Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment

Fort Belvoir, Virginia

October 2021

Finding of No Significant Impact (FNSI)
Defense Intelligence Agency (DIA)
Headquarters (HQ) Annex
Fort Belvoir, Virginia

Name of Action: Defense Intelligence Agency Headquarters Annex

Description of the Proposed Action and Need: The Proposed Action involves the construction of the headquarters annex building within Fort Belvoir's North Area, in the vicinity of the National Geospatial-Intelligence Agency (NGA) complex. The Proposed Action would be implemented in accordance with the NEPA, as amended (Title 42 U.S.C. §4321 et seq.), NEPA-implementing regulations of the CEQ (40 CFR Parts 1500–1508), and the Army's NEPA-implementing regulations (32 CFR Part 651, *Environmental Analysis of Army Actions*).

The purpose of this project is to build and operate an approximately 77,000 net square foot/116,080 gross square foot administrative building with an associated parking structure at Fort Belvoir to consolidate administrative facilities for approximately 650 personnel from DIA HQ to address safety, security, and operational concerns specific to the administrative functions of the agency.

The need for the facility is to alleviate the current space constraints of existing leased facilities that pose sustained and increased safety and security concerns. The approximately 650 personnel proposed to be consolidated in an administrative facility on Fort Belvoir represent the authorized civilian and military strength and require quality work environment improvements to mitigate the lack of safety, security, and efficiency. The action would also provide for compliance with Office of Management and Budget guidance identifying "good stewardship of taxpayer resources" and increasing joint site usage efficiencies.

Alternatives: The Environmental Assessment (EA) evaluated the Proposed Action, as described above, and the No Action Alternative. Two other alternatives were considered but eliminated: a 4.1-acre site at the corner of Doerr Road and 3rd Street next to the hospital, and a 16.9-acre site at the southwest corner of 1st Street and Doerr Road, both in Fort Belvoir's 1400 East Area. These alternatives were not feasible primarily due to security standoffs necessary to protect the agency's mission.

No Action Alternative: The No Action Alternative would not construct the DIA HQ at Fort Belvoir. This would result in the continued use of multiple leased spaces spread throughout the National Capital Region (NCR), which is not secure or efficient and does not meet safety standards. Additionally, the existing facilities are not compliant with current Department of Defense (DoD) antiterrorism and force protection requirements Unified Facilities Criteria 4-010-01 *DoD Minimum Antiterrorism Standards for Buildings*.

Environmental Consequences: Environmental effects of the Proposed Action would include those related to construction and operation of the Proposed Action as well as impacts of increased personnel and traffic to Fort Belvoir. Table 1 shows the resource areas analyzed in the EA and their expected effects for the Proposed Action and No Action Alternative.

Soils and surface waters would incur impacts from vegetation clearing, causing a temporary increase in erosion from destabilization. Erosion and sediment control measures would be implemented to prevent soil erosion in accordance with Virginia Erosion and Sediment Control Law (9 VAC 25-840). A stormwater pollution prevention plan and Virginia stormwater management program construction general permit would also be acquired/implemented to prevent negative effects. Stormwater would incur impacts from the addition of impervious surface to the project area. Increases in stormwater would be addressed by stormwater management strategies and best management practices (BMPs), as described in Section 3.2.6 of the EA (Page 25).

Vegetation would incur impacts from removal. Replanting of native vegetation to mitigate impacts would occur. Wildlife would incur temporary impacts from construction noise, ground disturbance, and vegetation removal. These impacts will be mitigated by replanting of vegetation and adhering to time of year restrictions. Wildlife would suffer minimal long-term negative impacts due to the relatively small area of construction. The project area is also already highly urbanized and would not be affected greatly by the addition of the HQ. Rare, threatened, and endangered species (RTE) would incur minimal impacts from disturbance of this largely unsuitable habitat. Surveys for wood turtles would occur prior to construction and all guidelines for their protection would be followed.

Munitions would incur beneficial impacts from munitions surveys, resulting in permanently reduced threats from unknown munition threats.

Utilities would incur impacts from increased demands with the new HQ. All the utility systems are capable of handling increased demands and will remain functional as supported in Section 3.5 of the EA (Page 49).

Noise would incur impacts during construction, which will cease when construction is completed. In addition, construction vehicles would require noise-dampening equipment and will exclusively operate during the day. Permanent noise level increases from commuting to and from the HQ would remain within Noise Zone II levels.

Airspace would not incur impacts with the addition of a six-story HQ building, as it would not encroach into airspace associated with the Davison Army Air Field.

Air quality would incur less-than-significant, short- and long-term adverse effects. During construction, engine emissions and potential fugitive dust emissions would have adverse effects; however, these impacts would be minimized through standard construction BMPs. Long-term operation of the facility would result in de minimis emissions.

Traffic would incur less-than-significant, short-term adverse effects on the regional roadway network and project vicinity from construction worker commutes and delivery/pickup of construction materials/debris. Less-than-significant long-term effects of increased personnel commuting to/from FBNA would occur, as supported by the analysis in Section 3.9 of the EA (Page 63) and the Traffic Impact Study found in Appendix D.

Cultural and historic resources would incur no effects. No sites eligible for listing on the National Register of Historic Places (NRHP) are located within the study area.

Socioeconomics would incur less-than-significant, beneficial impacts from the increase in workers and spending to the area, causing small economic growth.

Summary of Environmental Impacts: Based on the findings of the EA, it is anticipated that the Proposed Action would result in no significant adverse impact to any of the aforementioned resource areas. As summarized in Table 1, the Proposed Action could have minor adverse impacts on selected resources, and an overall beneficial impact on topography and soils, hazardous waste and munitions, and socioeconomics. The adverse impacts would be maintained at a less-than-significant level by implementing BMPs, permit requirements, and performing other management measures throughout the construction and operational phases.

Notice of Availability: The EA and Draft FNSI have been made available for a 30-day review and comment period by the public, regulatory agencies, and stakeholder organizations. A Notice of Availability of the EA and Draft FNSI and the 30-day review period was published in the *Springfield Connection*, the *Mount Vernon Voice*, and the *Gazette* on July 22, 2021. Printed copies of the EA and Draft FNSI were available for review at the Fort Belvoir Van Noy Library; the Fairfax County Library - Kingstowne Branch and the Sherwood Branch; and on the installation's website at: https://home.army.mil/belvoir/index.php/about/Garrison/directorate-public-works/environmental-division.

Response to Comments: Comments from federal, state, and local agencies and the public received during the public review period were considered by Fort Belvoir for incorporation into the Final EA.

Table 1: Summary of Potential Environmental Consequences on Environmental Resources

Resource	Proposed Action	No Action Alternative
Geology, topography, and soils	Less-than-significant, short-term adverse effects to soils; long term beneficial effects resulting from properly designed stormwater management features	Less-than-significant adverse impacts to soils
Water resources (surface water, riparian buffer areas, floodplains, groundwater, stormwater)	Less-than-significant, short-term adverse effects	Less-than-significant adverse impacts to surface waters
Biological resources (vegetation, wildlife, special status species, partners in flight)	Less-than-significant, short-term adverse effects to vegetation, wildlife, and RTE	No effects
Hazardous Waste Materials and Munitions	Less-than-significant beneficial effects to hazardous waste and munitions	No effects
Utilities (Electric, Wastewater, and Natural Gas)	Less-than-significant, long-term adverse effects to electric, wastewater, and natural gas	No effects
Noise	Less-than-significant, short-term adverse effects	No effects
Air Space	Less-than-significant, adverse effects	No effects
Air Quality	Less-than-significant, short- and long-term adverse effects.	No effects
Traffic	Less-than-significant, short-term adverse effects and less-than-significant long-term effects.	No effects
Cultural and Historic Resources	No effects	No effects
Socioeconomics, environmental justice, and protection of children	Less-than-significant, short-term beneficial effects to socioeconomics	No effects

Conclusion: Pursuant to the Council on Environmental Quality (CEQ) regulations; Title 40, CFR Section 1500-1508 regarding procedural implementation of the National Environmental Policy Act (NEPA) of 1969; and implemented for the Army by Title 32 CFR 651, Environmental Analysis of Army Actions, it is anticipated that the Proposed Action would not have a significant adverse effect on the environment and that a FNSI is appropriate. An environmental impact statement (EIS) will not be prepared.

04 OCT 2021

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Date

Proposed DIA HQ Annex

Fort Belvoir, Virginia

ENVIRONMENTAL ASSESSMENT

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

Pursuant to the National Environmental Policy Act (NEPA) of 1969 (Title 42, U.S. Code [USC], 4321-4370f), as amended, regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1500-1508), and 32 CFR Part 651 (Army Analysis of Environmental Actions), Fort Belvoir has prepared an Environmental Assessment (EA) to evaluate potential environmental effects associated with construction of the Defense Intelligence Agency Headquarters (DIA HQ) Annex Building at Fort Belvoir, Virginia.

Fort Belvoir is located approximately 18 miles southwest of Washington, DC, and 17 miles south of the Pentagon, on the Potomac River in Fairfax County, Virginia (Figure 1-1). As a strategic sustaining base for America's Army in the National Capital Region (NCR), Fort Belvoir provides logistical, intelligence, and administrative support to a diverse group of more than 140 Army and Department of Defense (DoD) organizations. Fort Belvoir contributes to the nation's defense primarily by providing a secure operating environment for regional and worldwide DoD missions and functions (U.S. Army, 2015).

The Defense Intelligence Agency (DIA) was established in the 1960s at Arlington Hall Station, in Arlington Virginia, and over the past four decades has provided vital intelligence in support of key moments in major conflicts. Its first offices were established on Bolling Air Force Base in 1984 (https://www.dia.mil/). The Defense Intelligence Analysis Center (DIAC) became operational in 1984 and allowed the consolidation and centralization of personnel and missions formerly scattered in a number of locations across the NCR. The DIAC was subsequently expanded in 2005 and renamed as DIA HQ in 2012. In 2010, a new Joint Use Intelligence Analysis Facility was opened in Rivanna Station, and, in 2011, the Russell-Knox Building, housing elements of five military investigative agencies, including DIA's Counterintelligence and Human Intelligence Center, opened at Marine Corps Base Quantico, Virginia.

1.2 PURPOSE AND NEED

The purpose of this project is to build and operate an approximately 77,000 net square foot (NSF) / 116,080 gross square foot (GSF) administrative building with an associated parking structure at Fort Belvoir to consolidate administrative facilities for approximately 650 personnel from DIA HQ to address safety, security, and operational concerns specific to the administrative functions of the agency.

The need for the facility is to alleviate the current space constraints of existing leased facilities in multiple, decentralized locations through the National Capital Region that pose sustained and increased safety and security concerns. The approximately 650 personnel proposed to be consolidated in an administrative facility on Fort Belvoir represent the authorized civilian and

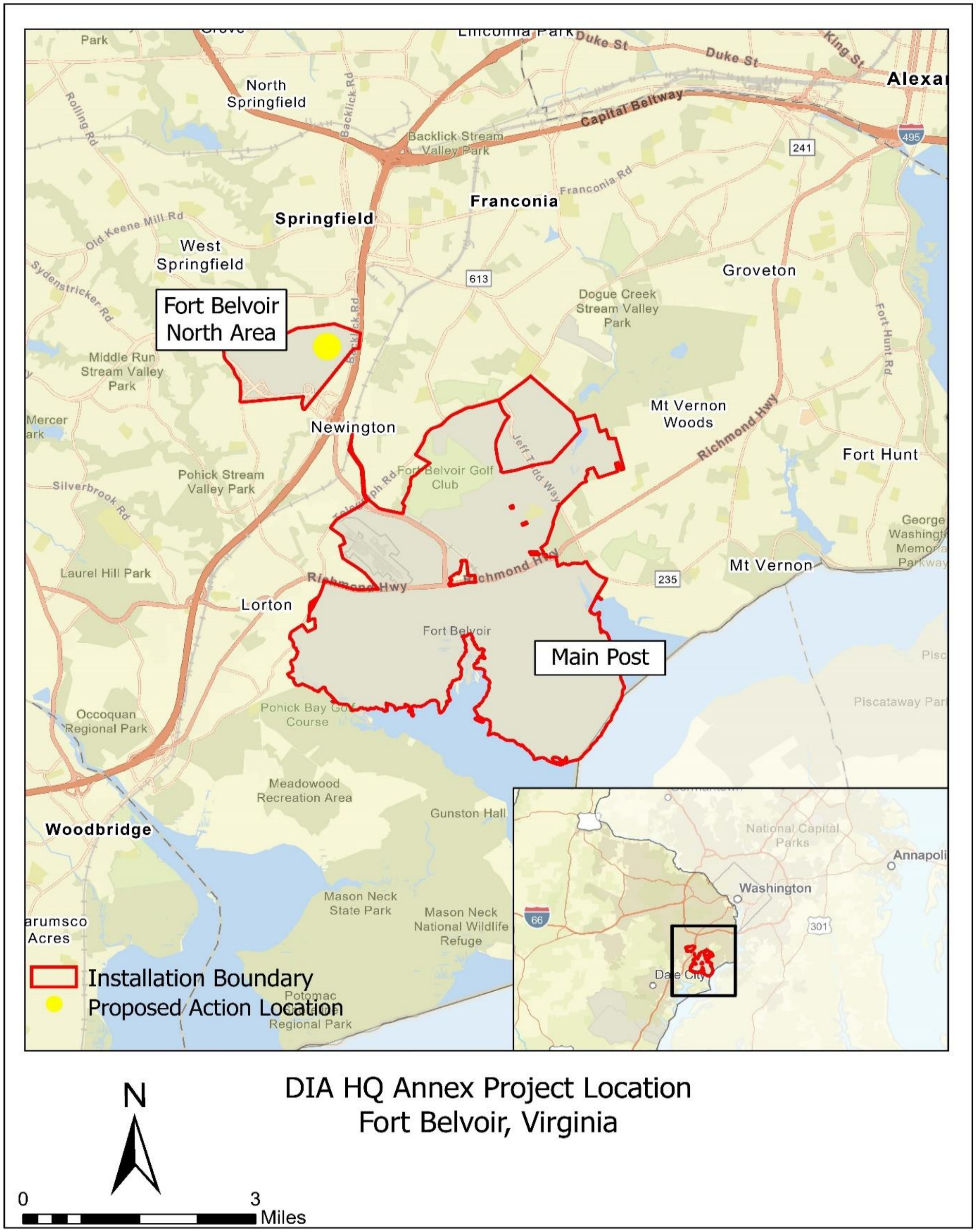

Figure 1-1: Location of Fort Belvoir, Virginia

military strength and require quality work environment improvements to mitigate the lack of safety, security, and efficiency in the current leased facilities. The action would also provide for compliance with Office of Management and Budget (OMB) guidance identifying "good stewardship of taxpayer resources" and increasing joint site usage efficiencies.

1.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

In accordance with CEQ NEPA implementation regulations and 32 CFR Part 651, either an Environmental Impact Statement (EIS) or an EA must be prepared for any federal action, unless the action is determined to be exempt by law, an emergency, or categorically excluded. The EA results in either a Finding of No Significant Impact (FNSI) or a Notice of Intent (NOI) to prepare an EIS.

This EA informs decision makers and the public of the likely environmental consequences of the Proposed Action and No Action Alternative. This EA identifies, documents, and evaluates environmental effects of the construction and operation of a HQ Annex facility at Fort Belvoir, Virginia. Environmental effects would include those related to construction and operation of the proposed action as well as impacts of increased personnel and traffic to Fort Belvoir. The Proposed Action and alternatives, including the No Action Alternative and other alternatives considered, are described in Section 2.0.

Section 3.0 outlines the existing conditions of the Affected Environment and the baseline, No Action Alternative, for which other alternatives are measured against to analyze the effects of the construction of the DIA HQ Annex. The following resources are evaluated at Belvoir: geological and soil resources, water resources, biological resources, air quality, cultural resources, hazardous materials and waste, munitions, utilities, airspace, socioeconomics, noise, traffic, and transportation.

1.4 PUBLIC INVOLVEMENT

Fort Belvoir solicited comments from the U.S. Fish and Wildlife Service (USFWS) and the Virginia State Historic Preservation Office (SHPO). Additionally, a Public Notice was sent to agencies and organizations known to have an interest in the site on July 22, 2021, soliciting public input on the proposed action.

Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 CFR Part 651. Upon completion of the analysis, the Draft EA was made available to the public for 30 days, along with a draft FNSI. At the end of the 30-day public review period, the Army considered any comments submitted by individuals, agencies, or organizations on the proposed action, the EA, or draft FNSI. As appropriate, the Army may then execute the FNSI and proceed with implementation of the proposed action. If it is determined prior to issuance of a final FNSI that implementation of the proposed action would result in significant impacts, the Army will publish in the *Federal Register* an NOI to prepare an EIS, commit to mitigation actions sufficient to reduce impacts below significance levels, or not take the action.

1.5 ENVIRONMENTAL LAWS AND REGULATIONS

Army decisions that affect environmental resources and conditions occur within the framework of numerous laws, regulations, and Executive Orders (EO). Some of these authorities prescribe standards for compliance while others require specific planning and management actions to protect environmental values potentially affected by Army actions. Key provisions of appropriate statutes and EOs are described in more detail throughout the text of this EA and in Table 1-1.

Table 1-1: Compliance with Federal Environmental Statutes and Executive Orders

ACTS	Compliance
Archaeological Resources Protection Act (ARPA) of 1979	FULL
Army Regulation 200-1, Environmental Protection and Enhancement	FULL
Clean Air Act, as amended (42 United States Code [U.S.C.] ch. 85, subch. I	FULL
Clean Water Act, as amended (33 U.S.C. ch. 23 §1151)	FULL
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. §9601 et seq.)	FULL
Endangered Species Act of 1973, as amended (16 U.S.C. ch. 35 §1531 et seq.)	FULL
Energy Independence and Security Act of 2007, Section 438	FULL
Farmland Protection Policy Act (7 U.S.C 4201)	FULL
Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e)	FULL
Migratory Bird Treaty Act (16 U.S.C §§703-712, et seq.)	FULL
National Environmental Policy Act of 1969 (42 U.S.C. §4321 et seq.)	FULL
National Historic Preservation Act of 1966, as amended (16 U.S.C. ch. 1A, subch.II §470 et seq.)	FULL
Noise Control Act of 1972, as amended (42 U.S.C. §§4901-4918, et seq.)	FULL
North American Wetlands Conservation Act (16 U.S.C. 4401-4412)	FULL
Resource Conservation and Recovery Act (42 U.S.C. ch. 82 §6901 et seq.)	FULL
Safe Drinking Water Act, as amended (42 U.S.C. §300f)	FULL
Sikes Act, as amended (16 U.S.C. 670a-670o)	FULL
Solid Waste Disposal Act of 1965, as amended (42 U.S.C 6901 et seq.)	FULL
Toxic Substances Control Act of 1976 (15 U.S.C. ch.53, subch. I §§2601-2629)	FULL
Watershed Protection and Flood Prevention Act of 1954 (16 U.S.C. §1101, et	FULL
Wild and Scenic Rivers Act (16 U.S.C. 1271, et seq.)	FULL
Executive Orders (EO)	
Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (EO 13990)	FULL

ACTS	Compliance
Floodplain Management (EO 11988)	FULL
Protection of Wetlands (EO 11990)	FULL
Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	FULL
Federal Compliance with Pollution Control Standards (EO 12088)	FULL
Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)	FULL
Invasive Species (EO 13112)	FULL
Consultation and Coordination with Indian Tribal Governments (EO 13175)	FULL
Efficient Federal Operations (EO 13834)	FULL
Chesapeake Bay Protection and Restoration (EO 13508)	FULL

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action involves the construction of the DIA HQ Annex building within Fort Belvoir's North Area (FBNA), in the vicinity of the National Geospatial-Intelligence Agency (NGA) complex (see Figure 2-1). The proposed HQ Annex building would be approximately 116,080 SF and would include a multi-story administrative building with offices, cubicles/workstations, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, a café/cafeteria, and a gym/fitness center. In addition, a utility plant, stormwater management pond, visitor control center, visitor parking, a secured employee parking structure, and a perimeter security fence would support the annex building to provide for stationing of approximately 650 personnel. The Area Development Plan (ADP) for FBNA currently being drafted by Fort Belvoir envisions the area immediately east of the NGA Headquarters as an Intelligence Community Campus. The HQ Annex will be the first programmed and funded construction under this ADP. The proposed perimeter fence alignment, as shown on Figure 2-1, encompasses a larger area than the annex and its supporting structures and is intended to accommodate potential long-term build-out of the FBNA without resulting in the need to realign the fence as additional structures are built. However, no other development elsewhere within the study area is proposed under this action. Any future development within this area would undergo separate NEPA analysis.

Numerous authorities impose design and stand-off requirements for the proposed facility, to include the Joint Mission Assurance Assessment Report, the National Counterintelligence and Security Center's Technical Specifications for Construction and Management of Sensitive Compartmented Information Facilities, Version 1.4 (2017), and information security (Infosec) requirements. Design and stand-off requirements include a 100-meter Telecommunications Electronics Materials Protected from Emanating Spurious Transmissions (TEMPEST) stand-off.

Screening criteria for the Proposed Action require that the activity be:

- economically viable in terms of project cost and resulting community impact;
- compatible with adjacent land uses and avoid potential encroachment;
- cognizant of the availability of buildable space and access to utilities, support services, and transportation infrastructure;
- compatible with the Fort Belvoir ADP;
- result in less than significant adverse impacts;
- pose a minimal security risk to operations; and,
- consider human health and safety impacts.

FBNA is classified as a Military Munitions Response Program (MMRP) site (See Section 3.4.2). Consequently, land use controls are in effect that require munitions clearances for all military construction projects, restrict the use of groundwater, and require vapor barriers on new construction due to groundwater contamination.

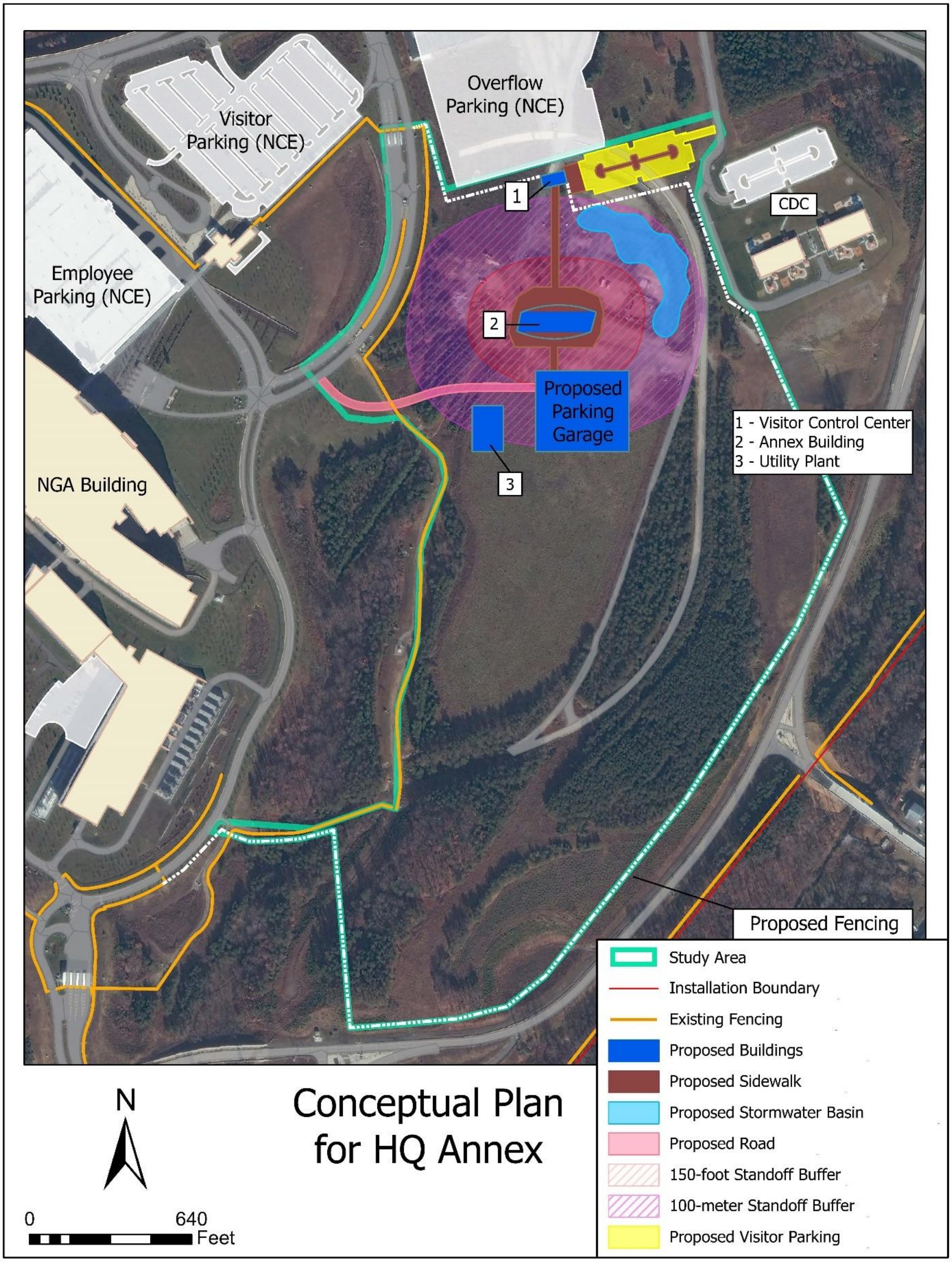

Figure 2-1: DIA HQ Annex Project Overview

2.1 OTHER ALTERNATIVES CONSIDERED BUT ELIMINATED

A smaller, 4.1-acre site was identified at the corner of Doerr Road and 3rd Street, next to the hospital in Fort Belvoir's 1400 East Area. This alternative was screened from further consideration because the area is too small to accommodate the setbacks necessary to comply with anti-terrorism/force protection (AT/FP) and agency security standards, particularly the placement of a fully, secure building and parking structure in such close proximity to the post hospital, where the need for less-restricted access would conflict with the agency's security mandates.

Another alternative involved the construction of the HQs Annex building within Fort Belvoir's 1400 Area East, near the southwest corner of 1st Street and Doerr Road. This approximately 16.9-acre area has been reviewed under Belvoir's ADP and designated for future development/siting of the DIA. However, as shown in Figure 2-2 below, the required TEMPEST buffers expand beyond the physical footprint of the site identified in the ADP. In order for the required buffers to be implemented, public access to 1st Street would be eliminated, resulting in impacts to a heavily used public and ambulance access route to the nearby hospital. This second-order impact represents a large roadblock to the project. This alternative does not meet the screening criteria for the security that is required to accommodate the sensitive nature of the DIA's mission, or for compatibility with the overall installation master plan.

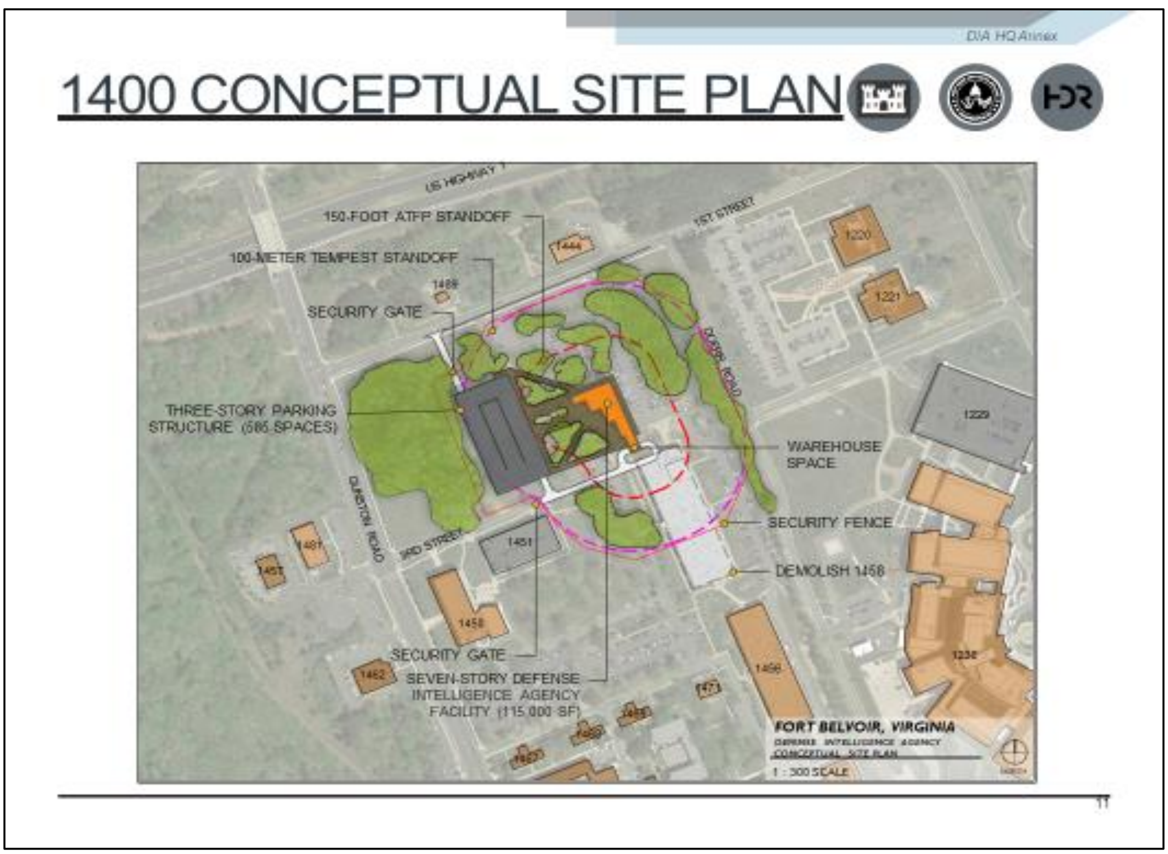

Figure 2-2: DIA HQ Annex Alternative Project Location

2.2 NO ACTION ALTERNATIVE

Under the No Action alternative DIA would not construct the headquarters facility on Fort Belvoir, resulting in the continued use of multiple and decentralized leased spaces spread throughout the NCR, which is not secure or efficient and does not meet safety standards. Additionally, the existing facilities are not compliant with current DoD antiterrorism and force protection requirements, nor with OMB guidance to reduce dependency on leases.

The Proposed Action and the No Action Alternative will be carried forward for analysis in this EA.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 GEOLOGY, TOPOGRAPY AND SOILS

3.1.1 Geology

Fort Belvoir North Area is located within the Piedmont geologic province, characterized by gently rolling topography with thick soils underlain by deeply weathered bedrock (http://geology.blogs.wm.edu/piedmont/). In Virginia, the Piedmont province is bounded by the Blue Ridge Mountains to the west and the Fall Line, roughly demarcated by I-95, to the east. The underlying bedrock of the Piedmont is as much as 1,070 million years old and is comprised of rocks of sedimentary and metamorphic origins.

A finger of Piedmont Upland province bedrock extends from north to south along Accotink Creek, forming the bed and adjacent slopes of the creek that roughly bisects FBNA. Most of the more gently sloping areas to the east and west of the creek consist of unconsolidated sediment deposits typical of the Coastal Plain province found east of the Fall Line (U.S. Army, 2007).

3.1.2 Topography

The topography of FBNA is gently rolling, with steep slopes ranging from 20 to 30 percent grade forming a narrow valley along Accotink Creek. Within the proposed study area east of Accotink Creek, the land has been previously graded and is mostly flat with a gradual decrease in elevation from 240 to 235 feet above mean sea level (an approximately 1.5 percent slope) from north to south (Figure 3-1) (HDR, 2020).

3.1.3 Soils

Soils within the study area are comprised predominantly of Kingstowne sandy clay loam, 0 to 45 percent slopes, according to the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) mapping (NRCS, 2020). Urban land is the next highest class, followed by Sassafras sandy loam, 7 to 15 percent slopes, Beltsville silt loam, 2 to 7 percent slopes, and Sassafras-Marumsco complex, 7 to 15 percent slopes (see Table 3-1 and Figure 3-2).

An area of soil and groundwater contamination is found within the study area as a result of three former underground fuel storage tank (UST) facilities associated with previous land use. Removal of the USTs and subsequent soil remediation to clean up contamination was conducted in 1996-1997. Five hundred and eight (508) tons of petroleum impacted soil were removed from two contaminated sites within the study area in 1996. Subsequent testing indicates little or no residual soil contamination within these sites (AECOM, 2021). Site contamination is discussed further in Section 3.4.

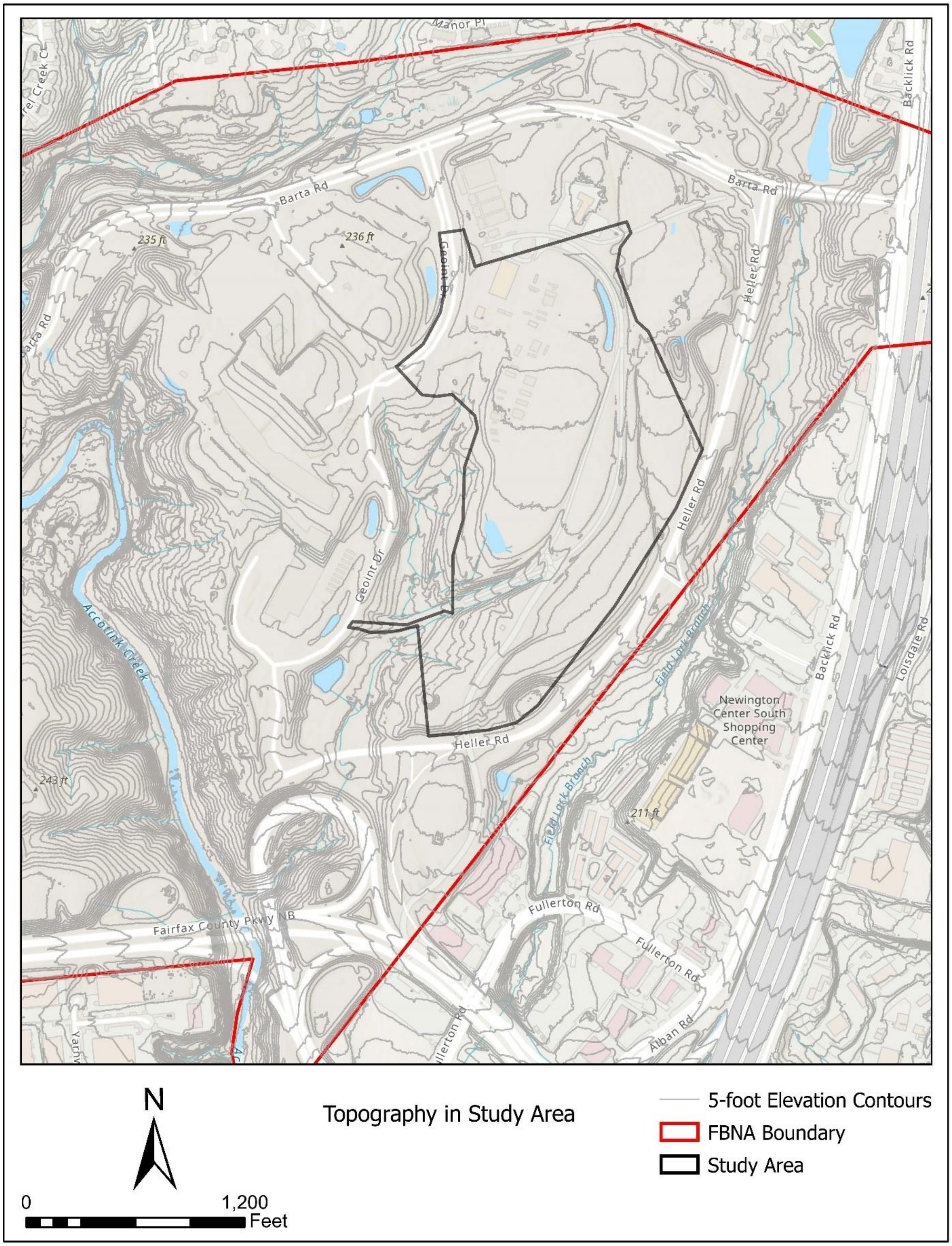

Figure 3-1: Topography in Study Area

Table 3-1: Soils in the Study Area

Map Unit Symbol	Soil	Drainage Class	Hydric
95	Urban land	N/A	N/A
90C	Sassafras sandy loam, 7 to 15 percent slopes	Well drained	No
66	Kingstowne sandy clay loam, 0 to 45 percent slopes	Well drained	No
7B	Beltsville silt loam, 2 to 7 percent slopes	Moderately well drained	No
91C	Sassafras-Marumsco complex, 7 to 15 percent slopes	Well drained	No
Notes: Hydric criteria refer to the potential of a soil to support vegetation and/or hydric conditions indicative of wetlands. Source: NRCS, 2020			

3.1.4 Environmental Consequences

3.1.4.1 Threshold of Significance

Impacts on geology, topography, and soils are evaluated separately in the following sections. The impacts on geology are analyzed based on potential changes, caused by the Proposed Action, to bedrock, unique sensitive landforms, or rock foundations. The impacts on topography are analyzed on potential changes to surface features, especially steep slopes. Impacts to soil are analyzed based on potential changes to soil type, erosion, and sedimentation due to the implementation of the Proposed Action.

3.1.4.2 Impacts of the Proposed Action

Geology

The Proposed Action would have minimal effects, beneficial or adverse, on underlying geology. While some excavation into underlying bedrock would be required to establish the foundation for this multi-story building, these actions would alter only a small area of approximately 12.5 acres within the larger, regional landscape and would not alter the underlying geological characteristics.

Topography

The Proposed Action would have minimal effects, beneficial or adverse, to the topography of this previously disturbed site, nor result in the alteration or destruction of any unique or noteworthy topographic features within FBNA. Excavating and grading would be employed to prepare the site for construction, and the elevations would be permanently altered to support the buildings, the parking areas and stormwater management pond. However, these effects would be beneficial in reducing accelerated rates of run-off from adversely affecting downstream receiving waters.

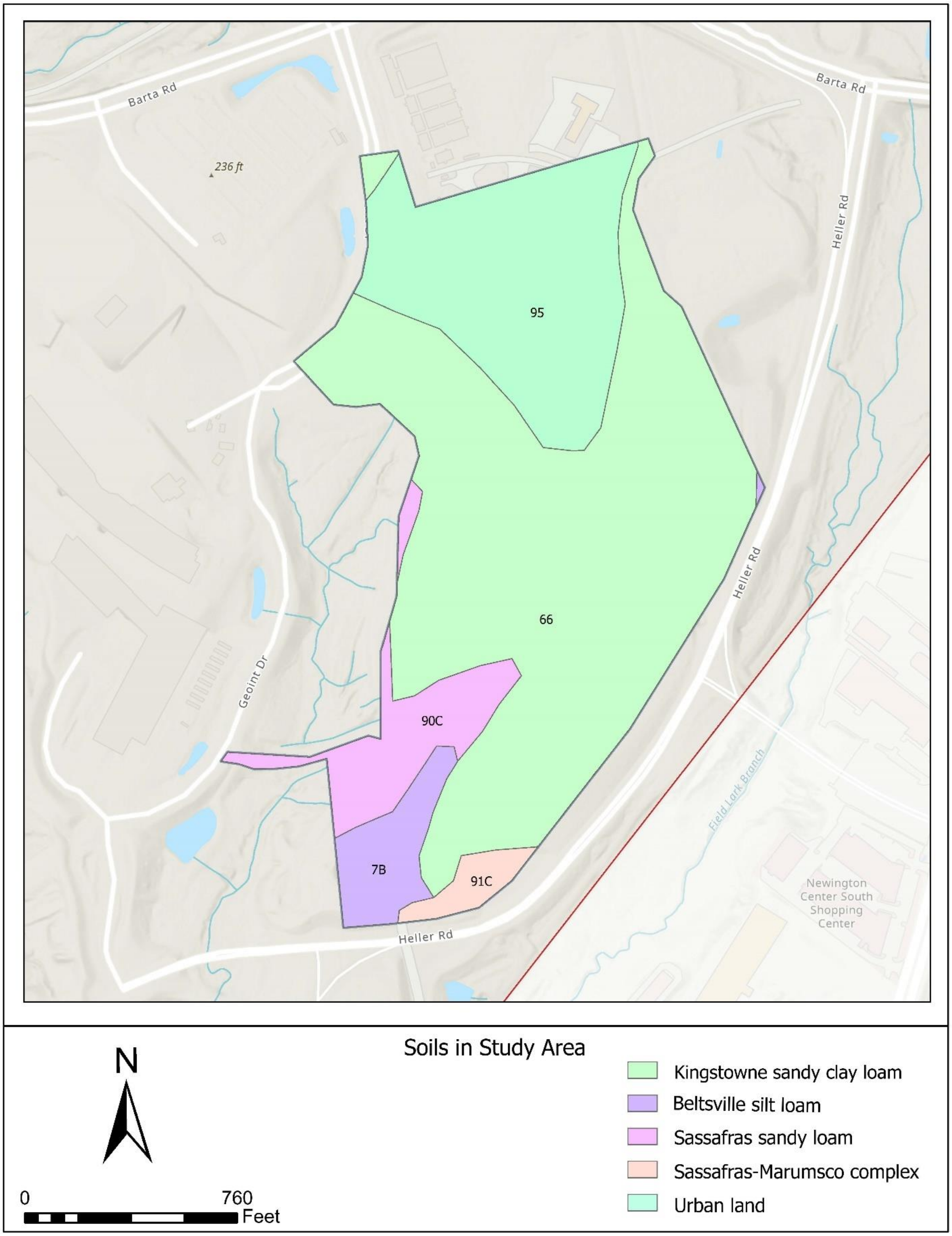

Figure 3-2: Soils in Study Area

Soils

Minor adverse impacts to soil would occur under the Proposed Action. The Proposed Action would require clearing of vegetation and grading and excavation of soils within the approximately 12.5-acre project footprint. These actions expose soils and increase the potential for erosion. Because of the well-established connection between erosion of exposed soils and introduction of increased sedimentation into downstream waters, regulations have been enacted by federal, state and local governments to require project proponents to develop and implement plans to control site conditions and prevent erosion. These regulations and the types of site control mechanisms are described in more detail in Section 3.2.6.

3.1.4.3 Impacts of the No Action Alternative

Geology

The No Action alternative would have no adverse effect on the underlying geology of the area, as no grading or other earthwork would occur.

Topography

The No Action Alternative would have no adverse effects on topography on FBNA or the study area because existing conditions would continue as no grading or other earthwork would occur.

Soils

Under the No Action alternative long-term, minor adverse impacts to soil quality would occur due to erosion. Soils within the gravel parking lot currently used as overflow parking for NGA, along with surrounding areas of sparse vegetation, would continue to be exposed and subject to erosion. Vegetated areas provide root structure that stabilizes soils and continue to support infiltration of rainwater, among other important services.

3.2 WATER RESOURCES

3.2.1 Surface Waters

FBNA is located entirely within the highly urbanized 52-square-mile Accotink Creek watershed, which ultimately discharges to Accotink Bay and the Potomac River. Accotink Creek roughly bisects the 804-acre FBNA into eastern and western sections. The Proposed Action study area is located within the eastern half of FBNA.

As described in Section 3.1.2, the study area is relatively flat, sloping gradually downhill from north to south. The northern portion of the site is currently used as a gravel overflow parking lot, known as the North Subcontractor Parking Lot, a relic of its use as an equipment and materials staging area during the construction of the NGA facility in 2007-2008. On the northwestern side of the project area the land slopes down from this gravel parking lot through an area vegetated predominantly with Virginia pines (*Pinus virginiana*), until it meets the NGA perimeter security fence and patrol path. Several unnamed erosional features carry stormwater down gradient from the gravel parking lot in a northeast to southwest direction. A site visit by personnel from the U.S. Army Corps of Engineers (USACE), Baltimore District on September 17, 2020 indicated no Ordinary High Water Mark (OHWM) present within these features. Further, a more recent stormwater run-off pathway has established itself along an abandoned dirt road. A series of rock weirs have been installed along this pathway, but erosion is still evident (Photos 3-1 and 3-2).


Photos 3-1 and 3-2: Erosional feature on northwestern side of the study area.

Downstream and outside of the study area, the Fort Belvoir Integrated Natural Resources Management Plan (INRMP) (Fort Belvoir, 2017) has identified perennial streams with associated riparian wetlands to the west and southwest of the study area, and which connect into Accotink Creek north of its intersection with Fairfax County Parkway (Figure 3-3).

Within the eastern portion of the study area, an approximately 0.25-acre stormwater pond (Photo 3-3) captures runoff from both sheet flow over the gravel parking as well as from a network of stormwater pipes serving the same area. This stormwater pond was constructed between 2007 and 2008, based on a review of historic aerial photography available on Google Earth, and was associated with the site grading that occurred in support of the NGA construction lay-down area. It is not currently maintained by Fort Belvoir as a stormwater management facility. The pond is bound to the east by the remnant of the former Engineering Proving Ground (EPG) concrete test track known as Heller Loop. No discharge pipe connecting this pond to downstream waters was observed during the September 17, 2020 inspection. Such a connection is not apparent on available Fort Belvoir Geographic Information System (GIS) mapping of the area; however, a potential down gradient discharge would be the swale underneath a stand of Virginia pines that parallels Heller Loop to the east until the land slopes downhill to the east, south of the North Belvoir Child Development Center (CDC). Stormwater in this area is detained and treated by a stormwater management facility located directly south of the CDC.

Photo 3-3: Stormwater pond on eastern edge of the study area.

The Accotink Creek watershed is 87% developed with commercial, industrial, transportation or residential land with 28% of the non-tidal portion of the watershed covered by impervious surface (Virginia Department of Environmental Quality [VADEQ], 2017). The quality of surface waters in such highly urbanized areas typically becomes degraded through increased amounts of sediments, chemicals, nutrients, and bacteria resulting from human activities. Pursuant to Section 303(d) of the federal Clean Water Act (CWA), which requires states to develop a list of impaired waterbodies, the VADEQ has identified Accotink Creek as an impaired water based on biological monitoring of benthic macroinvertebrate communities. Section 303(d) of the CWA further requires states to take steps to halt or counteract degradation through development of Total Maximum Daily Load (TMDL) standards for specific pollutants. TMDLs target the load reduction needed to reduce the pollutants of concern and represent the total pollutant loading that a waterbody can receive without exceeding water quality standards. For Accotink Creek, TMDLs are under development for sediment and chlorides.

3.2.2 Resource Protection Areas

The unnamed stream and associated riparian wetlands to the west of the study area are denoted as a Riparian Buffer Area (RPA) on Fort Belvoir's INRMP mapping (Figure 3-3). These features ultimately connect to Accotink Creek, which discharges to Accotink Bay, a tributary to the Potomac River and the Chesapeake Bay. Recognizing the Chesapeake Bay's critical role in the economy and health of the region and the importance of improving the health of the Bay, the State of Virginia's General Assembly adopted the Chesapeake Bay Preservation Act in 1988. The Act requires local governments within Tidewater Virginia to adopt implementing regulations that promote water quality protection measures. One of the key provisions of this Act requires the protection of vegetative buffers, known as RPAs, no less than 100 feet wide located adjacent to and landward of all tidal shores, tidal wetlands, water bodies with perennial flow, and non-tidal wetlands connected by surface flow and contiguous to tidal wetlands along water bodies with perennial flow. In Fairfax County, where Fort Belvoir is located, the Chesapeake Bay Preservation Ordinance (CBPO) is the applicable local regulation. Fort Belvoir recognizes the RPA designation but, being a federal entity, is not subject to the provisions of the Fairfax County ordinance. While Fort Belvoir does not use the RPA maps produced by Fairfax County, the Army does delineate RPAs on the installation, reflecting a spirit of compliance with the state and local requirements. Further, as part of the INRMP, Fort Belvoir designates a 35-foot RPA buffer for intermittent streams. The study area in relationship to installation-mapped RPAs is shown in Figure 3-3.

Establishing an RPA serves to limit adverse effects of development adjacent to streams and tidal wetlands by preserving vegetated buffers around sensitive aquatic resources. Vegetated buffers provide additional surface area for attenuation of surface water run-off velocity, thereby reducing erosion; filtration of excess nutrients and other pollutants carried by stormwater; and, additional habitat corridors. Development in these areas should be avoided and/or minimized. When impacts occur, an additional review is conducted to determine the extent of impact, as well as mitigation for the RPA infringement. Mitigation for RPA impacts typically includes the replanting of trees and/or shrubs at a predetermined ratio or the enhancement of a degraded RPA elsewhere on Fort Belvoir. RPAs are typically addressed during the wetland permitting process or the Coastal Zone Management Act (CZMA) consistency determination process.

It should be noted that EO 13508, *Chesapeake Bay Protection and Restoration*, must be addressed in terms of the Army's obligation to consider the protection and restoration of the Chesapeake Bay Watershed in terms of meeting the goals, outcomes and objectives set out in the Strategy for Protecting and Restoring the Chesapeake Bay Watershed. This document not only sets goals/outcomes/objectives of the federal government, but encourages coordination with state, local, and non-governmental partners to protect and restore the health of the Chesapeake Bay Watershed.

3.2.3 Floodplains

One-hundred-year floodplains on Fort Belvoir are protected under Executive Order (EO) 11988, *Floodplain Management* (May 24, 1977), which directs federal agencies to avoid, to the extent

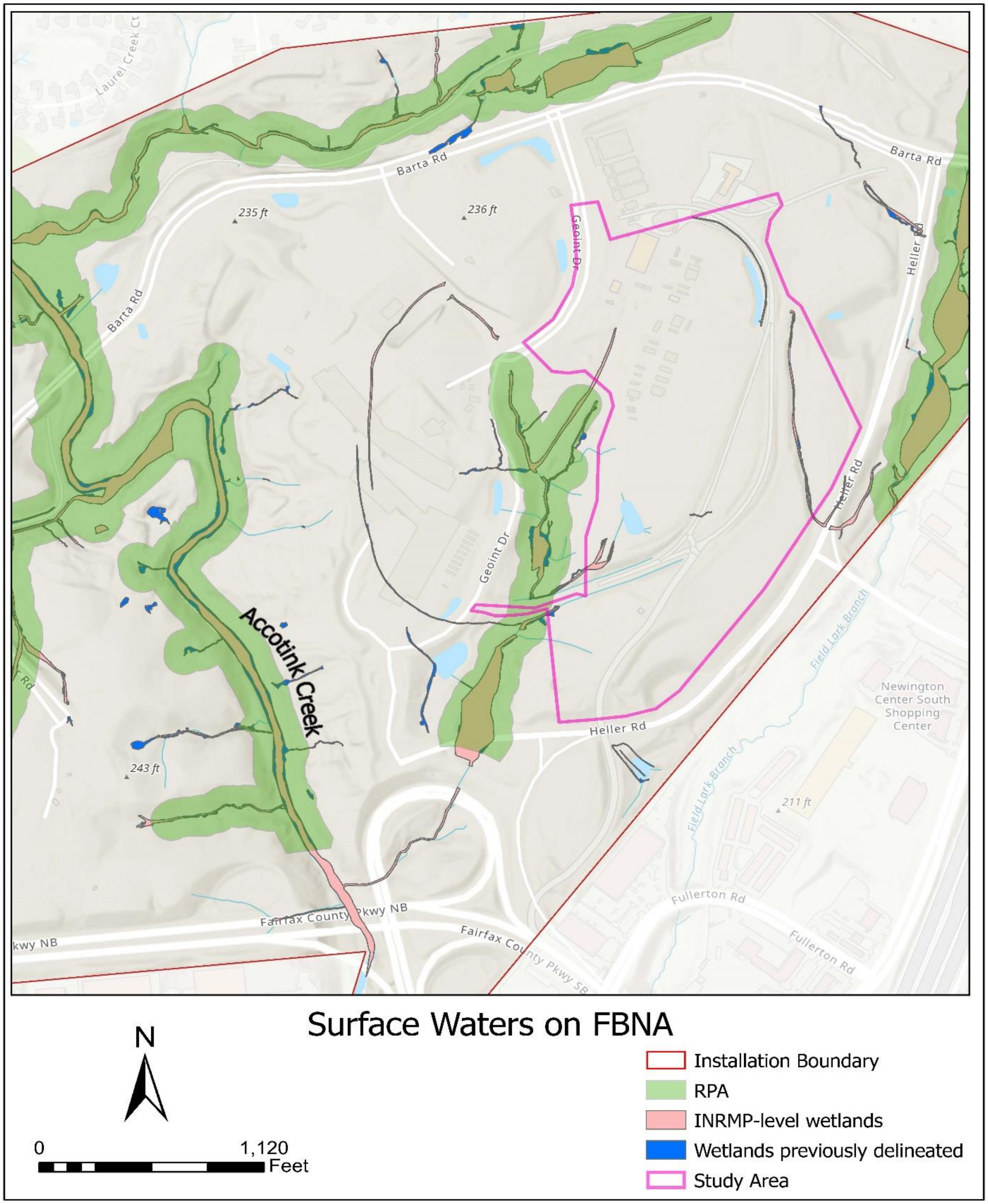

Figure 3-3: Surface Waters on FBNA

possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. The EO was issued in furtherance of NEPA, the National Flood Insurance Act of 1968, and the Flood Disaster Protection Act of 1973. Floodplains are defined in EO 11988 as the "lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year."

As a federal agency subject to this EO, Fort Belvoir is required to evaluate potential effects of any action occurring in a floodplain. The Proposed Action is located outside of the 100-year floodplain associated with Accotink Creek (Figure 3-4).

3.2.4 Wetlands

USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328). Important wetland functions include water quality improvement, groundwater recharge and discharge, storm water attenuation and storage, sediment detention, fish and wildlife habitat, and erosion protection.

EO11990, *Protection of Wetlands* (May 24, 1977), requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Construction in jurisdictional wetlands and waters of the US is regulated by the USACE pursuant to Section 404 of the CWA as implemented in regulations contained in 33 CFR, Parts 320–330. Impacts to state waters, including wetlands, are regulated by the Virginia Water Protection Permit Program (9 Virginia Administrative Code [VAC] 25-210-10 et seq.), which serves as Virginia's 401 Water Quality Certification Program for federal Section 404 Permits.

The predominant wetland type on Fort Belvoir is palustrine forested (PFO) wetland, which tends to occur in association with the riparian areas of Accotink, Dogue, and Pohick Creeks. Wetlands generally occur along the perennial and intermittent streams that are drainages of these creeks (Fort Belvoir, 2017).

The stormwater pond on the eastern side of the project area, previously described in Section 3.2.1 and denoted on installation natural resources mapping as a wetland, was examined during the September 17, 2020 site inspection by USACE biologists during a natural resources survey for the project (USACE, 2020). Mapping of potential resources under the INRMP makes general assumptions based on a review of aerial photography, but site-specific verification using the 1987 Corps of Engineers Wetland Delineation Manual must be conducted to confirm and refine this high-level mapping. While the littoral zone of the pond supports an abundance of hydrophytic vegetation such as black willow (*Salix nigra*), barnyard grass (*Echinochloa muricata*), soft rush (*Juncus effusus*), and swamp smartweed (*Polygonum hydropiperoides*), the soils lacked hydric characteristics and were of a homogeneous distribution indicative of a man-made feature created

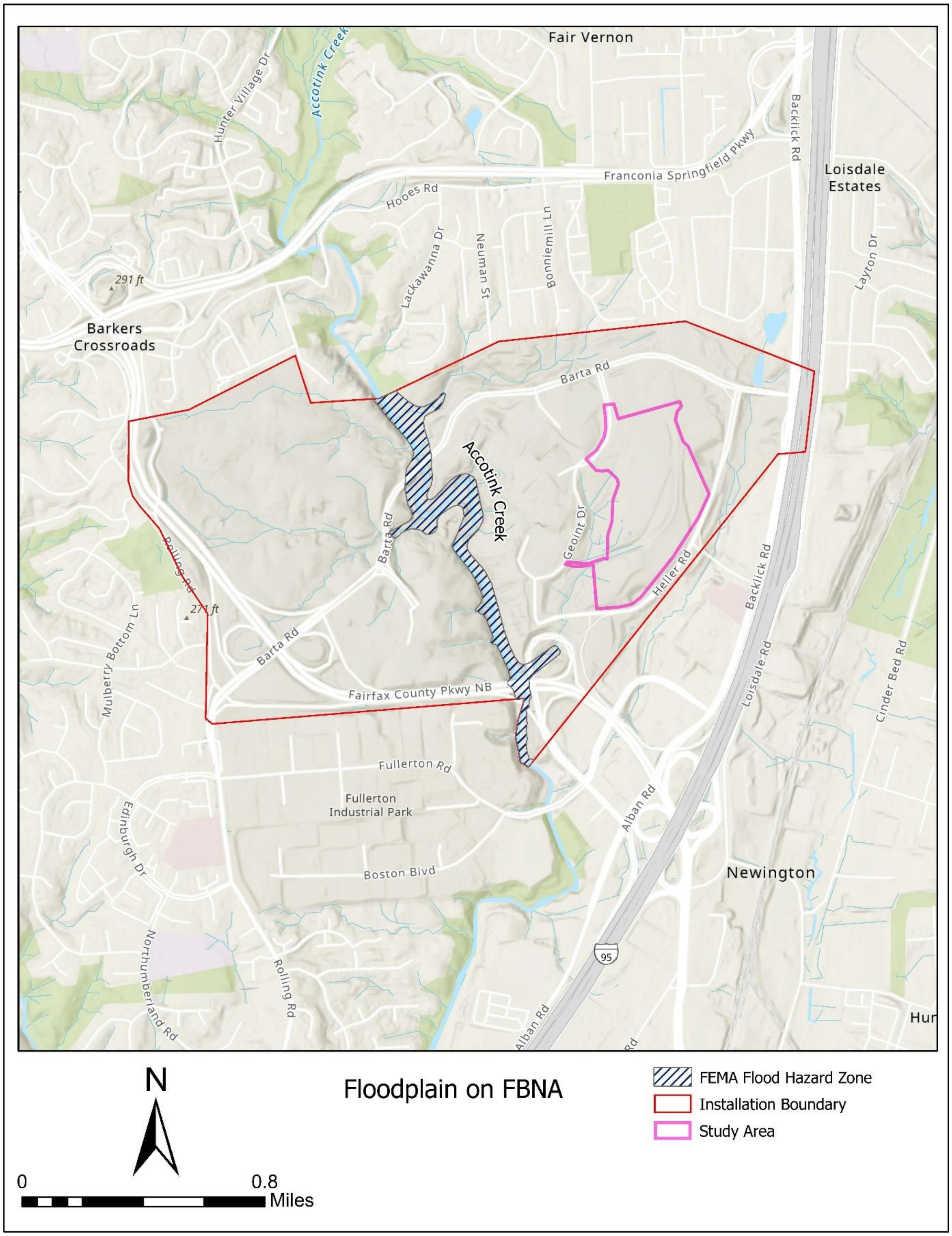

Figure 3-4: Floodplain of Accotink Creek

as a result of grading. Therefore, the littoral zone of the pond does not meet the required parameters to be considered a wetland.

A March 23, 2021 inspection by biologists from USACE confirmed the presence of wetlands in the southwest portion of the study area (represented by the blue in Figure 3-3). The proposed perimeter security fence that would tie into the existing NGA perimeter structure in this area could cross over these wetlands.

3.2.5 Groundwater

The geology of the study area lends itself to unconfined, shallow groundwater located approximately 15 to 20 feet below the ground surface (AECOM, 2021). Groundwater could become perched in lenses within the unconsolidated coastal plain sediments. Groundwater flow patterns on FBNA generally follow surface water drainage (U.S. Army, 2007). Fracture zones in the deeper, less weathered rock could result in higher water heads in some areas, but only minimal artesian conditions have been found to exist during previous sampling conducted on the vicinity of the study area (USACE, 2015). As a result of its previous uses under the EPG mission, there is contamination of groundwater on FBNA, as outlined in the 2021 AECOM final feasibility report and described in more detail in Section 3.4. The contaminants include benzene, naphthalene, 2-methylnaphthalene, toluene, and ethyl benzene; however, the report, which includes data from 2006 to 2018 obtained from an array of monitoring wells within and adjacent to the project site, indicates the plume of contaminated groundwater is relatively stable and not migrating. Land use controls are in place for FBNA to prevent the withdrawal of groundwater for potable use.

The construction and operation of the Proposed Action will require the relocation of some of the monitoring wells. Any existing wells identified for relocation would be coordinated with Fort Belvoir Department Public Works (DPW) and closed in accordance with 12 VAC 5-630-450, *Well Abandonment*.

3.2.6 Stormwater

As described in the earlier section on Surface Water (Section 3.2.1), the study area on FBNA is located within the Accotink Creek watershed. Existing stormwater management structures include the series of underground pipes draining the gravel parking area that discharge to the man-made stormwater pond on the eastern side of the study area. Stormwater not captured within this system is directed by existing topography, namely the downhill slope on the western portion of the Proposed Action study area that becomes characterized by the erosional gully that connects downstream into the unnamed tributary to Accotink Creek.

Stormwater runoff in urban areas is one of the leading sources of water pollution in the United States. Recognizing the importance of controlling stormwater generated from development, federal, state and local governments have adopted requirements. The following regulations apply to the Proposed Action:

Federal Requirements

- National Pollutant Discharge Elimination System (NPDES) - Section 402 of the Federal CWA, known as the NPDES program, requires permits for the discharge of pollutants from point sources and is administered by VADEQ through its Virginia Stormwater Management Program (VSMP). Fort Belvoir operates a municipal separate storm sewer system (MS4) for the entirety of the installation (including FBNA) pursuant to the NPDES regulations, and discharges stormwater runoff under VPDES Stormwater Permit No. VAR040093. Stormwater runoff generated by development on FBNA, including the Proposed Action, would be included under the installation-wide permit, provided the proponent comply with its terms and conditions and coordinate with the appropriate personnel on Fort Belvoir.

- Energy Independence and Security Act (EISA), Section 438 – federal projects 5,000 square feet or greater in size are required to maintain or restore pre-development hydrology. Guidance provided by the U.S. Environmental Protection Agency (EPA) promotes retaining rainfall on-site through infiltration, evaporation/transpiration, and re-use to the same extent as occurred prior to development. Section 438 requires that practices known as low impact development (LID) or green infrastructure, including reducing impervious surfaces and using vegetative practices, porous pavements, cisterns and green roofs be incorporated into development plans https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438-factsheet.pdf .

  LID is a stormwater management approach that emphasizes the retention of native vegetation and soils, reduces runoff, and seeks to approximate predevelopment hydrologic conditions. LID provides an effective alternative to more traditional stormwater management approaches that rely on engineered structures. When properly used, LID can be cost effective by reducing the reliance on hard structures. It can make more efficient use of land resources by reducing the need for large, centralized stormwater basins, decreasing the total amount of runoff generated, and providing water-quality improvements (HDR, 2020).

VADEQ Requirements

- Stormwater Management Act (9VAC25-870)
  - General Permit for Discharges of Stormwater from Construction Activities
  - Virginia BMP Clearinghouse
  - Virginia Runoff Reduction Method
- Erosion and Sediment Control Law (9VAC25-840)
  - Erosion and Sediment Control Plan
  - Virginia Erosion and Sediment Control Handbook
- Chesapeake Bay Preservation Area Designation and Management (9VAC25-830-130)
  - Construction activities disturbing one or more acres, requires:
  - General Permit for the Discharge of Stormwater from Construction Activities

- Stormwater Pollution Prevention Plan (SWPPP), developed by the project proponent, requires stormwater management measures as included in the approved site plan, and demonstration of how these measures would be maintained, identifying the responsible entity throughout duration of construction.

Installation Requirements

- Fort Belvoir, DPW, reviews all construction site plans involving 2,500 square feet or more of earth disturbance for compliance with the installation's municipal separate storm sewer system (MS4) conditions, state requirements for stormwater management and erosion/sediment control, and the Fairfax County Public Facilities Manual.

3.2.7 Coastal Zone

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 CZMA Reauthorization Amendment 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
- 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 VADEQ serves as the lead agency for consistency reviews. The project area is characterized as previously disturbed, with a gravel parking lot, unpaved and paved roads, and areas of forest, wetlands, and grass/shrub groundcover. While there are streambanks adjacent to the project area, there is no coastline present, nor dunes.

The proposed construction would be consistent with Virginia's Coastal Resources Management Policies. Non-point source pollution would be managed through the use of temporary erosion and sediment control measures defined in the approved Erosion and Sediment Control Plan or permanent stormwater management best management practices (BMPs), as appropriate. The Coastal Zone Consistency Determination will be submitted to the Commonwealth of Virginia as an appendix in the Final EA/Draft FNSI. Complete results of this coordination, including recommendations from VADEQ, when received, will be presented in Appendix A.

3.2.8 Environmental Consequences

3.2.8.1 Threshold of Significance

The threshold of significance for water resource and surface water quality impacts would be exceeded if the alternative would result in changes to regional groundwater patterns or depletion of groundwater, alteration of local surface water, or substantial degradation of water quality. The threshold of significance for wetlands/RPA and floodplains would be exceeded if the alternative would result in substantial degradation of wetlands without mitigation, and notable adverse impact on natural and beneficial floodplain values.

In regard to coastal zone resources, the threshold of significance would be exceeded if the alternative would not be consistent with the federal coastal zone policy, including consideration of the following:

- Impacts of the Proposed Action on any land or water use or natural resource of the coastal zone;
- Incremental impacts of the Proposed Action on any land or water use or natural resource of the coastal zone when added to past, present, and reasonably foreseeable future actions; and,
- Collective impacts of individual unrelated actions on any land or water use or natural resource of the coastal zone.

3.2.8.2 Impacts of the Proposed Action

Surface Waters and RPAs

Implementation of the Proposed Action would result in less-than-significant adverse effects to surface water. The Proposed Action includes installation of a perimeter security fence, which, if connected to the existing NGA fence line, could involve minimal construction in, on, or over surface waters (i.e., wetlands or streams) and could result in the disturbance, alteration, or filling of the adjacent RPAs on the eastern portion of FBNA. Short-term, less-than-significant effects would result from the destabilization of the soils within the limits of disturbance as a result of vegetation clearing and excavation/grading to prepare the site. This stage of construction exposes soils and increases the potential for erosion and discharge of sediment-laden stormwater to downstream receiving waters; however, appropriate erosion and sediment control measures would be implemented, pursuant to the construction SWPPP and the VSMP Construction General Permit, and would minimize any detrimental effects.

Construction of permanent stormwater management features would capture stormwater generated from the development and be designed to maintain pre-development levels of off-site discharge. It is expected that the overall effects of construction and operation of the buildings and parking features would be beneficial to downstream receiving waters through stabilization of soils through vegetation and retention and treatment of stormwater flows because currently there are no such stormwater management features, resulting in channeling and erosion of soil, particularly associated with the more steeply sloped portions of the study area.

Through the site layout design process, all practicable steps will be made to avoid inclusion of the unnamed tributary to Accotink Creek, and its associated RPA, within the limits of disturbance (LOD). Any work within the stream and RPA as necessary to construct the security fence would be appropriately permitted through the USACE and the Commonwealth of Virginia. Activities during construction would include appropriate BMPs to minimize sediment transport and erosion consistent with state and federal land and water quality criteria.

Wetlands

Implementation of the Proposed Action could affect wetlands, as there may be approximately 0.02 acres of jurisdictional wetlands within the limits of disturbance. As the project plans are in the early stages of development, project designers will be encouraged to consider avoidance of these wetlands by relocating the perimeter fence alignment. Prior to construction, any unavoidable impacts would be permitted through the USACE and Commonwealth of Virginia's wetland permitting programs. Stormwater generated from within the project site during construction would be appropriately managed through erosion and sediment control measures required through the permitting process, preventing adverse effects of sedimentation to downstream receiving waters that include wetlands. Permanent stormwater management features would maintain pre-development levels of stormwater discharge.

Groundwater

Under the Proposed Action, no adverse effects are expected to occur to groundwater. The construction of the Proposed Action would result in an increase of impervious surface area, reducing the infiltration of stormwater into the shallow, near-surface aquifer; however, due to the existing plume of groundwater contamination within the project footprint, stormwater management features for the Proposed Action will be required to retain all stormwater volume on site and will not be allowed to infiltrate into subsurface groundwater.

Floodplains

Under the Proposed Action, no adverse effects are expected to occur as a result of floodplain alterations. The Proposed Action is not located within a floodplain.

Coastal Zone

Both construction and operation of the Proposed Action would be consistent with Virginia's CRMP. Any impacts to streams would be mitigated through contributions to habitat restoration at the installation's mitigation sites. Non-point source pollution would be managed through the use of temporary erosion and sediment control measures defined in an approved Erosion and Sediment Control plan or permanent stormwater management BMPs, as appropriate.

Based on this EA, Fort Belvoir has determined that the Proposed Action would be consistent, to the maximum extent practicable, with the Commonwealth of Virginia CRMP's enforceable policies, as described in Appendix C, Determination of Consistency with Virginia's CRMP. Review and concurrence with the negative determination will be requested prior to initiating the Proposed Action.

Stormwater

Under the Proposed Action, less-than-significant adverse effects would occur to stormwater. The Proposed Action would add approximately 0.74 acres of impervious area within the Accotink Creek watershed, resulting in an increase in storm water volume from impervious surfaces that could cause an increase in erosion and sedimentation if not appropriately controlled. The Proposed Action will meet all applicable stormwater management regulations, ensuring consistent and measurable steps to minimize detrimental impacts to water quality in downstream waters. As stated earlier, approximately 87 percent of land (45 square miles) within the watershed is developed, while approximately 28 percent (14 square miles) is covered by impervious surfaces. In the context of this 52 square mile watershed in central Fairfax County, which encompasses all of FBNA, this increase would be minimal and would be offset by stormwater management strategies such as the approximately 2-acre stormwater management pond proposed within the eastern portion of the project area. Petroleum pollutants from the exposed surfaces of the parking garage and associated paved roadways would be treated through vegetated buffers and stormwater management structures.

Because the project is located within a Chesapeake Bay Preservation Area and would disturb more than 2,500 square feet, the contractor would be required to prepare an erosion and sediment control plan in compliance with the Virginia Erosion and Sediment Control Law (9 VAC 25-840) and in conformance with the *Virginia Erosion and Sediment Control Handbook, Third Edition, 1992*. The plan would be submitted to Fort Belvoir's Stormwater Permit Manager for review and approved by VADEQ's Northern Regional Office (NRO) and routine inspections would be conducted throughout construction to ensure compliance with these permits. As noted in Section 3.2.6, the contractor would also obtain a Construction General Permit and prepare and implement a construction SWPPP to minimize sedimentation to downstream receiving water bodies.

This project and any construction activities associated with it has the potential to discharge pollutants in surface waters to monitored/permitted Industrial Stormwater Outfall (ISW RO-031 and RO-032). This outfall is continually monitored for Total Suspended Solids (TSS), Total Petroleum Hydrocarbons (TPH), chloride, specific conductance, nitrogen and phosphorous, along with other constituents, therefore, any uncharacteristically high sediment content in the stormwater discharge detected at sampling could result in a violation of the VA0092771 permit. The construction contractor must contact DPW's Industrial Stormwater Section when construction begins and ends, so that precautions can be employed in the course of routine permit-required sampling events for this outfall. Also, construction as-builts of the new stormwater system will be required and must be submitted to DPW's Environmental Division.

Construction BMPs would be implemented in accordance with federal, state, and local Fort Belvoir regulations, including Fort Belvoir's MS4 Program and VPDES Permit VA0400093, to protect downstream waters from sediment migration by ensuring adequate perimeter controls and buffers are used, including silt fencing, synthetic hay bales, and similar measures. While these measures would not completely eliminate the potential for erosion and sedimentation, they would ensure that short-term adverse impacts remain negligible.

Use of appropriate erosion and sediment control measures and long-term LID measures would ensure that neither the construction nor the operation of the Proposed Action would contribute to further degradation of water quality or exceed TMDLs established for Accotink Creek as regulated under Section 303(d). Therefore, short-term and long-term detrimental impacts on surface water quality on and in the vicinity of FBNA would be negligible.

The master plan for Fort Belvoir envisions the FBNA as a future center for an intelligence community integrated campus, with mid- and long-term additions of more buildings and associated infrastructure including roads, parking and stormwater management facilities. This additional build-out would add more impervious surfaces to FBNA. Construction of an extension of Heller Road, to form a loop (with Barta Road) around the eastern portion of FBNA could potentially impact Accotink Creek and associated wetlands. Project proponents would be expected to obtain coverage under applicable permits issued by USACE and VADEQ in accordance with the CWA and would adhere to avoidance, minimization and compensatory mitigation to ensure that impacts to regulated waters would remain minor, and the resulting cumulative impacts would not be significant.

3.2.8.3 Impacts of the No Action Alternative

Surface Waters and RPAs

Under the No Action alternative, less-than-significant adverse effects would occur to surface water; existing conditions at the study area would remain. There would be no man-made alteration of the current pattern of surface water flows across and discharging from the study area. The erosional feature discharging to the unnamed tributary to Accotink Creek would likely continue to experience further downcutting, contributing to sediment loads downstream. There would be no alteration or construction within the RPA.

Wetlands

The No Action alternative would not impact jurisdictional wetlands on FBNA. Runoff would continue to discharge with no enhanced treatment for volume, velocity or sedimentation downstream to tributaries of Accotink Creek and associated floodplain wetlands that are located beyond the study area.

Groundwater

The No Action alternative would have no effect on groundwater. The current level of infiltration of stormwater would remain unchanged.

Floodplains

Under the No Action Alternative, no adverse effects are expected to occur as a result of floodplain alterations because no construction would occur within a floodplain.

Coastal Zone

The No Action Alternative would have no impacts on the Virginia Coastal Zone or future implementation of the Coastal Resources Management Plan.

Stormwater

There would be no increase in impervious surfaces on FBNA. Stormwater would continue to be directed to the existing stormwater management pond to the east of the study area, and through the erosional features downslope and west of the study area, which ultimately connect to the intermittent tributary to Accotink Creek. The compacted nature of the existing gravel parking lot allows for minimal infiltration of rainwater and the accelerated flows through these erosional features would continue to result in further erosion and sedimentation (the rock weirs emplaced would not function properly), thus resulting in a continued, minor, detrimental effect on downstream waters of Accotink Creek and Accotink Bay.

3.3 BIOLOGICAL RESOURCES

Located on the western shore of the Potomac River, within the larger metropolitan area of Washington, D.C., Fort Belvoir sustains its military mission while maintaining relatively large areas of native vegetation in terms of size, diversity and regional position. Fort Belvoir has recognized the ecological importance of its natural habitats by designating three refuges, two biological corridors, wetlands and steep-sloped areas as environmentally constrained areas (Fort Belvoir, 2017). These large areas of native vegetation afford a contiguous band of wildlife habitat within and extending outside of the installation. Fort Belvoir's natural resources management strategy, outlined in its INRMP, prioritizes preserving the native diversity of communities and species within communities and implements an ecosystem-based natural resources management program based in part on DoD Instruction 4715.3, *Natural Resources Conservation Program* and

Army Regulation 200-1, *Environmental Protection and Enhancement*, to guide development on Fort Belvoir.

The Accotink Bay Wildlife Refuge, Jackson Miles Abbott Wetland Refuge, T-17 Refuge, Accotink Creek Conservation Corridor, and Forest and Wildlife Corridor are designated Special Natural Areas by Fort Belvoir.

The Accotink Creek Conservation Corridor, located within FBNA, was designated as a Special Natural Area in 2005 as a mitigation measure associated with the 2005-era base realignment and closure actions (BRAC) and serves to protect the Accotink Creek riparian area within the boundaries of FBNA. This predominantly forested 191-acre area serves as a wildlife migratory corridor and supports potential habitat for federally listed small whorled pogonia and several other species of management concern (Fort Belvoir, 2017).

Biological resources discussed in the following sections include vegetation, wildlife, threatened and endangered species, and Partners in Flight habitat. Relevant regulations and policies are also discussed when applicable. The area of analysis for biological resources focuses on the project study area, taking into account a broader geographic range when appropriate.

3.3.1 Vegetation

Approximately seven (7) acres of the study area is occupied by a gravel parking lot. The southern portions of the study area, bounded by Heller Loop, have been partially planted with Eastern red cedar (*Juniperus virginiana*). This approximately 9-acre area of plantings was established to offset removal of vegetation associated with construction of the additional NGA Campus East (NCE) 900-space, 7-acre overflow surface parking lot located to the north of the project area, as stipulated in a March 20, 2008 memorandum between USACE and Fort Belvoir (USACE, 2015). The cedars in this area remain less than five (5) feet in height and are surrounded by tall grasses, supporting avian species that require open field habitat.

The western periphery of the study area slopes downward from the gravel parking lot into a previously disturbed area with uneven topography and a mixture of upland field grasses and Virginia pine stands until it is intercepted by GEOINT Drive. South of GEOINT Drive the study area is characterized by a narrow (ranging from approximately 50 to 200 feet) swath of Virginia pines and mixed hardwoods that form a visual screen between the NGA perimeter patrol path and the open, grassy field. The eastern periphery of the study area is formed by the remnant, concrete-paved test track of Heller Loop paralleled by a stand of Virginia pines.

In the above-referenced 2008 Memorandum, USACE committed to Fort Belvoir's tree replacement requirement by agreeing to restore areas of vegetation cleared outside the primary NCE construction area's limit of disturbance, including the North Subcontractor Parking Lot and adjacent areas serving as temporary construction management infrastructure. The intent was to restore these temporarily impacted areas to their original condition or better, replacing trees and vegetation lost as a result of that clearing. USACE developed a re-vegetation plan (USACE, 2010) for those areas in accordance with the requirements of the memorandum. This 2008 memorandum and the 2010 planting plan include the area within and surrounding the Proposed Action.

In partial fulfillment of the restoration requirements set forth in the 2008 USACE Memorandum and subsequent planting plan, USACE and NGA planted areas in the southwestern and eastern portions of the NCE project site with landscape size cedar trees at 20 trees per acre, and pine seedlings at 480 seedlings per acre (USACE, 2015). The full requirements of the planting plan have not been fulfilled to date. Fort Belvoir DPW, Environmental Division's natural resources staff perform routine, yearly surveys of this area, as it is designated as a mitigation area, and have indicated that in its current condition it does not meet the standards of the planting plan.

Fort Belvoir's Tree Removal and Protection Policy requires the protection of existing trees and, where tree loss is unavoidable, mitigation for the removal of trees must be performed unless expressly exempted. In-kind mitigation measures include replacing any trees four inches or greater in diameter at breast height (dbh) that are removed with the planting of two new trees. Out-of-kind compensatory mitigation, such as environmentally beneficial restoration, enhancement, or preservation measures may be completed if in-kind mitigation is not a feasible option (Fort Belvoir, 2018). Pursuant to the Tree Removal and Protection Policy, a Tree Protection Plan must be prepared in accordance with DPW requirements and included as part of the 35% design submittal for construction projects.

The Proposed Action will implement a mitigation planting plan in consideration of the installation's current tree removal policy and the existing mitigation status of the Proposed Action study area (Figure 3-5). USACE and DIA, as the project proponent, will work closely with DPW's natural resources staff to identify and meet requirements.

3.3.2 Wildlife

A wildlife survey was conducted on FBNA in 2006 (U.S. Army, 2007). Mammals present consisted predominantly of white-tailed deer (*Odocoileus virginianus*), Virginia opossums (*Didelphis marsupialis*), and gray squirrels (*Sciurus carolinensis*). By 2008, much of the study area was cleared, graded, and supported construction equipment and temporary buildings associated with the NGA construction, but at the conclusion of construction, equipment and materials were removed and the area was allowed to revegetate as described in Section 3.3.1. The establishment and growth of Virginia pine trees has allowed populations of the common woodland mammals listed above to re-establish themselves. Further, the maintenance of the open grassland on the southern portion of the study area supports mammal species favoring old fields such as eastern cottontails (*Sylvilagus floridanus*), field mice (*Peromyscus* sp.), opossums, and groundhogs (*Marmota monax*). Reptile species that favor the mix of uplands and wetlands, as well as old-field habitat, on FBNA include eastern garter snakes (*Thamnophis sirtalis*), black racers (*Coluber constrictor constrictor*) and the eastern box turtle (*Terapene carolina carolina*).

Accotink Creek, along with its tributaries and associated floodplain wetlands, supports amphibian species including spring peepers (*Pseudacris crucifer*), American toads (*Bufo americanus*),

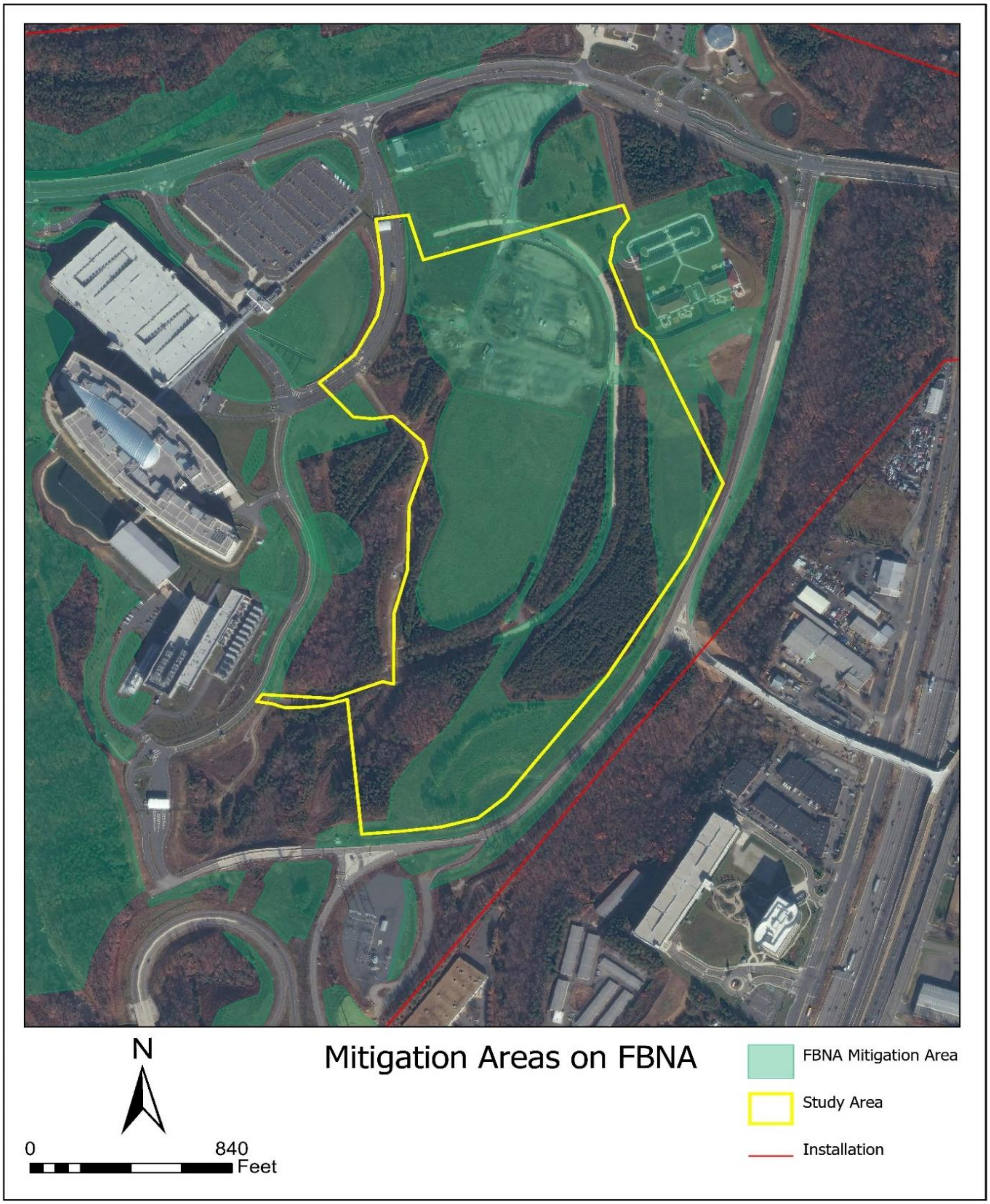

Figure 3-5: Tree Mitigation Areas on FBNA

Fowler's toads (*Bufo woodhousii fowleri*), and bullfrogs (*Rana catesbeiana*). The stormwater management pond on the eastern portion of the study area would also likely support these species.

The assortment of common animal species is typical of animals tolerant of disturbed, urbanized areas with fragmented stands of forest and in close proximity to traffic and associated human activity. More suitable habitat for biologically diverse species assemblages can be found west of the study area along the Accotink Creek Conservation Corridor.

3.3.3 Rare, Threatened and Endangered Species

Under the Endangered Species Act (ESA) of 1973, plant and animal species in danger of extinction throughout all or a significant part of their range are listed as "endangered." Species that are likely to become endangered within the foreseeable future are listed as "threatened." The USFWS is responsible for administering the ESA for terrestrial and freshwater organisms, as may be found within the study area and its vicinity. The ESA establishes the federal government's responsibility for protection and recovery of species considered to be in danger of extinction. The ESA requires federal agencies, in consultation with the USFWS to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Critical habitat can include areas not occupied by the species at the time of the listing, but that are essential to the conservation of the species.

Federally Listed Species

Section 7 of the ESA requires federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any federal agency. Based on project area screening using the USFWS' Information for Planning and Conservation (IPaC) online tool, the northern long-eared bat (*Myotis septentrionalis*) (NLEB), listed as a threatened species under the ESA, may occur in forested areas on or near the project study area. No critical habitat has been designated for this species. White-nose syndrome, a fungal disease known to affect bats, is the most severe and immediate threat to NLEB survival and is the basis for the listing of the species as threatened. During the active season (April 1 to October 31), bats roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and snags.

USFWS signed a Programmatic Biological Opinion (BO) 5 January 2016 on the Final 4(d) Rule that addresses effects to the NLEB by federal actions and provides for a streamlined Section 7 consultation. USFWS has not yet designated critical habitat for NLEB. However, incidental clearing of vegetation would not occur during the northern long-eared bat active season from April 15 through September 15.

An earlier IPaC screening dated June 23, 2021 also listed small-whorled pogonia (*Isotria medeoloides*) as potentially present within the project area. The small-whorled pogonia is an orchid listed as federally threatened throughout its range and listed as state-endangered by the Commonwealth of Virginia. In Virginia, small-whorled pogonia is most typically found in deciduous second or third growth successional hardwood forests with fairly sparse ground cover and highly acidic, nutrient-poor, sandy loam soils, although plants have been found in a wider range of habitats in recent years. To date, FBNA is the only location in Fairfax County where the small-whorled pogonia has been found (U.S. Army, 2007). The small-whorled pogonia was observed in the summer of 2005 on steep, oak-dominated forested slopes on a first order tributary of Accotink Creek in the southwestern part of FBNA. Areas of FBNA that have been identified as potential suitable habitat for the small-whorled pogonia are along the western and southern boundaries of FBNA.

Mapping associated with the Fort Belvoir INRMP, shown in Figure 3-6, indicates there is an approximately 0.45-acre area of potentially suitable habitat for small-whorled pogonia within the southwest portion of the Proposed Action study area. This portion of the study area supports a vegetative community that has experienced less disturbance compared to the remainder of the proposed study area. However, no small-whorled pogonia have been documented within the study area and an updated IPaC screening dated July 26, 2021 indicates no potential habitat for the small-whorled pogonia.

If the small whorled pogonia, or any other listed species, is encountered at any project site, Fort Belvoir would coordinate a biological assessment with USFWS before approving the project to develop an appropriate mitigation plan if the plant cannot be avoided.

State-Listed Species

Virginia has also promulgated a state endangered species act that provides endangered and threatened listings for species vulnerable to extinctions at the state level. The Virginia statute (4 VAC 15-20-130) prohibits the taking, transportation, possession, sale, or offer for sale within the state any species listed on the federal endangered species list or any other species designated by the state board. The Commonwealth also provides protection for plant and insect species through Chapter 10 §3.2- 1000 of the Code of Virginia. It is the role of Virginia's Department of Conservation and Recreation, Division of Natural Heritage to maintain listings and rarity (i.e., conservation) rankings of rare plant and animal species 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, but, rather, are used to prioritize resources for conservation.

Fort Belvoir has five state-listed animal species that occur on the installation, including the state-listed threatened wood turtle (*Glyptemys insculpta*), the state-listed endangered peregrine falcon (*Falco peregrinus*, during fall migration), the state-listed endangered little brown bat (*Myotis lucifugus*), the state-listed endangered tri-colored bat (*Perimyotis subflavus*), and the state and federally listed threatened NLEB. Potential habitat for the wood turtle is primarily located along Accotink Creek and its tributaries. However, this species is also known to traverse connected deciduous woodlands within 300 feet of resident waterways. The peregrine falcon has been regularly recorded on Fort Belvoir as it migrates through the regional area and takes advantage of foraging habitat along the Accotink Creek/Accotink Bay stream corridor. The little brown bat and the tri-colored bat have an active season similar to that of the NLEB. The conservation measures outlined by the state include time of year restrictions that fall within the bounds of the time of year restrictions already established for the NLEB. Therefore, the conservation measures required for protection of the NLEB would also be adequate for protection of the state-listed bat species.

Although field surveys have not identified any listed threatened or endangered plant or animal species within the project study area, construction would be coordinated in accordance with Department of Wildlife Resources (DWR) guidance to avoid impacts to protected species. This would include conducting preconstruction protection surveys for wood turtles and installation of silt fencing around potential wood turtle habitat areas during the winter months to exclude wood turtles from proposed construction areas. Any turtles found during pre-construction screening of the fenced area shall be relocated by trained personnel in accordance with DWR guidance to avoid impacts. Preconstruction verification surveys for small-whorled pogonia would also be included as part of preconstruction activity coordination. Seasonal land clearing requirements would also be followed to reduce potential impacts to protected bird and bat species.

3.3.4 Partners in Flight

The DoD Partners in Flight (PIF) program uses a cooperative network of natural resources personnel from military installations across the United States to sustain and enhance the military mission through proactive, habitat-based conservation and management strategies that maintain healthy landscapes and training lands (https://partnersinflight.org/). The DoD PIF uses voluntary partnerships at local, state, regional, national and international levels to share information and develop ecosystem-based, proactive management programs and programmatic priorities that aim to "keep common birds common" and help recover species at risk. The USFWS, as well as state wildlife agencies such the Virginia Department of Wildlife Resources (VDWR), through the state nongame program, are also partners in this program.

As part of the PIF Program, DoD installations are encouraged to incorporate elements of the Partners in Flight Bird Conservation Strategy into their INRMPs. Such elements include habitat management practices such as prescribed burning and timber management programs. Designation of regional PIF priority bird species is the result of a cooperative/coordinated effort among various federal, state and private organizations. Fort Belvoir has designated approximately 4,200 acres of PIF habitat within its boundaries, most of it within the 1,480-acre Accotink Bay Wildlife Refuge along Accotink and Pohick Bays, and the 234-acre Jackson Miles Abbott Wetland Refuge along Dogue Creek, both areas of high-quality habitat located within Main Post. These large areas of habitat not only are valuable in and of themselves, but also provide for ecological connectivity through the installation to other regional habitats (USACE, 2015).

PIF Species of Concern (SOC) status and applicable conservation guidelines are part of a broader designation identified by the INRMP as Fort Belvoir Breeding Birds of Management Concern, and includes USFWS Birds of Conservation Concern, DoD PIF Mission Sensitive Species and Fort Belvoir Habitat Indicator Species in addition to the PIF SOC for Bird Conservation Region 30 (New England/Mid-Atlantic Coast). The prairie warbler (*Setophaga discolor*) and wood thrush

(*Hylocichla mustelina*) are Fort Belvoir Breeding Birds of Management Concern species documented on FBNA (USACE, 2017). Documented occurrences of these species include GIS mapping of a 500-foot buffer to provide protections for potential nesting and foraging areas (Figure 3-6). FBNA supports approximately 396 acres of designated habitat for PIF species (USACE, 2015). PIF management recommendations include maintaining upland forest habitat (to support wood thrushes) and creating and maintaining successional/shrub-scrub habitat (to support prairie warblers) (Fort Belvoir, 2017).

3.3.5 Environmental Consequences

3.3.5.1 Thresholds of Significance

The threshold of significance for biological resources impacts would be exceeded if the alternative would jeopardize the continued existence of any federally listed threatened or endangered species or result in destruction of critical habitat; decrease the available habitat for commonly found species to the extent that the species could no longer exist in the area; eliminate a sensitive habitat such as breeding areas, habitats of local significance, or rare or state-designated significant natural communities needed for the survival of a species; or substantially degrade or minimize habitat.

Potential impacts to plants, wildlife, and fish are evaluated in accordance with applicable regulations including but not limited to the Endangered Species Act of 1973, the Fish and Wildlife Conservation Act of 1980, the Magnuson-Stevens Fishery Conservation and Management Act, as amended, the Migratory Bird Treaty Act, and EO 13112 on Invasive Species. The Sikes Act provides for cooperation by the Department of the Interior and DoD with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. The area of analysis for biological resources includes the project study area.

3.3.5.2 Impacts of the Proposed Action

Vegetation

Under the Proposed Action, less-than-significant adverse effects would occur to vegetation. Removal of approximately 7 acres of vegetation for construction of the Proposed Action would result in temporary, minor adverse effects on open field and pine stand habitat on FBNA. This would be offset by a combination of replanting within the project's limits of disturbance (LOD) and replanting and/or enhanced planting within other areas of Fort Belvoir in consultation with Fort Belvoir natural resource specialists and in accordance with Fort Belvoir's Tree Removal and Protection Policy. A tree survey was conducted by USACE biologists on March 23, 2021 to characterize and quantify the forest resources within the study area to support determination of appropriate mitigation (USACE, 2021).

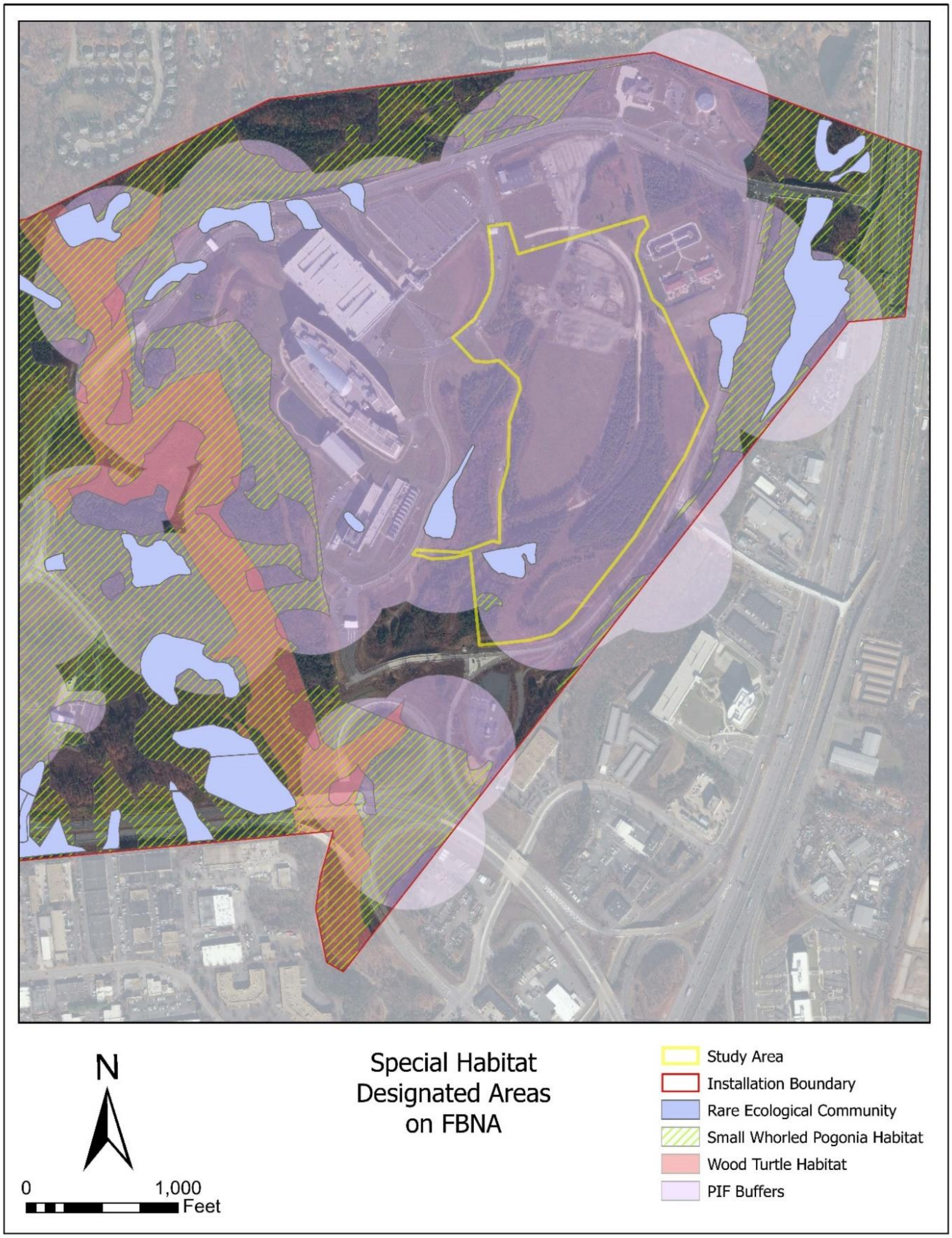

Figure 3-6: Special Habitat Designated Areas on FBNA

Upon completion of construction, the Proposed Action area would be landscaped with grass, shrub and tree species coordinated with the Fort Belvoir natural resources program staff to ensure no invasive species are utilized, and planting enhances wildlife habitat in a low-maintenance manner consistent with master planning objectives. While the character of the area would change from that of a mixture of grass field and pine/hardwood stands to a campus-like landscaped setting, it would provide for the continued removal of invasive vegetative species and upkeep of desirable, native species throughout the life cycle of the building, thus resulting in an overall long-term beneficial effect.

Wildlife

Under the Proposed Action, less-than-significant adverse impacts would occur to wildlife. During construction of the Proposed Action, equipment noise, ground disturbance and vegetation removal would temporarily displace individual species of common wildlife residing in the LOD. There may be limited mortality to individual species that are not able to relocate during construction. However, population-level impacts would not reasonably occur due to the relatively small size of the construction area in relation to the overall size of FBNA. Additionally, most mobile species are able to safely avoid equipment. Therefore, construction activities associated with the Proposed Action are expected to result in short-term, negligible, direct, adverse effects on terrestrial wildlife resources located within the immediate work area.

To minimize impacts to birds, construction activities would avoid cutting and removal of vegetation from April 1 to July 15. If cutting and removal occurs in this time frame, a survey for birds and active bird nests is recommended. No bird, active nest, egg, or hatchling can be disturbed, removed, damaged, or destroyed per the Migratory Bird Treaty Act.

Following completion of construction, the Proposed Action would replace a vacant, infrequently used area into an administrative headquarters with associated parking areas, an operational plant and security fencing. Wildlife accustomed to frequent human activity would use the new environment, while species requiring less disturbance and more secrecy would likely relocate. Planting of native vegetation near buildings and in open spaces within the campus would support habitat needs of species typically found within the study area and would serve as an extension of the stream corridor to the west of the developed area. The long-term adverse or beneficial effects of operation of the Proposed Action on wildlife are expected to be negligible.

Rare, Threatened, & Endangered Species

Under the Proposed Action, less-than-significant effects would occur to Rare, Threatened and Endangered (RTE) species. The Proposed Action occurs in a location that has had extensive prior disturbance, most recently as a staging area for the NGA facility construction between 2007-2008, and prior to that as an area supporting testing facilities as part of the Engineering Proving Grounds mission from the 1950's to the 1990's. While the study area includes areas mapped as potential habitat for the small-whorled pogonia, it is no longer included on the updated species list from

IPaC and its presence would be highly unlikely due to the intensively disturbed ground and poor soil conditions that are not preferred by this species.

Despite the disturbed nature of the study area, clearing of vegetation associated with construction of the Proposed Action could adversely impact protected species if pre-construction surveys are not conducted. Surveys for the presence of the wood turtle would be conducted prior to site clearing, and the results of these surveys coordinated with Fort Belvoir's natural resources staff and the appropriate wildlife agencies. Perimeter controls would be installed during the winter months to exclude the endangered wood turtle from proposed areas of construction activity, as necessary. In order to protect nesting bat species, no trees over 3 inches in diameter would be removed within the study area between April 15 and September 15, in accordance with current USFWS guidelines and corresponding U.S. Army NLEB protection documents promulgated to protect the northern long-eared bat species.

Partners in Flight

Under the Proposed Action, less-than-significant adverse effects would occur to Breeding Birds of Management Concern. DIA will work with Fort Belvoir natural resources personnel to identify means to offset the loss of PIF habitat associated with the construction of the Proposed Action.

3.3.5.3 Impacts of the No Action Alternative

Vegetation

The No Action Alternative would have no effect on vegetation and existing conditions would continue. The area of restoration plantings would not be developed and would continue to provide habitat for faunal species that need open field habitat, but maintenance of the area to prevent succession to forest would be dependent on continued maintenance by DPW. The adjoining subcontractor gravel parking lot would continue to be used for overflow parking, resulting in periodic episodes of human activity and disturbance.

Wildlife

Under the No Action alternative, no changes would occur to existing wildlife and wildlife habitat.

Rare, Threatened and Endangered Species

Under the No Action alternative, no changes would occur to RTE species.

Partners in Flight

Under the No Action alternative, no changes would occur to habitat within the study area that supports Breeding Birds of Management Concern.

3.4 HAZARDOUS MATERIALS AND MUNITIONS

3.4.1 Hazardous Materials

Hazardous and toxic materials or substances are generally defined as materials or substances that pose a risk (i.e., through either physical or chemical reactions) to human health or the environment. Regulated hazardous substances are identified through a number of federal laws and regulations. The most comprehensive list is contained in 40 CFR 302, Designation, Reportable Quantities, and Notification, and provides quantities of these substances that, when released to the environment, require notification to a federal agency. Further, hazardous wastes, defined in 40 CFR 261.3, are considered hazardous substances. Generally, hazardous wastes are discarded materials (e.g., solids or liquids) not otherwise excluded by 40 CFR 261.4 that exhibit a hazardous characteristic (i.e., ignitable, corrosive, reactive, or toxic), or are specifically identified within 40 CFR 261. Petroleum products are specifically exempted from 40 CFR 302, but some are also generally considered hazardous substances due to their physical characteristics (i.e., especially fuel products), and their ability to impair natural resources.

Fort Belvoir conducts its hazardous waste management program in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 United States Code (U.S.C.) 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499. Fort Belvoir has a Hazardous Waste Management/Waste Minimization Plan and a Master Spill Plan. Fort Belvoir also 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. Fort Belvoir Directorate of Public Works Environmental Division also files annual hazardous material and toxic chemical reports in compliance with the *Emergency Planning and Community Right-to-Know Act*.

Installation Restoration Program (IRP)

The Fort Belvoir IRP operates in conjunction with the U.S. Army Environmental Command and the USACE to restore former military training areas, waste sites, and petroleum areas through regulatory closure. The IRP is a comprehensive program designed to address contamination from past activities and restore Army lands to useable conditions. It is one of two programs established under the Defense Environmental Restoration Program (DERP) to identify, investigate and clean up hazardous substances, pollutants, and contaminants that pose environmental health and safety risks at active military installations and formerly used defense sites. The IRP was established in 1975 and is achieving successful restoration of more than 11,000 identified active Army environmental cleanup sites.

IRP response actions (i.e., site identification, investigation, removal actions, remedial actions, or a combination of removal and remedial actions) correct other environmental damage (such as the detection and disposal of unexploded ordnance) that poses an imminent and substantial endangerment to the public health or welfare or to the environment. IRP actions are conducted according to the provisions of CERCLA, EOs 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300).

Site CC-MPS-2009 is located in an area of light industrial activity on the FBNA (Figure 3-7). The FBNA, formerly known as the EPG, is an 804.07-acre noncontiguous portion of Fort Belvoir that is located about 1.5 miles northwest of Main Post. CC-MPS-2009 consists of three former Petroleum Storage Areas (PSAs) (PSA-2009, PSA-2033, and PSA-2034) located within the project site. The USTs, along with approximately 508 tons of petroleum-contaminated soils, were removed in 1996-1997. Monitoring wells were installed and five phases of Environmental Investigation (EI) were conducted between 2006 and 2008 to determine the extent and severity of possible remaining contamination in both soils and groundwater. The EIs revealed little or no residual soil contamination at the three sites (AECOM, 2021).

Groundwater monitoring pursuant to the EIs detected constituents above residential U.S. EPA Region 3 Risk-Based Concentrations (RBCs) at PSA-2009, to include benzene, naphthalene, 2-methylnaphthalene, toluene, and ethyl benzene. PSA-2033 had groundwater contamination of naphthalene and 2-methylnaphthalene, and PSA-2034 had groundwater contamination of carbon tetrachloride. None of the plumes extended outside the FBNA property (AECOM, 2021). Investigations by AECOM in 2019 indicated the network of monitoring wells appeared to have been modified as a result of the BRAC construction on FBNA. The monitoring well network would need to be re-established in order to conduct future field investigations that would allow closure of the former PSA sites.

A Human Health Risk Assessment (HHRA) was performed in 2011 using the information collected through the EIs, which identified residential groundwater and residential vapor intrusion (VI) chemicals of concern (COCs) at PSA-2009, PSA-2033, and PSA-2034 (AECOM, 2021). The residential exposure thresholds are more conservative than commercial and industrial levels and were the benchmarks used for the HHRA.

Due to the VI COCs identified in the HHRA, a supplemental remedial investigation (RI) was conducted in 2018 to evaluate potential VI impacts to future construction on the site, and included the collection of grab groundwater and soil gas samples within the PSA-2009 and PSA-2033 benzene, naphthalene, and ethyl benzene plumes. PSA-2034 was not included as part of this investigation because the COC identified in the HHRA (carbon tetrachloride) did not exceed the Vapor Intrusion Screening Level (VISL) screening criteria or the Virginia Voluntary Remediation Program (VRP) construction worker in a trench screening criteria (AECOM, 2021).

Based on an assessment of the groundwater samples collected during this investigation, concentrations have generally decreased relative to the sampling conducted between 2006 and 2008 for the chemicals relevant to the VI evaluation. The VI risk was determined to be unacceptable based on deep soil gas concentrations immediately above the groundwater table for PSA-2009 and their potential impact to indoor air. VI risk for PSA-2033 was acceptable for the future construction worker exposure scenario but unacceptable for the future commercial/industrial worker exposure scenario.

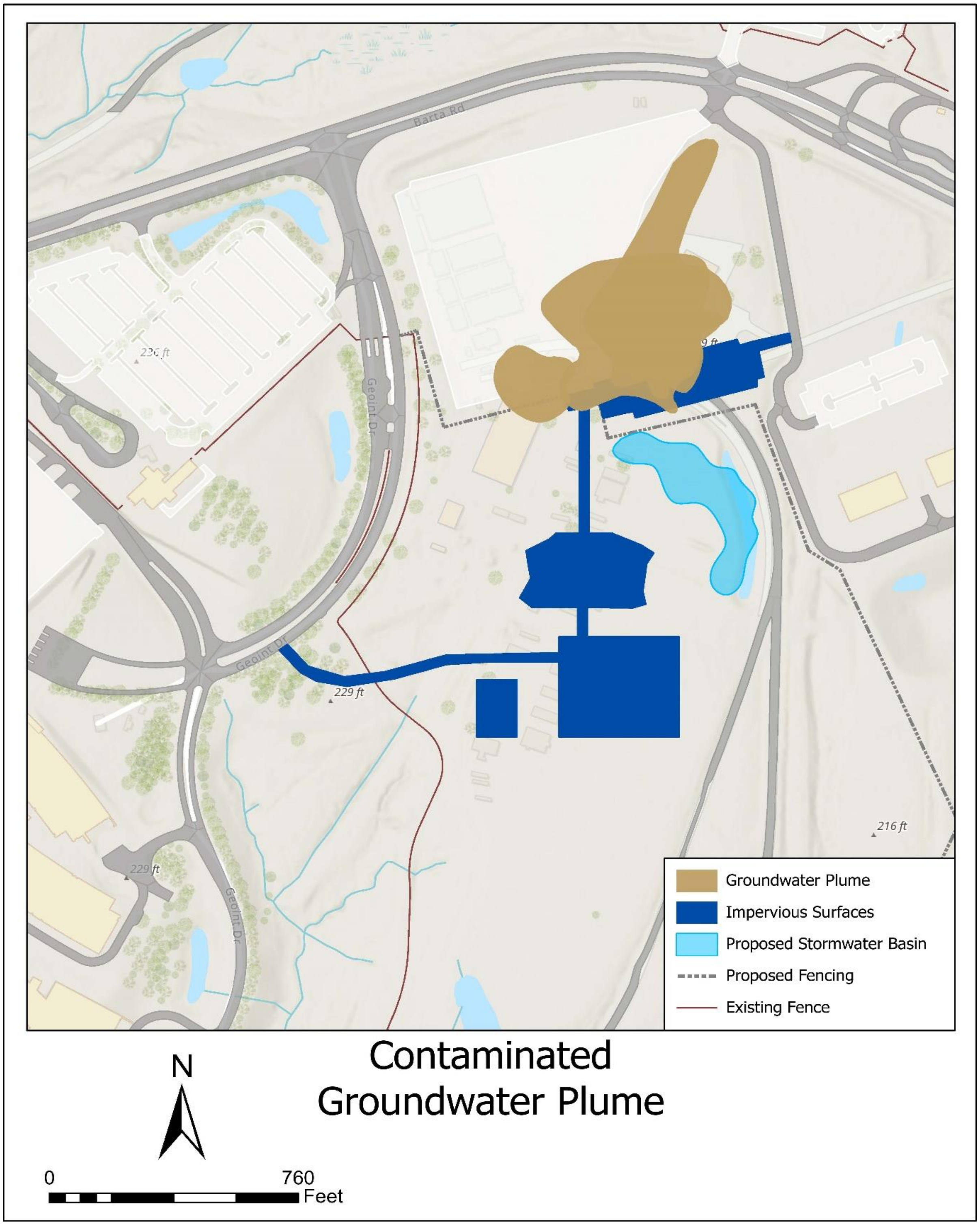

Figure 3-7: Contaminated Groundwater Plume

Subsequently, the *Focused Feasibility Study for CC-MPS-2009* (AECOM, 2021), which encompasses the three separate sites listed above, was commissioned to identify courses of action for safely closing out the contaminated sites. The remedial action objectives of the focused feasibility study (FFS) include limiting current and future use of the CC-MPS-2009 to non-residential; controlling, reducing or eliminating vapor intrusion and groundwater exposure pathways; and, achieving remedial goals for contaminants of concern (COC) concentrations in groundwater.

While the series of investigations conducted between 2006 and 2018 indicated the dissolved phase COC plumes are stable and show signs of natural attenuation processes, there are no time-series data collected from consistent well locations to estimate biodegradation rates. All nonmetal COCs with concentrations above the preliminary remediation goals (PRGs) are known to be biodegradable and, in general, the investigations have shown that the dissolved-phase concentrations have decreased over time (AECOM, 2021). A monitoring period of 10-20 years was recommended considering the remediation technologies available and recommended and the uncertainty of the attenuation rate resulting from the lack of consistent groundwater monitoring network. The alternatives recommended included 1) no action; 2) long-term monitoring and instituting land use controls (LUCs); 3) use of in situ chemical oxidation in conjunction with long-term monitoring and land use controls; and, 4) combining air sparging and soil vapor extraction together with long-term monitoring and land use controls. Each alternative was evaluated considering effectiveness (including short and long-term effectiveness), implementability (technical and administrative feasibility, availability of services and materials, state and community acceptance), and cost.

Institutional controls (ICs) at CC-MPS-2009 will be implemented in the form of administrative, engineering, and access controls. Administrative controls prevent changes in land use or development at CC-MPS-2009. Administrative ICs will include notations in Fort Belvoir's Master Plan and GIS. Additionally, the Master Plan would include a notation requiring engineering controls to manage vapor intrusion risks for any new construction (i.e., vapor mitigation system or vapor barrier). The specific requirements are highly dependent on building design; however, for construction of new buildings, there are five basic components to effective vapor intrusion resistant construction that would need to be considered (NAVFAC, 2011):

- Permeable sub-slab support material (e.g., gravel),
- Venting all sub-slab areas below occupied spaces,
- Properly sized sub-slab and riser piping,
- A sealed vapor barrier, and
- If an active system is specified, a properly sized blower to maintain sufficient negative pressure beneath the slab.

Performance monitoring of the chosen vapor mitigation measure for future construction would also be required to demonstrate the effectiveness of the measure at restricting vapors from entering the structure. The performance monitoring approach would be developed based on the mitigation measure chosen.

Engineering and administrative controls will restrict the use of groundwater for potable or industrial purposes and would also require the installation of a vapor barrier for any building built in the area until PRGs are met. A Land Use Control Implementation Plan (LUCIP) will also be generated to establish LUCs. Activity Hazard Analyses (AHAs) and Site Safety and Health Plans (SSHPs) would be required for any future intrusive work at the site.

The CC-MPS-2009 Feasibility Study (FS) was finalized in March 2021. Following the FS, the Proposed Plan (PP) and Record of Decision (ROD) will be completed (expected completion in 2023). The PP and ROD will outline the formal decision to achieve site closure. Following completion of the PP and ROD, the remedial design (RD), restoration in place (RIP), and any necessary monitoring will be completed (expected to begin in 2024 and carry through the duration of the monitoring).

3.4.2 Munitions

Congress established the MMRP in 2001, under the DERP, to address munitions-related concerns, including explosive safety, environmental, and health hazards from releases of unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) found at locations other than operational ranges on active and BRAC installations and Formerly Used Defense Sites (FUDS) properties. The MMRP provides a focused program to address the challenges presented at sites called munitions response sites. Munitions responses are response actions, including investigation, removal actions and remedial actions that address the explosives safety, human health or environmental risks presented by UXO, DMM, and MC (https://aec.army.mil/index.php?cID=365). Munitions response actions will be conducted under the process outlined in the National Contingency Plan (NCP) (40 CFR 300) as authorized by the CERCLA.

Given its historical use and concentration of ranges, all of FBNA is considered a MMRP site (US Army, 2014). The ranges at FBNA were used for mine warfare material testing, research, and development. In 2006, the 10 closed ranges on FBNA were determined to be eligible for the DERP and were subsequently enrolled in the MMRP. Several former FBNA training ranges were successfully cleared of ordnance and explosives from 2003 through 2005 in preparation for the proposed land transfer for the Fairfax County Parkway right-of-way. Subsequent clearance occurred between 2006 and 2010 for the areas outside of the Fairfax County Parkway right-of-way in support of the 2005 BRAC-related construction. Fort Belvoir developed a Focused Feasibility Study (FFS) to evaluate remedial alternatives, as required by CERCLA (AECOM, 2021).

In preparation of the FBNA for re-development under BRAC, site investigations were conducted in 2007-2008 to characterize the nature and extent of potential munitions left over from the use of the area as a testing ground. The investigations gave particular focus to two former range areas on the western portion of FBNA and the former Ebee Field on the northern portion of eastern FBNA. Also, two larger, non-range areas, located on either side of Accotink Creek, were characterized using linear transects with surface and subsurface to two feet intrusive investigations.

The 2021 FFS indicates Fort Belvoir will implement LUCs at the FBNA. As part of the LUCs, all future ground disturbances and construction activities will be required to conduct munitions clearance per the U.S. Army Garrison (USAG), Fort Belvoir, Policy Memorandum #28 (USAG, 2014). Once the full munitions clearance is complete for areas prior to development, then the level of munitions clearance and construction support will depend on the results of the full clearance and the recommendations of munitions experts on a case-by-case basis. VADEQ will be notified of any MEC/DMM discovered during these activities (AECOM, 2021).

3.4.3 Environmental Consequences

3.4.3.1 Thresholds of Significance

Effects on hazardous materials and wastes are assessed by evaluating the degree to which a proposed action could cause worker, resident, or visitor exposure to hazardous materials; whether the Proposed Action would lead to noncompliance with applicable federal or state regulations or increase the amounts generated or procured beyond current waste management procedures and capacities; and whether the Proposed Action would disturb a hazardous waste site, create a hazardous waste site, or contribute to a hazardous waste site resulting in adverse effects on human health or the environment.

Effects from UXO would occur if military munitions are inadvertently encountered, causing an unintended detonation or the release of munition chemicals to the environment.

3.4.3.2 Impacts of the Proposed Action

Hazardous Materials and Waste

Under the Proposed Action, no significant impacts would occur to hazardous material and waste. The construction contractor would be required to prepare and adhere to a Spill Prevention, Control, and Countermeasure (SPCC) plan that identifies practices to minimize the potential for accidental spills of petroleum products or other hazardous substances and the procedures for containing and cleaning up any accidental spills that may occur.

Construction of the building may require measures to prevent vapor intrusion in the below-ground levels. Also, site preparation may require the relocation of existing monitoring wells and re-establishment of wells removed during previous site alterations. Re-establishment of the monitoring well network will be coordinated with Fort Belvoir DPW.

Implementation of the Proposed Action would not result in a significant effect on hazardous material concerns within the study area. Ongoing remedial actions would be enhanced through the re-establishment of an effective groundwater monitoring well system that would be able to more accurately characterize the contamination plume. Soils excavated or otherwise disturbed during the project's construction phase would be tested in accordance with established Fort Belvoir policies and procedures. If concentrations of contaminants in soils are determined to exceed applicable regulatory thresholds for re-use on the site, any affected soils would be removed from the site and disposed of at a permitted facility off FBNA in accordance with Virginia Solid Waste Disposal Regulations as well as all other federal, state and local laws and regulations.

Munitions

Under the Proposed Action, less-than-significant effects would occur to munitions. As previously described, land use controls require all future ground disturbances and construction activities to complete munitions clearance. Prior to construction of the Proposed Action, munitions clearance would be conducted and coordinated with Fort Belvoir DPW and the VADEQ. The Proposed Action would have a beneficial, permanent effect in alleviating safety concerns related to possible munitions remaining on the surface or buried near the surface by screening the project area prior to construction. In addition, standard practice involves training of on-site personnel in the identification of potential munitions in order to prevent injury from unintentional detonations due to incorrect handling of discarded ordnance materials.

3.4.3.3 Impacts of the No Action Alternative

Hazardous Materials and Waste

The No Action alternative would have no effect on hazardous materials or hazardous wastes on FBNA. Long-term monitoring of the benzene plume suggests it is relatively stable and is expected to naturally attenuate over time even as current levels remain above acceptable limits. Land use controls prohibit extraction of groundwater for potable use and development of the site into another use unless determined to be compatible with applicable land use control policies and the Fort Belvoir ADP.

Munitions

The No Action alternative would have no effect on munitions concerns on FBNA. However, efforts to identify potentially buried munitions within the LOD would not occur until such future time when the study area could be developed.

3.5 UTILITIES

Utility representatives have been engaged in the scoping process and indicated the existing systems on FBNA are in good working order and have capacity to support the new construction. Wherever possible, new utilities associated with the construction will tie into existing supporting infrastructure (i.e., lift stations, transformers, etc.). Utility additions and modifications will take into consideration current and surge demands and will have the capability to support future expansion requirements including the Proposed Action (HDR, 2020).

3.5.1 Electric

Electrical power is provided to FBNA by Dominion Virginia Power (DVP) using a 34.5-kilovolt (kV) distribution infrastructure, including a substation on the south portion of FBNA and a network of overhead and buried cables. The system is in good condition and has ample capacity for additional loading that would result from the Proposed Action. DVP entered into a 50-year Utilities Privatization (UP) services contract with Fort Belvoir in 2007, under which DVP is responsible for operation and maintenance of the electrical distribution center as well as upgrades. As of 2016, more than 112 miles of overhead and underground electric line, three switching stations, and one substation are present on Fort Belvoir. DVP also owns and operates medium-sized emergency diesel generators to provide back-up power for critical-functions throughout the installation. There are no generating stations on FBNA that would be capable of powering the entire post. Backup generators, to include 48 hours of dedicated fuel supply, are necessary for the facility (HDR, 2020).

3.5.2 Potable Water and Wastewater

Potable water at FBNA is purchased from Fairfax County Water. No treatment facilities or groundwater wells supply potable water on post. The majority of the water distribution system at FBNA is owned by American Water under a 50-year utilities privatization (UP) contract to provide wastewater and wastewater services.

The water distribution system was designed and has the capacity to support full build-out of the FBNA campus. Currently, only 1.0 million gallons per day (MGD) is used out of a capacity of 3.0 MGD. A 1.5-million-gallon water storage tank that serves FBNA is located north of Barta Road, north of the study area.

Wastewater for the entire installation is collected by a 14-inch diameter line that runs to the Fairfax County Sewer stub-out at the south end of the campus.

3.5.3 Natural Gas

Washington Gas operates the natural gas distribution system serving FBNA since a privatization contract was issued in 1998. There are no natural gas production storage facilities on the installation. As of 2016, the natural gas distribution system has a network of approximately 120 miles of pipes. The existing gas distribution at FBNA is a high-pressure gas system with an 8-inch pipe that enters from the south side of the installation and runs west along Heller Road where it connects to the NGA facility's utility plants line. Fort Belvoir can receive approximately 160 million cubic feet per day of natural gas through two delivery points.

3.5.4 Environmental Consequences

3.5.4.1 Thresholds of Significance

Thresholds of significance for utilities dictate that a significant adverse effect would be to overload the capacity of existing utilities to the extent that current levels of service are compromised, resulting outages or shutdown of water or wastewater service.

3.5.4.2 Impacts of Proposed Action

<u>Electric</u>

Under the Proposed Action, less-than-significant, long-term effects would be expected. The electrical distribution system is new and in good condition with sufficient capacity for additional loading (HDR, 2020).

Two new utility feeders and two service transformers with a double-ended, main service entrance switchboard, in the Main-Tie-Main configuration would be provided for the new HQ DIA Annex. Pad-mounted, oil-cooled outdoor substation transformers would be utilized. The transformers would be configured for N+1 redundancy and would be sized based on the required load plus 25 percent spare capacity. The configuration of the utility feeder would be primary selective, utilizing automatic transfer circuit breakers or manual transfer switches. An automatic tie breaker in the Main-Tie-Main switchboard would be used.

Backup generators to support N+1, including 48 hours of dedicated diesel-fuel supply, would be required for the HQ DIA Annex facility. Cathodic protection systems and bonded protective coatings should be provided on buried or submerged utility piping where the electrolyte (soil or water) resistivity is less than 30,000 ohms per centimeter (cm) at the installation depth at any point along the piping installation, in accordance with UFC 3-570-01, Cathodic Protection.

<u>Wastewater</u>

Less-than-significant, long-term effects to wastewater are expected under the Proposed Action. The current usage of water distribution center is only 1/3 of the maximum usage available on the installation. The water distribution system at FBNA was designed to accommodate future development and is considered to be in good working condition. Connections to the primary distribution network are planned at the Fairfax County Sewer stub-out. Minimal industrial water is expected because the most cost-effective way to accomplish a dual-path, chilled-water system is to provide a looped piping system (HDR, 2020).

The wastewater system was also designed and built in anticipation of full build-out of the FBNA campus and therefore has the capacity to accommodate the wastewater generated by construction and operation of the Proposed Action. A new high-density polyethylene (HDPE) line will be installed along GEOINT Drive to connect the project site to the southern stub-out (HDR, 2020). Because the Proposed Action site is at a higher elevation than the sewer connection point, a gravity-flow system can be used. Low-flow toilets, sinks and showers will be installed wherever possible to minimize impacts on water. Potable water and fire suppression will be supplied by at least an 8-inch diameter service pipe and a redundant 6-inch diameter pipe. A fire hydrant loop around the facility will be provided.

Natural Gas

Under the Proposed Action, less-than-significant, long-term impacts would occur to natural gas distribution. No system problems or capability issues would occur should the Proposed Action move forward (HDR, 2020). Connection to the HQ DIA Annex facility will start at the main lines off Heller Road and will run east along Heller Road until the closest connection can be made. Proposed construction would increase the natural gas demands of the current system; however, it was built with expansion in mind and is more than adequate to support increased gas demands.

3.5.4.3 Impact of No Action Alternative

Under the No Action Alternative, no changes would be expected to any utilities. All operations at FBNA would remain the same, with no fluctuations in utility demands.

3.6 NOISE

Noise is generally defined as unwanted sound. It can be any sound that is undesirable because it interferes with communications or other human activities, is intense enough to affect hearing, or is otherwise annoying. Noise may be intermittent or continuous, steady, or impulsive. Human response to noise varies, depending on the type of the noise, distance from the noise source, sensitivity, and time of day.

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 applicable local noise control regulation is the Fairfax County Noise Ordinance (29-15-108.1), which states “no person shall permit, operate, or cause any source of sound or sound generation to create a sound which exceeds the limits set forth in the following table titled ‘Maximum Sound Levels’ when measured at the property boundary of the sound source or at any point within any other property affected by the sound”. As shown in **Error! Reference source not found.**3-2, the maximum sound levels from continuous sounds sources (such as a jackhammer) in residential areas should not exceed 60 dBA during the day and 55 dBA at night. An impulse sound is generally characterized by a sound event that lasts for no more than one second, such as sounds from weapons, pile drivers, or blasting.

Land use guidelines identified by the Federal Interagency Committee on Urban Noise are used to determine compatible levels of noise exposure for land use planning and control. Chapter 14 of AR 200-1 implements federal regulations associated with environmental noise from Army activities. There are three Noise Zones (I, II, and III), which correlate to increasing noise levels (see Table 3-3). These zones are established based on average day-night levels (DNL) of noise over 104 days. Additionally, there is the Land Use Planning Zone (LUPZ), which is the portion of Noise Zone I exposed to noise levels within 5 decibels (dB) of Noise Zone II levels.

Table 3-2: Fairfax County Noise Ordinance (§29-15-108.1)

Use and Zoning District Classification	Time of Day	MAXIMUM SOUND LEVELS	
		Continuous Sound (dBA)	Impulse Sound (dBA)
Residential Areas in Residential Districts	7 a.m. to 10 p.m.	60	100
Residential Areas in Residential Districts	10 p.m. to 7 a.m.	55	80

The decibel is the accepted unit of measurement for noise level and uses a logarithmic scale. For low-frequency events such as artillery fire, C-weighted decibels may be used to calculate measurements like DNLs. The final noise metric relevant to this discussion is peak sound level (dBP), which is the maximum instantaneous sound level of an event. The dBP is neither weighted nor time integrated and is used to further define noise zones.

Table 3-3: Noise Limits Definitions (Army Regulation 200-1)

Noise Zone	Population Highly Annoyed (%)	Transportation Noise ADNL (dBA)	Impulsive Noise CDNL (dBC)	Small Arms Noise (dBP)
I	Less than 15	Less than 65	Less than 62dBC	Less than 87
II	15-39	65-75	62-70	87-104
III	More than 39	More than 75	More than 70	More than 104

* dBA = decibels, A-weighted ,dBC = decibels, C-weighted ,dBP = decibels, unweighted

Table 3-4: Sensitive Land Use

Noise Zone	Noise Sensitive Land Use	Demolition and Large Caliber Activity dB CDNL
LUPZ	Generally Compatible	57-62 db
Zone I	Generally Compatible	<62 db
Zone II	Generally Compatible	62-70 db
Zone III	Not Compatible	>70 db

The nearest potential noise-sensitive receptors to the Proposed Action are the North Belvoir CDC, located adjacent and to the east of the project site, and the existing NGA offices, located adjacent to the west. The somewhat isolated enclave of the Proposed Action, NGA and CDC is surrounded by Barta Road to the west and north, Heller Road to the east and south, and Fairfax County Parkway to the south. The major thoroughfare of Interstate 95 (I-95) is located approximately 0.3-mile to the east of the study area. Currently, the major noise source in the project vicinity is generated from vehicular traffic on Fairfax County Parkway and I-95. Activities at the Davidson Army Air Field (DAAF), including airplane and helicopter takeoffs and landings, are also apparent at the site, located approximately 2.25 miles to the northwest.

3.6.1 Environmental Consequences

3.6.1.2 *Threshold of Significance*

Noise impacts would be significant if the Proposed Action created appreciable long-term noise increases in areas of incompatible land use, would substantially increase noise resulting from traffic, or result in substantial disruptions to nearby sensitive receptors. Additionally, continuous construction noises above 60 dBA may be considered a nuisance if audible at residential properties during daytime hours (07:00 to 22:00) per the Fairfax County noise ordinance. Furthermore, noise levels exceeding National Institute for Occupational Safety and Health (NIOSH) or Occupational Safety and Health Administration (OSHA) guidance can be harmful to workers.

3.6.1.2 Impacts of Proposed Action

Less-than-significant, long-term adverse effects to noise would be expected under the Proposed Action. The primary use of the proposed facilities would be administrative office space.

Construction. The Proposed Action would require construction activities on FBNA. Individual pieces of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high construction noise typically extends to distances of 400 to 800 feet from the site of major equipment operations. Locations more than 1,000 feet from construction sites seldom experience noteworthy levels of construction noise. Given the temporary nature of proposed construction activities and the limited amount of noise that construction equipment would generate, this effect would be considered minor.

Existing sounds generated from aircraft traveling to and from the DAAF, and from vehicle traffic on Fairfax County Parkway and I-95 dominate the noise profile in the area, making construction-related sounds at the proposed project site less likely to be perceived or considered a nuisance to nearby receptors.

During the construction period, sources of noise would include equipment used to construct the Proposed Action. Noise produced by construction equipment varies depending on the type of equipment used and its duration. Equipment associated with constructing the Proposed Action would include cement and mortar mixers, cranes, excavators, forklifts, graders, pavers, rollers, and skid steer loaders.

To minimize the potential adverse impact from these noises, construction vehicles would be equipped with noise-dampening equipment including mufflers which would be operated according to the manufacturers' instructions. Construction vehicles and equipment would be turned off when not in use for more than five minutes. Additionally, construction would take place during daylight hours on weekdays, unless there is a specific action that would require working outside of this normal timeframe, such as mobilizing oversized materials or equipment to the site.

Construction noises would be further dampened by maintaining vegetated borders which act as natural sound barriers. Therefore, construction noises would be minimally evident to nearby noise-sensitive receptors.

OSHA regulations require that employers make hearing protectors available to those employees who are exposed to work conditions at or above 85 dBA (OSHA, 2002). Thus, potential impacts from construction equipment noise on workers would be minimized by following OSHA regulations and the USACE *Safety and Health Requirements Manual EM 385-1-1* (USACE, 2014). Therefore, construction noise associated with the Proposed Action would have short-term, direct, negligible adverse impacts to workers and to nearby receptors.

Noise levels on the FBNA could increase as a result of additional commuters, primarily during weekday mornings (06:00-09:00) and afternoons (15:00-18:00). However, noise levels for noise-sensitive receptors (NSR) adjacent to the main traffic routes near the FBNA, Main Post, and the surrounding area would not exceed the noise-abatement criterion (67 dBA) for residential land uses and Zone III noise levels would not occur (U.S. Army, 2007).

3.6.1.3 Impacts of No Action Alternative

Under the No Actional Alternative, no changes would occur to noise. All operations at FBNA would remain the same, with no fluctuations in noise production.

3.7 AIR SPACE

The DAAF occupies approximately 400 developed acres of land west of Fairfax County Parkway. The mission of the Davison Army Airfield is to transport passengers and freight for the Army and DoD to, from, and within the NCR.

Building height restrictions are governed by guidelines and regulations relating to the identification and construction of obstructions within airspace are established in the Federal Aviation Regulations (FAR Part 77, Objects Affecting Navigable Airspace). Building restrictions within the conical surface begin at the 150 feet level above the runway at the boundary with the inner horizontal surface and extend outward at a slope of 20:1 (horizontal: vertical) for a distance of 7,000 feet to an elevation of 500 feet above the airfield. The majority of the remaining portion of the Main Post (with the exception of the extreme northeast and southeast sections) and FBNA fall within the 150- to 500-foot building height restriction within the conical surface (U.S. Army, 2007).

3.7.1 Environmental Consequences

3.7.1.1 Threshold of Significance

The Proposed Action and No Action Alternative were evaluated against the following significance criteria to determine if they would result in a significant impact on the airspace environment:

- Airspace would be obstructed by building heights
- Aircraft operations would be substantially altered to accommodate new construction

3.7.1.2 Impacts of Proposed Action Alternative

Under the Proposed Action, less-than-significant impacts to airspace would occur. The Proposed Action would include a 6-story headquarter buildings as its tallest structure, remaining within the vertical limits of the applicable airspace restrictions and consistent with the height of the adjacent NGA complex.

3.7.1.3 Impacts of No Action Alternative

Under the No Actional Alternative, no changes would be expected to airspace. All operations at FBNA would remain the same, with the same aircraft operation and airspace available.

3.8 AIR QUALITY

Air pollution occurs when harmful substances, including solid particles and gases, are introduced into the earth's atmosphere. It can cause harm to the natural environment, including humans, animals, and plants. Air quality refers to the pollution-free ambient air. The lower the air quality the more polluted the air, and the higher the quality the more pollutant-free the air. In the following sections, air quality in the vicinity of the Proposed Action site is described, applicable laws and regulations are explained, and potential impacts are assessed.

3.8.1 NAAQS

The United States Environmental Protection Agency (USEPA), under the requirements of the 1970 *Clean Air Act* (CAA) as amended in 1977 and 1990, has established National Ambient Air Quality Standards (NAAQS) for the following six contaminants, referred to as criteria pollutants (40 CFR 50):

- Carbon monoxide (CO)
- Lead
- Nitrogen dioxides (NO_x)
- Ozone (O_3)
- Sulfur dioxide (SO_2)
- Particulate matter (PM), divided into two size classes:
  - Aerodynamic size less than or equal to 10 micrometers (PM_{10})

- Aerodynamic size less than or equal to 2.5 micrometers ($PM_{2.5}$)

The NAAQS include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. Table 3-5 shows primary and secondary air quality standards.

Table 3-5: National Ambient Air Quality Standards

NAAQS Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Nitrogen Dioxide	Primary	1-hour	100 ppb	98th percentile, averaged over 3 years
	Primary and secondary	Annual	53 ppb	Annual Mean
Ozone	Primary and secondary	8-hour	0.070 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particular Matter ($PM_{2.5}$)	Primary	Annual	12 µg/m3	Annual mean, averaged over 3 years
	Secondary	Annual	15 µg/m3	Annual mean, averaged over 3 years
	Primary and secondary	24-hour	35 µg/m3	98th percentile, averaged over 3 years
Particular Matter (PM_{10})	Primary and secondary	24-hour	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
Lead	Primary and secondary	Rolling 3-month average	0.15 µg/m3	Not to be exceeded
Sulfur Dioxide	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

The CAA, as amended in 1990, mandates that state agencies adopt State Implementation Plans (SIP) that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS. 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.

The Commonwealth of Virginia, in coordination with Metropolitan Washington Council of Governments (MWCOG), developed a SIP that outlined actions to achieve the NAAQS. The current EPA-approved regional air quality plan is the *Plan to Improve Air Quality in the Metropolitan Washington, DC-Maryland (MD)-VA Region: State Implementation Plan (SIP) for*

8-Hour Ozone Standard (MWCOG, 2007). Within this plan, VADEQ compiles a regional emissions inventory and sets regional emissions budgets.

Federal regulations designate Air Quality Control Regions (AQCR) that have concentrations of one or more of the criteria pollutants that exceed the NAAQS as *nonattainment areas*, while AQCRs with levels below the NAAQS are designated as *attainment areas*. Further, *maintenance areas* are AQCRs that have previously been designated nonattainment and have been redesignated to attainment for a probationary period through implementation of maintenance plans. According to the severity of the pollution problem, O_3 and PM_{10} nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme. Where insufficient data exist to determine an area's attainment status, it is designated unclassifiable or in attainment.

Fairfax County (which encompasses Fort Belvoir) is within the National Capital Interstate AQCR (AQCR 047, or "DC-MD-VA AQCR") (40 CFR 81.12). AQCR 047 is in the ozone transport region that includes 12 states and Washington, DC.

The EPA (as of August 31, 2021) has classified Fairfax County as being in marginal non-attainment for 8-hour ozone; Fairfax County is in attainment with the remaining NAAQS (USEPA, 2021).

3.8.2 Clean Air Act Conformity

The 1990 amendments to the CAA require federal agencies to ensure that their actions conform to the SIP in a nonattainment area. Under Section 176(c) of CAA, a project is in "conformity" if it corresponds to a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving their expeditious attainment.

Conformity further requires that such activities would not:

- cause or contribute to any new violations of any standards in any area;
- increase the frequency or severity of any existing violation of any standards in any area; or
- delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The EPA published final rules on general conformity (40 CFR Parts 51 and 93) in the Federal Register on November 30, 1993. The General Conformity Rules (GCR) apply to federal actions in nonattainment or maintenance areas for any of the criteria pollutants. The rules specify *de minimis* emission levels by pollutant to determine the applicability of conformity requirements for a project. The corresponding *de minimis* levels for the ozone precursors for marginal O_3 nonattainment areas are 100 tons per year for NO_x and 50 tons per year for volatile organic compounds (VOCs). A federal action is exempt from the GCR requirements if the action's total net emissions are below the *de minimis* threshold or are otherwise exempt per 40 CFR 51.153. There are two main components to the overall process: an applicability analysis to determine whether a conformity determination is required and, if it is, a conformity determination to demonstrate that the action conforms to the SIP.

3.8.3 Hazardous Air Pollutants

In addition to criteria pollutant standards, EPA also regulates hazardous air pollutant (HAP) emissions for each state. HAPs differ from criteria pollutants for they are known or suspected to cause cancer and other diseases or have adverse environmental impacts. The National Emission Standards for Hazardous Air Pollutants regulate 188 HAPs based on available control technologies. Sources of HAP emission at Fort Belvoir include stationary, mobile, and fugitive emissions sources. Stationary sources include boilers, incinerators, fuel storage tanks, fuel-dispensing facilities, vehicle maintenance shops, laboratories, degreasing units, and similar testing units. Mobile sources of emissions include private and government-owned vehicles. Fugitive sources include dust generated from demolition activities and roadway traffic.

3.8.4 Greenhouse Gas Emissions and Climate Change

Greenhouse gases (GHGs) are compounds that contribute to the greenhouse effect. The greenhouse effect is a natural phenomenon where gases trap heat within the surface-troposphere (lowest portion of Earth's atmosphere) system, causing heating at the Earth's surface. The primary long-lived GHGs directly emitted by human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The heating effect from these gases is considered the probable cause of the global warming observed over the last 50 years (NASA, 2019). Global warming and climate change can affect many aspects of the environment. In the past, the EPA has recognized potential risks to public health or welfare and signed an endangerment finding regarding GHGs under Section 202(a) of the CAA (74 Federal Register 66496, December 15, 2009), which found that the current and projected concentrations of the six key well-mixed GHGs in the atmosphere (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. To estimate global warming potential (GWP), all GHGs are expressed relative to a reference gas, CO_2, which is assigned a GWP equal to one (1). All six GHGs are multiplied by their GWP and the results are added to calculate the total equivalent emissions of CO_2 (CO_2e). However, the dominant GHG gas emitted is CO_2, accounting for 81% of all GHG emissions as of 2018, the most recent year for which data are available (USEPA, 2020). Current GHG emission sources at Fort Belvoir include combustion engines, boilers, chillers, and water heaters.

One of the key ways the DoD achieves reduction in GHG emissions in building construction and operation is through the Leadership in Energy and Environmental Design (LEED) certification program, an internationally recognized green building certification system providing third-party verification that a building or community was designed and built using measures to reduce energy and water use, GHG emissions and the amount of construction waste sent to landfills. The Energy Independence and Security Act of 2007 requires federal agencies to use a green building certification system for new construction and major renovations of buildings. Pursuant to DoD policy, the Proposed Action will be designed to achieve an LEED rating of Silver.

It is noted that EO 13990, signed January 20, 2021, reinstated the final guidance issued on August 5, 2016 by the CEQ that required federal agencies to consider GHG emissions and the effects of climate change in NEPA reviews. DoD has committed to reduce GHG emissions from non-combat activities 42% by 2025 (DoD, 2016). Accordingly, estimated CO_2e emissions associated with the Proposed Action are provided in this EA for informative purposes.

Current GHG emission sources at Fort Belvoir include combustion engines, boilers, chillers, and water heaters. The total CO2e for Fort Belvoir is inclusive of Main Post and FBNA. However, FBNA sources only account for 0.1% (natural gas) of the total 27,366.02 metric tons CO2e for calendar year (CY) 2020. The emission total is the amount reported annually under the requirements of 40 CFR Part 98 and does not include GHG emissions from mobile sources or emergency generator use. Fort Belvoir is required to report to EPA through the electronic GHG tool (e-GRRT) as the installation has exceeded 25,000 metric tons per year for CO_2e for the last five years.

3.8.5 Emissions Reporting

Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. As a major stationary source for emissions, Fort Belvoir (Main Post) operates under a Title V Permit (Registration Number 70550, issued on March 21, 2003). Fort Belvoir also operates under a minor New Source Review (mNSR) permit for Main Post (same Registration Number 70550).

The Title V and mNSR permits for Main Post do not apply to FBNA emission sources, as this area is non-contiguous from Main Post and considered a separate source. Stationary emission sources at FBNA include large boilers, generators, heaters, above ground storage tanks and emergency generators. FBNA emission sources are operated under a separate synthetic mNSR air permit (Registration Number 73630). As a synthetic minor source, the FBNA annual update report does not include the requirement for an emission statement. The FBNA annual update report provides specific total throughput (million cubic feet burned and/or gallons burned) for the permitted equipment. However, as a requirement of the permit, Fort Belvoir Air Program maintains a rolling 12-month total for the criteria pollutant emissions from the FBNA sources, as found in Table 3-6.

Table 3-6. Emissions from Stationary Sources (tons/year) for CY 2020

SO_2	CO	PM_{10}	$PM_{2.5}$	NO_2	VOCs
0.15	1.65	0.25	0.25	6.31	0.35

Source: Fort Belvoir, Air Program

Should the final design require it, existing air emissions permits would be modified, or a new permit obtained, to account for future stationary sources, as warranted.

3.8.6 Sensitive Receptors

CEQ NEPA regulations require evaluation of the degree to which the Proposed Action affects public health (40 CFR 1508.27). Children, elderly people, and people with illnesses are especially sensitive to the effects of air pollutants; therefore, hospitals, schools, convalescent facilities, religious facilities, and residential areas are considered to be sensitive receptors for air quality impacts, particularly when located within one mile from the emissions source. There are several Fort Belvoir-based medical facilities, schools, residential areas, and religious institutions on FBNA, with the North Belvoir CDC located within a one-mile radius of the project study area.

3.8.7 Environmental Consequences

3.8.7.1 Threshold of Significance

The threshold of significance for air quality impacts would be exceeded if the alternative would result in any of the following:

- Causing or contributing to new violations of NAAQS,
- Contributing to the worsening of existing violations of the NAAQS,
- Delaying the attainment of the NAAQS

Thus, an impact could be significant if emissions exceed "*de minimis*" standards as designated in federal or state air quality regulations during construction or operation of the Proposed Action.

3.8.7.2 Impacts of the Proposed Action

Air Quality General Conformity

Construction. 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.

Specifically, direct emissions would result from using construction equipment needed to build the HQs Annex, parking garage and appurtenant structures described for the Proposed Action in Section 2.1. Following completion of the construction phase, no additional construction equipment would be required to operate the Proposed Action.

As previously described, Fairfax County has been classified as a marginal non-attainment area for 8-hour ozone and is in attainment for all other criteria pollutants. Therefore, since construction associated with the Proposed Action would result in the emissions of precursors of this air pollutant, a review has been conducted to determine if the Proposed Action is subject to a general conformity determination.

The type of construction equipment and hours of operation to be used during the construction phase were estimated based on experience on similar projects. This information was then used to calculate the emissions associated with the construction phase of the Proposed Action. The total project construction emissions associated with the use of off-road construction equipment (e.g., bulldozers, backhoes), on-road construction equipment (e.g., haul trucks), workers' vehicles, and fugitive dust from surface disturbances are presented in **Error! Reference source not found.**3-7.

As shown in **Error! Reference source not found.**3-7, the total estimated emissions for construction of the Proposed Action would be below the GCR *de minimis* thresholds. Therefore, the Proposed Action does not require a formal conformity determination. The U.S. Army has prepared a Record of Non-Applicability (RONA) for CAA conformity (refer to Appendix B of this EA).

Table 3-7: Air Quality Calculations for the Proposed Action

Pollutant	2024-2025 Proposed Action Alternative Emissions (tpy)[3]	2025-2026 Proposed Action Alternative Emissions (tpy)	Operational Emissions (generator) (tpy)	*De minimis* Level (tpy) [1]	Major Source Threshold (tpy) [2]
VOCs	3.51	3.51	0.22	50	--
NO_x	34.11	34.11	8.05	100	--
SO_2	2.64	2.64	0.004	--	100
CO	18.61	18.61	1.84	--	100
PM_{10}	34.86	34.86	0.24	--	100
$PM_{2.5}$	34.77	34.77	0.24	--	100
CO_2e	4,216.89	4,216.89	388.89	--	25,000 (4)

1. *De minimis thresholds are not applicable to pollutants for which the area is in attainment for the NAAQS. De minimis levels for an 0_3 non-attainment area in the ozone transport region.*
2. *Major source threshold for criteria pollutants.*
3. *A two-year construction window is anticipated, from 2024-2026.*
4. *In 40 CFR Part 98, the EPA established a requirement of mandatory reporting of greenhouse gases (GHG) from large GHG emissions sources in the United States. The threshold for reporting is 25,000 metric tons or more of carbon dioxide (CO_2e) equivalent per year.*

Operation. The Proposed Action would result in long-term, direct, negligible adverse impacts from the additional buildings and associated maintenance activities. Operational emissions would be generated from landscaping, boiler and emergency generator emissions. Landscaping emissions resulting from the operation of the Proposed Action would be negligible.

No potentially significant adverse effects on air quality were identified by analysis; therefore, no mitigation measures would be required. The following management measures and/or BMPs would be implemented to further reduce the anticipated less-than-significant, adverse effects:

- Truck beds would be covered while in transit to limit fugitive dust emissions.
- Water would be sprayed on any unpaved roads or stockpiles to limit fugitive dust emissions.

- Ultra-low sulfur diesel would be used as a fuel source where appropriate to minimize oxides of sulfur emissions.
- Clean diesel would be used in construction equipment and vehicles through the implementation of add-on control technologies such as diesel particulate filters and diesel oxidation catalysts, repowers, and/or newer and cleaner equipment. When feasible, electric-powered equipment would be used in lieu of diesel-powered equipment.
- Control measures for heavy construction equipment and vehicles, such as minimizing operating and idling time, would be implemented to limit criteria pollutant emissions.
- Air quality permits would be obtained for the Proposed Action Alternative, as necessary, in compliance with federal, state, and local standards.
- Building design would achieve the LEED-Silver certification, ensuring reductions in energy and water use and greenhouse gas emissions over the life cycle of the building.

3.8.7.3 Impacts of the No Action Alternative

Under the No Action alternative, no short- or long-term changes in emissions quantities or types would occur. Therefore, under the No Action alternative, current baseline air emissions would continue unchanged for the foreseeable future.

3.9 TRAFFIC

This section describes the existing road network serving the Proposed Action at FBNA. A Traffic Impact Study (TIS) was conducted to evaluate existing conditions and the potential impacts of the Proposed Action to traffic patterns in the vicinity (see Appendix D). Eleven key intersections were identified in the traffic study area. Turning Movement Counts (TMCs) and roadway volume counts were conducted at the eleven locations shown in Figure 3.8.

<u>Existing Traffic Volumes</u>

Traffic counts were conducted at the previously referenced 11 intersections in the study area. Lower volume intersections were counted manually, while automated recording systems were used at the higher volume intersections. The counts were conducted between March 22 and April 7, 2021.

The peak hour represents the four consecutive 15-minute periods with the highest total traffic volume for the intersection as a whole. In the study area, the PM peak hour volumes were higher than the AM peak hour volumes. A review of the traffic count data indicates that the weekday morning and afternoon peak hours are not consistent among the study intersections. The respective peak hour for each intersection is shown in Table 3-9.

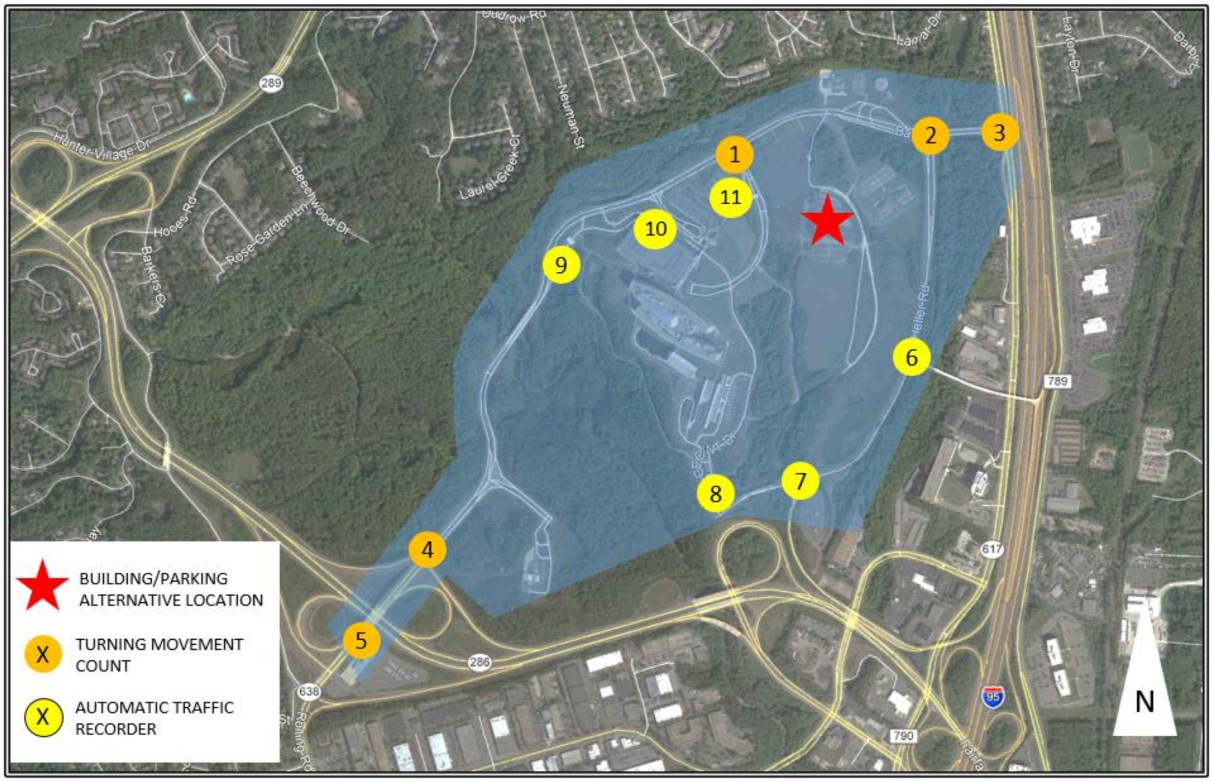

Figure 3-8: Traffic Count Locations

Table 3-8: Traffic Volume Count Locations

Count ID	Intersection	Count Date
1	Barta Road with GEOINT Drive	2021-03-23
2	Barta Road with Heller Road	2021-03-23
3	Barta Road with Backlick Road	2021-03-23
4	Barta Road / Fairfax County Parkway (VA 286) NB Ramps	2021-03-24
5	Barta Road / Fairfax County Parkway (VA 286) SB Ramps	2021-03-24
6	Heller Road with I-95 NB/I-95 SB Express Lane	2021-03-23
7	Heller Road with I-95 SB	2021-03-23
8a	Heller Road with NGA South Gate (inbound)	2021-03-23
8b	Heller Road with NGA South Gate (outbound)	2021-03-24
9	Barta Road at NGA West Gate Entry	2021-03-24
10	Barta Road at NGA West Gate Exit	2021-03-24
11	GEOINT Drive Visitor Parking Lot Access Lane	2021-03-24

Table 3-9: Peak Hours for Existing (2021) Counts

Count ID	Location	Peak Hour	
		AM	PM
Alternative 1 – FBNA			
1	Barta Road with GEOINT Drive	6:45–7:45	4:30–5:30
2	Barta Road with Heller Road	7:15-8:15	3:45-4:45
3	Barta Road with Backlick Road	7:00-8:00	4:00-5:00
4-5	Barta Road with Fairfax County Parkway (VA 286) NB Ramps (WB Barta Road)	6:45–7:45	3:45-4:45
6	Heller Road with I-95 NB/I-95 SB Express Lane	12:00-1:00	5:45-6:45
7	Heller Road with I-95 SB	7:45-8:45	3:00-4:00
8	Heller Road with NGA South Gate (inbound)	7:30-8:30	8:45-9:45
9	Barta Road at NGA West Gate Entry	9:30-10:30	-
10	Barta Road at NGA West Gate Exit	-	5:45-6:45
11	GEOINT Drive Visitor Parking Lot Access Lane	7:15-8:15	2:45-3:45

Based on the results of the traffic count data, the AM peak hour was modeled as 7:45 AM to 8:45 AM and the PM peak hour was modeled as 4:00 PM and 5:00 PM. Each of these peak hours were chosen as they represent the highest peak hour volume for the FBNA study area in their respective time periods.

The existing traffic operating conditions in the study area were analyzed using Trafficware's Synchro 11 traffic analysis software and the methodology in the Highway Capacity Manual 6th Edition. The existing peak hour traffic volume (AM peak and PM peak hours) and the existing lane-use configuration were used in performing the existing (2021) operational analysis.

To account for the COVID-19 pandemic and its effect on traffic patterns on and in the vicinity of the study area, the existing (2021) peak hour volumes were adjusted upwards, assuming 60% of "normal" personnel were counted during March/April 2021 traffic counts. Gate counts were provided from inbound Tulley, Pence, Kingman, and Farrar gates for a similar Monday through Friday time period in January 2020 and January 2021 that validate this volume adjustment.

Level of Service Standards

Level of service (LOS) is a qualitative measure describing operational traffic conditions and the perception of these conditions by drivers or passengers. These conditions include factors such as speed, delay, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. Levels of service are given letter designations from A to F, with LOS A representing the best operating conditions (free flow, little delay) and LOS F representing the worst (congestion, long delays). Generally, LOS A and B are considered high level of service, LOS C and D are considered moderate, and LOS E and F are considered low.

In general, the standards are LOS D in urban areas and LOS C in rural areas. The results of the operational analysis at FBNA using Synchro are provided in Table 3-10 below.

Table 3-10: Existing (adjusted) Intersection Operational Analysis

Intersection	Signalized (Y/N)	AM	PM	AM	PM
		Delay (s/veh)		LOS	
Barta Road / FBNA Facilities Access	Y	1.7	1.1	A	A
West Gate Entrance	N	-	-	A	A
Barta Road / Parking Garage Exit	Y	0.0	10.4	A	B
Barta Road / Main Guest Access	N	-	-	A	A
Barta Road / GEOINT Drive	Y	5.5	13.3	A	B
Barta Road / Heller Road	Y	9.8	0.6	A	A
Barta Road / Backlick Road	Y	7.9	20.1	A	C
Heller Road / HOV Entrance Ramp	N	-	-	A	A
95 Exit Ramp / Heller Road	N	-	-	A	A
South Gate Entrance	N	-	-	A	A

As shown in the table, all intersections are operating at LOS C or better.

Transit

There are three bus transit routes that pass near Fort Belvoir and FBNA:

- Route 171
- Route 335
- REX (Richmond Highway Express)

Routes 171 and 335 are operated by the Fairfax Connector, and the REX is operated by Washington Metropolitan Area Transit Authority.

Non-motorized Facilities

There are sidewalks and pedestrian crossings in the study area, however few pedestrian movements were noticed during the traffic counts. Surrounding streets do not have marked bicycle lanes, and no bicycle movements were observed during the traffic counts.

3.9.2 Environmental Consequences

3.9.2.1 Thresholds of Significance

Roadway traffic resulting from operations of the Proposed Action could result in changes to the LOS provided by existing road systems. Key issues of concerns regarding potential traffic impacts of the Proposed Action include:

- Maintaining a LOS on affected roadways that meets an acceptable standard;

- Minimizing the effect of 650 additional employees at the Access Control Points (ACPs) serving FBNA.

3.9.2.2 Impacts of Proposed Action

The Proposed Action is estimated to generate 650 additional staff positions. The analysis assumes that each additional staff member generates one (1) additional AM and PM peak hour trip for both 650 additional staff and 1000 additional staff scenarios. A sensitivity analysis that assumes 1000 additional employees was conducted to determine operational levels for possible future staff. The distribution between site access points was determined utilizing the March 2021 count data.

Peak Period Vehicular Traffic Impacts

Table 3-11 presents the general traffic operations summary for all scenarios analyzed for the Proposed Action.

Table 3-11: Build Condition (2021 adjusted) Intersection Operational Analysis

Int. ID	Intersection	Signalized (Y/N)	*650 Added Personnel*				*1000 Added Personnel*			
			AM	PM	AM	PM	AM	PM	AM	PM
			Delay (s/veh)		LOS		Delay (s/veh)		LOS	
B	Barta Road / FBNA Facilities Access	Y	2.0	1.3	A	A	2.2	1.5	A	A
C	West Gate Entrance	N	-	-	A	A	-	-	A	A
D	Barta Road / Parking Garage Exit	Y	0.1	10.0	A	A	0.1	10.0	A	A
E	Barta Road / Main Guest Access	N	-	-	A	A	-	-	A	A
F	Barta Road / GEOINT Drive	Y	8.7	21.5	A	C	11.1	67.2	B	E
G	Barta Road / Heller Road	Y	11.5	3.1	B	A	12.2	2.9	B	A
H	Barta Road / Backlick Road	Y	8.0	21.5	A	C	20.4	20.9	C	C
I	Heller Road / HOV Entrance Ramp	N	-	-	A	A	-	-	A	A
J	95 Exit Ramp / Heller Road	N	-	-	A	A	-	-	A	A
K	South Gate Entrance	N	-	-	A	A	-	-	A	A

Under the Proposed Action, all intersections (AM and PM) would operate at LOS B or better with the exception of the intersections of:

- Barta Road / GEOINT Drive (LOS C during the PM peak hour) – Exiting traffic from GEOINT Drive creates queues while waiting to turn on to Barta Road.

- Barta Road / Backlick Road (LOS C during the AM peak hour) – Backlick Road NB left turns queue and saturate the lanes waiting for SB Backlick thru movements to clear.

The TIS concludes that FBNA can accommodate the anticipated additional traffic generated by the Proposed Action. There also appears to be excess capacity if additional site traffic generators are proposed, with the exception of Barta Road/GEOINT Drive, which would require additional mitigation. Gate SMART Evaluator -Quick Calculator was used to determine potential staffing and lane needs for ACPs. Based on 650 added vehicles to the AM peak hour at each gate, the analysis determined that all gates have excess number of receiving lanes and no additional manpower or lanes would be required to handle the additional volume.

3.9.2.3 Impacts of the No Action Alternative

Currently, the primary users of FBNA are government employees of NGA and their visitors. No growth in background traffic volumes in the study area would result from the No Action Alternative.

3.10 CULTURAL AND HISTORIC RESOURCES

3.10.1 Site History

The Army acquired FBNA (formerly EPG) in the early 1940s to support the Research, Development and Engineering Center for the testing of a wide range of engineering equipment and supplies, including methods and equipment for the deployment, detection, and neutralization of landmines. The Army used FBNA for these purposes from the 1940s through the 1970s (U.S. Army, 2007). The highest level of activity at EPG occurred during the 1940s to the mid-1950s. Commercial and residential encroachment in the vicinity of FBNA in the 1960s and 1970s contributed to the reduction of testing activities at this location.

The historical testing and training activities on the eastern portion of FBNA, where the study area is located, included the following (U.S. Army, 2007):

- Construction, material handling, maintenance, railway, power generation, air compression, and bridging equipment
- Fuels and fuel handling and storage equipment, mobile water purification equipment, and waste and sewage structures
- Climatic effects on paints, tactical sensors, and anti-mine systems and techniques.

Several federal laws and regulations—including the National Historic Preservation Act (NHPA) of 1966, as amended, the Archaeological and Historic Preservation Act of 1974, the AIRFA of 1978, the Archaeological Resource Protection Act of 1979 (ARPA), and the NAGPRA of 1990—have been established to manage cultural resources. Cultural resources include "historic properties" as defined by the NHPA "cultural items" as defined by the Native American Graves Protection and Repatriation Act of 1979 (NAGPRA), "archaeological resources" as defined by the

ARPA, “sacred sites” as defined by EO 13007 to which access is afforded under the American Indian Religious Freedom Act of 1987 (AIRFA), and collections and associated records as defined in 36 CFR 79.

Archaeological resources consist of locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains. Architectural resources include standing buildings, districts, bridges, dams, and other structures of historic significance. Traditional cultural properties include locations of historic occupations and events, historic and contemporary sacred and ceremonial areas, prominent topographical areas that have cultural significance, traditional hunting and gathering areas, and other resources that Native Americans or other groups consider essential for the persistence of their traditional culture.

The NHPA outlines federal policy to protect historic properties and promote historic preservation in cooperation with other nations, tribal governments, states, and local governments. Sections 106 and 110 of the NHPA require federal agencies to identify, evaluate, inventory, and protect historic properties (i.e. those listed or eligible for listing in the National Register of Historic Places [NRHP]) that are under their jurisdiction and control. Federal agencies must delineate the Area of Potential Effect (APE) within which impacts from a proposed action may occur, identify historic properties present within the APE, assess the potential effects of the undertaking on those historic properties and consider ways to avoid, minimize and mitigate any adverse effects. The APE is the geographic area in which an undertaking may directly or indirectly cause changes in the use or character of a historic property. An undertaking is any federal action with the potential to affect historic properties. Federal agencies are further required to initiate consultation with the State Historic Preservation Officer (SHPO) for actions that may impact historic properties. The Virginia Department of Historic Resources (VDHR) serves as the SHPO in Virginia.

Section 110 of the NHPA requires federal agencies to establish their own programs to locate, inventory, nominate, and protect historic properties owned or controlled by the agency that may qualify for inclusion in the National Register. The intent of Section 110 is to identify the historic properties that should be considered when federal agencies make planning decisions to ensure that these agencies provide good stewardship to the nation’s significant cultural resources. In compliance with Section 110, a comprehensive archaeological survey was completed for the former EPG area in 1993, and no archaeological properties eligible for the National Register of Historic Properties (NRHP) were present (MAAR Associates, 1993). Only one archaeological resource, an isolated prehistoric artifact, has been discovered on FBNA, but evaluated as not eligible for the NRHP (New South Associates, 2007).

A comprehensive architectural survey of all extant properties on FBNA was completed in 2006 and none were eligible for the National Register, nor listed on any state or local resister. The findings of this report were reviewed and concurred by Virginia SHPO. Further, a review of the Fairfax County Inventory of Historic Sites, current Fairfax County Historic Overlay Districts, the Virginia Landmarks Register, and the National Register indicated that no listed resources or historic overlay districts are in close proximity to FBNA (U.S. Army, 2007).

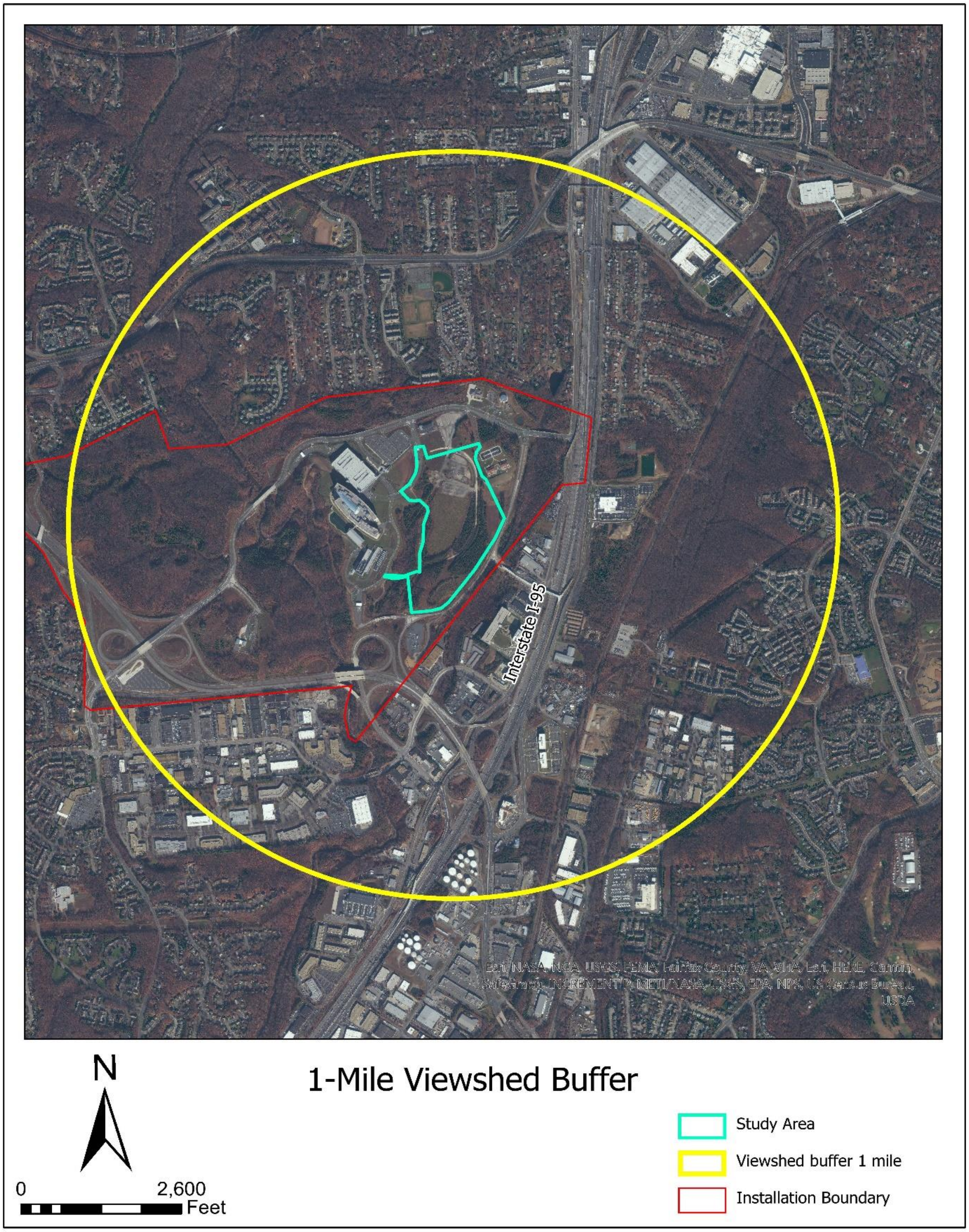

Figure 3-9: 1- Mile Viewshed Buffer

The APE for the Proposed Action is defined as the study area outlined in Figure 3-9. The APE also considered a 1-mile buffer surrounding the study area to account for any potential effects on the viewshed of historic districts in the vicinity. Based on the information provided above, Fort Belvoir has concluded that no historic properties exist within the APE or in close proximity.

3.10.2 Environmental Consequences

3.10.2.1 Thresholds of Significance

Significant impacts to cultural resources could occur if possible resources that have not been previously documented are not properly identified, consultation pursuant to Section 106 is not completed, and/or if impacts to viewsheds within the APE buffer are not appropriately considered and addressed.

3.10.2.2 Impacts of the Proposed Action

No effects on cultural resources are anticipated from the Proposed Action. The project site has been highly disturbed as a result of testing activities and supporting infrastructure since its inception as a testing ground in the 1940’s, with subsequent ground disturbance from removal of older buildings and infrastructure, testing for contamination and munitions, and use of the project site as a staging area for the BRAC construction of NGA in the late 2000’s. As noted in Section 3.10.1, no eligible archaeological or architectural resources exist within the APE for the Proposed Action on FBNA. In terms of potential effects to viewsheds of historic districts in the project vicinity, the project is consistent with the campus-style environment Fort Belvoir is striving to establish on FBNA. The administrative building will be designed in accordance with applicable installation design guidelines, including the Fort Belvoir Master Plan, and will be no higher than the adjacent NGA facility. Although situated in a relatively high point in comparison to surrounding areas, the site is surrounded by stands of second-growth pines and hardwood forest that provide a visual screen for off-site properties.

In accordance with Section 106 of the NHPA, consultation was initiated with the VDHR and Fort Belvoir received concurrence from the SHPO, represented in Virginia by the VDHR, on the determination of "no historic properties affected." A record of this consultation is included in Appendix A: Agency Coordination.

Additionally, should cultural artifacts be inadvertently discovered during construction or operation of the Proposed Action, the inadvertent discovery plan described in Fort Belvoir’s Integrated Cultural Resources Management Plan would be implemented to ensure notifications are made to appropriate personnel and the VDHR.

3.10.2.3 Impacts of the No Action Alternative

No effects on cultural resources are anticipated from the No Action Alternative.

3.11 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, and PROTECTION OF CHILDREN

3.11.1 Socioeconomics

Socioeconomic factors are defined by the interaction or combination of social and economic factors. The relevant factors related to the Proposed Action include population and housing, economic development, and quality of life/health and safety issues.

The Region of Influence (ROI) for socioeconomic characteristics encompasses Fairfax County, Virginia. This ROI includes the installation and the immediately surrounding communities that have direct and indirect socioeconomic relationships with the installation, as many DIA staff live in this county and many military personnel may frequent commercial establishments in this county.

3.11.2 Environmental Justice

Environmental justice addresses the race, ethnicity, and poverty status of populations within the ROI. On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* to focus the attention of federal agencies on the human health and environmental conditions in minority and low-income communities. EO 14008, *Tackling the Climate Crisis at Home and Abroad*, signed by President Biden on January 27, 2021, further strengthens EO 12898 by requiring that "Agencies shall make achieving environmental justice part of their missions by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts."

Potential environmental justice considerations are determined by comparing demographic and economic characteristics (minority population composition and poverty rates) within the study area to the same characteristics in the surrounding region. Environmental justice analyses are performed to identify potential disproportionate adverse effects from proposed actions and to identify alternatives that might mitigate these effects (U.S.EPA, 2016).

The term minority refers to people who classified themselves as American Indian or Alaskan Native; Asian or Pacific Islander; African Americans or Black, not of Hispanic origin; or Hispanic.

Minority populations are defined as areas where racial minorities comprise 50 percent or more of the total population. Because CEQ guidance does not establish a threshold for low- income communities, a low-income population is one with at least 25 percent or greater of its population living in poverty for the purposes of this EA.

Demographics

Fairfax County comprises an area of 391 square miles, and the estimated 2019 population was 1,147,532, a 6.1 percent increase from the population of 1,081,726 in 2010 (U.S. Census, 2021). In 2019, 35.3 percent of Fairfax County's population was composed of minorities. Fairfax County is not considered a minority community because the percentage of minorities living in the county is less than 50 percent of the total population. The median household income from 2015 to 2019 (in 2019 dollars) was $124,831. There were approximately 6 percent of persons living in poverty in Fairfax County. Fairfax County is not considered a low-income community since low-income people and families do not comprise 25 percent or more of the total population (U.S. Census 2021).

Fort Belvoir is approximately 8,000 acres in size and has an approximate working population of 40,000 people (NCPC, 2017). FBNA is 804.07 acres in size and supports approximately 8,600 employees, most of whom are government civilians, military members, and contractors employed by the NGA Campus East (NCE), whose headquarters were completed as part of the 2005 BRAC in September 2011. NCE is the third largest federal facility in Washington, D.C. area, at approximately 2.77 million square feet (https://www.nga.mil/history/).

Approximately 7,500 residents live on Fort Belvoir (2,100 housing units, located on Main Post) (NCPC, 2017).

3.11.3 Protection of Children

On April 21, 1997, President Clinton issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directing each federal agency to ensure that its policies, programs, activities, and standards address disproportionate environmental health or safety risks to children that may result from the agency's actions. EO 13045 recognizes that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health and safety risks due to still developing neurological, immunological, physiological, and behavioral systems. Examples of risks to children include increased traffic volumes and industrial- or production-oriented activities that would generate substances or pollutants that children could come into contact with and ingest.

Typically, children have only been present on FBNA at the Fort Belvoir North CDC #1 and #2, located to the east of the study area. These facilities were constructed in approximately 2013-2014 and provide childcare services primarily for the existing NGA facility. The Army has taken precautions for the safety of children by a number of means, including limiting access to certain areas, the use of fencing, and providing adult supervision.

3.11.4 Environmental Consequences

3.11.4.1 Thresholds of Significance

<u>Socioeconomics</u>

The Proposed Action Alternative and No Action Alternative were evaluated against the following significance criteria to determine if they would result in a significant impact on the socioeconomic environment:

- Alternative would substantially change local population growth rates or employment opportunities.
- Alternative would create a demand for housing, schools, public facilities, or recreational opportunities that exceeds existing supply.
- Alternative would increase risks to public health or safety, including safety of children.

<u>Environmental Justice</u>

The concept of environmental justice is based on the premise that no segment of the population should bear a disproportionate share of adverse human health or environmental effects of a proposed federal action. Historically, low-income and minority communities have been disproportionately affected by negative environmental effects, receiving few of the benefits of economic growth and development while absorbing much of the societal cost.

The Proposed Action Alternative and No Action Alternative were evaluated against the following significance criteria to determine if they would result in a significant impact on environmental justice populations:

- Alternative would cause socioeconomic impacts that disproportionately affect low-income or minority populations.

<u>Protection of Children</u>

Because children may suffer disproportionately from environmental health risks and safety risks, EO 13045 *Protection of Children from Environmental Health Risks and Safety Risks* was issued in 1997 to prioritize the identification and assessment of environmental health risks and safety risks that may affect children and to ensure federal agencies' policies, programs, activities, and standards address environmental and safety risks to children.

The Proposed Action Alternative and No Action Alternative were evaluated against the following significance criteria to determine if they would result in a significant impact on the protection of children:

- Alternative would increase risks to the safety of children.

3.11.4.2 Impacts of the Proposed Action

Socioeconomics

Under the Proposed Action, less-than-significant, long-term beneficial effects would be expected to occur to socioeconomics. The construction and renovation expenditures would result in beneficial increases in the ROI business sales volume, income, and employment. Although the Proposed Action's expenditures would be quite substantial, Fort Belvoir is in such an economically large and robust region that the magnitude of the expenditures relative to the regional demographic and economic forces would be considered minor. Because construction projects are, by nature, temporary, the economic stimulus from construction of the Proposed Action would diminish over time as the project reached completion.

Long-term beneficial impacts would be seen due to the transfer of employees from the current DIA HQ Annex in Washington, D.C. to Fort Belvoir. The new employees would bring an increase in spending throughout the area in a number of areas including housing, employment, and commercial businesses. Taxes revenues would also increase as a result of employees who relocate. However, these impacts are minor, as some of the Fort Belvoir employees live within an hour of the Proposed Action area and would not relocate. The benefits are also negated by an increase in demand for public services at and surrounding Fort Belvoir such as police, schooling, and firefighter services.

Environmental Justice

Under the Proposed Action, no effects would be anticipated on environmental justice. The ROI for the Proposed Action is not considered to be a minority or low-income community. In addition, the Proposed Action would not be an action that has the potential to substantially affect human health or the environment by excluding persons, denying persons benefits, or subjecting persons to discrimination because of their race, color, national origin, or income level.

Protection of Children

Under the Proposed Action, no adverse or disproportionate effects would be anticipated to occur to children. The CDC are to the east of the site and with proper precautions, would not allow children near the construction site. Post-construction, there would be no environmental risks for children near or in the HQs.

3.11.4.3 Impacts of the No Action Alternative

Socioeconomics

Under the No Action Alternative, no changes would be expected to occur to socioeconomics. Fairfax County would see no changes in employment or need for public services.

Environmental Justice

Under the No Action Alternative, no effects would be anticipated on environmental justice. No changes to minority or low-income communities would occur.

Protection of Children

Under the No Action Alternative, children would not be affected. No changes would occur on-site that had the potential to disproportionately affect children.

4.0 CONCLUSIONS

This EA has been prepared to analyze the potential environmental, cultural, and socioeconomic effects associated with the proposed construction and operation of a new DIA HQs Annex on FBNA. The purpose of this project is to build and operate an administrative building with an associated parking structure at Fort Belvoir to consolidate administrative facilities for approximately 650 personnel from DIA HQ to address safety, security, and operational concerns specific to the administrative functions of the agency.

The analysis within this EA concluded that there would be: no impacts to topography, groundwater, wetlands, coastal zones, environmental justice, protection of children, cultural resources, air quality, and utilities; short-term minor adverse impacts to surface water, wildlife resources, vegetation, noise and transportation; long-term minor beneficial impacts to topography and soils, and hazardous materials and munitions; and short-term minor beneficial impacts to socioeconomics.

Table 4-1 summarizes the potential consequences that the Proposed Action and the No Action Alternative would have on environmental resources.

Based on the evaluation of the environmental consequences accomplished by this EA, the Proposed Action would have no significant impact on the environment, and the preparation of an EIS is not warranted. The preparation of a FNSI will be appropriate.

Table 4-1: Summary of Potential Environmental Consequences on Environmental Resources

Resource	Proposed Action	No Action Alternative	Permits and Best Management and Mitigation Measures
Geology, topography, and soils	Less-than-significant, short-term adverse effects to soils. Clearing, grubbing and grading would temporarily increase erosion and the potential for sediments to be transported off-site; however, the finished building would be beneficial in reducing accelerated rates of run-off from adversely affecting downstream receiving waters as a result of properly designed stormwater management	Less-than-significant adverse impacts to soils.	-Obtain ground disturbance permits from Fort Belvoir DPW -Follow ESC Plan (to be included in the project civil design plan following review by Fort Belvoir DPW and approval by VDEQ) -Follow SWPPP -Obtain Construction General Permit from VDEQ.
Water resources (Surface water, RPAs, floodplains,	Less-than-significant, short-term adverse effects. This stage of construction exposes soils and increases the potential for erosion and discharge of sediment-laden	Less-than-significant adverse impacts to surface	-Obtain CGP -Follow ESC and SWPPP as referenced above.

groundwater, stormwater, Coastal Zone)	stormwater to downstream receiving waters; however, appropriate erosion and sediment control measures would be implemented, pursuant to the construction SWPPP and the VSMP Construction General Permit, and would minimize any detrimental effects. Construction of permanent stormwater management features will handle stormwater generated from the development and be designed to maintain pre-development levels of off-site discharge.	waters. Existing conditions would continue.	-Design and construction would be performed in accordance with Virginia CZMA policies. -Obtain permit for impacts to wetlands/streams pursuant to Section 401/404 of the CWA prior to disturbance to these resources - All temporarily disturbed areas would be graded and re-vegetated upon completion of construction -Employ erosion and sediment control measures during construction, to include silt fencing and sediment traps. -Provide spill kits on site in the event of an accidental release of petroleum products from construction equipment. -Provide appropriate secondary containment for on-site generators.
Biological resources (Vegetation, wildlife, RTE species, PIF)	Less-than-significant, short-term adverse effects to vegetation, wildlife, and RTE. The Proposed Action would remove existing vegetation, disturbing habitat areas and causing fauna that use the area to relocate. The vegetation/tree removal would be offset with replantings, and the construction area stabilized and revegetated with native plants.	No effects.	-Replanting to offset removal of existing trees within the site would be performed in accordance with Fort Belvoir's Tree Removal and Protection Policy. -Consultation regarding listed species would be conducted pursuant to Section 7 of the ESA. -Surveys for the presence of the wood turtle and small-whorled pogonia would be conducted prior to site clearing. - Perimeter controls would be installed during the winter months to exclude the endangered wood turtle from proposed areas of construction activity, as necessary. - To minimize impacts to birds, construction activities would avoid cutting and removal of vegetation from April 1 to July 15. - To protect nesting bat species, no trees over 3 inches in diameter would be removed within the project study area between April 15 and September 15.

Hazardous Waste Materials and Munitions	Less-than-significant beneficial effects to hazardous waste and munitions. Remediation of the contaminated groundwater at the site will be completed in accordance with the final CC-MPS-2009 Feasibility Study, and the munitions survey would ensure the Proposed Action area is cleared from munitions., alleviating safety concerns related to possible munitions remaining on the surface or buried near the surface.	No effects.	-Clean-up of groundwater contamination at the site would be conducted in accordance with CERCLA and Fort Belvoir's IRP, using steps and methodology outlined in the final Feasibility Study. -Munitions clearance would be conducted pursuant to U.S. Army Garrison (USAG), Fort Belvoir, Policy Memorandum #28 (USAG, 2014). -Land use controls, likely to result in the requirement for a vapor intrusion barrier for the administrative building, would continue to be in effect for this site. -Ongoing remedial actions would be enhanced through the re-establishment of an effective groundwater monitoring well system that would be able to more accurately characterize the contamination plume. -Soils excavated or otherwise disturbed during the project's construction phase would be tested in accordance with established Fort Belvoir policies and procedures. -The construction contractor would be required to prepare and adhere to a SPCC plan.
Utilities (Electric, Wastewater, and Natural Gas)	Less-than-significant, long-term adverse effects to electric, wastewater, and natural gas. The operation of the building would increase demand, but the existing utility systems have been constructed in consideration of long-term build-out of FBNA.	No effects	Any required ground disturbance associated with the extension of existing utilities for connection to the Proposed Action would adhere to the required sediment and erosion control permits.
Noise	Less-than-significant, short-term adverse effects during the construction period would occur as a result of the various types of heavy equipment needed. BMPs (listed in this section) would be employed to minimize the adverse effects from construction noise. Operation of the completed facility would be expected to result in a negligible increase in ambient noise from climate control (heating/cooling) infrastructure	No effects	-The Fairfax County noise ordinance limits construction noise above 60 dBA for residential areas during weekdays. -Noise levels must not exceed National Institute for Occupational Safety and Health (NIOSH) or Occupational Safety and Health Administration (OSHA) guidance for workers.

	supporting the building and additional commuting vehicles.		-To minimize the potential adverse impact from these noises, construction vehicles would be equipped with noise-dampening equipment including mufflers which would be operated according to the manufacturers' instructions. -Construction vehicles and equipment would be turned off when not in use for more than five minutes. -Construction would take place during daylight hours on weekdays, unless there is a specific action that would require working outside of this normal timeframe, such as mobilizing oversized materials or equipment to the site.
Air Space	Less-than-significant, adverse effects	No effects	
Air Quality	Less-than-significant, short- and long-term adverse effects. During construction engine emissions and potential fugitive dust emissions would have adverse effects; however, these impacts would be minimized through BMPs. Long-term operation of the facility would result in de minimis emissions.	No effects	-Comply with VDEQ's Fort Belvoir - North Area synthetic minor New Source Review (mNSR) air permit (Registration No. 73630) -BMPs include: covering truck beds while in transit to reduce fugitive emissions; spraying water on any unpaved roads or stockpiles to limit fugitive emissions; using ultra-low sulfur diesel as a fuel source where appropriate to minimize oxides of sulfur emissions; using clean diesel in construction equipment and vehicles though the implementation of add-on control technologies and using electric-powered equipment in lieu of diesel-powered equipment when feasible; and, implementing control measures for heavy construction equipment and vehicles (e.g. minimizing operating and idling time). -LEED-Silver design to reduce energy and water usage over the life of the building
Traffic	Less-than-significant, short-term adverse effects on the regional roadway network and project vicinity from construction worker commutes	No effects	

	and delivery/pickup of construction materials/debris. Less-than-significant long-term effects of increased personnel commuting to/from FBNA.		
Cultural and Historic Resources	No effects. No sites eligible for listing on the NRHP are located within the study area.	No effects	-Consultation in accordance with Section 106 of the NHPA required. -Inadvertent discovery of cultural resources would be managed according to procedures documented in Fort Belvoir's ICRMP.
Socioeconomics, Environmental Justice, and Protection of Children	Less-than-significant, short-term beneficial effects to socioeconomics due to the potential employment of local construction workers and purchasing of materials from local vendors.	No effects	The Proposed Action would be initiated only after this environmental review has been completed and the appropriate permits are acquired. It is anticipated that the permitting process would result in assurance of safety and protection of the public, including children. -Proper precautions including the placement of fencing, signage, and other types of barriers would be used to prevent potential harm to all civilians, including children.

5.0 ACRONYMS

ACP	Access Control Point
ADNL/dBA	A-weighted day night-levels
ADP	Area Development Plan
AHA	Activity Hazard Analysis
AIRFA	American Indian Religious Freedom Act
APE	Area of Potential Effect
ARPA	Archaeological Resource Protection Act
AT/FP	anti-terrorism/force protection
AQCR	Air Quality Control Regions
BMP	best management practices
BO	Biological Opinion
BRAC	Base realignment and closure
CAA	Clean Air Act
CBPO	Chesapeake Bay Preservation Ordinance
CDC	Child Development Center
CDNL/dBC	C-weighted decibels day night-levels
CEQ	Council of Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	equivalent emissions of CO_2
COC	chemicals of concern
CRMP	Coastal Resources Management Program
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DA	Department of the Army
DAAF	Davison Army Airfield
dB	Decibels
dBP	peak sound level
DEQ	Department of Environmental Quality
DERP	Defense Environmental Restoration Program
DIA	Defense Intelligence Agency
DIAC	Defense Intelligence Analysis Center
DMM	discarded military munitions
DNL	day-night levels
DoD	Department of Defense
DPW	Department of Public Works

DVP	Dominion Virginia Power
DWR	Department of Wildlife Resources
EA	Environmental Assessment
EI	Environmental Investigation
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
ENRD	Environmental and Natural Resources Division
EO	Executive Orders
EPA	U.S. Environmental Protection Agency
EPG	Engineering Proving Ground
ESA	Endangered Species Act
FBNA	Fort Belvoir North Area
FFS	Focused Feasibility Study
FNSI	Finding of No Significant Impact
FS	feasibility study
FUDS	Formerly Used Defense Sites
GCR	General Conformity Rule
GHGs	greenhouse gases
GIS	Geographic Information System
GSA	General Services Administration
GSF	gross square foot
GWP	global warming potential
HAP	Hazardous Air Pollutant
HDPE	high-density polyethylene
HFCs	hydrofluorocarbons
HHRA	Human Health Risk Assessment
HQ	Headquarters
IC	Institutional controls
Infosec	information security
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Conservation
IRP	Installation Restoration Program
ISW RO	Industrial Stormwater Outfall
kV	kilovolt
LEED	Leadership in Energy and Environmental Design
LID	low impact development
LOD	limits of disturbance
LOS	Level of Service

LUC	land use controls
LUCIP	Land Use Control Implementation Plan
LUPZ	Land Use Planning Zone
MC	Munitions constituents
MDW	Military District of Washington
MEC	munitions and explosives of concern
MGD	million gallons per day
MMRP	Military Munitions Response Program
MS4	Municipal Separate Storm Sewer System
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCE	NGA Campus East
NCP	National Contingency Plan
NCR	National Capital Region
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NGA	National Geospatial-Intelligence Agency
NIOSH	National Institute for Occupational Safety and Health
NLEB	northern long-eared bat
NOI	Notice of Intent
NO_x	nitrogen dioxides
N_2O	nitrous oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Properties
NRO	Northern Regional Office
NSF	net square foot
NSR	noise-sensitive receptors
O_3	ozone
OHWM	Ordinary High-Water Mark
OMB	Office of Management and Budget
OSAA	Operational Support Airlift Agency
OSACOM	Operational Support Airlift Command
OSHA	Occupational Safety and Health Administration
PFCs	perfluorocarbons
PFO	palustrine forested
PIF	Partners in Flight
PP	proposed plan
PM	particulate matter
PRG	Preliminary Remediation Goals

PSA	Petroleum Storage Areas
RBC	Risk-Based Concentrations
RD	remedial design
RIP	Restoration in place
ROD	Record of Decision
RPA	Riparian Buffer Area
RTE	Rare, Threatened and Endangered
SARA	Superfund Amendments and Reauthorization Act
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Office
SIP	state implementation plan
SO_2	sulfur dioxide
SOC	Species of Concern
SPCC	Spill Prevention, Control, and Countermeasure
SSHP	Site Safety and Health Plan
SWPP	Stormwater Pollution Prevention Plan
TEMPEST	Telecommunications Electronics Materials Protected from Emanating Spurious Transmissions
TIS	Traffic Impact Study
TMC	Turning Movement Counts
TMDL	Total Maximum Daily Load
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
UAG	U.S. Army Garrison
UP	Utilities Privatization
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
UST	underground fuel storage tank
UXO	unexploded ordnance
VAC	Virginia Administrative Code
VADEQ	Virginia's Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDWR	Virginia Department of Wildlife Resources
VI	vapor intrusion
VISL	vapor intrusion screening level
VOC	volatile organic compounds
VSMP	Virginia Stormwater Management Program

6.0 LIST OF PREPARERS

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7.0 REFERENCES

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APPENDIX A – AGENCY COORDINATION

NOTICE OF AVAILABILITY
FOR THE ENVIRONMENTAL ASSESSMENT AND
DRAFT FINDING OF NO SIGNIFICANT IMPACT FOR THE
PROPOSED DEFENSE INTELLIGENCE AGENCY (DIA)
HEADQUARTERS (HQ) ANNEX
FORT BELVOIR, VIRGINIA

The U.S. Army Garrison Fort Belvoir hereby gives Notice of the Availability (NOA) for the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) for the proposed construction of the DIA HQ Annex within the vicinity of the National Geospatial-Intelligence Agency (NGA) complex on Fort Belvoir's North Area, Fairfax County, Virginia. The purpose of this project is to build and operate an approximately 77,000 net square foot/116,080 gross square foot administrative building with an associated parking structure on Fort Belvoir to consolidate administrative facilities for approximately 650 personnel from DIA HQ to address safety, security, and operational concerns specific to the administrative functions of the agency. The proposed HQ Annex building would include a multi-story administrative building with offices, cubicles/workstations, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, a café/cafeteria, a gym/fitness center, a utility plant, visitor control center, visitor parking, a secured employee parking structure, and a perimeter security fence.

The EA has been prepared in accordance with the regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), (Public Law 91-190, 42 USC 4321-4347 January 1, 1970), amendments, and the Army's Implementing Regulations (32 CFR Part 651, *Environmental Analysis of Army Actions).* The EA is available to view in printed form at the Lorton Branch, Kingstowne Branch, and Sherwood Regional Branch of the Fairfax County Public Library system, or to view/download electronically at https://home.army.mil/belvoir/index.php/about/Garrison/directorate-public-works/environmental-division. Click the "Programs and Documents" tab, then "National Environmental Policy Act (NEPA) Program." Information about the EA and links to download the various documents are provided under the "Open for Public/Agency Review & Comment" heading.

Comments or questions on the EA and Draft FNSI may be directed in writing to: Environmental Division, Directorate of Public Works, Building 1442, 9430 Jackson Loop, Fort Belvoir, VA 22060, or by email to: usarmy.belvoir.imcom-atlantic.mbx.enrd@mail.mil. Comments must be received no later than 30 days after publication of this NOA.

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In Reply Refer To: June 23, 2021
Consultation code: 05E2VA00-2021-TA-3582
Event Code: 05E2VA00-2021-E-12582
Project Name: DIA HQ Annex

Subject: Verification letter for the 'DIA HQ Annex' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Connie Ramsey:

The U.S. Fish and Wildlife Service (Service) received on June 23, 2021 your effects determination for the 'DIA HQ Annex' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Small Whorled Pogonia *Isotria medeoloides* Threatened

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

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[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

DIA HQ Annex

2. Description

The following description was provided for the project 'DIA HQ Annex':

> Administrative building with parking and security fence on FBNA.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.7523379,-77.19079239440862,14z

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

6. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

7. Will the action involve Tree Removal?

   Yes

8. Will the action only remove hazardous trees for the protection of human life or property?

   No

9. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

10. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

    No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type ‘0’ in questions 1-3.

1. Estimated total acres of forest conversion:

0

2. If known, estimated acres of forest conversion from April 1 to October 31

0

3. If known, estimated acres of forest conversion from June 1 to July 31

0

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type ‘0’ in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type ‘0’ in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type ‘0’ in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032
http://www.fws.gov/northeast/virginiafield/

In Reply Refer To: July 26, 2021
Consultation Code: 05E2VA00-2021-SLI-3582
Event Code: 05E2VA00-2021-E-14152
Project Name: DIA HQ Annex

Subject: Updated list of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Project Summary

Consultation Code: 05E2VA00-2021-SLI-3582
Event Code: 05E2VA00-2021-E-14152
Project Name: DIA HQ Annex
Project Type: DEVELOPMENT
Project Description: Administrative building with parking and security fence on FBNA.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.7523379,-77.19079239440862,14z

Counties: Fairfax County, Virginia

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

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

Dear Mr. Holma:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Fort Belvoir has also sent letters to Fairfax County, the Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

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

Dear Ms. Rogers:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act, an Area of Potential Effects map (APE) has been developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and so was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties present for this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Principal Chief Richard Sneed
Eastern Band of Cherokee Indians
Qualla Boundary P.O. Box 455
Cherokee, North Carolina 28719

Dear Principal Chief Sneed:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Joe Bunch
United Keetowah Band of Cherokee Indians in Oklahoma
P.O. Box 746
Tahlequah, Oklahoma 74465

Dear Chief Bunch:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Robert Gray
Pamunkey Indian Tribe
1054 Pocahontas Trail
King William, Virginia 23086

Dear Chief Gray:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment, Fort Belvoir, Virginia

Chief Leo Henry
Tuscarora Nation of New York
2006 Mt. Hope Road
Lewistown, New York 14092

Dear Chief Henry:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Stephen R. Adkins
Chickahominy Indian Tribe
8200 Lott Cary Road
Providence Forge, Virginia 23140

Dear Chief Adkins:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Frank Adams
Upper Mattaponi Indian Tribe
13476 King William Road
King William, Virginia 23086

Dear Chief Adams:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act, an Area of Potential Effects map (APE) has been developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the “Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia”, was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and so was determined to be ineligible. The architectural survey, “An Architectural Survey of the Engineer Proving Ground” was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties present for this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Gerald Stewart
Chickahominy Indians Eastern Division
2895 Mt. Pleasant Road
Providence Forge, Virginia 23140

Dear Chief Stewart:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Upper Mattaponi Tribe, Rappahannock Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2020

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Anne Richardson
Rappahannock Tribal Center
5036 Indian Neck Road
St. Stephens, Virginia 23148

Dear Chief Richardson:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Monacan Indian Nation, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Tribal Chief Kenneth Branham
Monacan Indian Nation
P.O. Box 960
Amherst, Virginia 24521

Dear Tribal Chief Branham:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

The work to be completed for this undertaking is the construction of a new administrative facility meant to house approximately 650 people. This undertaking is necessary to address the current safety, security, and operational concerns of the DIA. The new facility will include the construction of an associated parking deck and visitors parking lot. In addition to the building construction, Fort Belvoir will also need to construct additional roads and sidewalks for access to the new building, and a stormwater basin. The proposed work locations are identified on the enclosed map (Enclosure 3). All new buildings and structures will comply with the Fort Belvoir Real Property Master Plan guidelines for new construction, which include height restrictions meant to protect historic properties.

Fort Belvoir has determined that there are no historic properties affected by this undertaking [36 CFR § 800.4]. Please provide comment on our determination of no historic properties in accordance with 36 CFR § 800.5(c). Letters have also been sent to the State Historic Preservation Officer, Fairfax County, Catawba Indian Nation, Eastern Band of Cherokee Indians, Chickahominy Indian Tribe, Pamunkey Indian Tribe, Tuscarora Nation of New York, United Keetoowah Band of Cherokee Indians in Oklahoma, Chickahominy Indian Tribe-Eastern Division, Upper Mattaponi Tribe, Rappahannock Tribe, and the Nansemond Indian Tribe. If we do not receive your comments within the requested 30 days, we will assume no comment and proceed with the project as planned.

Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Chief Samuel Bass
Nansemond Indian Tribe
1001 Pembroke Lane
Suffolk, Virginia 23434

Dear Chief Bass:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

The FBNA was originally acquired by the US Army in the 1940s and functioned as the Engineering Proving Grounds (EPG). The mission of the EPG involved: the construction, handling, and maintenance of equipment for bridging, air compression and railways; the handling and storage equipment of fuels, mobile water purification equipment, as well as waste and sewage structures, and the testing of climatic effects on paints, tactical sensors, and anti-mine systems and techniques. The highest level of activity at the EPG took place in the 1940s and 1950s but slowed with the increasing amount of encroachment brought on by commercial and residential construction in Fairfax County. Today, the buildings in the FBNA serve administrative purposes and are generally surrounded by large trees that screen any viewshed impingement outside of US Army owned property.

There have been two large surveys in the FBNA to identify any potential historic properties. An archaeological survey, the "Phase I Investigation of Various Development Sites and Training Areas, Fort Belvoir, Virginia", was completed by H. Polk and J. Traver in 1993. This survey identified only one archaeological site (44FX0665) that had been heavily disturbed and was determined to be ineligible. The architectural survey, "An Architectural Survey of the Engineer Proving Ground" was completed by the New South Associates in 2009 and this survey did not recommend any of the buildings in the FBNA as eligible for listing on the National Register of Historic Places (VDHR File No. 2007-0250).

Fort Belvoir also reviewed the undertaking for effects to historic properties associated with Fairfax County. The proposed undertaking does not fall within the boundaries of any historic overlay districts maintained by Fairfax County. The archaeological site, 44FX0467 is located

north of the FBNA, and is approximately 1300 feet away from the proposed work location. Site 44FX0467 was first identified in 1980 and later in a 1994 Phase I survey completed by Thunderbird Archaeology Associates which determined a need for further review.

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Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

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

JUL 13 2021

Directorate of Public Works

SUBJECT: Section 106 Consultation – Defense Intelligence Agency (DIA) Headquarters (HQ) Annex Environmental Assessment (EA), Fort Belvoir, Virginia

Ms. Laura Arseneau
Fairfax County Dept. of Planning and Development
12055 Government Center Parkway
DPZ-PD, Suite 730
Fairfax, Virginia 22035

Dear Ms. Arseneau:

Fort Belvoir is proposing to construct a new DIA HQ Annex in the Fort Belvoir North Area (FBNA). Due to the amount of disturbance brought on by this undertaking, an EA was prepared in accordance with the National Environmental Policy Act. A draft version of the EA is enclosed and the final will be made available for public review in both digital and print format (Enclosure 1). In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), an Area of Potential Effects map (APE) was developed for the proposed undertaking and Fort Belvoir has identified no historic properties within its boundaries (Enclosure 2).

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Point of contact is Mr. Bradford D. Britain, Director of Public Works, at 703-806-3017.

Sincerely,

Joshua P. SeGraves
Colonel, U.S. Army
Commanding

Enclosures

Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219
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(800) 592-5482 FAX (804) 698-4178
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Matthew J. Strickler
Secretary of Natural and Historic Resources

David K. Paylor
Director
(804) 698-4000

August 24, 2021

Environmental Division
Directorate of Public Works, Building 1442
9430 Jackson Loop
Fort Belvoir, VA 22060-5116
Via email: usarmy.belvoir.imcom-atlantic.mbx.enrd@mail.mil

RE: Comments on the Draft Environmental Assessment and Federal Consistency Determination for the Proposed Defense Intelligence Agency Headquarters Annex at Fort Belvoir proposed by the U.S. Department of the Army, Fairfax County, VA (DEQ 21-095F)

To Whom It May Concern:

The Commonwealth of Virginia has completed its review of the above-referenced documents. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents submitted under the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating Virginia's review of federal consistency documents submitted pursuant to the Coastal Zone Management Act (CZMA) and providing the state's response. This is in response to the June 2021 Draft Environmental Assessment (DEA) and Federal Consistency Determination (FCD) submitted by the U.S. Department of the Army for the above referenced project, received on July 23, 2021. The following agencies and locality participated in the review of this proposal:

Department of Environmental Quality
Department of Historic Resources (DHR)
Department of Conservation and Recreation (DCR)
Department of Wildlife Resources (DWR)
Marine Resources Commission (VMRC)
Department of Health (VDH)
Department of Transportation (VDOT)

Fairfax County

In addition, the Department of Forestry and the Northern Virginia Regional Commission were invited to comment on the proposal.

PROJECT DESCRIPTION

The U.S. Department of the Army proposes to construct a Headquarters (HQ) Annex Building for the Defense Intelligence Agency (DIA) within Fort Belvoir's North Area (FBNA), near the National Geospatial-Intelligence Agency (NGA) complex. The proposed HQ Annex building would be approximately 116,080 square feet and would include a multi-story administrative building with offices, cubicles and workstations, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, a café/cafeteria, a fitness center, a utility plant, a visitor control center, visitor parking, a secured employee parking structure, and a perimeter security fence. The building would support stationing of approximately 650 additional personnel.

The DEA includes a Federal Consistency Determination (located in Appendix C) which finds the proposed action consistent to the maximum extent practicable with the enforceable policies of the Virginia Coastal Zone Management Program.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972 (§ 1456(c)), as amended, and the federal consistency regulations implementing the CZMA (15 CFR Part 930, Subpart C, § 930.30 *et seq*.), federal actions that can have reasonably foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia Coastal Zone Management (CZM) Program. The CZM Program is comprised of a network of programs administered by several agencies. In order to be consistent with the CZM Program, the federal agency must obtain all the applicable permits and approvals listed under the enforceable policies of the CZM Program prior to commencing the project.

Federal Consistency Program Change
The National Ocean and Atmospheric Administration (NOAA) Office for Coastal Management (OCM) has approved a program change to Virginia's Coastal Zone Management Program on October 2, 2020. The program change converts Virginia's existing enforceable policies to a narrative format and creates new enforceable policies, in narrative format for use in federal consistency reviews. Details are available at the following website:
https://www.deq.virginia.gov/Programs/EnvironmentalImpactReview/FederalConsistencyReviews.aspx#cma

Future federal consistency submissions should address the new narrative enforceable policies.

Federal Consistency Public Participation
In accordance with 15 CFR § 930.2, public notice of the proposed action was published in the OEIR Program Newsletter from August 2, 2021 to August 13, 2021. No public comments were received in response to the notice.

Federal Consistency Determination
A Federal Consistency Determination for the proposed DIA HQ Annex was included in Appendix C of the DEA. The document provided an analysis of the project's impact on the enforceable policies. According to the FCD, the project will be consistent to the maximum extent practicable with Virginia's Coastal Zone Management Program.

The project is expected to affect the following enforceable policies: Tidal and Non-Tidal Wetlands, Chesapeake Bay Preservation Areas, Point Source Air Pollution, Non-point Source Water Pollution, and Wildlife and Inland Fisheries. These impacts and jurisdictional agency comments, recommendations, and requirements are discussed below in the "Environmental Impacts and Mitigation" section of this document.

Federal Consistency Concurrence
Based on our review of the FCD and the comments submitted by agencies administering the enforceable policies of the CZM Program, DEQ concurs that the proposal will be consistent to the maximum extent practicable with the CZM Program provided all applicable permits and approvals are obtained as described below in the Regulatory and Coordination Needs section.

If, prior to construction, the project should change significantly and any of the enforceable policies of the Virginia CZM Program would be affected, pursuant to 15 CFR 930.46, the applicant must submit supplemental information to DEQ for review and approval. Additionally, other state approvals which may apply to this project are not included in this consistency concurrence. Therefore, the Army must ensure that this project is operated in accordance with all applicable federal, state and local laws and regulations.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Surface Waters and Wetlands. According to the DEA (page 19), Fort Belvoir is located entirely within the highly urbanized Accotink Creek watershed. There is a stormwater pond on the eastern side of the project area that is denoted on the installation's natural resources mapping as a wetland. Additionally, there are wetlands present in the southwestern portion of the project area. The proposed perimeter security fence that would tie into the existing NGA perimeter structure in this area could cross over these wetlands (page 24). Implementation of the proposed action is expected to result in less than significant impacts on surface waters; the action could involve minimal construction in, on, or over surface waters.

According to the FCD (Appendix C) there will be no impact to tidal wetlands from the project. Approximately 0.2-acre of non-tidal wetlands are located within the southwest portion of the project area. These wetlands will be avoided and impacts would be minimized and mitigated in accordance with Virginia laws, if necessary.

1(a) Agency Jurisdiction. The State Water Control Board promulgates Virginia's water regulations covering a variety of permits to include the Virginia Pollutant Discharge Elimination System Permit (VPDES) regulating point source discharges to surface waters, Virginia Pollution Abatement Permit regulating sewage sludge, storage and land application of biosolids, industrial wastes (sludge and wastewater), municipal wastewater, and animal wastes, the Surface and Groundwater Withdrawal Permit, and the Virginia Water Protection (VWP) Permit regulating impacts to streams, wetlands, and other surface waters. The VWP permit is a state permit which governs wetlands, surface water, and surface water withdrawals and impoundments. It also serves as §401 certification of the federal Clean Water Act §404 permits for dredge and fill activities in waters of the U.S. The VWP Permit Program is under the Office of Wetlands and Stream Protection, within the DEQ Division of Water Permitting. In addition to central office staff that review and issue VWP permits for transportation and water withdrawal projects, the six DEQ regional offices perform permit application reviews and issue permits for the covered activities:

- Clean Water Act, §401;
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90);
- State Water Control Law, Virginia Code section 62.1-44.15:20 *et seq*.; and
- State Water Control *Regulations*, 9 VAC 25-210-10.

1(b) Agency Finding. The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Corps of Engineers (Corps). The Corps is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional.

VMRC found that there are no tidal wetlands in close proximity to the project area.

1(c) Agency Recommendation. The VWP program at the DEQ Northern Regional Office (NRO) recommends the avoidance and minimization of surface water impacts to the maximum extent practicable. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs).

1(d) Requirement. A VWP permit may be required for impacts to surface waters and wetlands. The Army should contact DEQ-NRO VWP staff to determine the need for any permits prior to commencing work.

1(e) CZMA Federal Consistency. Provided VWP authorization is received, as required, for impacts to surface waters and/or non-tidal wetlands, this project will be consistent to the maximum extent practicable with the Tidal and Non-tidal Wetlands enforceable policy of the Virginia Coastal Zone Management (CZM) Program (see Federal Consistency under the CZMA section above for additional information).

2. Subaqueous Lands. The FCD (Appendix C) indicates that there will be no impact to subaqueous lands.

2(a) Agency Jurisdiction. The Virginia Marine Resources Commission regulates encroachments in, on or over state-owned subaqueous beds as well as tidal wetlands pursuant to Virginia Code §28.2-1200 through 1400. For nontidal waterways, VMRC states that it has been the policy of the Habitat Management Division to exert jurisdiction only over the beds of perennial streams where the upstream drainage area is 5 square miles or greater. The beds of such waterways are considered public below the ordinary high water line.

2(b) Agency Finding. VMRC found that the project is not within the jurisdictional areas of the agency. There are no state-owned submerged lands in close proximity to the project area and a VMRC permit is not required.

2(c) CZMA Federal Consistency. As proposed, the project is consistent to the maximum extent practicable with the Subaqueous Lands enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA section above for additional information).

3. Nonpoint Source Water Pollution. The EA (page 26) notes that existing stormwater management features are located on the FBNA including underground drainage to the stormwater pond on the eastern side of the study area.

The FCD (Appendix C) states that an erosion and sediment control plan and stormwater management plan will required for the project since the proposed action will disturb approximately seven acres. Temporary erosion and sediment control measures and stormwater Best Management Practices (BMP) will be employed to minimize impacts to water quality from earth disturbance and potential erosion during construction.

3(a) Agency Jurisdiction. The DEQ Office of Stormwater Management administers the following laws and regulations governing construction activities:

- Virginia Erosion and Sediment Control (ECS) Law (§ 62.1-44.15:51 *et seq*.) and Regulations (9VAC25-840) (*VESCL&R*);
- Virginia Stormwater Management Act (§ 62.1-44.15:24 *et seq*.) (*VSWML)*;
- Virginia Stormwater Management Program (VSMP) regulation (9VAC25-870) (*VSWMR*); and

- 2014 General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (9VAC25-880).

In addition, DEQ is responsible for the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to Municipal Separate Storm Sewer Systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (9VAC25-890-40).

3(b) Requirements.

3(b)(i) Erosion and Sediment Control and Stormwater Management Plans. The Army and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and Virginia Stormwater Management Law and Regulations (*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, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in a Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Army must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Army must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ 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.

3(b)(ii) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities (VAR10). The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General VPDES 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 it must address water quality and quantity in accordance with the Virginia Stormwater Management Program Regulations. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. 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 DEQ's website at www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx.

3(c) Recommendation. Denuded areas should be promptly revegetated following construction work. Consider utilizing permeable paving for parking areas and walkways, where appropriate.

3(d) CZMA Federal Consistency. The project will be consistent to the maximum extent practicable with the Nonpoint Source Water Pollution enforceable policy of the Virginia CZM Program, provided the activities comply with the above requirements, and applicable permits are obtained as necessary (see Federal Consistency under the CZMA section above for additional information).

4. Point Source Water Pollution. The EA (page 2) states that the installation holds a General VPDES Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4), MS4 Permit VAR040093. Stormwater generated from this construction activity would be included under the installation-wide permit.

The FCD (Appendix C) indicates that the proposed action will not result in a point source water discharge.

4(a) Agency Jurisdiction. The point source program is administered by the State Water Control Board pursuant to Virginia Code §62.1-44.15. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to §402 of the federal Clean Water Act and administered in Virginia as the VPDES permit program. The Water Quality Certification requirements of §401 of the Clean Water Act of 1972 are administered under the Virginia Water Protection Permit program.

4(b) Agency Finding. The VDPES Individual Permit (VA0092771) renewal application is expected to be submitted to DEQ by the end of June 2021, and should address any permit-related impacts or changes to the outfall (or an application addendum would be necessary to address them). Additionally, external coordination with the Fort Belvoir MS4 program (Ashley Clark, Industrial Stormwater Program Manager for Fort Belvoir, (703) 732-9329, ashley.a.clark15.civ@mail.mil) should occur if the location of the outfall will change.

4(c) Requirements. The construction project should be conducted in accordance with Fort Belvoir's MS4 Permit (VAR040093); the project must also comply with its Individual VPDES Permit (VA0092771).

The project may require coverage under the VPDES General Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83) for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered.

4(d) Agency Recommendation. Coordinate with the DEQ NRO Water Permitting Program or visit DEQ's website at http://www.deq.virginia.gov/Programs/Water/Permitting Compliance.aspx to determine the applicability of the VAG83 permit.

4(e) CZMA Federal Consistency. Provided compliance with the facility's VDPES Individual Permit (VA0092771), MS4 permit (VAR040093), and the VAG83 permit, as necessary, the project will be consistent to the maximum extent practicable with the Point Source Water Pollution enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA above below for additional information).

5. Chesapeake Bay Preservation Areas. The EA (page 21) notes that Fort Belvoir recognizes the RPA designation, but as a federal entity, is not subject to the provisions of the Fairfax County ordinance. Fort Belvoir does not use the RPA maps produced by Fairfax County; instead, the Army delineates the RPA on the installation. In addition to RPA areas, Fort Belvoir places a 35-foot buffer around all intermittent streams. The proposed action could result in disturbance, alteration, or filling of the adjacent RPAs on the eastern portion of the FBNA. All practicable steps will be taken to avoid inclusion of the unnamed tributary to Accotink Creek and its associated RPA. Any work within the stream/RPA would be appropriately permitted through the Corps and DEQ.

The FCD (Appendix C) notes that there are Resource Protection Areas (RPAs) associated with Accotink Creek, its tributaries, and associated tidal and non-tidal wetlands. Minor, short-term adverse impacts to the RPA associated with the unnamed tributary to Accotink Creek and the adjacent non-tidal wetlands are anticipated.

5(a) Agency Jurisdiction. The DEQ Office of Local Government Programs (OLGP) administers the Chesapeake Bay Preservation Act (Virginia Code §62.1-44.15:67 *et seq*.) and Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 25-830-10 *et seq*.). Each Tidewater locality must adopt a program based on the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations. The Act and regulations recognize local government responsibility for land use decisions and are designed to establish a framework for compliance without dictating precisely what local programs must look like. Local governments have flexibility to develop water quality preservation programs that reflect unique local characteristics and embody other community goals. Such flexibility also facilitates innovative and creative approaches in achieving program objectives. The regulations address nonpoint source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The regulations use a resource-based approach that recognizes differences between various land forms and treats them differently.

5(b) Agency Findings. In Fairfax County, the areas protected by the Chesapeake Bay

Preservation Act, as locally implemented, require conformance with performance criteria. These areas include RPAs and RMAs as designated by the local government. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores. RPAs also include 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, which require less stringent performance criteria, include those areas of the County not included in the RPAs.

The proposed project would involve construction of a 116,080 square foot multi-story office building. In addition, the project calls for construction of a free-standing utility plant, a visitor control center, visitor parking, a secured parking structure for personnel and perimeter fencing around the entire complex. The subject area is located on the eastern half of FBNA, with Accotink Creek to the west. Construction activities will occur on wooded, previously undisturbed land. Based on information provided in the DEA it is not clear if the 116,800 square feet reflects the total of all new buildings to be constructed, or if it refers only to the proposed annex building.

Figure 3-3 of the EA (Surface Waters on FBNA) shows lands analogous to locally-designated RPAs outside the study area associated with an unnamed tributary of Accotink Creek and RPA associated with another unnamed tributary between the western boundary of the study area and Geoint Drive to the west. Figure 3-3 also shows a point in the southwest corner of the study area with a narrow east-west encroachment into the land area analogous to RPA. Based on review of both Figure 2-1 (DIA HQ Annex Project Overview) and Figure 3-3, it appears that the narrow RPA encroachment is far to the south of the area proposed for construction of the new buildings.

5(c) Requirement. Under the Federal Consistency Regulations of the *Coastal Zone Management Act of 1972*, federal actions in Virginia must be conducted in a manner "consistent to the maximum extent practicable" with the enforceable policies of the Virginia Coastal Zone Management Program. Those enforceable policies are administered through the Chesapeake Bay Preservation Act and Regulations.

Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in 9VAC25-830-130 and 140 of the Regulations. This includes the requirement to minimize land disturbance (including access and staging areas), retain existing vegetation and minimize impervious cover as well as including compliance with the requirements of the *Virginia Erosion and Sediment Control Handbook,* and stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations*." For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook.*

5(d) CZMA Federal Consistency. Pending additional information regarding the reason for the small area of RPA encroachment referenced above (with appropriate mitigation efforts activated to offset any negative impacts to water quality that may result from that encroachment), and adherence to the performance criteria referenced in the Regulations (specifically the minimization of land disturbance and impervious cover and the preservation of indigenous vegetation), the project will be consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA section above for additional information).

6. Air Pollution. According to the DEA (page 62), direct air emissions would result from construction equipment used during project construction. The total estimated emissions for construction of the proposed action would be below *de minimus* thresholds. Operational emissions would be generated from landscaping activities and boiler and emergency generator operation; these impacts would be negligible.

The FCD (Appendix C) notes that impacts to air quality associated with construction of the project would be temporary and minor. These impacts will not be regionally or locally significant.

6(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 *et seq.*). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with major projects are:

- Open burning: 9 VAC 5-130 *et seq.*
- Fugitive dust control: 9 VAC 5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9 VAC 5-80-1100 *et seq.*

6(b) Agency Findings. According to the DEQ Air Division, the project site is located in a designated ozone non-attainment area and an emission control area for oxides of nitrogen (NOx) and volatile organic compounds (VOCs).

6(c) Requirements.

6(c)(i) Fugitive Dust. During construction, 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.

6(c)(ii) Open Burning. If project activities include the open burning of construction material or the use of special incineration devices, this activity must meet the requirements under 9 VAC 5-130 *et seq.* of the *Regulations* for open burning, and may require a permit. The *Regulations* provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact locality officials to determine what local requirements, if any, exist.

6(c)(iii) Fuel-Burning Equipment. Fuel-burning equipment (boilers, generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements under 9 VAC5-80, Article 6, Permits for New and Modified Sources.

The project should evaluate all potential sources of air emissions for the facility, including but not limited to boilers, generators, and cooling towers, and submit an application for a permit if necessary. The permit must be obtained prior to construction.

6(c)(iv) Asphalt Paving. A precaution, which typically applies to road construction and paving work (9 VAC 5-45-780 *et seq*.), places limitations on the use of “cut-back” (liquefied asphalt cement, blended with petroleum solvents), and may apply to the project. The asphalt must be “emulsified” (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 from April through October in VOC emission control areas.

6(d) Agency Recommendation. Take precautions to limit the emissions of VOCs and NOx during construction, principally by controlling or limiting the burning of fossil fuels.

6(e) CZMA Federal Consistency. The project will be consistent to the maximum extent practicable with the Point Source Air Pollution enforceable policy of the Virginia CZM Program, provided adherence to the above requirements (see Federal Consistency under the CZMA section above for additional information).

7. Solid and Hazardous Wastes and Materials. The DEA (page 49) states that no significant impacts would occur to hazardous material and waste. The construction contractor would be required to prepare and adhere to a Spill Prevention, Control, and Countermeasure (SPCC) plan that identifies practices to minimize the potential for accidental spills of petroleum products or other hazardous substances and the procedures for containing and cleaning up any accidental spills that may occur.

Soils excavated or otherwise disturbed during the project's construction phase would be tested in accordance with established Fort Belvoir policies and procedures. If concentrations of contaminants in soils are determined to exceed applicable regulatory thresholds for re-use on the site, any affected soils would be removed from the site and disposed of at a permitted facility in accordance with Virginia Solid Waste Disposal Regulations as well as all other federal, state and local laws and regulations.

7(a) Agency Jurisdiction. On behalf of the Virginia Waste Management Board, the DEQ Division of Land Protection and Revitalization is responsible for carrying out the mandates of the Virginia Waste Management Act (Virginia Code §10.1-1400 *et seq*.), as well as meeting Virginia's federal obligations under the Resource Conservation and Recovery Act and the Comprehensive Environmental Response Compensation Liability Act (CERCLA), commonly known as Superfund. The DEQ Division of Land Protection and Revitalization also administers those laws and regulations on behalf of the State Water Control Board governing Petroleum Storage Tanks (Virginia Code §62.1-44.34:8 *et seq*.), including Aboveground Storage Tanks (9VAC25-91 *et seq*.) and Underground Storage Tanks (9VAC25-580 *et seq*. and 9VAC25-580-370 *et seq*.), also known as 'Virginia Tank Regulations', and § 62.1-44.34:14 et seq. which covers oil spills.

Virginia:

- Virginia Waste Management Act, Virginia Code § 10.1-1400 *et seq.*
- *Virginia Solid Waste Management Regulations*, 9 VAC 20-81
  - (9 VAC 20-81-620 applies to asbestos-containing materials)
- *Virginia Hazardous Waste Management Regulations*, 9 VAC 20-60
  - (9 VAC 20-60-261 applies to lead-based paints)
- *Virginia Regulations for the Transportation of Hazardous Materials*, 9 VAC 20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq.*
- U.S. Department of Transportation *Rules for Transportation of Hazardous Materials*, 49 *Code of Federal Regulations*, Part 107
- Applicable rules contained in Title 40, *Code of Federal Regulations*.

7(b) Agency Findings. The DEQ Division of Land Protection & Revitalization (DLPR) completed a database search (200-foot radius) to identify waste sites, including petroleum releases, in close proximity to the project area. Four petroleum release sites were identified on Fort Belvoir, which may impact the project.

Petroleum releases at Fort Belvoir:
- Pollution Complaint (PC) Number 20003095, Fort Belvoir – Building 05033, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 07/19/1999, Status: Closed.

- PC Number 20003096, Fort Belvoir – Building 05033, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 07/19/1999, Status: Closed.

- PC Number 20003097, Fort Belvoir – Building 05033, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 07/19/1999, Status: Closed.

- PC Number 19973109, Fort Belvoir Buildings 02009 and 02034, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 12/26/1996, Status: Closed.

7(c) Requirements.

7(c)(i) Waste Management. Any soil or groundwater 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. All construction waste, including excess soil, must be characterized in accordance with the *Virginia Hazardous Waste Management Regulations* prior to disposal at an appropriate facility. It is the generator's responsibility to determine if solid waste meets the criteria of a hazardous waste and is subsequently managed appropriately.

7(c)(ii) Petroleum Releases. If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by Virginia Code § 62.1-44.34.8 through 9 and 9 VAC 25-580-10 *et seq*.

7(c)(iii) Asbestos-containing Material and Lead-based Paint. All structures being demolished/renovated/removed must be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP materials are identified all federal and state requirements must be followed.

7(d) Recommendations.

7(d)(i) Pollution Prevention, DEQ recommends that the Army implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

7(d)(ii) Petroleum Release Site. The DEQ's PC cases identified above should be further evaluated by the project engineer or manager to establish the exact location, nature and extent of the releases and the potential for them to impact the proposed project. In addition, the project engineer or manager should contact the DEQ's Northern Regional Office at (703) 583-3800 (Tanks Program) for further information about the PC case.

8. Pesticides and Herbicides. 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 to the extent feasible. Contact the Department of Agriculture and Consumer Services at (804) 786-3501 for more information.

9. Natural Heritage Resources. The DEA (page 40) notes that less than significant adverse effects would occur to vegetation as a result of the project. Approximately seven acres of open field and pine stand habitat on FBNA would be cleared for the proposed construction.

9(a) Agency Jurisdiction.

9(a)(i) The Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH). DNH's mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and the protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

9(a)(ii) Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

9(b) Agency Findings. DCR's Division of Natural Heritage (DNH) searched its Biotics Data System (Biotics) for occurrences of natural heritage resources from the area outlined on the submitted map. According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

9(b)(i) State-listed Plant and Insect Species*.* DCR found that the proposed project will not affect any documented state-listed plants or insects.

9(b)(ii) State Natural Area Preserves. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

9(c) Recommendation. Contact DCR-DNH to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before it is utilized. New and updated information is continually added to the Biotics Data System.

10. Floodplain Management. According to the EA (page 24), the proposed project is outside of the 100-year floodplain associated with Accotink Creek.

10(a) Agency Jurisdiction. The DCR Division of Dam Safety and Floodplain Management is the lead coordinating agency for the Commonwealth's floodplain management program and the National Flood Insurance Program (Executive Order 45). The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (shaded Zone X).

10(b) Requirement. Projects conducted by federal agencies within the Special Flood Hazard Area must comply with federal Executive Order 11988: Floodplain Management.

For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.

11. Historic and Archeological Resources. The EA (page 76) states that no effects on cultural resources are expected from the proposed action. There are no eligible archaeological or architectural resources within the area of potential effect. Section 106 consultation with the State Historic Preservation Office has been initiated and concurrence with the "no historic properties affected" determination is sought.

11(a) Agency Jurisdiction. The Department of Historic Resources (DHR) conducts reviews of projects to determine their effect on historic structures or cultural resources under its jurisdiction. DHR, as the designated State's Historic Preservation Office, ensures that federal actions comply with Section 106 of the National Historic Preservation Act of 1962 (NHPA), as amended, and its implementing regulation at 36 CFR Part 800. The NHPA requires federal agencies to consider the effects of federal projects on properties that are listed or eligible for listing on the National Register of Historic Places. Section 106 also applies if there are any federal involvements, such as licenses, permits, approvals or funding. DHR also provides comments to DEQ through the state environmental impact report review process.

11(b) Agency Finding. DHR determined that no further identification efforts are warranted. No historic properties will be affected by the project.

11(c) Requirement. Should unidentified historic properties be discovered during implementation of the project, notify DHR.

12. Pollution Prevention. DEQ advocates that principles of pollution prevention and sustainability be used in all construction projects as well as in facility operations. Effective siting, planning, and on-site BMPs will help to ensure that environmental impacts are minimized. However, pollution prevention and sustainability techniques also include decisions related to construction materials, design, and operational procedures that will facilitate the reduction of wastes at the source.

12(a) Recommendations. We have several pollution prevention recommendations that may be helpful in the implementation of this project:

- Consider development of an effective Environmental Management System (EMS). An effective EMS will ensure that the proposed facility is committed to complying with environmental regulations, reducing risk, minimizing environmental impacts, setting environmental goals, and achieving improvements in its environmental performance. DEQ offers EMS development assistance and recognizes facilities with effective Environmental Management Systems through its Virginia Environmental Excellence Program (VEEP). VEEP provides recognition, annual permit fee discounts, and the possibility for alternative compliance methods.
- 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 energy efficiency when choosing materials and products, like insulation, fixtures, and HVAC systems.
- Consider contractors' commitment to the environment 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 building construction and design.
- Integrate pollution prevention techniques into the facility maintenance and operation, to include inventory control for centralized storage of hazardous materials. Maintenance facilities should have sufficient and suitable space to allow for effective inventory control and preventive maintenance.

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, Meghann Quinn at (804) 698-4021.

13. Public Water Supply. The EA does not indicate that public water supplies will be affected. Potable water to FBNA is supplied by Fairfax County Water (EA, page 51).

13(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes). VDH administers both federal and state laws governing waterworks operation.

13(b) Agency Findings. VDH ODW determined that there are no apparent impacts to public drinking water sources.

13(c) Agency Requirement. Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility.

14. Wildlife and Inland Fisheries. The EA (page 42) states that less than significant adverse impacts to wildlife are expected to occur as a result of the project. The action is located in an area where there has been extensive prior disturbance. Rare, threatened, and endangered species will not be significantly impacted. Surveys for the presence of the wood turtle and small-whorled pogonia would be conducted prior to site clearing, and the results of these surveys coordinated with Fort Belvoir's natural resources staff and appropriate wildlife agencies. In order to protect nesting bat species, no trees over three inches in diameter would be removed within the project study area between April 15 and September 15, in accordance with current U.S. Fish and Wildlife Service guidelines to protect the northern long-eared bat species.

The FCD (Appendix C) states that the action will have no foreseeable impact on fish or shellfish resources.

14(a) Agency Jurisdiction. DWR, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over wildlife and freshwater fish, including state- or federally-listed endangered or threatened species, but excluding listed insects (Virginia Code, Title 29.1). DWR is a consulting agency under the U.S. Fish and Wildlife Coordination Act (16 U.S.Code §661 *et seq*.) and provides environmental analysis of projects or permit applications coordinated through DEQ and several other state and federal agencies. DWR determines likely impacts upon fish and wildlife resources and habitat, and recommends appropriate measures to avoid, reduce or compensate for those impacts. For more information, see the DWR website at *www.dwr.virginia.gov.*

14(b) Agency Finding. Based on the scope and location of the proposed work, significant adverse impacts are not anticipated to occur upon listed species or designated resources under DWR's jurisdiction.

14(c) Agency Recommendations. To minimize overall impacts on wildlife and natural resources from development activity, observe the following DWR recommendations:

- 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 perennial and intermittent streams;
- Maintain wooded lots to the fullest extent possible;
- Design stormwater controls for this project to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales. 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;
- Adhere to erosion and sediment controls during ground disturbance;
- Utilize matting made from natural/organic materials such as coir fiber, jute, and/or burlap, to minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting; and
- Adhere to a time-of-year restriction from March 15 through August 15 of any year for all tree removal and ground clearing to protect nesting resident and migratory songbirds.

14(d) CZMA Federal Consistency. Assuming strict adherence to BMPs for erosion and sediment control is maintained, the project is consistent to the maximum extent practicable with the Wildlife and Inland Fisheries enforceable policy of the Virginia CZM Program (see Federal Consistency under the CZMA section below for additional information).

15. Transportation. The EA (page 67) notes that the proposed action is estimated to generate 650 additional staff positions. A traffic impact study (TIS) was conducted and concluded that FBNA can accommodate the anticipated additional traffic generated by the action.

15(a) Agency Jurisdiction. The Virginia Department of Transportation provides comments pertaining to potential impacts to existing and future transportation systems.

15(b) Agency Comments. VDOT requests an opportunity to review the methodology used for traffic projections.

16. Locality Review. Fairfax County was invited to comment on the proposed action.

16(a) Agency Jurisdiction. In accordance with CFR 930, Subpart A, § 930.6(b) of the *Federal Consistency Regulations*, DEQ, on behalf of the state, is responsible for securing necessary review and comment from other state agencies, the public, regional government agencies, and local government agencies, in determining the

Commonwealth's concurrence or objection to a federal consistency determination.

16(b) Fairfax County Comments. The Fairfax County Department of Planning and Development submitted extensive comments on the EA related to applicable Comprehensive Plan policies and recommendations. Fairfax County recommendations are summarized below. Please refer to the attached letter dated August 9, 2021 for complete comments.

16(c) Fairfax County Recommendations.

Water Resources Protection and Stormwater Management/ Best Management Practices Recommendations: Review the practices included in the Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Pages 7-9, to minimize the impacts that new development and redevelopment may have on the county's streams. These practices should be incorporated into the study and design of the development plan to the greatest extent feasible.

Stormwater improvements should provide stormwater quality and quantity controls above the minimum requirements to minimize impacts to adjacent streams and, at a minimum, meet the water quantity detention requirements in Chapter 124 of the Fairfax County Code. The use of stormwater controls to address water quality and quantity requirements is strongly recommended, given that control of the rainwater runoff at its source would provide the greatest water quality and stream protection results. Alternatives include dry swales, subsurface chamber storage, gravel galleries, and oversized pipes, with manufactured filtering devices at the outfall of these facilities. Such an approach would limit the project footprint and reduce environmental impacts to streams, where proposed pond facilities have been sited.

Fairfax County recommends the following:

- avoidance of significant ecological resources to the maximum extent feasible;
- incorporation of linear stormwater controls into the design to address stormwater requirements while minimizing the disturbance of ecological resources and open spaces;
- incorporation of ecological enhancements into any pond design to replace the ecological functionality of disturbed areas;
- integration of stream protection measures;
- demonstration that there will be no adverse impacts to downstream waterways, infrastructure, or property;
- incorporation of natural channel design, where applicable;
- incorporation of constructed wetlands as an alternative to the proposed pond designs;
- consideration of the retrofitting of existing wet ponds to meet stormwater requirements;
- adherence to current pollutant removal criteria for any dry ponds;
- restoration and monitoring of disturbed areas; and
- management of invasives to be considered in the project study.

Resource Protection Area and Wetlands Recommendation: Fairfax County continues to encourage the Army to meet the County's Chesapeake Bay Preservation Ordinance as described in Chapter 118 of the County Code, including conformance with the requirements for areas designated as RPAs and RMAs.

Soils Recommendation: The Comprehensive Plan encourages new development to either avoid problem soil areas, or implement appropriate engineering measures to protect existing and new structures from unstable soils. This property contains Sassafras-Marumsco Complex, which was formally referred to as Marine Clay and is a problem class soil. Staff recommends the Army cluster development away from problem class soils and complete a geotechnical study for the proposed development in the areas that exhibit problem class soils.

Forest Resources Policies and Recommendation: Good quality vegetation should be preserved and enhanced and lost vegetation restored through replanting. Tree planting should be incorporated extensively into the project design for all disturbed areas, including firm commitments to soil remediation for all planting areas. In order to ensure the viability of the proposed plantings and to ensure that tree protection measures are implemented as planned, staff recommends tree protection to include adequate supervision during construction. Additionally, staff recommends that all development plans avoid the following: significant changes to elevations (both "cut" and "fill" operations); changes to water flow; and excavation within the critical root zones of all trees to be protected. Additionally, staff recommends planting schemes featuring indigenous trees, shrubs, perennial grasses and grass-like plants, and forbs for each planting area in the project design. For all new planting areas and for areas in which existing pavement is to be removed, staff recommends soil rebuilding in the project design, which would help ensure the viability of the proposed plantings.

Green Building Recommendations: Fairfax County encourages commercial building development to incorporate green building measures into the design of all projects. Staff encourages provision of or readiness for charging stations and related infrastructure for electric vehicles within new development and redevelopment projects.

Transportation Recommendations: Fairfax County encourages multi-modal transportation strategies that reduce auto travel, minimize dependence on single-occupant automobiles and improve traffic flow, thereby reducing auto emissions.

This TIS notes that all intersections in the vicinity of the property are operating at a Level of Service (LOS) "C" or better. Fairfax County Policy is to achieve LOS "D" or better at intersections in this area of the County. While staff agrees that traffic impacts are likely to be mitigated through signal timing adjustments, the Virginia Department of Transportation would need to approve any requested signal timing modification. The Department of the Army should also consider traffic mitigations like incentives for employees using transit or carpooling and disincentives for single occupancy (SOV) use like paid parking. Staff notes there are three bus transit routes that pass near the property that include service provided by Fairfax Connector and Richmond Highway Express. Staff requests that the selected traffic mitigation strategy be shared with Fairfax County Department of Transportation (FCDOT).

Fairfax County encourages the applicant to provide safe pedestrian options throughout the site not only for access but recreation/exercise. Finally, FCDOT notes that U.S. Route 1 should be referenced as Richmond Highway, not Richmond Parkway. That error is in several different places throughout the DEA and Finding of No Significant Impact (FNSI).

REGULATORY AND COORDINATION NEEDS

1. Surface Waters and Wetlands. Contact DEQ NRO (Trisha Beasley, VWP Permit Manager, 703-583-3940) to discuss the need for a VWP permit for this project. The VMRC is the clearinghouse for Joint Permit Applications (JPAs) and it will distribute the application to participating agencies; contact VMRC (Mark Eversole, 757-247-8028) with questions regarding the JPA review process.

Upon receipt of a JPA for the surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. Coordinate with the DEQ NRO VWP Permit program manager with questions regarding VWP permitting requirements.

Fairfax County also encourages the Army to minimize any impact to wetlands, to the greatest extent feasible. The EA notes that portions of the proposed perimeter fence may impact wetlands as it ties into an existing perimeter security fence. Any mitigation/compensation of wetlands should occur as close to the area of impact as possible.

2. Erosion and Sediment Control and Stormwater Management.

2(a) Erosion and Sediment Control and Stormwater Management. This project must comply with Virginia's *Erosion and Sediment Control Law* (Virginia Code § 62.1-44.15:61) and *Regulations* (9 VAC 25-840-30 *et seq*.) and *Stormwater Management Law* (Virginia Code § 62.1-44.15:31) and *Regulations* (9 VAC 25-870-210 *et seq*.) as administered by DEQ. Activities that disturb equal to or greater than 10,000 square feet (2,500 square feet in a Chesapeake Bay Preservation Area) would be regulated by *VESCL&R* and *VSWML&R*. Erosion and sediment control, and stormwater management requirements should be coordinated with the DEQ Northern Regional Office (Trisha Beasley, 703-583-3940)

2(b) Virginia Stormwater Management Program General Permit for Stormwater Discharges from Construction Activities (VAR10). For projects involving land-disturbing activities of equal to or greater than one acre the project owner is required to register for coverage under the Virginia Stormwater Management Program General Permit for Discharges of Stormwater from Construction Activities (9 VAC 25-870-1 *et* *seq.*). Specific questions regarding the Stormwater Management Program requirements should be directed to DEQ, Holly Sepety at (804) 698-4039.

3. Point Source Water Pollution. The construction project should be conducted in accordance with Fort Belvoir's MS4 Permit (VAR040093); the project must also comply with its Individual VPDES Permit (VA0092771). Coordinate with the DEQ NRO Water Permitting Program (Susan Mackert, 703-583-3853) for questions about the VPDES permit and Central Office (Jeffrey Selengut, 804-698-4265) for questions about the MS4 permit.

Contact DE NRO (703-583-3800) to determine whether coverage under the VPDES General Permit for Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83) is required.

4. Chesapeake Bay Preservation Areas. The project must be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in 9VAC25-830-130 and 140 of the Regulations. Coordinate with Daniel Moore (804-698-4520) regarding the reason for the small area of RPA encroachment associated with the project.

5. Air Quality Regulations*.* Activities associated with this project may be subject to air regulations administered by DEQ. The state air pollution regulations that may apply to the construction phase of the project are

- fugitive dust and emissions control (9VAC5-50-60 *et seq*.);
- open burning (9VAC5-130 *et seq.*);
- asphalt paving operations (9VAC5-45-760 *et seq*.); and
- permits for fuel-burning equipment (9VAC5-80-1100 *et seq*.).

For additional information and coordination, contact DEQ NRO, Tom Faha at (703) 583-3810.

6. Solid and Hazardous Wastes*.* All solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. For additional information concerning location and availability of suitable waste management facilities in the project area or if free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ NRO, Randy Chapman at (703) 583-3816.

6(a) Asbestos-Containing Material. It is the responsibility of the owner or operator of a renovation or demolition activity, prior to the commencement of the renovation or demolition, to thoroughly inspect the affected part of the facility where the operation will occur for the presence of asbestos, including Category I and Category II nonfriable asbestos-containing material (as applicable). Upon classification as friable or non-friable, all asbestos-containing material shall be disposed of in accordance with the Virginia Solid Waste Management Regulations (9VAC20-81-640) and transported in accordance with the Virginia regulations governing Transportation of Hazardous Materials (9VAC20-110-10 et seq.). Contact the DEQ Division of Land Protection and Revitalization (Carlos Martinez at 804-698-4575) and the Department of Labor and Industry (Richard Wiggins, 540-562-3580 Ext. 131) for additional information.

6(b) Lead-Based Paint. If applicable, this project must comply with the U.S. Department of Labor Occupational Safety and Health Administration (OSHA) regulations and with the Virginia Lead-Based Paint Activities Rules and Regulations. For additional information regarding these requirements, contact the Department of Professional and Occupational Regulation (804-367-8500).

6(c) Petroleum Release. If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ in accordance with Virginia Code §62.1-44.34.8 through 19 and 9 VAC 25-580-10 *et seq*. Contact DEQ NRO, Randy Chapman at (703) 583-3816, for additional information and coordination.

7. Natural Heritage Resources. Contact DCR-DNH, Rene Hypes at (804) 371-2708, to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before the project is implemented, since new and updated information is continually added to the Biotics Data System.

8. Floodplain Management. The Army should reach out to the local floodplain administrator for an official floodplain determination and comply with the local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS): www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

9. Historic Resources. Coordinate directly with DHR (Marc Holma, 804-482-6090) should unidentified historic properties be discovered during implementation of the project.

10. Water and Sewer Lines. Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility (Fairfax Water, 703-698-5600 and Fairfax County Department of Public Works and Environmental Services, 703-324-5033).

11. Transportation. Contact VDOT (Halie Mitchell, 703-259-1929) regarding its request to review the methodology used for the traffic projections discussed in the DEA.

12. Wildlife Resources. Contact DWR (Amy Martin, 804-367-2211) with questions regarding its recommendations.

13. Fairfax County Coordination. Contact Ellen Huber with the Department of Planning and Development (Ellen.Huber@fairfaxcounty.gov or 703-324-1364) with questions regarding county recommendations.

Thank you for the opportunity to review and respond to the Draft Environmental Assessment and Federal Consistency Determination for the Proposed DIA HQ Annex at Fort Belvoir in Fairfax County, Virginia. Detailed comments of reviewing agencies are attached for your review. Please contact me at (804) 698-4204 or Janine Howard at (804) 698-4299 for clarification of these comments.

Sincerely,

Bettina Rayfield, Program Manager
Environmental Impact Review

Ec: Amy Ewing, DWR
Robbie Rhur, DCR
Arlene Warren, VDH
Roger Kirchen, DHR
Tiffany Birge, VMRC
Terry Lasher, DOF
Heather Williams, VDOT
Denise James, Fairfax County
Robert Lazaro, Northern Virginia Regional Commission
Connie Ramsey, Corps

COMMONWEALTH of VIRGINIA

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Matt Strickler
Secretary of Natural and Historic Resources

Julie V. Langan
Director
Tel: (804) 482-6446
Fax: (804) 367-2391
www.dhr.virginia.gov

MEMORANDUM

DATE: 23 August 2021 **DHR File #** 2021-4249
2021-0193

TO: Mr. Brice Bartley
Army

FROM: Marc E. Holma, Architectural Historian (804) 482-6090
Review and Compliance Division

PROJECT: DIA Headquarters Annex Environmental Assessment
Fairfax County

____ 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 below.**

_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:

COMMONWEALTH of VIRGINIA

Department of Historic Resources

2801 Kensington Avenue, Richmond, Virginia 23221

Matt Strickler
Secretary of Natural and Historic Resources

Julie V. Langan
Director
Tel: (804) 482-6446
Fax: (804) 367-2391
www.dhr.virginia.gov

28 July 2021

Ms Connie Ramsey
Department of the Army
U.S. Army Corps of Engineers
Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201

Re: Defense Intelligence Agency (DIA) Headquarters Annex
Fort Belvoir
DHR File No. 2021-0193; DEQ Project No. 21-095F

Dear Ms Ramsey:

Through the Virginia Department of Environmental Quality (DEQ) we were made aware of the above referenced project.

We want to remind you that the Army, as a federal agency, must consider the effects of its actions on historic properties listed in or eligible for the National Register of Historic Places and provide the Advisory Council on Historic Preservation the opportunity to comment in accordance with Sections 106 of the National Historic Preservation Act, as amended, and its implementing regulation 36 CFR 800. The Section 106 review process begins when the federal agency provides a description of the undertaking and its Area of Potential Effect (APE) to the State Historic Preservation Officer (SHPO), which in Virginia is the Department of Historic Resources (DHR). For this reason, we request that you consult with us directly on this undertaking. While 36 CFR 800.8 allows federal agencies to coordinate Section 106 compliance with the National Environmental Policy Act (NEPA), the agency must inform the applicable SHPO early in the process that it intends to do so. The agency must also take care that the environmental documentation prepared under NEPA does present information about historic properties and potential effects to such resources at a level of detail that allows the SHPO and other consulting parties to comment.

We look forward to working with you on this project. If you have any questions concerning our comments, please contact me at (804) 482-6090.

Sincerely,

Marc Holma

Marc Holma, Architectural Historian
Review and Compliance Division

C: Ms Janine Howard, DEQ
Fort Belvoir, Directorate of Public Works

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

ESSLog# 41453_21-095F_DIA HQ Annex_DWR_AEM20210811

1 message

Martin, Amy <amy.ewing@dwr.virginia.gov> Wed, Aug 11, 2021 at 3:19 PM
To: Janine Howard <janine.howard@deq.virginia.gov>

Janine,
We have reviewed the subject project that proposes to construct a facility at a site in Fairfax County. Based on the scope and location of the proposed work, we do not anticipate it to result in significant adverse impacts upon listed species or designated resources under our jurisdiction.

To minimize overall impacts to wildlife and our natural resources, we offer the following comments about development activities: we recommend that the applicant avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable. We recommend maintaining 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. We recommend maintaining wooded lots to the fullest extent possible. We generally do not support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor do we support the creation of in-stream stormwater management ponds.

We recommend that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales. 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.

We recommend that all tree removal and ground clearing adhere to a time of year restriction (TOYR) protective of resident and migratory songbird nesting from March 15 through August 15 of any year.

We recommend adherence to erosion and sediment controls during ground disturbance. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap.

Assuming strict adherence to best management practices for erosion and sediment control is maintained, we find this project to be consistent with the Wildlife and Inland Fisheries and Commonwealth Lands Enforceable Policies of the Coastal Zone Management Program.

Thanks, Amy

****please note name change below; email address not yet changed****

Amy E. Martin *(she/her/hers)*
Environmental Services Biologist
Manager, Wildlife Information
P 804.367.2211
Department of Wildlife Resources
CONSERVE. CONNECT. PROTECT.
A 7870 Villa Park Drive, P.O. Box 90778, Henrico, VA 23228
www.VirginiaWildlife.gov

County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

August 9, 2021

Janine Howard
Department of Environmental Quality
Office of Environmental Impact Review
P.O. Box 1105
Richmond, VA 23218

RE: Army Corps of Engineers Defense Intelligence Agency Headquarters Annex, DEQ #21-095F

Dear Janine Howard:

Thank you for the opportunity to comment on the draft environmental assessment (EA) and draft Finding of No Significant Impact (FNSI) for the Defense Intelligence Agency (DIA) Headquarters (HQ) Annex within the vicinity of the National Geospatial Intelligence Agency (NGA) complex on Fort Belvoir's North Area. The project proposes to build and operate an approximately 116,080 gross square foot (77,000 net square foot) administrative building for approximately 650 personnel from DIA HQ to address safety, security, and operational concerns specific to the administrative functions of the agency. The proposed HQ Annex building would include a multi-story administrative building with offices, cubicles/workstations, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, a café/cafeteria, a gym/fitness center, a utility plant, visitor control center, visitor parking, a secured employee parking structure, and a perimeter security fence. Fairfax County understands that two alternatives for the site were reviewed, and that the Proposed Action and the No Action Alternative would be carried forward for analysis due to site constraints from the other two alternatives. The Department of Planning and Development (DPD) in collaboration with the Fairfax County Department of Transportation (FCDOT) has reviewed the above-mentioned draft EA and FNSI and provides the comments below.

ENVIRONMENTAL ASSESSMENT

The sections listed below include an overview of the applicable Comprehensive Plan policies and potential impacts within the project study area.

Department of Planning and Development
Planning Division
12055 Government Center Parkway, Suite 730
Fairfax, Virginia 22035-5507
Phone 703-324-1380
Fax 703-653-9447
www.fairfaxcounty.gov/planning-development

<u>Water Resources Protection and Stormwater Management/Best Management Practices</u>

The Environment Element of the Policy Plan states that the protection and restoration of the ecological integrity of streams is expected in Fairfax County. In order to minimize the impacts that new development and redevelopment projects may have on county streams, the Comprehensive Plan encourages the protection of stream channels, buffer areas along stream channels, and commitments to the restoration of degraded stream channels and riparian buffer areas. (Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Pages 7-9).

New development and redevelopment are expected to result in high quality site design and low impact development (LID) techniques and *"pursue commitments to reduce stormwater runoff volumes and peak flows, to increase groundwater recharge, and to increase preservation of undisturbed areas."* Some or all of the following practices should be considered in order to minimize the impacts that new development and redevelopment projects may have on the county's streams:

- *"Minimize the amount of impervious surface created …*
- *Where feasible, convey drainage from impervious areas into pervious areas …*
- *Encourage the use of innovative BMPs and infiltration techniques of stormwater management …*
- *Apply nonstructural best management practices and bioengineering practices …*
- *Maximize the use of infiltration landscaping within streetscapes consistent with county and state requirements."*

(Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Pages 7-9).

Given that the proposed project has the potential to create significant areas of impervious cover, a primary consideration is the impact to county streams, and specifically to the tributaries to Accotink Creek on the site. With a greater amount of impervious surface, more runoff and pollutants reach the county streams. Higher levels of runoff from increased imperviousness accelerate stream channel erosion causing increased sedimentation. Deicing salt applied to roads and parking lots is the primary source of chloride in streams. The above listed practices would also be applicable to the study and design of the development plan and should be incorporated to the greatest extent feasible.

County policies state that stormwater design for all stormwater facilities should be closely coordinated with county staff to avoid degradation of impacted streams. The county anticipates the implementation of *"best management practices to reduce runoff pollution and other impacts. Preferred practices include: those which recharge groundwater when such recharge will not degrade groundwater quality; those which preserve as much undisturbed open space as possible; and, those which contribute to ecological diversity by the creation of wetlands or other habitat enhancing BMPs, consistent with state guidelines and regulations." (Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Page 9).* The proposed improvements should provide stormwater quality and quantity controls above the minimum requirements to minimize impacts to adjacent streams and, at a minimum, meet the water quantity detention requirements in Chapter 124 of the Fairfax County Code. County policies state that the county will maintain a best management practices (BMP) program for water quality and will ensure that new development and redevelopment complies with the county's best management practice (BMP) requirements. The use of stormwater controls to address water quality and quantity requirements is strongly recommended, given that control of the rainwater runoff at its source would provide the greatest water quality and stream protection results. Alternatives include dry swales, subsurface chamber storage, gravel galleries, and oversized pipes, with manufactured filtering devices at the outfall of these facilities. Such an approach would limit the project footprint and reduce environmental impacts to streams, where proposed pond facilities have been sited.

Overall, staff recommends the avoidance of significant ecological resources to the maximum extent feasible; incorporation of linear stormwater controls into the design to address stormwater requirements while minimizing the disturbance of ecological resources and open spaces; incorporation of ecological enhancements into any pond design to replace the ecological functionality of disturbed areas; integration of stream protection measures; demonstration that there will be no adverse impacts to downstream waterways, infrastructure, or property; incorporation of natural channel design, where applicable; incorporation of constructed wetlands as an alternative to the proposed pond designs; consideration of the retrofitting of existing wet ponds to meet stormwater requirements; adherence to current pollutant removal criteria for any dry ponds; restoration and monitoring of disturbed areas; and management of invasives to be considered in the project study.

Resource Protection Area (RPA) and Wetlands

A Resource Protection Area (RPA) is located offsite and east of the project area; however, a small portion of the project area bisects the RPA. Fairfax County recognizes that the Department of the Army is not subject to the provisions of the Chesapeake Bay Preservation Ordinance (CBPO) or County policies regarding RPAs. However, Fairfax County continues to encourage the Army to meet the County's CBPO as described in Chapter 118 of the County Code, including conformance with the requirements for areas designated as Resource

Protection Areas (RPAs) and Resource Management Areas. Fairfax County also encourages the Army to minimize any impact to wetlands, to the greatest extent feasible. The EA notes that portions of the proposed perimeter fence may impact wetlands as it ties into an existing perimeter security fence. Any mitigation/compensation of wetlands should occur as close to the area of impact as possible.
(Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Page 11).

Soils

The Comprehensive Plan encourages new development to either avoids problem soil areas, or implement appropriate engineering measures to protect existing and new structures from unstable soils.
(Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Page 13).

This property contains Sassafras-Marumsco Complex, which was formally referred to as Marine Clay and is a problem class soil. Staff recommends the Army cluster development away from problem class soils and complete a geotechnical study for the proposed development in the areas that exhibit problem class soils.

Forest Resources Policies and Impacts

The Comprehensive Plan anticipates that new development would include an urban forestry program and be designed in a manner that retains and restores meaningful amounts of tree cover, consistent with planned land use and good silvicultural practices. Good quality vegetation should be preserved and enhanced and lost vegetation restored through replanting.
(Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019 Pages 17-18).

The project has the potential to disturb existing trees. Tree planting should be incorporated extensively into the project design for all disturbed areas, including firm commitments to soil remediation for all planting areas. In order to ensure the viability of the proposed plantings, staff recommends tree protection to include adequate supervision during construction, to ensure that tree protection measures are implemented as planned. Additionally, staff recommends that all development plans avoid the following: significant changes to elevations (both “cut” and “fill” operations); changes to water flow; and excavation within the critical root zones of all trees to be protected. Additionally, staff recommends planting schemes featuring indigenous trees, shrubs, perennial grasses and grass-like plants, and forbs for each planting area in the project design. For all new planting areas and for areas in which existing pavement is to be removed, staff recommends soil rebuilding in the project design, which would help ensure the viability of the proposed plantings.

Together, these measures would minimize impacts to property owners and ecological resources, increase the viability of the existing tree cover, increase the habitat value of the project, promote water infiltration, and provide shade, consistent with the intent of the Comprehensive Plan.

Green Building

Fairfax County encourages commercial building development to incorporate green building measures into the design of all projects. Example green building measures can be derived from the U.S. Green Building Council's Leadership in Energy and Environmental Design for New Construction [LEED-NC®] or the U.S. Green Building Council's Leadership in Energy and Environmental Design for Core and Shell [LEED-CS®] or an equivalent program with independent third-party verification. Additional examples of measures that can be considered for the interior design are: Energy STAR fixtures, low flush toilets, high efficiency light, recycling of non-hazardous renovation materials, etc.

Further, staff encourages provision of or readiness for charging stations and related infrastructure for electric vehicles within new development and redevelopment projects. (Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Pages 20-22).

COORINDATION WITH OTHER COUNTY AGENCIES

Transportation Impacts (FCDOT)

Fairfax County encourages multi-modal transportation strategies that reduce auto travel, minimize dependence on single-occupant automobiles and improve traffic flow, thereby reducing auto emissions. These strategies could also meet trip reduction goals and provide access to the proposed project area. Strategies include incorporation of telework options, flexible work schedules, transit use incentives, ridesharing/carpooling programs, shuttle buses and other transportation demand management measures; provision of infrastructure, facilities and/or programs (e.g., on-site transportation coordinators) to support telework efforts and other transportation demand management measures; development of parking management strategies in transit station areas to encourage transit and high-occupancy vehicle use and minimize single occupant vehicle trips; establishment of and/or participation in transportation management associations; the location, design and construction of trails, dedicated bicycle lanes and crosswalks to facilitate nonmotorized transportation among residential uses, transit

facilities, commercial areas, public facilities and recreational opportunities; and the provision of facilities that support nonmotorized transportation, such as bicycle parking facilities and changing/shower facilities in office buildings.
(Fairfax County Comprehensive Plan, 2017 Edition, Policy Plan, Environment, Amended through 12-3-2019, Page 4).

The Department of the Army completed a Traffic Impact Study (TIS) as part of this draft EA and FNSI to evaluate existing conditions and the potential impacts of the Proposed Action to traffic patterns in the vicinity. This TIS notes that all intersections in the vicinity of the property are operating at a Level of Service (LOS) C or better. Fairfax County Policy is to achieve LOS "D" or better at intersections in this area of the County. While staff agrees that traffic impacts are likely to be mitigated through signal timing adjustments, the Virginia Department of Transportation (VDOT) would need to approve any requested signal timing modification. Mitigation alternatives could also include dispersing traffic to other access points or lengthening the left turn lane to avoid spillback into the through lane. The Department of the Army should also consider traffic mitigations like incentives for employees using transit or carpooling and disincentives for single occupancy (SOV) use like paid parking. Staff notes there are three bus transit routes that pass near the property that include service provided by Fairfax Connector and Richmond Highway Express. Staff requests that the selected traffic mitigation strategy be shared with FCDOT.

The TIS notes there are sidewalks and pedestrian crossings in the area; however, the draft EA and FNSI notes that few pedestrian movements were noticed during the traffic study. Surrounding streets do not have marked bicycle lanes, and no bicycle movements were observed during the traffic counts. Fairfax County encourages the applicant to provide safe pedestrian options throughout the site not only for access but recreation/exercise. Finally, FCDOT notes that US Route 1 should be referenced as Richmond Highway, not Richmond Parkway. That error is in several different places throughout the draft EA and FNSI.

Thank you again for the opportunity to comment on this proposal. If you have any questions about the comments, please contact Ellen Huber with the Department of Planning and Development at Ellen.Huber@fairfaxcounty.gov or 703-324-1364.

Sincerely,

Kelly M. Atkinson

Kelly M. Atkinson, Chief, Environment and Development Review Branch
Department of Planning and Development

KMA:EKH

cc: Board of Supervisors
Bryan Hill, County Executive
Rachel Flynn, Deputy County Executive
Barbara Byron, Director, DPD
Leanna H. O'Donnell, Director, Planning Division, DPD

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Re: NEW PROJECT ACOE DIA HQ Annex, DEQ #21-095F

1 message

Holland, Benjamin <benjamin.holland@deq.virginia.gov>
To: Janine Howard <Janine.Howard@deq.virginia.gov>
Cc: "Miller, Mark" <mark.miller@deq.virginia.gov>

Wed, Jul 28, 2021 at 2:51 PM

Northern Regional Office comments regarding the Draft EA/FCC for *Defense Intelligence Agency Headquarters Annex, DEQ #095F*, are as follows:

Land Protection Division – The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the project manager would follow applicable federal, state, and local regulations for their disposal.

Air Compliance/Permitting - The project manager is reminded that during the construction phases that occur with this project; the project is subject to the Fugitive Dust/Fugitive Emissions Rule 9 VAC 5-50-60 through 9 VAC 5-50-120. In addition, should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100. The project should also evaluate all potential sources of air emissions for the facility, including but not limited to boilers, generators, and cooling towers, and submit an application for a permit if necessary. The permit must be obtained prior to construction.

Virginia Water Protection Permit (VWPP) Program – The project manager is reminded that a VWP permit from DEQ may be required should impacts to surface waters be necessary. Measures should be taken to avoid and minimize impacts to surface waters and wetlands during construction activities. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers. The Army Corps of Engineers is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs). If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant should contact DEQ-NRO VWPP staff to determine the need for any permits prior to commencing work that could impact surface waters or wetlands. Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. VWPP staff reserve the right to provide comment upon receipt of a permit application requesting authorization to impact state surface waters, and at such time that a wetland delineation has been conducted and associated jurisdiction determination made by the U.S. Army Corps of Engineers.

Erosion and Sediment Control, Storm Water Management – DEQ has regulatory authority for the Virginia Pollutant Discharge Elimination System (VPDES) programs related to municipal separate storm sewer systems (MS4s) and construction activities. Erosion and sediment control measures are addressed in local ordinances and State regulations. Additional information is available at http://www.deq.virginia.gov/Programs/Water/StormwaterManagement.aspx. Non-point source pollution resulting from this project should be minimized by using effective erosion and sediment control practices and structures. Consideration should also be given to using permeable paving for parking areas and walkways where appropriate, and denuded areas should be promptly revegetated following construction work. If the total land disturbance exceeds 10,000 square feet, an erosion and sediment control plan will be required. Some localities also require an E&S plan for disturbances less than 10,000 square feet. A stormwater management plan may also be required. For any land disturbing activities equal to one acre or more, you are required to apply for coverage under the VPDES General Permit for Discharges of Storm Water from Construction Activities. The Virginia Stormwater Management Permit Authority may be DEQ or the locality.

Other VPDES Permitting – The construction project may require coverage under the VAG83 permit for discharges from petroleum contaminated sites, groundwater remediation, and hydrostatic tests for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered. Additionally, the project should consider any impacts to, or additional permitting requirements for, the facility's individual VPDES permit and MS4 program.

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Re: NEW PROJECT ACOE DIA HQ Annex, DEQ #21-095F

1 message

Gavan, Lawrence <larry.gavan@deq.virginia.gov> Tue, Jul 27, 2021 at 5:02 PM
To: Janine Howard <janine.howard@deq.virginia.gov>

(a) Agency Jurisdiction. The Department of Environmental Quality (DEQ) administers the *Virginia Erosion and Sediment Control Law and Regulations* (*VESCL&R*) and *Virginia Stormwater Management Law and Regulations* (*VSWML&R*).

(b) Erosion and Sediment Control and Stormwater Management Plans. The Applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with *VESCL&R* and *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, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 10,000 square feet (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VESCL&R*. Accordingly, the Applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 1 acre (2,500 square feet in Chesapeake Bay Preservation Area) would be regulated by *VSWML&R*. Accordingly, the Applicant must prepare and implement a Stormwater Management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan is submitted to the DEQ Regional Office that serves the area where the project is located for review for compliance. The Applicant 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 62.1-44.15 et seq.]

(c) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is 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. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre 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*.
[Reference: Virginia Stormwater Management Act 62.1-44.15 et seq.; VSMP Permit Regulations *9*VAC25-880 *et seq.]*

Larry Gavan

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

Re: NEW PROJECT ACOE DIA HQ Annex, DEQ #21-095F

1 message

Warren, Arlene <arlene.warren@vdh.virginia.gov> Tue, Aug 3, 2021 at 8:37 AM
To: Janine Howard <janine.howard@deq.virginia.gov>
Cc: rr Environmental Impact Review <eir@deq.virginia.gov>

Project Name: Defense Intelligence Agency Headquarters Annex
Project #: 21-095 F
UPC #: N/A
Loca on: Fairfax County

VDH – Office of Drinking Water has reviewed the above project. Below are our comments as they relate to proximity to **public drinking water sources** (groundwater wells, springs and surface water intakes). Poten al impacts to public water distribu on systems or sanitary sewage collec on systems **must be verified by the local u lity.**

There are no public groundwater wells within a 1-mile radius of the project site.

There are no surface water intakes located within a 5-mile radius of the project site.

The project is not within the watershed of any public surface water intakes.

There are no apparent impacts to public drinking water sources due to this project.

The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any ques ons, please let me know.

Best Regards,

Arlene Fields Warren

GIS Program Support Technician

Office of Drinking Water

Virginia Department of Health

109 Governor Street

Richmond, VA 23219

(804) 864-7781

On Tue, Jul 27, 2021 at 1:35 PM Fulcher, Valerie <valerie.fulcher@deq.virginia.gov> wrote:

> **Good a. ernoon - this is a new OEIR review request/project:**
>
> **Document Type: Dra. Environmental Assessment/Federal Consistency Determina on**
> **Project Sponsor: Army Corps of Engineers**

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

NEW PROJECT ACOE DIA HQ Annex, DEQ #21-095F VDOT Permit (Fairfax/Arlington) section comment

1 message

Chowdhury, Aminul <aminul.chowdhury@vdot.virginia.gov> Thu, Jul 29, 2021 at 8:09 PM
To: Janine Howard <janine.howard@deq.virginia.gov>
Cc: eir.coordination@vdot.virginia.gov, "Burton, Robert" <robert.burton@vdot.virginia.gov>

Good afternoon Janine,
We have completed the review of the above mentioned project. The VDOT Permit(Fairfax/Arlington) section doesn't have any comments. Please find the attached form.

Should you have any questions, please do not hesitate to contact me.

Regards.

Aminul H Chowdhury

Engineering Specialist Permits

NOVA Fairfax/Arlington Permits, Virginia Dept of Transportation

4975 Alliance Drive, Fairfax, VA 22030

(703) 259-1733

aminul.chowdhury@vdot.virginia.gov

www.virginiadot.org/business/fairfax-permits-main.asp

DEQ #21-095F.doc
41K

VIRGINIA DEPARTMENT OF TRANSPORTATION **PROJECT REVIEW** **COMMENT AND RESOLUTION SHEET**		**CODES:** **A. ACCEPT COMMENT—WILL BE CORRECTED, ADDED, OR CLARIFIED.** **B. DESIGNER WILL EVALUATE.** **C. DELETE COMMENT** **D. DEPARTMENT TO EVALUATE.**	
DEQ Project #21-095F	**UPC NUMBER: N/A**	**REVIEWER(S): AMINUL H CHOWDHURY**	**DATE: JULY, 29TH,2021**
DESCRIPTION: ACOE DIA HQ Annex,	**REVIEW PHASE & TYPE: FINAL PLAN REVIEW-1**	**DISCIPLINE: NOVA ARL/FAIRFAX PERMITS**	**CRM: (IF REQUIRED)**

ITEM NO.	**DWG. NO.(1)**	**COMMENTS**	**CODE(2)**	**RESPONSE(2)**	**FINAL DISPOSITION(3)**
1		1. No Comments			

(1) Indicate drawing no./page no. or use "G" for general comment. (2) To be filled out by Project Manager in conjunction w/ Designer. (3) To be determined in comment resolution meeting/discussion(CEP Milestone Meeting) (list date resolved).	Note: The intended use of this form is to provide a means for the Department to raise issues or concerns associated with the Design/Builder's designs. However, it is the Design/Builder's responsibility to determine what action is necessary to resolve those issues in accordance with the contract.

(1) Indicate drawing no./page no. or use "G" for general comment. (2) To be filled out by Project Manager in conjunction w/ Designer. (3) To be determined in comment resolution meeting/discussion(CEP Milestone Meeting) (list date resolved).	Note: The intended use of this form is to provide a means for the Department to raise issues or concerns associated with the Design/Builder's designs. However, it is the Design/Builder's responsibility to determine what action is necessary to resolve those issues in accordance with the contract.

Commonwealth of Virginia

Howard, Janine <janine.howard@deq.virginia.gov>

VDOT Review of NEW PROJECT ACOE DIA HQ Annex, DEQ #21-095F

1 message

Mitchell, Halie <halie.mitchell@vdot.virginia.gov> Tue, Aug 10, 2021 at 1:58 PM
To: Janine.Howard@deq.virginia.gov
Cc: eir.coordination@vdot.virginia.gov, Norman Whitaker <norman.whitaker@vdot.virginia.gov>, "Trivedi, Rahul" <rahul.trivedi@vdot.virginia.gov>

Ms. Howard,

Thank you for the opportunity to review the ACOE DIA HQ Annex, DEQ #21-095F Environmental Assessment. The document was coordinated with several disciplines at VDOT and one comment was received:

- VDOT requests that we are provided an opportunity to review the methodology used for traffic projections.

Thank you,

Halie Mitchell, AICP
Multimodal Transportation Planner, Transportation Planning and Investment
Virginia Department of Transportation, NOVA District
703-259-1929
halie.mitchell@vdot.virginia.gov
Twitter | LinkedIn | Facebook | Instagram

COMMONWEALTH of VIRGINIA

Marine Resources Commission
380 Fenwick Road
Bldg 96
Fort Monroe, VA 23651-1064

Matthew J. Strickler
Secretary of Natural Resources

Steven G. Bowman
Commissioner

August 17, 2021

Department of Environmental Quality
Office of Environmental Impact Review
Attn: Janine Howard
1111 East Main St.
Richmond, VA 23219

Re: Draft Environmental Assessment/Federal Consistency Determination - ACOE DIA HQ Annex, DEQ #21-095F

Dear Ms. Howard,

This will respond to the request for comments regarding the Draft Environmental Assessment and Federal Consistency Determination for the Defense Intelligence Agency Headquarters (DAI HQ) Annex Building project (DEQ #21-095F), prepared by U.S. Army Corps of Engineers, on behalf of U.S. Army Garrison Fort Belvoir. Specifically, the Fort Belvoir has proposed to impact nontidal wetlands associated with the construction of a new administrative building with associated parking facilities within the vicinity of the National Geospatial Intelligence Agency (NGA) complex in Fairfax County, Virginia.

We reviewed the provided documents and found the proposed project is outside the areas of the Marine Resources Commission (VMRC) and will not require a permit from this agency.

Please be advised that the Virginia Marine Resources Commission (VMRC), pursuant to §28.2-1200 et seq of the Code of Virginia, has jurisdiction over any encroachments in, on, or over the beds of the bays, ocean, rivers, streams, or creeks which are the property of the Commonwealth. Accordingly, if any portion of the subject project involves any encroachments channelward of ordinary high water along non-tidal, natural rivers and streams with a drainage area greater than 5-square miles, a permit may be required from our agency. Any permit issued by the VMRC will specify necessary special conditions for the project. The VMRC administers the enforceable policies of fisheries management, subaqueous lands, tidal wetlands, and coastal primary sand dunes and beaches, which comprise some of Virginia's Coastal Zone Management Program. VMRC staff has reviewed the submittal and offers the following comments:

Fisheries and Shellfish: none in close proximity to the project area

Submerged Lands: none in close proximity to the project area

Tidal Wetlands: none in close proximity to the project area

Beaches and Coastal Primary Sand Dunes: none in close proximity to the project area

As such, this project has no foreseeable impact on the VMRC's enforceable policies. As proposed, we have no objection to the consistency findings provided by the applicant. Should the proposed project change, a new review by this agency may be required relative to these jurisdictional areas.

Please contact me at 757-247-8028 or by email at mark.eversole@mrc.virginia.gov if you have questions. Thank you for the opportunity to comment.

Sincerely,

Mark Eversole
Environmental Engineer, Habitat Management

ME/tlb
HM

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: Janine L. Howard

We thank **OEIR** for providing DEQ-AIR an opportunity to review the following project:

Document Type: Draft Environmental Assessment/Federal Consistency Determination
Project Sponsor: Army Corps of Engineers
Project Title: Defense Intelligence Agency Headquarters Annex
Location: Fairfax County
Project Number: DEQ #21-095F

Accordingly, I am providing following comments for consideration.

PROJECT LOCATION: X **OZONE NON ATTAINMENT AND EMISSION CONTROL AREA FOR NOX & VOC**

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO:
X **CONSTRUCTION**
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-45-760 et seq. – Asphalt Paving operations
3. **X 9 VAC 5-130 et seq. – Open Burning**
4. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
5. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to____________________
6. ☐ 9 VAC 5-60-300 et seq. – Standards of Performance for Toxic Pollutants
7. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the______________________________
8. ☐ 9 VAC 5-80-1100 et seq. of the regulations – Permits for Stationary Sources
9. ☐ 9 VAC 5-80-1605 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the ______________________________
10. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
11. ☐ 9 VAC 5-80-800 et seq. Of the regulations – State Operating Permits. This rule may be applicable to ____

COMMENTS SPECIFIC TO THE PROJECT:

All precautions are necessary to restrict the emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_X).

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: July 30, 2021

Matthew J. Strickler
Secretary of Natural and Historic Resources and Chief Resilience Officer

Clyde E. Cristman
Director

COMMONWEALTH of VIRGINIA
DEPARTMENT OF CONSERVATION AND RECREATION

Rochelle Altholz
Deputy Director of Administration and Finance

Nathan Burrell
Deputy Director of Government and Community Relations

Darryl M. Glover
Deputy Director of Dam Safety & Floodplain Management and Soil & Water Conservation

Thomas L. Smith
Deputy Director of Operations

MEMORANDUM

DATE: August 10, 2021

TO: Janine Howard, DEQ

FROM: Roberta Rhur, Environmental Impact Review Coordinator

SUBJECT: DEQ 21-095F, Defense Intelligence Agency Headquarters Annex

Division of Natural Heritage

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please re-submit project information and map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Ernie Aschenbach at 804-367-2733 or Ernie.Aschenbach@dwr.virginia.gov.

Division of Dam Safety and Floodplain Management

Floodplain Management Program:

The National Flood Insurance Program (NFIP) is administered by the Federal Emergency Management Agency (FEMA), and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

All development within a Special Flood Hazard Area (SFHA), as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.

State Agency Projects Only

Executive Order 45, signed by Governor Northam and effective on November 15, 2019, establishes mandatory standards for development of state-owned properties in Flood-Prone Areas, which include Special Flood Hazard Areas, Shaded X Zones, and the Sea Level Rise Inundation Area. These standards shall apply to all state agencies.

1. Development in Special Flood Hazard Areas and Shaded X Zones
    A. All development, including buildings, on state-owned property shall comply with the locally-adopted floodplain management ordinance of the community in which the state-owned property is located and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
    B. If any state-owned property is located in a community that does not participate in the NFIP, all development, including buildings, on such state-owned property shall comply with the NFIP requirements as defined in 44 CFR §§ 60.3, 60.4, and 60.5 and any flood-related standards identified in the Virginia Uniform Statewide Building Code.
        (1) These projects shall be submitted to the Department of General Services (DGS), for review and approval.
        (2) DGS shall not approve any project until the State NFIP Coordinator has reviewed and approved the application for NFIP compliance.
        (3) DGS shall provide a written determination on project requests to the applicant and the State NFIP Coordinator. The State NFIP Coordinator shall maintain all documentation associated with the project in perpetuity.
    C. No new state-owned buildings, or buildings constructed on state-owned property, shall be constructed, reconstructed, purchased, or acquired by the Commonwealth within a Special Flood Hazard Area or Shaded X Zone in any community unless a variance is granted by the Director of DGS, as outlined in this Order.

The following definitions are from Executive Order 45:

Development for NFIP purposes is defined in 44 CFR § 59.1 as "Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials."

The Special Flood Hazard Area may also be referred to as the 1% annual chance floodplain or the 100-year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study. This includes the following flood zones: A, AO, AH, AE, A99, AR, AR/AE, AR/AO, AR/AH, AR/A, VO, VE, or V.

The Shaded X Zone may also be referred to as the 0.2% annual chance floodplain or the 500- year floodplain, as identified on the effective Flood Insurance Rate Map and Flood Insurance Study.

The Sea Level Rise Inundation Area referenced in this Order shall be mapped based on the National Oceanic and Atmospheric Administration Intermediate-High scenario curve for 2100, last updated in 2017, and is intended to denote the maximum inland boundary of anticipated sea level rise.

"State agency" shall mean all entities in the executive branch, including agencies, offices, authorities, commissions, departments, and all institutions of higher education.

"Reconstructed" means a building that has been substantially damaged or substantially improved, as defined by the NFIP and the Virginia Uniform Statewide Building Code.

Federal Agency Projects Only
Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

DCR's Floodplain Management Program does not have regulatory authority for projects in the SFHA. The applicant/developer must contact the local floodplain administrator for an official floodplain determination and comply with the community's local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For state projects, DCR recommends that compliance documentation be provided prior to the project being funded. For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.

To find flood zone information, use the Virginia Flood Risk Information System (VFRIS): www.dcr.virginia.gov/vfris

To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory

The remaining DCR divisions have no comments regarding the scope of this project. Thank you for the opportunity to comment.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

MEMORANDUM

TO: Janine Howard, DEQ/EIR Environmental Program Planner

FROM: Carlos A. Martinez, Division of Land Protection & Revitalization Review Coordinator

DATE: August 2, 2021

COPIES: Sanjay Thirunagari, Division of Land Protection & Revitalization Review Manager; file

SUBJECT: Environmental Impact Review: 21-095F Defense Intelligence Agency Headquarters Annex in Fairfax County, Virginia.

The Division of Land Protection & Revitalization (DLPR) has completed its review of the Army Corps of Engineers' July 27, 2021 EIR for Defense Intelligence Agency Headquarters Annex in Fairfax County, Virginia.

DLPR staff conducted a search (200 ft. radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified four (4) petroleum release sites within the project area which might impact the project.

DLPR staff has reviewed the submittal and offers the following comments:

***Hazardous Waste/RCRA Facilities* – none in close proximity to the project area**

***CERCLA Sites* – none in close proximity to the project area**

***Formerly Used Defense Sites (FUDS)* – none in close proximity to the project area.**

***Solid Waste* – none in close proximity to the project area**

***Virginia Remediation Program (VRP)* – none in close proximity to the project area**

***Petroleum Releases* – Four (4) found in close proximity to the project area**

1. ***PC Number 20003095, Fort Belvoir – Building 05033, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 07/19/1999, Status: Closed.***

2. ***PC Number 20003096, Fort Belvoir – Building 05033, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 07/19/1999, Status: Closed.***

3. ***PC Number 20003097, Fort Belvoir – Building 05033, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 07/19/1999, Status: Closed.***

4. ***PC Number 19973109, Fort Belvoir Buildings 02009 and 02034, Telegraph Rd and Potomac River, Fort Belvoir, Virginia. Release Date: 12/26/1996, Status: Closed.***

Please note that the DEQ's Pollution Complaint (PC) cases identified should be further evaluated by the project engineer or manager to establish the exact location, nature and extent of the petroleum release and the potential to impact the proposed project. In addition, the project engineer or manager should contact the DEQ's Northern Regional Office at (703) 583-3800 (Tanks Program) for further information about the PC cases.

PROJECT SPECIFIC COMMENTS

None

GENERAL COMMENTS

Soil, Sediment, Groundwater, and Waste Management

Any soil, sediment or groundwater that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-81); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Part 107.

Asbestos and/or Lead-based Paint

All structures being demolished/renovated/removed should be checked for asbestos-containing materials (ACM) and lead-based paint (LBP) prior to demolition. If ACM or LBP are found, in addition to the federal waste-related regulations mentioned above, State regulations 9VAC 20-81-620 for ACM and

9VAC 20-60-261 for LBP must be followed. Questions may be directed to Richard Doucette at the DEQ's Northern Regional Office at (703) 583-3800.

Pollution Prevention – Reuse - Recycling

Please note that DEQ encourages all construction projects and facilities to implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately.

If you have any questions or need further information, please contact Carlos A. Martinez by phone at (804) 698-4575 or email carlos.martinez@deq.virginia.gov.

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 1111 East Main Street, Suite 1400, Richmond, VA 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

MEMORANDUM

TO: Janine Howard, DEQ Environmental Program Planner

FROM: Daniel Moore, DEQ Principal Environmental Planner

DATE: August 4, 2021

SUBJECT: DEQ #21-095F: ACOE, Defense Intelligence Agency HQ Annex, Ft. Belvoir North, Fairfax County

We have reviewed the Draft Environmental Assessment (EA) for the proposed Defense Intelligence Agency HQ Annex at Fort Belvoir in Fairfax County and offer the following comments regarding consistency with the provisions of the *Chesapeake Bay Preservation Area Designation and Management Regulations* (Regulations):

In Fairfax County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by the local government. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores. RPAs also include 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, which require less stringent performance criteria, include those areas of the County not included in the RPAs.

Under the Federal Consistency Regulations of the *Coastal Zone Management Act of 1972*, federal actions in Virginia must be conducted in a manner "consistent to the maximum extent practicable" with the enforceable policies of the Virginia Coastal Zone Management Program. Those enforceable policies are administered through the Chesapeake Bay Preservation Act and Regulations.

Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in §9VAC25-830-130 and 140 of the Regulations, including the requirement to minimize land disturbance (including access and staging areas), retain existing vegetation and minimize impervious cover as well as including compliance with the requirements of the *Virginia Erosion and Sediment Control Handbook,* and stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations*." For land disturbance over 2,500 square feet, the project must comply with the requirements of the *Virginia Erosion and Sediment Control Handbook.*

The proposed project would involve construction of a 116,080 square foot multi-story office building (the "annex") with offices, cubicles, work stations, conference rooms, server rooms, a multi-purpose auditorium and rooms for other associated amenities for 650 personnel. In addition, the project calls for construction of a free-standing utility plant, a visitor control center, visitor parking, a secured parking structure for personnel and perimeter fencing around the entire complex. The subject area is located on the eastern half of the Ft. Belvoir North Area, with Accotink Creek to the west. Construction activities will occur on wooded, previously undisturbed land. (Based on information provided in the EA it is not clear if the 116,800 square feet reflects the total of all new buildings to be constructed, or if it refers only to the proposed annex building.)

Figure 3-3 of the EA (Surface Waters on FBNA) shows lands analogous to locally-designated RPAs outside the study area associated with an unnamed tributary of Accotink Creek and RPA associated with another unnamed tributary between the western boundary of the study area and Geoint Drive to the west. Figure 3-3 also shows a point in the southwest corner of the study area with a narrow east-west encroachment into the land area analogous to RPA. Based on review of both Figure 2-1 (DIA HQ Annex Project Overview) and Figure 3-3, it appears that the narrow RPA encroachment is far to the south of the area proposed for construction of the new buildings.

Pending additional information regarding the reason for the small area of RPA encroachment referenced above (with appropriate mitigation efforts activated to offset any negative impacts to water quality that may result from that encroachment), and adherence to the performance criteria referenced in the Regulations (specifically the minimization of land disturbance and impervious cover and the preservation of indigenous vegetation), the proposed activity would be consistent with the *Chesapeake Bay Preservation Act* and the Regulations.

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

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

August 17, 2021

Attention: Bradford Britain
Dept. of the Army
9820 Flagler Road, Suite 213
Fort Belvoir, VA 22060

Re. THPO #	TCNS #	Project Description
2021-253-5		Defense Intelligence Agency Headquarters Annex Environment Assessment

Dear Mr. Britain,

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 Rogers at 803-328-2427 ext. 226, or e-mail Caitlin.Rogers@catawba.com.

Sincerely,

Caitlin Rogers for

Wenonah G. Haire
Tribal Historic Preservation Officer

From:	Traver, Carrie
To:	Ramsey, Connie L CIV USARMY CENAB (USA); usarmy.belvoir.imcom-atlantic.mbx.enrd@mail.mil
Cc:	Nevshehirlian, Stepan
Subject:	[Non-DoD Source] Notice of Availability for the Draft EA for DIA HQ Annex, Fort Belvoir
Date:	Friday, August 20, 2021 2:34:39 PM
Attachments:	NOA DIA HQ Annex Fort Belvoir.pdf

Dear Ms. Ramsey:

The U.S. Environmental Protection Agency (EPA) received notice of the Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the proposed construction of the Defense Intelligence Agency (DIA) Headquarters (HQ) Annex within the vicinity of the National Geospatial-Intelligence Agency (NGA) complex on Fort Belvoir's North Area (FBNA), in Fairfax County, Virginia.

The Proposed Action is to build and operate the DIA HQ for approximately 650 personnel. The proposed HQ Annex building would be an approximately 116,080 gross square foot multi-story administrative building, which would include workspaces, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, a café/cafeteria, a gym/fitness center. Associated facilities would include a utility plant, visitor control center, visitor parking, a secured employee parking structure, and a perimeter security fence.

Thank you for providing the notice for our review. In accordance with the National Environmental Policy Act (NEPA) of 1969, Section 309 of the Clean Air Act and the Council on Environmental Quality regulations implementing NEPA (40 CFR 1500-1508), we have the following comments for your consideration in the development of the final EA and FONSI as well as future NEPA studies.

Master Plan and EIS

Section 3.2.8.2 states that the master plan for Fort Belvoir envisions the FBNA as a future center for an intelligence community integrated campus. The master plan is also briefly mentioned in other sections of the EA. The plan referenced appears to be the Real Property Master Plan Installation Vision and Development Plan for Fort Belvoir, dated 2014. The Final Environmental Impact Statement (EIS) for Short-Term Projects and Real Property Master Plan (RPMP) Update, dated June 2015, is the associated NEPA study. The plan included conceptual mid- and long-term development projects proposed for implementation between 2018 and 2030. We recommend including a link to the RPMP document and associated final EIS in the EA.

As indicated, additional facilities in the Study Area such as roads, parking and stormwater management facilities could include additional impacts, including both direct and indirect impacts to surface waters. As planning moves forward on the campus, we recommend identifying and minimizing these impacts.

Purpose and Need
Section 1.2 indicates that the need for the facility is to alleviate the current space constraints of existing leased facilities that pose sustained and increased safety and security concerns and consolidate personnel. To the extent possible, we recommend further explanation of this need, including location of existing facilities, space constraints, and other issues. If this is discussed or supported in a previous NEPA study, we recommend including the location of this information.

Description of Proposed Action and Alternatives
It would be helpful to further refine the area evaluated in the EA. We recommend defining the boundaries of the Study Area, the size and extent of the site, and the expected area of disturbance for construction to clarify resource impacts. Section 3.1.4.2 indicates that the site is 50 acres, but it appears that a much smaller area will likely be disturbed. Sections 3.3.1 and Appendix C indicate approximately 7 acres of disturbance to vegetation and soils, while the RECORD OF NON-APPLICABILITY SUPPORTING DOCUMENTATION states that a total of approximately 12.5 acres may be cleared and grubbed. We recommend clarifying the likely or maximum extent of earth disturbance for the proposed buildings, parking, and security fence.

Vegetation
Section 3.3.1 states that removal of approximately 7 acres of vegetation for construction of the Proposed Action would result in temporary, minor adverse effects on field and pine stand habitat. This section also indicates that approximately 7 acres of the project area is occupied by a gravel parking lot; it would appear that much of the proposed disturbance would be located in this area. Although design is in the preliminary stages, we recommend clarifying the expected vegetation disturbance area by type, including impacts to vegetated areas that were established as mitigation.

- The section indicates that a tree survey was conducted by USACE on March 23, 2021. We suggest summarizing the results and including the survey as an appendix.

- As detailed in Section 3.3.1, approximately 9-acres of Eastern red cedar (*Juniperus virginiana*) plantings were established to offset vegetation removal associated with construction of the NGA Campus East overflow parking lot. We recommend clarifying how much of this mitigation area will likely be impacted, how the habitat value may be affected for remaining mitigation areas, and how temporal loss from impacts to mitigation will be offset.

- We recommend an expanded discussion of mitigation efforts at FBNA, including potential areas for tree mitigation. We recommend identifying areas that would not likely be disturbed for future projects to ensure long-term, viable mitigation.

Water Resources
FBNA is located within the Accotink Creek watershed. The EA indicates that approximately 87 percent of land within the watershed is developed and 28 percent is covered by impervious surfaces. This highly urbanized watershed is impaired and TMDLs are under development for sediment and chlorides.

Section 3.2.8.2 states that the Proposed Action would add approximately 0.74 acres of impervious area. While the EA indicates that in the context of the entire Accotink Creek watershed this increase would be minimal, any increase may exacerbate the existing impairments in tributaries and downstream. We suggest not only minimizing construction of additional impervious areas, but also consideration of measures that would improve water quality by reducing impervious area in other locations where possible, improving road crossings, expanding vegetated buffers, and improving stormwater management.

<u>Stormwater</u>
Permanent stormwater management features "would maintain pre-development levels of stormwater discharge." Given the disturbed nature of the site, we recommend that the applicable standards and goals for the site be clarified. We also suggest indicating whether any of the existing stormwater facilities described would be retained or modified.

- One stormwater management strategy appears to be the construction of an approximately 2-acre stormwater pond in the eastern portion of the project area; it would be helpful to indicate why this is appropriate or preferred BMP for addressing stormwater volume and quality.

- Further, the contamination issues warrant further discussion regarding potential stormwater management. Section 3.2.8.2 states due to the existing plume of groundwater contamination, stormwater management features for the Proposed Action will be required to retain all stormwater volume onsite and will not be allowed to infiltrate into subsurface groundwater.

The EA notes any uncharacteristically high sediment content detected during sampling could result in a violation of the VA0092771 permit during monitoring. We recommend indicating the location of the permitted industrial stormwater outfall, how an exceedance would be reported, and what corrective actions may be taken.

<u>Wetlands and Streams</u>
We appreciate the stated intention to avoid impacts to the unnamed tributary to Accotink Creek and its associated Resource Protection Area (RPA) during the site design process. It appears that the proposed perimeter security fence may cross over wetlands in the southwest portion of the study area. We recommend relocating the fence to avoid

these impacts. If wetland impacts are not avoided, we recommend including information regarding the hydrology and vegetation of the wetlands, such as the wetland delineation and the Norfolk District Wetland Attribute Form.

As indicated, the build out of FBNA would likely add more impervious surfaces as well as potential direct impacts to streams and wetlands. Therefore, the assessment would benefit from a discussion of existing impacts to wetlands and streams from the development of FBNA, reasonably foreseeable impacts, and the location(s) of existing mitigation.

Biological Resources - Rare, Threatened and Endangered Species
As shown in Figure 3-6, there is a small area of potentially suitable habitat for federally threatened and state-endangered small-whorled pogonia (*Isotria medeoloides*) within the southwest portion of the study area. This appears to be in the vicinity of the new security fence. We recommend discussing whether impacts from the new fence are likely, and if so, exploring whether this area can be avoided by tying in the fence at another location.

We note that Figure 3-6 also appears to show a Rare Ecological Community within the Study Area and recommend that that be discussed.

Hazardous Materials
As described, groundwater contamination above residential Risk-Based Concentrations occurs onsite. Pollutants include benzene, naphthalene, 2-methylnaphthalene, toluene, ethyl benzene, and carbon tetrachloride.

- Section 3.4 states that the network of monitoring wells appeared to have been modified as a result of the base realignment and closure (BRAC) construction, and the monitoring well network would need to be re-established in order to conduct future investigations that would allow closure of the site. It also states that site preparation may require the relocation of existing monitoring wells. We recommend further discussion of impacts to the wells, re-establishment of monitoring, and how this would be coordinated with Fort Belvoir and other agencies such as VA DEQ.

- We suggest indicating when a Land Use Control Implementation Plan will be created.

- If further information is determined regarding vapor intrusion mitigation measures or other engineering or administrative controls for construction, or proposed monitoring measures are identified, we recommend updating the final EA and FONSI to reflect that information.

Utilities
The construction of utility lines and infrastructure, including natural gas, electric, sewer, and water are associated with the construction of the HQ DIA facility.

- We recommend indicating whether impacts to resources (vegetation, wetlands, streams, habitat for sensitive species, etc.) are likely from construction of utilities based on the location of proposed facilities and tie-in to existing infrastructure.

- We recommend avoidance of impacts by locating utilities in roads or other disturbed areas where possible.

Air Quality
Section 3.8.5 indicates that existing stationary emission sources at FBNA are operated under a synthetic minor New Source Review air permit. We recommend indicating whether modification of the permit or additional permits will be needed for additional sources/air emissions associated with the Proposed Action, including the required backup generators.

Greenhouse Gases (GHG) and Climate Change
In accordance with the Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (2016), we recommend that GHG emissions from the proposed action be evaluated.

It appears that carbon dioxide equivalent (CO2e) emissions from construction and emergency generators were estimated in the RONA Supporting Documentation but the expected GHG from the Proposed Action were not discussed in the narrative. Emissions reported via the electronic greenhouse gas tool (e-GRRT) for calendar year 2020 were 27,366.02 metric tons for both the Main Post and FBNA, but this does not include GHG emissions from mobile sources or emergency generator use. We recommend a specific discussion of emissions from the construction and operation of the Proposed Action.

Socioeconomics
The Proposed Action would relocate personnel from DIA HQ in Washington DC. We recommend further discussion of the impacts of moving personnel from Joint Base Anacostia-Bolling or other facilities.

Environmental Justice (EJ)
The EA would benefit from an expanded evaluation of potential impacts on environmental justice (EJ) communities. The EA indicates that 35.3 percent of Fairfax County's population in 2019 was composed of minorities, and that minority populations are defined as areas where racial minorities comprise 50 percent or more of the total population.

- We note that CEQ Environmental Justice Guidance discusses two tests to help identify minority populations. The first to be applied is the identification of populations that exceed the 50% minority population benchmark. The second is the application of the significantly or meaningfully greater analysis when local minority population averages are below 50%. This analysis compares the percentage of minority individuals residing within the area of investigation in comparison to the state and/or county averages. Please refer to Promising Practices for EJ Methodologies in NEPA Reviews. https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf

- Additionally, EPA recommends using census block group data for the identification of potential EJ communities as it is the most refined geographical unit for which the Census Bureau publishes data. EPA's environmental justice screening tool, EJSCREEN, can be used to obtain data at this scale.

Traffic and Transportation
The project includes construction and operation of an approximately 135,000 square foot parking garage. We note that the structure is planned to accommodate a minimum of 650 spaces (a minimum 1:1 ratio), with an additional surface lot for visitors. We recommend discussing the parking needs for the facility for the short and long term.

- Specifically, we recommend indicating whether the parking area is expected to accommodate future growth of the site and whether strategies to reduce single occupancy vehicles (SOV) will be employed.

- We appreciate the stated intention to construct a multi-story parking structure instead of a surface lot to reduce the footprint of the facility.

Availability to the site from public transportation appears to be limited. To reduce impacts of traffic on surrounding communities and emissions, we recommend evaluating options to improve public transit and other alternatives to SOVs to access to the site. We recommend that the EA indicate if there is an existing Transportation Management Plan (TMP) for development of the FBNA or whether a TMP will be developed or updated.

Again, thank you for coordinating with EPA. Please let me know if you would like to discuss any of these comments.

Have a great weekend,
Carrie

Carrie Traver

Life Scientist
Office of Communities, Tribes, & Environmental Assessment
U.S. Environmental Protection Agency, Region 3
1650 Arch Street – 3RA12
Philadelphia, PA 19103
215-814-2772
traver.carrie@epa.gov

National Capital Planning Commission 401 9th Street, NW North Lobby, Suite 500 Washington, DC 20004 Tel 202.482.7200 Fax 202.482.7272 www.ncpc.gov

IN REPLY REFER TO:
NCPC File No. MP020A

August 17, 2021

U.S. Army Fort Belvoir Directorate of Public Works
Attn: EA for DIA HQ Annex
Environmental Division, Chief
9430 Jackson Loop, Building 1442, Rm #226
Fort Belvoir, VA 22060-5116

RE: Defense Intelligence Agency (DIA) Draft Environmental Assessment (EA) and Finding of No Significant Impact (FNSI) Comments

To Whom This May Concern:

Thank you for the opportunity to comment on the draft EA and FONSI prepared by the Department of the Army for the DIA Headquarters Annex located at the Fort Belvoir North Area (FBNA) in Springfield, Virginia. As the federal government's central planning agency in the National Capital Region, the National Capital Planning Commission (NCPC) has advisory review authority over projects at Fort Belvoir under the National Capital Planning Act ((40 USC § 8722 (b) (1))[1]. We note that NCPC is currently reviewing the application for the FBNA draft Area Development Plan (ADP) which will be presented to the Commission at its September 2, 2021 meeting for approval of comments on the draft master plan. The final FBNA ADP and Federal Elements of the Comprehensive Plan for the Nation's Capital will be the basis for the Commission's review of the DIA Headquarters Annex. Preliminary plans for the DIA Headquarters Annex should be reviewed by the Commission as soon as possible, following final approval of the FBNA ADP, to ensure that the DIA Headquarters Annex meets the policies of the Comprehensive Plan and so that any changes requested by the Commission can be evaluated fully by the National Environmental Policy Act (NEPA) process.

The draft EA evaluates a reasonable range of alternatives for the Proposed Action and staff generally supports the location of the proposed DIA Headquarters Annex adjacent to the existing National Geospatial Intelligence Agency (NGA) Headquarters on previously disturbed land. In general, the draft EA demonstrates that the Proposed Action seeks to avoid or minimize adverse effects upon the quality of the human environment through evaluation of associated environmental impacts. NCPC staff encourages the Department of the Army to consider the following comments in preparation of the final EA and future submissions to the Commission.

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[1] The Planning Act requires federal agencies to advise and consult with NCPC in the preparation of agency plans prior to preparation of construction plans.

Tree Preservation and Replacement

The draft EA indicates the approximately nine-acre project area was established to offset removal of vegetation associated with the construction of the additional NGA Campus East (NCE) 900-space, 7-acre overflow surface parking lot located to the north of the project site. Cedar trees and pine seedlings have been planted in partial fulfillment of the restoration requirements; however, the full requirements of the replanting plan have not been fulfilled to-date. The ADP and EA should quantify the remaining amount of replanting required to meet the NGA replanting commitments and also the amount of vegetation that will be removed as a result of constructing the Proposed Action and identify areas within the FBNA that are eligible for replanting this vegetation at the required ratios pursuant to Fort Belvoir's Tree Removal and Protection Policy. Any shortfalls in meeting the NGA replanting requirements or those required as a result of the Proposed Action should be considered in the EA's analysis of adverse effects to biological resources.

Transportation

The draft EA includes a Traffic Impact Study (TIS) to evaluate existing conditions and potential impacts of the Proposed Action to traffic patterns in the vicinity of the site. This analysis assumes that each additional staff member of the DIA Headquarters annex will generate one additional morning (AM) and one additional evening (PM) peak hour trip for 650 and 1,000 DIA staff. This assumption further implies a 1:1 parking ratio will be provided for the DIA Headquarters Annex. NCPC notes that the parking ratio standard for suburban federal facilities is 1:2 per the policies of the Federal Transportation Element of the Comprehensive Plan for the National Capital. The impacts of the Proposed Action do not include a trip reduction credit, which would assume implementation of Travel Demand Management (TDM) strategies, such as carpooling, to reduce single occupancy vehicle (SOV) trips and parking demand. Staff acknowledges the analysis' intent to study the most extreme or "worst case" scenario; however, the EA and ADP should account for implementing TDM strategies at the FBNA to reduce SOV trips and meet the transportation policies of the Comprehensive Plan. In addition, the TIS should be coordinated with Fairfax County transportation staff and the Virginia Department of Transportation (VDOT) to ensure their input is considered in the analysis.

Energy Use and Water Resources

The draft EA indicates one of the key ways the Department of Defense achieves reductions in Greenhouse Gas (GHG) emissions in building construction and operation through the Leadership in Energy and Environment Quality (LEED) certification program. Pursuant to Department of Defense policy, the Proposed Action will be designed to achieve a LEED rating of Silver. The LEED program is an internationally recognized green building standard supported by the policies of the Comprehensive Plan. Comprehensive Plan policies also strongly encourage renewable energy sources, such as the integration of solar panels with the building design, for federal workplaces. Given the expected life cycle of institutional government buildings has considerable long-term carbon footprint impacts, the EA and ADP should consider renewable energy sources for new buildings to further reduce GHG emissions in addition to LEED Silver certification.

The draft EA provides a thorough analysis of the potential impacts of the Proposed Action on water resources and identifies Low Impact Development (LID) techniques and meeting permitting requirements as mitigation measures to reduce impacts to water resources. Since the Proposed Action is one of many future projects that will increase impervious surfaces and potentially adversely impact water resources at the FBNA, the Army is strongly encouraged to coordinate with Fairfax County staff and the Virginia Department of Environmental Quality on a comprehensive stormwater management plan for the entire campus that utilizes LID techniques integrated with the landscape and building designs. Stormwater ponds and manufactured treatment devices should be limited.

NCPC Review

As noted above, the Commission will review a draft of the FBNA ADP at its September 2, 2021 meeting. Comments and feedback provided at this meeting will guide further development of the ADP and therefore the DIA Headquarters Annex. Staff strongly recommends the Department of the Army account for the Commission's recommendations prior to finalizing the EA so that they may be considered as part of the NEPA analysis as necessary.

NCPC appreciates the opportunity to provide these comments as part of this important project. We look forward to continued involvement in the NEPA process, and the review of the final master plan. If you have any questions, please contact Stephanie Free at (202) 482-7209 stephanie.free@ncpc.gov, or consult our agency website at ncpc.gov/plans/compplan/ for further information about the Comprehensive Plan or ncpc.gov/review/guidelines/ for information about the Submission Guidelines.

Sincerely,

Diane Sullivan

Diane Sullivan, Director

Urban Design and Plan Review Division

From:	Merino, Michael R CIV DIA (US)
To:	Ernstrom, Robin E CIV USARMY CENAB (USA); Ramsey, Connie L CIV USARMY CENAB (USA); Walworth, Nicole U CIV USARMY CENAB (USA)
Cc:	Merino, Michael R CIV DIA (US); Coggins, Janaye A CIV DIA (US); Tully, William J (Bill) CIV USARMY CENAB (USA)
Subject:	FW: Comments to FBNA Environmental Assessment
Date:	Monday, June 21, 2021 3:06:45 PM
Importance:	High

All,

Review comments received from an outside stakeholder forwarded for your information/integration as required. Please review and advise of any issues/concerns.

Thanks,

Mike

R/

Dr. Michael R. Merino, RA
MASTER PLANNER / ARCHITECT
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-----Original Message-----
From: Davis, Jennifer J CIV (USA) <davijenn@nro.mil>
Sent: Friday, June 18, 2021 12:32 PM
To: Merino, Michael R CIV DIA (US) <Michael.Merino@dodiis.mil>
Subject: Comments to FBNA Environmental Assessment

Hi Mike,
Here are my comments for your consideration:

Page 26 / lines 614-627
- Section 3.2.5 notes groundwater contamination found from 2006-2017 including benzene, toluene, and ethyl benzene. What CERCLA site(s) is the contamination associated with; what are the continuing agreements with regulatory entities (e.g. EPA, VDEQ); and, what agencies is responsible for continued regulatory coordination and remediation funding?
- 3.2.5 also notes land use controls. What are the restrictions, and what is the basis (e.g. Human Health Risk Assessment, Ecological Risk Assessment)?

Page 38 / lines 1100-1127
- Is there potential Brindle Shiner habitat?

Page 48 / lines 1445-1485
- 3.4.2 notes FBNA is part of the MMRP due to historic mine warfare, material testing, research & development, and activities at ten closed ranges. What CERCLA site(s) represent the MMRP areas; what are the continuing agreements with regulatory entities (e.g. EPA, VDEQ); and, what agencies is responsible for continued regulatory coordination and remediation funding?
- What are the LUCs cited in the FFS; what capabilities does the Fort or other local element have for UXO/MMRP response and demilitarization; what environmental/safety/risk management requirements are there for intrusive

construction activities including testing/reuse/disposal of construction spoils?

Page 50 / lines 1528-1529
- What specific MMRP items have been identified at this site, either through clearing performed 2003-2010 for the FFCP right-of-way or other activities? What type of screening has been required? And, what have the timelines for regulatory approval been for intrusive/construction activities?

Respectfully,
Jennifer

						DIA HQ Annex - Comment Response Matrix		
No.	Reviewer	Agency	Section	Page	Line	Comments	Comment Received Date	Response to Comment
1	Diane Sullivan, Director, Urban Design and Plan Review Division	NCPC				The final FBNA ADP and Federal Elements of the Comprehensive Plan for the Nation's Capital will be the basis for the Commission's review of the DIA Headquarters Annex. Preliminary plans for the DIA Headquarters Annex should be reviewed by the Commission as soon as possible, following final approval of the FBNA ADP, to ensure that the DIA Headquarters Annex meets the policies of the Comprehensive Plan and so that any changes requested by the Commission can be evaluated fully by the National Environmental Policy Act (NEPA) process.	8/17/2021	Noted. Design plans for the DIA HQ Annex will be coordinated with the NCPC early in the development process.
2	Diane Sullivan, Director, Urban Design and Plan Review Division	NCPC				The ADP and EA should quantify the remaining amount of replanting required to meet the NGA replanting commitments and also the amount of vegetation that will be removed as a result of constructing the Proposed Action and identify areas within the FBNA that are eligible for replanting this vegetation at the required ratios pursuant to Fort Belvoir's Tree Removal and Protection Policy. Any shortfalls in meeting the NGA replanting requirements or those required as a result of the Proposed Action should be considered in the EA's analysis of adverse effects to biological resources.	8/17/2021	Noted. DPW will address the status of the remaining amount of replanting associated with the NGA construction when considering areas appropriate for replanting in association with the ADP. With regard to the Proposed Action in particular, tree removal will be offset in accordance with the Fort Belvoir Tree Removal and Protection Policy.
3	Diane Sullivan, Director, Urban Design and Plan Review Division	NCPC				NCPC notes that the parking ratio standard for suburban federal facilities is 1:2 per the policies of the Federal Transportation Element of the Comprehensive Plan for the National Capital. The impacts of the Proposed Action do not include a trip reduction credit, which would assume implementation of Travel Demand Management (TDM) strategies, such as carpooling, to reduce single occupancy vehicle (SOV) trips and parking demand. Staff acknowledges the analysis' intent to study the most extreme or "worst case" scenario; however, the EA and ADP should account for implementing TDM strategies at the FBNA to reduce SOV trips and meet the transportation policies of the Comprehensive Plan. In addition, the TIS should be coordinated with Fairfax County transportation staff and the Virginia Department of Transportation (VDOT) to ensure their input is considered in the analysis.	8/17/2021	Noted. The TIS will be provided to Fairfax County transportation staff and the Virginia Department of Transportation (VDOT). The recommendations to implement TDM strategies will be forwarded to the project proponent for consideration.
4	Diane Sullivan, Director, Urban Design and Plan Review Division	NCPC				Given the expected life cycle of institutional government buildings has considerable long-term carbon footprint impacts, the EA and ADP should consider renewable energy sources for new buildings to further reduce GHG emissions in addition to LEED Silver certification.	8/17/2021	Noted. This recommendation will be provided to the project design team.
5	Diane Sullivan, Director, Urban Design and Plan Review Division	NCPC				Since the Proposed Action is one of many future projects that will increase impervious surfaces and potentially adversely impact water resources at the FBNA, the Army is strongly encouraged to coordinate with Fairfax County staff and the Virginia Department of Environmental Quality on a comprehensive stormwater management plan for the entire campus that utilizes LID techniques integrated with the landscape and building designs. Stormwater ponds and manufactured treatment devices should be limited.	8/17/2021	Noted. Stormwater management, including LID techiques as part of a comprehensive stormwater management plan, is a consideration in the ADP process.
6	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3	3.2.8.2			Section 3.2.8.2 states that the master plan for Fort Belvoir envisions the FBNA as a future center for an intelligence community integrated campus. The master plan is also briefly mentioned in other sections of the EA. The plan referenced appears to be the Real Property Master Plan Installation Vision and Development Plan for Fort Belvoir, dated 2014. The Final Environmental Impact Statement (EIS) for Short-Term Projects and Real Property Master Plan (RPMP) Update, dated June 2015, is the associated NEPA study. The plan included conceptual mid- and long-term development projects proposed for implementation between 2018 and 2030. We recommend including a link to the RPMP document and associated final EIS in the EA. As indicated, additional facilities in the Study Area such as roads, parking and stormwater management facilities could include additional impacts, including both direct and indirect impacts to surface waters. As planning moves forward on the campus, we recommend identifying and	8/20/2021	The master plan referenced is the Area Development Plan (ADP) for the Fort Belvoir North Area (FBNA) that is currently under development by the installation.
7	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3	1.2			Section 1.2 indicates that the need for the facility is to alleviate the current space constraints of existing leased facilities that pose sustained and increased safety and security concerns and consolidate personnel. To the extent possible, we recommend further explanation of this need, including location of existing facilities, space constraints, and other issues. If this is discussed or supported in a previous NEPA study, we recommend including the location of this information.	8/20/2021	Noted, however, due to the sensitive nature of the action agency's (proponent's) mission, it is not appropriate to include this information in the EA.
8	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				It would be helpful to further refine the area evaluated in the EA. We recommend defining the boundaries of the Study Area, the size and extent of the site, and the expected area of disturbance for construction to clarify resource impacts. Section 3.1.4.2 indicates that the site is 50 acres, but it appears that a much smaller area will likely be disturbed. Sections 3.3.1 and Appendix C indicate approximately 7 acres of disturbance to vegetation and soils, while the RECORD OF NON-APPLICABILITY SUPPORTING DOCUMENTATION states that a total of approximately 12.5 acres may be cleared and grubbed. We recommend clarifying the likely or maximum extent of earth disturbance for the proposed buildings, parking, and security fence.	8/20/2021	Site disturbance is estimated at 12.5 acres as outlined in pre-design documentation. The study area of 50 acres includes the larger area encompassed by the security fence, which is designed to include possible future buildings envisioned as part of the FBNA ADP (not part of this action). Discrepanies within the EA have been corrected.
9	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3	3.3.1			The section indicates that a tree survey was conducted by USACE on March 23, 2021. We suggest summarizing the results and including the survey as an appendix.	8/20/2021	Comment noted. Report included as an appendix.

10	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3	3.3.1			As detailed in Section 3.3.1, approximately 9-acres of Eastern red cedar (*Juniperus virginiana*) plantings were established to offset vegetation removal associated with construction of the NGA Campus East overflow parking lot. We recommend clarifying how much of this mitigation area will likely be impacted, how the habitat value may be affected for remaining mitigation areas, and how temporal loss from impacts to mitigation will be offset.	8/20/2021	Noted. Tree removal will be offset in accordance with Fort Belvoir's Tree Removal and Protection Policy. The precise amount of tree removal will be identified as the project's design is refined and potential tree replanting areas can be identified within the project area.
11	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3	3.3.1			We recommend an expanded discussion of mitigation efforts at FBNA, including potential areas for tree mitigation. We recommend identifying areas that would not likely be disturbed for future projects to ensure long-term, viable mitigation.	8/20/2021	Noted. Typically, the tree replanting plan is part of the project design phase. DPW will provide guidance on the appropriate location of replanting in accordance with the installation tree replacement policy and in consideration of master planning tools like the ADP and INRMP.
12	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				One stormwater management strategy appears to be the construction of an approximately 2-acre stormwater pond in the eastern portion of the project area; it would be helpful to indicate why this is appropriate or preferred BMP for addressing stormwater volume and quality. Further, the contamination issues warrant further discussion regarding potential stormwater management. Section 3.2.8.2 states due to the existing plume of groundwater contamination, stormwater management features for the Proposed Action will be required to retain all stormwater volume onsite and will not be allowed to infiltrate into subsurface groundwater.		The plans presented in the EA are conceptual in nature to facilitate discussion of potential environmental impacts. Architectural and site engineering practices will be applied to the design as it progresses, taking into account recommendations of resource agency stakeholders. Specific approaches to compliance with the regulations and guidance regarding contaminated groundwater have not been identified and therefore cannot be discussed in detail.
13	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				The EA notes any uncharacteristically high sediment content detected during sampling could result in a violation of the VA0092771 permit during monitoring. We recommend indicating the location of the permitted industrial stormwater outfall, how an exceedance would be reported, and what corrective actions may be taken.		Noted, however, the procedures for reporting exceedances are outlined in the permit.
14	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				We appreciate the stated intention to avoid impacts to the unnamed tributary to Accotink Creek and its associated Resource Protection Area (RPA) during the site design process. It appears that the proposed perimeter security fence may cross over wetlands in the southwest portion of the study area. We recommend relocating the fence to avoid these impacts.		The potential for the security fence to impact the RPA and wetlands has been communicated with the project design team, with the recommendation that strong consideration be given to moving the fence alignment to avoid encroaching on these features. Any unavoidable impacts (and associated mitigation) would then be addressed through applicable permitting actions, during which detailed information on the jurisdictional waters would be provided.
15	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				As indicated, the build out of FBNA would likely add more impervious surfaces as well as potential direct impacts to streams and wetlands. Therefore, the assessment would benefit from a discussion of existing impacts to wetlands and streams from the development of FBNA, reasonably foreseeable impacts, and the location(s) of existing mitigation.		The final design will consider the best way to balance national security requirements and minimize or avoid impacts to wetlands and RPA buffer areas.
16	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				As shown in Figure 3-6, there is a small area of potentially suitable habitat for federally threatened and state-endangered small-whorled pogonia (*Isotria medeoloides*) within the southwest portion of the study area. This appears to be in the vicinity of the new security fence. We recommend discussing whether impacts from the new fence are likely, and if so, exploring whether this area can be avoided by tying in the fence at another location. We note that Figure 3-6 also appears to show a Rare Ecological Community within the Study Area and recommend that that be discussed.		An updated IPaC screening indicated the project area is no longer considered potential habitat for the SWP, and the EA has been updated to reflect this new information. Much of the project area has been subjected to major disturbance through prior land use activities and not expected to support habitat for this species. The Rare Ecological Community is a desgination found in the Fort Belvoir INRMP.
17	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				We recommend further discussion of impacts to the wells, re-establishment of monitoring, and how this would be coordinated with Fort Belvoir and other agencies such as VA DEQ. We suggest indicating when a Land Use Control Implementation Plan will be created. If further information is determined regarding vapor intrusion mitigation measures or other engineering or administrative controls for construction, or proposed monitoring measures are identified, we recommend updating the final EA and FONSI to reflect that information.		The monitoring well network is discussed in the AECOM Draft Final Focused Feasibility Study for CC-MPS-2009 as referenced in the EA. The Land Use Control Implementation Plan remains under development by Fort Belvoir and is not yet finalized. Should this information become avialable in the short term, it will be incorproated into the final EA and FONSI as warranted.
18	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				We recommend indicating whether impacts to resources (vegetation, wetlands, streams, habitat for sensitive species, etc.) are likely from construction of utilities based on the location of proposed facilities and tie-in to existing infrastructure. We recommend avoidance of impacts by locating utilities in roads or other disturbed areas where possible.		Noted. The project would be designed to minimize excess earth disturbance or the need for unnecessary increases in the length of utility corridors.
19	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				Section 3.8.5 indicates that existing stationary emission sources at FBNA are operated under a synthetic minor New Source Review air permit. We recommend indicating whether modification of the permit or additional permits will be needed for additional sources/air emissions associated with the Proposed Action, including the required backup generators.		The EA will be updated to reflect that, should the final design require, existing air emissions permits would be modified, or new permit obtained, to account for future stationary sources, as warranted. (See updated Section 3.8.5.)
20	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				It appears that carbon dioxide equivalent (CO2e) emissions from construction and emergency generators were estimated in the RONA Supporting Documentation but the expected GHG from the Proposed Action were not discussed in the narrative. Emissions reported via the electronic greenhouse gas tool (e-GRRT) for calendar year 2020 were 27,366.02 metric tons for both the Main Post and FBNA, but this does not include GHG emissions from mobile sources or emergency generator use. We recommend a specific discussion of emissions from the construction and operation of the Proposed Action.		Thank you for your comment. We believe the discussion is adequate, as FBNA does not currently qualify as a major source for CO2e and the Proposed Action would contribute a negligible amount to the overall emissions of this area.

21	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				The Proposed Action would relocate personnel from DIA HQ in Washington DC. We recommend further discussion of the impacts of moving personnel from Joint Base Anacostia-Bolling or other facilities.		The relocation of personnel would have the largest relative impact on trasportation. The EA includes an analysis of impacts on transportation conditions. The distance between Fort Belvoir and JBAC is approximately 20 miles; thus, there is not anticipated to be impacts to residential properties, schools, or other community-related services.
22	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				We note that CEQ Environmental Justice Guidance discusses two tests to help identify minority populations. The first to be applied is the identification of populations that exceed the 50% minority population benchmark. The second is the application of the significantly or meaningfully greater analysis when local minority population averages are below 50%. This analysis compares the percentage of minority individuals residing within the area of investigation in comparison to the state and/or county averages. Please refer to Promising Practices for EJ Methodologies in NEPA Reviews. https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf. Additionally, EPA recommends using census block group data for the identification of potential EJ communities as it is the most refined geographical unit for which the Census Bureau publishes data. EPA's environmental justice screening tool,		Noted. We appreciate the information, but believe the extent of the analysis for this project is appropriate. Additionally, development of the DIA HQ will provide short-term benefits to socioeconomic conditions in terms of construction-wroker employment and the purchasing of construction materials from local and regional suppliers.
23	Carrie Traver, Life Scientist, Office of Communities, Tribes, & Environmental Assessment	EPA Region 3				We recommend indicating whether the parking area is expected to accommodate future growth of the site and whether strategies to reduce single occupancy vehicles (SOV) will be employed. We appreciate the stated intention to construct a multi-story parking structure instead of a surface lot to reduce the footprint of the facility. Availability to the site from public transportation appears to be limited. To reduce impacts of traffic on surrounding communities and emissions, we recommend evaluating options to improve public transit and other alternatives to SOVs to access to the site. We recommend that the EA indicate if there is an existing Transportation Management Plan (TMP) for development of the FBNA or whether a TMP will be developed or updated.		The project proponent, in coordination with NCPC, will address strategies to reduce single occupancy vehicles as the design progresses. The Springfield to Quantico Enhanced Public Transportation Feasibility Study is under development for the area by the Virginia Department of Rail and Public Transportation, which includes consideration of potential addition of mass transit stops to serve FBNA.
24	Jennifer Davis, Northern Regional Office (NRO)	Virginia DEQ	3.2.5	Page 26		Section 3.2.5 notes groundwater contamination found from 2006-2017 including benzene, toluene, and ethyl benzene. What CERCLA site(s) is the contamination associated with; what are the continuing agreements with regulatory entities (e.g. EPA, VDEQ); and, what agencies is responsible for continued regulatory coordination and remediation funding? 3.2.5 also notes land use controls. What are the restrictions, and what is the basis (e.g. Human Health Risk Assessment, Ecological Risk Assessment)?	6/18/2021	The CERCLA site is identified as CC-MPS-2009. Fort Belvoir DPW coordinates with VDEQ for continued regulatory compliance. Land use restrictions include vapor intrusion protection for enclosed structures. Restrictions are based on a risk assessment from remedial investigation of the groundwater.
25	Jennifer Davis, Northern Regional Office (NRO)	Virginia DEQ		Page 38	Lines 1100-1127	Is there potential Brindle Shiner habitat?	6/18/2021	Habitat for the brindle shiner includes warm, slow creeks and rivers, ponds, lakes, and impoundments around submerged aquatic vegetation; however, it may no longer be found in the Rappahannock, Chowan, or Potomac drainages. The project site occurs within the Potomac watershed. Therefore, presence of the brindle shiner is highly unlikely.
26	Jennifer Davis, Northern Regional Office (NRO)	Virginia DEQ	3.4.2			3.4.2 notes FBNA is part of the MMRP due to historic mine warfare, material testing, research & development, and activities at ten closed ranges. What CERCLA site(s) represent the MMRP areas; what are the continuing agreements with regulatory entities (e.g. EPA, VDEQ); and, what agencies is responsible for continued regulatory coordination and remediation funding? What are the LUCs cited in the FFS; what capabilities does the Fort or other local element have for UXO/MMRP response and demilitarization; what environmental/safety/risk management requirements are there for intrusive construction activities including testing/reuse/disposal of construction spoils?	6/18/2021	The FBNA Munitions Response Area (MRA) is identified as FTBL-005-R-01. DPW coordinates with VDEQ for regulatory compliance. CERCLA is the regulatory driver, in which DERP (Defense Environmental Restoration Program) funds can be used for the cleanup. Munitions clearance would be conducted prior to initiation of construction, with construction support personnel on standby during construction itself.
27	Jennifer Davis, Northern Regional Office (NRO)	Virginia DEQ		Page 50	Lines 1528-1529	What specific MMRP items have been identified at this site, either through clearing performed 2003-2010 for the FFCP right-of-way or other activities? What type of screening has been required? And, what have the timelines for regulatory approval been for intrusive/construction activities?	6/18/2021	Refer to Table 3-1, Previous Investigations, in the Final RI/FFS dated, January 2021
28	Janine Howard	Environmental Impact Review Coordinator, Virginia Department of Environmental Quality			1(c) and 1(d)	The VWP program at the DEQ Northern Regional Office (NRO) recommends the avoidance and minimization of surface water impacts to the maximum extent practicable. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs). A VWP permit may be required for impacts to surface waters and wetlands. The Army should contact DEQ-NRO VWP staff to determine the need for any permits prior to commencing work.	24-Aug-21	Impacts to jurisdictional waters will be avoided and minimized to the extent practicable. All applicable permits will be obtained.
29	Janine Howard	Environmental Impact Review Coordinator, Virginia Department of Environmental Quality			3c	Denuded areas should be promptly revegetated following construction work. Consider utilizing permeable paving for parking areas and walkways, where appropriate. The project will be consistent to the maximum extent practicable with the Nonpoint Source Water Pollution enforceable policy of the Virginia CZM Program, provided the activities comply with the above requirements (referenced in Section 3(b) of the DEQ letter dated August 24, 2021), and applicable permits are obtained as necessary.	8/24/2021	Noted. All applicable permits will be obtained. An Erosion and Sediment Control Plan will be developed to reduce any potential for erosion of denuded soils during construction.
30	Daniel Moore	Principal Environmental Planner, Department of Environmental Quality			5(d)	Pending additional information regarding the reason for the small area of RPA encroachment referenced above (with appropriate mitigation efforts activated to offset any negative impacts to water quality that may result from that encroachment), and adherence to the performance criteria referenced in the Regulations (specifically the minimization of land disturbance and impervious cover and the preservation of indigenous vegetation), the project will be consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy of the Virginia CZM Program (see Paragraph 5(c) in the August 24, 2021 letter for additional information).	8/24/2021	The small area of RPA encroachment is associated with the perimeter security fence for the complex. The perimeter fence would tie into the existing NGA security fence in the southwest portion of the project site. During design of the Proposed Action, all pracitcalbe efforts to avoid and/or minimize encroachment into the RPA will be made and all applicable permits obtained for unavoidable impacts.

31	DEQ	AirCompliance/ Permitting			6c and 6d	The project should evaluate all potential sources of air emissions for the facility, including but not limited to boilers, generators, and cooling towers, and submit an application for a permit if necessary. The permit must be obtained prior to construction. Take precautions to limit the emissions of VOCs and NOx during construction, principally by controlling or limiting the burning of fossil fuels.	8/24/2021	The final design will identify specific HVAC systems and capacities. The emissions from these systems will be accounted for in updates to existing air permits, or, if required, a new permit. Such permit modifications or new permits would be applied for and obtained prior to facility construction.
32	DEQ					The project manager is reminded that during the construction phases that occur with this project; the project is subject to the FugitiveDust/Fugitive Emissions Rule 9 VAC 5-50-60 through 9 VAC5-50-120. In addition, should any open burning or use ofspecial incineration devices be employed in the disposal of land clearingdebris during demolition and construction, the operation would be subject tothe Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC5-130-100.	8/24/2021	Open burning would not occur under construction or operation of the Proposed Action. Fugitive dust/fugitive emissions would be minimized by implementing BMPs required under the soil and erosion control plan.
33	DEQ				7d	DEQ recommends that the Army implement pollution prevention principles, including the reduction, reuse, and recycling of all solid wastes generated. All generation of hazardous wastes should be minimized and handled appropriately. The DEQ's PC cases identified above should be further evaluated by the project engineer or manager to establish the exact location, nature and extent of the releases and the potential for them to impact the proposed project. In addition, the project engineer or manager should contact the DEQ's Northern Regional Office at (703) 583-3800 (Tanks Program) for further information about the PC case.	8/24/2021	Comment noted. The Army implements pollution prevention controls and these would be incorporated into the design, construction, and operation of the Proposed Action.
34	Roberta Rhur, Environmental Impact Review Coordinator	Department of Conservation and Recreation			9c	Contact DCR-DNH to secure updated information on natural heritage resources if the scope of the project changes and/or six months has passed before it is utilized. New and updated information is continually added to the Biotics Data System.	8/24/2021	Comment noted. The Army would contact DCR-DNH for information on natural heritage resources should the Proposed Action scope change in the future.
35	Roberta Rhur, Environmental Impact Review Coordinator	Department of Conservation and Recreation			10b	For federal projects, the applicant/developer is encouraged reach out to the local floodplain administrator and comply with the community's local floodplain ordinance.	8/24/2021	The Proposed Action is not within a county or FEMA identified floodplain; however, the proponent and Fort Belvoir will commit to implement all recommendations to the extent appropriate and practicable, with the understanding that the federal government is not mandated to follow local regulations but does so as a means of supporting consistency in community planning and natural resource protection.
36	Marc Holma, Architectural Historian	Department of Historic Resources (DHR)			11c	No historic properties will be affected by the project. Should unidentified historic properties be discovered during implementation of the project, notify DHR.	8/23/2021	Noted.
37	Amy Martin, Environmental Services Biologist	Department of Wildlife Resources (DWR)				DWR provided recommendations that can be found in the August 24, 2021 DEQ letter (Appendix A) as a consulting agency pursuant to the U.S. Fish and Wildlife Coordination Act.	8/24/2021	The proponent and Fort Belvoir acknowledge these recommendations were provided to minimize overall impacts from development on wildlife and natural resources. The proponent and Fort Belvoir are committed to implementing the recommendations as appropriate and practicable.
38	Kelly Atkinson, Chief, Environment and Development Review Branch	Department of Planning and Development, Fairfax County				Fairfax County provided recommendations, enclosed as part of the DEQ's CZM Consistency Determination review and response letter dated August 24, 2021 (see Appendix A).	8/24/2021	The proponent and Fort Belvoir will commit to implement all recommendations to the extent appropriate and practicable, with the understanding that the federal government is not mandated to follow local regulations but does so as a means of supporting consistency in community planning and natural resource protection.

APPENDIX B – AIR QUALITY RECORD OF NON-APPLICABILITY

GENERAL CONFORMITY – RECORD OF NON-APPLICABILITY

Project/Action Name:	**DIA HQ Annex Facility**
Project/Action Point of Contact:	**Connie Ramsey (410) 209-7589 Baltimore District, Corps of Engineers**
Begin Date (Anticipated): May 2024	**End Date (Anticipated): February 2026**

The Proposed Action involves the construction of the headquarters annex building within Fort Belvoir's North Area (FBNA), in the vicinity of the National Geospatial-Intelligence Agency (NGA) complex. The proposed headquarters annex building would be approximately 116,080 SF and would include a multi-story administrative building with offices, cubicles/workstations, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, café/cafeteria and gym/fitness center, and a parking structure, all on a 12.5-acre site, to support stationing of approximately 650 personnel.

<u>Emissions for Building Construction:</u>

Volatile Organic Compounds (VOC)	3.51 tons per year (tpy)(1)
Nitrogen Oxides (NO_x)	34.11 tpy
Sulfur Oxides (SO_x)	2.64 tpy
Carbon Monoxide (CO)	18.61 tpy
Particulate Matter Less than 2.5 µm ($PM_{2.5}$)	34.77 tpy

(1) Values were obtained by dividing the calculated total emissions by 2, assuming a construction window of approximately 2 years, to obtain the tons per year (tpy) value.

<u>Emissions for Building Operation (Generator):</u>

Volatile Organic Compounds (VOC)	0.22 tons per year (tpy)(2)
Nitrogen Oxides (NO_x)	8.05 tpy
Sulfur Oxides (SO_x)	0.004 tpy
Carbon Monoxide (CO)	1.84 tpy
Particulate Matter Less than 2.5 µm ($PM_{2.5}$)	0.24 tpy

(2) Calculations performed using a conservative estimate of 500 hours of run-time per year at maximum output.

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project/action because the highest annual emissions from this project/action have been estimated to be under the applicability thresholds as below:

Conformity Threshold Rate

VOC	50 tpy
NO_x	100 tpy
SO_x	100 tpy
CO	100 tpy

$PM_{2.5}$ 100 tpy

Supporting documentation and emissions estimates are attached.

Wilamena G Harback

Wilamena Harback
Chief, Environmental Division

24 June 2021
Date

Joshua P. SeGraves
Colonel, US Army
Commanding

13 JUL 2021
Date

RECORD OF NON-APPLICABILITY (RONA)
SUPPORTING DOCUMENTATION
For DIA HQ Annex Facility

The purpose of this documentation is to support General Conformity applicability determinations under the Clean Air Act, Section 176 for the Defense Intelligence Agency (DIA) Headquarters (HQ) Annex located on Fort Belvoir, Fairfax County, Virginia. This document provides an estimate of worst-case emissions from the proposed construction and operation of a 6-story administration building with an associated parking garage. The emission estimates for which this documentation was developed were based on the following assumptions:

<u>Project Characteristics and Area Disturbed</u>

- Construction and operation of a 6-story approximately116,080 SF Command and Control Facility (C2F) building and an approximately 135,000 SF parking garage to accommodate 650 personnel.

- A total of approximately 12.5 acres will be cleared and grubbed.

- The LOD will be cleared of all vegetation, topsoil, and unsuitable material in order to prepare the site for construction. Topsoil will be reserved for use in final grading of the site.

- As construction activities will occur throughout the project to varying degrees, a project duration of approximately 510 days (2 years) was used.

<u>Contractor and Equipment Assumptions</u>

- Assumed sixty contractor staff would be on-site for 510 working days to complete this work. Approximately 60% would commute to the site each day in a light duty diesel truck, with a round trip of 30 miles.

- Assumed 6 heavy duty diesel trucks would come to the site (again, 30 mile roundtrip) each construction day, to mobilize and demobilize the equipment.

- Assumed durations of operation for heavy equipment are explicitly identified in the enclosed spreadsheet where air emissions are quantified for this project. This includes the following:

    - Estimated equipment to be used includes skid steer (bobcat), cement mixers, plate compactors, lifts, excavators, backhoes, asphalt pavers, paving equipment, graders, scrapers, cranes, and dumpers/tenders. To develop a conservative estimate, it was assumed that 9 skid steers would be used 8 hours a day for one year, and one scraper and one crane would be used 8 hours a day for one year.

Also, it was assumed 6 each of the remaining equipment would be used for 8 hours a day for two years.

Project Duration

- Assumed to be 510 working days, or two years, which will dictate contractor travel to the site, and the number of 8-hour days over which fugitive dust emissions will be generated as a result of the work performed.

- Operational emissions will result from the project (i.e., permanent air emissions sources from the generator).

Emissions

The emission calculations to quantify these values are presented in the following tables, and were performed using methodology and information provided in the *Air Emissions Guide for Air Force Mobile Sources, U.S. Air Force Installations, 2020, Air Emissions Guide to Air Force Transitory Sources, 2016, and Air Emissions Factor Guide to Air Force Stationary Sources, 2020.*

Emissions for Building Construction:

Volatile Organic Compounds (VOC)	3.51 tons per year (tpy)[(1)]
Nitrogen Oxides (NO_x)	34.11 tpy
Sulfur Oxides (SO_x)	2.64 tpy
Carbon Monoxide (CO)	18.61 tpy
Particulate Matter Less than 2.5 µm ($PM_{2.5}$)	34.77 tpy

[(1)] Values were obtained by dividing the total calculated construction emissions by 2, assuming a construction window of approximately 2 years, to obtain the tons per year (tpy) value.

Emissions for Building Operation (Generator):

Volatile Organic Compounds (VOC)	0.22 tons per year (tpy)[(2)]
Nitrogen Oxides (NO_x)	8.05 tpy
Sulfur Oxides (SO_x)	0.004 tpy
Carbon Monoxide (CO)	1.84 tpy
Particulate Matter Less than 2.5 µm ($PM_{2.5}$)	0.24 tpy

[(2)] Calculations performed using a conservative estimate of 500 hours of run-time per year at maximum output.

Conformity Threshold Rate

VOC	50 tpy
NO_x	100 tpy
SO_x	100 tpy
CO	100 tpy
$PM_{2.5}$	100 tpy

$PM_{2.5}$ is some fraction of PM_{10} and to be conservative, it was assumed that PM_{10} is equal to $PM_{2.5}$ where a $PM_{2.5}$ emission factor was not available. Therefore, if the predicted PM_{10} emissions do not exceed regulatory thresholds, then neither will $PM_{2.5}$. Fugitive dust emissions are presented as PM_{10} in the emission calculations.

Construction Equipment Air Quality Emissions Factors

Diesel Equipment	Average Rated HP[1]	Loading Factors[2]	Emissions Factors (lbs/hr)[3]						GHG[3]
			CO	NOx	VOC	PM_{10}	$PM_{2.5}$	SOx	CO_{2e}
Asphalt Pavers	91	59%	0.26	0.58	0.05	0.05	0.05	0.05	65.20
Plate Compactors	8	43%	0.03	0.05	0.01	0.01	0.01	0.00	4.47
Concrete Pavers	130	59%	0.37	0.82	0.07	0.07	0.06	0.06	93.14
Rollers	99	59%	0.34	0.65	0.06	0.06	0.06	0.05	72.07
Scrapers	311	59%	0.86	2.01	0.12	0.12	0.12	0.15	217.15
Paving Equipment	99	59%	0.37	0.68	0.07	0.06	0.06	0.05	71.68
Signal Boards	6	43%	0.02	0.03	0.01	0.00	0.00	0.00	3.34
Trenchers	60	59%	0.28	0.42	0.05	0.05	0.05	0.03	45.08
Bore/Drill Rigs	209	43%	0.49	1.38	0.12	0.10	0.09	0.08	106.96
Excavators	183	59%	0.40	1.08	0.08	0.08	0.07	0.09	129.00
Concrete/Indust. Saw	56	59%	0.29	0.39	0.05	0.05	0.05	0.03	43.11
Cement Mixers	11	43%	0.03	0.07	0.01	0.01	0.01	0.00	5.89
Cranes	194	43%	0.25	1.01	0.07	0.05	0.05	0.07	139.10
Graders	172	59%	0.34	1.02	0.08	0.07	0.07	0.08	120.29
Off-Highway Trucks	489	59%	1.06	3.25	0.18	0.16	0.16	0.24	341.43
Crushing/Proc Equip.	127	43%	0.23	0.69	0.05	0.04	0.04	0.05	126.38
Rough Terrain Lifts	93	59%	0.40	0.64	0.07	0.07	0.06	0.05	85.99
Rubber Tired Loaders	158	59%	0.45	1.10	0.08	0.08	0.07	0.08	143.93
Tractor/Loader/Backhoe	77	21%	0.24	0.25	0.06	0.04	0.04	0.02	37.09
Crawler Tractors/Dozer	157	59%	0.42	1.03	0.07	0.07	0.07	0.08	110.23
Skid Steer Loader	42	21%	0.17	0.14	0.04	0.03	0.03	0.01	13.62
Off-Highway Tractor	214	59%	0.77	1.64	0.12	0.11	0.10	0.10	258.30
Dumpers/Tenders	23	21%	0.09	0.08	0.02	0.02	0.01	0.01	11.46
Forklifts	83	59%	0.32	0.49	0.04	0.04	0.05	0.04	61.49
Other Const. Equip.	161	59%	0.61	1.24	0.09	0.09	0.08	0.08	112.59

Note: Emissions Factors in lb/1000 HP-hr from Table 4-1 of the Air Emissions Guide for Air Force Mobile Sources, U.S. Air Force Installations, 2020, converted to lbs/hr using the conversion equation:
Average Rated HP X Loading Factors X Emission Factors (lb/1000 HP-hr) /1,000

Fugitive Dust from Site Preparation for DIA HQ Annex Facility

Description:	
Total disturbed area (square feet):	544,500
Total disturbed area (acres):	12.5
Assumed number of 8-hr work days:	255

Equation for Fugitive Dust Emissions (PM_{10})

E_{PM10} (lb/yr) = 20 (lb/acre day) * GA (acres) * WD (days)

Where:

20 = factor converting acre-day to lb
GA = grading area (acres)
WD = work days

Calculation

E_{PM10} =	63,750	lb/yr
	3.19E+01	tpy

Assumptions

1. Construction and operation of an approximately 116,080 square foot operations building. The limits of disturbance (LOD) will be minimized to reduce erosion and sediment control requirements. A total of approximately 12.5 acres will be cleared and grubbed. The LOD will be cleared of all vegetation, topsoil, and unsuitable material in order to install the perimeter trail. Topsoil will be reserved for use in final grading of the site.

2. It was assumed that the majority of the site preparation work would be completed within the first 6 months of construction, approximately 127.5 hours which were rounded up for a conservative estimate.

3. It was conservatively assumed that PM_{10} = $PM_{2.5}$.

Source of Equation

Air Emissions Guide to Air Force Transitory Sources, July 2016, Section 4, Equation 4.4.

Personal Vehicle Emissions for DIA HQ Annex Facility

Personal Vehicles	Number of Vehicles	Calendar Years	Emissions Factors (grams/mile)						
			CO	NOx	VOC	PM_{10}[1]	$PM_{2.5}$[1]	SOx	CO_{2e}
Heavy Duty Diesel Trucks	6	2024 & 25	1.628	4.498	0.412	0.146	0.134	0.013	1483.312
Light Duty Diesel Trucks	36	2024 & 25	4.046	0.336	0.217	0.007	0.006	0.004	425.412

Personal Vehicles	Number of Days	Number of Vehicles	Miles/Day	Emissions (lbs/year)						
				CO	NOx	VOC	PM_{10}[1]	$PM_{2.5}$[1]	SOx	CO_{2e}
Heavy Duty Diesel Trucks	255	6	30	164.74	455.16	41.69	14.774	13.560	1.316	150100.4
Light Duty Diesel Trucks	255	36	30	2456.55	204.00	131.75	4.25	3.643	2.429	258291.6

Assumptions:

- Up to 60 contractors on-site on any one day, approximately 60% driving light duty diesel trucks.
- Assume 6 heavy duty trucks for material and equipment hauling for the duration of the project.
- The project duration is approximately 510 days, which is two years of work. The value of 510/2 (=255) is used to obtain lbs/year.
- Average round trip is 30 miles/day.

Source: Emissions factors and methodology from Air Emissions Factor Guide to Air Force Mobile Sources, June 2020, Section 5, Table 5-20.

Note: [1] $PM_{10/2.5}$ factors derived from combining PM combustion and fugitive emission factors on paved surfaces (EF Combustion + EF Fugitive). The PM_{10} and $PM_{2.5}$ fugitive emission factors for diesel trucks (both light and heavy duty) are 0.058 and 0.014 grams/mile, respectively. The calendar year 2021 combustion emission factors (grams/mile) from the Air Force guidance, Table 5-20 (On-Road Vehicle Emission Factors - 2021) are being used in the emissions calculation. The fugitive emission factors will remain unchanged.

Operational Emissions (Generator) – DIA HQ Annex Facility

Pollutant	Emissions Factor lb/hp-hr (2)	PTE Rates(4)	
		(lb/yr)	(tpy)
DIA HQ Annex Facility Emergency Generator (1)			
$PM/PM_{10}/PM_{2.5}$ (3)	7.00E-04	4.69E+02	0.235
NO_X	2.40E-02	1.61E+04	8.046
VOC	6.42E-04	4.30E+02	0.215
CO	5.50E-03	3.69E+03	1.844
SO_2	1.21E-05	8.11E+00	0.004
CO_2e	1.16E+00	7.78E+05	388.890

Total Air Emissions – DIA HQ Annex Facility

Construction Equipment	Usage (hrs)	Emissions (lbs) CO	NOx	VOC	PM$_{10}$	PM$_{2.5}$	SOx	CO$_{2e}$ (tpy)
Asphalt Pavers (Paving)	12240	3,128.11	7,044.82	591.45	578.31	552.02	552.02	399.02
Plate Compactors (Soil/Stone Compaction)	12240	417.69	631.16	102.32	72.42	70.74	37.90	27.36
Concrete Pavers (Large Concrete Placement)		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rollers (Soil/Stone/Paving Compaction)	12240	4,132.34	7,928.67	722.09	707.79	693.49	614.85	441.07
Scrapers (Soil relocation)	2,336	2,014.57	4,706.39	282.90	291.47	282.90	351.48	253.63
Paving Equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Signal Boards		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trenchers (Pipe/Utility Trenching)		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bore/Drill Rigs		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Excavators (Dig Holes)	12240	4,955.82	13,255.17	991.16	938.30	898.66	1,110.10	789.47
Concrete/Indust. (Saw Line Cutting)		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cement Mixers (Mixes Concrete Ingredients)	12240	415.11	914.17	104.79	78.16	75.26	49.79	36.05
Cranes	2,336	588.50	2,350.12	163.69	124.72	120.82	159.79	162.47
Graders (Push soils to make flat)	12240	4,136.24	12,483.26	931.59	844.64	819.80	1,018.53	736.17
Off-Highway Trucks (Huge Dump Truck)		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crushing/Proc. Equipment (Stone Crusher or Washer)		0.000	0.000	0.000	0.000	0.000	0.000	0.00
Rough Terrain Lifts (Either a man lift or material lift)	8160	3268.496	5243.026	550.719	541.764	523.855	394.010	350.84
Rubber-Tired Loaders (Dump Truck Loader)		0.000	0.000	0.000	0.000	0.000	0.000	0.00
Tractor/Loader/Backhoe	12240	2897.561	3089.544	676.889	467.093	449.280	199.900	226.99
Crawler Tractors/Rubber Tired Dozer (Farm Tractor and Dirt Pusher)		0.000	0.000	0.000	0.000	0.000	0.000	0.00
Skid Steer Loader (Big Tired Fork Lift/Bobcat)	21024	3630.752	2968.761	899.344	576.693	560.004	196.558	143.17
Off-Highway Tractor (Huge Equipment/Think Quarry Equipment)		0.000	0.000	0.000	0.000	0.000	0.000	0.00
Dumpers/Tenders (Concrete Delivery Vehicle)	12240	1107.894	971.328	296.187	183.861	177.358	61.484	70.14
Forklifts	12240	3896.053	5975.946	539.454	539.454	557.435	527.466	376.32
Other Construction Equipment		0.000	0.000	0.000	0.000	0.000	0.000	0.00
Site Preparation (Tree/Overgrowth Removers)	-	-	-	-	63750.00	63750.00		
POVs - Contractors	-	2621.296	659.169	173.444	19.024	17.203	3.744	204.20
Total - Construction Phase (tons per year)		**18.61**	**34.11**	**3.51**	**34.86**	**34.77**	**2.64**	**4216.89**
Generators (**Operation Phase**) (tpy)		1.844	8.046	0.215	0.235	0.235	0.004	388.89

Estimated equipment to be used includes skid steer (bobcat), cement mixers, plate compactors, lifts, excavators, backhoes, asphalt pavers, paving equipment, graders, scrapers, cranes, and dumpers/tenders. To develop a conservative estimate, it was assumed that 9 skid steers would be used 8 hours a day for one year. Also, it was assumed 6 each of the remaining equipment would be used for 8 hours a day for two years.

Source: The above estimates were calculated using the methodology and information provided in the Air Emissions Guide for Air Force Mobile Sources, U.S. Air Force Installations, 2020, Air Emissions Guide for Air Force Transitory Sources, 2016, and Air Emissions Factor Guide to Air Force Stationary Sources, 2020.

APPENDIX C – COASTAL ZONE FEDERAL CONSISTENCY DETERMINATION

APPENDIX C
Determination of Consistency with Virginia's Coastal Resources Management Program

This document provides the Commonwealth of Virginia with the Fort Belvoir Consistency Determination under the Coastal Zone Management Act Section 307(c)(1) and 15 CFR Part 930, Subpart C, for the Defense Intelligence Agency (DIA) Headquarters Annex on Fort Belvoir North Area, Fort Belvoir, Virginia. The information in this Consistency Determination is provided pursuant to 15 CFR §930.39.

This document represents an analysis of project activities in light of established Virginia Coastal Resources Management Program (CRMP) Enforceable Policies and Programs. Furthermore, submission of this consistency determination reflects the commitment of the U.S. Department of the Army (Army) to comply with those Enforceable Policies and Programs. The Proposed Action would be implemented in a manner that is consistent with the Virginia CRMP. The Army has determined that the construction and operation of the DIA HQ Annex would have a negligible impact on any land and water uses or natural resources of the Commonwealth of Virginia's coastal zone.

C1 Description of Proposed Action

The Proposed Action involves the construction of the HQs Annex building within Fort Belvoir's North Area (FBNA), in the vicinity of the National Geospatial-Intelligence Agency (NGA) complex (see Figure 2-1). The proposed headquarters annex building would be approximately 116,080 SF and would include a multi-story administrative building with offices, cubicles/workstations, publications rooms, conference rooms, break rooms, server rooms, a multi-purpose auditorium, café/cafeteria and gym/fitness center, and a utility plant, stormwater management facility, visitor control center, visitor parking, a secured employee parking structure, and a perimeter security fence, all to support stationing of approximately 650 personnel.

C2 Assessment of Probable Effects

Fort Belvoir has prepared an Environmental Assessment (EA) to evaluate the potential environmental impacts from the DIA HQ Annex in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code 4321-4347), and 32 Code of Federal Regulations (CFR) Part 651, Environmental Analysis of Army Actions.

The Army intends to obtain all applicable permits required for implementation of the Proposed Action alternative. A review of the permits and/or approvals required under the enforceable policies is being conducted. The Army has evaluated the construction of the headquarter annex building for its foreseeable effects on the following enforceable policies:

Fisheries – The Proposed Action alternative has no foreseeable impacts on fish or shellfish resources and would not affect the promotion of, or access to, commercial or recreational fisheries.

The proposed site is located approximately 4.5 miles northwest of the Potomac River and approximately 0.25 miles east of Accotink Creek. The closest water features near the proposed site are an unnamed tributary to Accotink Creek and associated riparian wetlands. Compliance with the installation's Municipal Separate Storm Sewer System (MS4) Permit and the Virginia Erosion and Sediment Control regulations would minimize the risk of sediment being transported off the site to the Potomac River Fishery. Best management practices recommended by the Virginia Departments of Conservation and Recreation (DCR) and Forestry (DOF) would be employed when necessary.

Subaqueous Lands Management – The Virginia Marine Resources Commission (VMRC), pursuant to Virginia Administrative Code (VAC) Section 28.2-1204, has jurisdiction over encroachments in, on, or over any State-owned rivers, streams and creeks. The project would have no foreseeable impacts on subaqueous resources.

Tidal and Non-tidal Wetlands Management – The Proposed Action alternative would not affect any tidal wetlands. Potential impacts to approximately 0.02 acres of non-tidal wetlands within the southwest portion of the project area would be avoided, minimized and, if necessary, mitigated in accordance with applicable Virginia laws.

Dunes Management – The Proposed Action alternative would not affect any coastal primary sand dunes.

Non-Point Source Water Pollution Control – Typically, a Proposed Action that is greater than 2,500 square feet would require an erosion and sediment control (ESC) plan and a stormwater management plan to be developed. The ESC plan would include temporary erosion and sediment control measures. The ESC plan and stormwater management plan would be prepared utilizing the requirements for water quality and quantity found in the Virginia Technical Criteria Part IIB (9VAC25-870-62 through 9VAC25-870-92). The Proposed Action disturbance of soil is approximately 7 acres, therefore an ESC plan and stormwater management plan are required. A construction general permit in accordance with 9VAC25-830-130 would also be required. Minor short-term adverse impacts would occur from the Proposed Action on surface water with regard to water quality. Appropriate temporary erosion and sediment control measures and stormwater Best Management Practices (BMP) will be employed to minimize impacts to water quality from earth disturbance and potential erosion during construction.

Point Source Water Pollution Control – The Proposed Action would not result in point source water discharge.

Shoreline Sanitation – The Proposed Action is not located on or near a shoreline. The Proposed Action alternative would therefore have no impact on shoreline sanitation.

Air Pollution Control – The proposed site is located within an ozone (O_3) non-attainment area, triggering the need to analyze emissions and determine the applicability of General Conformity Rule under the Clean Air Act (CAA). A construction emissions estimate indicates that construction and operation activity would not generate sufficient emissions to trigger a need for a full General Conformity Analysis.

The estimated emissions associated with the construction and operation of this project are very low. The temporary impacts to air quality would be minor, short-term impacts that are not regionally or locally significant.

Coastal Lands Management –Resource Protection Areas (RPAs) are associated with Accotink Creek, its tributaries, and its associated tidal and non-tidal wetlands. Minor, short-term adverse impacts to the RPAs associated with an unnamed tributary to Accotink Creek and the adjacent riparian, non-tidal wetlands are anticipated in the project area (Figure 3-3). Avoidance and minimization of impacts to this area will be fully considered as the project design progresses. Any unavoidable impacts will be addressed through applicable permitting pursuant to Section 404 of the Clean Water Act and the Virginia Water Protection Permit Program (9 Virginia Administrative Code [VAC] 25-210-10 et seq.). Appropriate temporary erosion and sediment control measures and stormwater BMPs will be employed at the construction site to minimize downstream impacts to Accotink Creek from earth disturbance associated with construction activities.

C3 Summary of Findings

Based on the above analysis, which is elaborated on in the EA, Fort Belvoir personnel would: (1) ensure that the construction contractor uses and maintains appropriate temporary erosion and sediment controls; and (2) obtain the requisite permits and approvals. Fort Belvoir finds that the proposed HQs Annex construction is fully consistent to the maximum extent practicable with the federally approved enforceable provisions of Virginia CRMP, pursuant to the Coastal Zone Management Act of 1972, as amended and in accordance with 15 CFR 930.30.

Pursuant to 15 CFR Part 930.41, the Virginia Coastal Resources Management Program has 60 days from receipt of this letter in which to concur with or object to this Consistency Determination, or to request an extension, in writing, under 15 CFR Part 930.41(b). Virginia's concurrence will be presumed if its response is not received by Fort Belvoir on the 60th day from receipt of this determination. The state's response should be sent to U.S. Army Garrison Fort Belvoir, 9430 Jackson Loop, Suite 200, Fort Belvoir, VA 22060-5116.

____

Joshua P. SeGraves
Colonel, US Army
Commanding

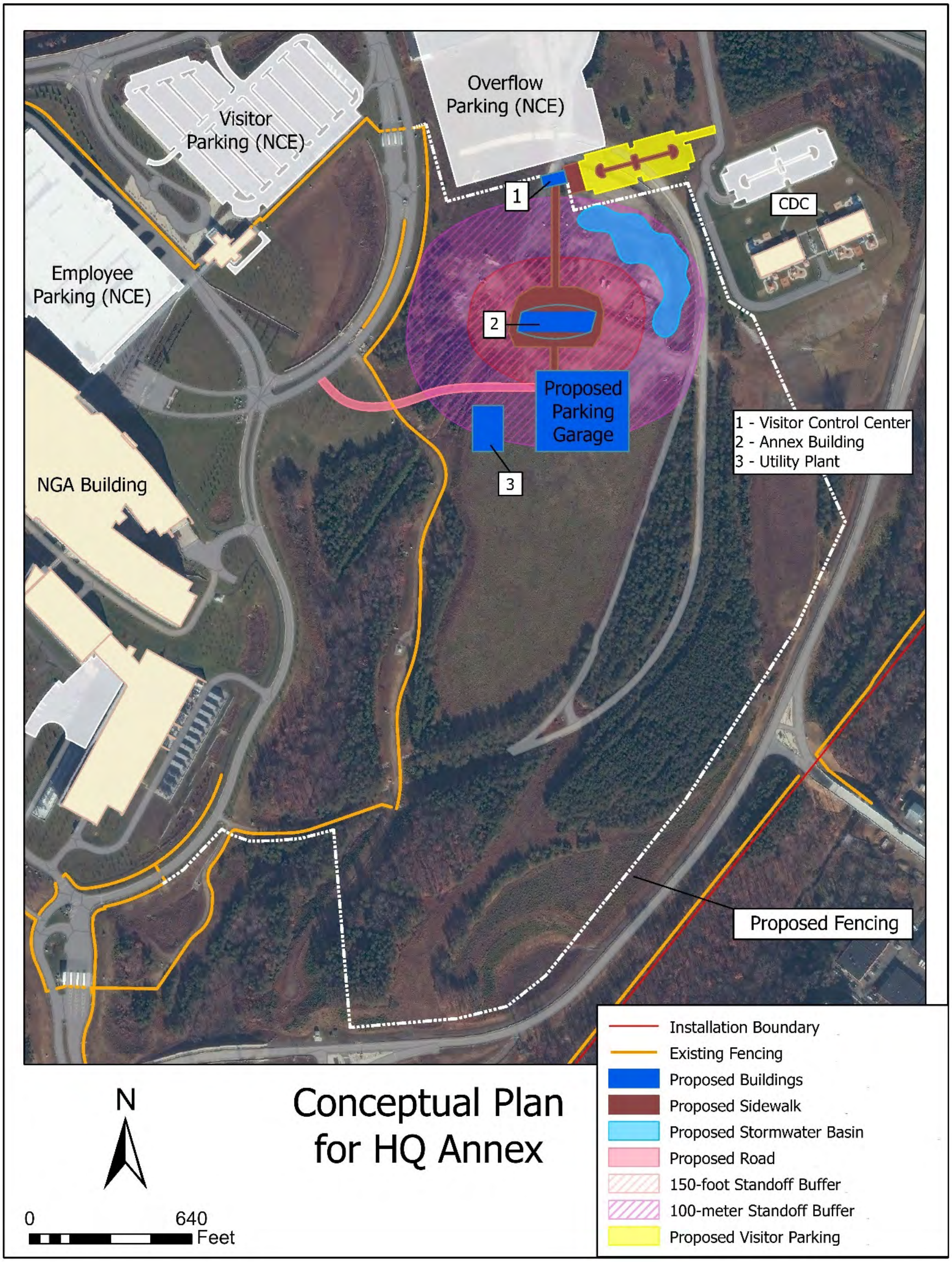

Figure 2-1: DIA HQ Annex Project Overview

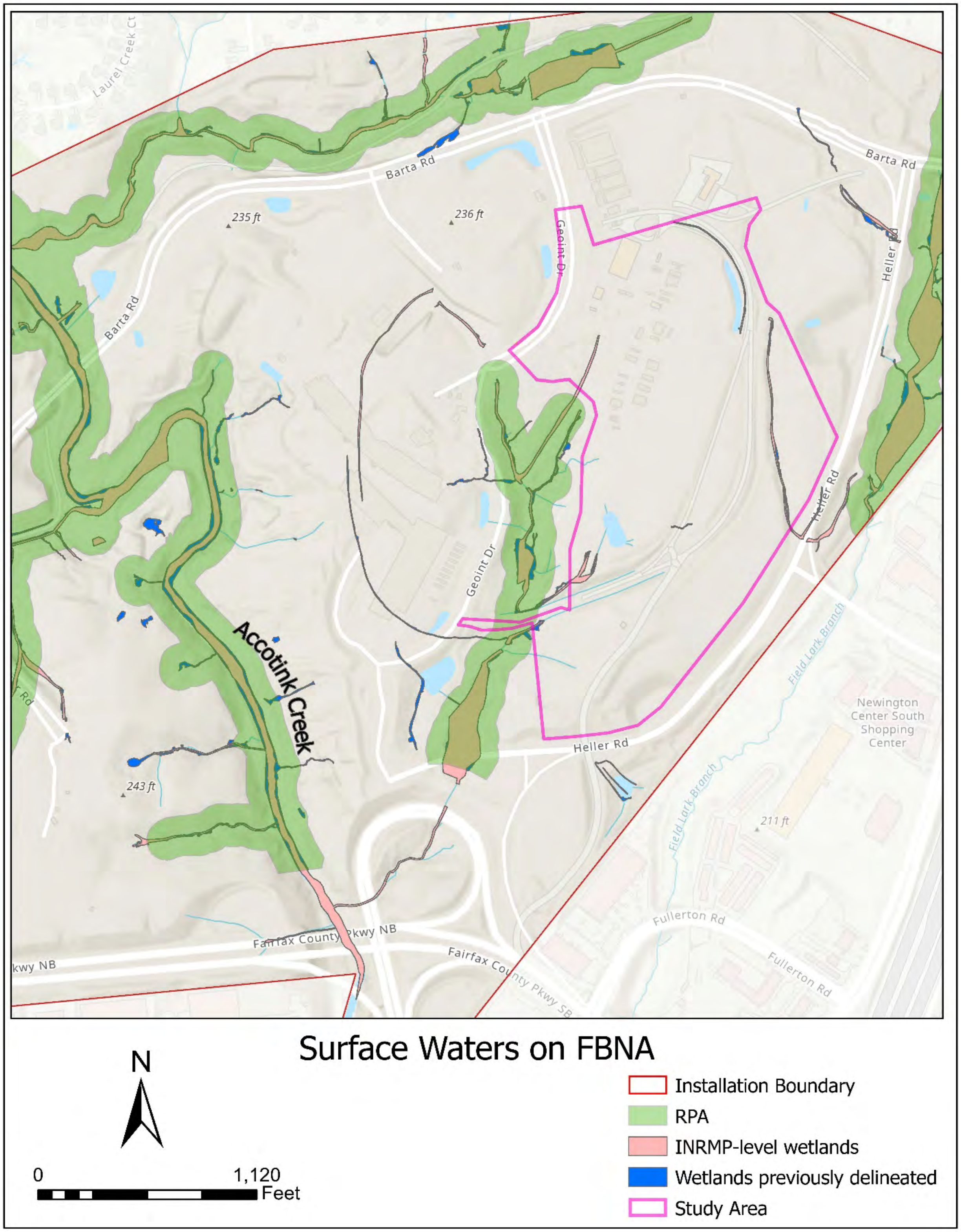

Figure 3-3 Surface Waters on FBNA

APPENDIX D – TRAFFIC IMPACT STUDY

HDR
A JOINT VENTURE
TEHAMA

US Army Corps
of Engineers
Baltimore District

Traffic Impact Study to Support National Environmental Policy Act Documentation for DIA HQ Annex

REVISED DRAFT

Fort Belvoir, Virginia

Contract No. W912DR-20-D-0010
Task Order W912DR21F0071

June 2021

HDR
TEHAMA

Traffic Impact Study to Support National Environmental Policy Act Documentation for DIA HQ Annex

Fort Belvoir, Virginia

Prepared for:
US Army Corps of Engineers
Baltimore District

Under contract with:
U.S. Army Corps of Engineers

Brad Loomis
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Contract W912DR-20-D-0010
Task Order W912DR21F0071
Tehama Project F0133.01

Date:
23 June 2021

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ACRONYMS AND ABBREVIATIONS

ATR	Automated Traffic Recorder
DIA	Defense Intelligence Agency
EBL	Eastbound Left
EBR	Eastbound Right
EBT	Eastbound Thru
Ex	Existing
Ft	Foot
HCM	Highway Capacity Manual
HQ	Headquarters
LOS	Level of Service
NBL	Northbound Left
NBR	Northbound Right
NBT	Northbound Thru
NGA	National Geospatial-Intelligence Agency
PE	Professional Engineer
s	Seconds
SBL	Southbound Left
SBR	Southbound Right
SBT	Southbound Thru
TIS	Traffic Impact Study
TMC	Turning Movement Count
USACE	United States Army Corps of Engineers
veh	Vehicle
v/c	volume to capacity
WBL	Westbound Left
WBR	Westbound Right
WBT	Westbound Thru

EXECUTIVE SUMMARY

This Traffic Impact Study (TIS) study presents the traffic operational analysis results at two (2) alternative locations in order to accommodate the proposed construction and operation of a new 155,000 square foot Defense Intelligence Agency (DIA) Headquarters (HQ) Annex building with an associated parking structure. Approximately 650 additional personnel will be employed at the new site. The traffic study focused on roadways providing access to the two alternative sites:

- **Alternative 1 on Fort Belvoir North Area (FBNA)**
- **Alternative 2 within the 1400 Area East district of the Fort Belvoir Main Post.**

Traffic data was collected at sixteen (16) locations to support the development of the traffic impact study (TIS). Both turning movement counts (TMCs) at the major intersections (10 locations) and automatic traffic recorders (ATRs) at select ramps and entrance/exit lanes (6 locations) were collected. In addition, security gate entry data was requested for the time period prior to decreased site reporting conditions (early 2020) and January of 2021. This gate entry data was used to estimate and generate Adjusted No-Build volumes for pre-COVID conditions.

Level of Service Standards

Level of service is a qualitative measure describing operational traffic conditions, and the perception of these conditions by drivers or passengers. These conditions include factors such as speed, delay, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. Levels of service are given letter designations from A to F, with LOS A representing the best operating conditions (free flow, little delay) and LOS F, the worst (congestion, long delays). Generally, LOS A and B are considered high level of service, LOS C and D are considered moderate, and LOS E and F are considered low. In general, the standards are LOS D in urban areas and LOS C in rural areas.

The results of the operational analysis using Synchro are provided below.

Table ES 1: Existing (adjusted) Intersection Operational Analysis – FBNA

Intersection	Signalized (Y/N)	AM	PM	AM	PM
		Delay (s/veh)		LOS	
Barta Road / FBNA Facilities Access	Y	1.7	1.1	A	A
West Gate Entrance	N	-	-	A	A
Barta Road / Parking Garage Exit	Y	0.0	10.4	A	B
Barta Road / Main Guest Access	N	-	-	A	A
Barta Road / GEOINT Drive	Y	5.5	13.3	A	B
Barta Road / Heller Road	Y	9.8	0.6	A	A
Barta Road / Backlick Road	Y	7.9	20.1	A	C
Heller Road / HOV Entrance Ramp	N	-	-	A	A
95 Exit Ramp / Heller Road	N	-	-	A	A
South Gate Entrance	N	-	-	A	A

As shown in the table above, all intersections are operating at LOS C or better.

Table ES 2: Existing (adjusted) Intersection Operational Analysis – Fort Belvoir					
Intersection	Signalized (Y/N)	AM	PM	AM	PM
		Delay (s/veh)		LOS	
Richmond Highway (Hwy 1) / Pohick Road	Y	25.1	36.4	C	D
Gunston Road / 1st Street	Y	11.0	33.6	B	C
Gunston Road / 3rd Street	Y	22.2	14.1	C	B
Pohick Road / Theote Road	Y	11.4	12.2	B	B
Gunston Road / Pohick Road / 12th Street	Y	19.9	24.5	B	C
Richmond Highway (Hwy 1) / Belvoir Road	Y	42.8	78.7	D	E
Belvoir Road / DeWitt Loop (N)	N	19.4	4.3	C	A
Gunston Road / Meade Road	Y	3.0	55.6	A	E

As shown in the table above, all intersections are operating at LOS E or better.

The Build scenario with 650 additional personnel was analyzed using current roadway geometrics and intersection control. No background growth was assumed for the construction year. This 'build' scenario was compared to adjusted existing 2021 volumes. A sensitivity analysis was performed using 1,000 new personnel (in lieu of 650) to determine any effects possible with increased volumes over the anticipated traffic generated from the annex construction.

Trip generation was based on one additional employee resulting in one AM trip and one PM trip and assumed all occur during the peak hours. This approach assumes no carpool trips for estimated added employees. Site entry distribution was based on traffic counts performed March 2021.

Field personnel observed the Meade and Belvoir gates opened at varying times. For modeling purposes, the analyses assumed AM entering traffic through the Belvoir Road gate and the Pohick Road gate. It also assumes that PM exiting traffic leaves the site back through the Pohick Road gate and the Meade gate. Individual analyses at critical intersections were performed to determine capacity of alternate entrance and exit routes.

The following potential operational impacts were identified.

Table ES 3: Build Condition (2021 adjusted) Intersection Operational Analysis – Alternative 1

Intersection	Signalized (Y/N)	*650 Added Personnel*				*1000 Added Personnel*			
		AM	PM	AM	PM	AM	PM	AM	PM
		Delay (s/veh)		LOS		Delay (s/veh)		LOS	
Barta Road / FBNA Facilities Access	Y	2.0	1.3	A	A	2.2	1.5	A	A
West Gate Entrance	N	-	-	A	A	-	-	A	A
Barta Road / Parking Garage Exit	Y	0.1	10.0	A	A	0.1	10.0	A	A
Barta Road / Main Guest Access	N	-	-	A	A	-	-	A	A
Barta Road / GEOINT Drive	Y	8.7	21.5	A	C	11.1	67.2	B	E
Barta Road / Heller Road	Y	11.5	3.1	B	A	12.2	2.9	B	A
Barta Road / Backlick Road	Y	8.0	21.5	A	C	20.4	20.9	C	C
Heller Road / HOV Entrance Ramp	N	-	-	A	A	-	-	A	A
95 Exit Ramp / Heller Road	N	-	-	A	A	-	-	A	A
South Gate Entrance	N	-	-	A	A	-	-	A	A

- **Alternative 1 FBNA, Adjusted Build**
    - *Build with 650 Additional Personnel* - All intersection (AM and PM) operate at **LOS B** or better with the exception of the intersection of Barta Road /Geoint Drive (**LOS C** during the PM peak hour) and Barta Road / Backlick Road (**LOS C** during the PM peak hour).
    - *Build with 1000 Additional Personnel* - All intersection (AM and PM) operate at **LOS C** or better with the exception of the intersection of Barta Road /Geoint Drive (**LOS E** during the PM peak hour).

Table ES 4: Build Condition (2021 adjusted) Intersection Operational Analysis – Alternative 2									
Intersection	Signalized (Y/N)	***650 Added Personnel***				***1000 Added Personnel***			
		AM	PM	AM	PM	AM	PM	AM	PM
		Delay (s/veh)		LOS		Delay (s/veh)		LOS	
Richmond Parkway (US 1) / Pohick Road	Y	36.2	41.1	D	D	51.1	46.2	D	D
Gunston Road / 1st Street	Y	11.3	101.5	B	F	11.2	155.7	B	F
Gunston Road / 3rd Street	Y	11.9	18.4	B	B	9.8	22.6	A	C
Pohick road / Thoete Road	Y	18.8	11.5	B	B	32.9	11.8	C	B
Gunston Road / Pohick Road	Y	23.3	44.0	C	D	36.7	71.9	D	E
Richmond Parkway (US 1) / Belvoir Road	Y	63.5	124.5	E	F	82.6	153.2	F	F
Belvoir Road / DeWitt Loop (roundabout)	N	50.3 (98.5 SB RT)	4.3	F	A	87.1 (178.4 SB RT)	4.3	F	A
Gunston Road / Meade Road	Y	9.4	112.4	A	F	12.4	167.5	B	F

- **Alternative 2 Fort Belvoir, Adjusted Build**
  - *Build with 650 Additional Personnel* - Several intersections fail in the AM and PM peak hour. Belvoir Road / DeWitt Loop Roundabout (**LOS F** during the AM peak hour). Gunston Road / 1st Street and Richmond Parkway (US 1) / Belvoir Road (**LOS F** during the PM peak hour).
  - *Build with 1000 Additional Personnel* - Several intersections fail in the AM and PM peak hour. Belvoir Road / DeWitt Loop Roundabout and Richmond Parkway (US 1) / Belvoir Road (**LOS F** during the AM peak hour). Gunston Road / 1st Street and Richmond Parkway (US 1) / Belvoir Road (**LOS F** during the PM peak hour).

The Alternative 1 FBNA location is separated from heavy traffic and does not share significant intersections with arterials like Alternative 2 Fort Belvoir does with Richmond Parkway (US 1). In addition, the roundabout at Belvoir Road / DeWitt Loop is currently near capacity for a dual-lane roundabout and will exceed capacity with the additional volumes.

Based on the traffic operational results of both alternates, this study concludes that Alternative 1 FBNA can accommodate the existing site traffic and the anticipated additional traffic generated by the annex. There also appears to be excess capacity if additional site traffic generators are proposed.

Entrance Control Facility Impacts

Each gate was reviewed relative to impacts from the proposed added volumes. Gate SMART Evaluator - Quick Calculator was used to determine potential staffing and lane needs. Based on 650 added vehicles to the AM peak hour at each gate, the following possible impacts were determined. All gates have excess number of receiving lanes.

Alternative 1

- All Gates
  - No additional manpower or lanes required.
  - Minor additional vehicle queueing.

Alternative 2

- Meade Gate
  - No additional manpower or lanes required.
- Belvoir Gate
  - No additional lanes required.
  - 2 additional staff required for Handheld Tandem processing, or 1 additional staff for No Arms AIE processing.
  - Minor additional vehicle queueing.
  - Minor additional delays.
- Pohick Gate
  - No additional lanes required.
  - 1 additional staff required for Handheld Single processing.
  - Minor additional vehicle queueing.
  - Minor additional delays.

Site Parking

Proposed improvements would include a parking facility at either alternative location. The facility would need to accommodate a minimum of 650 spaces with appropriate number of accessible parking stalls. Limited area is available at Alternative 2 and may require a multi-story parking structure. Additionally, space available between the structure and roadway system is limited and may create turning queues into the new facility. Alternative 1 has adequate available space for additional surface lots and new HQ Annex. Available space is present to create new access roads into the new facility.

Indirect Effects

Increased vehicle traffic may affect some intersections outside of the study area. The project traffic traveling through those intersections is expected to result in a small (less than 1 percent) increase in traffic at those intersections. The project trips associated with this project are not expected to affect the level of service of those intersections significantly.

Proposed Design Features Intended to Reduce Impacts

From the analyses results, possible roadway and intersection improvements were identified to mitigate operational impacts that were degraded to LOS E or LOS F. Potential mitigation is discussed below.

Alternative 1 – 1000 Additional Personnel

- PM - NB Geoint Drive to both EB & WB Barta Road
  - Mitigation – Signal optimization

Alternative 2 – 650 Additional Personnel

- AM - WB Richmond Parkway to SB Belvoir Road (dual-lane left turn)
  - Mitigation – Signal optimization and construct an additional SB merge lane for EB Richmond Parkway right turns.
- PM - SB Meade Road to EB / WB Richmond Parkway
  - Mitigation – Provide an additional 200-250 foot left and right turn lane to provide for dual lefts and a designated right turn lane.
- AM - SB Belvoir Road to WB DeWitt Loop (roundabout)
  - Mitigation – **DETERMINATION IN PROGRESS**
- PM - NB Gunston Road to EB Meade Road
  - Mitigation – Signal optimization and construct signalized NB dual right turn lanes onto Meade Road.

Alternative 2 – 1000 Additional Personnel

- AM - WB Richmond Parkway to SB Belvoir Road (dual-lane left turn)
  - Mitigation – Signal optimization and construct an additional SB merge lane for EB Richmond Parkway right turns.
- PM - SB Meade Road to EB / WB Richmond Parkway
  - Mitigation – Provide an additional 200-250 foot left and right turn lane to provide for dual lefts and a designated right turn lane.
- AM - SB Belvoir Road to WB DeWitt Loop (roundabout)
  - Mitigation – DETERMINATION IN PROGRESS
- PM - NB Gunston Road to EB Meade Road
  - Mitigation – Signal optimization and construct signalized NB dual right turn lanes onto Meade Road.

This study recommends that Alternative 1 (FBNA) be selected, as there is more available capacity to accommodate increased traffic volumes.

1 INTRODUCTION

1.1 Introduction

Tehama HDR JV was retained by US Army Corps of Engineers (USACE) to evaluate the potential traffic impacts resulting from the proposed construction and operation of a new approximately 155,000 square foot Defense Intelligence Agency (DIA) Headquarters (HQ) Annex building with an associated parking structure to accommodate approximately 650 personnel at Fort Belvoir, Virginia. The traffic study will focus on roadways providing access to the two alternative sites.

Various Measures of Effectiveness (MOEs), such as intersection delay and Level of Service (LOS) will be presented in this study. The analysis results will be determined using the definitions and methodology outlined in the 6th edition of the Highway Capacity Manual (HCM). The Synchro 11 software module will be used to evaluate the signalized and unsignalized intersections.

1.2 Analyses Years

The traffic analyses were performed during morning (AM) and afternoon (PM) weekday peak hours for the following analysis years:

- Existing Year (2021, As Counted)
- Existing Year (2021) Adjusted
    - Adjusted volumes are based on total inbound base gate counts from January 2020 (pre COVID) and January 2021. Volumes were increased by 40% to account for the 35-40% reduction in overall base traffic experienced. Volumes along Richmond Parkway (US 1) were not inflated.
- Build Condition
    - Build with 650 additional personnel reporting to new annex with adjusted 2021 traffic.
    - Build with 1000 additional personnel reporting to new annex (sensitivity analysis) with adjusted 2021 traffic.

1.3 Study Area / Project

The study area consists of two (2) separate locations within Ft. Belvoir, Virginia. The Regions of Influence (study areas) are shown on Figure 1-1 and are as described below. **Alternative 1** - Fort Belvoir North Area (FBNA) in the vicinity of the National Geospatial-Intelligence Agency (NGA)

- **Alternative 2 -** southeast corner of 1st Street and Gunston Road within the 1400 Area East district of Main Post

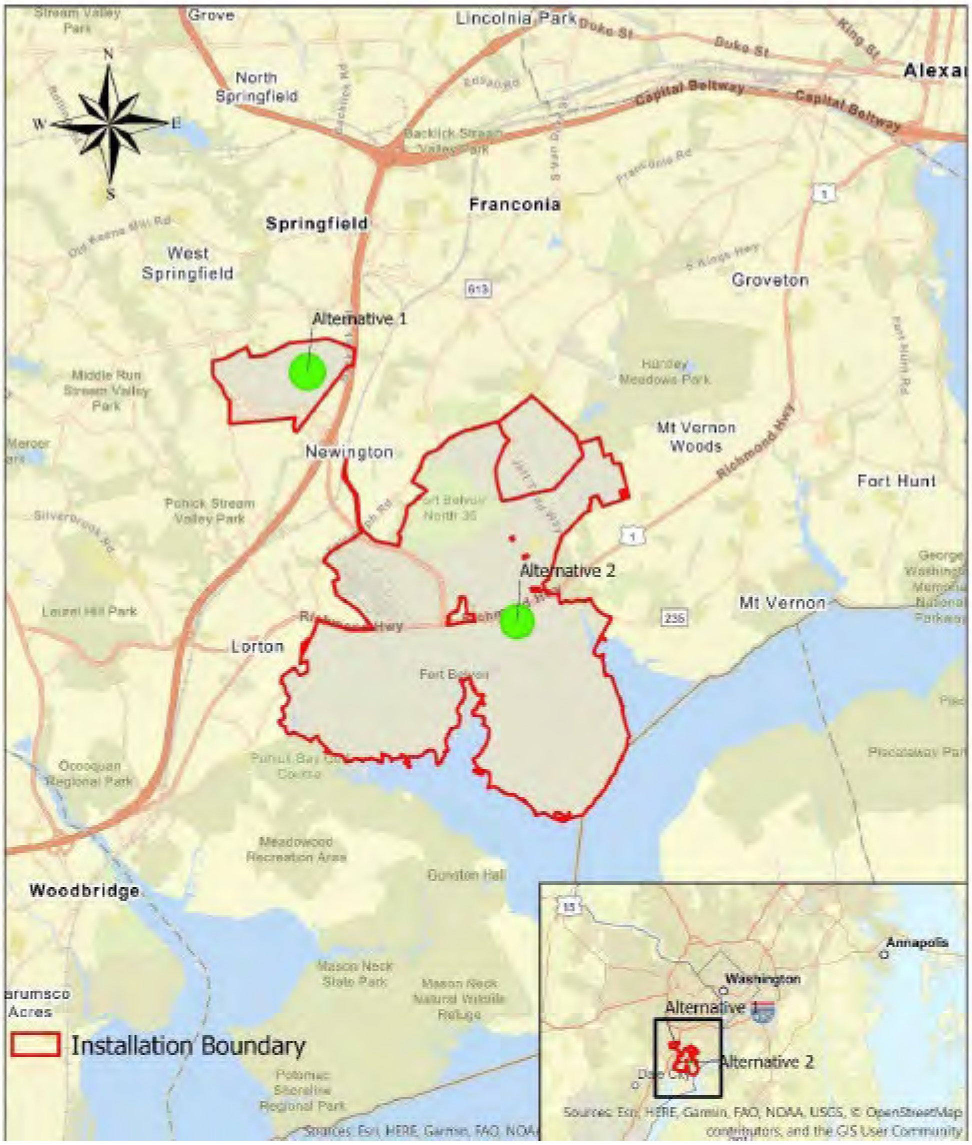

Figure 1-1: Regions of Influence – Alternatives 1 and 2

2 DATA COLLECTION

2.1 Traffic Volume Collection

Traffic data was collected at sixteen (16) locations to support the development of the traffic impact study (TIS). Both turning movement counts (TMCs) at the major intersections (10 locations) and automatic traffic recorders counts (ATRs) at select ramps/gates (6 locations) were collected. The turning movement counts were completed using JAMAR boards. These are industry standard counting equipment which are versatile in acquiring data at signalized, unsignalized and roundabout intersections. PICO tubes were used for the volume data at ATR identified locations. The tubes allowed the acquisition of 24-hour counts which helped identify peak hours.

Turning Movement Counts (TMCs) and roadway volume counts were conducted at the locations shown in Figure 2-1 and Figure 2-2. The locations for the roadways and intersection counts are listed below in Table 2-1 and Table 2-2. Figure 2-3 and Figure 2-4 present diagrams of the volumes counted at specific intersections within the study areas (refer to Appendix B for the original count data). The counts were collected during the AM and PM peak hours over a three-day period of a typical Tuesday, Wednesday, and Thursday. During project discussions, NGA noted that focus may be given to certain times based on employee work schedules. Based on this input, it was assumed the AM peak occurs between 6-9 AM and the PM peak occurs between 3-6 PM. The turning movement counts were collected in 15-minute periods and include classification of passenger vehicles, trucks (vehicles with 3 or more axles), and bicycles/pedestrians. This information was input into the existing conditions model.

Figure 2-1: Count Locations for Existing Conditions – Alternative 1 (FBNA)

Table 2-1 : Traffic Volume Count Locations – Alternative 1

Count ID	Intersection	Count Date	Type
1	Barta Road with Geoint Drive	2021-03-23	TMC (JAMAR)
2	Barta Road with Heller Road	2021-03-23	TMC (JAMAR)
3	Barta Road with Backlick Road	2021-03-23	TMC (JAMAR)
4	Barta Road / Fairfax County Parkway (VA 286) NB Ramps	2021-03-24	TMC (JAMAR)
5	Barta Road / Fairfax County Parkway (VA 286) SB Ramps	2021-03-24	TMC (JAMAR)
6	Heller Road with I-95 NB/I-95 SB Express Lane	2021-03-23	ATR (Pico)
7	Heller Road with I-95 SB	2021-03-23	ATR (Pico)
8a	Heller Road with NGA South Gate (inbound)	2021-03-23	ATR (Pico)
8b	Heller Road with NGA South Gate (outbound)	2021-03-24	ATR (Pico)
9	Barta Road at NGA West Gate Entry	2021-03-24	ATR (Pico)
10	Barta Road at NGA West Gate Exit	2021-03-24	ATR (Pico)
11	GEOINT Drive Visitor Parking Lot Access Lane	2021-03-24	ATR (Pico)

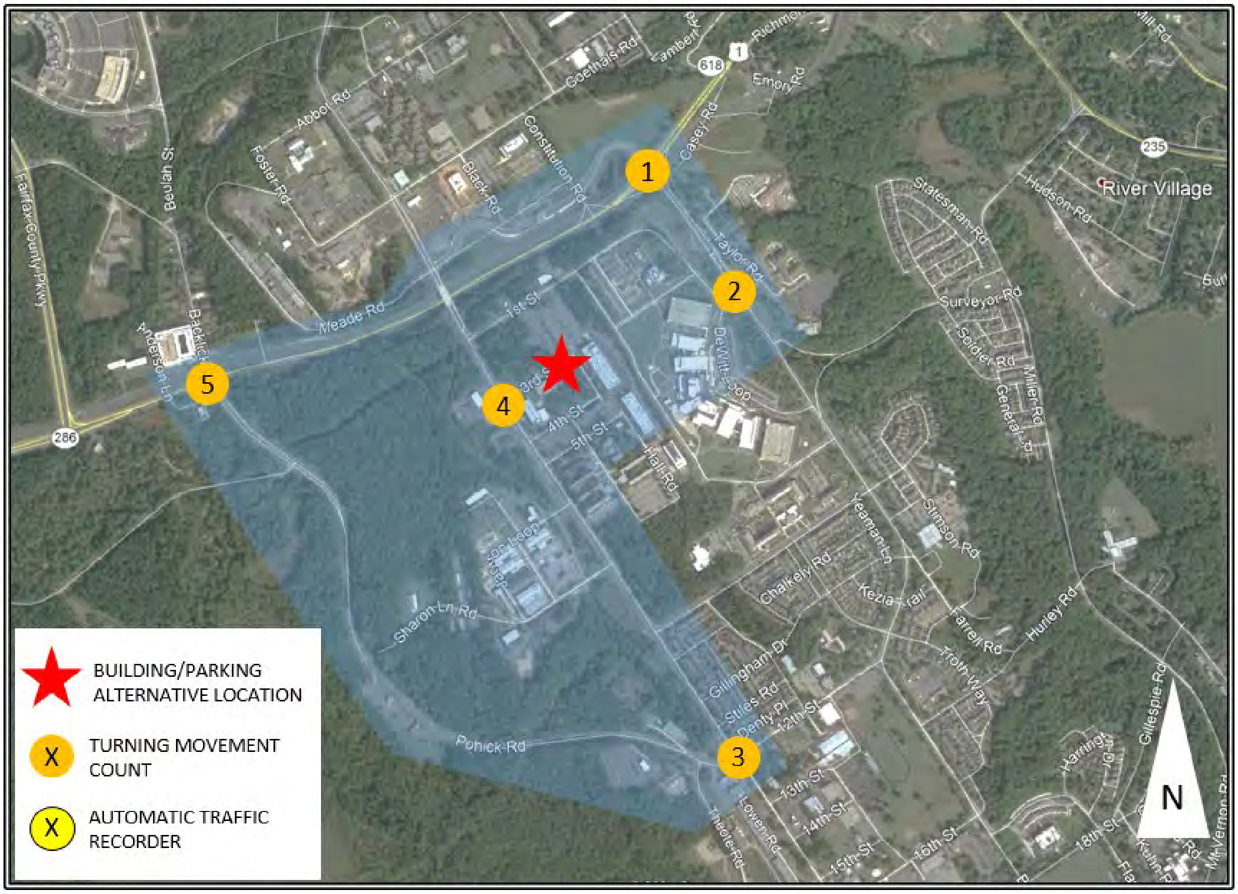

Figure 2-2: Count Locations for Existing Conditions – Alternative 2 (Fort Belvoir)

Table 2-2 : Traffic Volume Count Locations – Alternative 2			
Count ID	**Intersection**	**Count Date**	**Direction**
1	US 1 with Meade Road/Belvoir Road	2016-02-24	TMC (JAMAR)
2	Belvoir Road with Dewitt Loop/Taylor Road	2016-02-25	TMC (JAMAR)
3	Gunston Road with Pohick Road/12th Street	2016-02-25	TMC (JAMAR).
4	Gunston Road with 3rd Street	2016-02-25	TMC (JAMAR)
5	US 1 with Pohick Road	2016-02-24	TMC (JAMAR)

24-Hour Counts: 24-Hour Counts were taken on either Tuesday, Wednesday, or Thursday at 6 primary locations (6 – 11) identified in Figure 2-1: The average daily traffic (ADT) measured in vehicles per day (vpd) is shown in Table 2-3.

Table 2-3 : 24-Hour Tube (ATR) Count ADT (2021)

Count ID	Roadway	Description	Direction	ADT (vpd)
6	HOV Entrance Lane	Traffic From Heller Road to I-95	EB	4697
7a	I-95 Exit Ramp	Exit Ramp to Heller Road (RT)	EB	2234
7b	I-95 Exit Ramp	Exit Ramp to Heller Road (LT)	WB	1792
8a	Heller Road	South Gate (Outbound)	SB	188
8b	Heller Road	South Gate (Inbound)	NB	2632
9	West Gate	West Gate Entrance Traffic	EB	5788
10	Exit Gate (Onto Barta Road)	Parking Garage Exit	NB	4180
11	GEOINT Drive	Visitor Parking Lot Access Lane	SB	1344

2.2 Existing Year (2021) Traffic Volumes

A review of the traffic count data indicates that the weekday morning and afternoon peak hours are not consistent among the study intersections in both Alternative Locations. The respective peak hour for each intersection is shown in Table 2-4.

Table 2-4 : Peak Hours for Existing Counts (2021)

Count ID	Location	Peak Hour	
		AM	PM
Alternative 1 – FBNA			
1	Barta Road with Geoint Drive	6:45–7:45	4:30–5:30
2	Barta Road with Heller Road	7:15-8:15	3:45-4:45
3	Barta Road with Backlick Road	7:00-8:00	4:00-5:00
4-5	Barta Road with Fairfax County Parkway (VA 286) NB Ramps (WB Barta Road)	6:45–7:45	3:45-4:45
6	Heller Road with I-95 NB/I-95 SB Express Lane	12:00-1:00	5:45-6:45
7	Heller Road with I-95 SB	7:45-8:45	3:00-4:00
8	Heller Road with NGA South Gate (inbound)	7:30-8:30	8:45-9:45
9	Barta Road at NGA West Gate Entry	9:30-10:30	-
10	Barta Road at NGA West Gate Exit	-	5:45-6:45
11	GEOINT Drive Visitor Parking Lot Access Lane	7:15-8:15	2:45-3:45
Alternative 2 – Fort Belvoir			
1	US 1 with Meade Road/Belvoir Road	7:30-8:30	3:30-4:30
2	Belvoir Road with Dewitt Loop/Taylor Road	7:00-8:00	3:45-4:45
3	Gunston Road with Pohick Road/12th Street	7:45-8:45	3:30-4:30
4	Gunston Road with 3rd Street	7:30-8:30	3:45-4:45
5	US 1 with Pohick Road	7:15-8:15	3:30-4:30

Figures 2-3 through **Figure 2-6** show the Existing (2021) morning (AM) and afternoon (PM) peak hour traffic volumes for both Alternatives, both ***as counted*** and ***adjusted.***

Figure 2-3: AM (PM) Peak Hour Turning Movement Volumes for Existing Conditions (2021, as counted) – Alternative 1 (FBNA)

HDR TEHAMA

Figure 2-4: AM (PM) Peak Hour Turning Movement Volumes for Existing Conditions (2021, adjusted) – Alternative 1 (FBNA)

HDR TEHAMA

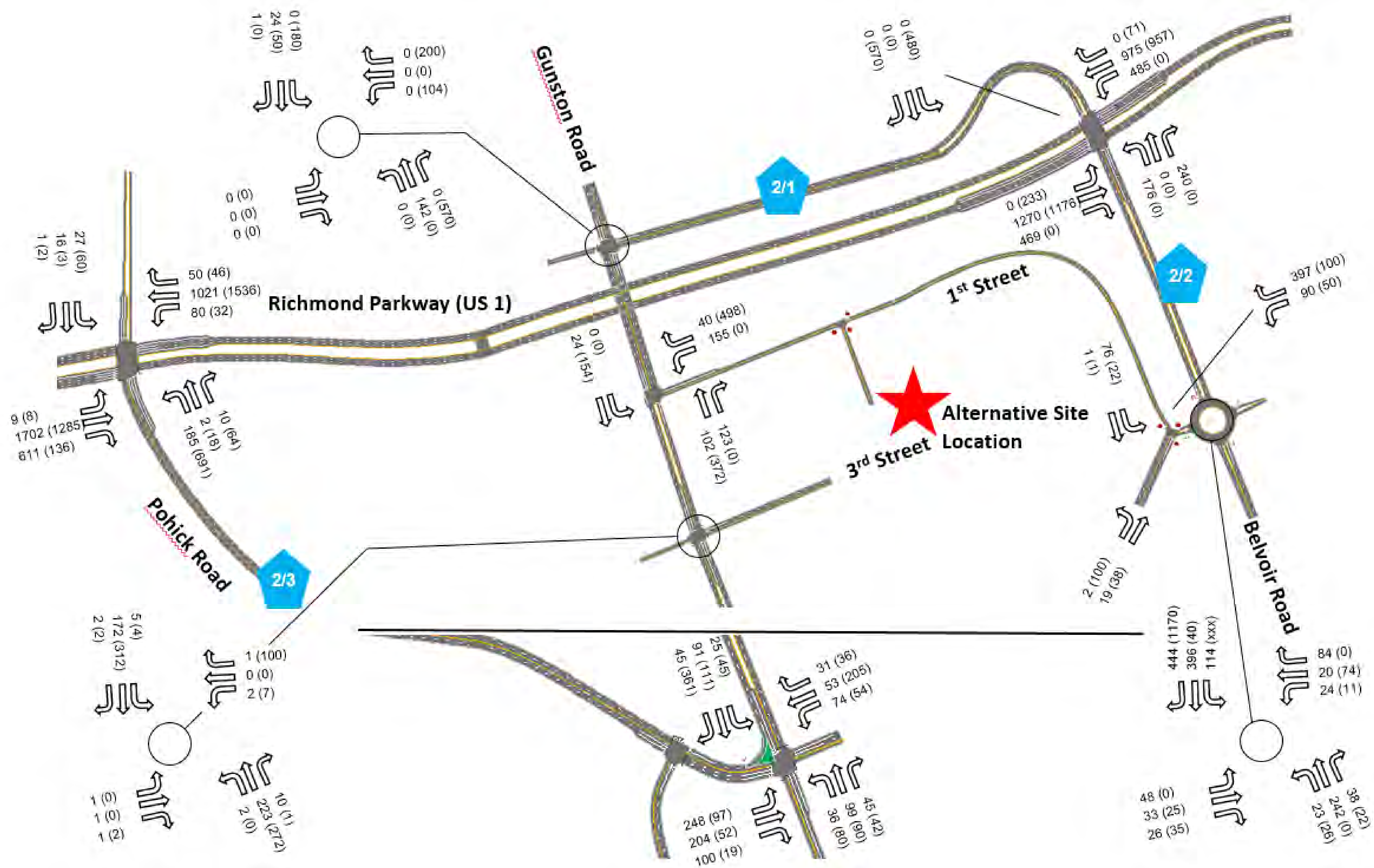

Figure 2-5: AM (PM) Peak Hour Turning Movement Volumes for Existing Conditions (2021, as counted) – Alternative 2 (Fort Belvoir)

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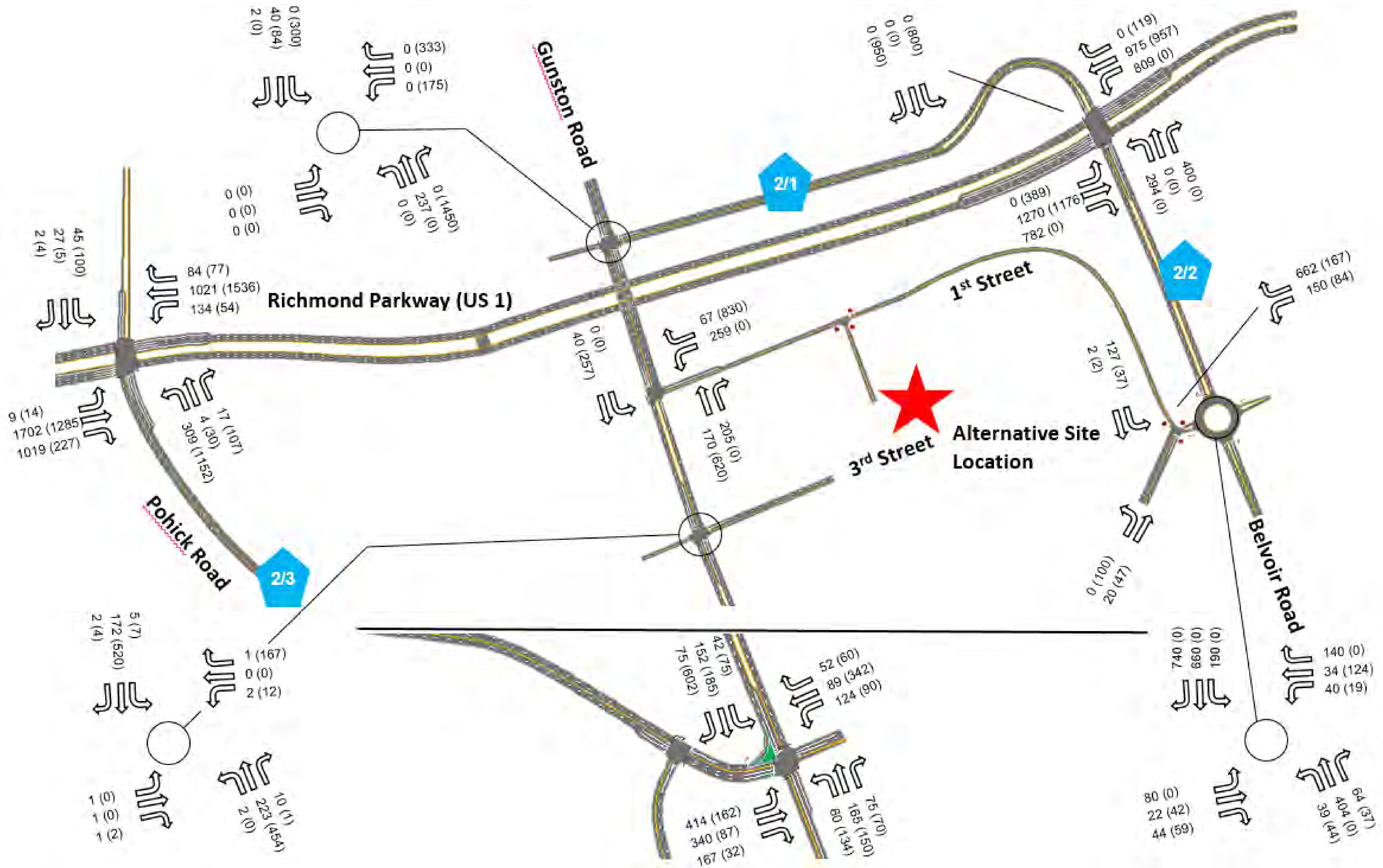


Figure 2-6: AM (PM) Peak Hour Turning Movement Volumes for Existing Conditions (2021, adjusted) – Alternative 2 (Fort Belvoir)

2.3 Traffic Signal Timing Data

Signal timing was not provided by the agencies. Timing was observed during traffic counts and noted. Total cycle length, protected / permissive movements, and phase lengths were collected and modelled within Synchro 11. Where timing and cycle length information was not recorded in the field, Synchro "optimized" conditions were used in the model. See Appendix A for field notes taken.

3 OPERATIONAL ANALYSES

3.1 Methodology

This study includes the operational analysis of the existing year 2021 conditions, future 2021 conditions with 650 new staff, and sensitivity analysis scenarios. The future year analyses were performed for only the Build condition. The operating condition of the study intersections were evaluated using the Synchro/SimTraffic micro- simulation software.

Different Measures of Effectiveness (MOEs) were evaluated while performing the operational condition. The intersection delay and Level of Service (LOS) were evaluated and presented in this study for the existing, future year build traffic conditions.

The Synchro 11 traffic simulation software program was used to perform intersection and arterial operational analyses. This software provides industry standard analysis for signalized and roundabout intersections. The study area consists of both unsignalized and signalized intersections. The analysis methodologies are described in the following sections.

3.2 Description of Level of Service Grades (LOS)

Based on delay or density values, a "grade" or level of service (LOS) ranging from LOS A, the best, to LOS F, the worst are assigned. The Highway Capacity Manual (HCM) describes service as the following:

LOS A - free flow

Traffic flows at or above the posted speed limit and motorists have complete mobility between lanes. The average spacing between vehicles is about 550 ft (167 m) or 27 car lengths. Motorists have a high level of physical and psychological comfort. The effects of incidents or point breakdowns are easily absorbed. LOS A generally occurs late at night in urban areas and frequently in rural areas.

LOS B - reasonably free flow

LOS A speeds are maintained, maneuverability within the traffic stream is slightly restricted. The lowest average vehicle spacing is about 330 ft(100 m) or 16 car lengths. Motorists still have a high level of physical and psychological comfort.

LOS C - stable flow, at or near free flow

Ability to maneuver through lanes is noticeably restricted and lane changes require more driver awareness. Minimum vehicle spacing is about 220 ft (67 m) or 11 car lengths. Most experienced drivers are comfortable, roads remain safely below but efficiently close to capacity, and posted speed is maintained. Minor incidents may still have no effect but localized service will have noticeable effects and traffic delays will form behind the incident. This is the target LOS for some urban and most rural highways.

LOS D - approaching unstable flow

Speeds slightly decrease as traffic volume slightly increase. Freedom to maneuver within the traffic stream is much more limited and driver comfort levels decrease. Vehicles are spaced about 160 ft (50m) or 8 car lengths. Minor incidents are expected to create delays. Examples are a busy shopping corridor in the middle of a weekday, or a functional urban highway during commuting hours. It is a common goal for urban streets during peak hours, as attaining LOS C would require prohibitive cost and societal impact in bypass roads and lane additions.

LOS E - unstable flow, operating at capacity

Flow becomes irregular and speed varies rapidly because there are virtually no usable gaps to maneuver in the traffic stream and speeds rarely reach the posted limit. Vehicle spacing is about 6 car lengths, but speeds are still at or above 50 mi/h(80 km/h). Any disruption to traffic flow, such as merging ramp traffic or lane changes, will create a shock wave affecting traffic upstream. Any incident will create serious delays. Drivers' level of comfort become poor. This is a common standard in larger urban areas, where some roadway congestion is inevitable.

LOS F - forced or breakdown flow

Every vehicle moves in lockstep with the vehicle in front of it, with frequent slowing required. Travel time cannot be predicted, with generally more demand than capacity. A road in a constant traffic jam is at this LOS, because LOS is an average or typical service rather than a constant state. For example, a highway might be at LOS D for the AM peak hour, but have traffic consistent with LOS C some days, LOS E or F others, and come to a halt once every few weeks.

Figure 3-1 shows the roadway traffic condition corresponding to the LOS letter grades. The goal of this study is to ensure study intersections would operate at an acceptable LOS D or better in the future build year.

Figure 3-1: Level of Service (LOS) Conditions

3.3 Analysis Methodology for STOP and Roundabout Controlled Intersections

The capacity analysis procedures provide an 'approach delay' for the stop sign controlled approaches to the unsignalized intersections. The intersection LOS "grades" for two-way stop-controlled intersections are as follows in Table 3-1:

Table 3-1: STOP Controlled Intersection Level of Service (LOS) Criteria

Level of Service (LOS)	Average Control Delay (sec/veh)
A	< 10
B	10 to 15
C	15 to 25
D	25 to 35
E	35 to 50
F	> 50

3.4 Analysis Methodology for SIGNAL Controlled Intersections

At a signalized intersection, the total delay is dependent upon a number of factors, including when a driver approaches the intersection, the driver's position in the queue and the traffic signal cycle length and green times. The control delay for a signalized intersection is determined for each lane group and aggregated for each approach and for the intersection as a whole.

Table 3-2 below presents the LOS criteria for signalized intersections (based on Highway Capacity Manual), which is directly related to the overall intersection control delay value. The intersection LOS for signalized intersections are as follows:

Table 3-2 : SIGNAL Controlled Intersection Level of Service (LOS) Criteria

Level of Service (LOS)	Average Control Delay (sec/veh)
A	< 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80

Source: Highway Capacity Manual

The operational analyses at each study area intersection, for each individual alternative, were evaluated based on these signalized intersection delay thresholds.

4 EXISTING CONDITIONS

4.1 Existing Geometric Configuration and Intersections

The study areas have been defined to include site access points for both alternatives.

Figure 4-1: Analyzed Intersections within the Alternative 1 Study Area (FBNA)

Figure 4-2: Analyzed Intersections within the Alternative 2 Study Area (Fort Belvoir)

Figure 4-3 presents the lane configurations for intersections within the study area under existing conditions for Alternative 1, Fort Belvoir North Area. Figure 4-4 presents the lane configurations for intersections within the study area under existing conditions for Alternative 2, Fort Belvoir.

Existing conditions in this report refer to the current conditions as of March 2021. A site visit was conducted in March 2021 to document the lane configurations in place at that time.

	B	C	D
			
E	F	G	H
			
I	J	K	
			

Figure 4-3: Existing Lane Configurations, Fort Belvoir North Area

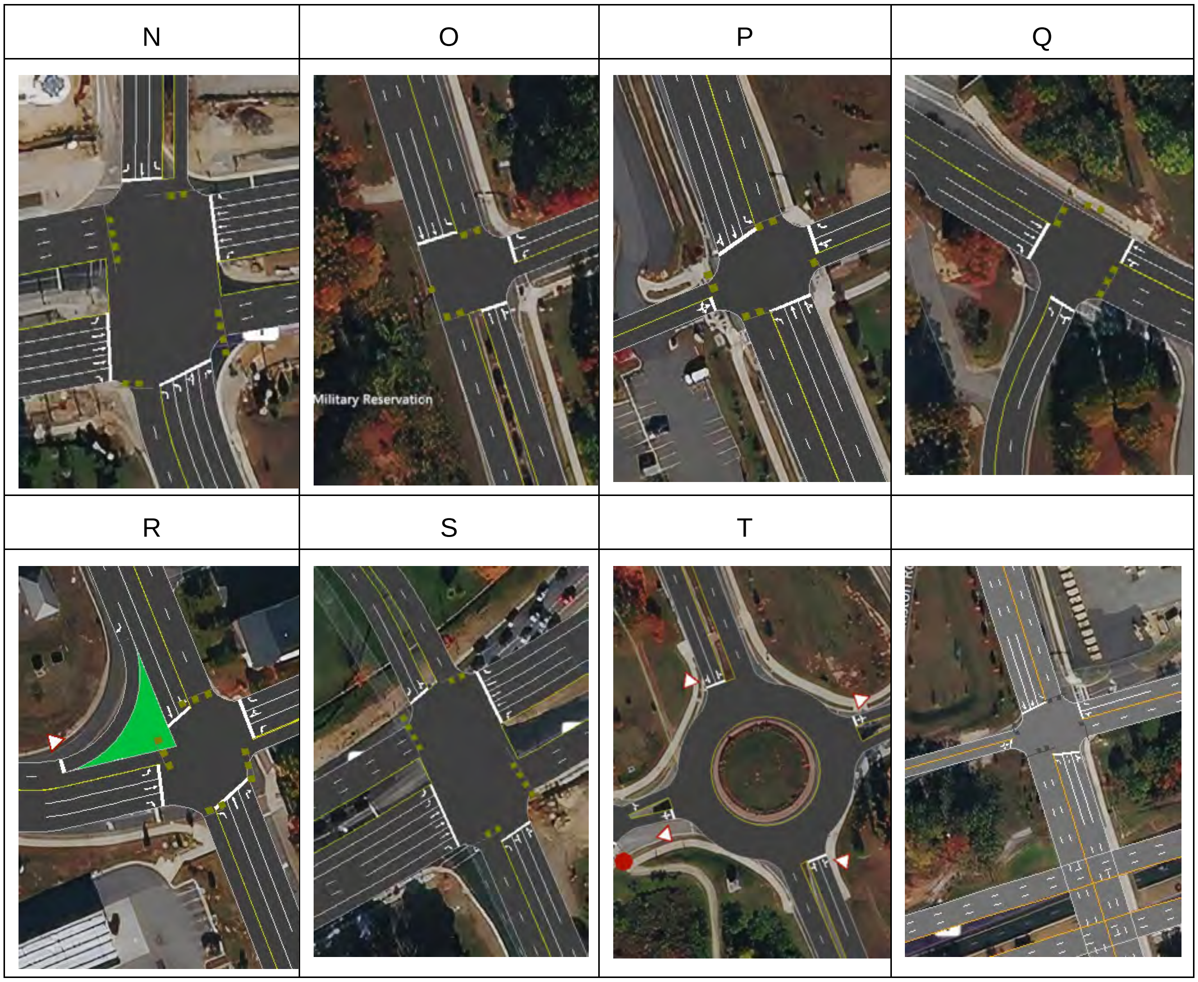


Figure 4-4: Existing Lane Configurations, Fort Belvoir

4.2 Existing Gate Access

4.2.1 Existing Gate Access Location

During field visits and data acquisition tasks, it was observed that gate accessibility varied during the week. Alternative 1 (FBNA) has three (3) main points of access and Alternative 2 (Fort Belvoir) has three (3) main points of access. Figure 4-5 and Figure 4-6 depict gated access locations.

Alternative 1 FBNA

- West Gate – (1/1)
- North Gate (GEOINT Drive) - (1/2)
- South Gate (Heller Road) – (1/3)

Alternative 2 Fort Belvoir

- Lieber Gate (Meade Road) – (2/1)
- Pence Gate (Belvoir Drive) – (2/2)
- Tulley Gate (Pohick Road) – (2/3)

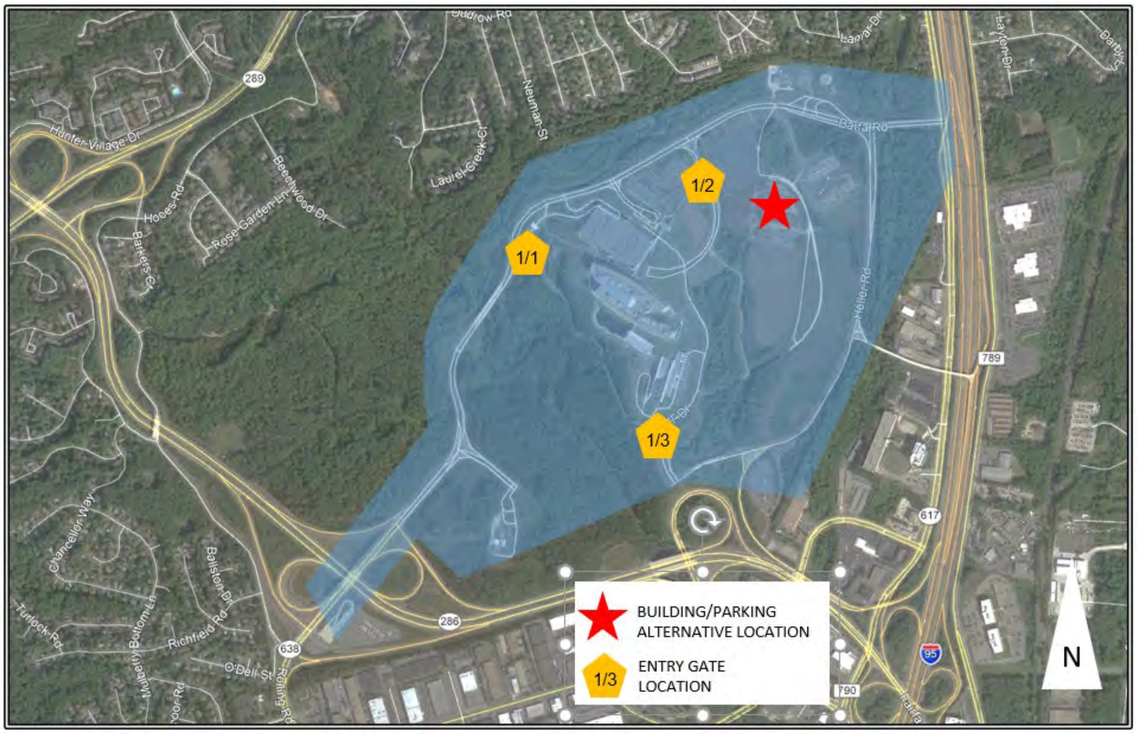


Figure 4-5: **Gate Access Locations Alternative 1 Study Area (FBNA)**

Figure 4-6: **Gate Access Locations Alternative 2 Study Area (Fort Belvoir)**

4.2.2 Existing Gate Access Volumes

Estimated percentages of entering and exiting traffic was calculated using the March 2021 field counts. Table 4-1 and Table 4-2 summarize entering and exiting vehicle percentages for each location during peak hours. It was noted that the Alternative 1 - South Gate traffic occurred during off peak times. However, the West Gate off Barta Road does not have direct access to the Alternative 1 site location. Therefore, this study assumes that the South Gate will provide an alternative access point. Based on field observations in March 2021, Alternative 2 - Meade Road Gate (Lieber) was used for exiting (PM) traffic only and the Belvoir Road Gate (Tulley) was utilized only for entering (AM) traffic during field counts. Estimated peak hour traffic will be routed through alternate gates (Meade vs. Belvoir) for optional gate access conditions. The percentage shown below will be used to distribute expected new trips generated by the new facility for normal conditions.

Table 4-1: Modeled Gate Access Volume Splits (%) – Alternative 1

Access ID	Description	AM	PM
1/1	West Gate / Parking Garage Exit (Barta Road)	0%	0%
1/2	North Gate (GEOINT Drive)	70%	70%
1/3	South Gate (Heller Road)	30%	30%

Table 4-2: Modeled Gate Access Volumes (%) – Alternative 2

Access ID	Description	AM	PM
Belvoir Gate (Enter) / Meade Gate (Exit)			
2/1	Meade Road Gate (Lieber)	0%	57%
2/2	Belvoir Road Gate (Pence)	60%	0%
2/3	Pohick Road Gate (Tulley)	40%	43%

4.3 Existing Operational Analysis

The existing peak hour traffic volume (AM peak and PM peak hours) (**Figures 2-3 and 2-4**) and the existing lane-use configuration (**Figures 4-3 and 4-4**) were used in performing the existing (2021) operational analysis. ***The existing (2021) peak hour volumes were adjusted assuming 60% of personnel reported during March 2021 counts from pre-COVID conditions. January 2020 and January 2021 total inbound gate counts were used for volume adjustment.*** Gate counts were totaled from Inbound Tulley, Pence, Kingman, and Farrar gates for a similar Monday through Friday time period. See table for calculation summary.

Table 4-3: Adjusted Volume Calculation Methodology

2020						
Gate Inbound	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Total**
Tulley	8251	8315	8957	5324	7570	
Pence	7170	15403	15173	14781	14326	
Kingman	4338	5478	4773	4929	5909	
Farrar	1313	1415	1767	2079	1810	
Subtotal	21072	30611	30670	27113	29615	139081
2021						
Tulley	11810	11156	11555	12278	5714	
Pence	6839	6642	6930	6815	1637	
Kingman	2567	1957	5538	4530	1392	
Farrar	1486	1263	1264	1449	138	
Subtotal	22702	21018	25287	25072	8881	102960
2020 volume / 2021 volume						135%
Assume 2020 volumes 40% higher than 2021 counted volumes						**140%**

4.3.1 Existing (2021) Intersection Operational Analysis

The AM and PM peak hour intersection operational analyses results were evaluated using the Synchro 11 model. They are presented in **Tables 4-3 through 4-6**. The existing year Synchro output files are included in **Appendix C**.

Due to the nature of the anticipated additional trips, the weekday AM and PM peak periods were the focus of this study. Total volume counts system-wide were calculated from the intersection (TMC) and ATR data. The following peak hours identified and compared to Table 2-4.

Alternative 1 - FBNA

- AM peak period: 7:45am-8:45am;
- PM peak period: 4:00pm-5:00pm.

Table 4-4: Existing (2021, as counted) Intersection Operational Analysis – Alternative 1

Intersection ID	Intersection	Signalized (Y/N)	AM	PM	AM	PM
			Delay (s/veh)		LOS	
B	Barta Road / FBNA Facilities Access	Y	0.9	1.0	A	A
C	West Gate Entrance	N	-	-	A	A
D	Barta Road / Parking Garage Exit	Y	0.0	10.0	A	A
E	Barta Road / Main Guest Access	N	-	-	A	A
F	Barta Road / GEOINT Drive	Y	3.2	8.9	A	A
G	Barta Road / Heller Road	Y	8.8	1.0	A	A
H	Barta Road / Backlick Road	Y	6.8	11.4	A	B
I	Heller Road / HOV Entrance Ramp	N	-	-	A	A
J	95 Exit Ramp / Heller Road	N	-	-	A	A
K	South Gate Entrance	N	-	-	A	A

Table 4-5: Existing (adjusted) Intersection Operational Analysis – Alternative 1

Intersection ID	Intersection	Signalized (Y/N)	AM	PM	AM	PM
			Delay (s/veh)		LOS	
B	Barta Road / FBNA Facilities Access	Y	1.7	1.1	A	A
C	West Gate Entrance	N	-	-	A	A
D	Barta Road / Parking Garage Exit	Y	0.0	10.4	A	B
E	Barta Road / Main Guest Access	N	-	-	A	A
F	Barta Road / GEOINT Drive	Y	5.5	13.3	A	B
G	Barta Road / Heller Road	Y	9.8	0.6	A	A
H	Barta Road / Backlick Road	Y	7.9	20.1	A	C
I	Heller Road / HOV Entrance Ramp	N	-	-	A	A
J	95 Exit Ramp / Heller Road	N	-	-	A	A
K	South Gate Entrance	N	-	-	A	A

Alternative 2 – Fort Belvoir

- AM peak period: 7:30am-8:30am
- PM peak period: 3:45-4:45pm.

Table 4-6: Existing (2021, as counted) Intersection Operational Analysis – Alternative 2

Intersection ID	Intersection	Signalized (Y/N)	AM Delay (s/veh)	PM Delay (s/veh)	AM LOS	PM LOS
N	Richmond Highway (Hwy 1) / Pohick Road	Y	20.1	29.5	C	C
O	Gunston Road / 1st Street	Y	9.2	10.5	A	B
P	Gunston Road / 3rd Street	Y	22.8	13.7	C	B
Q	Pohick Road / Theote Road	Y	9.1	9.2	A	A
R	Gunston Road / Pohick Road / 12th Street	Y	15.8	14.8	B	B
S	Richmond Highway (Hwy 1) / Belvoir Road	Y	31.5	44.5	C	D
T	Belvoir Road / DeWitt Loop (N)	N	8.0	3.8	A	A
U	Gunston Road / Meade Road	Y	2.8	23.7	A	C

Table 4-7: Existing (2021, adjusted) Intersection Operational Analysis – Alternative 2

Intersection ID	Intersection	Signalized (Y/N)	AM Delay (s/veh)	PM Delay (s/veh)	AM LOS	PM LOS
N	Richmond Highway (Hwy 1) / Pohick Road	Y	25.1	36.4	C	D
O	Gunston Road / 1st Street	Y	11.0	33.6	B	C
P	Gunston Road / 3rd Street	Y	22.2	14.1	C	B
Q	Pohick Road / Theote Road	Y	11.4	12.2	B	B
R	Gunston Road / Pohick Road / 12th Street	Y	19.9	24.5	B	C
S	Richmond Highway (Hwy 1) / Belvoir Road	Y	42.8	78.7	D	E
T	Belvoir Road / DeWitt Loop (N)	N	19.4	4.3	C	A
U	Gunston Road / Meade Road	Y	3.0	55.6	A	E

4.3.2 Existing (2021) Entry Control Facility Analyses

In addition to analyzing intersections within each alternative location, entry control facility (ECF) gate capacities were calculated to determine existing manpower and entry lane needs. Adjusted peak hour volumes at each gate were utilized for calculations. The Quick Calculation method of Gate SMART Evaluator, provided through the SDDCTEA website, was used to determine these needs. Since this study is only determining the direct impacts the Annex will have on the existing site facilities, the analyses calculate only the current need and no future growth based on the *adjusted* existing volumes. The following table summarizes the existing needs. Demand volumes are 15-minute counts. The peak hour volumes were divided by 4 to calculate the inputs. Each gate's current configuration is either 3 or 4 processing lanes and is shown in the table. See Appendix D for calculation tables.

Table 4-8: Existing Gate Needs – Alternative 1

Gate ID	Location	Existing (Adjusted Demand Volume 15-minutes (veh)	Future Growth (%)	Percent Deployed (%)		Manual		Handheld		AIE	
						Single	Tandem	Single	Tandem	No Arms	Arms
1/1	West Gate / Parking Garage Exit (Barta Road)	148	0	0	Existing Lanes	4					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	1	1	1	1	1	1
					Delay / Veh (seconds)	19	15	22	17	17	20
					Total Manpower Needed	1	2	1	2	1	1
1/2	North Gate (GEOINT Drive)	150	0	0	Existing Lanes	3					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	1	1	1	1	1	1
					Delay / Veh (seconds)	19	15	22	17	17	20
					Total Manpower Needed	1	2	1	2	1	1
1/3	South Gate (Heller Road)	19	0	0	Existing Lanes	4					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	0	0	0	0	0	0
					Delay / Veh (seconds)	16	13	17	15	15	17
					Total Manpower Needed	1	2	1	2	1	1

Summary – Alternative 1

Currently, from the calculations, either 1 lane or 2 lanes of the existing lanes is utilized depending on the method of entrant processing.

Table 4-9: Existing Gate Needs – Alternative 2											
Gate ID	Location	Existing (Adjusted Demand Volume 15-minutes (veh)	Future Growth (%)	Percent Deployed (%)		Manual		Handheld		AIE	
						Single	Tandem	Single	Tandem	No Arms	Arms
2/1	Meade Road Gate	0	0	0	Existing Lanes	3					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	0	0	0	0	0	0
					Delay / Veh (seconds)	16	13	17	15	15	16
					Total Manpower Needed	1	2	1	2	1	1
2/2	Belvoir Road Gate	398	0	0	Existing Lanes	3					
					Required Lanes	2	1	2	1	1	2
					Traffic Queue (Veh)	3	5	4	9	9	4
					Delay / Veh (seconds)	18	27	21	59	59	20
					Total Manpower Needed	2	2	2	2	1	2
2/3	Pohick Road Gate	288	0	0	Existing Lanes	3					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	4	2	7	3	3	5
					Delay / Veh (seconds)	31	18	54	23	23	39
					Total Manpower Needed	1	2	1	2	1	1

Summary – Alternative 2

Currently, from the calculations, either 1 lane or 2 lanes of the existing lanes is utilized depending on the method of entrant processing.

5 BUILD CONDITIONS

5.1 Proposed Site Development

Two alternative locations have been selected to accommodate the proposed construction and operation of a new 155,000 square foot Defense Intelligence Agency (DIA) Headquarters (HQ) Annex building with an associated parking structure. Approximately 650 additional personnel will be employed at the new site. No changes to existing roadways have been identified for either locations. New infrastructure improvements are assumed to be limited to the building, parking structure, access lanes, and associated site improvements.

5.2 Geometric Configuration

No changes in roadway geometrics has been assumed for this study.

5.3 Trip generation

The annex construction is estimated to generate 650 additional staff positions. The analysis assumes that each additional staff member generates one (1) additional AM and PM peak hour trip for both 650 additional staff and 1000 additional staff scenarios. The distribution between site access points was determined utilizing the March 2021 count data.

Table 5-1: Trip Generation

Scenario	Scenario Description	Trips	
		AM	PM
1	650 Additional Staff	650	650
2	1000 Additional Staff	1000	1000

Table 4-1 and Table 4-2 show the percentage and volumes assigned to each site access point.

Figure 5-1 through Figure 5-4 show the total intersection volumes used for the Build condition. No background growth was used for the two alternative sites.

Figure 5-1: Volumes for Build Conditions (650 Additional Personnel) – Alternative 1

HDR TEHAMA

Figure 5-2: Volumes for Build Conditions (1000 Additional Personnel) – Alternative 1

HDR TEHAMA

Figure 5-3: Volumes for Build Conditions (650 Additional Personnel) – Alternative 2

HDR TEHAMA

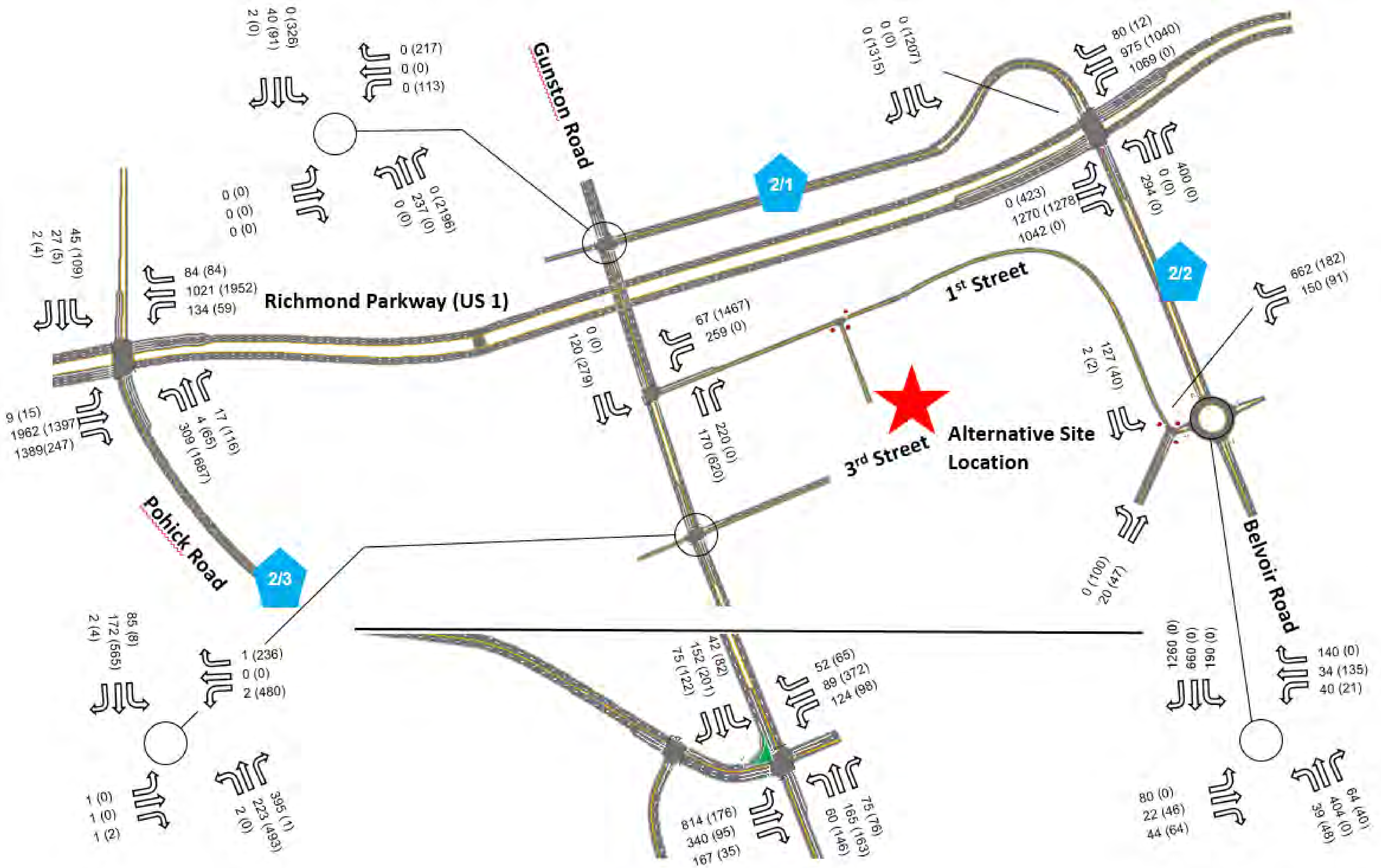


Figure 5-4: Volumes for Build Conditions (1000 Additional Personnel) – Alternative 2

5.4 General Traffic Operations

Synchro traffic analysis models were created for each of the AM and PM peak periods to analyze traffic operations under existing and full-build conditions. The performance results of these models area presented in this section. Full Synchro reports are provided in Appendix C.

5.4.1 Intersections Analysis

Table 5-2 presents the general traffic operations summary for all scenarios analyzed for the in **Alternative 1**. Table 5-3 presents the general traffic operations summary for all scenarios analyzed for the intersections in **Alternative 2**.

Table 5-2: Build Condition (2021 adjusted) Intersection Operational Analysis – Alternative 1

Int. ID	Intersection	Signalized (Y/N)	***650 Added Personnel***				***1000 Added Personnel***			
			AM	PM	AM	PM	AM	PM	AM	PM
			Delay (s/veh)		LOS		Delay (s/veh)		LOS	
B	Barta Road / FBNA Facilities Access	Y	2.0	1.3	A	A	2.2	1.5	A	A
C	West Gate Entrance	N	-	-	A	A	-	-	A	A
D	Barta Road / Parking Garage Exit	Y	0.1	10.0	A	A	0.1	10.0	A	A
E	Barta Road / Main Guest Access	N	-	-	A	A	-	-	A	A
F	Barta Road / GEOINT Drive	Y	8.7	21.5	A	C	11.1	67.2	B	E
G	Barta Road / Heller Road	Y	11.5	3.1	B	A	12.2	2.9	B	A
H	Barta Road / Backlick Road	Y	8.0	21.5	A	C	20.4	20.9	C	C
I	Heller Road / HOV Entrance Ramp	N	-	-	A	A	-	-	A	A
J	95 Exit Ramp / Heller Road	N	-	-	A	A	-	-	A	A
K	South Gate Entrance	N	-	-	A	A	-	-	A	A

Alternative 1 FBNA, Adjusted Build

- All intersection (AM and PM) operate at LOS B or better with the exception of the intersections of:
  - Barta Road /Geoint Drive (LOS C during the PM peak hour) – Exiting traffic from Geoint Drive creates queues while waiting to turn on to Barta Road.
  - Barta Road / Backlick Road (LOS C during the PM peak hour) – Barta Road EB left turns queue and saturate the lanes waiting for Backlick thru movements to clear.

Table 5-3: Build Condition (2021 adjusted) Intersection Operational Analysis – Alternative 2

Int. ID	Intersection	Signalized (Y/N)	***650 Added Personnel***				***1000 Added Personnel***			
			AM	PM	AM	PM	AM	PM	AM	PM
			Delay (s/veh)		LOS		Delay (s/veh)		LOS	
N	Richmond Parkway (US 1) / Pohick Road	Y	36.2	41.1	D	D	51.1	46.2	D	D
O	Gunston Road / 1st Street	Y	11.3	101.5	B	F	11.2	155.7	B	F
P	Gunston Road / 3rd Street	Y	11.9	18.4	B	B	9.8	22.6	A	C
Q	Pohick road / Thoete Road	Y	18.8	11.5	B	B	32.9	11.8	C	B
R	Gunston Road / Pohick Road	Y	23.3	44.0	C	D	36.7	71.9	D	E
S	Richmond Parkway (US 1) / Belvoir Road	Y	63.5	124.5	E	F	82.6	153.2	F	F
T	Belvoir Road / DeWitt Loop (roundabout)	N	50.3 (98.5 SB RT)	4.3	F	A	87.1 (178.4 SB RT)	4.3	F	A
U	Gunston Road / Meade Road	Y	9.4	112.4	A	F	12.4	167.5	B	F

Alternative 2 Fort Belvoir, Adjusted Build

- Several intersections fail in the AM and PM peak hour.
    - Belvoir Road / DeWitt Loop Roundabout (LOS F during the AM peak hour) – Additional Belvoir Gate traffic causes the SB right turn movement to fail.
    - Gunston Road / 1st Street and Richmond Parkway (US 1) / Belvoir Road (LOS F during the PM peak hour) – Large NB exiting volumes on Gunston Road are required to use a single right-turn lane onto Meade Road.
- Already heavy entering and exiting traffic at the Richmond Parkway / Meade Road / Belvoir Road intersection during the AM and PM peak hours are added to with the planned additional traffic. Traffic operations show less than desired performance given the limited intersection options along the busy arterial of Richmond Parkway.

5.4.2 Intersection Failure Analysis

Alternative 1 FBNA, Adjusted Build

In order to determine the approximate additional traffic the existing roadway system could accommodate, the build model traffic volume was loaded incrementally. This analysis was completed to determine local agency-maintained intersection impacts and impacts to those intersections interior to the project that could not be mitigated with signal timing modifications. This analysis was complete only for Alternative 1 –FBNA location. The volumes were increased until an intersection reported a LOS E or poorer. The following table summarizes the intersections where failure is anticipated and the associated additional traffic generated from the development.

Table 5-4: Intersection Operational Analysis (Failure Volumes) – Alternative 1

Int. ID	Intersection	Signalized (Y/N)	***1250 Added Personnel***		***1350 Added Personnel***	
			AM	PM	AM	PM
			LOS		LOS	
B	Barta Road / FBNA Facilities Access	Y	A	A	A	A
C	West Gate Entrance	N	A	A	A	A
D	Barta Road / Parking Garage Exit	Y	A	B	A	B
E	Barta Road / Main Guest Access	N	A	A	B	B
F	Barta Road / GEOINT Drive	Y	D	F	E	F
G	Barta Road / Heller Road	Y	B	B	B	A
H	Barta Road / Backlick Road	Y	E	C	E	C
I	Heller Road / HOV Entrance Ramp	N	A	A	A	A
J	95 Exit Ramp / Heller Road	N	A	A	A	A
K	South Gate Entrance	N	A	A	A	A

The addition of 1250 AM trips shows that a LOS E is expected at the intersection of Barta Road and Backlick Road entering the site. Likewise, the additional 1250 PM trips will experience a LOS F at Barta Road and Geoint Drive. The model was also run for 1350 AM and PM trips with similar results. Build alternates generating this level of trips would likely require additional roadway improvements above modifications to signal timing. Possible improvements may include:

- Geometric Improvements
- Signal timing/modification
- Volume diversion

5.4.3 Proposed Entry Control Facility Analyses

The ECFs were analyzed for the 650 additional staff build condition. The gate capacities were calculated to determine future build year manpower and entry lane needs. Adjusted peak hour volumes and the proposed 650 vehicles were utilized for calculations. The Quick Calculation method of Gate SMART Evaluator, provided through the SDDCTEA website, was used to determine these needs. The analyses calculate only the current build need and no future growth. The following tables show the build needs for the existing adjusted volumes plus the additional 650 personnel. Demand volumes are 15-minute counts. Each gate's current configuration is either 3 or 4 processing lanes and is shown in the table. See Appendix D for calculation tables.

Table 5-5: Existing Gate Build Needs – Alternative 1

Gate ID	Location	Existing (Adjusted) Demand Volume w/ 650 Additional Staff 15-minutes (veh)	Future Growth (%)	Percent Deployed (%)		Manual		Handheld		AIE	
						Single	Tandem	Single	Tandem	No Arms	Arms
1/1	West Gate / Parking Garage Exit (Barta Road)	148	0	0	Existing Lanes	4					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	1	1	1	1	1	1
					Delay / Veh (seconds)	19	15	22	17	17	20
					Total Manpower Needed	1	2	1	2	1	1
1/2	North Gate (GEOINT Drive)	264	0	0	Existing Lanes	3					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	3	2	5	2	2	4
					Delay / Veh (seconds)	27	17	40	21	21	32
					Total Manpower Needed	1	2	1	2	1	1
1/3	South Gate (Heller Road)	51	0	0	Existing Lanes	4					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	0	0	0	0	0	0
					Delay / Veh (seconds)	16	14	18	15	15	17
					Total Manpower Needed	1	2	1	2	1	1

Alternative 1

- All Gates
  - No additional manpower or lanes required.
  - Minor additional vehicle queueing.

Table 5-6: Existing Gate Build Needs – Alternative 2											
Gate ID	Location	Existing (Adjusted) Demand Volume w/ 650 Additional Staff 15-minutes (veh)	Future Growth (%)	Percent Deployed (%)		Manual		Handheld		AIE	
						Single	Tandem	Single	Tandem	No Arms	Arms
1/1	Meade Road Gate	13	0	0	Existing Lanes	3					
					Required Lanes	1	1	1	1	1	1
					Traffic Queue (Veh)	0	0	0	0	0	0
					Delay / Veh (seconds)	16	13	17	15	15	17
					Total Manpower Needed	1	2	1	2	1	1
1/2	Belvoir Road Gate	482	0	0	Existing Lanes	3					
					Required Lanes	2	1	2	2	2	2
					Traffic Queue (Veh)	5	11	7	4	4	6
					Delay / Veh (seconds)	20	66	25	17	17	22
					Total Manpower Needed	2	2	2	4	2	2
1/3	Pohick Road Gate	349	0	0	Existing Lanes	3					
					Required Lanes	1	1	2	1	1	1
					Traffic Queue (Veh)	9	3	3	5	5	11
					Delay / Veh (seconds)	63	21	20	33	33	110
					Total Manpower Needed	1	2	2	2	1	1

Alternative 2

- Meade Gate
  - No additional manpower or lanes required.
- Belvoir Gate
  - No additional lanes required.
  - 2 additional staff required for Handheld Tandem processing, or 1 additional staff for No Arms AIE processing.
  - Minor additional vehicle queueing.
  - Minor additional delays.
- Pohick Gate
  - No additional lanes required.
  - 1 additional staff required for Handheld Single processing.
  - Minor additional vehicle queueing.
  - Minor additional delays.

5.5 Transit Operations

No transit lines are present within either alternate location.

5.5.1 Existing Bus Routes

There are three bus transit routes that pass near Fort Belvoir and FBNA:

- Route 171
- Route 335
- REX (Richmond Highway Express)

Routes 171 and 335 are operated by the Fairfax Connector, and the REX is operated by Washington Metropolitan Area Transit Authority. Ongoing studies and public outreach are being completed for possible expansion of transit facilities *(Springfield to Quantico Enhanced Public Transportation Feasibility Study*). For the purpose of this study no analysis of bus route capacity or level of service was deemed relevant.

5.6 Pedestrian and Bicycle Operations

For the signalized intersections within the study area there are no intersections that are expected to experience lane changes. Pedestrian and bicycle volumes were witnessed to be extremely low. Signals within the alternative sites allow for pedestrian movements. There are dedicated bicycle facilities (NB / SB bike lanes) along Gunston Road and Belvoir Road at Alternative 2. Separated pedestrian facilities are present along Barta Road from 286 to Backlick Road at Alternate 1.

6 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis completed in the above sections, the following conclusions can be made:

Traffic Operations

- Existing Conditions
  - The analysis indicates that all signalized intersections are operating at acceptable levels overall (LOS D or better) at both alternate locations.
  - For the unsignalized intersections, the analysis indicates that the majority of the intersections are operating well.
  - Alternative 2
    - The intersection of Richmond Parkway and Belvoir Road operates at capacity (v/c ratio at 1.02, WB left) currently.
- Build Scenarios
  - FBNA – Alternative 1, Scenario 1 (650 Additional Personnel)
    - Intersection F (Barta Road/Geoint Drive) – The additional left turning volumes into Geoint Drive (AM) and the increased left/right turning volumes exiting Geoint Drive (PM) decrease the level of service due to added delay. Intersection AM peak LOS drops from LOS A to LOS B. Intersection PM peak LOS drops from LOS B to LOS C. The following are critical movement:
      - AM - WB Barta Road to SB Geoint Drive
        - Mitigation – Signal optimization.
      - PM - NB Geoint Drive to both EB & WB Barta Road
        - Mitigation – Signal optimization
    - Intersection H (Barta Road/Backlick Drive) – The additional AM left turns from the south leg of Backlick Road exceed the capacity of the single turn lane and signal timing plan. Intersection PM peak LOS drops from LOS A to LOS C.
      - PM - EB Barta Road to NB Backlick Road
        - Mitigation – Signal optimization.

- FBNA – Alternative 1, Scenario 2 (1000 Additional Personnel)
  - The results discussed above in Scenario 1 are compounded with the additional 350 personnel.
  - Intersection F (Barta Road/Geoint Drive) – The additional left turning volumes into Geoint Drive (AM) and the increased left/right turning volumes exiting Geoint Drive (PM) decrease the level of service due to added delay. Intersection AM peak LOS drops from LOS A to LOS C. Intersection PM peak LOS drops from LOS B to LOS E. The following are critical movements:
    - AM - WB Barta Road to SB Geoint Drive
      - Mitigation – Signal optimization
    - PM - NB Geoint Drive to both EB & WB Barta Road
      - Mitigation – Signal optimization
  - Intersection H (Barta Road/Backlick Drive) – The additional AM left turns from the south leg of Backlick Road exceed the capacity of the single turn lane and signal timing plan. Intersection AM peak LOS drops from LOS A to LOS D. The following are critical movements:
    - PM - EB Barta Road to NB Backlick Road
      - Mitigation – Signal optimization
- Fort Belvoir – Alternative 2, Scenario 1 (650 Additional Personnel)
  - Intersection S (Belvoir Road / Richmond Parkway) – The additional left turning volumes into Belvoir Road (AM) and the increased left/right turning volumes exiting Meade Road (PM) decrease the level of service due to added delay. Intersection AM peak LOS drops from LOS D to LOS E. Intersection PM peak LOS drops from LOS E to LOS F. The following are critical movements:
    - AM - WB Richmond Parkway to SB Belvoir Road (dual-lane left turn)
      - Mitigation – Signal optimization and construct an additional SB merge lane for EB Richmond Parkway right turns.
    - PM - SB Meade Road to EB / WB Richmond Parkway
      - Mitigation – Provide an additional 200-250 foot left and right turn lane to provide for dual lefts and a designated right turn lane.
  - Intersection T (Belvoir Road / DeWitt Loop roundabout t) – The adjusted existing volumes entering the existing roundabout approach capacity for a two-lane roundabout. SB Belvoir Road to WB DeWitt Loop exceeds lane capacity. The roundabout AM peak hour LOS decreases from LOS C to LOS F. The following are critical movements:

- AM - SB Belvoir Road to WB DeWitt Loop (roundabout)
  - Mitigation – DETERMINATION IN PROGRESS

▪ Intersection U (Gunston Road / Meade Road) – Similarly to the Belvoir Road roundabout, the Gunston Road / Meade Road intersection operates poorly in the PM peak hour. The exiting base traffic flows through a single lane right-turn movement. Intersection PM peak LOS drops from LOS E to LOS F. The following are critical movements:

- PM - NB Gunston Road to EB Meade Road
  - Mitigation – Signal optimization and construct signalized NB dual right turn lanes onto Meade Road.

o Fort Belvoir – Alternative 2, Scenario 2 (1000 Additional Personnel)

▪ The results discussed above in Scenario 1 are compounded with the additional 350 personnel.

▪ Intersection S (Belvoir Road / Richmond Parkway) – The additional left turning volumes into Belvoir Road (AM) and the increased left/right turning volumes exiting Meade Road (PM) decrease the level of service due to added delay. Intersection AM peak LOS drops from LOS D to LOS F. Intersection PM peak LOS drops from LOS E to LOS F. The following are critical movements:

- AM - WB Richmond Parkway to SB Belvoir Road (dual-lane left turn)
  - Mitigation – Signal optimization and construct an additional SB merge lane for EB Richmond Parkway right turns.
- PM - SB Meade Road to EB / WB Richmond Parkway
  - Mitigation – Provide an additional 200-250 foot left and right turn lane to provide for dual lefts and a designated right turn lane.

▪ Intersection T (Belvoir Road / DeWitt Loop roundabout t) – The adjusted existing volumes entering the existing roundabout approach capacity for a two-lane roundabout. SB Belvoir Road to WB DeWitt Loop exceeds lane capacity. The roundabout AM peak hour LOS decreases from LOS C to LOS F. The following are critical movements:

- AM - SB Belvoir Road to WB DeWitt Loop (roundabout)
  - Mitigation – DETERMINATION IN PROGRESS

▪ Intersection U (Gunston Road / Meade Road) – Similarly to the Belvoir Road roundabout, the Gunston Road / Meade Road intersection operates poorly in the PM peak hour. The exiting base traffic flows through a single lane right-turn movement. Intersection PM peak LOS drops from LOS E to LOS F. The following are critical movements:

- PM - NB Gunston Road to EB Meade Road
  - Mitigation – Signal optimization and construct signalized NB dual right turn lanes onto Meade Road.

- Pedestrian and Bicycle Operations
    - Pedestrians are provided shared phasing with appropriate traffic phases. No impacts are expected at either site.

This study recommends that Alternative 1 (FBNA) be selected, as there is more available capacity to accommodate increased traffic volumes.

APPENDIX A

Signal Timing

Traffic Impact Study for DIA HQ Annex

Signalized Intersections Phasing and Timing

Alternative 1 – Location 1: Barta Road with Geoint Drive

- Notes taken right after AM time slot on Wednesday, April 7TH
- 35 MPH for EB/WB legs (Barta Rd), 25 MPH for SB leg (Geoint Dr)
- Phase 2 -> EB, Phase 6 -> WB, Phase 4 -> SB
- Protected left hand turn phase for EBL (Phase 5)
- 20 sec EBL (Phase 5), 15 sec EB/WB (Phases 2 and 6), 15 sec SBL/SBR (Phase 4)
- 50 sec total cycle
- Median separated WBR lane (yield), Median separated SBR lane (yield)

Alternative 1 – Location 2: Barta Road with Heller Road

- Notes taken right during AM time slot on Wednesday, April 7TH
- 25 MPH for all legs
- Phase 2 -> EB, Phase 6 -> WB, Phase 4 -> SB
- Phases 2 and 6 are continuous until Phase 4 is called when a vehicle arrives
- 15 sec SBL/SBR (Phase 4), Continuous EB/WB (Phases 2 and 6)
- All right turn on reds are legal
- WBR had extended median a few hundred feet down the road closer to NGA buildings

Alternative 1 – Location 3: Barta Road with Backlick Road

- Notes taken shortly after AM time slot on Wednesday, April 7TH
- 25 MPH for WB leg (Barta Rd), 45 MPH for NB/SB leg (Backlick Rd)
- Phase 2 -> SB, Phase 6 -> NB, Phase 4 -> WB, Phase 5 -> SBL (protected)
- Protected left turn phase for SBL (Phase 5)
- NBR arrow on when Phase 4 is on
- Phases 2 and 6 are continuous (with flashing yellow arrow for Phase 5) until Phase 4 is called when a vehicle arrives
- 10-15 sec WBL/WBR (Phase 4) , 15 sec SBL (Phase 5)
- SBL must yield on a flashing yellow arrow (NBR has right of way over SBL except during Phase 5)
- Phase 2 and Phase 5 run concurrently
- WB has two lanes -> one left only lane and one dual left-right turn lane
- All right turns on red are legal
- Not sure what the total cycle length adds up to -> I would guess on the lower side 60 sec maybe

Alternative 2 – Location 1: US 1 with Meade Road/ Belvoir Road

- Notes taken at approximately 11:45 AM - 12:00 PM Wednesday, April 7TH
- 45 MPH for EB/WB legs (US 1), 25 MPH for NB leg (Belvoir Rd)
- Meade Road was closed during the traffic counts so the intersection acted as a three-legged intersection
- Phase 2 -> EB, Phase 6 -> WB, Phase 4 -> NB, Phase 5 -> EBL (Protected), Phase 1 -> WBL (Protected), Phase 8 -> SB (Closed), Phase 3- > SBL (Closed)
- EBR and WBR both have right turn arrows
- All right turns on red are legal
- Total phase time = 150 sec
- 125 sec total EB/WB (Phases 1, 2, 5 and 6), 25 sec EBL/WBL (Phases 1 and 2), 25 sec NBL/NBR (Phase 4)
- WBL/WBT would start at same time if no vehicles going EBL (Blocked off since closed gate/road)
- 55 sec crossing for pedestrians across US 1 (across WB leg)
- 30 sec crossing for pedestrians across Meade Rd/Belvoir Rd

Alternative 2 – Location 5: US 1 with Pohick Road/Backlick Road

- Notes take at approximately 11:15 AM – 11:40 AM Wednesday, April 7TH
- 50 MPH for EB/WB legs (US 1), 25 MPH for NB/SB legs (Pohick Rd/ Backlick Rd)
- Phase 2 -> EB, Phase 6 -> WB, Phase 4 -> NB, Phase 8 -> SB, Phase 1 -> WBL (Protected), Phase 5 -> EBL (Protected)
- All turns on red are legal
- EBR and WBR have right turn arrows
- 20-25 sec WBL/EBL (Phases 1 and 5), 80-100 sec WB/EB total (Phases 2 and 6), 18-25 sec NB (Phase 4), 18 sec SB (Phase 8)
- Was hard to tell the timings of each leg as it was a busy intersection
- Total phase time = 145 – 160 sec
- SB and NB legs did not run concurrently! Phases 2 and 6 did, Phase 4, then Phase 8
- WBL starts with WBT if no vehicles in queue at EBL
- 3O sec crossing for pedestrians across Pohick Rd (across NB leg)
- 60 sec crossing for pedestrians across US 1 (across EB/WB legs)
- 17 sec crossing for pedestrians across Backlick Rd (across SB leg)

Alternative 2 – Location 3: Gunston Road with Pohick Road/12th Street

- Notes taken at approximately 12:15 PM – 12:45 PM Wednesday, April 7TH
- 25 MPH for all legs
- Phase 2 -> NB, Phase 6 -> SB, Phase 4 -> EB, Phase 8 -> WB, Phase 5 -> NBL, Phase 1 -> SBL, Phase 7-> EBL, Phase 3 -> WBL
- All lefts are protected-permissive if possible
- 5-15 sec NBL (Phase 5), 5-15 sec SBL (Phase 1), 5-15 sec EBL (Phase 7), 5-15 sec NBL (Phase 3) when they are isolated
- 20 sec EBL/WBL together (Phases 1 and 7)
- 45 sec total NB/SB (Phases 2 and 6), 45 sec total EB/ WB (Phases 4 and 8)
- Total cycle time = 90 sec
- 30 sec crossing pedestrians for each leg

Alternative 2 – Location 4: Gunston Road with 3rd Street

- Notes taken at approximately 12:45 PM – 1:00 PM Wednesday, April 7th
- 25 MPH for all legs
- Phase 2 -> NB, Phase 6 -> SB, Phase 4 -> WB, Phase 8 -> EB, Phase 5 -> NBL, Phase 1 -> SBL, Phase 7 -> WBL
- NBL, SBL and WBL are all permitted left turns
- All turns on red are legal
- 15 sec EB/WB (Phases 4, 7 and 8)
- Phases 2 and 6 are continuous until Phase 4, 7 or 8 are called when a vehicle arrives
- EB and WB run concurrently
- Pedestrian crossing on NB, EB and WB legs

APPENDIX B

Traffic Data

	Total Traffic	Total Traffic	Location											
Time	(1 Hr)	(15 min)	1	2	3	4/5	6	7A	7B	8A	8B	9	10	11
12:00:00 AM	10	2					2	0	0	0	0	0	0	0
12:15:00 AM	10	4					3	1	0	0	0	0	0	0
12:30:00 AM	9	3					3	0	0	0	0	0	0	0
12:45:00 AM	11	1					1	0	0	0	0	0	0	0
1:00:00 AM	11	2					2	0	0	0	0	0	0	0
1:15:00 AM	11	3					0	2	0	0	1	0	0	0
1:30:00 AM	11	5					2	1	0	0	2	0	0	0
1:45:00 AM	12	1					0	1	0	0	0	0	0	0
2:00:00 AM	15	2					0	1	0	0	1	0	0	0
2:15:00 AM	18	3					0	3	0	0	0	0	0	0
2:30:00 AM	36	6					0	5	0	0	1	0	0	0
2:45:00 AM	39	4					0	4	0	0	0	0	0	0
3:00:00 AM	40	5					0	5	0	0	0	0	0	0
3:15:00 AM	43	21					0	20	0	0	1	0	0	0
3:30:00 AM	27	9					0	5	0	3	1	0	0	0
3:45:00 AM	27	5					0	2	0	1	2	0	0	0
4:00:00 AM	34	8					0	7	0	1	0	0	0	0
4:15:00 AM	36	5					0	5	0	0	0	0	0	0
4:30:00 AM	44	9					0	9	0	0	0	0	0	0
4:45:00 AM	50	12					0	11	0	1	0	0	0	0
5:00:00 AM	276	10					0	9	0	0	0	0	0	1
5:15:00 AM	705	13					0	11	0	2	0	0	0	0
5:30:00 AM	1142	15					0	11	0	1	0	0	0	3
5:45:00 AM	1633	238			199	27	0	10	0	1	0	0	0	1
6:00:00 AM	1924	439	119	94	194	21	0	10	0	1	0	0	0	0
6:15:00 AM	2037	450	89	95	238	10	0	16	0	1	0	0	0	1
6:30:00 AM	2219	506	101	82	300	6	0	11	0	0	0	0	0	6
6:45:00 AM	2346	529	114	109	281	8	0	13	0	1	0	0	0	3
7:00:00 AM	2468	552	116	83	320	3	0	10	0	3	0	15	0	2
7:15:00 AM	2589	632	110	116	343	5	0	12	0	0	0	40	0	6
7:30:00 AM	2611	633	123	109	324	8	0	18	0	2	0	44	0	5
7:45:00 AM	2632	651	108	104	310	3	0	30	0	7	0	81	0	8
8:00:00 AM	2565	673	109	108	318	3	0	27	0	8	0	89	0	11
8:15:00 AM	2020	654	130	104	279	11	0	28	0	1	0	93	0	8
8:30:00 AM	1501	654	112	116	292	7	0	32	0	1	0	92	0	2
8:45:00 AM	992	584	111	83	284	0	0	14	0	1	0	88	0	3
9:00:00 AM	554	128	0	0	0	0	0	17	0	0	0	101	0	10
9:15:00 AM	566	135	0	0	0	0	0	14	0	1	0	108	0	12
9:30:00 AM	571	145	0	0	0	0	0	11	0	2	0	117	0	15
9:45:00 AM	552	146	0	0	0	0	0	10	0	0	0	124	0	12
10:00:00 AM	515	140	0	0	0	0	0	10	0	1	0	116	0	13
10:15:00 AM	441	140	0	0	0	0	0	11	0	1	0	112	0	16
10:30:00 AM	324	126	0	0	0	0	0	11	0	1	0	102	0	12
10:45:00 AM	219	109	0	0	0	0	0	12	0	1	0	81	0	15
11:00:00 AM	126	66	0	0	0	0	0	9	0	0	0	44	0	13
11:15:00 AM	69	23	0	0	0	0	0	10	0	1	0	0	0	12
11:30:00 AM	57	21	0	0	0	0	0	13	0	0	0	0	0	8
11:45:00 AM	56	16	0	0	0	0	0	5	0	1	0	0	0	10
12:00:00 PM	49	9	0	0	0	0	0	6	0	0	0	0	0	3
12:15:00 PM	47	11	0	0	0	0	0	5	0	0	0	0	0	6
12:30:00 PM	43	20	0	0	0	0	0	8	0	2	0	0	0	10
12:45:00 PM	29	9	0	0	0	0	0	5	0	0	0	0	0	4
1:00:00 PM	25	7	0	0	0	0	0	2	0	0	0	0	0	5
1:15:00 PM	34	7	0	0	0	0	0	2	0	0	0	0	0	5
1:30:00 PM	46	6	0	0	0	0	0	3	0	0	0	0	0	3
1:45:00 PM	58	5	0	0	0	0	0	1	0	0	0	0	0	4
2:00:00 PM	578	16	0	0	0	0	4	4	0	0	0	0	0	8
2:15:00 PM	1447	19	0	0	0	0	10	5	0	0	0	0	0	4
2:30:00 PM	2295	18	0	0	0	0	11	4	0	0	0	0	0	3
2:45:00 PM	3106	525	181	0	329	0	10	1	0	0	0	0	0	4
3:00:00 PM	3465	885	189	176	372	123	13	6	0	0	0	0	0	6
3:15:00 PM	3679	867	213	153	365	85	42	3	0	0	0	0	0	6
3:30:00 PM	3817	829	178	146	365	120	12	2	0	0	0	0	0	6
3:45:00 PM	4034	884	221	132	347	134	35	10	0	0	0	0	1	4
4:00:00 PM	4149	1099	215	186	441	127	60	3	0	0	0	0	63	4
4:15:00 PM	4017	1005	175	186	387	129	64	4	0	0	0	0	59	1
4:30:00 PM	3992	1046	191	174	426	123	45	4	0	0	0	0	79	4
4:45:00 PM	3779	999	219	131	427	117	47	0	0	0	0	0	55	3
5:00:00 PM	3445	967	213	157	365	108	37	3	0	0	0	0	81	3
5:15:00 PM	2629	980	210	135	388	93	68	1	0	0	0	0	83	2
5:30:00 PM	1856	833	159	120	323	72	59	0	0	0	0	0	97	3
5:45:00 PM	1198	665		103	320	68	65	0	0	0	0	0	109	0
6:00:00 PM	688	151		0			54	0	0	0	0	0	95	2
6:15:00 PM	589	207					87		0	0	0	0	116	4
6:30:00 PM	413	175					71		3	0	0	0	98	3
6:45:00 PM	266	155					55		3	0	6	0	89	2
7:00:00 PM	143	52								0	27	0	20	5
7:15:00 PM	131	31								0	28	0	0	3
7:30:00 PM	138	28								0	26	0	0	2
7:45:00 PM	154	32								0	29	0	0	3
8:00:00 PM	172	40								0	39	0	0	1
8:15:00 PM	182	38								0	37	0	0	1
8:30:00 PM	205	44								0	44	0	0	0
8:45:00 PM	223	50								0	49	0	0	1
9:00:00 PM	210	50								0	50	0	0	0
9:15:00 PM	218	61								0	61	0	0	0

	Total Traffic	Total Traffic	Location												
Time	(1 Hr)	(15 min)	1	2	3	4/5	6	7A	7B	8A	8B	9	10	11
9:30:00 PM	199	62								0	62	0	0	0
9:45:00 PM	172	37								0	37	0	0	0
10:00:00 PM	144	58								0	58	0	0	0
10:15:00 PM	87	42								0	42	0	0	0
10:30:00 PM	50	35								0	35	0	0	0
10:45:00 PM	17	9								0	9	0	0	0
11:00:00 PM	10	1								0	1	0	0	0
11:15:00 PM		5								0	5	0	0	0
11:30:00 PM		2								0	2	0	0	0
11:45:00 PM		2								0	2	0	0	0

File Name: C:\Petra\Gray\2021_03_23_Alt 1_Loc 1_ Barta Road with Geoint.ppd
Start Date: 3/23/2021
Start Time: 6:00:00 AM
Site Code: 00000000
Comment 1: Default Comments
Comment 2: Change These in The Preferences Window
Comment 3: Select File/Preference in the Main Scree
Comment 4: Then Click the Comments Tab

	Barta Road From East			Geoint Drive From South			Barta Road From West				
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Tot. Veh.	Tot. Ped.
06:00 AM	82	5	1	4	8	1	6	14	0	119	2
06:15 AM	71	6	0	0	6	1	2	4	0	89	1
06:30 AM	68	5	0	4	9	0	6	9	0	101	0
06:45 AM	90	5	0	2	3	0	7	7	0	114	0
07:00 AM	86	4	0	2	4	1	10	10	0	116	1
07:15 AM	87	2	0	7	2	2	9	3	0	110	2
07:30 AM	98	4	0	1	4	2	10	6	0	123	2
07:45 AM	79	4	0	0	3	1	15	7	0	108	1
08:00 AM	81	5	0	3	5	1	11	4	0	109	1
08:15 AM	93	6	0	5	1	1	13	12	0	130	1
08:30 AM	73	8	0	5	2	2	13	11	0	112	2
08:45 AM	71	7	0	4	7	1	8	14	0	111	1
09:00 AM	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	11	8	0	28	96	0	34	4	0	181	0
03:00 PM	11	4	0	34	98	2	38	4	0	189	2
03:15 PM	12	5	0	32	119	3	40	5	0	213	3
03:30 PM	7	10	0	21	85	5	45	10	0	178	5
03:45 PM	7	13	0	27	112	0	56	6	0	221	0
04:00 PM	6	18	0	28	108	4	52	3	0	215	4
04:15 PM	6	16	0	26	91	5	33	3	0	175	5
04:30 PM	8	10	0	26	107	7	40	0	0	191	7
04:45 PM	14	11	0	80	96	6	17	1	0	219	6
05:00 PM	10	6	0	76	96	1	18	7	0	213	1
05:15 PM	9	12	0	82	91	4	15	1	0	210	4
05:30 PM	6	11	0	70	53	1	15	4	0	159	1

File Name: C:\Petra\Green\Download 2\Alt 1 Loc 2 - Barta Road with Heller Road_PM.ppd
Start Date: 4/7/2021
Start Time: 6:00:00 AM
Site Code: 00338202
Comment 1: Default Comments
Comment 2: Change These in The Preferences Window
Comment 3: Select File/Preference in the Main Scree
Comment 4: Then Click the Comments Tab

	Barta Road From East				Heller Road From South				Barta Road From West					
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Tot. Veh.	Tot. Ped.
06:00 AM	0	65	0	0	10	0	3	0	0	14	2	0	94	0
06:15 AM	0	68	0	0	12	0	1	0	0	11	3	0	95	0
06:30 AM	0	63	0	0	6	0	0	0	0	12	1	0	82	0
06:45 AM	1	83	0	0	12	0	1	0	0	11	1	0	109	0
07:00 AM	0	73	0	0	4	0	0	0	0	6	0	0	83	0
07:15 AM	0	96	0	0	11	0	0	0	0	9	0	0	116	0
07:30 AM	1	76	0	0	14	0	1	0	0	16	1	0	109	0
07:45 AM	0	76	0	0	17	0	0	0	0	10	1	0	104	0
08:00 AM	1	80	0	0	12	0	3	0	0	12	0	0	108	0
08:15 AM	0	77	0	0	17	0	0	0	0	10	0	0	104	0
08:30 AM	2	76	0	0	18	0	1	0	0	18	1	0	116	0
08:45 AM	0	59	0	0	12	0	0	0	0	11	1	0	83	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	5	9	0	0	2	0	2	1	0	96	62	0	176	1
03:15 PM	6	15	0	0	1	0	1	0	0	74	56	0	153	0
03:30 PM	4	16	0	0	1	0	2	1	0	71	52	1	146	2
03:45 PM	5	15	0	0	0	0	1	0	0	68	43	0	132	0
04:00 PM	2	21	0	0	1	0	5	0	0	84	73	1	186	1
04:15 PM	4	20	0	0	2	0	1	1	0	89	70	0	186	1
04:30 PM	3	17	0	0	2	0	3	0	0	80	69	0	174	0
04:45 PM	2	11	0	0	0	0	3	0	0	58	57	0	131	0
05:00 PM	3	16	0	0	2	0	3	2	0	79	54	0	157	2
05:15 PM	4	10	0	0	2	0	3	0	0	72	44	0	135	0
05:30 PM	4	15	0	0	2	0	4	0	0	48	47	0	120	0
05:45 PM	1	9	0	0	0	0	2	1	0	45	46	1	103	2
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: C:\Petra\Green\2021_03_23_Alt 1_Loc 3_Barta Road with Backlick Road.ppd
Start Date: 3/23/2021
Start Time: 5:45:00 AM
Site Code: 00000000
Comment 1: Default Comments
Comment 2: Change These in The Preferences Window
Comment 3: Select File/Preference in the Main Scree
Comment 4: Then Click the Comments Tab

	Backlick Road From North			Backlick Road From South			Barta Road From West				
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Tot. Veh.	Tot. Ped.
05:45 AM	27	29	0	55	78	0	9	1	0	199	0
06:00 AM	19	24	0	43	102	0	6	0	0	194	0
06:15 AM	34	24	0	38	132	0	5	5	0	238	0
06:30 AM	34	41	0	50	170	0	5	0	0	300	0
06:45 AM	54	32	0	47	139	0	8	1	0	281	0
07:00 AM	51	39	0	39	180	0	10	1	0	320	0
07:15 AM	70	43	0	58	156	0	10	6	0	343	0
07:30 AM	50	31	0	44	182	0	15	2	0	324	0
07:45 AM	46	38	0	45	170	0	8	3	0	310	0
08:00 AM	52	50	0	50	148	0	17	1	0	318	0
08:15 AM	51	29	0	53	138	0	5	3	0	279	0
08:30 AM	65	22	0	42	143	0	13	7	0	292	0
08:45 AM	58	25	0	45	140	0	10	6	0	284	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	105	10	0	9	135	0	53	17	0	329	0
03:00 PM	112	7	0	9	152	0	73	19	0	372	0
03:15 PM	116	8	0	2	149	0	69	21	0	365	0
03:30 PM	122	10	0	9	140	0	71	13	0	365	0
03:45 PM	96	16	0	14	143	0	60	18	0	347	0
04:00 PM	152	10	0	8	161	0	89	21	0	441	0
04:15 PM	123	15	0	4	170	0	59	16	0	387	0
04:30 PM	137	16	0	3	177	0	78	15	0	426	0
04:45 PM	141	10	0	9	194	0	56	17	0	427	0
05:00 PM	124	6	0	9	170	0	48	8	0	365	0
05:15 PM	135	10	0	6	169	0	54	14	0	388	0
05:30 PM	112	14	0	1	160	0	30	6	0	323	0
05:45 PM	115	12	0	1	157	0	27	8	0	320	0

File Name: C:\Petra\Gray\2021_03_24_Alt 1_Loca 4-5_ Barta Road with VA 286 Ramps.ppd
Start Date: 3/24/2021
Start Time: 5:45:00 AM
Site Code: 4-5
Comment 1: NB Thru = Barta WB Thru
Comment 2: NB RT = Barta WB to VA 286 NB Ramp
Comment 3: SB LT = Barta WB to VA 286 SB Ramp
Comment 4:

	Barta Road WB	Barta Road WB From South	
Start Time	Left	Thru	Right
05:45 AM	6	19	2
06:00 AM	1	20	0
06:15 AM	2	6	2
06:30 AM	2	1	3
06:45 AM	4	2	2
07:00 AM	2	0	1
07:15 AM	3	1	1
07:30 AM	0	2	6
07:45 AM	1	0	2
08:00 AM	0	0	3
08:15 AM	1	6	4
08:30 AM	2	4	1
08:45 AM	0	0	0
09:00 AM	0	0	0
09:15 AM	0	0	0
09:30 AM	0	0	0
09:45 AM	0	0	0
10:00 AM	0	0	0
10:15 AM	0	0	0
10:30 AM	0	0	0
10:45 AM	0	0	0
11:00 AM	0	0	0
11:15 AM	0	0	0
11:30 AM	0	0	0
11:45 AM	0	0	0
12:00 PM	0	0	0
12:15 PM	0	0	0
12:30 PM	0	0	0
12:45 PM	0	0	0
01:00 PM	0	0	0
01:15 PM	0	0	0
01:30 PM	0	0	0
01:45 PM	0	0	0
02:00 PM	0	0	0
02:15 PM	0	0	0
02:30 PM	0	0	0
02:45 PM	0	0	0
03:00 PM	34	25	64
03:15 PM	25	13	47
03:30 PM	35	21	64
03:45 PM	32	13	89

File Name: C:\Petra\Gray\2021_03_24_Alt 1_Loca 4-5_ Barta Road with VA 286 Ramps.ppd
Start Date: 3/24/2021
Start Time: 5:45:00 AM
Site Code: 4-5
Comment 1: NB Thru = Barta WB Thru
Comment 2: NB RT = Barta WB to VA 286 NB Ramp
Comment 3: SB LT = Barta WB to VA 286 SB Ramp
Comment 4:

	Barta Road WB	Barta Road WB From South	
Start Time	Left	Thru	Right
04:00 PM	26	26	75
04:15 PM	32	23	74
04:30 PM	32	19	72
04:45 PM	22	25	70
05:00 PM	20	21	67
05:15 PM	22	16	55
05:30 PM	16	16	40
05:45 PM	19	13	36

Location: **Location 6 Heller Road with I-95 NB/I-95 SB Express Lane**
Counter ID: **Counter D**
Scheme: **FHWA**
Notes: **Counter set 3/22/21 (approximately 7 PM) and picked up after 3/23/21 PM Count (approximately 7 PM)**

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/23/2021 0:00	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:15	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:30	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:00	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:30	2	0	1	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:00	4	0	3	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:15	10	0	9	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:30	11	0	11	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:45	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:00	13	0	10	3	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:15	42	0	37	4	0	1	0	0	0	0	0	0	0	0
3/23/2021 15:30	12	0	11	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:45	35	0	35	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:00	60	0	52	7	0	1	0	0	0	0	0	0	0	0
3/23/2021 16:15	64	2	58	4	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:30	45	0	41	4	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:45	47	0	40	7	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:00	37	0	33	4	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:15	68	1	64	3	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:30	59	0	54	5	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:45	65	1	59	5	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:00	54	1	50	3	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:15	87	0	79	8	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:30	71	2	64	3	1	1	0	0	0	0	0	0	0	0
3/23/2021 18:45	55	0	50	5	0	0	0	0	0	0	0	0	0	0
~~3/23/2021 19:00~~	~~62~~	~~0~~	~~57~~	~~5~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~

Location: Location 6 Heller Road with I-95 NB/I-95 SB Express Lane
Counter ID: Counter D
Scheme: FHWA
Notes: Counter set 3/22/21 (approximately 7 PM) and picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
~~3/23/2021 19:15~~	~~66~~	~~0~~	~~64~~	~~2~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:30~~	~~53~~	~~1~~	~~48~~	~~4~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:45~~	~~45~~	~~1~~	~~40~~	~~4~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:00~~	~~33~~	~~0~~	~~32~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:15~~	~~33~~	~~0~~	~~30~~	~~3~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:30~~	~~24~~	~~0~~	~~24~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~

Location: Location 7_Heller Road with I-95 SB_Channelized RT Lane
Counter ID: Counter A
Scheme: FHWA
Notes: Counter picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/23/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:15	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:15	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:30	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:15	3	0	2	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:30	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:45	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:00	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:15	20	0	18	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:30	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:45	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:00	7	0	7	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:15	5	0	4	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:30	9	0	9	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:45	11	0	10	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:00	9	0	9	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:15	11	0	9	1	0	1	0	0	0	0	0	0	0	0
3/23/2021 5:30	11	0	11	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:45	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:00	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:15	16	0	15	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:30	11	0	11	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:45	13	0	11	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:00	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:15	12	0	12	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:30	18	0	17	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:45	30	0	30	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:00	27	0	27	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:15	28	0	27	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:30	32	0	31	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:45	14	0	13	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:00	17	0	17	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:15	14	0	13	0	0	0	1	0	0	0	0	0	0	0
3/23/2021 9:30	11	0	10	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:45	10	0	8	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:00	10	0	9	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:15	11	0	11	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:30	11	0	11	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:45	12	0	11	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:00	9	0	9	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:15	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:30	13	0	12	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:45	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:00	6	0	4	1	0	1	0	0	0	0	0	0	0	0
3/23/2021 12:15	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:30	8	0	7	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:45	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:00	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:15	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:30	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:00	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:15	5	0	5	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:30	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:00	6	0	6	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:15	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:30	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:45	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:00	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:15	4	0	3	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:30	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:00	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:15	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
~~3/23/2021 18:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 18:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 18:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~

Location: Location 7_Heller Road with I-95 SB_Channelized RT Lane
Counter ID: Counter A
Scheme: FHWA
Notes: Counter picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
~~3/23/2021 19:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:00~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:45~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~

Location: Location 7_ Heller Road with I-95 SB_Left Turns
Counter ID: Counter B
Scheme: FHWA
Notes: Counter set 3/22/21 (approximately 7 PM) and picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/23/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:30	3	0	0	1	1	1	0	0	0	0	0	0	0	0
3/23/2021 18:45	3	0	0	1	0	2	0	0	0	0	0	0	0	0
~~3/23/2021 19:00~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~

Location: Location 7_ Heller Road with I-95 SB_Left Turns
Counter ID: Counter B
Scheme: FHWA
Notes: Counter set 3/22/21 (approximately 7 PM) and picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
~~3/23/2021 19:30~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 19:45~~	~~3~~	~~0~~	~~0~~	~~1~~	~~1~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:00~~	~~1~~	~~0~~	~~0~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:15~~	~~2~~	~~0~~	~~0~~	~~0~~	~~0~~	~~2~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:30~~	~~59~~	~~0~~	~~0~~	~~20~~	~~1~~	~~38~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 20:45~~	~~43~~	~~0~~	~~0~~	~~20~~	~~0~~	~~23~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:00~~	~~48~~	~~0~~	~~0~~	~~22~~	~~0~~	~~26~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:15~~	~~47~~	~~0~~	~~0~~	~~26~~	~~1~~	~~20~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:30~~	~~48~~	~~0~~	~~0~~	~~33~~	~~0~~	~~15~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 21:45~~	~~44~~	~~0~~	~~0~~	~~33~~	~~0~~	~~11~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:00~~	~~51~~	~~0~~	~~0~~	~~34~~	~~1~~	~~16~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:15~~	~~39~~	~~0~~	~~0~~	~~13~~	~~0~~	~~26~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:30~~	~~31~~	~~0~~	~~0~~	~~9~~	~~0~~	~~22~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 22:45~~	~~12~~	~~0~~	~~0~~	~~4~~	~~0~~	~~8~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:00~~	~~9~~	~~0~~	~~0~~	~~2~~	~~0~~	~~7~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:15~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:30~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~
~~3/23/2021 23:45~~	~~2~~	~~0~~	~~0~~	~~0~~	~~1~~	~~1~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~	~~0~~

Location: Location 8_Heller Road with NGA South Gate_Outbound
Counter ID: Counter A
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/24/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:30	3	0	0	0	0	3	0	0	0	0	0	0	0	0
3/24/2021 3:45	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 4:00	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:45	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:15	2	0	0	0	1	1	0	0	0	0	0	0	0	0
3/24/2021 5:30	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 5:45	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 6:00	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 6:15	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0
3/24/2021 7:00	3	0	0	0	0	3	0	0	0	0	0	0	0	0
3/24/2021 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:30	2	0	0	0	0	2	0	0	0	0	0	0	0	0
3/24/2021 7:45	7	0	0	2	0	5	0	0	0	0	0	0	0	0
3/24/2021 8:00	8	0	0	0	0	8	0	0	0	0	0	0	0	0
3/24/2021 8:15	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 8:30	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 8:45	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0
3/24/2021 9:30	2	0	1	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:00	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 10:15	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 10:30	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 10:45	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:15	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:45	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:30	2	0	0	0	0	2	0	0	0	0	0	0	0	0
3/24/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Location: Location 8_Heller Road with NGA South Gate_Outbound
Counter ID: Counter A
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/24/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Location: Location 8_Heller Road with NGA South Gate_Inbound
Counter ID: Counter B
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/24/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:15	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 1:30	2	0	0	0	0	2	0	0	0	0	0	0	0	0
3/24/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:00	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0
3/24/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:15	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:30	1	0	0	0	0	1	0	0	0	0	0	0	0	0
3/24/2021 3:45	2	0	0	0	0	2	0	0	0	0	0	0	0	0
3/24/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:45	6	0	0	2	0	4	0	0	0	0	0	0	0	0
3/24/2021 19:00	27	0	0	18	0	9	0	0	0	0	0	0	0	0

Location: **Location 8_Heller Road with NGA South Gate_Inbound**
Counter ID: **Counter B**
Scheme: **FHWA**
Notes: **Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/24/21 PM Count (approximately 7 PM)**

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 19:15	28	0	0	21	0	7	0	0	0	0	0	0	0	0
3/24/2021 19:30	26	0	1	20	0	5	0	0	0	0	0	0	0	0
3/24/2021 19:45	29	0	1	22	1	5	0	0	0	0	0	0	0	0
3/24/2021 20:00	39	0	4	28	0	6	1	0	0	0	0	0	0	0
3/24/2021 20:15	37	0	5	30	0	2	0	0	0	0	0	0	0	0
3/24/2021 20:30	44	0	9	34	0	1	0	0	0	0	0	0	0	0
3/24/2021 20:45	49	0	11	36	0	2	0	0	0	0	0	0	0	0
3/24/2021 21:00	50	0	21	23	1	5	0	0	0	0	0	0	0	0
3/24/2021 21:15	61	0	32	29	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:30	62	0	42	19	0	1	0	0	0	0	0	0	0	0
3/24/2021 21:45	37	1	25	11	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:00	58	0	40	16	0	2	0	0	0	0	0	0	0	0
3/24/2021 22:15	42	0	35	7	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:30	35	0	24	7	0	4	0	0	0	0	0	0	0	0
3/24/2021 22:45	9	0	5	3	0	1	0	0	0	0	0	0	0	0
3/24/2021 23:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:15	5	0	2	3	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:30	2	0	0	1	1	0	0	0	0	0	0	0	0	0
3/24/2021 23:45	2	0	1	0	1	0	0	0	0	0	0	0	0	0

Location: Location 9 Barta Road with NGA West Gate Entrance
Counter ID: Counter D
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/24/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:00	15	0	13	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:15	40	0	33	7	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:30	44	0	37	7	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:45	81	0	64	17	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:00	89	0	76	11	0	2	0	0	0	0	0	0	0	0
3/24/2021 8:15	93	0	78	12	0	3	0	0	0	0	0	0	0	0
3/24/2021 8:30	92	0	75	12	0	5	0	0	0	0	0	0	0	0
3/24/2021 8:45	88	0	77	10	0	1	0	0	0	0	0	0	0	0
3/24/2021 9:00	101	1	93	6	0	1	0	0	0	0	0	0	0	0
3/24/2021 9:15	108	0	96	10	0	2	0	0	0	0	0	0	0	0
3/24/2021 9:30	117	0	99	18	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:45	124	0	114	9	0	1	0	0	0	0	0	0	0	0
3/24/2021 10:00	116	0	106	10	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:15	112	0	102	9	0	1	0	0	0	0	0	0	0	0
3/24/2021 10:30	102	0	93	9	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:45	81	0	70	10	0	1	0	0	0	0	0	0	0	0
3/24/2021 11:00	44	0	39	5	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Location: Location 9 Barta Road with NGA West Gate Entrance
Counter ID: Counter D
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/24/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Location: Location 10_Barta Road and NGA West Gate_Exit
Counter ID: Counter C
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/25/21 AM Count (approximately 10 AM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 15:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:00	63	0	61	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:15	59	0	57	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:30	79	0	73	6	0	0	0	0	0	0	0	0	0	0
3/24/2021 16:45	55	0	54	1	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:00	81	0	80	1	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:15	83	0	81	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:30	97	2	93	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 17:45	109	0	106	3	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:00	95	0	91	4	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:15	116	2	111	3	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:30	98	0	96	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 18:45	89	0	87	2	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:00	20	0	19	0	0	1	0	0	0	0	0	0	0	0

Location: Location 10_Barta Road and NGA West Gate_Exit
Counter ID: Counter C
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/25/21 AM Count (approximately 10 AM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/24/2021 19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/24/2021 23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Location: Location 10_Barta Road and NGA West Gate_Exit
Counter ID: Counter C
Scheme: FHWA
Notes: Counter set after 3/23/21 PM Count (approximately 7 PM) and picked up after 3/25/21 AM Count (approximately 10 AM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/25/2021 14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/25/2021 23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Location: Location 11_NGA Visitor Center Access Roadway
Counter ID: Counter C
Scheme: FHWA
Notes: Counter set on 3/22/21 PM (approximately 7 PM) and picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/23/2021 0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:30	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 5:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:15	1	0	0	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:30	6	0	6	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 6:45	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:00	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 7:15	6	0	5	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 7:30	5	0	3	1	0	1	0	0	0	0	0	0	0	0
3/23/2021 7:45	8	0	8	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:00	11	0	9	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:15	8	0	7	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:30	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 8:45	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:00	10	0	10	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:15	12	0	11	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:30	15	0	14	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 9:45	12	0	11	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:00	13	0	13	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:15	16	0	16	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:30	12	0	12	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 10:45	15	0	14	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 11:00	13	0	11	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:15	12	0	12	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:30	8	0	8	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 11:45	10	0	9	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 12:00	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:15	6	0	5	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:30	10	0	9	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 12:45	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:00	5	0	4	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:15	5	0	3	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:30	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 13:45	4	0	3	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 14:00	8	0	5	2	0	1	0	0	0	0	0	0	0	0
3/23/2021 14:15	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:30	3	0	1	2	0	0	0	0	0	0	0	0	0	0
3/23/2021 14:45	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:00	6	0	6	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:15	6	0	4	1	0	1	0	0	0	0	0	0	0	0
3/23/2021 15:30	6	0	6	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 15:45	4	0	3	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:00	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:15	1	0	0	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 16:30	4	0	3	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 16:45	3	0	2	1	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:00	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:15	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:30	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:00	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:15	4	0	4	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 18:30	3	0	2	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 18:45	2	0	2	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 19:00	5	0	3	2	0	0	0	0	0	0	0	0	0	0

Location: Location 11_NGA Visitor Center Access Roadway
Counter ID: Counter C
Scheme: FHWA
Notes: Counter set on 3/22/21 PM (approximately 7 PM) and picked up after 3/23/21 PM Count (approximately 7 PM)

Date/Time	Volume	Class #1	Class #2	Class #3	Class #4	Class #5	Class #6	Class #7	Class #8	Class #9	Class #10	Class #11	Class #12	Class #13
3/23/2021 19:15	3	0	2	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 19:30	2	0	1	0	0	1	0	0	0	0	0	0	0	0
3/23/2021 19:45	3	0	3	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 20:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 20:15	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 20:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3/23/2021 23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX C

Synchro Files

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	86	0	6	30	0	0
Future Volume (vph)	86	0	6	30	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt						
Flt Protected				0.991		
Satd. Flow (prot)	3539	0	0	3507	0	1863
Flt Permitted				0.991		
Satd. Flow (perm)	3539	0	0	3507	0	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	0	7	33	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	93	0	0	40	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 8.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	24	115	355	0	0
Future Volume (vph)	0	24	115	355	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	26	125	386	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	26	125	386	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 22.0%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations				↑↑	↑↑↑	↱
Traffic Volume (vph)	0	0	0	470	14	10
Future Volume (vph)	0	0	0	470	14	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	511	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	511	15	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	24	0	0	470	0
Future Volume (vph)	0	24	0	0	470	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	26	0	0	511	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	26	0	0	511	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			47.1	
Actuated g/C Ratio		1.00			0.94	
v/c Ratio		0.01			0.16	
Control Delay		0.0			0.9	
Queue Delay		0.0			0.0	
Total Delay		0.0			0.9	
LOS		A			A	
Approach Delay					0.9	
Approach LOS					A	
Queue Length 50th (ft)		0			0	
Queue Length 95th (ft)		0			29	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			3234	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.01			0.16	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.16
Intersection Signal Delay: 0.9 Intersection LOS: A
Intersection Capacity Utilization 17.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	115	0	0	24	0	0
Future Volume (vph)	115	0	0	24	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	3614	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	3614	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	0	0	26	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	125	0	0	26	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	45.0			45.0		
Actuated g/C Ratio	1.00			1.00		
v/c Ratio	0.04			0.01		
Control Delay	0.0			0.0		
Queue Delay	0.0			0.0		
Total Delay	0.0			0.0		
LOS	A			A		
Approach Delay						
Approach LOS						
Queue Length 50th (ft)	0			0		
Queue Length 95th (ft)	0			1		
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	3539			3539		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.04			0.01		

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

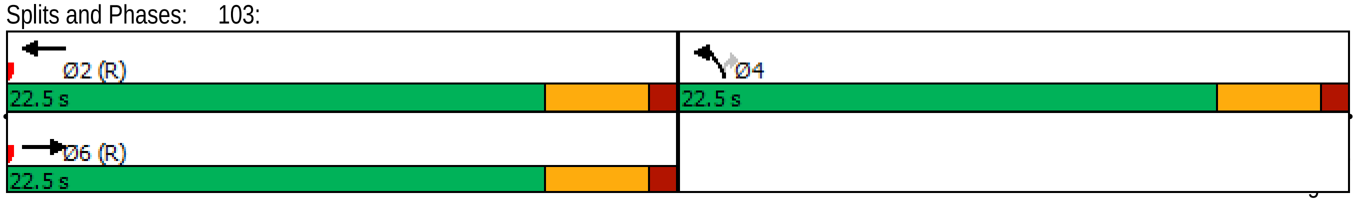
Maximum v/c Ratio: 0.04

Intersection Signal Delay: 0.0 Intersection LOS: A

Intersection Capacity Utilization 7.9% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	86	29	6	24	0	0
Future Volume (vph)	86	29	6	24	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.962					
Flt Protected			0.950			
Satd. Flow (prot)	3405	0	1770	3539	1863	1863
Flt Permitted			0.673			
Satd. Flow (perm)	3405	0	1254	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	32					
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	32	7	26	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	125	0	7	26	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0		18.0	18.0		
Actuated g/C Ratio	0.40		0.40	0.40		
v/c Ratio	0.09		0.01	0.02		
Control Delay	6.9		8.3	8.2		
Queue Delay	0.0		0.0	0.0		
Total Delay	6.9		8.3	8.2		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A		A	A		
Approach Delay	6.9			8.3		
Approach LOS	A			A		
Queue Length 50th (ft)	7		1	2		
Queue Length 95th (ft)	18		6	7		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1381		501	1415		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.09		0.01	0.02		

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Natural Cycle: 45

Control Type: Pretimed

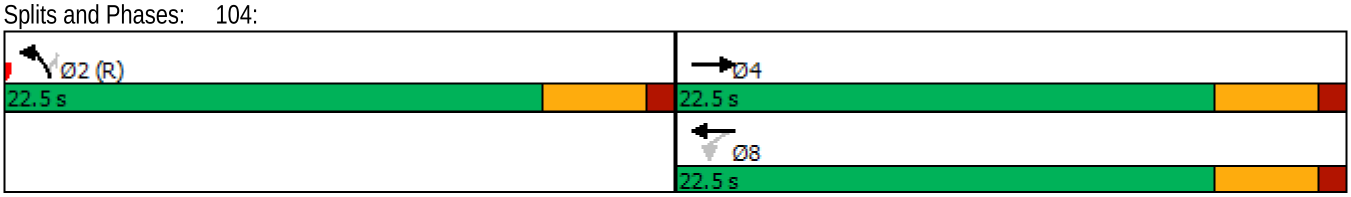
Maximum v/c Ratio: 0.09

Intersection Signal Delay: 7.2 Intersection LOS: A

Intersection Capacity Utilization 8.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 104:

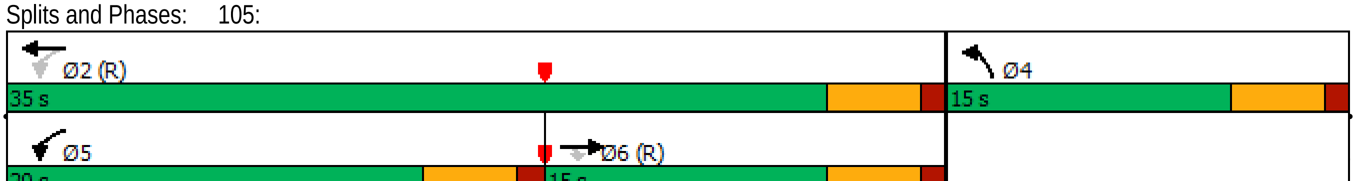


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	52	34	326	23	13	11
Future Volume (vph)	52	34	326	23	13	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.931	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3539	1583	1770	3539	3277	0
Flt Permitted			0.619		0.974	
Satd. Flow (perm)	3539	1583	1153	3539	3277	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		37			12	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	37	354	25	14	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	57	37	354	25	26	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	15.0	15.0	20.0	35.0	15.0	
Total Split (%)	30.0%	30.0%	40.0%	70.0%	30.0%	
Maximum Green (s)	10.5	10.5	15.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	31.9	31.9	43.3	46.9	5.8	
Actuated g/C Ratio	0.64	0.64	0.87	0.94	0.12	
v/c Ratio	0.03	0.04	0.33	0.01	0.07	
Control Delay	6.1	3.7	2.0	1.0	15.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.1	3.7	2.0	1.0	15.0	
LOS	A	A	A	A	B	
Approach Delay	5.2			1.9	15.0	
Approach LOS	A			A	B	
Queue Length 50th (ft)	1	0	0	0	2	
Queue Length 95th (ft)	14	14	50	2	10	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	2257	1023	1190	3321	697	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.03	0.04	0.30	0.01	0.04	

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 36.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	59	4	90	349	9	0	0	2	0	0	0
Future Volume (vph)	0	59	4	90	349	9	0	0	2	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991			0.997			0.865				
Flt Protected					0.990							
Satd. Flow (prot)	0	3507	0	0	3493	0	0	1611	0	0	1863	0
Flt Permitted					0.990							
Satd. Flow (perm)	0	3507	0	0	3493	0	0	1611	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	64	4	98	379	10	0	0	2	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	68	0	0	487	0	0	2	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 25.8%	ICU Level of Service A
Analysis Period (min) 15	

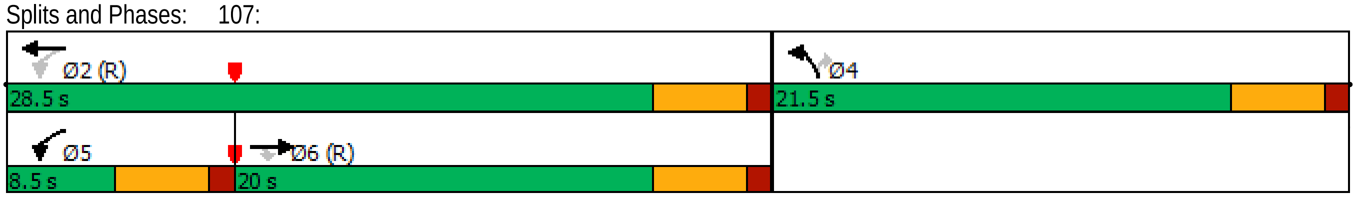
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	55	6	5	324	124	2
Future Volume (vph)	55	6	5	324	124	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	3539	1689	0	3536	1770	1583
Flt Permitted				0.953	0.950	
Satd. Flow (perm)	3539	1689	0	3373	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		7				2
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	7	5	352	135	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	7	0	357	135	2
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	34.8	34.8		34.8	9.1	9.1
Actuated g/C Ratio	0.70	0.70		0.70	0.18	0.18
v/c Ratio	0.02	0.01		0.15	0.42	0.01
Control Delay	2.7	1.5		5.2	21.4	11.5
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	2.7	1.5		5.2	21.4	11.5
LOS	A	A		A	C	B
Approach Delay	2.6			5.2	21.2	
Approach LOS	A			A	C	
Queue Length 50th (ft)	4	0		17	35	0
Queue Length 95th (ft)	1	0		48	69	4
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	2465	1179		2350	601	539
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.02	0.01		0.15	0.22	0.00

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.42
Intersection Signal Delay: 8.8 Intersection LOS: A
Intersection Capacity Utilization 26.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 107:



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	14	190	599	214	139
Future Volume (vph)	43	14	190	599	214	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.964					0.850
Flt Protected	0.963		0.950			
Satd. Flow (prot)	3355	0	1770	3539	3539	1583
Flt Permitted	0.963		0.470			
Satd. Flow (perm)	3355	0	875	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	15					151
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	15	207	651	233	151
Shared Lane Traffic (%)						
Lane Group Flow (vph)	62	0	207	651	233	151
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	15.0		15.0	35.0	20.0	20.0
Total Split (%)	30.0%		30.0%	70.0%	40.0%	40.0%
Maximum Green (s)	10.5		10.5	30.5	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	10.5		30.5	30.5	15.5	15.5
Actuated g/C Ratio	0.21		0.61	0.61	0.31	0.31
v/c Ratio	0.09		0.29	0.30	0.21	0.25
Control Delay	10.6		5.5	5.1	13.4	4.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	10.6		5.5	5.1	13.4	4.3

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	B		A	A	B	A
Approach Delay	10.6			5.2	9.8	
Approach LOS	B			A	A	
Queue Length 50th (ft)	7		22	39	25	0
Queue Length 95th (ft)	18		43	60	47	30
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	716		721	2158	1097	594
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.09		0.29	0.30	0.21	0.25

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 6.8	Intersection LOS: A
Intersection Capacity Utilization 31.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 108:

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑			↑		
Traffic Volume (vph)	134	0	0	6	0	0
Future Volume (vph)	134	0	0	6	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	0	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	146	0	0	7	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	146	0	0	7	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 10.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	17	0	0	6	0	117
Future Volume (vph)	17	0	0	6	0	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	0	0	7	0	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	18	0	0	7	127	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 17.2%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	6	17	0
Future Volume (vph)	0	0	0	6	17	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	7	18	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	7	0	18	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	128	12	0	215	42	21
Future Volume (vph)	128	12	0	215	42	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.987					0.865
Flt Protected					0.950	
Satd. Flow (prot)	3493	0	0	3539	0	1611
Flt Permitted					0.950	
Satd. Flow (perm)	3493	0	0	3539	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	13	0	234	46	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	152	0	0	234	46	23
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	495	123	0	0	0
Future Volume (vph)	0	495	123	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	538	134	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	538	134	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 20.6%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations				↑↑	↑↑↑	↱
Traffic Volume (vph)	0	0	0	0	205	291
Future Volume (vph)	0	0	0	0	205	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	223	316
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	223	316
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	496	0	0	123	0
Future Volume (vph)	0	496	0	0	123	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	539	0	0	134	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	539	0	0	134	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			35.5	
Actuated g/C Ratio		1.00			0.71	
v/c Ratio		0.19			0.05	
Control Delay		0.4			2.3	
Queue Delay		0.0			0.0	
Total Delay		0.4			2.3	
LOS		A			A	
Approach Delay	0.4				2.3	
Approach LOS	A				A	
Queue Length 50th (ft)		0			4	
Queue Length 95th (ft)		0			8	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			2437	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.19			0.05	

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.19	
Intersection Signal Delay: 0.7	Intersection LOS: A
Intersection Capacity Utilization 21.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	123	0	0	257	239	17
Future Volume (vph)	123	0	0	257	239	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	3433	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						18
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	0	0	279	260	18
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	0	0	279	260	18
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	27.5			27.5	22.5	22.5
Total Split (%)	55.0%			55.0%	45.0%	45.0%
Maximum Green (s)	23.0			23.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	31.9			31.9	9.1	9.1
Actuated g/C Ratio	0.64			0.64	0.18	0.18
v/c Ratio	0.06			0.12	0.42	0.06
Control Delay	3.4			4.1	19.8	8.8
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	3.4			4.1	19.8	8.8
LOS	A			A	B	A
Approach Delay	3.4			4.1	19.1	
Approach LOS	A			A	B	
Queue Length 50th (ft)	6			13	35	0
Queue Length 95th (ft)	12			27	58	12
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	2259			2259	1235	581
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.06			0.12	0.21	0.03

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

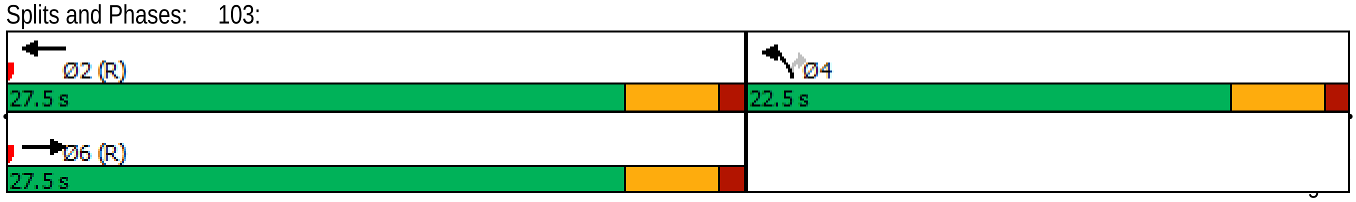
Maximum v/c Ratio: 0.42

Intersection Signal Delay: 10.0 Intersection LOS: A

Intersection Capacity Utilization 21.4% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:

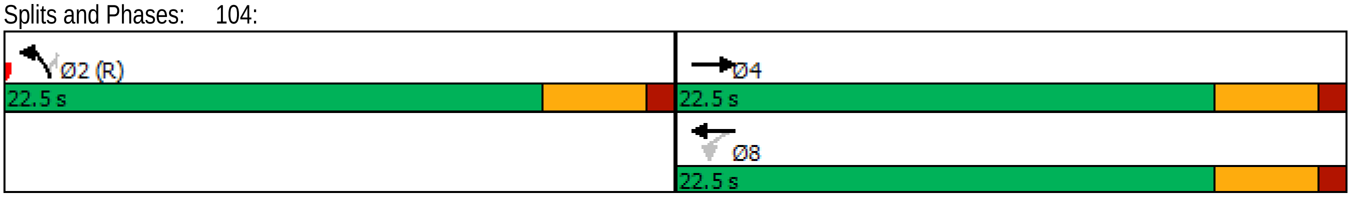


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	123	0	0	257	0	0
Future Volume (vph)	123	0	0	257	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	1863	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	1863	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	0	0	279	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	134	0	0	279	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0			18.0		
Actuated g/C Ratio	0.40			0.40		
v/c Ratio	0.09			0.20		
Control Delay	8.7			9.3		
Queue Delay	0.0			0.0		
Total Delay	8.7			9.3		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A			A		
Approach Delay	8.7			9.3		
Approach LOS	A			A		
Queue Length 50th (ft)	10			23		
Queue Length 95th (ft)	22			42		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1415			1415		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.09			0.20		

Intersection Summary	
Area Type: Other	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 10.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 104:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	142	7	34	55	160	402
Future Volume (vph)	142	7	34	55	160	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.893	
Flt Protected			0.950		0.986	
Satd. Flow (prot)	3539	1583	1770	3539	3182	0
Flt Permitted			0.557		0.986	
Satd. Flow (perm)	3539	1583	1038	3539	3182	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		8			437	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	8	37	60	174	437
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	8	37	60	611	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	15.0	15.0	20.0	35.0	15.0	
Total Split (%)	30.0%	30.0%	40.0%	70.0%	30.0%	
Maximum Green (s)	10.5	10.5	15.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	28.3	28.3	32.7	32.7	8.3	
Actuated g/C Ratio	0.57	0.57	0.65	0.65	0.17	
v/c Ratio	0.08	0.01	0.05	0.03	0.69	
Control Delay	7.5	6.1	4.2	3.9	10.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.5	6.1	4.2	3.9	10.0	
LOS	A	A	A	A	B	
Approach Delay	7.5			4.0	10.0	
Approach LOS	A			A	B	
Queue Length 50th (ft)	6	0	3	2	23	
Queue Length 95th (ft)	28	6	3	1	58	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	2005	900	906	2315	1013	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.01	0.04	0.03	0.60	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

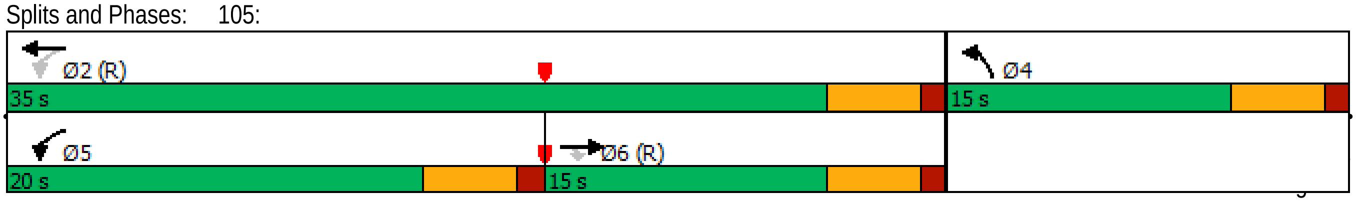
Maximum v/c Ratio: 0.69

Intersection Signal Delay: 8.9 Intersection LOS: A

Intersection Capacity Utilization 36.9% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	544	0	1	71	1	16	0	65	0	0	0
Future Volume (vph)	0	544	0	1	71	1	16	0	65	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.891				
Flt Protected					0.999			0.990				
Satd. Flow (prot)	0	3539	0	0	3529	0	0	1643	0	0	1863	0
Flt Permitted					0.999			0.990				
Satd. Flow (perm)	0	3539	0	0	3529	0	0	1643	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	591	0	1	77	1	17	0	71	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	591	0	0	79	0	0	88	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 26.6%		ICU Level of Service A
Analysis Period (min) 15		

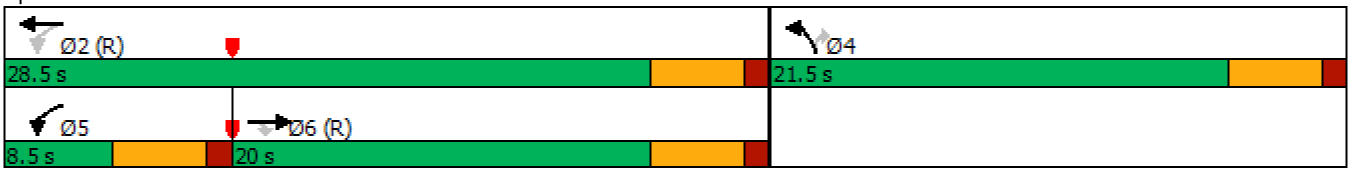
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	340	214	2	73	0	11
Future Volume (vph)	340	214	2	73	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999		
Satd. Flow (prot)	3539	1689	0	3536	1863	1583
Flt Permitted				0.951		
Satd. Flow (perm)	3539	1689	0	3366	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		233				406
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	370	233	2	79	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	370	233	0	81	0	12
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	47.1	47.1		47.1		5.5
Actuated g/C Ratio	0.94	0.94		0.94		0.11
v/c Ratio	0.11	0.15		0.03		0.02
Control Delay	1.0	0.7		2.4		0.1
Queue Delay	0.0	0.0		0.0		0.0
Total Delay	1.0	0.7		2.4		0.1
LOS	A	A		A		A
Approach Delay	0.9			2.4	0.1	
Approach LOS	A			A	A	
Queue Length 50th (ft)	0	0		0		0
Queue Length 95th (ft)	23	m0		15		0
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	3334	1604		3171		806
Starvation Cap Reductn	0	0		0		0
Spillback Cap Reductn	0	0		0		0
Storage Cap Reductn	0	0		0		0
Reduced v/c Ratio	0.11	0.15		0.03		0.01

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.15
Intersection Signal Delay: 1.0 Intersection LOS: A
Intersection Capacity Utilization 24.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107:



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	282	69	24	702	553	51
Future Volume (vph)	282	69	24	702	553	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.971					0.850
Flt Protected	0.961		0.950			
Satd. Flow (prot)	3372	0	1770	3539	3539	1583
Flt Permitted	0.961		0.269			
Satd. Flow (perm)	3372	0	501	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	56					55
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	75	26	763	601	55
Shared Lane Traffic (%)						
Lane Group Flow (vph)	382	0	26	763	601	55
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	15.0		15.0	35.0	20.0	20.0
Total Split (%)	30.0%		30.0%	70.0%	40.0%	40.0%
Maximum Green (s)	10.5		10.5	30.5	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	10.5		30.5	30.5	15.5	15.5
Actuated g/C Ratio	0.21		0.61	0.61	0.31	0.31
v/c Ratio	0.51		0.05	0.35	0.55	0.10
Control Delay	16.4		4.1	5.4	16.6	5.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	16.4		4.1	5.4	16.6	5.1

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	B		A	A	B	A
Approach Delay	16.4			5.4	15.7	
Approach LOS	B			A	B	
Queue Length 50th (ft)	37		3	47	75	0
Queue Length 95th (ft)	73		9	72	116	19
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	752		572	2158	1097	528
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.51		0.05	0.35	0.55	0.10

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 11.4 Intersection LOS: B

Intersection Capacity Utilization 37.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 108:

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	11	0	216	0	0	0
Future Volume (vph)	11	0	216	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	0	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	0	235	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	235	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 22.0%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	11
Future Volume (vph)	0	0	0	0	0	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	1863
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	0	0	60	0	0
Future Volume (vph)	144	0	0	60	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	0	0	65	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	157	0	0	65	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 7.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	40	192	592	0	0
Future Volume (vph)	0	40	192	592	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	209	643	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	209	643	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 34.5%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations				↑↑	↑↑↑	↱
Traffic Volume (vph)	0	0	0	470	14	10
Future Volume (vph)	0	0	0	470	14	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	511	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	511	15	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 16.3%		ICU Level of Service A
Analysis Period (min) 15		

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	40	0	0	784	0
Future Volume (vph)	0	40	0	0	784	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	0	0	852	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	0	0	852	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			44.2	
Actuated g/C Ratio		1.00			0.88	
v/c Ratio		0.02			0.28	
Control Delay		0.0			1.8	
Queue Delay		0.0			0.0	
Total Delay		0.0			1.8	
LOS		A			A	
Approach Delay					1.8	
Approach LOS					A	
Queue Length 50th (ft)		0			0	
Queue Length 95th (ft)		0			51	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			3035	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.02			0.28	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.28
Intersection Signal Delay: 1.7 Intersection LOS: A
Intersection Capacity Utilization 26.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↰↰	↱
Traffic Volume (vph)	115	0	0	40	0	0
Future Volume (vph)	115	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	3614	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	3614	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	125	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	45.0			45.0		
Actuated g/C Ratio	1.00			1.00		
v/c Ratio	0.04			0.01		
Control Delay	0.0			0.0		
Queue Delay	0.0			0.0		
Total Delay	0.0			0.0		
LOS	A			A		
Approach Delay						
Approach LOS						
Queue Length 50th (ft)	0			0		
Queue Length 95th (ft)	0			1		
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	3539			3539		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.04			0.01		

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

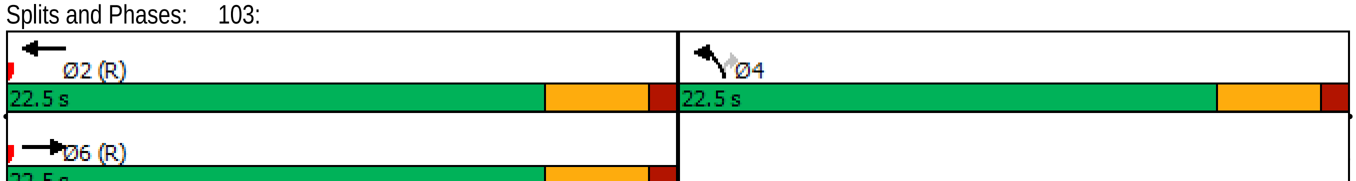
Maximum v/c Ratio: 0.04

Intersection Signal Delay: 0.0 Intersection LOS: A

Intersection Capacity Utilization 7.9% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:



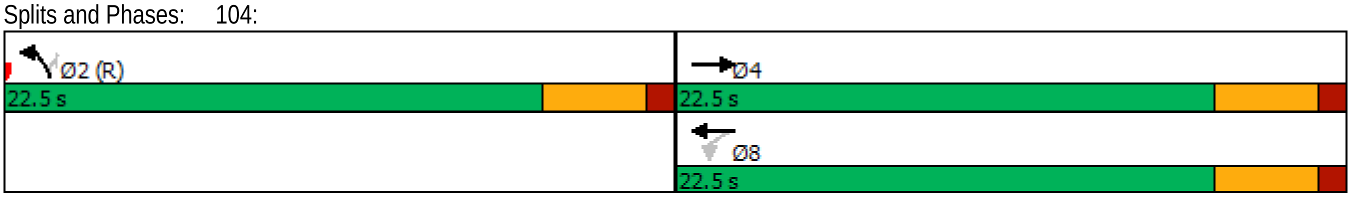
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	49	20	40	0	0
Future Volume (vph)	144	49	20	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.962					
Flt Protected			0.950			
Satd. Flow (prot)	3405	0	1770	3539	1863	1863
Flt Permitted			0.620			
Satd. Flow (perm)	3405	0	1155	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	53					
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	53	22	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	210	0	22	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0		18.0	18.0		
Actuated g/C Ratio	0.40		0.40	0.40		
v/c Ratio	0.15		0.05	0.03		
Control Delay	6.8		8.7	8.3		
Queue Delay	0.0		0.0	0.0		
Total Delay	6.8		8.7	8.3		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A		A	A		
Approach Delay	6.8			8.5		
Approach LOS	A			A		
Queue Length 50th (ft)	12		3	3		
Queue Length 95th (ft)	27		13	10		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1393		462	1415		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.15		0.05	0.03		

Intersection Summary

Area Type: Other
Cycle Length: 45
Actuated Cycle Length: 45
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle: 45
Control Type: Pretimed
Maximum v/c Ratio: 0.15
Intersection Signal Delay: 7.2 Intersection LOS: A
Intersection Capacity Utilization 17.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 104:

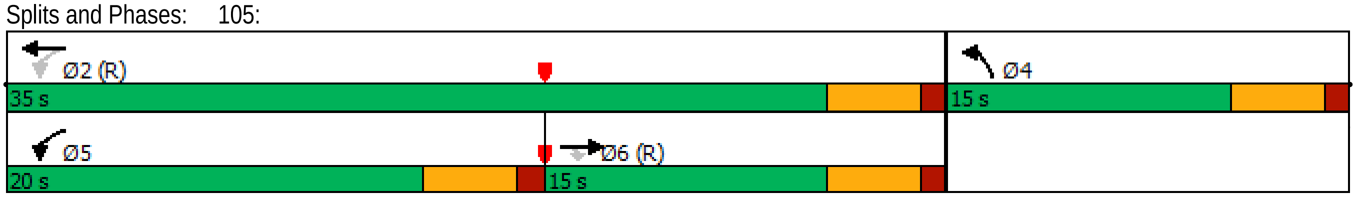


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	87	57	544	39	22	19
Future Volume (vph)	87	57	544	39	22	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.930	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3539	1583	1770	3539	3273	0
Flt Permitted			0.581		0.974	
Satd. Flow (perm)	3539	1583	1082	3539	3273	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		62			21	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	62	591	42	24	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	62	591	42	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	15.0	15.0	20.0	35.0	15.0	
Total Split (%)	30.0%	30.0%	40.0%	70.0%	30.0%	
Maximum Green (s)	10.5	10.5	15.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	26.1	26.1	41.1	43.8	6.0	
Actuated g/C Ratio	0.52	0.52	0.82	0.88	0.12	
v/c Ratio	0.05	0.07	0.57	0.01	0.11	
Control Delay	11.3	5.8	4.2	1.3	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.3	5.8	4.2	1.3	13.9	
LOS	B	A	A	A	B	
Approach Delay	9.1			4.0	13.9	
Approach LOS	A			A	B	
Queue Length 50th (ft)	3	0	1	0	3	
Queue Length 95th (ft)	26	23	75	m3	14	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1848	856	1112	3099	703	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.07	0.53	0.01	0.06	

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 5.5	Intersection LOS: A
Intersection Capacity Utilization 48.5%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	99	7	150	582	15	0	0	4	0	0	0
Future Volume (vph)	0	99	7	150	582	15	0	0	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.997			0.865				
Flt Protected					0.990							
Satd. Flow (prot)	0	3504	0	0	3493	0	0	1611	0	0	1863	0
Flt Permitted					0.990							
Satd. Flow (perm)	0	3504	0	0	3493	0	0	1611	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	108	8	163	633	16	0	0	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	116	0	0	812	0	0	4	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

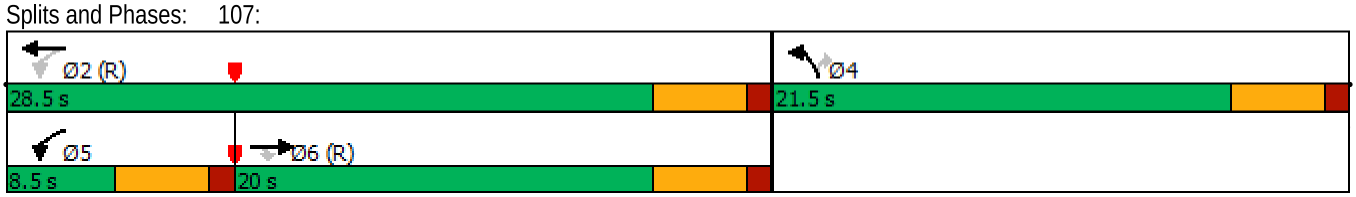
Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 34.2%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	10	9	540	207	4
Future Volume (vph)	92	10	9	540	207	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	3539	1689	0	3536	1770	1583
Flt Permitted				0.952	0.950	
Satd. Flow (perm)	3539	1689	0	3369	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				4
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	11	10	587	225	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	11	0	597	225	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	29.5	29.5		29.5	11.5	11.5
Actuated g/C Ratio	0.59	0.59		0.59	0.23	0.23
v/c Ratio	0.05	0.01		0.30	0.55	0.01
Control Delay	2.2	0.5		6.8	21.5	9.0
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	2.2	0.5		6.8	21.5	9.0
LOS	A	A		A	C	A
Approach Delay	2.0			6.8	21.3	
Approach LOS	A			A	C	
Queue Length 50th (ft)	7	1		37	58	0
Queue Length 95th (ft)	1	0		75	98	5
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	2085	999		1984	601	540
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.05	0.01		0.30	0.37	0.01

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 37.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 107:



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	24	317	999	357	232
Future Volume (vph)	72	24	317	999	357	232
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.962					0.850
Flt Protected	0.964		0.950			
Satd. Flow (prot)	3351	0	1770	3539	3539	1583
Flt Permitted	0.964		0.405			
Satd. Flow (perm)	3351	0	754	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	26					252
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	26	345	1086	388	252
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	345	1086	388	252
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	15.0		15.0	35.0	20.0	20.0
Total Split (%)	30.0%		30.0%	70.0%	40.0%	40.0%
Maximum Green (s)	10.5		10.5	30.5	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	10.5		30.5	30.5	15.5	15.5
Actuated g/C Ratio	0.21		0.61	0.61	0.31	0.31
v/c Ratio	0.14		0.51	0.50	0.35	0.38
Control Delay	8.3		7.7	6.5	14.5	4.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	8.3		7.7	6.5	14.5	4.2

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	A		A	A	B	A
Approach Delay	8.3			6.8	10.5	
Approach LOS	A			A	B	
Queue Length 50th (ft)	12		40	77	45	0
Queue Length 95th (ft)	26		74	113	74	39
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	724		673	2158	1097	664
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.14		0.51	0.50	0.35	0.38

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 7.9 Intersection LOS: A

Intersection Capacity Utilization 42.8% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 108:

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	211	0	0	19	0	0
Future Volume (vph)	211	0	0	19	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	0	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	229	0	0	21	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	0	0	21	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 14.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (vph)	28	0	0	19	0	183
Future Volume (vph)	28	0	0	19	0	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	0	0	21	0	199
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	0	21	199	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 21.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	19	28	0
Future Volume (vph)	0	0	0	19	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	21	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	21	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	214	20	0	359	70	35
Future Volume (vph)	214	20	0	359	70	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.987					0.865
Flt Protected					0.950	
Satd. Flow (prot)	3493	0	0	3539	0	1611
Flt Permitted					0.950	
Satd. Flow (perm)	3493	0	0	3539	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	22	0	390	76	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	0	0	390	76	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	827	205	0	0	0
Future Volume (vph)	0	827	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	899	223	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	899	223	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 32.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	205	342	485
Future Volume (vph)	0	0	0	205	342	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	223	372	527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	223	372	527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	827	0	0	205	0
Future Volume (vph)	0	827	0	0	205	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	899	0	0	223	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	899	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			34.7	
Actuated g/C Ratio		1.00			0.69	
v/c Ratio		0.32			0.09	
Control Delay		0.7			2.7	
Queue Delay		0.0			0.0	
Total Delay		0.7			2.7	
LOS		A			A	
Approach Delay	0.7				2.7	
Approach LOS	A				A	
Queue Length 50th (ft)		0			8	
Queue Length 95th (ft)		1			16	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2783			2382	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.32			0.09	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.32
Intersection Signal Delay: 1.1 Intersection LOS: A
Intersection Capacity Utilization 32.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102:

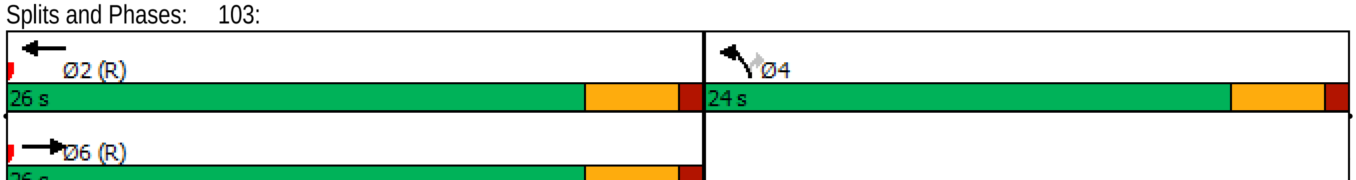
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	0	0	429	399	29
Future Volume (vph)	205	0	0	429	399	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	3433	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						32
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	0	0	466	434	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	466	434	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	26.0			26.0	24.0	24.0
Total Split (%)	52.0%			52.0%	48.0%	48.0%
Maximum Green (s)	21.5			21.5	19.5	19.5
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	29.3			29.3	11.7	11.7
Actuated g/C Ratio	0.59			0.59	0.23	0.23
v/c Ratio	0.11			0.22	0.54	0.08
Control Delay	4.4			5.8	18.9	6.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	4.4			5.8	18.9	6.3
LOS	A			A	B	A
Approach Delay	4.4			5.8	18.0	
Approach LOS	A			A	B	
Queue Length 50th (ft)	11			28	57	0
Queue Length 95th (ft)	19			58	81	14
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	2072			2072	1338	636
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.11			0.22	0.32	0.05

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 10.5 Intersection LOS: B
Intersection Capacity Utilization 30.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 103:

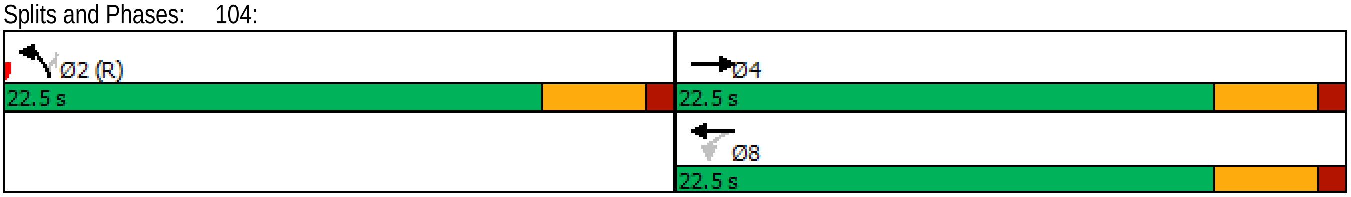


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	234	0	0	429	0	0
Future Volume (vph)	234	0	0	429	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	1863	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	1863	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	254	0	0	466	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	466	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0			18.0		
Actuated g/C Ratio	0.40			0.40		
v/c Ratio	0.18			0.33		
Control Delay	9.2			10.2		
Queue Delay	0.0			0.0		
Total Delay	9.2			10.2		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A			B		
Approach Delay	9.2			10.2		
Approach LOS	A			B		
Queue Length 50th (ft)	21			41		
Queue Length 95th (ft)	38			67		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1415			1415		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.18			0.33		

Intersection Summary	
Area Type: Other	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 9.8	Intersection LOS: A
Intersection Capacity Utilization 15.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 104:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	237	12	57	92	267	670
Future Volume (vph)	237	12	57	92	267	670
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.893	
Flt Protected			0.950		0.986	
Satd. Flow (prot)	3539	1583	1770	3539	3182	0
Flt Permitted			0.950		0.986	
Satd. Flow (perm)	3539	1583	1770	3539	3182	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13			571	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	13	62	100	290	728
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	13	62	100	1018	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6				
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	21.0	21.0	10.0	31.0	19.0	
Total Split (%)	42.0%	42.0%	20.0%	62.0%	38.0%	
Maximum Green (s)	16.5	16.5	5.5	26.5	14.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	22.4	22.4	5.6	28.4	12.6	
Actuated g/C Ratio	0.45	0.45	0.11	0.57	0.25	
v/c Ratio	0.16	0.02	0.31	0.05	0.88dr	
Control Delay	10.9	6.8	27.9	4.4	14.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.9	6.8	27.9	4.4	14.2	
LOS	B	A	C	A	B	
Approach Delay	10.7			13.4	14.2	
Approach LOS	B			B	B	
Queue Length 50th (ft)	27	0	18	5	55	
Queue Length 95th (ft)	50	9	50	11	113	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1586	717	199	2011	1328	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.02	0.31	0.05	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 13.5 Intersection LOS: B

Intersection Capacity Utilization 50.8% ICU Level of Service A

Analysis Period (min) 15

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 105:

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	907	0	2	119	2	27	0	17	0	0	4
Future Volume (vph)	0	907	0	2	119	2	27	0	17	0	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.948			0.865	
Flt Protected					0.999			0.970				
Satd. Flow (prot)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Flt Permitted					0.999			0.970				
Satd. Flow (perm)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	986	0	2	129	2	29	0	18	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	986	0	0	133	0	0	47	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.9% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	567	357	4	122	0	19
Future Volume (vph)	567	357	4	122	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999		
Satd. Flow (prot)	3539	1689	0	3536	1863	1583
Flt Permitted				0.945		
Satd. Flow (perm)	3539	1689	0	3345	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		388				181
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	616	388	4	133	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	616	388	0	137	0	21
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Perm	NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	2	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	27.0	27.0	27.0	27.0	23.0	23.0
Total Split (%)	54.0%	54.0%	54.0%	54.0%	46.0%	46.0%
Maximum Green (s)	22.5	22.5	22.5	22.5	18.5	18.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	47.1	47.1		47.1		5.5
Actuated g/C Ratio	0.94	0.94		0.94		0.11
v/c Ratio	0.18	0.24		0.04		0.06
Control Delay	1.2	0.9		0.8		0.4
Queue Delay	0.0	0.0		0.0		0.0
Total Delay	1.2	0.9		0.8		0.4
LOS	A	A		A		A
Approach Delay	1.1			0.8	0.4	
Approach LOS	A			A	A	
Queue Length 50th (ft)	0	0		0		0
Queue Length 95th (ft)	m49	m15		9		0
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	3334	1613		3151		699
Starvation Cap Reductn	0	0		0		0
Spillback Cap Reductn	0	0		0		0
Storage Cap Reductn	0	0		0		0
Reduced v/c Ratio	0.18	0.24		0.04		0.03

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.24

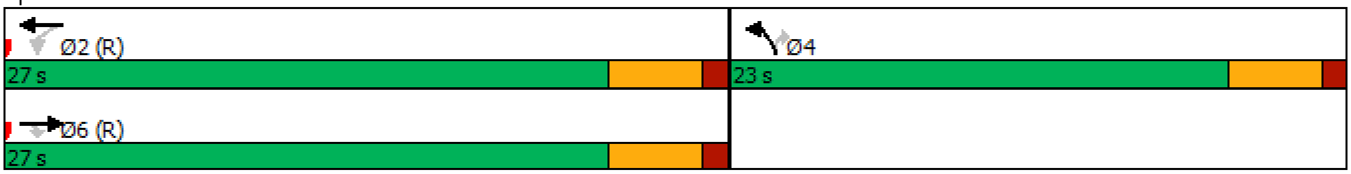
Intersection Signal Delay: 1.1 Intersection LOS: A

Intersection Capacity Utilization 33.8% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 107:



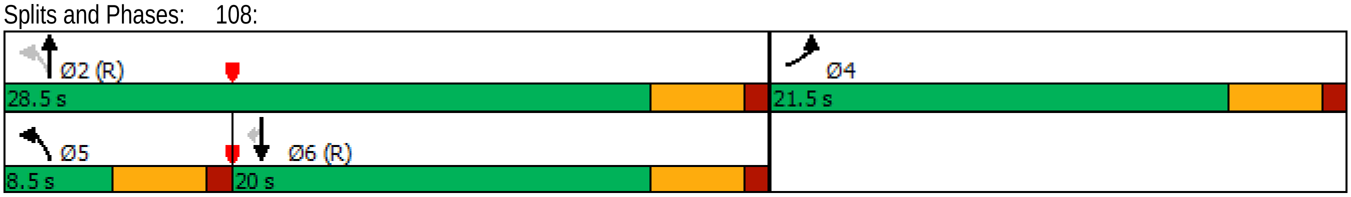
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	470	115	40	1170	922	85
Future Volume (vph)	470	115	40	1170	922	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.971					0.850
Flt Protected	0.961		0.950			
Satd. Flow (prot)	3372	0	1770	3539	3539	1583
Flt Permitted	0.961		0.200			
Satd. Flow (perm)	3372	0	373	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	67					92
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	511	125	43	1272	1002	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	636	0	43	1272	1002	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	21.5		8.5	28.5	20.0	20.0
Total Split (%)	43.0%		17.0%	57.0%	40.0%	40.0%
Maximum Green (s)	17.0		4.0	24.0	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	17.0		24.0	24.0	15.5	15.5
Actuated g/C Ratio	0.34		0.48	0.48	0.31	0.31
v/c Ratio	0.53		0.15	0.75	0.91	0.17
Control Delay	14.0		8.2	14.0	32.0	4.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.0		8.2	14.0	32.0	4.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	B		A	B	C	A
Approach Delay	14.0			13.8	29.7	
Approach LOS	B			B	C	
Queue Length 50th (ft)	69		6	145	145	0
Queue Length 95th (ft)	116		18	212	#253	24
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1190		290	1698	1097	554
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.53		0.15	0.75	0.91	0.17

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 19.6 Intersection LOS: B
Intersection Capacity Utilization 57.8% ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑			↑		
Traffic Volume (vph)	19	0	361	0	0	0
Future Volume (vph)	19	0	361	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	0	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	0	392	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	392	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 30.0% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	19
Future Volume (vph)	0	0	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	1863
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Volume (vph)	144	0	0	60	0	0
Future Volume (vph)	404	0	0	60	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	439	0	0	65	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	439	0	0	65	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 7.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	40	192	592	0	0
Future Volume (vph)	0	40	452	592	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	491	643	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	491	643	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 34.5%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations				↑↑	↑↑↑	↱
Traffic Volume (vph)	0	0	0	470	14	10
Future Volume (vph)	0	0	0	730	14	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	793	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	793	15	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	40	0	0	784	0
Future Volume (vph)	0	40	0	0	1044	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	0	0	1135	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	0	0	1135	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			44.2	
Actuated g/C Ratio		1.00			0.88	
v/c Ratio		0.02			0.37	
Control Delay		0.0			2.1	
Queue Delay		0.0			0.0	
Total Delay		0.0			2.1	
LOS		A			A	
Approach Delay					2.1	
Approach LOS					A	
Queue Length 50th (ft)		0			0	
Queue Length 95th (ft)		0			76	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			3035	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.02			0.37	

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.37	
Intersection Signal Delay: 2.0	Intersection LOS: A
Intersection Capacity Utilization 26.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	115	0	0	40	0	0
Future Volume (vph)	375	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	3614	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	3614	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	408	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	408	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	45.0			45.0		
Actuated g/C Ratio	1.00			1.00		
v/c Ratio	0.12			0.01		
Control Delay	0.1			0.0		
Queue Delay	0.0			0.0		
Total Delay	0.1			0.0		
LOS	A			A		
Approach Delay	0.1					
Approach LOS	A					
Queue Length 50th (ft)	0			0		
Queue Length 95th (ft)	0			0		
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	3539			3539		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.12			0.01		

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

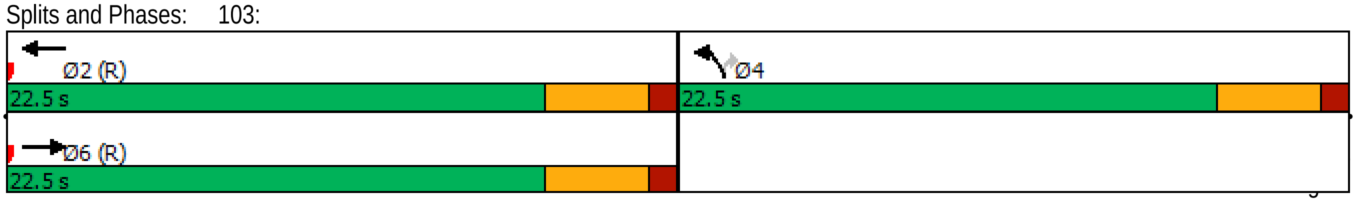
Maximum v/c Ratio: 0.12

Intersection Signal Delay: 0.1 Intersection LOS: A

Intersection Capacity Utilization 7.9% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	49	20	40	0	0
Future Volume (vph)	404	49	20	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3483	0	1770	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3483	0	1770	3539	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	439	53	22	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	22	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.5% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	87	57	544	39	22	19
Future Volume (vph)	87	317	740	39	22	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.930	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3539	1583	1770	3539	3273	0
Flt Permitted			0.547		0.974	
Satd. Flow (perm)	3539	1583	1019	3539	3273	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		345			21	
Link Speed (mph)	35			35	25	
Link Distance (ft)	491			971	1149	
Travel Time (s)	9.6			18.9	31.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	345	804	42	24	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	345	804	42	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	20.0	20.0	15.0	35.0	15.0	
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	
Maximum Green (s)	15.5	15.5	10.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	19.7	19.7	41.1	43.8	6.0	
Actuated g/C Ratio	0.39	0.39	0.82	0.88	0.12	
v/c Ratio	0.07	0.41	0.74	0.01	0.11	
Control Delay	10.7	3.8	10.6	1.7	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.7	3.8	10.6	1.7	13.9	
LOS	B	A	B	A	B	
Approach Delay	5.3			10.2	13.9	
Approach LOS	A			B	B	
Queue Length 50th (ft)	6	0	0	0	3	
Queue Length 95th (ft)	23	45	#426	m3	14	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1394	832	1090	3099	703	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.41	0.74	0.01	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 8.7 Intersection LOS: A

Intersection Capacity Utilization 48.5% ICU Level of Service A

Analysis Period (min) 15

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

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

Splits and Phases: 105:

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	99	7	150	582	15	0	0	4	0	0	0
Future Volume (vph)	0	99	7	150	778	15	0	0	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.998			0.865				
Flt Protected					0.992							
Satd. Flow (prot)	0	3504	0	0	3504	0	0	1611	0	0	1863	0
Flt Permitted					0.992							
Satd. Flow (perm)	0	3504	0	0	3504	0	0	1611	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	108	8	163	846	16	0	0	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	116	0	0	1025	0	0	4	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 34.2%		ICU Level of Service A
Analysis Period (min) 15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	10	9	540	207	4
Future Volume (vph)	92	10	75	703	240	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.995	0.950	
Satd. Flow (prot)	3539	1689	0	3522	1770	1583
Flt Permitted				0.916	0.950	
Satd. Flow (perm)	3539	1689	0	3242	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				4
Link Speed (mph)	25			25	25	
Link Distance (ft)	777			738	307	
Travel Time (s)	21.2			20.1	8.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	11	82	764	261	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	11	0	846	261	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	10.0	35.0	15.0	15.0
Total Split (%)	50.0%	50.0%	20.0%	70.0%	30.0%	30.0%
Maximum Green (s)	20.5	20.5	5.5	30.5	10.5	10.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	31.0	31.0		31.0	10.0	10.0
Actuated g/C Ratio	0.62	0.62		0.62	0.20	0.20
v/c Ratio	0.05	0.01		0.42	0.74	0.01
Control Delay	0.7	0.1		6.1	33.7	11.5
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	0.7	0.1		6.1	33.7	11.5
LOS	A	A		A	C	B
Approach Delay	0.7			6.1	33.3	
Approach LOS	A			A	C	
Queue Length 50th (ft)	1	0		51	71	0
Queue Length 95th (ft)	1	0		94	#161	6
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	2191	1049		2007	371	335
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.05	0.01		0.42	0.70	0.01

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 11.5 Intersection LOS: B
Intersection Capacity Utilization 37.5% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 107:

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	24	317	999	357	232
Future Volume (vph)	72	24	383	999	357	395
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.962					0.850
Flt Protected	0.964		0.950			
Satd. Flow (prot)	3351	0	1770	3539	3539	1583
Flt Permitted	0.964		0.405			
Satd. Flow (perm)	3351	0	754	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	26					429
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	26	416	1086	388	429
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	416	1086	388	429
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	15.0		15.0	35.0	20.0	20.0
Total Split (%)	30.0%		30.0%	70.0%	40.0%	40.0%
Maximum Green (s)	10.5		10.5	30.5	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	10.5		30.5	30.5	15.5	15.5
Actuated g/C Ratio	0.21		0.61	0.61	0.31	0.31
v/c Ratio	0.14		0.62	0.50	0.35	0.55
Control Delay	7.1		9.5	6.5	14.5	4.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	7.1		9.5	6.5	14.5	4.8

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	A		A	A	B	A
Approach Delay	7.1			7.3	9.4	
Approach LOS	A			A	A	
Queue Length 50th (ft)	9		51	77	45	0
Queue Length 95th (ft)	0		92	113	74	50
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	724		673	2158	1097	786
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.14		0.62	0.50	0.35	0.55

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 8.0 Intersection LOS: A
Intersection Capacity Utilization 42.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 108:

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	211	0	0	19	0	0
Future Volume (vph)	244	0	0	85	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	0	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	265	0	0	92	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	265	0	0	92	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 14.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (vph)	28	0	0	19	0	183
Future Volume (vph)	28	0	0	85	130	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.916	
Flt Protected					0.982	
Satd. Flow (prot)	1863	0	0	1863	1676	0
Flt Permitted					0.982	
Satd. Flow (perm)	1863	0	0	1863	1676	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	0	0	92	141	235
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	0	92	376	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	19	28	0
Future Volume (vph)	0	0	0	215	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	234	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	234	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	214	20	0	359	70	35
Future Volume (vph)	214	20	0	619	70	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.987					0.865
Flt Protected					0.950	
Satd. Flow (prot)	3493	0	0	3539	0	1611
Flt Permitted					0.950	
Satd. Flow (perm)	3493	0	0	3539	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	22	0	673	76	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	0	0	673	76	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	827	205	0	0	0
Future Volume (vph)	0	1087	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1182	223	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1182	223	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 32.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	205	342	485
Future Volume (vph)	0	0	0	205	602	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	223	654	527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	223	654	527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 33.4%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	827	0	0	205	0
Future Volume (vph)	0	1087	0	0	205	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1182	0	0	223	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1182	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			33.9	
Actuated g/C Ratio		1.00			0.68	
v/c Ratio		0.42			0.10	
Control Delay		1.0			3.1	
Queue Delay		0.0			0.0	
Total Delay		1.0			3.1	
LOS		A			A	
Approach Delay	1.0				3.1	
Approach LOS	A				A	
Queue Length 50th (ft)		0			8	
Queue Length 95th (ft)		0			18	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2773			2327	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.43			0.10	

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.42	
Intersection Signal Delay: 1.3	Intersection LOS: A
Intersection Capacity Utilization 32.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	0	0	429	399	29
Future Volume (vph)	205	0	0	689	399	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	3433	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						32
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	0	0	749	434	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	749	434	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	26.0			26.0	24.0	24.0
Total Split (%)	52.0%			52.0%	48.0%	48.0%
Maximum Green (s)	21.5			21.5	19.5	19.5
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	29.3			29.3	11.7	11.7
Actuated g/C Ratio	0.59			0.59	0.23	0.23
v/c Ratio	0.11			0.36	0.54	0.08
Control Delay	4.4			6.6	18.9	6.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	4.4			6.6	18.9	6.3
LOS	A			A	B	A
Approach Delay	4.4			6.6	18.0	
Approach LOS	A			A	B	
Queue Length 50th (ft)	11			51	57	0
Queue Length 95th (ft)	18			97	81	14
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	2072			2072	1338	636
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.11			0.36	0.32	0.05

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

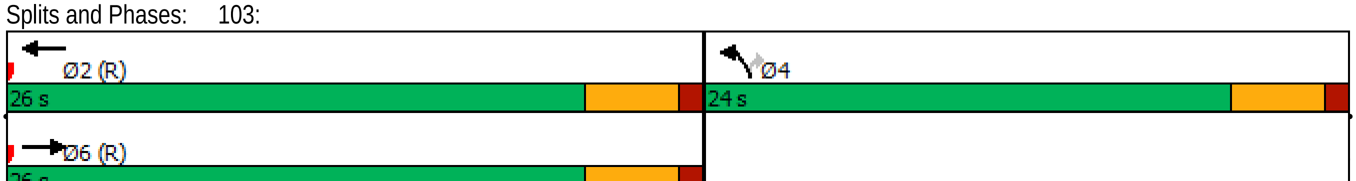
Maximum v/c Ratio: 0.54

Intersection Signal Delay: 10.0 Intersection LOS: A

Intersection Capacity Utilization 30.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	234	0	0	429	0	0
Future Volume (vph)	234	0	0	689	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	1863	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	1863	3539	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	254	0	0	749	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	749	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Stop	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 15.2%	ICU Level of Service A
Analysis Period (min) 15	

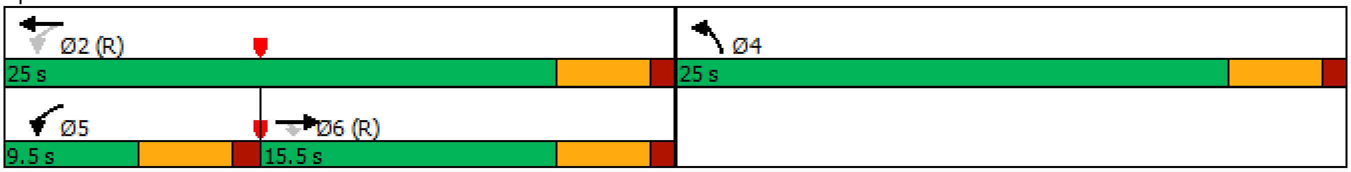
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	237	12	57	92	267	670
Future Volume (vph)	237	12	57	92	527	865
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.907	
Flt Protected			0.950		0.981	
Satd. Flow (prot)	3539	1583	1770	3539	3215	0
Flt Permitted			0.441		0.981	
Satd. Flow (perm)	3539	1583	821	3539	3215	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13			503	
Link Speed (mph)	35			35	25	
Link Distance (ft)	491			971	1149	
Travel Time (s)	9.6			18.9	31.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	13	62	100	573	940
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	13	62	100	1513	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	15.0	15.0	9.5	22.5	15.0	
Total Split (s)	15.5	15.5	9.5	25.0	25.0	
Total Split (%)	31.0%	31.0%	19.0%	50.0%	50.0%	
Maximum Green (s)	11.0	11.0	5.0	20.5	20.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	14.9	14.9	20.6	20.6	20.4	
Actuated g/C Ratio	0.30	0.30	0.41	0.41	0.41	
v/c Ratio	0.24	0.03	0.14	0.07	0.98dr	
Control Delay	15.8	9.2	11.0	10.2	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.8	9.2	11.0	10.2	23.8	
LOS	B	A	B	B	C	
Approach Delay	15.5			10.5	23.8	
Approach LOS	B			B	C	
Queue Length 50th (ft)	33	0	11	9	140	
Queue Length 95th (ft)	60	10	36	26	#293	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1054	480	435	1457	1614	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.24	0.03	0.14	0.07	0.94	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 50.8% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	907	0	2	119	2	27	0	17	0	0	4
Future Volume (vph)	0	1102	0	2	119	2	27	0	17	0	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.948			0.865	
Flt Protected					0.999			0.970				
Satd. Flow (prot)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Flt Permitted					0.999			0.970				
Satd. Flow (perm)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1198	0	2	129	2	29	0	18	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1198	0	0	133	0	0	47	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	567	357	4	122	0	19
Future Volume (vph)	697	422	4	122	0	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999		
Satd. Flow (prot)	3539	1689	0	3536	1863	1583
Flt Permitted				0.943		
Satd. Flow (perm)	3539	1689	0	3337	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		459				465
Link Speed (mph)	25			25	25	
Link Distance (ft)	777			738	307	
Travel Time (s)	21.2			20.1	8.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	758	459	4	133	0	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	758	459	0	137	0	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	15.0	35.0	15.0	15.0
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	30.0%
Maximum Green (s)	15.5	15.5	10.5	30.5	10.5	10.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	41.3	41.3		41.3		5.5
Actuated g/C Ratio	0.83	0.83		0.83		0.11
v/c Ratio	0.26	0.31		0.05		0.16
Control Delay	4.0	2.2		2.9		0.6
Queue Delay	0.0	0.0		0.0		0.0
Total Delay	4.0	2.2		2.9		0.6
LOS	A	A		A		A
Approach Delay	3.3			2.9	0.6	
Approach LOS	A			A	A	
Queue Length 50th (ft)	61	22		4		0
Queue Length 95th (ft)	m66	m28		18		0
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	2923	1475		2756		699
Starvation Cap Reductn	0	0		0		0
Spillback Cap Reductn	0	0		0		0
Storage Cap Reductn	0	0		0		0
Reduced v/c Ratio	0.26	0.31		0.05		0.13

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay: 3.1 Intersection LOS: A
Intersection Capacity Utilization 33.8% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107:

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	470	115	40	1170	922	85
Future Volume (vph)	568	213	40	1170	922	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.959					0.850
Flt Protected	0.965		0.950			
Satd. Flow (prot)	3344	0	1770	3539	3539	1583
Flt Permitted	0.965		0.156			
Satd. Flow (perm)	3344	0	291	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	105					92
Link Speed (mph)	25			45	45	
Link Distance (ft)	738			727	965	
Travel Time (s)	20.1			11.0	14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	617	232	43	1272	1002	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	849	0	43	1272	1002	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	16.0		8.0	34.0	26.0	26.0
Total Split (%)	32.0%		16.0%	68.0%	52.0%	52.0%
Maximum Green (s)	11.5		3.5	29.5	21.5	21.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	11.5		29.5	29.5	21.5	21.5
Actuated g/C Ratio	0.23		0.59	0.59	0.43	0.43
v/c Ratio	1.00		0.16	0.61	0.66	0.13
Control Delay	53.4		5.6	8.1	13.9	3.0
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	53.4		5.6	8.1	13.9	3.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	D		A	A	B	A
Approach Delay	53.4			8.1	13.0	
Approach LOS	D			A	B	
Queue Length 50th (ft)	129		5	105	115	0
Queue Length 95th (ft)	#230		13	154	169	19
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	849		275	2088	1521	733
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	1.00		0.16	0.61	0.66	0.13

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 21.5 Intersection LOS: C

Intersection Capacity Utilization 57.8% ICU Level of Service B

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 108:

Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	19	0	361	0	0	0
Future Volume (vph)	85	130	426	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.918					
Flt Protected				0.950		
Satd. Flow (prot)	1710	0	0	1770	0	0
Flt Permitted				0.950		
Satd. Flow (perm)	1710	0	0	1770	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	141	463	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	233	0	0	463	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 30.0%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	19
Future Volume (vph)	196	0	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	213	0	0	0	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	0	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	196	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	213	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	213	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	0	0	60	0	0
Future Volume (vph)	544	0	0	60	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	591	0	0	65	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	591	0	0	65	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 7.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	40	192	592	0	0
Future Volume (vph)	0	40	592	592	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	643	643	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	643	643	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.5% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	470	14	10
Future Volume (vph)	0	0	0	870	14	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	946	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	946	15	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	40	0	0	784	0
Future Volume (vph)	0	40	0	0	1184	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	0	0	1287	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	0	0	1287	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			44.2	
Actuated g/C Ratio		1.00			0.88	
v/c Ratio		0.02			0.42	
Control Delay		0.0			2.3	
Queue Delay		0.0			0.0	
Total Delay		0.0			2.3	
LOS		A			A	
Approach Delay					2.3	
Approach LOS					A	
Queue Length 50th (ft)		0			0	
Queue Length 95th (ft)		0			92	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			3035	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.02			0.42	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 2.2 Intersection LOS: A

Intersection Capacity Utilization 26.1% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 102:

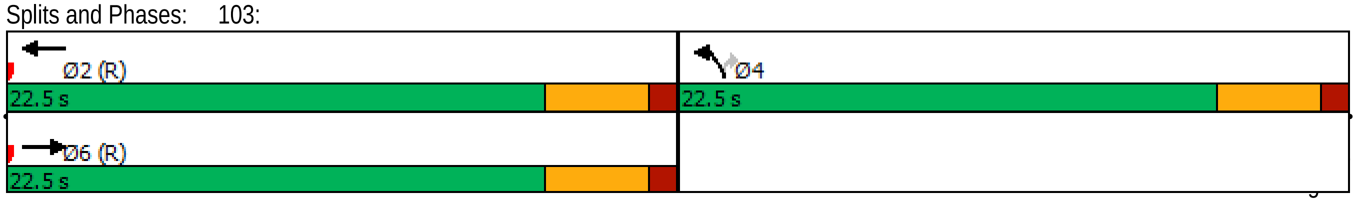
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	115	0	0	40	0	0
Future Volume (vph)	515	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	3614	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	3614	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	560	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	560	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	45.0			45.0		
Actuated g/C Ratio	1.00			1.00		
v/c Ratio	0.16			0.01		
Control Delay	0.1			0.0		
Queue Delay	0.0			0.0		
Total Delay	0.1			0.0		
LOS	A			A		
Approach Delay	0.1					
Approach LOS	A					
Queue Length 50th (ft)	0			0		
Queue Length 95th (ft)	0			0		
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	3539			3539		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.16			0.01		

Intersection Summary

Area Type: Other
Cycle Length: 45
Actuated Cycle Length: 45
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.16
Intersection Signal Delay: 0.1 Intersection LOS: A
Intersection Capacity Utilization 7.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 103:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	49	20	40	0	0
Future Volume (vph)	544	49	20	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.988					
Flt Protected			0.950			
Satd. Flow (prot)	3497	0	1770	3539	1863	1863
Flt Permitted			0.950			
Satd. Flow (perm)	3497	0	1770	3539	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	591	53	22	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	644	0	22	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.5% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	87	57	544	39	22	19
Future Volume (vph)	87	457	844	39	22	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.930	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3539	1583	1770	3539	3273	0
Flt Permitted			0.490		0.974	
Satd. Flow (perm)	3539	1583	913	3539	3273	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		487			21	
Link Speed (mph)	35			35	25	
Link Distance (ft)	491			971	1149	
Travel Time (s)	9.6			18.9	31.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	497	917	42	24	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	497	917	42	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	15.0	15.0	20.0	35.0	15.0	
Total Split (%)	30.0%	30.0%	40.0%	70.0%	30.0%	
Maximum Green (s)	10.5	10.5	15.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	13.6	13.6	41.1	43.8	6.0	
Actuated g/C Ratio	0.27	0.27	0.82	0.88	0.12	
v/c Ratio	0.10	0.63	0.80	0.01	0.11	
Control Delay	14.6	7.0	13.3	1.5	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.6	7.0	13.3	1.5	13.9	
LOS	B	A	B	A	B	
Approach Delay	8.2			12.8	13.9	
Approach LOS	A			B	B	
Queue Length 50th (ft)	8	2	0	0	3	
Queue Length 95th (ft)	26	#73	#352	m2	14	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	964	785	1143	3099	703	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.63	0.80	0.01	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 11.1 Intersection LOS: B

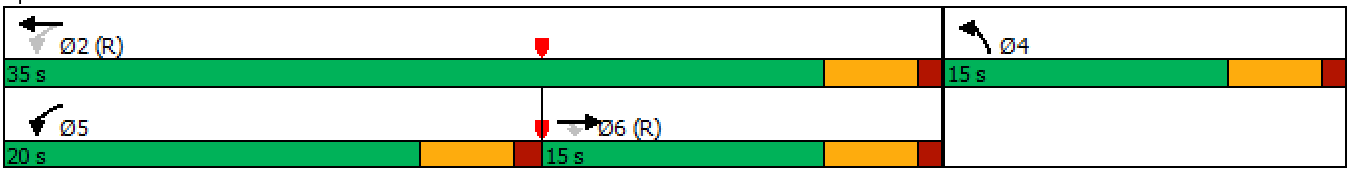
Intersection Capacity Utilization 48.5% ICU Level of Service A

Analysis Period (min) 15

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

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

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	99	7	150	582	15	0	0	4	0	0	0
Future Volume (vph)	0	99	7	150	882	15	0	0	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.998			0.865				
Flt Protected					0.993							
Satd. Flow (prot)	0	3504	0	0	3507	0	0	1611	0	0	1863	0
Flt Permitted					0.993							
Satd. Flow (perm)	0	3504	0	0	3507	0	0	1611	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	108	8	163	959	16	0	0	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	116	0	0	1138	0	0	4	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.2% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	10	9	540	207	4
Future Volume (vph)	92	10	109	790	257	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.994	0.950	
Satd. Flow (prot)	3539	1689	0	3518	1770	1583
Flt Permitted				0.901	0.950	
Satd. Flow (perm)	3539	1689	0	3189	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				4
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	11	118	859	279	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	11	0	977	279	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	28.2	28.2		28.2	12.8	12.8
Actuated g/C Ratio	0.56	0.56		0.56	0.26	0.26
v/c Ratio	0.05	0.01		0.54	0.62	0.01
Control Delay	0.9	0.1		10.7	21.9	8.2
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	0.9	0.1		10.7	21.9	8.2
LOS	A	A		B	C	A
Approach Delay	0.8			10.7	21.7	
Approach LOS	A			B	C	
Queue Length 50th (ft)	1	0		93	71	0
Queue Length 95th (ft)	1	0		m137	117	5
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	1994	956		1797	601	540
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.05	0.01		0.54	0.46	0.01

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.62

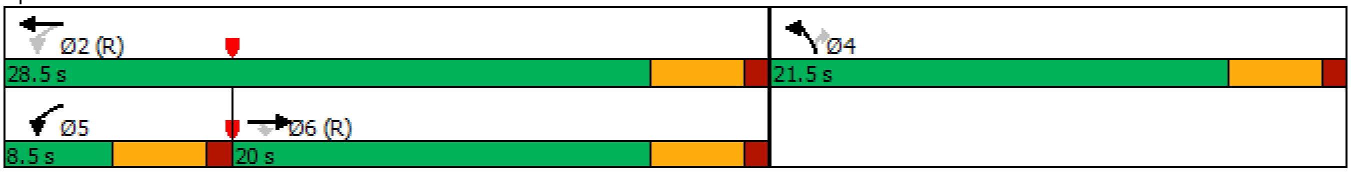
Intersection Signal Delay: 12.2 Intersection LOS: B

Intersection Capacity Utilization 37.5% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 107:



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	24	317	999	357	232
Future Volume (vph)	72	24	417	999	357	482
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.962					0.850
Flt Protected	0.964		0.950			
Satd. Flow (prot)	3351	0	1770	3539	3539	1583
Flt Permitted	0.964		0.405			
Satd. Flow (perm)	3351	0	754	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	26					524
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	26	453	1086	388	524
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	453	1086	388	524
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	21.5		8.5	28.5	20.0	20.0
Total Split (%)	43.0%		17.0%	57.0%	40.0%	40.0%
Maximum Green (s)	17.0		4.0	24.0	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	17.0		24.0	24.0	15.5	15.5
Actuated g/C Ratio	0.34		0.48	0.48	0.31	0.31
v/c Ratio	0.09		1.02	0.64	0.35	0.62
Control Delay	6.8		66.4	11.9	14.5	5.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	6.8		66.4	11.9	14.5	5.3

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	A		E	B	B	A
Approach Delay	6.8			28.0	9.2	
Approach LOS	A			C	A	
Queue Length 50th (ft)	12		~88	114	45	0
Queue Length 95th (ft)	27		#259	167	74	55
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1156		443	1698	1097	852
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.09		1.02	0.64	0.35	0.62

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 20.4 Intersection LOS: C

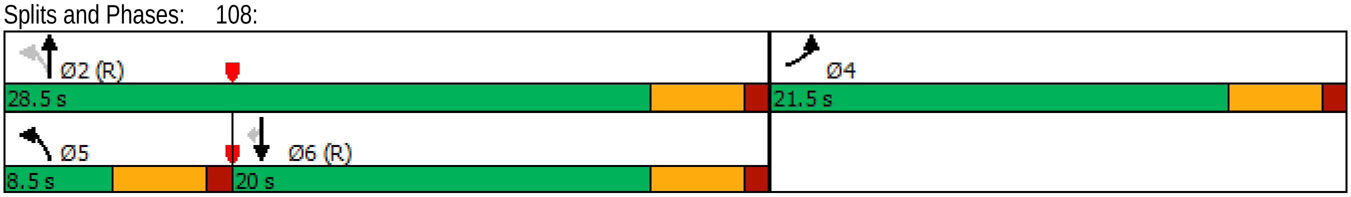
Intersection Capacity Utilization 42.8% ICU Level of Service A

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	211	0	0	19	0	0
Future Volume (vph)	261	0	0	119	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	0	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	284	0	0	129	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	284	0	0	129	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 14.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	28	0	0	19	0	183
Future Volume (vph)	28	0	0	119	200	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.927	
Flt Protected					0.977	
Satd. Flow (prot)	1863	0	0	1863	1687	0
Flt Permitted					0.977	
Satd. Flow (perm)	1863	0	0	1863	1687	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	0	0	129	217	253
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	0	129	470	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 21.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	19	28	0
Future Volume (vph)	0	0	0	319	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	347	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	347	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	214	20	0	359	70	35
Future Volume (vph)	214	20	0	759	70	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.987					0.865
Flt Protected					0.950	
Satd. Flow (prot)	3493	0	0	3539	0	1611
Flt Permitted					0.950	
Satd. Flow (perm)	3493	0	0	3539	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	22	0	825	76	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	0	0	825	76	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	827	205	0	0	0
Future Volume (vph)	0	1227	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1334	223	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1334	223	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 32.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	205	342	485
Future Volume (vph)	0	0	0	205	742	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	223	807	527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	223	807	527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	827	0	0	205	0
Future Volume (vph)	0	1227	0	0	205	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1334	0	0	223	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1334	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			33.1	
Actuated g/C Ratio		1.00			0.66	
v/c Ratio		0.48			0.10	
Control Delay		1.2			3.4	
Queue Delay		0.0			0.0	
Total Delay		1.2			3.4	
LOS		A			A	
Approach Delay	1.2				3.4	
Approach LOS	A				A	
Queue Length 50th (ft)		4			8	
Queue Length 95th (ft)		0			19	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2762			2272	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.48			0.10	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 1.5 Intersection LOS: A
Intersection Capacity Utilization 32.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102:

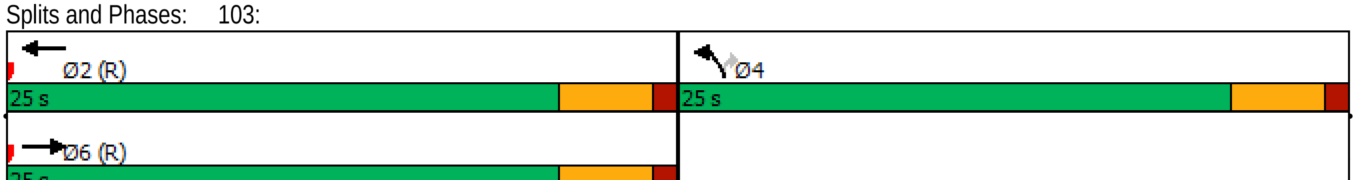
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	0	0	429	399	29
Future Volume (vph)	205	0	0	829	399	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	3433	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						32
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	0	0	901	434	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	901	434	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	25.0			25.0	25.0	25.0
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	20.5			20.5	20.5	20.5
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	29.3			29.3	11.7	11.7
Actuated g/C Ratio	0.59			0.59	0.23	0.23
v/c Ratio	0.11			0.43	0.54	0.08
Control Delay	4.6			7.1	18.9	6.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	4.6			7.1	18.9	6.3
LOS	A			A	B	A
Approach Delay	4.6			7.1	18.0	
Approach LOS	A			A	B	
Queue Length 50th (ft)	12			64	57	0
Queue Length 95th (ft)	20			121	81	14
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	2072			2072	1407	667
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.11			0.43	0.31	0.05

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 10.0 Intersection LOS: A
Intersection Capacity Utilization 30.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 103:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	234	0	0	429	0	0
Future Volume (vph)	234	0	0	829	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	1863	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	1863	3539	1863	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	254	0	0	901	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	901	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 15.2% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	237	12	57	92	267	670
Future Volume (vph)	237	12	57	92	667	970
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.911	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	3539	1583	1770	3539	3226	0
Flt Permitted			0.452		0.980	
Satd. Flow (perm)	3539	1583	842	3539	3226	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13			437	
Link Speed (mph)	35			35	25	
Link Distance (ft)	491			971	1149	
Travel Time (s)	9.6			18.9	31.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	13	62	100	725	1054
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	13	62	100	1779	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

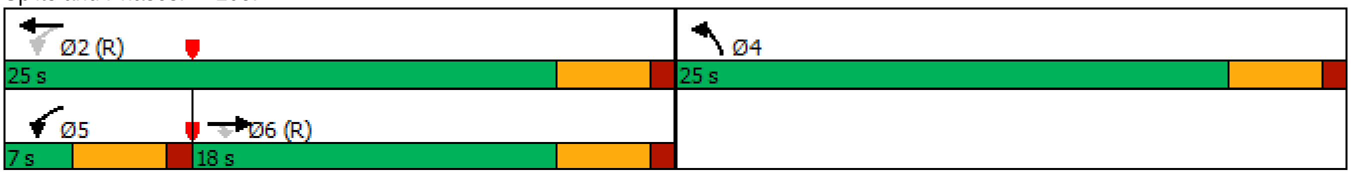
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	15.0	15.0	9.5	22.5	15.0	
Total Split (s)	18.0	18.0	7.0	25.0	25.0	
Total Split (%)	36.0%	36.0%	14.0%	50.0%	50.0%	
Maximum Green (s)	13.5	13.5	2.5	20.5	20.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	16.3	16.3	20.5	20.5	20.5	
Actuated g/C Ratio	0.33	0.33	0.41	0.41	0.41	
v/c Ratio	0.22	0.02	0.16	0.07	1.15dr	
Control Delay	14.1	8.0	6.5	5.7	80.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.1	8.0	6.5	5.7	80.9	
LOS	B	A	A	A	F	
Approach Delay	13.8			6.0	80.9	
Approach LOS	B			A	F	
Queue Length 50th (ft)	31	0	9	7	~282	
Queue Length 95th (ft)	55	10	18	13	#403	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1153	524	391	1450	1580	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.22	0.02	0.16	0.07	1.13	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 67.2 Intersection LOS: E
Intersection Capacity Utilization 50.8% ICU Level of Service A
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	907	0	2	119	2	27	0	17	0	0	4
Future Volume (vph)	0	1207	0	2	119	2	27	0	17	0	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.948			0.865	
Flt Protected					0.999			0.970				
Satd. Flow (prot)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Flt Permitted					0.999			0.970				
Satd. Flow (perm)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1312	0	2	129	2	29	0	18	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1312	0	0	133	0	0	47	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.9% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	567	357	4	122	0	19
Future Volume (vph)	767	457	4	122	0	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999		
Satd. Flow (prot)	3539	1689	0	3536	1863	1583
Flt Permitted				0.941		
Satd. Flow (perm)	3539	1689	0	3330	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		497				288
Link Speed (mph)	35			35	35	
Link Distance (ft)	777			738	307	
Travel Time (s)	15.1			14.4	6.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	834	497	4	133	0	129
Shared Lane Traffic (%)						
Lane Group Flow (vph)	834	497	0	137	0	129
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	25.0	25.0	10.0	35.0	15.0	15.0
Total Split (%)	50.0%	50.0%	20.0%	70.0%	30.0%	30.0%
Maximum Green (s)	20.5	20.5	5.5	30.5	10.5	10.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	38.4	38.4		38.4		5.5
Actuated g/C Ratio	0.77	0.77		0.77		0.11
v/c Ratio	0.31	0.35		0.05		0.30
Control Delay	3.9	1.7		2.1		1.8
Queue Delay	0.0	0.0		0.0		0.0
Total Delay	3.9	1.7		2.1		1.8
LOS	A	A		A		A
Approach Delay	3.1			2.1	1.8	
Approach LOS	A			A	A	
Queue Length 50th (ft)	56	13		4		0
Queue Length 95th (ft)	m55	m14		9		0
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	2717	1412		2557		559
Starvation Cap Reductn	0	0		0		0
Spillback Cap Reductn	0	0		0		0
Storage Cap Reductn	0	0		0		0
Reduced v/c Ratio	0.31	0.35		0.05		0.23

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.35

Intersection Signal Delay: 2.9 Intersection LOS: A

Intersection Capacity Utilization 33.8% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 107:

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	470	115	40	1170	922	85
Future Volume (vph)	620	265	40	1170	922	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.955					0.850
Flt Protected	0.966		0.950			
Satd. Flow (prot)	3334	0	1770	3539	3539	1583
Flt Permitted	0.966		0.200			
Satd. Flow (perm)	3334	0	373	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	144					92
Link Speed (mph)	25			45	45	
Link Distance (ft)	738			727	965	
Travel Time (s)	20.1			11.0	14.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	674	288	43	1272	1002	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	962	0	43	1272	1002	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	20.0		10.0	30.0	20.0	20.0
Total Split (%)	40.0%		20.0%	60.0%	40.0%	40.0%
Maximum Green (s)	15.5		5.5	25.5	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	15.5		25.5	25.5	15.5	15.5
Actuated g/C Ratio	0.31		0.51	0.51	0.31	0.31
v/c Ratio	0.85		0.13	0.71	0.91	0.17
Control Delay	23.4		7.0	12.1	32.0	4.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	23.4		7.0	12.1	32.0	4.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	C		A	B	C	A
Approach Delay	23.4			11.9	29.7	
Approach LOS	C			B	C	
Queue Length 50th (ft)	122		6	134	145	0
Queue Length 95th (ft)	#201		17	195	#253	24
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1132		343	1804	1097	554
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.85		0.13	0.71	0.91	0.17

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 60

Control Type: Pretimed

Maximum v/c Ratio: 0.91

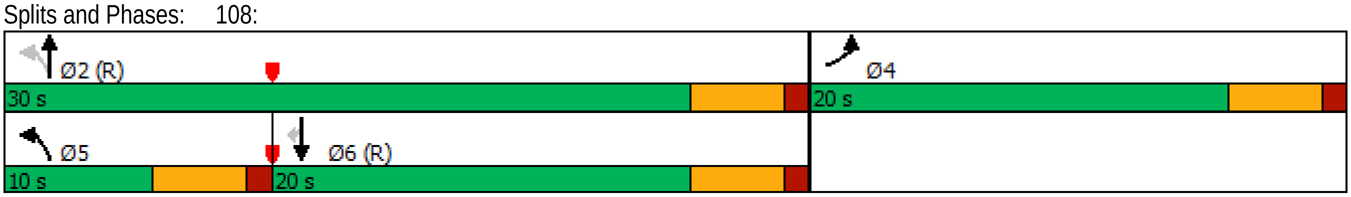
Intersection Signal Delay: 20.9 Intersection LOS: C

Intersection Capacity Utilization 57.8% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	19	0	361	0	0	0
Future Volume (vph)	119	200	461	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.915					
Flt Protected				0.950		
Satd. Flow (prot)	1704	0	0	1770	0	0
Flt Permitted				0.950		
Satd. Flow (perm)	1704	0	0	1770	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	217	501	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	346	0	0	501	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.0%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	19
Future Volume (vph)	300	0	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	0	0	0	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	326	0	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	300	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	326	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	326	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	0	0	60	0	0
Future Volume (vph)	207	0	0	60	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	0	0	65	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	225	0	0	65	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 7.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	40	192	592	0	0
Future Volume (vph)	0	40	255	1217	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	277	1323	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	277	1323	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.5% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations				↑↑	↑↑↑	↱
Traffic Volume (vph)	0	0	0	470	14	10
Future Volume (vph)	0	0	0	1158	14	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1259	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1259	15	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	40	0	0	784	0
Future Volume (vph)	0	40	0	0	1472	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	0	0	1600	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	0	0	1600	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			44.2	
Actuated g/C Ratio		1.00			0.88	
v/c Ratio		0.02			0.53	
Control Delay		0.0			2.9	
Queue Delay		0.0			0.0	
Total Delay		0.0			2.9	
LOS		A			A	
Approach Delay					2.9	
Approach LOS					A	
Queue Length 50th (ft)		0			0	
Queue Length 95th (ft)		0			136	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			3035	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.02			0.53	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 2.9 Intersection LOS: A
Intersection Capacity Utilization 26.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102:

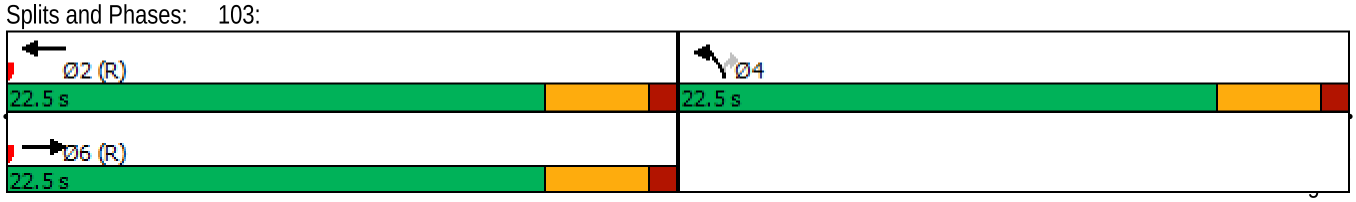
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	115	0	0	40	0	0
Future Volume (vph)	178	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	3614	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	3614	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	193	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	193	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	45.0			45.0		
Actuated g/C Ratio	1.00			1.00		
v/c Ratio	0.05			0.01		
Control Delay	0.0			0.0		
Queue Delay	0.0			0.0		
Total Delay	0.0			0.0		
LOS	A			A		
Approach Delay						
Approach LOS						
Queue Length 50th (ft)	0			0		
Queue Length 95th (ft)	0			1		
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	3539			3539		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.05			0.01		

Intersection Summary

Area Type: Other
Cycle Length: 45
Actuated Cycle Length: 45
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.05
Intersection Signal Delay: 0.0 Intersection LOS: A
Intersection Capacity Utilization 7.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 103:

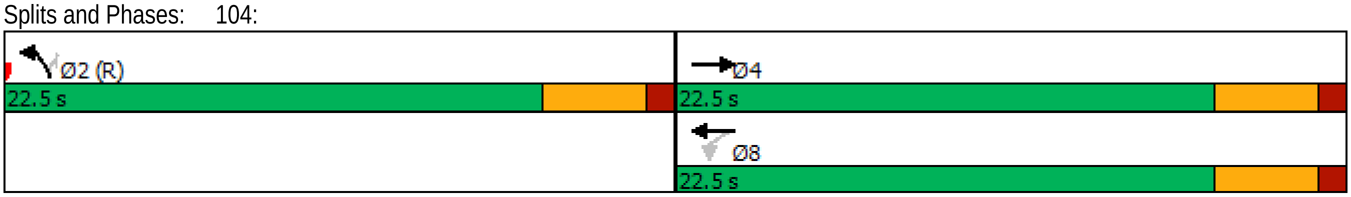


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	49	20	40	0	0
Future Volume (vph)	207	49	20	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.971					
Flt Protected			0.950			
Satd. Flow (prot)	3437	0	1770	3539	1863	1863
Flt Permitted			0.581			
Satd. Flow (perm)	3437	0	1082	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	53					
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	53	22	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	278	0	22	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0		18.0	18.0		
Actuated g/C Ratio	0.40		0.40	0.40		
v/c Ratio	0.20		0.05	0.03		
Control Delay	7.5		8.8	8.3		
Queue Delay	0.0		0.0	0.0		
Total Delay	7.5		8.8	8.3		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A		A	A		
Approach Delay	7.5			8.5		
Approach LOS	A			A		
Queue Length 50th (ft)	18		3	3		
Queue Length 95th (ft)	36		13	10		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1406		432	1415		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.20		0.05	0.03		

Intersection Summary	
Area Type: Other	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 17.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 104:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	87	57	544	39	22	19
Future Volume (vph)	87	120	1107	39	22	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.930	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3539	1583	1770	3539	3273	0
Flt Permitted			0.512		0.974	
Satd. Flow (perm)	3539	1583	954	3539	3273	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		130			21	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	130	1203	42	24	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	130	1203	42	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	20.0	20.0	15.0	35.0	15.0	
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	
Maximum Green (s)	15.5	15.5	10.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	15.5	15.5	41.1	43.8	6.0	
Actuated g/C Ratio	0.31	0.31	0.82	0.88	0.12	
v/c Ratio	0.09	0.22	1.07	0.01	0.11	
Control Delay	12.6	4.3	58.5	1.5	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.6	4.3	58.5	1.5	13.9	
LOS	B	A	E	A	B	
Approach Delay	7.8			56.6	13.9	
Approach LOS	A			E	B	
Queue Length 50th (ft)	10	0	132	0	3	
Queue Length 95th (ft)	23	28	#749	m2	14	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1097	580	1127	3099	703	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.22	1.07	0.01	0.06	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 48.1 Intersection LOS: D
Intersection Capacity Utilization 48.5% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 105:

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	99	7	150	582	15	0	0	4	0	0	0
Future Volume (vph)	0	99	7	150	1145	15	0	0	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.998			0.865				
Flt Protected					0.994							
Satd. Flow (prot)	0	3504	0	0	3511	0	0	1611	0	0	1863	0
Flt Permitted					0.994							
Satd. Flow (perm)	0	3504	0	0	3511	0	0	1611	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	108	8	163	1245	16	0	0	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	116	0	0	1424	0	0	4	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 34.2%		ICU Level of Service A
Analysis Period (min) 15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	10	9	540	207	4
Future Volume (vph)	92	10	9	1040	270	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	1689	0	3539	1770	1583
Flt Permitted				0.953	0.950	
Satd. Flow (perm)	3539	1689	0	3373	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				4
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	11	10	1130	293	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	11	0	1140	293	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	27.9	27.9		27.9	13.1	13.1
Actuated g/C Ratio	0.56	0.56		0.56	0.26	0.26
v/c Ratio	0.05	0.01		0.61	0.63	0.01
Control Delay	3.3	1.8		10.8	22.2	8.2
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	3.3	1.8		10.8	22.2	8.2
LOS	A	A		B	C	A
Approach Delay	3.1			10.8	22.0	
Approach LOS	A			B	C	
Queue Length 50th (ft)	2	0		113	75	0
Queue Length 95th (ft)	6	2		m131	123	5
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	1976	948		1883	601	540
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.05	0.01		0.61	0.49	0.01

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

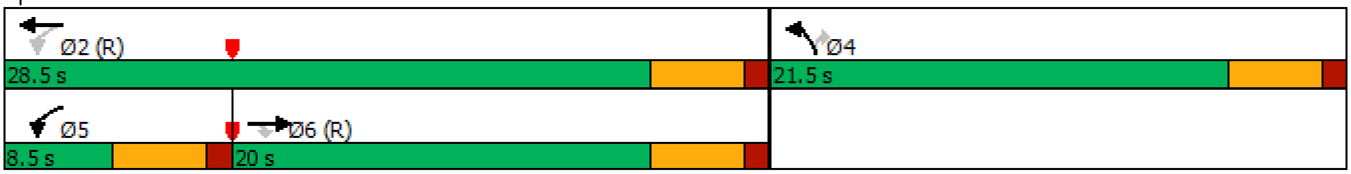
Intersection Signal Delay: 12.4 Intersection LOS: B

Intersection Capacity Utilization 37.5% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 107:



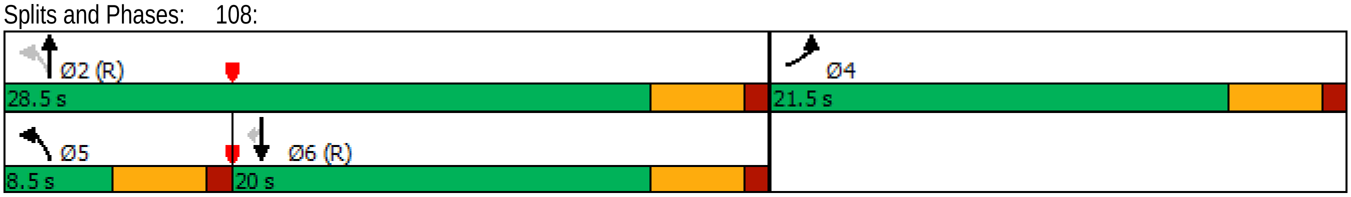
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	24	317	999	357	232
Future Volume (vph)	72	24	567	999	357	482
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.962					0.850
Flt Protected	0.964		0.950			
Satd. Flow (prot)	3351	0	1770	3539	3539	1583
Flt Permitted	0.964		0.405			
Satd. Flow (perm)	3351	0	754	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	26					524
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	26	616	1086	388	524
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	616	1086	388	524
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	21.5		8.5	28.5	20.0	20.0
Total Split (%)	43.0%		17.0%	57.0%	40.0%	40.0%
Maximum Green (s)	17.0		4.0	24.0	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	17.0		24.0	24.0	15.5	15.5
Actuated g/C Ratio	0.34		0.48	0.48	0.31	0.31
v/c Ratio	0.09		1.39	0.64	0.35	0.62
Control Delay	6.5		208.0	11.9	14.5	5.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	6.5		208.0	11.9	14.5	5.3

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	A		F	B	B	A
Approach Delay	6.5			82.9	9.2	
Approach LOS	A			F	A	
Queue Length 50th (ft)	12		~203	114	45	0
Queue Length 95th (ft)	29		#412	167	74	55
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1156		443	1698	1097	852
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.09		1.39	0.64	0.35	0.62

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 1.39
Intersection Signal Delay: 55.2 Intersection LOS: E
Intersection Capacity Utilization 42.8% ICU Level of Service A
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	211	0	0	19	0	0
Future Volume (vph)	274	0	0	19	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	0	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	298	0	0	21	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	298	0	0	21	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 14.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	28	0	0	19	0	183
Future Volume (vph)	28	0	0	19	0	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	0	0	21	0	267
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	0	21	267	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	19	28	0
Future Volume (vph)	0	0	0	19	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	21	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	21	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	214	20	0	359	70	35
Future Volume (vph)	214	20	0	922	70	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.987					0.865
Flt Protected					0.950	
Satd. Flow (prot)	3493	0	0	3539	0	1611
Flt Permitted					0.950	
Satd. Flow (perm)	3493	0	0	3539	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	22	0	1002	76	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	255	0	0	1002	76	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	827	205	0	0	0
Future Volume (vph)	0	1390	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1511	223	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1511	223	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 32.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	205	342	485
Future Volume (vph)	0	0	0	205	905	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	223	984	527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	223	984	527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 33.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	827	0	0	205	0
Future Volume (vph)	0	1390	0	0	205	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1511	0	0	223	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1511	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			32.5	
Actuated g/C Ratio		1.00			0.65	
v/c Ratio		0.54			0.10	
Control Delay		1.6			3.7	
Queue Delay		0.0			0.0	
Total Delay		1.6			3.7	
LOS		A			A	
Approach Delay	1.6				3.7	
Approach LOS	A				A	
Queue Length 50th (ft)		1			9	
Queue Length 95th (ft)		0			21	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2752			2231	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.55			0.10	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 1.9 Intersection LOS: A

Intersection Capacity Utilization 32.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	0	0	429	399	29
Future Volume (vph)	205	0	0	992	399	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	3433	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						32
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	0	0	1078	434	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	1078	434	32
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	26.0			26.0	24.0	24.0
Total Split (%)	52.0%			52.0%	48.0%	48.0%
Maximum Green (s)	21.5			21.5	19.5	19.5
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	29.3			29.3	11.7	11.7
Actuated g/C Ratio	0.59			0.59	0.23	0.23
v/c Ratio	0.11			0.52	0.54	0.08
Control Delay	4.4			7.9	18.9	6.3
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	4.4			7.9	18.9	6.3
LOS	A			A	B	A
Approach Delay	4.4			7.9	18.0	
Approach LOS	A			A	B	
Queue Length 50th (ft)	11			83	57	0
Queue Length 95th (ft)	19			154	81	14
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	2072			2072	1338	636
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.11			0.52	0.32	0.05

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

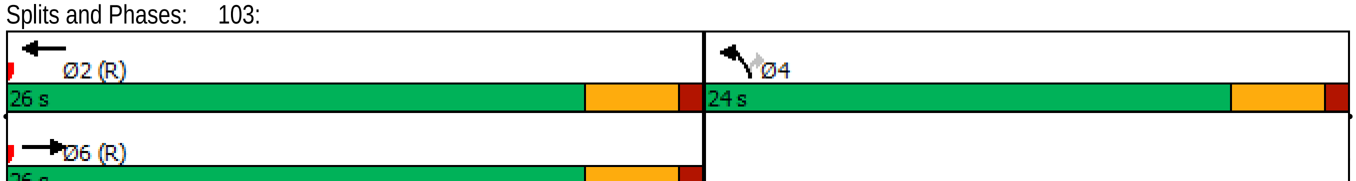
Maximum v/c Ratio: 0.54

Intersection Signal Delay: 10.1 Intersection LOS: B

Intersection Capacity Utilization 30.7% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:

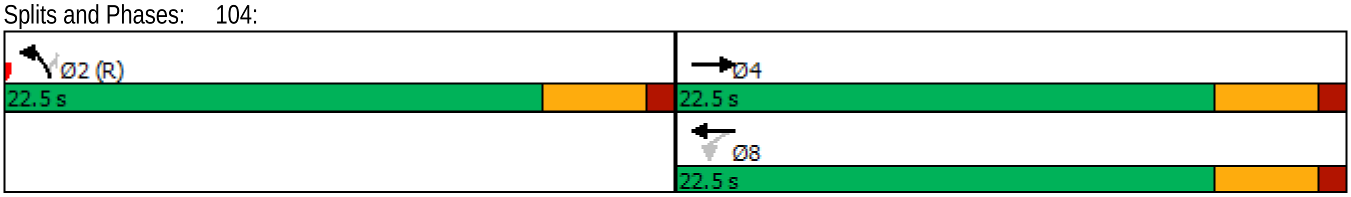


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	234	0	0	429	0	0
Future Volume (vph)	234	0	0	992	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	1863	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	1863	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	254	0	0	1078	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	1078	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0			18.0		
Actuated g/C Ratio	0.40			0.40		
v/c Ratio	0.18			0.76		
Control Delay	9.2			16.3		
Queue Delay	0.0			0.0		
Total Delay	9.2			16.3		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A			B		
Approach Delay	9.2			16.3		
Approach LOS	A			B		
Queue Length 50th (ft)	21			119		
Queue Length 95th (ft)	38			178		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1415			1415		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.18			0.76		

Intersection Summary	
Area Type: Other	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 14.9	Intersection LOS: B
Intersection Capacity Utilization 15.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 104:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	237	12	57	92	267	670
Future Volume (vph)	237	12	57	405	517	1296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.893	
Flt Protected			0.950		0.986	
Satd. Flow (prot)	3539	1583	1770	3539	3182	0
Flt Permitted			0.440		0.986	
Satd. Flow (perm)	3539	1583	820	3539	3182	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13			503	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	13	62	440	562	1409
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	13	62	440	1971	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	15.0	15.0	9.5	22.5	15.0	
Total Split (s)	15.5	15.5	9.5	25.0	25.0	
Total Split (%)	31.0%	31.0%	19.0%	50.0%	50.0%	
Maximum Green (s)	11.0	11.0	5.0	20.5	20.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	14.8	14.8	20.5	20.5	20.5	
Actuated g/C Ratio	0.30	0.30	0.41	0.41	0.41	
v/c Ratio	0.25	0.03	0.14	0.30	1.47dr	
Control Delay	15.8	9.2	15.2	17.1	125.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.8	9.2	15.2	17.1	125.8	
LOS	B	A	B	B	F	
Approach Delay	15.5			16.9	125.8	
Approach LOS	B			B	F	
Queue Length 50th (ft)	33	0	18	67	~338	
Queue Length 95th (ft)	60	10	m31	107	#461	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1047	477	431	1450	1601	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.03	0.14	0.30	1.23	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.23

Intersection Signal Delay: 95.0 Intersection LOS: F

Intersection Capacity Utilization 50.8% ICU Level of Service A

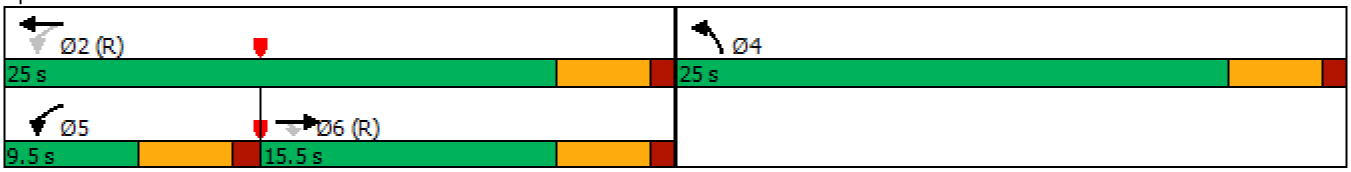
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

m Volume for 95th percentile queue is metered by upstream signal.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	907	0	2	119	2	27	0	17	0	0	4
Future Volume (vph)	0	1533	0	2	432	2	27	0	17	0	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999			0.948			0.865	
Flt Protected								0.970				
Satd. Flow (prot)	0	3539	0	0	3536	0	0	1713	0	0	1611	0
Flt Permitted								0.970				
Satd. Flow (perm)	0	3539	0	0	3536	0	0	1713	0	0	1611	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1666	0	2	470	2	29	0	18	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1666	0	0	474	0	0	47	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 40.9%	ICU Level of Service A
Analysis Period (min) 15	

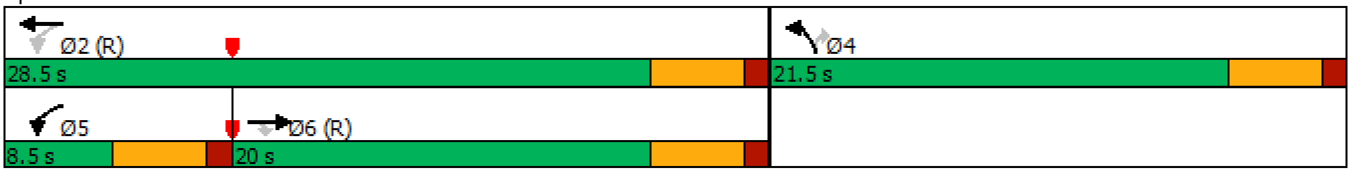
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	567	357	4	122	0	19
Future Volume (vph)	1005	545	4	122	313	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	3539	1689	0	3536	1770	1583
Flt Permitted				0.933	0.950	
Satd. Flow (perm)	3539	1689	0	3302	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		592				89
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1092	592	4	133	340	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1092	592	0	137	340	89
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	27.0	27.0		27.0	14.0	14.0
Actuated g/C Ratio	0.54	0.54		0.54	0.28	0.28
v/c Ratio	0.57	0.50		0.08	0.69	0.18
Control Delay	12.6	4.0		9.4	23.3	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	12.6	4.0		9.4	23.3	4.4
LOS	B	A		A	C	A
Approach Delay	9.5			9.4	19.4	
Approach LOS	A			A	B	
Queue Length 50th (ft)	120	37		8	86	0
Queue Length 95th (ft)	m107	m27		30	145	22
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	1912	1184		1784	601	596
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.57	0.50		0.08	0.57	0.15

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 33.8% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 107:



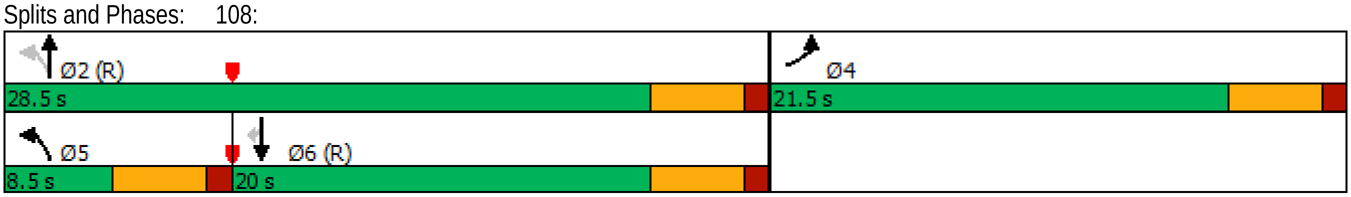
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	470	115	40	1170	922	85
Future Volume (vph)	683	403	40	1170	922	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.944					0.850
Flt Protected	0.970		0.950			
Satd. Flow (prot)	3309	0	1770	3539	3539	1583
Flt Permitted	0.970		0.200			
Satd. Flow (perm)	3309	0	373	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	234					92
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	742	438	43	1272	1002	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1180	0	43	1272	1002	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	21.5		8.5	28.5	20.0	20.0
Total Split (%)	43.0%		17.0%	57.0%	40.0%	40.0%
Maximum Green (s)	17.0		4.0	24.0	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	17.0		24.0	24.0	15.5	15.5
Actuated g/C Ratio	0.34		0.48	0.48	0.31	0.31
v/c Ratio	0.92		0.15	0.75	0.91	0.17
Control Delay	24.5		8.2	14.0	32.0	4.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	24.5		8.2	14.0	32.0	4.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	C		A	B	C	A
Approach Delay	24.5			13.8	29.7	
Approach LOS	C			B	C	
Queue Length 50th (ft)	161		6	145	145	0
Queue Length 95th (ft)	#276		18	212	#253	24
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1279		290	1698	1097	554
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.92		0.15	0.75	0.91	0.17

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 65
Control Type: Pretimed
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 22.2 Intersection LOS: C
Intersection Capacity Utilization 57.8% ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	19	0	361	0	0	0
Future Volume (vph)	395	0	549	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	0	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	0	597	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	429	0	0	597	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.0%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	19
Future Volume (vph)	376	0	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	409	0	0	0	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	409	0	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	376	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1863	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1863	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	409	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	409	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	0	0	60	0	0
Future Volume (vph)	212	0	0	60	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	0	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	0	1863
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	230	0	0	65	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	230	0	0	65	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 7.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	40	192	592	0	0
Future Volume (vph)	0	40	260	1267	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	283	1377	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	283	1377	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 34.5%		ICU Level of Service A
Analysis Period (min) 15		

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	470	14	10
Future Volume (vph)	0	0	0	1213	14	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	1318	15	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1318	15	11
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 16.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	40	0	0	784	0
Future Volume (vph)	0	40	0	0	1527	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	43	0	0	1660	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	43	0	0	1660	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			44.2	
Actuated g/C Ratio		1.00			0.88	
v/c Ratio		0.02			0.55	
Control Delay		0.0			3.1	
Queue Delay		0.0			0.0	
Total Delay		0.0			3.1	
LOS		A			A	
Approach Delay					3.1	
Approach LOS					A	
Queue Length 50th (ft)		0			0	
Queue Length 95th (ft)		0			147	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2787			3035	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.02			0.55	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 3.0 Intersection LOS: A
Intersection Capacity Utilization 26.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	115	0	0	40	0	0
Future Volume (vph)	183	0	0	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	0	3539	3614	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	0	3539	3614	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	0	0	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	199	0	0	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	22.5			22.5	22.5	22.5
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	18.0			18.0	18.0	18.0
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	45.0			45.0		
Actuated g/C Ratio	1.00			1.00		
v/c Ratio	0.06			0.01		
Control Delay	0.0			0.0		
Queue Delay	0.0			0.0		
Total Delay	0.0			0.0		
LOS	A			A		
Approach Delay						
Approach LOS						
Queue Length 50th (ft)	0			0		
Queue Length 95th (ft)	0			1		
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	3539			3539		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.06			0.01		

Intersection Summary

Area Type: Other

Cycle Length: 45

Actuated Cycle Length: 45

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green

Natural Cycle: 45

Control Type: Actuated-Coordinated

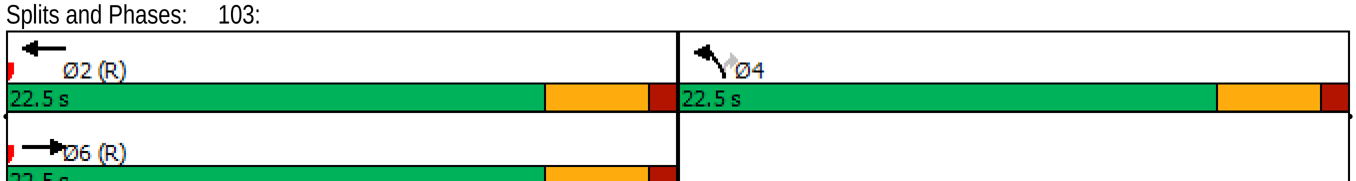
Maximum v/c Ratio: 0.06

Intersection Signal Delay: 0.0 Intersection LOS: A

Intersection Capacity Utilization 7.9% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 103:

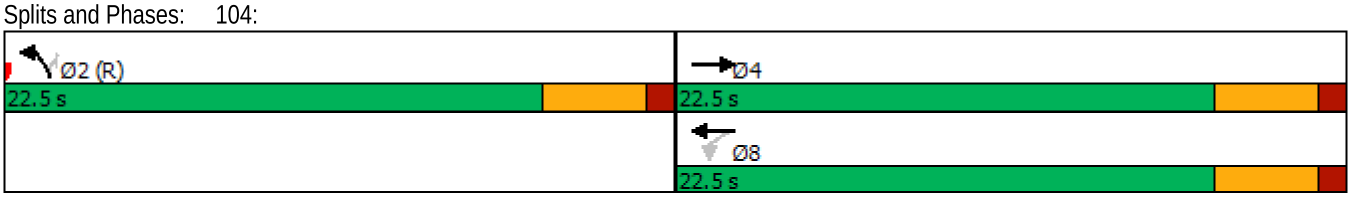


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	144	49	20	40	0	0
Future Volume (vph)	212	49	20	40	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.972					
Flt Protected			0.950			
Satd. Flow (prot)	3440	0	1770	3539	1863	1863
Flt Permitted			0.578			
Satd. Flow (perm)	3440	0	1077	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	53					
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	230	53	22	43	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	283	0	22	43	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0		18.0	18.0		
Actuated g/C Ratio	0.40		0.40	0.40		
v/c Ratio	0.20		0.05	0.03		
Control Delay	7.6		8.8	8.3		
Queue Delay	0.0		0.0	0.0		
Total Delay	7.6		8.8	8.3		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A		A	A		
Approach Delay	7.6			8.5		
Approach LOS	A			A		
Queue Length 50th (ft)	18		3	3		
Queue Length 95th (ft)	37		13	10		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1407		430	1415		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.20		0.05	0.03		

Intersection Summary	
Area Type: Other	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 17.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 104:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	87	57	544	39	22	19
Future Volume (vph)	87	125	1152	39	22	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.930	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3539	1583	1770	3539	3273	0
Flt Permitted			0.512		0.974	
Satd. Flow (perm)	3539	1583	954	3539	3273	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		136			21	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	136	1252	42	24	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	136	1252	42	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	20.0	20.0	9.5	22.5	15.0	
Total Split (s)	20.0	20.0	15.0	35.0	15.0	
Total Split (%)	40.0%	40.0%	30.0%	70.0%	30.0%	
Maximum Green (s)	15.5	15.5	10.5	30.5	10.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	15.5	15.5	41.1	43.8	6.0	
Actuated g/C Ratio	0.31	0.31	0.82	0.88	0.12	
v/c Ratio	0.09	0.23	1.11	0.01	0.11	
Control Delay	12.6	4.3	74.7	1.4	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.6	4.3	74.7	1.4	13.9	
LOS	B	A	E	A	B	
Approach Delay	7.7			72.3	13.9	
Approach LOS	A			E	B	
Queue Length 50th (ft)	10	0	153	0	3	
Queue Length 95th (ft)	23	29	#785	m2	14	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1097	584	1127	3099	703	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.23	1.11	0.01	0.06	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.11

Intersection Signal Delay: 61.1 Intersection LOS: E

Intersection Capacity Utilization 48.5% ICU Level of Service A

Analysis Period (min) 15

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

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

Splits and Phases: 105:

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	99	7	150	582	15	0	0	4	0	0	0
Future Volume (vph)	0	99	7	150	1190	15	0	0	4	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.998			0.865				
Flt Protected					0.994							
Satd. Flow (prot)	0	3504	0	0	3511	0	0	1611	0	0	1863	0
Flt Permitted					0.994							
Satd. Flow (perm)	0	3504	0	0	3511	0	0	1611	0	0	1863	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	108	8	163	1293	16	0	0	4	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	116	0	0	1472	0	0	4	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 34.2%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	92	10	9	540	207	4
Future Volume (vph)	92	10	9	1080	275	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	1689	0	3539	1770	1583
Flt Permitted				0.953	0.950	
Satd. Flow (perm)	3539	1689	0	3373	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		11				4
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	11	10	1174	299	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	11	0	1184	299	4
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	27.8	27.8		27.8	13.2	13.2
Actuated g/C Ratio	0.56	0.56		0.56	0.26	0.26
v/c Ratio	0.05	0.01		0.63	0.64	0.01
Control Delay	3.3	1.8		11.0	22.4	8.2
Queue Delay	0.0	0.0		0.0	0.0	0.0
Total Delay	3.3	1.8		11.0	22.4	8.2
LOS	A	A		B	C	A
Approach Delay	3.2			11.0	22.2	
Approach LOS	A			B	C	
Queue Length 50th (ft)	2	0		118	76	0
Queue Length 95th (ft)	6	2		m134	126	5
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	1967	944		1875	601	540
Starvation Cap Reductn	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0
Reduced v/c Ratio	0.05	0.01		0.63	0.50	0.01

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

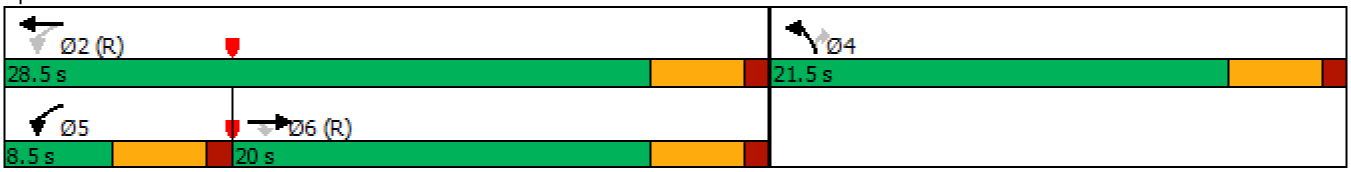
Intersection Signal Delay: 12.6 Intersection LOS: B

Intersection Capacity Utilization 37.5% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 107:



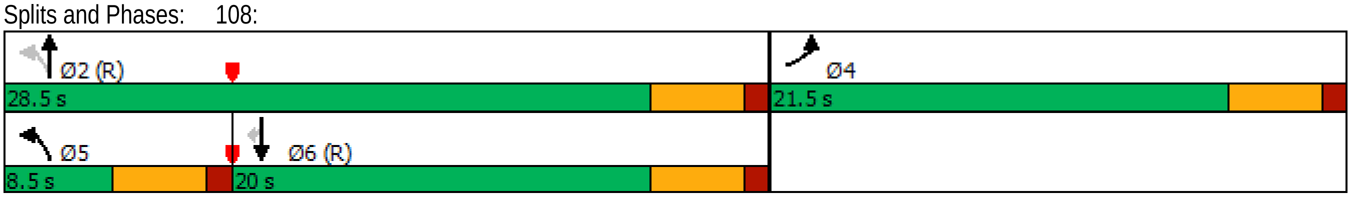
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	24	317	999	357	232
Future Volume (vph)	72	24	587	999	357	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.962					0.850
Flt Protected	0.964		0.950			
Satd. Flow (prot)	3351	0	1770	3539	3539	1583
Flt Permitted	0.964		0.405			
Satd. Flow (perm)	3351	0	754	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	26					546
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	26	638	1086	388	546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	104	0	638	1086	388	546
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	21.5		8.5	28.5	20.0	20.0
Total Split (%)	43.0%		17.0%	57.0%	40.0%	40.0%
Maximum Green (s)	17.0		4.0	24.0	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	17.0		24.0	24.0	15.5	15.5
Actuated g/C Ratio	0.34		0.48	0.48	0.31	0.31
v/c Ratio	0.09		1.44	0.64	0.35	0.63
Control Delay	6.5		229.4	11.9	14.5	5.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	6.5		229.4	11.9	14.5	5.4

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	A		F	B	B	A
Approach Delay	6.5			92.4	9.2	
Approach LOS	A			F	A	
Queue Length 50th (ft)	12		~220	114	45	0
Queue Length 95th (ft)	29		#429	167	74	56
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1156		443	1698	1097	867
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.09		1.44	0.64	0.35	0.63

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 1.44
Intersection Signal Delay: 61.0 Intersection LOS: E
Intersection Capacity Utilization 42.8% ICU Level of Service A
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	211	0	0	19	0	0
Future Volume (vph)	279	0	0	19	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	0	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	303	0	0	21	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	303	0	0	21	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 14.4% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	28	0	0	19	0	183
Future Volume (vph)	28	0	0	19	0	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	0	0	21	0	273
Shared Lane Traffic (%)						
Lane Group Flow (vph)	30	0	0	21	273	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 21.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	19	28	0
Future Volume (vph)	0	0	0	19	28	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	1611	0	1770	1863
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	1611	0	1770	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	21	30	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	21	0	30	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 13.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	214	20	0	359	70	35
Future Volume (vph)	282	20	0	629	70	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.990					0.865
Flt Protected					0.950	
Satd. Flow (prot)	3504	0	0	3539	0	1611
Flt Permitted					0.950	
Satd. Flow (perm)	3504	0	0	3539	0	1611
Link Speed (mph)	30			30	30	
Link Distance (ft)	404			491	211	
Travel Time (s)	9.2			11.2	4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	307	22	0	684	76	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	329	0	0	684	76	38
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	12			24	0	
Link Offset(ft)	0			6	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization Err% ICU Level of Service H

Analysis Period (min) 15

Lane Group	SBL	SBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	827	205	0	0	0
Future Volume (vph)	0	1435	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	0.97	1.00	1.00	1.00
Frt		0.850				
Flt Protected			0.950			
Satd. Flow (prot)	0	2787	3433	1863	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	2787	3433	1863	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	227			1186	549	
Travel Time (s)	5.2			27.0	12.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1560	223	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1560	223	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			36	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 32.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBR	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (vph)	0	0	0	205	342	485
Future Volume (vph)	0	0	0	205	950	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	1.00
Frt						0.850
Flt Protected						
Satd. Flow (prot)	0	0	0	3539	5085	1583
Flt Permitted						
Satd. Flow (perm)	0	0	0	3539	5085	1583
Link Speed (mph)	30			30	30	
Link Distance (ft)	1042			233	359	
Travel Time (s)	23.7			5.3	8.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	223	1033	527
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	223	1033	527
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	8			0	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Free			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 33.4%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Traffic Volume (vph)	0	827	0	0	205	0
Future Volume (vph)	0	1435	0	0	205	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.88	1.00	1.00	0.97	1.00
Frt		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	1863	2787	1863	1863	3433	1863
Flt Permitted					0.950	
Satd. Flow (perm)	1863	2787	1863	1863	3433	1863
Right Turn on Red		Yes		Yes		Yes
Satd. Flow (RTOR)		1920				
Link Speed (mph)	30		30		30	
Link Distance (ft)	763		723		430	
Travel Time (s)	17.3		16.4		9.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1560	0	0	223	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1560	0	0	223	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Right
Median Width(ft)	30		32		32	
Link Offset(ft)	30		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15	9	15	9
Number of Detectors	0	0	0	0	0	0
Detector Template	Thru	Thru	Thru	Thru	Thru	Thru
Leading Detector (ft)	0	0	0	0	0	0
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pt+ov	Prot	Perm	Prot	Perm
Protected Phases	5	5 6	4		6	
Permitted Phases				4		6
Detector Phase	5	5 6	4	4	6	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	15.5		15.5	15.5	19.0	19.0
Total Split (%)	31.0%		31.0%	31.0%	38.0%	38.0%
Maximum Green (s)	11.0		11.0	11.0	14.5	14.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag	Lead				Lag	Lag
Lead-Lag Optimize?	Yes				Yes	Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		None	None	C-Max	C-Max

Lane Group	SBL	SBR	NWL	NWR	NEL	NER
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)		50.0			32.4	
Actuated g/C Ratio		1.00			0.65	
v/c Ratio		0.56			0.10	
Control Delay		1.6			3.8	
Queue Delay		0.0			0.0	
Total Delay		1.6			3.8	
LOS		A			A	
Approach Delay	1.6				3.8	
Approach LOS	A				A	
Queue Length 50th (ft)		13			9	
Queue Length 95th (ft)		9			21	
Internal Link Dist (ft)	683		643		350	
Turn Bay Length (ft)						
Base Capacity (vph)		2751			2227	
Starvation Cap Reductn		0			0	
Spillback Cap Reductn		0			0	
Storage Cap Reductn		0			0	
Reduced v/c Ratio		0.57			0.10	

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 6:NEL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 1.9	Intersection LOS: A
Intersection Capacity Utilization 32.7%	ICU Level of Service A
Analysis Period (min) 15	

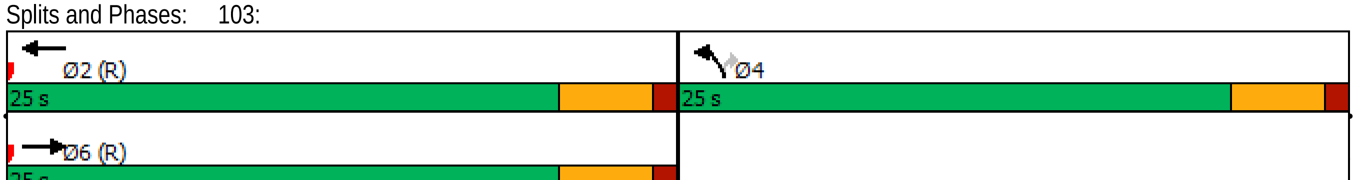
Splits and Phases: 102:

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	205	0	0	429	399	29
Future Volume (vph)	205	0	0	699	737	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	3539	0	0	3539	3433	1583
Flt Permitted					0.950	
Satd. Flow (perm)	3539	0	0	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						105
Link Speed (mph)	30			30	30	
Link Distance (ft)	923			533	500	
Travel Time (s)	21.0			12.1	11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	223	0	0	760	801	105
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	0	0	760	801	105
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2			2	1	1
Detector Template	Thru			Thru	Left	Right
Leading Detector (ft)	100			100	20	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	6			6	20	20
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA			NA	Prot	Perm
Protected Phases	6			2	4	
Permitted Phases						4
Detector Phase	6			2	4	4
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	5.0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	22.5			22.5	22.5	22.5
Total Split (s)	25.0			25.0	25.0	25.0
Total Split (%)	50.0%			50.0%	50.0%	50.0%
Maximum Green (s)	20.5			20.5	20.5	20.5
Yellow Time (s)	3.5			3.5	3.5	3.5
All-Red Time (s)	1.0			1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	None	None
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	23.8			23.8	17.2	17.2
Actuated g/C Ratio	0.48			0.48	0.34	0.34
v/c Ratio	0.13			0.45	0.68	0.17
Control Delay	6.3			10.6	16.9	3.4
Queue Delay	0.0			0.0	0.0	0.0
Total Delay	6.3			10.6	16.9	3.4
LOS	A			B	B	A
Approach Delay	6.3			10.6	15.3	
Approach LOS	A			B	B	
Queue Length 50th (ft)	12			72	98	0
Queue Length 95th (ft)	20			125	131	21
Internal Link Dist (ft)	843			453	420	
Turn Bay Length (ft)						
Base Capacity (vph)	1685			1685	1407	710
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.13			0.45	0.57	0.15

Intersection Summary	
Area Type: Other	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 30.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 103:

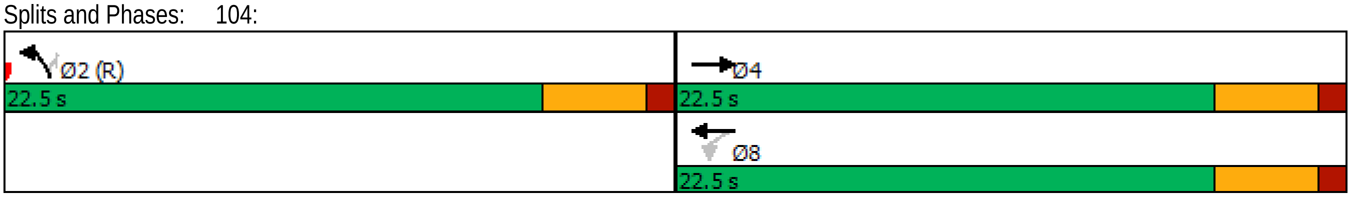


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	234	0	0	429	0	0
Future Volume (vph)	302	0	0	699	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	3539	0	1863	3539	1863	1863
Flt Permitted						
Satd. Flow (perm)	3539	0	1863	3539	1863	1863
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			30	30	
Link Distance (ft)	533			404	428	
Travel Time (s)	12.1			9.2	9.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	328	0	0	760	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	328	0	0	760	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	20	
Link Offset(ft)	-12			8	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	4			8	2	
Permitted Phases			8			2
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (%)	50.0%		50.0%	50.0%	50.0%	50.0%
Maximum Green (s)	18.0		18.0	18.0	18.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	18.0			18.0		
Actuated g/C Ratio	0.40			0.40		
v/c Ratio	0.23			0.54		
Control Delay	9.5			12.1		
Queue Delay	0.0			0.0		
Total Delay	9.5			12.1		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
LOS	A			B		
Approach Delay	9.5			12.1		
Approach LOS	A			B		
Queue Length 50th (ft)	27			74		
Queue Length 95th (ft)	48			114		
Internal Link Dist (ft)	453			324	348	
Turn Bay Length (ft)						
Base Capacity (vph)	1415			1415		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.23			0.54		

Intersection Summary	
Area Type: Other	
Cycle Length: 45	
Actuated Cycle Length: 45	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 45	
Control Type: Pretimed	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 15.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 104:



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	237	12	57	92	267	670
Future Volume (vph)	305	12	57	92	537	1346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	0.95
Frt		0.850			0.893	
Flt Protected			0.950		0.986	
Satd. Flow (prot)	3539	1583	1770	3539	3182	0
Flt Permitted			0.410		0.986	
Satd. Flow (perm)	3539	1583	764	3539	3182	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		13			444	
Link Speed (mph)	30			30	30	
Link Distance (ft)	491			971	1149	
Travel Time (s)	11.2			22.1	26.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	13	62	100	584	1463
Shared Lane Traffic (%)						
Lane Group Flow (vph)	332	13	62	100	2047	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	
Protected Phases	6		5	2	4	
Permitted Phases		6	2			
Detector Phase	6	6	5	2	4	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Split (s)	15.0	15.0	9.5	22.5	15.0	
Total Split (s)	15.5	15.5	9.5	25.0	25.0	
Total Split (%)	31.0%	31.0%	19.0%	50.0%	50.0%	
Maximum Green (s)	11.0	11.0	5.0	20.5	20.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	C-Max	None	C-Max	None	
Walk Time (s)	7.0	7.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	0	0				
Act Effct Green (s)	14.8	14.8	20.5	20.5	20.5	
Actuated g/C Ratio	0.30	0.30	0.41	0.41	0.41	
v/c Ratio	0.32	0.03	0.15	0.07	1.59dr	
Control Delay	16.3	9.2	10.6	9.7	159.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.3	9.2	10.6	9.7	159.9	
LOS	B	A	B	A	F	
Approach Delay	16.0			10.0	159.9	
Approach LOS	B			B	F	
Queue Length 50th (ft)	44	0	10	8	~376	
Queue Length 95th (ft)	74	10	33	23	#501	
Internal Link Dist (ft)	411			891	1069	
Turn Bay Length (ft)						
Base Capacity (vph)	1047	477	413	1450	1566	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.32	0.03	0.15	0.07	1.31	

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.31

Intersection Signal Delay: 131.0 Intersection LOS: F

Intersection Capacity Utilization 50.8% ICU Level of Service A

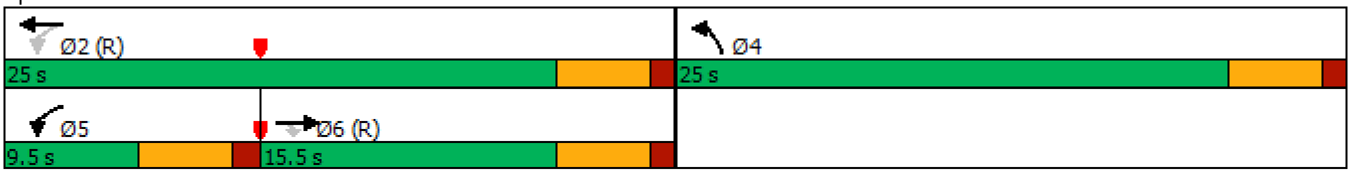
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Splits and Phases: 105:



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑			↑	
Traffic Volume (vph)	0	907	0	2	119	2	27	0	17	0	0	4
Future Volume (vph)	0	1651	0	2	119	2	27	0	17	0	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998			0.948			0.865	
Flt Protected					0.999			0.970				
Satd. Flow (prot)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Flt Permitted					0.999			0.970				
Satd. Flow (perm)	0	3539	0	0	3529	0	0	1713	0	0	1611	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		971			260			262			305	
Travel Time (s)		22.1			5.9			6.0			6.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1795	0	2	129	2	29	0	18	0	0	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1795	0	0	133	0	0	47	0	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 40.9% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	567	357	4	122	0	19
Future Volume (vph)	1094	574	4	122	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	14	12	12	12	12
Lane Util. Factor	0.95	1.00	0.95	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999		
Satd. Flow (prot)	3539	1689	0	3536	1863	1583
Flt Permitted				0.935		
Satd. Flow (perm)	3539	1689	0	3309	1863	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		624				228
Link Speed (mph)	30			30	30	
Link Distance (ft)	777			738	307	
Travel Time (s)	17.7			16.8	7.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1189	624	4	133	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1189	624	0	137	0	21
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	R NA	Left	Left	Left	Right
Median Width(ft)	16			16	36	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	0.92	1.00	1.00	1.00	1.00
Turning Speed (mph)		15	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6	2			4
Detector Phase	6	6	5	2	4	4
Switch Phase						

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	20.0	20.0	8.5	28.5	21.5	21.5
Total Split (%)	40.0%	40.0%	17.0%	57.0%	43.0%	43.0%
Maximum Green (s)	15.5	15.5	4.0	24.0	17.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0
Act Effct Green (s)	47.1	47.1		47.1		5.5
Actuated g/C Ratio	0.94	0.94		0.94		0.11
v/c Ratio	0.36	0.38		0.04		0.06
Control Delay	1.8	1.1		2.1		0.3
Queue Delay	0.0	0.0		0.0		0.0
Total Delay	1.8	1.1		2.1		0.3
LOS	A	A		A		A
Approach Delay	1.6			2.1	0.3	
Approach LOS	A			A	A	
Queue Length 50th (ft)	0	0		0		0
Queue Length 95th (ft)	m100	m21		22		0
Internal Link Dist (ft)	697			658	227	
Turn Bay Length (ft)						
Base Capacity (vph)	3334	1627		3117		688
Starvation Cap Reductn	0	0		0		0
Spillback Cap Reductn	0	0		0		0
Storage Cap Reductn	0	0		0		0
Reduced v/c Ratio	0.36	0.38		0.04		0.03

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.38

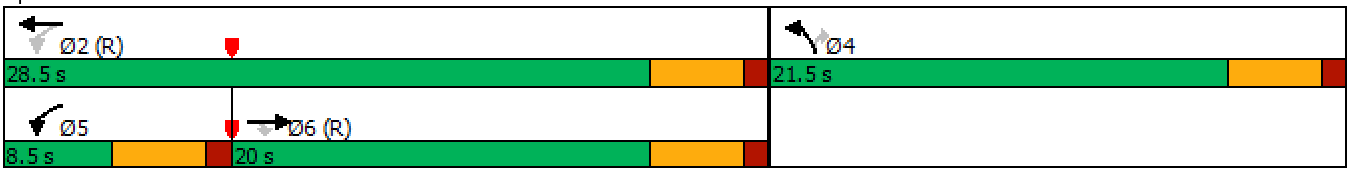
Intersection Signal Delay: 1.6 Intersection LOS: A

Intersection Capacity Utilization 33.8% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 107:



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	470	115	40	1170	922	85
Future Volume (vph)	767	345	40	1170	922	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	1.00	0.95	0.95	1.00
Frt	0.953					0.850
Flt Protected	0.967		0.950			
Satd. Flow (prot)	3330	0	1770	3539	3539	1583
Flt Permitted	0.967		0.200			
Satd. Flow (perm)	3330	0	373	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	165					92
Link Speed (mph)	30			30	30	
Link Distance (ft)	738			727	965	
Travel Time (s)	16.8			16.5	21.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	834	375	43	1272	1002	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1209	0	43	1272	1002	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Turn Type	Prot		pm+pt	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases			2			6
Minimum Split (s)	22.5		9.5	22.5	22.5	22.5
Total Split (s)	21.5		8.5	28.5	20.0	20.0
Total Split (%)	43.0%		17.0%	57.0%	40.0%	40.0%
Maximum Green (s)	17.0		4.0	24.0	15.5	15.5
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5	4.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Walk Time (s)	7.0			7.0	7.0	7.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	17.0		24.0	24.0	15.5	15.5
Actuated g/C Ratio	0.34		0.48	0.48	0.31	0.31
v/c Ratio	0.97		0.15	0.75	0.91	0.17
Control Delay	37.8		8.2	14.0	32.0	4.6
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	37.8		8.2	14.0	32.0	4.6

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	D		A	B	C	A
Approach Delay	37.8			13.8	29.7	
Approach LOS	D			B	C	
Queue Length 50th (ft)	129		6	145	145	0
Queue Length 95th (ft)	#304		18	212	#253	24
Internal Link Dist (ft)	658			647	885	
Turn Bay Length (ft)						
Base Capacity (vph)	1241		290	1698	1097	554
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.97		0.15	0.75	0.91	0.17

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green, Master Intersection

Natural Cycle: 70

Control Type: Pretimed

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 26.7 Intersection LOS: C

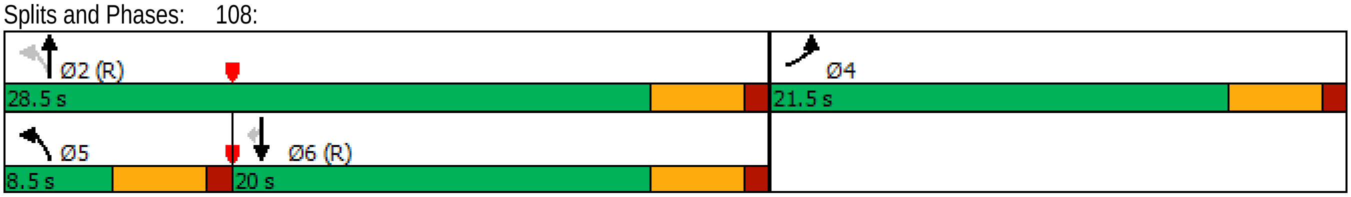
Intersection Capacity Utilization 57.8% ICU Level of Service B

Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 108:



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	19	0	361	0	0	0
Future Volume (vph)	19	0	578	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected				0.950		
Satd. Flow (prot)	1863	0	0	1770	0	0
Flt Permitted				0.950		
Satd. Flow (perm)	1863	0	0	1770	0	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1082			1015	590	
Travel Time (s)	24.6			23.1	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	0	628	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	0	0	628	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 30.0% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	Y	
Traffic Volume (vph)	0	0	0	0	0	19
Future Volume (vph)	0	0	0	0	0	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	839			634	538	
Travel Time (s)	19.1			14.4	12.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	21	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	1863	0	1863	1863
Flt Permitted						
Satd. Flow (perm)	0	1863	1863	0	1863	1863
Link Speed (mph)		30	30		30	
Link Distance (ft)		98	839		286	
Travel Time (s)		2.2	19.1		6.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		36	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Sign Control		Free	Stop		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 13.3% ICU Level of Service A

Analysis Period (min) 15

APPENDIX D

Gate SMART Analysis

Existing Gate Needs (Adjusted Volume) – Alternative 1

Barta Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	1	1	1	1	1	1
Expected Delay per Vehicle (seconds)	19	15	22	17	17	20
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 148 vph

GEOint Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	1	1	1	1	1	1
Expected Delay per Vehicle (seconds)	19	15	22	17	17	20
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 150 vph

Heller Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	0	0	0	0	0	0
Expected Delay per Vehicle (seconds)	16	13	17	15	15	17
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 19 vph

Existing Gate Needs (Adjusted Volume) – Alternative 2

Meade Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	0	0	0	0	0	0
Expected Delay per Vehicle (seconds)	16	13	17	15	15	16
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 1 vph

Belvoir Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	2	1	2	1	1	2
Traffic Queue (Total # of Vehicles) ?	3	5	4	9	9	4
Expected Delay per Vehicle (seconds)	18	27	21	59	59	20
Total Manpower Needed	2	2	2	2	1	2

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 398 vph

Pohick Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	4	2	7	3	3	5
Expected Delay per Vehicle (seconds)	31	18	54	23	23	39
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 288 vph

Existing Gate Needs (Adjusted Volumes w/ 650 Additional Personnel) – Alternative 1

Barta Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	1	1	1	1	1	1
Expected Delay per Vehicle (seconds)	19	15	22	17	17	20
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 148 vph

GEOint Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	3	2	5	2	2	4
Expected Delay per Vehicle (seconds)	27	17	40	21	21	32
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 264 vph

Heller Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	0	0	0	0	0	0
Expected Delay per Vehicle (seconds)	16	14	18	15	15	17
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 51 vph

Existing Gate Needs (Adjusted Volumes w/ 650 Additional Personnel) – Alternative 2

Meade Road Gate – AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	0	0	0	0	0	0
Expected Delay per Vehicle (seconds)	16	13	17	15	15	17
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 13 vph

Belvoir Road Gate – AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	2	1	2	2	2	2
Traffic Queue (Total # of Vehicles) ?	5	11	7	4	4	6
Expected Delay per Vehicle (seconds)	20	66	25	17	17	22
Total Manpower Needed	2	2	2	4	2	2

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 482 vph

Pohick Road Gate – AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	2	1	1	1
Traffic Queue (Total # of Vehicles) ?	9	3	3	5	5	11
Expected Delay per Vehicle (seconds)	63	21	20	33	33	110
Total Manpower Needed	1	2	2	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 349 vph

Existing Gate Needs (Adjusted Volumes w/ 1000 Additional Personnel) – Alternative 1

Barta Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	1	1	1	1	1	1
Expected Delay per Vehicle (seconds)	19	15	22	17	17	20
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 148 vph

GEOint Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	2	1	1	1
Traffic Queue (Total # of Vehicles) ?	9	3	3	5	5	11
Expected Delay per Vehicle (seconds)	61	21	20	33	33	107
Total Manpower Needed	1	2	2	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 348 vph

Heller Road Gate - AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	0	0	0	0	0	0
Expected Delay per Vehicle (seconds)	17	14	19	15	15	18
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 78 vph

Existing Gate Needs (Adjusted Volumes w/ 1000 Additional Personnel) – Alternative 2

Meade Road Gate – AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	1	1	1	1	1	1
Traffic Queue (Total # of Vehicles) ?	0	0	0	0	0	0
Expected Delay per Vehicle (seconds)	16	13	17	15	15	17
Total Manpower Needed	1	2	1	2	1	1

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 13 vph

Belvoir Road Gate – AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	2	2	2	2	2	2
Traffic Queue (Total # of Vehicles) ?	6	3	10	5	5	8
Expected Delay per Vehicle (seconds)	21	15	29	18	18	24
Total Manpower Needed	2	4	2	4	2	2

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 528 vph

Pohick Road Gate – AM

Quick Calculation

	Manual Processing		Handheld Processing		AIE Processing	
	Single	Tandem	Single	Tandem	No Traffic Arms	Traffic Arms
Required Lanes	2	1	2	1	1	2
Traffic Queue (Total # of Vehicles) ?	3	4	4	8	8	4
Expected Delay per Vehicle (seconds)	18	25	21	51	51	20
Total Manpower Needed	2	2	2	2	1	2

Note: All conditions operate at or below the maximum delay per vehicle value set in the "Defaults" tab.

Design Demand Volume: 388 vph

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