ENVIRONMENTAL ASSESSMENT TO CONSTRUCT NEW CREDIT UNION MAIN POST, 400 AREA FT. MONMOUTH, NEW JERSEY

Prepared for

U.S. Army Garrison Fort Monmouth
Directorate of Public Works
Fort Monmouth, New Jersey 07703-5108

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FINDING OF NO SIGNIFICANT IMPACT (FNSI) AND ENVIRONMENTAL ASSESSMENT (EA) FOR THE CONSTRUCTION OF A NEW FAFCU CREDIT UNION FACILITY AT FORT MONMOUTH, NEW JERSEY

ACTION: Notice of Availability

SUMMARY. The proposed action would involve construction of a building with a footprint of approximately 9,000 square feet on a 0.82-acre parcel at the intersections of Oceanport and Riverside Avenues. Approximately 0.68 acres of the 0.82-acre parcel (83 percent) would be within the 100-year floodplain under the proposed action. No other impacts are likely. The proposed facility would house First Atlantic Federal Credit Union (FAFCU) administrative/Back Office operations offices as well as provide a full service branch where teller transactions could be performed. Also, all loan services from application to disbursement, including consumer and real estate loans, will be available. In addition, the proposed branch will reduce Main Post congestion by providing convenient and accessible financial services adjacent to but removed from high traffic areas. The existing main post credit union facility will remain open.

Alternatives considered in the EA included:

Alternative 1:

The No-Action Alternative: This alternative is the continuation of existing conditions without the implementation of, or in absence of, the proposed action.

Alternative 2:

This alternative is the proposed action (preferred alternative). Under this alternative, Fort Monmouth would construct the new FAFCU credit union building at the proposed 0.82-acre site on the Main Post, near the intersection of Oceanport and Riverside Avenues. Approximately 0.68 acres of the 0.82-acre parcel (83 percent) would be within the 100-year floodplain under the proposed action.

Alternative 3:

Alternative 3 would provide for construction of the new FAFCU credit union building in a different location to the northwest of the proposed action. This alternative would provide for an identical building on a non-floodplain site to the northwest of the proposed action site. The alternative 3 building site is currently an active parking lot; the action would remove at least 90 of the current parking spaces from this lot. The Directorate of Public Works estimates that the action would eliminate a critical number of parking spaces from this area of the Main Post.

Implementation of the preferred alternative (Alternative 2: The proposed action) will not alter baseline environmental conditions. Biological, physical, and cultural resources will not be impacted by the preferred alternative. There will be no change in population size or distribution; therefore, there will be no potential impacts on infrastructure such as water, wastewater, solid waste and energy.

The proposed FAFCU credit union facility is expected to have no impact on the socioeconomic environment, including total sales, employment, population and income.

Based on the EA, which is incorporated into the FNSI, it has been determined that implementation of the proposed action would have no significant individual or cumulative impacts on the quality of the natural or human environment. Because there will be no significant environmental impacts resulting from implementation of the proposed action, an Environmental Impact Statement is not required.

Date:_____ _____

DOCUMENT OVERVIEW

This Environmental Assessment (EA) addresses the construction of a new FAFCU credit union building on the Fort Monmouth Main Post.

The EXECUTIVE SUMMARY briefly describes the actions, environmental impacts, and relevant federal legal requirements.

SECTION 1 PURPOSE, NEED AND SCOPE summarizes the background of this proposed action and describes the environmental analysis process.

SECTION 2 PROPOSED ACTION describes the new FAFCU credit union building proposed by the Army.

SECTION 3 AFFECTED ENVIRONMENT presents the environmental and socioeconomic setting of Fort Monmouth and its vicinity without the proposed action.

SECTION 4 ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES describes the potential environmental and socioeconomic effects of the proposed action.

SECTION 5 FINDINGS AND CONCLUSIONS provides the basis for the Finding of No Significant Impact (FNSI) or a Notice of Intent (NOI).

SECTION 6 AGENCIES AND PERSONS CONTACTED provides a list of people and agencies that provided information to the preparers of this report.

SECTION 7 LIST OF PREPARERS identifies the people who prepared the report and their disciplines.

SECTION 8 REFERENCES provide full bibliographical information for sources used to prepare the report.

ACRONYMS A list of acronyms is provided as the last page of the document.

APPENDIX A: Environmental Baseline Study
APPENDIX B: Determination of Availability
APPENDIX C: Traffic and Transportation Analysis Report
APPENDIX D: Record of Non-Applicability

Executive Summary

Fort Monmouth, New Jersey has received a request that land be made available for lease by the First Atlantic Federal Credit Union (FAFCU) in the 400 Area of the Main Post. The FAFCU is currently the only financial institution on Fort Monmouth. As such, it provides complete financial services to the active duty and retired military and civilian community. The proposed facility would house FAFCU administrative/Back Office operations offices as well as provide a full service branch where teller transactions could be performed. Also, all loan services from application to disbursement, including consumer and real estate loans, will be available. In addition, the proposed branch will reduce Main Post congestion by providing convenient and accessible financial services adjacent to but removed from high traffic areas. The FAFCU would use their own funds to construct the new facility, and a "Outgrant Lease" would be prepared by FAFCU to lease the federally owned lands.

The preferred alternative would involve construction of a building with a footprint of approximately 9,000 square feet on a 0.82-acre parcel at the intersection of Oceanport and Riverside Avenues. Approximately 0.68 acres of the 0.82-acre parcel (83 percent) would be within the 100-year floodplain under the proposed action. No other impacts are likely. Alternative 3 would provide for an identical building on a non-floodplain site to the northwest of the proposed action site. The alternative 3 building site is currently an active parking lot; the action would remove at least 90 of the current parking spaces from this lot. The Directorate of Public Works estimates that the action would eliminate a critical number of parking spaces from this area of the Main Post. This would pose serious parking conflicts for Army personnel located in Buildings 142, 454, 455, and 457.

Some of the background information presented in this Environmental Assessment (EA) was obtained from two documents previously prepared by Fort Monmouth (BRAC 1994 and Fort Monmouth 1999). Other information was obtained from the Environmental Baseline Study and the Report of Availability, both prepared for the project by the Fort Monmouth Directorate of Public Works (Appendices A and B).

Alternatives

Three alternatives were considered in this EA. These include no-action, the proposed action, and an alternative that would locate the proposed building at a site other than that of the proposed action.

1. No Action Alternative (Alternative 1)

National Environmental Policy Act (NEPA) documents typically refer to the No-Action Alternative as the continuation of existing conditions in the affected environment without the implementation of, or in the absence of, the proposed action. Inclusion of the No-Action Alternative is prescribed by the Council on Environmental Quality (CEQ) regulations as the benchmark against which federal actions are to be evaluated. This alternative is considered to provide a baseline for evaluation of other alternatives.

2. Proposed Action (Alternative 2)

Alternative 2 is the proposed action. Under this alternative, Fort Monmouth would construct the new FAFCU credit union building at the proposed 0.82-acre site on the Main Post, near the intersection of Oceanport and Riverside Avenues. Approximately 0.68 acres of the 0.82-acre parcel (83 percent) would be within the 100-year floodplain under the proposed action.

3. Proposed Action with Amendments (Alternative 3)

Alternative 3 would provide for construction of the new FAFCU credit union building in a different location to the northwest of the proposed action. This alternative would provide for an identical building on a non-floodplain site to the northwest of the proposed action site. The alternative 3 building site is currently an active parking lot; the action would remove at least 90 of the current parking spaces from this lot. The Directorate of Public Works estimates that the action would eliminate a critical number of parking spaces from this area of the Main Post.

Consequences

The impacts of the preferred alternative would not be significant. Table ES-1 summarizes impacts to Fort Monmouth resources and commitments to mitigation, if applicable.

Regulatory Requirements

Compliance with environmental regulations is required prior to the initiation of the proposed action at Fort Monmouth. The preferred alternative would be in compliance with all current Federal environmental statutes and Executive Orders.

Conclusions and Findings

The proposed action is not expected to result in significant environmental or socioeconomic impacts at Fort Monmouth or the surrounding region.

Table ES-1

Summary of Environmental Impacts and Commitments

Resource	Alternative	Level of Impact	Commitments[2]
LAND AND AIR SPACE USE	All	N.S.[1]	N.A.[3]
CLIMATE	All	N.S.	N.A.
AIR QUALITY	All	N.S.	N.A.
GEOLOGY, SOILS AND TOPOGRAPHY	All	N.S.	N.A.
RAINFALL AND RUNOFF	All	N.S.	N.A.
WATER RESOURCES	All	N.S.	N.A.
INFRASTRUCTURE			
Building/Grounds Maintenance	All	N.S.	N.A.
Roads/Railways/Runways	All	N.S.	N.A.
Water Supply and Distribution	All	N.S.	N.A.
Wastewater Collection And Treatment	All	N.S.	N.A.
Solid Waste Disposal	All	N.S.	N.A.
Energy	All	N.S.	N.A.
Communications	All	N.S.	N.A.
TRAFFIC/TRANSPORTATION	All	N.S.	N.A.
NOISE	All	N.S.	N.A.
During Construction	All	N.S.	N.A.
Following Construction	All	N.S.	N.A.

[1] N.S. = Not Significant
[2] Commitments describe mitigation that will be conducted.
[3] N.A. = Not Applicable

Table ES-1

Summary of Environmental Impacts and Commitments

Resource	Alternative	Level of Impact	Commitments[2]
HAZARDOUS AND TOXIC MATERIALS			
Contaminated Sites	All	N.S.	N.A.
Hazardous Waste	All	N.S.	N.A.
Explosives	All	N.S.	N.A.
Radioactive Materials	All	N.S.	N.A.
Asbestos	All	N.S.	N.A.
Radon	All	N.S.	N.A.
PCBs	All	N.S.	N.A.
Lead Paint	All	N.S.	N.A.
Pesticides	All	N.S.	N.A.
Medical and Bio-hazardous Wastes	All	N.S.	N.A.
Underground Storage Tanks	All	N.S.	N.A.
Aboveground Storage Tanks	All	N.S.	N.A.
PLANT AND ANIMAL RESOURCES	All	N.S.	N.A.
WETLANDS	All	N.S.	N.A.
THREATENED AND ENDANGERED SPECIES	All	N.S.	N.A.

[1] N.S. = Not Significant
[2] Commitments describe mitigation that will be conducted.
[3] N.A. = Not Applicable

Table ES-1

Summary of Environmental Impacts and Commitments

Resource	Alternative	Level of Impact	Commitments[2]
CULTURAL RESOURCES			
Architectural	All	N.S.	N.A.
Archeological	All	N.S.	N.A.
SOCIOECONOMIC ENVIRONMENT			
Population	All	N.S.	N.A.
Housing	All	N.S.	N.A.
Schools	All	N.S.	N.A.
Recreational and Community Facilities	All	N.S.	N.A.
Regional Economic Development	All	N.S.	N.A.
Public health and Safety	All	N.S.	N.A.
Native American/Ethnic Concerns	All	N.S.	N.A.
Homeless Concerns	All	N.S.	N.A.
VISUAL RESOURCES	All	N.S.	N.A.
INTERAGENCY AGREEMENTS	All	N.S.	N.A.

[1] N.S. = Not Significant
[2] Commitments describe mitigation that will be conducted.
[3] N.A. = Not Applicable

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Acronyms and Abbreviations

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Acronyms and Abbreviations

AEC	Army Environmental Center
AEHA	Army Environmental Hygiene
AMC	Army Materiel Command
AR	Army Regulation
AST	Above-ground Storage Tank
BMP	Best Management Practices
BRAC	Defense Base Closure and Realignment Commission
CECOM	U.S. Army Communications – Electronics Command
CEQ	Council on Environmental Quality
CERL	Construction Engineering Research Laboratory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRMP	Cultural Resources Management Plan
CW	Charles Wood Subpost
2,4-D	Dichlorophenoxyacetic acid
DCPA	Dimethyl ester of tretrachloroterephthalic acid
DBA	Decibel, A-rated
DPW	Directorate of Public Works
EA	Environmental Assessment
EIFS	Economic Information Forest System
FAFCU	First Atlantic Federal Credit Union
FNSI	finding of no significant impact
FTE	fulltime-equivalent job
FY	fiscal year
ICUZ	installation compatible use zone
IRP	Integrated Resources Plan
GPU	General Public Utility Energy
Leq	equivalent sound level
LOS	Level of Service
km	kilometers
kVA	Kilo Amperes
mgd	million gallons per day
MP	Main Post
msl	mean sea level
NEPA	National Environmental Policy Act
NJDEPE	New Jersey Department of Environmental Protection and Energy
NJNGC	New Jersey Natural Gas Company
NJT	New Jersey Transit
NRHP	National Register of Historic Places
PA	Programmatic Agreement
PCB	polychlorinated biphenyl
PM	project manager
RCRA	Resource Conservation and Recovery Act
R&D	research and development

ROI	region of influence
RTV	rational threshold value
SHPO	State Historic Preservation Officer
TCLP	toxicity characteristic leaching procedure
TPHCs	Total Petroleum Hydrocarbons
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
V/C	Volume to Capacity ratio

1.0 PURPOSE, NEED, AND SCOPE

1.1 Purpose And Need

The Directorate of Public Works (DPW) for US Army Fort Monmouth is planning for the construction of a 15,000 square-foot administrative banking facility on the Main Post of Fort Monmouth. Fort Monmouth received a request that land be made available for lease by the First Atlantic Federal Credit Union (FAFCU) in the 400 Area of the Main Post. The FAFCU is currently the only financial institution on Fort Monmouth. As such, it provides complete financial services to the active duty and retired military and civilian community. The proposed facility would house FAFCU administrative/Back Office operations offices as well as provide a full service branch where teller transactions can be performed. Also, all loan services from application to disbursement, including consumer and real estate loans, will be available. In addition, the proposed branch will reduce Main Post congestion by providing convenient and accessible financial services adjacent to but removed from high traffic areas, and by dividing the financial services into two separate locations (the existing credit union facility will remain open).

1.2 Scope

This EA documents and analyzes the environmental and socioeconomic effects associated with implementing the proposed action (Alternative 2), the proposed action with amendments (Alternative 3), and the no-action alternative (Alternative 1) (described in Section 2.0). The study area for this EA includes Fort Monmouth and the region of influence (ROI) within the communities surrounding the post.

1.3 Impact Analysis

The impact analysis in this EA focuses on each potentially affected existing resource within the ROI. The baseline conditions for each resource are described in Section 3.0, "Affected Environment." Section 4.0, "Environmental and Socioeconomic Consequences," presents the results of the impacts analysis.

The Army has standardized the evaluation of socioeconomic effects by using the Economic Information Forecast System (EIFS) model developed by the U.S. Army Construction Engineering Research Laboratory. Because little change in the number or distribution of personnel is involved in the proposed action, no socioeconomic impacts are anticipated and the EIFS model was not applied.

1.4 Public Involvement

The public and concerned organizations will be notified of the conclusions of this EA by publishing the FNSI in the local newspaper and making the EA available for review 30 days prior to initiating the actions. The Fort Monmouth Public Affairs Office will keep the public informed on the status and progress of the proposed action.

2.0 PROPOSED ACTION

2.1 Introduction

Fort Monmouth, New Jersey received a request that land be made available for lease by the First Atlantic Federal Credit Union (FAFCU) in the 400 Area of the Main Post (Figure 2-1). The FAFCU is currently the only financial institution on Fort Monmouth. As such, it provides complete financial services to the active duty and retired military and civilian community. The proposed facility would house FAFCU administrative/Back Office operations offices as well as provide a full service branch where teller transactions could be performed. Also, all loan servicing from application to disbursement, including consumer and real estate loans, would be available. In addition, the proposed branch will reduce Main Post congestion by providing convenient and accessible financial services adjacent to but removed from high traffic areas.

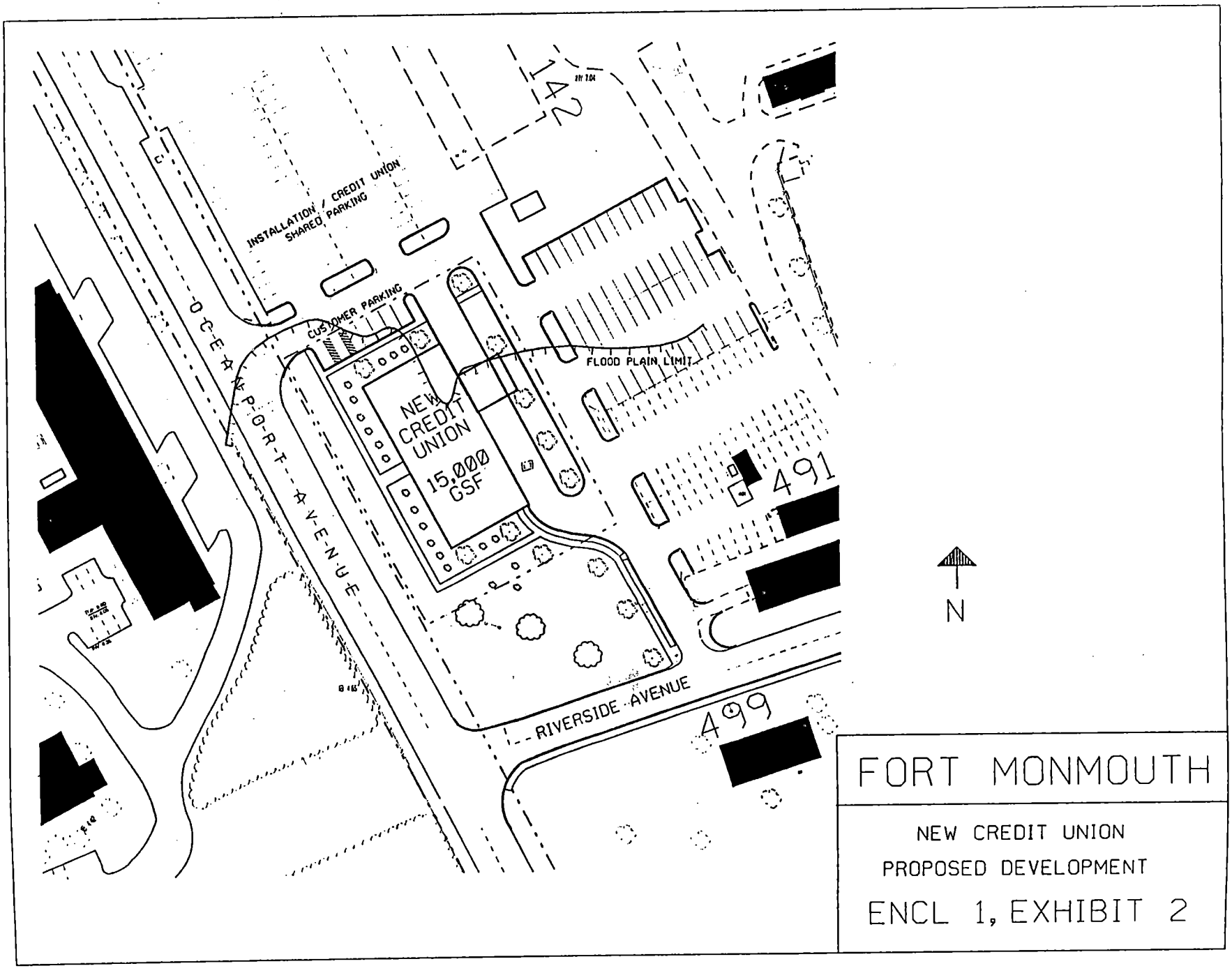
The new credit union facility proposed under the preferred alternative would replace the existing outdated, undersized Main Post facility. The proposed action would involve construction of a 15,000 square-foot building with a footprint of approximately 9,000 square feet on a 0.82-acre parcel at the intersection of Oceanport and Riverside Avenues.

Approximately 0.68 acres of the 0.82-acre parcel (83 percent) would be within the 100-year floodplain under the proposed action. To put this into context, however, floodplains exist along all of the tidal and non-tidal creeks at the Main Post. Many (if not most) of these areas mapped as floodplains along the creeks contain large amounts of old fill, and are highly disturbed from their natural condition (Versar 1998). Additionally, the recent comprehensive wetland delineation of the Main Post indicated that the site footprint was not directly located in wetlands, nor was it within the applicable 50-foot state-mandated buffer (Versar 1998).

Current land cover at the proposed site is mowed lawn; several medium-sized planted trees are also present.

2.2 Mission

It is a Department of the Army (DA) policy that Credit Unions on DA installations will be recognized and assisted at all levels because of their contribution to the morale and welfare of DA personnel. Granting office space and real property to the Credit Union will be governed by Section 124 of the Federal Credit Union Act.


INSTALLATION / CREDIT UNION
SHARED PARKING
CUSTOMER PARKING
OCEAN PORT AVENUE
NEW CREDIT UNION
15,000 GSF
FLOOD PLAIN LIMIT
491
499
RIVERSIDE AVENUE
N
FORT MONMOUTH
NEW CREDIT UNION
PROPOSED DEVELOPMENT
ENCL 1, EXHIBIT 2

3.0 AFFECTED ENVIRONMENT

3.1 Introduction

This section describes the existing environmental conditions at Fort Monmouth and its ROI. It provides baseline information for identification and evaluation of potential impacts that would result from implementation of the proposed action. Much of the information on the affected environment was described in a report entitled, "Realignment of Fort Monmouth, Fort Monmouth, New Jersey, Environmental Assessment Final, July 1994" (BRAC 1994).

Fort Monmouth is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City and 70 miles northeast of Philadelphia. In addition to the Main Post, the installation includes two subposts, Charles Wood and Evans Area, the latter of which will be closed.

The Main Post (Figure 3-1) encompasses approximately 636 acres and is generally bounded by State Highway 35, Parkers Creek, Lafetra Brook, the New Jersey Transit Railroad, and a residential area to the south. The Main Post provides supporting administrative, training, and housing functions, as well as many of the community facilities for Fort Monmouth (Harland Bartholomew & Associates, 1987a).

The Charles Wood Area (Figure 3-2) encompasses approximately 454 acres and is located approximately 1 mile west of the Main Post. The Charles Wood Area is generally bounded by Tinton Avenue, Pine Brook Road, the Garden State Parkway, and residential development. The area is used primarily for research, development, and testing. The Charles Wood Area also provides military family housing.

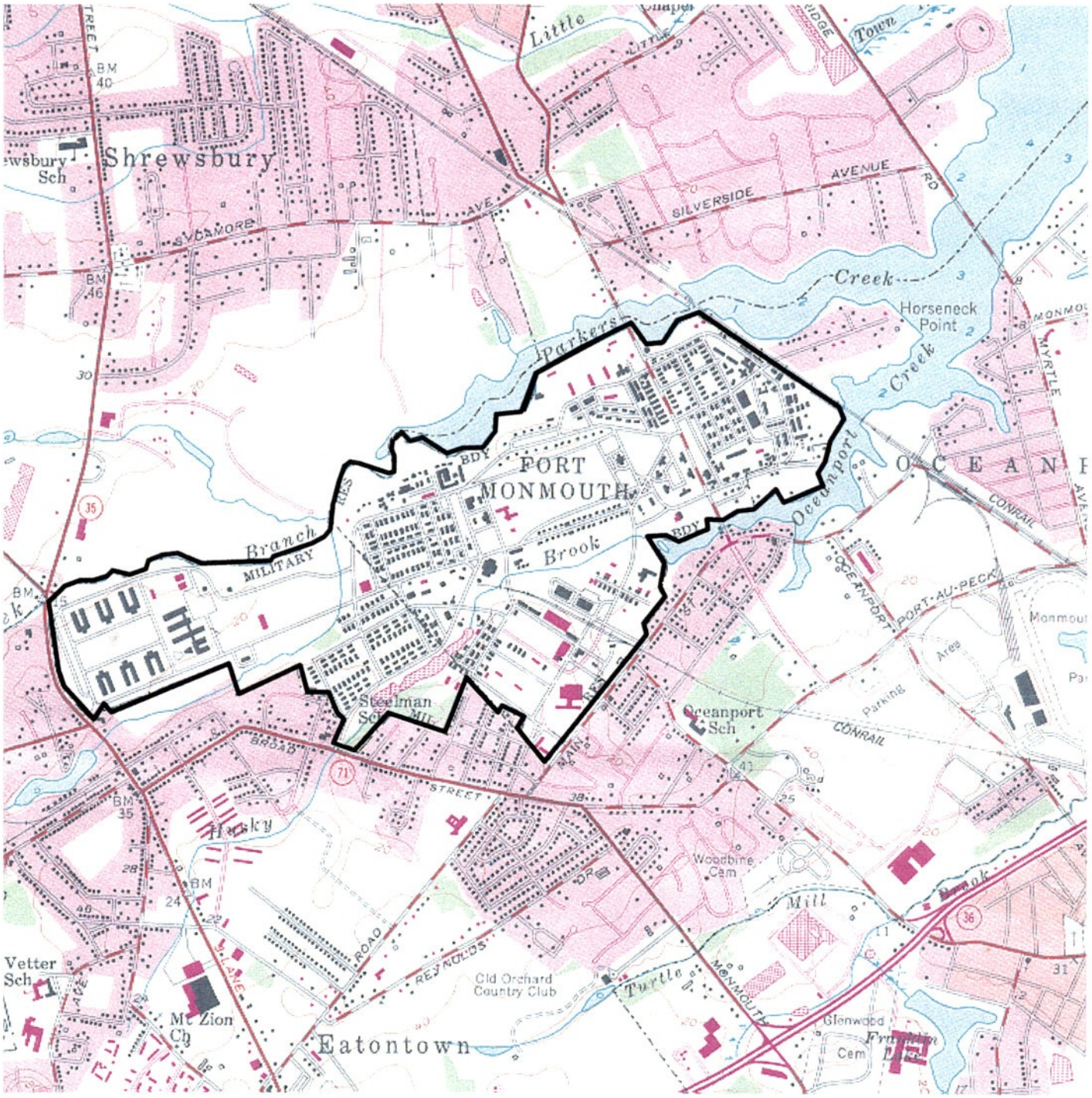
Fort Monmouth and Monmouth County are characterized by warm summers and moderate winters. The average annual precipitation for Monmouth County is 45.18 inches, with the heaviest rainfalls occurring during the summer months. Destructive storms are infrequent in Monmouth County; however, summer thunderstorms occasionally combine high winds with heavy rainfall. Heavy rains have occurred in connection with hurricanes which move northward along the mid-Atlantic coast. The mean annual temperature for Monmouth County is 53 degrees Fahrenheit. Temperatures frequently reach into the 90s from late May through early September. Winter temperatures rarely fall below 0 degrees Fahrenheit (The Earth Technology Corporation, 1993).

3.2 Land and Air Space Use

According to the Fort Monmouth General Site Map (1992), most of the land on the post (57 percent) is designated as open space or recreation. Research, development, and testing encompass approximately 14 percent, as does family housing. The remaining areas on the post are designated as administrative, community facility, maintenance and supply, or medical.

The areas surrounding Fort Monmouth are a mix of residential, commercial, and light industrial uses. Because federal facilities are not subject to local planning and zoning regulations, the zoning restrictions established by the surrounding townships and boroughs do not apply to Fort Monmouth. A review of the land-use plans for the surrounding municipalities shows that land uses in the surrounding municipalities are compatible with those along the inside perimeter of Fort Monmouth.

No air space restrictions exist over Fort Monmouth.



LONG BRANCH, N. J.

40073-C8-TF-024

1954

PHOTOREVISED 1981

DMA 6164 I SE-SERIES V822

QUADRANGLE LOCATION

Mapped, edited and published by the Geological Survey

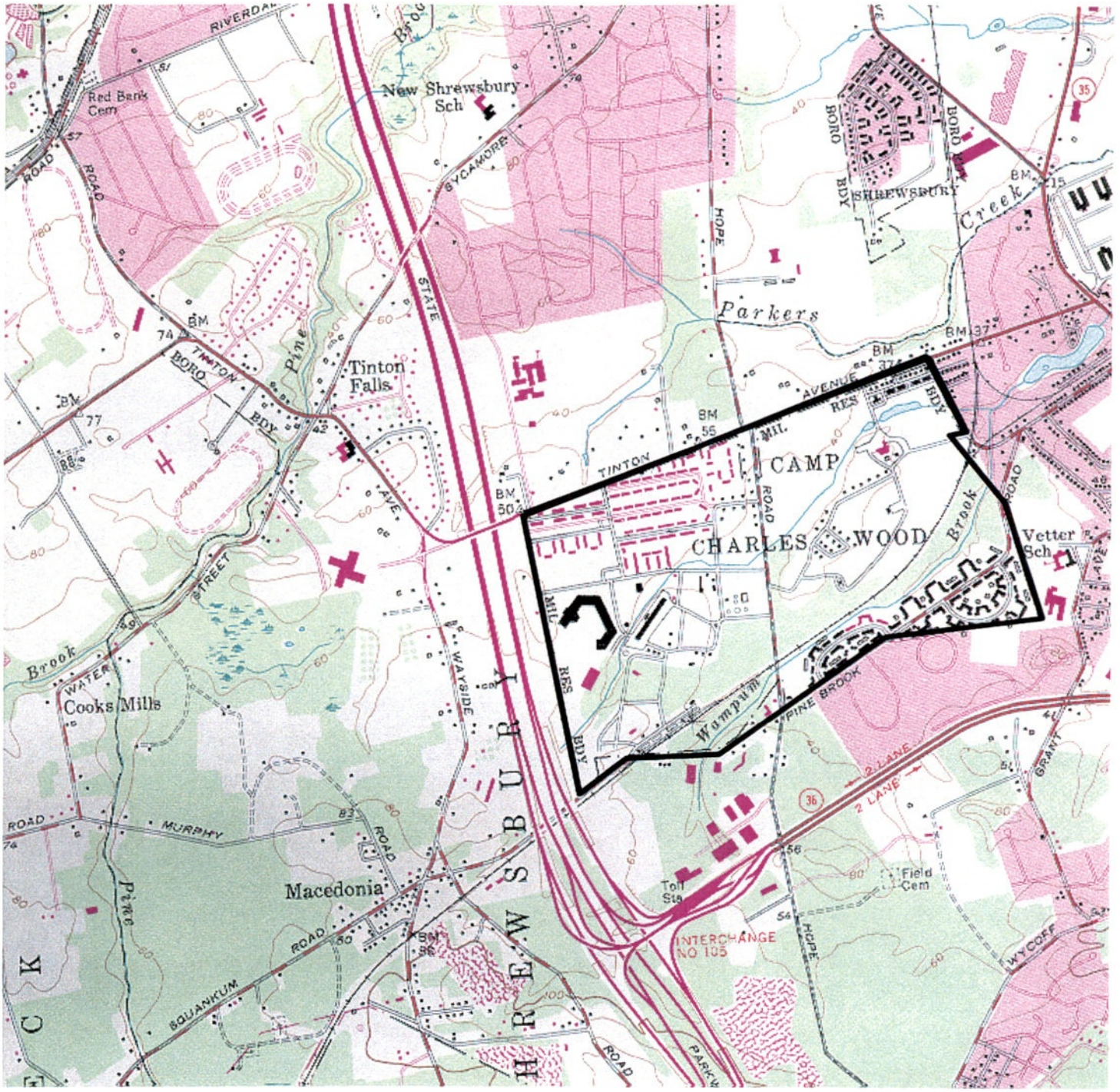
FIGURE 3-1

LOCATION MAP
Main-Post
Fort Monmouth Army Base
Monmouth County, NJ

VERSAR
Engineers, Managers, Scientists, & Planners
Bristol, PA

Scale: 1" = 2000'

Date: DEC 1998



LONG BRANCH, N. J.
40073-C8-TF-024
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NEW JERSEY
QUADRANGLE LOCATION

Mapped, edited and published by the Geological Survey

FIGURE 3-2

LOCATION MAP
Charles Wood
Fort Monmouth Army Base
Monmouth County, NJ

VERSAR
Engineers, Managers, Scientists, & Planners
Bristol, PA

Scale: 1" = 2000'

Date: DEC 1998

3.3 Air Quality

Monmouth County monitors carbon monoxide, particulates, and ozone as part of its air quality monitoring program. Monmouth County is located within the New York-Northern New Jersey-Long Island Air Quality Control Region for ozone. Monmouth County is classified as a severe ozone non-attainment area, meaning that the county air quality does not meet federal and state air quality standards for ozone.

There are three sources of emissions at Fort Monmouth: fossil fuel burning, volatile organic material storage (primarily gasoline storage tanks), and vehicular emissions. Fort Monmouth has permits issued by the NJDEP for the boiler plants. All of the volatile organic materials are stored in accordance with applicable federal, state, and local laws and regulations to minimize emissions.

3.4 Geology

3.4.1 Topography

The topography of the Main Post is relatively flat. Elevations at the Main Post range from approximately 6 feet above mean sea level (msl) near the stream edges to 30 feet above msl near the center of the post. Elevations at Charles Wood range from approximately 27 feet above msl to 60 feet above msl. The lowest elevations at Charles Wood are found along Wampum Brook near the eastern property boundary (US Army Toxic and Hazardous Materials Agency, 1980).

3.4.2 Stratigraphy/Aquifers

Monmouth County lies within the Atlantic Coastal Plain physiographic province and is underlain by unconsolidated sediments of the Mesozoic and Cenozoic Ages. The coastal plain sediments of Monmouth County consist primarily of marine and continental origin. The sediments are composed mainly of sands, silts and clays and green sands or glauconite sands with interspersed gravel beds. Strata of iron-cemented sandstone are present locally. A thin veneer of sand, clay, and gravel deposits of more recent age overlie the older coastal plain sediments. This layer is less than one million years old (Quaternary Age) and was deposited by outwash or meltwater from the glacial ice that covered the land as far south as northern New Jersey (Harland Bartholomew & Associates, 1984).

3.4.3 Soils

The soils of Monmouth County are varied, ranging from deep fertile soils to droughty infertile soils with little humus or organic material present. The Soil Conservation Service (SCS) recognizes 32 soil series, with 85 types or subtypes in Monmouth County (United States Department of Agriculture, 1989).

Soils within the Main Post are primarily mapped as Udorthents. This map unit consists of areas of soils that have been altered by excavating or filling. Other soil types found within the Main Post include Freehold, Downer, and Kresson. The Freehold and Downer soil types are typically well-drained soils that occur on upland areas. Kresson soils are somewhat poorly drained soils that also occur on upland areas. Soils within Charles Wood are mapped primarily as Freehold, Freehold-Urban Land Complex, and Holmdel-Urban Land Complex. Holmdel-Urban Land Complex soils are moderately or somewhat poorly drained soils located on uplands. The wooded southern portion of Charles Wood is mapped as Shrewsbury soil (United States Department of Agriculture, 1989). Shrewsbury soils are poorly drained soils on upland flats.

The Soil Survey of Monmouth County New Jersey (United States Department of Agriculture, 1989) provides information on the degree and types of soil limitations that may affect shallow excavations (such as basements and trenches for utility lines, small dwellings, and small commercial buildings). Both the Freehold and Downer soil types found within Fort Monmouth have slight limitations for dwellings and small commercial buildings and severe limitations for shallow excavations. The severe limitation for these soils is due to the tendency of the walls of excavations to cave in. The Shrewsbury and Kresson soil types found within Fort Monmouth have severe limitations for excavations, dwellings, and small commercial buildings. The severe limitations for these soils are due to wetness. The properties and characteristics of the Freehold-Urban Land Complex, Holmdel-Urban Land Complex, and Udorthent soil types found within Fort Monmouth are quite variable.

Soils within the Main Post and Charles Wood have been classified by the College of Agriculture and Environmental Science, Rutgers University, as sandy loam. The Main Post and Charles Wood are not classified as "lands suitable for cultivation" by the Monmouth County Soil Conservation District (Harland Bartholomew & Associates, 1984).

3.4.4 Erosion

Because the land areas are relatively level, there are no soil erosion problem areas within the Main Post and Charles Wood (Fort Monmouth, 1993c).

3.4.5 Minerals/Mining

There are no mineral resources on the Main Post or Charles Wood (CH2M Hill, 1994a).

3.4.6 Seismicity

Earthquakes that have occurred or have been felt in New Jersey have been caused by fault movements of the North American tectonic plate. Minor seismic activity has been reported in three general areas of New Jersey: north-central New Jersey, the Delaware Valley, and the Raritan Bay-New York Bight area (Dombrowski, 1992). Monmouth County is located near the Raritan Bay-New York Bight area of seismic activity.

There are no records of significant earthquake damage in New Jersey. The return period for earthquakes for eastern states is estimated from known return periods for smaller-magnitude events (return period is the average length of time between earthquakes of a given magnitude). The return period for eastern states is estimated to be approximately 300 years. The return period for western states is approximately 70 years. Eight earthquakes have been recorded with an epicenter within Monmouth County, Raritan Bay, or immediately offshore from Monmouth County between 1663 and 1990 (Dombrowski, 1992). Earthquakes recorded in Monmouth County have generally ranged between 1 and 3 on the Richter scale. A 3.1 magnitude earthquake, with the epicenter located in Keyport, Monmouth County, New Jersey, occurred on August 2, 1980. An earthquake with a magnitude of 3.1 will cause vibrations like that of a passing truck and would be largely unnoticed by the general population.

3.5 Hydrology

3.5.1 Rainfall

The average annual precipitation for Monmouth County is 45.18 inches, with the heaviest rainfalls occurring during the summer months. The heaviest 24-hour rainfall for the period of record was 7.18 inches and occurred in Freehold on August 28, 1971.

The average seasonal snowfall for Monmouth County is 2 to 5 inches. The greatest snow accumulation for the period of record is 26 inches. At least one inch of snow is present on the ground an average of 9 days of the year.

3.5.2 Runoff

Two natural drainage systems convey surface water runoff from the Main Post. The northern portion of the Main Post is drained by Lafetra Brook and Mill Brook. These two creeks join to form Parkers Creek, which forms the northern boundary of the Main Post. Surface water runoff from the southern portion of the Main Post is conveyed by Husky Brook to Oceanport Creek.

An extensive storm drainage system was constructed on the Main Post approximately 50 years ago. The system was designed to supplement natural drainage and prevent localized flooding. The storm drainage system discharges at various points into Husky Brook, Husky Brook Lake, Lafetra Brook, Mill Brook, Parkers Creek, and Oceanport Creek. Because of the age of the storm drainage system, many pipes and catch basins are in need of repair. The storm drainage system in the 600 area of the Main Post adequately carries storm water drainage and is not subject to flooding. Some of the storm drainage system outfalls are below the elevation of the mean high tide, particularly along Oceanport Creek and Parkers Creek. Thus, during high tides water backs up into the storm drainage system (Harland Bartholomew & Associates, 1984). The extreme southeastern portion of the Main Post is subject to flooding during high tides combined with heavy rains (U.S. Army Toxic and Hazardous Materials Agency, 1980).

Surface water runoff from the southern portion of Charles Wood is generally conveyed by the two creeks that form Wampum Brook. The unnamed creek that flows through the golf course conveys surface water runoff from the northern portion of Charles Wood. A storm drainage system, consisting of catch basins, clay pipes, and open drainage ditches, conveys stormwater runoff to the three creeks that run through Charles Wood (Harland Bartholomew & Associates, 1994).

3.6 Water Resources

3.6.1 Surface Water

Several waterways, which generally flow from west to east, drain the Main Post (Figure 3-1). Mill Brook enters Fort Monmouth along the southwest boundary and flows northwesterly to Lafetra Brook. Lafetra Brook originates west of the Main Post and flows east along the northern boundary of the Main Post. Parkers Creek originates at the confluence of Lafetra Brook and Mill Brook and flows along the northern boundary of the Main Post until it discharges to the Shrewsbury River. Parkers Creek is a shallow tidal creek with an average depth of 3 feet at high tide (Harland Bartholomew & Associates, 1984).

The southern portion of the Main Post is drained by Husky Brook, a freshwater stream that originates southwest of the Main Post (Figure 3-1). A portion of the stream has been dredged, widened, and dammed to form a lake. The lake is used for recreational purposes. Downstream from the lake, Husky Brook is piped for approximately 1,100 feet before it surfaces and flows east into Oceanport Creek. Oceanport Creek is a tidal stream that flows along the southern boundary of the Main Post before discharging into the Shrewsbury River. A portion of Oceanport Creek east of the Oceanport Avenue Bridge is periodically dredged by Fort Monmouth to maintain a marina for Fort Monmouth personnel (Harland Bartholomew & Associates, 1984).

The southern portion of Charles Wood is drained by two unnamed streams that unite near the eastern boundary of Charles Wood (Figure 3-2). The southernmost of the two unnamed streams originates south of Charles Wood. The northernmost stream originates in a low wooded area

near the old sewage treatment plant. The northernmost stream flows northeasterly near the Conrail Railroad right-of-way until it joins the southernmost unnamed stream near the eastern boundary of Charles Wood. The two streams form the mainstem of Wampum Brook, which flows through Eatontown and forms a small freshwater pond called Wampum Lake. Mill Brook, which flows through the Main Post, originates from Wampum Lake. Another stream, which flows northeast through the golf course, originates west of Charles Wood. This stream flows into Wampum Brook east of the Charles Wood eastern boundary (Harland Bartholomew & Associates, 1984).

The Installation Assessment of Fort Monmouth, Report No. 171 (U.S. Army Toxic and Hazardous Materials Agency, 1980) describes poor water quality conditions for Wampum Brook and Lafetra Brook. Local industrial operations upstream of Charles Wood discharge into Wampum Brook. contaminants suspected of entering Charles Wood via Wampum Brook included metal plating wastes, antifreeze, photographic wastes, fuel oil, and boiler blowdown.

Light industry and a large shopping center discharge into Lafetra Brook upstream of the Main Post. Husky Brook is also described as receiving storm drainage and drainage from apartment complex sump pumps prior to entering the Main Post (U.S. Army Toxic and Hazardous Materials Agency, 1980).

The portion of the Main Post that is bordered by the Borough of Oceanport is not included in the Borough of Oceanport, New Jersey, Flood Insurance Rate Map (Federal Emergency Management Agency, 1977). The Charles Wood Area and the portion of the Main Post that is bordered by the Borough of Eatontown are identified as "areas of undetermined, but possible, flood hazards" in the Borough of Eatontown, New Jersey, Flood Insurance Rate Map (Federal Emergency Management Agency, 1981).

The Main Post of Fort Monmouth is geographically located within the coastal area of New Jersey (New Jersey Administrative Code [N.J.A.C.] 13:19-1 *et seq.*). Federal lands, including Fort Monmouth, are excluded from New Jersey's Coastal Zone regulations (N.J.A.C. Chapter 7E) as required by the federal Coastal Zone Management Act. Although the federal Coastal Zone Management Act specifies that federal lands are excluded from a state's coastal zone, New Jersey has the authority to review activities on federal lands when the activities have spillover impacts that would significantly affect New Jersey's coastal zone.

3.6.2 Groundwater

The Main Post and Charles Wood are located within the Atlantic Coastal Plain. Eroded edges of the Coastal Plain are exposed at the surface in bands generally oriented northeast-southwest in Monmouth County. The Main Post and Charles Wood are situated in an area where the Tertiary Hornerstown Sand and the Cretaceous Red Bank sand are exposed at the surface.

The Hornerstown sand is a body of relatively impermeable soil that is capable of slowly absorbing water. The Hornerstown sand acts as an upper boundary of the Red Bank aquifer, but may yield enough water within its own outcrop to supply individual house needs.

The Red Bank sand outcrops along the eastern and northern edges of the Main Post and north of Charles Wood. The Red Bank contains two members, an upper sand member and a lower clayey sand member. The upper sand member functions as the aquifer, but because of erosion prior to deposition of the Hornerstown, it terminates down-dip within 6 to 10 kilometers (km) of its outcrop. The upper sand member is probably present on some of the surface of the Main Post and at a shallow depth below the remainder of the Main Post and throughout Charles Wood. The Red Bank sand supplied many domestic wells with water at one time (U.S. Army Toxic and Hazardous Materials Agency, 1980).

The water table is relatively shallow at both the Main Post and Charles Wood. The water table beneath the Main Post fluctuates with the tidal action in Parkers and Oceanport Creeks. The depth to groundwater on the Main Post is between 5 and 12 feet (U.S. Army Toxic and Hazardous Materials Agency, 1980). Water is also encountered at depths of 5 to 12 feet below ground surface in Charles Wood (The Earth Technology Corporation, 1993).

Groundwater monitoring wells have been installed at Fort Monmouth because of the presence of nine closed landfills (i.e., eight on the Main Post and one in Charles Wood) and 23 other areas of environmental concern, including suspected landfills, a sludge dump, former PCB transformer sites, former pesticide storage and mixing areas, closed incinerator sites, former sewage treatment plants, neutralization pits, indoor/outdoor small arms ranges, a former training area, and a former temporary hazardous waste storage area. Groundwater contamination, consisting primarily of volatile organic compounds (e.g., trichloroethene, tetrachloroethene, chlorobenzene, benzene, and 1,2-dichloroethene), total petroleum hydrocarbons, and PCBs, has been confirmed at several of these areas of environmental concern. The impacted areas are currently undergoing various stages of additional investigation, long-term monitoring, and remedial action/remedial design in accordance with a Final Site Investigation Report dated December 1995, which was conditionally approved by the NJDEP in April 1996 (Fort Monmouth, 1999a).

3.6.3 Recharge Areas

Rainwater and melting snow slowly recharge the Hornerstown deposits below the Main Post and Charles Wood. Recharge from rainfall, melting snow, surface runoff, or bodies of water may occur in the upper member of the Red Bank aquifer at the Main Post and Charles Wood Area (U.S. Toxic and Hazardous Materials Agency, 1980).

3.7 Infrastructure

3.7.1 Buildings/Grounds Maintenance

There are approximately 346 buildings and other structures on the Main Post (Fort Monmouth, 1999b). Supply/storage, administrative, and family housing units comprise the largest percentage of these structures. Roughly 50 percent of the buildings on-post are temporary structures. Many of these are scheduled to be removed and replaced with newer, more permanent buildings.

In Charles Wood there are 185 buildings and other structures, most of which provide family housing and support services (Fort Monmouth, 1999b).

The pest control program at Fort Monmouth targets a variety of vectors including insects, birds, rats, and mice. The program employs a variety of insecticides, fungicides, repellents, and baits. The product used is dependent upon the species targeted.

General grounds maintenance includes early spring treatment with weed killers and pre-emergent crabgrass controls. Lime and fertilizer are spread on an annual basis at a rate of 1 ton per acre for lime and 500 pounds per acre for fertilizer.

3.7.2 Roads

Roads are discussed in detail in Section 3.8

3.7.3 Railroads

Fort Monmouth is located within four miles of two New Jersey Transit (NJT) stations that provide train service to New York City. The nearest NJT rail station is located approximately one-half mile from the post.

3.7.4 Runways

Newark International Airport provides scheduled and charter flights to destinations within and outside the U.S. There are also three small airports within Monmouth County. Two of the county airports, Colts Neck Airport and Prestion Airport, only provide service for private planes. Allair Airport, formerly Monmouth County Airport, provides commercial, scheduled flights to Washington D.C., Philadelphia, Newark, and Boston, as well as charter service. However, Newark International Airport is the airport most air travelers use to reach Fort Monmouth.

The Main Post and Charles Wood each have a heliport. Each of these heliports averages three flights per week.

3.7.5 Water Supply/Distribution

Potable water at the Main Post and Charles Wood Area is supplied by the New Jersey American Water Company with no quantity limitation. Water is supplied through three metering stations at the Main Post. These metering stations have a total delivery capability of 3.8 million gallons per day (mgd). Two additional stations can be activated if additional demand is anticipated and can supply an additional 3.9 mgd, which would more than double the total delivery capacity. Current demand is approximately 2.9 mgd, which is well within the existing system capacity (BRAC 1994).

3.7.6 Wastewater Collection/Treatment

Wastewater treatment is provided by the Northeast Monmouth County Regional Sewerage Authority. The average combined flow from the Main Post and Charles Wood Area is 0.696 mgd. By contract, the flows cannot exceed 3.6 mgd. This flow rate will support a post population of 49,686 (Harland Bartholomew & Associates, 1987b). The current post population and flows are significantly below the contracted maximum.

3.7.7 Solid Waste Disposal/Landfills/Incineration

Solid waste generated at Fort Monmouth is collected by a private contractor and disposed of at the Monmouth Reclamation Center Landfill in Tinton Falls, New Jersey. The average monthly volume collected from Fort Monmouth is approximately 235 tons of uncompacted waste, excluding recycled materials. The landfill was expanded in mid-1996, and Monmouth County is currently using the Phase III landfill. With the 1996 expansion, the landfill is expected to have adequate capacity for 20+ years (Personal communication with Larry Zyanga, Monmouth County Planning Board).

Monmouth County has an extensive recycling program in which Fort Monmouth participates. Newspapers, corrugated cardboard, high-grade paper, glass, tin, steel, aluminum, concrete, asphalt, yard waste, asphalt shingles, batteries and white goods (major appliances, such as washing machines) are all recycled. Recyclable waste is picked up by a contractor and transported to the county recycling center at the landfill. In 1993, recyclables comprised roughly 135 tons per month, or 36 percent of the total solid waste collected at Fort Monmouth.

An average annual volume of 13,000 pounds of biomedical waste, primarily hospital waste, is collected, manifested, and removed from Fort Monmouth by a contractor. The biomedical waste is subsequently incinerated at a permitted facility.

3.7.8 Energy

Electricity is supplied to Fort Monmouth by Jersey Central Power and Light Company (JCP&L) through two 34,500-volt, three-phase 60-hertz transmission lines. The power is transformed at two substations on the Main Post. The total capacity of the two substations is approximately 25,000 kilo amperes (kVA). Peak demand occurs in the summer and averages 9,400 kVA, well below the system capacity (Harland Bartholomew & Associates, 1987b).

Fort Monmouth uses three different heating fuels: fuel oil, natural gas and propane. Both fuel oil and propane are supplied by private contractors with no limit on supply. Natural gas is provided by New Jersey Natural Gas Company (NJNGC), and although no contractual limit has been established, additional supply is limited to that which can be delivered at current line pressures. Current line pressures can provide natural gas for a postwide population of 11,620, excluding the housing areas, which are on a separate system (Harland Bartholomew & Associates, 1987b). NJNGC is currently upgrading the natural gas system on the post. The capacity of the new system is not known. However, the current population is well within the old system's capacity, and the new system will provide similar or greater capacity.

3.7.9 Communications

Fort Monmouth maintains its own telephone system. The system consists of Northern Telecomm Inc. (NTI) SI-100 and SI-1 switches. Bell Atlantic, formerly New Jersey Bell, provides DOD, WATSBO, and DID trunk lines. AT&T provides long-distance services through FTS 2000. AT&T also provides Defense Systems Network (DSN) trunk lines. The Main Post is supported by two main switches (SI-100 and SI-1). The SI-1 supports three buildings; the rest of the buildings are supported by SI-100. The Charles Wood Area is supported by the SI-100 through a Remote Standalone Module.

Fort Monmouth's computers are interconnected by a campus-area network. Local area networks (LANs) are also provided within buildings for individual activities.

3.8 Traffic and Transportation

The existing transportation network around Fort Monmouth consists of a combination of state, county and local roadways. North-south rail service is provided along the west edge of the study area via New Jersey Transit, with stations located in Red Bank and Little Silver.

A Traffic and Transportation Analysis (CH2M HILL, 1994b) was conducted and included an assessment of existing traffic and transportation conditions. The study is provided in Appendix C and is summarized below.

3.8.1 Roadways

Key north-south roadways serving the area include Hope Road, State Route 35 (SR 35), and Oceanport Avenue. Hope Road, located to the west, bisects Charles Wood.

SR 35 is a principal north-south arterial and serves as the primary access from the north and south to Main Post via the intersection at West Gate. Oceanport Avenue (County Highway 11) is

located along the east side of Main Post, providing access to Main Post via Hartman Gate (East Gate).

East-west roadways serving Fort Monmouth include Tinton Avenue, SR 71 (Broad Street), Main Street, and SR 36 (located approximately one mile south of Tinton Avenue). Tinton Avenue serves as the primary roadway between Charles Wood and Main Post. Direct access to Charles Wood is provided via the Tinton Avenue intersection with Pearl Harbor Drive and Lowther Drive.

The internal roadway network serving Main Post includes the Avenue of Memories, Saltzman Avenue, Sherrill Avenue, Wilson Avenue, Alexander Avenue, and Murphy Drive. These roadways serve as the primary network for providing access and traffic circulation to existing base activities.

The Avenue of Memories, Saltzman Avenue and Hildreth Avenue tie together to form the principal continuous east-west roadway through Main Post, in effect connecting West and East Gates. This roadway system provides one through-lane in each direction of travel from west to east, with a flush median provided to the west along the Avenue of Memories.

Sherrill Avenue and Wilson Avenue provide for circulation and access to base activities north of Saltzman Avenue. These are minor local roadways providing one lane in each direction of travel. Alexander Avenue and Murphy Drive provide for circulation to base activities to the South of Saltzman Avenue (primarily the hospital and commercial areas). These are also minor roadways providing one lane in each direction of travel.

The internal roadway network serving Charles Wood consists of four primary roadways. These include Pearl Harbor Avenue, Corregidor Road, Pine Brook Road, and Hope Road. Pearl Harbor Road and Hope Road are both two-lane, urban, north-south roadways that provide access to Charles Wood. Corregidor Road and Pine Brook Road are two-lane urban east-west roads.

3.8.2 Public Transportation

Transit and public transportation are provided by rail and bus service. North-south rail service is provided along the west edge of the study area via two NJT stations. One station is nearby in Red Bank; the other is about four miles to the north in Little Silver. Bus service is provided directly to Fort Monmouth through the Asbury Park Transit Line and NJT routes M21 and M22. In addition, Fort Monmouth operates its own shuttle-bus service between Charles Wood and the Main Post, as well as within the Main Post.

3.8.3 Existing Traffic Conditions

The evaluation and analysis of existing traffic conditions and operations are based on 1993 peak hour traffic, prepared by CH2M Hill, and presented in a former environmental assessment (BRAC 1994). Traffic conditions of urban arterial systems are generally controlled by the operation of their signalized intersections. Two principal measures are used to estimate peak hour traffic conditions and operations at signalized intersections. These are level of service (LOS) and volume to capacity ratio (V/C)[1].

LOS is defined and measured in terms of the average stopped delay per vehicle entering the signalized intersection (that is, how long it takes the average vehicle to travel through the intersection). LOS is considered a good measure of the "quality" of the traffic flow at an intersection. LOS ranges from A (less than 5 seconds of stopped delay per vehicle) to F (greater than 60 seconds of stopped delay per vehicle). LOS E is considered the lower limit of acceptable

[1] Procedures for LOS and V/C evaluation followed the 1985 Highway Capacity Manual (Transportation Research Board Special Report 209).

delay, and ranges from 40 to 60 seconds of stopped delay per vehicle. LOS D or better is generally considered acceptable for peak-hour operation in urban areas. LOS E often results at complex intersections that have high levels of turning traffic and no left turn signals.

The V/C ratio is another measure of the operation of a signalized intersection. The V/C ratio measures the magnitude of traffic at an intersection and compares it to the intersection's practical capacity. Intersections with V/C ratios greater than 1.0 represent potential problems; queue-building and a rapid degradation in LOS can occur with minor traffic increases.

The following signalized intersections were studied as part of a former environmental assessment (BRAC 1994):

- Hope Road and Tinton Avenue
- SR 35 and Tinton Avenue (West Gate)
- Oceanport Avenue and East Gate

Table 3-1 summarizes the current conditions at the three intersections. The intersections of Tinton Road with Hope Road and Tinton Avenue with SR 35 are currently approaching capacity (BRAC 1994). At Tinton Avenue and Hope Road, the relatively heavy through-movement on Tinton Avenue, which has only one through lane, results in a less-than-desirable LOS E, and a V/C ratio greater than 1.0 in the afternoon peak hour. At Tinton Avenue (West Gate) and SR 35 the V/C ratio is approaching or at capacity (V/C=1.0) for the morning and afternoon peak hour. Furthermore, LOS E was computed for the morning peak hour because SR 35 (both southbound and northbound) is near capacity at this time. The signalized intersection of Oceanport Avenue and East Gate showed no capacity or operational problems.

Table 3-1
Existing Signalized Intersection Conditions*

	Level of Service		Average Stopped Delay (sec)		V/C	
Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Hope Road and Tinton Avenue	D	E	28.2	55.0	0.91	1.03
SR 35 and Tinton Avenue (West Gate)	E	D	41.8	34.4	1.01	0.97
Oceanport Avenue and East Gate	B	B	7.7	7.6	0.48	0.40

*This table was originally prepared by CH2M Hill in 1993, and was presented in a previous environmental assessment (BRAC 1994).

3.9 Training Areas

There are no designated training areas at Fort Monmouth.

3.10 Noise

Noise sources at Fort Monmouth consist of helipad operations, roadway traffic noise, and general activities associated with office and residential developments. Unlike some military installations,

Fort Monmouth does not have high amplitude impulsive noise resulting from armor, artillery, and demolition activities, or noise from small arms ranges.

Chapter 7 of Army Regulation (AR) 200-1 implements all federal laws concerning environmental noise from Army activities through the Installation Compatible Use Zone (ICUZ) program. The ICUZ program defines three noise zones:

- Zone I - compatible (the majority of people adapt to these noise levels)
- Zone II - normally incompatible (most people can adapt to these noise levels)
- Zone III - incompatible (most people would find it difficult to adapt to these noise levels)

These compatibility zones are used for land-use planning to prevent conflicts with noise-sensitive land uses, such as residential housing and hospitals.

Based on an evaluation of potential noise studies performed by the Department of the Army-U.S. Army Environmental Hygiene Agency (AEHA) and documented in *Environmental Noise Consultation No. 52-340662-91*, operations at the helipads are the only installation-generated noise source with the potential to cause annoyance to the nearest sensitive receivers. However, the AEHA further concluded that, based on day/night averaging, the small numbers of flight operations per month, and the location of the helipads, noise Zones II and III as defined above do not extend beyond Fort Monmouth.

3.11 Hazardous and Toxic Materials

Numerous substances that can be considered hazardous are stored and used on Fort Monmouth. These substances are primarily petroleum products, solvents, degreasers, and photodevelopers. All of these materials are stored and used in accordance with local, state, and federal regulations. Employees using hazardous materials are trained in their proper use to minimize injury and the potential for contamination.

3.11.1 Contaminated Sites

Fort Monmouth Army Base contains a total of 40 sites with confirmed on-post soil, groundwater, and/or surface water contamination. Eight of these contaminated sites are associated with leaking underground storage tanks (USTs), while another eight of these sites are closed landfills. The remaining 24 sites are associated with a variety of activities, including a surface debris dump, a sludge dump, PCB transformer sites, former pesticide storage areas, former incinerator sites, a former burning area, neutralization pits, former sewage treatment plants, a sewage lift station, small arms firing ranges, a former training area landfill, water tank sites, a former asbestos storage area, and a former temporary hazardous waste storage area. The most widespread contaminants identified at Fort Monmouth consist of trichloroethene, tetrachloroethene, chlorobenzene, benzene, 1,2-dichloroethene, petroleum hydrocarbons, pesticides, arsenic, cadmium, and lead (Fort Monmouth 1999a). All 40 of these sites are in various stages of investigation, long-term monitoring, and remediation.

It should be noted that the construction site for the proposed action formerly possessed two World War II-era buildings that served as a printing press. The two buildings (#104 and #107) were demolished in 1988. A sub-surface investigation of the site was recently conducted as part of the Environmental Baseline Study performed for the project (Appendix A). As part of the investigation, soils and groundwater were analyzed at the site. Two of the six soils borings analyzed indicated high levels of contaminants; one contained total petroleum hydrocarbons (TPHCs) in levels above 10,000 mg/kg, and the other contained a mercury compound at 3.77

mg/kg. Under the current state criteria, NJDEP requires notification and soil excavation when TPHC levels exceed 10,000 mg/kg. The NJDEP soil criteria for mercury compounds is 14 mg/kg, which is well above the levels found at the site. In response to the excavation required for removal of the TPHCs, Fort Monmouth removed a 3,000- gallon UST on 27 January, 1998, and excavated all soils greater than the NJDEP allowable limits. Contaminated soils were taken off-site to an NJDEP approved facility, and were incinerated. The results of groundwater sampling indicated that three compounds were detected greater than background, but less than the NJDEP groundwater cleanup criteria, requiring no further action.

The site for the proposed action was restored to Fort Monmouth's satisfaction and presents no further soil or groundwater contamination above the NJDEP criteria. Fort Monmouth is satisfied that there is no immediate threat to the environment or human health. Supplemental groundwater sampling and analysis are being performed in accordance with NJDEP regulations and guidelines. Upon completion of the field investigation, a final document requesting "No Further Action" will be forwarded to the NJDEP for approval.

3.11.2 Regulated Substances

3.11.2.1 Hazardous Waste

Fort Monmouth, both the Main Post and Charles Wood, is a large quantity generator of RCRA hazardous waste. Hazardous wastes at the Main Post are managed under EPA ID No. NJ3210020597, and the wastes from Charles Wood are managed under EPA ID No. NJ2210020978. All hazardous waste streams and generators are identified, and all hazardous wastes from both the Main Post and Charles Wood are managed in accordance with Fort Monmouth Regulation 200-1.

3.11.2.2 Explosives

Presently, no explosives are stored at Fort Monmouth on either the Main Post or Charles Wood. All explosives are currently stored off base at the Earle Weapons Station; DPW proposes that all such materials remain at the Earle facility indefinitely. Previously, less than 300 pounds of Class 1.1 explosives were stored for test use at Fort Monmouth in an igloo-type magazine and small bunker. Each of these structures is covered on three sides by earth with the fourth side facing the installation. The fragment distance for this class of explosives extends approximately 600 feet into a residential area of Eatontown, New Jersey. Typically, the required storage distance for a facility of this type is a minimum of 1,250 feet for 400 pounds of explosives. Because less than 300 pounds of material were stored in the igloo bunker, Fort Monmouth obtained a waiver for the minimum safety distance.

3.11.2.3 Asbestos

Fort Monmouth completed a post-wide asbestos survey in 1993. Approximately 2.9 million square feet of building space were surveyed for asbestos-containing material. Buildings found to contain friable asbestos have been scheduled for remediation. All of the material removed is being hauled off the site and disposed of in an approved facility. The process of removing the asbestos from the buildings on Fort Monmouth is ongoing. Buildings containing nonfriable asbestos will not be remediated; however, management plans have been implemented to prevent the asbestos from becoming friable and to protect human health and the environment. The asbestos survey is currently being revised, and the asbestos database is being updated to reflect asbestos abatement activities that have occurred since the original 1993 survey.

3.11.2.4 Radon

Fort Monmouth completed a post-wide radon survey in 1989. The entire installation, including Charles Wood, was found to have radon levels well below the 4-picocurie per liter action level.

3.11.2.5 PCBs

Fort Monmouth completed an inventory and testing of all the electrical transformers on the base; PCB-contaminated and PCB transformers[2] were identified. All PCB transformers were eliminated prior to 1990. Twenty-one pieces of PCB-contaminated equipment (e.g., transformers, and switchgear) remain at the Main Post, however, no PCB-contaminated equipment remains in Charles Wood. Fort Monmouth has acquired retrofilling equipment which will allow the draining and refilling of the PCB-contaminated transformers. These transformers are in the process of being replaced with non-PCB transformers or have been removed and not replaced. None of the transformers are leaking.

3.11.2.6 Lead Paint

Fort Monmouth has not completed a post-wide lead paint survey although, owing to their age, most of the World War II-era buildings on the post probably contain some lead paint. The AEHA has concluded, based on a sample of buildings, that there is sufficient evidence to classify demolition debris from Fort Monmouth as non-hazardous.

3.11.2.7 Pesticides

As part of the pest management program, Fort Monmouth personnel regularly use pesticides to prevent and eliminate insect, bird, and rodent infestations. The most commonly used substances include chlorpyrigos, boric acid, pyrethrin, hydramethylonon, acephate, and cypermethrin. The DPW is responsible for maintaining a list of all substances used in pest control on a monthly basis, for ensuring the proper handling and usage of the substances, and for ensuring that only substances approved by the U.S. Environmental Protection Agency (USEPA) and the NJDEP are used as part of Fort Monmouth's pest control program.

3.11.2.8 Medical and Bio-Hazardous Wastes

The medical clinic and dental facility produce approximately 13,000 pounds of medical waste annually. All of this waste is incinerated off the post at a licensed facility. All of the medical and dental waste is handled, transported off-site, and incinerated in accordance with local, state, and federal regulations.

3.11.2.9 Underground Storage Tanks (USTs)

The UST program at Fort Monmouth involves the management of 71 tanks located throughout the installation (Main Post and Charles Wood Areas). Eighty (80) percent of the tanks are not in use and are awaiting removal. USEPA and NJDEP-regulated USTs are currently upgraded with leak detection, monitoring, corrosion protection, and spill and overfill protection as required.

The DPW's plan for managing Fort Monmouth's USTs was to replace the use of heating oil as a major energy source and convert to natural gas. This approach involved installing new gas lines, new boilers which can be gas-fed, and removing the unnecessary USTs. This process has been

[2] A "PCB transformer" is defined as a transformer having a PCB concentration greater than or equal to 500 ppm. A "PCB-contaminated transformer" is defined as a transformer having a PCB concentration of greater than or equal to 50 ppm and less than 500 ppm.

completed for all regulated USTs and continues for all non-regulated (residential) USTs. Upon completion in year 2000, ninety-seven (97) percent of Fort Monmouth's USTs will have been removed. The only remaining USTs at the end of the project will be 16 USTs storing gasoline and a small number of tanks being used to store diesel fuel for vehicles and emergency generators as required. Upon final completion of this project, a major potential spill source will be eliminated at Fort Monmouth.

3.11.2.10 Above Ground Storage Tanks (ASTs)

Presently, there are 31 ASTs at Fort Monmouth between the Main Post and Charles Wood Area. In addition, there are another 16 ASTs in use at the Evans Area. The ASTs range in size from 75 gallons to 15,000 gallons, and all of the tanks contain petroleum products, including diesel fuel, gasoline, and #2 fuel oil. These ASTs primarily provide fuel for vehicles, heating, and emergency generators. All of the ASTs are inspected monthly, and no leaking ASTs were noted during the most recent inspections.

3.12 Biological Resources

3.12.1 Wildlife Communities

Wildlife communities for the general vicinity of Monmouth County were described by Harland Bartholomew & Associates (1984). Commonly-occurring mammals in Monmouth County include white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), eastern chipmunk (*Tamias striatus*), eastern gray squirrel (*Sciurus carolinensis*), muskrat (*Ondatra zibethica*), eastern cottontail rabbit (*Sylvilagus floridanus*), and Norway rat (*Rattus norvegicus*).

According a report by the U.S. Army Corps of Engineers (1993), birds that most commonly occur in Monmouth County include Canada goose (*Branta canadensis*), herring gull (*Larus argentatus*), mallard (*Anas platyrhynchos*), blue jay (*Cyanocitta cristata*), European starling (*Stumus vulgaris*), American robin (*Turdus migratorius*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), northern mockingbird (*Mimus polyglottos*), house sparrow (*Passer domesticus*), red-winged blackbird (*Agelaius phoeniceus*), northern cardinal (*Cardinalis cardinalis*), house finch (*Carpodacus mexicanus*), and song sparrow (*Melospiza melodia*).

Also according to the Corps (1993), locally common amphibians most likely to occur at the Main Post and Charles Wood Area include the redback salamander (*Plethodon cinereus*), spring peeper (*Hyla crucifer*), wood frog (*Rana sylvatica*), bullfrog (*Rana catesbeiana*), and green frog (*Rana clamitans*).

Both the Main Post and Charles Wood Area of Fort Monmouth consist of primarily man-made features such as buildings, roads, parking lots, and a golf course; such features provide only limited habitat values for wildlife. On the Main Post, wetlands were only associated with the existing watercourses, including Parker's Creek, Oceanport Creek, Lafetra Brook, Mill Brook, and Husky Brook. Parker's Creek and Oceanport Creek are large freshwater tidal creeks that converge to form the Shrewsbury River about 1 mile to the east of the eastern-most part of the Main Post. These Main Post watercourses are typically disturbed, often channelized streams with obvious historical modifications to their original floodplains. The principal watercourses on the Main Post (particularly Lafetra Brook) possess narrow forested buffers that offer some value to wildlife. At Charles Wood, wetlands were found in several forested parcels supplied by Mill Brook and Husky Brook and in several man-made features on the golf course. None of the forested areas on either Main Post or Charles Wood are large enough, however, to be considered valuable habitat for most forest interior-dwelling species.

Wildlife at the Fort Monmouth Main Post and Charles Wood Area were described in Versar's recent wetland delineation report (Versar 1998). No formal wildlife surveys were conducted as part of the wetland delineation. However, numerous observations of wildlife were made by Versar biologists during the extensive fieldwork at the Main Post and Charles Wood Area. Wildlife species were either directly observed during the fieldwork, or their signs (e.g., tracks, calls, songs, scats, and habitat modifications) were recorded. Tables 3-2 and 3-3 list the bird and mammal species, respectively, observed at the Main Post and Charles Wood Area. Commonly-occurring reptiles likely to be present at Fort Monmouth include the common snapping turtle (*Chelydra serpentina*), northern brown snake (*Storeria dekaa*), northern water snake (*Nerodia sipedon*), and eastern garter snake (*Thamnophis sirrae*).

3.12.1.1 Wildlife Management

There are currently no land areas on the Main Post or Charles Wood Area set aside for hunting activities. No special wildlife management activities for game species occur on the Main Post or Charles Wood Area.

3.12.1.2 Threatened and Endangered Species

Letters from the U.S. Fish and Wildlife Service (USFWS) and NJDEP regarding the occurrence of threatened and endangered species within the vicinity of Fort Monmouth were presented in a previous EA (BRAC 1994). Other than an occasional transient bald eagle *(Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*), no federal or state-listed flora or fauna are known to occur within Fort Monmouth. Both USFWS and NJDEP have indicated that suitable habitat for swamp pink (*Helonias bullata*) may exist within Fort Monmouth. The swamp pink is federally listed as a threatened plant species. Swamp pink typically occurs in forested wetlands and may occur within scrub/shrub wetlands. No specimens of swamp pink or appropriate habitat for the species were found on either the Main Post or Charles Wood Area, despite a concerted effort during the recent wetland delineations of both areas by Versar (Versar 1998). No other state or federal-listed plants or animals or other species of special concern were observed during the wetland fieldwork (Versar 1998).

TABLE 3-2 FIFTY-ONE SPECIES OF BIRDS OBSERVED BY VERSAR ON, ADJACENT TO, OR FLYING OVER THE FORT MONMOUTH, NJ MAIN POST AND CHARLES WOOD AREA, AUGUST 1998.	
FAMILY: SUBFAMILY Species	**COMMON NAME**
ARDEIDAE	**HERONS, BITTERNS**
Ardea herodias	Great blue heron
Butorides striatus	Green heron
Casmerodius albus	Great egret
Egretta thula	Snowy egret
THRESHKIORNITHIDAE	**IBISES AND SPOONBILLS**
Plegadis falcinellus	Glossy ibis
ANATIDAE	**SWANS, GEESE, DUCKS**
Branta canadensis	Canada goose
Anas platyrhynchos	Mallard
CATHARTIDAE	**AMERICAN VULTURES**
Cathartes aura	Turkey vulture
ACCIPITRIDAE	**HAWKS, EAGLES, VULTURES**
Buteo lineatus	Red-shouldered hawk
Buteo jamaicensis	Red-tailed hawk
FALCONIDAE	**FALCONS**
Falco sparverius	American Kestrel
CHARADRIIDAE	**PLOVERS**
Charadrius vociferus	Killdeer
COLUMBIDAE	**PIGEONS AND DOVES**
Zenaida macroura	Mourning dove
Columba livia	Rock dove
APODIDAE	**SWIFTS**
Chaetura pelagica	Chimney swift
ALCEDINIDAE	**KINGFISHERS**
Ceryle alcyon	Belted kingfisher
PICIDAE	**WOODPECKERS**
Melanerpes carolinus	Red-bellied Woodpecker
Picoides pubescens	Downy woodpecker
Colaptes auratus	Common flicker
TYRANNIDAE	**FLYCATCHERS**
Contopus virens	Eastern wood-pewee
Sayornis phoebe	Eastern phoebe
Myiarchus crinitus	Great crested flycatcher
Tyranus tyranus	Eastern kingbird
HIRUNDINIDAE	**SWALLOWS**
Hirundo rustica	Barn swallow
CORVIDAE	**JAYS, CROWS**
Cyanocitta cristata	Blue jay
Corvus ossifragus	Fish crow
Corvus brachyrhynchos	American crow
PARIDAE	**TITMICE**
Parus atricapillus	Black-capped chickadee
Parus bicolor	Tufted titmouse
SITTIDAE	**NUTHATCHES**

TABLE 3-2 FIFTY-ONE SPECIES OF BIRDS OBSERVED BY VERSAR ON, ADJACENT TO, OR FLYING OVER THE FORT MONMOUTH, NJ MAIN POST AND CHARLES WOOD AREA, AUGUST 1998.	
FAMILY: SUBFAMILY **Species**	**COMMON NAME**
Sitta carolinensis	White-breasted nuthatch
TROGLODYTIDAE	**WRENS**
Thryothorus ludovicianus	Carolina wren
Troglodytes aedon	House wren
MUSCICAPIDAE: SYLVIINAE	**GNATCATCHERS, KINGLETS**
Polioptila caerulea	Blue-gray gnatcatcher
MUSCICAPIDAE: TURDINAE	**THRUSHES, BLUEBIRDS**
Sialia sialis	Eastern bluebird
Turdus migratorius	American robin
MIMIDAE	**MOCKINGBIRDS, THRASHERS**
Dumetella carolinensis	Gray catbird
Mimus polyglottos	Northern mockingbird
BOMBYCILLIDAE	**WAXWINGS**
Bombycilla cedrorum	Cedar waxwing
STURNIDAE	**STARLINGS**
Sturnus vulgaris	European starling
VIREONIDAE	**VIREOS**
Vireo olivaceus	Red-eyed vireo
EMBERIZIDAE: PARULINAE	**WOOD WARBLERS**
Geothlypis trichas	Common yellowthroat
EMBERIZIDAE: CARDINALINAE	**CARDINAL, GROSBEAKS**
Cardinalis cardinalis	Northern cardinal
Passerina cyanea	Indigo bunting
EMBERIZIDAE: EMBERIZINAE	**NEW WORLD SPARROWS, BUNTINGS**
Melospiza melodia	Song sparrow
Melospiza georgiana	Swamp sparrow
EMBERIZIDAE: ICTERINAE	**BLACKBIRDS, ORIOLES**
Agelaius phoeniceus	Red-winged blackbird
Quiscalus quiscula	Common grackle
Molothrus ater	Brown-headed cowbird
FRINGILLIDAE	**FINCHES**
Carpodacus mexicanus	House finch
Carduelis tristis	American goldfinch
PASSERIDAE	**OLD WORLD SPARROWS**
Passer domesticus	House sparrow

TABLE 3-3. THIRTEEN SPECIES OF MAMMALS OBSERVED (DIRECTLY OBSERVED OR BY THEIR SIGNS) BY VERSAR ON OR ADJACENT TO THE FORT MONMOUTH, NJ MAIN POST AND CHARLES WOOD AREA, AUGUST 1998.	
FAMILY **Genus/Species**	**COMMON NAME**
DIDELPHIIDAE	**OPOSSUMS**
Didelphis marsupialis	Opossum
LEPORIDAE	**HARES AND RABBITS**
Sylvilagus floridanus	Eastern cottontail
SCIURIDAE	**SQUIRRELS**
Tamias striatus	Eastern chipmunk
Marmota monax	Woodchuck
Sciurus carolinensis	Gray squirrel
CRICETIDAE	**MICE, RATS, VOLES AND LEMMINGS**
Peromyscus leucopus	White-footed mouse
Ondatra zibethicus	Muskrat
MURIDAE	**OLD WORLD RATS AND MICE**
Rattus norvegicus	Norway rat
Mus musculus	House mouse
CANIDAE	**WOLVES AND FOXES**
Vulpes vulpes	Red fox
PROCYONIDAE	**RACCOONS**
Procyon lotor	Raccoon
MUSTELIDAE	**WEASELS, SKUNKS AND OTTERS**
Mephitis mephitis	Striped skunk
CERVIDAE	**DEER**
Odocoileus virginianus	White-tailed deer

3.12.2 Vegetation

3.12.2.1 Forests, Shrubs, Grasses and Timber Activities

The major waterways at the Main Post and Charles Wood Area possess narrow forested corridors consisting of upland deciduous forest and wetland deciduous forest. Principal trees in the upland forests are sweetgum *(Liquidambar styraciflua)*, red maple (*Acer rubrum*), black locust (*Robinia pseudoacacia*), black cherry (*Prunus serotina*), and black oak (*Quercus velutina*). In the wetland forests, red maple (*Acer rubrum*), sweetgum *(Liquidambar styraciflua)*, green ash (*Fraxinus pennsylvanica* var. *subintegerrima)*, and pin oak (*Quercus palustris*) are the predominant trees. Both the upland and wetland forests have been intensively managed in the past and generally possess relatively small trees. No large, specimen-sized trees were observed in any of the parcels of upland or wetland forest on the Main Post or Charles Wood Area. Refer to Versar (1998) for more detailed information on vegetation at the Main Post and Charles Wood Area of Fort Monmouth.

Lawns, ballfields, parade grounds, and roadside areas within the Main Post and Charles Wood have been planted in grass mixtures that may include Kentucky bluegrass, Merion bluegrass, Chewings fescue, and perennial ryegrass. The fairways and tees at the golf course in Charles Wood are planted in Kentucky bluegrass and Chewings fescue, and the greens are planted in bent grass (Black and Veatch, 1991).

There are currently no timber harvesting activities at the Main Post or Charles Wood Area.

3.12.2.2 Preserves, Special Habitat and Significant Natural Areas, and Critical Habitats

There are currently no preserves or special habitats for threatened or endangered species within the Main Post or Charles Wood Area. The Analytical Environmental Assessment Report on Plans of Future Development (Harland Bartholomew & Associates, 1987a) describes the forested areas adjacent to streams within the Main Post and Charles Wood Area as environmentally sensitive. These areas are designated in the current land-use plan as environmentally sensitive and are recommended to be left in a natural state. The natural areas within the Main Post and Charles Wood Area are generally small and surrounded by urban and suburban land uses. There are no officially designated critical habitat areas within the Main Post or Charles Wood Area.

3.12.2.3 Aquatic Environment

Parkers Creek and Oceanport Creek are brackish, tidally-influenced creeks located on the northern and southern boundaries, respectively, of the Main Post. Fish known to occur in these creeks include menhaden (*Brevooritia tyrannus*), blueback herring (*Alosa aestivales*), and alewife (*Alosa pseudoherengus*).

Freshwater creeks within the Main Post include Mill Brook, Lafetra Brook, and Husky Brook. Fish species that may occur within these creeks include white perch (*Morone antericana*), carp (*Carprinus carpio*), catfish (*Ictalurus* spp.), sunfish (*Lepomis* spp.), and crappie (*Poxomis* spp.) (U.S. Army Corps of Engineers, 1993). Husky Brook Lake is stocked with approximately 1,000 rainbow and brook trout each year in March and May for a "put and take" fishery. The fish are each about 10 to 12 inches in length. The trout do not survive beyond August of each year because the increase in water temperature causes a depletion of available oxygen. Largemouth bass have also been introduced to Husky Brook Lake in an attempt to create a recreational bass fishery.

3.12.2.4 Wetlands

Wetlands were delineated in the Main Post and Charles Wood Area by Versar during August 1998 (Versar 1998). The entire Main Post and a portion of Charles Wood was delineated by Versar (a small portion of Charles Wood wetlands were previously delineated for DPW by another consultant, DeBellis and Semmens, in 1994).

A total of 12.36 acres of wetlands were delineated at the Fort Monmouth Main Post; a total of 29.6 acres were delineated at Charles Wood. The Versar report and maps will be submitted to the New Jersey Department of Environmental Protection, Environmental Regulation Section, Land Use Regulation Program, to determine their jurisdiction on these tracts under the New Jersey Freshwater Wetland Act.

Both the Main Post and Charles Wood Area of Fort Monmouth consisted of primarily man-made features such as buildings, roads, parking lots, and a golf course. On the Main Post, wetlands were only associated with the existing watercourses, including Parker's Creek, Oceanport Creek, Lafetra Brook, Mill Brook, and Husky Brook. Parker's Creek and Oceanport Creek are large freshwater tidal creeks that converge to form the Shrewsbury River about 1 mile to the east of the eastern-most part of the Main Post. These Main Post watercourses are typically disturbed, often channelized streams with obvious historical modifications to their original floodplains. At Charles Wood, wetlands were found in several forested parcels supplied by Mill Brook and Husky Brook and in several man-made features on the golf course.

The following description of Main Post and Charles Wood Area wetlands was contained in Versar's recent wetland delineation report (Versar 1998):

Vegetation in the Main Post wetlands was predominantly hydrophytic. Wetlands along Parker's Creek varied from a common reed/narrow-leaved cattail/Japanese knotweed association in the eastern and central sections to a narrow forested community in the western section where it becomes Lafetra Brook. Few trees and shrubs were observed in the eastern and central sections of the creek. In some parts of the eastern and central sections, Japanese knotweed completely dominated the herbaceous wetlands, from the upper bank of the stream to the high water line. The forested western section was dominated by green ash, red maple, and pin oak. In the shrub layer, silky dogwood, southern arrowwood, and multiflora rose were predominant. The herbaceous layer in the western section was sparse; reed canary grass was predominant. Mill Brook (splits from Parker's Creek at Lafetra Brook) is highly channelized and possesses a narrow margin of herbaceous wetland on both banks in the northern section (north of crossing under the Avenue of Memories) dominated by reed canary grass and stinkweed. South of the Avenue of Memories, Mill Brook possesses a shrub/scrub community dominated by silky dogwood and southern arrowwood in the shrub layer, Japanese knotweed in the herbaceous layer, and small red maple and sweetgum trees in the tree layer. Near the western end of Husky Brook Lake is an alder thicket, dominated by speckled alder and black willow. The shrub layer is dominated by silky dogwood, and the herbaceous layer is dominated by jewelweed. Around the rest of the perimeter of the lake is a very narrow shrubby community dominated by silky dogwood and speckled alder, with arrow leaved tearthumb, jewelweed, and water purslane in the herbaceous layer. Wetlands along Oceanport Creek are generally herbaceous, and are dominated by *Spartina alterniflora* and common reed (the *Spartina* occupied most inundated areas); the only shrubs observed were groundsel bush and high tide bush. Few trees were observed in these tidal wetlands. The western-most section of Oceanport Creek (i.e., west of the culvert at Murphy Drive) is highly channelized (and mowed to the edges in places), but possesses a narrow fringe of herbaceous wetlands dominated by common reed and grass-leaved goldenrod; scattered shrubs included bayberry, swamp rose, and silky dogwood.

Vegetation at Charles Wood was also predominantly hydrophytic. The forested parcel south of the railroad tracks was very wet in all areas; red maple and black gum were the predominant trees. In many areas of the forest, the trees possessed water marks on the trunks up to about 6 inches, indicating seasonally high water. The shrub layer in this parcel was dominated by swamp azalea, sweet pepperbush, and southern arrowwood; the herbaceous layer was dominated by Canada mayflower, cinnamon fern, and sensitive fern. Common greenbrier was moderately abundant in the southern parcel. The species composition in the forested parcel north of the railroad tracks was almost identical to the parcel to the south, with the exception that the northern parcel contained much more common greenbrier (making traverse across parts of this parcel very difficult). A narrow wetland ditch began prior to the railroad crossing at Maxwell Place Road and flowed along the northern side of the railroad tracks and then through the northern parcel forest. Much of the ditch was defoliated by herbicide along the railroad (likely applied by New Jersey Transit) at the time of the fieldwork, but the identifiable principal species included silky dogwood, climbing hempweed, mild water pepper, and water purslane. Other wetlands in Charles Wood were associated with Mill Brook, where it flows through the entire length of the golf course and then under Hope Road into the western section of the site. Wetlands associated with Mill Brook on the golf course were all herbaceous (with the exception of some large planted weeping willow trees) and very narrow. A diverse number of species were observed in these wetlands; jewelweed, arrow-leaved tearthumb, halberd-leaved tearthumb, and reed canary grass were predominant. To the west of Hope Road, Mill Brook was very channelized and possessed concrete reinforcements along its banks; the riparian area was mowed to the water's edge in other areas, allowing for only a very narrow margin of herbaceous wetlands in the water. Principal species along the stream in this area included unidentifiable grasses (mowed), arrow-leaved tearthumb, red-rooted sedge, and American bur-reed. The western-most section of Mill Brook (after it passes under Corregidor Road) was also highly channelized and was considered herbaceous wetland, but possessed a very narrow treed corridor that shaded the stream. The

herbaceous layer was dominated by jewelweed, fox grape and meadow horsetail. The tree layer was dominated by sweetgum, and the shrub layer was dominated by common elderberry and multiflora rose. One small herbaceous wetland area immediately south of Corregidor Road and west of Hope Road was also delineated. This area was actively mowed, making identification of many species difficult. Principal species identified included blunt spikerush, water purslane, and soft rush.

Soils encountered at the Main Post and Charles Wood Area were generally similar to the physical descriptions and mapping contained in the county soil survey. In general, most of the soils examined were sandy silts and sandy clays. Many areas of the Main Post (especially along the streams) and parts of the golf course at Charles Wood contained historic fill materials and were difficult to sample. Most of the soils on the wettest areas of the sites exhibited hydric characteristics such as low chromas, gleying, mottling, and oxidized rhizospheres within 12 inches of the surface.

Indicators of wetland hydrology were present in all Main Post and Charles Wood Area wetlands. The wetlands associated with Parker's Creek and Oceanport Creek were inundated or saturated by the tidal action of these creeks. In addition to inundation and saturation of the soils within the root zone, other typical indicators of wetland hydrology observed in site wetlands included water marks on vegetation, drift lines, sediment deposits, oxidized rhizospheres in the upper 12 inches of soil, water-stained leaves, multiple trunks, and buttressed tree trunks. Such hydrologic indicators were observed in varying combinations in all wetlands on both sites, regardless of the prolonged dry conditions prior to the fieldwork.

3.12.2.5 Vegetation Management

Vegetation management within the Main Post and Charles Wood Area is conducted in accordance with the Draft Natural Resources Management Plan (Fort Monmouth, 1993c). Routine maintenance activities include lawn mowing, application of herbicides and fertilizers, and installation of new plant materials. Approximately 60 percent of the lawn mowing work and 50 percent of the fertilizer application work on the Main Post and Charles Wood Area are performed by contractors, according to the Draft Natural Resources Management Plan.

Grassed areas are fertilized with 10-6-4 fertilizer (10 percent nitrogen-6 percent phosphoric acid-4 percent potash) in April and September. Lime is applied to grassed areas every 2 to 3 years. Herbicides are used to control broad-leaved weeds in grassed areas. Dichlorophenoxyacetic acid (2,4-D) is used in late April or early May to control broad-leaved weeds. Dacthal (dimethyl ester of tetrachloroterephthalic acid) (DCPA) is applied in late April to control crabgrass. Amitrole (3-arnino-1,21,4 triazzole) is used to control poison ivy, poison oak and honeysuckle (Fort Monmouth, 1993c).

3.13 Cultural Resources

3.13.1 Prehistory

The prehistory of the Fort Monmouth region spans the time from approximately 10,000 B.C. until European contact (early 17th century), and is generally divided into Paleo-Indian, Archaic, and Woodland periods. Following the retreat of the glaciers, the Paleo-Indians were the first human occupants of New Jersey (10,000 to 8,000 B.C.). Paleo-Indians were migratory hunters and gatherers who traveled in small bands, often following herds of large game animals.

During the Archaic Period (approximately 8,000 to 1,000 B.C.), the Fort Monmouth region was occupied by small groups of seasonally mobile Indians who were dependent upon hunting and

gathering. An increased reliance on plant foods is indicated by the appearance and proliferation of ground stone tools. Hunting now focused on smaller animal species.

Woodland Period Indian populations (1,000 B.C. to early 17th century) are primarily distinguished from earlier groups by the introduction of pottery. Later in the Woodland Period, Indian groups lived in larger villages and subsisted largely on corn, beans, and squash, while continuing their traditional hunting and gathering activities. At the time of European contact, the Delaware or Lenape Indians occupied this region. European settlers had largely driven the Delaware out of the coastal areas of New Jersey by the early 1700s.

3.13.2 History

English colonists established the first permanent European settlements in the Monmouth region in 1664. This area developed quickly. Agriculture was the predominant occupation of most settlers, but a number also engaged in timber harvesting, grist milling, and small-scale iron manufacturing. The first railroad development in the Monmouth region (the Raritan and Delaware Bay Railroad) occurred later than in most other areas of the state (1854). The tracks passed along the southern side of what is now Charles Wood. Although improved transportation systems were developed within this region during the late 19th and early 20th centuries, it remained largely an area characterized by small towns surrounded by agricultural land.

The majority of the land that would eventually become the Main Post was owned by the Monmouth Park Association between 1866 and 1891, and was used, in part, as a horse racetrack. After the track closed, the land was again used for agricultural purposes, until the Army purchased it in 1917. Lands that now make up Charles Wood were used for agriculture until the 1920s, when they were purchased to form the Sun Eagles Country Club. The country club was in operation under a series of names until the Army purchased the property in 1941.

3.13.3 Military History

Fort Monmouth was established during World War I, in 1917, as an Army Signal Corps training center. It was first known as Signal Corps Camp, Little Silver, and later as Camp Alfred Vail. Late in 1917, the Army set up a radio laboratory at Camp Alfred Vail, and the post increased in importance. In 1919, after World War I, the Army moved the Signal School from Fort Leavenworth to Camp Alfred Vail. In August 1925, Camp Alfred Vail was declared a permanent post, and its name was changed to Fort Monmouth. During the interwar years and during World War II, Fort Monmouth was the principal training center for the Signal Corps. The Charles Wood Area was acquired in 1941, as part of the wartime expansion of Fort Monmouth. Since the end of World War II, Fort Monmouth has maintained its importance to the Army as a center for communications developments.

3.13.4 Summary of Historic Resource Investigations

A Cultural Resources Management Plan (CRMP) was prepared for Fort Monmouth in compliance with Army Regulation 200-4 (TRC 1996). The 5-year plan provides for the integrated management of cultural resources at Fort Monmouth and provides the information needed to make appropriate decisions about the management of the cultural resources at Fort Monmouth, with regard to the National Historic Preservation Act of 1966 and other legislation.

Fort Monmouth's cultural resources include both historic buildings and archeological sites. According to the CRMP, of the approximately 670 buildings and structures on the Main Post and Charles Wood Area, most do not meet the minimum criteria for National Register of Historic Places (NRHP) eligibility and do not warrant assessment. A total of 343 buildings and structures that meet the minimum criteria were assessed in the CRMP. Of these, 98 (primarily residential

structures) were found to be eligible for inclusion on the NRHP. Ninety-three of the 98 eligible buildings were physically located within two districts, one on the Main Post and one in Charles Wood. The historic district on the Main Post contains 88 of the eligible properties; Charles Wood historic district contains five eligible properties. In addition, five buildings are not located within either of the two historic districts. Two buildings required secret clearance for access and were not inventoried or assessed (TRC 1996).

An archeological field inventory for Fort Monmouth is currently about three percent complete (TRC 1996; personal communication, Dinkerrai Desai, DPW). The three percent field sample found no sites. Nine archeological sites, however, have been recorded by other means. In addition, TRC indicated that 204 potential sites were suspected but not yet investigated; none of these sites have been evaluated for NRHP eligibility. The uninventoried portions of the Main Post and Charles Wood Area were classified in the CRMP into three zones of archeological potential. The CRMP indicated that approximately 446 acres have "high" potential for archeological sites, 156 acres possess "medium" potential, and 602 acres have "low" potential. Figures indicating the locations of the historical buildings and archeological sites were included in the CRMP (TRC 1996).

3.14 Socioeconomic Environment

3.14.1 Population

Ocean County, Middlesex County, and Union County, which adjoin Monmouth County, share commuting routes and socioeconomic characteristics with Monmouth County and are influenced by Fort Monmouth. Most of the Fort Monmouth workforce living off-post resides within this area. At the 1990 census, the total combined population in the four counties (including all municipalities) was approximately 2.2 million persons, which represents approximately 28 percent of the total population of the State of New Jersey. The population density in the area averages more than 1,000 persons per square mile, which is typical of New Jersey, the most densely populated state in the nation (Monmouth County Planning Board, 1993).

Ocean, Middlesex, and Monmouth counties were the three fastest-growing counties in New Jersey between 1980 and 1990; Union County experienced a slight decrease in population during the same period. Much of the population growth in Monmouth County occurred in the inland, suburban areas rather than in the older urban areas on the Atlantic coast. The population in the four-county Fort Monmouth area is projected to increase by 20 percent by the year 2010 to approximately 2.6 million persons according to the New Jersey Department of Labor, Division of Labor Market & Demographic Research (Union County, 1991).

The workforce population at Fort Monmouth is 7,825 persons and is composed of 897 military personnel, which includes 233 officers and 664 enlisted personnel, and 6,928 civilians. In addition, 1,173 dependents live on the Main Post or Charles Wood Area in family housing, bringing the total combined installation population to 8,998. Included in this baseline population count are those persons employed at the Evans Area, Charles Wood, and the Main Post. Approximately 35,000 retired military personnel live in the vicinity of Fort Monmouth.

3.14.2 Housing

3.14.2.1 On-Post Housing

There are a total of 1,142 family housing units located in the three areas of Fort Monmouth, of which 1,020 units are located at Charles Wood, and 120 units on the Main Post. Typically, more than half of these units are occupied by enlisted personnel. There are no vacancies in family

housing at the present time. The average waiting period to obtain family housing is 1 to 2 months.

Housing for unaccompanied personnel is located on the Main Post only. There are 1,773 available spaces for enlisted personnel and 100 for officers. The current vacancy rate is approximately 23 percent for enlisted personnel and 13 percent for officers. There are two dining facilities located on the Main Post, with a combined serving capacity of approximately 1,000 persons.

3.14.2.2 Off-Post Housing

In 1990, there were approximately 844,000 housing units in the four-county Fort Monmouth area, of which approximately 548,500 are owner-occupied and 205,200 are renter-occupied. The average vacancy rate was 11 percent, slightly higher than the average New Jersey vacancy rate of 9 percent.

The average cost of housing in Monmouth County is higher than that in New Jersey as a whole. According to the 1990 census, the value of owner-occupied houses ranged from a low median of $126,000 in Ocean County to a high median of $180,500 in Union County (statewide median is $162,300); in the area closest to Fort Monmouth, Monmouth County, the median cost of housing in higher ($180,400). The median contract rent in the area was also higher than the statewide median ($521 per month), ranging from a low of $530 in Union County to a high of $667 in Middlesex County (Monmouth County, 1993; Ocean County, 1992; Union County, 1991; U.S. Dept. of Commerce, 1990).

3.14.3 Schools

There are no schools for military dependents, other than child care facilities, located on Fort Monmouth. Children of military personnel residing on the post attend schools in the surrounding area. Public schools are mostly administered by individual municipalities (townships, boroughs, and cities). Vocational and technical schools are administered by the counties. There are approximately 130 school districts with more than 560 individual public schools in the four-county Fort Monmouth area. Total public school enrollment in the 1990 census year was 288,020. Most schools have sufficient capacity to accommodate enrollments. In addition to the public schools, there are numerous private and parochial schools in the area (CH2M HILL, 1994e).

Fort Monmouth has two infant and child care centers with spaces for a total of about 240 children, a preschool serving about 50 children, and a school-age "latchkey" center. In addition, there are a number of homes on the post that provide daycare. Management and training for home daycare providers is furnished by Fort Monmouth administrative personnel (CH2M HILL. 1994d).

Nearby colleges include Monmouth College, a four-year college with graduate programs located in West Long Branch, and Brookdale Community College, which offers a two-year program.

3.14.4 Recreational and Community Facilities

Fort Monmouth offers a number of recreational facilities, such as a community center, library, bowling alley, golf course, several youth centers and Boy or Girl Scout buildings, several physical fitness centers, approximately 10 ball fields, several picnic areas with one picnic shelter, an arts and crafts center, and an automotive shop. Other community facilities include a commissary and post exchange. Recreational, medical, commissary, and other community facilities on the post are used by retired military personnel living in the region, as well as by active-duty personnel.

Ample recreational opportunities are available in the Fort Monmouth area. Approximately 9 percent of the land area of Monmouth County (over 26,000 acres) is devoted to public open space under federal, state, county, or municipal stewardship. Parks, such as Allaire State Park, Turkey Swamp Park, the Manasquan River Wildlife Area, Monmouth Battlefield Park, and Gateway National Recreation Area at Sandy Hook, offer sports facilities, historic sites, picnicking, camping, fishing, hunting, boating, and hiking. In addition, area residents have access to New Jersey's many seashore resorts and to cultural attractions in New York City.

3.14.5 Regional Economic Development

Employment in the Fort Monmouth area was estimated at approximately 1.1 million in the 1990 census, with an average unemployment rate of 5.2 percent. This is lower than New Jersey's overall unemployment rate of 6 percent. According to the New Jersey Department of Labor, employment in the four-county area is projected to increase to approximately 1.3 million by the year 2000, with an annual average change of 1.5 percent. Business and professional services, retail trade, and manufacturing accounted for approximately 66 percent of the jobs in 1990. Fort Monmouth is one of the largest employers in the four-county area. Other large employers include AT&T Bell Labs (with 4,000 employees in Monmouth County and 4,500 in Union County), Ciba-Geigy Corporation (3,500 employees), several of the area hospital centers (over 2,000 employees at each), and county governments.

Total personal income in the four-county Fort Monmouth area was approximately $51.5 billion in 1989. Per capita income in the area was $23,926 in 1989, comparable to the state per capita income of $23,726.

The total value of tax ratables (the net valuation of personal property on which property taxes are apportioned) in the Fort Monmouth area was approximately $33.6 billion in 1991. Property taxes collected by municipalities (which include the counties' share of property taxes) in the four-county area totaled approximately $2.8 billion in 1991; total municipal revenues in 1991, including tax revenues, state and federal aid revenues, and payments in lieu of taxes, totaled approximately $3.6 billion. Municipal expenditures totaled about $3.64 billion in 1991, of which approximately $2.2 billion represents taxes passed on by the municipalities to counties, school districts, and other special tax districts.

3.14.6 Public Health and Safety

3.14.6.1 Police Service

Police protection at Fort Monmouth is provided by approximately 3 military police officers, 30 Department of Defense police, and 45 security guards. An additional 10 police officers and 15 security guards could potentially be added under currently authorized personnel levels at Fort Monmouth.

Township and borough police departments, county sheriffs, and the New Jersey state police provide police protection to the areas surrounding Fort Monmouth. At present, there are no formal agreements for assistance with local or state police jurisdictions, and there is no regular contact between military and civilian police in the area.

3.14.6.2 Fire Stations

Fort Monmouth currently possesses two fire stations, one at the Main Post and one at Charles Wood. The fire stations are staffed by a 40-man, career crew. In addition, Fort Monmouth

participates in the Mid-Monmouth Mutual Aid Agreement, a first-response emergency program that includes 28 surrounding townships (all volunteer crews).

The Fort Monmouth fire stations currently possess several significant pieces of equipment, including a 100-foot ladder truck; a 65-foot ladder 1,250 GPM pumper truck; a 2,000 GPM pumper truck; a 1,000 GPM pumper truck; a hazardous material response trailer; a haz-mat/reserve unit; two chiefs' 4X4 response vehicles; and 2 EMS ambulances.

3.14.6.3 Medical Facilities

Several hospitals and many medical centers are located near Fort Monmouth, providing emergency facilities as well as urgent care, inpatient care, psychiatric services, rehabilitative services, and outpatient surgical facilities. The hospitals closest to Fort Monmouth, located in Monmouth County, are: Monmouth Medical Center (526 beds) in Long Branch, Riverview Medical Center (494 beds) in Red Bank, Jersey Shore Medical Center (501 beds) in Neptune, Bayshore Community Hospital (225 beds) in Holmdel, and the CentraState Medical Center (248 beds) in Freehold (CH2M HILL, 1994f).

A dental clinic with 14 chairs is also located at Fort Monmouth.

3.14.7 Native American/Ethnic Concerns

Less than 1 percent of the population in the four-county Fort Monmouth area was identified as being Native American in the 1990 census. Approximately 7 percent of the population was identified as being of Hispanic origin.

3.15 Visual/Aesthetic Resources

The Main Post is visible to the surrounding community. Although the Main Post is bounded by Parkers Creek to the north, there is extensive residential development to the south. There is scattered vegetation to provide some visual screening, but in general, views of the post are open.

Much of Charles Wood west of Hope Road is not visible to the surrounding community due to the presence of perimeter vegetation and, along the northern boundary of the site, military housing. East of Hope Road, the golf course presents viewers with an open, naturalistic landscape.

The Fort Monmouth Installation Design Guide defines visual zones, provides design themes for each zone, and provides design criteria for new projects. Personnel responsible for the design of new facilities are responsible for incorporating the proper design criteria into each project. Implementation of the design criteria allows new facilities to be in harmony with established design themes and maintains the overall visual image of Fort Monmouth.

According to the Fort Monmouth Installation Design Guide, five visual zones have been identified for Fort Monmouth: administrative/mission support, community support facilities, housing, industrial facilities, and open spaces. These zones have been defined on the basis of land use and type of activity. Architectural styles in these zones include colonial, traditional, modified traditional, and high technology.

3.16 Interagency Agreements

Written mutual aid agreements exist between Fort Monmouth and a number of surrounding communities. As is shown in Table 3-4, these agreements are concerned primarily with public safety issues.

TABLE 3-4
INSTALLATION AGREEMENTS

Agreeing Agencies	Purposes of Agreement	Effective Date of Agreement	Ending Date of Agreement	Location of Official Agreement Copy
Fort Monmouth and Mid Monmouth Mutual Aid Association	Mutual Aid for Fire Protection And Emergencies	June 1986	Open	Fort Monmouth Garrison Headquarters
Fort Monmouth Patterson Army Community Hospital (PACH) and Monmouth-Ocean County Mobile Intensive Care Unit (MONOC)	PACH allows MONOC to utilize government facilities to position an EMS vehicle and personnel	July 1986	Open	Fort Monmouth Garrison Headquarters

4.0 ENVIRONMENTAL AND SOCIOECONOMIC CONSEQUENCES

4.1 Introduction

This section identifies and evaluates the expected environmental and socioeconomic consequences of implementing the proposed action. All expected environmental and socioeconomic consequences for alternative 3 would be identical to the proposed action, with the exception that there would be no impact to the 100-year floodplain, and the fact that alternative 3 would eliminate 90 parking spaces from an existing parking lot. The consequences are discussed in terms of their effect on the baseline conditions described in Section 3.0.

4.2 Land and Air Space Use

Because there are no existing or proposed air space restrictions at Fort Monmouth, no impacts to use of air space would occur under the proposed action. Fort Monmouth is not subject to zoning restrictions, so zoning approvals would not be required for the proposed action. The Fort Monmouth Land Use Plan provides general guidance for the location of new facilities. Consistency with the plan and compatibility with off-site land uses are described below.

4.3 Air Quality

No impacts to local air quality are expected because the proposed facility would be only an insignificant new stationary air pollution source. Compliance with the Conformity Rule under the Clean Air Act Amendments was evaluated, and the proposed action was found to be in compliance with all Clean Air Act requirements. The proposed action is not subject to Conformity Rule because the pollutants resulting from the action are below the de minimus thresholds for NO_x and VOCs established at 40 CFR 51.853(b). A Record of Non-Applicability has been prepared for the proposed action and is included in Appendix D.

4.4 Geology

4.4.1 Topography

Owing to the generally flat nature of the construction site for the proposed action (i.e., the site would require relatively little grading as compared to a hilly one), and the relatively compact size of the 9,000 square-foot footprint facility, existing topography of the Main Post will remain relatively unchanged. Therefore, only minor impacts are anticipated.

4.4.2 Stratigraphy/Aquifers

The proposed action would not affect stratigraphy or aquifers within the Main Post or Charles Wood. Therefore, no impacts are anticipated.

4.4.3 Soils

The soils of the Main Post would only be impacted within the proposed action's 0.82-acre site. It must be noted that the soils in the vicinity of the proposed site for the proposed action are already highly disturbed due to historic fill (refer to Section 3.4.3). Put in this context (i.e., very small site and historically disturbed soils), only minor impacts are anticipated under the proposed action.

4.4.4 Erosion

The construction footprint for the proposed action is relatively small. In addition, the existing site is almost flat, and would require relatively little grading, compared with a hillier site. Finally, to minimize erosion impacts, all applicable best management practices would be followed during the construction of the facility. Therefore, only minor, temporary erosion impacts are anticipated under the proposed action.

4.4.5 Minerals/Mining

There are no known extractable mineral resources on the Main Post or Charles Wood; no mining would be required as a result of the implementation of the proposed action or the no-action alternative. Therefore, mineral resources would not be affected by the proposed action.

4.4.6 Seismicity

None of the items relating to the proposed action are anticipated to affect or be affected by seismic activity. All renovation and construction under the proposed action would adhere to applicable building codes.

4.5 Hydrology

4.5.1 Rainfall

Rainfall or snowfall within the Main Post and Charles Wood would not be affected by the proposed action.

4.5.2 Runoff

The footprint of the proposed project would cover a 9,000 square-foot area of currently undeveloped land with impermeable surface. It is probable that local runoff to Oceanport Creek could be slightly increased in the vicinity of the proposed action during storm events. This factor would be partially mitigated by the fact that Oceanport Creek generally possesses buffers of dense wetland herbaceous vegetation (common reed, spartina, Japanese knotweed, etc.) that would tend to slow runoff and drop pollutants prior to entering the streams. Therefore, only minor impacts to runoff are anticipated owing to the proposed action.

4.6 Water Resources

4.6.1 Surface Water

Surface water quality will likely only be affected temporarily during the construction of the proposed facility. All applicable best management practices (BMPs) would be implemented during construction of the facility. Surface flows from the credit union facility would be directed into the existing stormwater management system at the Main Post. Owing to the small size of the proposed project (9,000 square feet), permanent impacts to Mill Brook and other surface waters are likely to be minor. Therefore, only minor, temporary impacts are anticipated relating to the proposed action.

4.6.2 Groundwater

Main Post and Charles Wood groundwater resources will not be affected by the proposed action because it will not require discharge to or withdrawal from groundwater resources.

4.6.3 Recharge Areas

No aspects of the proposed action would adversely affect recharge areas within the Main Post or Charles Wood.

4.7 Infrastructure

4.7.1 Buildings/Grounds Maintenance

All of the buildings and landscaped grounds at Main Post and Charles Wood will continue to be maintained either by Fort Monmouth personnel or by a third party under contract. The maintenance requirements are not expected to be significant for changes under the proposed action, and as a result, no impacts are expected.

4.7.2 Roads

The proposed action at Main the Post would only require minor modifications to the existing road system, such as tie-ins from the new facility to Wilson Avenue. The new credit union facility would employ a maximum of 25 new personnel. Based on the existing traffic study (CH2M HILL, 1994b) (Appendix C), it is estimated that the small number of new vehicles used by the new personnel would not generate a volume of new traffic sufficient to require anything other than minor modifications to the existing Main Post road system. Fort Monmouth will work with the surrounding towns to control the traffic light at Oceanport Avenue to maximize safety. Therefore, no impacts to the existing roadway system are anticipated.

4.7.3 Railroads

There will be no changes in personnel on the base owing to the proposed action; therefore, no impacts on local commuter rail service are expected.

4.7.4 Runways

No impact on the local air transportation system is expected because the proposed action does not include air travel or the use of military aircraft for testing.

4.7.5 Water Supply/Distribution

The water supply and distribution system at the Main Post is currently under-utilized. The Main Post metering stations have a total delivery capability of 3.8 million gallons per day (mgd). Two additional stations can be activated if additional demand is anticipated and can supply an additional 3.9 mgd, which would more than double the total delivery capacity. Current demand is approximately 2.9 mgd, which is well within the existing system capacity. Therefore, based on the relatively small number of new Main Post personnel resulting from the proposed action (i.e., 25 total), no significant impact on water supply and distribution is expected.

4.7.6 Wastewater Collection/Treatment

Even with the 25 new personnel that would be added to the Main Post under the proposed action, the current post population and flows are significantly below the contracted maximum provided by the Northeast Monmouth County Regional Sewerage Authority. The average combined flow from Main Post and Charles Wood is 0.696 mgd. By contract, the flows cannot exceed 3.6 mgd. This flow rate will support a post population of 49,686 (Harland Bartholomew & Associates, 1987b). Owing to these factors, no significant impacts to the existing wastewater collection/treatment systems are expected.

4.7.7 Solid Waste Disposal/Landfills/Incineration

The proposed action will not affect the solid waste produced at either the Main Post or Charles Wood. Therefore, no impacts to solid waste disposal or landfills are expected.

4.7.8 Energy

Because of the relatively small size of the credit union facility under the proposed action (15,000 square feet total), it is unlikely to have an adverse effect overall on the either the natural gas system or the electrical supply and distribution system. Both electrical and natural gas systems are currently operating below capacity, and the negligible increase in the use of the credit union facility will not exceed either system's capacity. Therefore, no impacts to the existing energy systems are anticipated.

4.7.9 Communications

The proposed action will not affect the normal pattern of communications at either Main Post or Charles Wood; therefore no impacts are expected.

4.8 Traffic and Transportation

The new credit union facility would employ a maximum of 25 new personnel. Based on the existing traffic study (CH2M HILL, 1994b), it is estimated that the small number of new vehicles used by the new personnel would not generate a volume of new traffic sufficient to require anything other than minor modifications to the existing Main Post road system. Therefore, only minimal impacts to the existing traffic and transportation patterns are anticipated.

4.9 Training Areas

Because there are no training areas on Fort Monmouth, no adverse impacts will occur relating to the proposed action.

4.10 Noise

Noise generated from the construction of the credit union facility under the proposed action is expected to fall under the Domestic Housing and Office Building categories. The building is well over 1,000 feet from off-site sensitive receivers. The small number of vehicles ultimately using the facility (including new employees and customers of the facility) would only be equivalent to a small fraction of the current total vehicular traffic at Fort Monmouth. All construction of the facility would be performed in full compliance with all federal, state, and local noise-related regulations and ordinances. Owing to these factors, noise-related impacts under the proposed action are expected to be insignificant.

4.11 Hazardous and Toxic Materials

As indicated in Section 3.11, the construction site for the proposed action was the former site of two World War II-era buildings that served for printing operations and oil heating. Although TPHC's and low-level mercury compounds were detected at the site, it was remediated and restored to Fort Monmouth's satisfaction and presents no further soil or groundwater contamination above the NJDEP criteria. Based on this fact, there is no immediate threat to the environment or human health. Supplemental groundwater sampling and analysis are being performed in accordance with NJDEP regulations and guidelines. Therefore, no impacts are expected under the proposed action.

4.11.1 Contaminated Sites

During routine investigations of soils and groundwater at the site of the proposed action, TPHC's and a mercury compound were detected in several soil samples. The NJDEP soil criteria for mercury compounds is 14 mg/kg, well above the levels found at the site. The TPHC's were found at levels of greater than 10,000 mg/kg. Under the current state criteria, NJDEP requires notification and soil excavation when TPHC levels exceed 10,000 mg/kg. In response to the excavation required for removal of the TPHC's, Fort Monmouth removed a 3,000- gallon UST on 27 January, 1998, and excavated all soils greater than the NJDEP allowable limits. Contaminated soils were taken off-site to an NJDEP approved facility, and were incinerated.

The site for the proposed action was restored to Fort Monmouth's satisfaction and presents no further soil or groundwater contamination above the NJDEP criteria. Therefore, no impacts are anticipated.

4.11.2 Regulated Substances

4.11.2.1 Hazardous Waste

The construction and operation of the credit union facility will not affect the volume of hazardous waste generated at Fort Monmouth. Therefore, no significant impacts pertaining to hazardous waste are expected under the proposed action.

4.11.2.2 Explosives

There are currently no explosives stored at Fort Monmouth on either the Main Post or the Charles Wood Area, and no explosives will be brought onto the site as a result of the proposed action. Therefore, no impacts are anticipated related to explosives.

4.11.2.3 Radioactive Materials

No radioactive materials will be brought to Fort Monmouth as a result of the proposed action. Therefore, no impacts are anticipated relating to the proposed action.

4.11.2.4 Asbestos

The proposed credit union facility under the proposed action would be constructed with non-asbestos materials; therefore, no impacts are anticipated.

4.11.2.5 Radon

Test results indicate that Fort Monmouth does not have a radon contamination problem (refer to Section 3.11.2.5), and no radon will be generated by the proposed action. Therefore, no impacts are anticipated relating to the proposed action.

4.11.2.6 PCBs

The Determination of Availability for the proposed credit union facility (Appendix B) indicated that no PCBs are known to occur on this site. Therefore, no impacts are anticipated relating to the proposed action.

4.11.2.7 Lead Paint

The Determination of Availability for the proposed credit union facility (Appendix B) indicated that there are no improvements constructed prior to 1960 that are considered to contain lead-based paint or which have been proven to contain lead-based paint. Therefore, no impacts are anticipated relating to the proposed action.

4.11.2.8 Pesticides

No pesticides above background levels were found in the soils or groundwater as a result of the testing done for the Environmental Baseline Study (Appendix A). Therefore, no impacts are expected.

4.11.2.9 Medical and Bio-Hazardous Wastes

Medical and Bio-hazardous wastes will not be used or stored as part of the proposed action; therefore, no impacts are expected.

4.11.2.10 USTs

The proposed action does not require use of, or disturbance to, any USTs. As a result, no UST-related impacts are expected as a result of the proposed action.

4.11.2.11 ASTs

The proposed action does not require use of, or disturbance to, any ASTs. As a result, no AST-related impacts are expected as a result of the proposed action.

4.12 Biological Resources

4.12.1 Wildlife Communities

Based primarily on the relatively small footprint (9,000 square feet), it is estimated that none of the activities associated with the construction and operation of the proposed action will significantly affect wildlife within the Main Post. In addition, the small increase in vehicle traffic to this already heavily developed part of the Main Post would not substantially affect any of the life requirements for existing wildlife. Therefore, no impacts relating to the proposed action are expected.

4.12.1.1 Special Interest Wildlife

There are no known special interest wildlife species at Fort Monmouth. Therefore, no impacts relating to the proposed action are expected.

4.12.1.2 Wildlife Management

There are no wildlife management programs or land areas at Fort Monmouth set aside for hunting activities. Therefore, no impacts relating to the proposed action are expected.

4.12.1.3 Threatened and Endangered Species

No federal or state threatened or endangered species are known to occur on Fort Monmouth. Therefore, no impacts relating to the proposed action are expected.

4.12.2 Vegetation

4.12.2.1 Forests, Shrubs, Grasses, Timber Activities

The proposed action would affect an area that is currently mowed lawn with several scattered small planted trees. Therefore, no mature natural communities (such as mature forest) would be affected by the proposed action. Therefore, no impacts to mature natural vegetation communities are anticipated.

4.12.2.2 Preserves, Special Habitat and Significant Natural Areas

There are no preserves or special habitats for threatened or endangered species on the Main Post or Charles Wood. Therefore, no impacts are expected.

4.12.2.3 Critical Habitat (Officially Designated)

There are no officially designated critical habitat areas within the Main Post or Charles Wood. Therefore, no impacts are expected.

4.12.2.4 Aquatic Environment

The proposed action will not affect the aquatic environment within the Main Post (refer to the analyses in Sections 4.6.1, 4.6.2, and 4.7.6). Therefore, no impacts to the aquatic environment are expected relating to the proposed action.

4.12.2.5 Wetlands and Floodplains

Based on mapping contained in the recent Fort Monmouth wetland delineation survey (Versar 1998), the proposed action will not affect wetlands at the Main Post. In addition, all activities would be conducted at a distance of at least 300 feet to the nearest wetland (a narrow margin of freshwater tidal herbaceous marsh along Oceanport Creek, to the southeast). Therefore, no impacts to wetlands are expected. Based on existing floodplain mapping, approximately 0.68 acres of the 0.82-acre parcel (83 percent) would be within the 100-year floodplain under the proposed action. Due to the fact that most of the existing areas mapped as floodplain at the Main Post are highly disturbed and contain large amounts of old fill (including this site), and that the proposed action would be a relatively small disturbance, the impact to the overall condition of the floodplain at the Main Post is expected to be insignificant.

4.12.2.6 Vegetation Management

There would be only a minor effect on vegetation management practices relating to the proposed action at the Main Post. The proposed construction site is currently mowed lawn; construction of the credit union facility footprint would remove about 9,000 square feet of the lawn (i.e., the lawn would no longer have to be mowed). A small quantity of landscaping plants (i.e., cultivated landscaping shrubs and grasses) would be installed in the immediate vicinity of the proposed building. Vegetation management within the Main Post would continue to be conducted in accordance with the Natural Resources Management Plan (Fort Monmouth, 1993c). Therefore, no impacts are expected.

4.13 Cultural Resources (Section 106 Compliance)

No aspect of the proposed action would affect known historic structures or archeological sites. Earthwork to create the relatively small proposed facility would be minor. Further, as no known historic structures are present near the proposed construction site, no visual or aesthetic impacts to these resources are anticipated. Therefore, the proposed action will not affect the cultural resources within the Main Post.

4.14 Socioeconomic Environment

A total of 25 new personnel would be employed to operate the new FAFCU credit union facility. It is envisioned that the new personnel would live off-site. Existing on-site services, such as police, fire, and hospital are currently adequately staffed and equipped to handle the small increase in new personnel related to the proposed action on the Main Post. Therefore, no impacts are anticipated at the Main Post.

4.14.1 Population

A total of 25 new personnel would be employed to operate the new FAFCU credit union facility. In the context of the combined population of approximately 9,000 people currently working or residing at Fort Monmouth, the change in population due to the proposed action would be insignificant. Therefore, no impacts to the existing population are anticipated.

4.14.2 Housing

4.14.2.1 On-Post Housing

It is assumed that the 25 new personnel hired to operate the proposed FAFCU credit union facility would not live at the Main Post. Therefore, no impacts to on-post housing are anticipated at Main Post relating to the proposed action.

4.14.2.2 Off-Post Housing

4.14.2.2 Based on the relatively small number of new personnel (i.e., 25 total) needed to operate the new FAFCU credit union facility, little impact to off-post housing is anticipated. Therefore, impacts to off-post housing relating to the proposed action are anticipated to be insignificant.

4.14.3 Schools

As indicated in Section 3.14.3, there are no schools for military dependents, other than childcare facilities, located on Fort Monmouth. Most area schools have sufficient capacity to accommodate enrollments. In addition to the public schools, there are numerous private and parochial schools in the area. Based on this and the fact that only 25 new personnel would be required to staff the facility, no impacts to area schools are expected.

4.14.4 Recreational and Community Facilities

As indicated in Section 3.14.4, a number of recreational facilities exist at Fort Monmouth, including a community center, library, bowling alley, several youth centers and Boy or Girl Scout buildings, several physical fitness centers, approximately 10 ball fields, several picnic areas with one picnic shelter, an arts and crafts center and an automotive shop. Owing to the small number of new personnel that will be hired to operate the credit union facility under the proposed action (i.e., 25 total), it is apparent that these facilities would be adequate to supply recreational and community needs. Therefore, no impacts to recreational and community facilities are expected.

4.14.5 Regional Economic Development

The proposed action is not expected to significantly affect regional economic development because of the small number of new employees needed to staff the proposed credit union facility, and the fact that the services the facility would provide are nearly identical to those provided by the existing credit union. The proposed action, therefore, is not expected to pose any impacts to regional economic development.

4.14.6 Public Health and Safety

4.14.6.1 Police Service

Under the proposed action there would be no requirement for additional police services above their current level. Therefore, the proposed action is not expected to pose any impacts on police service.

4.14.6.2 Fire Stations

There would be no requirement for additional fire protection services above their current level under the proposed action. Therefore, the proposed action is not expected to pose any impacts on fire protection service.

4.14.6.3 Medical Facilities

There would be no requirement for additional medical services above their current level under the proposed action. Therefore, the proposed action is not expected to pose any impacts on medical facilities.

4.14.7 Native American/Ethnic Concerns

There are no known concerns or anticipated effects on Native American populations or ethnic groups resulting from the proposed action. Therefore, no impacts are expected.

4.15 Visual/Aesthetic Resources

Based on the limited size of the proposed facility (9,000 square-foot footprint), and its proposed location in a previously developed, disturbed area of the Main Post, only minor impacts to visual and aesthetic resources are expected relating to the proposed action.

4.16 Interagency Agreements

Impacts to existing mutual aid agreements are not expected to result from the proposed action.

5.0 FINDINGS AND CONCLUSIONS

The action to implement the construction of a new FAFCU credit union facility under the proposed action has been reviewed in accordance with NEPA as implemented by the regulations of the Council on Environmental Quality and AR-200-2. Baseline environmental and socioeconomic conditions at Fort Monmouth have been described and the environmental consequences of implementing the proposed action and its alternatives have been evaluated. Evaluation of the proposed action leads to the conclusion that the physical and socioeconomic environments at Fort Monmouth and in the region of influence would not be significantly affected.

The implementation of the proposed action would not significantly alter baseline environmental conditions. The on-base population at Fort Monmouth would not change; a total of only 25 new personnel would operate the proposed facility. In the context of the approximately 9,000 total persons at Fort Monmouth, this small number of new persons related to the proposed action is negligible. Therefore, impacts on air quality, transportation, water supply, wastewater systems, solid waste infrastructure, energy communications, and socioeconomic resources such as housing, schools, and health and safety services would be insignificant.

Noise mitigation measures and best management practices will be implemented as needed during renovation.

The USFWS previously indicated that forested wetlands on Charles Wood could provide suitable habitat for swamp pink (*Helonias bullata*), a species listed as Threatened under the Endangered Species Act. Based on the recent comprehensive wetland delineation at Main Post and Charles Wood (Versar 1998), no swamp pink or other species of special concern were observed at either Main Post or Charles Wood. Therefore, there will be no known impact to swamp pink or other species of special concern as a result of the proposed action. In addition, no activities would occur in or within 150 feet of wetlands under the proposed action.

Impact to cultural resources are not expected at the proposed location of the credit union facility. This assessment is based on the fact that no aspect of the proposed action would affect known historic structures or archeological sites, and that the relatively small size (9,000 square-foot footprint) of the facility would not affect visual or aesthetic resources.

The proposed action would not significantly change total sales, employment, population and income within the region.

None of the effects resulting from implementation of the proposed action would significantly affect the environment. Therefore, an Environmental Impact Statement is not required, and a FNSI will be published in accordance with AR 200-2.

6.0 AGENCIES AND PERSONS CONTACTED

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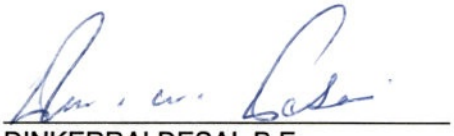

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ENVIRONMENTAL BASELINE STUDY
TO ASSESS

A PROPOSED OUTGRANT OF FEDERAL LANDS FOR USE AS A BUILDING SITE TO CONSTRUCT A NEW CREDIT UNION.

I. SCOPE DEFINITION

A. **PURPOSE:** DETERMINE IF HAZARDOUS SUBSTANCES WERE STORED, RELEASED INTO THE ENVIRONMENT, OR DISPOSED OF AT SITE.

B. **PROPOSED REAL PROPERTY TRANSACTION:** ***The First Atlantic Federal Credit Union (FAFCU), already the Fort Monmouth provider of credit union services, has requested to construct another permanent structure to better serve the Fort Monmouth community. The FAFCU will use their own funds to construct the new facility, and a "Outgrant Lease" will be prepared to lease the federally own lands located east of Oceanport Avenue in the 400 area.***

C. **DESCRIPTION OF PROPERTY:** ***The subject federally owned property is a 0.82 Acre rectangular plot with sides of 223 feet at Oceanport Avenue and 160 feet at Riverside Avenue. The subject property is currently a grassed area with no above ground improvements. Installation underground utility mains that traverse the subject plot will remain under Fort Monmouth's control and ownership.***

II. SCREENING PHASE

A. REVIEW OF PAST HAZARDOUS/CONTAMINATING PRACTICES

1. Properties or structures, in which it is known that hazardous substances were stored, released or disposed of. ***WWII building's 104 and 107, demolished in 1988 were in the footprint of the proposed credit union. Building 104 was originally constructed as a printing plant and continued that function until demolition. Building 107 served B-104 as an oil heating plant. The printing plant function most likely utilized chemicals of some sort, and for this reason Fort Monmouth decided to conduct a sub-surface investigation of the proposed site.***

   Installation Restoration Program (IRP) Initial Assessment Documents, Preliminary Assessment Site Investigation (PA/SI) Reports, Remedial Investigation/Feasibility study (RI/FS) Status Reports; land use plans, and other environmental review reports; Installation Master Plan; Asbestos Surveys; etc. . ***Analytical reports generated from sub-surface investigation. The reports analyzed Total Petroleum Hydrocarbon's (TPHC's), Volatile Organic Compounds (VOC's) and Heavy Metals from the soil borings. Soil borings and analysis, and analytical reports were prepared in house by the Directorate of Public Works (DPW) environmental laboratory. The laboratory is certified by the NJDEP, certification number 13461. Report Of Analysis, numbers 3062 and 3069 dated 10/16/97 summarize TPHC's. . Report Of***

Analysis, number 3671 dated 6/23/98 summarize Volatiles and semi-Volatiles from groundwater samples. All reports are on file for review.

ENCLOSURE 8

2. Visual Site Inspection (unusual odors, stained soils, stressed vegetation, leachate seeps, land features related to human activities, unnatural surface features, etc.) ***NONE.***

3. Any permit, permit discontinuance or closure requirements. ***NONE***

4. Other sources of information such as interviews or review of historic records. ***Historic records and photo documentation were consulted. Information is presented in II.A.1.***

B. ASSESS HEALTH AND SAFETY RISKS. ***The site is currently a grassed area, and upon sub-surface site excavation, in compliance with NJDEP "Site Remediation Program", no immediate danger to life and health and/or safety risks are suspected to exist at the site.***

C. DEFINE NATURE, MAGNITUDE AND EXTENT OF ENVIRONMENTAL CONTAMINATION, IF ANY.

Initially six soil borings were collected, numbers B1 to B6, as shown in Exhibit 1 (attached to the EBS). Of the six borings, numbers B3 and B5 were flagged as containing high concentrations of TPHC's, VOC's, and Metals.

<u>Soil Boring B3:</u> Detected high levels of TPHC's at 5,176 mg/kg, and according to NJDEP guidelines is greater than the trigger level of 1,000 mg/kg. This level necessitated further subsurface exploration in and around boring B3, and additional soil borings (B7, B8, B9, B10, B10A, B10B, and B10C) were collected (Exhibit 1). It was assumed the TPHC levels were the result of an underground fuel oil storage tank which was verified later. Four of the new borings (B8, B9, B10, & B10C) exceeded the trigger level and two of the borings (B9 and B10C) exceeded 10,000 mg/kg. NJDEP requires notification and soil excavation when TPHC levels exceed 10,000 mg/kg. Further action was required and is dictated at II.D.

<u>Soil Boring B5:</u> Detected a mercury compound at 3.77 mg/kg, which is higher then background, but below the NJDEP soil criteria of 14 mg/kg. There was no need for further action at location B5.

<u>Ground Water Sampling:</u> In accordance with NJDEP regulations, removal of UST's which discharged fuel oil to the environment, require ground water sampling for analysis of VOC's. Samples were collected and analyzed. Three compounds were detected greater than background, but less than NJDEP groundwater cleanup criteria. The following compounds were detected from the initial samples:

Compound	*Result*	*GW Criteria*
Acetone	*11.52 ug/L*	*700 ug/L*
2-Butanone	*6.55 ug/L*	*300 ug/L*
Toluene	*29.58 ug/L*	*1,000 ug/L*

D. IDENTIFY POTENTIAL ENVIRONMENTAL CONTAMINATION LIABILITIES ASSOCIATED WITH PROPOSED REAL PROPERTY TRANSACTION. ***NONE. Fort Monmouth removed the 3,000 gallon UST on January 27, 1998 and excavated all soils greater than the NJDEP allowable limits. Contaminated soils were taken off-site to a NJDEP approved facility and incinerated.***

III. STATEMENT OF FINDINGS

A. CONCLUSIONS AND RECOMMENDATIONS CONCERNING PROPOSED REAL PROPERTY TRANSACTION. ***The proposed site has been restored to Fort Monmouth's satisfaction and presents no further soil or groundwater contamination above NJDEP criteria. In addition, Fort Monmouth is satisfied there is no immediate threat to human health or the environment. Additional groundwater sampling and analysis is being performed in accordance with NJDEP regulations and guidelines. Upon completion of the field investigation, a final document requesting "No Further Action" will be forwarded to the NJDEP for approval.***

B. DECIDE ON EA OR EIS. ***No further action necessary.***

IV. SUBMISSION

PREPARER: Mr. Robert J Melascaglia
Installation Master Planner

_____

CONCURRENCE: Mr. Charles Appleby
Environmental Protection Specialist

_____

APPROVAL: Mr. James Ott, PE
Director, Public Works

_____

SECTION A

DETERMINATION OF AVAILABILITY

Part 1. MACOM CERTIFICATION
FOR THOSE ACTIONS TO BE EXECUTED BY ACSIM OR DASA(I&H):

The information furnished in Sections B and C has been fully coordinated with BRAC, if applicable, Environmental, legal, and real estate and is accurate and complete. I recommend that the Determination of Availability be approved by signing Section A, Part 2, of this ROA.

Date

P.J. Morris
Colonel, GS
Deputy Chief of Staff for
Engineering, Housing,
Environment, and Installation Logistics

I have reviewed Section C, Environmental Considerations, including all attachments, and, if this is a lease action, the draft FOSL and EBS, and have determined that the environmental considerations are legally sufficient.

Date

SIGNATURE
(MACOM Staff Judge Advocate/Counsel)

ENCLOSURE 7

DETERMINATION OF AVAILABILITY

Part 2. APPROVAL

1. Based upon the attached Report of Availability (ROA) and its findings, which have been reviewed for accuracy and completeness, I have determined that the intended use of this property as set out in the attached Report of Availability is in the public interest or promotes national defense and is consistent with delegated authorities, applicable laws and regulations.

2. I have determined that the proposed use is compatible with the installation mission and with the installation Master Plan. (INSERT IF APPLICABLE: The use will directly support or further the installation mission.)

3. (NON-BRAC) I have determined that the property is not excess to the overall installation purpose and has not been identified as not utilized in an ICARPUS.

4. The proposed outgrant action described in the ROA is approved (subject to

(INSERT ANY ADDITIONAL INSTRUCTIONS PERTAINING TO THE OUTGRANT NEGOTIATIONS OR EXECUTION AND ANY MODIFICATION TO THE ROA OR ADDITIONAL CONDITIONS WHICH MUST BE PLACED IN THE OUTGRANT DOCUMENT).

5. I determine that the property is available for the proposed use with the restrictions as stated in the Report of Availability (and as added above) and hereby authorize negotiation and execution of an outgrant in accordance with the attached ROA and applicable laws, regulations, and policy guidance.

_____ _____

Date (Approving Official)

SECTION B

REPORT OF AVAILABILITY
(Installation: Fort Monmouth, New Jersey)
GENERAL AND OPERATIONAL INFORMATION

SECTION I. OUTGRANT ADMINISTRATION:

1. *First Atlantic Federal Credit Union (FAFCU)*
   P.O Box 25, West Long Branch, NJ 07764

2. **Proposed use:** ***Fort Monmouth, New Jersey has received a request that land be made available for lease by the First Atlantic Federal Credit Union (FAFCU) in the 400 Area of the Main Post. The FAFCU is the only financial institution on Fort Monmouth. As such, it provides complete financial services to the active duty and retired military and civilian community. The proposed facility will house FAFCU administrative/Back Office operations offices as well as provide a full service branch where teller transactions can be performed. Also, all loan servicing from application to disbursement, including consumer and real estate loans will be available. In addition, the proposed branch will reduce main post congestion by providing convenient and accessible financial services adjacent to but removed from high traffic areas.***

3. **Proposed type of outgrant:**
   [X] Lease
   [ ] For BRAC: _____ Interim Lease
   _____ Lease in Furtherance of Conveyance
   [ ] Easement
   [ ] Permit or License

4. **Start date, if applicable:**

5. **Recommended term of Outgrant:** ***25 years.***

SECTION II. PROPERTY INFORMATION:

1. ***The subject federally owned property is a 0.82-Acre rectangular plot with sides of 223 feet at Oceanport Avenue and 160 feet at Riverside Avenue. The subject property is currently a grassed area with no above ground improvements. Installation underground utility mains that traverse the subject plot will remain under Fort Monmouth's control and ownership. Existing site plan is at EXHIBIT 1, and the proposed new facility siting at EXHIBIT 2 of the ROA.***

2. Acreage: *0.82 Includes building and adjacent lands for site amenities.*

3. General character of the property (short description of the uses of the property; i.e., industrial, residential, warehouse, etc.): *The subject property will be used as office/banking facilities to service the Fort Monmouth community.*

4. Are Government buildings and improvements included in the area?
[ ] No. [X] Yes. If yes, identify and describe all buildings, facilities and improvements, e.g., Identification Nos., square footage outgranted/percentage of building, type of construction, and condition: *No buildings present on site, The only improvements are UG utilities that will remain under government control.*

5. Existing or preceding property use (Provide a description below for each building, facility, area, etc., in either list or table format. If the overall use is the same, i.e. industrial, then a general description is sufficient.): *Property use prior to 1988 was industrial. The existing buildings at that time were used as a printing plant and were demolished in 1988. Since that time the area was restored to an open grassed parcel with no above ground improvements.*

6. United States property interest:
[X] fee simple title
[ ] easement
[ ] in-lease
[ ] other.

7. Is the property subject to a reversionary interest, which would be violated by the proposed use?
[X] No.
[ ] Information not known. USACE District should check title documents.
[ ] Yes. If yes, describe

8. Army interest:
[X] direct control
[ ] permit from a Federal Agency
[ ] withdrawn from the public domain.

9. Type of jurisdiction:
[X] Exclusive Federal Jurisdiction
[ ] Concurrent Federal Jurisdiction
[ ] Proprietary status

10. If Exclusive or concurrent, does jurisdiction need to be retrocede to allow for the proposed use?
[X] No
[ ] Yes, Explain. If a retrocession action is pending, identify the status of that effort:

SECTION III. OPERATIONAL FACTORS:

1. Will the proposed use require utilities?

[ ] No. If no, go to question 2.

[X] Yes. Will Army be providing required utilities or services on a reimbursable basis?

[ ] No. Are utilities, e.g. electricity, natural gas/propane/heating oil, potable water, wastewater treatment, telephone, etc., available from public utility companies?

( ) No

( ) Yes. If yes, identify the type, quantity, and provider of such services: _____

_____

[X] Yes. If yes, identify the instrument to be used to establish the terms under which such services will be provided and the type, quantity, and estimated cost. Note that this instrument should be executed prior to execution of the Outgrant. *Memorandum of Agreement.*

2. Will the proposed use require destruction, relocation, modification, or replacement of Government facilities?

[ ] No

[X] Yes. If yes, please explain: *This action will require the relocation of an electrical aerial poleline, and will be relocated as part of the FAFCU's site design and expense. In addition, there will be some minor utility connections and some curb modification. FAFCU will provide all funds for construction, and relocation/modifications to government owned utility systems.*

3. The grant of the proposed use:

(X) a. is compatible with the operation of the installation,

( ) b. is compatible with the BRAC Implementation Plan, if BRAC,

( ) c. is compatible with contemplated development and other activities as shown in an approved Master Plan , or

( ) d. is in support of the installation mission.

4. If it is not compatible with any of the above or in support of the installation missions, please explain why the use should be approved or list the site specific limitations, restrictions, or conditions to be included in the outgrant to make the proposed use compatible, e.g., security, access, parking, hours of operation: *N/A*

5. Non-Environmental Safety Issues and Concerns, if any: *The lessee may erect and maintain upon said leased premises a permanent building, provided, that plans and specification for such structure shall have been approved by Commander, Fort Monmouth, New Jersey or his authorized representatives prior to commencement of construction. All construction work to be accomplished, including any connection to or relocation of Government owned utilities, clearing, construction of roads, driveways, sidewalks and parking*

areas shall be at the sole expense of the lessee.

6. Airfields and Airspace:

a. Will the planned use of the property affect the airspace over or near the property or military installation?

[X] No

[ ] Yes. If yes, the proposed occupancy or modification may be allowed subject to the following restrictions being incorporated in the outgrant: _____

_____

[ ] Yes, near the property or military installation but affecting property not owned by the United States. If yes, does the United States have a potential "taking of private property" issue? Explain. _____

_____

b. Will the outgrant of the property require the notification of the FAA?

[X] No

[ ] Yes. If yes, please explain who will notify the FAA and when: _____

_____

c. Will structures be built on the property which will require an airspace study?

[X] No

[ ] Yes. If yes, please explain who will do the study and any other requirements: ___

_____

7. REMARKS - include any legal, policy, or mission factors you are aware of which may affect the proposed use of the property: ***It is a DA Policy that Credit Unions on DA installations will be recognized and assisted at all levels because of the unions contributions to the morale and welfare of DA personnel. Granting office space and real property to the Credit Union will be governed by Section 124 of the Federal Credit Union Act. To receive no cost space, at least 95% of the membership must consist of persons who are now or were when they joined the Credit Union military members or federal employees or their family members. The 95% membership certification letter, dated 5 June 1998, and signed by the president of FAFCU is available upon request. The proposed lease will not interfere with military preparedness or ongoing military functions.***

SECTION IV. PRELIMINARY PROCEDURES:

1. Inventory and Condition Reports: A recent inventory showing the condition of the property is available:

[X] No

[ ] Yes. Give date and location of the document: _____

2. Consideration:

[ ] For BRAC, less than fair market value is recommended for this action under authority of 10 USC 2667(f). Provide justification. Current estimated caretaker or operational costs are _____. Provide any specific recommendations:

[ ] USACE district is requested to determine fair market value for the outgranted interest.

( ) Consideration should be collected in cash.

( ) Consideration should be in cash or in-kind as set out in the attached discussion of possible in-kind consideration.

( ) Consideration should be offset for the improvement, maintenance, protection, repair or restoration of the property outgranted, as shown in an attached offset plan.

[X] *Fair market value has been determined through the efforts of a private State Certified General Real Estate Appraiser hired by the FAFCU. The fair rental value estimate is as follows.*

Years 1-5	*$5,400 per year*
Years 6-10	*$6,200 per year*
Years 11-15	*$7,130 per year*
Years 16-20	*$8,200 per year*
Years 21-25	*$9,430 per year*

3. Waiver of Competition:

[X] Competition is not required in accordance with AR 405-80.

[ ] A waiver of competition is not recommended.

[ ] A waiver of competition is recommended. Provide full justification and proposed grantee, if waiver is recommended.

4. Other applicable laws, regulations, MOA's, etc. requiring consideration for processing this action:

---

5. Additional information that will assist in processing this application/action: *The land is located within the 100 year floodplain and has minimal potential for improvements. The First Atlantic Federal Credit Union (FAFCU) acknowledges the proposed construction site is within the 100-year flood plain and that the government accepts no liability for the proposed facility. FAFCU accepts all risks associated with building in the flood plain and will obtain flood insurance.*

Conditions

(1) The FAFCU agrees to assume all risks of loss or damage to property and injury or death to persons by reason of or incident to its possession and/or use of the premises or the activities conducted under this lease. FAFCU expressly waives all claims against the United

States of America for any such loss, damage, personal injury or death caused by or occurring as a consequence of such possession and/or use of the premises by FAFCU, or the conduct of activities or the performance of responsibilities under this lease. FAFCU further agrees to indemnify and hold harmless the Army its officers, agents and employees, from and against all suits, claims, demands or actions, liabilities, judgments, costs and attorneys, fees arising out of, or in any manner predicated upon, personal injury, death or property damage resulting from, related to caused by or arising out of the possession and/or use of the premises by FAFCU.

(2) The lease shall contain the following insurance provisions: At the commencement of this lease, FAFCU shall obtain, from a reputable insurance company, or companies, comprehensive liability insurance. The insurance shall provide an amount not less than a combined single limit of FIVE MILLION DOLLARS ($5,000,000) for any number of persons or claims arising from any one incident with respect to bodily injuries or death resulting therefrom, property damage, or both, suffered or alleged to have been suffered by any person or persons resulting from the operations of FAFCU under the terms of this lease.

(3) The grantee will comply with applicable Federal, State, and local environmental laws, regulations, mitigation and inspect and sample the property to determine compliance. The premises must be restored to equal or better than environmental baseline conditions established when the lessee was given possession of the property. The lessee and any sublessees will be held financially and legally responsible for any and all restoration or cleanup required as a result of its activities and occupancy. Lessees and sublessees will be required to obtain insurance, with the Government as the beneficiary to secure this obligation, in an amount satisfactory to the Government.

(4) The grantee will be responsible for restoration of all leased grounds, facilities, properties, and of any utility infrastructure situated within the boundaries of the property. The property will be restored to the condition in which received at the commencement of the Lease.

(5) All work performed by the Grantee shall comply with applicable federal, state, and local laws and regulations.

(6) The Grantee shall not be entitled to any compensation for improvements made by the Grantee to the premises in the event of revocation, termination, or expiration of the lease.

(7) The government has the right to enter upon and cross under the premises covered by this lease.

(8) The Grantee will have the right of egress and ingress into and across Fort Monmouth property to the premises.

(9) There are no known environmental conditions that would negate the proposed construction of the FAFCU. The proposed site has been restored to Fort Monmouth's satisfaction, in accordance with NJDEP guidelines, and presents no further soil or

groundwater contamination above NJDEP criteria. The EBS, at Encl 9 presents a detailed analysis of the site and the remediation efforts.

(10) The grantee shall comply with the "Environmental Protection Lease Provisions" enclosed to the Finding of suitability to Lease (FOSL).

6. Stewart B. McKinney Homeless Requirements:

[X] McKinney Act requirements do not apply to this action.

[ ] McKinney Act requirements apply, necessary screening has been completed, and no interest was expressed. Give dates.

7. Estimated Costs to further process the outgrant:

USACE District costs: *$3,000*

Installation costs: *None, other than preparation of the ROA.*

Funds are currently available [X] Yes [ ] No

If No, how will costs be funded? _____

8. I certify that I have reviewed Section B, that is has been coordinated in accordance with applicable command guidance, and that it is accurate and complete. Based on the information provided above, I recommend that the outgrant be

[ ] APPROVED [ ] DENIED.

_____ _____

Date **James Ott, P.E.**
Director, Public Works

Enclosures: 2

Exhibit 1 **New Credit Union, Existing Site Conditions.**

Exhibit 2 **New Credit Union, Proposed Development**

SECTION C
REPORT OF AVAILABILITY
ENVIRONMENTAL CONSIDERATIONS

1. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REQUIREMENTS:

a. The requirements under NEPA for the proposed outgranting action have been met as follows:

[ ] CX/REC. This action falls under one of the Categorical Exclusions (CX) contained in AR 200-2 (Environmental Effects of Army Actions). The environmental effect of the action has been considered. A Record of Environmental Consideration (REC) is attached, indicating the CX pursuant to which the proposed outgrant is authorized.

If the ROA is required to be forwarded to HQDA, and the CX is based on a pre-existing NEPA analysis, then state:

[ ] for BRAC, NEPA document is on file at HQDA (Identify location, title and date: _____)

[ ] pertinent extracts are attached from the applicable NEPA analysis.]

[ ] EA/FONSI. The impact of this action is considered to be minimal or insignificant. The Environmental Assessment (EA) with Finding of No Significant Impact (FONSI) is:

[ ] for BRAC, on file at HQDA (Identify location, title and date: _____ _____)

[ ] attached.

[ ] EIS/ROD. The impact of this action is considered to be significant. An Environmental Impact Statement (EIS), or supplement thereto, along with the Record of Decision (ROD) is:

[ ] for BRAC, on file at HQDA (Identify location, title and date: _____)

[ ] attached. (IF the EIS is too large to attach, then state where it can be viewed)

b. For EA and EIS, identify mitigation actions, if any, which are required, costs, and responsible party for the mitigation: ***Upon a concept approval from the MACOM, the DPW will engage a consultant to perform an EA. The EA will address the impact to the floodplain. FAFCU will fund this effort if project siting is approved in concept.***

c. If the EIS or EA covers more than the proposed outgranting action, explain how and where the outgranting action is analyzed and considered in the NEPA documentation:

_____

_____

2. COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA), For Leases only:

a. Environmental Baseline Study:

[ ] An EBS has been conducted and no hazardous, toxic, radiological waste (HTRW) substances were identified as released, stored, or disposed on the property in the threshold quantities. Go to question 3. A draft FOSL is attached. A copy of the EBS is:

[ ] on file at HQDA (Identify location, title and date: _____)

[ ] attached.

[X] An EBS has been conducted which indicates HTRW substances were released, stored, or disposed on the property in the threshold quantities. Hazardous storage, disposal, or release notification must be included in the outgrant document (reference 40 CFR Part 373). A draft FOSL is attached. A copy of the EBS containing the details is:

[ ] on file at HQDA (Identify location, title and date: _____)

[X] attached.

b. Choose the appropriate status of remedial actions:

[X] Remedial actions have been completed so that the property is considered safe for the proposed use.

[ ] Remedial actions are not required.

[ ] Remedial actions have not been completed. Estimate the time to complete such action: Provide details and justification for outgranting in the current condition, if applicable. Attach any land use restrictions and access clauses that must be put into the outgrant.

3. REAL PROPERTY CONTAMINATED WITH AMMUNITION, EXPLOSIVES OR CHEMICAL WEAPONS.

a. Does the property contain ammunition, explosives or chemical weapons?

[X] No. If no, go to question 4.

[ ] Yes. If yes, Reference AR 385-64, "US Army Explosives Safety Program." Has a Land Disposal Site Plan (LDSP) to clean up the property been submitted through the MACOM and HQDA, DACS-SF and DAMO-SWS, the U. S. Army Technical Center for Explosives Safety, to the Department of Defense Explosives Safety Board (DDESB) for approval before cleanup and outgrant?

[ ] No.

[ ] Yes. If yes, have the ammunition, explosives, or chemical weapons been removed using the most appropriate technology consistent with the proposed use of the property?

[ ] Yes

[ ] No. Provide date when property will be cleared: _____

b. Will access rights to implement any monitoring plan or use restrictions be required?

[ ] No.

[ ] Yes. Describe. (Set out proposed language to be inserted in outgrant):

_____

_____

c. If outgrant is to another Federal agencies for compatible use of surface de-contaminated real property, list limitations, restrictions and prohibitions concerning the use of the property, to ensure personnel and environmental protection:

_____

4. WASTE DISPOSAL (The Solid Waste Recovery Act, as amended; Resource Conservation and Recovery Act (RCRA)).

a. Choose one:

[X] The applicant will not generate hazardous waste or will not treat, dispose or store waste defined by EPA or State with RCRA primacy.

[ ] The applicant will generate hazardous waste or will produce waste defined by EPA or State with RCRA primacy. Identify all waste streams and quantities:

_____

_____

[ ] The applicant will treat or temporary store, for less than 90 days, hazardous waste as defined by EPA or State with RCRA primacy. Identify all waste streams and quantities.

_____

_____

b. If applicable, choose the appropriate:

[ ] The applicant has obtained a hazardous waste generator identification number from EPA. ID No. _____

[ ] The applicant has established records, waste management requirements, and a Spill Prevention Plan.

c. Will the grantee be required to comply with an installation's Hazardous Waste Management Plan?

[ ] No

[ ] Yes, provide date and location of plan.

5. COMPLIANCE WITH 10 USC 2692:

[X] The applicant will not store or dispose of non-DOD toxic or hazardous materials pursuant to 10 USC 2692.

[ ] Storage or disposal of non-DOD toxic or hazardous materials has been authorized pursuant to 10 USC 2692. (Attach copy of authorization).

6. UNDERGROUND/ABOVE GROUND STORAGE TANKS.

[X] There are no Underground Storage Tanks (USTs) on the property and the

applicant will not be installing such tanks. Go to question 7.

[ ] There are no above ground storage tanks for fuel or other regulated substances and the applicant will not be installing such tanks. Go to question 7.

[ ] There are USTs on the property and/or the applicant will be installing such tanks.

a. Existing underground storage tanks are in compliance with current laws and regulations:

[ ] Yes

[ ] No. Explain: _____

b. Construction of proposed underground storage tanks have been certified for such compliance:

[ ] Yes

[ ] No. Explain: _____

[ ] There are above ground storage tanks for fuel or other regulated substances on the property and/or the applicant will be installing such tanks.

a. Existing above ground storage tanks are in compliance with current laws and regulations:

[ ] Yes

[ ] No. Explain: _____

b. Construction of proposed above ground storage tanks have been certified for such compliance:

[ ] Yes

[ ] No. Explain: _____

7. CLEAN WATER ACT (FEDERAL WATER POLLUTION CONTROL ACT):

[X] This action will not involve the discharge of any pollutants into the waters of the United States or less than one million gallons of discharge per day will be made.

[ ] This action will entail the discharge of any pollutants into the waters of the United States or it is more than one million gallons into the waters of the United States per day.

[ ] Will the grantee's activities on the outgranted property result in a discharge of wastewater to an accumulation, collection, or drainage system?

[ ] No.

[ ] Yes. If yes, can the existing wastewater collection system and treatment system accommodate such discharge without adverse operational or environmental impacts?

[ ] Yes.

[ ] No. If not, are there other options? Describe.

[ ] Has the applicant applied for or obtained a National Pollutant Discharge Elimination System (NPDES) Permit or State equivalent from the EPA/appropriate state agency?

[ ] Yes.

[ ] No. If not, state whether the grantee must have a NPDES Permit or State

equivalent to operate. [ ] No. [ ] Yes. If not received, state circumstances:

_____

[ ] Would the grantee's operations result in a violation of a NPDES permit or State equivalent held by the United States?

[ ] No.

[ ] Yes. Explain.

[ ] The Grantee is complying with the requirements of a NPDES Permit and the Grantee has a monitoring and reporting procedure.

8. CLEAN AIR ACT (FEDERAL CONFORMITY REQUIREMENTS):

[ ] This action does not require a written conformity determination in accordance with EPA's rule because:

[ ] The installation is in an attainment area. NOTE: The EA or EIS must contain a statement that the action conforms to the applicable State or Federal Implementation Plan, if any, with adequate supporting analysis.

[ ] The installation is in a non-attainment or maintenance area and the action falls within an exemption in the rule. Attach a Record of Non-Applicability (RONA) in accordance with Army Guidance. List pollutants: _____

[X] This action is not exempt from the conformity regulation. Attach conformity determination. Describe the mitigation requirements or other restrictions, if any, which must be incorporated in the outgrant: *A written conformity is not necessary due to the small emissions expected (approx., 500 MBTU). The resulting air emissions in the 400 area, due to the new credit union verses the 1997 buildings demolished (43,046 GSF), will decrease since a "positive net effect in air quality" will occur because the previous sources were removed from the site.*

9. ENDANGERED SPECIES:

[X] Coordination with the USFWS to determine the possible presence of any federally listed endangered, threatened, or candidate species in the action area has occurred (attach correspondence). Provide date of last coordination and describe results of coordination:

Letter on file from the USFWS, dated 12 Feb 1996, and states "Except for an occasional transient bald eagle or peregrine falcon no other federally listed or proposed threatened or endangered flora or fauna under service jurisdiction are known to occur in the vicinity of the proposed project site" Project site meaning Fort Monmouth's main post.

[ ] This action will not jeopardize the habitat of any endangered, threatened or candidate species of fish, wildlife, or plants pursuant to the Endangered Species Act or a state listed species.

[ ] This action may jeopardize or affect: (identify on an attached map.)

[ ] a federally listed endangered or threatened species; list: _____

[ ] a federal candidate species; list: _____

[ ] a state listed species: _____

[ ] designated critical habitat; describe: _____

[ ] This outgranting action may affect a federally listed endangered, threatened, or candidate species and required consultation with the USFWS has been completed. Attach any biological assessment, opinion, and correspondence with the USFWS. Accordingly, the following restrictions must be incorporated in the outgrant to protect the affected species and its habitat:

_____

_____

9. FISH AND WILDLIFE COORDINATION ACT (FWCA):

[X] This action will not jeopardize fish and wildlife species or habitat integral to Congressionally authorized mitigation or General Plans, or Army agreed to recommendations in Fish and Wildlife reports prepared under the provisions of the FWCA.

[ ] This action will jeopardize fish and wildlife species or habitat integral to Congressionally authorized mitigation or General Plans, or Army agreed to recommendations in Fish and Wildlife reports prepared under the provisions of the FWCA. Impact description, and recommended actions prior to availability:

_____

10. COASTAL ZONE MANAGEMENT (CZM) (if applicable):

[X] CZM is not applicable.

[ ] CZM is applicable, and a CZM Act determination with the approved state CZM Plan has/will be obtained.

11. FLOODPLAIN:

[ ]This property is not located within the 100 year floodplain and does not fall under the purview of Executive Order 11988.

[X] This property is located within the 100 year floodplain and does fall under the purview of Executive Order 11988 and (check the appropriate):

( ) The proposed occupancy or modification will not adversely impact the floodplain.

( ) There is no other practicable alternative available for this intended use.

(X) The proposed occupancy or modification may be allowed subject to the following restrictions being incorporated in the outgrant document: *Upon a tentative approval, by the MACOM/DA, to site and build the credit union, the installation will engage a consultant to examine the impact to the floodplain. This is considered prudent by the installation to conserve funds. If the MACOM/DA initially disapproves the action, then no funds will have been spent in considering the floodplain. If tentatively approved, and upon completion of the floodplain analysis, the MACOM/DA can then render a final decision.*

12. WETLANDS:

Does the property to be outgranted contain wetlands regulated under Section 404 of the Clean Water Act (CWA) or falling under the purview of Executive Order 11990:

[X] No.

[ ] Yes. Attach map showing wetland areas. The following restrictions must be incorporated in the outgrant document:

_____

_____

Does the action require a 404 Permit?

( ) No

( ) Yes. State status of Section 404 permit process: _____

13. HISTORICAL AND CULTURAL RESOURCES:

[X] No historical, cultural, or archaeological sites or resources have been identified on this property.

[ ] Historical and/or cultural resources may be present on this property. This action has been coordinated with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, if applicable, in accordance with 36 CFR 800, and not restrictions apply. (Attach relevant correspondence).

[ ] Historical and/or cultural resources have been identified by a survey of this property. This action has been coordinated with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, if applicable, in accordance with 36 CFR 800. The following restrictions must be incorporated into the outgrant document to protect the property (attach any Programmatic Agreement, MOA, and relevant correspondence):

_____

[ ] Native American graves have been identified on this property. (Refer to requirements of the American Indian Religious Freedom Act and Native American's Graves Protection and Repatriation Act). Consultation on the disposition of Native American graves and objects has been initiated with interested Native American organizations; correspondence attached.

[ ] Archaeological sites or resources have been identified on this property. Refer to the Antiquities Act; Archaeological and Historical Preservation Act; and Archaeological Resources Protection Act. The plan for curation and disposition of these resources is attached.

14. LEAD-BASED PAINT:

a. Are there improvements constructed prior to 1960, which are considered to contain lead-based paint, or which have been determined to contain lead-based paint?

[X] No

[ ] Yes. If there has been a survey, attach.

b. Are there improvements constructed between 1960 and 1978 which are considered to contain lead-based paint or which have been determined to contain lead-based paint?

[ ] No

[ ] Yes. If there has been a survey, attach.

c. Are these improvements the type that children under age seven frequently inhabit, e.g. housing, child care? [ ] No [ ] Yes, lead-based paint notice is required.

15. OTHER ENVIRONMENTAL CONSIDERATIONS:

a. Is there any Asbestos Containing Material (ACM) on the property?
[X] No
[ ] Yes. If yes, attach any surveys, condition and type.

b. Will the proposed outgrant activity impact an area designated under the Wild and Scenic Rivers Act?
[X] No
[ ] Yes. If yes, what conditions may need to be included in the outgrant?

---

c. Will the proposed outgrant activity involve the use of insecticide, fungicide, and rodenticide so that compliance with the Federal Insecticide, Fungicide, and Rodenticide Act is necessary, e.g. Agricultural, golf courses, restaurants?
[X] No
[ ] Yes. If yes, list:

---

d. Are there polychlorinated biphenyls (PCBs) present?
[X] No
[ ] Yes.

e. Has a radon survey been completed for the buildings to be outgranted?
[X] No. ***This is not an area prone to excessive levels of radon .***
[ ] Yes. Choose one:
[ ] no buildings have radon in excess of applicable standards.
[ ] the following buildings exceed standards: List with appropriate use restrictions:

---

f. Are there any other special-purpose environmental laws applicable to the proposed activity?
[X] No
[ ] Yes. Explain: _____

g. Is further environmental study required?
[ ] No
[X] Yes. Explain: ***Floodplain Analysis, see section 11.***

16. ADDITIONAL COMMENTS:

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17. I certify that I have reviewed Section C, that is has been coordinated in accordance with applicable command guidance, and that it is accurate and complete. Based on the information provided above, I recommend that the outgrant be

[ ] APPROVED [ ] DENIED.

Date

James Ott, PE
Director, Public Works

18. I have reviewed Section C, Environmental Considerations, including all attachments, and, if this is a lease action, the draft FOSL and EBS, and have determined that they contain sufficient environmental considerations.

Date

Diana Moore
LTC, JA
Staff Judge Advocate

Traffic and Transportation Analysis Report Fort Monmouth Realignment

Prepared by

CH2M HILL

Chicago, Illinois

February 1994

Traffic and Transportation Analysis
Fort Monmouth Realignment

This report describes traffic and transportation impacts associated with the proposed Department of Army Base Realignment and Closure (BRAC) Implementation Plan for Fort Monmouth. The purpose of this analysis is to forecast future traffic conditions and identify and address traffic related concerns that would result from the proposed BRAC action.

This analysis was performed to provide input to an environmental assessment of the BRAC action. It does not serve as a comprehensive traffic and transportation impact study for the area, but rather it provides an estimate of future traffic conditions, associated impacts and improvements to alleviate potential impacts attributable to the Fort Monmouth realignment.

As noted below, the study scope was limited to an assessment of conditions based on existing data bases, a one-day field trip to observe the site and existing traffic, and interviews with Monmouth County and base personnel including the Directorate of Public Works. No original traffic counts were taken for this study.

The following sections provide:

- A description of the study area
- A summary of existing traffic conditions
- A description of future traffic demands associated with the BRAC action
- A summary of future operating conditions at key intersections
- Future needs to address impacts

Description of Study Area

The study area was defined by Tinton Avenue and the Lafetra Brook/Parkers Creek to the north, Pearl Harbor Drive to the west, Route 71 (Broad Street) and Main Street to the south and Oceanport

Avenue to the east, as shown in Figure 1. This area includes key roadways that affect access and egress associated with Fort Monmouth activities.

Existing Transportation System

The existing transportation network consists of a combination of state, county and local roadways. Additionally, north-south rail service is provided along the west edge of the study area via New Jersey Transit, with a station located in Red Bank and Little Silver.

External Roadway Network

Figure 1 depicts the existing external transportation network. Key north-south roadways serving the study area include Hope Road, State Route 35 (SR 35) and Oceanport Avenue. Hope Road located to the west bisects the Charles Wood subpost. South of Tinton Avenue, Hope Road is a four lane undivided urban roadway, with curb and gutter along the outside and left turn channelization at key intersections. North of Tinton Avenue, Hope Road narrows to a two-lane cross section.

SR 35 is a principal north-south arterial, and serves as the primary access from the north and south to Main Post via the intersection at West Gate. SR 35 is a four-lane urban arterial, with a continuous median varying in dimension with curb and gutter along the outside.

Oceanport Avenue (County Highway 11) is located along the east side of Main Post, providing access to Main Post via Hartman Gate (East Gate). Oceanport Avenue is a minor urban roadway providing one lane in each direction of travel, with closed drainage and curb and gutter. Left turn lanes are provided at key intersections.

East-west roadways serving Fort Monmouth include: Tinton Avenue, SR 71 (Broad Street), Main Street and SR 36 (located approximately one mile south of Tinton Avenue). Tinton Avenue is a minor urban arterial providing two through lanes of traffic (one lane in each direction of travel). Tinton Avenue does not have a continuous median. However, left turn lanes are provided at select locations. Tinton Avenue serves as the primary roadway between the Charles Wood subpost and Main Post. Direct access is provided to Charles Wood via the Tinton Avenue intersection with Pearl Harbor Drive and Lowther Drive.

Other East-west arterials are located south of Main Post and provide for traffic circulation between Main Post and the north-south arterial network. Both SR 71 and Main Street are minor urban

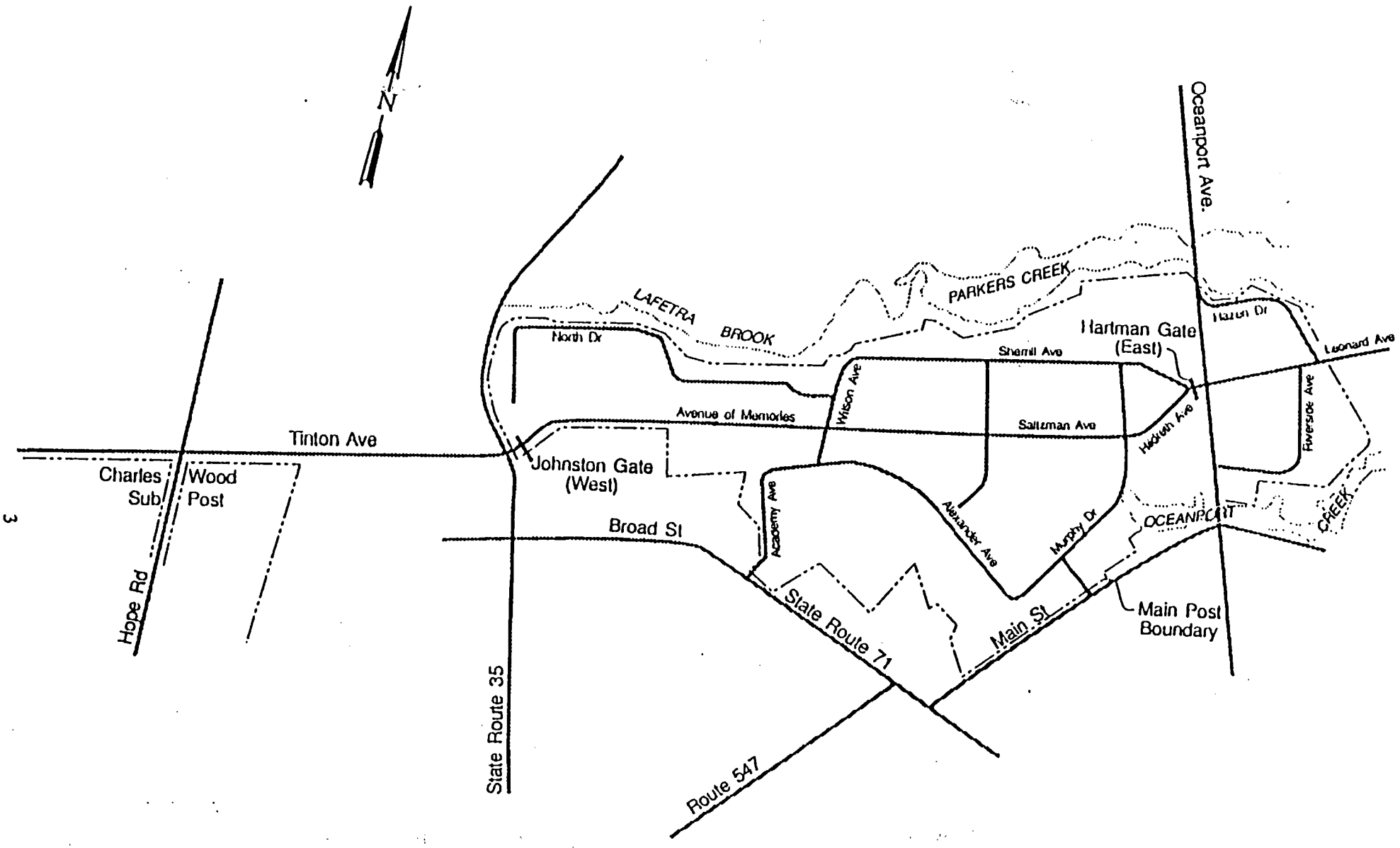

Figure 1
EXTERNAL AND INTERNAL ROADWAY NETWORK

two-lane roadways. SR 36 is a principal arterial with four through lanes (two lanes in each direction of travel).

Internal Roadway Network

The internal roadway network serving Main Post includes Avenue of Memories, Saltzman Avenue, Sherrill Avenue, Wilson Avenue, Alexander Avenue and Murphy Drive. These roadways serve as the primary network for providing access and traffic circulation to existing base activities.

Avenue of Memories, Saltzman Avenue and Hildreth Avenue tie together to form the principle continuous east-west roadway through Main Post, in effect connecting West and East gates. This roadway system provides one through lane in each direction of travel from west to east, with a flush median provided to the west along the Avenue of Memories.

Sherrill Avenue and Wilson Avenue provide for circulation and access to base activities north of Saltzman Avenue. These are minor local roadways providing one lane in each direction of travel. Alexander Avenue and Murphy Drive provide for circulation to base activities to the south of Saltzman Avenue (primarily the hospital and commercial areas). These are also minor roadways providing one lane in each direction of travel.

Activities east of Oceanport Avenue including public works, administrative and maintenance services are serviced primarily by Leonard Avenue, Riverside Avenue and Hazen Drive. Leonard Avenue is located opposite the East Gate and intersects with Oceanport Avenue at the signalized intersection. Riverside Avenue and Hazen Drive also intersect with Oceanport Avenue and are controlled by stop signs.

The internal roadway network serving the Charles Wood subpost consists of four primary roadways: Pearl Harbor Avenue, Corregidor Road, Pine Brook Road and Hope Road. Pearl Harbor Road and Hope Road are both two lane urban north-south roadways that provide access to Charles Wood. Corregidor Road and Pine Brook Road are two-lane urban east-west roads.

Transit

Public transportation is provided through rail and bus service. North-south rail service is provided along the west edge of the study area via New Jersey Transit with stations located in Red Bank and Little Silver. Bus service is provided directly to Fort Monmouth through the Asbury Park Transit

Line and New Jersey Transit, routes M21 and M22. The Asbury Park Transit Line serves Fort Monmouth with a stop along SR 35 at West Gate. The frequency of service varies depending on time of day, with service more frequent during peak periods.

New Jersey Transit Route M21 runs between Shrewsbury and Long Branch providing a stop along SR 35 at West Gates. Busses run at 30 minute and 60 minute intervals during the AM and PM peak hours respectively. New Jersey Transit Route M22 runs north-south along SR 35 between Shrewsbury, Eatontown and Asbury Park. AM and PM peak period intervals are roughly 60 minutes.

In addition to the public transportation described above, Fort Monmouth operates its own shuttle bus service. The shuttle service provides for movement between Charles Wood subpost and the Main Post, as well as providing for internal service within Main Post.

Existing Traffic Conditions

Evaluation of traffic conditions associated with BRAC actions at Fort Monmouth requires establishment of an existing condition for comparison purposes. The base condition is represented by 1993 peak period traffic.

Traffic and Transportation Data

A data base describing traffic volumes and roadway geometrics, as well as transit data within the study area, was assembled from existing available sources.

- Peak period turning movement counts from 1986, 1988 and 1990 were collected from the Fort Monmouth Directorate of Public Works, Monmouth County and Eatontown for key intersections at the site.

- Average Daily Traffic (ADT) counts were provided from Monmouth County. These counts included 1988 ADT along Oceanport Avenue and SR 35 and 1990 ADT along Hope Road.

Field reviews were performed at key intersections surrounding the site. Geometric and traffic control data were obtained, including lane arrangements, parking conditions, traffic control and other relevant

data. Based on discussions with Monmouth County staff and Fort Monmouth it was determined that key intersections that would be affected by the base realignment include:

- Hope Road and Tinton Avenue
- Tinton Avenue (West Gate) and SR 35
- Oceanport Avenue and East Gate

The number of through lanes and lane arrangements at these intersections are shown in Figure 2.

Traffic Analysis

Traffic operations of urban arterial systems are generally controlled by the operation of their intersections, signalized or unsignalized (stop controlled). Therefore, the focus of characterizing base year traffic impacts was on the operation of the above key intersections.

Existing peak period turning movement counts (ranging from 1988 to 1990) were adjusted upward using a growth factor of 1.5 percent per year to represent 1993 traffic. This factor was applied to all non-post traffic (i.e., background traffic). Figure 3 documents the 1993 peak hour traffic assignment. (Note: for the intersection of Oceanport Avenue and East Gate the ADT count was used to establish a 1993 peak hour estimated through movement along Oceanport Avenue.)

The revised 1985 Highway Capacity Manual (HCM) procedures were followed in evaluating intersection level of service (LOS) and volume to capacity (v/c) ratios for the following signalized intersections:

- Hope Road and Tinton Avenue
- SR 35 and Tinton Avenue (West Gate)
- Oceanport Avenue and East Gate

A base saturation flow rate of 1900 passenger cars per hour per lane per hour of green time was assumed per the Transportation Research Board (TRB) Highway Capacity Committee recommendations. The analysis did not assume in-field signal timing. Instead all analyses were performed assuming minimum feasible cycle lengths and optimization of signal timing regardless of the timing scheme or cycle length currently in use. This assumption produces an analysis of the highest LOS and lowest v/c ratio given the existing intersection geometrics.

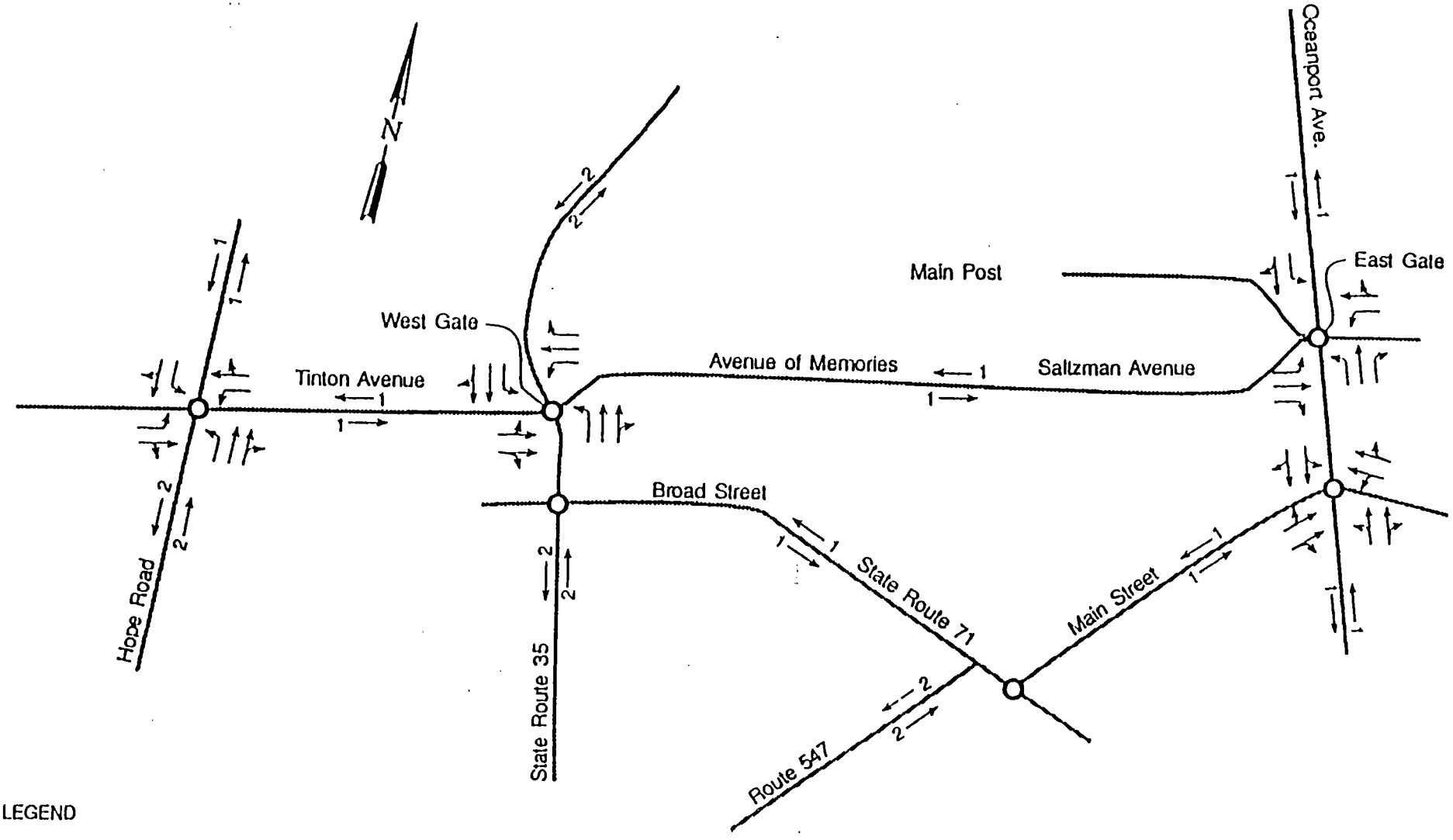

Figure 2

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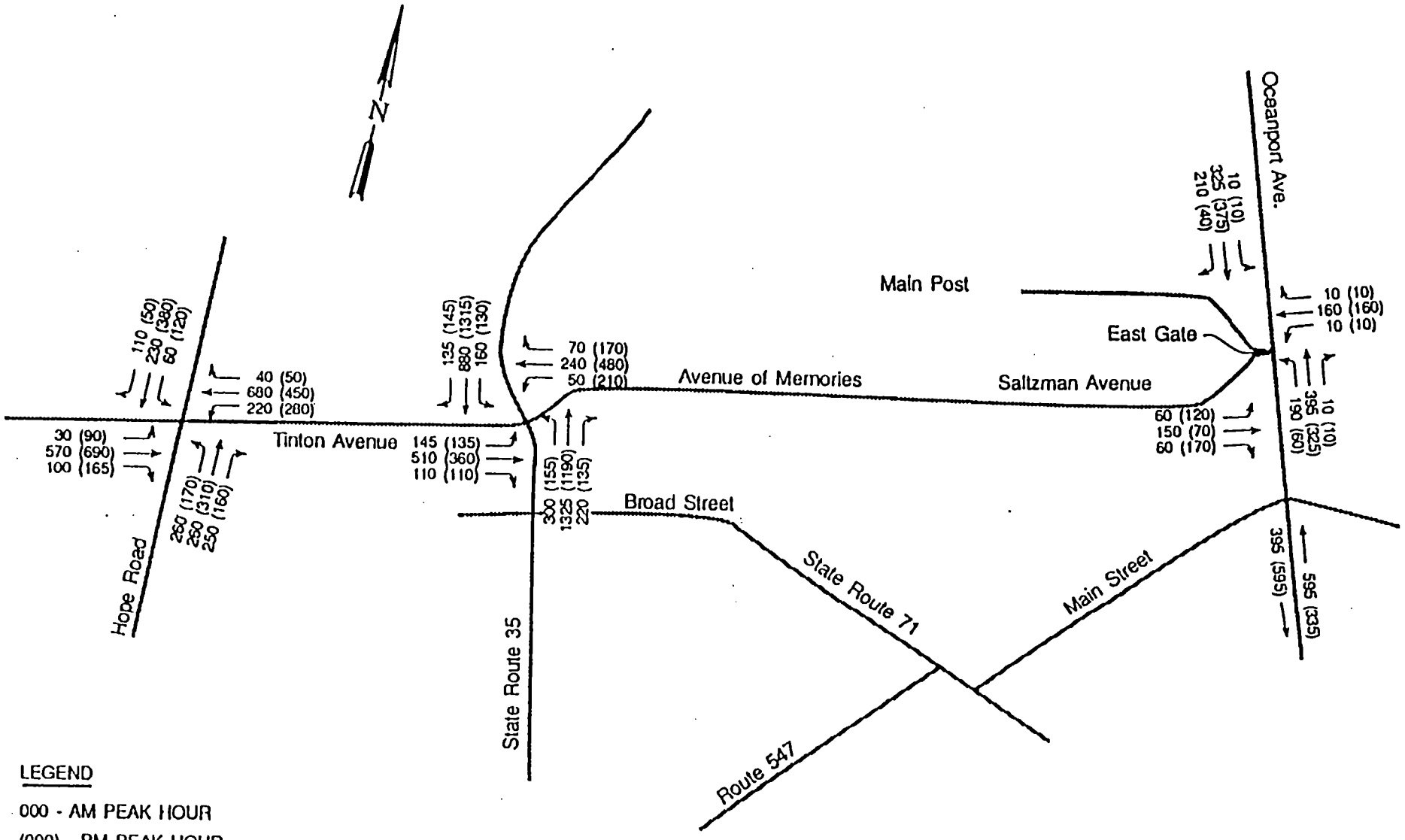

LEGEND

000 - AM PEAK HOUR

(000) - PM PEAK HOUR

NOTE: Existing Counts at
Hope and Tinton = 2/88
Tinton and SR 35 = 9/90
East Gate and Oceanport 1996

Figure 3
1993 PEAK HOUR TRAFFIC ASSIGNMENT

For signalized intersections LOS is defined in terms of average stopped delay per vehicle. This is considered a good measure of the "quality" of traffic flow at an intersection. Levels of service range from A (less than 5 seconds of stopped delay per vehicle) to F (greater than 60 seconds of stopped delay per vehicle). LOS E is considered the limit of acceptable delay and ranges from 40 to 60 seconds of stopped delay per vehicle. (LOS E represents the capacity of the intersection.) LOS F represents breakdown conditions. The v/c ratio compares the demand flow rate approaching the intersection to the intersection's practical capacity. Intersections with v/c ratios greater than 1.0 represent potential problems. Queue building and a rapid degradation in level of service can occur with only minor increases in traffic volume.

Table 1 summarizes the signalized intersection analysis. As Table 1 indicates, the intersections of Tinton Road with Hope Road and Tinton Avenue with SR 35 are both approaching or at the theoretical capacity. At Tinton Avenue and Hope Road the relatively heavy through movements along Tinton Avenue with only one lane of through capacity results in a less-than-desirable LOS (LOS E) in the PM peak hour. At Tinton Avenue (West Gate) and SR 35 the v/c ratio is approaching or at capacity (1.0) for the AM and PM peak hour. Furthermore, LOS E was computed for the morning peak hour. This is the result of the near-capacity condition of SR 35 both southbound and northbound. The signalized intersection of Oceanport Avenue and East Gate showed no capacity or operational problems.

These calculations were confirmed by field observations and are in agreement with a general understanding of existing operating conditions.

Table 1
Existing (1993) Signalized Intersection Operational Analysis

Intersection	Level of Service		Average Stopped Delay (sec)		v/c	
	AM	PM	AM	PM	AM	PM
Hope Road and Tinton Avenue	D	E	28.2	55.0	0.91	1.03
SR 35 and Tinton Avenue (West Gate)	E	D	41.8	34.4	1.01	0.97
Oceanport Avenue and East Gate	B	B	7.7	7.6	0.48	0.40

The analyses are consistent with field observations, which confirm the above results. During the morning peak period the SR 35 and Tinton Avenue intersection often experience vehicle queues in excess of 10-15 vehicles per lane on all approaches. Moreover, during critical periods, vehicles require more than one signal cycle to pass through the intersection.

Future Conditions

The proposed BRAC action will result in an increase in activity within the Main Post and surrounding street system. This would be expected to produce changes in traffic volumes and patterns and potential adverse operations at key intersections. Working with personnel from Fort Monmouth, an estimate was made of BRAC and non-BRAC actions that may cause changes in traffic volume and traffic patterns. For purposes of assessing traffic impacts, the actions documented in Table 2 were considered in the development of the future condition. Table 2 includes the number of additional staff positions that will be added to or subtracted from Fort Monmouth as a result of realignment.

For trip generating purposes, Table 3 indicates approximately 1,236 net positions to be added to Fort Monmouth. This represents a net increase of 2,218 civilian positions and a net decrease of 982 military positions. To estimate the changes in trip making with respect to the changes in military positions, it is necessary to identify where at Fort Monmouth military personnel are housed and where their activity is located. With this information it is possible to estimate the traffic changes at the key intersections.

The process used in evaluating traffic impacts associated with the realignment involves trip generation, trip distribution, traffic assignment and level of service and capacity analysis.

Table 2
Summary and Base Activities for Consideration in Development of Trip Generation

Location	Total Positions	Positions		% Military Housed on Post	% Military Housing at		Activity Located at	
		Civilian	Military		C. Wood	M. Post	C. Wood	M. Post
CECOM	+2,071	+2,020	+51	60%	90%	10%	0%	100%
Chaplain School Staff	-175	-52	-123	100%	90%	10%	0%	100%
Chaplain School Students	-175	0	-175	100%	0%	100%	0%	100%
Vint Hill	+712	+587	+125	60%	90%	10%	0%	100%
Evans Subpost	+497	+447	+50	100%	60%	40%	25%	75%
513th Brigade	-603	-6	-597	100%	0%	100%	25%	75%
Electronic Power Sources	-310	-300	-10	60%	90%	10%	100%	0%
389th Army Band	-40	0	-40	60%	90%	10%	0%	100%
Downsizing (Main Post)	-494	-252	-241	60%	90%	10%	0%	100%
Downsizing (C. Wood)	-190	-168	-22	60%	90%	10%	100%	0%

Trip Generation

Trip generation involves a process in which the magnitude of vehicle trip making is predicted for a proposed development or activity. Trip generation is a function of the type of development and the intensity or size of development. For purposes of this study, trip generation was based on an estimate of positions added to or subtracted from Fort Monmouth.

Peak hour vehicle trip ends (that is, origins and destinations) were estimated by adjusting the total number of positions by an assumed average automobile vehicle occupancy, the percentage of trips assumed to occur during the peak hour of the roadway, and the percentage of employees using automobile as the mode of choice.

The following assumptions were used in the calculation of peak hour trip generation:

- An automobile vehicle occupancy (AVO) of 1.40 was used. This represents a 25 percent increase in existing AVO and is consistent with the AVO mandated by the Clean Air Act, with which the installation must comply.

- CECOM currently has a flexible work hour policy in place. Staff arrive at work between 7:00 AM and 9:00 AM. Based on discussions with base personnel it was assumed that this policy will continue or possibly expand (i.e., 6:00-9:00 am). Therefore, for purposes of peak hour trip generation, 60 percent of all vehicle trips were estimated to occur during the peak hour of the roadway system.

- 95 percent of trips were assumed to use the automobile as their mode of travel. The remaining 5 percent are assumed to use bus, train, or bicycle, or to walk.

Table 3 summarizes the results of the trip generation analysis. To verify the reasonableness of the above calculations, the procedure was compared to techniques described in the Institute of Transportation Engineers (ITE) publication *Trip Generation* (5th Edition). The number of trip ends computed from ITE for a general office building was compatible.

Based on the results described in Table 3 a net increase of 887 civilian vehicle trip ends and a net decrease of 49 military vehicle trip ends was estimated to occur during the peak periods. In the AM this represents an increase of 823 new trips into Main Post and 84 out of Main Post. Similarly, in the PM peak an increase of 775 trips out of Main Post and 109 into Main Post are estimated.

Because CECOM is currently located within close proximity to the study area, it was necessary to estimate the number and pattern of existing peak hour trips, and to "zero-out" or subtract them from the existing traffic conditions. Utilizing existing counts at CECOM, an estimate of peak hour turning movements associated with CECOM at the intersection of SR 35 and Tinton Avenue and Tinton Avenue and Hope Road was established. These trips were then subtracted from the base year (1993) assignment.

Table 3
Vehicle Trip Generation for Traffic Forecasting

Fort Monmouth Action	Total Positions	Civilian Positions	Military Positions	Total Peak Hour Vehicle Trip Ends	Peak Hour Vehicle Trips	
					In	Out
CECOM	+2,071	+2,020	+51	+815 [+7]	+740(+114) [+6(+1)]	+75(+701) [+1(+6)]
Vint Hill	+712	+587	+125	+200 [+18]	+180(+28) [+16(+3)]	+20(+172) [+2(+15)]
Evans Subpost	+440	+390	+50	+150 [+7]	+135(+21) [+6(+1)]	+15(+129) [+1(+6)]
Chaplain School Staff	-175	-53	-122	-10 [-40]	-9(-1) [-35(-5)]	-1(-9) [-5(-35)]
Chaplain School Students	-175	0	-175	0[0]	–	–
513th Brigade	-603	-6	-597	-2 [0]	–	–
Electronic Power Source	-310	-300	-10	-112 [0]	-101(-16) [-(-)]	-11(-96) [-(-)]
389th Army Band	-40	-0	-40	0 [-6]	-(-) [-5 (-1)]	-(-) [-1(-5)]
Downsizing (C. Wood)	-190	-168	-22	-62 [-]	-55 (-9) [-(-)]	-7(-53) [-(-)]
Downsizing (Main Post)	-494	-252	-241	-92 [-35]	-83(-13) [-32(-5)]	-9(-79) [-3(-30)]
Total		+2,218	-982	+887 [-49]	+807 (+124) [-39 (-6)]	+82(+765) [-5(-43)]

Note: 000-AM Peak Hour
(000)-PM Peak Hour
[ ]-Military Trips

Trip Distribution

It is necessary to estimate trip distribution to achieve an understanding of the destination and routing of vehicle trips associated with the realignment.

Trip distribution estimates for the BRAC action (movement of personnel from the CECOM Office Building, Vint Hill and Evans subpost) were estimated based on the general location of existing Fort Monmouth personnel. A data base file containing personnel residence location and zip codes was evaluated. Personnel were categorized by the route most likely to travel to and from Fort Monmouth. The results of this analysis are summarized in Table 4 below and are depicted in Figure 4.

In an attempt to verify the trip distribution results, a 1990 count at the entrance to CECOM was

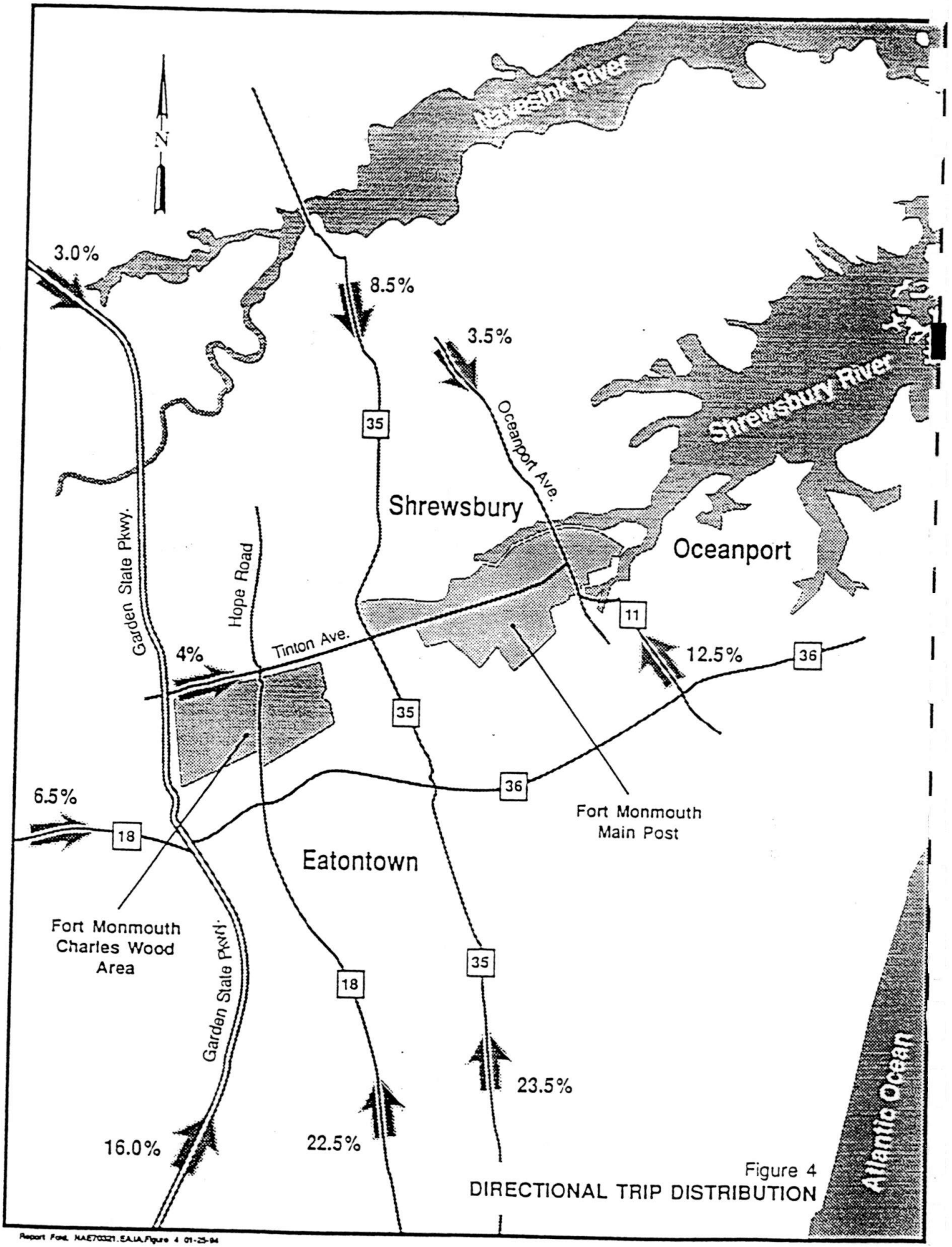

Figure 4
DIRECTIONAL TRIP DISTRIBUTION

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referenced. In general, the existing count was sufficient to obtain an approximation of existing trip distribution. The existing count verified the reasonableness of the trip distribution estimate.

Table 4
Trip Distribution at Fort Monmouth

Cardinal Direction	Route Travelled	Percent Arriving by Direction
N	SB SR 35	8.5
NE	SB Oceanport Ave	3.5
E	NB Oceanport Ave	12.5
SE	NB 35	23.5
S	WB SR 18	22.5
SW	NB Garden State Pkwy	16
W	EB SR 18	6.5
NW	SB Garden State Pkwy	3.0
W(Internal)	EB Tinton Ave	4.0
	Total	100%

Assignment of Traffic

The final step in travel forecasting is to assign trips to the local street system. This was accomplished by routing vehicles to and from the Main Post and Charles Wood and applying the above trip generation and trip distribution. Due to the size of the study area a manual traffic assignment process was used wherein logical vehicle routings were used based on the trip distribution.

The year 1996 was selected as a base year for analysis purposes. A worst-case scenario was considered, whereby all BRAC actions would be implemented by the year 1996. It was therefore necessary to adjust the 1993 traffic assignment to reflect the 1996 base year.

To account for regional traffic growth that would take place by 1996 a growth factor of 1.5 percent per year was uniformly applied to the 1993 traffic assignment. This factor was applied to non-post traffic only.

1996 Peak Hour Traffic Forecast

The development of the 1996 peak hour traffic forecast is depicted by the flow chart in Figure 5. An "unrestricted" 1996 peak hour forecast was developed. "Unrestricted" refers to how traffic was routed into and out of the base. For purposes of determining traffic impacts, traffic was assigned to the closest accessible gate without restriction of access to any gate. Based on conversations with base personnel, an alternative would be to restrict access to the West Gate to certain activities (e.g., CECOM only). By developing an "unrestricted" assignment, a worst case scenario in terms of the magnitude of traffic at the West Gate was developed.

Furthermore, restricting access at the West Gate to specific base activities may result in undesirable traffic circulation or circuitous movements, increased vehicle miles of travel, and possible increased congestion at other intersection locations (i.e., the problem may be moved to another location).

As Figure 5 indicates, the process of assigning traffic consisted of the following steps:

- Subtract existing CECOM traffic from the 1993 assignment
- Factor remaining base peak hour traffic for an AVO of 1.40 (as mandated by the Clean Air Act)
- Apply a traffic growth factor of 1.5 percent per year up to 1996
- Apply trip generation and trip distribution and add to 1993 assignment

Summary of Traffic Impacts

The 1996 peak hour traffic forecast is shown in Figure 6. Future traffic volumes and capacity/levels of service are quantified below.

Future Traffic

AM and PM peak hour turning movements at Fort Monmouth are shown in Figure 6. Estimated increases in peak hour traffic from 1993 (existing) to 1996 (BRAC plan in place) are documented in Figure 7. The BRAC action for Fort Monmouth will result in increased traffic growth along several

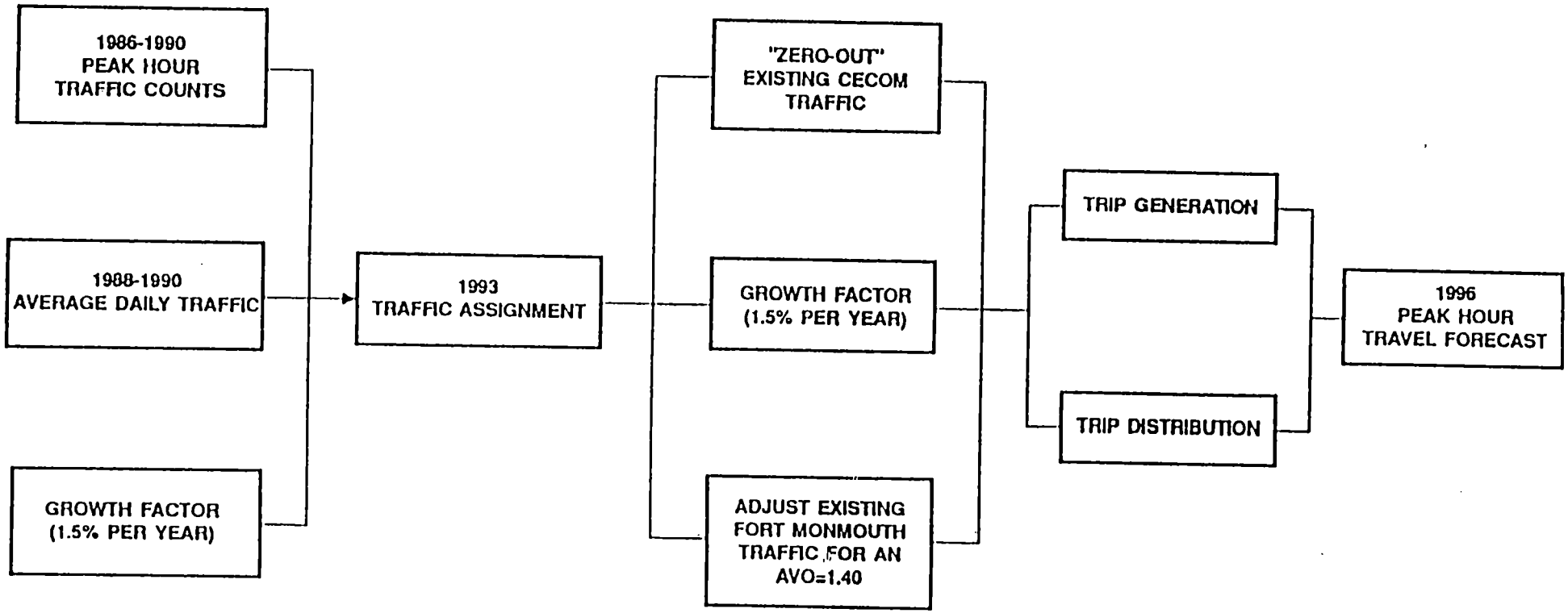
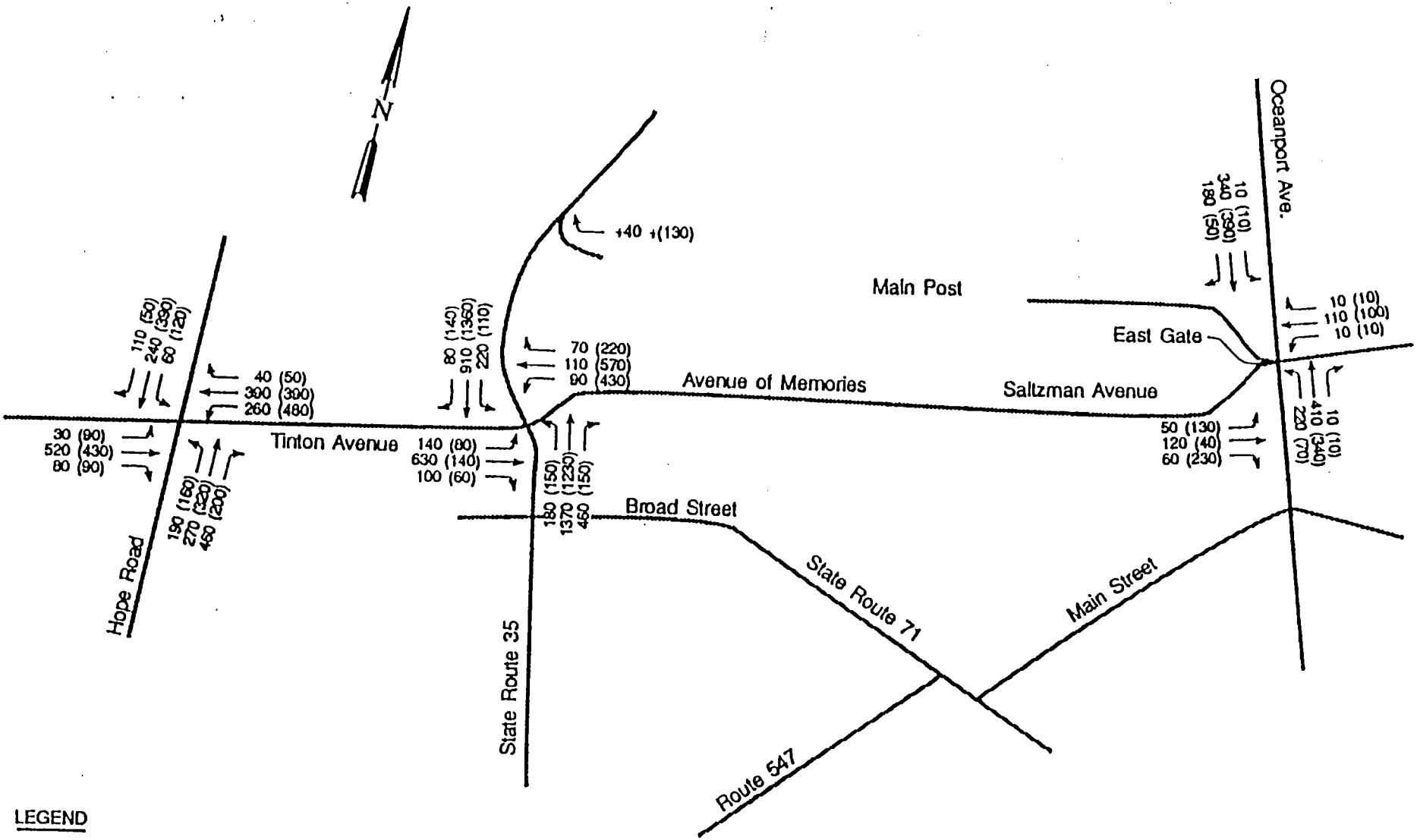


Figure 5
TRAVEL FORECASTING PROCESS



LEGEND

000 - AM PEAK HOUR VOLUME

(000) - PM PEAK HOUR VOLUME

Figure 6

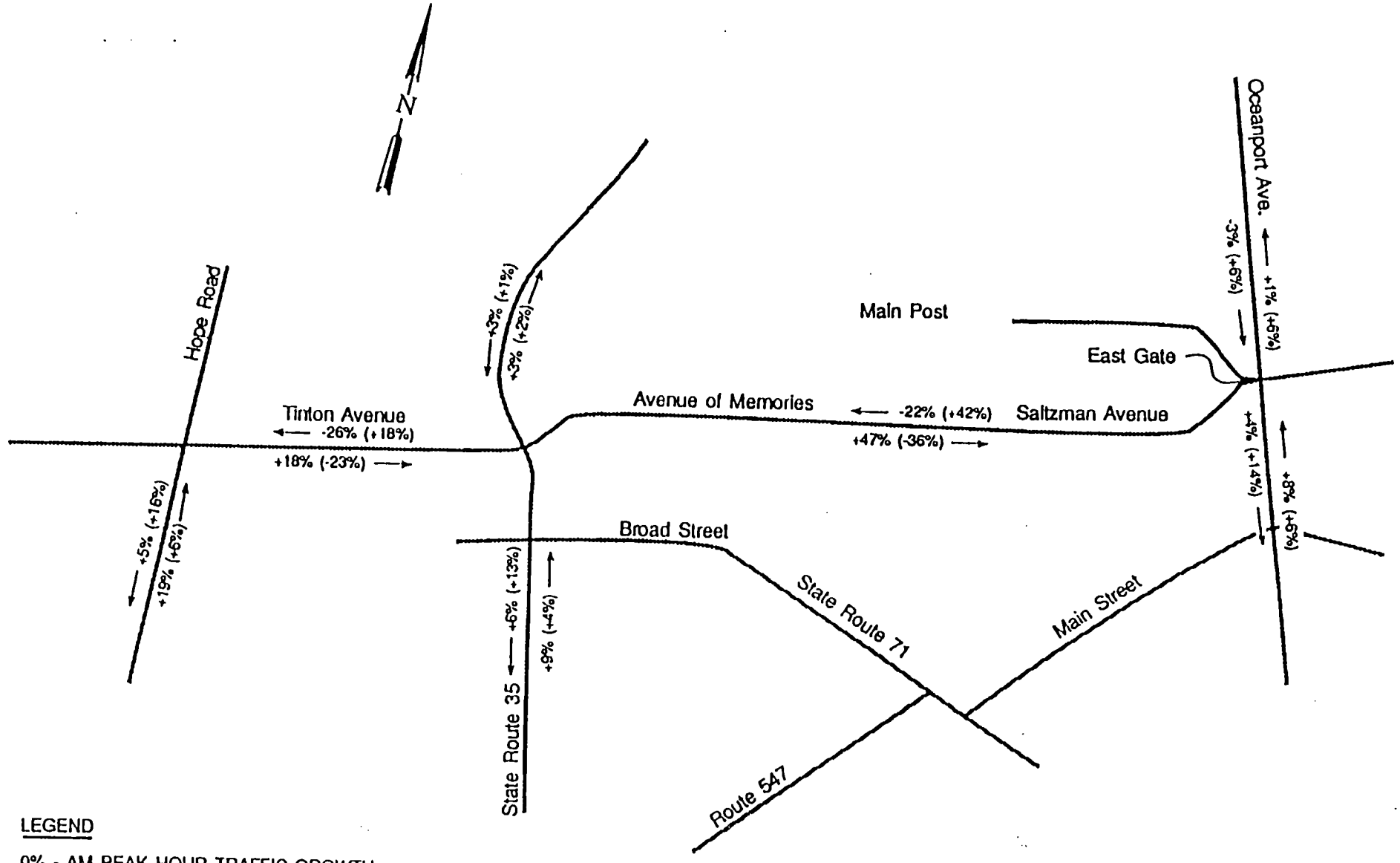


Figure 7
ESTIMATED INCREASE IN PEAK HOUR TRAFFIC (1993-1996)

roadways. Traffic increases are estimated to be the heaviest to and from the south and to and from the west. Traffic increases of 9 to 13 percent during the peak period peak direction, are forecast on SR 35 south of Tinton Avenue. To the west along Tinton Avenue peak period traffic is estimated to increase by approximately 18 percent in the peak direction.

Increases in peak hour traffic are also predicted along Hope Road and Oceanport Avenue. South of Tinton Avenue along Hope Road peak hour traffic is estimated to increase 16 to 19 percent during the peak period in the peak direction. North of the East Gate intersection along Oceanport Avenue, traffic increases of up to 6 percent are forecasted, while south of East Gate, traffic increase is expected on the order of 8 to 14 percent in the peak direction.

1996 Operational Analysis

Table 5 summarizes the results of intersection operational analyses for the signalized intersections based on 1996 peak hour traffic forecasts and no geometric changes to the street system or intersections. At Hope Road and Tinton Avenue, future operation of the signalized intersection remains basically unchanged relative to the existing condition. While traffic growth in the peak direction is anticipated at all approaches to this intersection, the relocation of CECOM to Main Post from the leased area to the west will improve traffic patterns. The change in traffic pattern and the resulting forecasted traffic at Hope Road and Tinton Avenue are more efficiently accommodated by the existing geometry.

The resulting changes in traffic patterns result in average stopped delay per vehicle and v/c ratios similar to 1993. Note, however that during the PM peak period operations remain critical with LOS E and a v/c=0.94 reported. This represents an intersection that operates at capacity.

At SR 35 and Tinton Avenue (West Gate) future operations at the signalized intersection are predicted to become more critical. LOS E was computed for the AM and PM peak hours respectively, while v/c ratios are approaching or at 1.0. This is primarily the result of the increased east-to-south left-turn movement in the PM peak hour, the increased northbound-to-eastbound right-turn movement in the AM peak and the increase in traffic to and from the west along Tinton Avenue into Main Post. The implications of this condition are increased delays at the intersection, longer vehicle queues and a greater percentage of vehicles requiring more than one signal cycle to travel through the intersection.

At Oceanport Avenue and East Gate, lower levels of service (that is, stopped delays) and higher v/c ratios were calculated. However, the analysis indicates that the LOS and v/c ratios are well within

acceptable limits and there is a sufficient level of reserve capacity to accommodate the projected increase in traffic demand.

Table 5
Future (1996) Signalized Intersection Operational Analysis After BRAC Action

Intersection	Level of Service		Average Stopped Delay (sec)		v/c	
	AM	PM	AM	PM	AM	PM
Hope Road and Tinton Avenue	C	E	20.6	41.0	0.79	0.94
SR 35 and Tinton Avenue (West Gate)	E	E	45.7	45.5	1.00	0.97
Oceanport Avenue and East Gate	B	B	7.5	7.5	0.44	0.46

1996 Operational Analysis Before BRAC Action

For comparison purposes future operation of the roadway network and associated intersections in 1996 assuming no BRAC action was considered. To accomplish this the 1993 peak hour traffic assignment was factored up to represent 1996 traffic using a growth factor of 1.5 percent per year. This factor was applied to all non-post traffic. In addition, peak period traffic was adjusted to account for downsizing associated with attrition (Force Change). Table 6 summarizes the signalized intersection analysis.

Table 6
Future (1996) Signalized Intersection Operational Analysis Without BRAC Action

Intersection	Level of Service		Average Stopped Delay (sec)		v/c	
	AM	PM	AM	PM	AM	PM
Hope Road and Tinton Avenue	D	E	30.4	47.3	0.93	1.00
SR 35 and Tinton Avenue (West Gate)	C	C	24.4	21.6	0.90	0.83
Oceanport Avenue and East Gate	B	B	7.10	6.90	0.40	0.36

The analysis indicates that future peak hour operations will remain critical at the intersection of Tinton Avenue and Hope Road during the PM peak. At the intersection of SR 35 and Tinton Avenue increased traffic demand will result in traffic operations similar to those today, with the potential for improved operations. The intersection of Oceanport Avenue and East Gate remains well under capacity.

Future Transportation Needs

The following discussion focuses on traffic control improvements that would alleviate traffic impacts resulting from the proposed Fort Monmouth BRAC action.

Intersection Improvements

Analysis of forecasted traffic at the signalized intersections identified the need for future improvements or actions at the intersections of Tinton Avenue and Hope Road and Tinton Avenue (West Gate) and SR 35.

At Tinton Avenue and Hope Road, no significant change in operation was predicted to occur as a result of the BRAC action. Intersection improvements are, however, needed at this intersection to accommodate existing traffic demand at an acceptable level of operation. The following measures would improve conditions at this intersection:

- Northbound along Hope Road a right turn lane could be striped out of the existing pavement. Note that this would not require widening of the existing pavement.

- Westbound along Tinton Avenue consideration should be given to providing a dual left turn lane. This would require some widening and reconstruction of the intersection.

At the intersection of Tinton Avenue (West Gate) and SR 35, conditions after the proposed action are roughly comparable to current conditions. The volume to capacity ratios are equivalent, however the stopped delay increases slightly. The following intersection improvements would improve conditions at this intersection.

- Northbound along SR 35 an exclusive right turn lane should be implemented. The actual effectiveness of this lane will be a function of its storage capacity. Storage capacity will likely be restricted by the location of the existing bridge south of the intersection. It appears that a right-turn lane of approximately 150 to 200 feet could be constructed without affecting the bridge.

- AM and PM peak period left-turn restrictions (6:00 AM-9:00 AM and 3:00 PM-6:00 PM) should be implemented along the eastbound approach of Tinton Avenue.

Improvements should also be considered at the two secondary gates located off of SR 71 at Academy Drive and off of Main Street. Improved access/egress at these two unsignalized gates may result in diversion of traffic from the East and West gates, thus improving conditions at those locations. The following improvements should be considered:

- Develop a left-turn lane on the westbound approach to Academy Drive to provide left-turn protection and to encourage access to the base at this location. At this location it is possible to stripe out the existing pavement to provide this lane without widening the existing pavement.

- Provide improved capacity at the egress point located along Main Street. Left and right turn lanes out of Main Post are recommended.

Transportation Demand Management Solutions

A number of traffic demand management (TDM) solutions may also help to minimize existing and future traffic problems. TDM solutions offer less costly and less environmentally intrusive alternatives compared to intersection channelization improvements or roadway widening. Some of these will be necessary to meet the required AVO ratio of 1.40 used to compute the 1996 traffic forecast. The following TDMs are recommended for implementation:

- Extending flexible working hours for as many activities at Fort Monmouth as possible.

- Providing incentives such as preferred parking spaces for high occupancy vehicles (HOVs), which could help achieve an AVO greater than 1.40.

- Limiting the number of parking spaces provided by setting aside HOV parking only.

Other TDMs that should be considered include:

- The development of a future park-n-ride facility near the base, providing shuttle service from the park-n-ride lot to Fort Monmouth activities.

- Development of economic incentives for employees to use other modes of travel.

Table 7 documents the results of 1996 peak hour traffic after the proposed BRAC action with geometric improvements. The analysis indicates that future operations at the signalized intersections would be similar to or slightly better than existing operating conditions.

Table 7
Future (1996) Signalized Intersection Operational Analysis with Improvements

Intersection	Level of Service		Average Stopped Delay (sec)		v/c	
	AM	PM	AM	PM	AM	PM
Hope Road and Tinton Avenue[1]	C	D	21.1	29.5	0.77	0.85
SR 35 and Tinton Avenue (West Gate)[2]	C	D	17.0	27.8	0.79	0.91
Oceanport Avenue and East Gate[3]	B	B	7.5	7.5	0.44	0.46

[1] Hope Road and Tinton Avenue: Stripe out NB right turn lane, add WB dual left turn lane.
[2] SR 35 and Tinton Avenue: Add NB right turn lane, implement EB peak hour left-turn restrictions.
[3] No recommended improvements

Long-Term Improvements

A number of long-term improvements are recommended for consideration. These improvements may be necessary in future years as regional traffic levels continue to increase. These improvements are intended to reflect the potential for increased travel demand in the study area resulting from increased development or other traffic-generating conditions. As the need arises, the following long-term improvements should be considered.

- Develop dual left-turn lane westbound at the intersection of West Gate (Tinton Ave) and SR 35.
- Develop left-turn lane eastbound at Tinton Ave (West Gate) and SR 35.
- Expand the cross section along Tinton Avenue between Hope Road and SR 35 to two lanes in each direction of travel.
- Provide signalization of the secondary access/egress points to Main Post along SR 71 and Main Street.

Because traffic impacts associated with the BRAC action do not appear significant, no mitigation measures are warranted at this time. However, due to current high-volume traffic conditions, the operating condition of Tinton Avenue, Hope Road and the intersection of Tinton Avenue and SR 35 should be monitored. The recommendations described in this report should be considered if and when conditions at these intersections deteriorate.

Alternative BRAC Action at Fort Monmouth

Alternative 2 of the BRAC action would be to relocate the IEWD complex at Charles Wood rather than Main Post. The effect of this alternative is described below.

Trip Generation

The number of potential trips generated at Charles Wood associated with the relocation of the IEWD complex was based on 292 civilian positions. Peak period trip generation based on assumptions described above amounted to approximately 110 trip ends. To verify this, trip ends were calculated assuming ITE techniques (assuming general office, number of positions and square feet office). ITE computed peak period trip ends equal to approximately 150 trips.

Recommended Improvements

To assess impacts related to the IEWD complex located at Charles Wood, ITE-generated rates were used. Because ITE-generated trips ends are higher this will predict the highest level of impacts.

Based on the number of trip ends generated by the proposed IEWD complex, improvements above and beyond those described previously are not recommended.

Summary and Conclusions

This study investigated the existing operating condition the roadway network surrounding Fort Monmouth and identified the amount and impacts of traffic associated with the proposed BRAC action at Fort Monmouth. The study measured impacts against an estimated "base" condition. The following provides a summary of the findings of this report.

Existing Conditions

- Hope Road and Tinton Avenue intersection is near or at capacity today, with little or no reserve capacity.

- Existing traffic volumes along Tinton Avenue between Hope Road and SR 35 indicate Tinton Avenue is approaching its functional capacity.

- The existing operation of the signalized intersection of Tinton Avenue and SR 35 is near capacity.

- Operation of all other access points to Fort Monmouth, Main Post and Charles Wood is well within existing capacity.

Alternative 1 Conditions

- As a result of the BRAC action, increases in peak hour traffic volumes are forecasted along all major streets. Forecasts were based on generally accepted trip generation relationships and distribution assumptions. Estimated traffic increases along SR 35 and Tinton Avenue in the peak hour and peak direction are approximately 13 percent and 18 percent respectively.

- The changes in traffic patterns that are predicted to occur at the intersection of Hope Road and Tinton Avenue as a result of the BRAC action result in future intersection operations that are no worse than 1993 conditions.

- At the intersection of SR 35 and Tinton Avenue (West Gate) future operating conditions would remain similar to 1993 conditions. Volume to capacity ratios, which measure the traffic carrying capacity of an intersection to its predicted demand is not predicated to increase. Level of service and average stopped delay is estimated to increase. The level of increase in average stopped delay is not considered significant.

- Future operating condition at the East Gate and Oceanport Avenue remains acceptable and well within the intersections functional capacity. No impact is identified.

- Increased peak hour traffic volumes on north-south roadways and east-west roadways can be accommodated within their present cross section and traffic control.

Alternative 2 Conditions

- Peak hour traffic into and out of Charles Wood would increase by 110 to 150 vehicles over Alternative 1.

- The increase in peak hour traffic at Charles Wood would result in similar traffic operations in the Charles Wood area as predicted by Alternative 1. Additional impacts were not identified.

- The analysis of Alternative 2 traffic operations at Main Post resulted in similar traffic operations at SR 35 and West Gate and Oceanport Avenue and East Gate as predicated by Alternative 1.

Potential Improvements

- Intersection improvements should be considered at Hope Road and Tinton Avenue and at Tinton Avenue (West Gate) and SR 35. These improvements are not needed based on the proposed action alone, but to improve current conditions.

- Improvements to the secondary access points should be considered to facilitate movement in and movement out of Main Post.

- The need for TDM solutions is essential to accommodate future traffic demand. The analysis of traffic conditions has assumed successful TDM programs have been fully implemented at the time of the BRAC action. This assumption is key to the results predicted in the traffic analysis.

- Failing to improve the automobile vehicle occupancy at Fort Monmouth could result in the need for intersection improvements beyond what is recommended in this report.

- Successful implementation of the recommended improvements would alleviate current traffic congestion and improve the future conditions.

- The operating condition of the local street system and internal roadway network should be monitored. If critical operations are identified one or more of the recommended improvements should be considered.

Potential operational problems and traffic impacts should be viewed with respect to a number of factors beyond the control of Fort Monmouth. This study did not attempt to identify or account for development in other neighboring communities or within Monmouth County. Currently, Monmouth county is conducting a comprehensive traffic study within the county, which includes Fort Monmouth. This study should be referenced for potential additional needs not identified as part of this report.

SIGNALIZED INTERSECTION ANALYSES

TINTON AVENUE AND HOPE ROAD

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) EAST GATE (HARTMAN) (N-S) OCEANPORT
Analyst: RWS File Name: OPEGAM96.HC9
Area Type: Other 3-8-94 AM PEAK
Comment: 1996 TRAFFIC BEFORE BRAC ACTION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1 <		1	1	1	1	1 <	
Volumes	50	120	50	10	110	10	120	410	10	10	335	140
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
WB Left	*				SB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	21.0P				Green	33.0P		
Yellow/A-R	3.0				Yellow/A-	3.0		
Lost Time	3.0				Lost Time	2.0		

Cycle Length: 60.0 secsPhase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	520	1486	0.11	0.35	10.0	B	10.2	B
	T	658	1881	0.20	0.35	10.4	B		
	R	560	1599	0.10	0.35	10.0	B		
WB	L	472	1348	0.02	0.35	9.7	B	10.3	B
	TR	650	1858	0.20	0.35	10.4	B		
NB	L	478	843	0.28	0.57	5.2	B	5.7	B
	T	1049	1852	0.43	0.57	5.9	B		
	R	906	1599	0.01	0.57	4.3	A		
SB	L	530	935	0.02	0.57	4.3	A	6.5	B
	TR	1002	1769	0.53	0.57	6.5	B		

Intersection Delay = 7.1 sec/veh Intersection LOS = B

V/c = 0.40

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) EAST GATE (HARTMAN) (N-S) OCEANPORT
Analyst: RWS File Name: OPEGPM96.HC9
Area Type: Other 3-8-94 PM PEAK
Comment: EXISTING CONDITIONS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	<	1	1	1	1	1	<
Volumes	75	10	115	10	80	10	50	355	10	10	390	30
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
WB Left	*				SB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	21.0P				Green	33.0P		
Yellow/A-R	3.0				Yellow/A-	3.0		
Lost Time	3.0				Lost Time	2.0		

Cycle Length: 60.0 secs Phase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	546	1561	0.15	0.35	10.2	B	10.3	B
	T	658	1881	0.02	0.35	9.7	B		
	R	560	1599	0.23	0.35	10.5	B		
WB	L	515	1471	0.02	0.35	9.7	B	10.1	B
	TR	648	1850	0.15	0.35	10.2	B		
NB	L	531	937	0.11	0.57	4.6	A	5.4	B
	T	1049	1852	0.38	0.57	5.5	B		
	R	906	1599	0.01	0.57	4.3	A		
SB	L	584	1030	0.02	0.57	4.3	A	5.9	B
	TR	1039	1833	0.45	0.57	6.0	B		

Intersection Delay = 6.9 sec/veh Intersection LOS = B

Y/C = 0.36

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) EAST GATE (HARTMAN) (N-S) OCEANPORT
Analyst: RWS File Name: OPEGAMFC.HC9
Area Type: Other 3-8-94 AM PEAK
Comment: FUTURE CONDITIONS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	<	1	1	1	1	1	<
Volumes	50	120	60	10	110	10	220	410	10	10	340	180
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Left					*			
Thru					*			
Right					*			
Peds								
SB Left					*			
Thru					*			
Right					*			
Peds								
NB Right								
SB Right								
EB Right								
WB Right								
Green	21.0P				33.0P			
Yellow/A-R	3.0				3.0			
Lost Time	3.0				2.0			

Cycle Length: 60.0 secsPhase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	520	1486	0.11	0.35	10.0	B	10.2	B
	T	658	1881	0.20	0.35	10.4	B		
	R	560	1599	0.12	0.35	10.1	B		
WB	L	462	1321	0.02	0.35	9.7	B	10.3	B
	TR	650	1858	0.20	0.35	10.4	B		
NB	L	436	770	0.56	0.57	7.5	B	6.4	B
	T	1049	1852	0.43	0.57	5.9	B		
	R	906	1599	0.01	0.57	4.3	A		
SB	L	530	935	0.02	0.57	4.3	A	7.0	B
	TR	994	1755	0.58	0.57	7.0	B		

Intersection Delay = 7.5 sec/veh Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) EAST GATE (HARTMAN) (N-S) OCEANPORT
Analyst: RWS File Name: OPEGPMFC.HC9
Area Type: Other 3-8-94 PM PEAK
Comment: FUTURE CONDITIONS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	<	1	1	1	1	1	<
Volumes	130	40	230	10	110	10	70	340	10	10	390	50
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
WB Left	*				SB Left	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	21.0P				Green	33.0P		
Yellow/A-R	3.0				Yellow/A-	3.0		
Lost Time	2.0				Lost Time	2.0		

Cycle Length: 60.0 secsPhase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	545	1486	0.26	0.37	10.2	B	10.7	B
	T	690	1881	0.06	0.37	9.4	B		
	R	586	1599	0.44	0.37	11.2	B		
WB	L	401	1094	0.03	0.37	9.2	B	9.8	B
	TR	681	1858	0.20	0.37	9.9	B		
NB	L	511	902	0.15	0.57	4.7	A	5.3	B
	T	1049	1852	0.36	0.57	5.5	B		
	R	906	1599	0.01	0.57	4.3	A		
SB	L	598	1055	0.02	0.57	4.3	A	6.1	B
	TR	1032	1822	0.47	0.57	6.1	B		

Intersection Delay = 7.5 sec/veh Intersection LOS = B

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) EAST GATE (HARTMAN) (N-S) OCEANPORT
Analyst: RWS File Name: OPEGEC.HC9
Area Type: Other 3-8-94 AM PEAK
Comment: EXISTING CONDITIONS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	<	1	1	1	1	1	<
Volumes	60	150	70	10	160	10	190	395	10	10	325	210
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	21.0P				33.0P			
Yellow/A-R	3.0				3.0			
Lost Time	3.0				2.0			

Cycle Length: 60.0 secsPhase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	474	1354	0.14	0.35	10.1	B	10.4	B
	T	658	1881	0.25	0.35	10.6	B		
	R	560	1599	0.14	0.35	10.1	B		
WB	L	424	1212	0.03	0.35	9.7	B	10.7	B
	TR	652	1864	0.29	0.35	10.8	B		
NB	L	423	746	0.50	0.57	6.8	B	6.1	B
	T	1049	1852	0.42	0.57	5.8	B		
	R	906	1599	0.01	0.57	4.3	A		
SB	L	545	961	0.02	0.57	4.3	A	7.2	B
	TR	988	1744	0.60	0.57	7.2	B		

Intersection Delay = 7.7 sec/veh Intersection LOS = B

v/c = 0.48

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) EAST GATE (HARTMAN) (N-S) OCEANPORT
Analyst: RWS File Name: OPEGPMEC.HC9
Area Type: Other 3-8-94 PM PEAK
Comment: EXISTING CONDITIONS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	1	1	1	<	1	1	1	1	1	<
Volumes	120	70	170	10	160	10	60	325	10	10	375	40
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	21.0P				33.0P			
Yellow/A-R	3.0				3.0			
Lost Time	3.0				2.0			

Cycle Length: 60.0 secsPhase combination order: #1 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	474	1354	0.28	0.35	10.8	B	10.8	B
	T	658	1881	0.12	0.35	10.1	B		
	R	560	1599	0.34	0.35	11.1	B		
WB	L	406	1159	0.03	0.35	9.7	B	10.7	B
	TR	652	1864	0.29	0.35	10.8	B		
NB	L	535	944	0.13	0.57	4.6	A	5.3	B
	T	1049	1852	0.34	0.57	5.4	B		
	R	906	1599	0.01	0.57	4.3	A		
SB	L	613	1082	0.02	0.57	4.3	A	5.9	B
	TR	1034	1825	0.45	0.57	5.9	B		

Intersection Delay = 7.6 sec/veh Intersection LOS = B
Lost Time/Cycle, L = 5.0 sec Critical v/c(x) = 0.405

SIGNALIZED INTERSECTION ANALYSES

EAST GATE (HARTMAN) AND OCEANPORT AVENUE

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994

Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35

Analyst: RWS File Name: 35WGE96.HC9

Area Type: Other 1-20-94 AM PEAK

Comment: 1996 TRAFFIC BEFORE BRAC ACTION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2	<	1	1	1	1	2	<	1	2	<
Volumes	150	300	115	40	190	60	310	1370	110	100	910	140
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			73			24		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*				NB Left *	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
WB Left	*				SB Left *	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right *			
Green	25.0P				Green 14.0P	42.0P		
Yellow/A-R	3.0				Yellow/A- 3.0	3.0		
Lost Time	2.0				Lost Time 2.0	2.0		

Cycle Length: 90.0 secsPhase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	LTR	812	2810	0.81	0.29	27.0	D	27.0	D
WB	L	171	592	0.26	0.29	18.9	C	17.5	C
	T	543	1881	0.39	0.29	19.7	C		
	R	764	1599	0.09	0.48	9.7	B		
NB	L	298	1787	0.91	0.67	31.0	D	31.2	D
	TR	1752	3666	0.99	0.48	31.3	D		
SB	L	298	1787	0.29	0.67	4.9	A	14.2	B
	TR	1736	3633	0.71	0.48	15.0	B		

Intersection Delay = 24.4 sec/veh Intersection LOS = C

Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.897

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGPM96.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: 1996 TRAFFIC BEFORE BRAC ACTION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2	<	1	1	1	1	2	<	1	2	<
Volumes	140	275	115	100	280	100	160	1230	100	100	1360	150
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			65			41		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	31.0P				6.0P	44.0P		
Yellow/A-R	3.0				3.0	3.0		
Lost Time	2.0				2.0	2.0		

NB Left * *
NB Thru *
NB Right *
NB Peds
SB Left * *
SB Thru *
SB Right *
SB Peds
EB Right
WB Right *

Cycle Length: 90.0 secsPhase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	LTR	895	2518	0.69	0.36	20.4	C	20.4	C
WB	L	248	697	0.45	0.36	17.8	C	16.1	C
	T	669	1881	0.47	0.36	17.4	C		
	R	728	1599	0.15	0.46	10.9	B		
NB	L	139	1787	0.81	0.60	30.3	D	19.0	C
	TR	1830	3661	0.85	0.50	17.7	C		
SB	L	139	1787	0.50	0.60	10.3	B	25.9	D
	TR	1824	3649	0.97	0.50	26.9	D		

Intersection Delay = 21.6 sec/veh Intersection LOS = C
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.829

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGAMFF.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: FUTURE CONDITION-WITH IMPROVEMENTS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		2	<	1	1	1	1	2	1	1	2	<
Volumes		630	100	85	110	70	180	1370	460	220	910	80
HF or PK15		0.90	0.90	0.95	0.90	0.90	0.90	0.90	0.95	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
Heavy Veh		2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type		3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			46			55		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left					NB Left	*	*	
Thru	*				Thru		*	
Right	*				Right		*	
Peds					Peds			
Left	*				SB Left	*	*	
Thru	*				Thru		*	
Right	*				Right		*	
Peds					Peds			
Right					EB Right			
SB Right					WB Right	*		
Green	25.0P				Green	12.0P	44.0P	
Yellow/A-R	3.0				Yellow/A-	3.0	3.0	
Lost Time	2.0				Lost Time	2.0	2.0	

Cycle Length: 90.0 secsPhase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	TR	1065	3687	0.76	0.29	24.5	C	24.5	C
WB	L	134	464	0.66	0.29	29.2	D	19.7	C
	T	543	1881	0.22	0.29	18.5	C		
	R	728	1599	0.11	0.46	10.7	B		
NB	L	258	1787	0.60	0.67	9.0	B	16.4	C
	T	1852	3705	0.86	0.50	18.2	C		
	R	800	1599	0.61	0.50	13.2	B		
SB	L	258	1787	0.73	0.67	14.3	B	13.2	B
	TR	1830	3661	0.63	0.50	13.0	B		

Intersection Delay = 17.0 sec/veh Intersection LOS = C
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.792

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGPMFF.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: FUTURE CONDITION-WITH IMPROVEMENTS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		2	<	1	1	1	1	2	1	1	2	<
Volumes		140	60	430	570	220	150	1230	150	110	1360	140
PHF or PK15		0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh		2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type		3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			85			64			47		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left								
Thru	*							
Right	*							
Peds								
WB Left	*	*						
Thru	*	*						
Right	*	*						
Peds								
NB Right		*						
SB Right								
Green	12.0P	23.0P						
Yellow/A-R	3.0	3.0						
Lost Time	2.0	2.0						
NB Left					*	*		
Thru						*		
Right						*		
Peds								
SB Left					*	*		
Thru						*		
Right						*		
Peds								
EB Right								
WB Right					*			
Green					6.0P	47.0P		
Yellow/A-					3.0	3.0		
Lost Time					2.0	2.0		

Cycle Length: 100.0 secsPhase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	TR	465	3574	0.50	0.13	31.5	D	31.5	D
WB	L	429	1787	0.92	0.39	39.3	D	29.4	D
	T	734	1881	0.86	0.39	28.6	D		
	R	768	1599	0.32	0.48	12.2	B		
NB	L	125	1787	0.82	0.57	35.9	D	18.9	C
	T	1778	3705	0.81	0.48	18.8	C		
	R	1151	1599	0.15	0.72	3.3	A		
SB	L	125	1787	0.60	0.57	16.0	C	34.4	D
	TR	1754	3655	1.00	0.48	35.7	D		

Intersection Delay = 27.8 sec/veh Intersection LOS = D
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.909

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGAMEF.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: FUTURE CONDITION-EXISTING CAPACITY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2	<	1	1	1	1	2	<	1	2	<
Volumes	140	630	100	85	110	70	180	1370	460	220	910	80
PHF or PK15	0.90	0.90	0.90	0.95	0.90	0.90	0.90	0.90	0.95	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			72			72		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*	*			NB Left *	*		
Thru	*	*			Thru	*		
Right	*	*			Right	*		
Peds					Peds			
WB Left	*				SB Left *	*		
Thru	*				Thru	*		
Right	*				Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right *			
Green	8.0P	18.0P			Green 9.0P	53.0P		
Yellow/A-R	3.0	3.0			Yellow/A- 3.0	3.0		
Lost Time	2.0	2.0			Lost Time 2.0	2.0		

Cycle Length: 100.0 secsPhase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	LTR	1073	3576	0.90	0.30	33.1	D	33.1	D
WB	L	75	836	1.18	0.09	208.7	F	89.5	F
	T	169	1881	0.72	0.09	42.9	E		
	R	304	1599	0.26	0.19	26.3	D		
NB	L	179	1787	0.72	0.66	16.9	C	61.6	F
	TR	1929	3572	1.09	0.54	65.8	F		
SB	L	179	1787	0.96	0.66	53.5	E	19.3	C
	TR	1977	3661	0.58	0.54	12.1	B		

Intersection Delay = 45.7 sec/veh Intersection LOS = E
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.996

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGPMEF.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: FUTURE CONDITION-EXISTING CAPACITY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2	<	1	1	1	1	2	<	1	2	<
Volumes	80	140	60	430	570	220	150	1230	150	110	1360	140
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			100			64			47		

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	*							
	Thru	*							
	Right	*							
	Peds								
WB	Left	*	*						
	Thru	*	*						
	Right	*	*						
	Peds								
NB	Right								
SB	Right								
Green		16.0P	21.0P						
Yellow/A-R		3.0	3.0						
Lost Time		2.0	2.0						

		5	6	7	8
NB	Left	*	*		
	Thru		*		
	Right		*		
	Peds				
SB	Left	*	*		
	Thru		*		
	Right		*		
	Peds				
EB	Right				
WB	Right	*			
Green		6.0P	45.0P		
Yellow/A-		3.0	3.0		
Lost Time		2.0	2.0		

Cycle Length: 100.0 secsPhase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	LTR	385	2262	0.85	0.17	42.2	E	42.2	E
WB	L	393	1787	0.96	0.41	47.9	E	30.6	D
	T	771	1881	0.82	0.41	24.9	C		
	R	800	1599	0.31	0.50	11.3	B		
NB	L	125	1787	0.82	0.55	36.7	D	30.8	D
	TR	1676	3644	0.96	0.46	30.2	D		
SB	L	125	1787	0.60	0.55	16.9	C	47.0	E
	TR	1681	3655	1.04	0.46	49.1	E		

Intersection Delay = 37.1 sec/veh Intersection LOS = D
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.930

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGEAM.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: EXISTING CONDITION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2	<	1	1	1	1	2	<	1	2	<
Volumes	145	510	110	50	240	70	300	1325	220	160	880	135
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			74			40		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*							
Thru	*							
Right	*							
Peds								
NB Right								
SB Right								
Green	28.0P							
Yellow/A-R	3.0							
Lost Time	2.0							
NB Left					*	*		
Thru						*		
Right						*		
Peds								
SB Left					*	*		
Thru						*		
Right						*		
Peds								
EB Right								
WB Right					*			
Green					13.0P	40.0P		
Yellow/A-					3.0	3.0		
Lost Time					2.0	2.0		

Cycle Length: 90.0 secsPhase combination order: #1 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	LTR	903	2802	0.99	0.32	43.5	E	43.5	E
WB	L	126	392	0.44	0.32	20.0	C	17.0	C
	T	606	1881	0.44	0.32	18.7	C		
	R	800	1599	0.10	0.50	9.0	B		
NB	L	278	1787	0.93	0.63	37.2	D	62.3	F
	TR	1652	3627	1.09	0.46	67.0	F		
SB	L	278	1787	0.50	0.63	7.9	B	15.0	B
	TR	1655	3633	0.72	0.46	16.1	C		

Intersection Delay = 41.6 sec/veh Intersection LOS = E
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 1.005

HCM: SIGNALIZED INTERSECTION SUMMARY 03-21-1994
Center For Microcomputers In Transportation

Streets: (E-W) Tinton Avenue (N-S) State Route 35
Analyst: RWS File Name: 35WGPMEF.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: FUTURE CONDITION-EXISTING CAPACITY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes		> 2 <		1	1	1	1	2 <		1	2 <	
Volumes	80	140	60	430	590	220	150	1230	150	110	1360	140
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	2	2	2	2	2	2	5	2	2	5	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			50			50			40		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*							
Thru	*							
Right	*							
Peds								
WB Left	*	*						
Thru	*	*						
Right	*	*						
Peds								
NB Right								
SB Right								
Green	17.0P	21.0P			6.0P	44.0P		
Yellow/A-R	3.0	3.0			3.0	3.0		
Lost Time	2.0	2.0			2.0	2.0		
NB Left					*	*		
Thru						*		
Right						*		
Peds								
SB Left					*	*		
Thru						*		
Right						*		
Peds								
EB Right								
WB Right					*			

Cycle Length: 100.0 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	Approach: LOS
EB	LTR	401	2225	0.83	0.18	39.8	D	39.8	D
WB	L	393	1787	1.09	0.42	88.6	F	44.5	E
	T	790	1881	0.83	0.42	24.9	C		
	R	815	1599	0.30	0.51	10.8	B		
NB	L	125	1787	0.94	0.54	59.7	E	36.7	D
	TR	1640	3644	0.98	0.45	34.3	D		
SB	L	125	1787	0.66	0.54	20.3	C	55.9	E
	TR	1644	3653	1.06	0.45	58.4	E		

Intersection Delay = 45.6 sec/veh Intersection LOS = E
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.973

SIGNALIZED INTERSECTION ANALYSES

TINTON AVENUE AND STATE ROUTE 35

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPAM96.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: 1996 TRAFFIC BEFORE BRAC ACTION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	1	<
Volumes	30	560	105	225	700	40	260	260	180	60	230	110
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	20			80			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*	*			NB Left	*		
Thru		*			Thru	*		
Right		*			Right	*		
Peds					Peds			
WB Left	*	*			SB Left	*		
Thru		*			Thru	*		
Right		*			Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	8.5P	39.0P			Green	33.5P		
Yellow/A-R	3.0	3.0			Yellow/A-	3.0		
Lost Time	2.0	2.0			Lost Time	2.0		

Cycle Length: 90.0 secsPhase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	189	1787	0.07	0.57	6.5	B	27.6	D
	TR	808	1817	0.92	0.44	28.6	D		
WB	L	189	1787	0.90	0.57	40.3	E	42.6	E
	TR	821	1848	1.00	0.44	43.3	E		
NB	L	318	829	0.91	0.38	40.3	E	24.3	C
	TR	1354	3531	0.38	0.38	15.3	C		
SB	L	356	929	0.19	0.38	14.0	B	16.7	C
	TR	687	1791	0.55	0.38	17.2	C		

Intersection Delay = 30.4 sec/veh Intersection LOS = D
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.930

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPPM96.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: 1996 TRAFFIC BEFORE BRAC ACTION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	1	<
Volumes	90	715	165	220	430	50	170	310	160	120	380	50
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	100			72			72			98		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*	*						
Thru		*						
Right		*						
Peds								
WB Left	*	*						
Thru		*						
Right		*						
Peds								
NB Left					*	*		
Thru						*		
Right						*		
Peds								
SB Left					*	*		
Thru						*		
Right						*		
Peds								
NB Right								
SB Right								
EB Right								
WB Right								
Green	9.0P	50.0P			6.0P	23.0P		
Yellow/A-R	3.0	3.0			3.0	3.0		
Lost Time	2.0	2.0			2.0	2.0		

Cycle Length: 100.0 secsPhase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	179	1787	0.00	0.63	0.0	A	54.4	E
	TR	923	1809	1.06	0.51	60.0	E		
WB	L	179	1787	0.96	0.63	54.6	E	26.4	D
	TR	935	1834	0.57	0.51	13.5	B		
NB	L	125	1787	0.94	0.33	68.1	F	37.6	D
	TR	857	3570	0.64	0.24	27.1	D		
SB	L	125	1787	0.28	0.33	19.1	C	73.1	F
	TR	443	1847	1.08	0.24	88.1	F		

Intersection Delay = 47.3 sec/veh Intersection LOS = E

ost Time/Cycle, L = 4.0 sec Critical v/c(x) = 1.001

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPAMFC.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: FUTURE CONDITION - WITH IMPROVEMENTS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1 <		2	1 <		1	2 <		1	1 <	
Volumes	30	520	80	260	390	40	190	270	460	60	240	110
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	33			0			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*	*			NB Left *			
Thru		*			Thru *			
Right		*			Right *			
Peds					Peds			
WB Left	*				SB Left *			
Thru		*			Thru *			
Right		*			Right *			
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	12.0P	37.0P			Green 32.0P			
Yellow/A-R	3.0	3.0			Yellow/A- 3.0			
Lost Time	2.0	2.0			Lost Time 2.0			

Cycle Length: 90.0 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Group: Mvmts	Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	258	1787	0.00	0.59	0.0	A	24.0	C
	TR	771	1826	0.87	0.42	25.1	D		
WB	L	500	3461	0.58	0.14	28.6	D	21.0	C
	TR	776	1837	0.61	0.42	16.5	C		
NB	L	286	781	0.74	0.37	25.3	D	20.6	C
	TR	1249	3406	0.68	0.37	19.4	C		
SB	L	196	534	0.34	0.37	16.1	C	18.2	C
	TR	658	1794	0.59	0.37	18.6	C		

Intersection Delay = 21.1 sec/veh Intersection LOS = C
Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.770

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPPMFF.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: FUTURE CONDITION WITH IMPROVEMENTS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	2	1	<	1	2	<	1	1	<
Volumes	90	430	90	480	390	50	160	320	200	120	390	50
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			0			72			78		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		*						
Thru		*						
Right		*						
Peds								
WB Left	*							
Thru	*	*						
Right	*	*						
Peds								
NB Right								
SB Right								
Green	21.0P	34.0P			6.0P	27.0P		
Yellow/A-R	3.0	3.0			3.0	3.0		
Lost Time	2.0	2.0			2.0	2.0		

Cycle Length: 100.0 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	178	508	0.56	0.35	23.0	C	34.0	D
	TR	635	1815	0.91	0.35	35.9	D		
WB	L	761	3461	0.70	0.22	29.3	D	19.6	C
	TR	1080	1831	0.45	0.59	8.9	B		
NB	L	125	1787	0.85	0.37	48.1	E	29.9	D
	TR	993	3548	0.61	0.28	24.6	C		
SB	L	125	1787	0.44	0.37	19.6	C	40.2	E
	TR	518	1850	0.94	0.28	45.9	E		

Intersection Delay = 29.5 sec/veh Intersection LOS = D

Lost Time/Cycle, L = 6.0 sec Critical v/c(x) = 0.847

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPAMFE.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: FUTURE CONDITION EXISTING CAPACITY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	1	<
Volumes	30	520	80	260	390	40	190	270	460	60	240	110
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	33			80			0			0		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*	*			NB Left	*		
Thru		*			Thru	*		
Right		*			Right	*		
Peds					Peds			
WB Left	*	*			SB Left	*		
Thru		*			Thru	*		
Right		*			Right	*		
Peds					Peds			
NB Right					EB Right			
SB Right					WB Right			
Green	12.0P	37.0P			Green	32.0P		
Yellow/A-R	3.0	3.0			Yellow/A-	3.0		
Lost Time	2.0	2.0			Lost Time	2.0		

Cycle Length: 90.0 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	258	1787	0.00	0.59	0.0	A	24.0	C
	TR	771	1826	0.87	0.42	25.1	D		
WB	L	258	1787	0.81	0.59	22.8	C	18.9	C
	TR	776	1837	0.61	0.42	16.5	C		
NB	L	286	781	0.74	0.37	25.3	D	20.6	C
	TR	1249	3406	0.68	0.37	19.4	C		
SB	L	196	534	0.34	0.37	16.1	C	18.2	C
	TR	658	1794	0.59	0.37	18.6	C		

Intersection Delay = 20.6 sec/veh Intersection LOS = C
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.787

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPPMFE.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: FUTURE CONDITION EXISTING CAPACITY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	1	<
Volumes	90	430	90	480	390	50	160	320	200	120	390	50
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	0			72			72			78		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left		*						
Thru		*						
Right		*						
Peds								
WB Left	*	*						
Thru	*	*						
Right	*	*						
Peds								
NB Right								
SB Right								
Green	28.0P	31.0P			6.0P	23.0P		
Yellow/A-R	3.0	3.0			3.0	3.0		
Lost Time	2.0	2.0			2.0	2.0		

NB	Left	*	*	
	Thru		*	
	Right		*	
	Peds			
SB	Left	*	*	
	Thru		*	
	Right		*	
	Peds			
EB	Right			
WB	Right			
Green		6.0P	23.0P	
Yellow/A-		3.0	3.0	
Lost Time		2.0	2.0	

Cycle Length: 100.0 secsPhase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	139	433	0.72	0.32	33.9	D	50.5	E
	TR	581	1815	1.00	0.32	53.3	E		
WB	L	518	1787	0.89	0.63	24.0	C	16.0	C
	TR	1154	1831	0.42	0.63	7.3	B		
NB	L	125	1787	0.85	0.33	49.8	E	33.3	D
	TR	852	3548	0.71	0.24	28.5	D		
SB	L	125	1787	0.44	0.33	21.6	C	81.7	F
	TR	444	1850	1.10	0.24	98.0	F		

Intersection Delay = 41.0 sec/veh Intersection LOS = E

Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.938

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPAMEC.HC9
Area Type: Other 1-20-94 AM PEAK
Comment: EXISTING CONDITION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	1	<
Volumes	30	570	100	220	680	40	260	260	250	60	230	110
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	20			80			0			0		

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	*	*						
	Thru		*						
	Right		*						
	Peds								
WB	Left	*	*						
	Thru		*						
	Right		*						
	Peds								
NB	Right								
SB	Right								
Green		8.5P	39.0P						
Yellow/A-R		3.0	3.0						
Lost Time		2.0	2.0						

		5	6	7	8
NB	Left	*			
	Thru	*			
	Right	*			
	Peds				
SB	Left	*			
	Thru	*			
	Right	*			
	Peds				
EB	Right				
WB	Right				
Green		33.5P			
Yellow/A-		3.0			
Lost Time		2.0			

Cycle Length: 90.0 secs Phase combination order: #1 #2 #5

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	189	1787	0.07	0.57	6.5	B	28.1	D
	TR	809	1820	0.92	0.44	29.1	D		
WB	L	189	1787	0.87	0.57	34.8	D	36.8	D
	TR	821	1847	0.97	0.44	37.5	D		
NB	L	318	829	0.91	0.38	40.3	E	23.8	C
	TR	1336	3485	0.45	0.38	15.8	C		
SB	L	317	827	0.21	0.38	14.2	B	16.8	C
	TR	686	1790	0.55	0.38	17.2	C		

Intersection Delay = 28.2 sec/veh Intersection LOS = D
Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 0.914

HCM: SIGNALIZED INTERSECTION SUMMARY 03-08-1994
Center For Microcomputers In Transportation

Streets: (E-W) TINTON AVE (N-S) HOPE RD
Analyst: RWS File Name: TNHPPMEC.HC9
Area Type: Other 1-20-94 PM PEAK
Comment: EXISTING CONDITION

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	1	1	<	1	1	<	1	2	<	1	1	<
Volumes	90	690	165	280	450	50	170	310	160	120	380	50
PHF or PK15	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Lane Width	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	
Grade		0			0			0			0	
% Heavy Veh	2	4	2	2	4	2	2	2	2	2	2	2
Parking	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Bus Stops			0			0			0			0
Con. Peds			0			0			0			0
Ped Button	(Y/N)	N		(Y/N)	N		(Y/N)	N		(Y/N)	N	
Arr Type	3	3	3	3	3	3	3	3	3	3	3	3
RTOR Vols			0			0			0			0
Prop. Share	0		0	0		0	0		0	0		0
Prop. Prot.												
Assign Perm	60			72			72			60		

Signal Operations

Phase Combination	1	2	3	4	5	6	7	8
EB Left	*	*			NB Left	*	*		
Thru		*			Thru		*		
Right		*			Right		*		
Peds					Peds				
WB Left	*	*			SB Left	*	*		
Thru		*			Thru		*		
Right		*			Right		*		
Peds					Peds				
NB Right					EB Right				
SB Right					WB Right				
Green	12.0P	48.0P			Green	6.0P	22.0P		
Yellow/A-R	3.0	3.0			Yellow/A-	3.0	3.0		
Lost Time	2.0	2.0			Lost Time	2.0	2.0		

Cycle Length: 100.0 secs Phase combination order: #1 #2 #5 #6

Intersection Performance Summary

	Lane Mvmts	Group: Cap	Adj Sat Flow	v/c Ratio	g/C Ratio	Delay	LOS	Approach: Delay	LOS
EB	L	232	1787	0.17	0.64	5.6	B	60.6	F
	TR	886	1808	1.07	0.49	66.4	F		
WB	L	232	1787	1.03	0.64	68.7	F	34.3	D
	TR	899	1834	0.62	0.49	15.1	C		
NB	L	125	1787	0.94	0.32	68.5	F	38.5	D
	TR	821	3570	0.67	0.23	28.1	D		
SB	L	125	1787	0.58	0.32	26.4	D	92.0	F
	TR	425	1848	1.12	0.23	110.3	F		

Intersection Delay = 54.5 sec/veh Intersection LOS = E

Lost Time/Cycle, L = 4.0 sec Critical v/c(x) = 1.024

RECORD OF NON-APPLICABILITY

Project/Action Name: Construction and Operation of New Credit Union Facility, Fort Monmouth Main Post, 400 Area

Project/Action Number: Not Applicable

Project/Action POC: Robert J. Melascaglia, DPW

Begin Date: ~ April 2000 (for construction)

End Date: ~ September 2000 (end date for construction and beginning date for operation)

Conformity under the Clean Air Act, Section 176 has been evaluated for the above described project per 40 CFR 51. The requirements of this rule are not applicable to this project/action because total direct and indirect emissions from the project/action have been estimated at 0.68 tons per year (TPY) for NO_x and 0.05 TPY for VOCs during construction (i.e., year 1), and 1.71 TPY for NO_x and 1.31 TPY for VOC during operation (i.e., all subsequent years after year 1), and these estimated levels are below the de minimus threshold established at 40 CFR 51.853(b) of 25 TPY for NO_x or VOCs in a severe non-attainment area for ozone.

In addition, the project/action is not considered "regionally significant" under 40 CFR 51.853(i).

The supporting documentation and emissions estimates are:

(X) ATTACHED

( ) ATTACHED TO NEPA DOCUMENT
(Reference the document)

( ) OTHER _____ (describe) _____

Dinkerrai Desai
Environmental Coordinator

Reviewed and Approved:

James Ott, P.E.
Director, Public Works

EMISSIONS ESTIMATE CALCULATIONS

CONSTRUCTION PHASE OF PROJECT (Year 1)

Grading Operations

- Conservatively assume that it takes one bulldozer, one excavator, one loader, and three dump trucks one work week (i.e., 5 days) to grade one acre. The subject site, which is 0.82 acre, is assumed to require approximately one acre of grading. Therefore, Operation Time = 5 days/yr x 8 hrs/day = 40 hrs/yr

- Emission Estimate = No. of pieces of equipment x Emission Factor (from attached AP 42 references) x operation time x 0.0005 tons/pound

NO_x Emissions:

1 bulldozer x 4.166 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.083 TPY
1 excavator x 1.691 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.034 TPY
1 loader x 1.89 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.038 TPY
3 dump trucks x 4.166 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.250 TPY
Total NO_x Emissions from grading operations:	0.405 TPY

VOC Emissions:

1 bulldozer x 0.192 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.0038 TPY
1 excavator x 0.152 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.0030 TPY
1 loader x 0.25 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.0050 TPY
3 dump trucks x 0.192 lbs/hr x 40 hrs/yr x 0.0005 tons/lb =	0.0115 TPY
Total VOC Emissions from grading operations:	0.0233 TPY

Building Construction Operations

- Conservatively assume that one crane will be needed to move/set framework for approximately 20 working days and that one forklift will be required to move masonry materials for 20 working days. Therefore, Operation Time = 20 days/yr x 8 hrs/day = 160 hrs/yr.

NO_x Emissions:

1 crane x 1.691 lbs/hr x 160 hrs/yr x 0.0005 tons/lb =	0.135 TPY
1 forklift x 1.691 lbs/hr x 160 hrs/yr x 0.0005 tons/lb =	0.135 TPY
Total NO_x Emissions from building construction operations:	0.270 TPY

VOC Emissions:

1 crane x 0.152 lbs/hr x 160 hrs/yr x 0.0005 tons/lb = 0.012 TPY
1 forklift x 0.152 lbs/hr x 160 hrs/yr x 0.0005 tons/lb = 0.012 TPY

Total VOC Emissions from building construction operations: 0.024 TPY

NO_x Emissions from Construction = 0.405 TPY + 0.270 TPY = 0.675 TPY ~ 0.68 TPY
VOC Emissions from Construction = 0.0233 TPY + 0.024 TPY = 0.0473 TPY ~ 0.05 TPY

OPERATION PHASE OF PROJECT (Subsequent years)

Boiler/Heater Operation for New Credit Union Facility

- The new credit union facility will be heated with a 500,000 Btu/hr, natural gas-fired unit (i.e., a commercial boiler as listed in AP 42, see attached reference). As an absolute worst case scenario, it is assumed that this unit will operate 24 hours per day, 365 days per year. Consequently, the Operation Time = 24 hrs/day x 365 days/yr = 8,760 hrs/yr.

- Emission Estimate = Emission Factor x conversion factor (i.e., ft^3 natural gas to Btus) x boiler energy production rate x operation time x 0.0005 tons/pound

NO_x Emissions:

100 lbs/10^6 ft^3 x 10^6 ft^3/10^9 Btu x 500,000 Btu/hr x 8,760 hrs/yr x 0.0005 tons/lb = 0.22 TPY

VOC Emissions:

2.784 lbs/10^6 ft^3 x 10^6 ft^3/10^9 Btu x 500,000 Btu/hr x 8,760 hrs/yr x 0.0005 tons/lb = 0.0061 TPY

Automobile Emissions from Additional Workers and Customers

- The new credit union facility will employ a maximum of 50 workers. As a conservative estimate, it is assumed that all workers will drive to the facility from either Monmouth County or one of the surrounding counties (i.e., Middlesex, Ocean, or Union County). The maximum one-way distance to Fort Monmouth from these counties is approximately 50 miles, however, most workers will be coming to the base from much closer. As a conservative approach, one-half of the maximum one-way distance was used to approximate a daily one-way commuting distance of 25 miles, which is equivalent to a daily round-trip commuting distance of 50 miles. Assuming two weeks vacation for each worker, the workers will travel to the credit union 5 days per week, 50 weeks per year.

- The existing credit union facility is visited by approximately 200 customers per week, based on information provided by the credit union. The round-trip travel distance for each customer (i.e., 50 miles) was estimated as detailed above for the credit union workers.

- Emission factors were obtained from the MOBILE5a Model, which predicts emission factors over all vehicle types and driving conditions (see attached documentation)

- Annual Emission Estimate = Number of people x Daily roundtrip distance x days/week x weeks/yr x predicted emission factor x 0.002205 lbs/gram x 0.0005 tons/pound

NO_x Emissions:

50 workers x 50 miles/day x 5 days/week x 50 weeks/year x 1.18 grams/mile x 0.002205 lbs/gram x 0.0005 tons/lb = 0.81 TPY

200 customers x 50 miles/day x 1 day/week x 52 weeks/year x 1.18 grams/mile x 0.002205 lbs/gram x 0.0005 tons/lb = 0.68 TPY

Total NO_x Emissions from automobiles: 1.49 TPY

VOC Emissions:

50 workers x 50 miles/day x 5 days/week x 50 weeks/year x 1.03 grams/mile x 0.002205 lbs/gram x 0.0005 tons/lb = 0.71 TPY

200 customers x 50 miles/day x 1 day/week x 52 weeks/year x 1.03 grams/mile x 0.002205 lbs/gram x 0.0005 tons/lb = 0.59 TPY

Total VOC Emissions from automobiles: 1.30 TPY

NO_x Emissions from Operation = 0.22 TPY + 1.49 TPY = 1.71 TPY
VOC Emissions from Operation = 0.0061 TPY + 1.30 TPY = 1.3061 TPY ~ 1.31 TPY

Estimated Emissions from Construction Vehicles

The following emission factors (lb/hr) are from Volume II of AP-42, Table II-7.1, for heavy-duty diesel-powered construction equipment.

Equipment	NO_x	VOC	CO	SO_2	PM
Bulldozer	4.166	0.192	1.794	0.348	0.165
Loader	1.89	0.25	0.572	0.182	0.172
Excavator	1.691	0.152	0.675	0.143	0.139
Truck	4.166	0.192	1.794	0.454	0.256
Crane	1.691	0.152	0.675	0.143	0.139
Forklift	1.691	0.152	0.675	0.143	0.139

The DIS project was used as the basis for calculating emissions for the other proposed actions:

Grading Operations (see Notes below)

40 days/yr x 8 hrs/day = 320 hrs/yr

Estimated Emissions (TPY)

Equipment	NO_x	VOC	CO	SO_2	PM
Bulldozer	0.67	0.03	0.29	0.06	0.03
Loader	0.30	0.04	0.09	0.03	0.03
Excavator	0.27	0.02	0.11	0.02	0.02
3 Trucks	2.00	0.09	0.86	0.22	0.12
Total:	3.24	0.19	1.35	0.33	0.20

Building Operations (see Notes below)

100 days/yr x 8 hrs/day = 800 hrs/yr

Estimated Emissions (TPY)

Equipment	NO_x	VOC	CO	SO_2	PM
Crane	0.68	0.06	0.27	0.06	0.06
Forklift	0.27	0.01	0.11	0.02	0.01
Total:	0.94	0.07	0.38	0.08	0.07
TOTAL:	**4.18**	**0.26**	**1.73**	**0.41**	**0.27**

Notes:

1. Assumed that the area graded for the DIS project is 9 acres (as given in Appendix C of the BRAC 95 document)
2. Conservatively assumed that it takes one bulldozer, one excavator, one loader, and three dump trucks four days to grade one acre; therefore, a total of approximately 40 days needed to complete grading
3. Assumed that a crane is needed to move/set steel framework for 100 working days
4. Assumed that a forklift is needed to move masonry materials (cinderblock, etc.) for 100 working days
5. Assumed that a work day consists of 8 hours
6. For AP-42 bulldozer emission factors, assumed a wheeled bulldozer
7. For AP-42 loader emission factors, assumed wheeled loader
8. For AP-42 excavator, crane, and forklift emission factors, assumed miscellaneous equipment category

New Boilers

The following emission factors are from Volume I of AP-42, Tables 1.4-1, 1.4-2, and 1.4-3, for natural gas combustion.
Commercial boiler (0.3 - <10 MMBtu/hr heat input) is assumed.

SO_2: 0.6 lb/10^6 ft^3
NO_x: 100 lb/10^6 ft^3
CO: 21 lb/10^6 ft^3
VOC: 2.784 lb/10^6 ft^3 (see Notes below)
PM: 11.9 lb/10^6 ft^3 (see Notes below)

Estimated annual emissions (TPY) from anticipated new natural gas-fired boilers

Proposed Action	Gas Use	PM		SO_2		NO_x		CO		VOC	
	ft^3	lb/yr	TPY	lb/yr	TPY	lb/yr	TPY	lb/yr	TPY	lb/yr	TPY
DIS	4,369,000	51.99	0.0260	2.62	0.0013	436.90	0.22	91.75	0.05	12.16	0.0061
ESSD & SDC-W	0	0.00	0.0000	0.00	0.0000	0.00	0.00	0.00	0.00	0.00	0.0000
Mil. Ent. Pro. Stn.	1,715,000	20.41	0.0102	1.03	0.0005	171.50	0.09	36.02	0.02	4.77	0.0024
USAR Center	7,662,000	91.18	0.0456	4.60	0.0023	766.20	0.38	160.90	0.08	21.33	0.0107
Brrcks Rep. Ph. I	6,077,000	72.32	0.0362	3.65	0.0018	607.70	0.30	127.62	0.06	16.92	0.0085
Brrcks Rep. Ph. II	6,077,000	72.32	0.0362	3.65	0.0018	607.70	0.30	127.62	0.06	16.92	0.0085
1RBDE/AMEDD	1,497,000	17.81	0.0089	0.90	0.0004	149.70	0.07	31.44	0.02	4.17	0.0021
Bold Ven. Init. I	1,870,000	22.25	0.0111	1.12	0.0006	187.00	0.09	39.27	0.02	5.21	0.0026
Bold Ven. Init. II	4,400,000	52.36	0.0262	2.64	0.0013	440.00	0.22	92.40	0.05	12.25	0.0061
	TOTAL	104.35	0.05	5.26	0.00	876.90	0.44	184.15	0.09	24.41	0.01

Notes:
1. Assumptions made in estimating gas use for the new boilers are provided on the following page
2. VOC factor is for non-methane organic compounds, which comprise 48% of the total organic compounds based on guidance given in AP-42 Table 1.4-3, footnote e
3. PM factor is based on the sum of the factors for filterable and condensible PM, based on giudance given in AP-42 Table 1.4-2, footnote c
4. The ESSD & SDC-W proposed action will use existing boilers; therefore, no "new" emissions are anticipated

Commuter Vehicle Emission Estimates for Project 7 (Beginning 1998)

Project-Specific Information

Personnel Deployed:	290
Assumed distance for 1-way trip:	30 miles
Number of days/week:	5
Number of weeks/year:	52
Year:	2001

MOBILE5a Predicted Emission Factors (over all vehicle types)

VOC:	1.03 grams/mile
CO:	6.30 grams/mile
NOx:	1.18 grams/mile

Estimated Emission Rates

VOC:	5.14 TPY
CO:	31.42 TPY
NOx:	5.89 TPY

Note:
The annual emission rate (TPY) is estimated as follows:
(No. of personnel) x (Daily round-trip distance) x (days/week) x (weeks/year) x (MOBILE5a emission factor) x (0.002205 lb/gram) x (0.0005 ton/lb)