National Capital Planning Commission

National Institute of Standards and Technology Campus Master Plan Background

Gaithersburg, Maryland

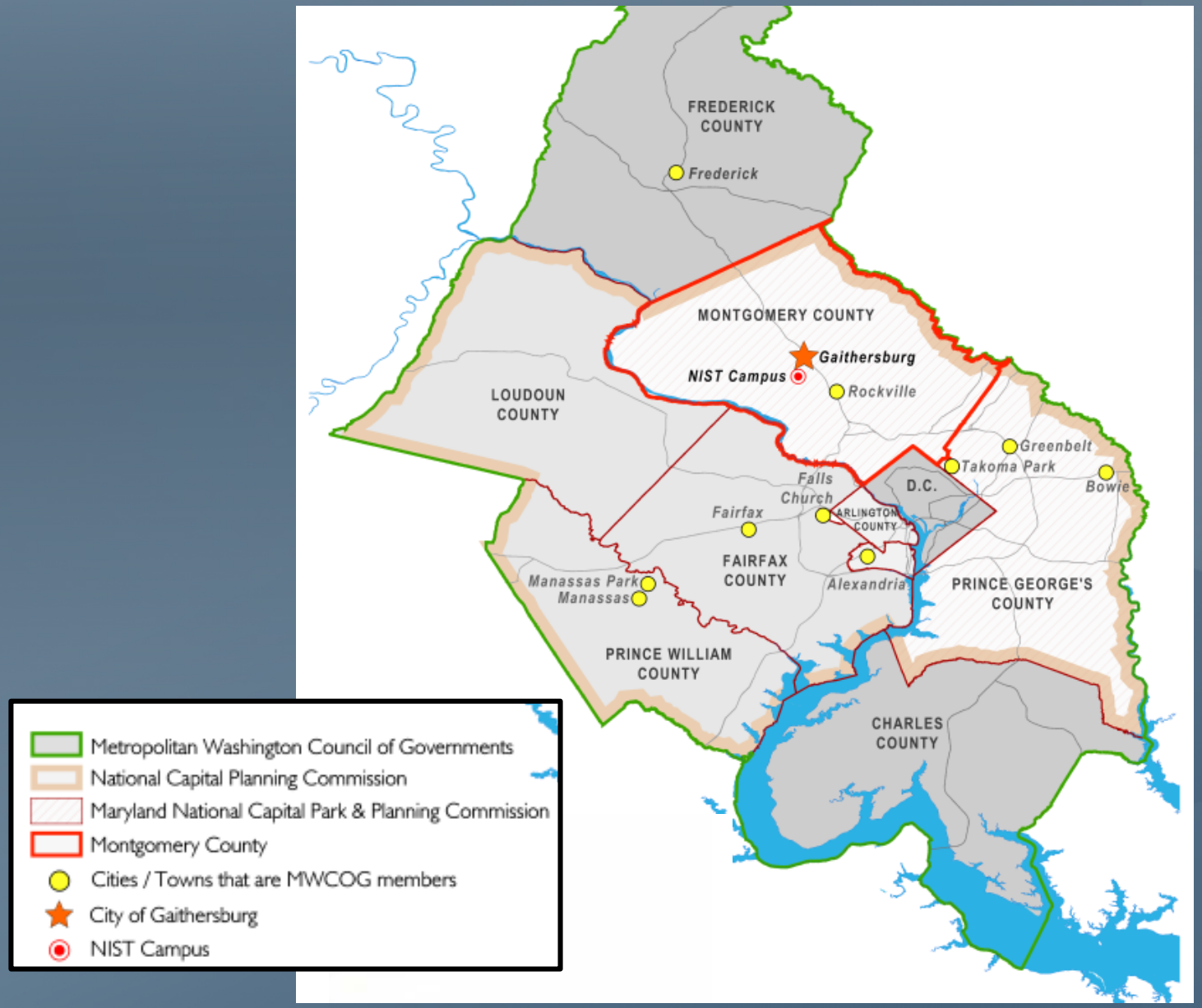
Submitted by the National Institute of Standards and Technology

February 1, 2018

Information Presentation

National Capital Planning Commission

Location



Surrounding Context

National Capital Planning Commission

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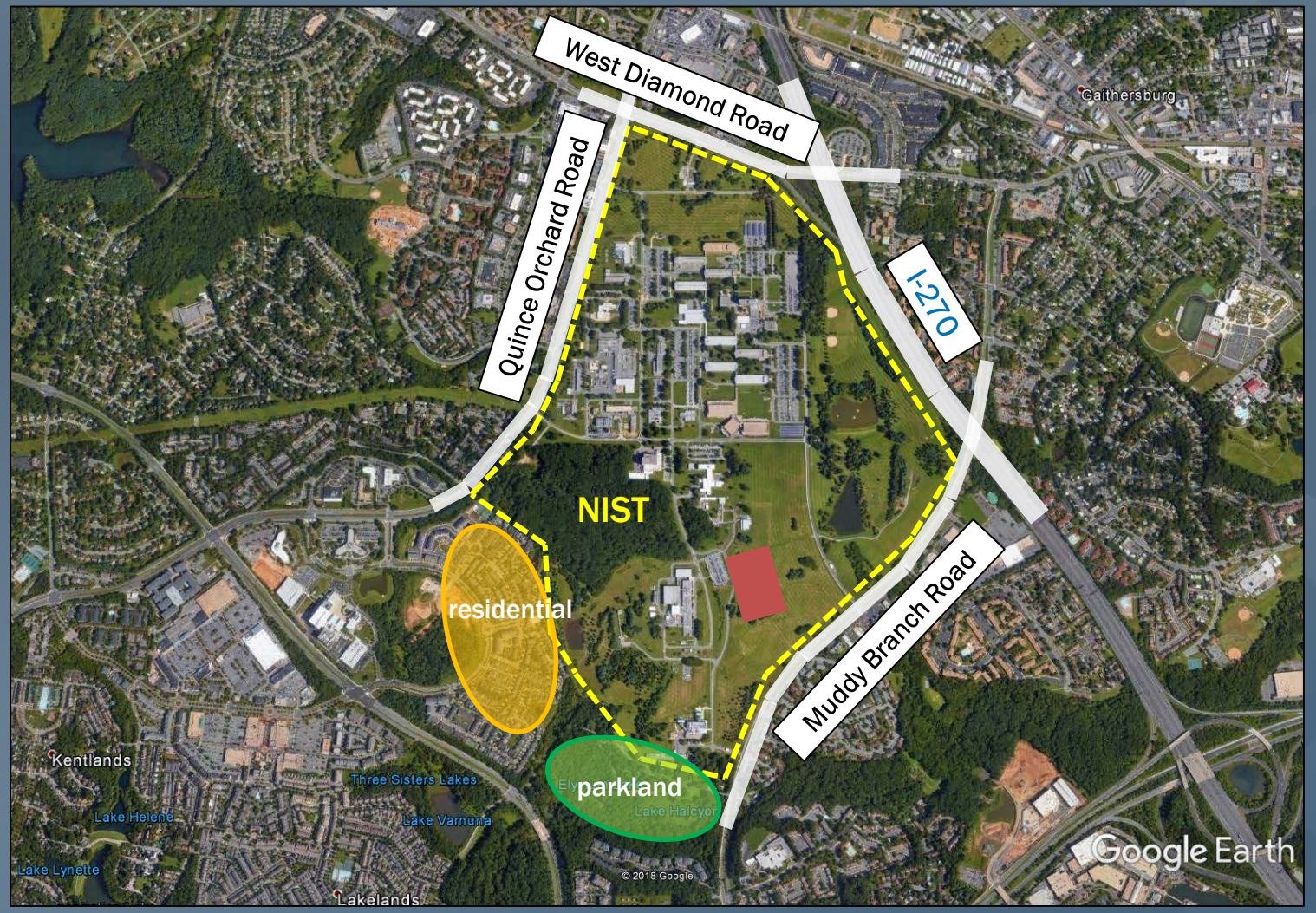
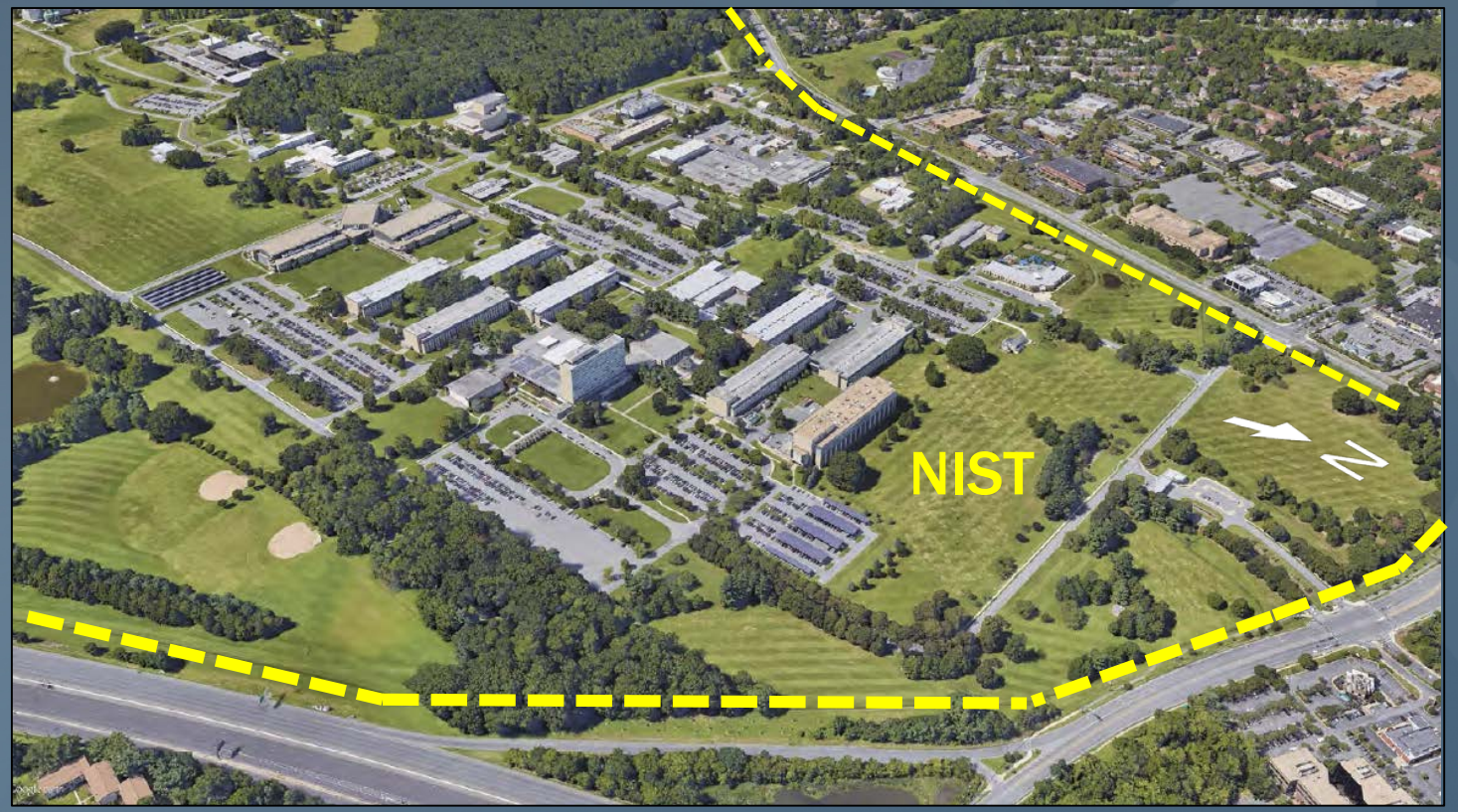


Surrounding Context

Setting

- Rolling terrain, dotted with trees and wooded areas
- 62 buildings and structures, totaling over 3.6 million gross square feet of space
- 4,000 personnel (both employees and associates)
- Approximately half of the permanent buildings are currently over 50 years old
- Campus features modern architectural design of the late 1950s and the 1960s



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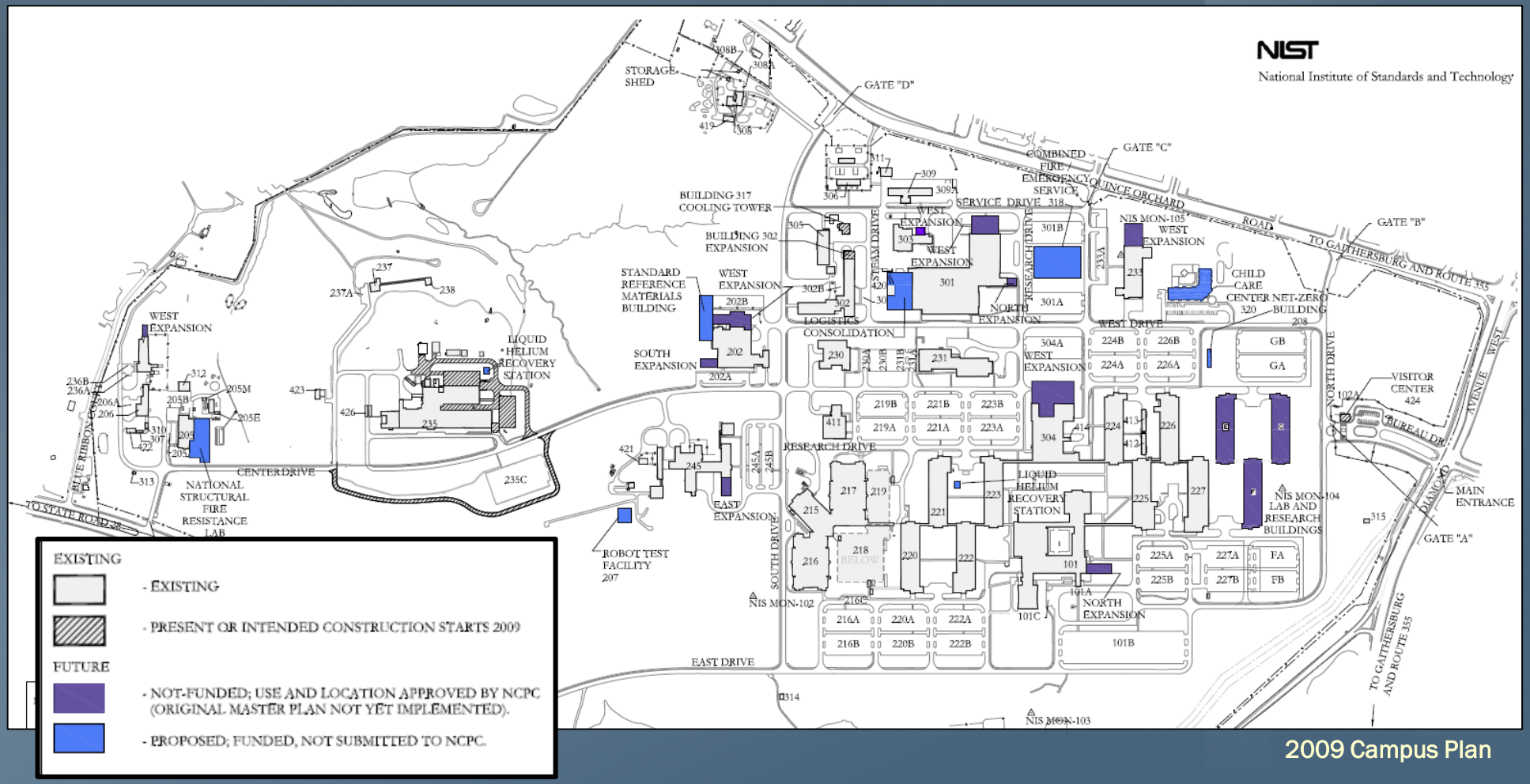
Master Planning History

- Many of the 1960's-era buildings needed modernization.
- Many of the 1972 master plan projects were never constructed due to lack of funding.
- Many of the 2009 projects were constructed with "American Recovery and Reinvestment Act" funding.



2009 Campus Plan

National Institute of Standards and Technology
Gaithersburg, MD

Campus Master Plan

Background Information
for the
National Capital Planning Commission

February 1, 2018

United States Department of Commerce

National Institute of Standards and Technology

Mission: *To promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.*

- Founded in 1901 as National Bureau of Standards, NIST is a non-regulatory agency and Federal research laboratory in the US Department of Commerce
- Relocated from Washington DC to Gaithersburg in 1960's as NIST HQ
- Additional NIST owned locations in Boulder & Ft. Collins, CO and Kauai, HI
- National presence through research coops/agreements, Manufacturing Extension Partnership Centers, and advanced Manufacturing USA Institutes

Example NIST Services:
- Calibration Services
- Standard Reference Materials
- Lab Accreditation
- Time Services

NIST 1964

Diversity of NIST Research

- Acoustics
- Additive manufacturing
- Biochemistry
- Biology
- Biotechnology
- Chemistry & Chemical Engineering
- Computer science
- Dimensional metrology
- Engineering
- Fire Research
- Forensic Science
- Materials Science
- Mathematics and Statistics
- Mechanical Engineering
- Medical Physics
- Metallurgy
- Molecular Biology
- Nanotechnology
- Neutron Research
- Quantum Physics
- Robotics
- Structural Engineering
- Wireless Communications

Current Drivers

- Aging buildings with obsolete systems
- Poor Lab Environmental Controls, limiting research
- Outdated site infrastructure
- Security & circulation issues at Gates

Common Issues

- Historic District Context
- Stormwater management
- Pedestrian connections
- Parking
- Landscape – unity & maintenance
- Energy Efficiency & Sustainability

Future Requirements: 20 Years

- Precision measurement and flexible labs for expected program growth
- Specialty labs for planned research
- Office space for improved utilization and expected 27% staff increase
- CCT driven changes & linkages

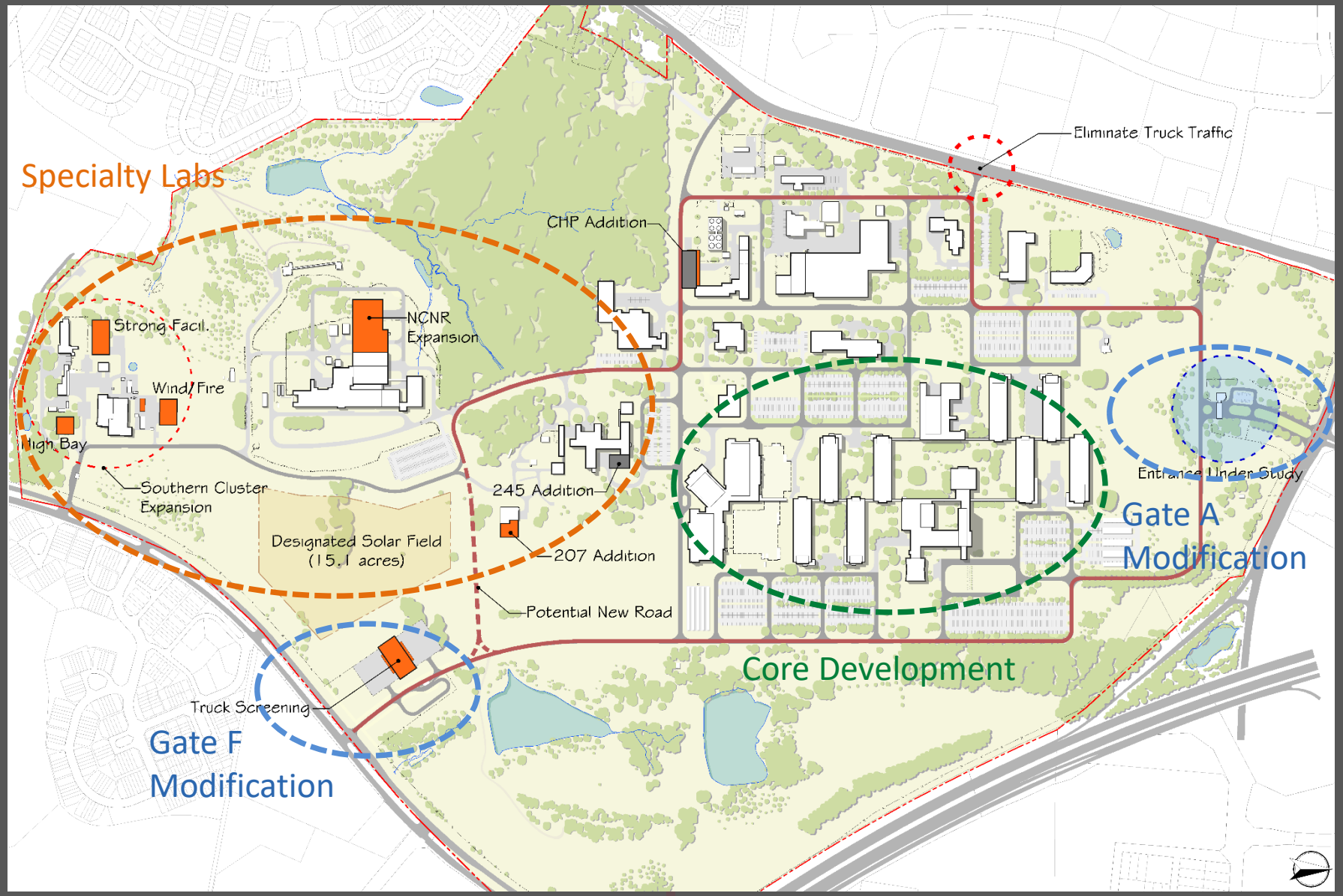
Goals of the Master Plan

- Establish a framework for future development (20-year horizon)
- Meet near and long-term needs of the campus in support of NIST research mission
- Maintain attractive campus environment
- Respect & embrace campus historic district designation
- Advance NIST and DoC sustainable design goals

Master Plan Program Summary

- Space Program represents current needs for upgrade & replacement as well as anticipated growth in research programs.
- Growth projections based on planned research programs by Laboratories, and related support by administrative organizations.
- Staff projections are in line with the historic growth patterns.

MASTER PLAN PROGRAM	EXISTING		20 YEAR PROJECTIONS		20 YEAR GROWTH & CHANGE	
ASF = Assignable Square Feet	People #	Space ASF	People #	Space ASF	People #	Space ASF
PROJECTED GROWTH						
People	4,007		5,106		1,099	
Office/Labs/Support Space		615,463		2,339,446		513,744
Subtotal - Growth	4,007	1,825,702	5,106	2,339,446	1,099	513,744
ADDITIONAL FACILITY NEEDS						
Expansions/New Facilites				93,755		93,755
TOTAL EXISTING & NEW FACILITIES	ASF GSF	1,825,702 3,641,255	 est. GSF	2,433,201 5,050,000	ASF est. GSF	607,499 ± 1,400,000
RENOVATION					GSF	2,083,965


Specialty Labs
Eliminate Truck Traffic
CHP Addition
NCNR Expansion
Strong Facil.
Wind/Fire
High Bay
Southern Cluster Expansion
Designated Solar Field (15.1 acres)
245 Addition
207 Addition
Potential New Road
Entrance Under Study
Gate A Modification
Core Development
Truck Screening
Gate F Modification

The original NBS Campus, ca. 1930

Chemistry Building Ground Breaking, 1916

Stone Gate Post and Gate at Upton Street

Relocated Post and Gate at Gaithersburg

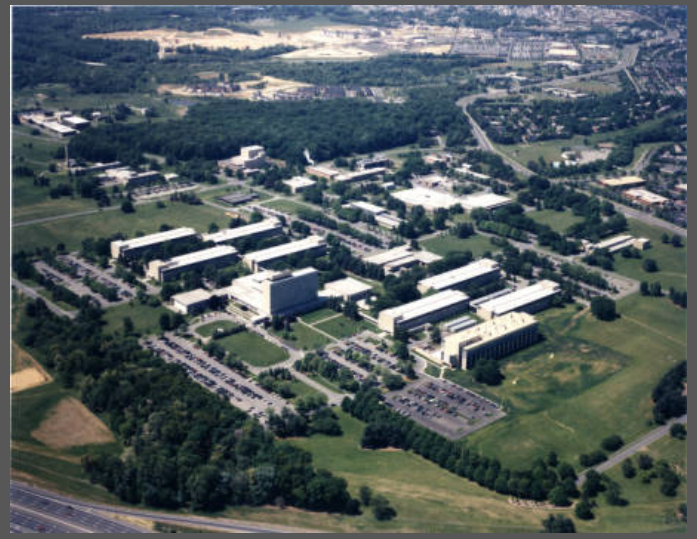
Architect's Model of Campus

View looking South: *note the combination of new landscape design elements such as allee of trees, and the retention of natural landscape elements such as forested area to the top right*

NIST Gaithersburg Campus 1964 - 2017

1964

1975



2000

2017

Administration Building, 101

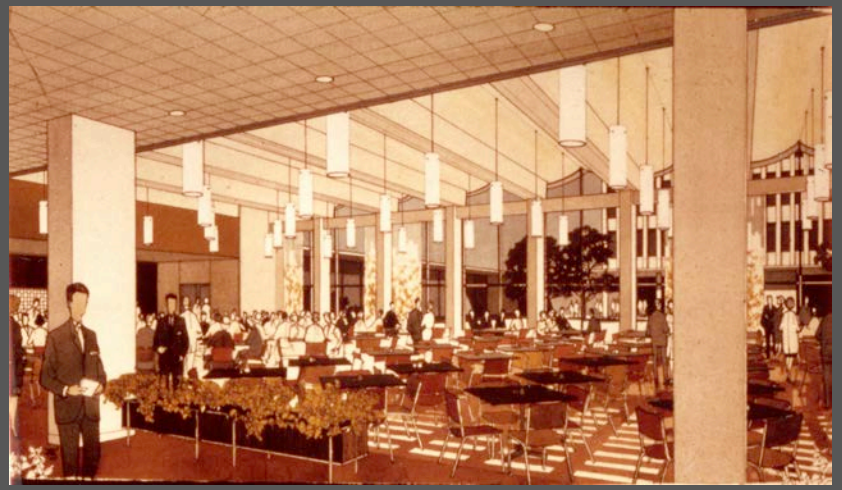
1964, view looking west

2017, view looking west

1964, view of Library from arcade

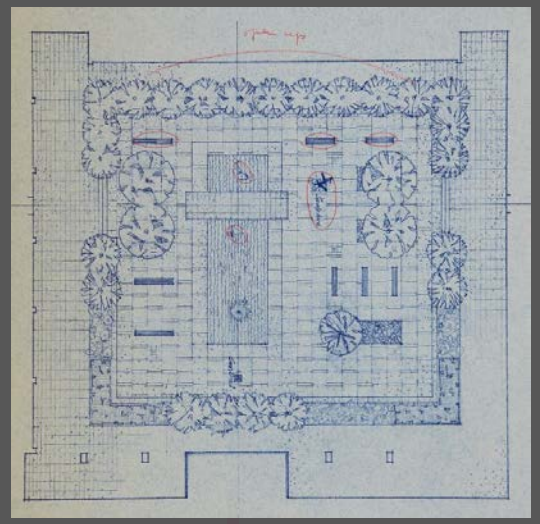
2017, view of Library and adjoining arcade

Building 101 Cafeteria and Courtyard



Architect's original rendering of Cafeteria

Proposed refurbishment, 2017
courtesy of OKKS Studios/Delta Engineers



Contemporary views and original plan of the Courtyard, *photos courtesy of Jason Stoughton, NIST*

Radiation Physics Building, 245

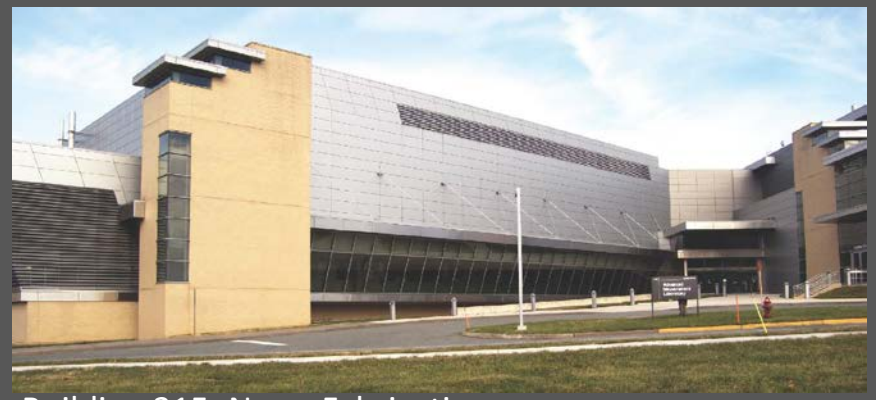
Built 1964, Chart of the Nuclides in glass block wall

Campus Core: Research Buildings

Building 220: General Purpose Laboratory

Building 227: General Purpose Laboratory

Building 225: Typical General Purpose Laboratory



Building 215: Nano-Fabrication

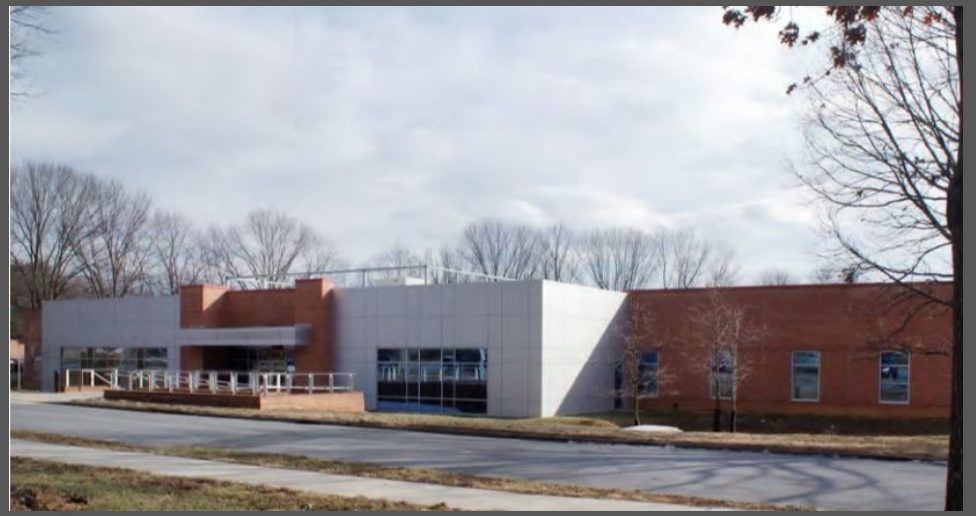
Building 217: Advanced Measurement Laboratory (Precision)

Support Buildings

Building 301: Supply and Plant Building

Building 302: Steam and Chilled Water Plant

Building 304: Shops (Instrument)



Building 318: Emergency Services Building

Building 320: Childcare Center

NIST Cultural Landscape

Masonry Test Wall

South Pond

Building 101 Entry

Allée along North Drive

North Pond

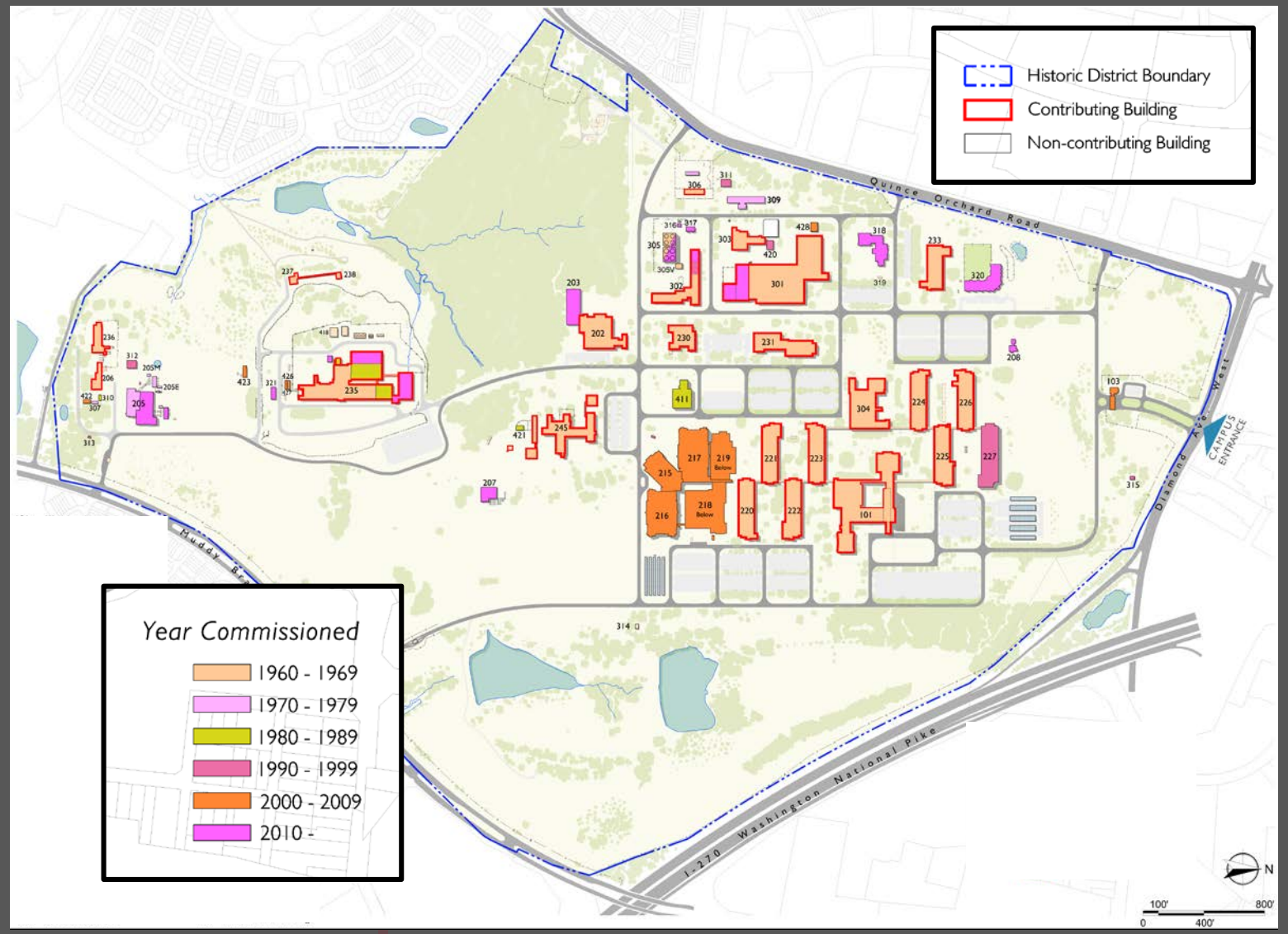
Prominent Landscape Features

NIST Campus as a Historic District is recognized for:

- Association with developments in science and technology
- Significant example of Post-WW II research campus design

Implications:

- NIST is the Steward of all cultural resources within the campus
- All buildings constructed in 1960's are contributing resources to the District
- Campus improvements are reviewed for compliance with federal preservation standards



Aged research facilities are unable to support precision measurements and research:

- 50 year old infrastructure systems have outlived their useful life & are energy inefficient
- Lack of temperature stability
- Lack of humidity control
- Lack of vibration control
- Inadequate quality & quantity of power
- Deficiencies in piped services to labs
- Lack of sprinkler systems for fire protection
- General degradation in infrastructure equipment & distribution
- No redundancy of infrastructure systems
- Components for legacy equipment are difficult to obtain
- Building exterior envelopes are uninsulated and not energy efficient

Building 225: Typ. General Purpose Lab (1964)

Phase I includes:

- Collect & analyze data
- Assess impacts of regulations & polices
- Review recent & ongoing planning studies
- Conduct OU interviews/questionnaires
- Conduct employee survey
- Develop a master plan program
- Prepare alternatives & select master plan concept
- Initiate NEPA tasks

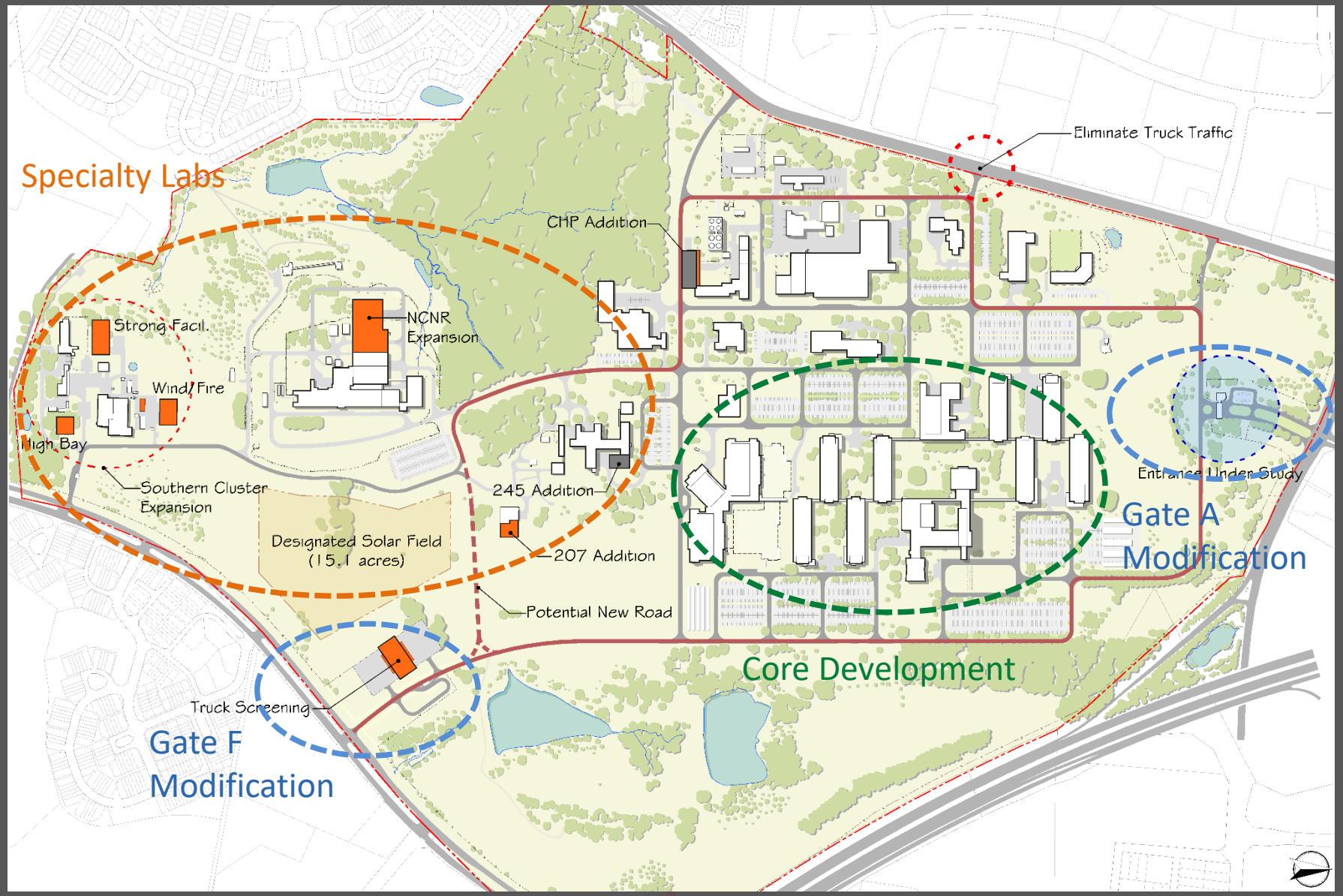
Contextual Analysis
- Regional Analysis
- Natural and Built Environment
- Circulation & Transportation
- Utility Infrastructure

Phase II:

- Develop draft Master Plan and draft Environmental Assessment (EA)

Phase III:

- Develop final Master Plan, EA and ROD or FONSI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QUESTIONS / DISCUSSION

United States Department of Commerce