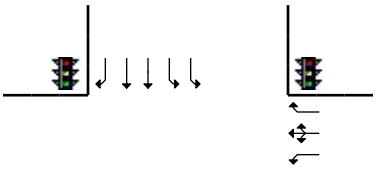


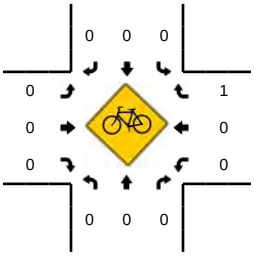
Peak-Hour: 3:45 PM -- 4:45 PM

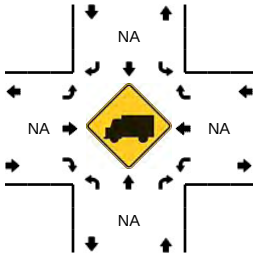
Peak 15-Min: 4:30 PM -- 4:45 PM

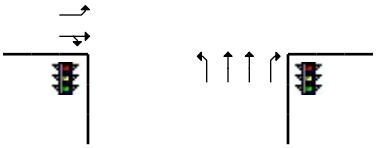


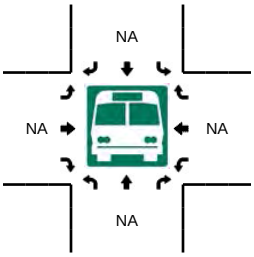












15-Min Count Period Beginning At	Fairfax County Pkwy (Northbound)				Fairfax County Pkwy (Southbound)				John J Kingman Rd (Eastbound)				John J Kingman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	198	27	1	45	205	0	3	2	3	2	0	97	0	185	0	768	
3:15 PM	0	249	14	0	52	220	2	4	1	1	6	0	95	2	157	1	804	
3:30 PM	0	196	17	4	52	185	1	1	2	2	3	0	130	1	184	0	778	
3:45 PM	1	195	17	0	85	219	1	2	3	2	1	0	111	0	207	0	844	3194
4:00 PM	0	191	15	0	51	208	2	0	4	0	3	0	132	0	236	0	842	3268
4:15 PM	0	154	12	0	51	243	0	1	3	3	5	0	140	1	258	0	871	3335
4:30 PM	0	148	10	0	72	226	0	2	5	0	3	0	162	1	259	0	888	3445
4:45 PM	0	196	8	0	59	220	0	5	8	4	3	0	127	0	183	0	813	3414
5:00 PM	0	179	7	0	47	262	0	7	8	6	11	0	92	0	178	0	797	3369
5:15 PM	0	171	15	0	40	248	1	2	7	2	3	0	113	0	184	0	786	3284
5:30 PM	0	158	18	2	48	237	0	3	4	1	6	0	85	0	201	0	763	3159
5:45 PM	0	191	11	1	33	204	0	3	4	0	1	0	81	1	199	0	729	3075

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	592	40	0	288	904	0	8	20	0	12	0	648	4	1036	0	3552
Heavy Trucks	0	20	4		16	36	0		0	0	0		0	0	32		108
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

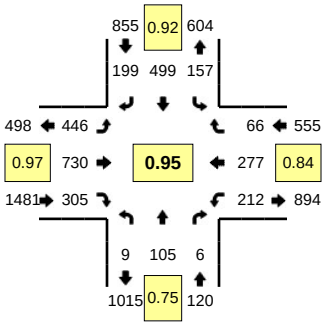
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- Telegraph Rd

QC JOB #: 10673101

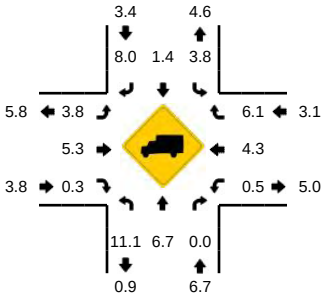
CITY/STATE: Fort Belvoir, VA

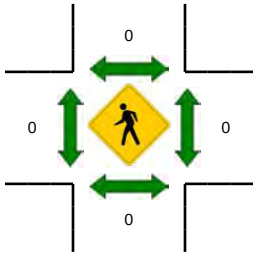
DATE: Tue, Oct 25 2011

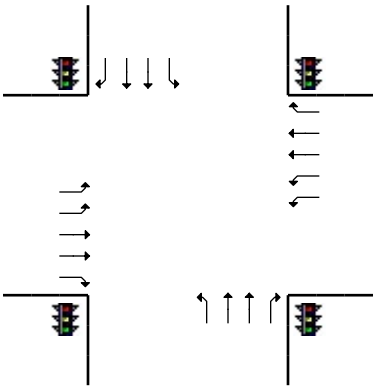


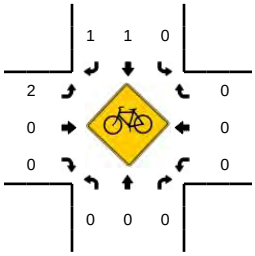
Peak-Hour: 7:45 AM -- 8:45 AM

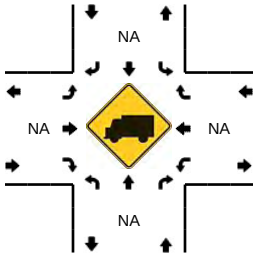
Peak 15-Min: 8:30 AM -- 8:45 AM

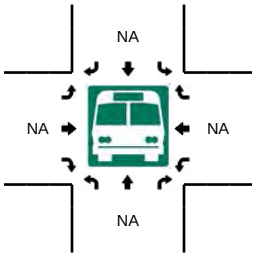












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				Telegraph Rd (Eastbound)				Telegraph Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	1	15	1	0	22	46	22	0	32	125	3	0	33	49	9	0	358	
6:15 AM	1	16	5	0	33	63	31	0	41	175	11	0	19	54	16	0	465	
6:30 AM	0	17	4	0	44	65	48	0	68	229	16	0	46	51	7	0	595	
6:45 AM	1	17	9	0	70	90	49	0	71	305	10	0	55	68	26	0	771	2189
7:00 AM	0	20	2	0	54	117	76	0	84	243	21	1	33	72	43	0	766	2597
7:15 AM	5	11	0	0	36	115	67	0	106	167	75	0	51	96	40	1	770	2902
7:30 AM	4	27	5	0	27	102	44	0	95	163	87	2	54	75	16	0	701	3008
7:45 AM	3	22	3	0	29	115	58	0	113	182	84	1	53	69	17	0	749	2986
8:00 AM	5	17	2	0	43	125	33	0	106	183	69	5	55	63	18	0	724	2944
8:15 AM	0	28	0	0	41	125	56	0	118	173	70	3	52	60	15	1	742	2916
8:30 AM	1	38	1	0	44	134	52	0	96	192	82	4	51	85	16	0	796	3011
8:45 AM	3	21	1	0	59	116	69	0	92	176	67	0	45	69	22	3	743	3005

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	152	4	0	176	536	208	0	384	768	328	16	204	340	64	0	3184
Heavy Trucks	0	8	0		12	8	12		20	40	4		0	16	0		120
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		1	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

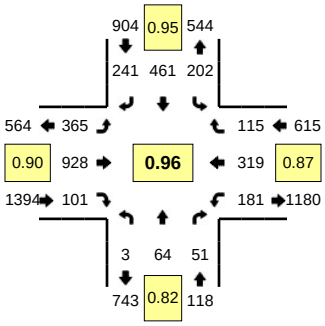
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- Telegraph Rd

CITY/STATE: Fort Belvoir, VA

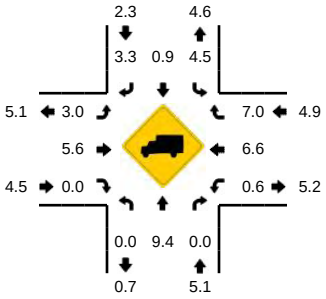
QC JOB #: 10673102

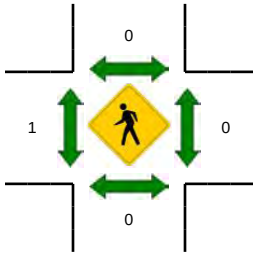
DATE: Wed, Oct 26 2011

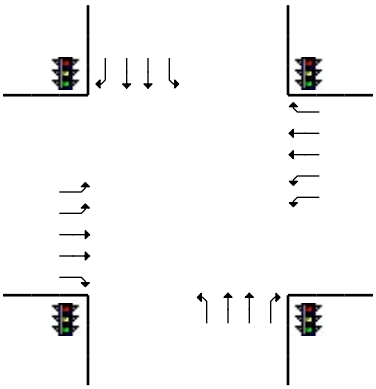


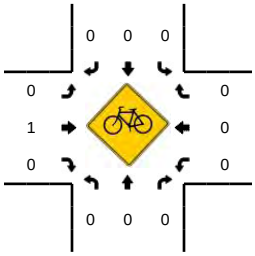
Peak-Hour: 6:45 AM -- 7:45 AM

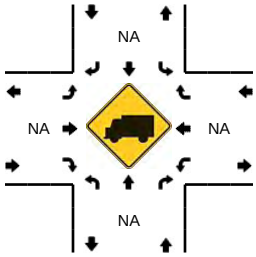
Peak 15-Min: 7:00 AM -- 7:15 AM

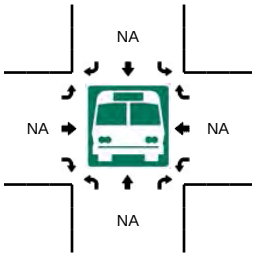












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				Telegraph Rd (Eastbound)				Telegraph Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	0	11	6	0	29	52	25	0	33	119	8	0	29	44	17	0	373	
6:15 AM	1	11	9	0	35	47	35	0	43	162	4	0	26	50	8	0	431	
6:30 AM	1	22	8	0	42	59	40	0	48	227	14	0	38	58	16	0	573	
6:45 AM	1	11	15	0	56	90	48	0	75	293	18	0	47	79	22	0	755	2132
7:00 AM	0	20	9	0	63	109	50	0	89	272	16	0	34	82	42	0	786	2545
7:15 AM	0	9	11	0	37	129	73	1	96	181	30	1	59	89	28	0	744	2858
7:30 AM	2	24	16	0	45	133	70	0	104	182	37	0	41	69	23	0	746	3031
7:45 AM	1	24	9	0	51	104	73	0	87	234	33	1	46	59	16	0	738	3014
8:00 AM	2	21	12	0	56	59	65	0	101	162	13	0	39	62	16	0	608	2836
8:15 AM	1	13	13	0	39	89	53	0	102	175	16	0	40	52	21	0	614	2706
8:30 AM	4	18	6	0	59	62	77	0	63	179	19	0	35	78	15	0	615	2575
8:45 AM	3	21	11	0	47	69	65	0	69	167	13	0	39	70	13	0	587	2424

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	80	36	0	252	436	200	0	356	1088	64	0	136	328	168	0	3144
Heavy Trucks	0	0	0		8	4	8		4	44	0		4	28	16		116
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

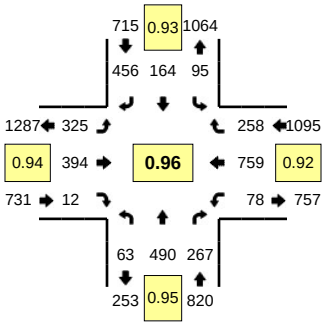
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

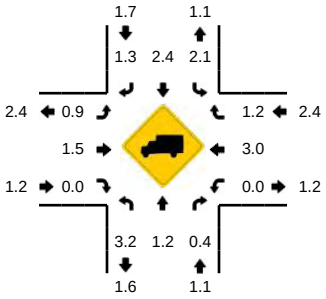
Method for determining peak hour: Total Entering Volume

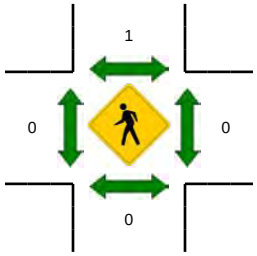
LOCATION: Beulah St -- Telegraph Rd
CITY/STATE: Fort Belvoir, VA

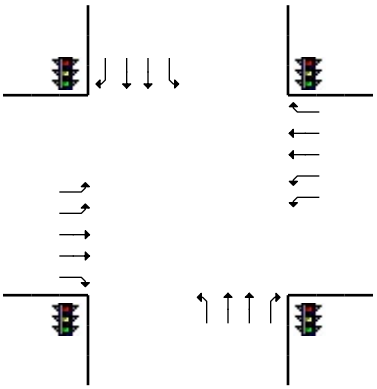
QC JOB #: 10673103
DATE: Tue, Oct 25 2011

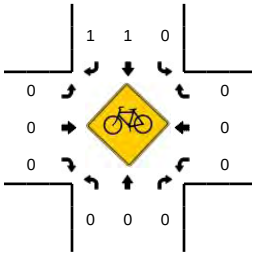


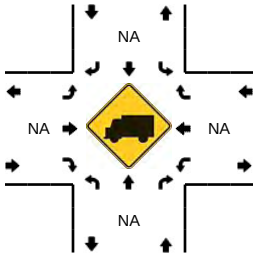
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

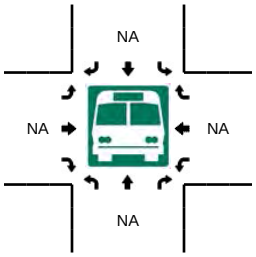












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				Telegraph Rd (Eastbound)				Telegraph Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	7	60	45	0	22	28	62	0	66	83	3	1	12	162	46	0	597	
3:15 PM	9	57	37	0	13	33	75	0	58	92	2	1	20	189	43	0	629	
3:30 PM	5	70	47	0	21	34	108	1	57	88	2	0	18	175	57	0	683	
3:45 PM	15	94	54	0	23	32	79	0	64	98	3	0	18	175	54	0	709	2618
4:00 PM	13	98	54	0	36	33	82	0	67	88	2	2	23	205	55	0	758	2779
4:15 PM	16	112	69	0	27	24	100	0	79	110	4	1	24	197	47	1	811	2961
4:30 PM	20	120	61	0	26	32	104	0	72	93	4	4	11	212	68	0	827	3105
4:45 PM	14	124	68	0	23	41	111	0	86	94	1	2	20	159	51	0	794	3190
5:00 PM	16	124	75	0	18	41	114	0	76	106	5	1	26	199	73	1	875	3307
5:15 PM	13	122	63	0	28	50	127	0	82	101	2	2	20	189	66	0	865	3361
5:30 PM	17	119	44	0	22	47	124	0	87	110	2	3	17	172	56	1	821	3355
5:45 PM	12	101	52	0	29	37	122	1	81	77	0	3	18	158	61	0	752	3313

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	64	496	300	0	72	164	456	0	304	424	20	4	104	796	292	4	3500
Heavy Trucks	0	0	0		4	4	4		0	8	0		0	32	4		56
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

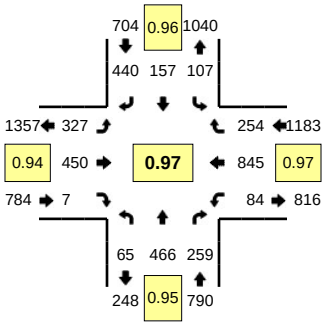
Method for determining peak hour: Total Entering Volume

LOCATION: Beulah St -- Telegraph Rd

QC JOB #: 10673104

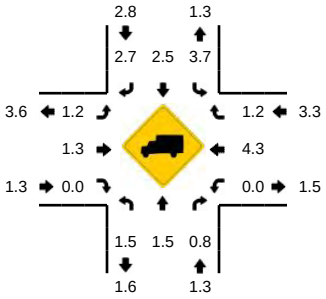
CITY/STATE: Fort Belvoir, VA

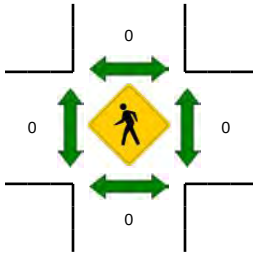
DATE: Wed, Oct 26 2011

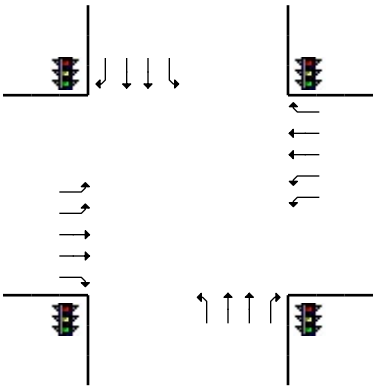


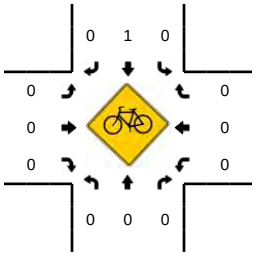
Peak-Hour: 4:30 PM -- 5:30 PM

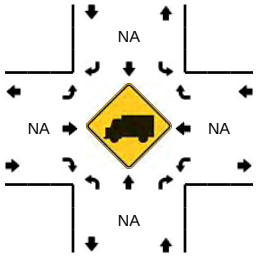
Peak 15-Min: 5:15 PM -- 5:30 PM

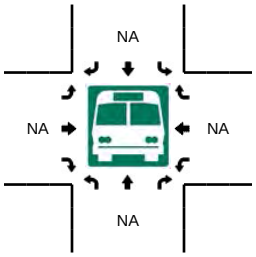












15-Min Count Period Beginning At	Beulah St (Northbound)				Beulah St (Southbound)				Telegraph Rd (Eastbound)				Telegraph Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	9	60	41	0	18	24	54	0	54	83	0	0	17	153	51	0	564	
3:15 PM	5	57	37	0	25	33	94	0	65	68	0	1	16	168	58	0	627	
3:30 PM	2	55	52	0	22	29	92	0	67	91	2	1	16	182	51	0	662	
3:45 PM	13	85	45	0	26	27	88	0	69	87	1	2	22	179	42	0	686	2539
4:00 PM	16	85	47	0	24	50	103	0	62	117	0	2	18	199	52	0	775	2750
4:15 PM	16	105	78	0	20	37	76	0	65	96	0	3	31	193	50	0	770	2893
4:30 PM	19	126	65	0	21	32	92	0	71	111	3	3	16	217	71	0	847	3078
4:45 PM	18	105	72	0	32	42	113	0	89	97	2	1	26	229	49	0	875	3267
5:00 PM	13	124	56	0	33	36	109	0	77	119	1	2	18	193	65	0	846	3338
5:15 PM	15	111	66	0	21	47	126	0	83	123	1	1	24	206	69	0	893	3461
5:30 PM	10	116	48	0	24	36	123	0	84	87	3	1	12	174	60	0	778	3392
5:45 PM	16	106	45	0	29	27	101	0	71	99	2	2	15	156	68	0	737	3254

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	60	444	264	0	84	188	504	0	332	492	4	4	96	824	276	0	3572
Heavy Trucks	4	8	0		0	4	8		0	4	0		0	16	0		44
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 11/9/2011 2:58 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: NB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 25 2011 - Oct 30 2011

Start Time	Mon	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM		1	1	0	2	1	4	1	2	
1:00 AM		4	0	2	5	3	0	1	2	
2:00 AM		5	0	0	6	3	0	0	2	
3:00 AM		4	7	5	4	5	1	1	4	
4:00 AM		11	16	14	19	15	2	0	10	
5:00 AM		56	39	41	31	42	**13**	**14**	32	
6:00 AM		62	33	39	32	42	4	3	29	
7:00 AM		53	64	24	22	41	2	3	28	
8:00 AM		81	88	36	36	60	1	3	41	
9:00 AM		106	100	49	47	76	3	4	52	
10:00 AM		122	142	**131**	87	120	1	3	81	
11:00 AM		**196**	**210**	107	**152**	**166**	6	4	**112**	
12:00 PM		147	126	108	136	129	**12**	6	89	
1:00 PM		155	169	108	128	140	8	**11**	96	
2:00 PM		191	209	176	152	182	1	7	123	
3:00 PM		270	265	222	202	240	5	7	162	
4:00 PM		**291**	**283**	**297**	**215**	**272**	7	6	**183**	
5:00 PM		184	188	190	120	170	11	11	117	
6:00 PM		87	95	96	56	84	7	8	58	
7:00 PM		44	42	39	24	37	3	3	26	
8:00 PM		26	25	17	19	22	2	5	16	
9:00 PM		14	21	11	8	14	9	6	12	
10:00 PM		8	14	8	5	9	4	4	7	
11:00 PM		10	11	5	6	8	3	3	6	
Day Total		2128	2148	1725	1514	1881	109	114	1290	
% Weekday Average		113.1%	114.2%	91.7%	80.5%					
% Week Average		165.0%	166.5%	133.7%	117.4%	145.8%	8.4%	8.8%		
AM Peak Volume		11:00 AM 196	11:00 AM 210	10:00 AM 131	11:00 AM 152	11:00 AM 166	5:00 AM 13	5:00 AM 14	11:00 AM 112	
PM Peak Volume		4:00 PM 291	4:00 PM 283	4:00 PM 297	4:00 PM 215	4:00 PM 272	12:00 PM 12	1:00 PM 11	4:00 PM 183	

Comments:

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: NB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 31 2011 - Nov 06 2011

Start Time	Mon 31-Oct-11	Tue 01-Nov-11	Wed 02-Nov-11	Thu 03-Nov-11	Fri 04-Nov-11	Average Weekday Hourly Traffic	Sat 05-Nov-11	Sun 06-Nov-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	3	2	0	2	0	1	3	1	2	
1:00 AM	0	0	0	5	3	2	0	0	1	
2:00 AM	0	0	0	3	3	1	1	0	1	
3:00 AM	3	2	6	6	9	5	0	0	4	
4:00 AM	14	14	13	8	16	13	1	1	10	
5:00 AM	45	39	49	46	40	44	12	0	33	
6:00 AM	28	56	29	23	24	32	9	11	26	
7:00 AM	20	30	32	56	22	32	5	5	24	
8:00 AM	33	37	36	61	43	42	2	8	31	
9:00 AM	58	48	124	105	37	74	17	**19**	58	
10:00 AM	60	84	59	147	78	86	11	6	64	
11:00 AM	**151**	**149**	**133**	**170**	**132**	**147**	**33**	7	**111**	
12:00 PM	88	83	92	151	96	102	14	25	78	
1:00 PM	112	105	93	154	123	117	13	9	87	
2:00 PM	200	168	170	158	167	173	7	15	126	
3:00 PM	**301**	268	**274**	**259**	**243**	**269**	9	9	**195**	
4:00 PM	258	**285**	253	247	206	250	**34**	4	184	
5:00 PM	154	171	180	187	140	166	31	**38**	129	
6:00 PM	48	86	90	101	61	77	3	28	60	
7:00 PM	19	30	18	29	17	23	4	5	17	
8:00 PM	16	17	20	23	14	18	6	5	14	
9:00 PM	7	4	11	12	5	8	26	4	10	
10:00 PM	8	10	8	14	5	9	6	4	8	
11:00 PM	5	7	8	14	9	9	1	5	7	
Day Total	1631	1695	1698	1981	1493	1700	248	209	1280	
% Weekday Average	86.7%	99.7%	99.9%	116.5%	87.8%					
% Week Average	126.4%	132.4%	132.7%	154.8%	116.6%	132.8%	19.4%	16.3%		
AM Peak	11:00 AM	11:00 AM	11:00 AM	11:00 AM	11:00 AM	11:00 AM	11:00 AM	9:00 AM	11:00 AM	
Volume	151	149	133	170	132	147	33	19	111	
PM Peak	3:00 PM	4:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	4:00 PM	5:00 PM	3:00 PM	
Volume	301	285	274	259	243	269	34	38	195	

Comments:

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: NB
CITY/STATE: Fort Belvoir, VA
DATE: Nov 07 2011 - Nov 07 2011

Start Time	Mon 07-Nov-11	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM	2					2			2	
1:00 AM	1					1			1	
2:00 AM	0					0			0	
3:00 AM	2					2			2	
4:00 AM	2					2			2	
5:00 AM	15					15			15	
6:00 AM	42					42			42	
7:00 AM	31					31			31	
8:00 AM	78					78			78	
9:00 AM	61					61			61	
10:00 AM	93					93			93	
11:00 AM	**120**					**120**			**120**	
12:00 PM	206					206			206	
1:00 PM	100					100			100	
2:00 PM	172					172			172	
3:00 PM	197					197			197	
4:00 PM	282					282			282	
5:00 PM	**283**					**283**			**283**	
6:00 PM	188					188			188	
7:00 PM	75					75			75	
8:00 PM	25					25			25	
9:00 PM	11					11			11	
10:00 PM	12					12			12	
11:00 PM	5					5			5	
Day Total	2003					2003			2003	
% Weekday Average	117.8%									
% Week Average	156.5%					100.0%				
AM Peak Volume	11:00 AM 120					11:00 AM 120			11:00 AM 120	
PM Peak Volume	5:00 PM 283					5:00 PM 283			5:00 PM 283	

Comments:

SUMMARY - Tube Count - Volume Data (Weekday)

LOCATION: Beulah St south of John J Kingman Rd
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673117
DIRECTION: NB
DATE: Oct 24 2011 - Oct 28 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic			Average Weekday Profile
12:00 AM	3	1	1	0	2	1			
1:00 AM	0	4	0	2	5	2			
2:00 AM	0	5	0	0	6	2			
3:00 AM	3	4	7	5	4	5			
4:00 AM	14	11	16	14	19	15			
5:00 AM	45	56	39	41	31	42			
6:00 AM	28	62	33	39	32	39			
7:00 AM	20	53	64	24	22	37			
8:00 AM	33	81	88	36	36	55			
9:00 AM	58	106	100	49	47	72			
10:00 AM	60	122	142	**131**	87	108			
11:00 AM	**151**	**196**	**210**	107	**152**	**163**			
12:00 PM	88	147	126	108	136	121			
1:00 PM	112	155	169	108	128	134			
2:00 PM	200	191	209	176	152	186			
3:00 PM	**301**	270	265	222	202	252			
4:00 PM	258	**291**	**283**	**297**	**215**	**269**			
5:00 PM	154	184	188	190	120	167			
6:00 PM	48	87	95	96	56	76			
7:00 PM	19	44	42	39	24	34			
8:00 PM	16	26	25	17	19	21			
9:00 PM	7	14	21	11	8	12			
10:00 PM	8	8	14	8	5	9			
11:00 PM	5	10	11	5	6	7			
Day Total	1631	2128	2148	1725	1514	1829			
% Weekday Average	89.2%	116.3%	117.4%	94.3%	82.8%				
% Week Average									
AM Peak	11:00 AM	11:00 AM	11:00 AM	10:00 AM	11:00 AM	11:00 AM			
Volume	151	196	210	131	152	163			
PM Peak	3:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM			
Volume	301	291	283	297	215	269			

Comments:

SUMMARY - Tube Count - Volume Data (Weekend)

LOCATION: Beulah St south of John J Kingman Rd
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673117
DIRECTION: NB
DATE: Oct 29 2011 - Oct 30 2011

Start Time			Sat 29-Oct-11	Sun 30-Oct-11	Average Weekend Hourly Traffic	Average Weekend Profile
12:00 AM			4	1	2	
1:00 AM			0	1	0	
2:00 AM			0	0	0	
3:00 AM			1	1	1	
4:00 AM			2	0	1	
5:00 AM			**13**	**14**	**14**	
6:00 AM			4	3	4	
7:00 AM			2	3	2	
8:00 AM			1	3	2	
9:00 AM			3	4	4	
10:00 AM			1	3	2	
11:00 AM			6	4	5	
12:00 PM			**12**	6	9	
1:00 PM			8	**11**	10	
2:00 PM			1	7	4	
3:00 PM			5	7	6	
4:00 PM			7	6	6	
5:00 PM			11	11	**11**	
6:00 PM			7	8	8	
7:00 PM			3	3	3	
8:00 PM			2	5	4	
9:00 PM			9	6	8	
10:00 PM			4	4	4	
11:00 PM			3	3	3	
Day Total			109	114	113	
% Weekday Average						
% Week Average			96.5%	100.9%		
AM Peak Volume			5:00 AM 13	5:00 AM 14	5:00 AM 14	
PM Peak Volume			12:00 PM 12	1:00 PM 11	5:00 PM 11	

Comments:

SUMMARY - Tube Count - Volume Data (Week)

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: NB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 24 2011 - Oct 30 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	3	1	1	0	2	1	4	1	2	
1:00 AM	0	4	0	2	5	2	0	1	2	
2:00 AM	0	5	0	0	6	2	0	0	2	
3:00 AM	3	4	7	5	4	5	1	1	4	
4:00 AM	14	11	16	14	19	15	2	0	11	
5:00 AM	45	56	39	41	31	42	**13**	**14**	34	
6:00 AM	28	62	33	39	32	39	4	3	29	
7:00 AM	20	53	64	24	22	37	2	3	27	
8:00 AM	33	81	88	36	36	55	1	3	40	
9:00 AM	58	106	100	49	47	72	3	4	52	
10:00 AM	60	122	142	**131**	87	108	1	3	78	
11:00 AM	**151**	**196**	**210**	107	**152**	**163**	6	4	**118**	
12:00 PM	88	147	126	108	136	121	**12**	6	89	
1:00 PM	112	155	169	108	128	134	8	**11**	99	
2:00 PM	200	191	209	176	152	186	1	7	134	
3:00 PM	**301**	270	265	222	202	252	5	7	182	
4:00 PM	258	**291**	**283**	**297**	**215**	**269**	7	6	**194**	
5:00 PM	154	184	188	190	120	167	11	11	123	
6:00 PM	48	87	95	96	56	76	7	8	57	
7:00 PM	19	44	42	39	24	34	3	3	25	
8:00 PM	16	26	25	17	19	21	2	5	16	
9:00 PM	7	14	21	11	8	12	9	6	11	
10:00 PM	8	8	14	8	5	9	4	4	7	
11:00 PM	5	10	11	5	6	7	3	3	6	
Day Total	1631	2128	2148	1725	1514	1829	109	114	1342	
% Weekday Average	89.2%	116.3%	117.4%	94.3%	82.8%					
% Week Average	121.5%	158.6%	160.1%	128.5%	112.8%	136.3%	8.1%	8.5%		
AM Peak Volume	11:00 AM 151	11:00 AM 196	11:00 AM 210	10:00 AM 131	11:00 AM 152	11:00 AM 163	5:00 AM 13	5:00 AM 14	11:00 AM 118	
PM Peak Volume	3:00 PM 301	4:00 PM 291	4:00 PM 283	4:00 PM 297	4:00 PM 215	4:00 PM 269	12:00 PM 12	1:00 PM 11	4:00 PM 194	

Comments:

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: SB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 25 2011 - Oct 30 2011

Start Time	Mon	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM		3	2	0	1	2	4	1	2	
1:00 AM		3	0	2	3	2	0	0	1	
2:00 AM		5	3	4	5	4	0	0	3	
3:00 AM		3	7	6	3	5	1	2	4	
4:00 AM		30	34	28	30	30	3	4	22	
5:00 AM		194	146	130	123	148	**12**	**11**	103	
6:00 AM		241	226	219	236	230	2	1	154	
7:00 AM		279	**351**	**319**	**293**	**310**	2	3	**208**	
8:00 AM		**283**	239	242	201	241	4	3	162	
9:00 AM		159	126	117	92	124	4	7	84	
10:00 AM		69	63	65	60	64	4	0	44	
11:00 AM		124	68	98	63	88	5	5	60	
12:00 PM		**123**	**153**	**143**	**100**	**130**	**9**	8	**89**	
1:00 PM		98	106	92	64	90	5	9	62	
2:00 PM		48	51	54	75	57	2	9	40	
3:00 PM		43	34	31	39	37	3	3	26	
4:00 PM		31	28	22	18	25	8	6	19	
5:00 PM		23	24	21	15	21	4	9	16	
6:00 PM		14	6	14	6	10	6	5	8	
7:00 PM		10	10	10	5	9	3	9	8	
8:00 PM		18	21	19	7	16	5	**20**	15	
9:00 PM		15	14	18	3	12	6	15	12	
10:00 PM		6	8	3	6	6	5	3	5	
11:00 PM		3	8	4	1	4	2	4	4	
Day Total		1825	1728	1661	1449	1665	99	137	1151	
% Weekday Average		109.6%	103.8%	99.8%	87.0%					
% Week Average		158.6%	150.1%	144.3%	125.9%	144.7%	8.6%	11.9%		
AM Peak Volume		8:00 AM 283	7:00 AM 351	7:00 AM 319	7:00 AM 293	7:00 AM 310	5:00 AM 12	5:00 AM 11	7:00 AM 208	
PM Peak Volume		12:00 PM 123	12:00 PM 153	12:00 PM 143	12:00 PM 100	12:00 PM 130	12:00 PM 9	8:00 PM 20	12:00 PM 89	

Comments:

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: SB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 31 2011 - Nov 06 2011

Start Time	Mon 31-Oct-11	Tue 01-Nov-11	Wed 02-Nov-11	Thu 03-Nov-11	Fri 04-Nov-11	Average Weekday Hourly Traffic	Sat 05-Nov-11	Sun 06-Nov-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	3	2	1	0	8	3	1	0	2	
1:00 AM	0	0	0	1	0	0	1	0	0	
2:00 AM	2	2	2	5	1	2	0	0	2	
3:00 AM	5	3	3	3	5	4	1	1	3	
4:00 AM	27	32	24	33	28	29	4	0	21	
5:00 AM	137	138	129	114	110	126	10	6	92	
6:00 AM	200	249	216	204	218	217	22	12	160	
7:00 AM	**334**	**310**	**295**	**321**	**270**	**306**	**30**	18	**225**	
8:00 AM	221	230	256	280	211	240	10	**29**	177	
9:00 AM	105	104	122	131	90	110	17	21	84	
10:00 AM	67	65	48	80	64	65	11	15	50	
11:00 AM	72	75	121	72	68	82	13	7	61	
12:00 PM	**121**	**118**	**138**	**134**	**112**	**125**	**28**	6	**94**	
1:00 PM	91	115	79	102	94	96	12	21	73	
2:00 PM	43	78	65	35	46	53	6	22	42	
3:00 PM	29	28	33	35	32	31	11	8	25	
4:00 PM	21	23	26	26	17	23	5	3	17	
5:00 PM	18	20	27	26	15	21	9	3	17	
6:00 PM	13	11	11	17	7	12	1	11	10	
7:00 PM	4	8	8	8	5	7	3	3	6	
8:00 PM	31	25	27	23	5	22	8	7	18	
9:00 PM	14	17	16	20	5	14	20	**23**	16	
10:00 PM	4	3	6	7	3	5	4	16	6	
11:00 PM	5	4	3	5	5	4	1	4	4	
Day Total	1567	1660	1656	1682	1419	1597	228	236	1205	
% Weekday Average	94.1%	103.9%	103.7%	105.3%	88.9%					
% Week Average	136.1%	137.8%	137.4%	139.6%	117.8%	132.5%	18.9%	19.6%		
AM Peak Volume	7:00 AM 334	7:00 AM 310	7:00 AM 295	7:00 AM 321	7:00 AM 270	7:00 AM 306	7:00 AM 30	8:00 AM 29	7:00 AM 225	
PM Peak Volume	12:00 PM 121	12:00 PM 118	12:00 PM 138	12:00 PM 134	12:00 PM 112	12:00 PM 125	12:00 PM 28	9:00 PM 23	12:00 PM 94	

Comments:

LOCATION: Beulah St south of John J Kingman Rd
QC JOB #: 10673117
SPECIFIC LOCATION: 0 ft from
DIRECTION: SB
CITY/STATE: Fort Belvoir, VA
DATE: Nov 07 2011 - Nov 07 2011

Start Time	Mon 07-Nov-11	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM	2					2			2	
1:00 AM	2					2			2	
2:00 AM	0					0			0	
3:00 AM	2					2			2	
4:00 AM	4					4			4	
5:00 AM	33					33			33	
6:00 AM	140					140			140	
7:00 AM	232					232			232	
8:00 AM	**321**					**321**			**321**	
9:00 AM	232					232			232	
10:00 AM	104					104			104	
11:00 AM	76					76			76	
12:00 PM	78					78			78	
1:00 PM	**136**					**136**			**136**	
2:00 PM	90					90			90	
3:00 PM	54					54			54	
4:00 PM	37					37			37	
5:00 PM	17					17			17	
6:00 PM	15					15			15	
7:00 PM	6					6			6	
8:00 PM	8					8			8	
9:00 PM	24					24			24	
10:00 PM	14					14			14	
11:00 PM	7					7			7	
Day Total	1634					1634			1634	
% Weekday Average	102.3%									
% Week Average	135.6%					100.0%				
AM Peak	8:00 AM					8:00 AM			8:00 AM	
Volume	321					321			321	
PM Peak	1:00 PM					1:00 PM			1:00 PM	
Volume	136					136			136	

Comments:

SUMMARY - Tube Count - Volume Data (Weekday)

LOCATION: Beulah St south of John J Kingman Rd
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673117
DIRECTION: SB
DATE: Oct 24 2011 - Oct 28 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic			Average Weekday Profile
12:00 AM	3	3	2	0	1	2			
1:00 AM	0	3	0	2	3	2			
2:00 AM	2	5	3	4	5	4			
3:00 AM	5	3	7	6	3	5			
4:00 AM	27	30	34	28	30	30			
5:00 AM	137	194	146	130	123	146			
6:00 AM	200	241	226	219	236	224			
7:00 AM	**334**	279	**351**	**319**	**293**	**315**			
8:00 AM	221	**283**	239	242	201	237			
9:00 AM	105	159	126	117	92	120			
10:00 AM	67	69	63	65	60	65			
11:00 AM	72	124	68	98	63	85			
12:00 PM	**121**	**123**	**153**	**143**	**100**	**128**			
1:00 PM	91	98	106	92	64	90			
2:00 PM	43	48	51	54	75	54			
3:00 PM	29	43	34	31	39	35			
4:00 PM	21	31	28	22	18	24			
5:00 PM	18	23	24	21	15	20			
6:00 PM	13	14	6	14	6	11			
7:00 PM	4	10	10	10	5	8			
8:00 PM	31	18	21	19	7	19			
9:00 PM	14	15	14	18	3	13			
10:00 PM	4	6	8	3	6	5			
11:00 PM	5	3	8	4	1	4			
Day Total	1567	1825	1728	1661	1449	1646			
% Weekday Average	95.2%	110.9%	105.0%	100.9%	88.0%				
% Week Average									
AM Peak Volume	7:00 AM 334	8:00 AM 283	7:00 AM 351	7:00 AM 319	7:00 AM 293	7:00 AM 315			
PM Peak Volume	12:00 PM 121	12:00 PM 123	12:00 PM 153	12:00 PM 143	12:00 PM 100	12:00 PM 128			

Comments:

SUMMARY - Tube Count - Volume Data (Weekend)

LOCATION: Beulah St south of John J Kingman Rd
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673117
DIRECTION: SB
DATE: Oct 29 2011 - Oct 30 2011

Start Time			Sat 29-Oct-11	Sun 30-Oct-11	Average Weekend Hourly Traffic	Average Weekend Profile
12:00 AM			4	1	2	
1:00 AM			0	0	0	
2:00 AM			0	0	0	
3:00 AM			1	2	2	
4:00 AM			3	4	4	
5:00 AM			**12**	**11**	**12**	
6:00 AM			2	1	2	
7:00 AM			2	3	2	
8:00 AM			4	3	4	
9:00 AM			4	7	6	
10:00 AM			4	0	2	
11:00 AM			5	5	5	
12:00 PM			**9**	8	8	
1:00 PM			5	9	7	
2:00 PM			2	9	6	
3:00 PM			3	3	3	
4:00 PM			8	6	7	
5:00 PM			4	9	6	
6:00 PM			6	5	6	
7:00 PM			3	9	6	
8:00 PM			5	**20**	**12**	
9:00 PM			6	15	10	
10:00 PM			5	3	4	
11:00 PM			2	4	3	
Day Total			99	137	119	
% Weekday Average						
% Week Average			83.2%	115.1%		
AM Peak Volume			5:00 AM 12	5:00 AM 11	5:00 AM 12	
PM Peak Volume			12:00 PM 9	8:00 PM 20	8:00 PM 12	

Comments:

SUMMARY - Tube Count - Volume Data (Week)

LOCATION: Beulah St south of John J Kingman Rd
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA
QC JOB #: 10673117
DIRECTION: SB
DATE: Oct 24 2011 - Oct 30 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	3	3	2	0	1	2	4	1	2	
1:00 AM	0	3	0	2	3	2	0	0	1	
2:00 AM	2	5	3	4	5	4	0	0	3	
3:00 AM	5	3	7	6	3	5	1	2	4	
4:00 AM	27	30	34	28	30	30	3	4	22	
5:00 AM	137	194	146	130	123	146	**12**	**11**	108	
6:00 AM	200	241	226	219	236	224	2	1	161	
7:00 AM	**334**	279	**351**	**319**	**293**	**315**	2	3	**226**	
8:00 AM	221	**283**	239	242	201	237	4	3	170	
9:00 AM	105	159	126	117	92	120	4	7	87	
10:00 AM	67	69	63	65	60	65	4	0	47	
11:00 AM	72	124	68	98	63	85	5	5	62	
12:00 PM	**121**	**123**	**153**	**143**	**100**	**128**	**9**	8	**94**	
1:00 PM	91	98	106	92	64	90	5	9	66	
2:00 PM	43	48	51	54	75	54	2	9	40	
3:00 PM	29	43	34	31	39	35	3	3	26	
4:00 PM	21	31	28	22	18	24	8	6	19	
5:00 PM	18	23	24	21	15	20	4	9	16	
6:00 PM	13	14	6	14	6	11	6	5	9	
7:00 PM	4	10	10	10	5	8	3	9	7	
8:00 PM	31	18	21	19	7	19	5	**20**	17	
9:00 PM	14	15	14	18	3	13	6	15	12	
10:00 PM	4	6	8	3	6	5	5	3	5	
11:00 PM	5	3	8	4	1	4	2	4	4	
Day Total	1567	1825	1728	1661	1449	1646	99	137	1208	
% Weekday Average	95.2%	110.9%	105.0%	100.9%	88.0%					
% Week Average	129.7%	151.1%	143.0%	137.5%	120.0%	136.3%	8.2%	11.3%		
AM Peak Volume	7:00 AM 334	8:00 AM 283	7:00 AM 351	7:00 AM 319	7:00 AM 293	7:00 AM 315	5:00 AM 12	5:00 AM 11	7:00 AM 226	
PM Peak Volume	12:00 PM 121	12:00 PM 123	12:00 PM 153	12:00 PM 143	12:00 PM 100	12:00 PM 128	12:00 PM 9	8:00 PM 20	12:00 PM 94	

Comments:

LOCATION: INSCOM Dwy east of Beulah St
QC JOB #: 10673118
SPECIFIC LOCATION: 0 ft from
DIRECTION: EB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 25 2011 - Oct 30 2011

Start Time	Mon	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM		2	1	0	0	1	1	0	1	
1:00 AM		4	0	1	0	1	0	0	1	
2:00 AM		3	1	3	4	3	0	0	2	
3:00 AM		3	6	5	1	4	0	1	3	
4:00 AM		13	10	18	15	14	0	2	10	
5:00 AM		151	115	93	90	112	**15**	**10**	79	
6:00 AM		163	148	158	168	159	2	2	107	
7:00 AM		215	**289**	**247**	**231**	**246**	1	1	**164**	
8:00 AM		**225**	159	191	160	184	3	1	123	
9:00 AM		106	80	72	59	79	5	6	55	
10:00 AM		35	52	45	52	46	4	1	32	
11:00 AM		77	48	54	51	58	3	3	39	
12:00 PM		68	**98**	**120**	**63**	**87**	**8**	4	**60**	
1:00 PM		**70**	78	70	51	67	6	7	47	
2:00 PM		41	44	43	53	45	2	9	32	
3:00 PM		34	28	32	32	32	1	3	22	
4:00 PM		25	21	13	12	18	8	5	14	
5:00 PM		18	20	22	13	18	6	8	14	
6:00 PM		10	6	15	5	9	3	5	7	
7:00 PM		10	7	8	5	8	4	4	6	
8:00 PM		12	16	15	7	12	4	**16**	12	
9:00 PM		9	5	13	3	8	2	11	7	
10:00 PM		7	6	7	3	6	2	2	4	
11:00 PM		2	6	3	0	3	0	2	2	
Day Total		1303	1244	1248	1078	1220	80	103	843	
% Weekday Average		106.8%	102.0%	102.3%	88.4%					
% Week Average		154.6%	147.6%	148.0%	127.9%	144.7%	9.5%	12.2%		
AM Peak Volume		8:00 AM 225	7:00 AM 289	7:00 AM 247	7:00 AM 231	7:00 AM 246	5:00 AM 15	5:00 AM 10	7:00 AM 164	
PM Peak Volume		1:00 PM 70	12:00 PM 98	12:00 PM 120	12:00 PM 63	12:00 PM 87	12:00 PM 8	8:00 PM 16	12:00 PM 60	

Comments:

LOCATION: INSCOM Dwy east of Beulah St
QC JOB #: 10673118
SPECIFIC LOCATION: 0 ft from
DIRECTION: EB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 31 2011 - Nov 06 2011

Start Time	Mon 31-Oct-11	Tue 01-Nov-11	Wed 02-Nov-11	Thu 03-Nov-11	Fri 04-Nov-11	Average Weekday Hourly Traffic	Sat 05-Nov-11	Sun 06-Nov-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	4	0	0	1	8	3	0	0	2	
1:00 AM	0	1	0	0	0	0	1	0	0	
2:00 AM	1	1	1	3	0	1	0	0	1	
3:00 AM	4	3	3	4	6	4	0	0	3	
4:00 AM	8	17	14	14	11	13	5	1	10	
5:00 AM	106	101	97	88	92	97	11	5	71	
6:00 AM	149	184	153	156	156	160	10	11	117	
7:00 AM	**261**	**239**	**216**	**248**	**220**	**237**	**34**	7	**175**	
8:00 AM	190	193	206	203	165	191	7	**32**	142	
9:00 AM	67	62	91	80	64	73	13	9	55	
10:00 AM	39	41	31	55	49	43	6	14	34	
11:00 AM	41	49	83	41	52	53	9	7	40	
12:00 PM	**80**	82	**84**	**94**	73	**83**	**22**	2	**62**	
1:00 PM	60	**83**	67	86	**80**	75	13	14	58	
2:00 PM	32	51	47	34	32	39	5	**18**	31	
3:00 PM	23	23	28	29	22	25	6	13	21	
4:00 PM	15	14	15	20	8	14	4	4	11	
5:00 PM	18	15	21	18	10	16	4	3	13	
6:00 PM	7	7	6	13	9	8	1	7	7	
7:00 PM	5	8	5	9	4	6	0	2	5	
8:00 PM	19	15	21	15	4	15	5	2	12	
9:00 PM	13	14	12	16	3	12	3	17	11	
10:00 PM	4	2	6	5	1	4	1	11	4	
11:00 PM	4	3	2	4	4	3	1	5	3	
Day Total	1150	1208	1209	1236	1073	1175	161	184	888	
% Weekday Average	94.3%	102.8%	102.9%	105.2%	91.3%					
% Week Average	136.4%	136.0%	136.1%	139.2%	120.8%	132.3%	18.1%	20.7%		
AM Peak	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	8:00 AM	7:00 AM	
Volume	261	239	216	248	220	237	34	32	175	
PM Peak	12:00 PM	1:00 PM	12:00 PM	12:00 PM	1:00 PM	12:00 PM	12:00 PM	2:00 PM	12:00 PM	
Volume	80	83	84	94	80	83	22	18	62	

Comments:

LOCATION: INSCOM Dwy east of Beulah St
QC JOB #: 10673118
SPECIFIC LOCATION: 0 ft from
DIRECTION: EB
CITY/STATE: Fort Belvoir, VA
DATE: Nov 07 2011 - Nov 07 2011

Start Time	Mon 07-Nov-11	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM	1					1			1	
1:00 AM	2					2			2	
2:00 AM	0					0			0	
3:00 AM	1					1			1	
4:00 AM	5					5			5	
5:00 AM	19					19			19	
6:00 AM	112					112			112	
7:00 AM	178					178			178	
8:00 AM	**249**					**249**			**249**	
9:00 AM	176					176			176	
10:00 AM	70					70			70	
11:00 AM	57					57			57	
12:00 PM	47					47			47	
1:00 PM	**86**					**86**			**86**	
2:00 PM	75					75			75	
3:00 PM	35					35			35	
4:00 PM	28					28			28	
5:00 PM	7					7			7	
6:00 PM	17					17			17	
7:00 PM	3					3			3	
8:00 PM	5					5			5	
9:00 PM	18					18			18	
10:00 PM	11					11			11	
11:00 PM	6					6			6	
Day Total	1208					1208			1208	
% Weekday Average	102.8%									
% Week Average	136.0%					100.0%				
AM Peak Volume	8:00 AM 249					8:00 AM 249			8:00 AM 249	
PM Peak Volume	1:00 PM 86					1:00 PM 86			1:00 PM 86	

Comments:

SUMMARY - Tube Count - Volume Data (Weekday)

LOCATION: INSCOM Dwy east of Beulah St
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673118
DIRECTION: EB
DATE: Oct 24 2011 - Oct 28 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic			Average Weekday Profile
12:00 AM	4	2	1	0	0	1			
1:00 AM	0	4	0	1	0	1			
2:00 AM	1	3	1	3	4	2			
3:00 AM	4	3	6	5	1	4			
4:00 AM	8	13	10	18	15	13			
5:00 AM	106	151	115	93	90	111			
6:00 AM	149	163	148	158	168	157			
7:00 AM	**261**	215	**289**	**247**	**231**	**249**			
8:00 AM	190	**225**	159	191	160	185			
9:00 AM	67	106	80	72	59	77			
10:00 AM	39	35	52	45	52	45			
11:00 AM	41	77	48	54	51	54			
12:00 PM	**80**	68	**98**	**120**	**63**	**86**			
1:00 PM	60	**70**	78	70	51	66			
2:00 PM	32	41	44	43	53	43			
3:00 PM	23	34	28	32	32	30			
4:00 PM	15	25	21	13	12	17			
5:00 PM	18	18	20	22	13	18			
6:00 PM	7	10	6	15	5	9			
7:00 PM	5	10	7	8	5	7			
8:00 PM	19	12	16	15	7	14			
9:00 PM	13	9	5	13	3	9			
10:00 PM	4	7	6	7	3	5			
11:00 PM	4	2	6	3	0	3			
Day Total	1150	1303	1244	1248	1078	1206			
% Weekday Average	95.4%	108.0%	103.2%	103.5%	89.4%				
% Week Average									
AM Peak	7:00 AM	8:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM			
Volume	261	225	289	247	231	249			
PM Peak	12:00 PM	1:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM			
Volume	80	70	98	120	63	86			

Comments:

SUMMARY - Tube Count - Volume Data (Weekend)

LOCATION: INSCOM Dwy east of Beulah St
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673118
DIRECTION: EB
DATE: Oct 29 2011 - Oct 30 2011

Start Time			Sat 29-Oct-11	Sun 30-Oct-11	Average Weekend Hourly Traffic	Average Weekend Profile
12:00 AM			1	0	0	
1:00 AM			0	0	0	
2:00 AM			0	0	0	
3:00 AM			0	1	0	
4:00 AM			0	2	1	
5:00 AM			**15**	**10**	**12**	
6:00 AM			2	2	2	
7:00 AM			1	1	1	
8:00 AM			3	1	2	
9:00 AM			5	6	6	
10:00 AM			4	1	2	
11:00 AM			3	3	3	
12:00 PM			**8**	4	6	
1:00 PM			6	7	6	
2:00 PM			2	9	6	
3:00 PM			1	3	2	
4:00 PM			8	5	6	
5:00 PM			6	8	7	
6:00 PM			3	5	4	
7:00 PM			4	4	4	
8:00 PM			4	**16**	**10**	
9:00 PM			2	11	6	
10:00 PM			2	2	2	
11:00 PM			0	2	1	
Day Total			80	103	89	
% Weekday Average						
% Week Average			89.9%	115.7%		
AM Peak Volume			5:00 AM 15	5:00 AM 10	5:00 AM 12	
PM Peak Volume			12:00 PM 8	8:00 PM 16	8:00 PM 10	

Comments:

SUMMARY - Tube Count - Volume Data (Week)

LOCATION: INSCOM Dwy east of Beulah St
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA
QC JOB #: 10673118
DIRECTION: EB
DATE: Oct 24 2011 - Oct 30 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	4	2	1	0	0	1	1	0	1	
1:00 AM	0	4	0	1	0	1	0	0	1	
2:00 AM	1	3	1	3	4	2	0	0	2	
3:00 AM	4	3	6	5	1	4	0	1	3	
4:00 AM	8	13	10	18	15	13	0	2	9	
5:00 AM	106	151	115	93	90	111	**15**	**10**	83	
6:00 AM	149	163	148	158	168	157	2	2	113	
7:00 AM	**261**	215	**289**	**247**	**231**	**249**	1	1	**178**	
8:00 AM	190	**225**	159	191	160	185	3	1	133	
9:00 AM	67	106	80	72	59	77	5	6	56	
10:00 AM	39	35	52	45	52	45	4	1	33	
11:00 AM	41	77	48	54	51	54	3	3	40	
12:00 PM	**80**	68	**98**	**120**	**63**	**86**	**8**	4	**63**	
1:00 PM	60	**70**	78	70	51	66	6	7	49	
2:00 PM	32	41	44	43	53	43	2	9	32	
3:00 PM	23	34	28	32	32	30	1	3	22	
4:00 PM	15	25	21	13	12	17	8	5	14	
5:00 PM	18	18	20	22	13	18	6	8	15	
6:00 PM	7	10	6	15	5	9	3	5	7	
7:00 PM	5	10	7	8	5	7	4	4	6	
8:00 PM	19	12	16	15	7	14	4	**16**	13	
9:00 PM	13	9	5	13	3	9	2	11	8	
10:00 PM	4	7	6	7	3	5	2	2	4	
11:00 PM	4	2	6	3	0	3	0	2	2	
Day Total	1150	1303	1244	1248	1078	1206	80	103	887	
% Weekday Average	95.4%	108.0%	103.2%	103.5%	89.4%					
% Week Average	129.7%	146.9%	140.2%	140.7%	121.5%	136.0%	9.0%	11.6%		
AM Peak Volume	7:00 AM 261	8:00 AM 225	7:00 AM 289	7:00 AM 247	7:00 AM 231	7:00 AM 249	5:00 AM 15	5:00 AM 10	7:00 AM 178	
PM Peak Volume	12:00 PM 80	1:00 PM 70	12:00 PM 98	12:00 PM 120	12:00 PM 63	12:00 PM 86	12:00 PM 8	8:00 PM 16	12:00 PM 63	

Comments:

LOCATION: INSCOM Dwy east of Beulah St
QC JOB #: 10673118
SPECIFIC LOCATION: 0 ft from
DIRECTION: WB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 25 2011 - Oct 30 2011

Start Time	Mon	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM		1	2	0	2	1	1	0	1	
1:00 AM		3	0	2	1	2	1	1	1	
2:00 AM		5	0	1	3	2	0	0	2	
3:00 AM		2	5	2	3	3	0	0	2	
4:00 AM		4	8	8	9	7	0	0	5	
5:00 AM		24	22	25	17	22	7	**11**	18	
6:00 AM		47	22	18	23	28	**9**	5	21	
7:00 AM		27	16	14	14	18	1	2	12	
8:00 AM		40	25	30	25	30	1	1	20	
9:00 AM		81	78	61	28	62	2	2	42	
10:00 AM		65	66	**104**	57	73	0	2	49	
11:00 AM		**98**	**90**	62	**115**	**91**	5	2	**62**	
12:00 PM		66	68	56	90	70	9	1	48	
1:00 PM		68	69	81	87	76	5	5	52	
2:00 PM		79	94	99	92	91	5	**9**	63	
3:00 PM		187	198	164	154	176	3	7	119	
4:00 PM		**214**	**204**	**223**	**164**	**201**	7	3	**136**	
5:00 PM		140	141	153	97	133	**10**	9	92	
6:00 PM		77	78	78	51	71	4	8	49	
7:00 PM		40	34	28	19	30	4	3	21	
8:00 PM		16	23	19	14	18	3	2	13	
9:00 PM		6	7	10	4	7	1	3	5	
10:00 PM		12	13	8	9	10	3	4	8	
11:00 PM		7	9	4	3	6	1	2	4	
Day Total		1309	1272	1250	1081	1228	82	82	845	
% Weekday Average		106.6%	103.6%	101.8%	88.0%					
% Week Average		154.9%	150.5%	147.9%	127.9%	145.3%	9.7%	9.7%		
AM Peak		11:00 AM	11:00 AM	10:00 AM	11:00 AM	11:00 AM	6:00 AM	5:00 AM	11:00 AM	
Volume		98	90	104	115	91	9	11	62	
PM Peak		4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	5:00 PM	2:00 PM	4:00 PM	
Volume		214	204	223	164	201	10	9	136	

Comments:

LOCATION: INSCOM Dwy east of Beulah St
QC JOB #: 10673118
SPECIFIC LOCATION: 0 ft from
DIRECTION: WB
CITY/STATE: Fort Belvoir, VA
DATE: Oct 31 2011 - Nov 06 2011

Start Time	Mon 31-Oct-11	Tue 01-Nov-11	Wed 02-Nov-11	Thu 03-Nov-11	Fri 04-Nov-11	Average Weekday Hourly Traffic	Sat 05-Nov-11	Sun 06-Nov-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	4	1	0	2	0	1	1	1	1	
1:00 AM	1	0	0	0	3	1	0	0	1	
2:00 AM	0	0	0	5	3	2	1	0	1	
3:00 AM	1	1	3	4	8	3	0	0	2	
4:00 AM	3	8	6	3	8	6	0	1	4	
5:00 AM	26	23	25	32	32	28	6	0	21	
6:00 AM	24	30	19	16	14	21	8	6	17	
7:00 AM	15	26	14	15	14	17	4	5	13	
8:00 AM	22	24	20	27	33	25	3	6	19	
9:00 AM	61	41	**97**	68	22	58	9	7	44	
10:00 AM	37	54	35	63	56	49	7	**9**	37	
11:00 AM	**90**	**102**	95	**73**	**86**	**89**	**26**	5	**68**	
12:00 PM	55	62	59	78	74	66	8	19	51	
1:00 PM	57	72	60	68	82	68	11	4	51	
2:00 PM	119	95	96	108	104	104	7	14	78	
3:00 PM	208	193	197	191	**192**	196	6	5	**142**	
4:00 PM	**219**	**211**	**199**	**193**	167	**198**	3	4	142	
5:00 PM	117	134	150	144	115	132	**48**	**27**	105	
6:00 PM	48	71	80	83	56	68	3	21	52	
7:00 PM	17	26	13	25	12	19	2	8	15	
8:00 PM	12	10	18	16	12	14	4	1	10	
9:00 PM	1	2	3	7	3	3	4	5	4	
10:00 PM	7	8	9	15	4	9	2	2	7	
11:00 PM	5	7	8	4	7	6	0	3	5	
Day Total	1149	1201	1206	1240	1107	1183	163	153	890	
% Weekday Average	93.6%	101.5%	101.9%	104.8%	93.6%					
% Week Average	136.0%	134.9%	135.5%	139.3%	124.4%	132.9%	18.3%	17.2%		
AM Peak	11:00 AM	11:00 AM	9:00 AM	11:00 AM	11:00 AM	11:00 AM	11:00 AM	10:00 AM	11:00 AM	
Volume	90	102	97	73	86	89	26	9	68	
PM Peak	4:00 PM	4:00 PM	4:00 PM	4:00 PM	3:00 PM	4:00 PM	5:00 PM	5:00 PM	3:00 PM	
Volume	219	211	199	193	192	198	48	27	142	

Comments:

LOCATION: INSCOM Dwy east of Beulah St
QC JOB #: 10673118
SPECIFIC LOCATION: 0 ft from
DIRECTION: WB
CITY/STATE: Fort Belvoir, VA
DATE: Nov 07 2011 - Nov 07 2011

Start Time	Mon 07-Nov-11	Tue	Wed	Thu	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM	4					4			4	
1:00 AM	0					0			0	
2:00 AM	0					0			0	
3:00 AM	1					1			1	
4:00 AM	2					2			2	
5:00 AM	4					4			4	
6:00 AM	30					30			30	
7:00 AM	21					21			21	
8:00 AM	19					19			19	
9:00 AM	24					24			24	
10:00 AM	**80**					**80**			**80**	
11:00 AM	52					52			52	
12:00 PM	106					106			106	
1:00 PM	49					49			49	
2:00 PM	72					72			72	
3:00 PM	105					105			105	
4:00 PM	195					195			195	
5:00 PM	**207**					**207**			**207**	
6:00 PM	142					142			142	
7:00 PM	68					68			68	
8:00 PM	22					22			22	
9:00 PM	9					9			9	
10:00 PM	4					4			4	
11:00 PM	9					9			9	
Day Total	1225					1225			1225	
% Weekday Average	103.6%									
% Week Average	137.6%					100.0%				
AM Peak Volume	10:00 AM 80					10:00 AM 80			10:00 AM 80	
PM Peak Volume	5:00 PM 207					5:00 PM 207			5:00 PM 207	

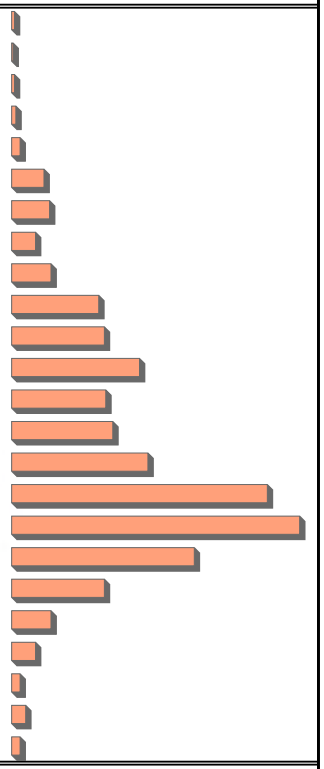
Comments:

SUMMARY - Tube Count - Volume Data (Weekday)

LOCATION: INSCOM Dwy east of Beulah St
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673118
DIRECTION: WB
DATE: Oct 24 2011 - Oct 28 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic			Average Weekday Profile
12:00 AM	4	1	2	0	2	2			
1:00 AM	1	3	0	2	1	1			
2:00 AM	0	5	0	1	3	2			
3:00 AM	1	2	5	2	3	3			
4:00 AM	3	4	8	8	9	6			
5:00 AM	26	24	22	25	17	23			
6:00 AM	24	47	22	18	23	27			
7:00 AM	15	27	16	14	14	17			
8:00 AM	22	40	25	30	25	28			
9:00 AM	61	81	78	61	28	62			
10:00 AM	37	65	66	**104**	57	66			
11:00 AM	**90**	**98**	**90**	62	**115**	**91**			
12:00 PM	55	66	68	56	90	67			
1:00 PM	57	68	69	81	87	72			
2:00 PM	119	79	94	99	92	97			
3:00 PM	208	187	198	164	154	182			
4:00 PM	**219**	**214**	**204**	**223**	**164**	**205**			
5:00 PM	117	140	141	153	97	130			
6:00 PM	48	77	78	78	51	66			
7:00 PM	17	40	34	28	19	28			
8:00 PM	12	16	23	19	14	17			
9:00 PM	1	6	7	10	4	6			
10:00 PM	7	12	13	8	9	10			
11:00 PM	5	7	9	4	3	6			
Day Total	1149	1309	1272	1250	1081	1214			
% Weekday Average	94.6%	107.8%	104.8%	103.0%	89.0%				
% Week Average									
AM Peak	11:00 AM	11:00 AM	11:00 AM	10:00 AM	11:00 AM	11:00 AM			
Volume	90	98	90	104	115	91			
PM Peak	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM			
Volume	219	214	204	223	164	205			



Comments:

SUMMARY - Tube Count - Volume Data (Weekend)

LOCATION: INSCOM Dwy east of Beulah St
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673118
DIRECTION: WB
DATE: Oct 29 2011 - Oct 30 2011

Start Time			Sat 29-Oct-11	Sun 30-Oct-11	Average Weekend Hourly Traffic	Average Weekend Profile
12:00 AM			1	0	0	
1:00 AM			1	1	1	
2:00 AM			0	0	0	
3:00 AM			0	0	0	
4:00 AM			0	0	0	
5:00 AM			7	**11**	**9**	
6:00 AM			**9**	5	7	
7:00 AM			1	2	2	
8:00 AM			1	1	1	
9:00 AM			2	2	2	
10:00 AM			0	2	1	
11:00 AM			5	2	4	
12:00 PM			9	1	5	
1:00 PM			5	5	5	
2:00 PM			5	**9**	7	
3:00 PM			3	7	5	
4:00 PM			7	3	5	
5:00 PM			**10**	9	**10**	
6:00 PM			4	8	6	
7:00 PM			4	3	4	
8:00 PM			3	2	2	
9:00 PM			1	3	2	
10:00 PM			3	4	4	
11:00 PM			1	2	2	
Day Total			82	82	84	
% Weekday Average						
% Week Average			97.6%	97.6%		
AM Peak Volume			6:00 AM 9	5:00 AM 11	5:00 AM 9	
PM Peak Volume			5:00 PM 10	2:00 PM 9	5:00 PM 10	

Comments:

SUMMARY - Tube Count - Volume Data (Week)

LOCATION: INSCOM Dwy east of Beulah St
SPECIFIC LOCATION: 0 ft from
CITY/STATE: Fort Belvoir, VA

QC JOB #: 10673118
DIRECTION: WB
DATE: Oct 24 2011 - Oct 30 2011

Start Time	Mon 24-Oct-11	Tue 25-Oct-11	Wed 26-Oct-11	Thu 27-Oct-11	Fri 28-Oct-11	Average Weekday Hourly Traffic	Sat 29-Oct-11	Sun 30-Oct-11	Average Week Hourly Traffic	Average Week Profile
12:00 AM	4	1	2	0	2	2	1	0	1	
1:00 AM	1	3	0	2	1	1	1	1	1	
2:00 AM	0	5	0	1	3	2	0	0	1	
3:00 AM	1	2	5	2	3	3	0	0	2	
4:00 AM	3	4	8	8	9	6	0	0	5	
5:00 AM	26	24	22	25	17	23	7	**11**	19	
6:00 AM	24	47	22	18	23	27	**9**	5	21	
7:00 AM	15	27	16	14	14	17	1	2	13	
8:00 AM	22	40	25	30	25	28	1	1	21	
9:00 AM	61	81	78	61	28	62	2	2	45	
10:00 AM	37	65	66	**104**	57	66	0	2	47	
11:00 AM	**90**	**98**	**90**	62	**115**	**91**	5	2	**66**	
12:00 PM	55	66	68	56	90	67	9	1	49	
1:00 PM	57	68	69	81	87	72	5	5	53	
2:00 PM	119	79	94	99	92	97	5	**9**	71	
3:00 PM	208	187	198	164	154	182	3	7	132	
4:00 PM	**219**	**214**	**204**	**223**	**164**	**205**	7	3	**148**	
5:00 PM	117	140	141	153	97	130	**10**	9	95	
6:00 PM	48	77	78	78	51	66	4	8	49	
7:00 PM	17	40	34	28	19	28	4	3	21	
8:00 PM	12	16	23	19	14	17	3	2	13	
9:00 PM	1	6	7	10	4	6	1	3	5	
10:00 PM	7	12	13	8	9	10	3	4	8	
11:00 PM	5	7	9	4	3	6	1	2	4	
Day Total	1149	1309	1272	1250	1081	1214	82	82	890	
% Weekday Average	94.6%	107.8%	104.8%	103.0%	89.0%					
% Week Average	129.1%	147.1%	142.9%	140.4%	121.5%	136.4%	9.2%	9.2%		
AM Peak	11:00 AM	11:00 AM	11:00 AM	10:00 AM	11:00 AM	11:00 AM	6:00 AM	5:00 AM	11:00 AM	
Volume	90	98	90	104	115	91	9	11	66	
PM Peak	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	5:00 PM	2:00 PM	4:00 PM	
Volume	219	214	204	223	164	205	10	9	148	

Comments:

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APPENDIX B:

DERIVATION OF FUTURE VOLUME FOR THE NO-BUILD AND BUILD ALTERNATIVES

Volume Growth for EA Analaysis of Build vs NO-BUILD Alternatives

John J Kingman Rd and Beulah St													
		AM Peak: INSCOM No Build						AM Peak: INSCOM Build					
Approach	Movement	Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)		Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Eastbound Kingman Rd	L	25	21.60%	7%	28	30						28	25
	T	445	21.60%	7%	503	500						503	500
	R	152	0%		152	150		152	2.63	16%	184	336	325
Overall Approach		622			684	680						867	850
Westbound Kingman Rd	L	56	0%		56	55		56	2.63	16%	68	124	125
	T	175	21.60%	7%	198	200						198	200
	R	114	21.60%	7%	129	125						129	125
Overall Approach		345			383	380						451	450
Northbound Beulah St	L	10	0%		10	10		10	2.63	16%	12	22	20
	T	12	0%		12	10		12	2.63	16%	15	27	25
	R	26	0%		26	25		26	2.63	16%	31	57	55
Overall Approach		48			48	45						106	100
Southbound Beulah St	L	519	21.60%	7%	587	575						587	575
	T	110	0%		110	100		110	2.63	16%	133	243	250
	R	226	21.60%	7%	256	250						256	250
Overall Approach		855			953	925						1086	1075
Overall Intersection		1870			**2067**	**2030**		366			443	**2509**	**2475**

Overall Intersection Volume Growth = 22%

NOTES:

1 Existing Volumes from Prior INSCOM Traffic Counts

2 Growth factors from Additional PN assignments in Short Range Component of Master Plan:
Davison Airfield 8.2%; Traffic on Public Roads 2% annual growth compounded for 6 years = 12.6%
North Post west of Woodlawn Road = 21.6%

3 TMP Reduction based on actions to reduce SOV use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle.
The 7% TMP factor assumes 10% reduction in SOV drivers (5% volume reduction), plus 2% volume reduction from other TMP actions: carpools with 3 persons, use of non-automobile modes, telecommuting, etc.

4 Existing volumes from prior study proportionally allocatated to movements

5 INSCOM growth factor based on expansion from 234,000 SF to 616,000 SF

6 INSCOM TMP reduction based on actions to reduce SOVE use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle. The 16% TMP factor assumes a 20% reduction in SOV drivers (10% volume reduction), plus a 6% volume reduction from other TMP actions: carpools with 3 persons, use of non-autombile modes, telecommuting, etc.

7 No-Build Volumes adjusted for additional INSCOM Volume Growth

8 Values <100 rounded to nearest multiple of 5. Values >100 rounded to nearest multiple of 25.

Volume Growth for EA Analaysis of Build vs NO-BUILD Alternatives

John J Kingman Rd and Beulah St													
		PM Peak: INSCOM No Build						PM Peak: INSCOM Build					
Approach	Movement	Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)		Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Eastbound Kingman Rd	L	193	21.60%	7%	218	225						218	225
	T	304	21.60%	7%	344	350						344	350
	R	10	0%		10	10		10	2.63	16%	12	22	20
Overall Approach		507			572	585						584	595
Westbound Kingman Rd	L	9	0%		9	10		9	2.63	16%	11	20	20
	T	584	21.60%	7%	660	650						660	650
	R	550	21.60%	7%	622	625						622	625
Overall Approach		1143			1291	1285						1302	1295
Northbound Beulah St	L	140	0%		140	150		140	2.63	16%	169	309	300
	T	38	0%		38	40		38	2.63	16%	46	84	85
	R	49	0%		49	50		49	2.63	16%	59	108	100
Overall Approach		227			227	240						501	485
Southbound Beulah St	L	228	21.60%	7%	258	250						258	250
	T	11	0%		11	10		11	2.63	16%	13	24	25
	R	32	21.60%	7%	36	35						36	35
Overall Approach		271			305	295						318	310
Overall Intersection		2148			**2395**	**2405**		257			311	**2706**	**2685**

Overall Intersection Volume Growth = 12%

NOTES:

1 Existing Volumes from Prior INSCOM Traffic Counts

2 Growth factors from Additional PN assignments in Short Range Component of Master Plan:
Davison Airfield 8.2%; Traffic on Public Roads 2% annual growth compounded for 6 years = 12.6%
North Post west of Woodlawn Road = 21.6%

3 TMP Reduction based on actions to reduce SOV use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle. The 7% TMP factor assumes 10% reduction in SOV drivers (5% volume reduction), plus 2% volume reduction from other TMP actions: carpools with 3 persons, use of non-automobile modes, telecommuting, etc.

4 Existing volumes from prior study proportionally allocated to movements

5 INSCOM growth factor based on expansion from 234,000 SF to 616,000 SF

6 INSCOM TMP reduction based on actions to reduce SOVE use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle. The 16% TMP factor assumes a 20% reduction in SOV drivers (10% volume reduction), plus a 6% volume reduction from other TMP actions: carpools with 3 persons, use of non-autombile modes, telecommuting, etc.

7 No-Build Volumes adjusted for additional INSCOM Volume Growth

8 Values <100 rounded to nearest multiple of 5. Values >100 rounded to nearest multiple of 25.

Volume Growth for EA Analaysis of Build vs NO-BUILD Alternatives

Fairfax County Pkwy and Farrar Dr and John J Kingman Rd													
		AM Peak: INSCOM No Build					AM Peak: INSCOM Build					
Approach	Movement	Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)	Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Northbound Fairfax County Pkwy	L	8	8.20%	7%	8	10					8	10
	T	858	12.60%		966	975					966	975
	R	442	21.60%	7%	500	500	44	2.63	16%	53	553	550
Overall Approach		1308			1474	1485					1527	1535
Southbound Fairfax County Pkwy	L	1093	21.60%	7%	1236	1225	108	2.63	16%	131	1367	1375
	T	852	12.60%		959	950					959	950
	R	25	8.20%	7%	25	25					25	25
Overall Approach		1970			2221	2200					2351	2350
Eastbound Farrar Dr	L	4	8.20%	7%	4	5					4	5
	T	4	8.20%	7%	4	5					4	5
	R	2	8.20%	7%	2	0					2	0
Overall Approach		10			10	10					10	10
Westbound Kingman Rd	L	40	21.60%	7%	45	45	4	2.63	16%	5	50	50
	T	4	21.60%	7%	5	5					5	5
	R	151	21.60%	7%	171	175	13	2.63	16%	16	186	175
Overall Approach		195			221	225					241	230
Overall Intersection		3483			**3925**	**3920**	169			204	**4130**	**4125**

Overall Intersection Volume Growth =5%

NOTES:

1 Existing Volumes from Prior INSCOM Traffic Counts

2 Growth factors from Additional PN assignments in Short Range Component of Master Plan:
Davison Airfield 8.2%; Traffic on Public Roads 2% annual growth compounded for 6 years = 12.6%
North Post west of Woodlawn Road = 21.6%

3 TMP Reduction based on actions to reduce SOV use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle.
The 7% TMP factor assumes 10% reduction in SOV drivers (5% volume reduction), plus 2% volume reduction from other TMP actions: carpools with 3 persons, use of non-automobile modes, telecommuting, etc.

4 Existing volumes from prior study proportionally allocated to NB & SB Turns from/to Fairfax County Parkway

5 INSCOM growth factor based on expansion from 234,000 SF to 616,000 SF

6 INSCOM TMP reduction based on actions to reduce SOVE use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle. The 16% TMP factor assumes a 20% reduction in SOV drivers (10% volume reduction), plus a 6% volume reduction from other TMP actions: carpools with 3 persons, use of non-autombile modes, telecommuting, etc.

7 No-Build Volumes adjusted for additional INSCOM Volume Growth

8 Values <100 rounded to nearest multiple of 5. Values >100 rounded to nearest multiple of 25.

Volume Growth for EA Analaysis of Build vs NO-BUILD Alternatives

Fairfax County Pkwy and Farrar Dr and John J Kingman Rd													
		PM Peak: INSCOM No Build					PM Peak: INSCOM Build					
Approach	Movement	Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)	Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Northbound Fairfax County Pkwy	L	2	8.20%	7%	2	0					2	0
	T	709	12.60%		798	800					798	800
	R	43	21.60%	7%	49	50	2	2.63	16%	2	50	50
Overall Approach		754			849	850					851	850
Southbound Fairfax County Pkwy	L	240	21.60%	7%	271	275	8	2.63	16%	10	282	275
	T	966	12.60%		1088	1100					1088	1100
	R	1	8.20%	7%	1	0					1	0
Overall Approach		1207			1360	1375					1370	1375
Eastbound Farrar Dr	L	23	8.20%	7%	23	25					23	25
	T	14	8.20%	7%	14	15					14	15
	R	28	8.20%	7%	28	30					28	30
Overall Approach		65			65	70					65	70
Westbound Kingman Rd	L	555	21.60%	7%	628	625	51	2.63	16%	62	689	700
	T	3	21.60%	7%	3	0					3	5
	R	971	21.60%	7%	1098	1100	89	2.63	16%	108	1206	1200
Overall Approach		1529			1729	1725					1898	1905
Overall Intersection		3555			**4004**	**4020**	150			181	**4185**	**4200**

Overall Intersection Volume Growth = 4%

NOTES:

1 Existing Volumes from Prior INSCOM Traffic Counts

2 Growth factors from Additional PN assignments in Short Range Component of Master Plan:
Davison Airfield 8.2%; Traffic on Public Roads 2% annual growth compounded for 6 years = 12.6%
North Post west of Woodlawn Road = 21.6%

3 TMP Reduction based on actions to reduce SOV use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle.
The 7% TMP factor assumes 10% reduction in SOV drivers (5% volume reduction), plus 2% volume reduction from other TMP actions: carpools with 3 persons, use of non-automobile modes, telecommuting, etc.

4 Existing volumes from prior study proportionally allocated to NB & SB Turns from/to Fairfax County Parkway

5 INSCOM growth factor based on expansion from 234,000 SF to 616,000 SF

6 INSCOM TMP reduction based on actions to reduce SOVE use. Every carpool formed by 2 SOV drivers eliminates 1 vehicle. The 16% TMP factor assumes a 20% reduction in SOV drivers (10% volume reduction), plus a 6% volume reduction from other TMP actions: carpools with 3 persons, use of non-autombile modes, telecommuting, etc.

7 No-Build Volumes adjusted for additional INSCOM Volume Growth

8 Values <100 rounded to nearest multiple of 5. Values >100 rounded to nearest multiple of 25.

Volume Growth for EA Analaysis of BUILD vs NO-BUILD Alternatives

Telegraph Rd and Beulah St													
		AM Peak: INSCOM No Build					AM Peak: INSCOM Build					
Approach	Movement	Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)	Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Eastbound Telegraph Rd	L	362	12.60%		408	400					408	400
	T	903	12.60%		1017	1025					1017	1025
	R	147	21.60%	7%	166	175	21	2.63	16%	25	191	200
Overall Approach		1412			1591	1600					1616	1625
Westbound Telegraph Rd	L	188	21.60%	7%	213	225	27	2.63	16%	32	245	250
	T	315	12.60%		355	350					355	350
	R	120	12.60%		135	125					135	125
Overall Approach		623			702	700					735	725
Northbound Beulah St	L	7	21.60%	7%	8	10	1	2.63	16%	1	9	10
	T	70	21.60%	7%	79	75	8	2.63	16%	9	88	90
	R	34	21.60%	7%	38	50	4	2.63	16%	4	43	45
Overall Approach		111			126	135					140	145
Southbound Beulah St	L	194	12.60%		218	225					218	225
	T	443	21.60%	7%	501	500	63	2.63	16%	76	577	575
	R	239	12.60%		269	275					269	275
Overall Approach		876			989	1000					1064	1075
Overall Intersection		3022			3407	3435	122			148	3555	3570

Overall Intersection Volume Growth = 4%

NOTES:

1 Existing Volumes from Prior INSCOM Traffic Counts

2 Growth factors from Additional PN assignments in Short Range Component of Master Plan:
Davison Airfield 8.2%; Traffic on Public Roads 2% annual growth compounded for 6 years = 12.6%
North Post west of Woodlawn Road = 21.6%

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7 No-Build Volumes adjusted for additional INSCOM Volume Growth

8 Values <100 rounded to nearest multiple of 5. Values >100 rounded to nearest multiple of 25.

Volume Growth for EA Analaysis of BUILD vs NO-BUILD Alternatives

Telegraph Rd and Beulah St												
		PM Peak: INSCOM No Build					PM Peak: INSCOM Build					
Approach	Movement	Volume (veh/hr) (1)	Growth Factor (2)	TMP Reduc'n (3)	Adjusted Volume	Rounded Volume (8)	Existing INSCOM (4)	INSCOM Growth Fctr (5)	INSCOM TMP Rdn (6)	Add'nl INSCOM Vol	Adjusted Volume (7)	Rounded Volume (8)
Eastbound Telegraph Rd	L	326	12.60%		367	375					367	375
	T	422	12.60%		475	475					475	475
	R	10	21.60%	7%	11	10	0	2.63	16%	1	12	10
Overall Approach		758			854	860					854	860
Westbound Telegraph Rd	L	82	21.60%	7%	93	95	4	2.63	16%	4	97	100
	T	802	12.60%		903	900					903	900
	R	256	12.60%		288	300					288	300
Overall Approach		1140			1284	1295					1288	1300
Northbound Beulah St	L	64	21.60%	7%	72	70	3	2.63	16%	4	76	75
	T	478	21.60%	7%	541	550	23	2.63	16%	27	568	575
	R	263	21.60%	7%	297	300	12	2.63	16%	15	312	300
Overall Approach		805			910	920					956	950
Southbound Beulah St	L	101	12.60%		114	125					114	125
	T	161	21.60%	7%	182	175	7	2.63	16%	8	191	200
	R	448	12.60%		504	500					504	500
Overall Approach		710			800	800					809	825
Overall Intersection		3413			3848	3875	49			59	3907	3935

Overall Intersection Volume Growth = 2%

NOTES:

1 Existing Volumes from Prior INSCOM Traffic Counts

2 Growth factors from Additional PN assignments in Short Range Component of Master Plan:
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North Post west of Woodlawn Road = 21.6%

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7 No-Build Volumes adjusted for additional INSCOM Volume Growth

8 Values <100 rounded to nearest multiple of 5. Values >100 rounded to nearest multiple of 25.

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APPENDIX C:

SYNCHRO VERSION 8 REPORTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	500	150	55	200	125	10	10	25	575	100	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.89		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3417		1770	3539	1583	1770	1663		1770	1663	
Flt Permitted	0.63	1.00		0.20	1.00	1.00	0.51	1.00		0.73	1.00	
Satd. Flow (perm)	1166	3417		365	3539	1583	945	1663		1368	1663	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	30	500	150	55	200	125	10	10	25	575	100	250
RTOR Reduction (vph)	0	31	0	0	0	97	0	11	0	0	100	0
Lane Group Flow (vph)	30	619	0	55	200	28	10	24	0	575	250	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	21.8	19.3		24.0	20.4	20.4	50.6	50.6		50.6	50.6	
Effective Green, g (s)	21.8	19.3		24.0	20.4	20.4	50.6	50.6		50.6	50.6	
Actuated g/C Ratio	0.24	0.21		0.27	0.23	0.23	0.56	0.56		0.56	0.56	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	299	733		154	802	359	531	935		769	935	
v/s Ratio Prot	0.00	c0.18		c0.01	0.06			0.01			0.15	
v/s Ratio Perm	0.02			0.08		0.02	0.01			c0.42		
v/c Ratio	0.10	0.84		0.36	0.25	0.08	0.02	0.03		0.75	0.27	
Uniform Delay, d1	26.3	33.9		25.9	28.5	27.4	8.7	8.8		14.9	10.2	
Progression Factor	0.53	0.71		0.49	0.43	0.29	0.82	0.86		1.00	1.00	
Incremental Delay, d2	0.1	8.7		1.4	0.2	0.1	0.1	0.0		6.6	0.7	
Delay (s)	14.1	32.8		14.2	12.4	7.9	7.2	7.6		21.4	10.9	
Level of Service	B	C		B	B	A	A	A		C	B	
Approach Delay (s)		32.0			11.2			7.5			17.4	
Approach LOS		C			B			A			B	

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	350	10	20	650	625	150	40	50	250	10	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.92		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3524		1770	3539	1583	1770	1708		1770	1645	
Flt Permitted	0.25	1.00		0.54	1.00	1.00	0.73	1.00		0.70	1.00	
Satd. Flow (perm)	458	3524		1000	3539	1583	1356	1708		1301	1645	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	350	10	20	650	625	150	40	50	250	10	35
RTOR Reduction (vph)	0	2	0	0	0	415	0	33	0	0	23	0
Lane Group Flow (vph)	225	358	0	20	650	210	150	57	0	250	22	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	47.8	40.7		31.8	30.2	30.2	31.2	31.2		31.2	31.2	
Effective Green, g (s)	47.8	40.7		31.8	30.2	30.2	31.2	31.2		31.2	31.2	
Actuated g/C Ratio	0.53	0.45		0.35	0.34	0.34	0.35	0.35		0.35	0.35	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	420	1594		367	1188	531	470	592		451	570	
v/s Ratio Prot	c0.07	0.10		0.00	0.18			0.03			0.01	
v/s Ratio Perm	c0.21			0.02		0.13	0.11			c0.19		
v/c Ratio	0.54	0.22		0.05	0.55	0.39	0.32	0.10		0.55	0.04	
Uniform Delay, d1	12.9	15.0		19.0	24.3	22.9	21.6	19.9		23.8	19.5	
Progression Factor	1.17	0.65		1.05	1.00	1.68	0.93	0.89		1.00	1.00	
Incremental Delay, d2	1.3	0.1		0.0	0.4	0.3	1.7	0.3		4.8	0.1	
Delay (s)	16.3	9.8		20.0	24.7	38.8	21.8	18.0		28.6	19.6	
Level of Service	B	A		B	C	D	C	B		C	B	
Approach Delay (s)		12.3			31.5			20.4			27.2	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	500	325	125	200	125	20	25	55	575	250	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3330		1770	3539	1583	1770	1671		1770	1723	
Flt Permitted	0.63	1.00		0.14	1.00	1.00	0.35	1.00		0.70	1.00	
Satd. Flow (perm)	1166	3330		267	3539	1583	647	1671		1313	1723	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	500	325	125	200	125	20	25	55	575	250	250
RTOR Reduction (vph)	0	113	0	0	0	86	0	28	0	0	43	0
Lane Group Flow (vph)	25	712	0	125	200	39	20	52	0	575	457	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	25.4	23.8		33.6	27.9	27.9	44.0	44.0		44.0	44.0	
Effective Green, g (s)	25.4	23.8		33.6	27.9	27.9	44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.28	0.26		0.37	0.31	0.31	0.49	0.49		0.49	0.49	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	340	881		195	1097	491	316	817		642	842	
v/s Ratio Prot	0.00	c0.21		c0.04	0.06			0.03			0.27	
v/s Ratio Perm	0.02			0.20		0.02	0.03			c0.44		
v/c Ratio	0.07	0.81		0.64	0.18	0.08	0.06	0.06		0.90	0.54	
Uniform Delay, d1	23.5	31.0		21.5	22.7	22.0	12.1	12.1		20.9	16.0	
Progression Factor	0.57	0.76		1.11	0.48	0.11	0.93	0.86		1.00	1.00	
Incremental Delay, d2	0.1	5.5		7.0	0.1	0.1	0.4	0.1		17.5	2.5	
Delay (s)	13.6	29.1		30.9	11.1	2.4	11.7	10.6		38.4	18.5	
Level of Service	B	C		C	B	A	B	B		D	B	
Approach Delay (s)		28.6			14.2			10.8			29.2	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	225	370	20	650	625	300	185	250	60
v/c Ratio	0.57	0.24	0.05	0.63	0.69	0.57	0.26	0.55	0.09
Control Delay	20.8	10.2	12.3	28.8	6.6	26.5	12.1	28.6	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	10.2	12.3	28.8	6.6	26.5	12.1	28.6	10.9
Queue Length 50th (ft)	37	30	6	136	32	150	48	114	9
Queue Length 95th (ft)	105	66	m11	m180	m82	m200	m71	201	36
Internal Link Dist (ft)		585		917			4124		1524
Turn Bay Length (ft)	200		350		350				
Base Capacity (vph)	401	1583	369	1160	939	524	714	451	686
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.23	0.05	0.56	0.67	0.57	0.26	0.55	0.09

Intersection Summary

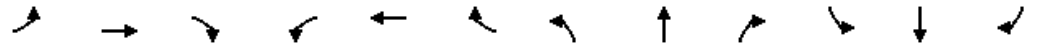
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	350	20	20	650	625	300	85	100	250	25	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3539	1583	1770	1712		1770	1700	
Flt Permitted	0.24	1.00		0.53	1.00	1.00	0.72	1.00		0.62	1.00	
Satd. Flow (perm)	447	3511		990	3539	1583	1337	1712		1151	1700	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	225	350	20	20	650	625	300	85	100	250	25	35
RTOR Reduction (vph)	0	4	0	0	0	421	0	46	0	0	23	0
Lane Group Flow (vph)	225	366	0	20	650	204	300	139	0	250	37	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	47.0	39.9		31.0	29.4	29.4	32.0	32.0		32.0	32.0	
Effective Green, g (s)	47.0	39.9		31.0	29.4	29.4	32.0	32.0		32.0	32.0	
Actuated g/C Ratio	0.52	0.44		0.34	0.33	0.33	0.36	0.36		0.36	0.36	
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	411	1557		355	1156	517	475	609		409	604	
v/s Ratio Prot	c0.07	0.10		0.00	0.18			0.08			0.02	
v/s Ratio Perm	c0.21			0.02		0.13	c0.22			0.22		
v/c Ratio	0.55	0.23		0.06	0.56	0.39	0.63	0.23		0.61	0.06	
Uniform Delay, d1	13.4	15.6		19.6	25.0	23.4	24.1	20.3		23.9	19.1	
Progression Factor	1.15	0.64		1.04	0.98	1.57	0.96	0.94		1.00	1.00	
Incremental Delay, d2	1.5	0.1		0.0	0.4	0.3	6.2	0.9		6.7	0.2	
Delay (s)	16.9	10.0		20.5	24.9	37.2	29.3	19.9		30.5	19.3	
Level of Service	B	A		C	C	D	C	B		C	B	
Approach Delay (s)		12.6			30.8			25.7			28.4	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	0	45	5	175	10	975	500	1225	950	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00		1.00	0.87	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1881		1732	1508	1550	1752	3504	1567	3399	3504	1567
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1881		1732	1508	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	0	45	5	175	10	975	500	1225	950	25
RTOR Reduction (vph)	0	0	0	0	80	51	0	0	137	0	0	6
Lane Group Flow (vph)	5	5	0	40	14	40	10	975	363	1225	950	19
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	2.5	2.5		8.8	8.8	73.6	2.5	63.9	63.9	64.8	126.2	126.2
Effective Green, g (s)	2.5	2.5		8.8	8.8	73.6	2.5	63.9	63.9	64.8	126.2	126.2
Actuated g/C Ratio	0.01	0.01		0.05	0.05	0.44	0.01	0.38	0.38	0.39	0.75	0.75
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	27	28		91	79	744	26	1333	596	1311	2632	1177
v/s Ratio Prot	c0.00	0.00		c0.02	0.01	0.02	0.01	c0.28		c0.36	0.27	
v/s Ratio Perm						0.01			0.23			0.01
v/c Ratio	0.19	0.18		0.44	0.18	0.05	0.38	0.73	0.61	0.93	0.36	0.02
Uniform Delay, d1	81.7	81.7		77.2	76.2	27.2	82.0	44.7	42.0	49.6	7.1	5.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	3.0		3.4	1.1	0.0	9.2	2.6	2.6	12.4	0.2	0.0
Delay (s)	85.0	84.8		80.6	77.3	27.2	91.2	47.2	44.6	62.0	7.3	5.3
Level of Service	F	F		F	E	C	F	D	D	E	A	A
Approach Delay (s)		84.9			57.6			46.6			37.7	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM Average Control Delay	42.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	168.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	15	30	625	0	1100	0	800	50	275	1100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95		0.95	1.00	0.97	0.95	
Frt	1.00	0.90		1.00	0.87	0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.99	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1693		1732	1505	1550		3504	1567	3399	3504	
Flt Permitted	0.95	1.00		0.95	0.99	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1693		1732	1505	1550		3504	1567	3399	3504	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	15	30	625	0	1100	0	800	50	275	1100	0
RTOR Reduction (vph)	0	29	0	0	169	39	0	0	35	0	0	0
Lane Group Flow (vph)	25	16	0	562	411	544	0	800	15	275	1100	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	5.2	5.2		57.0	57.0	77.9		45.7	45.7	20.9	73.6	
Effective Green, g (s)	5.2	5.2		57.0	57.0	77.9		45.7	45.7	20.9	73.6	
Actuated g/C Ratio	0.03	0.03		0.36	0.36	0.50		0.29	0.29	0.13	0.47	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0		5.0	5.0	4.0	5.0	
Lane Grp Cap (vph)	59	56		630	547	839		1021	457	453	1645	
v/s Ratio Prot	c0.01	0.01		c0.32	0.27	0.09		c0.23		0.08	c0.31	
v/s Ratio Perm						0.26			0.01			
v/c Ratio	0.42	0.29		0.89	0.75	0.65		0.78	0.03	0.61	0.67	
Uniform Delay, d1	74.3	74.0		47.0	43.7	29.3		51.0	39.7	64.1	32.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.8	2.8		14.9	5.8	1.9		4.6	0.1	2.7	1.4	
Delay (s)	79.2	76.8		61.9	49.4	31.2		55.6	39.8	66.7	33.6	
Level of Service	E	E		E	D	C		E	D	E	C	
Approach Delay (s)		77.6			47.3			54.7			40.2	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	47.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	156.8	Sum of lost time (s)	28.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	5	0	50	5	175	10	975	550	1375	950	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00		1.00	0.87	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1881		1732	1508	1550	1752	3504	1567	3399	3504	1567
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1881		1732	1508	1550	1752	3504	1567	3399	3504	1567
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	0	50	5	175	10	975	550	1375	950	25
RTOR Reduction (vph)	0	0	0	0	80	49	0	0	120	0	0	6
Lane Group Flow (vph)	5	5	0	45	14	42	10	975	430	1375	950	19
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	2.6	2.6		7.8	7.8	80.9	2.6	62.9	62.9	73.1	133.4	133.4
Effective Green, g (s)	2.6	2.6		7.8	7.8	80.9	2.6	62.9	62.9	73.1	133.4	133.4
Actuated g/C Ratio	0.01	0.01		0.04	0.04	0.46	0.01	0.36	0.36	0.42	0.76	0.76
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0	3.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	27	28		77	67	781	26	1264	565	1425	2680	1199
v/s Ratio Prot	c0.00	0.00		c0.03	0.01	0.02	0.01	c0.28		c0.40	0.27	
v/s Ratio Perm						0.00			0.27			0.01
v/c Ratio	0.19	0.18		0.58	0.21	0.05	0.38	0.77	0.76	0.96	0.35	0.02
Uniform Delay, d1	84.9	84.8		81.7	80.3	25.7	85.1	49.4	49.1	49.4	6.6	4.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	3.0		10.8	1.5	0.0	9.2	3.5	7.1	16.2	0.2	0.0
Delay (s)	88.2	87.9		92.5	81.8	25.7	94.3	52.9	56.2	65.6	6.8	4.9
Level of Service	F	F		F	F	C	F	D	E	E	A	A
Approach Delay (s)		88.0			61.7			54.3			41.2	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM Average Control Delay	47.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	174.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	5	45	94	91	10	975	550	1375	950	25
v/c Ratio	0.07	0.06	0.55	0.62	0.11	0.14	0.79	0.82	0.92	0.34	0.02
Control Delay	84.2	84.2	105.3	37.4	3.9	86.1	55.3	43.9	54.1	6.0	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.2	84.2	105.3	37.4	3.9	86.1	55.3	43.9	54.1	6.0	2.3
Queue Length 50th (ft)	5	5	51	12	0	11	501	382	669	76	0
Queue Length 95th (ft)	22	22	#120	#92	32	35	666	#662	894	244	10
Internal Link Dist (ft)		1005		682			1789			2364	
Turn Bay Length (ft)	170		310			390		390	470		495
Base Capacity (vph)	76	80	84	153	923	74	1235	674	1632	2849	1279
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.06	0.54	0.61	0.10	0.14	0.79	0.82	0.84	0.33	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	15	30	700	5	1200	0	800	50	275	1100	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		2%			-2%			2%			2%	
Total Lost time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Lane Util. Factor	1.00	1.00		0.95	0.91	0.95		0.95	1.00	0.97	0.95	
Frt	1.00	0.90		1.00	0.87	0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.99	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1693		1732	1507	1550		3504	1567	3399	3504	
Flt Permitted	0.95	1.00		0.95	0.99	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1693		1732	1507	1550		3504	1567	3399	3504	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	25	15	30	700	5	1200	0	800	50	275	1100	0
RTOR Reduction (vph)	0	29	0	0	152	37	0	0	36	0	0	0
Lane Group Flow (vph)	25	16	0	630	487	599	0	800	14	275	1100	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4	1	5	2		1	6	
Permitted Phases						4			2			6
Actuated Green, G (s)	5.2	5.2		64.6	64.6	85.7		45.4	45.4	21.1	73.5	
Effective Green, g (s)	5.2	5.2		64.6	64.6	85.7		45.4	45.4	21.1	73.5	
Actuated g/C Ratio	0.03	0.03		0.39	0.39	0.52		0.28	0.28	0.13	0.45	
Clearance Time (s)	7.0	7.0		7.0	7.0	7.0		7.0	7.0	7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	4.0		5.0	5.0	4.0	5.0	
Lane Grp Cap (vph)	57	54		681	593	875		968	433	437	1568	
v/s Ratio Prot	c0.01	0.01		c0.36	0.32	0.09		c0.23		0.08	c0.31	
v/s Ratio Perm						0.30			0.01			
v/c Ratio	0.44	0.30		0.93	0.82	0.68		0.83	0.03	0.63	0.70	
Uniform Delay, d1	78.1	77.8		47.5	44.7	29.2		55.8	43.4	67.9	36.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	3.0		18.4	8.9	2.4		6.6	0.1	3.2	1.8	
Delay (s)	83.4	80.8		66.0	53.6	31.7		62.3	43.5	71.1	38.4	
Level of Service	F	F		E	D	C		E	D	E	D	
Approach Delay (s)		81.7			50.4			61.2			44.9	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	164.3	Sum of lost time (s)	28.0
Intersection Capacity Utilization	95.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	45	630	639	636	800	50	275	1100
v/c Ratio	0.31	0.43	0.92	0.85	0.69	0.82	0.11	0.62	0.70
Control Delay	94.2	51.2	67.3	39.7	27.2	65.2	12.2	76.8	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.2	51.2	67.3	39.7	27.2	65.2	12.2	76.8	40.1
Queue Length 50th (ft)	29	18	734	501	486	471	0	160	551
Queue Length 95th (ft)	67	66	#997	731	652	558	38	214	635
Internal Link Dist (ft)		1005		682		1789			2364
Turn Bay Length (ft)	170		310				390	470	
Base Capacity (vph)	80	104	794	827	951	1093	523	519	1662
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.43	0.79	0.77	0.67	0.73	0.10	0.53	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	1025	175	225	350	125	10	75	50	225	500	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.44	1.00	1.00	0.15	1.00	1.00	0.43	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	1578	3539	1583	531	3539	1583	807	3539	1583	1106	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	1025	175	225	350	125	10	75	50	225	500	275
RTOR Reduction (vph)	0	0	47	0	0	74	0	0	35	0	0	167
Lane Group Flow (vph)	400	1025	128	225	350	51	10	75	15	225	500	108
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	41.7	31.7	37.3	32.7	27.2	36.8	26.8	21.2	26.7	34.8	25.2	35.2
Effective Green, g (s)	41.7	31.7	37.3	32.7	27.2	36.8	26.8	21.2	26.7	34.8	25.2	35.2
Actuated g/C Ratio	0.46	0.35	0.41	0.36	0.30	0.41	0.30	0.24	0.30	0.39	0.28	0.39
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	937	1247	753	370	1070	744	300	834	566	498	991	716
v/s Ratio Prot	c0.05	c0.29	0.01	0.04	0.10	0.01	0.00	0.02	0.00	c0.05	c0.14	0.02
v/s Ratio Perm	0.15		0.07	0.18		0.02	0.01		0.01	0.13		0.05
v/c Ratio	0.43	0.82	0.17	0.61	0.33	0.07	0.03	0.09	0.03	0.45	0.50	0.15
Uniform Delay, d1	14.9	26.6	16.6	21.1	24.3	16.2	22.3	26.9	22.4	19.5	27.2	17.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	4.5	0.1	2.8	0.2	0.0	0.0	0.2	0.0	0.7	1.8	0.1
Delay (s)	15.2	31.1	16.7	23.9	24.5	16.2	22.4	27.1	22.5	20.2	29.0	17.8
Level of Service	B	C	B	C	C	B	C	C	C	C	C	B
Approach Delay (s)		25.5			22.8			25.0			23.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	375	475	10	95	900	300	70	550	300	125	175	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.12	1.00	1.00	0.48	1.00	1.00	0.64	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	448	3539	1583	1735	3539	1583	1195	3539	1583	481	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	375	475	10	95	900	300	70	550	300	125	175	500
RTOR Reduction (vph)	0	0	6	0	0	36	0	0	125	0	0	65
Lane Group Flow (vph)	375	475	4	95	900	264	70	550	175	125	175	435
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	45.0	32.8	36.3	33.5	26.8	33.3	25.5	22.0	28.7	31.5	25.0	37.7
Effective Green, g (s)	45.0	32.8	36.3	33.5	26.8	33.3	25.5	22.0	28.7	31.5	25.0	37.7
Actuated g/C Ratio	0.50	0.36	0.40	0.37	0.30	0.37	0.28	0.24	0.32	0.35	0.28	0.42
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	645	1290	735	772	1054	682	361	865	602	261	983	760
v/s Ratio Prot	c0.08	0.13	0.00	0.01	c0.25	c0.03	0.01	0.16	0.02	0.03	0.05	c0.08
v/s Ratio Perm	0.21		0.00	0.04		0.14	0.05		0.09	0.13		0.19
v/c Ratio	0.58	0.37	0.01	0.12	0.85	0.39	0.19	0.64	0.29	0.48	0.18	0.57
Uniform Delay, d1	16.4	21.0	16.1	18.2	29.8	20.8	24.1	30.4	23.0	21.2	24.7	20.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	0.0	0.1	6.9	0.4	0.3	3.6	0.3	1.4	0.4	1.0
Delay (s)	17.8	21.2	16.1	18.3	36.6	21.2	24.3	34.0	23.3	22.6	25.1	21.0
Level of Service	B	C	B	B	D	C	C	C	C	C	C	C
Approach Delay (s)		19.6			31.7			29.8			22.2	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	1025	200	250	350	12	10	90	45	225	575	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.45	1.00	1.00	0.15	1.00	1.00	0.37	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	1626	3539	1583	535	3539	1583	680	3539	1583	1101	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	1025	200	250	350	12	10	90	45	225	575	275
RTOR Reduction (vph)	0	0	39	0	0	7	0	0	31	0	0	165
Lane Group Flow (vph)	400	1025	161	250	350	5	10	90	14	225	575	110
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	40.5	30.5	35.6	33.5	27.0	36.0	27.1	22.0	28.5	34.9	25.9	35.9
Effective Green, g (s)	40.5	30.5	35.6	33.5	27.0	36.0	27.1	22.0	28.5	34.9	25.9	35.9
Actuated g/C Ratio	0.45	0.34	0.40	0.37	0.30	0.40	0.30	0.24	0.32	0.39	0.29	0.40
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	932	1199	723	408	1062	730	267	865	598	494	1018	728
v/s Ratio Prot	c0.05	c0.29	0.01	0.04	0.10	0.00	0.00	0.03	0.00	c0.05	c0.16	0.02
v/s Ratio Perm	0.15		0.09	0.18		0.00	0.01		0.01	0.13		0.05
v/c Ratio	0.43	0.85	0.22	0.61	0.33	0.01	0.04	0.10	0.02	0.46	0.56	0.15
Uniform Delay, d1	15.6	27.7	18.0	21.0	24.5	16.2	22.2	26.4	21.2	19.4	27.3	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	6.1	0.2	2.7	0.2	0.0	0.1	0.2	0.0	0.7	2.3	0.1
Delay (s)	15.9	33.8	18.2	23.7	24.7	16.2	22.2	26.6	21.2	20.1	29.5	17.4
Level of Service	B	C	B	C	C	B	C	C	C	C	C	B
Approach Delay (s)		27.5			24.1			24.6			24.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	400	1025	200	250	350	12	10	90	45	225	575	275
v/c Ratio	0.43	0.85	0.26	0.61	0.33	0.02	0.04	0.10	0.07	0.46	0.57	0.31
Control Delay	15.4	35.5	10.5	20.9	25.0	6.6	18.1	27.8	6.4	22.8	30.4	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.4	35.5	10.5	20.9	25.0	6.6	18.1	27.8	6.4	22.8	30.4	3.0
Queue Length 50th (ft)	63	271	42	38	78	0	4	21	0	89	150	0
Queue Length 95th (ft)	92	351	85	59	114	9	14	41	22	146	204	43
Internal Link Dist (ft)		1052			1122			886			708	
Turn Bay Length (ft)	400		300	425		550	370		370	250		250
Base Capacity (vph)	936	1278	759	409	1136	737	267	865	626	493	1017	878
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.80	0.26	0.61	0.31	0.02	0.04	0.10	0.07	0.46	0.57	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	375	475	10	95	900	300	70	550	300	125	175	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.13	1.00	1.00	0.48	1.00	1.00	0.64	1.00	1.00	0.26	1.00	1.00
Satd. Flow (perm)	457	3539	1583	1735	3539	1583	1195	3539	1583	487	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	375	475	10	95	900	300	70	550	300	125	175	500
RTOR Reduction (vph)	0	0	6	0	0	36	0	0	125	0	0	65
Lane Group Flow (vph)	375	475	4	95	900	264	70	550	175	125	175	435
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	44.4	32.1	35.9	32.9	26.1	32.9	26.1	22.3	29.1	32.1	25.3	38.1
Effective Green, g (s)	44.4	32.1	35.9	32.9	26.1	32.9	26.1	22.3	29.1	32.1	25.3	38.1
Actuated g/C Ratio	0.49	0.36	0.40	0.37	0.29	0.37	0.29	0.25	0.32	0.36	0.28	0.42
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	649	1262	728	763	1026	675	371	877	609	271	995	767
v/s Ratio Prot	c0.08	0.13	0.00	0.01	c0.25	c0.03	0.01	0.16	0.02	0.03	0.05	c0.08
v/s Ratio Perm	0.20		0.00	0.04		0.14	0.05		0.09	0.13		0.19
v/c Ratio	0.58	0.38	0.01	0.12	0.88	0.39	0.19	0.63	0.29	0.46	0.18	0.57
Uniform Delay, d1	16.7	21.5	16.3	18.6	30.4	21.1	23.6	30.1	22.7	20.8	24.5	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	0.0	0.1	8.6	0.4	0.2	3.4	0.3	1.2	0.4	1.0
Delay (s)	18.0	21.7	16.3	18.7	39.0	21.5	23.9	33.5	23.0	22.0	24.9	20.7
Level of Service	B	C	B	B	D	C	C	C	C	C	C	C
Approach Delay (s)		20.0			33.5			29.4			21.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	27.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	375	475	10	95	900	300	70	550	300	125	175	500
v/c Ratio	0.58	0.38	0.01	0.12	0.88	0.42	0.18	0.63	0.42	0.46	0.17	0.59
Control Delay	17.4	22.2	6.8	12.3	41.1	16.2	20.9	34.6	10.1	25.8	26.1	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	22.2	6.8	12.3	41.1	16.2	20.9	34.6	10.1	25.8	26.1	16.8
Queue Length 50th (ft)	56	100	0	12	249	90	26	151	45	48	41	160
Queue Length 95th (ft)	90	143	8	24	#330	156	55	207	108	89	68	268
Internal Link Dist (ft)		1052			1122			886			708	
Turn Bay Length (ft)	400		300	425		550	370		370	250		250
Base Capacity (vph)	672	1284	752	958	1081	709	392	877	801	270	1039	855
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.37	0.01	0.10	0.83	0.42	0.18	0.63	0.37	0.46	0.17	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX D:

OCCUPANCY STUDY

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

1937 Logan Manor Dr
Reston, VA. 20190
703.542.4400
Date: 11/2/2011
Weather: Clear

INSCOM Driveway Vehicle Occupancy Counts							10/25/2011 Pedestrian Counts	Results
Time	Passenger Vehicles		Motorcycle -1 Rider	Tractor Trailer	Bicycle	Medium Vehicle (Van) - 1 Occupant	Pedestrians	
	1 Occupant	2 Occupant						
6:00 AM	147	2	2					
7:00 AM	209	2	1					
8:00 AM	187	5	4	1	1	2		
Total Autos	543	9				2		554
Total Occs	543	18				2		563
Average Auto Occupancy								1.02
Pedestrians								
EMPLOYEES	543	18	7		1	2	9	580
SOV Use								96%

Appendix B

Air Conformity Analysis
Emissions Calculations
Record of Non-Applicability

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RECORD OF NON-APPLICABILITY

In Accordance with the Clean Air Act- General Conformity Rule For
The Proposed INSCOM Expansion, Fort Belvoir, Virginia

July 23, 2012

The Army proposes to expand of current and future INSCOM personnel and missions. The Proposed Action includes:

- Constructing a five-story parking structure with up to 1,420 spaces, access roads, sidewalks, a stormwater retention pond, retaining walls (along the north side of the proposed parking structure and around the retention pond), and reconfiguring existing surface parking areas and landscaping.
- Constructing two basement levels and the ground level for a new addition to the Nolan Building. The addition would be approximately 188,000 sq ft, and include a Sensitive Compartmented Intelligence Facility (SCIF), administrative areas, specialized operations space, special equipment storage, a server room, and a generator.
- Constructing three more levels (approximately 199,000 square feet) to the building addition, including the SCIF, administrative area, classrooms, a server room, a wellness center, a shower, and a cafeteria. Approximately 30 percent of the new building will be equipped with a green roof, and another 30 percent with a roof top garden.
- Renovating the existing 234,000-sq ft Nolan Building and completing any remaining site work.
- The addition of back-up generators and boilers for the proposed facilities.

General Conformity under the Clean Air Act, Section 176 has been evaluated according to the requirements of Title 40 of the Code of Federal Regulations Part 93, Subpart B. The requirements of this rule are not applicable to the action because:

The highest total annual direct and indirect emissions from this Proposed Action have been estimated at 13.0 tons of nitrous oxides (NO_x), 4.0 tons of volatile organic compounds (VOCs), 1.6 tons very fine particulate matter ($PM_{2.5}$), and 16.3 tons sulfur dioxide ($S0_2$) per year, which would be below the applicability threshold values of 50 tons VOCs and 100 tons for $S0_2$, $PM_{2.5}$, and NO_x.

Supported documentation and emission estimates:

(X) Are attached
( ) Appear in the National Environmental Policy Act documentation
( ) Other (not necessary)

Gregory D. Gadson
Colonel, US Army
Garrison Commander

B.1 EMISSIONS ESTIMATIONS AND METHODOLOGY

The Army has considered net emissions generated from all direct and indirect sources of air emission that are reasonably foreseeable. *Direct emissions* are emissions that are caused or initiated by a Federal action and occur at the same time and place as the action. *Indirect emissions* are defined as reasonably foreseeable emissions that are caused by the action but might occur later in time and/or be farther removed in distance from the action itself, and that the Federal agency can practicably control. More specifically, project-related direct emissions would result from the following:

- *Construction activities*: the use of non-road equipment (e.g., bulldozers, backhoes), worker vehicles, the use of volatile organic compound (VOC) paints, paving off-gasses, and fugitive particles from surface disturbances
- *Operational activities*: Emergency generators and heating boilers not subject to major new source review, and the use of private motor vehicles

All direct and indirect emissions associated with the Proposed Action were estimated. The construction emissions were generated by estimating equipment use for utilities, site preparation, construction, and landscaping for the proposed facilities, including:

- Phase 1: Constructing a five-story parking structure with up to 1,420 spaces, access roads, sidewalks, a stormwater retention pond, retaining walls (along the north side of the proposed parking structure and around the retention pond), and reconfiguring existing surface parking areas and landscaping.
- Phase 2: Constructing two basement levels and the ground level for a new addition to the Nolan Building. The addition would be approximately 188,000 sq ft, and include a Sensitive Compartmented Intelligence Facility (SCIF), administrative areas, specialized operations space, special equipment storage, a server room, and a generator.
- Phase 3: Constructing three more levels (approximately 199,000 square feet) to the building addition, including the SCIF, administrative area, classrooms, a server room, a wellness center, a shower, and a cafeteria. Approximately 30 percent of the new building will be equipped with a green roof, and another 30 percent with a roof top garden.
- Phase 4: Renovating the existing 234,000-sq ft Nolan Building and completing any remaining site work.

Construction emissions associated with the use of construction equipment (e.g., bulldozers, backhoes), worker vehicles, the use of VOC paints, paving off-gasses, and fugitive particles from surface disturbances are presented in Table B-1 for all phases. This section also outlines all the calculations and assumptions made to derive these construction emission estimations.

B.1.1 Heavy Construction Equipment

Pollutant emissions resulting from activities associated with constructing the proposed buildings, parking facilities, and roadways were estimated. The typical construction would involve such activities as demolition of existing buildings or structures, utility installation, road construction, site clearing and grading, building construction, and asphalt paving.

Construction would involve the use of various non-road equipment, power generators, and trucks. Pieces of equipment to be used for building construction include, but are not limited to, backhoes, loaders, excavators, air compressors, chain saws, chipping machines, dozers, cranes, pavers, graders, rollers, and heavy trucks. Information regarding the number of pieces and types of construction equipment to be used

on the project, the schedule for deployment of equipment (monthly and annually), and the approximate daily operating time (including power level or usage factor) were estimated for each phase based on a schedule of construction activity.

Emissions from construction activities were estimated based on the projected construction activity schedule, the number of vehicles/pieces of equipment, and vehicle/equipment utilization rates. Emission factors for heavy-duty diesel equipment were obtained from EPA's *NONROAD Emissions Model* (USEPA 2005a). The equipment and vehicle operation hours were estimated based on R.S.Means' *Building Cost Construction Data*, 64th annual edition (Waier 2006), and field experience from similar projects.

Table B-1. Estimated Construction Emissions

			Construction Emissions (tpy)			
Year	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Phase 1	52.5	10.9	0.6	0.4	1.5	3.5
Phase 2	16.8	3.7	0.3	0.2	0.5	1.1
Phase 3	17.3	3.4	0.1	0.1	0.5	1.1
Phase 4	16.3	3.2	0.2	0.1	0.5	1
Total	102.9	21.2	1.2	0.8	3	6.7
Phase 1 **Construction Emissions**						
Construction Activity	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	43.7	10.2	0.4	0.4	1.5	1.6
Worker Trip Emissions	8.8	0.7	0	0	0	0.6
Architectural Coating Emissions	0	0	0	0	0	1.3
Fugitive Dust Emissions	0	0	0.2	0	0	0
Total	52.5	10.9	0.6	0.4	1.5	3.45
Phase 2 **Construction Emissions**						
Construction Activity	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	14	3.5	0.1	0.1	0.5	0.5
Worker Trip Emissions	2.8	0.2	0	0	0	0.2
Architectural Coating Emissions	0	0	0	0	0	0.4
Fugitive Dust Emissions	0	0	0.2	0	0	0
Total	16.8	3.7	0.3	0.2	0.5	1.1
Phase 3 **Construction Emissions**						
Construction Activity	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	14.4	3.2	0.1	0.1	0.5	0.5
Worker Trip Emissions	2.9	0.2	0	0	0	0.2
Architectural Coating Emissions	0	0	0	0	0	0.4
Total	17.3	3.4	0.1	0.1	0.5	1.12
Phase 4 **Construction Emissions**						
Construction Activity	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Heavy Equipment Emissions	13.5	3	0.1	0.1	0.5	0.5
Worker Trip Emissions	2.7	0.2	0	0	0	0.2
Architectural Coating Emissions	0	0	0	0	0	0.4
Total	16.3	3.2	0.2	0.1	0.5	1.04

Note: Inconsistencies due to rounding may exist.

Emission factors in grams of pollutant per hour were multiplied by the estimated running time to calculate total grams of pollutant from each piece of equipment. Finally, these total grams of pollutant were converted to tons of pollutant. The following formula was used to calculate hourly emissions from non-road engine sources, including cranes, backhoes, and the like:

$M_i = (N \times EF_i) \times AI$

where: M_i = mass of emissions of i^{th} pollutant during inventory period
N = source population (units)
EF_i = average emissions of i^{th} pollutant per unit of use (e.g., grams per hour)
AI = anti-idling factor (0.98).

The total annual emissions levels are summarized in Table B-2.

Table B-2. Estimated Annual Emissions from Construction Equipment

	Annual Emissions (tpy)					
Year	**CO**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**VOC**
Phase 1	43.7	10.2	0.4	0.4	1.5	1.6
Phase 2	14.0	3.5	0.1	0.1	0.5	0.5
Phase 3	14.4	3.2	0.1	0.1	0.5	0.5
Phase 4	13.6	3.0	0.1	0.1	0.5	0.5
Total	85.7	19.9	0.8	0.8	3.0	3.0

Sources: SCAQMD 1993, USEPA 1995a and USEPA 2005a

B.1.2 Construction Worker Vehicle Operations

Emissions due to construction worker vehicle use were included in the analysis. Emission factors for motor vehicles were conservatively calculated using the EPA *MOBILE6.2*. These emission factors were then multiplied by the vehicle operational hours to determine motor vehicle emissions. The analysis assumed conservatively that the worker's vehicle would drive 30 miles per day at an average speed of 35 miles per hour. The total annual emissions levels are summarized in Table B-3.

Table B-3. Estimated Annual Emissions from Construction Worker Vehicles

			Annual Emissions (tpy)			
Year	**CO**	**NO_x**	**VOC**	**$PM_{2.5}$**	**PM_{10}**	**SO_2**
Phase 1	8.8	0.7	0.6	Less than 0.05		
Phase 2	2.8	0.2	0.2			
Phase 3	2.9	0.2	0.2			
Phase 4	2.7	0.2	0.2			

Sources: SCAQMD 1993 and USEPA 2005A

B.1.3 Emissions from Architectural Coatings

Emission factors relating emissions to total square footage to be built were used to estimate VOC emissions from architectural coating activities – primarily painting activities. For office space, the area to be painted was assumed to be approximately twice the heated area of the facility, and the dry film

thickness was assumed to be three millimeters (mm). The following formula was used to calculate emissions from the painting of the facilities:

$E = [(F \times G) / 1000] \times H$

where: E = emissions of VOCs from architectural coatings
F = pounds of VOC emissions per gallon
G = total area to be coated (floor area x 2)
H = paint coverage.

A sample calculation for architectural coating VOC emissions during construction of an example facility is provided below:

Floor area = 100,000 ft^2

E = [(0.83 [lb/gallon] / 400 [ft^2/gallon] x [(100,000 [ft^2] x 2)]]/2,000 [lb/ton]
= 0.208 tons

The total annual emissions levels are summarized in Table B-4.

Table B-4. Annual VOC Emissions from Architectural Coatings

Year	Annual VOC Emissions (tpy)
Phase 1	1.3
Phase 2	0.4
Phase 3	0.4
Phase 4	0.4

Sources: SCAQMD 1993

B.1.4 Asphalt Curing Emissions

Asphalt paving would generate emissions from (1) asphalt curing, (2) operation of onsite paving equipment, and (3) operation of motor vehicles, including paving material delivery trucks and worker commuting vehicles. Because the emissions resulting from the operation of onsite paving equipment, trucks, and vehicles were included in the previous section, only asphalt curing-related emissions are discussed in this section. Asphalt curing-related VOC emissions were calculated based on the amount of paving for the onsite parking lot and proposed roadways. The following assumption was used in VOC emission calculations for asphalt curing (SCAQMD 1993):

E = area paved x 2.62 lb VOC/acre

A sample calculation is provided below:

Paved area = 100 acres

E = 100 acres x 2.62 lb VOC/acre/2000 lb/ton
= 0.131 ton

Due to the minimal paving anticipated, negligible (i.e. <0.1 tpy) off gas emissions are anticipated.

B.1.5 Surface Disturbance

The quantity of dust emissions from construction operations is proportional to the area of land being worked and to the level of construction activity. The following assumptions were used in $PM_{2.5}$ emission calculations for fugitive dust emissions (USEPA 1995A and USEPA 2005B).

E = open area x *EF* x PM_{10}/TSP x $PM_{2.5}$/PM_{10} x capture fraction
where: open area = number of acres open
EF = 80 lb TSP/acre
PM_{10}/TSP = 0.45 lb PM_{10}/lb TSP
TSP = total suspended particulates
$PM_{2.5}$/PM_{10} = 0.15 lb $PM_{2.5}$/lb PM_{10}
Capture fraction = 0.5

A sample calculation is provided below:

Disturbed area = 100 acres
E = 100 ac x 80 lb TSP /acre x 0.45 lb PM_{10}/lb TSP x 0.15 lb $PM_{2.5}$/ lb PM_{10} x 2000 lb/ton
= 1.35 tons

The total emissions are summarized in Table B-5.

Table B-5. Annual $PM_{2.5}$ Emissions from Surface Disturbance

Year	Annual emissions (tpy)	
	PM_{10}	**$PM_{2.5}$**
Phase 1	0.2	<0.1
Phase 2	0.2	<0.1
Phase 3	<0.1	<0.1
Phase 4	<0.1	<0.1

Sources: USEPA 1995A and USEPA 2005B

B.1.6 Heating Boiler Emissions

Each building is assumed to be adequately heated, with heating values based on the U.S. Department of Energy's *Consumption and Gross Energy Intensity by Census Region for Sum of Major Fuels, Commercial Buildings Energy Consumption Survey* (DOE 1999). An example calculation of heating gas requirements for an individual project is presented below:

Total building size = 26,000 GSF
Natural gas energy intensity = 31.4 ft^3/GSF
Total natural gas = 26,000 GSF x 31.4 cubic feet/GSF
= 816,400 ft^3

Emission estimates were calculated based on the EPA-provided AP-42 emission factors for a natural-gas boiler. An example calculation for the annual emission rate for VOCs from building boiler operations for a sample project is presented below:

AP-42 emission factor = 5.5 lb/10^6 ft^3

Annual emission level = 816,400 ft^3/year x 5.5 lb/10^6 ft^3
= 4.5 lb/year
= 0.0022 tons/yr

Table B-6. Annual Heating Emissions

Gross Area	387,000	sf					
Heating Requirements	99,000	btu/sf					
Total Annual Heat Required	38,313	MMBTU					
Total Consumption	37,561,765	(cf/yr)					
	CO	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
Emission Factors (lb/10^6 cf)[1]	84	190	5.5	0.6	7.6	7.6	120,000
Total Emissions	1.58	3.57	0.10	0.01	0.14	0.14	2,253.8

1. Natural gas emission factors were obtained from U.S. EPA's AP-42, Section 1.4.

Table B-8. Equipment Use by Phase

Equipment Type	Phase 1	Phase 2	Phase 3	Phase 4	Total Hours
Trimmers/Edgers/Brush Cutter	14.3	23.1	0.0	0.0	37.5
Lawn Mowers	21.5	34.7	0.0	0.0	56.2
Lawn & Garden Tractors	25.1	40.5	0.0	0.0	65.6
Generator Sets	6,351.8	1,990.2	2,106.7	1,972.2	12,420.9
Air Compressors	3,629.6	1,137.3	1,203.8	1,127.0	7,097.7
Pavers	25.1	40.5	0.0	22.8	88.4
Plate Compactors	7,273.5	2,297.7	2,407.6	2,267.0	14,245.9
Rollers	50.2	81.0	0.0	45.7	176.9
Scrapers	152.2	146.1	0.0	30.4	328.7
Cement & Mortar Mixers	12,703.6	3,980.4	4,213.3	3,944.5	24,841.8
Cranes	12,703.6	3,980.4	4,213.3	3,944.5	24,841.8
Graders	152.2	146.1	0.0	30.4	328.7
Off-highway Trucks	12,906.0	4,207.5	4,213.3	3,997.7	25,324.6
Tractors/Loaders/Backhoes	12,855.7	4,126.5	4,213.3	3,974.9	25,170.5
Crawler Tractor/Dozers	152.2	146.1	0.0	30.4	328.7

Table B-9. Heavy Equipment Emissions

Project	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	VOC
Phase I, Parking Garage, Clearing and Grading	0.1491	0.347	0.0158	0.0153	0.0667	0.0158
Phase I, Parking Garage, Building Construction	43.452	9.8376	0.3826	0.3707	1.4415	1.5459
Phase I, Parking Garage, Landscaping	0.1312	0.0049	0.0003	0.0003	0	0.0043
Phase I, Parking Garage, Paving	0.0111	0.0234	0.0012	0.0012	0.0039	0.0013
Phase II, Addition 1, Clearing and Grading	0.1432	0.3331	0.0151	0.0147	0.0641	0.0152
Phase II, Addition 1,Building Construction	13.615	3.0825	0.1199	0.1162	0.4517	0.4844
Phase II, Addition 1,Landscaping	0.2116	0.0079	0.0005	0.0004	0	0.007
Phase II, Addition 1,Paving	0.018	0.0377	0.0019	0.0019	0.0063	0.0021
Phase III, Addition 2,Building Construction	14.4231	3.1869	0.1315	0.1274	0.4781	0.4921
Phase IV, Clearing and Grading	0.0299	0.0654	0.0036	0.0035	0.0134	0.0033
Phase IV, Building Renovation	13.5101	2.9155	0.1274	0.1236	0.4476	0.4499
Phase IV, Paving	0.01	0.0203	0.0012	0.0012	0.0035	0.0012
Total Non-Road	85.7	19.86	0.8	0.78	2.98	3.02
Phase I, Parking Garage, Clearing and Grading	0.1491	0.347	0.0158	0.0153	0.0667	0.0158

Sources: USEPA 1995A and SCAQMD 1993

Table B-10. Architectural Coating Emissions (Paint)

Project	Floor Area	Wall Surface	EFVOC [lbs/1000 Square Feet]	VOC [tons]
Phase I, Parking Garage, Building Construction	600000	1200000	55.5	1.25
Phase II, Addition 1,Building Construction	188000	376000	55.5	0.39
Phase III, Addition 2,Building Construction	199000	398000	55.5	0.42
Phase IV, Building Renovation	186300	372600	55.5	0.39

Sources: SCAQMD 1993

Table B-11. Fugitive Dust Emissions

Project	PM_{10}/ TSP	$PM_{2.5}$/ PM_{10}	EF TSP [lbs/acre/day]	Capture Fraction	Duration of Grading [days]	Cleared Area [acres]	$PM_{2.5}$ [tons]
Phase I, Parking Garage, Clearing and Grading	0.45	0.15	80	0.5	37.81	5.75	0.2
Phase II, Addition 1, Clearing and Grading	0.45	0.15	80	0.5	37.81	5.52	0.19
Phase IV, Clearing and Grading	0.45	0.15	80	0.5	37.81	1.15	0.04
Phase I, Parking Garage, Clearing and Grading	0.45	0.15	80	0.5	37.81	5.75	0.2

Sources: USEPA 1995A and USEPA 2005A

Table B-12. Worker Trip Emissions (tons)

Project	VMT	EFNO$_x$ [g/mile]	NO$_x$ [tons]	FPM$_{2.5}$ [g/mile]	PM$_{2.5}$ [tons]	EFSO$_2$ [g/mile]	SO$_2$ [tons]	EFVOC [g/mile]	VOC [tons]
Phase I, Parking Garage, Clearing and Grading	8152	4.05	0	0.32	0	0.01	0	0	0
Phase I, Parking Garage, Building Construction	1959978	4.05	0.68	0.32	0.02	0.01	0.02	0.02	0.63
Phase I, Parking Garage, Landscaping	1076	4.05	0	0.32	0	0.01	0	0	0
Phase I, Parking Garage, Paving	1345	4.05	0	0.32	0	0.01	0	0	0
Phase II, Addition 1, Clearing and Grading	7826	4.05	0	0.32	0	0.01	0	0	0
Phase II, Addition 1,Building Construction	614127	4.05	0.21	0.32	0.01	0.01	0.01	0.01	0.2
Phase II, Addition 1,Landscaping	1735	4.05	0	0.32	0	0.01	0	0	0
Phase II, Addition 1,Paving	2169	4.05	0	0.32	0	0.01	0	0	0
Phase III, Addition 2,Building Construction	650059	4.05	0.23	0.32	0.01	0.01	0.01	0.01	0.21
Phase IV, Clearing and Grading	1630	4.05	0	0.32	0	0.01	0	0	0
Phase IV, Building Renovation	608573	4.05	0.21	0.32	0.01	0.01	0.01	0.01	0.19
Phase IV, Paving	1223	4.05	0	0.32	0	0.01	0	0	0

Sources: SCAQMD 1993 and USEPA 2005a

Table B-13. Emergency Generators

Emission Factor [lb/hp-hr]	**NO$_x$**	**VOC**	**PM$_{2.5}$**	**SO$_2$**	**CO$_2$**				
Large Diesel Engine	0.024	0.000705	0.0007	0.00809	1.16				
Generator Rating [kW]	**Estimated Run Time (hr/yr)**	**Annual Power Output [kw-hr/yr]**	**[hp/kW]**	**(lbs/ton]**	**NO$_x$ (tpy)**	**VOC (tpy)**	**PM$_{2.5}$ (tpy)**	**SO$_2$ (tpy)**	**CO$_2$**
3000	500	1500000	1.341	2000	24.14	0.71	0.70	8.14	1,166.7
3000	500	1500000	1.341	2000	24.14	0.71	0.70	8.14	1,166.7
				Total	48.28	1.42	1.41	16.27	2,333.3
Total with SCR (85% Efficiency)					**7.24**	**1.42**	**1.41**	**16.27**	**2,333.3**

Table B-14. Employee Commutes

	NO_x	VOC	$PM_{2.5}$	SO_2
Number of Employees	950	950	950	950
Roundtrip Commute [Miles]	30	30	30	30
Operations [days/year]	230	230	230	230
Total Miles Driven	6,555,000	6,555,000	6,555,000	6,555,000
Emission Factor [grams/mile]	0.3	0.34	0.0113	0.0068
Conversion Factor [gm/ton]	908000	908000	908000	908000
Emissions [tons/year]	2.166	2.455	0.082	0.049

Sources: SCAQMD 1993 and USEPA 2005a

Table B-15. Operational Emissions Roll-Up

	NO_x	VOC	$PM_{2.5}$	SO_2	CO_2
Emergency Generators	7.24	1.42	1.41	16.27	2,333.3
Heating and Cooling Emissions	3.568	0.103	0.143	0.011	2,253.7
Employee POV	2.166	2.455	0.082	0.049	-
TOTAL	**12.98**	**3.98**	**1.63**	**16.33**	**4,587.0**

Appendix C

Coordination Letters

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DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BELVOIR
9820 FLAGLER ROAD, SUITE 213
FORT BELVOIR, VIRGINIA 22060-5928

REPLY TO
ATTENTION OF

MAR 19 2012

Directorate of Public Works

SUBJECT: Section 106 Consultation, Expansion of INSCOM Headquarters Facility, Fort Belvoir, Virginia

Mr. Marc Holma
Architectural Historian
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Mr. Holma:

Fort Belvoir proposes to renovate and expand the existing U.S. Army Intelligence and Security Command (INSCOM) headquarters facility. The expansion will include the renovation of the existing headquarters building, the construction of a new parking garage, and the restructuring of existing surface parking lots and interior roadways.

The Area of Potential Effect (APE) for this undertaking is defined as all land within the existing INSCOM facility fence line and a small increase of additional land surrounding the facility (map enclosed). Fort Belvoir has undertaken historic resource identification efforts within one-quarter-mile of the APE.

No historic architectural resources were identified within the study area. Building 2444, constructed in 1989, is less than 50 years of age and lacks the exceptional significance required for National Register listing. Two archaeological resources, sites 44FX1095 and 44FX1275, were identified within the APE. Both sites have been determined ineligible for National Register listing. Fort Belvoir received State Historic Preservation Office (SHPO) concurrence on these determinations on July 20, 2005 (VDHR# (2005-0921) and May 30, 2006 (VDHR# 2005-0921) respectively.

Fort Belvoir has determined that no historic properties will be affected by the expansion of INSCOM headquarters facility as outlined above [36CFR800.4]. Please provide comment on our determination of no historic properties affected in accordance

with 36CFR800.4(d). If we do not receive your comments within the required 30 days, we will assume concurrence and proceed with the project as planned. A copy of this correspondence has been sent to the Tribal Historic Preservation Office of the Catawba Indian Nation.

Point of contact is Bill Sanders, Director of Public Works, at 703-806-3017.

Sincerely,

for Stephen Rush, Deputy
John J. Strycula
Colonel, US Army
Commanding

Enclosure

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BELVOIR
9820 FLAGLER ROAD, SUITE 213
FORT BELVOIR, VIRGINIA 22060-5928

REPLY TO
ATTENTION OF

MAR 19 2012

Directorate of Public Works

SUBJECT: Section 106 Consultation, Expansion of INSCOM Headquarters Facility, Fort Belvoir, Virginia

Dr. Wenonah G. Haire
Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Dear Dr. Haire:

Fort Belvoir proposes to renovate and expand the existing U.S. Army Intelligence and Security Command (INSCOM) headquarters facility. The expansion will include the renovation of the existing headquarters building, the construction of a new parking garage, and the restructuring of existing surface parking lots and interior roadways.

The Area of Potential Effect (APE) for this undertaking is defined as all land within the existing INSCOM facility fence line and a small increase of additional land surrounding the facility (map enclosed). Fort Belvoir has undertaken historic resource identification efforts within one-quarter-mile of the APE.

No historic architectural resources were identified within the study area. Building 2444, constructed in 1989, is less than 50 years of age and lacks the exceptional significance required for National Register listing. Two archaeological resources, sites 44FX1095 and 44FX1275, were identified within the APE. Both sites have been determined ineligible for National Register listing. Fort Belvoir received State Historic Preservation Office (SHPO) concurrence on these determinations on July 20, 2005 (VDHR# (2005-0921) and May 30, 2006 (VDHR# 2005-0921) respectively.

Fort Belvoir has determined that no historic properties will be affected by the expansion of INSCOM headquarters facility as outlined above [36CFR800.4]. Please provide comment on our determination of no historic properties affected in accordance

with 36CFR800.4(d). If we do not receive your comments within the required 30 days, we will assume concurrence and proceed with the project as planned. A copy of this correspondence has been sent to the Virginia SHPO.

Point of contact is Bill Sanders, Director of Public Works, at 703-806-3017.

Sincerely,

Stephen J. Rooker, Deputy

John J. Strycula
Colonel, US Army
Commanding

Enclosure

Daniel, Christopher A CTR (US)

From: Holma, Marc (DHR) [Marc.Holma@dhr.virginia.gov]
Sent: Tuesday, April 03, 2012 11:55 AM
To: Daniel, Christopher A CTR (US)
Subject: expansion of INSCOM Headquarters Facility (2012-0389)

Chris,

The DHR concurs with Fort Belvoir that No Historic Properties are Affected by the above referenced project.

Marc

Marc E. Holma, Architectural Historian

Office of Review and Compliance

Virginia Department of Historic Resources

2801 Kensington Avenue

Richmond, Virginia 23221

phone: (804) 482-6090

fax: (804) 367-2391

web: www.dhr.virginia.gov

*** Learn more about DHR's ePIX - Electronic Project Information Exchange ***

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Catawba Indian Nation
Tribal Historic Preservation Office
1536 Tom Steven Road
Rock Hill, South Carolina 29730

Office 803-328-2427
Fax 803-328-5791

April 11, 2012

Attention: John J. Strycula
Dept. of the Army
9820 Flagler Road, Suite 213
Fort Belvoir, VA 22060-5928

Re. THPO #	TCNS#	Project Description
2012-253-2		Expansion of INSCOM Headquarters Facility, Fort Belvoir, Virginia

Dear Mr. Strycula,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Totherow at 803-328-2427 ext. 226, or e-mail caitlinh@ccppcrafts.com.

Sincerely,

Caitlin Totherow for

Wenonah G. Haire
Tribal Historic Preservation Officer

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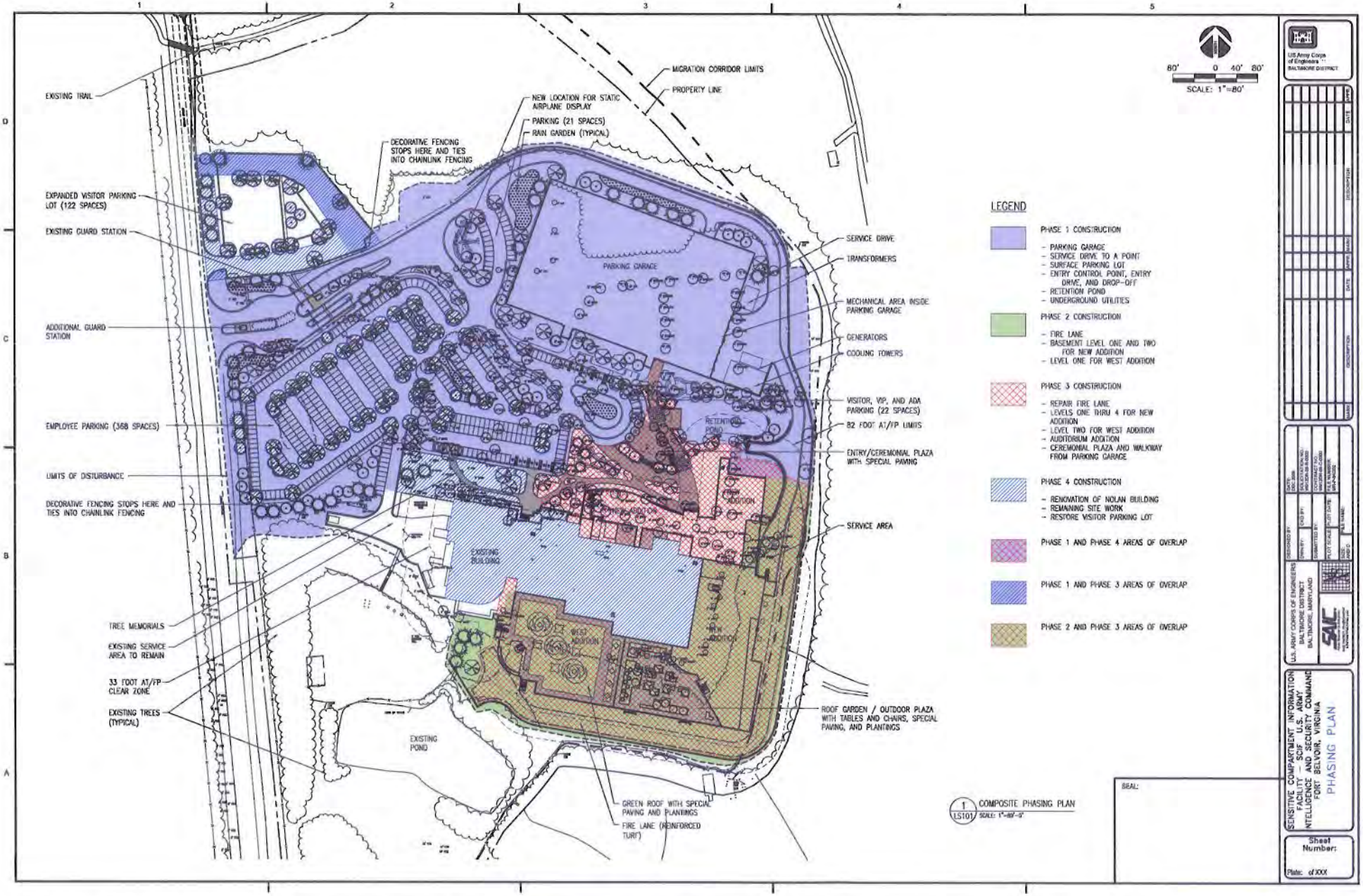
EXISTING TRAIL
EXPANDED VISITOR PARKING LOT (122 SPACES)
EXISTING GUARD STATION
ADDITIONAL GUARD STATION
EMPLOYEE PARKING (368 SPACES)
LIMITS OF DISTURBANCE
DECORATIVE FENCING STOPS HERE AND TIES INTO CHAINLINK FENCING
TREE MEMORIALS
EXISTING SERVICE AREA TO REMAIN
33 FOOT AT/FP CLEAR ZONE
EXISTING TREES (TYPICAL)
MIGRATION CORRIDOR LIMITS
PROPERTY LINE
NEW LOCATION FOR STATIC AIRPLANE DISPLAY
PARKING (21 SPACES)
RAIN GARDEN (TYPICAL)
DECORATIVE FENCING STOPS HERE AND TIES INTO CHAINLINK FENCING
PARKING GARAGE
SERVICE DRIVE
TRANSFORMERS
MECHANICAL AREA INSIDE PARKING GARAGE
GENERATORS
COOLING TOWERS
VISITOR, VIP, AND ADA PARKING (22 SPACES)
82 FOOT AT/FP LIMITS
RETENTION POND
ENTRY/CEREMONIAL PLAZA WITH SPECIAL PAVING
ADDITION
SERVICE AREA
EXISTING BUILDING
WEST ADDITION
NEW ADDITION
ROOF GARDEN / OUTDOOR PLAZA WITH TABLES AND CHAIRS, SPECIAL PAVING, AND PLANTINGS
EXISTING POND
GREEN ROOF WITH SPECIAL PAVING AND PLANTINGS
FIRE LANE (REINFORCED TURF)
80' 0 40' 80'
SCALE: 1"=80'
LEGEND
PHASE 1 CONSTRUCTION
- PARKING GARAGE
- SERVICE DRIVE TO A POINT
- SURFACE PARKING LOT
- ENTRY CONTROL POINT, ENTRY DRIVE, AND DROP-OFF
- RETENTION POND
- UNDERGROUND UTILITIES
PHASE 2 CONSTRUCTION
- FIRE LANE
- BASEMENT LEVEL ONE AND TWO FOR NEW ADDITION
- LEVEL ONE FOR WEST ADDITION
PHASE 3 CONSTRUCTION
- REPAIR FIRE LANE
- LEVELS ONE THRU 4 FOR NEW ADDITION
- LEVEL TWO FOR WEST ADDITION
- AUDITORIUM ADDITION
- CEREMONIAL PLAZA AND WALKWAY FROM PARKING GARAGE
PHASE 4 CONSTRUCTION
- RENOVATION OF NOLAN BUILDING
- REMAINING SITE WORK
- RESTORE VISITOR PARKING LOT
PHASE 1 AND PHASE 4 AREAS OF OVERLAP
PHASE 1 AND PHASE 3 AREAS OF OVERLAP
PHASE 2 AND PHASE 3 AREAS OF OVERLAP
1 LS101 COMPOSITE PHASING PLAN
SCALE: 1"=80'-0"
SEAL:
US Army Corps of Engineers
BALTIMORE DISTRICT
U.S. ARMY CORPS OF ENGINEERS
BALTIMORE DISTRICT
BALTIMORE, MARYLAND
SAIC
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
SENSITIVE COMPARTMENT INFORMATION FACILITY SCIF
NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY, ARMY INTELLIGENCE AND SECURITY COMMAND
FORT BELVOIR, VIRGINIA
PHASING PLAN
Sheet Number:
Plate: of XXX

HQ INSCOM - Proposed Expansion

Proposed New Retaining Wall
Proposed New Fence
Site Limits
Stream
Water Body
Existing INSCOM Building
Proposed New Building
Proposed New Paved Area

N

0 80 160 320 Feet

Source: Fort Belvoir CAD and GIS

Figure 2-2

HQ INSCOM - Existing Site Layout

5 Foot Contour
Existing Fence
Existing Wall
Existing Unpaved Road
Stream
Water Body
Existing INSCOM Building
Existing Building
Existing Sidewalk
Existing Pavement

N

0 80 160 320 Feet

Source: Fort Belvoir GIS

Figure 2-1

PHASE IV: PROJECT NUMBER 77905

PHASE IV SCOPE

Renovate Nolan Building
Repair Landscaping and Tree Memorial Area
Restore Visitor Parking Lot

DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT AGENCY
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BELVOIR
9820 FLAGLER ROAD, SUITE 213
FORT BELVOIR, VIRGINIA 22060-5928

REPLY TO
ATTENTION OF

April 19, 2006

Directorate of Public Works

SUBJECT: Section 106 Consultation, Addition to INSCOM Building (VDHR File No. 2005-0921)

Mr. Marc Holma
Architectural Historian
Department of Historic Resources
2801 Kensington Avenue
Richmond, Virginia 23221

Dear Mr. Holma:

This letter continues the Section 106 coordination for the construction of an addition to the Intelligence and Security Command (INSCOM) Building. Coordination for this project was initiated in June 2005 (VDHR File No. 2005-0921). During the initial coordination your office concurred with a finding of *no historic properties affected*. This determination was based on the determination that a potentially impacted archeological site (44FX1275) was *not eligible for listing in the National Register*. Our initial coordination failed to consider impacts to a second archeological site (44FX1095). Archaeological site 44FX1095 is located under the existing INSCOM building parking lot and to the south of the existing building.

Site 44FX1095 is a historic, agricultural site dating from 1890-1925. The site was initially identified through shovel tests in 1989 (MAAR 1989). The initial survey determined that the site was not significant and recommended no further site research. Fort Belvoir has evaluated the historic significance of archeological site 44FX1095 and determined that it is *not eligible for the National Register* [36CFR800.4].

Please provide comment on our determination that site 44FX1095 is *not eligible for listing in the National Register* in accordance with 36CFR800.4(c). Based upon our determination that 44FX1095 is *not eligible* Fort Belvoir has reached a finding of *no historic properties affected* for this undertaking [36CFR800.4 (d)(1)]. Please provide comment on our finding of *no historic properties affected* in accordance with 36CFR800.4. If we do not receive your comments within the allowed time period, we will assume concurrence and proceed with the project as planned.

Point of contact is Mr. Patrick McLaughlin, Directorate of Public Works, Environmental and Natural Resource Division, at 703-806-3193 if additional information is needed.

Sincerely,

Brian W. Lauritzen
Colonel, US Army
Garrison Commander

Enclosures

COMMONWEALTH *of* VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel (804) 367-2323
Fax (804) 367-2391
TDD (804) 367-2386
www.dhr.virginia.gov

July 20, 2005

Mr. Bill Sanders, Director
Directorate of Public Works
Environmental and Natural Resource Division
U.S. Army Garrison, Fort Belvoir
9430 Jackson Loop, Suite 100
Fort Belvoir, Virginia 22060-5116

Re Building Addition, INSCOM – Impacts to site 44FX1275
DHR File No. 2005-0921

Dear Mr. Sanders:

Thank you for submitting information concerning the project referenced above. The proposed project is an addition to an existing facility within the INSCOM compound. Archaeological site 44FX1275 was previously recorded in the area proposed for construction. We have reviewed the submitted materials and provide the following comments.

The assessment conducted by John Milner Associates, Inc. did not identify any significant intact historic or prehistoric resources associated with 44FX1275. We generally do not accept letter reports, such as was submitted, for the purposes of Section 106 compliance. In this case, however, our records indicate that site 44FX1275 was previously determined by our office to be not eligible for listing in the National Register of Historic Places. As such, no further work is necessary. We concur with your finding of *no historic properties affected*.

We appreciate your continued efforts to consider the potential impacts of your projects on historic resources. If you have questions about these comments please contact me at 804-367-2323, ext.153, or at Roger.Kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

RECEIVED
JUL 26 2005
ENVIRONMENTAL AND NATURAL RESOURCE DIVISION
U.S. ARMY FORT BELVOIR

Administrative Services
10 Courthouse Avenue
Petersburg, VA 23803
Tel: (804) 863-1624
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way, 2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Roanoke Region Office
Fax: (540) 857-7585

Winchester Region Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-3335

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COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
Fax: (804) 367-2391
TDD: (804) 367-2386
www.dhr.virginia.gov

July 20, 2005

Mr. Bill Sanders, Director
Directorate of Public Works
Environmental and Natural Resource Division
U.S. Army Garrison, Fort Belvoir
9430 Jackson Loop, Suite 100
Fort Belvoir, Virginia 22060-5116

Re: Building Addition, INSCOM – Impacts to site 44FX1275
DHR File No. 2005-0921

Dear Mr. Sanders:

Thank you for submitting information concerning the project referenced above. The proposed project is an addition to an existing facility within the INSCOM compound. Archaeological site 44FX1275 was previously recorded in the area proposed for construction. We have reviewed the submitted materials and provide the following comments.

The assessment conducted by John Milner Associates, Inc. did not identify any significant intact historic or prehistoric resources associated with 44FX1275. We generally do not accept letter reports, such as was submitted, for the purposes of Section 106 compliance. In this case, however, our records indicate that site 44FX1275 was previously determined by our office to be not eligible for listing in the National Register of Historic Places. As such, no further work is necessary. We concur with your finding of *no historic properties affected.*

We appreciate your continued efforts to consider the potential impacts of your projects on historic resources. If you have questions about these comments please contact me at 804-367-2323, ext.153, or at Roger.Kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

Administrative Services
10 Courthouse Avenue
Petersburg, VA 23803
Tel: (804) 863-1624
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
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Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way, 2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Valley Region Office
[illegible]
Fax: (540) 857-7588

Northern Region Office
407 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7535

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COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

Tel: (804) 367-2323
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www.dhr.virginia.gov

MEMORANDUM

DATE: 30 May 2006 **DHR File #** 2005-0921

TO: Mr. Patrick McLaughlin

FROM: Marc E. Holma, Architectural Historian
Office of Review and Compliance

PROJECT: Addition to INSCOM Building, Fort Belvoir
Fairfax County, Virginia

___ This project will have an effect on historic resources. Based on the information provided, the effect will not be adverse.

___ This project will have an adverse effect on historic properties. Further consultation with DHR is needed under Section 106 of the NHPA.

___ Additional information is needed before we will be able to determine the effect of the project on historic resources. **Please see attached sheet.**

_X_ No further identification efforts are warranted. No historic properties will be affected by the project. Should unidentified historic properties be discovered during implementation of the project, please notify DHR.

___ We have previously reviewed this project. Attached is a copy of our correspondence.

___ Other (Please see comments below)

COMMENTS: **Site 44FX1095 is not eligible for listing in the National Register of Historic Places.**

Administrative Services
10 Courthouse Avenue
Petersburg, VA 23803
Tel: (804) 863-1624
Fax: (804) 862-6196

Capital Region Office
2801 Kensington Ave.
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Tidewater Region Office
14415 Old Courthouse Way, 2nd Floor
Newport News, VA 23608
Tel: (757) 886-2807
Fax: (757) 886-2808

Roanoke Region Office
1030 Penmar Ave., SE
Roanoke, VA 24013
Tel: (540) 857-7585
Fax: (540) 857-7588

Winchester Region Office
107 N. Kent Street, Suite 203
Winchester, VA 22601
Tel: (540) 722-3427
Fax: (540) 722-7535

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DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY GARRISON, FORT BELVOIR
DIRECTORATE OF PUBLIC WORKS
9430 JACKSON LOOP, SUITE 100
FORT BELVOIR, VIRGINIA 22060-5116

REPLY TO
ATTENTION OF

Directorate of Public Works

Project Review Coordinator
Virginia Department of Game and Inland Fisheries
4010 West Broad Street
Richmond, Virginia 23230

Dear Madam or Sir:

The Army is preparing an environmental assessment to expand the U.S. Army Intelligence and Security Command's (INSCOM's) headquarters facilities on U.S. Army Garrison Fort Belvoir. The proposed project includes renovating the existing 234,000 square-foot building and building two additions 188,699 square feet and 199,112 square feet in size for a total of 621,811 square feet. Rather than expanding beyond the developed part of the 39-acre site, which is on a plateau, the building expansion will make use of the existing surface parking lot, and a five-story parking garage will be built to replace the lost surface parking.

As a result the increase in impervious surface was minimized and would be 3.4 acres. Figure 1 is the U.S. Geological Survey map of the Fort Belvoir area. Figure 2 illustrates the location of the INSCOM site on Fort Belvoir, and Figure 3, the proposed site plan and environmental constraints.

Field surveys of the INSCOM site for the state-listed threatened wood turtle (Glyptemys inscuplta) and for the state-listed endangered and federally-listed threatened small whorled pogonia (sotria medeoloides) were conducted at appropriate times within the last year, but no specimens were found. A wetland delineation survey and perennial stream survey were also conducted; no wetlands or perennial streams accur within the proposed limits of disturbance.

A tree/forest type survey documented the number and species of trees that would be affected. Because the developed part of the site lies adjacent to Fort Belvoir's dedicated Forest and Wildlife Corridor, the proposed changes in the site plan purposefully avoid and minimize intrusions into this forested reserve, and only 0.34 acres lie within the proposed limits of construction and 0.69 acres within a 25-foot buffer beyond the limits of construction. Trees lost would be replaced on a 2.1 basis and other measures would be taken to mitigate for the loss of forest and habitat in the Forest and Wildlife Corridor.

Please review and comment on the project and provide any additional information that may be pertinent to the assessment of project impacts.

Sincerely,

Bill Sanders
Director

Enclosures

DEPARTMENT OF THE ARMY
U.S. ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY GARRISON, FORT BELVOIR
DIRECTORATE OF PUBLIC WORKS
9430 JACKSON LOOP, SUITE 100
FORT BELVOIR, VIRGINIA 22060-5116

REPLY TO
ATTENTION OF

Directorate of Public Works

Project Review Coordinator
Virginia Field Office
US Fish and Wildlife Service
6669 Short Lane
Gloucester, Virginia 23061

Dear Madam or Sir:

The Army is preparing an environmental assessment to expand U.S. Army Intelligence and Security Command INSCOM headquarters facilities on U.S. Army Garrison, Fort Belvoir. The proposed project includes renovating the existing 234,000 square-foot building and constructing additions at 188,699 square feet and 199,112 square feet for a total of 621,811 square feet. Rather than expanding beyond the developed part of the 39-acre site, which is on a plateau, the expansion will make use of the existing surface parking lot, and a five-story parking garage will be built to replace the lost surface parking.

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Sincerely,

Bill Sanders
Director

Enclosures

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U.S. ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY GARRISON, FORT BELVOIR
DIRECTORATE OF PUBLIC WORKS
9430 JACKSON LOOP, SUITE 100
FORT BELVOIR, VIRGINIA 22060-5116

REPLY TO
ATTENTION OF

Directorate of Public Works

Project Review Coordinator
Virginia Department of Conservation and Recreation
217 Governor Street
Richmond, Virginia 23219-2010

Dear Madam or Sir:

The Army is preparing an environmental assessment to expand U.S. Army Intelligence and Security Command INSCOM headquarters facilities on U.S. Army Garrison, Fort Belvoir. The proposed project includes renovating the existing 234,000 square-foot building and constructing additions at 188,699 square feet and 199,112 square feet for a total of 621,811 square feet. Rather than expanding beyond the developed part of the 39-acre site, which is on a plateau, the expansion will make use of the existing surface parking lot, and a five-story parking garage will be built to replace the lost surface parking.

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Sincerely,

Bill Sanders
Director

Enclosures

COMMONWEALTH of VIRGINIA

Douglas W. Domenech
Secretary of Natural Resources

Department of Game and Inland Fisheries

Robert W. Duncan
Executive Director

June 29, 2012

Bill Sanders - Director
DOA-USA Installation Management Command
USA Garrison, Fort Belvoir
Directorate of Public Works
9430 Jackson Loop - Suite 100
Fort Belvoir, VA 22060-5116

Re: Environmental assessment to expand INSCOM's headquarters facilities.

Dear Mr. Sanders:

We appreciate your interest in submitting your project(s) for review by VDGIF to ensure the protection of sensitive wildlife resources during project development. Unfortunately, due to staffing limitations, our Fish and Wildlife Information Services Section (FWIS) is unable to review or provide an assessment of any projects submitted to them for review.
No response from VDGIF does not constitute "no comment" nor does it imply support of the project or associated activities. It simply means VDGIF has not been able to respond.

If you should have further questions or need additional information, please visit:
http://www.dgif.virginia.gov/environmental-programs/

Please feel free to attach a copy of this letter/email with your project paper work.

Sincerely,

Mrs. Gladys D. Cason

Mrs. Gladys D. Cason
Virginia Department of Game & Inland Fisheries
Environmental Services Division
4010 West Broad Street // P.O. Box 11104
Richmond, VA 23230-1104
Phone: (804) 367-0909 Fax: (804) 367-2427
gladys.cason@dgif.virginia.gov

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Appendix D

Natural Resources Surveys

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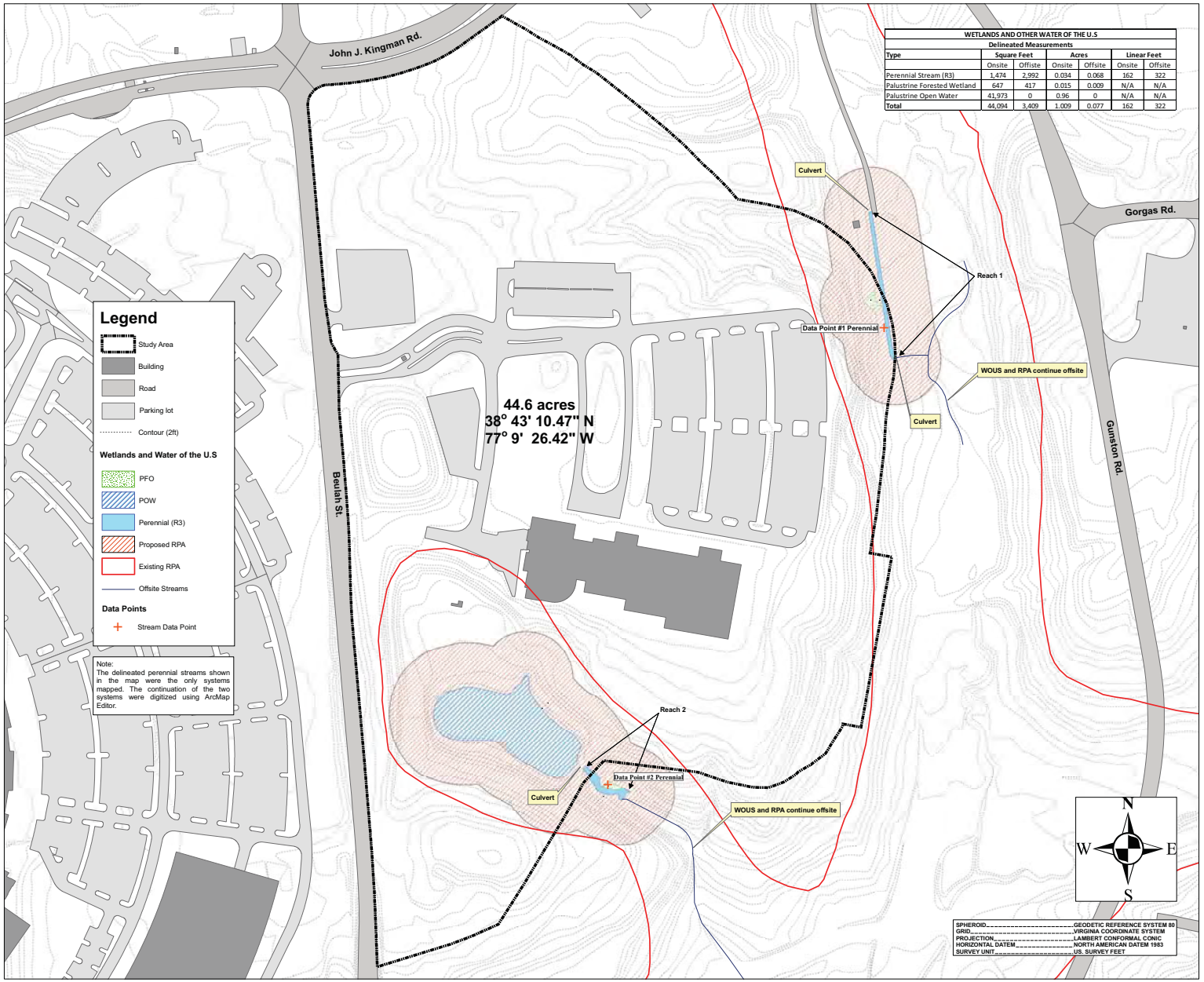


WETLANDS AND OTHER WATER OF THE U.S						
Delineated Measurements						
Type	Square Feet		Acres		Linear Feet	
	Onsite	Offsite	Onsite	Offsite	Onsite	Offsite
Perennial Stream (R3)	1,474	2,992	0.034	0.068	162	322
Palustrine Forested Wetland	647	417	0.015	0.009	N/A	N/A
Palustrine Open Water	41,973	0	0.96	0	N/A	N/A
Total	44,094	3,409	1.009	0.077	162	322

2002 Aerial Imagery w/NWI Data

2008 NAIP Orthophoto w/Estimated Watershed

USGS Fort Belvoir, VA Quadrangle

PACIULLI SIMMONS & ASSOCIATES

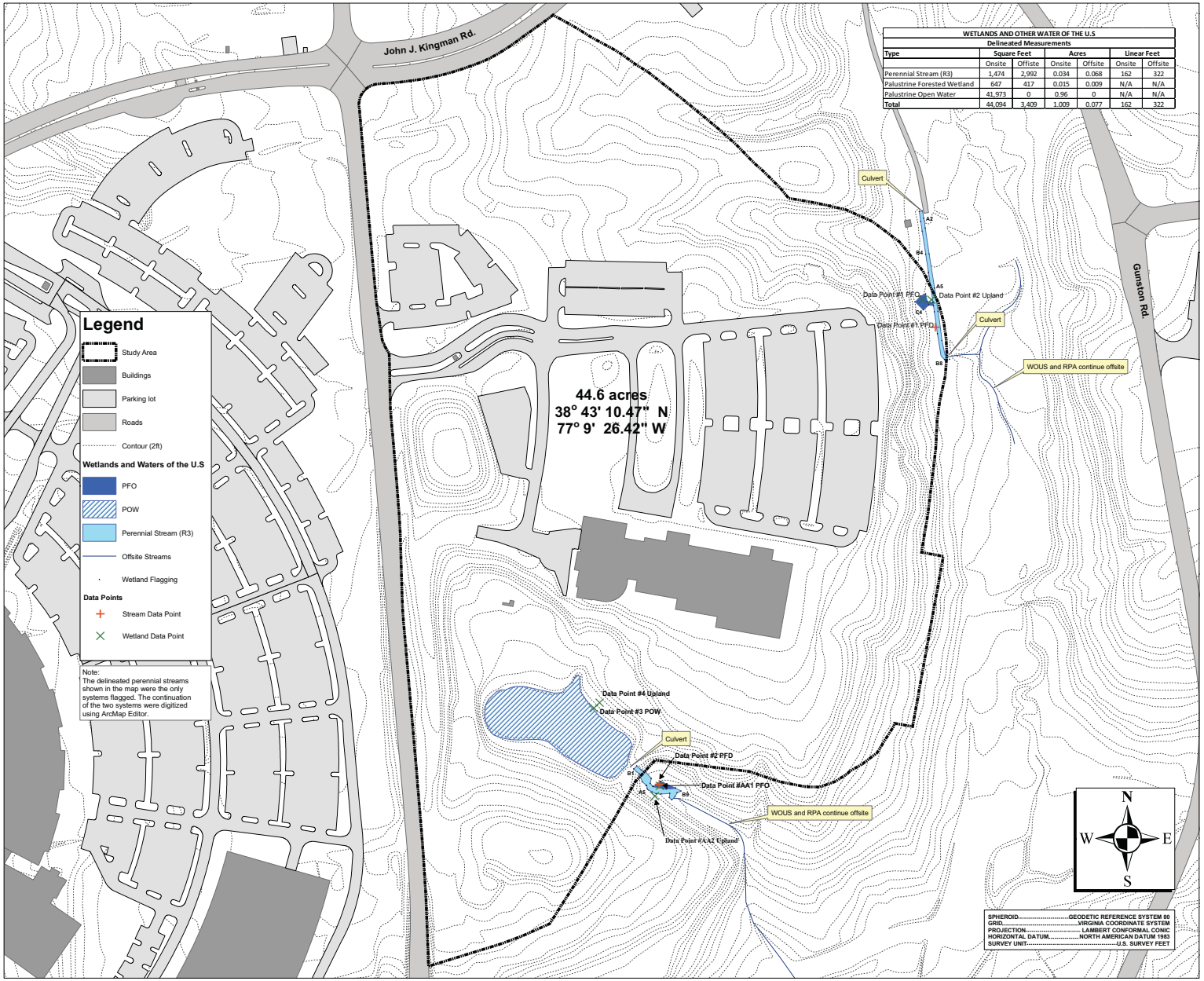
Engineering
Planning
Surveying
Landscape Architecture
Wetland Expertise
Environmental Science

3975 Fair Ridge Drive
Suite 300 South
Fairfax, Virginia 22033
Phone: 703.934.0900
Fax: 703.934.9787
Email: fairfax@psatld.com

INSCOM - SCIF
Fort Belvoir, Virginia

Perennial Flow Determination Map

Scale: 1"=110'
Date: 10/31/11
DRN: ZMW
CKD:
Sheet: 1 of 1
File No:



WETLANDS AND OTHER WATER OF THE U.S
Delineated Measurements

Type	Square Feet		Acres		Linear Feet	
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Total	44,094	3,409	1.009	0.077	162	322

2002 Aerial Imagery w/ NWI Data

2008 NAIP Orthophoto w/RPA Data

USGS Fort Belvoir, VA Quadrangle

PACIULLI SIMMONS & ASSOCIATES
Established 1946

Engineering
Planning
Surveying
Landscape Architecture
Wetland Expertise
Environmental Science

3975 Fair Ridge Drive
Suite 300 South
Fairfax, Virginia 22033
Phone: 703.934.0900
Fax: 703.934.9787
Email: fairfax@psaltd.com

INSCOM - SCIF
Fort Belvoir, VA

Wetland Delineation Map

Scale: 1"=110'
Date: 11/2/11
DRN: ZMW
CKD:
Sheet: 1 of 1
File No:

2008 NAIP Orthophoto Imagery with NWI Data

2002 Aerial Orthophoto with Wildlife Corridor

USGS Fort Belvoir, VA Quadrangle

Legend

- Forest Stand Boundary
- Study Area Boundary
- DP-1 Forest Stand Data Point

PACIULLI SIMMONS & ASSOCIATES

Engineering
Planning
Surveying
Landscape Architecture
Wetland Expertise
Environmental Science

11212 Waples Mill Road
Suite 100
Fairfax, VA 22030-7404
Ph. 703-934-0900
Fax 703-934-9787
E-mail fairfax@psaltd.com

INSCOM-SCIF
Fort Belvoir, Virginia

Forest Stand Delineation Map

N
W E
S

Scale: 1"=100'
Date: 08-01-2011
DRN: KMR
CKD: KMR
Sheet: 1 of 1
File No:

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Appendix E

Federal
Coastal Consistency Determination

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Determination of Consistency with Virginia's Coastal Resources Management Program

Pursuant to Section 307 of the Coastal Zone Management Act of 1972, as amended, this is a Federal Consistency Determination for the expansion of the US Army Intelligence & Security Command's Headquarters Facilities (HQINCOM). The Army is required to determine the consistency of its activities affecting Virginia's coastal resources or coastal uses with the Virginia Coastal Resources Management Program (CRMP).

This document represents an analysis of project activities in light of established Virginia CRMP Enforceable Policies and Programs. Furthermore, submission of this consistency determination reflects the commitment of the Army to comply with those Enforceable Policies and Programs. The proposed project would be constructed and operated in a manner that is consistent with the Virginia CRMP. The Army has determined that the construction, renovation, and operation of the HQINCOM facilities would have a negligible impact on any land and water uses or natural resources of the Commonwealth of Virginia's coastal zone.

1. Description of Proposed Action

The US Army Intelligence and Security Command (INSCOM) proposes to renovate and expand its headquarters on US Army Garrison Fort Belvoir, Virginia. The Proposed Action would include:

- Renovating the existing 234,000-square-foot HQINSCOM Nolan Building.
- Constructing a new 382,000-square-foot addition to the existing HQINSCOM Nolan Building.
- Constructing a 1,420-space parking structure.
- Reconfiguring and reconstructing the surface parking lots, landscaping, roadways, and sidewalks on site.
- Constructing new utilities and a new stormwater management/best management practice pond.

The HQINSCOM site covers approximately 45 acres in the upper part of Fort Belvoir's North Post. Approximately 23 acres on the site are presently developed. Overall development in the upper North Post is clustered and of moderate to low density. The site is presently designated for professional/ institutional land use, as are the sites of the Defense Threat Reduction Agency (DTRA) and the Defense Logistics Agency (DLA) immediately west of Beulah Street.

The HQINSCOM site is bounded by a forested valley to the north and steep-sided, forested stream valleys associated with Mason Run to the east and south. Mason Run and its associated wetlands and Chesapeake Bay Resource Protection Area, and the Fort Belvoir Forest and Wildlife Corridor (FWC) are designated in the Fort Belvoir Real Property Master Plan as "natural constraints on development." These protected areas separate the HQINSCOM site from John J. Kingman Road to the north, Keene Road (a little-used dirt road) and Gunston Road to the east, and Abbot and Stuart Roads to the south. Another small gravel access road south of the existing building currently intrudes into the Chesapeake Bay RPA.

The Proposed Action would rearrange the configuration of buildings, parking, roadways and other features on the HQINSCOM site, but no new functions or uses would be introduced there. The expansion areas would largely be confined to the existing footprint of the complex except for the proposed parking garage and a proposed access road along the east and south sides of the new building. The project would increase overall impermeable surfaces by 4.3 acres. The new construction would encroach on forested habitat, the FWC, and the Chesapeake Bay RPA to varying degrees, with the largest encroachment on forested habitat and the smallest encroachment on the Chesapeake Bay RPA. These impacts would be mitigated through planting of trees at several locations on or in the vicinity of the INSCOM property.

2. Assessment of Probable Effects

In compliance with the National Environmental Policy Act of 1969, Fort Belvoir has prepared an Environmental Assessment (EA) to evaluate the environmental impacts potentially resulting from the proposed expansion and renovation of the HQINSCOM facility. Through this evaluation, Fort Belvoir has determined that the proposed action is consistent, to the maximum extent practicable, with the Commonwealth of Virginia CRMP's enforceable policies, for the following reasons:

- **Fisheries Management**: The proposed action has little or no potential to affect fisheries, either directly or indirectly. There would be no direct impacts on wetlands or aquatic habitats, and compliance with state and the new federal stormwater (see Point Source Pollution Control below) requirements would assure minimal impacts on water quality. Effects on stormwater are addressed in Section 3.4.3 of the EA, while effects on surface and ground water resources are presented in Section 3.7.3.
- **Erosion and Sedimentation Controls:** Strict measures consistent with the *Virginia Erosion and Sediment Control Handbook* would be used to minimize adverse effects to other resources, particularly water quality. Such measures are addressed in Section 3.7.2 of the EA.
- **Subaqueous Lands Management**: The proposed action would not encroach on any subaqueous lands. The Mason Run watershed is approximately one square mile. The Commonwealth of Virginia regulates subaqueous lands where the watershed is greater than five square miles. Effects on water resources are discussed in Section 3.7.3 of the EA.
- **Wetlands Management:** The proposed project would have no impact on wetlands, as explained in Section 1.4 of the EA.
- **Dune Management:** The proposed action has no potential to affect sand dunes; therefore, the EA does not include an evaluation of this resource.
- **Non-Point Source Pollution Control:** The project does not include any new sources of non-point pollution. As such, non-point pollution is not evaluated in the EA.
- **Point Source Pollution Control:** The proposed action would result in a new source (construction stormwater) of point source pollution, but adverse impacts would be minimal, controlled through a Stormwater Pollution Prevention Plan, and subject to obtaining a Virginia Stormwater Management Program (VSMP) Permit. Also applicable, Section 438 of the 2007 Energy Independence and Security Act (EISA) requires federal development projects with a footprint exceeding 5,000 square feet to include site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with

regard to the temperature, rate, volume, and duration of flow, which would also act to control point source pollution. No new sanitary point sources would result from the proposed action. Effects pertaining to stormwater are presented in Sections 3.4.3 and 3.7.2 of the EA.

- **Shoreline Sanitation:** The proposed action does not involve discharges from vessels or sanitary septic systems. Such discharges are not evaluated in the EA.
- **Air Pollution Control:** A construction emissions estimate indicates that the construction activity would not generate sufficient emissions to trigger a need for a full General Conformity Analysis. No changes to the Fort Belvoir's Title V air permit would be required. The construction contractor will be required to follow VAC 5-50-60, Control and Abatement Air Pollution. The impacts of the proposed action on air quality would be minimal, and are discussed in Section 3.3 of the EA.
- **Coastal Lands Management:** As explained in Section 3.7.6 of the EA, the impacts of the proposed action on sensitive lands, including RPAs and RMAs, would be negligible, less than the 2,500 square feet that would normally trigger buffer replacement requirements.

3. Summary of Findings

The preceding analysis is provided in more detail in the EA referenced above. Fort Belvoir would ensure that: the HQINSCOM project design includes appropriate BMPs; the construction contractor uses and maintains appropriate BMPs; project designers obtain the requisite permits and approvals; and INSCOM implements the mitigation measures proposed in the EA. With the proposed mitigation measure, Fort Belvoir finds that the proposed construction, renovation, and operation of HQINSCOM facilities would be consistent to the maximum extent practicable with the federally-approved enforceable policies of the Virginia CRMP, pursuant to the Coastal Zone Management Act of 1982, as amended, and in accordance with 15 CFR 930.30.

By certification that the Proposed Action is consistent with the Virginia CRMP Enforceable Policies, the Commonwealth of Virginia is hereby notified that it has 60 days from receipt of this document to concur with, or object to, this Federal Consistency Determination. However, pursuant to 15 CFR 930.62(b), if the Commonwealth of Virginia has not issued a decision within 60 days from receipt of this determination, it shall notify Fort Belvoir of the status of this matter and the basis for further delay. Point of contact is Mr. Patrick McLaughlin, Chief, Environmental and Natural Resources Division, Directorate of Public Works by telephone at 703-806-4007, or by email at imcom.fortbelvoir.dpw.environmental@us.army.mil.

Gregory D. Gadson
Colonel, US Army
Garrison Commander

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Appendix F

Environmental Assessment Public Distribution List

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Environmental Assessment
Expansion of U.S. Army Intelligence & Security Command Headquarters Facilities
Public Distribution List
August 2, 2012

Honorable Scott Surovell Virginia House of Delegates P.O. Box 289 Mount Vernon, Virginia 22121	Ms. Cynthia Arrington Virginia National Defense Industrial Authority P.O. Box 798 Richmond, Virginia 23218
Honorable David Albo Virginia House of Delegates 6367 Rolling Mill Place, Suite 102 Springfield, Virginia 22150	Mr. Mike McClanahan Chief of Staff Lee District Association of Civic Organizations P.O. Box 10413 Alexandria, Virginia 22310
Honorable Vivian E. Watts Virginia House of Delegates 8717 Mary Lee Lane Annandale, Virginia 22003	Mr. David Versel Executive Director Southeast Fairfax Development Corporation 8850 Richmond Highway, Suite 105 Alexandria, Virginia 22309
Honorable Richard L. Saslaw Virginia Senate, District 35 P.O. Box 1856 Springfield, VA 22151	Honorable Sharon Bulova Chairman, Fairfax County Board of Supervisors Fairfax County Government Center 12000 Government Center Parkway, Suite 530 Fairfax, Virginia 22035-0071
Honorable Linda T. Puller Virginia Senate, District 36 P.O. Box 73 Mount Vernon, Virginia 22121-0073	Supervisor Gerald Hyland Fairfax County Board of Supervisors Mount Vernon Government Center 2511 Parkers Lane Alexandria, Virginia 22306-3273
Honorable George L. Barker Virginia Senate, District 39 P.O. Box 10527 Alexandria, Virginia 22310	Supervisor Jeff McKay Fairfax County Board of Supervisors Franconia Government Center 6121 Franconia Road Franconia, Virginia 22310-2508
Honorable Gerry Connolly Representative in Congress Annandale District Office 4115 Annandale Road, Suite 103 Annandale, Virginia 22003	Supervisor Pat Herrity Fairfax County Board of Supervisors West Springfield Governmental Center 6140 Rolling Road Springfield, Virginia 22152-1580
Honorable James P. Moran Representative in Congress 333 North Fairfax Street, Suite 201 Alexandria, Virginia 22314	Mr. Edward L. Long, Jr. Fairfax County Executive 12000 Government Center Parkway, Suite 552 Fairfax, Virginia 22035-0066
Honorable Mark Warner Senator of Virginia 475 Russell Senate Office Bldg Washington, DC 20510	Peter F. Murphy, Jr. Chairman Fairfax County Planning Commission 4050 Legato Road, Suite 400 Fairfax, Virginia 22033
Honorable Jim Webb Senator of Virginia 248 Russell Senate Office Bldg Washington, DC 20510	Ms. Laura Miller Fairfax County Department of Transportation 4050 Legato Road, Suite 400 Fairfax, Virginia 22033

Mr. Todd Hafner Director of Planning and Development Northern Virginia Regional Park Authority 5400 Ox Road Fairfax Station, Virginia 22039	Mr. Thomas Biesiadny Director Fairfax County Department of Transportation 4050 Legato Road, Suite 400 Fairfax, Virginia 22033
Mr. Kanathur Srikanth Director, Planning Section Northern Virginia District Virginia Department of Transportation 4975 Alliance Drive Fairfax, Virginia 22030	Mr. Fred R. Selden Director Department of Planning and Zoning 12055 Government Center Parkway, Suite 730 Fairfax, Virginia 22035
Mr. Tom Fahrney Northern Virginia District Virginia Department of Transportation 4975 Alliance Drive Fairfax, Virginia 22030	Ms. Marianne Gardner Director, Planning Division Department of Planning and Zoning 12055 Government Center Parkway, Suite 730 Fairfax, Virginia 22035
Mr. David Robertson Executive Director Metropolitan Washington Council of Governments 777 N. Capitol Street, N.E., Suite 300 Washington, DC 20002	Ms. Lynn Tadlock Planning and Development Division Fairfax County Park Authority 12055 Government Center Parkway, Suite 421 Fairfax, Virginia 22035-1118
Mr. Richard K. Taube Executive Director Northern Virginia Transportation Commission 2300 Wilson Boulevard, Suite 620 Arlington, Virginia 22201	Ms. Karen DelGrosso NEPA-Federal Facilities Director U. S. Environmental Protection Agency Region 3 Attn: 3EA30 – NEPA 1650 Arch Street Philadelphia, Pennsylvania 19103-2029
Ms. Ellie Irons Program Manager Office of Environmental Impact Review Virginia Department of Environmental Quality P.O. Box 1105 Richmond, Virginia 23218	Ms. Linda Cornish Blank Historic Preservation Planner Fairfax County Department of Planning & Zoning 12055 Government Center Parkway, Suite 730 Fairfax, Virginia 22035
Mr. John Bricker State Conservationist USDA, Natural Resources Conservation Service 1606 Santa Rosa Road, Suite 209 Richmond, Virginia 23229-5014	Ms. Darci Levit The Audubon Society of Northern Virginia 4022 Hummer Road Annandale, Virginia 22003
Mr. Marcel Acosta Executive Director National Capital Planning Commission 401 Ninth Street NW, Suite 500, North Lobby Washington, DC 20004	Mr. Marc Holma Virginia Department of Historic Resources 2801 Kensington Ave. Richmond, Virginia 23221

Ms. Mary Colligan Protected Resources National Marine Fisheries Service Northeast Region 55 Great Republic Drive Gloucester, Massachusetts 01930-2276	Mr. Paul Herbert President Historical Society of Fairfax County Virginia P.O. Box 415 Fairfax, Virginia 22038
Ms. Patricia Soriano Mount Vernon Group, Sierra Club 5405 Barrister Place Alexandria, Virginia 22304	Ms. Susan Hellman Acting Executive Director Woodlawn Plantation and Frank Lloyd Wright's Pope Leighey House P.O. Box 15097 Mt. Vernon, Virginia 22309
Ms. Lucia Ferguson Mason Neck Citizens Association P.O. Box 505 Mason Neck, Virginia 22199	Ms. Cindy Schulz Supervisor U. S. Fish and Wildlife Service Virginia Field Office 6669 Short Lane Gloucester, Virginia 23061
Ms. Gloria Bannister South County Federation P.O. Box 442 Mason Neck, Virginia 22199-0442	Ms. Aimee Vosper Environmental and Planning Services Director Northern Virginia Regional Commission 3060 Williams Drive, Suite 510 Fairfax Virginia 22031
Ms. Judy Riggin Alexandria Monthly Meeting Religious Society of Friends 2405 Nemeth Court Alexandria, Virginia 22306	Ms. Elizabeth Crowell Fairfax County Park Authority Cultural Resources Management James Lee Center 2855 Annandale Road Fairfax, Virginia 22042
Chairman Bob Reynolds Mount Vernon Council of Citizens' Associations P.O. Box 203 Alexandria, Virginia 22121	Reverend Donald Binder Pohick Church 9301 Richmond Highway Lorton, Virginia 22076
Chairman Jim Davis Mount Vernon Council of Citizen's Associations P.O. Box 203 Mount Vernon, Virginia 22121-0203	Ms. Katy Fike Mount Vernon Lee Chamber of Commerce 6515 Potomac Ave #B-1 Alexandria, VA 22307
Ms. Stella Koch Northern Virginia Environment Network 1056 Manning Street Great Falls, Virginia 22066	Mr. Brett Kenney Mount Vernon Board of Supervisors 2511 Parkers Lane Alexandria, Virginia 22306
Ms. Kathi McNeil Friends of Huntley Meadows C/O Huntley Meadows Park 3701 Lockheed Blvd. Alexandria, Virginia 22306	Mr. David Reese Director Gunston Hall Plantation 10709 Gunston Road Mason Neck, Virginia 22079
Mr. Kevin Monroe Huntley Meadows Park 3701 Lockheed Boulevard Alexandria, Virginia 22306	Ms. Martha Catlin 8324 Mount Vernon Hwy. Alexandria, Virginia 22309

Mr. Nathan Lott The Virginia Conservation Network 422 East Franklin Street, Suite 303 Richmond, Virginia 23219	Ms. Kathryn Alleman - Branch Manager Fairfax County Public Library John Marshall Branch 6209 Rose Hill Drive Alexandria, Virginia 22310-6299
Rev. Travis Hilton Woodlawn Baptist Church 9001 Richmond Highway Alexandria, Virginia 22309	Ms. Barbara Rice - Branch Manager Fairfax County Public Library Kingstowne Branch 6500 Landsdowne Centre Alexandria, Virginia 22315-5100
Ms. Patricia Tyson 8641 Mount Vernon Highway Alexandria, Virginia 22309	Ms. Gari Plehal - Branch Manager Fairfax County Public Library Lorton Branch 9520 Richmond Highway Lorton, Virginia 22079-2124
Mr. Todd Benson Park Manager Pohick Bay Regional Park 6501 Pohick Bay Drive Lorton, Virginia 22079	Ms. Denise Morgan - Branch Manager Fairfax County Public Library Sherwood Regional Branch 2501 Sherwood Hall Lane Alexandria, Virginia 22306-2799
Mr. Greg Weiler Refuge Manager Mason Neck National Wildlife Refuge 14344 Jefferson Davis Highway Woodbridge, Virginia 22191	Mr. Daniel Sadowitz - Director Van Noy Library 5966 12th St. Building 1024 Fort Belvoir, Virginia 22060
Mr. Philip Latasa Friends of Accotink Creek 127 Poplar Road Fredericksburg, Virginia 22406-5022	
Mr. Peyton Robertson Director National Marine Fisheries Service Chesapeake Bay Program Office 410 Severn Ave., Suite 107A Annapolis, Maryland 21403	

Appendix G

Public Comments and Army Responses

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Comment Response Matrix
EA and Draft FNSI
Expansion of INSCOM Headquarters Facilities

Name/ Agency	Comment Number	Comment Category	Comment	Response
Federal Agency (code 'F')				
Natural Resources Conservation Service	F-1-1	Natural Resources Soils	The finding of "No Significant Impact" is correct concerning the soil resources. The soils that would be affected by this construction under the Farmland Protection Policy Act would classify as "committed to urban" and thus not covered under the FPPA.	Concur.
State Agency (code 'S')				
Virginia Dept of Historic Resources	S-1-1	Cultural Resources	No further identification efforts are warranted. No historic properties will be affected by the project. Should unidentified resources be discovered during implementation of the project, please notify DHR.	Concur.
Virginia Dept of Historic Resources	S-1-2	Cultural Resources	According to DHR, the Army and its agents have been in direct consultation with DHR pursuant to Section 106 NHPA, as amended, and its implementing regulation 36 CFR Part 800. The parties have reached consensus that the US Army Intelligence and Security Command Headquarters Facility at Fort Belvoir will not affect historic properties. For additional information, contact DHR, Roger Kirchen at (804) 482-6091.	Concur.
Virginia Dept of Environmental Quality (DEQ)	S-2-1		Provided activities are performed in accordance with the recommendations which follow in the Impacts and Mitigation section of this report, this proposal is unlikely to have significant effects on ambient air quality, important farmland, forest resources, and wetlands. It is unlikely to adversely affect species of plants or insects listed by state agencies as rare, threatened, or endangered. However, DEQ was unable to complete its review of the FCD at this time due to unresolved issues associated with potential project impacts to Chesapeake Bay Resource Protection Areas (see pages 20-21).	Federal Consistency Determination issue has since been resolved through subsequent discussions between Fort Belvoir and DCR staff (see comment S-2-1a and S-6-4a).

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia Dept of Environmental Quality (DEQ)	S-2-1a	Federal Consistency Determination	(REVISED COMMENT) Based on our review of the Army's consistency determination and the comments submitted by agencies administering the enforceable policies of the VCP, DEQ conditionally concurs that the proposal is consistent with the VCP provided the proposal complies with all the applicable permits, approvals and conditions of the enforceable policies of the VCP (see detailed discussion below). The conditions of this concurrence include, but are not limited to , consistency with the coastal lands management enforceable policy which is contingent on conformance with 9 VAC 10-20-130 1d of the Regulations, which provides that roads and driveways may be constructed in or across Resource Protection Areas if each of the following conditions is met: (1) DCR finds that there are no reasonable alternatives to aligning the road or driveway in or across the Resource protection Area; (2) The alignment and design of the road or driveway are optimized, consistent with other applicable requirements, to minimize i. encroachment in the Resource Protection Area and ii. adverse effects on water quality; (3) The design and construction of the road or driveway satisfy all applicable criteria of this chapter, including submission of a water quality impact assessment; and (4) DCR reviews the plan for the road or driveway proposed in or across the Resource Protection Area in coordination with local government site plan, subdivision and plan of development approvals. In accordance with the Federal Consistency Regulations at 15 CFR Part 930, section 930.4, this conditional concurrence is based on the Army obtaining necessary authorizations prior to any ground disturbance. If the requirements of section 930.4, sub-paragraphs (a)(1) through (a)(3) are not met, this conditional concurrence becomes an objection under 15 CFR Part 930, section 940.43.	Concur.
Virginia DEQ	S-2-2	Hazardous Materials/ Hazardous Wastes	DEQ recommends that the use of herbicides or pesticides for construction or landscape maintenance should be in accordance with the principles of integrated pest management. The least toxic pesticides that are effective in controlling the target species should be used. Contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more information.	Concur.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia DEQ	S-2-3	Pollution Prevention	We have several pollution prevention recommendations that may be helpful in the construction of this project and in the operation of the facility: • Consider development of an effective Environmental Management System (EMS). An effective EMS will ensure that the airport is committed to minimizing its environmental impacts, setting environmental goals, and achieving improvements in its environmental performance. DEQ offers EMS development assistance and it recognizes facilities with effective Environmental Management Systems through its Virginia Environmental Excellence Program. • Consider environmental attributes when purchasing materials. For example, the extent of recycled material content, toxicity level, and amount of packaging should be considered and can be specified in purchasing contracts. • Consider contractors' commitment to the environment (such as an EMS) when choosing contractors. Specifications regarding raw materials and construction practices can be included in contract documents and requests for proposals. • Choose sustainable materials and practices for infrastructure construction and design. These could include asphalt and concrete containing recycled materials, and integrated pest management in landscaping, among other things. • Integrate pollution prevention techniques into the facility maintenance and operation, to include the following: inventory control (record-keeping and centralized storage for hazardous materials}, product substitution (use of non- toxic cleaners), and source reduction (fixing leaks, energy-efficient HVAC and equipment). Maintenance facilities should be designed with sufficient and suitable space to allow for effective inventory control and preventative maintenance.	Comment noted. Pursuit of a silver certification under the LEED rating system will assist in achieving many of these goals.
Virginia DEQ	S-2-4	Pollution Prevention	DEQ's Office of Pollution Prevention provides information and technical assistance relating to pollution prevention techniques and EMS. For more information, contact DEQ's Office of Pollution Prevention, Sharon Baxter at (804} 698-4344.	comment noted.
Virginia DEQ	S-2-5	Energy Conservation	The proposed facilities should be planned and designed to comply with state and federal guidelines and industry standards for energy conservation and efficiency. For example, the energy efficiency of the facility can be enhanced by maximizing the use of the following: • thermally-efficient building shell components (roof, wall, floor, windows, and insulation); • facility siting and orientation with consideration towards natural lighting and solar loads • high efficiency heating, ventilation, air conditioning systems; • high efficiency lighting systems and daylighting techniques; and • energy-efficient office and data processing equipment.	Comment noted. The project intends to achieve a Silver rating under the USGBC's LEED rating system in addition to complying with Army energy use reduction policies which will require the building to achieve energy efficiency goals far above those required by basic building code.
Virginia DEQ	S-2-6	Energy Conservation	Contact the Department of Mines, Minerals, and Energy, David Spears at (434) 951-6350 for additional information. For more information on the LEED rating system visit: http://www.leedbuilding.org.	Comment noted.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia DEQ	S-2-7	Infrastructure and Utilities Potable Water Supply	The following recommendations will result in reduced water use associated with the operation of the facilities. • Grounds should be landscaped with hardy native plant species to conserve water as well as lessen the need to use fertilizers and pesticides. • Convert turf to low water-use landscaping such as drought resistant grass, plants, shrubs and trees. • Low-flow toilets should be installed with the rehabilitation. • Consider installing low flow restrictors and aerators to faucets. • Improve irrigation practices by: o upgrading sprinkler clock; water at night, if possible, to reduce evapotranspiration (lawns need only 1 inch of water per week, and do not need to be watered daily; overwatering causes 85% of turf problems); o installing a rain shutoff device; and o collecting rainwater with a rain bucket or cistern system with drip lines. • Install new high-efficiency washers and dishwashers to reduce water useage by 30-50% per use over older models. • Check for and repair leaks (toilets and faucets) during regular routine maintenance activities.	Comment noted. Many of these recommendations including using native plant species and low flow toilets are included in the current design.
Virginia DEQ Northern Regional Office (NRO)	S-3-1	Natural Resources Surface Waters	The DEQ Northern Regional Office (NRO) finds the project does not currently propose impacts to surface waters.	Concur.
Virginia DEQ Northern Regional Office (NRO)	S-3-2	Natural Resources Surface Waters	DEQ-NRO Virginia Water Protection Permit (VWPP) staff recommends that project activities avoid and minimize impacts to the surface waters to the maximum extent practicable.	Concur.
Virginia DEQ Northern Regional Office (NRO)	S-3-3	Natural Resources Surface Waters	A VWPP from DEQ-NRO may be required should impacts to surface waters become necessary. The initiation of the VWPP review process is accomplished through the submission of a Joint Permit Application (JPA) (form MAC 30-300) to the Virginia Marine Resources Commission (VMRC). Upon receipt of a JPA for the proposed surface waters impacts, VWPP staff at DEO-NRO will review the proposed project in accordance with the VWPP program regulations and guidance.	Comment noted.
Virginia Marine Resources Commission (VMRC)	S-4-1	Natural Resources Surface Waters	If any portion of the subject projects involves encroachments channelward of ordinary high water along natural rivers and streams, a permit may be required from VMRC. The VMRC serves as the clearinghouse for the JPA used by the: • U.S. Army Corps of Engineers (Corps) for issuing permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act; • DEQ for issuance of a Virginia Water Protection Permit; • VMRC for encroachments on or over state-owned subaqueous beds as well as tidal wetlands; and • local wetlands board for impacts to wetlands.	Comment noted.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia Dept of Conservation and Recreation (DCR) Div of Stormwater Management (DSM)	S-5-1	Natural Resources Soils	According to DCR-DSM, the Army and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with the VESCL&R, VSWML&R (including coverage under the general permit for stormwater discharge from construction activities), and other applicable federal nonpoint source pollution mandates (e.g., Clean Water Act Section 313 and federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, or other structures, soil or dredge spoil areas, or related land conversion activities that disturb greater than 2,500 square feet or more in designated Chesapeake Bay Preservation Areas (CBPAs), or areas on federal lands which are analogous to CPBAs, would be regulated by VESCL&R and VSWML&R. Accordingly, the Army must prepare and implement erosion and sediment control plan to ensure compliance with state law and regulations. The ESC plan is submitted to the OCR Regional Office that serves the area where the project is located for review for compliance. The Army is ultimately responsible for achieving project compliance through oversight of on site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy. [Reference: VESCL §10.1-567].	Concur. Project will comply.
Virginia DCR-DSM	S-5-2	Natural Resources Soils	The operator or owner of construction activities involving land-disturbing activities equal to or greater than 2,500 square feet in areas designated as subject to the Chesapeake Bay Preservation Area Designation and Management Regulations are required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations. General information and registration forms for the General Permit are available on OCR's website at http://www.dcr.virqinia.qov/stormwater manaqementlstormwat.shtml. [Reference: Virginia Stormwater Management Act§10.1-603.1 et seq.; VSMP Permit Regulations 4 VAC-50 et seq.]	Concur. Project will comply.
Virginia DCR-DSM, Local Implementation	S-6-1	Land Use, Plans, and Coastal Zone Management	According to DCR-DSM-LI, the Bay Act, as locally implemented through the Fairfax County Chesapeake Bay Preservation Ordinance, strictly controls land disturbance in environmentally sensitive lands. These areas include Resource Protection Areas and Resource Management Areas (RMAs) as designated by the local government. RPAs include: • tidal wetlands; • certain non-tidal wetlands; • tidal shores; and • a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. RMAs are subject to the county's jurisdiction-wide performance criteria for development activities.	Comment noted. Fort Belvoir recognizes the RPA and RMA designations.
Virginia DCR-DSM, Local Implementation	S-6-2	Land Use, Plans, and Coastal Zone Management	Federal actions on installations located within Virginia's federally approved coastal zone under the Coastal Zone Management Act are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated Chesapeake Bay Preservation Areas (CBPAs). The following requirements apply to the proposed project.	Concur.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia DCR-DSM, Local Implementation	S-6-2a	Land Use, Plans, and Coastal Zone Management	RPA Delineation - Pursuant to 9 VAC 10-20-105 of the Regulations, an on-site delineation of the RPA is required for all projects in CBPAs. Because U.S. Geological Survey maps are not always indicative of site conditions, they may not be used to determine the site-specific boundaries of the RPA. The applicant should be aware that on-site delineation of the RPA and/or RMA may necessitate the undertaking of a perennial flow determination.	Concur, the Army performed an on-site delineation of the RPA for this project.
Virginia DCR-DSM, Local Implementation	S-6-2b	Land Use, Plans, and Coastal Zone Management	Development in RPA - Development within an RPA is subject to the development criteria of 9 VAG 10-20-120 and 130 of the Regulations and the local ordinance. No land disturbance (to include clearing of vegetation) or development is to occur within RPAs unless specifically permitted by the Regulations and the local ordinance.	Concur, development within the RPA for this project is consistent with the Regulations.
Virginia DCR-DSM, Local Implementation	S-6-2c	Land Use, Plans, and Coastal Zone Management	General Performance Criteria - Development on lands analogous to RPAs and RMAs are subject to general performance criteria found in 9 VAG 10-20-120 of the Regulations, including requirements to: • minimize land disturbance (including access and staging areas); • retain indigenous vegetation; and • minimize post-development impervious surfaces. For land disturbance over 2,500 square feet, the project must comply with: • the requirements of the Virginia Erosion & Sediment Control Handbook, Third Edition, 1992; and • stormwater management criteria consistent with water quality protection provisions of the Virginia Stormwater Management Regulations (4 VAC 50-60-10) shall be satisfied.	Concur, project will comply.
Virginia DCR-DSM, Local Implementation	S-6-2d	Land Use, Plans, and Coastal Zone Management	Chesapeake Ecosystem Unified Plan - The 1998 Chesapeake Ecosystem Unified Plan requires the signatories, including the Department of the Army, to fully cooperate with local and state governments in carrying out voluntary and mandatory actions to comply with the management of stormwater. All signatory agencies committed to encouraging construction design that: (a) minimizes natural area loss on new and rehabilitated federal facilities; (b) adopts low impact development and best management technologies for stormwater, sediment and erosion control, and reduces impervious surfaces; and (c) considers the Conservation Landscaping and BayScapes Guide for Federal Land Managers.	Comment noted, project design is consistent with Army's commitment.
Virginia DCR-DSM, Local Implementation	S-6-2e	Land Use, Plans, and Coastal Zone Management	Chesapeake 2000 Agreement - The Chesapeake 2000 Agreement committed the signatory agencies to a number of sound land use and stormwater quality controls. The signatories additionally committed the agencies to lead by example with respect to controlling nutrient, sediment and chemical contaminant runoff from govemment properties. In December 2001, the Executive Council of the Chesapeake Bay Program issued Directive No. 01-1: Managing Storm Water on State, Federal and District-owned Lands and Facilities, which includes specific commitments for agencies to lead by example with respect to stormwater control.	Concur.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia DCR-DSM, Local Implementation	S-6-3	Land Use, Plans, and Coastal Zone Management	DCR-DSM-LI finds that the proposed project is within lands analogous to locally designated CBPAs. A review of the Fairfax County RPA maps and the EA indicate that there are RPA lands located on the project site. The Natural Constraints on Development map (EA, Figure 6) shows RPA lands between Beulah Street and the existing INSCOM building. The EA (page 3-66) states that a "...proposed peripheral road for the expanded building would encroach on approximately 1,672 square feet...near the southwest corner of the building." Land disturbance (to include clearing of vegetation) or development within RPAs is not allowed unless specifically permitted by the Regulations and the local ordinance.	The project's development in the RPA is consistent with 9VAC10-120-130 1(d) that allows road construction within an RPA provided they meet certain conditions. This road is for emergency vehicle access only and no other alternative exists. Permeable materials will be considered for this road and a Water Quality Impact Analysis will be included in the final design package. Fort Belvoir is engaged in the design process and will approve the final design. This satisfies the conditions for encroachment into the RPA.
Virginia DCR-DSM, Local Implementation	S-6-4	Land Use, Plans, and Coastal Zone Management	DCR-DSM-LI concludes that, as proposed, the project is inconsistent with the coastal lands management enforceable policy of the Virginia Coastal Zone Management Program as administered through the Bay Act and Regulations.	Discussions between Fort Belvoir staff and Virginia DCR staff resulted in this comment being revised. See comment S-2-1a and S-6-4a.
Virginia DCR-DSM, Local Implementation	S-6-4a	Land Use, Plans, and Coastal Zone Management	(REVISED COMMENT) Based on additional information provided by the Army, DCR-DSM-LI finds that it appears that the only area of RPA encroachment would occur at the western terminus of the fire road at the southwest corner of the proposed building expansion located in the southern half of the property. Therefore, to ensure that the proposed encroachment meets the criteria reference in 9 VAC 10-20-130 1 d 9 of the Regulations and because the proposed fire road does not meet the definition of a public road, DCR staff requires the Army submit a Water Quality Impact Assessment (WQIA) for DCR-DSM-LI review. DCR-DSM-LI concludes that, provided the Army submits a WQIA for DCR-DSM-LI review, the proposed activity would be consistent with the coastal lands management enforceable policy of the Virginia Coastal Zone Management Program as administered through the Bay Act and Regulations, if (note: use if since started off with provided) land disturbance (to include clearing of vegetation) or development does not occur within RPAs unless specifically permitted by the Regulations.	Concur. The Army has submitted a draft WQIA for DCR review already and will submit a final WQIA once design plans for this project are finalized.
Virginia DEQ Air Quality Div	S-7-1	Air Quality	According to the DEQ Air Division, the project site is located in a designated ozone nonattainment area and emission control area for and oxides of nitrogen (NOx) and volatile organic compounds (VOCs). Precursors to ozone (03) pollution include VOCs and NOx.	Concur.
Virginia DEQ Air Quality Div	S-7-2	Air Quality	The project proponent should take all reasonable precautions to limit emissions of VOCs and NOx, principally by controlling or limiting the burning of fossil fuels.	Concur.
Virginia DEQ Air Quality Div	S-7-3	Air Quality	In accordance with 9 VAG 5-40-5490, there are limitations on the use of "cut-back" {liquefied asphalt cement, blended with petroleum solvents) that may apply to paving activities associated with the project. The asphalt must be "emulsifiedu (predominantly cement and water with a small amount of emulsifying agent) except when specified circumstances apply. Moreover, there are time-of-year restrictions on its use during the months of April through October in VOC emission control areas.	Concur, project will comply.
Virginia DEQ Air Quality Div	S-7-4	Air Quality	Fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following: • Use, where possible, of water or chemicals for dust control; • Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials; • Covering of open equipment for conveying materials; and • Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.	Concur, project will comply.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia DEQ Air Quality Div	S-7-5	Air Quality	If project activities include the open burning or use of special incineration devices for the disposal of land clearing debris, this activity must meet the requirements of 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-1OOof the Regulations tor open burning, and it may require a permit. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The project proponent should contact Fairfax County officials to determine what local requirements, if any, exist.	Comment noted. Fort Belvoir maintains a "No Open Burning" policy on construction sites.
Virginia DEQ Air Quality Div	S-7-6	Air Quality	The installation of fuel burning equipment (e.g. boilers and generators), may require permitting from DEQ prior to beginning construction of the facility (9 VAC 5-80, Article 6, Permits for New and Modified Sources). The project proponent should contact DEQ- NRO for guidance on whether this provision applies.	Comment noted, project will comply.
Virginia DEQ Division of Land Protection and Revitalization	S-8-1	Hazardous Materials/ Hazardous Wastes	DEQ's Division of Land Protection and Revitalization (DLPR) (formerly the Waste Division) determined that solid and hazardous waste issues and sites were generally addressed in the report. DEQ-DLPR staff performed a cursory review of DEQ data files and determined that there are a number of Resource Conservation and Recovery Act (RCRA) hazardous waste sites, one Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) site and one petroleum release site located within a 500-foot radius of the project site. A detailed list of these sites is attached to this review. The DEQ Federal Facilities Restoration Program notes that the EA indicates that the project site is in close proximity to the T-15 Range Military Munitions Restoration Program (MMRP) site at Fort Belvoir.	Comment noted
Virginia DEQ Division of Land Protection and Revitalization	S-8-2	Hazardous Materials/ Hazardous Wastes	The following website may be accessed to locate additional information on RCRA hazardous waste sites using their identification numbers: http://www.epa.gov/enviro/html/rcris/rcris query java.html.	Comment noted.
Virginia DEQ Division of Land Protection and Revitalization	S-8-3	Hazardous Materials/ Hazardous Wastes	The DEQ Federal Facilities Restoration Program recommends contacting the Environmental Compliance Branch Chief at the Directorate of Public Works, Environmental and Natural Resource Division, Fort Belvoir for information concerning CERCLA obligations at Fort Belvoir's Main Post. The Directorate should be advised prior to initiating any land, sediment, or groundwater disturbing activities at or near MMRP range areas and Main Post Solid Waste Management Units (SWMUs). Please contact DEQ, Wade Smith at (804) 698-4125 or wade.smith@deq.virqinia.qov with any additional questions regarding this recommendation.	Comment noted.
Virginia DEQ Division of Land Protection and Revitalization	S-8-4	Hazardous Materials/ Hazardous Wastes	DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the red'uction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.	Concur.
Virginia DEQ Division of Land Protection and Revitalization	S-8-5	Hazardous Materials/ Hazardous Wastes	Any soil that is suspected of contamination or wastes that are generated during construction-related activities must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations.	Concur. Project will comply.
Virginia DEQ Division of Land Protection and Revitalization	S-8-6	Hazardous Materials/ Hazardous Wastes	All structures to be demolished, renovated or removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to construction. If ACM or LBP are found, state regulations 9 VAG 20-80-640 for ACM and 9 VAC 20-60-261 for LBP must be followed. Questions about ACM and LBP may be directed to Ms. Kathryn Perszyk at DEQ's Northern Virginia Regional Office, 703-583-3856.	Concur

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia DCR Division of Natural Heritage	S-9-1	Natural Resources Threatened and Endangered Species	DCR-DNH confirms the presence of natural heritage resources in the project area and that it does not anticipate that this project will adversely impact these resources due to the scope of the activity and the distance to the resources.	Concur.
Virginia DCR Division of Natural Heritage	S-9-2	Natural Resources Threatened and Endangered Species	Under a Memorandum of Agreement established between VDACS and OCR, OCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. OCR finds that the current activity will not affect any documented state-listed threatened or endangered plants or insects.	Concur.
Virginia DCR Division of Natural Heritage	S-9-3	Natural Resources Threatened and Endangered Species	OCR files do not indicate the presence of any State Natural Area Preserves under the agency's jurisdiction in the project vicinity.	Concur.
Virginia DCR Division of Natural Heritage	S-9-4	Natural Resources Threatened and Endangered Species	Contact DCR-DNH, Rene Hypes at (804) 371-2708 for an update on natural heritage information if a significant amount of time passes before the project is initiated since new and updated information is continually added to the Biotics Data System.	Comment noted.
Virginia Dept of Game and Inland Fisheries	S-10-1	Natural Resources Threatened and Endangered Species	According to DGIF records, the state-listed threatened bald eagle, state-listed threatened wood turtle, and anadromous fish use areas have been documented from the project area. However, based on the scope and location of the proposed work, DGIF does not anticipate it to result in adverse impacts upon these species and resources.	Concur.
Virginia Dept of Game and Inland Fisheries	S-10-2	Natural Resources	DGIF offers the following recommendations to minimize overall project impacts to wildlife and natural resources: • avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable; • maintain undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams; • maintain wooded lots to the fullest extent possible; • adhere to a time-of-year restriction protective of resident and migratory songbird nesting from March 15 through August 15 of any year for all tree removal and ground clearing; • adhere to erosion and sediment controls during ground disturbance; and • design stormwater controls to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to: o utilizing bioretention areas, and o minimizing the use of curb and gutter in favor of grassed swales.	Comment noted. Project will comply where applicable.
Virginia Dept of Game and Inland Fisheries	S-10-3	Natural Resources	Bioretention areas (also called rain gardens) and grass swales are components of Low Impact Development (LID). They are designed to capture stormwater runoff as close to the source as possible and allow it to slowly infiltrate into the surrounding soil. They benefit natural resources by filtering pollutants and decreasing downstream runoff volumes.	Comment noted.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia Dept of Game and Inland Fisheries	S-10-4	Natural Resources	DGIF generally does not support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor does it support the creation of in- stream stormwater management ponds.	Comment noted.
Virginia Dept of Game and Inland Fisheries	S-10-5	Natural Resources	DGIF is available to assist the Army in developing a plan that includes open-space, wildlife habitat, and natural stream channels which retain their wooded buffers. For additional information and coordination, contact DGIF, Amy Ewing at (804) 367-2211.	Comment noted.
Virginia Dept of Forestry	S-11-1	Natural Resources Vegetation	According to VDOF, it appears this project will have a very minor impact on the forest resources of the Commonwealth based on the environmental assessment document and documents posted on the Fort Belvoir web site. The EA indicates how the 4.68 acres of impacted forestland will be mitigated. The assessment also provides consideration for protecting residual forestland from damage during construction.	Concur.
Virginia Dept of Forestry	S-11-2	Natural Resources Vegetation	The following measures are recommended during construction to protect trees not slated for removal: • Where feasible, existing groupings and/or clusters of trees and natural benefits and to reduce future open space maintenance costs. • Trees not slated for removal can be protected form the effects of construction activities associated with future construction. These trees should be marked and fenced at least to the drip line or the end of the root system, whichever extends farther from the stem. Marking should be done with highly visible ribbon so that equipment operators see the protected areas easily. • Parking and stacking of heavy equipment and construction materials near trees can damage root systems by compacting the soil. Soil compaction, from weight or vibration, affects root growth, water and nutrient uptake, and gas exchange. The protection measures suggested above should be used for parking and stacking as well as for moving of equipment and materials. If parking and stacking are unavoidable, the contractors should use temporary crossing bridges or mats to minimize soil compaction and mechanical injury to plants. • Any stock piling of soil should take place away from trees. Piling soil at a tree stem can kill the root system of the tree. Soil stockpiles should be covered, as well, to prevent soil erosion and fugitive dust.	Concur. Project will comply where applicable.
Virginia Dept of Forestry	S-11-3	Natural Resources Vegetation	Questions concerning the protection of trees and forest resources may be addressed to the VDOF, Buck Kline at (434) 220-9035.	Comment noted.
Virginia Dept of Health	S-12-1	Infrastructure and Utilities Potable Water Supply	VDH has no comment on the proposed expansion. Contact VDH, Diedre Forsgren at (804) 864-7241 for additional information.	Comment noted.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia Dept of Transportation	S-13-1	Traffic and Transportation Networks Traffic	VDOT notes that the EA includes the following information: 1. The expansion of INSCOM facilities is adding about 890 more personnel to the current personnel of 1,650. This is an increase of about 54% personnel by year 2018. 2. The increase in traffic from personnel growth will directly impact the traffic performance of intersections in the near vicinity of the project area. The traffic impact from growth will increase delays at the three intersections (Fairfax County Parkway and John Kingman Road, John Kingman Road and Beulah Street and Telegraph Road and Beulah Street) in the immediate vicinity of the project. 3. The EA concludes that, besides the increase in delays, the three intersections would continue to perform at acceptable level of service in 2018 during AM/PM peak periods. VDOT finds that the EA does not have enough information to support the above conclusion. VDOT's estimate of project impacts shows that there will be a significant impact on the above three intersections based on the following assumptions: **1.** The addition of 890 personnel will have substantial impact as they will generate about 765 trips entering the base during AM peak hours. The trip generation estimate is based on the Institute of Transportation Engineers (ITE) Code 730 for government office. **2.** The existing level of service of the three intersections is already below the acceptable level of "D" and any increase in traffic would make it worse. An Environmental Assessment for the Route 1 and Telegraph Road connector has already shown level of service of "E" and "F" for the above intersections for year 2010. VDOT requires additional information about the trip generation, distribution and assignment for the above intersections from the expansion. For additional information, contact the VDOT, Randy Hodgson at (703) 259-2753.	Regarding Point 1 Trip Generation – Table 3 in the INSCOM Traffic Assessment predicts a total additional AM peak hour inbound demand of 304 vehicles, before reductions for TMP actions. This value was based on the actual measured AM peak hour trip generation from the INSCOM site. This measured trip generation rate conforms to the trip rates for R&D Center (ITE Code 760) of 237 trips, and General Office (ITE Code 710) 319 trips. The ITE Code 730 estimate of 765 trips is based on the Government Office trip generation rate from only one study. Regarding Point 2 Level of Service – Table 4-5 in the Environmental Assessment for the Richmond Highway/Telegraph Road Connector shows 2010 LOS values for the Fairfax County Parkway & John Kingman Rd, and Telegraph Road & Beulah St. intersections. Only the PM LOS at the Fairfax County Parkway & John Kingman Rd intersection was shown as worse than LOS “D” - it was shown as LOS “F. Although the 2005 analysis contained in the EA is based on actual counts, the 2010 values in the report were estimated. Comparing the 2005 PM volumes from the EA with the PM volumes we counted in 2011 revealed that the total intersection volume went up by only 20 cars. More significantly the Northbound through movement declined by about 500 vehicles (about 40%). This is a very significant decrease because it allowed a greater proportion of the signal cycle to be allocated to the other movements and reduced the overall delay to all vehicles! Most of this Northbound traffic volumes comes from the right turn from Route 1 southeast bound to the Fairfax County Parkway. The Telegraph Road Connector EA shows 1130 vehicles making this turn in the PM peak hour in 2005. In January of 2012 we collected data at the US-1 and Fairfax County Parkway intersection for 2 days. Our data shows this right turn volume to be 649 vehicles on day 1 and 570 vehicles on day 2. This confirms the volume decrease at the Fairfax County Parkway Kingman Road intersection. Looking further "upstream" the Telegraph Road Connector Report shows 1050 cars turning left from the Tulley gate to US-1 and 1610 vehicles going straight through the US-1 at Pohick Rd intersection southeast on US-1. Our January 2012 counts at this intersection showed a slight increase to 1670 through vehicles going southeast on US-1 and a decrease to 760 vehicles turning left from the Tulley gate. Again our numbers make sense and are consistent. All in all we believe that the intersection volumes used in the INSCOM Traffic Assessment reflect current use of the intersection, and that the traffic volume forecast in the Telegraph Road Connector EA predicting a decrease in Level of Service at the Fairfax County Parkway Intersection at Kingman Road was inaccurate. However, we do recognize that even though the overall LOS was at D at the Fairfax County Parkway & John Kingman intersection several of the PM Peak hour movements Rd intersections did have LOS worse than D. Conclusion – A reassessment of traffic on the public roadways in the Fort Belvoir area will be performed for the TMP/Master Plan. This study will examine traffic impacts in the short-term (2017) and the long-term (2030), and will reflect all of the new facilities anticipated on the Post, as well as the trip reductions that are anticipated through the TMP actions. This Traffic Analysis for the TMP/Master Plan will address the short-term and long-term transportation improvements needed to mitigate the expansion of INSCOM as part of the overall TMP and Master Plan for Fort Belvoir.

Name/ Agency	Comment Number	Comment Category	Comment	Response
Virginia Dept of Transportation	S-13-2	Traffic and Transportation Networks Traffic	The EA does not discuss integration of the site into the bicycle and pedestrian plan for this area of Fairfax County. According to VDOT, Policy D of the Fairfax County Transportation Plan states "Provide sidewalks, trails and/or on-road bicycle routes which link residential concentrations with transit stations, activity centers, shopping districts, recreational facilities and major public facilities and provide for pedestrian and bicycle circulation within activity centers."	A Transportation Management Plan will be provided as part of the NCPC submission and will contain discussion of transit routes along with graphics.
Local Government (code 'L')				
County of Fairfax, Virginia	L-1-1		Overall, staff endorses INSCOM's proposal to consolidate its operations into an expanded facility.	Concur.
County of Fairfax, Virginia	L-1-2	Site Layout Parking	Staff commends Fort Belvoir for incorporating structured parking into INSCOM's expansion plans, and would like to see more of the proposed parking incorporated into this structure to reduce the overall amount of impervious surface.	Concur.
County of Fairfax, Virginia	L-1-3	RPA	Inconsistent delineation of the Resource Protection Area (RPA) throughout the document is a concern, as is the assertion that the proposed extent of RPA disturbance is less than the 2,500-square-foot threshold triggering buffer replacement requirements. Such a threshold does not exist in the Chesapeake Bay Preservation Ordinance.	Figure 5 Land Use contains a planning level depiction of wetlands and streams created prior to field delineation. The Installation conducted a site-specific wetlland, waters, and Chesapeake Bay RPA delineation to support this EA, and Figure 5 is an artifact of figures generated prior to that delineation. In addition, figures that were generated to support cultural and natural resources coordination (Appendix D) may show the old RPA line as well as two streams north of the site that were later determined to be upland swales. Because they are part of the record for coordination, we should not change them. However, we will check all figures and text within the primary document for consistency and accuracy. The statement regarding the 2,500 square foot threshold under the Chesapeake Bay Preservation Ordinance is incorrect and will be deleted.
County of Fairfax, Virginia	L-1-4	Parking	The EA indicates that there would ultimately be 2,006 parking spaces onsite, including 1,524 for employee parking, 446 for visitors and students (121 of which would be informal parking spaces along Beulah Street), and 36 for storage of government vehicles. However, the spaces shown in the plans only add up to 1,724. The EA notes that the proposed ratio of employee parking spaces to employees (60 percent) would be below the National Capital Planning Commission's parking goal of 67 percent, indicating that employee parking capacity has been minimized. Guidance is needed, however, regarding whether the proposed 446 visitor/student parking spaces would be the minimum necessary, and how this number was determined.	INSCOM's student capacity is approximately 300 students. In addition, per Army Technical Instruction 800-1, visitor parking allowance averages at 7%, or 177 spaces. The 446 spaces provided is actually below the minimum allowed under Army guidance.
County of Fairfax, Virginia	L-1-5	Parking	Given the amount of spaces provided for visitors, government vehicles, and students, it is possible that employees would be able to use these spaces as overflow parking. This could potentially dilute the effects of providing a 60 percent parking capacity for employees. Further information should be provided to detail how the 60 percent parking capacity will be enforced.	INSCOM maintains its own security personnel and has committed to adding parking enforcement duties to their scope of work. Different strategies of management space allocation are being considered including issuing stickers, tags or cards. The Transportation Management Plan will be submitted for review as part of the NCPC submission package.
County of Fairfax, Virginia	L-1-6	Site Layout and Parking	The EA indicates that, in addition to the proposed structured parking, there would continue to be a significant amount of surface parking. The layout ofthe INSCOM campus has a large footprint, and the proposed surface parking creates additional impervious surface on the site. In order to minimize clearing of forested areas, parking capacity should be limited to the minimum number of spaces needed and/or should be provided in a manner that would minimize the site footprint needed for parking. Likewise, the proposed area of disturbance could be further reduced by decreasing surface parking in favor of additional structured parking. Expanding the size of the parking garage to accommodate additional parking spaces would reduce the amount of impervious surface on site by removing some of the surface parking spaces. This may provide an opportunity to reduce the overall development envelope, thereby preserving more of the forested area to the south and east of the existing building.	Project budget does not allow for additional expansion of the parking structure.

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L-1-7	Parking	Plans show that approximately 141 visitor/student parking spaces, referred to as the informal spaces, are being placed at a great distance from the building. If these will be used frequently, it may be desirable to locate these spaces in the parking structure so as to eliminate the traffic safety problems that currently exist as a result of those spaces.	comment noted.
County of Fairfax, Virginia	L-1-8	RPA and Federal Consistency Determination	Both the FONSI and the EA (on page 3-66) state that the project would encroach into a small portion (approximately 1,672 square feet) of a Resource Protection Area (RPA) associated with a pond to the southwest of the proposed building addition, but that the proposed extent of disturbance is below the threshold (2,500 square feet) triggering RPA buffer replacement requirements. There is nothing in the county's Chesapeake Bay Preservation Ordinance (Chapter 118 ofthe Fairfax County Code) that generally exempts minor land disturbances from RPA requirements; there is no 2,500 square foot land disturbance threshold in RPAs- the "Exemption from Chesapeake Bay RPA Requirements" inset on page 3-66 is incorrect. The "Coastal Lands Management" conclusion in the Federal Consistency Determination is also incorrect. Unless the proposed disturbance would otherwise constitute an allowed or exempted use, an exception under the ordinance would be needed for the proposed disturbance, no matter how small in extent. The proposed development should therefore be redesigned such that the encroachment into the RPA would be avoided. At a minimum, the proposed disturbance should be subject to the appropriate RPA exception review process, although it is not clear that the proposed encroachment would satisfy the required findings in Section 118-6-6 of the ordinance.	Fort Belvoir, a federal installation, is not subject to the Fairfax County exception review process. The statement regarding the 2,500 square foot threshold under the Chesapeake Bay Preservation Ordinance is incorrect and will be deleted. However, under 9VAC10-120-130 1(d), roads are allowed within an RPA provided they meet certain conditions. This road is for emergency vehicle access only and no other alternative exists. Permeable materials will be considered for this road and a Water Quality Impact Analysis will be included in the final design package. Fort Belvoir is engaged in the design process and will approve the final design. This satisfies the conditions for encroachment into the RPA. Fort Belvoir has discusse this issue with Virginia Department of Conservation and Recreation and obtained approval that the minor encroachment is exempted and the project is consistent with the Coastal Zone Management Act.
County of Fairfax, Virginia	L-1-9	RPA	Additionally, the document presents various interpretations of the extent of the RPA. Figure 6 shows the road encroaching into the RPA mainly at the turnaround to the access road. However, Appendix D of the document shows a red line that extends beyond the boundary in Fig. 6. The origins of this discrepancy are unclear.	1. There are 2 RPA boundaries on the Perennial Flow Determination Map in Appendix D. The red line referenced in the comments is identified on the map as the “Existing RPA". Before field work (consisting of a wetland delineation and perennial flow determination) the red line represented Fort Belvoir’s planning level RPA. The cross hatching on the Perennial Flow Determination Map is identified as the “Proposed RPA” or the field delineated RPA. The proposed RPA was mapped after the wetland delineation and perennial flow determination, thus depicting the most accurate extents of the RPA and superseding the “Existing RPA.” It is the cross-hatched proposed RPA that is shown in Figure 6.
County of Fairfax, Virginia	L-1-10	Fairfax County's Mason Run Environmental Quality Corridor	The EA does not recognize Fairfax County's Environmental Quality Corridor policy; the policy should be recognized in section 3.7.6 of the report (Forest Riparian Buffers/ Chesapeake Bay Resource Protection Areas). The proposed area of disturbance would extend into a wooded area to the south and east of the existing building; the EA does not indicate whether or not any of this clearing would occur on slopes of 15 percent or greater. Any such slopes adjacent to the floodplain of Mason Run would be located within the EQC associated with Mason Run. The disturbance of such slopes would be in conflict with the EQC policy and should therefore be avoided. Fort Belvoir should clarify whether or not any of the proposed clearing would occur within the EQC; if such clearing is proposed, the project should be designed to avoid this impact.	The Fairfax County’s EQC policy is based only on voluntary participation and is not a regulation applicable to Federal installations. Fort Belvoir is not bound by the County's Comprehensive Plan policies, which includes the EQC policy. We do, as our own policy, avoid impacts within a 35-foot buffer from intermittent streams as well as comply with the Chesapeake Bay Preservation Act.
County of Fairfax, Virginia	L-1-11	RPA encroachment permits	Additionally, there is no mention of the permits necessary to encroach into the RPA to remove the abandoned trail that crosses Mason Run.	See response to comment L-1-8 and L-1-10
County of Fairfax, Virginia	L-1-12	Fairfax County designation of RPAs	Page 3-65 of the EA states that Fairfax County has added the 100-year floodplain to its designation of RPAs. Not all county-defined floodplains have been added; the addition is limited to major floodplains, which are 100-year floodplains associated with streams with drainage areas of 360 acres or more.	EA will be revised to reflect this comment.

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L1-13	Streams shown on Figure 5	There are several streams that are indicated on the Land Use map in Figure 5 (page 3-3) that do not appear anywhere else in the document. The lower of the two channels appears to be located within new parking garage's footprint. It is unclear why these channels were not addressed throughout the EA. Any defined stream channel in this area should be protected along with a wooded buffer area. The width of the buffer area should follow guidance from the county's EQC policy (see Objective 9, Policy a, Environment section, Fairfax County Policy Plan, as reinforced for headwater streams by Objective 2, Policy 1). Per Objective 2, Policy 1, if this is not feasible, buffer areas as wide as possible along any such stream should be protected. In no case should the width of such a buffer area be less than 35 feet on either side of the stream.	See response to L-1-3 above.
County of Fairfax, Virginia	L-1-14	Stormwater Mgt	Though it is assumed that the northwest parking lot would be removed and remediated, it is not one of the locations identified as such in Figure 17 (page 3-61). Additional text regarding the amount of impervious surfaces to be restored is requested to fully understand the impacts of the development.	The northwest parking lot in question will remain as the primary visitor parking lot. The total amount of pervious surface to be remediated as depicted in Figure 17 is 16,000 square feet.
County of Fairfax, Virginia	L-1-15	Stormwater Mgt	As a federal facility, the Stormwater Planning Division (SWPD) of the Department of Public Works and Environmental Services expects that stormwater management will at least conform to new stormwater management guidelines/requirements for sites given the goals of the Chesapeake Bay Total Maximum Daily Load (TMDL). If this is adhered to, it is SWPD's view that the design will conform also to the new Virginia stormwater regulations adopted in 2011, which require a "runoff volume reduction" approach. This approach is more effective in reducing volume of runoff as well as pollutants of concern and will be more beneficial in reducing harmful stream impacts than current Fairfax County Public Facilities Manual requirements. In addition to meeting water *quality* benefits (nutrients and sediment reductions) stipulated by the Chesapeake Bay TMDL, the Army should ensure that the combined water *quantity* benefits of the proposed BMPs result in no net increase in stormwater runoff from any expanded impervious area. In addition, any existing runoff currently being directed to Accotink Creek must be reduced according to the requirements of the Accotink flow TMDL.	Fort Belvoir is a MS4 permit holder and are required to comply with all state and Federal requirements including review and approval of project designs. Project's stormwater system will be designed to adhere to the Chesapeak Bay TMDL as well as utilizing the runoff volume reduction approach. It is Fort Belvoir's view that the Accotink Creek TMDL recently issued is currently in litigation. NEPA documents are generally created early in the planning process and before final designs are available.
County of Fairfax, Virginia	L-1-16		The EA recognizes that the project will be subject to Section 438 of the 2007 Energy Independence and Security Act (EISA), which will require post-development hydrology to mimic predevelopment hydrology "to the maximum extent technically feasible." The EA states that low impact development (LID) measures are being evaluated, including pervious pavements, rain gardens, vegetated swales and rainwater harvesting devices. The EA further notes that "about 30 percent of the new building would provide stormwater retention with a green roof." The provision of vegetated swales is also noted, as is the construction of a new stormwater management/best management practice retention pond. LID measures should be supported, as should be rainwater harvesting, for which there may be a substantial on-site opportunity (e.g., use of rooftop runoff in cooling towers).	Concur.
County of Fairfax, Virginia	L-1-17	Stormwater Mgt	The commitment to meeting EISA requirements and the proposal to provide a green roof are commendable, and we would encourage the Army to further these efforts through a consideration of a larger green roof beyond the relatively small portion of the building (30percent) that would be covered. We also encourage efforts to use green roofs and other LID measures to the maximum extent technically feasible. Other possibilities include, but are not limited to, rainwater harvesting, implementing a grey-water system, using pervious pavement and soil amendments.	Concur.
County of Fairfax, Virginia	L-1-18	Stormwater Mgt	It is difficult to review the full intention of the plan due to the limited mapping of the proposed stormwater management. Figure 4 (page 2-5) only provides the proposed location for a stormwater management pond.	NEPA documents are generally created early in the planning process and before final designs are available.

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L-1-19	Stormwater Mgt	The "Proposed Project Construction Phases 1 & 2" images have some of the general locations for the stormwater management facilities proposed identified, such as a green roof and rain gardens, but there is no one clear map of all the proposed stormwater management facilities. It would be helpful if all of the facility locations were in one clear map so that we may review the full extent of the proposal.	NEPA documents are generally created early in the planning process and before final designs are available.
County of Fairfax, Virginia	L-1-20	Stormwater Mgt	Due to the topography of the site, management facilities would need to be located throughout the complex to capture and treat the stormwater runoff produced by the additional impervious surfaces. Fort Belvoir is encouraged to coordinate with the Stormwater Planning Division of the Department of Public Works and Environmental Services as detailed stormwater management plans are being developed.	Through the NCPC submission and review process, Fairfax County will provided an opportunity to review and comment on a more advanced design of the project.
County of Fairfax, Virginia	L-1-21	Vegetation Site Plan	The EA indicates that "INSCOM has made every effort to limit" impacts to existing vegetation. However, it is not clear if there could be additional building and/or site design modifications that could be pursued to further reduce the proposed area of disturbance. Figure 16 indicates that much of the proposed clearing of forested areas would occur to the south and east of the existing building, in the area where building additions are proposed for the Information Dominance Center. Could the needed square footage be accommodated in taller additions with smaller footprints? Would there be an ability to increase the proposed building heights without creating conflicts with the Davison Army Airfield Building Height Restriction Zone threshold height of 216 feet?	Mission requirements, budget and site constraints prevent the use of this realignment.
County of Fairfax, Virginia	L-1-22	Forest and Wildlife Corridor	The EA indicates that there would be a minor encroachment (0.34 acres) into the Forest and Wildlife Corridor (FWC) but that Fort Belvoir would restore an equivalent area adjacent to the existing corridor area elsewhere on the site by removing pavement, removing invasive vegetation and planting native trees in this area. While there would be a loss of a broader forested area outside the FWC that is effectively functioning as part of the FWC, the proposed mitigation measures within and near the FWC would appear to offer a reasonable approach to compensating for the ecological benefits that would be lost as a result of the proposed encroachment into the FWC.	Concur.
County of Fairfax, Virginia	L-1-23	Vegetation Site Plan	If possible, is there opportunity to shift the project to parallel Beulah Street to a great extent, minimizing impacts on the Beech-Mesic Mixed Oak Forest and shifting it to the northwest portion of the site, thereby concentrating impacts in the Virginia Pine Forest? This would tend to move the site disturbance further from the stream and out of what are likely higher quality forest resources and into lower quality forest resources. Shifting the project as described would also remove the proposed encroachmentin the Forest and Wildlife Corridor.	Mission requirements, budget and site constraints prevent the use of this realignment.
County of Fairfax, Virginia	L-1-24	Vegetation -- Tree Replacement	The EA states that trees will be planted at a 2:1 ratio to replace those of four-inch diameter or greater that will be removed. We have consistently recommended replacement of lost canopy and not just the larger trees. We encourage Fort Belvoir to consider canopy replacement and not just replacement of larger trees.	Comment noted.

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L-1-25	Vegetation -- Restoration	The proposed mitigation sites are already surrounded by natural areas so their restoration is not a one-to-one replacement since they seem to currently provide some habitat benefit. The area available for wildlife will shrink in composite. Restoration should include a native meadow seed mix and woody planting which mimic the highest quality cover type in the project area in composition. All native species selected should be locally common natives to Fairfax County (refer to the Digital Atlas of Virginia Flora for native species by county). In addition, there will need to be long-term warranty standards for plantings to ensure survivability. Regular mortality, deer browse and non-native invasive species will likely greatly impair restoration efforts. The Fairfax County Park Authority's Natural Resources Management and Protection Branch (NRMP) recommends at least a four year warranty. The warranty should extend at least four years during which time the contractor will return, monitor for establishment and success of native plantings, control non-native invasive plant species, and replant or reseed with the native seed mix as necessary to get a vigorous stand established (reseeding could be done at 15 lbs. per acre ofthe original native seed mix). The warranty period should extend four full growing seasons from the year of planting (e.g., if they	Restoration of the selected sites is consistent with Fort Belvoir's Tree Restoration policy and Integrated Natural Resources Management Plan. Remainder of comment appears to be standard contract requirement language for contracts issued by Fairfax County which are not applicable to Fort Belvoir.
County of Fairfax, Virginia	L-1-26	Deer Management	The mitigation goals must address the severe browse by white-tailed deer. No restoration will succeed if white-tailed deer are overabundant as they will eliminate all native vegetation on the ground up to about five feet, will prevent forest regeneration, and will cause remaining forest stands to shift to a few native species that are less palatable to deer and to NNI plant species that deer do not eat. The result will be extremely impoverished natural areas lacking native plant diversity and many ofthe animals that rely on those plant communities will disappear. Fort Belvoir needs to have an active deer management plan with the stated goal of conducting periodic inventories to determine deer herd numbers and health, and continued hunting and sharpshooting pressure to reduce deer numbers to as close to 20 deer per square mile as possible. Fifteen to twenty deer per square mile represents the ecological carrying capacity for deer in eastern forests. Once deer numbers exceed this capacity they begin to cause significant and long term damage to the forests. In most of Fairfax County deer herd numbers are at least 60 deer per square mile and our forests are highly impacted.	Fort Belvoir maintains a successful recreational hunting program and continues to monitor deer population for its effectiveness in reducing deer induced impacts.
County of Fairfax, Virginia	L-1-27	LEED	The EA states that "the new INSCOM facilities will achieve the Leadership in Energy and Environmental Design-New Construction (LEED-NC) silver rating criteria for sustainable design." Fort Belvoir should be commended for its continued dedication to green building design and its commitment to the LEED Silver level of performance. However, it is not clear if Fort Belvoir intends to attain LEED Silver certification through the Green Building Certification Institute or if more of an internal review process would be used to determine if the building would be capable of attaining LEED Silver certification. It is never clearly stated that the building will achieve LEED Silver certification-c. larification should be provided.	Per Army policy, this project will be certified by USGBC at the LEED silver level under the LEED rating system.
County of Fairfax, Virginia	L-1-28	Cultural Resources	Cultural resources were not evaluated in the EA since no impacts were found. DPZ Heritage Resources staff agrees that no historical architectural resources will be affected. Any impacts to archaeological sites should be reviewed by the Cultural Resource Management and Protection Branch of the Fairfax County Park Authority.	Concur
County of Fairfax, Virginia	L-1-29	Transit	Transit routes should be discussed as a part of the transportation network in Section 3.2.1. It would be beneficial to include a map showing existing and planned transit routes should be included as a figure in the EA.	A Transportation Management Plan will be provided as part of the NCPC submission and will contain discussion of transit routes along with graphics.
County of Fairfax, Virginia	L-1-30	Transit	It is Fairfax County's understanding that there are no 'post' shuttles being operated on-site, meaning that they are operated by the Garrison for the benefit of all tenant agencies. Any shuttles that are developed for this project (including the shuttle mentioned on Page 2-2) should be coordinated with the Garrison transportation demand management (TDM) Coordinator and Fairfax County so they don't compete with commercially operated bus service offered on post by Fairfax Connector and WMATA.	INSCOM is developing Parking Shuttles only for use during the construction phase. INSCOM will not be developing Postwide shuttles that compete with Commercially operated services.

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L-1-31	TMP	INSCOM-specific traffic management plans (TMPs) as well as Garrison-wide TMPs, should be coordinated with Fairfax County, WMATA, and the Northern Virginia Regional Commission to take advantage of available services. The TMP should include definitive goals and reporting toward progress to the Garrison TDM Coordinator, who will then coordinate with Fairfax County.	A Transportation Management Plan will be provided as part of the NCPC submission and will contain discussion of transit routes along with graphics.
County of Fairfax, Virginia	L-1-32	Bicycles and Pedestrians	Bicycle and pedestrian routes should be discussed as part of the transportation network in Section 3.2.1. A bicycle and pedestrian plan, including the location of sidewalks, multi-use trails, bicycle lanes, bicycle storage, and shower/locker facilities, should be included as a figure in the EA. This would illustrate how bicyclists and pedestrians can circulate throughout the area.	A Transportation Management Plan will be provided as part of the NCPC submission and will contain discussion of transit routes along with graphics.
County of Fairfax, Virginia	L-1-33	Traffic Analysis	Section 3.2.2, page 3-15 states that "While LOS ofE and Fare undesirable, they are deemed to be tolerable as long as the overall LOS for the intersection as a whole is level of service (LOS) D or better" (p. 3-15). Given the impacts to Fairfax County Parkway and Telegraph Road, it would be helpful to understand the basis for making this statement. It is possible that the Fairfax County Department of Transportation (FCDOT) and the Virginia Department of Transportation (VDOT) may not agree with this rationale.	LOS D is generally recognized as the acceptable LOS in urban areas. One place where this is recognized by both FHWA and VDOT is the “Revised Draft Section 4(F) Evaluation for Route 3 in Culpeper County (approved 3/5/12). As noted on page 7 of this document “Typically, most design and planning efforts try to achieve LOS C in rural areas and LOS D in urban areas to ensure acceptable operating levels of service for motorists.”
County of Fairfax, Virginia	L-1-34	Increase in Main Post Personnel as a result of BRAC	In a couple of places, the EA states that 19,000 workers were moved to Fort Belvoir in BRAC 2005. Of those, only 3,400 went to Main Post. It is Fairfax County's understanding that those positions were all associated with the hospital, and that there may be 2,000-3,000 additional positions resulting from leased space moves that have not been accounted for in the BRAC totals. Now that all the relocations are complete (or near complete), please provide a final tally of the relocations related to BRAC. If there are 2,000-3,000 more new workers on Main Post than included in the traffic forecasts, they should be updated. If the leased space moves are included in the 3,400, please identify how many workers are associated with the hospital v. leased space.	The assumption that all 3,400 positions on Main Post were associated with the Hospital is incorrect. The Hospital has approximately 1600 employees. Agencies such as MDA, OCAR, OAA, and USALSA added to the Main Post workforce population. No significant growth beyond the 3400 came to Main Post.
County of Fairfax, Virginia	L-1-35	Bicycles and Pedestrians	As mentioned previously, additional graphics should be provided to indicate existing and planned transit, bicycle and pedestrian facilities on Figure 7 (page 16).	A Transportation Management Plan will be provided as part of the NCPC submission and will contain discussion of transit routes along with graphics.
County of Fairfax, Virginia	L-1-36	Traffic Analysis	Traffic counts were collected in October and November 2011. However, this may not reflect peak season conditions. If these counts do not reflect peak season conditions, the volumes may need to be adjusted.	Comment noted, we do not concur. Peak Season counts are only used for shopping center analysis. The data and this study reflects "typical" conditions.
County of Fairfax, Virginia	L-1-37	Trip Generation Rates	Trip generation rates should be derived using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition. The analysis in the EA uses the 7th Edition, which is not the most recent (page 23). Additionally, ITE code 710 (General Office) is a better comparison as opposed to ITE code 760 (R&D Center), since the use of this facility does not seem to be consistent with a R&D Center use. The 2018 trip generation of the expanded site should be based on ITE trip generation rates, not the ratio of existing/proposed personnel. Despite this, the growth factor of 2.63 does appear conservative.	Comment noted. The references to the ITE Trip Generation were mentioned for comparison purposes only. Several methods of factoring up the existing trips were investigated. The most reasonable is the ratio of the existing square footage to the future square footage. This resulted in the very conservative growth factor of 2.63.
County of Fairfax, Virginia	L-1-38	Trip Origins & Destinations	INSCOM site trip distribution after expansion is assumed to stay constant with the existing trip distribution. This does not take into account the present location of the employees that will be moving to this facility. A survey, similar to what was undertaken for BRAC 133/Mark Center, would assist in determining the origins and destinations of these additional trips.	The additional staff moving into INSCOM currently works approximately 3 miles North of Ft Belvoir. The Mission of the organization is not changing. The recent Belvoir Commuter Survey completed in November 2011, determined which gates INSCOM personnel typically take to travel from work to home and was used to support trip distribution. The trip distribution of the current employees is an excellent predictor of the overall trip distribution of the combined current and future employee population. Additional Survey not needed due to this proximity.

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L-1-39	Traffic Growth Rates	The North Post growth rate is based on the planned increase in personnel. However, there may be other factors contributing to this growth rate, including the Route 1 construction and widening, planned changes to entrance gates including construction of a new North Post access control point, improvements to Gunston Road, construction of a new Commissary and PX, additional transit services, and construction of the Potomac Heritage Trail. The External Road Growth Rate (two percent per year) may also be affected by these factors. Based upon a two percent increase per year compounded annually for 6 years (2012-2018), a 12.6 percent growth rate is assumed. The base count data, however, is from 2011. The growth rate to be applied to base count data for external roads should be 14.9 percent based on the same two percent increase per year but compounded annually over 7 years (2011-2018).	Comment Noted. As previously discussed traffic volume data was collected in the fourth quarter of 2011, which was assumed to be the same as the 1st quarter of the following year. Changing the growth rate to 14.9% will change the expanded traffic volumes by only 2%. The volumes over 100 VPH were expanded and rounded to the nearest multiple of 25 which makes this 2% difference moot. The additional development cited is not expected to affect traffic beyond the 2% annual growth rate.
County of Fairfax, Virginia	L-1-40	Traffic Growth Rates & the TMP	When looking at the 2018 volumes, TMP growth rates, which take into consideration single-occupancy vehicle (SOV) reduction goals, trump otherwise calculated growth rates. Applying a TMP reduction to the growth rate may be supportive of the TMP's plan to reduce SOVs, but it makes for a less conservative analysis. It is important to understand the roadway impacts if the goals ofthe TMP are not met. Likewise, the North Post growth rate of 21.6 percent is significantly higher than the seven percent growth rate used in the TMP, which seems like a major difference based on personnel. This difference does not seem consistent with Fort Belvoir's 60 percent parking policy, which is a 40 percent reduction in SOV trips. The difference between 21.6 percent and seven percent is nearly a 70 percent reduction.	Table 4 contains the details of the adjustment factors applied to the volumes. For the INSCOM No build, the 21.6% growth factor for North Post growth is based on programmed projects identified in the Short Range Component (SRC). This added growth from new projects (estimated to be in place by 2017) was than reduced by the 7% TMP reduction. For example on Table 4, the Northbound Fairfax County Parkway County Right turn lane approach in the no build the AM peak is 442 Vehicles/per hour which translates to a volume of 442 x 1.21 x (1-.07) = 497 veh/hr which was rounded to 500. A 7% reduction in volume due to TMP actions seems quite conservative for traffic analysis. The effect of the Army's 60% parking policy for administrative uses at Fort Belvoir is the policy will continue to reduce the amount of parking spaces over time and motivate personnel to participate in TMP activities. As evidenced by a recent installation wide parking inventory, the ratio of parking spaces to employees has been reduced, as spaces become less available to the workforce, it will reduce SOV use to meet the goal of 60% SOV use.
County of Fairfax, Virginia	L-1-41	Patient Trips	It is not clear ifthe traffic forecasts include the 574,000 patient trips per year to the Fort Belvoir Community Hospital	Hospital located on Southern Portion of Ft Belvoir and the traffic is not expected to have a great impact on the Intersections studied. Traffic study already incorporated the limited Hospital traffic that uses those intersections. Route 1 Widening Environmental Assessment has analyzed the vehicle trips for both pass through traffic and Hospital trips for all adjacent road networks including those proximal to INSCOM.
County of Fairfax, Virginia	L-1-42	Traffic Analysis	It is unclear why individual LOS E or F intersection approaches are considered tolerable if the overall intersection is at LOS D or better. Likewise, a number of important movements are shown to operate below the LOS standard in 2018: o Fairfax County Parkway @ Kingman Road • NBL: LOS F- 94.3 sec (AM) • NBR: LOS E- 56.2 sec (AM)- 500+ Turns Projected (AM) • SBL: LOSE- 65.6 sec (AM); 71.1 sec (PM)- 1,375 Turns Projected (AM) • EB: LOS F- 88.0 sec (AM); 81.7 sec (PM) • WBL: LOS F/E- 92.5 sec (AM); 66.0 sec (PM) -700 Turns Projected (PM) No queuing analysis been done for those problem tum approaches that are below the LOS standard. Queuing issues may interfere with adequate operations.	Queuing Analysis was performed but was not included in the appendix to the traffic summary. The queue data will be submitted in a revised appendix. Where queues are significant most of the impacts are on vehicles entering or exiting Fort Belvoir.
County of Fairfax, Virginia	L-1-43	Proposed Action	Sections ES.2 (page ES-2) and 2.1 (page 2-2) both refer to INSCOM personnel working in leased space approximately 10 miles away at Metro Park in Springfield, VA. The distance between these two facilities (via Beulah Street/Telegraph Gate) is approximately 4 miles.	Comment Noted. Will Correct

Name/ Agency	Comment Number	Comment Category	Comment	Response
County of Fairfax, Virginia	L-1-44	Cumulative Impacts	Section ES.8 (pages BS-4 to ES-5) states "The 2005 BRAC realigned approximately 19,000 workers to Fort Belvoir, but approximately 6,200 of those 19,000 workers were moved to new office space being constructed on Seminary Road in Alexandria, Virginia." This reference should be updated since the Mark Center building is completed. This section also states that the Commissary is scheduled for completion in 2015; however, the preliminary submission to NCPC for the Commissary, dated July 6, 2012, states that the construction will be complete in the first quarter of 2016.	Comment Noted. Will Correct
County of Fairfax, Virginia	L-1-45	Utilities	Section 3.4.2 (page 3-30) states that Fort Belvoir is discharging effluent to Fairfax Water, which is treated at the Norman Cole Wastewater Treatment Plant. The Norman Cole Plant is owned and operated by Fairfax County, not Fairfax Water.	Comment Noted. Will Correct
County of Fairfax, Virginia	L-1-46	Community Facilities	Section 3.6.1 (page 3-42) states "By 2011, medical needs of military personnel and their dependents (and, in an emergency, civilian personnel) at Fort Belvoir will be served by the Fort Belvoir Community Hospital being constructed on South Post near Pence Gate on Belvoir Road." This reference should be updated since hospital construction is complete and the facility is open.	Comment Noted. Will Correct
County of Fairfax, Virginia	L-1-47	Cumulative Impacts	Section 3.9 (page 3-71) list of number of projects that "have been approved by Fairfax County or are pending site plan approval." It is important to note that some of these projects, such as the Village of Accotink and the Northern Virginia Industrial Park, have yet to be rezoned by Fairfax County. Additionally, the Federal Express distribution facility is located on Cinder Bed Road, not Lorton Station Boulevard.	Comment Noted. Will Correct

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