

# SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

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## **SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002**







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## Chapter 1

## INTRODUCTION

- Regional Context
- Surrounding Context
- Local Context
- Need for a Development Plan
  - Conformance/relationship with other planning initiatives
  - Timeline for NASA projects
- Report Organization

SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002



## INTRODUCTION

#### **REGIONAL CONTEXT**

Moffett Field consists of approximately 2,000 acres of land in the heart of Silicon Valley in the San Francisco Bay Area. It is located between Highway 101 and the southwestern edge of the San Francisco Bay in Santa Clara County, California. The City of Mountain View borders it on the south and west, and the City of Sunnyvale to the south and east. It is about 35 miles south of San Francisco and 10 miles north of San Jose. Figures 1.1 and 1.2 show the regional context of the site.



Figure 1.1 Regional Context



Figure 1.2 Regional Context

#### SURROUNDING CONTEXT

Adjacent to the NASA/Ames Research Center are various land uses that include industrial, office, residential, agricultural and open spaces. To the west of Ames Research Center is Stevens Creek and the recreational trail. To the northwest are office and light industrial buildings, with retail and entertainment services to the north of Shoreline Boulevard. To the south of Ames Research Center and Highway 101 are a variety of uses that include light industrial, office and commercial. Residential uses include both detached single family units and high-density multi-family units. To the southwest, below Highway 85 is a regional park. To the southeast is the Sunnyvale Municipal Golf Course, which is dedicated as open space. The area immediately to the east of Ames Research Center is industrial and office uses with residential uses beyond it. These land uses are illustrated in Figure 1.3 and described below:



Figure 1.3 Surrounding Context

#### LOCAL CONTEXT

Moffett Field is comprised of several sub-areas or districts, each with its own identity and function. These Districts are listed below and illustrated in Figure 1.4.

#### **NASA Ames Campus**

With 234 acres, these federal research facilities comprise the heart of the site. These facilities include laboratories, wind tunnels, flight simulators, and numerous testing facilities and advanced computing systems. The majority of the 5,000 Ames employees work in this campus..

#### **Bay View**

The Bay View district is a 95-acre parcel bordered by the wetlands to the north, Eastside/Airfield to the east and the Ames Campus to the south. Potential land uses for this area include mixed-density housing with recreational facilities.

#### Eastside/Airfield

The airfield, airfield-support areas and the California Air National Guard make up the Eastside/Airfield sub-area, with a total area of 952 acres. The airfield stretches from the wetlands and the San Francisco Bay to the north and Highway 101 to the south. The continued operation of the airfield is essential to NASA's aerospace research and development activities and the research and develop-



Figure 1.4 Local Context

ment activities and the rescue mission of its largest tenant, the California Air National Guard.

#### **NASA Research Park**

The NASA Research Park consists of 213 acres of land bordered by the Eastside/Airfield, the Ames Campus, military housing owned by the Department of Defense and U.S. Highway 101. The NASA Ames Development Plan (November 2001) envisions that this area will contain a variety of uses including laboratories, office space, classrooms, auditoriums, museums, a conference center, open space and a burrowing owl open space preserve. The Shenandoah Historic District is part of the NASA Research Park.

#### NEED FOR A DEVELOPMENT PLAN

In 1991, the Federal Base Closure and Realignment Commission decommissioned Moffett Field. In 1994 the Dept. of Defense transferred 1,875 acres of former Naval Air Station property to NASA. NASA plans on utilizing the property for collaborative aerospace and aeronautic research. In 1994, NASA developed a Comprehensive Use Plan (CUP) for the base. The CUP served as the initial guiding document for development at Ames Research Center. As part of the CUP, a total of 1 million square feet of new building space was planned for construction over a 15-year period.

In 1996, the cities of Mountain View and Sunnyvale appointed a 19-member Citizens Advisory Committee (CAC) to study and provide input to NASA about the future uses of Moffett Field. The CAC endorsed NASA's 6-point initiative, which provided the goals and a framework to guide the future development at Moffett Field.

As part of the 6-point initiative, NASA decided to consolidate its high-tech and aviation resources and develop partnerships with government agencies, local universities, private industry and non-profit organizations to create a collaborative research and development community. In order to achieve this, NASA proposes to develop a state-of-the-art campus for shared use. This development plan is outlined in the NASA Ames Development Plan (NADP). This plan, once adopted, will replace the CUP as the operative

#### planning document for all development for Ames Research Center.

The NADP includes a land use and development plan for the 500 acre campus of NASA Ames Research Center and the 1,500 acre Moffett Field. The NADP also recommends the establishment of the NASA Research Park, a 213 acre research and development campus. The NASA Research Park (NRP) contains much of the fabric of the Navy's original development of Shenandoah Historic District.

At full build-out, the NASA Research Park will contain 3.5 million square feet of building area. Approximately 2.1 million square feet will be the result of new construction under the NADP. The existing building stock makes up the remaining 1.4 million square feet. As part of the NADP, the Shenandoah Historic District is slated for new development in the next few years to accommodate NASA's vision of a research park that will house a world-class center for research and learning.

The NADP is based on certain planning principles that direct the planning efforts throughout the site. One of ten planning principles is Historic Resource Preservation. NASA is committed to protecting and preserving its historic resources in the Shenandoah Historic District specifically, as well as other historically significant buildings throughout Moffett Field.

Shenandoah Historic District is a historic and architecturally distinct district within NASA Research Park. Its clear, powerful arrangement



Hangar One - South Elevation



Building 17 - West Elevation



Building 20 - North Elevation

of buildings and spaces has not been adversely impacted over time, a testimony to the strength of the original Master Plan. The Historic District has retained its original Master Plan's spatial organization and its distinct Spanish Colonial Revival architectural heritage.

On February 24, 1994, the Shenandoah Plaza Historic District was officially added to the National Register of Historic Places. Shenandoah Historic District includes Hangers One, Two and Three, their ancillary buildings, roads and the plaza encompassed in the oval formed by Wescoat and Bushnell Roads. Twenty-two of the existing buildings in Shenandoah Historic District are historically significant.

In November 2000, the Historic Resources Protection Plan (HRPP) began the process of establishing procedures to integrate the planning, preservation and use of historic properties at Shenandoah Historic District. The NADP recommends that a set of detailed design guidelines be developed to guide any development within the Historic District with the intent of preserving the character of the original Master Plan. Based on direction from the NADP, this **Shenandoah Historic District Development Plan** ("Development Plan") will focus on the Historic District and provide a set of specific design guidelines and development standards for new development within the historic area, including criteria for preservation and modification to existing historic structures.

Specifically, the focus of the Shenandoah Historic District Development Plan will be to:

- Integrate historic preservation requirements for properties within the Shenandoah Historic District, including planning, design, construction, facility leasing, building repair and maintenance, and other land use decisions.
- Provide for the protection and treatment of historic properties, including Shenandoah Historic District's physical landscape.
- Establish design guidelines for new construction within the Shenandoah Historic District.

- Establish guidelines for the repair, maintenance, rehabilitation, alteration, reuse, and leasing of historic resources within the Shenandoah Historic District.
- Establish design standards for site and landscape related improvements.
- Provide an implementation and phasing plan for improvements.



#### CONFORMANCE/RELATIONSHIP WITH OTHER PLANNING INITIATIVES

In preparing this Development Plan for the Shenandoah Historic District, prior standards and guidelines were evaluated in order to preserve and comply with the intentions of the planners of Moffett Field's spatial and cultural development. These documents include:

The Historic Resources Protection Plan (HRPP), which provides guidelines for complying with historic preservation requirements set forth in Section 106 and 110 of the National Historic Preservation Act of 1966, as amended. The primary purpose of the HRPP is to establish procedures to integrate the planning, preservation, and use of historic properties on lands that will be developed by NASA Ames Research Center into a world-class campus featuring research, development, and education partnerships between government, academia, industry, and non-profit organizations. Appendix D of the HRPP includes Design Guide-lines for New Construction at the Shenandoah

Historic District, including codified standards for new construction, height limits and building setbacks within the Historic District.

The NASA Ames Development Plan (NADP) details the transformation of the original 200-hectare (500 acre) campus of NASA Ames Research Center and the 1,500 acre former Naval Air Station Moffett Field into an integrated, dynamic research and education facility. The document describes NASA's vision of the proposed development as well as the various interconnected dynamics between the districts.

The Environmental Impact Statement (EIS) for the NASA Ames Development Plan addresses the internal and external environmental impacts associated with future development. The draft EIS is currently under a public comment period.

The NASA Research Park Design Guide includes both qualitative guidelines and quantitative standards for the development of the entire NASA Research Park. This document is integral to this Development Plan describing the dynamics between Shenandoah Historic District and the adjacent districts as well as the identity of the facility as a whole.

The Environmental Issues Management Plan provides a decision framework for the management of residual hazardous chemicals in soils and groundwater at the site during development. The various phases of health risk assessment, risk management during construction and post-construction risk management are outlined. These procedures will need to be considered in the redevelopment of the Shenandoah Historic District, which have areas of high concentration of chemicals.

The Base Exterior Architecture Plan is another document that addresses design rehabilitation specific to Shenandoah Historic District. Prepared in 1983 for the U.S. Department of the Navy at Moffett Field, it describes development and implementation plans envisioned at the time. Since then, the major occupation and function of the airfield has changed. However, the basic architectural treatment discussed in the document is still relevant today.



The information relevant to development in the Shenandoah Historic District area is scattered under various documents. This Development Plan will provide a compilation of all relevant data and provide a comprehensive set of design guidelines and development standards for both infill development and rehabilitation of existing historic buildings.

#### TIMELINE / SCHEDULE FOR OTHER NASA RESEARCH PARK PROJECTS

The proposed development under the NASA Ames Development Plan has the purpose of furthering NASA's mission by developing the vital scientific, engineering and academic community necessary to achieve a world-class, shared-use education, research and development campus. Currently a ten-year implementation and phasing plan is being developed for this proposal.

The majority of the proposed new development is contained within the NASA Research Park. The

2.7 million square feet of new development in this district consists of educational, office, research and development, museum, conference center, housing and retail spaces. A light rail station and a burrowing owl open space preserve are also planned for this district. Approximately 600,000 square feet of existing historic structure renovation including the rehabilitation of Hangar One are planned.

The Ames Campus district is the original 234 acre site, Ames Research Center represents a sub-set of the total NASA-ARC complex. Currently there are approximately 2.9 million square feet of unique Federal research facilities including laboratories, wind tunnels, flight simulators, numerous test facilities and advanced computing systems. A net of 100,000 square feet of new development is proposed for this restricted-access district.

To the north lies the future Bay View development. This 95 acre area of land is predominately undeveloped upland grasslands and vast wetlands. One million square feet of new development, primarily mixed-use housing are proposed for this area. Recreational spaces and another burrowing owl open space preserve are also projected to occupy this land.

Finally, the Eastside/Airfield district contains the runway as well as the lands to the east of it. This 952 acre site will primarily serve the current occupants of the California Air National Guard (CANG) and their airfield operations, fueling and munitions storage. Other users will include the Army National Guard, Coast Guard, Air Force, and NASA Research Aircraft. It will also include a burrowing owl preserve and a golf course. The proposed new development in this district is 12,000 square feet. CANG has developed a master plan for development within this area.



#### **REPORT ORGANIZATION**

This report is organized into nine chapters as briefly described below:

- Chapter 1, **Introduction**. This chapter explains the need for the Shenandoah Historic District Development Plan, includes this plan's relationship with other plans and outlines the timeline and schedule for all of the projects as part of the NASA Ames Development Plan.
- Chapter 2, **Executive Summary**. Chapter 2 highlights the significant components of the Shenandoah Historic District Development Plan and provides an overview of the future vision for the Historic District.
- Chapter 3, **History**. This chapter sets the Development Plan within the regional and local contexts. It also provides a historical overview of the District, illustrating the chronology of development through plans and photographs. This section also includes a listing of all historic designations.
- Chapter 4, Defining Character/Existing

**Conditions.** Chapter 4 includes a description of the existing organization of the Historic District, its visual and spatial relationships, contributing buildings and the predominant architectural vocabulary. It also describes the historic monuments that are part of the District and reviews landscape features that exist from the original Master Plan. These elements set the framework for the opportunities and constraints diagram that will depict appropriate areas for future development within the Historic District.

 Chapter 5, Land Use and Urban Design. This chapter is intended to provide comprehensive information to direct future development. Specifically, it includes the goals and objectives of the Development Plan, a list of planning principles and proposed land uses. It also includes a proposed development plan that identifies the areas and extent of future development. This chapter discusses specific early projects such as the proposed Conference Center, the California Air and Space Museum and the Educational/ Technical Center. Also included is a detailed set of development standards and modifications to existing programs and policies that are required to implement this Development Plan.

- Chapter 6, Circulation. Chapter 6 contains a description of the existing roadway system and outlines proposed modifications to the existing street, pedestrian, bicycle and mass transit systems.
- Chapter 7, **Design Guidelines**. This chapter includes design guidelines for the site, buildings, landscape, site furnishings and elements of the public realm. It outlines mechanisms for the protection and enhancement of the integrity of the Historic District.
- Chapter 8, **Infrastructure**. This chapter includes a description of the existing and proposed sewer, water, electric, gas and telecommunication systems.
- Chapter 9, Implementation. Chapter 9 pro-



vides details of the development phasing and infrastructure improvements including a cost summary of the required upgrades and identifies funding sources.

- Appendix A includes a summary of the relationship of the Historic District to other districts, references.
- Appendix B includes a bibliography and relevant information from the EIS.
- Appendix C includes the relevant information from the EIS/EA.
- Appendix D includes a Glossary of Terms.
- Appendix E includes a list of abbreviations used throughout the document.

## Chapter 2 **EXECUTIVE SUMMARY**



SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

## **EXECUTIVE SUMMARY**

## Chapter 3 **HISTORY**

- Historic Context
- Historic District
- Site Designations
- Building Chronology



SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

### HISTORY

MOFFETT CREATION OF FIELD -1929-1935: The creation of Moffett Field is linked to the birth of a new period in American aviation, the Lighter-Than-Air (LTA) era, which began with an idea over 75 years ago. Germany had found success in using giant airships for scouting purposes during World War I, and the United States did not want to be left behind (Moffett Field 60th Anniversary, 1993). As the United States became concerned about the security of its lengthy coast lines, dirigibles (rigid airships) became an essential component of the Navy Department. The Navy's earliest use of the LTA craft may be traced back to the Civil War. Union forces used hydrogen filled balloons with attached baskets for aerial reconnaissance missions. Dirigibles, designed in the 1920s, were more effective than balloons: occupants were able to observe large areas of land and sea for longer periods; the craft were more maneuverable; ascent and descent could be more dependently controlled.

In support of the dirigible program, a chain of three airship mooring and docking stations was constructed across the country, on the east coast (Lakehurst, New Jersey), in the Midwest (Akron, Ohio) and in the west coast (NAS Sunnyvale, California). Naval Air Station (NAS) Sunnyvale, later known as Moffett Field was constructed for the Navy in order to house Lighter-Than-Air craft. In the 1920s and 1930s, dirigibles, along with sea planes and surface craft, would provide the best protection against submarines. In 1929, the Navy authorized construction of two large dirigibles, named USS Akron and USS Macon, that were to be the nucleus of the modern air force. The Navy began searching for a west coast base for these airships. Contributing to this search was Laura Thane Whipple, a local real estate agent who was selling a ranch in Sunnyvale at this time. She recalled an article indicating the need for a dirigible base near a metropolitan area on the west coast. Mrs. Whipple alerted representatives of the Bay Area Chamber of Commerce and state politicians who began a campaign for the base. Competition was heated throughout the nation, particularly with the city of San Diego which offered Camp Kearny for \$1. Santa Clara, San Mateo, San Francisco, and Alameda counties collaborated to raise support and funds. They eventually raised \$470,000 to buy 1,000 acres of the Ynigo Rancho, believed to be the last intact land grant in California. In February of 1931, President Herbert Hoover signed a bill authorizing the acceptance of 1000 acres of land between Sunnyvale and Mountain View. The land was sold to the





government for \$1, in order to match San Diego's deal. The new base, constructed out a cost of \$5M, would bring much needed jobs and income to Northern California at a time when the country was in a depression.





HANGAR ONE AND THE MACON: The first building constructed at the base was Hangar One, which was to become the new home for the dirigible Macon, the largest aircraft in the world at the time. The Macon completed its maiden voyage across the United States to Sunnyvale, arriving with much fanfare on October 15, 1933 after a 70-hour flight from Lakehurst, New Jersey.

Tragically, eight days before the establishment of NAS Sunnyvale, Macon's sister ship, Akron, crashed with the loss of all hands except for 3, including Admiral William A. Moffett. On May 17, 1933, the facility landing field was renamed Moffett Field in honor of the admiral. Shenandoah Historic Distric was named for a similar disaster, the USS Shenandoah that was lost with a crew of 14 on September 3, 1925 in Ohio. On February 12, 1935, the Macon shared the same fate as the Akron, crashing into the water off of Point Sur, California. Two people were killed and eighty one survived, but it marked the end for the dirigible program. Government officials began to doubt the worth of such vehicles and deemed them obsolete. In 1935, the facility was turned over to the Army for use as a primary training center.



**SITE ATTRIBUTES:** The location of Shenandoah Historic District, 1,000 acres of flat agricultural land in the Santa Clara Valley, was selected to support the mission of the Lighter-Than-Air (LTA) naval base. The landscape and climatic conditions were ideal for a base of this kind. The mild temperatures, consistent direction of the prevailing wind, good visibility and the relative absence of topographical obstructions made this a highly desirable site for an LTA military installation.

The topography played an especially important role in site selection, with the only hills some nine miles away to the southwest and east of the station. This geographical consideration was necessary as the helium filled aircraft required an unobstructed path to successfully take off and land. Another desirable feature of the site was its close proximity to agricultural fields. The farmland suggested the possibility of future expansion into the properties to the east of the base.

BASE DESIGN: Shenandoah Historic District was designed with Hangar One as the dominant feature of the site with the base buildings arranged west of the hangar. The landing strip was located directly east of Hangar One. This resulted in an elongated oval shape in plan, with Hangar One positioned at one end of the site, providing a visual terminus for the base. The site is defined by Hangar One to the east, Bushnell Road to the north, the main entrance gate to the west, and Wescoat Road to the south. The original buildings at Shenandoah Historic District are clustered into a formal campus layout within a U-shaped road pattern. Incorporated in this design is a minimal landscape consisting of open lawns with relatively few street trees and scattered clumps of mature trees Figure 3.1.



Figure 3.1 Original Master Plan



**BUREAU OF YARDS & DOCKS:** The site plan and structures at Shenandoah Historic District were designed by the Bureau of Yards & Docks, whose function was design, construction and maintenance of all naval facilities and utilities around the country. The Bureau of Yards & Docks was established in the Department of the Navy in July, 1862, following many different incarnations under the War Department in 1789 and Board of Naval Commissioners in 1815. The Bureau was abolished in May 1966 to be succeeded by Naval Facilities Engineering Command.

**BEAUX ARTS TRADITIONS:** Although the buildings in the Shenandoah Historic District were built in the Spanish Colonial Revival style, the spatial plan for the base has its roots in the Beaux Arts tradition. The Beaux Arts City Beautiful planning tradition promoted concepts of order, dignity, and harmony in the layout of cities and government buildings. Popularized by the techniques of the Ecole des Beaux Arts in Paris, this style first became prevalent in the United States as a result of the World's Columbian Exposition of 1893 in

Chicago. The shimmering "White City," as the ceremonial court of the fair came to be known, set a precedent for city planning as part of the City Beautiful movement, and influenced American architecture for the next fifteen to twenty years. City Beautiful concepts, such as grouping major buildings along a central axis and at prominent intersections were translated into city, university and military campuses throughout the United States. At the Shenandoah Historic District, the main axis is drawn through the center of a lawn plaza and serves as the ceremonial core of the district.

**SPANISH COLONIAL REVIVAL:** Spanish Colonial Revival, based on the original Spanish Colonial architecture of the 1550s, was most common in parts of the southwest and Florida and was particularly popular in the 1920s and 1930s. This style was used in various government installations in California and the west. Shenandoah's buildings were designed in the popular Spanish Colonial Revival style. The style typically features a symmetrical façade with stucco or plastered walls and ornate low-relief carvings highlighting arches, columns, and window surrounds. A molded or arcaded cornice highlights the eaves. Other typical features included red tiled hipped or gabled roofs, parapets and arcaded porches.

The innovative architect, Bertram Goodhue, brought new energy to Spanish Colonial Revival style in his designs for the 1915 Panama-California Exposition in San Diego, which would eventually become the core Balboa Park in San Diego. Goodhue had earlier designed the U.S. Military Academy at West Point, becoming well-versed in the Spanish Colonial style. As the style became more popular, the Navy adopted Spanish Colonial Revival for use in various projects. A few of these designs include the Chollas Heights Radio Transmission Station in 1916 and Goodhue's Marine Corps Recruit Depot c. 1920, and at the Naval Air Station at North Island in 1921 (US Naval Air Station Sunnyvale, California, National Register of Historic Places nomination, 1994).

Implicit in the architectural design of Moffett Field were military cultural values such as hierarchy, uniformity, discipline, utility and patriotism. These qualities are physically manifested through building design, form, and placement. Hierarchy is established with the most dominant structure on the site, Hangar One, perpetuating the mission of the base, a Lighter-Than-Air defense station. Discipline and uniformity is expressed through the fluent architectural style, symmetry, massing and setting. Utility is expressed in the stripped down style used in building types such as warehouses, locomotive sheds and repair sheds, or the Streamline Moderne architecture of Hangar One.





MILITARY CONTROL AT MOFFETT FIELD - 1935-1942: From 1935 until 1942, the base remained under Army control. During this time, the base became the home for the 82nd Army Observation and the 9th Airbase Material squadrons. In 1938, the Army's 18th and 20th pursuit squadrons came to Moffett Field and the population of the base boomed to 5,000 enlisted men and 300 officers. The base later shifted to the West Coast training center for the Army Air Corps, the predecessor to the U.S. Air Force. Due to surge in use, a housing shortage necessitated the quick construction of a series of wood buildings on the east side of the Historic District, which became known as 'Splinter City." After December of 1941 and the bombing of Pearl Harbor, the site reverted to a naval base. Military leaders became concerned that the west coast lacked the aircraft necessary to patrol for submarines and mines. To this end, the Navy reestablished the air station as NAS Moffett Field on April 16, 1942 and blimps were employed for patrol. Although intended primarily as a LTA training base, NAS Moffett Field provided training to transport and patrol squadrons.

**1942-1946:** From 1942 to the end of WWII, Moffett Field was transformed from a base for training Air Corps cadets to the Naval Airship Training Command responsible for blimp operation. Nonrigid airships as well as hot air balloons were positioned at the base, providing similar surveillance of the coastline as the original dirigibles. Patrolling the Pacific coast was especially important as fear of an invasion on the west coast increased. During this time, Moffett Field became the nation's only air base devoted exclusively to Lighter-Than-Air craft. This necessitated the construction of additional buildings to house the training and storage of the LTA craft. Hangars Two and Three were quickly constructed in 1943 to meet the Navy's demand for more space. Due to the wartime shortage of steel, these were constructed primarily of wood and concrete. Along with training of blimp operators, Moffett Field began to manufacture blimps in the Assembly and Repair Department. However, this dependence on LTA craft was short lived. A Heavier-Than-Air (HTA) program was assigned to Moffett Field in 1942, marking the beginning of the end of the LTA program at the base. By 1944, the final airship arrived at Moffett Field for assembly and the last class for LTA pilot and crew graduated in that year. By the end of 1946, the Lighter-Than-Air program had been terminated.

**POST WWII-1950S:** During the post war years the base became a major Naval Air Transport Service Squadron Center. The base moved into the jet age and extended Moffett Field's landing strips and modified its hangars. During the Korean Conflict in 1950, Moffett housed the first night jet fighter in the service. More support buildings and landing facilities were built during this time period.



After 1950s, the structures inside the Shenandoah Historic District underwent few alterations and little new construction was initiated. Much of the new construction occurred outside of the Historic District, particularly in relation to the Ames Research Center. The National Advisory Committee for Aeronautics (NACA) was established in 1939 for aeronautical research. Named after Dr. Joseph S. Ames of John Hopkins University, Ames Research Center was established in 1940, specializing in the research of aerodynamics. In 1958, NACA officially became NASA, an independent agency of the federal government "devoted to the exploration of space for peaceful purposes for the benefit of mankind" (Moffett Field 60th Anniversary, 1993). The NASA-Ames Research Center eventually grew to occupy approximately 500 acres adjacent to the Historic District, with 50 major facilities including 14 major wind tunnels, 18 advanced flight simulators, and 25 aircraft.

**1960S-1970S:** In 1963, the base transferred use once more, becoming the home of the Navy's first land-based anti-submarine patrol aircraft, the 'P-3' Orion Hunter. For the next 30 years, the antisubmarine patrol would occupy the site. During the 1970s, the base became the headquarters of the Commander Patrol Wings, U.S. Pacific Fleet. The U.S. Pacific Fleet was responsible for patrolling 93 million square miles of ocean from Alaska to Hawaii, defending against enemy submarines.



**1980-2001:** Operations continued at Moffett Field until the base was recommended for closure in 1991. Officials from the local communities of Mountain View and Sunnyvale rallied to retain the airfield as a federal joint-use facility under the control of NASA and Ames Research Center. By December 1992, the final decision was made and NAS Moffett Field was officially transferred to NASA on 1994 (Moffett Field 60th Anniversary, 1993). Presently, NASA continues with design and research at the NASA Ames Research Center.

#### HISTORIC DISTRICT, NATIONAL/ REGIS-TER OF HISTORIC PLACES

The National Register of Historic Places nomination for the US Naval Air Station Sunnyvale, California Historic District was completed in February 1994 by Bonnie Bamburg of Urban Programmers in San José, California. The site was listed under Criteria A [Military] and Criteria C [Architecture and Engineering]. Under Criterion A, the site is nominated for its association with coastal defense and naval technology which made a significant contribution to the broad patterns of our history. The discontinuous district represents a unique and significant episode in the development of U.S. naval aviation prior to World War II. Under Criterion C, the nomination states that the three airship hangars (Hangar One, Two and Three) represent significant engineering accomplishments and are among a limited number of extant historic airship facilities in the United States. Hangars One, Two and Three and the support building accompanying these structures, represent excellent examples of early twentieth-century military planning, engineering and construction. The nomination also cites that the core of the historic Naval Air Station remains largely intact and includes fine regional examples of Spanish Colonial design (US Naval Air Station Sunnyvale, California, National Register of Historic Places nomination, 1994). According to the National Register of Historic Places nomination, 22 buildings and 2 objects are considered 'contributing' to the Historic District. The nomination also cites that 54 buildings in the Historic District are considered 'non-contributing'.

According to the 1994 National Register Nomination for the United State Naval Air Station Historic District, the period of significance for the site was established based on the early history of Moffett Field. The period of significance is defined as 1933-35 with the initial creation of the base under Navy control, and 1935-46 the period when the base was transferred transferred to Army control during WWII. This period marks the end of the Lighter Than Air era at Moffett Field.

#### SITE DESIGNATIONS

Prior designations include:

- US Naval Air Station, Sunnyvale, Californi-Historic District-National Register of Historic Places.
- Hangar One -Naval Historical Landmark.
- Hangar One-California Historic Civil Engineering Landmark by the San Francisco Section, American Society of Civil Engineers.
- Hangar One has been determined eligible for nomination to the National Register of Historic Places by the US Navy, in consultation with the California State Historic Preservation Officer.

#### **BUILDING CHRONOLOGY**

Most of the construction and changes in the Shenandoah Historic District occurred in its early history. The initial building campaign at the base established the core of the Historic District; these buildings were modified and added to as needed. This summary of the building chronology examines the Historic District at four points in time: 1933, 1946, Early 1970s and 2001. 1933 and 1946 were chosen because these dates mark the beginning and end of the Historic District's period of significance. The early 1970s was a logical midpoint between the period of significance and the base's present condition.

#### 1933

By 1933, what is now known as the Shenandoah Historic District had been constructed. There were a total of 40 buildings, including a section of residential quarters for officers Figure 3.2.

Photographs from the mid-1930s show the orderly planning of the Beaux-Arts influence is present from the base's inception. The roads, buildings within the Historic District, and sidewalks were all placed within the context of this design. The entrance from the county road was centered on the main axis of the Central Plaza. Two main boulevards, North and South Akron, were present from the beginning. They served to bring vehicular traffic into the Historic District as well as define the Central Plaza, made of expansive



Figure 3.2: 1933 Buildings

open lawns. The lawns were interrupted by crossroads at very deliberate and logical points. These crossroads include what are now McCord Avenue, Severyns Avenue, and Cummins Road. Only the flagpole and three buildings, the Admirals Building (# 17), the Cafe (# 3) and Hangar One were placed along the central axis. A view corridor from the entrance reveals the Admirals Building framed by Hangar One, standing formidably at the end of the eastern edge, creating the backdrop and focus for the Historic District. Only two sidewalks were placed within the Central Plaza, one running north/south along the front of the Admirals Building. The second sidewalk, also in the north/south direction, was placed on the east side of the Cafe.

The buildings that flank the Central Plaza along North and South Akron are placed with symmetrical sensitivity. The setbacks from one side to the other are similar, the building vocabulary is consistent, the street and sidewalk pattern is identical, and a dialog from one side of the Historic District

A less formal attitude was taken at the perimeter of the Shenandoah Historic District and especially in the east half of the base. Building placement at the outskirts of the Historic District is not symmetrical. Casual activities, such as tennis courts and parking, are located in this area. Both the tennis courts and parking are separated from the Central Plaza by a landscape buffer.



1933 Historic Map

It is the east side of the Historic District where the "workings" of the naval air station were placed. This area included a water tower, a balloon shed, a fire station, a commissary, a gas holder, and train tracks. Although the train tracks served a very important function for the air station, they deferred to the design of the master plan through their careful alignment. The tracks are restricted to the eastern half of the Historic District and run parallel to the north/south streets.

Although the landscape plan of 1933, calls for a very generous, though formal planting for the base, early photographs show lawns devoid of vegetation. It is not until 1938 that grass, a few young trees and shrubbery are evident. Planting, however, remains generally sparse. Early plans and photographs indicate an intent to place no buildings in the lawns in front of Hangar One, between Severyns Avenue and Cummins Avenue.



#### 1946

America's involvement in WWII brought with it much building at Moffett Field. Most of the building occurred outside the confines of Shenandoah Historic District. Building within the district was accomplished with little regard to the Beaux-Arts design of the original campus.

The central axis lost some of its grandeur with the addition of five new buildings and a parking lot

Figure 3.7. Two buildings (42) & (63) were placed between the Admirals Building (17) and the Cafe (3).

Two long barracks were added on the south side of the Historic District, between the Bachelors' Quarters and the Fire Station. In order to accommodate the need for additional space, several existing buildings received additions during this time, including the Public Works Building (# 6) and the Public Works Center (# 16).

The once open lawns in front of Hangar One had five new buildings by 1944. Left over space in this area was dedicated to parking, thus entirely filling up once spacious lawn open space.

Hangars Two and Three were built in 1943. These were located across from the landing strips but are aligned with Hangar One.



Figure 3.3: 1946 Buildings

New sidewalks were also added during this period. The new sidewalks lacked the ceremonial appeal of the two original sidewalks along North and South Akron had. Instead, the new sidewalks were placed with a bent toward practicality. A new sidewalk was built across the central plaza to connect the Recreation Building and the Dispensary, now Buildings 25 and 23, respectively. In the north and south sections, sidewalks connect buildings to parking lots. These no longer observe the north/ south or east/west axis, but are oriented at an angle for maximum efficiency.

Landscaping in the Shenandoah Historic District remained sparse Figure 3.4. By 1948, a few trees with generous canopies are evident. Planting generally follows the 1933 landscape plan, but is too modest to mark the edge of the District. A few clumps of shrubs and trees are scattered throughout the western half of the campus. The formal concept of the original landscape plan is not easily detected.



Figure 3.4: Early Landscape Framework

#### Early 1970s

Where once the Shenandoah Historic District had stood well defined against a landscape of farmland, by the early 1970s, it was surrounded by a heavily built up base, serving the U.S. Pacific Fleet (Figure 3.5). By necessity, new buildings were built outside of the Historic District. Only one new building was added within the District. Building 126, a warehouse was built across Hangar One, on the southwest side.

Much of the change to the Historic District came not with new construction, but with modifications to the existing buildings. By 1952, Building 19, the enlisted barricks had received two new wings on the east and west side. Buildings 12 and 13, the Commissary and Commissary/Storage, both had additions by 1967. The gymnasium (bldg 2) and

the Public Works Building (# 6) received additions that are revealed by a map of the area dated 1954. The Cafe was altered periodically, typically when the base had a change in command.

Changes also occurred in the form of demolitions. The Gas Holder was removed and replaced with additional parking between 1966 and 1968. The long barrack buildings, adjacent to the tennis courts, built in the 1940s were partially demolished



Figure 3.5: 1970 Buildings

in the 1950s. Additional parking was added in this area.

A significant portion of the train tracks were paved over by the early 1970s. The train tracks on the north end of Hangar One are still visible, however, the tracks adjacent to the fire station and on the south side of Hangar One are no longer visible.

Other changes by the early 1970s involve added sidewalks and parking. A new sidewalk was built across the Central Plaza in order to connect Building 19 to the buildings on the south side of the district. Additional parking was added behind the Dispensary Building (23). More parking was located behind Buildings 25, 14, and 15.

The landscaping features, however, did not change much from the mid-1940s. Additional planting in the Historic District is not evident. The trees have matured and are more distinguished, but the orderly design of the original landscape plan is less pronounced than it was in the 1940s. Indeed the sparse planting along the southeast perimeter of the campus was removed to make room for parking. An entrance marker, built in the early 1950's is also a visible landscape feature.



#### Mid 1970s to 2001

Less dramatic change has occurred in the Shenandoah Historic District from the mid-1970s to the present time Figure 3.6. Several buildings were demolished. The only remaining buildings along the central axis are the original Admirals Building (17), the much altered Café (3), and the small barracks across from Hangar One. Also gone are the two long barracks once adjacent to the old Bachelors' Quarters. The Café and Building 12, the Commissary, have both received additional alterations. Building 3 has lost integrity due to extensive modifications and therefore is no longer a contributing building to the Historic District. Building 566, 567 & 569 were built between 1978 and 1979 and are contextually incompatible with the Historc District. The roads and paved areas have seen little change since the early 1970s. There are no new landscaping features added since the 1970s. The existing landscaping has continued to mature and there is evidence of a concerted effort to maintain the landscaping.



Figure 3.6: 2001 Buildings



Aerial view of Shenendoah Historic District -2001

## Chapter 4

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## r 4 **DEFINING CHARACTER**

- Organization of District
- Visual and Spatial relationships
- Contributing buildings and architectural vocabulary

- Points of Interests/ Historic Monuments
- Landscape Features
- Opportunities and Constraints



### SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002
# **DEFINING CHARACTER**

The Shenandoah Historic District has several defining characteristics that are integral to its formal identity and historical significance. The identification, protection, and enhancement, where appropriate, of these characteristics is essential within the Historic District.

## ORGANIZATION

The Beaux-Arts inspired organizational framework of the Historic District is established by a clearly defined roadway network. The road configuration was built according to a base master plan by the Bureau of Yards and Docks, the internal agency responsible for many Navy facility site and building designs. The plan was understandably generous, providing an appropriate setting for Hangar One, one of the largest structures to be built at the time.

A central axis is established with a progression that begins at the main entrance, travels through a Central Plaza, and culminates at the most significant building on the base, Hangar One. The entry road (Clark Road) divides into two roads (North and South Akron) which flank the Central Plaza and continue toward the Hangar. This ceremo-



Figure 4.1 Site Organization

nial progression is the central spine of the plan, the formal public entry to the Historic District. It is also the location for the most important buildings in the Historic District.

The outer edge of the Historic District is inscribed by a horseshoe-shaped ring roadway (Bushnell and Wescoat Roads), centered on the main axis and connected to the main entry road. This ring allows for circulation and service access to the buildings and functions of the base. Similarly, the main perpendicular roadway running north-south (McCord Avenue) provides access to the functioning, back service, and parking areas. This perpendicular roadway also acts as the division between the formal, public side of the Historic District and the industrial workings of the base. Further east of McCord Avenue are several north-south roadways serving the industrial zone and the Hangar.

A distinctive circulation feature that occurs in multiple locations is the semi-circular entry drive. These roads bring traffic from the main road into a more intimate zone in front of the building entrance. The Admirals Building (#17), the Bachelor Enlisted Quarters (#19), and the Bachelor Officer Quarters (#20) have the most formal entry drives, a gesture appropriate to their location off the Central Plaza. Elsewhere, this occurs to gain access to back entrances and parking garages.

A residential zone of nine detached officers' residences is located off the main entry road (Clark Road) along a serpentine shaped boulevard (Berry Drive) and end cul-de-sac. This private area is clearly separated from the organizational core of the base and has a more informal, curvilinear layout. Because of the current ownership of this housing, it will not be included in the scope of this development plan.

The circulation network for the Historic District creates the basic framework for the plan. Within this organization, buildings are arranged according to purpose and importance. A hierarchy exists along the central axis. The Admirals Building



Entry gate at Clark Road

(#17) and the Cafe / Officers Club (#3) are the most visible and ornate buildings situated along the axis. The most impressive structure, Hangar One, is the terminus of the axis, the focus of the Historic District.



Flag Pole



North Akron Road



South Akron Road Looking West

#### VISUAL AND SPATIAL RELATIONSHIPS

The central organizational spine becomes the primary visual axis in the Historic District. It begins with the entry gate and a short, introductory drive into the Historic District (Clark Road) (Figure 4.2). Further into the core, the axis is accentuated by the Central Plaza, a wide grassy lawn allowing a linear, uninterrupted view to the Admirals Building (# 17) and the Hangar beyond. This axis is punctuated with visual markers, such as the flagpole in front of the Admirals Building (#17) and other more recent monuments added within the central spine. The circulation network of roadways and sidewalks run alongside and reinforce the perception of the axis.

Secondary axes are established across the Central Plaza with buildings facing directly opposite one another. Another important crossing is McCord Avenue. This roadway provides less of a visual axis than a spatial link across the width of the Historic District and an internal edge between a formal and less formal side. Diagonal views are also set up across the Central Plaza and at intermittent locations towards the ultimate focus of the Historic District and Hangar One.

The buildings arranged around the Central Plaza are generously spaced from one another in



Figure 4.2 View Corridor

dramatic fashion. They are separated by green planted zones and recreation spaces. In contrast, the buildings located east of McCord Avenue do not have green surrounds and are randomly spaced according to functional need. The two exceptions in this area are the two buildings located along the primary axis, the Cafe/Officers Club (#3) and Hangar One. Until recently, these buildings had some open space on all sides.

A distinct spatial relationship within the Historic District is also visible in the vertical dimension. Buildings leading up to the eastern edge are consistently 2-3 stories in height. A few taller structures are located at the eastern edge, including the Balloon Hangar (2), the Water Tower (33) and the Aerological Building (18). Finally, Hangar One, with 8 acres of floor area, looms at nearly 200 feet above grade. Just to the east of Hangar One are sited Buildings 32 and 33. These two historical structures served as floodlight towers during the era of the dirigible.



Memorial Anchor in Central Plaza



Hanger One (Building 3 in Foreground)



Central Plaza on axis with Hanger One



Building 25



Entry to Building 17

# CONTRIBUTING BUILDINGS AND ARCHITECTURAL VOCABULARY

The National Register Nomination Form for the Shenandoah Historic District lists and describes 22 significant and contributing buildings, or 40 contributing buildings including the housing area off Berry Drive (Bamburg, 1994). These early structures have a high level of historical and architectural character, and are the most important elements of the Historic District today.

The Administration (17) and Officers Quarters (20) buildings, built in 1933, are formally sited around the Central Plaza (Figure 4.3). They exhibit consistent architectural style, a late Spanish Colonial Revival interpretation, that was prevalent in California in the early half of the 20th century. Character-defining features include red terra cotta tile roof, cupola, flues and vents; ornamental lime-

stone entry surrounds; integrally colored stucco facades with band courses; wood paneled doors and wood fenestration; and historic lanterns and pendants (ARG, 1999). There is minimal decorative treatment to the stucco at the facades or window openings, rendering the limestone entry surrounds with their fluted columns, cornice lines, carved flora, and decorative urns more striking. The condition of these original elements is good in nearly all instances. All distinguishing or char-



Figure 4.3 Contributing Buildings

acter-defining features found at these contributing buildings shall be retained and preserved in accordance with The Secretary of Interior's Standards for the Treatment of Historic Properties.

Another feature that exists in the buildings surrounding the plaza is the rectangular, winged or T-shaped plan form. Every building is comprised of an arrangement of rectangular volumes, never more than 50 feet in width. This configuration allowed for efficient daylighting and ventilation of the internal spaces. The volume was frequently divided lengthwise by a central corridor with rooms having windows on the exterior side. In addition, most buildings have a covered porch in the form of an arched arcade at the main entry serving to provide weather protection and a vestibule space leading to decorative, terrazzo-floored lobby spaces.

The structures located in the eastern half of the Historic District are more utilitarian by nature, and exhibit a more stripped down, Spanish Revival style. A few contributing buildings including the original Fire Station, Boiler Plant, and Crane Shed cluster at the south edge of the Historic District, while the Balloon Hangar and typical buildings face the north edge. These structures have very simple stucco detailing, flat roofs, low parapet walls, and minimal ornamentation. Some details, however, such as articulated pilasters, a band course and stepped parapet lines, do reflect a relationship to the more ornate buildings surrounding the plaza.

The most dominate element and the most significant historic building in the Historic District is Hangar One, located at the eastern terminus of

the main axis. This immense structure mimics the form of the 785 foot long dirigible it once housed. It is 1,133 feet long, 308 feet wide and 198 feet tall, a remarkable visual landmark in the Historic District and its vicinity. Its Streamline Moderne, curvilinear form departs completely from the architectural vocabulary of the Historic District, serving a functional purpose with the most direct engineering approach. The structural design is comprised of 3-hinged steel trusses that span the width of the Hangar and are connected longitudinally by a lacework of steel bracing. The exterior cladding is corrugated steel with horizontal bands of steel strip windows marking each structural bay. At each end of the hangar there are a pair of 'clamshell' doors which run on a curved track and open the end of the building completely to the airstrip. The Hangar is distinguished as a Naval Historical Landmark, a Civil Engineering Landmark by the San Francisco Section of the American Society of Civil Engineers (ASCE), and has been determined to be eligible for nomination to the National Register of Historic Places.

A cluster of nine detached residential buildings (officer housing) at the western edge of the Historic District is also included in the list of contributing buildings in the National Register nomination. These Spanish Colonial Revival residences, also completed in 1933, are distinguished yet simple buildings that are architecturally consistent with the core of the base. They are not included in this study as they are not in NASA's ownership.

There are 54 non-contributing buildings within the area of the Historic District (Bamburg, 1994). These buildings, due to their recent age or utilitarian nature, are not historically significant and do not provide any architectural or spatial contribution to the Historic District. These buildings, mostly small industrial, service-oriented structures, are with only a few exceptions located in the eastern, more utilitarian subarea of the Historic District. They are not recognized as having any contributing role in the character definition of the Historic District. As such, their presence, or their absence, has no effect on the historic integrity of the Historic District.

The 22 contributing buildings are listed in Table 4.1. A treatment category is also indicated for each contributing building as prescribed by the Historic Resources Protection Plan (HRPP, 2001). Category I buildings are to follow the most stringent treatment whereas Category II buildings may be treated in a less stringent manner. All contributing buildings must adhere to The Secretary of Interior's Standards for the Treatment of Historic Proerties and the State Historical Building Code.

# Table 4.1 Contributing Buildings

Bldg.	Original Use	Current Use	Year	Treatment	
#			Built	Category	
1	Hangar One	Hangar One	1932	I	
2	Balloon Hangar	Gymnasium	1933	Ι	
5	Water Tank	Water Tank	1933	II	
10	Storehouse (Helium/Boiler Plant)	Heat Plant Building	1933	Ι	
15	Fire Station / Laundry / Garage	PW Shop	1933	II	
16	Locomotive Crane Shed	PW Shop	1933	II	
17	Admirals Building	Administration Building	1933	Ι	
18	Aerological Center / Control Tower	Administration Building	1933	Ι	
19	Bachelor Enlisted Quarters	Office Building	1933	Ι	
20	Bachelor Officers Quarters	Office Building	1933	Ι	
21	Bachelor Officers Garage	Storage	1933	Ι	
22	Bachelor Officers Garage	Storage	1933	Ι	
23	Dispensary	Instruction Building	1933	Ι	
24	Ambulance Garage	Office Building	1933	II	
25	Bowling Alley / Theater	Recreation Building	1933	Ι	
26	Gate House / Iron Fence	Gate House / Iron Fence	1933	Ι	
32	Floodlight Tower	Storage	1933	Ι	
33	Floodlight Tower	Storage	1933	Ι	
37	Scale House	Scale House	1933	II	
46	Hangar 2	Hangar 2	1943	Ι	
47	Hangar 3	Hangar 3	1943	Ι	
55	Heat Plant for Hangars 2 and 3	Heat Plant for Hangars 2 & 3	1943	II	
A,A1 – I,I1	Officers Housing and Garages	Housing and Garages	1933	Ι	

# Significant Objects

40	Flagpole / Commons	Flagpole / Commons	1933	Ι
	Memorial Anchor	Memorial Anchor		Ι







Building 17

Building 17 Entryway

Building 19



Building 20



Building 10



Hangar One

## POINTS OF INTEREST/HISTORIC MONUMENTS

Three significant objects are listed on the National Register of Historic Places Registration Form: the Flagstaff in front of the Admirals Building (#17), the 'commons' or green Central Plaza, and the memorial anchor (Bramburg, 1994). The flagstaff and the Central Plaza are certainly valuable original features of the Historic District dating from 1933. They are the focus of the central core area of the Historic District. More importantly, they are noteworthy from a historic perspective, as objects whose purpose was directly associated with the military culture at Moffett Field. The activities of flag raising, drill exercises, and ceremonial parades were practiced here at the Central Plaza during the period of significance (1933-1946) and thereafter.

A few objects were placed in the Central Plaza

soon after its completion. A Sundial presented by R. Adm. A. Farenhoff is located at the centerline of the plaza between the Dispensary (#23) and the Recreation Building (#25) and dates late 1930s. Two canons were placed either side of the flagstaff, centered about the main axis, in 1938.

Several decades later in 1988, the memorial anchor was installed with a plaque acknowledging the origins of the Shenandoah Plaza name. At this time,



Figure 4.4 Points of Interest

a pair of military arms was placed at the western end of the plaza. There are also plaques placed by the Navy wives and two time capsules in honor of the 50th and 100th anniversary of Moffett Field. The largest memorial, in memory of those lost at sea from Patrol Squadron Fifty in 1991, was located just east of McCord Avenue. All of these monuments are centered along the main axis of the Central Plaza.

The main entry signage at the intersection of Clark Road and the Central Plaza is not historically significant as it dates from the early 1950s. It is situated at a prime visual location, however, and does serve as the first marker, after the entry gate itself, that visitors encounter as they enter the District.



Sundial



Memorial Anchor



Flagpole



Building 3 Forecourt

## LANDSCAPE FEATURES

Although a thorough landscape plan was designed in 1933 at the time the Historic District buildings were completed, no landscaping was installed initially at the base. Open areas and the Central Plaza were left bare.

In the late 1930s a serious effort was made to implement the landscape plan, with grass and tree planting installed primarily in the Central Plaza area. The grass plaza, street trees, clustered tree arrangements, and interstitial grassy areas were installed to form the landscape setting. In keeping with the ceremonial central axis, the Central Plaza is exclusively open grass, with only a few trees located at the western end of the plaza at the intersection of the entry road (Clark Road). A regularly spaced line of street trees marks the outside edge of North and South Akron Roads, adjacent to the sidewalk, as well as along Clark Road. Low bush planting is placed symmetrically at building entrances and within the semi-circular entry drives. Tree planting, behind buildings, outside the central core, is more informally arranged. Groupings of trees or bushes are dotted in open spaces. The effect is that of a minimal, yet purposeful landscape that reflects the order and hierarchy of the plan. Much of this original planting remains.



Figure 4.5 Landscape Features

Elements of the 1933 landscape plan that were not installed include street trees along the outer ring road (Bushnell and Wescoat Roads), street trees along McCord Avenue, and parking lot screening. In a few locations planting was added that was not identified on the original plan, such as street trees and large ornamental trees in front of the Bachelor Enlisted Quarters (#19) and the Bachelor Officers Quarters (#20). Virtually no landscaping was planned or executed east of McCord Avenue. The only planting in this industrial area of the base exists around the Café (#3), and the monument, both on axis with the Central Plaza.

Today, the Shenandoah Historic District maintains the minimal landscape features from the late 1930s. Although some tree clusters have been removed for additional parking areas, the majority of the original plantings exist in fair condition.

Within the last decade the National Park Service (NPS) has begun to recognize what has become known as a cultural landscape. The NPS defines a cultural landscape as "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values" (NPS Preservation Briefs #36). Four general types exist, including historic sites, historic designed landscapes, historic vernacular landscapes, and ethnographic landscapes. In a manner similar to historic buildings and districts, these defined landscapes reveal aspects of our country's origins and development through their form and features and the ways they were used. A cultural landscape program has sought to formulate goals, objectives, and

initiatives regarding the preservation of cultural landscapes.

Although the Shenandoah Historic District is an important historic site due to its associations with the military's 'LTA' program and the merit of its planning and architecture, the landscape features themselves do not exhibit historical value. The landscape within the Historic District is reserved by nature, not of exceptional quality, and plays a secondary role to the organizational plan and the architecture. It is, therefore, our opinion that the Historic District landscape does not constitute a cultural landscape.





#### **OPPORTUNITIES AND CONSTRAINTS**

The Shenandoah Historic District provides an exciting opportunity for infill development. NASA's plans for expansion over the next few years focuses on development in all areas of NASA/Ames Research Center, including the Shenandoah Historic District. Because of the significant historic resources within this district that require protection, this section identifies the tremendous opportunities and potential constraints to development within the Historic District.

Historic Context: The National Historic Preservation Act defines a "historic resource" as any prehistoric or historic district, site, building, structure or object included or eligible for inclusion on the National Register of Historic Places. In 1994, the Shenandoah Historic District was officially added to the National Register of Historic Places. Within this Historic District are 22 buildings that are historically significant. These historic buildings will be rehabilitated and reused. Any proposed infill development must be designed to respect and be compatible with the existing character of the built environment.

Proposed New Uses: One of the primary objectives of the NASA Ames Development Plan is to guide future development to create a high-quality physical setting for NASA and its partners for their collaborative research and educational programs. The NASA Research Park, including the Shenandoah Historic District will contain a variety of uses including laboratories, office space, classrooms, auditoriums, museums, a conference center and open spaces. The Historic District provides a unique setting that can be enhanced with new compatible development.

Development Program: The NASA Ames Development Plan (NADP) includes a Land Use Plan for its campus. As part of this Plan, the Shenandoah Historic District is slated to include a total of 595,000 square feet of built area (this includes both existing buildings that are proposed to be retained and all new development). Including the addition to the existing area of Hangar One, the overall development area is 1,095,000 square feet. The total development potential for new additional buildings is 275,635 square feet (for further details, refer to Chapter 5, Land Uses). This provides an opportunity to include infill development within the District that can be designed to strengthen the original Master Plan's spatial concepts and to reinforce the significant architectural legacy of this area.

Site Planning: The original 1933 Master Plan was based on formal concepts such as hierarchy, order and symmetry. Many of these concepts are still evident in the area to the west of McCord Avenue. The area to the east of McCord Avenue was developed to be more utilitarian. The proposed infill development in this area provides an opportunity to incorporate the original site planning concepts.

Building Heights: Historically, the District has been designed to include low-rise buildings around the Central Plaza in order to preserve a sense of openness and to focus the vistas onto Hangar One. The NADP has proposed 3 height zones that take into account the existing character within the District. The maximum building height of any building located within the Central Plaza is 30 feet. Buildings around the Plaza can have a maximum height of 40 feet. The buildings located along the perimeter roads of the District can have a height of 65 feet. These height limits will have a significant impact on the building forms.

Surface Parking Lots: The existing parking is provided by paved surface parking lots. The parking areas within the Historic District are scattered throughout the District, including areas adjacent to buildings. Some of the existing parking could be consolidated into the parking structure that is proposed as part of the conference center. Overall, the parking lots can be consolidated in areas behind buildings, away from the Central Plaza and accessed by perimeter roads. This provides opportunities for either landscaped open spaces or additional infill development. The existing parking areas around buildings such a Building 19 should be considered as potential for landscaped open spaces.

Landscaping and Open Spaces: The original site plan for the Historic District was based on an extensive open space network with the Central Plaza being the ceremonial open space. This provided the District with a sense of openness. Much of the original landscaping and landscaping concepts is evident in the area to the west of McCord Avenue. However, the area to the east of McCord was developed sporadically over time and does not include a cohesive landscape environment.

The proposed infill development in this area

provides the chance to refurbish and enhance the landscaping. This is also an opportunity to intensify and enhance the landscaping around existing monuments such as the memorial anchor and flagpole. The area directly west of Hangar One can be developed as a landscaped open space similar in character to the Central Plaza. The streetscape and landscape elements can be successfully used to differentiate the Historic District as a unique place. Existing Infrastructure: The existing infrastructure in the Historic District dates back to 1933 with incremental development since then. Currently, there are no comprehensive details available of the location and sizing of the pipes for the water, sewer and drainage systems. An inventory of the existing system will direct the phasing of the infrastructure and future development.

Existing Road Network: The existing road network

within the Historic District includes the following roads: Bushnell Road, Wescoat Road, South Akron and North Akron running east-west; McCord Avenue, Cummins Road and Severyns Avenue running north-south. All of these roads were part of the original Master Plan. In addition to these roads, Dugan Road connects Wescoat Road to South Akron. Based on a historic evaluation of the site, all of the existing streets are required to be retained. The only road that may be eliminated is



Figure 4.6 Opportunities and Constraints

# Dugan Road.

Environmental Issues: Moffett Field has been designated a superfund site by the U.S. Environmental Protection Agency (U.S. EPA). Twenty- seven individual sites have been identified by the U.S. Navy as potential hazardous waste disposal or spill locations. These contaminated sites introduce a variety of issues that increase the complexity of infill development. NASA has prepared an Environmental Issues Management Plan to address these issues. NASA also has a comprehensive Environmental Compliance Program designed to ensure these materials are managed in compliance with various federal, state, and local laws. All development will be required to comply with this Environmental Compliance Program. Environmental Constraints: There are some environmental constraints specific to the Shenandoah Historic District. Noise can potentially be a constraint in regards to the type of uses proposed (Figure 4.7) includes composite noise contours that reflect exposure levels generated from wind tunnels, aircraft operations in the NASA Ames Research Center, as well as highway traffic directly adjacent to the site. Any proposed development at



Figure 4.7 Environmental Constraints

these locations should incorporate adequate mitigation measures to ensure acceptable standards of noise levels (as described in the Environmental Impact Statement for the NASA Ames Development Plan).

Because Ames Research Center is home to a large number of government research and development projects, many different hazardous substances exist there. Two groundwater treatment facilities are located east of McCord Avenue in the District. These water remediation systems treat major concentrations of hazardous materials located in the 'Regional Plume' beneath Ames Research Center, flowing northward toward the San Francisco Bay. These structures are important physical constraints because it is not possible to relocate them.

Figure 4.7 also delineates areas with large concentrations of monitoring and sampling ground wells. New development should be sited to avoid impacts to the wells and should be setback at least 15 feet from the wells wherever possible.

Development Potential: Based on the opportunities and constraints identified above, the area to the east of McCord Avenue appears most appropriate for infill development. All new structures and landscape elements should reflect a distinct and yet compatible style to the contributing buildings and features within the historic district. The development program is discussed in further detail in Chapter 5, Land Use.

# Chapter 5 LAND USE AND URBAN DESIGN

- Vision
- Goals
- Urban Design Context
- Existing Land Uses
- Historic District Parcels

- Proposed Land Uses
- Proposed Development Program
- Development Plans
- Development Standards



# SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

# LAND USE

The Land Use Chapter includes the vision for the Shenandoah Historic District (referred to in this document as SHD or Historic District) and a set of goals that provide the basis for the planning principles and design guidelines. This chapter also describes the existing urban design context and land uses. It includes the proposed uses and potential development program for the Historic District. Conceptual development plans illustrating site developments have also been included.

# **VISION**

Shenandoah Historic District will remain the symbolic core within the NASA Research Park - an area that is a proud repository of its historic past, nestled against the backdrop of the impressive structure of Hangar One. This District will provide a unique physical setting for a community that is involved in collaborative and creative research for technological innovations of the future.

The SHD Development Plan assembles and sets forth provisions for the protection of the integrity of the historic district while guiding new development. All new development will exhibit individual character while respecting and responding to the existing context. New spaces will be designed to create inviting and comfortable indoor and outdoor environments that foster human interaction and promote formal and informal meetings.



# **GOALS**

10 goals that are listed below reinforce the vision. While these goals are specific to the Shenandoah Historic District, they are an extension of the 10 planning principles of the NASA Ames Development Plan (NADP). Those principles are reflected in the planning throughout the Moffett Field site and are incorporated within the planning goals for the Historic District as applicable. The Planning Principles of the NADP include:

- Creation of a Community
- Provision of On-site Housing
- Transportation Demand Management
- Public Accessibility
- Sustainability
- Resource Conservation
- Environmental Issues Management
- Wildlife Preservation
- Wetland Preservation
- Historic Resource Protection

Within the Historic District, the primary criterion is the protection and enhancement of the historic resources. In addition, the following goals are intended to create a communityfriendly environment. Described below are the 10 planning goals that are specific to the Shenandoah Historic District. Goal 1:

Create a unique and inviting setting that fosters a community for NASA and its partners for educational, scientific and technological research activities. The new uses proposed for the NASA Research Park provide a unique opportunity to enhance and repair the existing historic fabric in the Shenandoah Historic District, while providing appropriate infill development. While this "District" will be designed to remain a unique and special place, it will be connected to the larger NASA Research Park District area.

The District will incorporate several uses ranging from educational amenities such as research and development areas, classrooms, auditoriums and office space to public facilities and amenities such as museums, conference centers, restaurants and cafes. The guidelines are aimed at the creation of a physical setting that is pedestrian and bicycle friendly, legible and easily accessible through a variety of transportation modes.



Building 25 facing the Central Plaza

Goal 2: Protect the integrity of the Historic District by preserving the historically significant buildings. The Shenandoah Historic District is listed on the National Register of Historic Places. Within the Historic District, there are 22 buildings that are historically significant. Preserving the historic buildings will protect the rich legacy that exists within the District. The buildings will be carefully rehabilitated for new uses according to the tenants' requirements. Additionally, the District's architectural integrity will be preserved by the application of the *Secretary of the Interior Guidelines for the Treatment of Historic Properties.* The design guidelines developed as part of this report and those included in the Reuse Guidelines and the Historic Resources Protection Plan will also guide the reuse of these buildings.



Building 17



Building 2



Hangar One



Historically Significant Buildings

Goal 3: Guide opportunities for appropriate new development that respects and responds to the existing historic context by emphasizing compatibility with the character of the district.

The Historic District has the potential to absorb infill development. The area to the west of McCord Avenue has not significantly changed since it was first developed in the 1930s. However, the area to the east of McCord Avenue was developed over time with a utilitarian character with buildings added as they were needed. Several of the buildings in this area can be demolished to make room for new development. A majority of the infill development within the Historic District is proposed to be built in the area to the east of McCord Avenue.





Aerial view of Shenendoah Historic District

Goal 4:

Incorporate site planning concepts that reflect and reinforce the strength of the original master plan with elements such as hierarchy, formal axes and composed spatial definitions.









1933 Original Master Plan

Establish a hierarchy of useable open spaces with the preservation and enhancement of the Central Plaza as the primary open space, which is in turn connected to the overall open space network within Moffett Field. A system of open spaces with a distinct hierarchy will be incorporated within the Historic District. These spaces will serve several functions such as provide "outdoor rooms" for activities, provide a visual focus and define building forms. Within this network of open spaces, the 4.5 acre Central Plaza will be retained as the ceremonial central green. A new greenway – the "East Central Plaza" - will be incorporated to the west of Hangar One running its entire length and will be designed to be open like the Central Plaza. The space to the south of Hangar One will be developed as an outdoor public plaza, designed for special gatherings. These open spaces will be linked to the open spaces within the NASA Research Park by pedestrian pathways.



Central Plaza



Akron Road

Goal 5:



Central Plaza

**Goal 6:** Use unifying elements of the public realm to provide a sense of uniqueness and interconnection within the District.

The elements of the public realm include streetscapes, public open spaces, light fixtures, bus shelters, landmarks, signage and public art. All these elements will be designed to portray a unified character throughout the Historic District. This will better integrate the different areas of the District, such as the east and west sides of McCord Avenue into a more unified district. The designs of these elements will be distinct and compatible with the existing historic context and will help differentiate this area from its surrounding context.



North Akron Road



Building 17 facing Central Plaza

Goal 7: Allow new development to Goal 8: incorporate individual architecture that is compatible and cohesive with the design elements of the existing historically significant buildings.

The intent of this goal is to ensure that a "theme park" is not created by replicating building designs from 60 years ago. Rather, the new buildings will share a common design vocabulary with the existing buildings in terms of its massing, building height, articulation, proportions and detailing. Any additions to the historic buildings will be designed in a vocabulary similar to the existing building, while not replicating the building design. Provide for the protection and Goal 9: management of the contributing buildings and resources that comprise the Historic District. Encourage sustainable development and design solutions.

The Design Guidelines (Chapter 7) and the Implementation Strategies (Chapter 9) will include criteria for the continued maintenance and management of the historic buildings and other historic resources within the district. NASA has stated that one of its primary goals for any development within the NASA Research Park is the incorporation of sustainable design solutions. This goal also applies to infill development within the Historic District. Important elements of sustainable development include green building construction, daylighting, reduced energy costs, designs that encourages resource efficiency, minimize destruction of natural resources and maximize environmental health and safety.

It also includes programs such as transportation demand management and multi-modal transportation systems. However, there may be some elements of the landscape such as the use of lawns and some non-native planting within the District that is required to reinforce the significance of the existing historic character. **Goal 10:** Consolidate and reduce the area of paved parking within the Historic District and ensure adequate screening.

The parking layout within the District is ill-defined. Over time, the surface parking areas have begun to infringe into areas adjacent to buildings and spill into the Central Plaza. All existing parking will be reconfigured to be more contained within screened areas away from the Central Plaza area. Any proposed parking within the infill development should be in structured parking wherever feasible. Surface parking areas should be screened with sufficient landscaping in order to avoid large "seas of parking".

## **URBAN DESIGN CONTEXT**

The Shenandoah Historic District consists of approximately 72 acres (82 acres including the area for housing off Clark Road) within the 213-acre NASA Research Park. This district contains significant history of Moffett Field based on its original 1933 Master Plan.

The District has very defined edges - with two

roads arching off of Clark Road to form the boundaries on the north and south sides. Hangar One forms a formidable edge on the eastern end of the District. Because of the existing development patterns and building types, McCord Avenue forms an east-west separation of the District.

The Historic District can be divided into 4 subdistricts based on its character (Figure 5.1). Subdistrict 1 is the area consisting of housing (Berry Court housing) off Clark Road. While this subdistrict is part of the Historic District, it is not included in this study. Subdistrict 2 is the area west of McCord Avenue and contains some of the original development of Moffett Field from the period of significance. Over the years, this subdistrict has managed to retain its original character in its site layout, architectural design elements and landscaping.



Figure 5.1: Subdistricts

The area to the east of McCord Avenue forms subdistrict 3. The development within this area is less formal than that found to the west of McCord Avenue. The structures are not as well detailed or impressive as the ones to its west. This area provides a great opportunity for intensified development and redevelopment, which can be designed to be more compatible with the western half of the District in its site layout and architectural detailing.

Subdistrict 4 includes Hangar One, the area between Severyns Avenue and Cummins Road and the adjacent area to the east of the structure. With a building area of 385,290 square feet, Hangar One has the potential for several public uses. The buildings were arranged by function, with McCord Avenue forming the boundary. The public and administrative buildings faced the Central Plaza in the area to the west of McCord. The original service and support buildings such as the shops, locomotive shed, store houses, garages, gas station and laundry were introduced as they were needed in the area east of McCord Avenue.



Figure 5.2: Urban Design Context

There are several landmark historic buildings within the District. The most prominent of the landmarks is Hangar One. Hangars Two and Three to the east of Hangar One and the airstrip are part of the Historic District and help provide an impressive skyline and identity to Moffett Field. Building 17 within the Central Plaza is also an impressive structure that is highly visible and is directly on axis with Hangar One.

To the south of the Historic District is the NASA Research Park, which is intended to be designed as a campus dedicated to research and learning for shared use by the government, academia, industry and non-profit organizations in partnership with NASA.

The Ames Campus abuts the Historic District to the north. This is designed to be a secured facility with fencing and restricted use access points. McCord Avenue provides a direct connection between the NASA Research Park and the Ames Campus through the center of the Historic District. Immediately to the south of the Historic District, McCord Avenue Extension is proposed to be designed as the primary urban street with mixed uses that includes retail.

Another north-south connector that is part of the Historic District is Cody Road, which is designed to be on axis with the southern side of Hangar One and turns into Sayre Road on the east side of Hangar One as it leads to the Ames Campus. On the west side of the Historic District, Clark Road serves as a primary access to Moffett Field and is on axis with Hangar One. In addition to Clark Road, there are 4 other primary entrances to the Historic District as shown in Figure 5.2. The historically significant buildings, identified in Figure 5.2, provide the context for the site planning and building forms for the infill development.



Hangar One



Building 17

# **EXISTING LAND USES**

There are several existing buildings within the Historic District, some of which are contributing buildings that will be retained. In addition, there are several buildings that were added over the years. These buildings can be demolished over time to provide room for additional infill development within the Historic District. The existing buildings are used for various purposes with some

buildings currently vacant. Several tenants occupy space in the Historic District buildings. Table 5.1 lists all existing buildings with the building areas and their current uses.

				T		1		
	Bldg Name			Building Area		Bldg Hght	Bldg Flrs	
	Hangar 1 (NAR)	Sayre Ave.	18	385,290	20 CONSTRUCT BOOK	240	2	Aircraft Exhibit
2	Gymnasium (NAR)	Severyns Ave.	13	24,738	Yes	68	2	recreation
3	Moffett Conf. & Banquet Ctr. (NASA Reserve)	Severyns Ave.	14	32,150		23	1	Conference Center
5	Water Tower & Storage Shed (ISP)	Severyns Ave.	15	900	Yes	20	1	Utility
6	Public Works/Recycl. & Storage (NAR)	Wescoat Rd.	15	15,735		16	1	Storage
10	Boiler Plant Facility (ISP)	Dugan Ave.	17	10,990	Yes	35	1	Boiler/shops
12	Commissary/Admin. (DECA/NAR)	Severyns Ave.	13	64,152		30	2	retail
13	Commissary Storage (DECA/NAR)	Severyns Ave.	13	16,080		17	1	retail
14	Moffett Field Police (Onizuka)	Mc Cord Ave.	13	12,000		24	1	office
15	Security Station - Shops	South Akron Rd.	17	17,150	Yes	20	1	security
16	Public Works Center (NASA Exclusive)	Mc Cord Ave.	17	16,866	Yes	28	1	shop/manufacturing
17	Administration/Telep. Exchange (ISP)	Shenandoah Plaza	12	20,920	Yes	35	2	office
18	Communications Building (Army 87th EOD)	Bushnell St.	12	3,751	Yes	40	3	office
19	Research Support Building	North Akron Rd.	12	137,994	Yes	40	2	office & dorm
20	BOQ (NAR)	South Akron Rd.	12	35,201	Yes	30	2	vacant
21	BOQ/MOQ Garage (NASA Warehouse)	Wescoat Rd.	12	2,350	Yes	12	1	storage
22	BOQ/MOQ Garage (Army 87th EOD)	Wescoat Rd.	12	2,350	Yes	12	1	storage
23	Administration (Army Reserve)	South Akron Rd.	12	27,898	Yes	35	2	office
24	Legal Office (Army Reserve)	Wescoat Rd.	12	1,350	Yes	15	1	office
25	Theatre/Recreation Services (Army Reserve)	North Akron Rd.	12	24,286	Yes	38	2	vacant
26	Pass Office/Main Gate (ISP)	Clark Rd.		1,982	Yes	12	1	badging
29	Office Equipment/Repair (NASA Warehouse)	Severyns Ave.		1,056		12	1	Storage
31	Commissary/Storage (NAR)	McCord Ave.		4,955		15	1	Storage
32	North Floodlight Tower (Unused)	Sayre Ave.	18	830	Yes	25	2	vacant
33	South Floodlight Tower (NAR)	Sayre Ave.	18	1,246	Yes	35	3	vacant
34	Photo Shop	Bushnell Rd.	12	480		12	1	storage
37	Scale House	McCord Rd.	1	69	Yes	12	1	vacant
38	Tennis Courts	Wescoat Rd.	12			0	0	recreation
40	Flag Pole	Akron Rd.	12		Yes	35	0	historical
44	Storage	Cummins Ave.	18	640		12	1	vacant
45	Paint Shop	Cummins Ave.	ECP	10,089		70	2	work/flex space
46	Hangar 2	Jagels Rd.		Í Í	Yes	180	2	aircraft
47	Hangar 3	Jagels Rd.			Yes	180	2	aircraft

Table 5.1: Existing Land Uses

#### HISTORIC DISTRICT PARCELS

Figure 5.3 illustrates the various parcels within the Historic District. The remainder of the discussion in this chapter references the proposed land uses and development potential by parcel numbers. There are 6 parcels within the Historic District. Parcel 12 is the 19.55 acre area to the west of

McCord Avenue (not including the 4.5 acre Central Plaza, the open space). Parcel 13 is the northeast portion of the Historic District. This 6.4 acre parcel is bounded by McCord Avenue to the west, North Akron Road to the south, Severyns Road to the east and Bushnell Road to the north. Parcel 14 is the 2.15 acre area to the east of McCord Avenue on axis with the Central Plaza. Parcel 15 is the

area to the southeast of McCord Avenue. To the west of this 2.62 acre parcel is Dugan Avenue, to the north is South Akron Road and to the south is Bushnell Road. Parcel 17 is the 4.26 acre parcel to the west of parcel 15. Parcel 18 includes the site on which Hangar One is located.



Figure 5.3: Historic District Parcels

#### **PROPOSED LAND USES**

The NASA Research Park (NRP), including the Historic District, is intended to contain a variety of land uses as listed below:

**Research and Development (R&D)/Office:** This includes buildings associated with research and development and the associated support functions including office areas, laboratories, high-bay space, parking and limited retail. It also includes general office buildings and associated support functions such as parking. Research and Development/Office is anticipated to be the primary use on parcel 12 and a potential use for parcels 13 and 17.

**Public Facilities:** Public facilities include uses that foster community building and support the NRP's research and educational activities. Specifically, these uses include public oriented facilities such as museums, conference and training facilities, exhibit halls and associated support functions such as overnight accommodations, childcare facilities, transit facilities, parking and limited retail. Parcels for which public facilities are the primary use include parcels 13, 14, 15, 17 and 18.

**Educational:** Facilities dedicated to educational activities include a variety of facilities such as class-rooms, lecture halls, auditoriums and laboratories. Associated support functions could include office areas, parking and limited retail. These facilities are required to achieve NASA's mission related to education and outreach at all levels, from elementary to post-doctorate. These facilities will be used by public and private universities and colleges that

form at partnership with NASA. While this use is predominantly housed in a portion of the NASA Research Park to the south of the Historic District, parcels 12 and 18 within the Historic District can be used for educational facilities.

**Residential:** These housing units are intended for the support of training, research and academic activities for temporary/transient use by individuals having business at NASA. Associated support functions include parking, child-care facilities and limited retail. This use is proposed primarily on parcel 13 and could optionally be included on parcel 17.

**Open Space:** All open spaces will be preserved as such allowing few facilities that support the open space area, such as bus shelters and kiosks. Parking, either surface or structured, is not permitted in all open space areas (except for drop-off locations). The Proposed Land Use Diagram (Figure 5.4) and Table 5.2 indicates the land uses for the Historic District. The Land Use Diagram indicates the predominant land use on each parcel. However, any of the uses listed above can be incorporated into all parcels within the Historic District, except in areas designated open spaces.



Figure 5.4: Proposed Land Use Diagram

Parcel #	Predominant Use	Alternative	Other Uses
		Use	
Parcel 12	Educational	R&D/Office	Offices, Campus for Educational
			Facilities, Recreational Uses,
			Housing
Parcel 13	Public	Educational	Residential, Parking Structure,
			Childcare, Conference Center,
			Auditoriums, Recreational Uses
Parcel 14	Public	Educational	Restaurant, Café, Museum with
			associated Open Space
Parcel 15	Public	Educational	Office, Recreational Uses,
			Conference Center
Parcel 17	R&D/Office	Public/	Residential, Office/Admin.,
		Educational	Parking Structure, Conference
			Center
Parcel 18	Public	Educational	California Air & Space Center,
			Museums, Auditoriums
Parcel A	Open Space		Building 17 as Office/Educational
	1914 Vinda		Monuments and Public Art
			(outdoor museum)
Parcel B	Open Space		No Permanent Buildings, could
	nen olde		incorporate Coffee Kiosks, etc.

Table 5.2: Proposed uses on the Historic District Parcels

\* Please note there are recommended uses. Other potential uses may be considered on the sites as appropriate.

## PROPOSED DEVELOPMENT PROGRAM

The proposed development program has been formulated to respond to the following criteria:

- To incorporate consolidated developed space to provide for appropriate uses.
- To create a flexible planning framework that responds to the market and new opportunities as they arise.
- To provide for development options that respond to the identified opportunities and constraints.
- To be consistent with Alternative 5 identified in the Environmental Impact Statement and the NASA Ames Development Plan.

The proposed building program is dictated by the assumptions in the Environmental Impact Statement (EIS), which evaluated five alternative development programs. The preferred alternative (Alternative 5) indicates the total buildable area for the NASA Research Park including the Shenandoah Historic District.

The NASA Ames Development Plan (NADP) assumes that most of the new development proposed will occur in the NASA Research Park (NRP). At full buildout, the NRP is intended to contain 3.5 million square feet of developed space. Approximately 2.1 million square feet will be the result of new construction under the NADP, with existing buildings constituting the remaining 1.4 million square feet. The overall density of development within the NRP is proposed to be at a

floor area ratio of 0.41, although the density widely varies for each specific parcel.

Currently, the NRP contains an inventory of over 140 buildings totaling approximately 1.5 million square feet. It includes areas that were previously used by the military for airfield support, barracks, maintenance support and storage.

Included in this total are the 71 existing structures located in the Historic District located predominantly to the west of McCord Avenue. Twenty two of the 71 buildings are historically significant, while 49 buildings are non-contributing buildings. potential development within the 6 parcels of the Historic District is 595,000 square feet (with an additional 500,000 square feet for parcel 18 - Hangar One). The area of the existing buildings that are proposed to be retained is 550,725 square feet (936, 015 square feet including Hangar One). The area of all the buildings that can be demolished is 116,650 square feet. Based on these numbers, infill development potential for new buildings is a total of 160,925 square feet (275,635 square feet including Hangar One). Table 5.3 lists the development potential for each of the parcels within the Historic District.

# **DEVELOPMENT PLANS**

The total building area including existing and

Parcel	Site Area	Floor Area	Existing Building	Retained Building	Total Allowed	New Devpt. Potential (sf)
	(in	Ratio	Area (sf)	Area (sf)	Building	. ,
	acres)		~ ~		Area (sf)	
# 12	19.55	N/A	267,138	256,100	275,000	18,900
# 13	6.40	0.75	67,773	24,738	210,000	185,262
#14	2.15	0.27	32,150	32,150	25,000	25,000
						(If Bl. 3
						demolished)
#15	2.52	0.35	45,006	45,006	40,000	0
#17	4.26	N/A	16,235	500	45,000	35,500
#18	14.09	0.81	385,290	385,290	500,000	114,710

Table 5.3: Site Specific Development Potential

Two conceptual site plans have been included to illustrate the potential infill development within the Historic District. These illustrations indicate two possible site planning options. They are purely illustrative and do not dictate the final site plan for these parcels. However, the site plans illustrate some design principles that are relevant for any development on this parcel. These ideas are detailed in the Design Guidelines Chapter (see Site Specific Design Recommendations).

The program for the conference center in both alternatives assumes a conference center with 250 rooms (mostly king sized and double rooms with some executive suites), a 25,000 square foot meeting space, conference rooms for smaller group meetings, two or more restaurants, all of which will be supported by approximately 265 parking spaces.

Both options (Figures 5.5 and 5.6) include the same development program. The primary differences are in the building configurations on parcels 13, 14 and 15, explained in the following pages.


Figure 5.5: Conceptual Site Plan- Option A



Figure 5.6: Conceptual Site Plan- Option B

The 19.55 acre parcel 12, located to the west of McCord Avenue, contains much of the original development of the area containing some of the oldest buildings of Moffett Field. As stated in the NASA Ames Development Plan (and the preferred alternative in the Environmental Impact Statement), this parcel has a development capacity of 275,000 square feet (including existing and proposed buildings). Buildings 17 (originally the Admirals' Building now being used as an administration building), 18, 19 (Bachelor Enlisted Quarters, now an office building), 20, 21, 22 (Bachelor Officers Quarters, now an office building), 23, 24 and 25 are "contributing" buildings and will be retained. Buildings 34, 66, 67 and 566 can be removed. The total building area of all the retained existing buildings is 256,000 square feet (with 166,149 square feet in the northern half of parcel 12 and 69,000 square feet in the southern half and 20,920 in the Central Plaza). Based on this total amount, any new development on this parcel is restricted to 18,900 square feet.

The conceptual site plans indicate preferable locations for new development (for site specific design guidelines, see Chapter 7, Design Guidelines). In both scenarios, new development is restricted to the southern portion of parcel 12. Option 1 includes the addition of an 18,900 square foot building adjacent to Building 20. Option 2 incorporates a new 18,000 square foot building to the west of McCord Avenue, in the same area as the existing building (Building 566), which is proposed to be demolished. The surface parking in this parcel has been added over time and is haphazardly laid out. Parking has begun to infringe into open space areas adjacent to buildings as with Building 19. This Development Plan recommends a reconfiguration of a majority of the required parking. Until such time that a parking structure is financially feasible on this parcel, all parking is assumed to be surface parking. Parking is proposed behind buildings, except for drop-offs and some short-term parking. The parking areas will be accessed primarily from the perimeter roads, Bushnell and Wescoat Roads. The reconfigured parking lots included in both options have adequate parking to support both existing and proposed development (with 355 spaces on the northern section and 388 spaces in the southern part of parcel 12). Detailed guidelines for parking lots have been included in Chapter 7.



Option 1- Conceptual Site Plan - Parcel 12

Option 2- Conceptual Site Plan - Parcel 12

Parcel 13 is the 6.4 acre parcel to the east of McCord Avenue and immediately south of Bushnell Road. There is one existing historic building (Building 2, the Balloon Hangar now being used as a gymnasium) at the northeast corner of the parcel. Besides this building, all other existing buildings can be demolished, providing the opportunity for intensified development. This is the parcel where the majority of the infill development within the Historic District is anticipated. The NADP development program allows a floor area ratio of 0.75 on this parcel. The primary use proposed for this parcel is a public facility such as a conference center with residential units or a hotel with conference facilities. Because of the intensity of the proposed development, the uses in this parcel will need to be supported by a parking structure.

In option 1, the conference facility and the residential units are located in parcel 13. In addition to the existing building, there are 2 new buildings proposed, ranging in height from 2 to 3 stories. This option has a total building area of 205,130 square feet (including the 24,738 square foot existing building). This development is supported by a 3-level parking structure (located at the northwest corner of the site) with 288 parking spaces and 30 space surface parking lot.

Option 2 has the conference center located on parcel 14. The residential units, restaurants and smaller conference rooms are located in 3 buildings on parcel 13. The total building area (including the existing building) is 173,538 square feet. Parking is provided by a 3 level parking garage with 365 spaces (a 2.5 level parking garage would yield 300 spaces).



Parcel 14 is located at the eastern end of the Central Plaza open space. This parcel allows the only other building that can be located along the stretch of the Central Plaza (in addition to Building 17 located on parcel 12). Building 3 is an existing one-story building with an area of 32,150 square feet. This building can be rehabilitated for use as either a conference facility or could include the Moffett Museum, a visitors center, a gift shop and a restaurant or café. If this building is demolished, a new building with a maximum square footage of 25,000 square feet can be built at that location. Because of the high visibility and axial relationship of this parcel with Hangar One, any building on this parcel will be required to be a landmark building with superior design, detailing and construction. Except for a drop off area and a few visitors' parking spaces, no parking will be allowed on this site (as in the rest of the Central Plaza). Therefore, any use on this site will need to be supported with "off-site" parking - potentially within the parking structure that is proposed either on parcel 13 or parcel 17. The remainder area around the building should be dedicated as open space and designed to continue the central green concept.



Option 1- Conceptual Site Plan - Parcel 14



Option 2- Conceptual Site Plan - Parcel 14

#### Parcels 15 and 17

Parcel 17 contains 3 historic buildings (Buildings 10, 15 and 16) that will be retained. The siting of these buildings does not support the addition of any new buildings. Additionally, the building area of the three existing buildings adds up to the building area allowed on the site, which is 45,000 square feet.

Parcel 15 contains no buildings that need to be retained, and therefore, provides an opportunity for infill development within the Historic District. This site has a development potential of 40,000 square feet. The proposed uses for this site could include residential facilities to support the conference center and office/administrative space.

While all of the existing roads within the Historic District are proposed to remain, Dugan Road that connects Wescoat Road to South Akron is the only segment of a roadway that can be removed if required. Removing the roadway will allow for coordinated site planning for the combined site with parcels 15 and 17. The resultant development potential on parcel 15 and 17 will depend on the parking scenario. With surface parking, as illustrated in Alternative 1, the total number of spaces that can be accommodated on the parcel is 270, which can support a total building area of 81,000 square feet. However, with structured parking as illustrated in Alternative 2, the site can accommodate the 95,000 square feet (45,000 square feet of existing building area on parcel 17 and 40,000 square feet of new building area on parcel 15). A 3-level parking structure can accommodate 320 spaces (or 265 spaces with a 2.5 level parking garage).



Option 2

Parcel 18 is the 14.09 acre parcel at the eastern end of the Historic District which contains Hangar One. The space within Hangar One is intended for future use by the California Air and Space Center, an existing NASA museum partner. The 385,290 square foot interior space of the Hangar is proposed to be converted into a dynamic science and technology learning center.

Based on the Nasa Ames Development Plan, the Hangar One interior space can be increased from 385,290 square feet to 500,000 square feet with the introduction of additional floor/s, taking advantage of the tremendous height of the building. Parking for any reuse of this structure will be supported by the surface parking area to the east of the Hangar under the limit of the 1,500 space capacity outlined in the TDM plan.



California Air and Space Museum in Hangar One

**Open Space:** The Central Plaza runs east-west along the length of the District, terminating at Hangar One. This space forms the visual focus of the District and will be retained as the ceremonial open space. The Central Plaza with the forecourts will remain free of any additional buildings except for the existing Building 17 and Building 3 (or a replacement of Building 3 at the same location). A majority of the surface parking that is part of the Central Plaza is proposed to be removed and replaced with landscaping. The landscaping around the existing monuments, such as the anchor and flagpole, provide a great opportunity for improvement to celebrate the historic significance of the District.

In addition to the Central Plaza, the area between Severyns and Cummins Avenues, to the west of Hangar One, is proposed to be converted to open space - the East Central Plaza. All of the existing buildings will be demolished with the exception of the treatment plant building. No new large permanent structures will be allowed on this green space, except for small structures for a café or visitors center.



The airfield to the east of Hangar One provides an open space that will be used for large gatherings during special events. The reconfiguration of Cody Road provides a great opportunity to introduce a plaza in front of the Hangar doors on the south end of the building. Additionally, the area to north of the Hangar has the potential of being designed as an outdoor plaza. The area to the east of the Hangar, between the building and Sayre Avenue, is proposed to be a landscaped open space (see Streetscape section in Chapter 6, Circulation Chapter, for details).



In addition to these open spaces, the existing forecourts on parcel 12 (in front of Buildings 19 and 20) will be retained as open space. Figure 5.7 shows all the potential open space areas.

There is also an opportunity to regain some of the "lost spaces" as useable open spaces. For instance, the courtyard spaces between the wings to the north of Building 19 is now filled with surface parking. These spaces can be appropriately landscaped to provide courtyards that can be used as "outdoor rooms."

All new developments should include useable open spaces in the form of patios, courtyards

and plazas. These internal open spaces should be visually linked to the Central Plaza and the East Central Plaza, wherever feasible.

The open space network within the Historic District is connected to the open spaces that are proposed within the NASA Research Park by pedestrian and bicycle pathways as illustrated in Figure 5.8.



**Parking:** The maximum number of parking spaces will be determined by the TDM Plan. Parking for the different uses will be provided by a combination of surface and structured parking. Parking structures will be required to support the intensity of development in the area to the east of McCord Avenue. Because there is not much proposed development of parcel 12, structured parking is not warranted - the existing buildings can be supported with surface parking. Additional discussion on the existing and proposed parking is included in Chapter 6, Circulation and Parking).

#### **DEVELOPMENT STANDARDS**

Development standards for new infill development within the Historic District are included for building heights, floor area ratios, building setback requirements and parking ratios. In addition to these standards, Chapter 7 outlines detailed design guidelines that will guide future architectural development in the Historic District.

**Building Setbacks:** Minimum building setbacks have been illustrated in Figure 5.9. These setbacks are consistent with those indicated in the Historic Resources Protection Plan.



Figure 5.9: Building Setbacks

**Building Heights:** Except for the Hangars, most of the buildings within the Historic District are generally low-rise structures ranging between 2 and 3 stories. Based on the historical context of SPHD, 3 height zones are proposed - from the lowest height facing the Central Plaza to taller buildings located along the perimeter of the District. Single story buildings are generally discouraged. If the development program does not allow for two story structures, the building should be designed to appear as a two story structure on the outside. If Building 3 is replaced, any proposed building at that location should have a minimum height of 25 feet. Buildings within the Central Plaza, such as buildings 17 and 3 (or its replacement) cannot exceed a height limit of 35 feet. Buildings facing the Central Plaza will have a height limit of 40 feet (measured to the top of the parapet for buildings with a flat roof and to the top of the pitched roof). Buildings facing the perimeter roads such as Bushnell and Wescoat, are within a zone that allows a maximum building height of 65 feet. Figure 5.10 indicates the various building height zones.



Figure 5.10: Building Heights

**Floor Area Ratio:** Floor area ratio (FAR) is the ratio of the gross building area to the gross site area. For example, an FAR of 0.5 on a 10,000 square foot lot would allow a building with a total area of 5,000 square feet. The following are the floor areas for each of the parcels within the Historic District. No FARs have been indicated for parcels 12 and 17 since there is no anticipated infill development on these parcel.

#### **Parking Ratio:**

Add text - Parking ratios and compliance with the Transportation Demand Management Plan.

## Chapter 6

# CIRCULATION

- Transportation Demand
  Management (TDM)
  - Streetscape Character

- Vehicular Circulation
- Pedestrian Circulation
- Bicycle Circulation
- Shuttle Bus Route
- Parking



### SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

### CIRCULATION

#### Introduction

The Shenandoah Historic District will require a new circulation and parking system to facilitate movement for vehicles, pedestrians, bicycles, and mass transit in a safe and convenient manner. The existing road network will need minor improvements to accommodate the new circulation system. Conceptually, the periphery of the Historic District will retain the majority of vehicular traffic and parking and the interior will be more pedestrian oriented with a one-way street system. This Chapter will first discuss the overall circulation and parking framework, and second provide additional detailed information for each streetscape within the Historic District.



#### **Vehicular Circulation**

The Historic District is centrally located on axis with the primary Moffett Field entrance on Clark Road which provides access to the Bay View, Ames Research Campus, and the NASA Research Park in order to preserve the integrity of the historic district, traffic access to these other districts should be redirected along the perimeter of Bushnell Road, Wescoat Road and Sayre Avenue. McCord Avenue will provide a primary north/ south connection between Ames Campus and the NASA Research Park. One-way streets will circle the Central Plaza and the proposed East Central Plaza adjacent to Hangar One providing internal access to the Historic District parcels. Dugan Avenue, between South Akron and Wescoat Road, will be removed to increase the development potential of parcels 15 and 17.





Figure 6.1 Proposed Vehicular Circulation

#### **Pedestrian Circulation**

Safe and convenient pedestrian movement within the Historic District will be accommodated with sidewalks generously setback from all streets and internal pedestrian linkages to all parcels. Primary two-way streets will have sidewalks on each side of the roadway and one-way streets will have sidewalks located on one side, the side opposite of the Central Plaza and the proposed East Central Plaza open spaces.





Figure 6.2 Proposed Circulation Plan

#### **Bicycle Circulation**

A Class II bicycle lane system will be accommodated on all streets excluding Sayre Avenue. Class II bicycle lanes are defined as being part of the roadway, but separated by pavement markings at a width of 5 to 6 feet. Although some streets will require some minimal widening (see Streetscape Character discussion), most existing curb-to-curb

dimensions will accommodate this type of bicycle lane system. Two-way streets will have one bicycle lane in each direction and one-way streets will have one bicycle lane in the direction of vehicle traffic.



Figure 6.3 Proposed Bicycle Circulation

#### **Shuttle Bus Route Circulation**

The Santa Clara Valley Transit Authority (SCVTA) recently completed the new Bayshore/NASA Ames light rail station on the Tasman Line, which connects Mountain View and Sunnyvale to Santa Clara, San Jose and Milpitas. Although the station is located in the southeast corner of the NASA Research Park and not in the Historic District, it will indeed offer an alternative mode of transportation to thousands of workers and students in the future. In order to promote the use of the light rail, an on-site shuttle system will be implemented





Figure 6.4 Proposed Bus Route (Refer to TDM Plan for Final Route)

with 10-minute headways throughout most of the day. The shuttle would ideally loop through the NASA Research Park/Historic District and Ames Campus extending to the housing and parking locations at Bay View; with the goal that all employees and students reach their destination within minutes (see Figure 6.4). Bus stops or turnouts within the Historic District should be designed as an integral component of the street ROW. Shelters that also provide a small amount of seating and other essential amenities will be provided.

#### Parking

The existing parking within the Historic District totals 1,561 spaces and is distributed throughout individual parking lots (see Figure 6.5). In accordance with the proposed Development Plan, parking lot locations and parking space distributions will require modifications to adhere to the established site planning principles. All surface parking will be removed from the Central Plaza and the proposed East Central Plaza open spaces and relocated to the periphery of the Historic District. The proposed structured and surface parking lots will be primarily accessed from the Bushnell Road, Wescoat Road, and Sayre Avenue (see Figure 6.6). The existing on-street parallel parking fronting the Central Plaza will remain; however, on-street parking will be expanded to Severyns Avenue and Cummins Road to similarly front the proposed East Central Plaza open space.



Figure 6.5 Existing Parking Plan

#### **Transportation Demand Management (TDM)**

Based on its goal of achieving sustainable developments, NASA has made a commitment to support alternative transportation systems. A specific Transportation Demand Management Plan (Draft, September 2001) was developed for the NASA Ames Research Center. The purpose of the TDM Plan (as stated in the Plan) is to:

- ٠ goals;
- Reduce vehicle trips to the site to minimize ٠ the traffic and environmental impacts of the .... Research Park;
- Support NASA's sustainable development . Increase the attractiveness of the NASA Research Park (NRP) by increasing transportation choices.
  - Limit the amount of land within the NRP that will be paved.



Figure 6.6 Proposed Parking Plan

This Historic District Plan follows the guidelines set forth in the TDM Plan. As indicated earlier, the emphasis of circulation in and around the Historic District is to balance the need for vehicular movement with creating a pedestrian and bicycle friendly environment.

Both existing and proposed parking will be deemphasized and located away from the Central Plaza. The paved area for surface parking in the area to the west of McCord Avenue is proposed to be consolidated to replace the existing paved areas scattered throughout the District. The proposed infill development to the east of McCord Avenue will be supported by a combination of surface and structured parking. The parking ratios incorporated here reflect the numbers suggested in the TDM Plan and will be kept to a minimum in order to encourage the use of alternative modes of transportation. As included in the NASA Ames Development Plan, preferential parking will be designated for carpool and vanpool parking.

#### **Streetscape Character**

The street Right-of-Way (ROW) improvements proposed for the Shenandoah Historic District are designed to respect the scale and character of the historic street framework and to provide a safe and pleasant environment for vehicles, bicyclists, and pedestrians. This section illustrates the proposed roadway cross section changes, such as the direction and number of travel lanes, landscape/ sidewalk treatments, and light standard spacing for each major street within the Historic District. In addition, recommended paving materials and site furnishings for each street are identified and are referenced to the Design Guidelines-Site Furnishings Chapter for further explanation.



#### **Clark Road**

As the primary entry road to the Historic District, Clark Road requires a formal streetscape design to strengthen the axial relationship to Hangar One and the Central Plaza. The existing 40 foot curbto-curb dimension will provide for one travel lane in each direction and Class II bicycle lanes with no street widening required. A formal row of palm trees alternating with light standards in the parkway strips (planted area between the curb and sidewalk) will provide a comfortable setback for pedestrian movement along the sidewalks.





#### **Bushnell Road**

This roadway defines the northern edge of the Historic District and will serve as a primary vehicular thoroughfare. The existing 27.5 foot curb-tocurb dimension will require approximately 4.5 feet of widening on the south side of the roadway to accommodate one travel lane in each direction and Class II bicycle lanes. The design of the northern parkway strip will vary along the roadway depending on existing conditions between the Ames Campus and the Shenandoah Historic District. However, the recommended treatment includes lawn parkway strip and palm trees alternating with light standards with a sidewalk adjacent to the NASA Ames security fence. The south parkway strip will have regularly spaced light standards with no palm trees that separate the sidewalk from the street.



#### Wescoat Road

Wescoast Road will serve as a primary vehicular thoroughfare at the south end of the Historic District. Wescoat Road defines the southern edge of the Historic District and will have a similar treatment as proposed for Bushnell Road. The existing 28 foot curb-to-curb dimension will require expansion of approximately 4 feet (2 feet on each side) to accommodate one travel lane in each direction and Class II bicycle lanes. Palm trees alternating with light standards will be located in the south parkway strip with only light standards in the north parkway strip. Sidewalks on both sides of the street will provide safe and efficient movement of pedestrians.





#### **McCord** Avenue

This roadway section is projected to be a primary pedestrian/vehicle connection between the Ames Campus to the north and the NASA Research Park to the south. The existing 28 foot curb-to-curb dimension will need to be expanded to 34 feet in order to merge with the proposed McCord Avenue Extension travel lanes to the south. One lane of travel in each direction and Class II bicycle lanes will be provided with parkway strips and sidewalks. The proposed special paving material for the sidewalks will reflect the materials used on McCord Avenue Extension, but is articulated in more modest design to respect the simplicity of the Historic District's landscape vocabulary. In addition, deciduous street trees will be spaced generously in the parkways. However, in order to preserve the axial views, the trees will not be planted in the Central Plaza open space.





#### North Akron

This one-way street defines the northern edge of the Central Plaza open space. To preserve the historic scale of the roadways, no curb-to-curb street widening is proposed. One travel lane and Class II bicycle lane in the westbound direction and parallel street parking on the north side will be accommodated. Deciduous trees are adequately spaced at 44 feet in the northern parkway strip to allow filtered views across the Central Plaza open space. A sidewalk with a minimal width of 6 feet is adjacent to the parkway strip to respect the quaint east west pedestrian access established in the early planning of the Historic District. Light standards are located only on the south side of the street to delineate the Central Plaza open space.





### South Akron

The South Akron streetscape is a mirror image of North Akron with one-way travel in the eastbound direction. One travel lane, bicycle lane, on-street parking, parkway strip, and sidewalk are present with deciduous trees on the south side of the street and light standards on the north side.





#### **Severyns Avenue**

This roadway defines the western edge of the proposed East Central Plaza open space adjacent to Hangar One and is similar to the streetscape vocabulary established on North and South Akron. The existing street width is proposed to remain; however, the travel lanes will be converted to one-way travel in the southbound direction. The roadway section will contain one lane of travel, a Class II bicycle lane, and on-street parallel parking. No formal street trees are proposed to allow the building mass of Hangar One to the east to dominate, although triangular spaced light standards will be required. A parkway strip and sidewalk will be provided for on the west side of the street, but not on the east side.



CIRCULATION <u>6-15</u>



#### **Cummins Road**

Similar to North and South Akron, Cummins Road streetscape is a mirror image of Severyns Avenue with a one-way travel lane in the northbound direction. One travel lane, bicycle lane, on-street parking, parkway strip, and sidewalk are present. No formal street trees are proposed only triangular spaced light standards.







#### Sayre Avenue

Located on the east side of Hangar One, Sayre Avenue will be a primary access road to special events occurring on the tarmac, i.e. air shows, etc. The existing curb-to-curb width will remain and contain one travel lane in each direction with no bicycle lanes. On the east side of the roadway a small parkway strip will separate the street from the sidewalk. A low growing groundcover will provide a buffer between the sidewalk and the surface parking lot. On the west side of the street no sidewalks or street trees are proposed. This will help provide a wide landscape strip that incorporates massing of palm trees accentuating the height and building mass of Hangar One.


# Chapter 7

# **DESIGN GUIDELINES**

- Secretary of Interiors Standards
- Sustainable Design
- Other

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• Site Specific Design Guideline Recommendations



Site Planning

Open Spaces

Plant Material

Hardscape Materials

Lighting and Site Furnishings

Buildings

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# SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

# **DESIGN GUIDELINES**

Design Guidelines provide a set of consistent direction for the separate elements of the Historic District to help guide future development within an area. These guidelines provide potential developers a clear picture of the vision and goals for the area. Additionally, design guidelines form a set of criteria by which to evaluate individual projects to ensure compatible design solutions. These design guidelines are also intended to assist in avoiding inappropriate design solutions for site planning, building design and landscaping.

The Shenandoah Historic District portrays a powerful integrity in its site planning and its distinct architectural character. The Historic District has retained much of its original Master Plan's spatial organization and Spanish Colonial Revival architectural heritage, especially in the area to the west of McCord Avenue. A significant component of the design concept is its axial layout, with roads, landscaping and buildings arranged symmetrically against the impressive backdrop of Hangar One.

In order to preserve and enhance the District's architectural integrity, site planning and landscaping concepts, a detailed set of guidelines are included. These guidelines are consistent with and include many of the concepts and design ideas incorporated in the NASA Ames Research Center Historic Resources Protection Plan, Moffett Federal Airfield Planning Guidelines and Standards (1994), Reuse Guidelines, the Base Exterior Architecture Plan (1983) and the NASA Ames Development Plan (Nov 2001) NASA Research Park Design Guide.

While these guidelines are intended to provide a design framework, it does not prohibit other solutions if found consistent with the intent of these guidelines.

The Design guidelines are organized under the following categories:

- Site Planning
- Open Spaces
- Buildings
- Plant Materials
- Hardscape Materials
- Lighting and Site Furnishings
- Secretary of Interiors Standards
- Sustainable Design Solutions
- Site Specific Design Guideline Recommendations

Each section has design principles that are followed by a series of design guidelines that help achieve the intent of the principle.

# SITE PLANNING

Principle 1: Restore and reinforce the site planning concepts of the 1933 Master Plan.





DESIGN GUIDELINES

# **GUIDELINES**

• Incorporate concepts such as hierarchy, formal axes and composed spatial definitions.



- Retain and reinforce the original Master Plan concept with low building heights and a sense of openness.
- Remove non-contributing buildings where their reuse is not feasible and create opportunities for new compatible development.



• Infill development on the eastside of McCord Avenue should follow the site planning concepts incorporated on the westside of McCord Avenue. • New developments, including additions to existing buildings and new buildings, should respect the formal symmetry and axial arrangement evident in the original Master Plan.



• Ensure that there is a consistent relationship of buildings to streets and buildings to the Central Plaza without the intervening of parking and service areas.



While buildings do not need to be symmetrical in their form, building entrances, driveways and pedestrian pathways should be aligned symmetrically.

- Develop strong visual linkages between building entrances and planting masses.
- The primary vehicular circulation should occur on the Historic District perimeter road and McCord Avenue, with pedestrian circulation focused along the internal roadways.



- Buildings should be oriented to face to the Central Plaza.
- Buildings and building groups should form coherent outdoor open spaces.



Building setbacks should generally be consistent within each block in order to obtain a defined street edge. Principle 2: Distinguish the Historic District as a unique place.

#### GUIDELINES

- Establish a cohesive and compatible vocabulary of public realm elements to differentiate the Historic District from the neighboring vicinity.
- Improve Wescoat and Bushnell Roads as important boulevards that define and emphasize the district edges with a consistent rhythm of palm trees.



• Include special treatments at gateway site entrances.



- The Central Plaza and the East Central Plaza provide an opportunity for incorporating unique site furniture, such as light fixtures and benches, which differentiate the Historic District from the neighboring vicinty.
- Provide clear connections to the neighboring areas of NASA Research Park through identified gateway elements.



- Principle 3: De-emphasize and consolidate paved areas for parking.
  - Parking should clearly be a secondary use and should be located behind buildings or in structures that are well screened from the Central Plaza.



• Structured and surface parking should be primarily accessed from the Historic District perimeter and McCord Avenue.

- Ensure adequate screening of surface parking areas that are located along the perimeter roads.
- Building service entries should be accessed from the Historic District perimeter.



• Remove surface parking immediately adjacent to buildings and reconfigure parking with an adequate landscape buffer.



• Incorporate adequate landscaping within parking lots in order to avoid the appearance of "seas-of-parking".

Provide direct, identifiable pedestrian connections from the parking areas to building entrances and sidewalks.



#### **OPEN SPACES**

Open spaces are important elements that help define the character of an area. Within the Historic District core, the open spaces have ranged from the ceremonial open Central Plaza to the transitional open spaces in front of buildings to the more intimate outdoor thresholds such as courtyards and portico. Historically, the area has been minimally landscaped with large canopy trees in informal clusters and a low open green for the Central Plaza.

The following guidelines have been developed in order to reinforce the landscape concept of the original Master Plan and to provide a sense of continuity within the public realm.





- Introduce landscaping in areas that are currently paved for surface parking in the Central and East Central Plazas.
- Continue the use of the existing plant palette and reinforce it with new compatible plant material.
- Remove all non-contributing buildings/ structures and parking from the Central and East Central Plazas.
- Remove all existing buildings on the block to the west of Hangar One (between Severyns and Cummins Roads) and convert that space into an open space, the East Central Plaza.

The design of the East Central Plaza will be similar to that of the Central Plaza.

- Develop a clear hierarchy of planting material that reflects the scale and function of the space.

- Tree planting should create a strong edge to define the District boundary with internal tree massings arranged in informal groupings.
- Use distinctive trees such as the California palms along the outer edges of the historic district to provide a defined edge and distinguish the Historic District.



Emphasize a sense of arrival into the district by defining gateways with clusters of special plantings and other architectural elements.



- Any tree planting in the Central Plaza should ٠ be kept to a minimum in order to preserve the sense of openness and should be used to highlight buildings and monuments.
- Existing mature vegetation surrounding the • Plaza should be preserved. The only exception is in areas where overgrown landscaping obstructs direct axial views between building entrances - in these cases, the landscaping can be trimmed or selectively removed.
  - Maintain and integrate existing monuments into open landscape areas.
  - Improve the existing landscaping around existing monuments such as the flagpole and anchor.

- Allow for the future addition of monuments
- the area to the east of McCord Avenue, wherever possible, to engage and provide an extension of the Central and East Central Plazas.
- in the newly created open areas.

DESIGN GUIDELINES

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Principle 5: Develop a clear hierarchy of open spaces.

- The Central Plaza and the East Central Plaza should be treated as the primary open spaces.
- Provide a hierarchy of open space connections that should link the parcels to the Central Plaza and East Central Plaza.



• Remove parking adjacent to Building 19 and landscape the areas as planted courtyards.



- Connect open spaces within the District to the open space network throughout the NASA Research Park with pedestrian and bicycle connections.
- Design spaces that allow formal gatherings and include ceremonial spaces.
- Retain open area at the southern end of Hanger One for use as a plaza.



- Incorporate open spaces in the form of courtyards, patios, colonnades and verandahs within the new infill development.
- Encourage the use of discrete plaques to describe the historic buildings, spaces, and other noteworthy historical events throughout the Historic District.
- Introduce selective monuments in the Central Plaza that emphasizes the history of aviation or uses the Central Plazas as outdoor extensions of the Moffett Museum in Hanger One.

#### BUILDINGS

The following building guidelines are developed from characteristics that are inherent in the rich architectural vocabulary of the Spanish Colonial Revival buildings found in the Shenandoah Historic District. These criteria for new construction are intended to facilitate design that is compatible with the existing historic buildings and fitting to the Historic District. The objective is not to endorse replication or false historicism in the new construction, but rather to encourage the use of planning principles that enable a formal consistency and a suitable level of detail in the new construction. New buildings should draw from and complement the historic environment. This is not to discourage other design solutions when executed in context of well-analyzed, thoughtful design scheme.

#### **Building Massing**

Massing defines the three dimensional form of a building in terms of its footprint, height, configuration, and profile. Within the Historic District, there is a distinct pattern of building massing: structures generally have a horizontal composition, of consistent height, with individual parts that break down the volume into comfortably scaled elements. Nearly every contributing building within the Historic District has a footprint comprised of rectilinear wings no more than 60' wide. These wings are expressed in the adjoining façade and the roof line. Roofs are low slope, tile clad in the Shenandoah Historic District, subarea 2, and flat roofed with articulated parapet lines in



Building volume composed of wings

the Conference Area, subarea 3. The signature building situated on the main axis (Building #17) has a tower centered on the façade and the axis.

#### **GUIDELINES**

- Maintain a maximum building height for buildings facing the Central Plaza of 40 feet, consistent with the existing building profile. Building heights can increase to 65 feet beyond the 40-foot setback from the building façade facing the plaza.
- Prohibit single story buildings unless they require a minimum height of 30 feet, as in conference facilities or museums.
- Where possible the, building footprint should be configured into wings not exceeding 60 feet in width.
- Tile roofs with low slopes should be encouraged within Subarea 2 and at locations of importance, such as along the main central axis of the Historic District. Flat roofs with articulated parapets may be used within Subarea 3. (See Figure 5.1 for definition of Subareas.)

# **Entry Articulation**

Primary entrances to historic buildings in Shenandoah Plaza are accentuated in the building form and articulated with great detail. A contrasting limestone surround, centered within a protruding entry bay, is found at the main entry off the plaza and occasionally at secondary or back entries. It is at this location where the Spanish Colonial Revival detail is most apparent, with carved limestone and classical entablatures. These entries form porticos or are preceded by arched-arcades courts with environmental protection. The main entries lead visitors to finished lobby spaces and the primary circulation path within the building.



#### GUIDELINES

- Articulate primary entries with entry thresholds, and use the greatest level of detail at these locations.
- Provide a means of weather protection that is appropriate to the use of the building.

#### **Entry Articulation**



Entry and surround centered within an entry bay

#### **Facade Treatment**



Façade relief with base, banding, and eave detailing

The building facades of contributing buildings are modestly and simply treated. They have relatively smooth surfaces with punched, trim-less for windows. Yet the façade plane is articulated with the use of base, band, and eave-line treatment that steps out from the face of the building. Interesting shadowlines are created with these understated horizontal accents.

Variation is also given to the building line in the form of recesses and protrusions along the length of the building. These are extremely effective in providing rhythm and scale to the facades and providing building edges that interact with the landscaped zones that surround the buildings. These stepped building segments give shape to courtyards, porticos, and entry thresholds.

# GUIDELINES

- Provide simple façade treatments and avoid the use of trims at openings (main entries excepted).
- Define the building façade with base, banding, and eave-line relief.
- Create relief along building edges with setbacks, projections, and regularly spaced bay elements.
- Design edges to shape outdoor spaces and respond to climatic conditions.







Building 10

#### **Fenestration to Wall Ratio**



Openings within the wall plane

Fenestration, doorways, arcades, and porticos create openings in the wall plane. The ratio of these openings to the wall area is an important defining characteristic of the architectural vocabulary. A massive, solid, or light quality is realized in part based on this ratio. A rhythm and pattern is established with the opening locations its and regularity. The fenestration pattern provides a sense of the scale and a connection of interior plan to the exterior facade.

The historic buildings at Shenandoah Historic District reveal a fenestration to wall ratio of approximately 45/55. This is consistent on all elevations of the building. Historic buildings of an industrial nature located east of McCord Avenue have a ratio on slightly less than 45/55. Fenestration patterns are fairly regular on all elevations, with window proportions of 1/2 (width/height). The fenestration patterns, although consistently of the 45/55 ratio, does vary from one building to another.

New construction within the Historic District should be encouraged to maintain this ratio. New fenestration patterns can be created where compatibility is demonstrated.

# GUIDELINES

• Establish a fenestration to wall ratio compatible to the existing ratio found in the Historic District: 45/55 percent.







#### **Arcades and Protected Spaces**



Covered arcade along front facade

Arcades and porticos provide protected space that modulates the transition from exterior to interior. Frequently found in Spanish Colonial buildings, these elements serve as climatic protection as well as articulated design features. Porticos highlight entries, signal a passageway, and connect spaces along a building or between buildings. They also grasp outdoor space and pull a habitable outdoor zone to the building edge.

Arcades, porticos, vestibules and other climate modulating elements by nature are energy conserving design features. They are effective in reducing energy costs while also providing a comfortable, natural environment for users. These are extremely suitable in climate zones such as Northern California.

# GUIDELINES

- Create arcades, porticos, and protected outdoor spaces to signal pedestrian passage and modulate environmental conditions.
- Use energy conserving design features, materials, and systems.







#### **Materials and Color**



Any new materials, textures, or colors should be minimally applied and made ancillary to the predominate palette when viewed from important site lines.

# GUIDELINES

- Establish the continuity of the existing material and neutral color palette.
- Allow for the introduction of new materials and colors that are complementary and ancil-



# Neutral color palette

A uniformity of materials and color throughout the Historic District is a familiar arrangement at military installations. This use if a similar color palette immediately creates an association between the structures as a collection of buildings. The exterior cladding and molding is stucco, the contrasting detail is limestone, and roofs are clay tile or flat built-up roofing. All facades are a tan, or natural sand color, and the limestone accent is a lighter, off -white color. Sloped roof profiles are brick red.

Continuity of these materials and colors should be encouraged in new construction. The introduction of new materials and neutral colors may be considered that complement the existing palette.





#### Lighting



architecture and be subtle in nature.

# GUIDELINES

- Maintain and preserve the existing historic light fixtures within the Historic District.
- Use lanterns, pendants, and wall or ceiling mounted fixtures that are distinct from the historic fixtures, yet complementary in scale and materials.
- Install a variety of types of fixtures that provide unique lighting effects at each important building.







Distinctive light fixtures

lary to the existing palette.

Decorative light fixtures are located at the entrances or within entry porticos of the historic buildings surrounding Shenandoah Plaza Historic District. Different types of fixtures are found at every building; either wall or post mounted lanterns, pendants, and wall and ceiling mounted fixtures. With each building, a slightly different character of accent lighting is apparent, giving a unique feel to each installation. This provides interest and variety throughout the area.

In addition to accent lighting, general lighting will also be important to the building exterior and to users passing between buildings. General lighting standards should be incorporated into the building

## PLANT MATERIALS

#### Landscape Concept

The original historic landscape concept for Shenandaoh Historic District was simple, straightforward, and bold. Evergreen tree masses were placed in large open lawn areas to define space, anchor buildings, and accentuate views. Shrubs and groundcovers were used sparingly to acknowledge building entries and to provide human scale. The use of accent plantings, such as flowering or "showy" plant material, were not fundamental to the original landscape framework. In short, the original landscape concept resembles 18th century French garden design: formal axial relationships contained by contrasting bright open lawn areas and dark masses of trees.

Today, the remnants of this simple and open landscape framework (found west of McCord Avenue) are essential to the historic integrity of the District. This section outlines guidelines for expansion and preservation of the landscape character and includes a recommended plant palette.

- Maintain and expand upon the existing historic landscape character west of McCord Avenue by utilizing evergreen trees massed in large open lawn areas.
- Primary open spaces should be simple lawn plantings.
- Informal massing of evergreen tree species should be used to anchor buildings and define open spaces.
- Similar tree species spaced at regular intervals, should be used to define the following streets
  (1) Clark Road, Bushnell Road, and Wescoat Road, (2) North and South Akron, and (3) McCord Avenue all other streets within the Historic District shall have no formally spaced street trees.
- Flowering accent trees should be used sparingly to provide seasonal interest to new courtyards and plazas - evergreen trees should be the dominate plant type.
- Trees planted directly adjacent to streets should be planted within four feet of the curb and sidewalk to provide canopies that extend into the street and provide shade over sidewalks.
- Trees planted in pavements should have a minimum tree well area of 16 square feet, with porous paving (i.e. pavers over sand and gravel setting beds rather than concrete subbase and/or grout filled joints).

- Shrub and groundcover massings of the same plant species is more desirable than mixing a few species together.
- Use low maintenance and high drought tolerant plant species where possible.
- Massing of plant material should reflect species with similar water requirements.

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- Wind and solar orientation and hydrozone delineation should be considered when selecting plant material.
- Only mature trees with large canopies are desirable at installation (24" box minimum).
- All non-lawn areas should receive a minimum of two to four inches of mulch that is of similar material and dark brown in color.
- Vegetation should be used to screen building service areas, parking lots, and other aesthetically undesirable areas.

#### Shenandoah Historic District - Plant Palette

- Street Tree Specific Recommendations

BOTANICAL NAME	TYPE	SIZE	ATTRIBUTES					DESIGN APPLICATION
COMMON NAME	Evergreen/ Deciduous	Height x Spread	Flowers	Fall Color	Sun/ Shade	Drought Tolerant	Shape	
Calocedrus decurrens	E	70' x 30'	Inconspicuous	No	Sun	Yes	Pyramidal	Background Massing/Screening
ncense Cedar								
Cedrus atlantica	E	60' x 40'	Inconspicuous	No	Sun	Yes	Pyramidal	Background Massing
Atlas Cedar								
Cedrus deodara	E	80' x 40'	Inconspicuous	No	Sun	Yes	Pyramidal	Background Massing
Deodar Cedar								
Cinnamomum camphora	E	40' x 50'	Inconspicuous	Some	Sun		Round Crown	Parking Lot Tree/Background Massing
Camphor Tree								
Juniperus chinensis 'Torulosa'	E	25' x 20'	Inconspicuous	No	Sun	Yes	Round Crown	Screening
Hollywood Juniper								
Ligustrum Lucidum	E	30' x 40'	Showy	No	Sun		Round Crown	Background Massing/Screening
Glossy Privet								
Liquidambar styraciflua	D	50' x 25'	Inconspicuous	Yes	Sun		Conical	Street Tree - North and South Akron
American Sweet Gum								
Magnolia grandiflora	E	70' x 40'	Showy	No	Sun		Round Crown	Parking Lot Tree
Southern Magnolia								
Pinus canariensis	E	70' x 30'	Inconspicuous	No	Sun		Pyramidal	Background Massing
Canary Island Pine								
Pinus halepensis	E	40' x 50'	Inconspicuous	No	Sun	Yes	Round Crown	Background Massing
Aleppo Pine				Lacity of				
Pistacia chinensis	D	50' x 40'	Inconspicuous	Yes	Sun		Round Crown	Accent/Parking Lot Tree
Chinese Pistache								
Platanus acerifolia	D	70' x 40'	Inconspicuous	Yes	Sun		Round Crown	Street Tree - McCord Avenue
London Plane Tree								
Platanus racemosa	D	80' x 70'	Inconspicuous	Yes	Sun	Yes	Round Crown	Background Massing
California Sycamore								
Podocarpus gracilior	E	50' x 40'	Inconspicuous	No	Sun		Round Crown	Background Massing/Parking Lot Tree
Fern Pine								
Prunus cerasifera 'Atropurpurea'	D	30' x 25'	Showy Leaves	Yes	Sun		Round Crown	Accent
Purple-Leaf Plum								
Quercus agrifolia	E	50' x 60'	Inconspicuous	No	Sun	Yes	Round Crown	Background Massing
Coast Live Oak								
Quercus suber	E	70' x 80'	Inconspicuous	No	Sun	Yes	Round Crown	Background Massing
Cork Oak								
Schinus terebinthifolius	E	50' x 50'	Inconspicuous	No	Sun	Yes	Round Crown	Background Massing/Screening
Brazilian Pepper Tree								
Sequoia sempervirens	E	80' x 30'	Inconspicuous	No	Sun	Yes	Pyramidal	Background Massing
Coast Redwood			-	•//•	-			
Nashingtonia filifera	E	50-60' Tall	Showy	No	Sun	Yes	Round Crown	Street Tree - Clark Road, Bushnell Road, and
California Fan Palm								Wescoat Road
Washingtonia robusta	E	70-100' Tal	l Showy	No	Sun	Yes	Round Crown	Accent - Adjacent to Hangar One
Mexican Fan Palm								(informal plantings)

BOTANICAL NAME	TYPE	SIZE	ATTRIBUTES					DESIGN APPLICATION
COMMON NAME	Evergreen/ Deciduous	Height x Spread	Flowers/ Fruit	Fall Color	Sun/ Shade	Drought Tolerant	Shape	
<i>Buxus microphylla japonica</i> Japanese Boxwood	E	4' x 5'	Inconspicuous	No	Sun/Shade		Mound	General Massing - ideal for clipping into shapes
Cotoneaster buxifolius	Е	3' x 4'	Showy	No	Sun	Yes	Mound	General Massing/Accent
Cotoneaster			•					
<i>Hibiscus rosa-sinensis</i> Chinese Hibiscus	E	8' x 6'	Showy	No	Sun		Mound	Accent
Juniperus chinensis 'Gold Coast' Juniper	E	4' x 6'	Inconspicuous	No	Sun	Yes	Mound	Screening/General Massing
Juniperus chinensis 'Mint Julep' Juniper	E	6' x 6'	Inconspicuous	No	Sun	Yes	Upright	Screening/General Massing
Osmanthus fragrans Sweet Olive	E	10' x 8'	Inconspicuous	No	Sun/Part Shade		Mound	Screening/General Massing or Small Tree
Nerium oleander 'Mrs. Roeding' Oleander	E	6' x 6'	Very Showy	No	Sun	Yes	Mound	General Massing/Accent
<i>Nerium oleander 'Petite Pink'</i> Oleander	Е	3' x 4'	Very Showy	No	Sun	Yes	Mound	General Massing/Accent
Photinia fraseri Photinia	E	15' x 15'	Very Showy	Some	Sun		Mound	General Massing/Accent

GROUNDCOVERS								
BOTANICAL NAME	TYPE	SIZE	ATTRIBUTES					DESIGN APPLICATION
COMMON NAME	Evergreen/	Height x	Flowers	Fall	Sun/	Drought	Shape	
	Deciduous	Spread		Color	Shade	Tolerant		
Juniperus conferta	E	1' x 6'	Inconspicuous	No	Sun	Yes	Carpet	General Massing
Shore Juniper								
Juniperus horizontalis	E	1' x 8'	Inconspicuous	No	Sun	Yes	Carpet	General Massing
Creeping Juniper								

#### HARDSCAPE MATERIALS

## **Paving Systems**

The paving systems should be relatively simple in design and materials to reflect the historic charm of the District. The predominate material should be cast-in-place concrete for pedestrian walkways and special paving for ceremonial plazas and courtyards. The exception is McCord Avenue. This streetscape sidewalk should portray the special paving materials proposed for the McCord Avenue Extension to the south as outlined in the NASA Research Park Design Guide, but designed in a less intricate arrangement of materials to distinguish the transition into the Historic District. The paving system guidelines are as follows:

- Recommended special paving types include natural stone, colored concrete, and higher quality concrete pavers.
- Entry forecourts to major buildings, crosswalks and gateways use a higher quality surface.
- Areas that receive a high level of foot traffic or require emergency vehicles should be of sufficient strength and have a rough textured/skid resistant finish.
- Avoid the use of more than three types of special paving in plazas and courtyards that are compatible with the adjoining architecture (where appropriate).

Below are the recommended paving materials for the major public right-of-way (ROWs) streetscapes. These paving materials are selected to provide a cohesive materials palette throughout the Historic District. Each paving type is crossed-referenced for location to the street plan enlargements in the Streetscape Character Section in Chapter 6.



**Paving Type 'A'** - Cast-In-Place Concrete Beige/Tan Color with Light Sandblast Finish and Sawn Joints Application: All sidewalks with the exception of McCord Avenue's Sidewalks



**Paving Type 'B'** - 18"x18" Precast Concrete Pavers Tan/Cream Color with light exposed aggregate texture Application: Field Paving for McCord Avenue's Sidewalks



**Paving Type 'C'** - 18"x24" Granite Pavers Red/Brown Color with Thermal Top and Split Edge Finish Application: Accent Band Paving for McCord Avenue's Sidewalks

#### Walls and Fences

The use of walls and fences should be limited within the Historic District and should be used only for screening and accent purposes, rather than separating spaces or for enforcing security. The character of the Historic District should remain open and undivided. When used, walls should be of high quality materials reflecting the same attention to detail as the site architecture. The guidelines are listed as follows:

- Walls over 3 feet in height are discouraged unless necessary for site screening purposes.
- Masonry walls are desirable and the color and treatment of the wall surface should be compatible with the adjoining building (where appropriate).
- Walls should have a cap and base element and exhibit relief and shadow, rather than be one contiguous surface.
- Fences should be metal or similar and display simple decorative or ornamental features within the design. Finishes should reflect a dark color.

#### **Trellises and Arbors**

Structures to help define walkways, provide shade, and provide vertical accents between buildings are encouraged. In some cases, these elements may be an extension of the building or be freestanding. The guidelines for proposed trellises and arbors are:

- Trellises and arbors should be made of stone, concrete, or metal or combinations of those materials depending on the function, location, and scale of the structure. In general, a maximum of three materials should be used and less is encouraged. Metal elements should be painted. All materials selected should relate to the existing building vocabulary of the Historic District.
- Plant materials that can climb around columns and provide overhead canopies are desirable to provide interest and shade.

# LIGHTING AND SITE FURNISHINGS

The existing site furnishing vocabulary in the Historic District is widespread as a result of additions over time. Site furnishing materials such as metal, precast concrete, wood and plastic have all been introduced diminishing the historical integrity of the District.



Existing Site Furnishings

This chapter is intended to simplify the proposed site furnishings palette such as bollards, light standards and fixtures, bus shelters, trash receptacles, bike racks, benches, information kiosks, etc. to be consistent with the simplicity of the original Master Plan vision. Based on the character of the precast concrete light standards adjacent to the Central Plaza and contributing buildings, all site furnishings in the exterior environment shall follow the guidelines outlined in this section.

# GUIDELINES

General

- Allow for multiple themes in the design of site furnishings however, provide some compatibility with those elements used in the NASA Research Park to the south.
- The site elements should be in keeping with the surrounding character of adjacent building materials. Finishes for site furniture should reflect those for walls, fences, and other landscape elements described herein to ensure consistency.
- Use materials that are durable, aesthetically appropriate, and of high quality to preserve and enhance the District's historical integrity.
- The site elements should be in scale with their surroundings.
- Selected materials need to be sturdy to withstand the rigors of the outdoor environment. The materials chosen need to wear well, and retain aesthetic interest.
- All site elements should be either fastened solidly to the pavement and/or heavy enough to lessen the chance of theft.
- All site elements should allow a free flow of pedestrian traffic, offer clear sight lines, and should not pose a hazard to anyone using the streets, sidewalks, or plazas.

Simple site elements with highlights of color and/or texture that complement their surroundings are preferable to complicated, elements. Recommended material colors should range from warm whites to red browns.



#### Light Standards and Fixtures

The basic intent for lighting throughout the Historic District is to provide necessary lighting for safety, and orientation or way finding while minimizing maintenance and energy consumption. • However, it is also an opportunity to enhance the historical integrity of the original Master Plan vision. The site lighting guidelines are listed as follows:

- Compatability with the historical character of the District should take precedence in select-ing light standards and fixtures.
- Light standards and fixtures should conform to the Illumination Engineering Society of North America (IESNA) lighting guidelines

#### STREETS AND SIDEWALKS



RECOMMENDED Manufacturer: Custom Model/Color: Existing Historic District Light Standard Pole Height: +/-18 feet Pole Type: Custom to Match Existing Cutoff Type: Design for Maximum Cutoff for minimum/maximum footcandle requirements and uniformity ratios to provide continuous illumination levels for safe night visibility. Use no more light than is necessary.

All outdoor lighting should include cutoff lighting fixtures that direct a percentage of all light emitted below the horizontal to reduce light pollution. The standard rating system, as per the Illumination Engineering Society of North America (IESNA), is the percentage of light direct below the horizon as follows: (1) Full Cutoff fixtures - 100%, (2) Cutoff fixtures - 97.5%, and (3) Semi-Cutoff - 95%. Where possible, outdoor lighting proposed in the Historic District should be Full Cutoff or Cutoff fixtures. Any proposed exceptions

shall be approved by the NASA Design Review Board.

- Parking lots and other site areas not requiring true color rendering shall use low pressure sodium light sources to improve efficiency and avoid light interference with astronomers' telescopes.
- Site areas of the Historic District requiring the quality of true color rendering at night, such as ceremonial plazas, monuments, streets, signs, etc., shall use metal halide light sources rather than the less efficient incandescent and mercury vapor lights.



ALTERNATE Manufacturer: Lumec Model/Color: ZED Zenith - Z12/White Pole Height: 18 feet Pole Type: Precast Concrete (Similar to Existing) Cutoff Type: Non-Cutoff



ALTERNATE Manufacturer: Bega Model/Color: 8090S/White Pole Height: 18 feet Pole Type: Precast Concrete (Similar to Existing) Cutoff Type: Full-Cutoff

#### PARKING LOTS



RECOMMENDED Manufacturer: Gardco Lighting Model/Color: Gullwing G18/White Pole Height: 25 feet Pole Type: Straight Round Aluminum Cutoff Type: Full Cutoff

# PLAZAS AND COURTYARDS



RECOMMEND POLE STANDARD Manufacturer: Custom Model/Color: Existing Historic District Light Standard Pole Height: +/-12 feet Pole Type: Custom to Match Existing Cutoff Type: Design for Maximum Cutoff



RECOMMENDED BOLLARD LIGHT Manufacturer: Gardco Lighting Model/Color: BR163/Gray Precast Concrete Height: 42 inches Cutoff Type: Full Cutoff

# **BENCHES**

Benches should be located at building entries, bus stops, plazas, courtyards and other appropriate areas within the Historic District to create a more pedestrian friendly environment. Precast concrete benches without backs should be used along North and South Akron, Severyns Avenue and Cummins Road frontages to help delineate the Central Plaza • open spaces. Metal benches should be used in interior plazas and courtyards. The bench selection guidelines are listed as follows:

The finishes on metal should include rust inhibitors and be resistant to UV light, chipping, and flaking. Recycled polyethylene (plastic) should also have UV light inhibitors added to the polyethylene.

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- Benches should be black, gray, or silver in color and be capable of being permanently attached to paving or footings to avoid theft.
- All benches should have a simple aesthetic that respects the Historic District character, but also relates to the NASA Research Park to the south.



**RECOMMENDED AT CENTRAL PLAZAS** Manufacturer: Quick Crete Products Corp. Model/Color: Q2-HO-60B/Warm Gray Materials: Precast Concrete



**RECOMMENDED IN PLAZAS/COURTYARDS** Manufacturer: Urban Accessories Model/Color: Transit Bay/Black Materials: Cast Iron



RECOMMENDED IN PLAZAS/COURTYARDS Manufacturer: Landscapeforms Model/Color: Plainwell/Black and/or Gray Materials: Aluminum Slats & Steel Frame

#### TRASH RECEPTACLES AND ASH URNS

Trash receptacles and ash urns should be located throughout the District in easily accessible locations, i.e. ceremonial plazas, building entries, and along pedestrian accessible streets. The material should be selected to relate to the recommended bench material as discussed above, i.e. precast concrete adjacent to the Central Plazas and metal in the plazas and courtyards. The trash receptacle and ash urn selection guidelines are listed as follows:

- Trash receptacles and should be chosen for durability, functionality that conceals the trash and reduces animal scavenging.
- The finishes on metal should include rust inhibitors and be resistant to UV light, chipping, and flaking. Recycled polyethylene (plastic) should also have UV light inhibitors added to the polyethylene.
- The use of recycling receptacles for glass and aluminum refuse should match the design and character of the other trash receptacles.



RECOMMENDED AT CENTRAL PLAZAS Manufacturer: Dura Art Stone Model/Color: TD-R/Natural Gray Materials: Precast Concrete



RECOMMENDED AT CENTRAL PLAZAS Manufacturer: Quick Crete Products Corp. Model/Color: QR-2130WA/Natural Gray Materials: Precast Concrete



RECOMMENDED AT PLAZAS/COURTYARDS Manufacturer: Landscapeforms Model/Color: Scarborough/Black Materials: Aluminum

# **BICYCLE RACKS**

Bicycle racks should be located appropriately • throughout the Historic District to encourage alternative modes of transportation. The bicycle rack selection guidelines are listed as follows:

- Bicycle racks should be located at (1) bus stops,
  (2) at ceremonial plazas, and (3) adjacent to main building entries.
- Covered bicycle storage areas should be located at the Hangar One Plaza.
- Bicycle racks should be located in well-lit areas and be easily accessible
- The bicycle racks should relate to the design vocabulary of the other site furnishing elements and be anchored to the pavement or footings.



RECOMMENDED Manufacturer: Urban Accessories Model/Color: Model-D/Black Materials: Metal



ALTERNATE Manufacturer: Columbia Cascade Model/Color: 2170-13-P-C/White Materials: Metal

# **Bus/Shuttle Shelters**

# Gateways:

# Signage:

Text to be added

Bus or shuttle structures should reflect the general character and design as generally described for buildings in the Building Design Guidelines in this chapter. The final design of the shelters will need to be coordinated with the participating transit agencies if appropriate.

- They should be scaled appropriately to the pedestrian, provide shelter, and seating.
- Bus shelters should be located within the ROW, and located at the Hangar One Plaza and Cummins Road, Cummins Road and Bushnell Road, McCord Avenue and Bushnell Road, and McCord Avenue and Wescoat Road. (Based on NADP shuttle/ bus routing)
- Shelter locations should be well-lit and signed for visibility and safety and have adequate access for persons with disabilities.

There are five locations that identify the entries into the Historic District. These locations should include landscape and design elements that identify it as a gateway.

• Gateway sites should be identified with special landcaping (see landscape section above).

#### Secretary of Interiors Standards

- Institute an Infrastructure and Facilities Maintenance program.
- Ongoing building analysis and evaluation.
- Development of a Preservation Maintenance Plan and a Facilities Management Plan
- Documentation and record-keeping for maintenance and repairs.

Protection of the Shenandoah Plaza Historic District and the Secretary of Interior's Standards for the Treatment of Historic Properties

In 1994 the Shenandoah Plaza Historic District was officially entered into the National Register of Historic Places (NRHP). A 1991 survey of buildings within the Historic District and Department of Parks and Recreation survey forms (DPR 523) were completed with the nomination. Additional buildings not included in the original submission were surveyed in 1994, 1999, and 2000 but were found to be ineligible for the NRHP [NASA Ames Research Center Historic Resources Protection Plan, 2000]. The Historic District consists of 22 contributing buildings and 49 non-contributing buildings, comprising a grouping that is sited under Criterion A and C, significant due to an association with historic events and architectural design and/or construction merit.

As a property listed on the National Register, the Shenandoah Plaza Historic District is subject to Section 106 of the National Historic Preservation Act (NHPA). The procedure described therein, known as Section 106 review, requires projects that involve Federal entities or funds to seek comments from an independent reviewing agency, the Advisory Council on Historic Preservation. The goal of this process is to avoid unnecessary harm to historic properties from Federal actions. Section 110 of the NHPA outlines roles and responsibilities of Federal agencies and designated preservation officers, such the State Historic Preservation Officers, to carry out national historic preservation policy, including identification and preservation of historic properties under their control.

The Secretary of Interior's Standards for the Treatment of Historic Properties (Standards) were developed by the National Park Service (NPS) to be used by State Historic Preservations Officers and the NPS when reviewing projects receiving Federal grant money or tax benefits. The principles outlined in the Standards have also been adopted by hundreds of preservation commissions nationwide in local design guidelines. NASA has included the Standards in the Historic Resources Protection Plan for Moffett Field (HRPP). The Standards provide a consistent philosophical framework for treatment of historic properties, be they buildings, structures, sites, objects, districts, or landscapes.

The NPS also publishes the Standards with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (Guidelines). This illustrated document assists in applying the Standards and describing responsible methods and approaches to four recognized treatments: preservation, rehabilitation, restoration, and reconstruction. The Guidelines for Rehabilitating Historic Buildings is the section that is most applicable to the Shenandoah Plaza Historic District. Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical or cultural values [Charles A. Birnbaum, NPS Technical Preservation Services, Preservation Brief 36]. With the transition of Shenandoah Plaza from its historic Navy and NASA users to occupancy by public, private agencies and University tenants, it will be necessary to rehabilitate the buildings and open spaces within the district to meet new needs and assure the district's continued use.

The Standards outlines the following points to define the Standards for Rehabilitation [NPS, The Secretary of Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, 1995]:

(1) A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

(2) The historic character of a property will be retained and preserved. The removal of distinc-

tive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

(3) Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

(4) Changes to a property that have acquired historical significance in their own right will be retained and preserved.

(5) Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

(6) Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible materials. Replacement of missing features will be substantiated by documentary and physical evidence.

(7) Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

(8) Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

(9) New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

(10) New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The Guidelines describes the following three important procedures to undertake with respect to the rehabilitation of a Setting, District, or Neighborhood [NPS, 1995]:

(1) Identifying retaining, and preserving building and landscape features which are important in defining the historic character of the setting. Retaining the historic relationship between buildings and landscape features of the setting.

(2) Protecting and maintaining historic building materials and plant features... Repairing features of the building or landscape by reinforcing the historic materials. Repair will also generally include the replacement in kind of those extensively deteriorated or missing parts of features when there are surviving prototypes.

(3) Replacing in kind an entire feature of the building or landscape that is too deteriorated to repair using the physical evidence as a model to guide the new work. The Standards and Guidelines suggest a model process for preservation work. They are intended to be used as a philosophical framework for a consistent and holistic approach to a project, and do not provide technical or prescriptive solutions. Therefore, careful consideration and consultation with appropriate professionals, the State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation, the National Park Service, and NASA preservation agencies is important. To streamline this process, the HRPP included a legally approved set of guidelines and a compliance procedure outlining actions that have an effect on cultural resources within the Historic District, and activities that do not have an effect on historic properties and are exempt from SHPO and ACHP review [HRPP, 2000]. All plans that may have an effect on cultural resources in the Historic District, including demolition, alterations, additions, landscaping, and new construction, must follow guidelines set out in the HRPP, the NASA Ames Development Plan (NADP), and this document. These projects, including the Shenandoah Plaza Historic District Development Plan herein described, will be reviewed in accordance to Section 106 and 110 of the National Historic Preservation Act.

# **Sustainable Design Solutions**

As described in the NASA Ames Development Plan, "sustainable developments are those that manage natural, economic and social systems to meet present needs without compromising the ability of future generations to meet their needs". Sustainable design solutions should be considered both for new buildings and retrofits of existing buildings.

- Encourage the use of green building construction using the Leadership in Energy and Environmental Design Green Building Rating System (LEED)
- Incorporate energy conservation in both design and construction (such as the use of energy-efficient lighting).
- Introducing concepts such as day-lighting and use of operable windows.
- Maximize the reduction, reuse and recycling
  of waste and scrap materials.
- Reuse or recycle demolished building materials whenever possible.
- Include a hazardous materials abatement pro gram.
- Employ solar and other renewable energy sources.
- Establish provisions for the integration of alternative modes of transportation.

# Other

Maintain and support the Moffett Field Museum. The Museum can be housed either in Hangar One or in Building 3. The Central Plazas can be used to selectively exhibit some of the museum artifacts.

- Facilitate public access to and awareness of the significance of Moffett Field to military and aviation history.
- Ensure that there is adequate screening of existing transformers and mechanical equipment on the roof and ground.
- All existing and proposed fire escape stairs, should comply with the standards set forth in the reuse guidelines. (oscar). bldg 19.
- Accessible ramp design should be compatible in design with the Historic District and consistent in its detailing.
- All recommended tree-planting on McCord Avenue, Bushnell and Wescoat Roads should be done simultaneously (and not phased) in order to ensure consistency in the scale and form of trees.
- Temporary surface parking areas should be adequately screened.

#### SITE SPECIFIC DESIGN RECOMMENDA-TIONS

The design guidelines listed above are applicable to all areas of the Historic District. Because each parcel within the District has varied development potential, the guidelines pertaining to each parcel are listed below with illustrations. The illustrations included here indicate one of several ways the parcels could be developed.

# PARCEL 12

Site 12 includes the 19.55 acre area to the west of McCord Avenue with much of the original development of the area containing some of the oldest buildings of Moffett Field. Because of the significant number of contributing historic buildings in this area, the potential for development is limited.

- Place parking behind buildings in lots accessed from perimeter.
- Service entries to buildings should be from the perimeter roads.
- No development envisioned for the northern half; development may occur in the southern half of parcel 12.
- Remove shrubs that obsruct direct views of building entrances
- Proposed buildings should be located in areas that are already developed.
- Provide direct pedestrian access from parking lots to building entries.
- Pedestrian pathways and driveways should be on axis.





- *Provide adequate screening between the parking and the street.*
- Remove surface parking adjacent to buildings and reconfigure parking away from buildings.
- Incorporate adequate landscaping within parking lots to avoid the appearance of "seas of parking".
- Provide landscaped areas adjacent to buildings
- Continue the pattern of informal tree massings adjacent to buildings.
- Align main driveway on axis with building entrance.
- Proposed infill development in Parcel 12 South of South Akron shoud be limited to a maximum of 18,900 sq.ft.



# PARCEL 13

Site 13 is the area to the northeast of McCord Avenue and has an area of 6.4 acres. Building 2 is a "contributing" building (originally designed as a balloon hangar and currently used as a gymnasium) and will be retained. Because this site contains the least number of existing buildings to be retained, it has the maximum potential for redevelopment.





# PARCEL 14

Consisting of 2.15 acres, this parcel is located at the eastern end of the plaza. There is an existing 26,000 square foot building. Because of the prominence of its location, any building on this site should be a "landmark" building with the special architectural detailing and massing.

- Any use on this site will be supported only by off-site, shared parking. Except for a drop off facility and handicapped parking spaces as required, no surface parking will be allowed on this parcel.
- A new building on this parcel should be limited to a total building area of 25,000 sq. ft.
- Suggested uses for a building on this site include a Moffett Field museum, conference center/auditorium, visitors' center, restaurant and gift shop or joint use..
- The existing building at this location may be remodeled for new uses or a new building built to accommodate specific uses.




- The maximum building height is 35 feet. To avoid being dwarfed by the Hangar, buildings in this area should have a minimum height of 25 feet.
- Because this is a "terminous" building, it should incorporate additional architectural detailing (reflecting some of the design characteristics of Building 17, the only other building along the central spine), and be designed as a a "foursided" building.
- The new proposed building should be designed to formally address both Building 17 and the open spaces on either side.
- Any service area that may need to be incorporated adjacent to the building should be sensitively designed because of the visibility of the new building. Adequate screening should be provided.



## PARCEL 15 & 17

- Eliminate Dugan Avenue and treat parcels 15 & 17 as one parcel for site
- Development on this site can be supported either by surface parking or strutured parking.
- New infill Development should be -85,000 sq. ft.
- Building placement should indicate a formal axial relationship with each other and with the central plaza.
- Buildings should address the Central Plaza.
- Buildings facing the perimeter roads should include sufficient building detailing and articulation to avoid the appearance of the "back" of the building.





- Buildings facing the central plaza should have a maximum height of 40 feet and should include a pitched roof similar in slope to the existing historic buildings in Subarea 2..
- The building form should be based on a maximum width of 60 feet and be consistent with the existing building forms.
- Building forms should create courtyards and other useable open spaces.
- Parking garage design should include detailing and building articulation that is consistent with other buildings in the district.
- Access to the parking structure should be accessed from Wescoat Road.



#### PARCEL 18 (Hangar One Plaza)

Hangar One Plaza: A ceremonial plaza is proposed at the south end of Hangar One in front of the large doors that open to expose the enormous interior volume of the facility. Because of the large size and relationship to Hangar One and Cody Road, the ceremonial plaza space is ideally suited for large gathering events. The plaza location also serves as a physical connection between the University partners and the Computer History Museum to the south.

The plaza program should be designed to include the following:

- a large outdoor pedestrian space for large gatherings
- shade trees and landscaping to define the space
- a strong axial relationship to Cody Road
- a bus stop on adjacent Cummins Road with bicycle storage

### **Design Concept #1**

A large pedestrian plaza space is provided in front of the hangar doors. This space could be used for displaying aeronautical or other technological exhibits. A formal allee of trees branch out from the hangar doors strengthening the visual and spatial relationship to University partners and Computer History Museum to the south. A bus stop is proposed for the eastside of Cummins Road adjacent the plaza. A pedestrian crossing at the intersection of Cummins Road and Wescoat will provide direct access to either the Historic District to the west or the NASA Research Park to south.

#### **Design Concept #2**

The second concept introduces a visual connection between the proposed plaza and the open space of the East Central Plaza between Severyns Avenue and Cummins Road while maintaining the axial relationship to Cody Road. The hardscape portion of the plaza holds the south frontage of Hangar One with a grid of smaller accent trees radiating out from the hangar doors towards the south. A double row of larger trees defines the southern edge of the plaza.



**Central Plaza:** Shenandoah Plaza is the district's most prominent and ceremonial open space that provides the District with its central focus with a strong visual sequence leading from Clark Road to Hangar One.

- Retain the importance of the central plaza by allowing limited buildings on the plaza.
- Except for Building 17 and Building 3 (or a replacement building at this location), no additional buildings should be allowed in the central plaza.
- The area between Cummins and Severyns Roads to the west of Hangar One should be treated as part of the central plaza. All existing buildings in this area should be demolished.
- Remove surface parking areas in the Central Plaza.
- Improve landscaping around existing monuments such as the anchor and flagpole.
- In order to retain the historic open character, the Central and East Central Plazas should be predominantly a lawn area.
- Use the Central and East Central Plaza areas as an extension of the proposed Moffett Field Museum.



Chapter 8

# INFRASTRUCTURE

- Electrical
- Natural Gas
- Telecommunications



Water

**Reclaimed Water** 

Sanitary Sewer

Storm Drainage

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# SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

# **INFRASTRUCTURE**

The following is a general overview of the existing infrastructure systems in Shenandoah Historic District. Due to the historic nature of the site, the condition of these systems will need to be evaluated and upgraded per the proposed occupancy demands and site modi-

fications. Furthermore, the contractor should ensure that future modifications comply with the local and federal construction standards as well as mitigate the potential significant impacts as outlined in the EIS for the NASA Ames Development Plan.

## WATER

Figure 8.1 illustrates the existing water distribution system in Shenandoah Historic District. NASA Ames Research Center receives its potable water and fire protection supply from the San Francisco Water Department (SFWD). Approximately 85 percent of the



Figure 8.1 Existing Water System

supply originates from SFWD's Hetch Hetchy Reservoir and about 15 percent comes from East Bay Municipal Utility District sources. The SFWD has indicated that the Hetch Hetchy line can accommodate any future proposed development at the site.

The condition of the original cast iron piping installed since 1932 ranges in size from 152 mm (6 inch) to 203 mm (8 inch). The overall condition is fair; however, a large portion has been deteriorated to the extent that it must operate at a significantly lower pressure. Weak links within the system can also cause shutdowns of up to 30 days. Certain portions of the deteriorated water lines have been replaced with asbestos-cement or plastic pipes. Furthermore, the current operating pressure in the NASA Research Park (NRP), which includes the Historic District district is significantly lower than the Ames Campus piping. Currently, pressure reducing valves separate the reduced-pressure system in the NRP from the Ames campus. Interconnectivity between the two systems is necessary for backup fire protection. However, the current water system and water storage tank in the NRP will not guarantee adequate fire protection for both Districts. In general, the existing water supply pipes are undersized to meet current fire protection demand criteria.

The proposed improvements in the Shenandoah Historic District water system should be congruent with the proposed development in the south NRP District which includes the baseline Lab Project currently underway. A 12 inch looped system is proposed for the entire NRP District. In addition, all buildings should have new or retrofitted meters as well as fire sprinkler systems.

## **RECLAIMED WATER**

There are four potential sources of reclaimed water at NASA Ames Research Center. The City of Sunnyvale indicates that there is adequate reclaimed water available from its system to serve all of NASA Ames Research Center's irrigation demands. The City of Mountain View is currently planning on constructing a new reclaimed water line to serve the site in the future. In addition, reclaimed water from the remediation of the Regional Plume from the NAVY and MEW Superfund treatment facilities can also be available to supplement these demands along with other industrial uses. The NAVY source will serve the irrigation demands and the MEW source will be used in the wind tunnel cooling towers in an effort to mitigate the domestic demand. Installation of the reclaimed water system in the Shenandoah Historic District and possible extension into the Ames Campus area would be phased with planned upgrades in utility service.

## SANITARY SEWER

Currently, the City of Sunnyvale, Mountain View and Palo Alto serve NASA Ames Research Center's sewage needs. Specifically, the NRP District is served by the Sunnyvale Water Pollution Control Plant (SWPCP). Figure 8.2 shows the location of all existing sanitary sewer lines, connectors and system boundaries. The sewer mains consist of cement-lined cast iron and vitrified-clay pipe in the smaller sizes. The existing system is also adequate to accommodate future growth of the site. Sewage is pumped to the Sunnyvale collection system treatment plant via a force main which connects to most of the sewer

mains throughout the site. Furthermore, industrial wastewater is reportedly discharged through separators before it is pumped into the sanitary sewer system.

Ames Research Center's sanitary sewer needs are currently served by City of Sunnyvale, Mountain View and Palo Alto. Sunnyvale's



Figure 8.2 Existing Sanitary Sewer System

Water Pollution Control Plant (SWPCP) serves the NRP area as well as the ESAF, and southern and eastern portions of Ames campus.

### STORM DRAINAGE

The existing drainage area of NASA Ames Research Center is divided into two subbasins; the western drainage area essentially serves the area west of the aircraft runways and the eastern drainage area serves the east, including the runways themselves. Run-off from the western drainage system services the NRP District, most of the Ames Campus, Berry Court Military Housing and the Bay View area. The existing storm drain piping ranges from 150 mm (6 inch) to 910 mm (36 inch). This system drains north through underground storm pipes and drainage ditches to the wetlands Storm Water Retention Pond north of the Bay View. There is no outflow from this basin; water is removed by evaporation only. This area has a tendency to flood when the flow into the SWRP exceeds storage capacity. The use of temporary pumps displaces this water directly into Stevens Creek.

It should be noted that the EPA and the State of California Water Quality Control Board are reportedly concerned about pollutant levels in the groundwater.

Two storm drain basins will be proposed in the NRP District. One in the Shenandoah Historic District and the other in the remaining portion of NRP to the south. Both systems will discharge to a pump station which will be located northeast of Hangar One.

Specific improvements regarding the storm drain system should be phased with the installation of a new storm drain system in the NRP.

## **ELECTRICAL**

The Ames Research Center receives wholesale electrical power from the United States Department of Energy, Western Area Power Administration (WAPA). Pacific Gas and Electric (PG&E) supplies the remaining surplus of power as well as power to the private located at ARC.

The ARC substation serves the Ames Campus. In addition, it also provides 12 kV emergency back up power to the switchgear located in the NRP area that runs through Shenandoah Historic District along McCord Avenue.

sector. There are two electrical substations A second and newer electrical substation was constructed in the early 1980's and is located in the Eastside Airfield to the northeast of the hangars. It essentially serves the remaining areas of the Ames Research Center including the Historic District. It receives power from a single PG&E 115 kV overhead transmission line.



Figure 8.3 Existing Electrical Distribution System

17 outdoor transformers step down the 115 kV to various secondary voltages: 13.8 kV to Ames Campus, 12.47 kV to the NRP and 6.9kV and others specific to lab testing. These outdoor substations have a cumulative capacity of approximately 650 MV. 600 MV is dedicated only to serve specific lab buildings and their equipment. The remaining 50 MVA is used to provide other electrical service to buildings throughout the Ames Campus.

Figure 8.3 shows the existing electrical distribution system in Shenandoah Historic District. The existing underground electrical distribution system in the NRP is a mixture of terra cotta (max 89 mm (3.5 in)) transite and PVC conduit. Recent construction provides either 4 or 5 inch diameter conduits with the majority at 100 mm (4 inch). The 12.47 system in the NRP is currently incompatible with the 13.8 KV system in the ARC. Existing building transformers in the Historic District will need to be replaced to accommodate the upgrade to 13.8 kV. From a safety standpoint, many of the manholes are overcrowded with cables and too small to accommodate the existing cabling system.

The proposed electrical demand in the NRP district is 30.2 MVA. The regional system operated by PG&E and the 115kV transmission lines that serve the site have adequate capacity to accommodate the increased

demand for electricity that would result from the proposed development.

Specific improvements to the existing electrical service to the Shenandoah Historic District include installing a new switchgear in the District, upgrading the existing building transformers as necessary to receive 13.8 kV power, or providing a temporary secondary switchgear to serve the existing development. Phasing the installation of a new electrical system as required to meet the demands of the proposed development.

## NATURAL GAS

Figure 8.4 illustrates the natural gas distribution system. Natural gas service for Shenandoah Historic District is purchased directly from producers via the Defense Energy Support Center (DESC) and a transmission fee is paid to PG&E to transport the gas service to

NASA Ames Research Center. The first, an east-west 10" line operates at a pressure of 2070 kPa (300 psig) and branches off into the 6" north-south line at 970 kPa (140psig). The second main service line originates south of the NRP under Highway 101. There are several metering stations throughout the site

the site. There are two main service lines in and the flows of each vary depending on the demand of the area served. The primary use of natural gas in the Shenandoah Historic District is for space heating offices, housing, shops and training centers.

> According to the EIS report for the NASA Ames Development Plan, the proposed



Figure 8.4 Existing Natural Gas Distribution System

natural gas demand is 2,540,000 therms per year for the NRP District. The existing meters are in good condition and will be able to accommodate any proposed development. However, the condition of the existing steel and plastic pipes is fair to poor due to corrosion through age and a high water table in the area. Furthermore, installation of new gas distribution piping within the Historic District should be phased as required to meet the demands of the proposed development.

## TELECOMMUNICATIONS

Text to be added.



Figure 8.5 Existing Telecommunication Distribution System

# Chapter 9

# **IMPLEMENTATION**

- Phasing of development/ infrastructure changes
- Cost summary of required changes
- Responsibility matrix/funding sources.



SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

# IMPLEMENTATION

# <u>Text</u>

- Phasing of development/infrastructure changes.
- Cost summary of required changes.
- Responsibility matrix/funding sources.

# **Graphics**

- Phasing Diagram
- Cost Summary table
- Responsibility/priority matrix

# **APPENDICES**

- Relationship to other districts
- References
- Bibliography
- Glossary of Terms
- Abbreviations



SHENANDOAH HISTORIC DISTRICT DEVELOPMENT PLAN - 2002

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### GLOSSARY

### Floor Area Ratio (FAR)

The ratio of gross floor area permitted on a lot to the gross acreage of the lot. A permitted floor area ratio of 2.0 on a 10,000 square foot lot would allow a building with a total floor area of 20,000 square feet. The areas used exclusively for parking (parking structures, garages) are not counted towards the floor area ratio.

### Green Buildings

Green building focuses on a whole system perspective, including energy conservation, resource efficient building techniques and materials, indoor air quality, water conservation, and designs that minimize waste while utilizing recycled materials. Green buildings are a product of good design that minimizes a building's energy needs and reduces construction and maintenance costs over the life cycle of a building.

### Pedestrian scale

Refers to the consideration of the human height as a measure for all elements of design. Pedestrian scale can be manifested in the design of streets, streetscape elements and building designs.

#### Pedestrian scaled streets

The traditional neighborhood street is narrower and is lined with trees and streetscape amenities that not only help slow down the cars but also create comfortable conditions for walkers and

in the design of and building designs.

cyclists. On existing streets that carry a large volume of traffic, traffic calming elements can be incorporated. It consists of a set of mostly physical treatments or changes to roadways that help manage the flow of traffic while requiring motorists to be aware of pedestrians around shopping districts, schools and neighborhoods.

### Pedestrian scaled buildings

The street level or the base of a building should include design detailing and articulation and elements such as awnings and trellises that reflect the human scale. The building façade should be predominantly transparent in order to provide a sense of visual connection between the inside and outside.

Pedestrian scaled light fixtures

Pedestrian scale light fixtures range in height between 12 and 16 feet.