

Environmental Assessment
for
Safe Visitor Access Trail



The Bloody Angle

Minute Man National Historical Park
May, 1996

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I. INTRODUCTION

This Environmental Assessment (EA) documents the results of planning activities undertaken to determine the potential impact on cultural and natural features and socioeconomics of a proposed action by the U.S. National Park Service (NPS). The action is the construction of a multi-purpose trail through the Battle Road Unit of the Minute Man National Historical Park (MMNHP) in order to provide safe and improved visitor access to interpretive sites.

This document has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969, 42 USC 4321 et Seq., the Council on Environmental Quality's NEPA regulations, 40 CFR 1500 et Seq., the United States Department of the Interior's Departmental Manual, Part 516 DM 6, Appendix 7, which contains the NPS' NEPA Regulations, NPS-12, which contains the NPS' NEPA Compliance Guidelines. In addition, the EA preparers consulted numerous internal and external sources, including but not limited to the 1989 General Management Plan for MMNHP, the Resource Management Plan (1993), the Interpretive Prospectus (1990), and the Management Plan to Balance Cultural and Natural Resources (1993).

II. PURPOSE AND NEED FOR ACTION

The primary purpose of the project is to provide safe visitor access to the historic and natural resources of the Park's Battle Road Unit. These resources are scattered throughout the Park's 936 acres, and include 24 historic structures, 27 documented archaeological sites and numerous other resources integral to the events of the first battle of the Revolutionary War, which occurred on April 19, 1775. Of the Park's 936 acres, approximately 800 are located within the Battle Road Unit.

The 1959 enabling legislation for MMNHP stated that the Park was established to "preserve, selectively restore and interpret portions of the Lexington-Concord Battle Road, as well as its associated structures, properties and sites so that the visitor may better appreciate and understand the beginning of the American Revolution..." (House Document 57, 78th Congress, January 27, 1959). That initial mission was expanded by Congress in 1992 to include more than interpretation of specific events associated with April 19, 1775. "The purposes of the Park shall include the preservation and interpretation of (1) the historic landscape along the road between Lexington and Concord, [and] (2) sites associated with the causes and consequences of the American Revolution." (Public Law 102-488, October 24, 1992).

The 1989 General Management Plan (GMP), which was developed to accomplish the original goals set out by Congress, includes among the Management Goals and Objectives to "Protect and restore the historic scene of April 19, 1775, or the landscape and associated cultural resources in selected areas...." In addition, the GMP outlines a strategy for providing safe visitor access within the Battle Road Unit and calls for the NPS to "provide for the separation of pedestrian and vehicular use, ... and create additional visitor use opportunities," (GMP at page 32). This strategy contemplated the development of a pedestrian access trail for the full length of the Battle Road Unit in order to accomplish the goals of improving visitor safety and enhancing access to areas of historical and natural significance.

The directives set out by Congress and the goals of the GMP have not been met, and this project is intended to correct this situation. At present, the interpretive sites, which are scattered throughout the Battle Road Unit, are not linked in a manner that provides for safe visitor access. Visitors must use busy roads, either through multiple short vehicle trips or by walking on heavily traveled thoroughfares in order to reach the sites that are accessible. Of the many interpretive sites in the Battle Road Unit, few are easily accessible. The roads that pass through the Park, including state Route 2A, are used by more than 20,000 vehicles daily, and contribute to an acute visitor safety problem. All of the Route 2A intersections are currently rated by the Level of Service (LOS) ratings F, which is the least safe rating.

The actual Battle Road and the interpretive sites along its historic route are only accessible for short stretches at scattered locations. The proposed trail alignment will follow portions of the historic Battle Road and will completely restore sections. The trail will provide a link to the majority of interpretive sites in a manner that allows for a safe and high quality

visitor experience. The trail will also provide access to numerous natural and agricultural areas, many of which have remained largely unchanged from Revolutionary War times. The project includes no net increase in parking but rather a reconfiguration or re-location of all parking areas and more efficient use of overflow parking. There will also be additional visitor services such as sanitary facilities.

III. PROPOSED ACTION AND ALTERNATIVES

PREFERRED ALTERNATIVE - PROPOSED ALIGNMENT

The Preferred Alternative (Appendix A) will provide the greatest balance between improving visitor access to the Park's natural and cultural features, provide a safe experience and minimize impacts to interpretive sites and the natural environment. Natural resource constraints and interpretive opportunities were the two paramount considerations used in the development and selection of this alternative. The Preferred Alternative follows the historic route of the actual Running Battle wherever possible, and several sections of the actual Battle Road will be restored. Where the trail diverges from the Battle Road, the NPS has attempted to either keep the trail as close to the Battle Road as possible, or take advantage of significant historical, cultural or natural features.

ALTERNATIVE 2 - ALIGNMENT OPTIONS

Alternative routes were developed at eight locations in response to natural resource constraints, property lines, agricultural operations and concern about affecting interpretive sites and associated resources. The following locations are described in detail below (and are shown on Appendices B, C and D) along with the concerns that led to their development and ultimate rejection. The NPS continues to work with affected tenants towards resolution of individual issues affecting their occupancy, including specific trail citing refinement based upon their concerns.

Location 1: **The Meriam Cornfield**, Appendix D, sheet 1. The Preferred Alternative has visitors leaving Meriam's House, on the east side or west side of the south field and passing near the Meriam's Corner monument, then along the north side of Lexington Road from the point at which it crosses Mill Brook (crossing to be with a small bridge) to the existing Willow Pond parking area (Appendix A, sheet 1). One alternative alignment (1a) would have taken visitors north from Meriam's House, through either the north or south side of an existing cornfield, across the Mill Brook where a footbridge now exists, then south along the west edge of the Perry field, back across the Mill Brook and into the Willow Pond parking area. Another option (1b) would have had visitors leaving the Meriam House and proceeding east across Mill Brook, through a wooded area and along the north edge of a tenant's rear yard, then emerging behind the Willow Pond structure.

Location 2: **The Perry Field**, Appendix D, sheet 1. The Preferred Alternative traverses the field along the northwest edge, crosses the field approximately midway and proceeds along the northeast edge between the existing farm road and the stone wall. Option 2a would have brought the visitor along the entire northwest edge of the field, crossing at the narrow northern tip. Option 2b would have taken the visitor east along Lexington Road and then along the southeast edge of the field to where the existing farm road comes in from the left.

Location 3: **The Swamp White Oak Crossing**, Appendix D, sheet 1. The Preferred Alternative takes the visitor in a relatively straight southeasterly direction through the swamp white oak area and then continues along the northern edge of the Farwell Jones field. Option 3a would have routed the trail to the south around the swamp white oak area, then along an existing farm road to the northern edge of the Farwell Jones field.

Location 4: **The Olive Stow Wetland**, Appendix D, sheet 1. All alternatives route the trail in a southeasterly direction along the farm road between the Farwell Jones field and the Olive Stow wetland. The Preferred Alternative takes the trail diagonally across the western third of the Stow wetland via a boardwalk and then traverses that wetland in a southeasterly direction then crosses the western edge of the adjacent wooded area before reaching Lexington Road. Option 4a would have taken the trail all along the farm road, and skirts just to the southeast of the Olive Stow house to Lexington Road. Option 4b would have taken the trail diagonally across the western third of the Stow wetland, and then followed a cart path remnant to the north side of Lexington Road.

Location 5: **The Shadyside Spring Area**, Appendix D, sheet 1. The Preferred Alternative will bring the trail along the northern edge of the current tenant's rear yard located just east of the intersection of Lexington Road and Shadyside Lane. Option 5a would have located the trail 50+ feet to the north in order to avoid the tenant's rear yard, but would have involved an additional wetland crossing. Discussions between the tenant and the NPS regarding specific mitigation are ongoing.

Location 6: **Concord Conservation Land, Shadyside Lane Crossing**, Appendix D, sheet 1. This alternative (Option 6a) would have routed the trail north of the Park boundary through Town of Concord conservation lands in order to avoid the Stow/Jones farm and adjacent wetlands. It would have required walking for several hundred feet along Shadyside Lane which is narrow and has limited sight lines. This option presented significant safety issues.

Location 7: **Elm Brook**, Appendix D, sheet 2. The Preferred Alternative involves crossing the Elm Brook wetland via a boardwalk located approximately 250 feet away from Route 2A. Option 7a would have routed the trail along the toe of the slope adjacent to Route 2A, and then northeast along the forest edge. Option 7b would have brought the trail north of the Preferred Alternative.

Location 8: **Virginia Road**, Appendix D, sheet 2. The Preferred Alternative runs southwest along Old Bedford Road from Bloody Angle to the intersection with Virginia Road, then east along Virginia Road to Hartwell Tavern. Option 8a would have routed the trail through the woods parallel and north of Virginia Road and come out behind Hartwell Tavern. Option 8b would have brought the visitor from the intersection of Old Bedford Road and Virginia Road, southwest to the Vernal Pool Trail, which comes out at the intersection of Virginia Road and Bedford Lane.

Location 9: **Hanscom Drive**, Appendix D, sheet 2. The Preferred Alternative involves a tunnel under Hanscom Drive. Option 9a would have involved a surface crossing of Hanscom Drive at the Route 2A entrance. Option 9b would have required an overpass.

ALTERNATIVE 3 - NO ACTION

The No Action Alternative would have maintained existing conditions, and continued the failure to provide the public with even the most basic access to the resources of the Battle Road Unit. Safety problems would continue, and as visitors try to reach the Park's natural and cultural highlights in an uncontrolled manner, adjacent resources would be further impacted. Without adequate public access, there can be no public value or public support - making it difficult to protect Park resources.

ALTERNATIVES CONSIDERED BUT REJECTED

Although numerous routes were evaluated, three primary conceptual alignments were assessed.

- The **Northern Alignment** (Appendix B, sheets 1-2) which closely paralleled Route 2A, presented numerous design and safety problems. Steep slopes adjacent to wetlands within the roadway prism presented design and regulatory problems. The proximity of high speed traffic and associated noise provided a poor visitor experience and exacerbated safety concerns.
- The **Southern Alignment**, (Appendix C, sheets 1-2) which would have run south of Route 2A; although technically feasible, essentially bypassed the great majority of interpretive sites, required several dangerous pedestrian crossings of Route 2A and would have had the greatest impact on natural resources.
- Another concept that was rejected early in the planning process was to construct the trail as a twelve foot wide paved trail. This option would have involved significantly greater disturbance to natural and cultural resources, and would have created additional safety concerns due to high speed bicycle and roller blade traffic. This would have been inevitable due to the Park's proximity to commuter type bikeways and would not have provided the type of visitor experience envisioned by the GMP.

The project was conceived and has been designed to enhance the experience of those who would visit the Park, not to provide another link in the already congested web of commuter routes in the area.

IV. AFFECTED ENVIRONMENT

A. CULTURAL FEATURES - HISTORIC STRUCTURES, CULTURAL LANDSCAPES, ARCHAEOLOGICAL RESOURCES, ETHNOGRAPHIC RESOURCES

This section describes the current conditions in the Battle Road Unit including historic structures, the cultural and natural landscape, archaeological resources and ethnographical resources. These elements are contained within a single section in order to give the reader a complete picture which more closely resembles what a visitor would encounter, i.e., all these elements together at several locations, as opposed to describing each element of the affected environment at each site in separate sections. Section IV.A. does break down the impacts to Park resources in terms of specific elements.

For the purpose of this section, the Battle Road Unit has been divided into seven distinct areas approximately representing historic ownership patterns at the time of the revolution. These areas include smaller component landscapes that represent land once included in individual family farmsteads as well as areas that have a connection to events which took place during the running battle.

The seven areas described here include Meriam's Corner, the Jones/Stow Farm, the Brooks Farm, Bloody Angles, Paul Revere site, the Nelson Farm, and Fiske Hill. They are described as a visitor proceeds west to east. Throughout these areas are numerous undocumented features such as stone walls, levees, drainage ditches, farm roads and other physical features indicative of a bucolic 18th century community.

Meriam's Corner

Meriam's Corner is the first of several distinct historic zones found along the Battle Road. It is located at the Park's western gateway and was home to five generations of the Meriam family. It played a critical role in the events of April 19, 1775 as the start of the Running Battle. The British flankers following the main column of troops crossed a small bridge in front of the Meriam House. The colonists were positioned in and around the house and barn. Shots were fired, with two British soldiers possibly killed. It was at this point that the running battle began and went all the way back to Boston.

The Meriam House still stands today, although some of its historical agricultural landscape has been abandoned in some areas. Few historic features remain in the yard area immediately surrounding the Meriam House. However, the field to the south of Lexington Road is maintained in its historic open character.

The Meriam House is located at what will be the western terminus of the trail. It dates from 1705 and only minor alterations have occurred since then. It is a 2-story saltbox with 5 bays and a central chimney, set in a grass lawn area that abuts Lexington Road

to the south and Old Bedford Road to the west. The Burke House, a 2-1/2 story Dutch Colonial Revival constructed in 1904, is visible from the Meriam House, located to the northwest. The remains of an old foundation are located in the wooded area at the east boundary of the Meriam house lot. Just east of this woodlot, is the East Quarter School House, a 2-story end gable constructed in 1853-1854, which is now occupied under a life occupancy reservation.

At the time of the Battle, much of the Meriam's Corner area was farmland. Today, some of these fields have reverted to wetlands or woodland. Farm fields are located to the north and south across Lexington Road. Hedgerows have grown between many fields, obscuring views to and from the Meriam House, and altering the historic scene. Many of the fields retain their historic patterns. These fields are crossed with stone walls, mostly dry-laid fieldstone, ranging from 2 to 5 courses high.

The exact location of the Battle Road is unclear in many locations, including where it crossed the Mill Brook, located south of the Meriam House. An archaeological study will be conducted in this area to determine the exact location of the crossing, the actual road and other historic foundations or structure remnants.

The Willow Pond Kitchen, located between Meriam's Corner and the Jones/Stow Farm areas, is set back from Lexington Road by an asphalt and gravel parking lot. It is a mid-20th century structure.

The Minot Farm House, whose lands formerly encompassed the area known as the Perry Fields, dates from 1865 and has been only slightly altered since its construction. It is located on the site of an earlier Minot residence from 1765 until 1808. The site, including the house location, agricultural fields and orchards, has been a farm since the early 17th-century.

Jones/Stow Farm

The Jones/Stow Farm area contains the largest area (50 acres) within the Park farmed continuously since the 17th century. At the time of the battle, Farwell Jones and his sister, the widow Olive Stow, operated neighboring farms in this area. Lexington Road follows the route of the Battle Road through this area, which includes views of open fields, hedgerows, stone walls and numerous historic farm structures. At the eastern edge of the Jones/Stow area are two houses, the Farwell Jones House and Olive Stow House. The Jones House is a two-story Greek Revival structure constructed before 1775 which underwent extensive remodeling up to 1870. Associated with the house is the Jones Barn, a large clapboard, end-gable structure constructed after 1870. On the east side of the Jones house is the Olive Stow House. Constructed in 1760, it is a 5-bay, 2-story Georgian with side gables.

The Jones/Stow area has been continuously farmed since the 17th-century and is characterized by a mix of agricultural fields, orchards, and forest cover. The historic

field patterns are mostly intact including ditches and stone walls consisting of dry-laid fieldstone, ranging from 2 to 5 courses high. This area has several farm roads which connect Lexington Road and the fields to the barns and houses. Several areas have significant views of the agricultural fields and hills to the north. This area is part of the Great Fields which Thoreau described in his writings. Hedge rows have grown between open fields, in some areas blocking the more extensive north south views.

Brooks Farm

This area came into the Brooks family in 1652 and was farmed continuously by them until 1862. The four Brooks home lots are located along both sides of Route 2A along the route of the original Battle Road. On the north side is the Samuel Brooks House, a two-story Georgian structure built in 1733 which serves as NPS housing. On the south side is the Noah Brooks Tavern, a two-story Federal house with clapboard siding and brick end walls, built in 1810. This structure also serves as NPS housing. Associated with the Noah Brooks Tavern is the Rogers Barn, a 20th-century construction on top of a 19th-century foundation. The Job Brooks House, constructed on the north side in 1760, is a two-story pre-classical box house with a central chimney. This structure is currently undergoing a complete facade restoration to 18th century conditions. The interior will be used for museum storage with state of the art environmental controls. Associated with this house is a large 19th century foundation located near its northwest corner, which is known as the Hastings Barn. On the south side of the road is the Joshua Brooks House, a two-story pre-classical box constructed in 1779-81, currently used for NPS housing. This house has significant views to the north across the Elm Brook wetland area and to the agricultural fields beyond. There is documented evidence that the Brooks family owned and operated a slaughterhouse and tannery in this area. To date, archaeological studies have not uncovered any physical evidence of these facilities.

Elm Brook, which crosses the road east of the Brooks sites, is the logical explanation for the citing of the tannery and several prehistoric sites in the area adjacent to the brook. A pre-20th century sluiceway located on the brook will be excavated to determine its archaeological significance and if construction of the trail will impact this resource. The trail will be routed around a historic well site located on the eastern slope of Elm Brook.

Bloody Angle

For purposes of this document, the area described below extends from the intersection of Route 2A and Old Bedford Road to the intersection of Route 2A and Virginia Road. This is the area where the trail will follow the Battle Road route for the longest contiguous distance. Some of the fiercest fighting occurred in this location as the British rounded the two bends and were met by Colonists concealed in the tree and rock cover along both sides of the road. As it was at the time of the battle, this area is the most heavily forested portion of the Park. Three contemporary structures exist

along the Battle Road route, now Old Bedford Road, from the intersection with Route 2A to Virginia Road. Two of these houses are occupied. For approximately 200 yards north of this intersection, Old Bedford Road is dirt, but had been paved. Five contemporary homes are located on the Battle road route, now Virginia Road, from its western end at Old Bedford Road to the intersection with Bedford Lane. Three of these homes are also occupied. The road in this area is bordered by historic stone walls and is paved. Along Virginia Road are two historic house sites, Joseph Mason and Samuel Hartwell. Both have been archaeologically excavated and studied. There are two historic structures that have undergone NPS restoration. The Ephraim Hartwell Tavern and the Captain William Smith House.

The Hartwell Tavern, constructed as a residence in 1733 and used as a tavern from 1756-1787, is a two-story side gable with a large central chimney and a 1783 gambrel addition on one end. Adjacent to the structure is a pasture with livestock which is part of the living history interpretation currently exhibited at this site. Behind the Hartwell Tavern is the McHugh Barn, constructed in 1939 on a 19th-century cut stone foundation. A visitor parking area is located south of the tavern on Bedford Lane, which runs north south from Route 2A to its intersection with Virginia Road at the tavern. Two contemporary structures, both occupied, exist along this road.

Further east on Virginia Road is the Samuel Hartwell House site. The house was originally constructed in 1693, but only a stone and mortar foundation and a large chimney remain. A timber shelter has been constructed around the site to protect it. The site is surrounded by a maintained yard. Remains of a fieldstone farm cellar foundation are also associated with the site.

At the east end of Virginia Road is the William Smith House, a two-story colonial house with a large central chimney, built in 1693. The house has been restored to its 17th-century appearance but the surrounding yard is currently maintained as an open lawn with several large row plantings in front of the house. Views in this area are limited to the Battle Road corridor. One unoccupied contemporary structure exists on Route 2A between the Virginia Road intersection and Hanscom Drive.

Paul Revere

The night before the Battle, Paul Revere, William Dawes and Dr. Samuel Prescott rode west toward Concord to warn the colonists of British troops marching toward Lexington and Concord. They were stopped in this area by British scout troops. Paul Revere was captured and Dawes turned Back, but Prescott escaped and continued to Concord. Revere's capture is commemorated by a bronze plaque embedded in a granite boulder. Historically this area was agricultural, and fragments of historic field patterns are still evident. An extant foundation exists in this area, but its historic significance has not been documented. One contemporary residence occupied under a life occupancy reservation exists just to the east of this site.

Nelson Farm

The Nelson Farm area diverges from Route 2A at the Hop House site and rejoins it at the intersection with Old Massachusetts Avenue. In the western portion of this area the Battle Road has had its historic surface recreated from the Hop House site to the Visitor Center Parking Area. Stone walls and mature oak and maple trees line the road. The Hop House site, consisting of a visible foundation, dates from circa 1805 and an archaeological investigation has been completed. The John Nelson House, built during 1808-1810, is a two-story Federal/Georgian house with a low hip roof. A one-story garage wing and a two-story ell have been added. This house may incorporate the relocated Daniel Brown House (c.1700) and has exceptional architectural integrity. Associated with this house is the Nelson Barn, an early 19th-century, one-story side gable with a 20th-century addition in the rear. The area surrounding this complex is maintained as an open lawn. The next site along the Battle Road, on the north side, is the Daniel Brown site, which was abandoned as a residence by the 1770's. The structures no longer remain, but the site has archeological significance and was excavated. It is currently overgrown with forest cover and is not interpreted. Also on the north side of the Battle Road, east of the Brown site, are the Josiah Nelson and Thomas Nelson Jr. sites. Evidence of the structures on these two sites remain. This includes foundations, chimneys, and land forms. The areas surrounding these sites are maintained in an open character. Both have historical and cultural value, and are interpreted to visitors. The Tabitha Nelson site's surface features were largely obliterated by previous construction of Airport Road. However, it is presumed that there are subsurface archaeological resources.

The Battle Road Visitor Center and its parking area is located east of the Nelson sites, with parking located near the house sites and the visitor center located toward the eastern portion along Airport Road.

Located along the northeast side of Marrett Street (which runs parallel to Airport Road) is the Jacob Whittemore House, constructed prior to 1745. It is a two-story, side-gable Georgian with a five-bay layout and a large central chimney. The Hargrove Barn associated with the house is an early 19th-century one-story side-gable structure. The area surrounding the Whittemore House is maintained as an open lawn. This site serves as NPS housing. Located within a triangle bordered by Marrett Street, Airport Road and Route 2A are the sites of the Bull Tavern and John Muzzy house site. Across Marrett Street is the archaeologically significant site of an eighteenth century blacksmith shop.

Access to the eastern portion of the Nelson Farm area is by Airport Road, which runs parallel to Marrett Street which is the Battle Road. This section has been paved but is no longer used since the introduction of Airport Road.

Many of the agricultural fields in this area have become overgrown but are still identified by stone walls. The close proximity of intensive residential development

within Hanscom Air Force Base and the Town of Lexington is buffered by this dense growth.

Fiske Hill

The Fiske Hill area consists of the land north and east of the intersection of Old Massachusetts Avenue and Route 2A. Traces of the Battle Road parallel Old Massachusetts Avenue to the north for most of its length. The area is mostly forested but contains some fields. Contemporary residences exist north of the Park in the Hayward Avenue neighborhood. Route 128/Interstate 95 abuts the Park to the east, and a large hotel abuts the Park to the south.

A bluff located just north of the intersection was the scene of intense fighting as the colonists fired down on the Redcoats. A major power line corridor crosses the Bluff running northeast to southwest, turning due south after crossing Route 2A.

At the eastern terminus of the trail is the Ebenezer Fiske House site, which was the scene of intense fighting. The stone foundation remains and is surrounded by an open lawn area. Also at this site is the historic Hayward Well marker. A trail leads from this site to a field, which is under a Special Use Permit for agriculture, on top of Fiske Hill. A small paved parking area is located across Old Massachusetts Avenue from this site.

The majority of the area is forested with the exception of the approximately six-acre field on top of Fiske Hill. The forest growth on the hill itself has altered the historic views of cultivated fields which made the agricultural patterns clear.

B. NATURAL FEATURES

1. VEGETATION

A biological survey was completed under contract with the Massachusetts Natural Heritage and Endangered Species Program in 1992. One aspect of the study included a vegetation survey which documented and evaluated the plant communities occurring in the Park, located any exemplary communities, and found rare species (Thompson and Jenkins 1992). This study was not comprehensive but included the most common plant communities in the Park and concentrated on native communities.

The vegetation within the Battle Road Unit includes active and abandoned agricultural fields, shrub lands, deciduous, coniferous, and mixed woods, and open and forested wetlands. In the late 1700's, 90% of this area had been cleared for agriculture. When much of the agriculture was abandoned in the 1800's, re-forestation occurred, only to be logged at least once by the late 1800's. Because

of fairly complicated land use and successional histories, all the plant communities in the Park tend to occur in small patches (1-4 acres). Small patches have a lot of edge, making them less able to resist invasion by alien species and that, combined with continual disturbance by human activities, has produced plant communities which are extensively invaded by non-native species.

Active agricultural fields used for row crops or hay are found mostly in the western end of the unit. Much of this land is drained wetland that has been farmed since the 1600's. The open wetlands, mostly post-agricultural land, are generally dominated by loosestrife, cattails, and common grasses and sedges. They are almost all weedy and disturbed. Dense shrub wetlands have also developed from post-agricultural wetlands and are very common and generally invaded by aliens.

The woods are all fairly young (most trees with a diameter at breast height of less than 12-14") and range from very dry oak-hickory to mesic maple-oak woods, to wet red maple swamps. The dry woods are dominated by a mixture of oaks, often with pignut or mockernut hickory, and with white pine or pitch pine. Beech is usually present in small amounts. Herb diversity is low and aliens only occur in small amounts. The mesic woods are typical mixed red maple-sugar maple-red oak woods and are fairly patchy. They generally have very low native species diversity and are extensively invaded by European bush honeysuckle and two species of buckthorn. The drier woods are considerably less weedy and native species range in diversity from low to about average for this community. The wet woods and forested wetlands are red maple woods which vary from seasonally to permanently wet. These areas range from disturbed and very weedy communities to relatively undisturbed, weed-free communities. They are the most diverse communities in the Park, however, they are noticeably less diverse than this type of community is elsewhere. Most of the individual swamps have relatively few species. This is probably a consequence of succession in small, fragmented patches.

A number of small ponds are in the Battle Road Unit. Some are kettlehole ponds; others are farm ponds. Like the wooded areas, these also range in disturbance and native plant species diversity.

The majority of the plants in the Park are wide-ranging species commonly found throughout the northeastern United States. A small group of plants are limited to a particular geographic region or to a particular community, including plants of the dry forest in the oak zone (e.g., *Carya tomentosa*, *Quercus coccinea*, *Q. velutina*) and plants in coastal plain wetlands (e.g., *Rhododendron viscosum*, *Glyceria acutiflora*). No rare species were found in the Park. However, the sedge *Carex atlantica* is probably a scarce species in eastern Massachusetts, and the bladderwort *Utricularia geminiscapa* may be a new county record.

2. WILDLIFE

Surveys of selected fauna (Martinez 1992, Windmiller and Walton 1992, and Jones 1993) indicate that a moderately diverse representation of the fauna of eastern Massachusetts occurs in the Park. Sixty-one species of birds and 11 species of amphibians breed in MMNHP. Observations of other taxa include 32 mammal species, 8 reptile, 12 fish, 42 butterfly, 30 odonate, and a variety of macro-invertebrates.

The birds in MMNHP are typical of the mixed deciduous/coniferous transitional forest, second growth fields, agricultural edges, and wetlands of eastern Massachusetts. Five species observed in MMNHP have declined locally and so are of particular interest: Eastern Meadowlark *Sturnella magna*, Brown Thrasher *Toxostoma rufum*, Rufous-sided Towhee *Pipilo erythrophthalmus*, Indigo Bunting *Passerina cyanea*, and Bobolinks *Dolichonyx oryzivorus*.

The most common mammal species in the Park appear to be the short-tailed shrew *Blarina brevicauda*, eastern chipmunk *Tamias striatus*, eastern cottontail *Sylvilagus floridanus*, eastern gray squirrel *Sciurus carolinensis*, raccoon *Procyon lotor*, opossum *Didelphis virginianus*, and white-tailed deer *Odocoileus virginianus*. Aside from state-listed species (see Threatened & Endangered Species), all of the amphibian species seen in MMNHP are relatively common in eastern Massachusetts except for the northern leopard frog *Rana pipiens* (a possibly declining species) and the northern dusky salamander *Desmognathus f. fuscus* (not particularly common in NE Massachusetts).

While most species common in eastern Massachusetts were found in the Park, species with large home ranges and those with specialized habitat requirements were either absent or present in fairly low numbers. Contributing ecological factors include: fairly dense human development surrounding the Park which limits the available species pool due to habitat fragmentation and encroachment, major roadways bisecting the Park which causes significant mortality of small terrestrial vertebrates and the long linear shape of the Park which puts all areas fairly close to a roadway and allows negative edge-related phenomena.

3. THREATENED AND ENDANGERED SPECIES

The U.S. Fish and Wildlife Service has indicated, by letter dated February 22, 1995, that except for occasional transient animals, no federally listed or proposed threatened or endangered plants or animals are known to exist in the Park. (Appendix E)

Two classifications of the Massachusetts Natural Heritage and Endangered Species Program in 1994 apply to species found in the Park. However, none of these species have been documented in the project area. The "Species of Special

Concern" found at MMNHP are the Elderberry Borer Beetle *Desmocerus palliatus*, the Mystic Valley Amphipod *Crangonyx aberrans* and the Spotted Turtle *Clennys guttata*. "Watch-Listed Species" found in the Park are the Common Shiner *Notropis cornutus*, the Frosted Elfin Butterfly *Incisalia irus* and the Spotted Salamander *Ambystoma maculatum*.

4. AGRICULTURAL LANDS/SOILS

MMNHP has some of the richest agricultural land in the Concord and Sudbury River Valleys. At the time of the American Revolution, the landscape was primarily open land consisting of agricultural fields, pastures, and home lots interspersed with orchards, woodlands, and marshy areas. Much of the western portion of the Battle Road Unit has been in agricultural use continually since 1700, while many fields in the eastern portion have become forested.

The prime agricultural land in the Park is a direct result of the glacial origins of the soils. Upland soils include Paxton, Scio, Hinckley, Windsor, and Woodbridge series. Paxton and Woodbridge are well-drained soils that are found on the slopes of drumlins. Hinckley and Windsor soils are excessively-drained and are found on outwash plains, and terraces. Scio soil is moderately well-drained, nearly level and gently sloping and formed in glacial outwash and lake beds.

Wetland soils in MMNHP are typically Wareham, Freetown, and Scarboro. Wareham loam is a poorly drained soil formed on glacial outwash plains and terraces. These soils generally support the richest variety of vegetation and are often in agricultural use. Silt and clay soils, such as Freetown and Scarboro mucks, tend to be waterlogged. The Freetown series is very deep, very poorly drained organic soils (muck) found in depressions and on flat areas of uplands and glacial outwash plains. Scarboro is nearly level, deep, very poorly drained soils in depressions and outwash plains and terraces. They form in sandy glacial outwash. Both of these soils are too wet to be used for agriculture. However, in many areas of the Park where these soils are present, ditches have been dug to drain the fields, rendering them suitable for agriculture.

5. WATER RESOURCES & WATER QUALITY

Water Resources

The main water resources in the Battle Road Unit are Mill Brook and Elm Brook, both of which are in the Merrimack Drainage System. Mill Brook is part of the Concord River Basin and a portion of its headwaters lie within MMNHP. Additionally, Mill Brook is the outlet for Crosby Pond which is south of the Park in Concord. Within the Battle Road Unit, Mill Brook generally flows in a southerly direction. Elm Brook is part of the Shawsheen River Basin and its headwaters lie outside the Park in Lincoln. Elm Brook flows in a northerly

direction. The watershed boundaries of Mill Brook border those of Elm Brook. Both brooks have been ditched extensively in the past 200 years and each have several intermittent tributaries. In many instances, the original watercourses have also been altered.

Throughout the Battle Road Unit, there are numerous small streams which drain seasonal run-off from wetlands. Additionally, there are a number of kettleponds, vernal pools, and man-made farm ponds.

Water Quality

There has never been a water quality study conducted in the Park. Under 314 CMR 4.00 of the Massachusetts Surface Water Quality Standards, Elm Brook is designated as a class B water source. Class B refers to water sources designated as habitats for aquatic life and wildlife as well as primary and secondary contact recreation. These waterways may be used for agriculture and industrial processes at designated points.

The Concord Tributary Monitoring Project of 1973 is a study that was conducted for the Concord Department of Natural Resources to determine the water quality of waterways in Concord. Both Elm Brook and Mill Brook were monitored. Elm Brook and Mill Brook were both recorded to have pollution levels exceeding those of the rivers into which they flow, thereby polluting them rather than diluting them. Possible sources of pollution include runoff from highways and agriculture. Due to high total coliform counts, which are results of sewage effluent, both brooks were declared unsafe for swimming.

The monitoring stations of the Concord study were located upstream from the areas of the brooks that flow through the Park. Thus, the information from the study is not conclusive concerning the water quality of the Park. It is likely that roadways and agricultural lands surrounding the brooks in the Park are sources of runoff pollution.

6. WETLANDS & FLOODPLAINS

Wetlands

There are numerous constraints imposed by the design specifications of the trail, term reservations, the locations of cultural resources, and the locations and characteristics of the wetlands. Thus, in order to accommodate a multi-use trail system within lands administered by the NPS, the trail must come within 100' of some wetland areas and, in some cases, must cross wetlands.

The wetlands within the Battle Road Unit are primarily associated with perennial and intermittent streams and ponds. Initially, wetlands located within the unit

were identified by the University of Rhode Island's Ecological Reconnaissance Project in 1992. Nine classifications of wetlands were identified through photo-interpretation of color aerial photographs at 1:4800 scale dated April 5, 1986. Additionally, all wetlands (16) within 100 feet of the preferred trail alignment (Alternative 1) were delineated in the field by a Natural Resource Management Specialist with Minute Man National Historical Park. Wetlands actually crossed by the proposed alignment were delineated using the 3-parameter method (soils, vegetation and hydrology) outlined in the Army Corps of Engineers Wetlands Delineation Manual (1987). Where the proposed alignment crossed within 100' of the trail, these wetlands were delineated using primarily vegetation (and soils where necessary) in compliance with the Massachusetts Wetlands Protection Act, corresponding regulations and local by-laws and regulations. The proposed alignment is routed near several jurisdictional areas, including five in Concord, seven in Lincoln and four in Lexington. For more specific descriptions of these wetlands and impacts, refer to section 4.2.6 and Appendices F, G and H.

Wetland A: Beginning at the western terminus of the preferred alignment and working east, the first wetland area along the trail is Mill Brook and its associated bordering vegetated wetland. The stream channel is about 10' wide at this point and with Alternative 1, the wetland crossing would be north of Lexington Road and extend for approximately 35 feet. The brook flows under Lexington Road south of the crossing. This wetland is seasonally flooded and dominated by shallow-rooted white ash *Fraxinus americana*, Norway maple *Acer platanoides* and red maple *A. rubrum*, as well as American elm *Ulmus americana*, crabapple *Malus* sp., jewelweed *Impatiens capensis* and sensitive fern *Onoclea sensibilis*. The wetland area considered here is bordered to the west by the lawn at Meriam's Corner and to the east by a private residence. The brook and associated wetlands continues northeast behind Willow Pond Kitchen Restaurant and includes Wetland B.

Wetland B: This wetland area is located east of the Willow Pond Kitchen and is divided by two parallel seasonal drainage ditches which run perpendicular to Lexington Road. A storm drain empties into one ditch. The second ditch appears to have two sources of water: runoff from the restaurant parking lot and a seasonal overflow ditch for Mill Brook. The vegetation includes a narrow (<10' wide) emergent wetland of primarily jewelweed and purple loosestrife *Lythrum salicaria* that borders an agricultural field, and a narrow forested wetland (20' wide) dominated by red maple, white ash, common buckthorn *Rhamnus cathartica*, and northern arrow-wood *Viburnum recognitum*. This wetland would necessitate a crossing approximately 30' wide.

These first two wetlands are part of the Mill Brook wetland complex which then extends north-northeast from the Willow Pond Kitchen Restaurant. The brook flows through an emergent wetland of purple loosestrife, Tall Goldenrod *Solidago altissima* and Broad-leaved Cattail *Typha latifolia*. The preferred alignment of the

multi-use trail lies to the east of the wetland on the western edge of the hay field and then crosses over to the eastern edge of the field.

Wetland C: The next wetland within 100' of the preferred alignment is a wooded area bordered by agricultural fields to the north, east and west and residential land and agricultural fields to the south. The wetland consists of two deciduous forested wetlands dominated by red maples, and a shrub swamp dominated by dogwood species, *Cornus amomum* and *C. stolonifera*, and jewelweed. One of the forested wetlands is a red maple swamp with mound and pool topography and the other receives less water, and is primarily fed by seasonal run-off. All of these wetlands are hydrologically connected to a farm pond through a ditch system. A small section of these wetlands (approximately 15' wide) would be crossed where a "finger" of swamp white oaks *Quercus bicolor* extends southward from the red maple swamp.

Wetland D: Wetland D lies to the east of the Olive Stow House and immediately north of Lexington Road. An intermittent tributary of Elm Brook runs north-south into the area. This is an extensive wetland consisting of tussock sedge *Carex stricta* meadows, a robust emergent wetland with purple loosestrife and goldenrods, a shrub swamp dominated by dogwoods, northern arrow-wood and glossy buckthorn *Rhamnus frangula*, and a red maple swamp. Because the wetland line begins 5-8' from the base of the slope of Lexington Road and extends northward to the Park boundary, the multi-use trail will have to cross this wetland.

Wetland E: This wetland is a spring-fed hillside seep located in the northeast corner of the intersection of Shadyside Avenue and Lexington Road, beginning just north of a private residence. A defined stream channel, which flows in winter and spring, bisects the site. Skunk cabbage *Symplocarpus foetidus*, cattails, purple loosestrife, and blackberries *Rubus* sp. are the dominant vegetation.

Wetland F: Elm Brook, the largest wetland in the project area, lies on the Concord/Lincoln town line and bisects the Battle Road Unit. The natural course of Elm Brook has been altered by extensive ditching and, therefore, the actual course through the wetland is defined by the extent of the ditching and the degree of sediment accumulation, which allows the growth and spread of emergent vegetation. There are several plant communities at the site. It is predominately an emergent marsh with some areas where cattail and tussock sedge dominate, and other slightly higher locations where purple loosestrife, goldenrod and reed canary grass dominate. Shrub swamps border the marsh and areas of higher topography. Common species here include alder *Alnus* sp., common buckthorn and Bebb willow *Salix bebbiana*. Forested wetland borders the site to the east and is dominated by red maple, with American elm, black willow *Salix nigra* and white ash. (Rice, 1987)

The next two wetlands are adjacent to Virginia Road in Lincoln and east of Bedford Lane. One wetland lies to the south of Virginia Road, and the other lies to the north.

Wetland G: A hillside seep flows seasonally between Rte. 2 and Virginia Road creating a wetland that encompasses an area dominated by red maple, American elm, northern arrow-wood, high-bush blueberry, sensitive fern, skunk cabbage, and jewelweed. The seep becomes a stream flowing northward through a culvert under Virginia Road and into a red maple swamp (Wetland H).

Wetland H: Once through the culvert, the stream (see Wetland G) flows down slope and then heads eastward where it spreads out and is no longer confined to a channel. The red maple swamp has mound and pool topography with tussock sedge, sphagnum moss, skunk cabbage, and jewelweed in the wettest areas. Water flows under two old farm roads that bisect the wetland. Another seep flows into the eastern corner of the wetland just west of the William Smith House.

Wetland I: Wetland I is an intermittent stream in the woods east of the William Smith House. The stream is fed by a cattail and loosestrife marsh south of Rte. 2A. Water flows from the marsh through a culvert under the road, empties into a temporary pond, and then seasonally flows down slope in a ditch (possibly hand-dug). The preferred alignment will have to cross the ditch.

Wetland J: This wetland is a fairly small isolated area immediately west of the southern end of Patterson Road. It is dominated by red maples and glossy buckthorn and has hydric soils.

Wetland K: A small isolated wetland lies to the northeast of Nelson Road near the entrance to the BRVC parking lot. The area is seasonally wet and dominated by red maples, glossy buckthorn and northern arrowwood.

Wetland L: Wetland L is located east of the BRVC parking lot. The wetland includes an intermittent stream which drains a wetland north of Airport Road, then passes under Nelson Road and empties into the wetland east of the parking lot. The wetland to the north of Nelson Road near Airport Road is fairly open to the east of the stream and is predominately tussock sedge and goldenrods. Red maples and glossy buckthorn dominate the west side. South of Nelson Road there is a red maple swamp, an emergent wetland dominated by cattails, purple loosestrife, and tussock sedge, a shrub swamp dominated by speckled alder *Alnus rugosa* and red maple, a small pond, vernal pool and stream.

Wetland M: Whittemore Pond (Wetland M) is immediately north of Marrett Street and east of the Jacob Whittemore House in Lexington. The pond is actually a vernal pool, often drying up completely except for a small puddle

during summer months. Dominant vegetation includes red maple, American elm, glossy buckthorn and northern arrow-wood.

Wetland N: This wetland is located south of the intersection of Route 2A and Old Massachusetts Avenue under the power line easement for Boston Edison. The preferred alignment of the trail is on north side of the road. This wetland includes an emergent wetland with broad-leaved cattails, tussock sedge and purple loosestrife, and a shrub wetland with glossy buckthorn, maleberry *Lyonia ligustrina*, meadow-sweet *Spiraea latifolia* and willows *Salix* sp.

Wetland O and O-1: Wetland N is located east of the Fiske Hill parking lot at the intersection of Old Massachusetts Avenue and Route 2A. This is a seasonally wet area with an intermittent stream. The wetland is dominated by red maple, northern arrow-wood, highbush blueberry *Vaccinium corymbosum*, glossy buckthorn, skunk cabbage and jewelweed. The wetland is connected by a culvert to an area across Old Massachusetts Avenue (Wetland O-1) that is dominated by wetland vegetation, although it is not as wet as Wetland O. Wetland O-1 is bordered to the north and west by a portion of the historic Battle Road. This area slopes toward the culvert under Old Massachusetts Avenue. During times of high run-off, this area drains into the stream behind Fiske Hill parking lot. Wetland O-1 is dominated with red maple, glossy buckthorn, and northern arrow-wood.

Wetland P: North of Wetland O-1 and the historic Battle Road lies Cook's Pond (also known as Lost Pond), a small marsh pond in a kettlehole. The pond is shallow with water 1-2' deep in spring and it may completely dry in summer (Thompson and Jenkins 1992). The pond is a vernal pool and has relatively high diversity of invertebrates compared to other locations in the Park. The areas between Cook's Pond and Whittemore Pond is a migration route for amphibians, as is the area between Cook's Pond and the uplands of Fiske Hill (Windmiller and Walton 1992). The bordering vegetated wetland closest to the preferred alignment (which is on the historic Battle Road in this area) is comprised primarily of red maple, glossy buckthorn, highbush blueberry and with small patches of sensitive fern and cinnamon fern *Osmunda cinnamomea*.

Floodplains

The Federal Emergency Management Agency (FEMA) has completed flood insurance rate maps for all areas subject to potential flooding within the study area. Areas showing 100-year flood and 500-year flood hazards were mapped. The preferred alignment crosses two areas of the Mill Brook wetland which are within the 100-year floodplain (classified as "Zone A"). The trail will cross Elm Brook in an area that is classified as "Zone B" - an area between limits of the 100-year flood and the 500-year flood, or an area subject to 100-year flooding

with average depths less than one foot. At its widest point in the project area, this zone is approximately 250'.

7. AIR QUALITY & CLIMATE

There has never been an air quality study conducted in the Park. According to the 1993 Annual Report on Air Quality in New England (USEPA Region 1), which tests levels of carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide, the air in Massachusetts is in compliance with the National Ambient Air Quality Standards (NAAQS).

The only pollutant tested in the vicinity of the Park is ozone which is recorded to be one day over the standard, thus being in excess of the NAAQS. The trend graph for Massachusetts shows that the number of days over the standard is relatively constant, varying between zero and six days over the standard for the sites selected for the study. Carbon monoxide levels are known to exceed the 8 hour NAAQS in Springfield and Worcester. The highest levels of nitrogen dioxide were recorded in Kenmore Square, Boston, however the five year trend graph shows stable levels of nitrogen dioxide. Particulate matter levels across the state are well below the 24 hour NAAQS. Of 28 monitoring sites, there are no exceedances of sulfur dioxide levels in the state, with the five year trend graph showing a slight decreasing trend.

According to information provided by Hanscom Air Force Base (Revised Uniform Summary of Surface Weather Observations, Feb 1943-May 1965, Office of Acquisition Meteorology), which is located adjacent to the Park, average temperatures in the area range from 42-62° in autumn, 26-29° in the winter, 36-57° in the spring and 67-72° in the summer.

The average annual precipitation is 43.7 inches. Typically, snow fall ranges from 12-15"/month December through March and thunderstorms account for 3-5"/month May through August. Winter and spring winds come out of the west-northwest while summer winds blow from the southwest.

8. TOPOGRAPHY AND GEOLOGY

Tectonic activities, erosion, and glaciation formed the topography of Southern New England. MMNHP straddles an area where an early "North Africa" collided into the predecessor of "North America" approximately 630 million years ago. Roughly 200 million years ago, the North Atlantic basin opened up near the same boundary. This left a remnant exposed in southern New England that had been attached to northwest Africa. The "collision zone" encompasses roughly the area between U.S. Routes 128 and 495 along Route 2A and is the largest fault zone in the United States. The major fault forming the boundary is named after Bloody

Bluff (or The Bluff), where a skirmish took place during the events of April 19, 1775. Other features related to the collision can be found throughout the Park.

Erosion and glaciation followed the tectonic activity. Together, these processes created a landscape at Minute Man National Historical Park of low, rolling hills and wide, flat plains with elevations ranging from 128' along Mill Brook in Concord to 307' at the top of Fiske Hill in Lexington. There are landforms within the Park that were produced by ice and are related to the continental glacier retreat which occurred in the area about 12,000 years ago. The smooth, rounded hills, such as Hardy's Hill, are "drumlins" composed of unconsolidated glacial till. "Glacial erratics" (large rocks dislodged from bedrock) are scattered throughout the Park, and were used as cover by the Minute Men and the British during the Running Battle. Impervious layers are common throughout the unit, and there are a number of small kettle hole ponds and swampy basins where large blocks of ice remained after the glaciers retreated. The flat topography and lake deposits found in the soils at the western end of the Battle Road Unit are typical of areas once covered by Glacial Lake Concord and these soils are some of the most productive agricultural soils in the Park. Any of the modification of the topography following the ice retreat is primarily a result of human activity.

C. SOCIOECONOMICS

1. NOISE & TRAFFIC

The 800+ acre, five mile long, Battle Road Unit of Minute Man National Historical Park is bisected by Route 2A and Lexington Road. Present visitation at the Park exceeds one million visitors per year. Each day more than 20,000 vehicles commute on these roads. Traffic data indicates that all of Route 2A intersections within the Park are at Level of Service (LOS) ratings F. Stretches of Route 2A within the Unit are particularly congested. Segments of the roadway are prone to high speed traffic and frequent accidents. Six intersections within the Park have been the sight of frequent injury producing accidents requiring ambulance or helicopter responses. Of these intersections, along Route 2A, fatalities have occurred within the last four years at both the Old Massachusetts Avenue and Massachusetts Avenue intersections. (Appendix J)

The Chiefs of Police for the towns of Concord, Lincoln and Lexington, members of the public and elected officials have expressed their concerns to the Park about the traffic congestion on Route 2A and Lexington Road. The extremely heavy and dangerous congestion necessitates the need, daily, during commuting hours, for traffic control officers at the Hanscom Drive intersection, the Airport Road intersection and the Wood Street and Massachusetts Avenue intersection. Traffic control officers are also frequently required at other intersections such as Massachusetts Avenue and Lexington Road when traffic becomes inordinately congested. The heavy traffic makes it difficult and dangerous for Park visitors to

use Route 2A and Lexington Road by vehicle, by foot or by bicycle. Numerous cultural resources remain inaccessible to visitors. Because of the traffic along 2A, stopping to observe historic sites by vehicle is not recommended. Likewise, visitors are discouraged from walking along Route 2A because of the absence of a shoulder within the roadway prism. Increased bike usage has resulted from the recent completion of a regional commuter bikeway north of the Park, making safe access within the Unit a more urgent need.

During the past 30 years the Park has arduously acquired properties and agricultural land along a five-mile stretch of this historic road. However, little has been done to interpret, preserve, or use the historic lands acquired, due to the heavy and dangerous traffic and the lack of NPS development. Public access to much of the Park--and to its historic message--has thus been almost non-existent. Now that nearly all use and occupancy reservations have expired, providing safe, interpretive access to the Park's significant historic resources is an important step toward fulfilling the mission of Minute Man National Historical Park.

2. LAND USE

MMNHP lies within the towns of Lincoln, Concord and Lexington. The dimensions of the Battle Road Unit are approximately 4.7 miles east/west and vary between 1 mile and 1/10 of a mile north/south. These towns and other surrounding towns are predominantly suburban, with primary concentrations of single family residences. Numerous commercial zones are contained within these towns, and the Hanscom Air Force Base abuts a large portion of the Battle Road Unit to the north. The towns contain a significant amount of active agricultural lands and protected conservation land, some of which abut the Park. More than 25% of the Battle Road Unit is comprised of active and fallow agricultural lands. Over 60% of the unit is presently forested, scrub brush or wetlands, with the remaining acreage comprised of houses, farms and associated structures, roads and Park facilities, such as parking lots and a visitor center.

3. COMMUNITY RELATIONS

Minute Man National Historical Park is located within the three towns of Concord, Lincoln and Lexington and abuts the Hanscom Air Force Base, a portion of which is located in Bedford. One of the primary goals of the 1990 General Management Plan (GMP) is to "continue cooperative efforts with Concord, Lincoln and Lexington; regional planning groups; and local and national organizations towards preserving and interpreting historic events and resources, including planning efforts affecting the three Park units," (GMP at 33). Several special events occur throughout the year including the participation of numerous re-enactment groups in the annual April 19 celebrations and ceremonies as well as other activities throughout the year.

The primary concerns to emerge over the years have been the hazardous traffic conditions along the main Park roads and the lack of public access to interpretive sites in the Battle Road unit. This lack of access has been due in part to numerous occupancy and use reservations and the need to respect the rights and privacy of these tenants. Another major contributing factor is the lack of physical access caused by natural features such as wetlands and dense vegetation, active agricultural operations and heavy vehicular traffic adjacent to Park lands and resources.

Area residents tend to use the Park during off-peak time periods. Although many do not frequent the Park, one of the things they invariably do with their out of town guests is to show them around the internationally significant Historical Park located in their community.

The adjacent communities have expressed interest in recent years in relating their trail systems with Park resources, which will be accomplished in part through development of this project.

One of the most frequent concerns that the Park hears is that in spite of a major public investment, the Park has not provided adequate access to public resources. This trail will provide that access and address a major public concern.

4. UTILITIES

The Park is served by a variety of utilities, including sewer, water, electric, gas and communications lines, many of which are either buried or overhead. A Boston Edison right of way with large overhead lines and towers bisects the Park at the eastern end by Fiske Hill. Over the years, numerous ideas have been considered and plans formed to either relocate certain lines to outside the Park or to bury lines having visual impacts on Park resources. Many of the existing lines are abandoned or non-functional where structures have been abandoned or removed. In ground septic systems and underground storage tanks also exist at various locations within the Park.

5. VISITOR EXPERIENCE & ACTIVITIES

The average annual visitation for the last five years is over 1 million, with the average length of stay in the area being 1.7 days per visitor. This is expected to increase with the addition of the Battle Road Trail, which will provide visitors with significant opportunity to tour the Park without the use of vehicles. Peak visitation occurs in April due to special ceremonies and celebrations commemorating the events of April 19, 1775, as well as July through October. Visitation drops significantly from November through most of March with week-long increases during each of the holidays.

Approximately 45 percent of the Park's visitors are from the general New England region, including 37 percent from Massachusetts. 48 Percent visit from the rest of the United States, including 11 percent from California. A significant number (7 percent) of visitors are from foreign countries. Visitors travel to the Park by car, bicycle, foot, canoe (Concord River) and bus. The most heavily visited site is the North Bridge; approximately 6 of every 10 visitors visit this site. About 2 out of every 10 visitors visit the Battle Road Visitor Center and/or Fiske hill area. The other main attractions presently suited to receive visitors are the Hartwell Tavern area and the Wayside Unit.

The Park is heavily used by residents of surrounding towns who often do not show up on Park surveys, as they usually do not use the visitor centers. These visitors are often picnicking, jogging, walking or bicycling through the Park.

The single biggest event of the year is the Annual Concord Parade, which usually falls on Patriots Day. This event draws visitor crowds which have exceeded 10,000 people. The main historical event which is formally interpreted is April 19, 1775, which marks the beginning of the American Revolution when Colonial Minutemen first stood together against the British; an event which eventually lead to American independence. This is the day of the Running Battle, which is the primary event for which the Battle Road Unit was created. Commemorative events of this battle are also held at other sites including Nelson Road, Fiske Hill, Bloody Angel, Meriam's Corner, Captain William Smith House and Hartwell Tavern. Current conditions do not allow for large groups to attend ceremonies at these areas. The reasons are due to parking limitations, use and occupancy reservations and lack of suitable space for visitors to observe activities.

Since the opening of the Minuteman Commuter Bikeway (MMCB) there has been a noticeable increase in the number of bicyclist using the Park. Many cyclists leave the MMCB, ride south on Hartwell Avenue to Wood Street which leads to the Fiske Hill area. From there, they ride along the Battle Road (2A, Virginia Road, Old Bedford Road, Lexington Road) on their way to points west. Also, cyclists traveling west beyond Hartwell Avenue will take the MMCB to its most western point and then leave it to points west, mostly by way of Route 62. They then travel back through the Park taking Lexington Road out of Concord.

A variety of interpretive programs are presented by Park rangers and volunteers. They consist of interpretive talks presented by uniformed rangers and volunteers dressed in historical garb. Living history programs are presented at the Battle Road Visitor Center, Captain William Smith House and Hartwell Tavern.

Of a total of nearly 50 interpretive sites in the Park, visitors currently have access to only 20. These are the interpretive sites near the North Bridge, along parts of Virginia Road (Hartwell Tavern and Smith House), and the Battle Road Visitor

Center (Nelson Road & Fiske Hill). The development of the trail is intended to allow visitors safe access to many more of the important interpretive sites.

6. PARK OPERATIONS

The Park includes three distinct units with the following characteristics:

The North Bridge Unit is located in Concord and consists of approximately 115 acres, one visitor center and two parking areas. The Concord River flows in a northerly direction from the Lowell Road Bridge, under the North Bridge to the Monument Street Bridge. A segment of this river, including the area within the Park, is currently under a Congressionally authorized study to determine its eligibility and suitability for inclusion into the National Wild and Scenic Rivers System. As of the spring of 1996, a study report which will recommend designation is being prepared in draft form. This recommendation is based in part on votes in favor of designation having been made by all eight towns within the study area. Those votes were made in the spring of 1995, and included the towns of Concord and Lincoln.

The North Bridge Visitor Center includes the Buttrick Mansion, which houses administrative offices and contains a number of visitor facilities, including a 30 person theater, rest rooms, an exhibit room and bookstore. The associated parking area includes 48 spaces which can accommodate up to 4 buses and 2 handicapped needs vehicles. There is a second parking area, known as the North Bridge Lot, which contains 132 spaces, including 2 for handicapped needs vehicles and 4 for buses, and 70 overflow spaces.

The Wayside Unit is located in Concord and consists of six acres, one parking area, and two historic structures; one used for a visitor center. It includes a 28 space parking area.

The Battle Road Unit is located in the towns of Concord, Lincoln and Lexington, is approximately 4.5 miles long and consists of approximately 850 acres, three loop trails, the Battle Road Visitor Center, and three historic structures open to the public during the Summer. The Battle Road Visitor Center (BRVC) has two 100 person theaters, rest rooms, an exhibit area and bookstore. There is parking capacity for 114 vehicles including 28 regular spaces, 4 for handicapped needs vehicles, 12 buses and 70 overflow spaces.

Additional parking is currently available at the Fiske Hill site (22 regular spaces), the Smith House (15 regular spaces), Hartwell Tavern (18 regular spaces) and Wood/Old Massachusetts Avenue (11 regular spaces).

MMNHP is one of the nation's 10 most heavily used parks in terms of bus traffic, with the three year average being 6,106 buses per year carrying 195,766 visitors.

Fall is the busiest time of year for bus traffic. The typical bus route through the Park is to enter at the east end after visiting the Lexington Green, proceed to Fiske Hill, then to the BRVC. Most then head west into Concord making roadside stops at Meriam's Corner, The Wayside House and the Bullet Hole House before arriving at the North Bridge parking area where passengers de-bus and walk to the North Bridge and Visitor Center. Most buses exit the Park via other routes after leaving the North Bridge area.

Visitors access and move through the Park on approximately 8.5 miles of public roads. Nearly one-half of these are state-owned while the remainder belong to the towns of Concord, Lincoln and Lexington. Visitor circulation is accomplished predominately by private vehicle. Interstate 95 brings traffic from the north and south to State Route 2A which directly serves the east end of the Park. Route 2A carries east-west traffic through a major portion of the Battle Road Unit of the Park and follows nearly 4 miles of the Battle Road. The North Bridge Unit of the Park can be reached by continuing west from Route 2A on Lexington Road into Concord Center and north on Monument Street to Liberty Street.

Route 2A bisects the Battle Road Unit of the Park. The roadway is 24 to 26 feet wide with two travel lanes without shoulders. The steady stream of traffic, numerous intersections and limited lines-of-sight along Route 2A make travel hazardous, especially for Park visitors. There are no bikeways or significant pedestrian trails along the road corridor to accommodate safe, non-motorized circulation. Traffic on Route 2A through the Park is particularly congested during the morning and evening peak hours on weekdays and remains heavy during most of the day. 20,000 cars per day travel on the section of Route 2A at the east end of the Park. New office space at the east end of the Battle Road Unit, office and residential development north of Virginia Road and potential development and operational changes at Hanscom Air Force Base is likely to generate additional traffic on Route 2A.

The Park exercises jurisdictional authority over state and town owned roads. The regulations contained in the Park Compendium apply to all persons entering, using, visiting, or otherwise within the boundaries of Minute Man National Historical Park on federally owned lands and on less-than-fee-interest lands.

Emergency and unusual situations occur in a variety of ways including: Structural and brush fires, extreme weather, impromptu VIP visits, First Amendment activities, demonstrations, traffic accidents and major traffic congestion on Park roads. Protection rangers render varied assistance to the visitor, whether unlocking locked cars, finding lost children, providing traffic directions, or acting as roving interpreters. Protection rangers also enforce state and federal laws and regulations.

Park staff include personnel involved in management, administration, interpretation, protection of cultural resources, visitor protection, resource management and maintenance. During peak visitor use periods, seasonal employees are utilized. Current staffing levels are at 37 Full Time Equivalent (FTE) employees, plus summer seasonal staff of up to 19 persons which includes maintenance workers, interpretive specialists, protection rangers and resource assistants from the Student Conservation Association.

V. ENVIRONMENTAL ANALYSIS

A. IMPACTS ON CULTURAL FEATURES

1. EFFECTS ON HISTORIC STRUCTURES

Preferred Alternative

Construction, operation and maintenance of the trail will not result in adverse impacts to any of the historic structures located within the Battle Road Unit. It is possible that as more visitors use the trail and are able to access the areas in and around these structures, additional maintenance may be required and incidents of vandalism may increase or occur at new locations. Additional rangers and increased patrol frequencies will be implemented in order to address these possibilities. See discussion at Section V.A.2. below.

Alternative 2

Implementation of any of the alignment options set out in Section III. would not have resulted in any adverse impacts to historic structures. Similar effects from increased visitor use and access may result as described in Section V.A.1. above.

Alternative 3

If the No Action Alternative were to be implemented, the NPS would continue to preserve and maintain all the historic structures within the Park, therefore no adverse impacts are expected from implementation of this alternative.

2. EFFECTS ON CULTURAL LANDSCAPES AND ETHNOGRAPHIC RESOURCES

While the Battle Road itself is the primary resource, the setting of the road defines its historic character. This setting is defined by the combination of the road and its surrounding features such as the agricultural fields, networks of stone walls, buildings and structures, circulations systems, and views. Taken together, these features and the continuity of agriculture at several locations create the historic character of the Park. The retention of these character-defining features while not interfering with agricultural operations is what allows the resource to maintain its integrity. While the combination of these features help to convey an understanding of the events of April 19, 1775, the Battle Road is the focal element.

Preferred Alternative

Implementation of the Preferred Alternative will have both positive and negative impacts on the character of the Park's cultural landscape as it exists today. In some

areas, the proposed trail will cause the addition of an element that never existed historically, while in other areas it will provide an opportunity to restore the Battle Road. The trail will also impact farming operations. Some farm fields or roads will be crossed by the trail.

Although the Park has experienced change over time, it possess a unique historic character. Construction of the trail, especially in locations where it diverges from the historic route of the Battle Road, will be done in a manner that minimizes its visual impact on the historic character of the Park as a whole and to specific sites within the Park. New parking areas and additions to existing parking lots providing access to the trail will be sensitively placed and sufficiently screened from view from historic resources. Indigenous vegetation will be used for these purposes.

While the overriding characteristic of the historic scene was the agricultural setting, the house lots and farmsteads contained smaller features which helped to define their individual character. Archaeological research has given the NPS some information about historic house lot configurations. Siting of the trail included attention to the level of historic landscape documentation currently in place at these sites, and attempts were made to route the trail around sensitive locations. The specific route of the trail will minimize impacts on these elements by observing any documented or existing historic patterns of circulation and field patterns. Introduction of contemporary elements, such as wayside exhibits and comfort stations will be sited so as to avoid or minimize their visual impact.

Increased visitation to the Park and proximity of the trail to resources will likely have adverse effects. Vandalism could be an issue at some of the more remote resources and certain agricultural fields, which will become more accessible with use of the trail. Excess wear on resources and facilities, additional litter, and impacts to private residences could occur throughout the Battle Road Unit. The trail will be patrolled throughout its length with signage explaining the importance of respecting farming operations and other resources. All rock wall crossings will be located wherever possible where there are existing breaks in the walls. Stones needed to be moved will be photographed and documented, then placed to either side of the new break in the wall or used to repair adjacent sections. Farm road crossings will be sited wherever possible at an existing junction. Where farm vehicles must cross the trail, the trail itself will be constructed in a manner so as to be able to handle frequent heavy equipment crossings. Signs will be placed in these areas explaining to visitors the importance of respecting agricultural operations and informing the users that farm vehicles have the right of way.

Visual trail impacts will be minimized through use of native materials, colors, sizes and configurations.

The following sections describe potential impacts from trail construction and use in individual sections of the Park.

Meriam's Corner

The trail will impact the cultural landscape due to the introduction of 20th-century structures, including the trail itself, the addition of three parking spaces across the street, the removal of pavement at the current driveway, with the exception of one handicapped space, and installation of a comfort station located in the Meriam House garage. The removal of most of the pavement adjacent to the historic structure will have a positive impact on the cultural landscape, as the only paved surface will be the handicapped space to be located adjacent to the street. Visitation to this area will increase due to it serving both as the western terminus (east to west) or entry point (west to east) for the Trail. Impacts to the landscape will be minimal since the Trail corridor from Meriam House, past the East Quarter Schoolhouse (both structures are not open to the public), to the current Willow Pond restaurant is an area that is no longer in active agriculture and with little historic integrity as a viewshed representative of 18th or 19th century agriculture. At the Willow Pond restaurant, the existing parking area will be reconfigured and a temporary overflow parking area will be established to the east. (See Appendix A, sheet 2) Handicap parking will be provided and the main parking area will be located within the site of the existing parking area. Only when no other option is available will the Trail traverse areas that possess character defining features such as 18th or 19th century stone walls, hedge rows, historic fencing or field patterns. Impacts to active agriculture will be minimal since the trail and services will be adjacent to Lexington Road and not in the vicinity of agricultural land.

It should be noted that the cultural landscape associated with Minot Farm is located south of Lexington Road. The proposed trail alignment will be north of Lexington Road, therefore, no adverse impacts to this area are anticipated.

Jones/Stow Farm

The trail will impact agricultural fields and the Thoreau Viewshed due to introduction of the trail and boardwalk sections into an area that has been continuously farmed since the 17th century. The impacts will be mitigated by locating the trail along the edges of the agricultural fields. To the east of the Thoreau viewshed area, the trail will pass through a swamp white oak area, and will utilize a boardwalk. The boardwalk will be only 18 inches high and will be screened by the natural vegetation. As it exits this wetland, it follows a stone wall that bisects two distinct farming operations. Impacts to these operations will be minimized by placement of the trail along the northern edge of one of the fields. The area known as Thoreau's Viewshed looking north towards "Pine Hill" will be maintained through the possible introduction of livestock into fields within this viewshed corridor or continued haying. The introduction of a potentially high volume of visitors could create impacts such as vandalism or looting of the farm crops. The NPS may rebuild one or more stone walls situated adjacent to these farm fields. A portion of the trail will be located on the eastern road of two

parallel sections of farm roads so as not to alter the historic configuration of these roads or agricultural operations, which still utilize the western of the parallel roads.

Brooks Farm

This landscape north of Route 2A is no longer in active agriculture and thus has little historic integrity as a viewshed representative of 18th or 19th century agriculture; much of the landscape has passed from field to woodland. South of Route 2A, there are cleared fields around the Noah Brooks Tavern. There are remnants of an old orchards both north and south of Route 2A in this area. There are some remnants of field patterns in the wooded fields as defined by the stone walls which are still evident. There are plans for the reintroduction of farming to this area in the future and the trail has been located to accommodate this. Due to the introduction of the boardwalk, the trail will impact a marshgrass wetland. This will be mitigated by placing the boardwalk 18 inches above the high water mark behind natural vegetative screening located the furthest allowable distance from Route 2A (Battle Road).

As the trail traverses the Brooks Farm area, it will run along the rear of the Samuel Brooks and Job Brooks Houses. A section north of these two houses crosses the site of a remnant of a historic orchard which may be replanted in the future. Its proximity to the house and these features will determine the effects, if any. East of the Job Brooks House is a wetland that was historically an agricultural field. This wetland and agricultural space beyond it provide a substantial view from the Battle Road (Rte. 2A). The trail and its proposed boardwalk could impact part of the view as the route crosses the wetland. When visitation is at its peak, this impact will be reduced as leaves will be on trees and other vegetative growth will be visible.

Bloody Angle/Hartwell Tavern

The Bloody Angle is a bend in the route of the Battle Road where Colonial Minutemen attacked the British as they rounded the bend. The trail will take the visitors through the forested area where the Minutemen were hiding. This experience should provide a unique interpretive opportunity, allowing visitors to see the opposite side of the Running Battle. The adjacent section of Virginia Road between Hartwell Tavern and Smith House will be historically reconstructed similar to the existing Nelson Road reconstruction and therefore, will enhance the cultural landscape adjacent to the these sites and the Samuel Hartwell Shelter Site. Current plans call for the existing parking area on Bedford Lane to be removed and revegetated. The two occupied structures on this road will also be removed after the expiration of term reservations or life tenancies. Also, the three occupied structures and two unoccupied structure between Bloody Angle and Hartwell Tavern on Virginia Road will eventually be removed. On Bedford Lane a new comfort station will be located at the site of the northern of these two structures, and will be

accessible from the new parking area. The comfort station and a parking area capable of accommodating buses will be accessed only from Route 2A in order to minimize impacts to the historic 18th century viewshed. The restored Virginia Road section will be accessed from the comfort station and parking area via a restored Bedford Lane (Appendix A, sheet 12). At the east end of Virginia Road the trail will cross in front of the restored William Smith House. The location of the trail will alter the views to and from the site; however, the construction of the trail will improve the historic character by removing twentieth century features such as the car turnaround and parking area.

Paul Revere

The trail in this area diverges slightly from the route of the Battle Road, again giving visitors the perspective of the Colonial Minute Men. The trail and associated parking area will not impact this landscape since it is no longer in agriculture and contains little historic integrity. 20th century structures were removed in the 1960's and 1970's, leaving some open fields. Character defining features such as 18th or 19th century stone walls and hedge rows are no longer part of this landscape. As a result of construction, open fields will be maintained and the viewshed will be enhanced through the reduction of trees and appropriate screening. The existing monument will be relocated and a stone wall and waysides will be constructed (Appendix A, sheet 18). This should not impact the cultural landscape as this area has been altered by 20th century structures and the monument was relocated earlier this century.

Nelson Farm

Nelson Road from its intersection with Route 2A to the Visitor Center parking lot is a 20th century reconstruction of the Battle Road. Impacts from trail construction on the cultural landscape from the intersection of Nelson Road and Airport Road and continuing along Marrett Street will be minimal due to the absence of viewshed integrity in that area. Additionally, Marrett Street is currently deteriorating and will be restored to Battle Road conditions, with the current perpendicular access to residences being preserved. These actions will serve to enhance the cultural landscape in this area. The stone walls along Marrett Street are currently owned by the Commonwealth of Massachusetts and are not maintained or protected. The NPS is pursuing the transfer and ownership of this land which will result in protection and maintenance of these stone walls.

This acquisition and Marrett Road restoration will have a positive impact on the view to and from the Whittemore House and Hargrove Barn, and Trainor Field located immediately east of the Whittemore House.

Fiske Hill

The proposal to route the trail along the path of the Battle Road will allow for accurate interpretation. The restored Battle Road will cross Bonair and Fairview Avenues, but will not affect residents use of these streets. The agricultural viewshed from Fiske Hill will not be impacted. The existing parking area at the eastern end of Old Massachusetts Avenue will be improved on the northern side of Massachusetts Avenue, just west of the intersection with Wood Street (Appendix A, sheet 26).

Alternative 2

As described in Section III., implementation of Options 1a or 1b at Location 1 would have resulted in a visitor experience that is separated from heavily traveled roads, but would have disrupted agricultural operations and passed through the rear yard of a residence. Option 2a at Location 2 would have involved a greater reduction in available farming acreage than the Preferred Alternative, which runs the trail a much shorter distance across the narrowest part of the field. Option 2b at Location 2 would have required trail users to remain adjacent to Lexington Road for a greater distance than the Preferred Alternative. Option 3a at Location 3 would have located the trail on an additional section of active farm road and would have been visible from Lexington Road. Options 4a and 4b at Location 4 would have routed the trail closer to a residence and along Lexington Road for a greater distance than the Preferred Alternative. Although Option 5a at Location 5 would have taken the trail farther away from the residence, construction would have likely caused significant impacts to a natural spring in that area. Options 7a and 7b would have kept the trail closer to Route 2A, and would have involved a greater visual impact to the wetland viewshed than the preferred location. Options 8a and 8b would have taken the visitor away from the actual Battle Road course and 8a would have involved altering the view to and from the Hartwell Tavern to accommodate the trail.

Alternative 3

Implementation of the No Action Alternative will not result in any of the direct impacts associated with building the trail.

3. EFFECTS ON ARCHAEOLOGICAL RESOURCES**Preferred Alternative**

Construction, operation and maintenance of the trail will not result in adverse impacts to any of known archaeological sites located within the Battle Road Unit. It is possible that as more visitors use the trail and are able to access areas near these sites, impacts may occur, but these should be minimized by measures

discussed in Section V.A.1. Where construction of the trail uncovers a previously unknown archaeological resource, that resource will be stabilized, documented and protected in accordance with NPS and state regulations, and the trail will be rerouted if necessary. In order to ensure this, an archaeologist will be on site when construction is occurring near known archaeological sites. In addition, prior to construction near known or suspected archaeological resources, the NPS will conduct archaeological testing to determine the nature and extent of these resources. In locations where the Battle Road will be restored, only the bituminous concrete will be removed down to the six inch level, so as to preserve any unknown archaeological resources. As discussed in Section V.A.1., the trail has been sited to minimize impacts to stone walls. Where they must be crossed, their original placement will be documented and stones removed will be used to repair adjacent sections or layed adjacent to the trail. The NPS may conduct archaeological investigations to uncover or locate additional historic foundations, pre-historic sites and other archaeological resources for interpretive purposes.

Alternative 2

The same measures as described in Section V.A.3. will be utilized to minimize impacts that may result from implementation of alignment options as described in Section III.

Alternative 3

If the No Action Alternative is implemented, the NPS will continue to preserve and maintain all the archaeological sites within the Park, therefore no adverse impacts are expected from implementation of this alternative.

B. IMPACTS ON NATURAL FEATURES

1. EFFECTS ON VEGETATION

Preferred Alternative

The trail will be 7' wide, with an additional cleared shoulder of 2 feet on each side, resulting in loss of flora throughout the length of the trail, with the exception of those areas where the trail will be sited on existing roadway or present trail surfaces. The boardwalk sections will be 5 feet wide. However, where significant vegetation or trees are present, the trail corridor will be modified to preserve these features. This activity may result in invasion of opportunistic species. As much of the clearing as possible will be done using hand tools, but some use of mechanized equipment will be necessary.

Alternative 2

Impacts on vegetation under the alternative route locations described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative. At Location 1, additional clearing would have been necessary under Option 1b. Option 3a at Location 3 would have involved additional vegetation clearing along a 400 foot linear corridor ten feet wide. Option 7a at Location 7 would have necessitated a large amount of clearing on the steep slope in order to allow for construction of the trail in that location, otherwise workers and equipment would have had to have been brought through the wetland to access that location. Option 7b would have required removal of significant amounts of vegetation in addition to what will be necessary under the Preferred Alternative, resulting in additional loss of habitat.

Alternative 3

No adverse impacts to vegetation would have resulted from implementation of the No Action Alternative.

2. EFFECTS ON WILDLIFE**Preferred Alternative**

There will be a loss of wildlife habitat within the trail corridor, and some direct losses of fauna will occur from construction activities. There will also be short term displacement of wildlife from adjacent areas due to noise and construction related activities. Following construction, there will be a period of habituation, during which wildlife will adapt to the increased presence of human activity. It is not likely that any species will be completely driven out of the area, as that would have occurred previously from intensive farming over the last few centuries, as well as residential encroachment during the last few decades.

In order to minimize direct fauna losses, Park natural resource management staff will direct and oversee contractors in removal of wildlife prior to physical work on the site. This will be done by a variety of methods including flushing burrowing animals and creating noise to flush birds from nests. Wildlife travel corridors may be temporarily disturbed by construction activities, but the trail itself will not act as a barrier to wildlife movement.

Alternative 2

Impacts on wildlife under the alternative route locations described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative. The removal of additional vegetation from Option 3a at Location 3 would have caused further loss of wildlife habitat. Option 4b at

Location 4 would have caused the loss of shrub and forested wetland habitat that would not be impacted from either of the other two alternatives at this location. Option 4a at Location 4 would have involved disturbing wetland edge as opposed to crossing the wetland under the other two options.

Alternative 3

Implementation of the No Action Alternative would not have resulted in any adverse impacts on wildlife.

3. EFFECTS ON THREATENED & ENDANGERED SPECIES

Preferred Alternative

There will not be any adverse impacts to threatened or endangered species, as none are known to exist in the trail corridor. However, a state listed species of special concern, the Mystic Valley Amphipod, is present downstream from a wetland crossing at Mill Brook (Appendix A, sheet 1). The construction of the trail at that location involves minor activity, and should not cause any adverse impact to the Amphipod (See Appendix G2, condition 32).

Alternative 2

Implementation of Option 1b at Location 1 would have resulted in the loss of Elderberry Borer Beetle habitat.

Alternative 3

There would have been no adverse impacts on threatened or endangered species from implementation of the No Action Alternative.

4. EFFECTS ON AGRICULTURAL LANDS/SOILS

Preferred Alternative

The trail will cross active agricultural operations at two main locations, and will remove some land from cultivation. Soils will be compacted along the length of the trail to prepare the surface and to minimize erosion from constant use. Erosion will also occur where the construction will involve cutting slopes in order to minimize the overall gradient, partially to facilitate general use, and to accommodate handicapped access. The actual field crossing locations have been developed in consultation with the farmers in order to accommodate normal patterns of equipment usage and harvesting. Where possible, the Preferred Alternative has kept the trail on existing farm roads, and along field edges to minimize loss of

agricultural lands and soils. Any topsoil removed will be either removed or relocated in accordance with the permit holder's recommendations.

Alternative 2

Option 1a at Location 1 would have involved constructing the trail across a portion of the existing cornfield, thus reducing the tillable area. Option 2a at Location 2 would have resulted in the loss of additional tillage area.

Alternative 3

Implementation of the No Action Alternative will not result in any adverse impacts on agricultural lands or soils.

5. EFFECTS ON WATER RESOURCES & WATER QUALITY

Preferred Alternative

Sedimentation may occur during construction activities, but in order to minimize such impacts, siltation barriers will be installed prior to ground disturbing activities under the direction of Park natural resource management staff and local officials as per Orders of Conditions. Water quality will not be adversely affected by construction activity or trail use, with the possible exception of an accidental fuel spill. However, construction personnel will be required to carry spill containment and absorption materials at all times when working in proximity to water bodies. As an added precaution, construction staging areas will be set up outside the wetland buffer zone, (Appendices F2 and G2). The installation of additional comfort stations will not result in any degradation of water quality as their waste water disposal systems will be installed in accordance with state and local regulations. In locations where structures are to be removed, any associated underground fuel storage tanks or existing septic systems will be either removed or capped as appropriate.

Alternative 2

Impacts on water resources and water quality under the alternative route locations described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative.

Alternative 3

Implementation of the No Action Alternative will not result in any adverse impacts on water resources or water quality.

6. EFFECTS ON WETLANDS & FLOODPLAINS

Preferred Alternative

Implementation of the Preferred Alternative will result in the alteration of bordering vegetated wetlands and buffer zone (Appendices F,G, and H). In the two areas where the trail crosses open water or seasonally wet areas, elevated boardwalks constructed on pilings will be used to minimize impacts. The placement of pilings will not impede the flow of water, nor change the characteristics of any affected wetlands. The construction methodology for these boardwalks has been developed in consultation with local wetlands officials. Hand tools will be used wherever feasible and strict on-site supervision of construction personnel will be maintained, (See Appendices F2 and G2 for construction requirements).

Mitigation for wetlands losses, wetlands replication and habitat impacts will be developed through the permitting process pursuant to federal, state and local wetlands laws, regulation and policies. All mitigation and protection measures contained in the Orders of Conditions issued by the Towns of Lincoln, Concord and Lexington will be implemented. Wetland dependent wildlife and flora will be affected by trail construction and use, but these impacts will be minimized in accordance with the Wildlife Habitat Evaluations contained in Appendices F and G. Invariably, visitors will leave marked trails and may trample sensitive areas or litter. Park staff will patrol the trail and signs will be present to advise visitors about the ecologically sensitive nature of wetland resource areas. Additional measures will be implemented as necessary.

Alternative 2

Implementation of Options 1a or 1b at Location 1 would have involved additional wetland impacts as a result of crossing Mill Brook at a location where the adjacent wetland is wider than in the Preferred Alternative location. Option 2a at Location 2 would have involved routing the trail through wetlands along almost the entire northern edge of the Perry field, resulting in significant amounts of wetlands alteration. Although implementation of Option 3a at Location 3 would have required less alteration of wetlands than the Preferred Alternative, the significant vegetation loss from that option was viewed as less intrusive. Option 4a at Location 4 would have involved citing the trail close to an occupied residence, and the NPS preferred to locate the trail in order to address the resident's privacy concerns. In order to have a continuous trail from Meriam's Corner to Fiske Hill, the trail must cross the Elm Brook. Option 7a would have required a significant structure to be built at the toe of the steep slope adjacent to the brook and would have involved significantly more trail construction adjacent to the Brook instead of the short perpendicular crossing in the Preferred Alternative. Option 7b, although requiring a similar wetlands type crossing as in the preferred alternative, would have involved additional habitat fragmentation, however, it would have taken

maximum advantage of the naturally occurring high point in the marsh. The Preferred Alternative was viewed by the NPS and the Lincoln Conservation Commission as an acceptable compromise. (See generally Section III. and Appendix F2).

Alternative 3

There would have been no adverse impacts on wetlands or floodplains from implementation of the No Action Alternative.

7. EFFECTS ON AIR QUALITY & CLIMATE

Preferred Alternative

During construction, the use of mechanized equipment may result in minor temporary emission of airborne pollutants. The development of additional parking areas may result in increased vehicular traffic, however, the aggregate number of parking spaces will not be increased. The overall increase in vehicular traffic will be more than offset by the reduction in visitors driving from one interpretive location to another, which will not be necessary when the trail is in use. Although additional buses will be accommodated in certain parking locations, they will be prohibited from idling for sustained periods of time.

Alternative 2

Impacts on air quality and climate under the alternative route locations described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative.

Alternative 3

There would have been no adverse impacts on air quality or climate from implementation of the No Action Alternative.

8. EFFECTS ON TOPOGRAPHY & GEOLOGY

Preferred Alternative

Minor topographic changes will occur, but will be insignificant as the trail has been located in order to minimize slopes, and the need to cut and fill. No adverse impacts on geologic formations will occur.

Alternative 2

Impacts on topography and geology under the alternative route locations described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative. Option 7a at Location 7 would have required significant cut and fill in order to accommodate the trail in this location.

Alternative 3

Implementation of the No Action Alternative would not have resulted in any adverse impacts on topography or geology.

C. IMPACTS ON SOCIOECONOMICS**1. EFFECTS ON NOISE & TRAFFIC****Preferred Alternative**

Implementation of the Preferred Alternative will alleviate a significant amount of the vehicular and dangerous pedestrian and bicycle traffic on roads within the Park. By providing an off road link to the Park's most popular and significant cultural and natural features, the trail will enable visitors to have safe access to these sites without utilizing public roads. Visitors wishing to access a number of Park resources will no longer be required to drive between them, but will be able to park or exit their vehicle and proceed on foot or by bicycle to various sites from existing and proposed parking areas. Implementation of The Preferred Alternative will also reduce vehicular noise within the Park by reducing the aggregate number of miles driven from one interpretive site to another (Appendix J).

Alternative 2

Impacts associated with implementation of any of the alignment options described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative.

Alternative 3

If the No Action Alternative were implemented, noise levels and traffic conditions currently experienced in the Park would continue to worsen as visitor and commuter use increase.

2. EFFECTS ON LAND USE

Preferred Alternative

Implementation of the Preferred Alternative will not change general land use patterns, however, a number of site specific impacts will occur. Construction of the trail will affect approximately 6 acres of land within the unit, with only 3 acres of new disturbance, as half the project will occur within the existing Battle Road corridor. New parking areas and comfort stations will involve alteration of approximately 2 acres. Several parking areas will be upgraded in their current locations, and other parking areas will be reduced.

No land uses will be changed. However, as term reservations, life tenancies and other agreements expire, some structures will be restored or removed. During the remaining years of occupancy of these residences, appropriate vegetative screening will be planted and maintained. Among the site specific impacts are the following:

Location 1b, Appendix D, sheet 1: The trail will be routed across a portion of a front yard adjacent to Lexington Road, and the eastern portion of an existing driveway will be removed. Vegetative screening will be planted and maintained, and other appropriate mitigation will be provided.

Willow Pond Kitchen: Although this restaurant may eventually be removed, there are no plans to do so at this time. The proposed trail will work with this land use and parking improvements will be made.

Perry Field: The gravel lot adjacent to Lexington Road may be used as interim parking for Willow Pond patrons and trail users when development of parking at Willow Pond is undertaken.

Stow/Jones Farm: The trail is proposed to run through a portion of land owned by the NPS, which is under a term reservation lasting until 2000. The specific trail location is the subject of ongoing discussions between the NPS and the tenant.

Farm Stand and Residence West of Shadyside Lane: The current tenants have not agreed to the projected trail crossing. In order to avoid their reservation entirely, the trail would have had to cross Lexington Road twice at a dangerous location with limited sight lines. The proposed trail will, therefore, follow the Lexington Road public right of way in front of the existing farm stand. This will not impact parking or the commercial farm stand operation as the trail will be a painted line at this location.

Location 5, Appendix D: The trail is proposed to be routed through a portion of a rear yard in order to avoid a spring and wetlands on the property. As mitigation, the NPS proposes to provide wood fencing, landscaping and security lighting.

Reservation east of Elm Brook: The trail is proposed to cross this reservation at the western end. The NPS is currently discussing site specific options with the tenant.

Virginia Road from Route 2A to the West end of Hartwell Tavern property, and all of Bedford Lane: A land transfer from the Town of Lincoln to the NPS was approved at Town Meeting on March 26, 1996.

Virginia Road and Bedford Lane: The recently approved transfer (see directly above) of a portion of Virginia Road and the northern third of Bedford Lane will be restored to their historic appearance. The existing contemporary structure on the southern part of Bedford Lane will remain. As portions of the roads are restored, this will be done in a manner that allows vehicles to continue to use the roads for private and emergency use. A new parking area will be located on the east side of Bedford Lane near the entrance from Route 2A, and a comfort station will be constructed on the West side of Bedford Lane near the site of an existing structure.

Farm Stand West of Hanscom Drive: An underground gasoline storage tank is located on this property. After the expiration of the term reservation, the NPS will remove the tank and clean the site in accordance with applicable waste site cleanup requirements.

Hanscom Drive: Massport currently owns the road, and the trail crossing, by using a tunnel, the trail will not affect the use of that heavily travelled road.

Location West of Nelson Road, Opposite Mill Street: The tenants have agreed to allow the trail to cross the northern edge of their property, provided that appropriate landscaping is placed to screen the trail from the residence.

Hanscom Air Force Base, Patterson Road: This base abuts much of the northern boundary of the unit. Due to adjacent landowner concerns, the trail will be routed near Patterson Road. The Air Force and the NPS have worked out an agreement with Patterson Road which was transferred to the NPS in a recent boundary change, and land exchange with the Base. The Air Force will remove existing pavement and revegetate the area and the NPS will allow the continued use of a portion of Patterson Road by the Air Force. The trail will follow the section of Nelson Road to be restored, approximately 120 feet south of the new end of Patterson Road (Appendix A, sheet 18, Appendix L). Trail construction and use will not impact operations at this facility.

Marrett Street: The portion of Marrett Street owned by Massachusetts Highway will be restored to its historic condition. Access to residences will not be interrupted. In addition, access to Hanscom via Airport Road will be maintained.

Boston Edison Power Line Crossing, Intersection of Old Massachusetts Avenue and Route 2A: An overhead power line crosses the Park at this location. The trail will be located along the northern edge of this intersection on land owned by Massachusetts Highway. The NPS is working with Massachusetts Highway on specific trail alignment and roadway issues. At the gate to the Boston Edison power line corridor, (at the northern edge of the intersection) the trail will need to be constructed in such manner as to allow for heavy vehicles to pass.

Old Wood Street Parking Area: In order to provide safer parking conditions, the existing parking area may be reconfigured as shown on Appendix A, sheet 26. Currently, vehicles park on both sides of the road, and vehicles in the existing parking area must back out onto Old Massachusetts Avenue in an area with limited sight lines. Vehicle are currently able to park at this location 24 hours a day. The new parking area, if constructed, would be gated and open from 8 a.m. to sunset. In order to construct the contemplated parking area, a portion of land owned by the Town of Lexington would need to be transferred to the NPS. This transfer is currently the subject of a Lexington Town Meeting Warrant.

Alternative 2

Effects associated with implementation of any of the alignment options described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative. A number of site specific impacts from alternative trail routings are discussed below.

Option 1b at Location 1 would have involved routing the trail through a tenant's rear yard, affecting their privacy more so than the location of the preferred alternative.

Option 2a at Location 2 would have involved a greater reduction in available agricultural land than the preferred alternative.

Option 3a at Location 3 would have run the trail along an existing farm road, resulting in greater impacts to farming operations than the location of the preferred alternative.

Options 4a and 4b at Location 4 would have brought the trail closer to a tenant's residence.

Option 5a at Location 5 would have resulted in less impact to the tenant at this location, but would have impacted a nearby spring and adjacent wetland.

Alternative 3

Implementation of the No Action alternative would not have resulted in any changes to land use in the Battle Road Unit.

3. EFFECTS ON COMMUNITY RELATIONS**Preferred Alternative**

Implementation of the Preferred Alternative is expected to improve the Park's relationship with adjacent communities, as well as generate beneficial economic activities (See Appendix L). These communities and surrounding towns have long advocated for this type of project, and it was contemplated during the time of initial Park acquisitions. The accomplishment of this project will provide for improved bicycle and pedestrian links from one community to another, and better linkage from the Park's resources to other points of interest. Visitor's understanding of the historic Running Battle will be enhanced by enabling them to more closely experience the actual battle scene locations and conditions. Other commemorative events will be allowed to occur at or closer to the actual locations. Educational opportunities will be enhanced by providing a safer experience for school groups to visit historic and cultural sites, as well as natural features. The NPS is also working closely with various neighborhoods to address trail management issues.

Alternative 2

Effects associated with implementation of any of the alignment options described in Section 2.2 will be similar to those that will occur through implementation of the Preferred Alternative.

Alternative 3

Without the proposed trail, it is expected that relations between the Park and surrounding communities would continue to improve, however, without continuous improvement of and additions to visitor facilities, traffic conditions would probably continue to worsen and pressure to accomplish the original plans for the Park (as outlined in the Enabling Legislation and 1989 GMP) would continue to increase. A continued lack of constituency and public value will make long term protection of Park resources difficult in the face of increasing threats.

4. EFFECTS ON UTILITIES**Preferred Alternative**

All septic systems, tanks and associated leaching fields will be constructed in accordance with state and local regulations. All new service connections will be

placed underground wherever possible, thus minimizing visual impacts to historic resources. Lighting will be constructed so as to minimize glare on adjacent residences. In locations where archaeologic resources are present, such services will be located after an appropriate evaluation of resource values has been completed. In addition, fire codes and police regulations require certain lines to be immediately accessible, and these requirements will be adhered to. In locations where the trail crosses a road, it will involve a surface connection, with the exception of Hanscom Drive, which is discussed below.

Meriam House: The existing garage will be converted into rest rooms for visitor use. The leach field will be placed across Old Bedford Road.

Bedford Lane Parking: Comfort stations associated with Bedford Lane parking area will include a septic system and area lighting.

Hanscom Drive: A tunnel is proposed to be constructed, which will be lighted, and all utility work affected by tunnel construction will be done in accordance with applicable state and local regulations and dig-safe methodologies. Excavated materials will be stored or disposed of in conformance with applicable regulations.

Marrett Street: Restoration of this road to its historic condition will include removal and/or burial of utilities.

Airport Road: The trail will cross this access road to Hanscom Air Force Base, and will involve a pedestrian crosswalk with appropriate signs.

Intersection of Old Massachusetts Avenue and Route 2A: The trail will pass north of this intersection, however, utilities will not be impacted, as the NPS project involves removal of a portion of the paved surface. It is expected that a realignment of this dangerous intersection will be undertaken in the future by the appropriate authorities as part of Marrett Road improvements, (See Appendix A, sheet 23).

Abandoned Wood Street to Old Massachusetts Avenue Connection: The Town of Lexington owns the land above an abandoned right of way that at one time connected Old Massachusetts Avenue to Wood Street, running northeast from the rear of the current paved parking area at the east end of Old Massachusetts Avenue. Within that right of way is a manhole that accesses a utility. In association with the reconfiguration of the existing parking area, that manhole cover will be reset if necessary.

Alternative 2

Implementation of any of the alignment options described in Section III. would have resulted in similar changes to and impacts on existing utilities as described in the Section V.C.4.

Alternative 3

As various life tenancies, reservations and leases expire, the septic systems associated with some of these structures, underground storage tanks, etcetera, will need to be addressed. Without the funding associated with this project, it is likely that stabilizing or removing potential problems would not occur in the foreseeable future, therefore allowing adverse impacts to natural resources to continue.

5. EFFECTS ON VISITOR EXPERIENCE & ACTIVITIES**Preferred Alternative**

Implementation of the Preferred Alternative will have a positive impact on the overall visitor experience and will provide for additional activities of a higher quality than are currently available. Visitors will be able to access a far greater number of historic and cultural sites as well as experience more of the Park's natural resources without causing adverse impacts. Visitors will be able to cycle or walk through the Park, either to experience the Park's historic resources or as a fitness activity. With the addition of the new trail, many of the area's cyclists and hikers are expected to use it, not only for the trail itself, but as a link to existing trails in the surrounding communities. This may result in a diffusion of use on the area's existing trails, or conversely, these trails may see an increase in use as Park visitation increases and more Park visitors are able to access trails on adjacent lands via the new trail. Visitors will also be able to closely view active agricultural activities. Most significantly, visitors will be able to get a more historically accurate picture of the running battle by being on or much closer to the actual battle road than is currently possible in most locations. Additional interpretive signs and wayside exhibits will be provided for self guided tours. Additional parking and comfort stations will be available at several locations, thus alleviating crowded conditions at visitor centers and in the surrounding communities and commercial establishments.

Alternative 2

Effects associated with implementation of any of the alignment options described in Section III. would have been similar to those that will occur through implementation of the Preferred Alternative.

Alternative 3

Implementation of the No Action Alternative will not result in any changes in visitor experiences or provide for additional activities. However, as Park visitation increases, crowding of existing facilities and adverse impacts on Park resources will continue to increase.

6. EFFECTS ON PARK OPERATIONS

Preferred Alternative

Significant effects from implementation of the Preferred Alternative will be experienced by Park staff, who will have additional visitor use facilities to maintain, patrol and operate. These facilities include the trail itself and the associated interpretive signs and wayside exhibits, additional comfort stations and parking areas, as well as the increased work associated with additional use of existing resources.

The NPS is working assertively to obtain additional Full Time Employees (FTE) and operational funding to meet additional visitor protection and resource management responsibilities associated with this trail. Concerns about staffing and funding have been raised by the towns and community groups. The NPS anticipates that this need will be addressed. Interim measures are being developed with other national parks in the area, and options are being explored with regional conservation groups and volunteer organizations.

The Park has several ongoing programs that effectively stretch resources. Among them are the Park Watch Program which is a neighborhood stewardship type program. Another program is the Volunteers in Parks Program (VIP), which will be enhanced to allow participants to assist visitors, perform maintenance tasks and report emergencies to rangers. In addition, relationships with local police departments involve periodic briefings as to Park and community issues. One example of cooperation is the recent update of a long term plan with the Lexington Police Department to identify and address problems associated with activities at Fiske Hill.

Alternative 2

Impacts associated with implementation of any of the alignment options described in Section III. will be similar to those that will occur through implementation of the Preferred Alternative.

Alternative 3

Implementation of the No Action Alternative will not result in any discernable impacts on Park operations. However, as visitor use rises, Park staff will face an increasingly difficult job of accommodating visitors and commuter traffic within the confines of the existing area.

VI. UNAVOIDABLE ADVERSE IMPACTS

This section outlines the primary unavoidable adverse environmental impacts which are likely to result from implementation of the Preferred Alternative, Alternative 2 or the No Action Alternative. Where possible, mitigating measures which offset these impacts to varying degrees, are presented. A number of mitigating measures are described in detail in previous sections or related appendices.

Impacts Resulting From the Preferred Alternative

Cultural Features

No historic structures will be physically impacted by the construction of the trail, however, indirect impacts may occur. These impacts will be evaluated and minimized in accordance with applicable NPS policies and regulations as outlined in Section VII.B. below. As more visitors access historic structures by foot, on bicycles and by handicapped transport means, a number of them will leave prescribed trails, resulting in compaction of vegetation and landscaping around the structures and additional litter. Visitors will be encouraged through brochures and with signs to remain on the designated trail.

Additional access to historic structures may result in increased vandalism, however, increased NPS presence will be instituted, and a comprehensive trail protection and security plan is being developed. In anticipation of this, the NPS is obtaining training and equipment for ranger bicycle patrols.

The cultural landscape may be altered as certain vistas will be opened up due to construction of the trail. A contemporary feature (the trail itself) will be visible from certain locations. This may be considered by some visitors to be a positive impact, while others may view it as negative.

An archaeologist will be present when construction occurs near known or suspected archaeological sites or where ground disturbing activities warrant the presence of an on site archaeologist. In the event that a site is uncovered or disturbed, it will be stabilized, catalogued and protected in accordance with applicable NPS policies as outlined in Section 6.2 below. As more visitors come into contact with known sites, some disturbances may occur, either through litter or removing of features. Some construction will involve the removal or relocation of historic stone walls, but the trail has been routed in order to minimize this impact.

Ethnographic impacts will be minimized, but in order to reduce impacts to natural features, the trail will pass somewhat close to a number of occupied structures. As lifetime tenancies end and term reservations expire, the trail may be relocated either closer to or away from certain structures, which may be removed, relocated or restored.

In some locations, the trail will abut or bisect existing agricultural operations. (See Appendix D, sheet 1, locations 2, 3 and 4). Farmers will be consulted as to specific trail locations and materials that should be used in order to facilitate access of farm machinery to fields and minimize impacts to yields.

Natural Features

The primary impacts from this alternative will be due to construction activity. Where possible, non motorized equipment will be used to construct the trail, but it may be necessary to use light machinery to bring in quantities of stone dust and other building materials that are not easily hand carried. This will result in temporary noise impacts, some ground compaction and loss of vegetation. Porous materials will be used for the trail surface in order to avoid the creation of impervious surfaces. Where vegetation is removed or disturbed, it will be replaced by indigenous vegetation. The construction will result in the loss of a number of trees and vegetation, however, the actual routing of the trail will be done so as to minimize this loss. Slopes will be kept to a minimum in order to reduce the amount of cutting and filling. Any materials removed for cut will either be removed and properly disposed of off-site or will be placed adjacent to the cut area to level the slope to be filled. Although bordering vegetated wetlands and land within the buffer zone will be impacted by the construction, the trail has been sited in order to keep these amounts to a minimum, while providing for a quality visitor experience.

During construction, Park resource management staff will be present to advise and direct contractors on mitigation measures including placement and maintenance of siltation barriers, protection of specific trees and vegetation, movement and storage of equipment and soils and other aspects of site work that have the potential to adversely impact natural resources.

The least intrusive construction techniques and materials will be employed in environmentally sensitive areas, and wherever possible, work will be done by hand with portable power tools. The use of elevated boardwalks will be employed in the wetland areas and some loss or disturbance of these areas will be necessary, however, construction will occur during the late summer when water levels are lowest so as to minimize the impacts. Wildlife habitat will be impacted by construction activities, and some amount of habitat will be lost.

The degree of the above described impacts and corresponding mitigation, construction methodologies and level of on-site supervision has been found to be acceptable by the local authorities responsible for evaluating impacts to wetland resources (Appendices F2, F3, G2 and H2).

Impacts Resulting From Alternative 2

Impacts of the same type and magnitude would have resulted from implementation of this alternative as from implementation of the Preferred Alternative, with the primary differences

being in the square footage of wetlands and buffer zone areas disturbed, aggregate areas of farm roads utilized and total area of newly disturbed vegetation.

Impacts Resulting From the No Action Alternative

No adverse physical impacts would have occurred from implementation of this alternative. However, visitors would have continued to experience difficulty traveling to and from interpretive locations, and the purpose for the Park's establishment would not have been accomplished.

VII. ENVIRONMENTAL COMPLIANCE

The NPS will comply with all applicable Federal Executive Orders, federal, state and local laws, regulations and policies in implementing the Preferred Alternative. Strict adherence to all permit requirements will be maintained.

A. THE NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321) as amended, does not contain specific time requirements for public review of an Environmental Assessment (EA), nor do the Council on Environmental Quality's (CEQ) NEPA regulations found at 40 CFR 1501 et seq. 516 DM Section 3 outlines the procedures for EA's, but also does not provide specific time requirements or public review guidance. However, 516 DM Section 3.3 A. and B. allow for, but do not require, the Scoping process for an Environmental Impact Statement (EIS) (as contained in 40 CFR Section 1501.7) to be applied to an EA and also allow for public involvement in the EA process (as contained in 40 CFR Section 1506.6). This EA meets the informational requirements of NEPA, and the NPS has and will continue to provide for public review and input as further described in Section VIII.A. of this document.

B. LAWS RELATED TO CULTURAL ISSUES

One of the NPS's mandates is to preserve and protect its cultural resources through the NPS' organic act of August 25, 1916 that established the NPS, and through specific legislation such as the Antiquities Act of 1906, NEPA, and the National Historic Preservation Act (described below). Cultural resources at MMNHP have and will continue to be managed in accordance with these acts and in accordance with Chapter 5 of NPS Management Policies, the Cultural Resource Management Guideline (NPS-28), the Secretary of the Interior's Standards for the Treatment of Historic Properties, the Secretary of the Interior's Standards for Rehabilitation, Guidelines for the Rehabilitation of Historic Buildings, the Secretary of the Interior's Standards for Archeology and Historic Preservation, and other relevant policy directives.

As part of its cultural resources management responsibilities, the NPS surveys and evaluates all cultural resources on lands under its jurisdiction. Cultural resources are evaluated by applying the criteria for the National Register of Historic Places.

In accordance with the Americans with Disabilities Act of 1990 (PL 101-336), the Architectural Barriers Act of 1968 (42 USC 4151 et seq.), the Rehabilitation Act of 1973 (29 USC 701 et seq.), and Uniform Federal Accessibility Standards, the trail will be made accessible to disabled persons through minimization of slopes and use of trail widths and safety features that allow for reasonable access given the site's natural physical constraints.

Section 106 of the National Historic Preservation Act of 1966, (16 U.S.C. 470) as amended, Executive Order 11593 and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470(a)) establish the obligations of the Federal government regarding activities proposed in or affecting properties on or eligible for listing in the National Register of Historic Places. Federal agencies are required to take into account the potential effects of their activities on protected resources and to allow the Advisory Council on Historic Preservation (ACHP) and appropriate state authorities an opportunity to comment. Toward that end, the NPS is working with the Massachusetts Commonwealth Historic Preservation Officer (HPO) and the ACHP to meet the requirements of the August 1990 programmatic agreement among the National Conference of State Historic Preservation Officers, the ACHP, and the NPS. The programmatic agreement requires the NPS to work closely with the HPO and the ACHP in planning new and existing areas, and in developments to existing units.

Internally, the NPS will complete a Section 106 form (Assessment of Actions Having an Effect on Cultural Resources) prior to implementing any proposed actions. The Section 106 form documents any project effects, outlines actions proposed to mitigate such effects, and documents that the proposed action flows from the Site Management Plan. New England System Support Office cultural resource specialists specified in NPS-28 will use the Section 106 form to review and certify all proposed actions affecting cultural resources. This form has been completed and has been sent to the HPO for approval.

All ground-disturbing actions will be preceded by an archeological evaluation to determine the level of archeological investigation required before construction can begin. As described in sections IV.A. and V.A., significant archaeological sites have been studied in the unit, and the trail has been located to avoid any adverse impacts on these resources. Should any unknown resources be identified during the construction process, the HPO and the NPS will evaluate their potential for inclusion on the National Register of Historic Places; if eligible, appropriate measures will be undertaken to preserve them. Archeological surveying and testing will be carried out prior to, or in conjunction with, construction activities.

C. LAWS RELATED TO NATURAL ISSUES

Federal Laws and Executive Orders

Section 404 of the Clean Water Act (33 U.S.C. 1344) requires that any activity involving dredging or filling in a water of the US or in a federally protected wetland must obtain a permit from the US Army Corps of Engineers (ACOE) prior to commencing the activity. On March 1, 1995, the New England Division of the ACOE issued a new Programmatic General Permit (PGP) for Massachusetts, which replaced the Nationwide Permit previously in place in Massachusetts. The PGP sets out three categories of activities that determine what level of permit will be required for each activity. In Massachusetts, when an applicant files a permit application pursuant to the Massachusetts Wetlands Protection

Act (MWPA) and applicable local wetlands by-laws (described below), that application also constitutes the application for a Section 404 permit with the ACOE.

The NPS has received all MWPA permits (See Appendices F2, G2 and H2) and has been informed by the ACOE that this project is eligible for a PGP, which when issued, will require that construction be completed within one year of the expiration of the PGP, which occurs in the year 2000. The 404 PGP will not become effective until the MDEP issues its Section 401 Water Quality Certification, (described below) which has been issued (Appendix M). The ACOE will formally issue the 404 permit when the HPO has completed its review of the Section 106 form.

Section 401 of the Clean Water Act is triggered by the filling of 5,000 square feet or more of wetlands and requires a Water Quality Certification by the MDEP. The filing of our NOI's for the project constituted the NPS' application for this certification. The NPS has received notification from the MDEP indicating that the work proposed does not require an individual 401 permit due to the 5,000 square foot threshold not having been passed, and that the Orders of Condition constitute the 401 permit for the project (Appendix M).

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) requires a permit from the ACOE for any activity in a navigable waterway occurring below the spring high tide. As the work proposed does not occur within a tidal zone, Section 10 is not applicable.

The NPS has and will continue to work with the ACOE throughout the permit and construction process to ensure that impacts to navigable waterways are minimized and accomplished through use of the least intrusive methods.

Executive Order 11988 ("Floodplain Management") requires that all federal agencies avoid construction within the hundred-year floodplain unless no other practicable alternative exists. In order to accomplish the work on the trail, which involves providing visitor access and safety improvements, construction activity will occur within the 100-year floodplain.

Executive Order 11990 ("Protection of Wetlands") requires that all federal agencies avoid, wherever possible, impacts on wetlands. The NPS has and will continue to work with the ACOE, the USFWS, the EPA and the MDEP to minimize any impacts to wetlands.

MMNHP is located twenty miles northwest of downtown Boston. The immediate area is characterized by rapidly spreading industrial, commercial and residential development. Sources of air pollution include industrial and motor vehicle emissions, Hanscom Airfield and Air Force Base (bordering the Park to the north) and generalized smog brought in from urban centers south and west of Massachusetts. In general, air quality at MMNHP is good. The U.S. Environmental Protection Agency monitors six air quality indices in eastern Massachusetts: sulphur dioxide, ambient particulate matter, carbon monoxide,

ozone, nitrogen dioxide and lead. These findings are reported on an annual basis, with only ozone exceeding Federal standards on a few occasions.

During any construction or restoration activities, the NPS will take all practical measures to limit fugitive dust and noise. Section 118 of the Clean Air Act requires all federal facilities to comply with existing federal, state, and local air pollution control laws and regulations. The NPS will work with the Commonwealth of Massachusetts to ensure that all site activities meet the requirements of the state air quality implementation plan.

Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat for such species. The NPS has consulted with the USFWS pursuant to Section 7 of the ESA and has received correspondence from that agency to the effect that our proposed actions will not jeopardize the habitat or the continued existence of any listed threatened or endangered species, (See Appendix E).

The Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901) and the implementing rules promulgated by EPA establish performance standards for generators, transporters and disposers of hazardous waste. Any such wastes generated or removed from the site will be disposed of through NPS procedures which are compatible with the Act's requirements.

State Permitting Requirements

During the design and construction permitting process, the NPS will contact the Massachusetts Highway Department to determine application procedures for all work associated with roads, intersections, curbs and utility siting, to determine what approvals are necessary either from the state or the municipalities where the work will be located.

Massachusetts Wetlands Protection Act, M.G.L.c 131, Section 40A (MWPA) and local wetlands By-Laws

The MWPA requires that for any alteration of a wetland or the area within 100 feet of a wetland, a permit, known as an Order of Conditions (OC) must be obtained from the Conservation Commission (CC) for the municipality in which the work is to occur. In addition to this state requirement, the towns of Lexington and Lincoln have local wetlands By-Laws which contain additional requirements for work affecting wetlands. The form on which the MWPA permit and ACOE 404 permit is applied for also constitutes the application form for the local wetlands By-Law permits for Lexington and Lincoln. The Town of Concord also has a Wetlands Setback Policy that is used by applicants as a guide for determining what actions may or may not cause adverse impacts to wetlands values in Concord.

The NPS has worked extensively with the Conservation Commissions from Concord, Lexington and Lincoln prior to filing wetlands permit applications to determine what is required under both the state and local wetlands laws and to ensure minimum impact to wetland values. The NPS has received Orders of Conditions under the MWPA and local wetlands By-Laws (See Appendices F2, G2 and H2). All conditions in the OC's and the March 7, 1996 clarification from the Town of Lincoln (Appendix F3) will be adhered to.

Local Ordinances

The NPS will work with the Towns of Concord, Lincoln and Lexington to determine how local rules and ordinances may apply to any proposed activities. All applicable requirements will be complied with.

VIII. CONSULTATION & COORDINATION

A. PUBLIC INVOLVEMENT

Representatives of local town boards and interested members of the public have been invited on numerous walks along the entire length of the proposed alignment and have provided input on a range of issues including wetlands and other environmental factors, safety and neighborhood concerns.

Specific public involvement has included the following:

- The NPS has held numerous open public forums to discuss trail planning (See Appendix N). In the future, the NPS expects to work with the local communities to formally establish a Minuteman Trail Advisory Committee comprised of local residents, NPS staff and residents and town officials.
- Meetings with all remaining tenants to gain their input regarding potential trail impacts and their preferences on the alignment,
- Contacts with numerous abutters to gain their feedback,
- Communication with surrounding communities to consider options to link key external points, including the three town centers, a regional commuter bikeway, Hanscom Air Force Base and existing trail networks,
- A long time local resident and noted landscape architect has assisted in community outreach to enhance public awareness.
- A historians workshop was held to familiarize regional historians with aspects of the trail project, and to allow them to assist Park staff.
- A teacher's workshop was conducted to familiarize local educators with the trail project in order to allow them to develop programs to help school children understand the significance of the events of April 19, 1775.

The information necessary for formulating the multi-use trail alternatives was gathered through a series of meetings with interested organizations, private citizens, and federal, state, and local governments. Additional information was acquired through site analysis, literature search, case studies in other national, state, and local park areas, and private programs. Perhaps most important was listening to the desires and concerns of the those who would be using the trail. Open forum meetings were held monthly beginning in September 1993 and then quarterly since March 1994. These meetings will continue throughout the trail planning process. Numerous trail hikes were held with representatives of federal, state and local governments, members of local community organizations, and interested residents of the surrounding towns.

Several additional hikes with various entities, including local planning boards and conservation commissions were also conducted. On at least nine occasions, representatives of the respective Conservation Commissions inspected wetland resource areas to be affected by the trail.

Additional hikes will be held for interest groups as the need arises. All who attended the hikes and meetings were encouraged to actively participate in the exchange of ideas and concerns regarding the development of the Battle Road Trail. The Battle Road Trail Environmental Assessment incorporates the data collected during the planning process.

For a list of formal and informal public meetings, open forums and other trail planning events, see Appendix N.

B. LIST OF AGENCIES AND ORGANIZATIONS TO RECEIVE COPIES

Town of Concord, Massachusetts
Town of Lincoln, Massachusetts
Town of Lexington, Massachusetts
Town of Bedford, Massachusetts
Massachusetts Department of Environmental Protection, Woburn, Massachusetts
Massachusetts Highway Department
Massachusetts Historic Preservation Officer
Massachusetts Advisory Council on Historic Preservation
MASSPORT
United States Army Corps of Engineers, Waltham, Massachusetts
United States Fish and Wildlife Service, Hadley and Sudbury, Massachusetts
United States Environmental Protection Agency, Region I, Boston, Massachusetts
United States Air Force, Hanscom Air Base, Massachusetts
Metropolitan Area Planning Council, Boston, Massachusetts
Bay Circuit Alliance, Andover, Massachusetts
Lincoln Guide Service, Lincoln, Massachusetts
Appalachian Mountain Club, Boston, Massachusetts
Lexington Friends of the Bikeway, Lexington, Massachusetts

IX. LIST OF PREPARERS

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Windmiller, B. and R. Walton, 1992, "A Survey of Selected Fauna With Recommendations for Wildlife Conservation and Habitat Management", 42 pp.

XI. APPENDICES

Appendix A: Landscape Plans, Battle Road Trail, Minute Man National Historical Park, Concord, Lincoln, Lexington, Massachusetts, Dated March 6, 1996, sheets 1-26, LD 1-7.

Appendix B: Battle Road Trail, Northern Alignment Alternative, dated November 23, 1994. Western Section, sheet 1, Eastern Section, sheet 2.

Appendix C: Battle Road Trail, Southern Alignment Alternative, dated November 23, 1994. Western Section, sheet 1, Eastern Section, sheet 2.

Appendix D: Battle Road Trail Alignment Options, Proposed Alternative, dated October 12, 1995. Western Section, sheet 1, Eastern Section, sheet 2.

Appendix E: Letter from William Nedermeier of the United States Fish & Wildlife Service to Jennifer Brown of the NPS, dated February 22, 1995.

Appendix F: Notice of Intent, Town of Lincoln, Massachusetts, filed December 21, 1995.

Appendix F2: Order of Conditions from Town of Lincoln, Massachusetts, issued February 21, 1996.

Appendix F3: Letter of Clarification for Order of Conditions from Town of Lincoln, Massachusetts, dated March 7, 1996.

Appendix G: Notice of Intent, Town of Concord, Massachusetts, filed January 24, 1996.

Appendix G2: Order of Conditions from Town of Concord, Massachusetts, issued March 20, 1996.

Appendix H: Notice of Intent, Town of Lexington, Massachusetts, filed January 24, 1996.

Appendix H2: Order of Conditions from Town of Lexington, Massachusetts, issued February 27, 1996.

Appendix I: Wildlife Habitat Evaluations, prepared by Jennifer Brown-Ellington, contained in the Notices of Intent for the Towns of Concord and Lincoln.

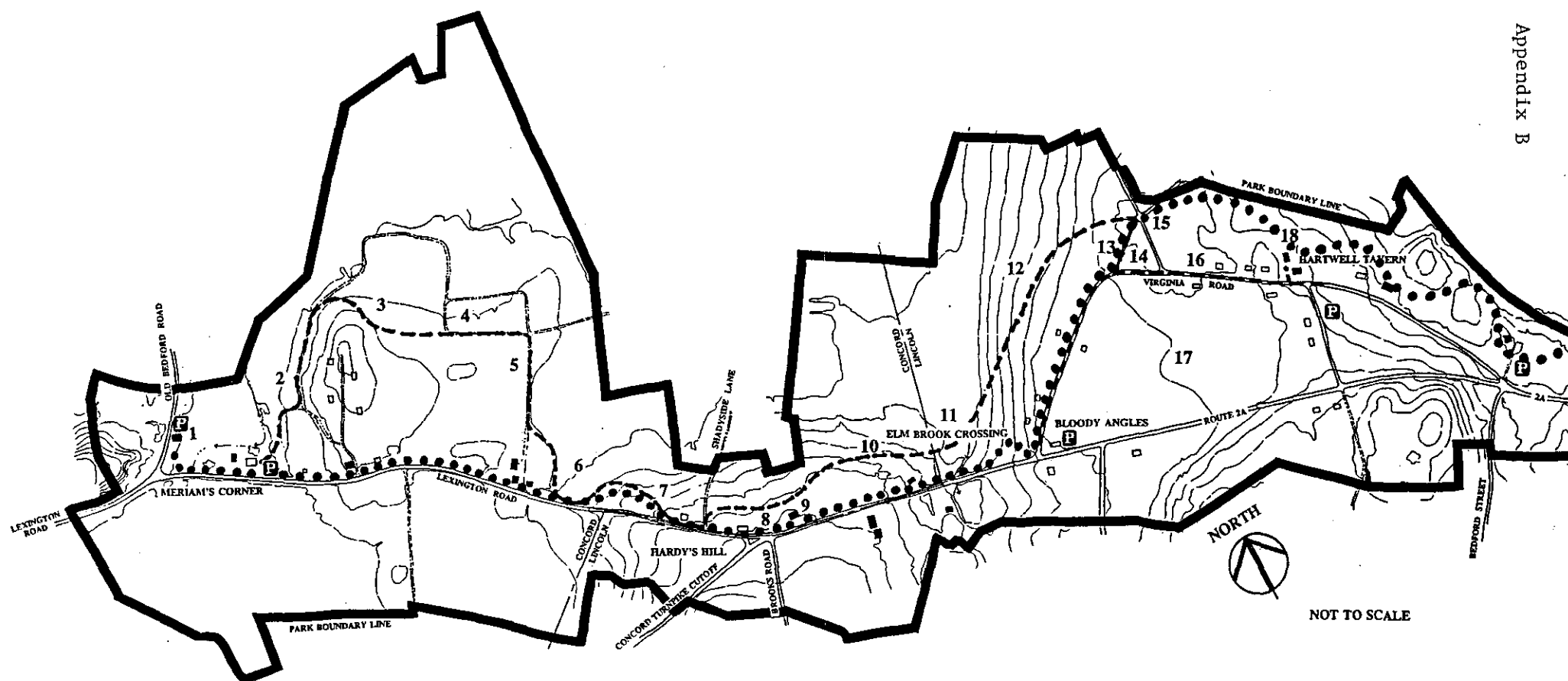
Appendix J: Minute Man National Historical Park Traffic Study Report, prepared by Hoyle, Tanner & Associates, Inc., dated December 14, 1995.

Appendix K: Patterson Road Removal Project for Battle Road Trail at Minute Man National Historical Park, dated April 11, 1996.

Appendix L: Economic Impact Analysis prepared by Gul Butaney, PhD. et al., Departments of Economics and Marketing, Bentley College, dated March 28, 1995.

Appendix M: Letter from Sabin M. Lord, Massachusetts Department of Environmental Protection to Kevin R. Mendik, NPS, dated April 9, 1996.

Appendix N: Community Open Forums for Trail Planning and Organized Trail Walks for Public Involvement, Minute Man National Historical Park, prepared by Dan Dattilio, dated April 18, 1996.



LEGEND

- HISTORIC STRUCTURES
- OTHER STRUCTURES
- - - PREFERRED ACCESS ALIGNMENT
- P EXISTING PARKING AREAS
- NORTHERN ALIGNMENT ALTERNATIVE

Appendix B

WESTERN SECTION (Sheet 1)

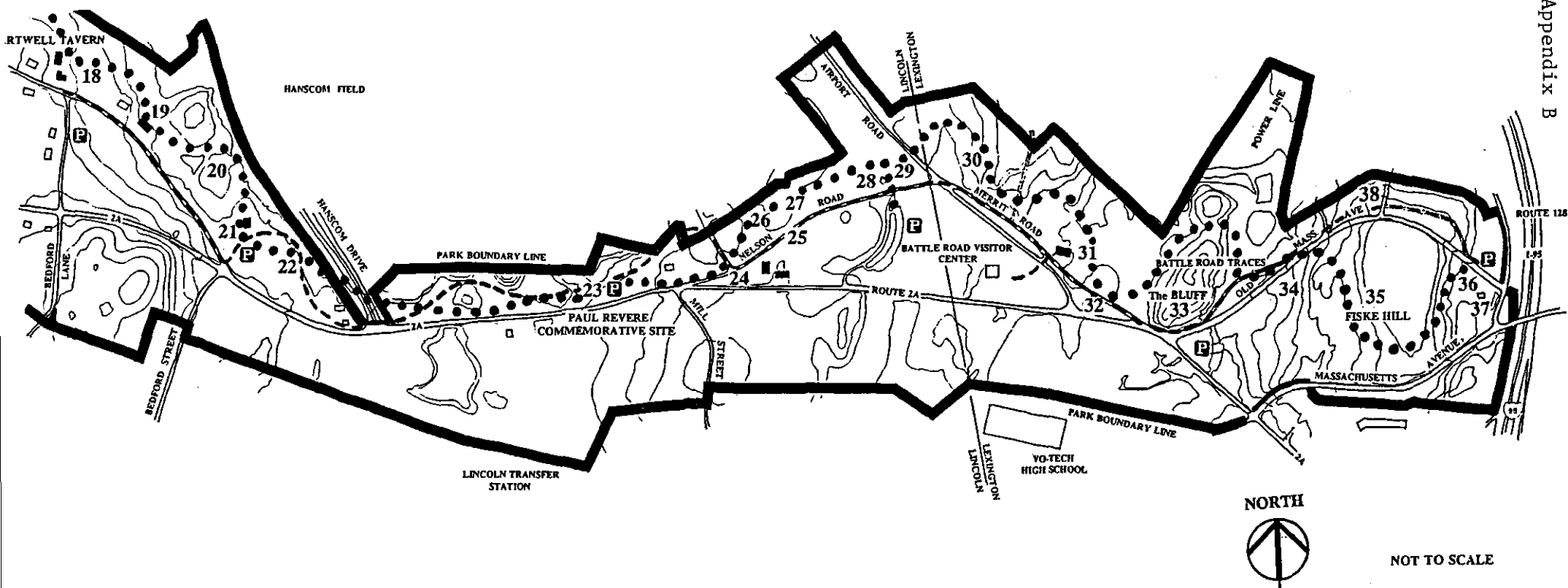
BATTLE ROAD TRAIL

NORTHERN ALIGNMENT ALTERNATIVE

MINUTE MAN NATIONAL HISTORICAL PARK

NATIONAL PARK SERVICE

11/23/94



LEGEND

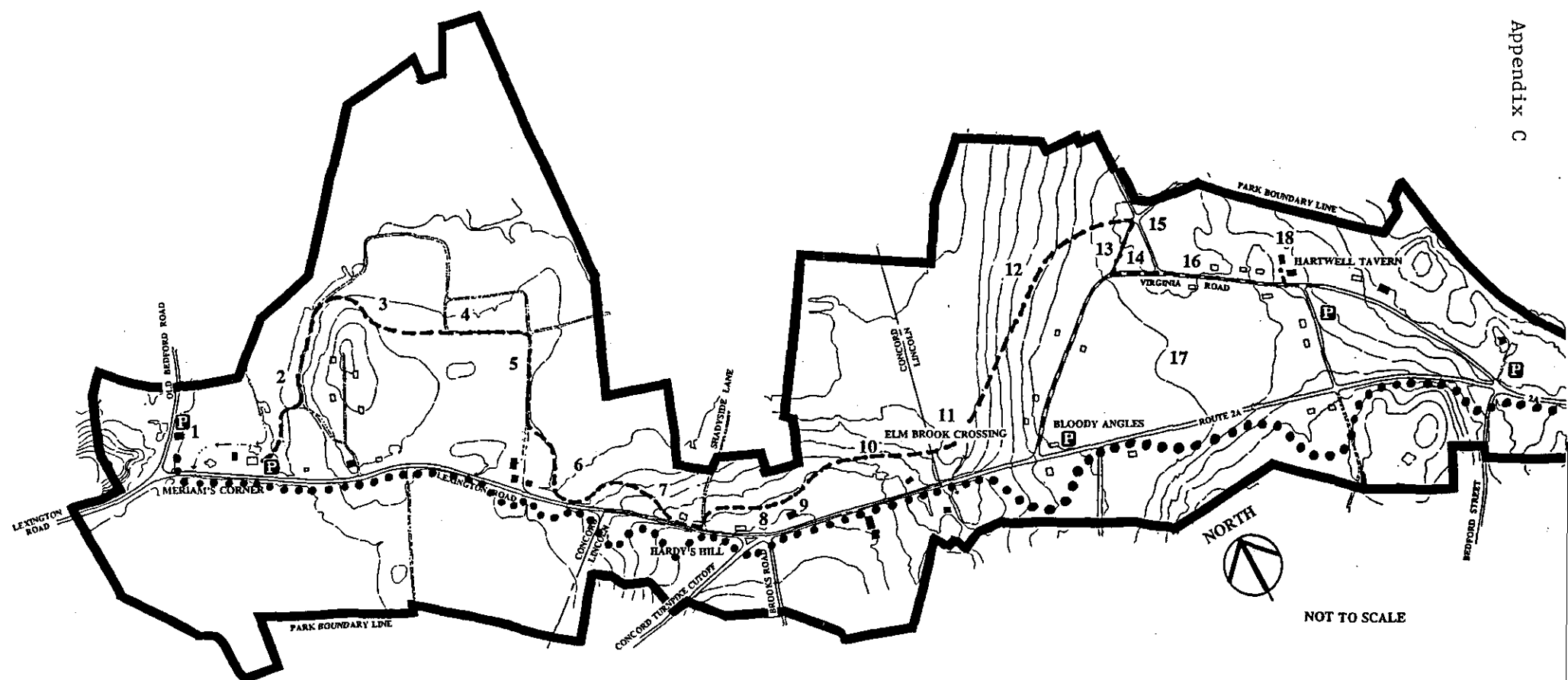
- HISTORIC STRUCTURES
- OTHER STRUCTURES
- PREFERRED ACCESS ALIGNMENT
- P EXISTING PARKING AREAS
- NORTHERN ALIGNMENT ALTERNATIVE

Appendix B

EASTERN SECTION (Sheet 2)
BATTLE ROAD TRAIL

NORTHERN ALIGNMENT ALTERNATIVE

MINUTE MAN NATIONAL HISTORICAL PARK
NATIONAL PARK SERVICE
11/23/94



LEGEND

- HISTORIC STRUCTURES
- OTHER STRUCTURES
- - - PREFERRED ACCESS ALIGNMENT
- Ⓟ EXISTING PARKING AREAS
- SOUTHERN ALIGNMENT ALTERNATIVE

Appendix C

WESTERN SECTION (Sheet 1)

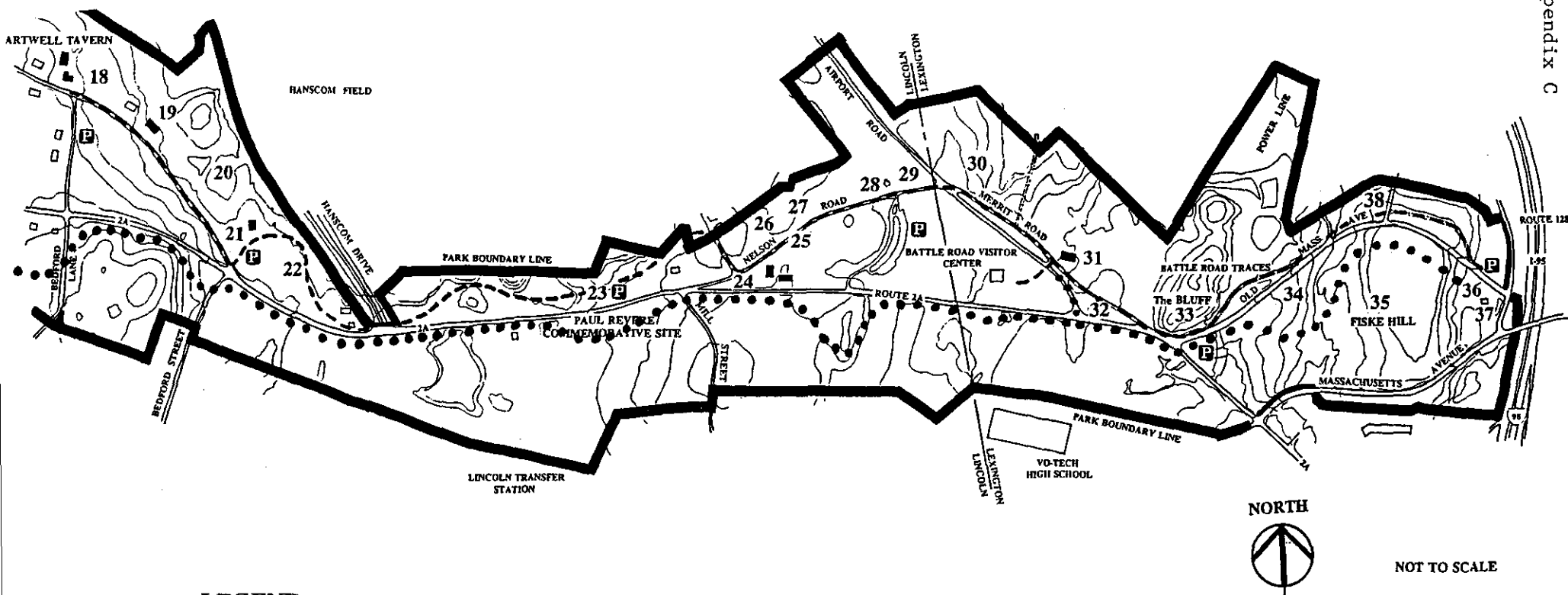
BATTLE ROAD TRAIL

SOUTHERN ALIGNMENT ALTERNATIVE

MINUTE MAN NATIONAL HISTORICAL PARK

NATIONAL PARK SERVICE

11/23/94



LEGEND

- HISTORIC STRUCTURES
- OTHER STRUCTURES
- - - PREFERRED ACCESS ALIGNMENT
- Ⓟ EXISTING PARKING AREAS
- SOUTHERN ALIGNMENT ALTERNATIVE

Appendix C

EASTERN SECTION (Sheet 2)

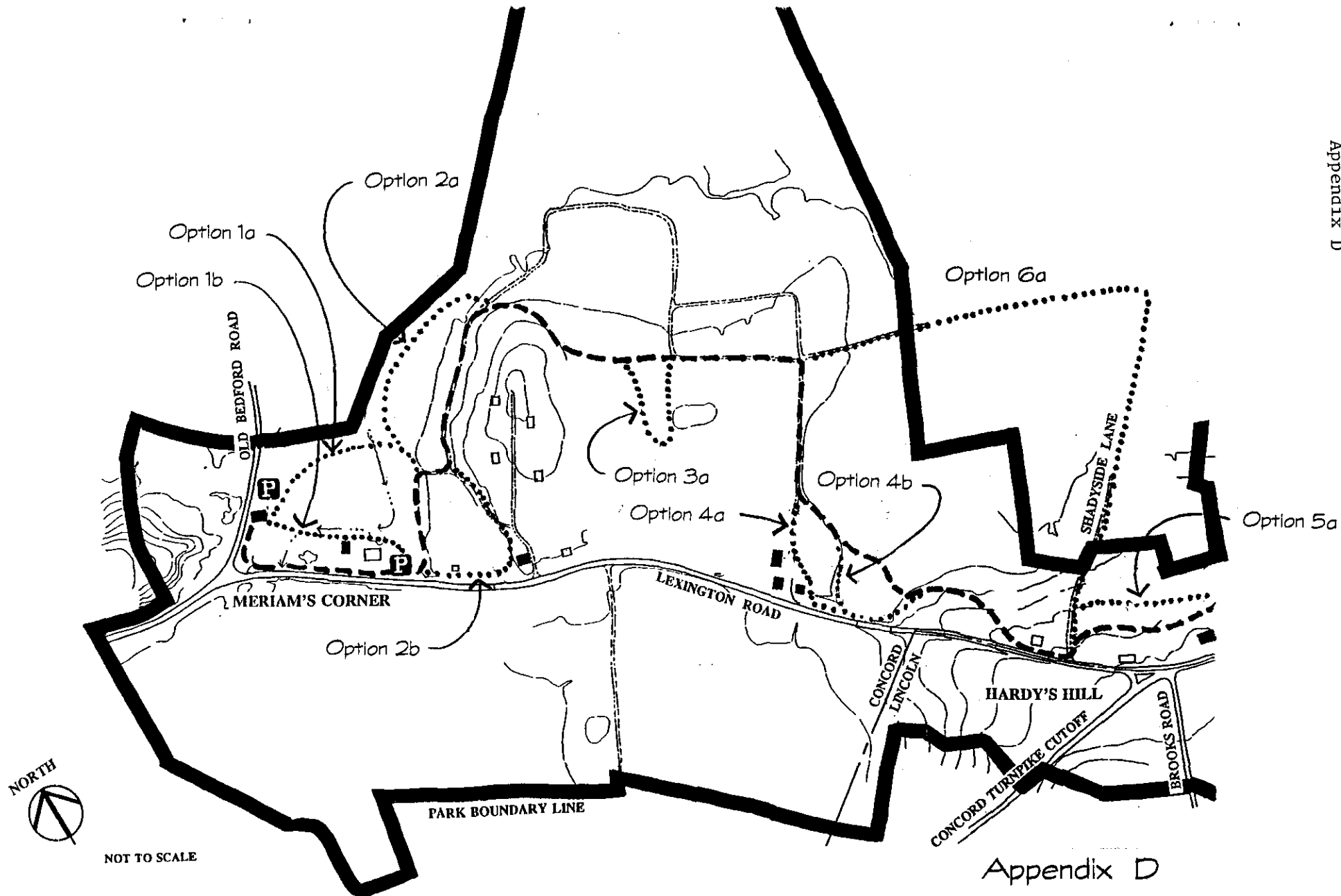
BATTLE ROAD TRAIL

SOUTHERN ALIGNMENT ALTERNATIVE

MINUTE MAN NATIONAL HISTORICAL PARK

NATIONAL PARK SERVICE

11/23/94



LEGEND

--- PREFERRED ALIGNMENT

..... ALIGNMENT OPTIONS

■ HISTORIC STRUCTURE

Appendix D

WESTERN SECTION (Sheet 1)

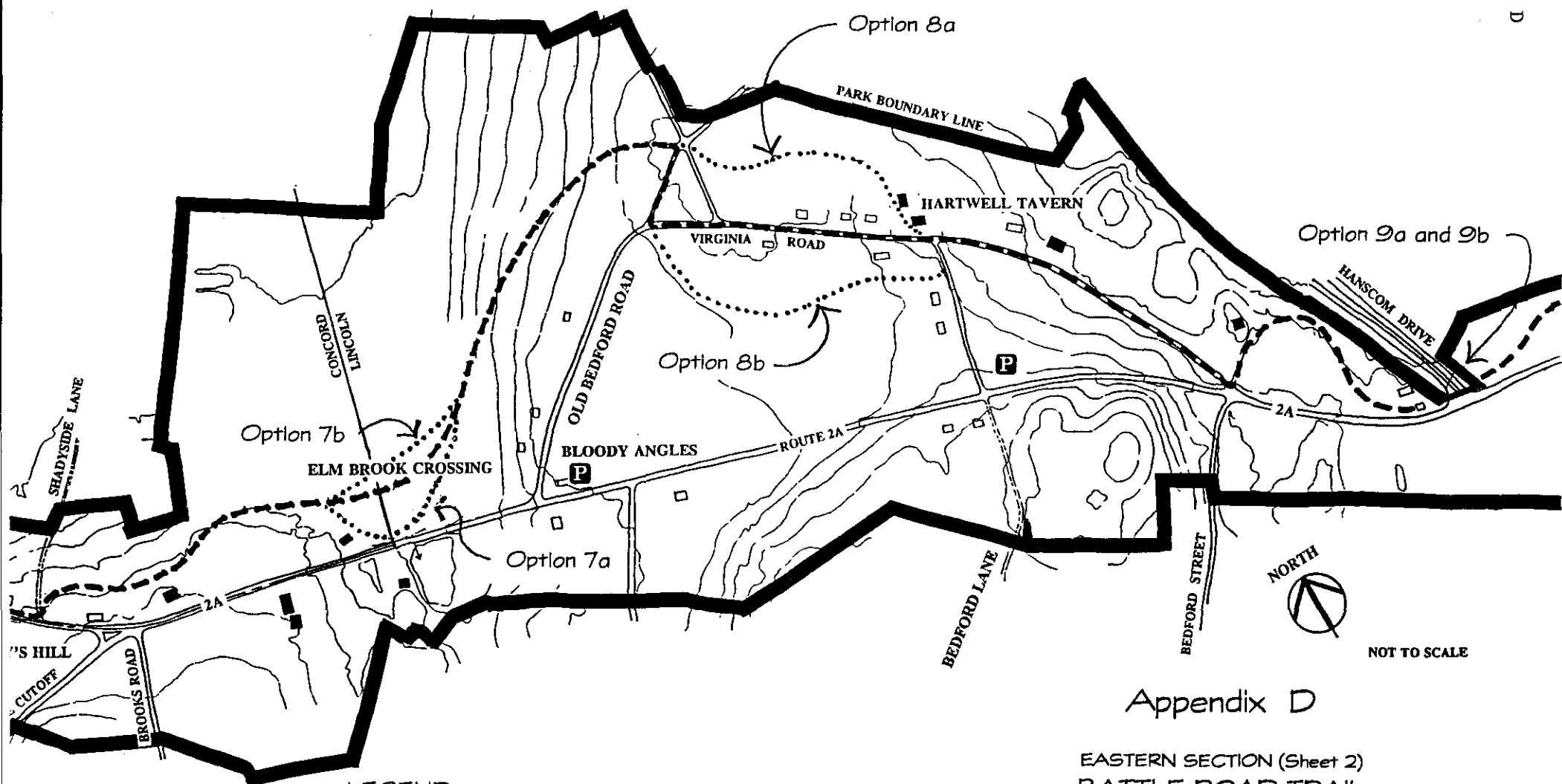
BATTLE ROAD TRAIL

ALIGNMENT OPTIONS

MINUTE MAN NATIONAL HISTORICAL PARK

NATIONAL PARK SERVICE

10/12/95



LEGEND

-  PREFERRED ALIGNMENT
-  ALIGNMENT OPTIONS
-  HISTORIC STRUCTURE

Appendix D
EASTERN SECTION (Sheet 2)
BATTLE ROAD TRAIL
ALIGNMENT OPTIONS



Appendix E

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Offices
22 Bridge Street, Unit #1
Concord, New Hampshire 03301-4986

February 22, 1995

Jennifer Brown
National Park Service
Minute Man National Historical Park
Concord, MA 01742

Dear Ms. Brown:

This responds to your letter dated January 18, 1995, for information on the presence of federally listed and proposed, endangered or threatened species in accordance with planning for an interpretative multi-use trail for Minute Man National Historical Park in the Towns of Lexington, Lincoln, and Concord, Massachusetts.

Based on information currently available to us, no federally listed or proposed, threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area, with the exception of occasional, transient endangered bald eagles (*Haliaeetus leucocephalus*) or peregrine falcons (*Falco peregrinus*). However, we suggest that you contact the Massachusetts Natural Heritage and Endangered Species Program, Division of Fisheries and Wildlife, 100 Cambridge Street, Boston, Massachusetts 02202, at 617-727-9194, for information on state listed species that may be present.

Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required. Should project plans change, or additional information on listed or proposed species becomes available, this determination may be reconsidered.

A list of federally designated endangered and threatened species in Massachusetts is enclosed for your information. Thank you for your cooperation and please contact Michael Amaral of this office at 603-225-1411 if we can be of further assistance regarding endangered species.

Sincerely yours,

William Neidermyer
Acting Supervisor
New England Field Offices

Enclosure

Excerpts from:

PART B.

VISITOR PROFILE

*Concord Museum, Lexington Historical Society, Museum of Our National
Heritage, Minuteman National Historical Park, and Orchard House*

Final Report

Presented To

The Lexington-Concord Area Visitors Collaborative

**Submitted by:
Ellen R. Foxman, Ph.D.
Gul Butaney, Ph.D.
Department of Marketing
Bentley College
Waltham, MA 02154**

March 28, 1995

MINUTEMAN NATIONAL HISTORICAL PARK VISITOR PROFILE

About This Visit: (survey questions 1 through 7)

A first visit for most -- but not December visitors. About sixty percent of July and October respondents indicated that this was their first visit to the Lexington-Concord area. In December, however, only about a third (37%) described this as their first trip to the area. More than three-quarters of respondents in all months stated that this was a day trip for them.

A vacation or a visit. Sixty percent of July visitors, and 68% of October visitors, stated their visit was part of a vacation; this dropped to twenty-seven percent in December. The percentage visiting friends or relatives was nineteen July and fourteen in October. One-third of December respondents gave visits as a reason for their trip. The percentage of respondents answering "other" when asked the primary purpose of their visit remained relatively steady over the three months.

A two-day stay. For the quarter of respondents who were on a multi-day trip, their stay in the Lexington-Concord area averaged 2.0 days in July, a somewhat shorter 1.5 days in October, and 1.8 days in December. These stays were part of an average total trip length ranging from almost twenty days in July down to under two weeks (12.5 days) in December.

Stay with friends or family. In July and October, about a quarter of respondents on a multi-day trip indicated that they were not staying in the Lexington-Concord area. In December, however, nearly all (except for 8%) were staying in the area. In all three months, staying with friends or family was the lodging option most commonly indicated by respondents - 27% in July, 41% in October, and 75% in December. Hotels or motels were chosen by about a quarter of respondents in July, and smaller percentages in the other two months. Average room charges rose steadily over the months surveyed -- from \$77 in July, to \$81 in October, to \$115 in December.

Visitors and Minuteman National Historical Park: (survey questions 9 through 12)

The American Revolution Brings them. When visitors were asked their reasons for visiting Minuteman, "interest in the American Revolution" was by far the most frequently checked response (at least double the next most frequently checked reason in all months surveyed. "Interest in

American culture" was the second most frequently checked response in all months. "Interest in American literary heritage" was the third most frequently mentioned reason for visiting in July and October, but this was displaced by "interest in outdoor activities" in December.

What admission fee? About two-thirds of respondents in July and October, and over ninety percent in December identified admission to Minuteman as free of charge. Almost half in July and a third in October identified admission fees as "about right" or "low." These findings make sense, given that Minuteman operates multiple sites, one of which (The Wayside) charges admission and is not open in December.

Word-of-mouth is most important. When respondents were asked how they had heard about Minuteman, word-of-mouth was the most frequently mentioned source in all months. The second most frequently mentioned source was the AAA tourbook in July, "other" in October, and "newspaper article or ad" in December. In July and October, respondents didn't hear about Minuteman at their hotel or from newspaper articles or ads

Good directions to the Park. Most respondents had no trouble finding the Park. Asked to rate directions to Minuteman, 92%-96% over the three months indicated that directions given were either "adequate" or "extremely clear and easy to follow."

This Visit As Part of a Longer Trip: (survey questions 13 through 18)

The largest group are from MA. To get some idea of where trips originated, respondents were asked where they lived. Approximately ninety percent were from the U.S. in all months surveyed. Looking at patterns across the three months, Massachusetts was the most frequently mentioned state of residence, followed by California. Few visitors came from the other New England states.

Travel by own car or a rental. Between eighty and ninety percent of the respondents in all months traveled to the Lexington-Concord area in their own car or a rental car. The Lexington-Concord area was the trip destination for about forty percent of the respondents in July and October, and almost seventy percent in December. Few respondents were traveling with a bus tour (3% in July, 8% in October, and 3% in December).

Largest travel parties in December. The average party size was 5.6 in July, 4.4 in October, and 5.9 in December. Considering the age and sex mix of individuals in visitor parties, adult males were a little more likely

to predominate in October, and adult women were a bit more likely to predominate in December. The number of children in visitor parties averaged about two in all months.

Following the Battle Road. Respondents were asked whether they had seen or planned to see other area attractions during this trip. In July, the attractions most frequently mentioned were Boston, Lexington Green, Concord Museum, Plymouth, and Salem. The two sites most strongly associated with a visit to Minuteman were Boston and the Lexington Green. A similar pattern of responses was observed in the other months.

Minuteman Visitors are: (survey questions 19 through 25)

Middle-aged and well-educated. The average age of July respondents was 45; in October, the average age was 48, and in December, 38. There was an approximately even split between male and female respondents in all three months. Individuals completing the survey were very well educated: in all the months surveyed, approximately two-thirds had a four-year college degree or postgraduate study.

Part of a family household. In July and October, about two-thirds of respondents described their household as consisting of either a husband and wife only or a husband, wife, and children under 18. In December, just over half placed their households in these categories. Ten to fifteen percent of respondents in July and October indicated that they lived alone; the percentage in this category was considerably larger (36%) in December. Respondents who visited in October and December had more children under 18 in their households than those who visited in July.

Employed full-time. Over half of respondents in all months described themselves as employed full-time. A significant minority, particularly in October and December, described themselves as retired. Very few respondents stated they were students. Finally, respondents were fairly prosperous: more than sixty percent in all three months reported annual incomes of \$40,000 or more. Twenty percent of those responding to this question in July had annual household incomes greater than \$70,000, as did almost a quarter of those in October and nearly a third in December.

Question #13, continued. Where do they live?

Minuteman National Historical Park

(a) State

	<u>July</u>	<u>October</u>	<u>December</u>	<u>All Months</u>	<u>Grand Totals</u>
Massachusetts	48 (34%)	31 (22%)	13 (48%)	92 (30%)	434 (37%)
Connecticut	2 (1%)	4 (3%)	1 (4%)	7 (2%)	22 (2%)
Maine	0 (0%)	1 (1%)	1 (4%)	2 (1%)	11 (1%)
New Hampshire	1 (1%)	2 (1%)	0 (0%)	3 (1%)	23 (2%)
Rhode Island	1 (1%)	2 (1%)	0 (0%)	3 (1%)	11 (3%)
Vermont	0 (0%)	1 (1%)	0 (0%)	1 (0%)	3 (0%)
California	9 (6%)	20 (14%)	4 (15%)	33 (11%)	132 (11%)
All other	80 (57%)	78 (56%)	8 (29%)	166 (54%)	532 (46%)

(b) Country

United States	143 (89%)	134(93%)	26 (87%)	303 (91%)	1151 (93%)
All other	17 (11%)	10(7%)	4 (13%)	31 (9%)	90 (7%)

Note: Percentages may not sum to 100 due to rounding.

Table 4M
Minuteman National Park

TOTAL DIRECT VISITOR EXPENDITURES

	TOTAL	AVERAGE PER TRIP
Day	\$ 4,680,369	\$ 18.21
Multiday	\$16,808,266	\$108.84
Total	\$21,488,635	

EXPENDITURE DISTRIBUTION BY TYPE OF VISITOR AND BY COMMODITY

EXPENDITURE CATEGORY	DAY		MULTIDAY	
	AMOUNT	PERCENT	AMOUNT	PERCENT
Souvenirs	\$899,382	19.0	\$733,836	4.0
Arts/Crafts	513,933	11.0	765,957	5.0
Groceries	316,266	7.0	926,561	6.0
Gasoline	394,097	8.0	1,457,790	9.0
Meals	1,512,148	32.0	4,632,806	28.0
Retail shopping	720,247	15.0	1,729,581	10.0
Entertainment	324,296	7.0	469,458	3.0
Lodging	—	0.0	6,092,277	36.0

Appendix N:

Community Open Forums for Trail Planning and Organized Trail Walks for Public Involvement, Minute Man National Historical Park, prepared by Dan Dattilio, dated April 18, 1996

The community open forums for trail planning and community trail walks were based on the final sentence in the statement of purpose for the Battle Road Trail Project "... Project planners must work closely with towns." Hundreds of community members, from a wide variety of backgrounds, were invited to participate in the trail planning process and to walk with NPS staff along the proposed trail alignment. In all, several hundred community members, from the surrounding towns of Concord, Lincoln, Lexington, Bedford and others, made contributions to the trail planning process.

Since the first meeting on March 17, 1993, NPS planners and Minute Man NHP staff have met formally in open forums with members of the community on 18 separate occasions. There have been more than 50 informal meetings with individuals, small groups and members of organizations such as Conservation Commissions, local Police Departments, Planning Boards and Historic Commissions. Community members were informed that NPS planners and Park staff would like to hear their ideas and they were encouraged to offer their varied expertise to the project. Topics discussed included community involvement, trail design, conservation issues, interpretive planning, safety and security, funding issues, and interfacing with surrounding trail systems.

Information about the organized trail walks was provided at the open community forums for trail planning, the Concord Conservation Coffees, the Lexington Land Stewardship Group, at all three Conservation Commissions and in the local press. On four occasions community members in groups of up to 40 participants have gone into the field with NPS personnel to walk along the proposed alignment in order to provide direct and immediate feedback on trail location planning issues. There was press coverage and subsequent articles about organized walks published in the Concord Journal, the Lincoln Minute Man, The Lexington Minutemen and the Boston Globe.

OPEN FORUM TRAIL PLANNING MEETINGS WITH THE SURROUNDING COMMUNITIES:

Community Trails Workshop	Concord Town Building	03/17/93
Open Forum Trail Planning	Minute Man NHP	08/14/93
Community Trail Walk	Minute Man NHP	08/23/93
Open Forum Trail Planning	Minute Man NHP	10/14/93
Open Forum Trail Planning	Minute Man NHP	11/23/93
Open Forum Trail Planning	Minute Man NHP	12/15/93

Open Forum Trail Planning	Minute Man NHP	03/24/94
Open Forum Trail Planning	Minute Man NHP	05/19/94
Community Trail Walk	Minute Man NHP	05/23/94
Open Forum Trail Planning	Minute Man NHP	10/05/94
Community Trail Walk	Minute Man NHP	11/10/94
Open Forum Trail Planning	Minute Man NHP	01/17/95
Open Forum Trail Planning	Minute Man NHP	03/28/95
Open Forum Trail Planning	Battle Road VC	04/25/95
Community Trail Walk	Minute Man NHP	06/17/95
Open Forum Trail Planning	Minute Man NHP	11/29/95
Teachers's Trail Workshop	Lincoln Schools	12/09/95
Historian's Trail Workshop	Minute Man NHP	03/26/96

Regular participants in the open forums for trail planning:

Mr. Jim Wagget	Concord resident
Mr. Mike Farney	Lincoln Guide Service
Mr. William G. Constable	Lincoln Land Conservation Trust
Mr. John Frey	Lexington Design Advisory Committee
Mr. Geoff McGean	Lincoln Conservation Commission Administrator
Mr. Carl P. Melberg	Biologist and Wetland Specialist with U.S. Fish and Wildlife Service
Mr. Daniel H. Monahan	Concord Natural Resources Coordinator
Ms. Marilyn Norby	Lexington Conservation Administrator
Ms. Wendy Reasenber	Member of the Friends of the Minuteman Commuter Bikeway
Mr. Gordon H. Shaw	Concord Resident
Mr. Jerry VanHook	Chairmen, Friends of the Minuteman Commuter Bikeway
Mr. Lawrence W. Zuelke	Landscape Consultant, Lincoln
Ms. Sarah Arnold	Massachusetts Port Authority
Ms. Dilla Tingley	Lincoln Resident
Mr. Brian Donahue	Local Historian
Mr. Tom Horth	Bay Circuit Alliance
Mr. Dan Fortier	Metropolitan Area Planning Council
Captain Ben McCarty	U.S. Air Force, Hanscom Air Force Base



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
METROPOLITAN BOSTON - NORTHEAST REGIONAL OFFICE

WILLIAM F. WELD
Governor

MARCO PAUL CELLUCCI
Lt. Governor

TRUDY COXE
Secretary

DAVID B. STRUHS
Commissioner

April 9, 1996

National Park Service
Minute Man National Historical Park
174 Liberty Street
Concord, MA 01742

RE: WETLANDS/LINCOLN
DEP FILE #203-636
WETLANDS/CONCORD
DEP FILE #137-422
401 STATUS

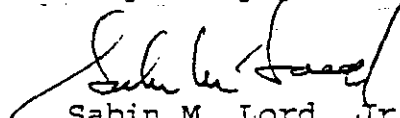
Dear Mr. Mendik:

The Department of Environmental Protection, Wetlands Division, has reviewed the Notices of Intent and Orders of Conditions for the projects referenced above. Based on that review, the Department has determined that there is reasonable assurance that the projects will be conducted in a manner which will not violate the Massachusetts Surface Water Quality Standards. The Order of Conditions issued by the Lincoln and Concord Conservation Commissions will serve as the 401 Water Quality Certifications for this project, provided that:

- 1) the applicant receives and complies with the Order of Conditions;
- 2) the project will not result in a discharge within or to an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00.

This Certification does not relieve the applicant of the responsibility of complying with any other statutes or regulations. If you have any questions, please contact Rachel Freed at 617/932-7783.

Very truly yours,


Sabin M. Lord, Jr.
Regional Engineer for
Resource Protection

cc: Lincoln Conservation Commission, Town Hall, Lincoln 01773
Concord Conservation Commission, Town Hall, Concord 01742

