



Executive Director's Recommendation

Commission Meeting: April 5, 2018

PROJECT

Draft Gaithersburg Campus Master Plan

National Institute of Standards and
Technology
100 Bureau Drive
Gaithersburg, Maryland

SUBMITTED BY

United States Department of Commerce

REVIEW AUTHORITY

Approval of Master Plans for use by the
Commission
per 40 U.S.C. § 8722(a) and (b)(1)

NCPC FILE NUMBER

MP23

NCPC MAP FILE NUMBER

3115.10(05.00)44725

APPLICANT'S REQUEST

Approval of comments on draft
master plan

PROPOSED ACTION

Approve comments on draft master
plan

ACTION ITEM TYPE

Staff Presentation

PROJECT SUMMARY

The National Institute of Standards and Technology (NIST) Gaithersburg campus is a beautiful setting, featuring a rolling terrain dotted with trees and wooded areas. There are 62 buildings and structures, totaling over 3.6 million gross square feet of space and housing approximately 4,000 personnel (both employees and associates). Approximately half of the permanent buildings are now more than 50 years old.

The master plan provides for the modernization of aging, inefficient buildings and accommodates the anticipated growth in research programs over the next 20 years. The campus plan includes approximately 1.4 million gross square feet of new facilities and 15 building renovations. Many of the proposed projects are required to address existing campus deficiencies rather than future program needs driven by growth. The master plan offers a framework for accomplishing NIST's goals of meeting anticipated scientific program growth, enhancing the Gaithersburg campus, providing appropriate facilities, encouraging professional collaboration and advancing sustainable practices. The emphasis is on research buildings - upgrading existing laboratory buildings and infrastructure to support current and future research, and adding new facilities needed for planned programs.

KEY INFORMATION

- The last time the Commission reviewed a master plan for the National Institute of Standards and Technology (NIST) was in 2009, which included many projects from its predecessor 1972 plan. Many of the projects have since been constructed.
- Most of the projects in the draft campus plan are intended to meet today's research needs rather than future projected needs.

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- The campus plan includes two projects that were recently reviewed by the Commission – the Building 245 Radiation Physics Laboratory rehabilitation and addition (July/September 2017) and new ground solar array installation (February 2018).
 - The City of Gaithersburg submitted comments that are supportive of the National Institute of Standards and Technology's draft master plan. In particular, the City appreciates the plan's focus on pedestrian and green infrastructure, as well as traffic flow and entrance queuing improvements. City staff had the opportunity to provide comments during the development of the draft, and the plan was presented to the City Planning Board in February 2018.
 - The NIST Gaithersburg campus is one of two research campuses under the administration of the United States Department of Commerce. The other campus is located in Boulder, Colorado.
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RECOMMENDATION

The Commission:

Approves the following comments on the draft campus plan for the National Institute of Standards and Technology (NIST) Gaithersburg campus.

Supports the Alternative F development concept, which concentrates new development in the campus center (historic core) to facilitate research; preserves the campus's open space character; and adds more programmable outdoor spaces to facilitate professional collaboration.

Finds that Alternative F most successfully provides for NIST's research mission, while preserving the historic campus core and integrating new sustainable development measures.

Historic Preservation

Notes that the Maryland Historic Trust (State Historic Preservation Office) has determined the campus is eligible for inclusion in the National Register of Historic Places “for its association with events that made important contributions to the broad patterns of history under the Science and Technology and Postwar Research Campus Design themes, and as a recognizable entity that embodies the characteristic of Post War Research Campus design.”

Finds that Alternative F best preserves the campus core's existing grid pattern of development, formal landscape, large-scale monumental buildings, and general/specialized laboratories, identified as hallmarks of postwar research campus design.

Commends NIST's careful consideration of the campus's unique historic character throughout the planning and design process.

Sustainability

Supports the National Institute of Standards & Technology's effort to meet federal and State sustainability goals at its Gaithersburg campus through integrated, campus-wide strategies related to stormwater management, landscaping, and energy-efficiency.

Finds that all of the proposed alternatives, including Alternative F, convert significant amounts of manicured property to new forests and meadows; identify a campus-wide system of rain gardens, bioswales, and planter boxes; and identify future solar panel installations and net-zero energy buildings.

Access/Transportation

Supports NIST's plans to develop a new pedestrian promenade between the adjacent Corridor Cities Transitway station and campus core, new interior campus trail network, additional sidewalks/crosswalks, bikeshare stations, and new external bicycle trails to encourage pedestrian, bicycle, and transit travel.

Supports the planned development of Gate F to accommodate future commercial vehicle inspections, shipping/receiving, and conference visitor screening based on site compatibility.

Requests that NIST continue refining the project's design to minimize impacts to the campus setting and off-site neighborhoods through landscaping, reconfiguring access roads, and light control measures.

Notes that NIST will improve its overall parking ratio from 1:1.5 to 1:1.9 with the implementation of the campus plan. The proposed ratio for federal employees, who comprise approximately 70 percent of the total population on campus, is 1:2. The proposed ratio for non-federal employees (contractors, guest researchers), who comprise 30 percent of the total population, is 1:1.7.

Requests that NIST prioritize development of a detailed Travel Demand Management plan with future mode share goals, program implementation steps/schedules, and regular commuter travel monitoring program for both federal and non-federal employees. The TDM plan should contain programs, strategies, goals, and implementation information specifically directed at encouraging more sustainable travel behavior by non-federal employees.

Requests that NIST submit a transportation progress report to NCPC for review prior to submitting the new parking garage and Building 411 lot expansion projects with the following information:

- Status of programs included in the future NIST Travel Demand Management plan, which demonstrate progress towards attaining future non-single occupant vehicle mode share goals; and
- Travel trend information based on commuter surveys given between 2016 and most recent survey prior to submission of the new garage and Building 411 lot expansion projects.

PROJECT REVIEW TIMELINE

Previous actions	None.
Remaining actions (anticipated)	July/September 2018 – Final master plan approval

PROJECT ANALYSIS

Executive Summary

The National Institute of Standards and Technology has submitted a draft campus plan for NCPC's review. In general, the plan articulates a reasonable balance between accommodating future growth, preserving the campus's historic nature, and attaining federal and State sustainability goals. The NIST campus plan goals and objectives appear to be generally consistent with many policies articulated in the *Comprehensive Plan for the National Capital*. As such, staff recommends that the Commission approve comments on the draft campus plan for the National Institute of Standards and Technology (NIST) Gaithersburg campus.

Background

Existing Conditions

The National Institute of Standards & Technology spans 579 acres in central Montgomery County, surrounded by the incorporated City of Gaithersburg, Maryland. The campus is bordered by Quince Orchard Road along its west-side, West Diamond Avenue along its north-side, Interstate 270 along its northeast-side, Muddy Branch Road along its east-side, and private residential development and forested property owned by the Izaak Walton League to the south. The daytime worker population is 4,007, with an average of 250 visitors per day. In addition, NIST hosts approximately 75-80 conferences a year, ranging in size from 3-650 attendees. The Gaithersburg campus is one of two research campuses under the administration of the Department of Commerce, with a 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."

The campus is divided into five basic land use areas, with service-oriented development situated along the western side (Quince Orchard Road) of campus; historic research-oriented development in the center of campus; specialty research in the south; forestland in the southwest; and manicured open space (with clusters of trees) along the northern, northeastern, and eastern sides of campus. Open space (448 acres) makes up approximately 77% of the total campus area, with development (75 acres) occupying approximately 13% of the campus and forested property (56 acres) occupying 10% of the campus area.

The entire NIST campus has been determined to be eligible for listing in the National Register of Historic Places by the Maryland Historic Trust based on its design as a mid-century modern research campus. The campus plan identifies a number of characteristics that define the historic campus setting and International architectural style of the buildings. Historic campus characteristics include a formal landscape, ample parking, large-scale monumental buildings, and general/specialized laboratories, identified as hallmarks of postwar research campus design. Historic building features include curtain-wall construction, ample use of glass, clean monolithic forms and minimal ornamentation. Twenty-five of the 62 existing buildings/structures are over 50 years old, with five (5) buildings constructed in the 1970's, two (2) buildings constructed in the 1980's, six (6) buildings constructed in the 1990's, and twenty-four (24) buildings constructed since 2000.

The campus has six gates (A-F), four of which are routinely used and the other two only intermittently used. The full service main gate (Gate A) is located along West Diamond Avenue (in the north), used by employees and visitors. There are three gates along Quince Orchard Road (Gates B, C, and D) and two gates along Muddy Branch Road (Gates E and F). Gate D is normally closed, Gate C is for inbound-only commercial delivery and employee traffic, and Gate D is for existing employee traffic only during afternoon/evening hours. Gate E is normally closed and Gate F is used by both employees and larger visiting groups for conferences.

The campus has 2,672 employee parking spaces (equating to a 1:1.5 ratio), 769 visitor/conference attendee spaces, 229 service spaces, and 34 short-term spaces. There are few bicycle racks on-campus, and a discontinuous sidewalk network within the historic core area. One of the notable features of the campus core development is its indoor pedestrian concourse that links each original General Purpose Laboratory (GPL) buildings. Externally, the campus is served by two NIST shuttle routes, one that provides service between Building 101 (Main Administration Building) and Shady Grove Metrorail station (15 minutes one-way travel) and one that provides service between Building 101 and the closest commuter rail station (7 minutes one-way). Montgomery County bus service (Ride-On) provides direct on-site service to Building 101 with one route, and two routes serving stops outside of the campus near the main gate (Gate A). Quince Orchard Avenue, West Diamond Avenue and Muddy Branch Road all have existing shared-use bicycle trails/sidewalks within their right-of-ways.

NIST identifies a number of considerations that the campus plan intends to address including:

- *Laboratory Environmental Control.* Much of the research on the campus requires precise performance and measurements, which demand very controlled environments - rigorous temperature and humidity control, vibration stability, air cleanliness and quality electric power.
- *Aging Buildings and Infrastructure.* Twenty-five buildings remain from the initial campus construction, with engineering systems that are well past their service life.
- *Public Facilities.* Conferences and professional visits bring many people to the campus and Building 101 facilities, at a time when security requirements are more of a concern. Previous studies propose improvements to food service on campus, as well as recommendations for changes to the conference center, library and visitor-use services.

- *Historic District Context.* As eligible for listing on the National Register of Historic Places as a historic district, all improvements should comply with the *Secretary of the Interior's Standards for the Treatment of Historic Preservation* to the degree possible.
- *Stormwater Management.* Future planning must reduce runoff from existing impervious surfaces and offset any addition, using structural or bio-retention approaches.
- *Transit linkages.* Maryland's Corridor Cities Transitway is planning a bus rapid transit (BRT) alignment between the Shady Grove Metro Station (along the NIST campus's west-side) and the Metropolitan Grove commuter rail station in an initial phase. The project will require various changes to NIST property to accommodate the facility, including relocation of Gate C.
- *Campus Circulation.* The gates around the campus perimeter experience frequent congestion at peak times, with limited queuing and turnaround space.
- *Security.* Most commercial vehicles currently enter at Gate C, with a lack of queuing space and inspection facilities. In addition, there are no facilities to screen visitors' or staff vehicles.
- *Parking.* Parking capacity and distribution must be a balanced approach, considering campus functions, employee commuting patterns, conference surge, public transportation opportunities, and community and environmental considerations.

Future Conditions

The campus plan assumes a population growth of 1,099 additional employees over the next 20 years (to a total population of 5106), with a projected need of 1.4 million gross feet of new space (renovated and new construction) to fulfil NIST's research mission in the future. Approximately 37% of the future space is planned as administrative office space, 13% is planned as service/support space, and 50% is planned as research-dedicated space. The campus plan bases projected population and space need assumptions on previous studies of historic data. The campus plan notes that a significant majority of the new space is necessary to accommodate current research needs.

In an effort to focus future development within the historic core area, NIST developed six potential future development concepts that would attain its planning goals, with varying concentrations of research and administration space interwoven throughout the core. The preferred NIST concept (F) adds new office space within existing General Purpose Laboratory buildings, thereby dedicating all new construction space solely to research uses. In addition, Concept F is one of two concepts (B and F) that best replicate the historic core development pattern along the interior pedestrian concourse, without extending beyond the historic boundary of the core. With the exception of Concept F, all other concepts (A-E) show the new administrative space as new construction, and some of the concepts show new development extending beyond the historic core area boundary. Each of the concepts redevelop (remove) surface core parking to different degrees; however, Concepts D and F maximize surface parking redevelopment.

The campus plan includes campus-wide strategies related to stormwater management, sustainability, and operational efficiency, designed to enable NIST to achieve a number of planning goals as follows:

- Increase total forest land area to 15% based on Maryland-National Capital Park and Planning standards and total tree canopy area to 40% by 2025 based on Maryland state standards;
- Treat 20% of all future impervious surface area runoff based on Maryland state standards;
- Reduce nutrient and sediment stormwater runoff loads equivalent to treatment of 20% of pre-1985 impervious surface area by 2025 based on Chesapeake Bay Preservation Act standards;
- Attain the following NIST building performance goals:
 - Daylighting for 75% of all regularly-occupied interior building space
 - 30% of hot water needs met by solar technology
 - 30% electric energy from renewable sources by FY25
 - Reduce energy intensity by 25% by FY 25.

To preserve the campus's historic qualities, in addition to adhering to the Secretary of the Interior's Standards for Rehabilitation, the campus plan includes a number of additional strategies to help preserve its history. Some of the strategies are as follows:

- Ensuring that a number of significant views across the campus remain unimpeded with proposed improvements;
- Maintaining all primary building entrances on the short sides of the General Purpose Laboratory buildings - on the spines and/or facing the roads – with entrances clearly marked and be visible from a distance;
- Maintaining the existing interior concourse (within the historic core) that connects the original General Purpose Laboratory buildings by siting new construction accordingly;
- Identifying “design language zones” (historic core, new development, existing site) with guidelines for landscaping, materials, and amenities;
- Creating a NIST Design Review Board to review and approve major capital improvements to buildings and grounds, establishing a predictable process for assuring that projects are consistent the campus plan, Section 106 historic review process, and NIST standards/mission goals.

The campus plan shows 25 total future projects, developed in three sequential phases (Immediate, Next Step, Program Expansion), with some projects listed as part of a fourth Independent Phase. Two notable projects (both included in the Immediate Phase 1) will redevelop Gate A and Gate F to better accommodate future commercial deliveries, shipping and receiving, and conference visitors. NIST considered three different alternative concepts for Gate A, with the NIST-preferred concept shown in the campus plan. The preferred Gate A concept allows for more thorough, convenient screening and processing of visitors and their vehicles compared to the existing facility.

The Gate F development would accommodate a relocated (from Gate C) commercial vehicle inspection, shipping/receiving, and larger visitor groups (conference attendees) with a dedicated visitor center, inspection area, shipping/receiving building, and security booth. NIST considered four separate Gate F concepts with varying numbers of access points, and combined and separate

visitor and commercial delivery handling facilities. The NIST-preferred Gate F concept is included in the campus plan.

Based on NIST's employment population change, the campus plan proposes to increase employee parking (over the next 20 years) based on NCPC's 1:2 ratio goal. The NCPC Comprehensive Plan specifies that the 1:2 ratio is appropriate for the NIST campus, with its proximity to High Occupancy Vehicle (HOV) facility access along Interstate 270. Although the NIST plan notes that its future parking calculation is based on only part (70%) of the total on-campus employment population based on NIST's interpretation of the parking ratio policy since contractors and guest researchers are not federal employees. Non-federal workers may not be eligible to participate in various travel demand management programs available to workers appointed to federal positions. Therefore, the campus plan proposes to increase NIST's parking supply by 125 spaces to accommodate the campus's additional non-federal population, which equates to a 1:1.7. Overall, the campus will improve from a 1:1.5 to a 1:1.9 ratio, with a total space increase of 275 for both federal and non-federal workers.

Analysis

Alternative F Development Concept

The Alternative F development concept is the best combination of replicating the historic core development pattern, respecting the traditional boundary of the historic center, and adding new space for research purposes. The concept dedicates all new construction to research purposes in support of NIST's research-oriented mission. In addition, Concept F focuses a majority of new development in the campus core, which helps preserve much of the campus's open space, consolidates employee parking (into a new garage), and creates more opportunities for programmable spaces. Outdoor spaces are viewed as helpful to facilitating professional collaboration and improving the usability of the campus. Therefore, staff recommends that the Commission **support the Alternative F development concept, which concentrates new development in the campus center (historic core) to facilitate research; preserves the campus's open space character; and adds more programmable outdoor spaces to facilitate professional collaboration.** Furthermore, staff recommends that the Commission **find that Alternative F most successfully provides for NIST's research mission, while preserving the historic campus core and integrating new sustainable development measures.**

Historic Preservation

The NIST Gaithersburg campus was designed by Voorhees Walker Smith Smith and Haines, who designed the Bell Labs in Murray Hill, New Jersey, as a modern suburban research campus in the early 1960's. The campus is eligible for listing in the National Register of Historic Places "for its association with events that made important contributions to the broad patterns of history under the Science and Technology and Postwar Research Campus Design themes, and as a recognizable entity that embodies the characteristic of Post War Research Campus design." Therefore, staff recommends that the Commission **note that the Maryland Historic Trust (State Historic Preservation Office) has determined the campus is eligible for inclusion in the National Register of Historic Places "for its association with events that made important contributions**

to the broad patterns of history under the Science and Technology and Postwar Research Campus Design themes, and as a recognizable entity that embodies the characteristic of Post War Research Campus design.”

The NIST-preferred Alternative F development concept is one of two concepts (B and F) that effectively replicates the historic core development pattern along the interior pedestrian concourse, without extending beyond the historic boundary of the core. Additionally, the concept respects the core's character-defining features, including its grid pattern of development, formal landscape, ample parking, large-scale monumental buildings, and general/specialized laboratories. Therefore, staff recommends that the Commission **find that Alternative F best preserves the campus's existing grid pattern of development, formal landscape, ample parking, large-scale monumental buildings, and general/specialized laboratories, identified as hallmarks of postwar research campus design.** Furthermore, staff recommends that the Commission **commend NIST's careful consideration of the campus's unique historic character throughout the planning and design process.**

Sustainability

As previously described, the campus plan is designed to attain a number of planning goals that will improve the natural environment, operational efficiency, and energy security. Notable strategies include a campus-wide system of stormwater management features; conversion of large areas of lawn/manicured area to forests and meadows; establishment of a water quality bank; and campus retrofit of energy saving/generation projects. In particular, the new development will be designed based on the latest energy-efficiency standards, and the new Gate F development will be designed to attain the “net-zero” energy standard. Therefore, staff recommends that the Commission **support the National Institute of Standards & Technology's effort to meet federal and State sustainability goals at its Gaithersburg campus through integrated, campus-wide strategies related to stormwater management, landscaping, and energy-efficiency.** Furthermore, staff recommends that the Commission **find that all of the proposed alternatives, including Alternative F, convert significant amounts of manicured property to new forests and meadows; identify a campus-wide system of rain gardens, bioswales, and planter boxes; and identify future solar panel installations and net-zero energy buildings.**

Access/Transportation

The campus plan reflects a substantive effort to improve pedestrian conditions through a new east-west promenade (between a future Corridor Cities Transitway station adjacent to the NIST campus and its core), a new multi-use trail network, and additional sidewalks/crosswalks. The new promenade will feature a robust streetscape with additional landscaping and street furniture. In addition, all three roads adjacent to NIST have existing designated bicycle routes within their right-of-ways. Notable planned bicycle improvements are a new trail connection between the existing West Diamond Avenue and Muddy Branch Road routes, and a new trail extension north along Quince Orchard Road adjacent to the future CCT alignment. Therefore, staff recommends that the Commission **support NIST's plans to develop a new pedestrian promenade between the adjacent Corridor Cities Transitway station and campus core, new interior campus trail**

network, additional sidewalks/crosswalks, bikeshare stations, and new external bicycle trails to encourage pedestrian, bicycle, and transit travel.

Relocation of the Gate C commercial delivery, inspection, and shipping/receiving operation to Gate F is advisable based on the availability of land and traffic conditions along Muddy Branch Road. The current operation does not meet current federal security standards in its present location, and the current operation adversely impacts traffic flow along Quince Orchard Road, which is busier than Muddy Branch Road. Consideration was given to developing Gate E with a new inspection/delivery facility; however, existing utilities prohibit that move. Therefore, staff recommends that the Commission **support the planned development of Gate F to accommodate future commercial vehicle inspections, shipping/receiving, and conference visitor screening based on site compatibility.**

Although redevelopment of Gate F to accommodate future commercial deliveries/inspections/conference visitor processing is reasonable, the size and scale of the facility should be minimized to reduce its potential impact to campus open space and views. This is particularly important with existing residential development on the other side of Muddy Branch Road, directly across from Gate F. NIST should continue to refine the project concept with additional landscaping, access road reconfigurations, and light control measures. Therefore, staff recommends that the Commission **request that NIST continue refining the project's design to minimize impacts to the campus setting and off-site neighborhoods through landscaping, reconfiguring access roads, and light control measures.**

The campus plan distinguishes between federal and non-federal employees (researchers, contractors), thereby applying NCPC's applicable 1:2 Comprehensive Plan goal for the campus to federal employees only. Approximately 70% of the campus's total employment is federal. Based on NIST's future projected non-federal employee population and future parking demand for these workers, the plan proposes to increase campus parking by 125, resulting in a parking ratio improvement from 1:1.5 to 1:1.7. Overall, the NIST plan will improve the campus ratio from 1:1.5 to 1:1.9. Therefore, staff recommends that the Commission **note that NIST will improve its overall parking ratio from 1:1.5 to 1:1.9 with the implementation of the campus plan. The proposed ratio for federal employees, who comprise approximately 70 percent of the total population on campus, is 1:2. The proposed ratio for non-federal employees (contractors, guest researchers), who comprise 30 percent of the total population, is 1:1.7.**

The NIST plan lists a number of future Travel Demand Management (TDM) strategies including: operating a shuttle with more campus coverage, installing additional secured bicycle parking/storage facilities, implementing a parking permit system, and developing a more detailed TDM plan. A recent commuter survey for the campus shows NIST with an 84% "single occupant vehicle" mode share. In recognition of the planned CCT and its potential accessibility improvements, a consultant assessed future campus employee commuting patterns using Census Transportation Planning Products data. The study concludes that the CCT would not significantly benefit most NIST employees since many do not currently live near future CCT station sites, nor connecting services such as commuter rail. However, the Gaithersburg area's changing land use patterns, with multiple mixed-use developments (with housing) and planned transportation

improvements, may result in a sizable redistribution of NIST employees in the future. As such, NIST should recognize the potential opportunity to reduce parking further at its Gaithersburg campus and benefit from associated environmental, construction, security, and maintenance cost reductions.

NIST should prioritize development of its future TDM plan with mode share goals, program implementation steps/schedules, and regular employee commuter travel monitoring in support of the future CCT facility and planned local area development. In particular, the TDM should also identify feasible strategies directed at encouraging more sustainable travel behavior by its non-federal employees, with detailed information on work duration, place of residence, barriers to commuting via non-SOV modes, and TDM program availability to these workers. NCPC staff notes that the Commission's parking ratio policy pertains to general employee populations, and does not differentiate between federal and non-federal workers. Therefore, staff recommends that the Commission **request that NIST prioritize development of a detailed Travel Demand Management plan with future mode share goals, program implementation steps/schedules, and regular commuter travel monitoring program for both federal and non-federal employees. The TDM plan should contain programs, strategies, goals, and implementation information specifically directed at encouraging more sustainable travel behavior by non-federal employees.**

In recognition that future planned development and transportation improvements near the NIST campus may result in a sizable employee residential distribution shift (and reduced parking demand), staff recommends that the Commission **request that NIST submit a transportation progress report to NCPC for review prior to submitting the new parking garage and Building 411 lot expansion projects with the following information:**

- **Status of programs included in the future NIST Travel Demand Management plan, which demonstrate progress towards attaining future non-single occupant vehicle mode share goals; and**
- **Travel trend information based on commuter surveys given between 2016 and most recent survey prior to submission of the new garage and Building 411 lot expansion projects.**

CONFORMANCE TO EXISTING PLANS, POLICIES AND RELATED GUIDANCE

Comprehensive Plan for the National Capital

The campus plan is generally consistent with the policies established in *The Comprehensive Plan for the National Capital*, including those related to historic preservation, sustainability, and the federal environment.

National Historic Preservation Act

The entire NIST campus has been determined to be eligible for listing in the National Register of Historic Places by the Maryland Historic Trust. New construction and work to existing buildings should comply with the Secretary of the Interior's Standards for the Treatment of Historic Properties to the degree possible. Adoption of the Secretary's Standards for new construction, will assure architectural compatibility in scale, massing, size, and overall design with existing historic building stock and landscapes. In consultation with MHT, NIST believes that consistency with the Standards may result in a finding of no adverse effects under 36 CFR 800. The ten Secretary's Standards outline an approach to facilitate the continued use of historic properties and to new construction while retaining character-defining design features. The Standards are accompanied by guidelines for general and specific rehabilitation strategies. NIST has indicated that should an adverse effect be determined, they will coordinate with MHT to develop a Programmatic Agreement to mitigate any identified adverse effects. For federal projects located outside of the District of Columbia, NCPC does not have a review responsibility under the National Historic Preservation Act.

National Environmental Policy Act

NIST is preparing an EA to analyze the campus plan with two alternatives – an action alternative that analyzes the “preferred” development scenario and a “no action” alternative. NIST is currently accepting public comments until March 31st, and has committed to accepting NCPC's draft campus plan comments (from its April meeting) in lieu of regular staff comments. The final campus plan submission to NCPC will include the final EA and FONSI. For federal projects located outside of the District of Columbia, NCPC does not have a review responsibility under the National Environmental Policy Act (NEPA).

CONSULTATION

NCPC referred out the draft campus plan submission to the Maryland Department of Planning clearinghouse on January 9, 2018, and the submission was transmitted to the Maryland Department of Transportation, Maryland Department of the Environment, Maryland Department of Natural Resources, Maryland Historic Trust, Montgomery County, and Maryland-National Capital Park and Planning Commission (Montgomery County). As of the writing of this staff report, NCPC has not received any comments from the clearinghouse.

Separately, NIST submitted a copy of the draft master plan to the City of Gaithersburg for review and comment. Representatives of NIST also presented the plan to the Mayor and City Council on February 5, 2018. As evidenced by feedback from the Mayor and City Council following the presentation, the City greatly values NIST's presence, and views this plan as a great model of sustainability and environmental consciousness. In particular, the City appreciates the plan's focus on pedestrian and green infrastructure, as well as traffic flow and entrance queuing improvements. City Staff had the opportunity to provide comments during the development of the draft, and is of the opinion that the plan is compatible with the adjoining Master Plan of the City of Gaithersburg

and concurs with the goals and conclusions outlined in the draft plan. These comments were transmitted to NCPC staff via e-mail on March 14, 2018.

ONLINE REFERENCE

The following supporting documents for this project are available online:

- Submission Letter
- Draft Environmental Assessment
- Draft NIST Campus Master Plan

Prepared by Michael Weil
03/29/2018

POWERPOINT (ATTACHED)

National Institute of Standards & Technology

Master Plan

Gaithersburg, Maryland

Submitted by the United States Department of Commerce

Draft Review

Project Synopsis

Commission meeting date: April 5, 2018

NPCPC review authority: Approval of Master Plans for use by the Commission (40 U.S.C. § 8722(a) and (b)(1))

Applicant request: Draft Review

Delegated / consent / open / executive session: Open Session

NPCPC Review Officer: Michael Weil

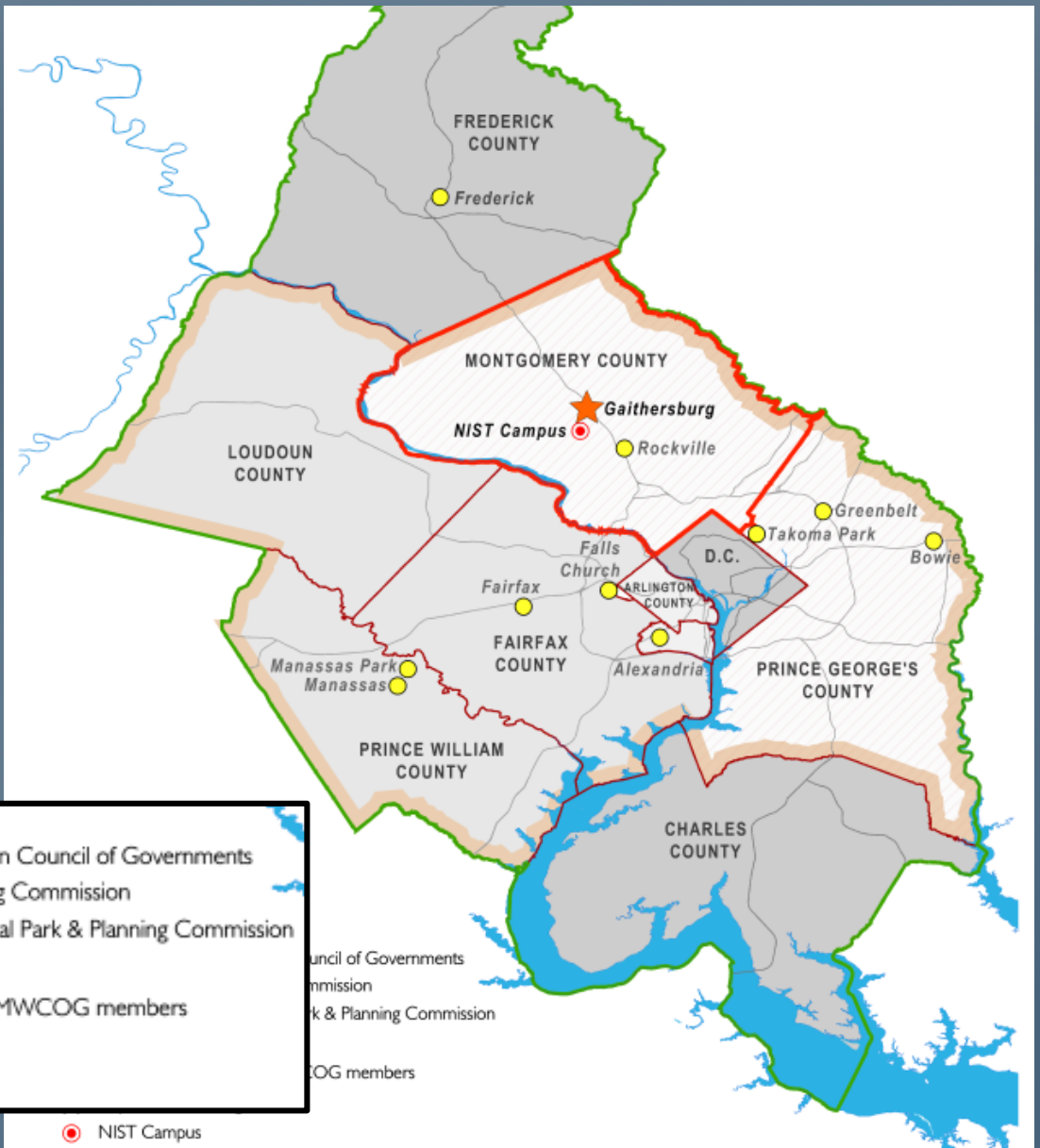
NPCPC File number: MP23

Project Summary:

The National Institute of Standards and Technology (NIST) Gaithersburg campus is a beautiful setting, featuring a rolling terrain dotted with trees and wooded areas. There are 62 buildings and structures, totaling over 3.6 million gross square feet of space and housing approximately 4,000 personnel (both employees and associates). Approximately half of the permanent buildings are now more than 50 years old, although two significant facilities were built in the last 20 years: the Advanced Chemical Sciences Laboratory (ACSL) and the Advanced Measurement Laboratory Complex (AML). Additionally, NIST has constructed several smaller buildings and additions within the last 10 years for specialty research and support operations.

The Master Plan provides for the modernization of aging, inefficient buildings and accommodates the anticipated growth in research programs over the next 20 years. Approximately 1.4 million gross square feet of new facilities will be added and 15 buildings will be renovated. Many of the proposed elements are needed today, and are not the result of program driven growth. The Master Plan offers a framework for accomplishing NIST's goals of meeting anticipated scientific program growth, enhancing the Gaithersburg campus, providing appropriate facilities, encouraging professional collaboration and advancing sustainable practices. The emphasis is on research buildings— upgrading existing laboratory buildings and infrastructure to support current and future research, and adding new facilities needed for planned programs.

The Master Plan concentrates new research buildings in the central campus core, where most of the existing laboratories buildings are located, including the seven original general purpose laboratories and the main administrative building. The building configurations follow a regular pattern, linked by an interior pedestrian concourse. The new building configurations and locations build upon that historic pattern, and connect into the interior pedestrian concourses. New specialty laboratory buildings are placed outside the core, and the existing special purpose laboratories are planned for renovations and additions as part of the 20-year Plan. Other campus recommendations improve security, upgrade infrastructure and encourage collaboration.



- Metropolitan Washington Council of Governments
- National Capital Planning Commission
- Maryland National Capital Park & Planning Commission
- Montgomery County
- Cities / Towns that are MWCOG members
- ★ City of Gaithersburg
- NIST Campus

● NIST Campus

- C-1 Local Commercial
- C-2 General Commercial
- Central Business District
- CD Corridor Development
- E-1 Urban Employment
- I-1 Light Industrial
- I-2 Industrial Park
- MXD Mixed Use Development
- R-A Low Density Residential
- R-4 Med. Density Residential
- R-18 Med. Density Residential
- R-20 Med. Density Residential
- R-90 Med. Density Residential
- RP-T Med. Density Residential
- R-90C High Density Residential
- R-B Residential Buffer
- City Boundary
- NIST Campus
- Historic Districts & Sites

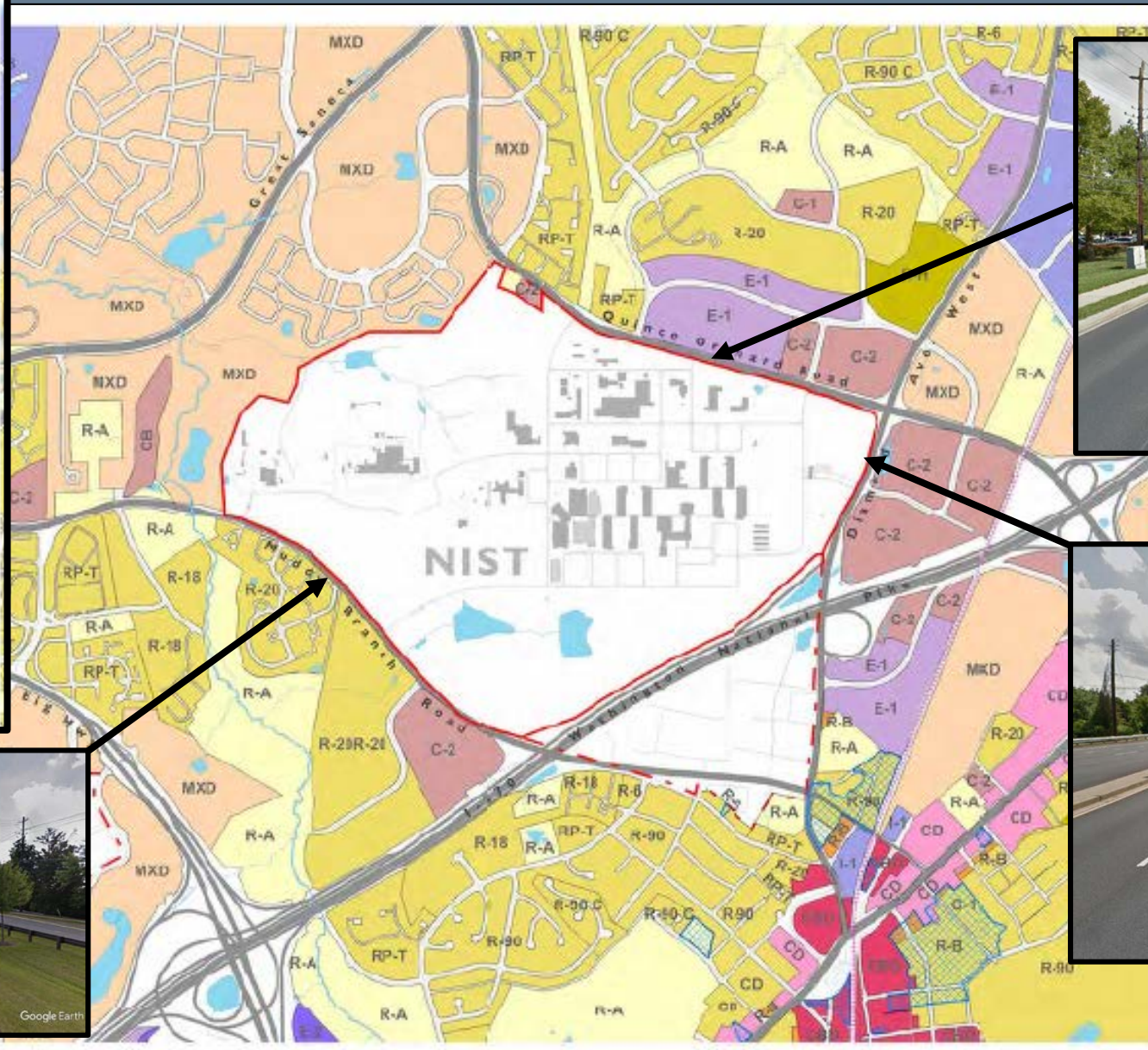




Exhibit 116: Campus Organization

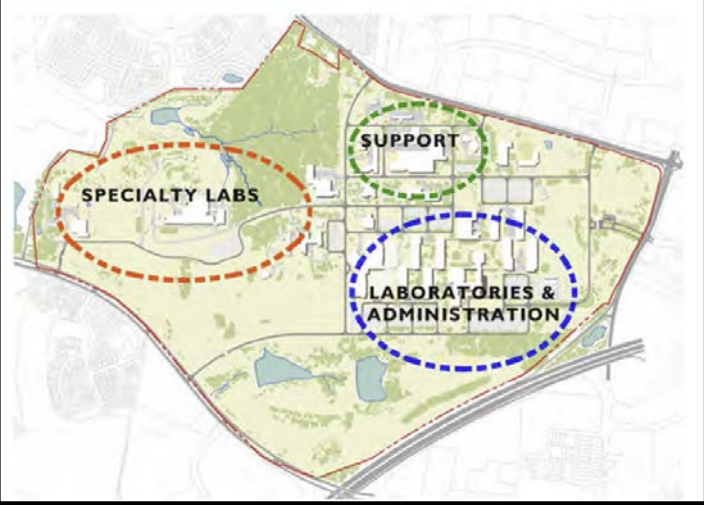


Exhibit 119: Existing Conditions, Major Site Focal Features

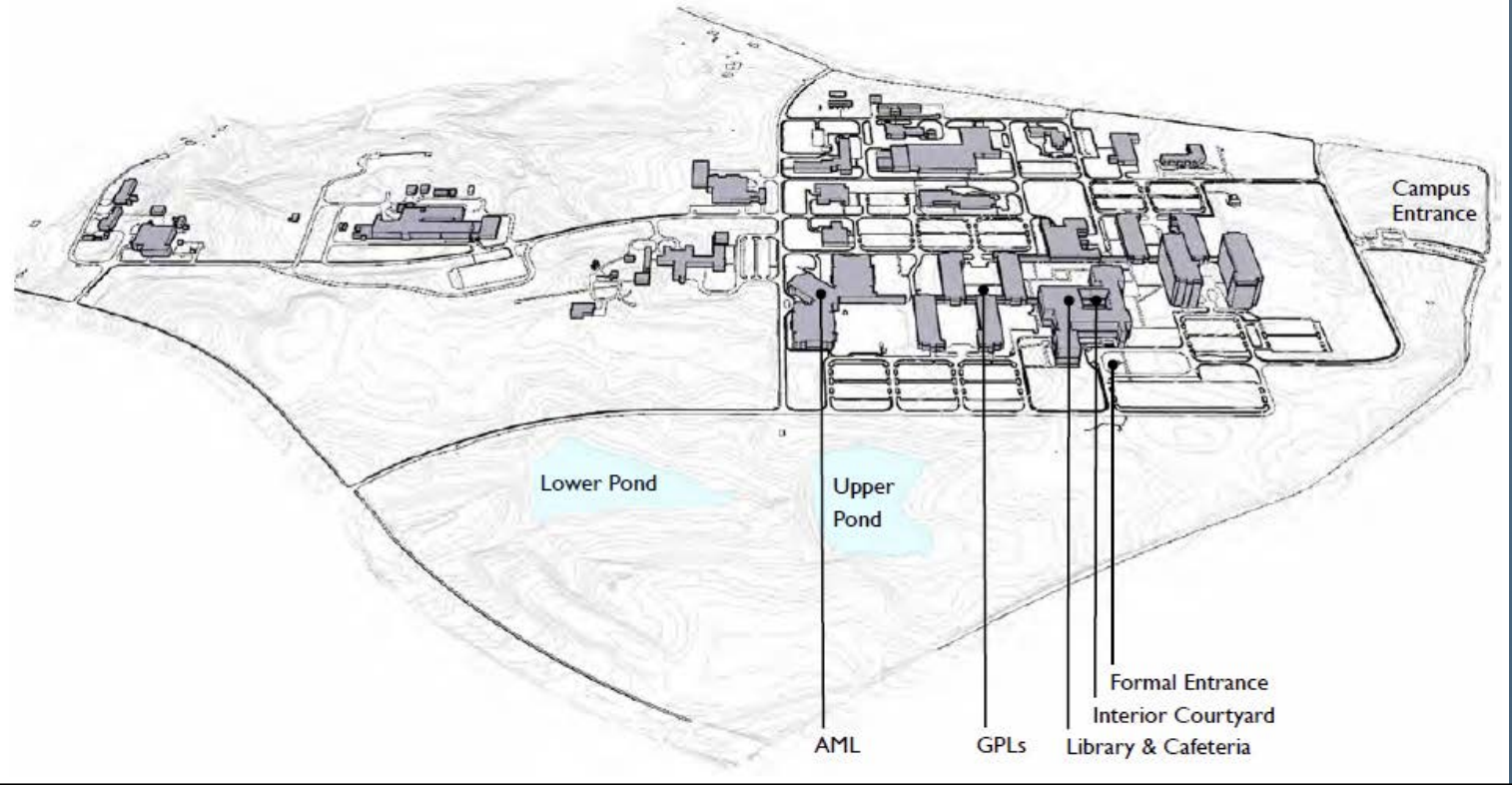
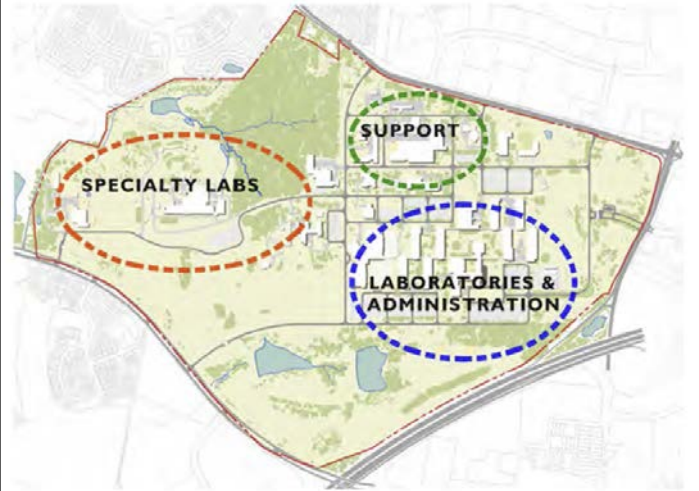


Exhibit 116: Campus Organization





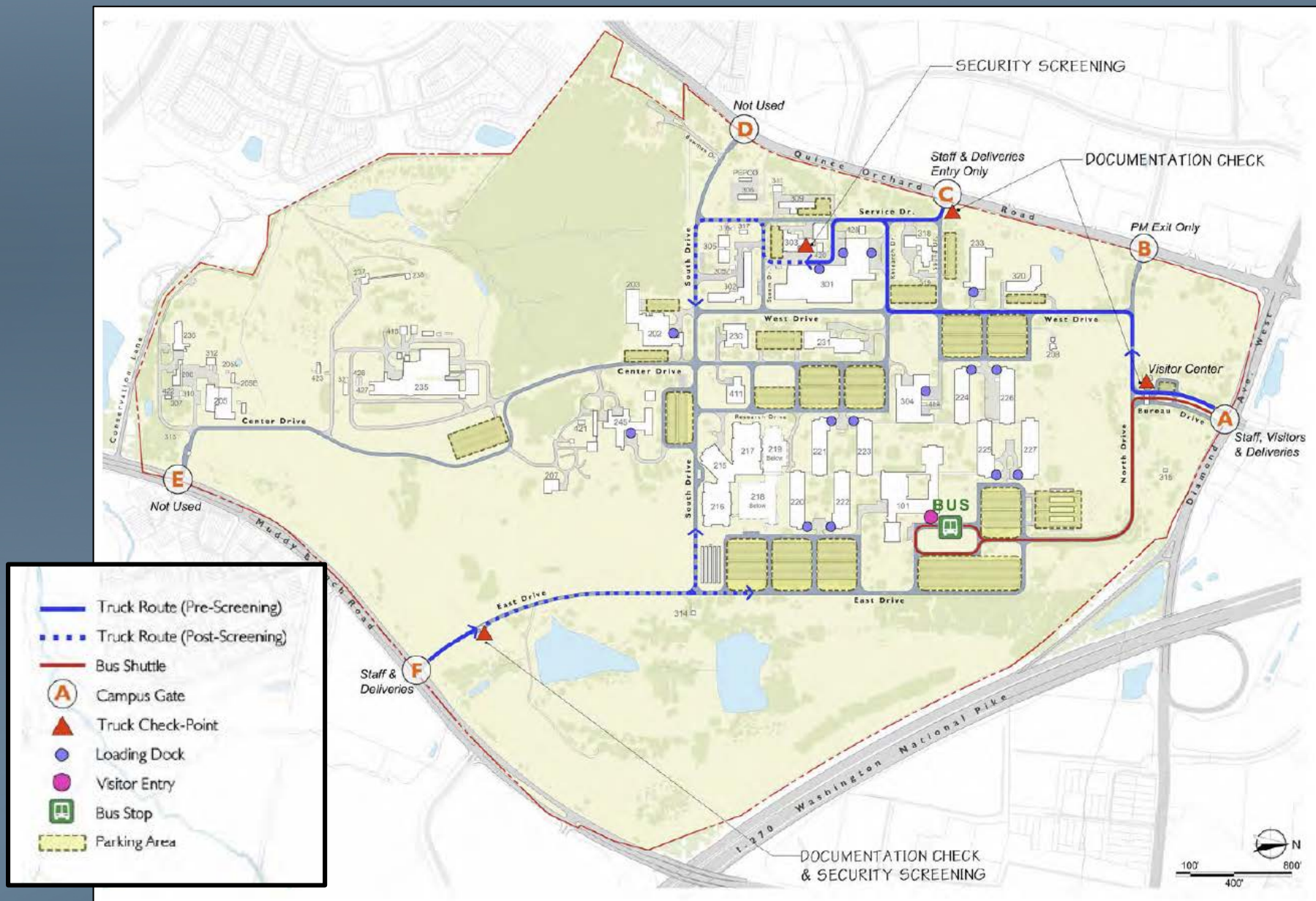


Exhibit 109: Vegetation



Goals

- A plan that creates a comprehensive and coordinated framework for future physical development of the Gaithersburg campus.
- A plan that develops appropriate facilities and infrastructure for the evolving and advancing scientific research, meeting both near and long-term needs.
- A plan that maintains the attractive campus environment.
- A plan that respects and embraces the designation of the campus as a historic district.
- A plan that supports and advances the sustainable design and environmental goals of NIST and the Department of Commerce.
- A plan for gradual change, complete at each step.

- **Secure Visitor Entry.** New circulation, facilities and equipment allows enhanced screening of visitors, in accordance with new security policies and procedures.
- **Gradual Growth.** Growth in laboratory, office and support needs will be gradual over the 20-year period, based on anticipated programs and in line with historic NIST growth patterns.
- **Modernized General Purpose Laboratories.** Complete renovation of the original General Purpose Laboratory Buildings (GPLs), built in 1966, will provide the improved environments necessary for advanced measurement science and research.
- **Specialty Research Buildings.** Specialty laboratory facilities are constructed as additions to existing buildings or new structures, in response to specific research programs.
- **Adaptive Reuse.** Several original General Purpose Laboratory Buildings are renovated for computer laboratory and office occupancy, in lieu of constructing new office buildings.
- **Connected Buildings.** New research buildings are within the campus core and linked into the interior pedestrian concourse, for flexible assignments and easy collaboration.
- **Enhanced Conference and Visitor Facilities.** The conference center is expanded, and the library and museum updated to support larger conferences, modern research methods, collaboration and campus security.
- **Historic Preservation.** The campus has been determined eligible for listing in the National Register of Historic Places as a historic district. The Master Plan has considered the campus' character defining features and recognizes that each future development and/or redevelopment action will be governed by the National Historic Preservation Act of 1966 (as Amended) and through NIST's conscientious application of the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.
- **Consolidated Shipping and Receiving.** New Gate F facilities provide for secure commercial vehicle screening, consolidated transfer of materials and deliveries, while significantly reducing commercial vehicle traffic within the campus.
- **Pedestrian Circulation.** Pedestrian circulation is enhanced by adding sidewalks and creating a pleasant walkway from the core buildings to Building 301 and the future CCT transit stop. A new recreational path encircles the entire campus.

Highlights

- **Coordinated Parking Strategy.** The Master Plan gradually reduces the parking per employee ratio over time as the staff grows. This assumes the completion of the state sponsored hiker-biker-trail as well as the Corridor Cities Transitway (CCT) along Quince Orchard Road. The new research buildings proposed for the third construction phase will be built on existing surface parking lots, which will then be replaced with an efficient parking structure.
- **Energy Conservation Emphasis.** Planned renovations to the original campus buildings will refurbish the uninsulated facades, and replace aging mechanical systems with modern energy-efficient/conserving systems. A new solar field will augment the several existing on-site solar arrays. The new warehouse and other non-lab buildings have net-zero energy use as a goal.
- **Natural and Sustainable Campus.** The Plan emphasizes natural and sustainable landscapes, introducing native and adapted vegetation for easy maintenance, a coordinated stormwater management strategy and the creation of additional landscaped seating and recreation areas.
- **Flexible, Incremental Growth and Change.** The Plan allows facilities to be added incrementally, as needed and financed when federal funding permits, each being linked to an established circulation and utility network.

A. Celebrating Courtyards

Alternative A configures new research buildings within the core to create courtyards that can be developed into neighborhood outdoor spaces. These new research buildings establish two courtyards adjacent to the GPLs, one centered around the Advanced Measurement Laboratory and the second around GPL Buildings 227 and 226. A new administrative office building is located to the west of Building 304. This would relate to Building 301, which houses other administrative office space, establishing an east-west administrative zone for added connectivity and flexibility. The alternative renovates the GPLs and adds three office/collaborative space additions recommended in the Research Facilities Strategic Plan.

Exhibit 9: Alternative A Diagram



Exhibit 10: Alternative A Plan



B. Extending Connections

Alternative B recognizes the importance of NIST's internal concourse, and ties all new buildings into this pedestrian spine, extending it both north and south. This approach extends the pattern of the original campus plan by adding research buildings stepping to the north beyond Building 227. This brings buildings closer to the Gate A entrance, suggesting a pedestrian path from the gate to an employee entrance. Expansion for the Advanced Measurement Laboratory can link directly into the circulation system of Building 216. An office building for administration is located on an existing central parking lot, tying into the circulation spine near Building 223. Like Alternative A, the GPLs are renovated with several office additions.

Exhibit 11: Alternative B Diagram

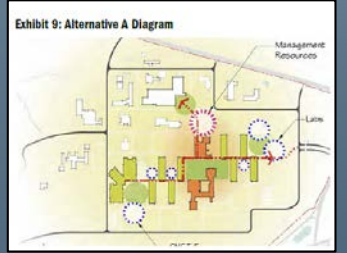


Exhibit 12: Alternative B Plan



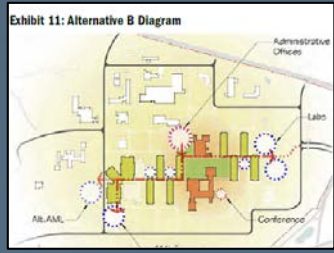
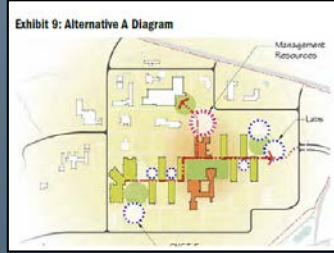
C. Creating a New Precinct

Alternative C clusters new research and administration buildings in a new neighborhood, established to the south of South Drive. Both the research and administration facilities are in the new precinct, as well as shared amenities and services that can be shared with the specialized laboratory occupants in the southern campus. The development and size/shape of the new buildings is flexible; they could be connected to the NIST internal concourse. The GPLs are renovated, but no additions are built.

Exhibit 13: Alternative C Diagram



Exhibit 14: Alternative C Plan



D. Capturing the Center

Alternative D concentrates buildings in the center of campus, emphasizing proximity and assignment flexibility. The location takes advantage of the existing central services. New research buildings are built to the south of Building 304, on the current parking lots, and connected into the pedestrian circulation spine near Building 223. A portion of roadway is removed for a pedestrian walkway to the administrative office building, west of Building 304 and near the other administrative offices in Building 301. This alternative renovates the GPLs and adds three office/collaborative space additions recommended in the Research Facilities Strategic Plan. Advanced Measurement Laboratory expansion is adjacent to the existing facility.



Exhibit 15: Alternative D Diagram

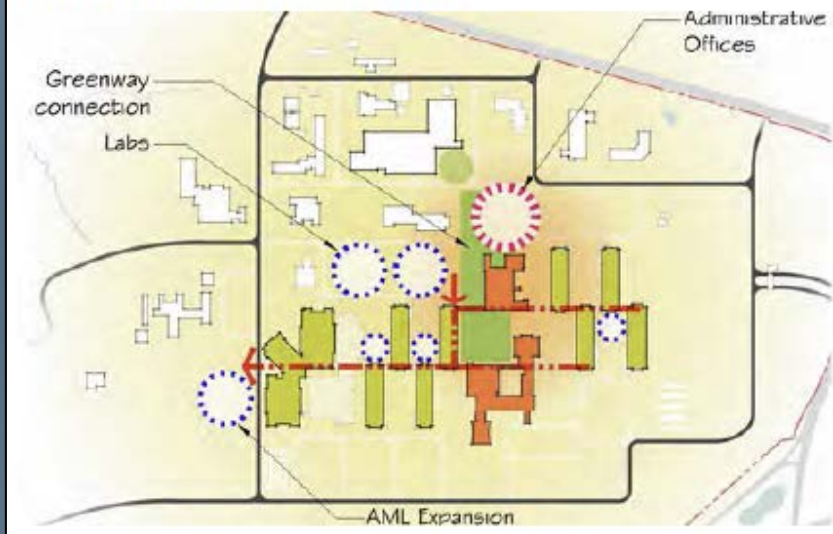


Exhibit 16: Alternative D Plan



Exhibit 9: Alternative A Diagram



Exhibit 11: Alternative B Diagram



Exhibit 13: Alternative C Diagram



E. Functional Organization

Alternative E constructs lab-only and office-only buildings, linked to other facilities in the GPLs. This alternative is a program variation of Alternative D, in which the new research buildings contain only laboratories and their support, with the office space for researchers located in adjacent GPLs. Non-laboratory organizations now located in GPLs, would move to a new administration building. The approach maintains the cluster of new facilities in the campus center, and it builds more office space than laboratory space.



Exhibit 17: Alternative E Diagram

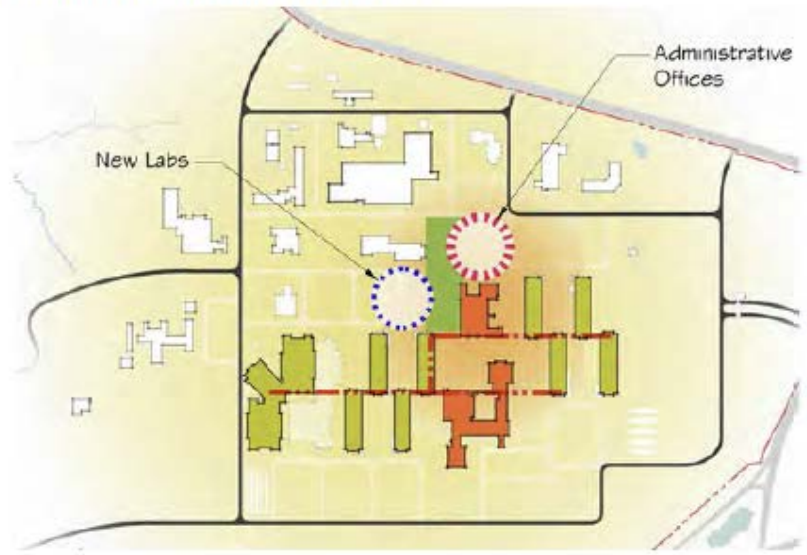
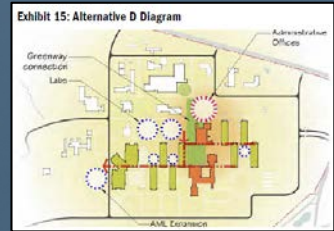
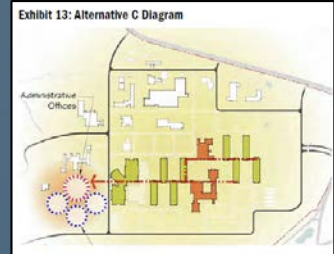
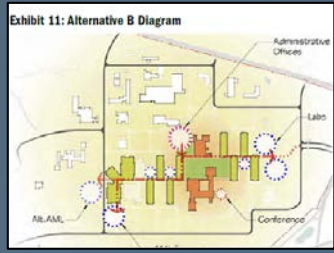
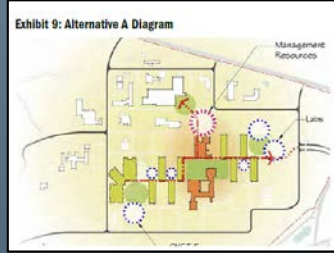


Exhibit 18: Alternative E Plan



F. Emphasizing Research

Alternative F concentrates research buildings in the center of campus, and emphasizes office space rather than new laboratories in GPL renovations. All new construction is for research, with its support and office areas. New research buildings are clustered in the center of campus, and like other alternatives, linked into the NIST pedestrian concourse. To accommodate the needed laboratory space, another research building is shown at the northern end of the concourse. The AML expansion would be adjacent to its related complex. Administrative office space is housed in renovated GPL buildings, which yield more usable square feet when renovated for this use.

NIST-Preferred



Exhibit 19: Alternative F diagram



Exhibit 20: Alternative F Plan

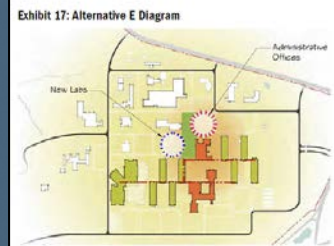
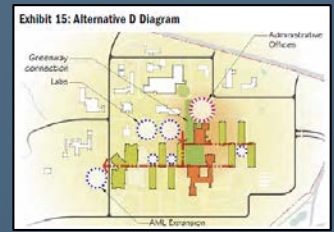
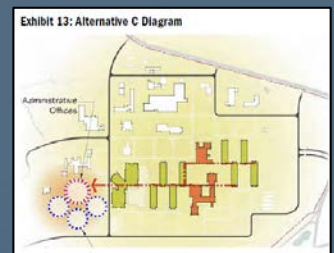
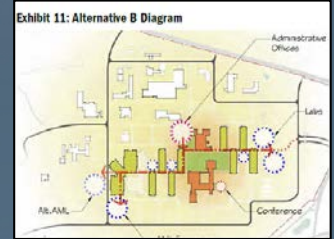
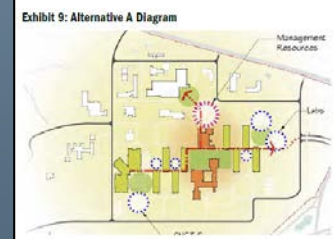
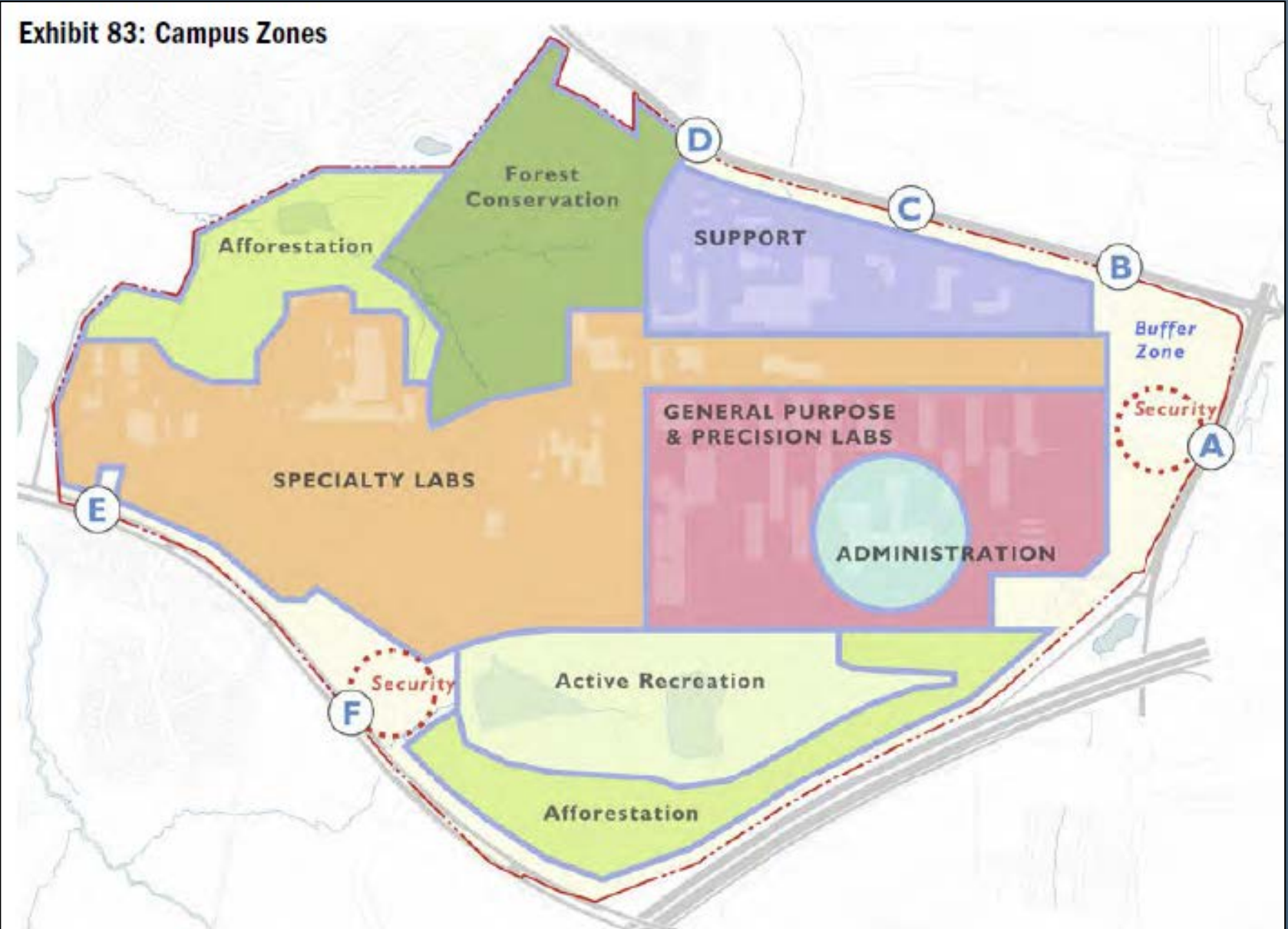


Exhibit 83: Campus Zones



Fast Facts		
	2016	20-Year
Personnel	4,007	5,106
Buildings	62	72
Square Footage—GSF	3,641,215	5,050,000
Parking—Potential	3,704	3,979



1. Minimal East Drive Alterations

For Option 1, all vehicles enter at East Drive. One new facility provides screening for conference attendees and their vehicles on one side, and screening for commercial vehicles on the other. The facility provides for credential screening for all conference attendees plus random selection for full vehicular and personal screening. Commercial vehicles receive full screening before they proceed to a NIST shipping and receiving center. All vehicles, including NIST employees and badge-holders, proceed to a security kiosk to double check their credentials before continuing into the campus. There are rejection lanes at both the initial screening facility and at the security kiosk.



3. East Drive Realignment

Option 3 is a variation on Option 1, with roadway configurations designed to increase the queuing space for both cars and commercial vehicles. The shipping/receiving building is farther removed from the entrance and screening. Like Option 1, the new screening building is designed to screen conference attendees on one side and commercial vehicles on the other, an arrangement that was determined to not meet the functional requirements.

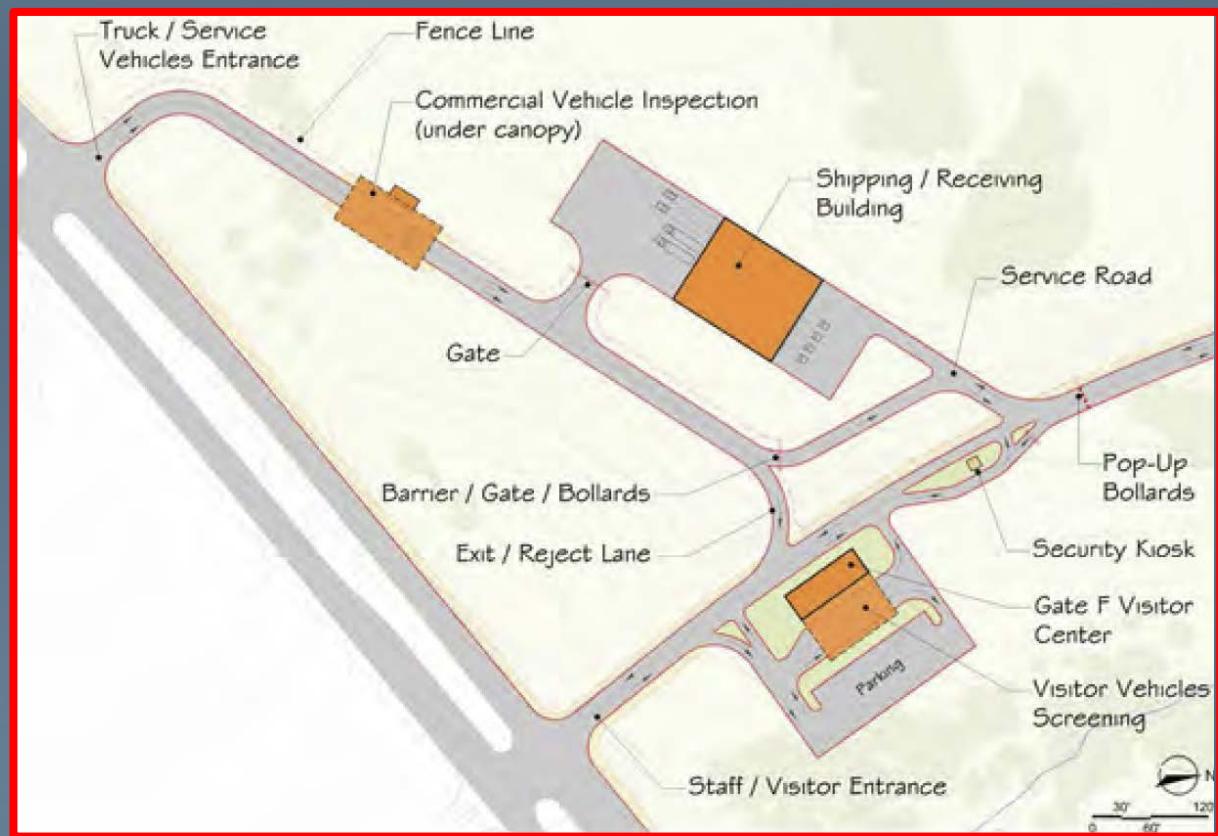


2. New Muddy Branch Entrance

Option 2 creates a new entrance and curb cut for commercial vehicles only, located at a separate Muddy Branch Road intersection to the south of the existing East Drive. This new entrance provides a dedicated commercial vehicle screening facility and more roadway for queuing. The commercial vehicle road leads to the shipping/receiving building, and then to East Drive to exit. Conference attendees and employees enter at the existing East Drive entrance where there is an ID screening facility for the visitors, and a security kiosk to check the credentials of screened visitors and employees.

4. Screening All Visitors

Option 4 is a variation that adds screening capability to Option 2. Today, and in the Master Plan, visitors typically are screened at Gate A, and only large conferences use Gate F for their conference attendees. This Option explored the implications of screening all conference attendees at Gate F, as they would be at Gate A. Visitors enter Gate F at East Drive and proceed to a full screening facility, with a covered pavilion for vehicle screening and an adjacent building with x-ray machines and magnetometers for individual screening. Adjacent is a parking lot for visitors who prefer to leave their car and walk onto campus. Commercial vehicle access and screening is the same as Option 2.



Further Modified NIST-Preferred



4. Screening All Visitors

Option 4 is a variation that adds screening capability to Option 2. Today, and in the Master Plan, visitors typically are screened at Gate A, and only large conferences use Gate F for their conference attendees. This Option explored the implications of screening all conference attendees at Gate F, as they would be at Gate A. Visitors enter Gate F at East Drive and proceed to a full screening facility, with a covered pavilion for vehicle screening and an adjacent building with x-ray machines and magnetometers for individual screening. Adjacent is a parking lot for visitors who prefer to leave their car and walk onto campus. Commercial vehicle access and screening is the same as Option 2.



Exhibit 55: Existing Gate A Conditions



December 2017 Google Earth/Google Maps

Exhibit 56: Recommended Gate A Improvements



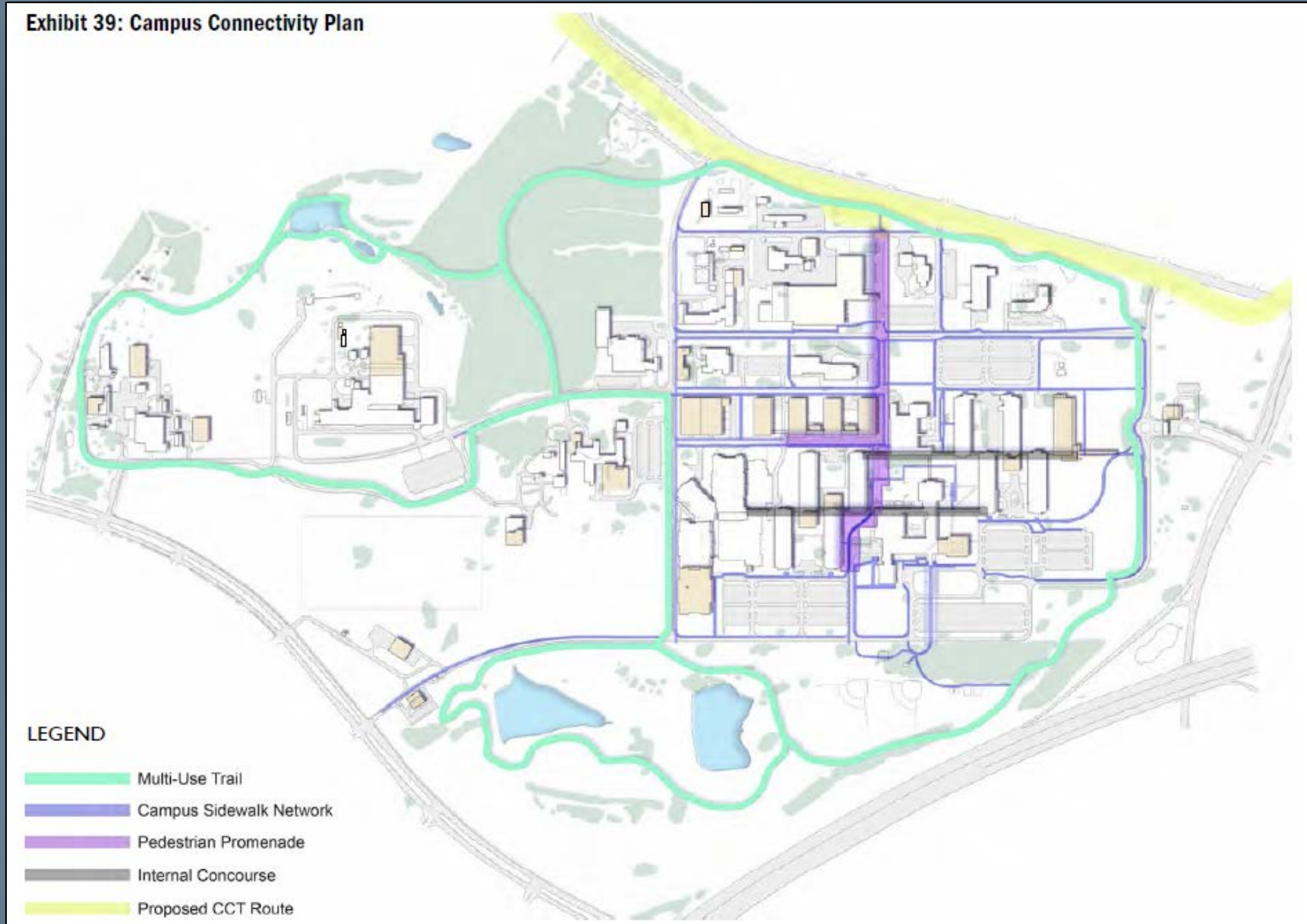
- 1. Storm Water Management.** As the campus expands and modernizes, it will need to meet current storm water management requirements. There are many simple interventions within the landscape that can slow run-off. In this plan those include removing curbs and creating bio-swales, retrofitting parking lots to include small rain gardens, possible building green roof systems, and reforestation.
- 2. Reforestation.** Expanding the canopy cover will create a noise and visibility buffer from highway 270, slow wind speeds, and aid in the absorption of storm water run off.
- 3. Historic Preservation.** NIST developed and relocated from the District of Columbia to its current Gaithersburg campus in the 1960s. Its campus reflects many aspects of suburban research campuses that were prominent in the US from the 1950s-1970s. Many of these elements on site need restoration, protection, or enhancement.
- 4. Connectivity.** This landscape plan seeks to address the site circulation needs—from creating a stronger pedestrian pathway network to incorporating other modes of transportation and recreation into the existing fabric.
- 5. Site Activation.** Establishing a hierarchy of social outdoor spaces will help modernize the campus and respond to the needs of staff and employees in the 21st century who value access to the outdoors.

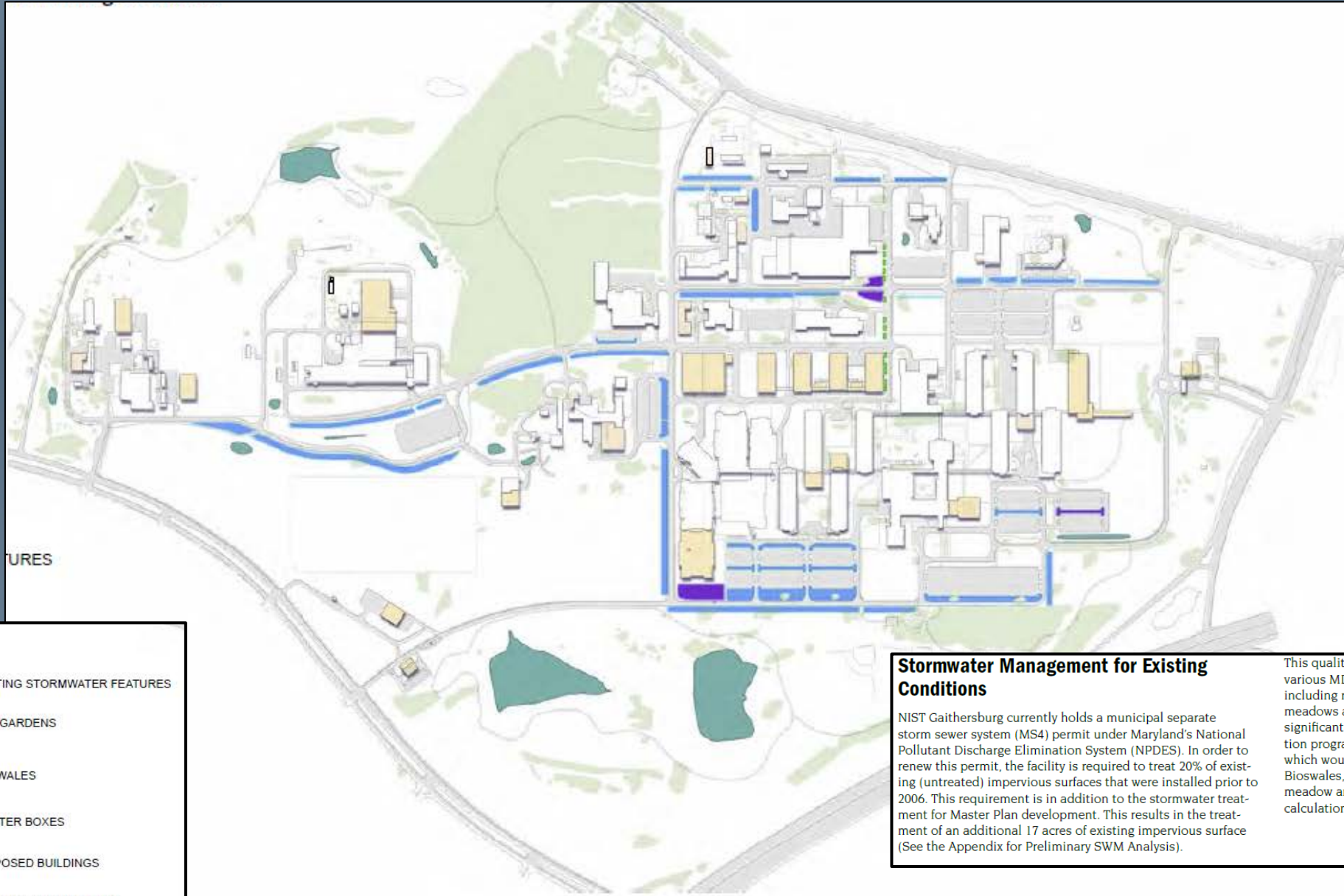


LEGEND

- Pond
- Proposed buildings
- Forest canopy cover
- Increased tree clusters
- Mowed lawn
- Meadow
- Activated core
- Multi-use trail
- Pedestrian network

Exhibit 39: Campus Connectivity Plan





LEGEND

- EXISTING STORMWATER FEATURES
- RAIN GARDENS
- BIOSWALES
- PLANTER BOXES
- PROPOSED BUILDINGS
- EXISTING CANOPY COVER

Stormwater Management for Existing Conditions

NIST Gaithersburg currently holds a municipal separate storm sewer system (MS4) permit under Maryland's National Pollutant Discharge Elimination System (NPDES). In order to renew this permit, the facility is required to treat 20% of existing (untreated) impervious surfaces that were installed prior to 2006. This requirement is in addition to the stormwater treatment for Master Plan development. This results in the treatment of an additional 17 acres of existing impervious surface (See the Appendix for Preliminary SWM Analysis).

This quality requirement can be satisfied through the use of various MDE-approved stormwater management strategies, including reforestation, bioswales, rain gardens, planter boxes, meadows and other structural methods. NIST plans to meet a significant portion of the requirement through their reforestation program. Reforestation of an additional 34 acres is planned, which would satisfy approximately 13 of the needed 17 acres. Bioswales, raingardens, planters and conversion of lawn to meadow are proposed to fulfill the remaining acres. Specific calculations/credits will be determined during design.

Exhibit 47: Reforestation Plan



- LEGEND**
- Existing Tree Canopy
 - Proposed Reforestation
 - Increased Tree Clusters
 - Proposed Buildings

Appropriate species for Reforestation

- Tulip Poplar, *Liriodendron tulipifera*
- White Oak, *Quercus alba*
- Southern Red Oak, *Quercus falcata*
- Northern Red Oak, *Quercus rubra*
- Black Oak, *Quercus velutina*
- Sassafras, *Sassafras albidum*
- Sweet Gum, *Liquidambar styraciflua*
- Beech, *Fagus grandiflora*
- Pignut Hickory, *Carya florida*
- Black Cherry, *Prunus serotina*
- Sycamore, *Platanus occidentalis*
- River Birch, *Betula nigra*
- Red Maple, *Acer rubrum*
- Dogwood, *Cornus florida*
- Shadbush, *Amelanchier arborea*



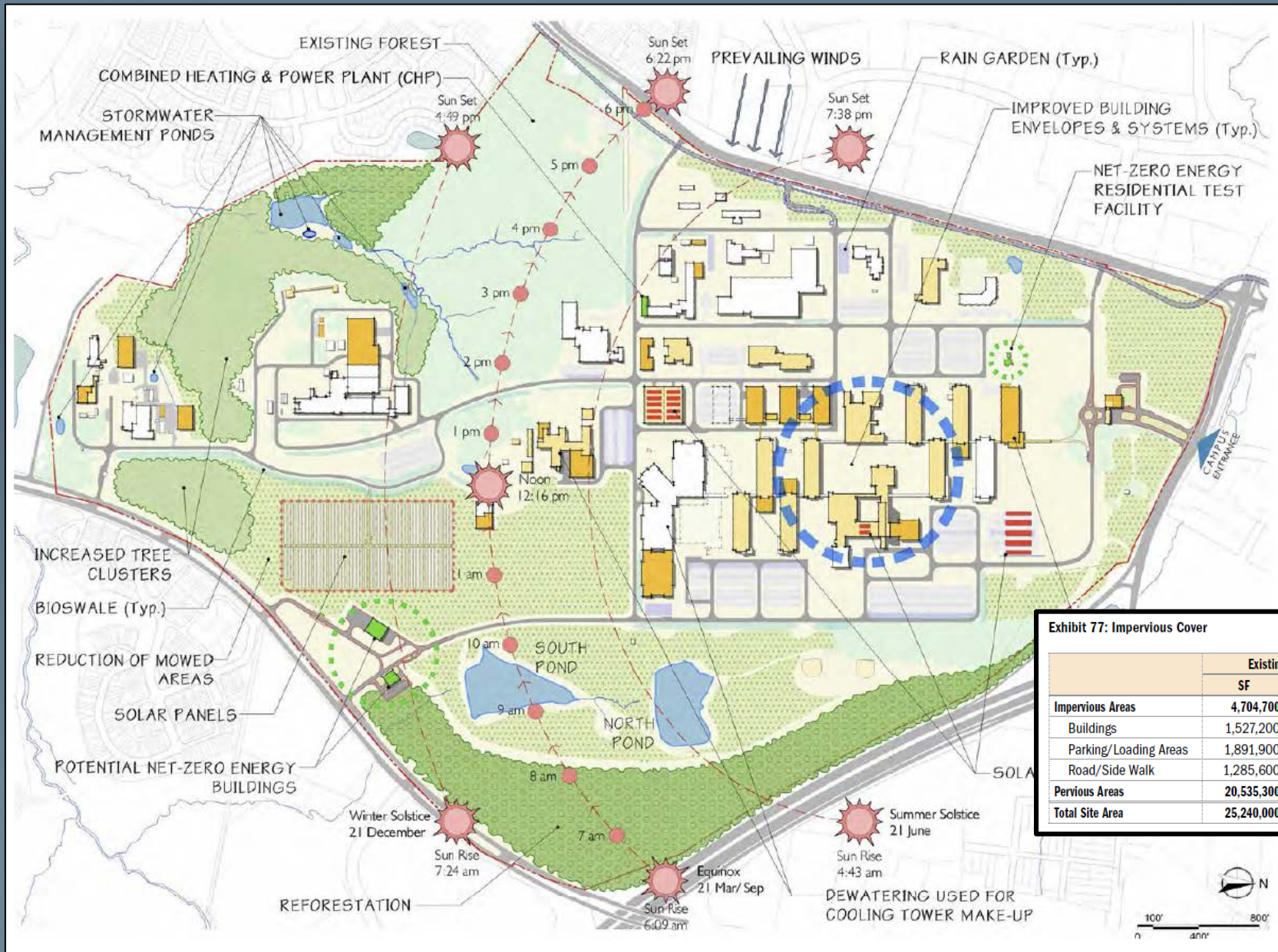


Exhibit 77: Impervious Cover

	Existing		Phase 1		Phase 2		Phase 3		Independent Phases	
	SF	Acres	SF	Acres	SF	Acres	SF	Acres	SF	Acres
Impervious Areas	4,704,700	108	4,897,500	112	5,031,800	116	5,136,700	118	5,432,500	125
Buildings	1,527,200	35	1,636,300	38	1,684,900	39	1,865,500	43	1,921,500	44
Parking/Loading Areas	1,891,900	43	1,913,700	44	1,923,000	44	1,822,200	42	1,825,100	42
Road/Side Walk	1,285,600	30	1,347,500	31	1,423,900	33	1,449,000	33	1,685,900	39
Pervious Areas	20,535,300	471	20,342,500	467	20,208,200	464	20,103,300	462	19,807,500	455
Total Site Area	25,240,000	579								

Exhibit 40: Campus Activation



LEGEND

- Pedestrian Promenade/ East-West axis
- Permanent programmed space
- Temporary programmed space

Sample Programmed Social Spaces

Exhibit 41: New Research Buildings II, III, IV

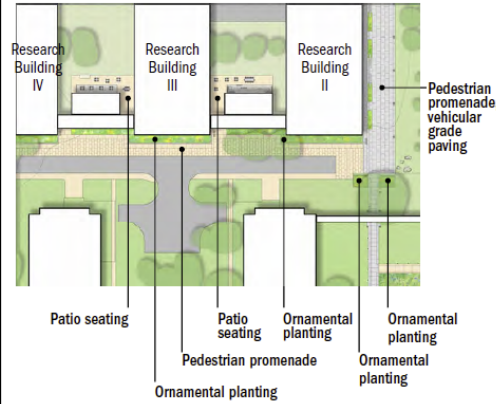


Exhibit 42: Temporary Courtyard Activation

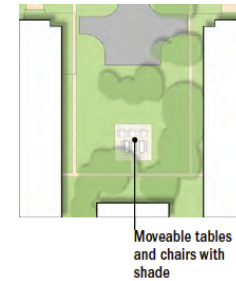
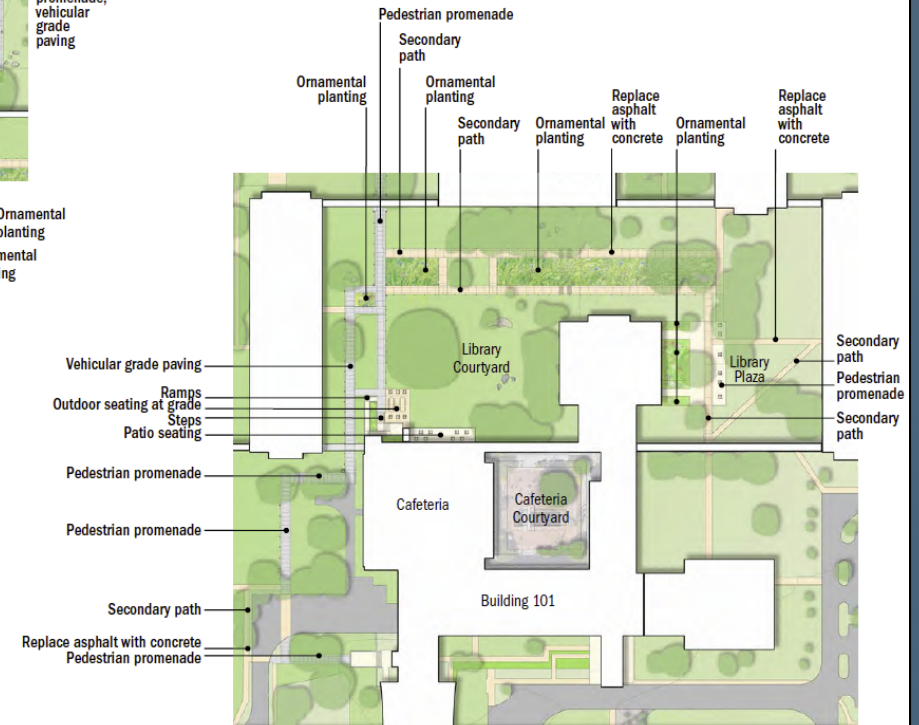


Exhibit 43: Building 101 Courtyard



Gaithersburg Campus Master Plan

PHASE 1: IMMEDIATE PRIORITIES

Exhibit 79: Priority Phase Diagram



PHASE 1: IMMEDIATE PRIORITIES

Exhibit 79: Priority Phase Diagram



PHASE 2: NEXT-STEP PROJECTS

Exhibit 80: Phase 2 Diagram



PHASE 1: IMMEDIATE PRIORITIES

Exhibit 79: Priority Phase Diagram



PHASE 2: NEXT-STEP PROJECTS

Exhibit 80: Phase 2 Diagram



PHASE 3: PROGRAM EXPANSION PROJECTS

Exhibit 81: Phase 3 Diagram



PHASE 1: IMMEDIATE PRIORITIES

Exhibit 79: Priority Phase Diagram



PHASE 2: NEXT-STEP PROJECTS

Exhibit 80: Phase 2 Diagram



PHASE 3: PROGRAM EXPANSION PROJECTS

Exhibit 81: Phase 3 Diagram



INDEPENDENT PROJECTS

Exhibit 82: Independent Phases



Exhibit 51: Modal split based on Survey Responses

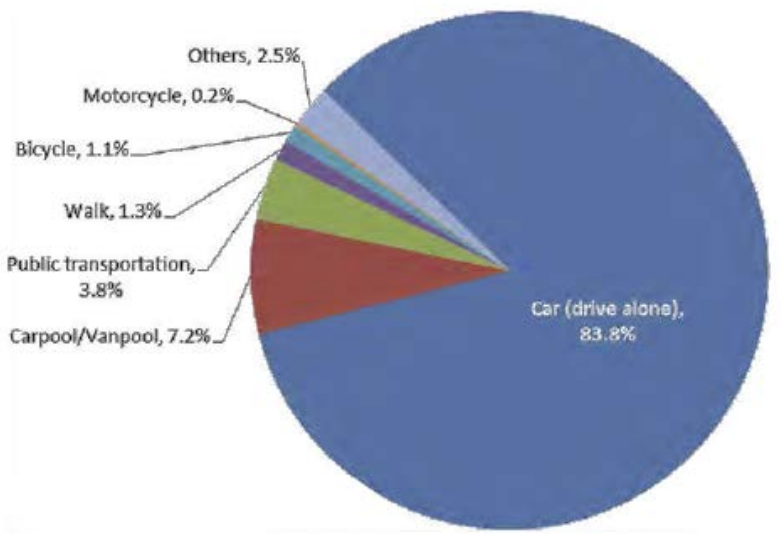


Exhibit 64: Residential Zip Code Map for NIST Employees

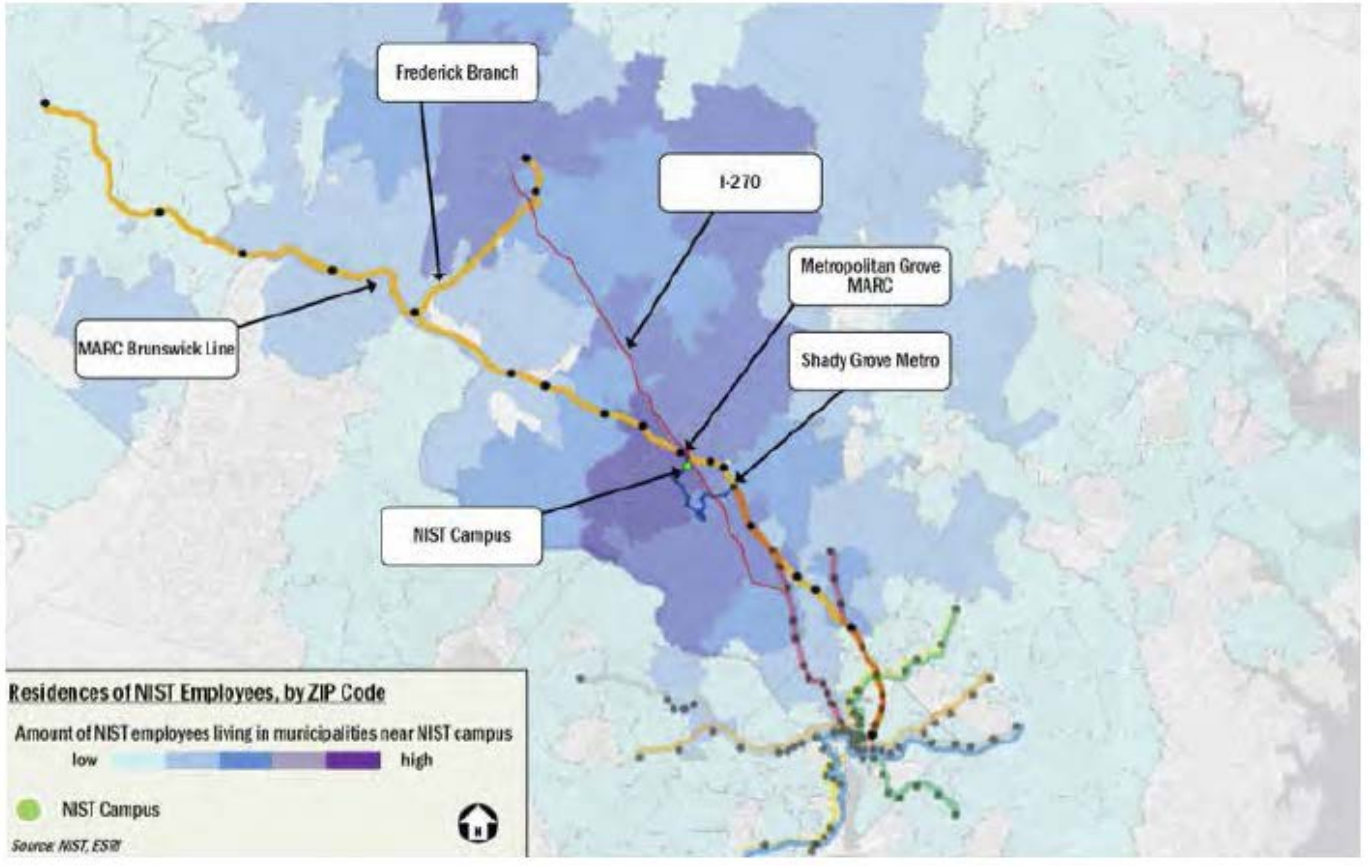


Exhibit 63: Travel Times from Major Stations to NIST Campus

Station	Via MARC to Metropolitan Grove & NIST Shuttle*	Via Washington Metro to Shady Grove & NIST Shuttle**	Via Future Corridor Cities Transitway	Via Auto (time during peak hour)***
Metropolitan Grove	7 minutes	-	5 minutes	5-10 minutes
Shady Grove	-	15 minutes	33 minutes	9-20 minutes
Union Station	46 minutes	57 minutes	44-75 minutes	40-60 minutes
Silver Spring	34 minutes	72 minutes	32-90 minutes	25-40 minutes
Rockville	12 minutes	19 minutes	10-37 minutes	15-30 minutes
Germantown	14 minutes	-	12 minutes	12-25 minutes
Tysons Corner	-	84 minutes	102 minutes	25-40 minutes
Gallery Place-Chinatown	-	56 minutes	74 minutes	35-50 minutes
Frederick	54 minutes	-	52 minutes	30-60 minutes
Harpers Ferry	56 minutes	-	54 minutes	50-85 minutes

*Shuttle from Metropolitan Grove is approximately 7 minutes
 **Shuttle from Shady Grove is approximately 15 minutes
 ***Driving time from Google Maps
 Travel Times do not include dwell time for transfer to shuttle

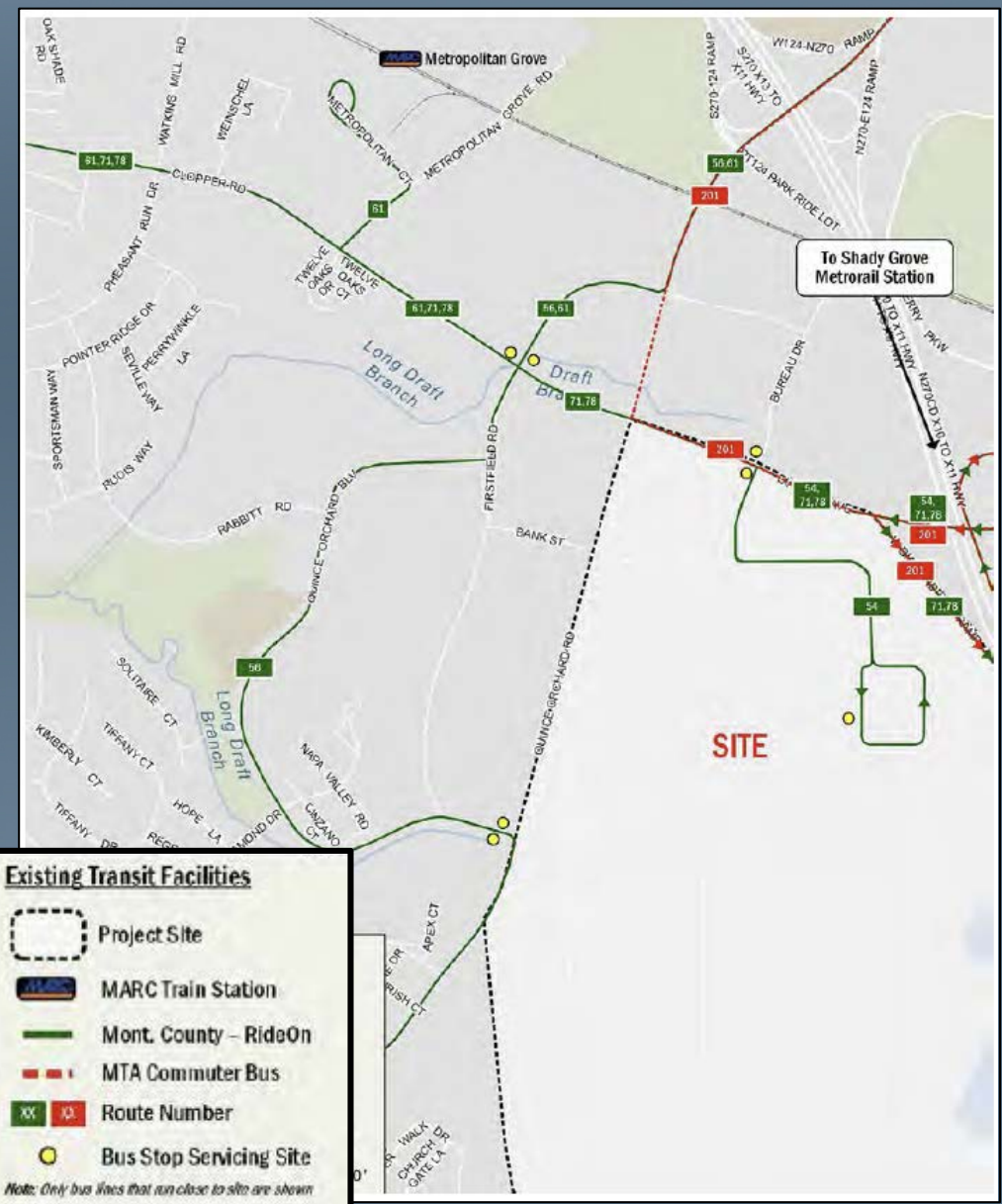


Exhibit 143: Trails

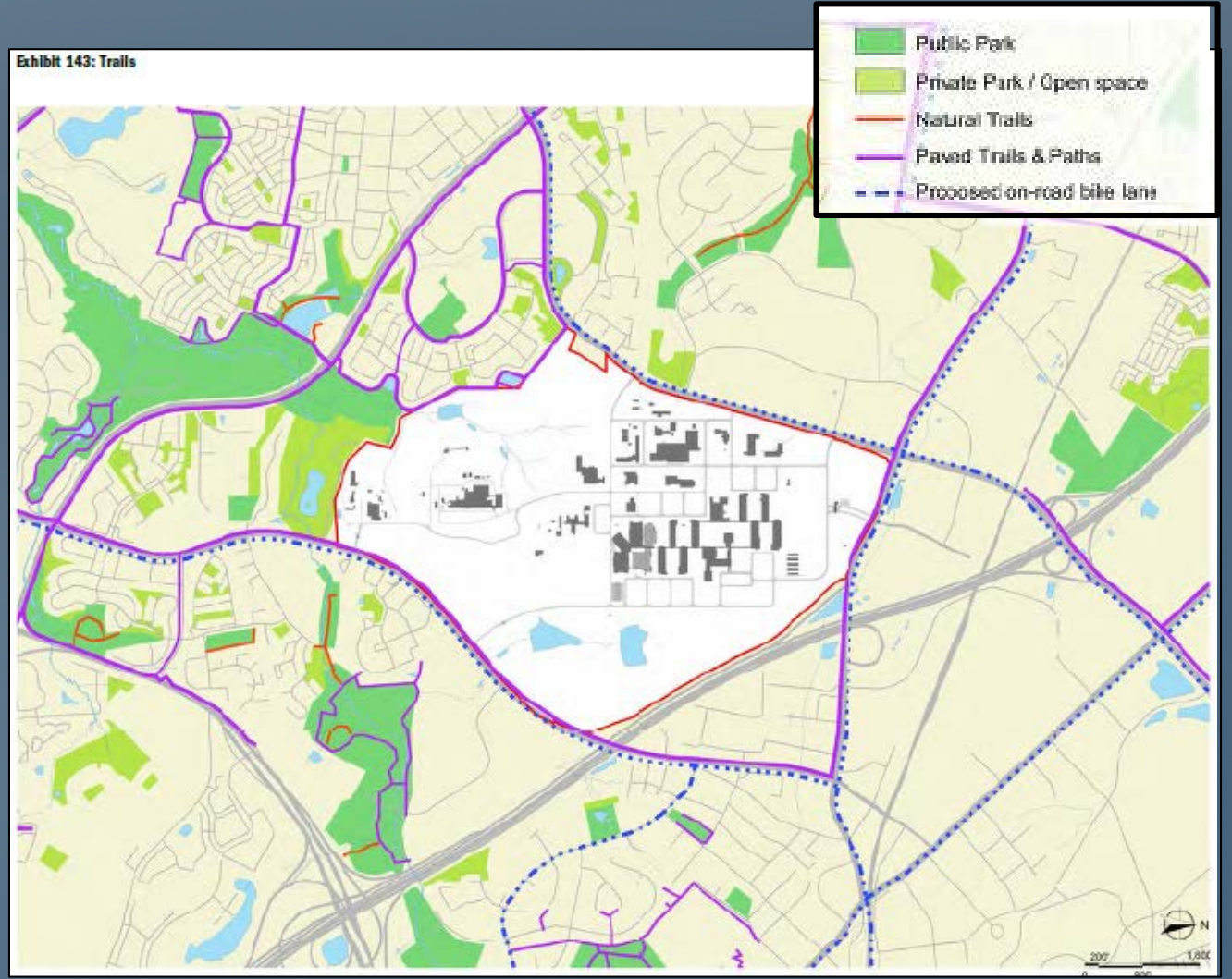


Exhibit 100: Transit Circulation

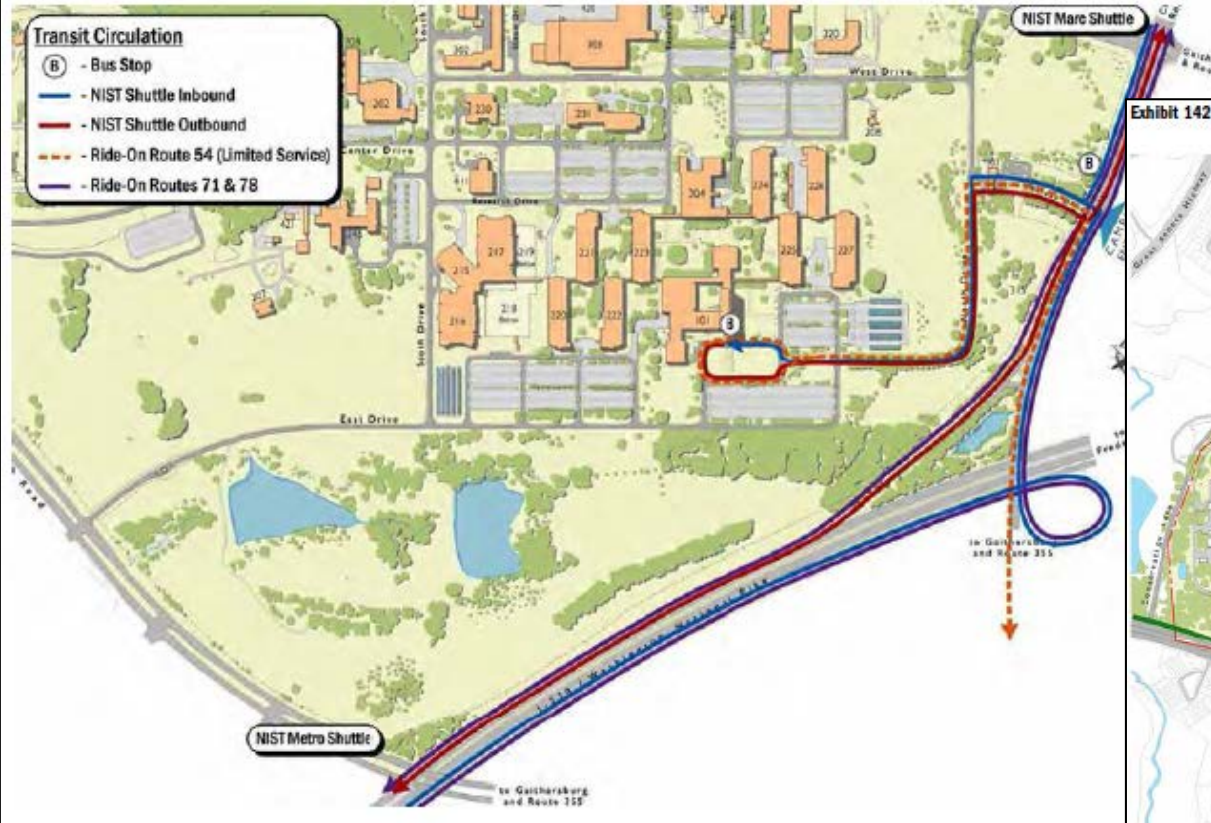


Exhibit 142: Pedestrian/Bicycle Facilities

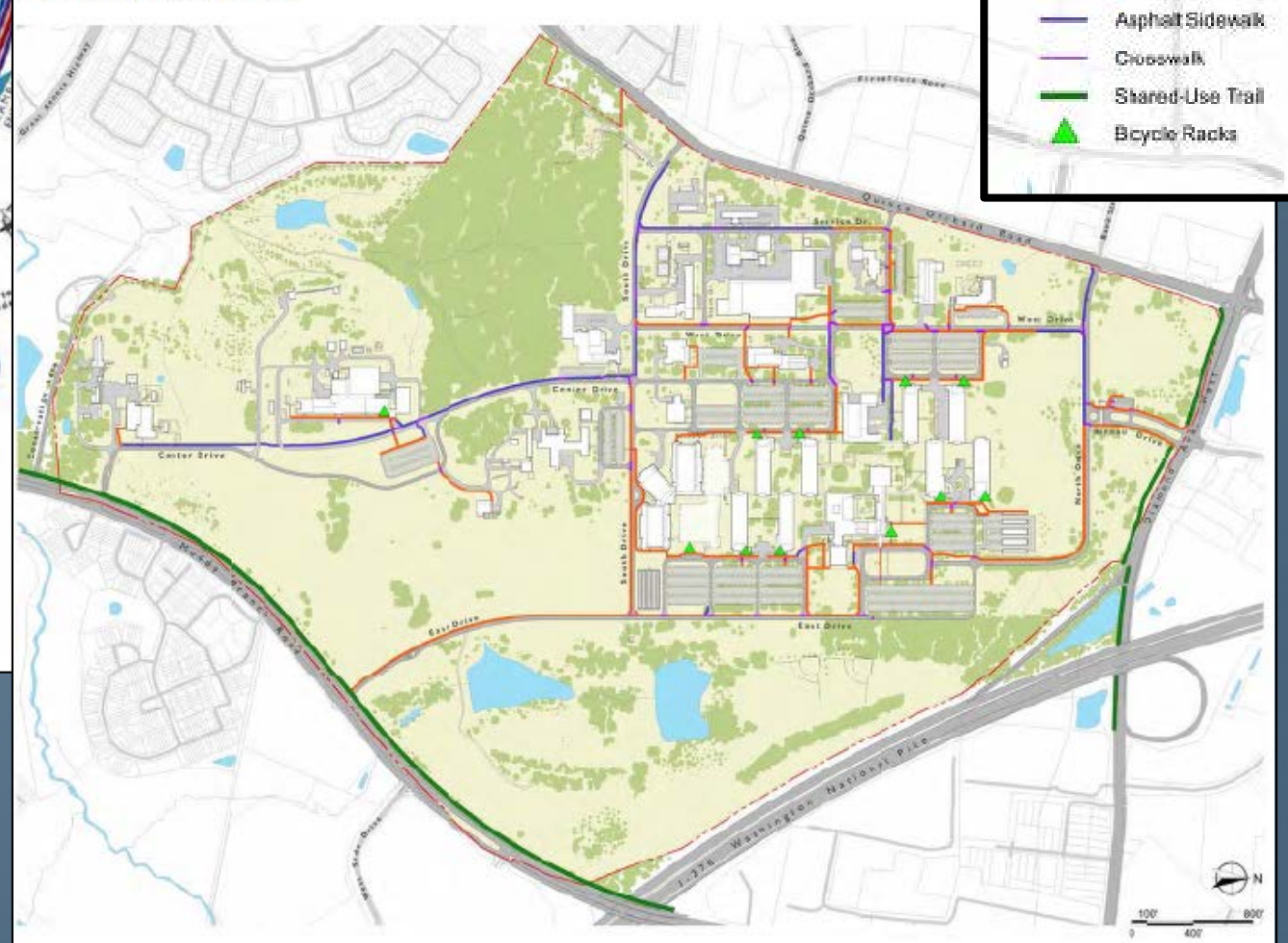
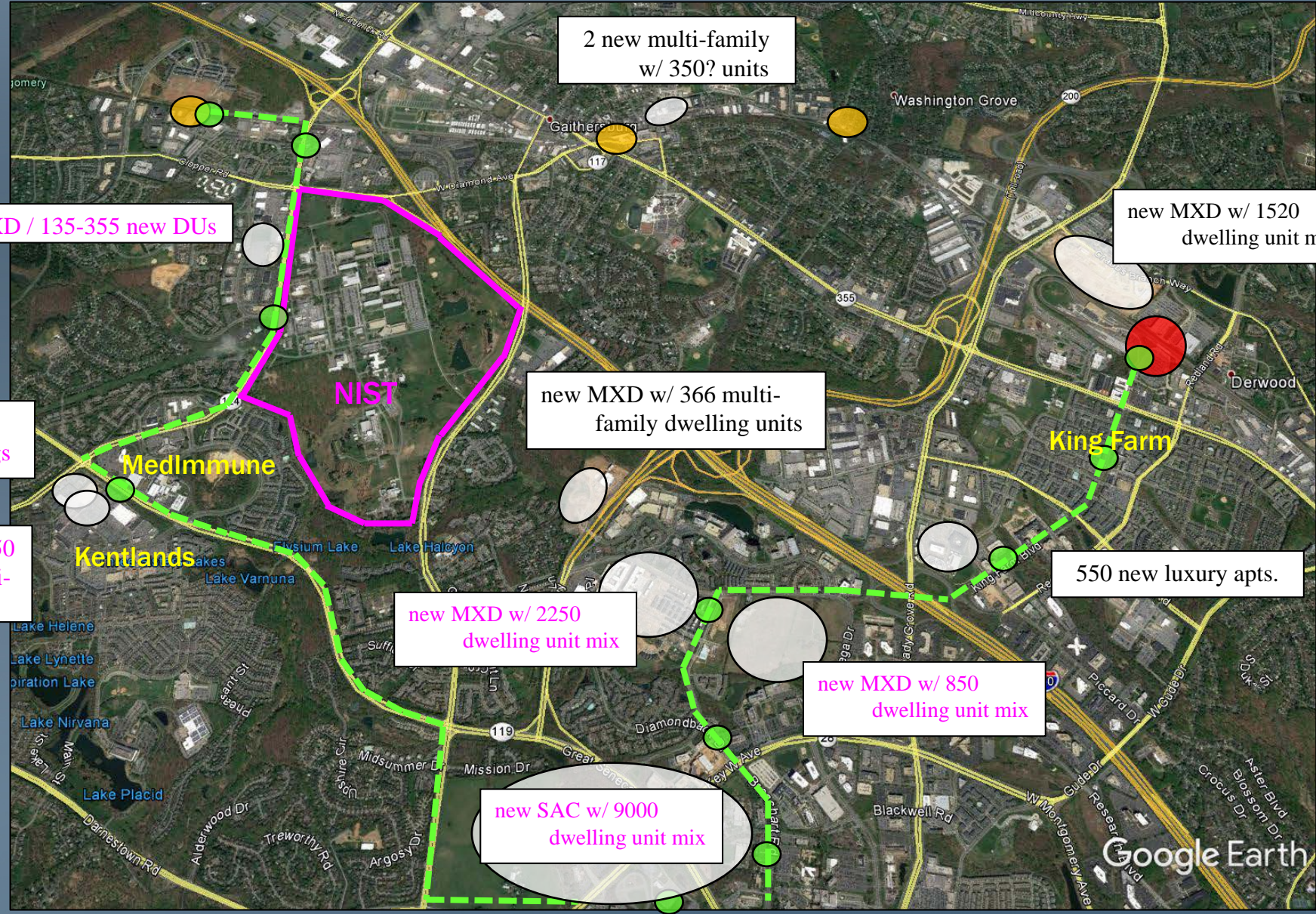


Exhibit 60: Comparison of Vehicle Parking on Conference Days

Day of Collection	Average Day (April 27, 2016)	Conference Day (April 14, 2016)
Total Vehicles	2,621	3,011
Employee/Visitor Vehicles	2,411	2,797
Total Spaces	3,704	3,704
Employee/Visitor Spaces	3,475	3,475



new MXD / 135-355 new DUs

2 new multi-family w/ 350? units

new MXD w/ 1520 dwelling unit mix

3 new multi-family apartment buildings

new MXD w/ 366 multi-family dwelling units

550 new luxury apts.

new MXD / up to 1450 residential multi-family units

new MXD w/ 2250 dwelling unit mix

new MXD w/ 850 dwelling unit mix

new SAC w/ 9000 dwelling unit mix

Google Earth