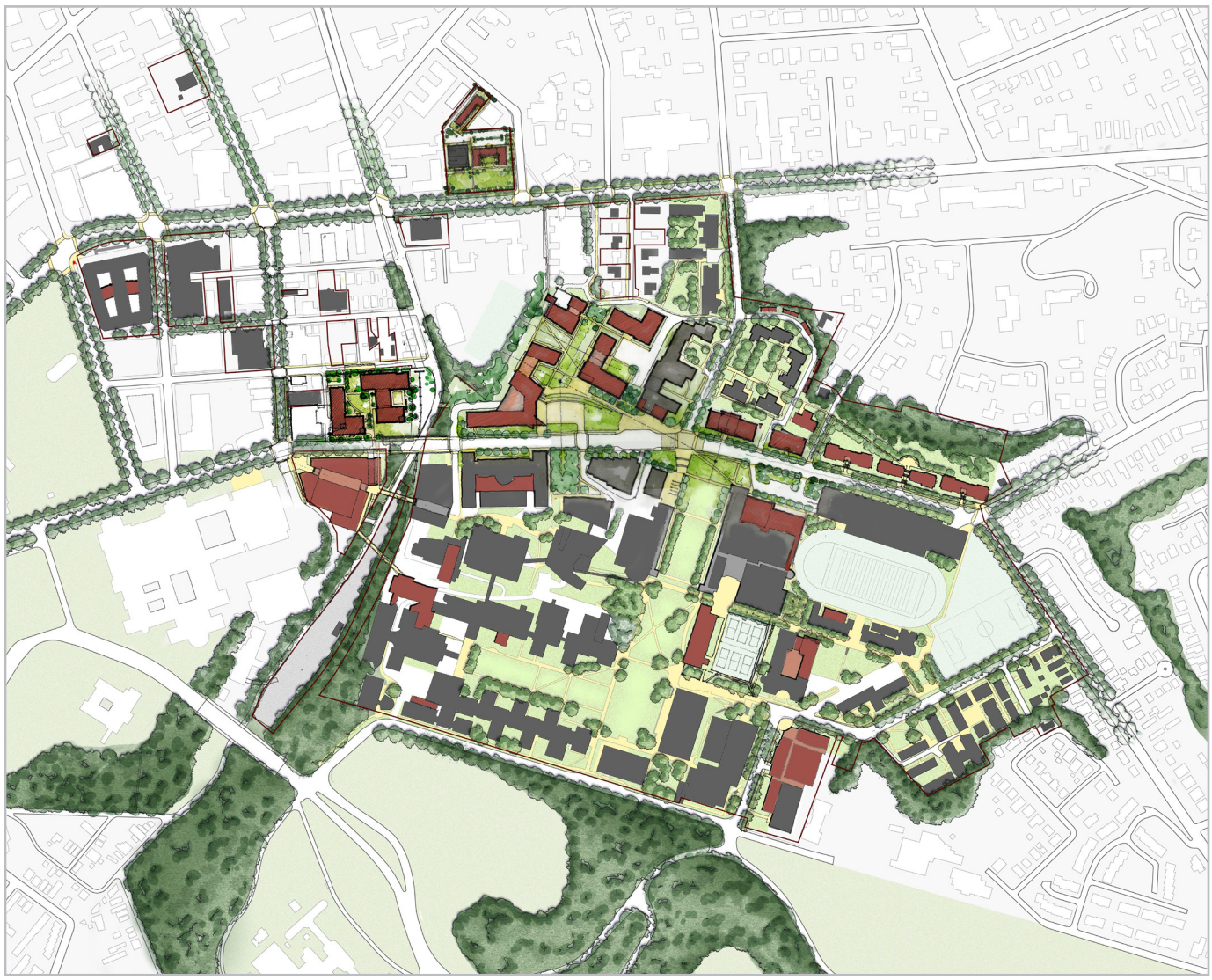
Carnegie Mellon University

INSTITUTIONAL MASTER PLAN

2012

Amended 2015



Carnegie Mellon University

A vision for the future of the campus

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Carnegie Mellon University will meet the changing needs of society by building on its traditions of innovation, problem solving, and interdisciplinarity.

- Carnegie Mellon University Vision

1. INTRODUCTION

1.1 CARNEGIE MELLON UNIVERSITY

1.1.1 Mission

Carnegie Mellon University is a global research university with more than 12,000 students, 84,000 alumni, and 4,000 faculty and staff. Carnegie Mellon is consistently recognized in university ranking studies for its world-class arts and technology programs, collaboration across disciplines and innovative leadership in education.

From its founding as the Carnegie Technical Schools in 1900 by industrialist and philanthropist Andrew Carnegie, Carnegie Mellon University has evolved into what it is today under the guidance of exceptional leadership teams. Our world-renowned faculty members are practicing professionals who bring extensive knowledge and experience into the classroom. With a student-faculty ratio of 10:1, faculty members are extremely accessible and able to take a genuine interest in their students' work.

Carnegie Mellon University consists of seven schools and colleges: Carnegie Institute of Technology (College of Engineering), College of Fine Arts, Dietrich College of Humanities and Social Sciences, Heinz College, Mellon College of Science, School of Computer Science and the Tepper School of Business.

While Carnegie Mellon University maintains a global presence in twelve other countries, most of the university's activities still take place on the 143-acre traditional campus in Oakland, the third busiest commercial district in the Commonwealth of Pennsylvania.

Vision

Carnegie Mellon University will meet the changing needs of society by building on its traditions of innovation, problem solving, and interdisciplinarity.

Mission

- To create and disseminate knowledge and art through research and creative inquiry, teaching, and learning, and to transfer our intellectual and artistic product to enhance society in meaningful and sustainable ways.
- To serve our students by teaching them problem solving, leadership and teamwork skills, and the value of a commitment to quality, ethical behavior, and respect for others.
- To achieve these ends by pursuing the advantages of a diverse and relatively small university community, open to the exchange of ideas, where discovery, creativity, and personal and professional development can flourish.

Inside Gates & Hillman Centers

Mudge House

Connections to the Strategic Plan

The *Institutional Master Plan* provides a clear action plan for the future development of the campus, the setting in which Carnegie Mellon University's students, faculty and staff research and create in an effort to make concrete and sustainable contributions to society. It is both a guiding document for the implementation of Carnegie Mellon University's institutional vision, and a legal document conforming to the City of Pittsburgh Zoning Code.

Through thoughtful planning and exemplary architecture, urban design and landscape management, the *Institutional Master Plan* contributes to the following goals and strategies as laid out in the *2008 Strategic Plan*:

- Create a vibrant environment that enables our faculty, students, alumni and staff to advance the university's vision and mission
- Transition to an environmentally sustainable society and emphasizing environmentally sustainable practices in campus operations and processes
- Improve health and quality of life
- Enhance the capacity of our students to interact productively with others
- Pursue optimal development and use of existing facilities and strategic expansion off-campus

Commencement, Gesling Stadium

Students on the Cut

Aerial view of campus

Aerial view of East Campus

The University Center and Merson Courtyard

Hammerschlag and Roberts Halls

East-West Walkway

2. EXISTING PROPERTY & USES

2.1 OAKLAND CONTEXT

Carnegie Mellon University's main campus is located three miles from Downtown Pittsburgh on a plateau high above the Monongahela River between Oakland, Squirrel Hill and Shadyside.

The second largest commercial center in the Pittsburgh Region, Oakland is a diverse urban environment that includes three universities, five hospitals, two large museums, two commercial districts, several residential neighborhoods and over 40 acres of open green space, including one of Pittsburgh's premier public gathering spaces, Schenley Plaza. Oakland has a vibrant street life and abundant services. There are over 160 businesses in the Oakland Business Improvement District (OBID) alone, and more are located along Craig Street and in several small neighborhood commercial nodes.

Every day, an estimated 100,000 people arrive in Oakland to work, visit or study, mostly along the Fifth and Forbes Avenue Corridor. With another 20,000 residents, Oakland will have up to 120,000 pedestrians circulating on any given day. It also has the city's highest concentration of cyclists, and is well connected to Downtown Pittsburgh and regional destinations by bus. Important regional connectors with access to Oakland are located along the Monongahela River.

With the region's highest concentration of foreign-born workers and of residents between the ages of 20 and 34, Oakland is one of Pittsburgh's most dynamic areas. Carnegie Mellon University, with its 16,000 staff, faculty and students from around the world, is a significant contributor to that vitality.

In spite of the close economic and programmatic ties between Carnegie Mellon and Oakland, there are limited physical linkages across Junction Hollow. Currently, a bridge on Forbes Avenue and on Schenley Drive provide the only vehicular and pedestrian crossing between Oakland and the campus.

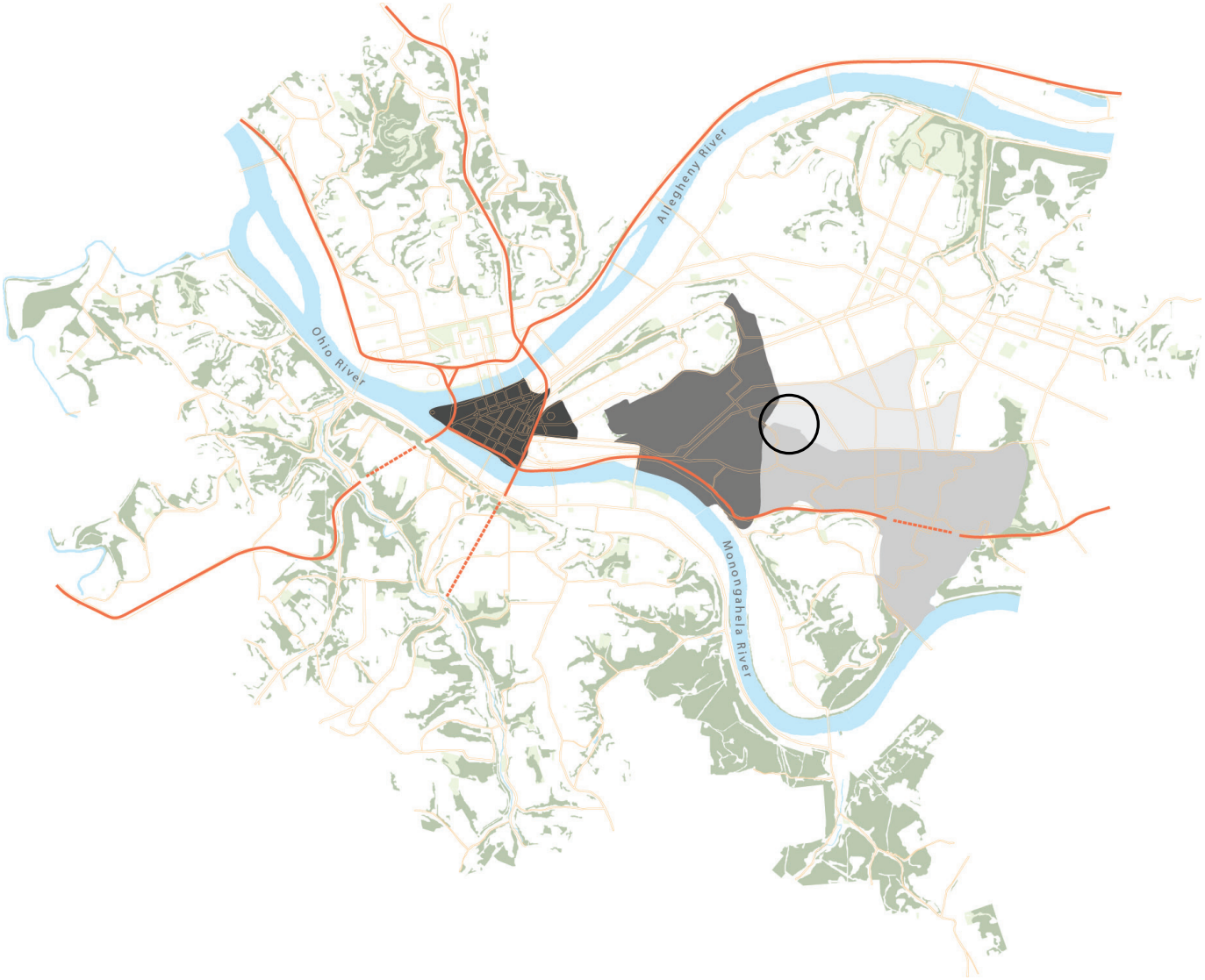
The university is also closely connected to the nearby neighborhoods of Squirrel Hill and Shadyside. Many students, faculty and staff live in these neighborhoods and frequent business and cultural venues in their business districts.

Carnegie Mellon University's Oakland campus is almost entirely car-free. Its buildings and facilities are organized around two large open space axes, the Cut and the Mall. A variety of natural boundaries and unbuilt spaces, from campus greens to steep wooded slopes, streets and pathways, provide an overall framework for the campus' buildings and facilities.

Academic and instructional space is currently located within the Historic Core, East Campus and West Campus districts. Research space is located in the Historic Core and West Campus. Student housing is concentrated in the East Campus and Morewood area. Athletics and recreational facilities are located in the East Campus (see Section 3.5.2 Precincts).

In addition to the main campus on the edge of Oakland, Carnegie Mellon University currently owns or leases buildings in Oakland, Lawrenceville, Downtown, Point Breeze/Larimer and in the Pittsburgh Technology Center (PTC). CMU's Pittsburgh facilities and global locations are found in Appendix C.

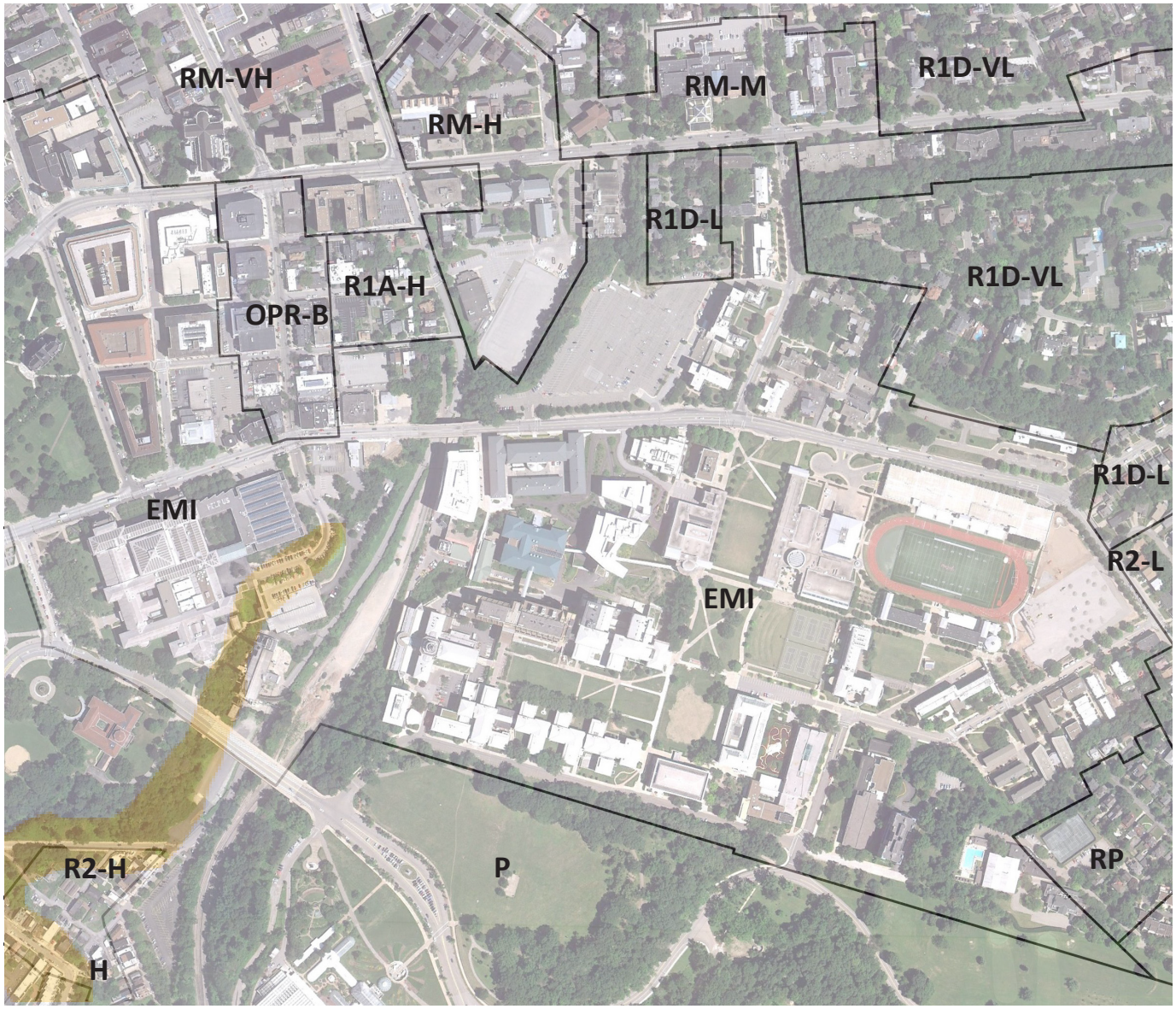
2.1 OAKLAND CONTEXT



City of Pittsburgh

- Carnegie Mellon University
- Oakland
- Squirrel Hill
- Shadyside
- Downtown Pittsburgh
- Regional Connectors
- Arterials
- Parks
- Woodlands

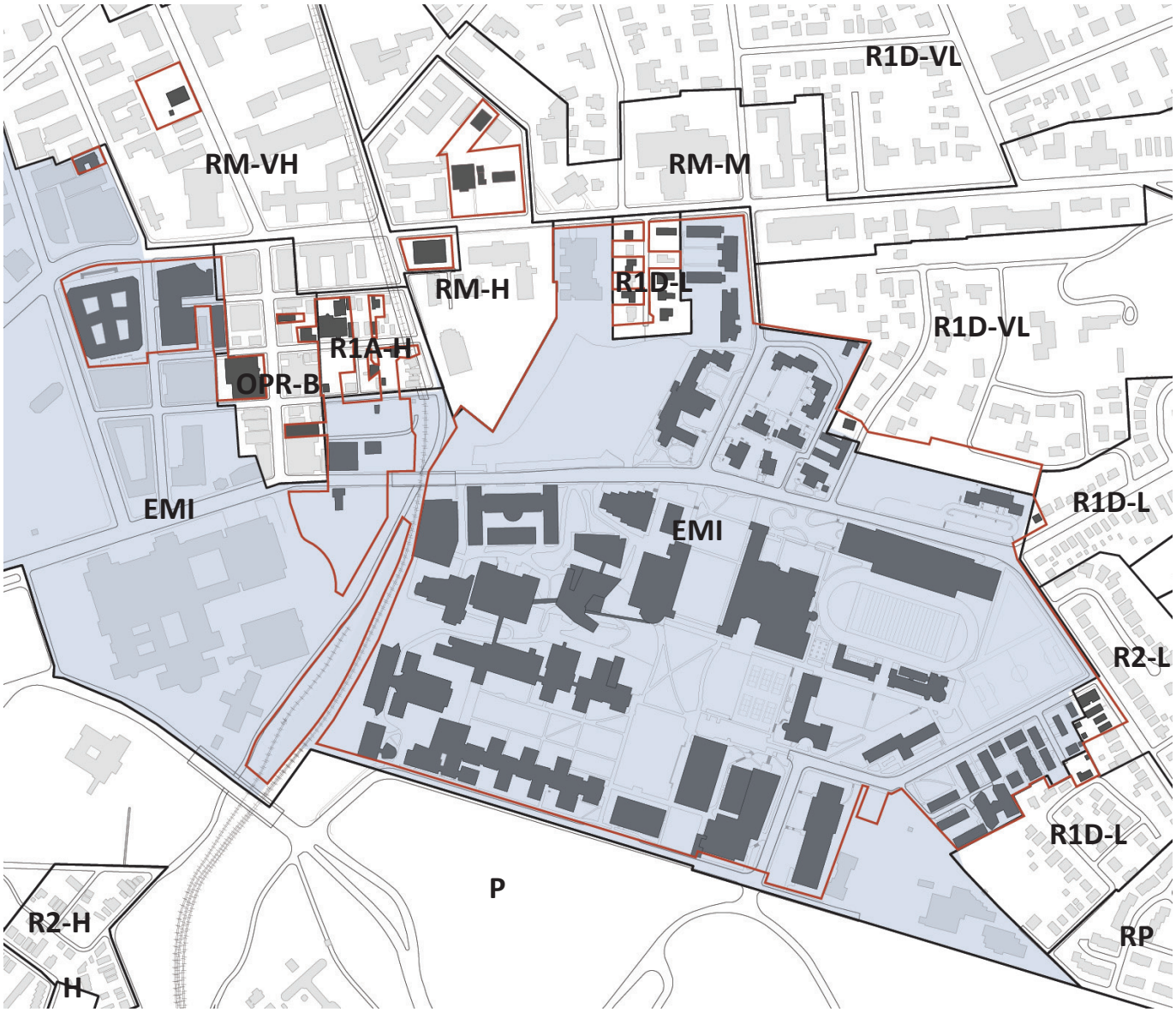
2.2 EXISTING ZONING



City of Pittsburgh Zoning

EMI	Educational Medical Institutional
OPR-B	Oakland Public Realm
P	Park
H	Hillside
RP	Residential Planned Unit Development
R1D-VL	Residential Single-Unit Detached, Very Low Density
R1D-L	Residential Single-Unit Detached, Low Density
R1A-H	Residential Single-Unit, High Density
R2-L	Residential Two-Unit, Low Density
RM-M	Residential Multi-Unit, Moderate Density
RM-H	Residential Multi-Unit, High Density
RM-VH	Residential Multi-Unit, Very High Density
●	SS/O Steep Slope Overlay District (>25%)

2.3 PROPERTIES & MASTER PLAN AREA

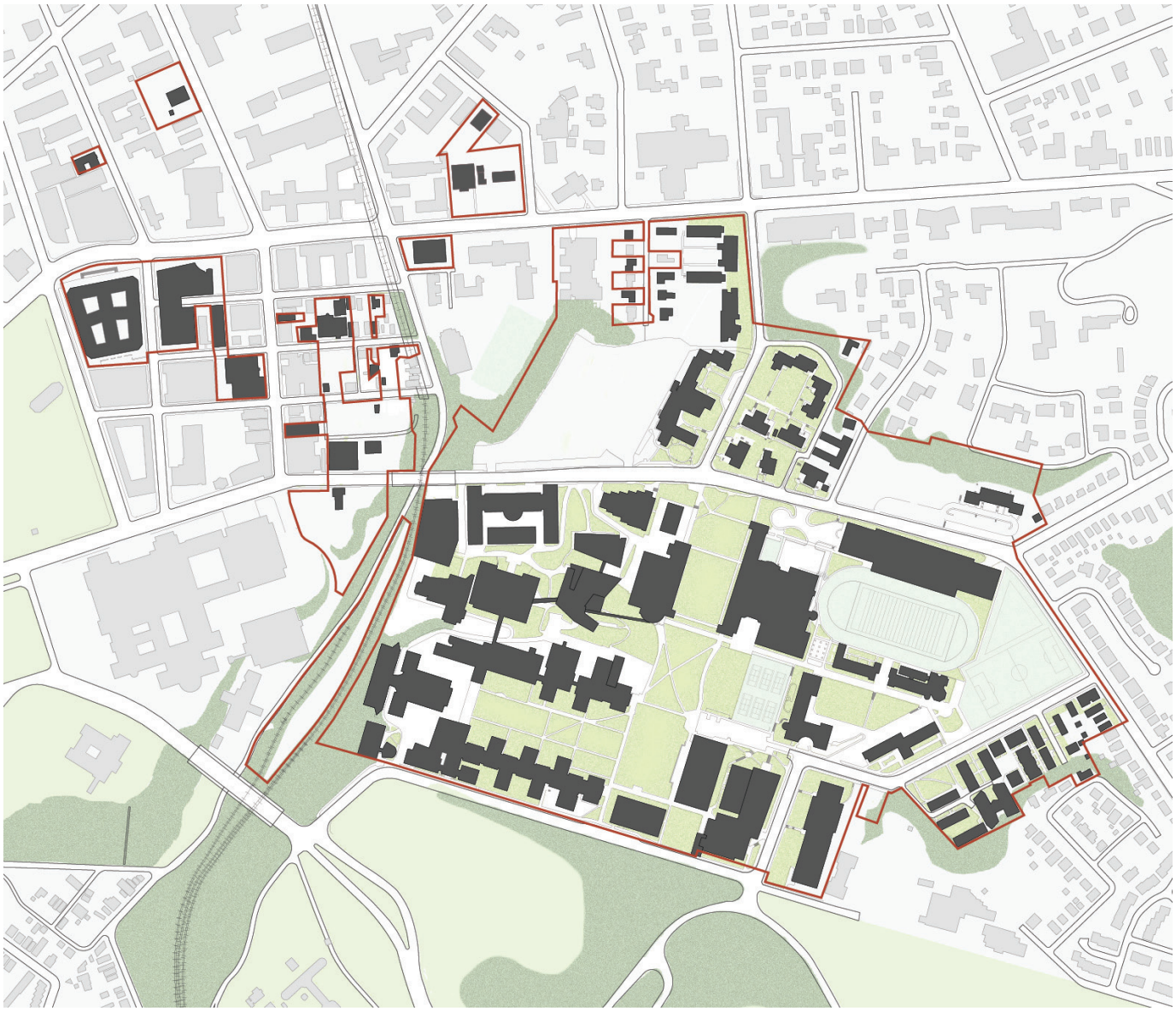


Institutional Master Planning Area

Carnegie Mellon University Property

EMI (Educational Medical Institutional) Zoning District

2.4 EXISTING BUILDINGS



Existing Buildings

CMU Property

CMU Buildings (owned)

2.5 BUILDING USE

Building Use

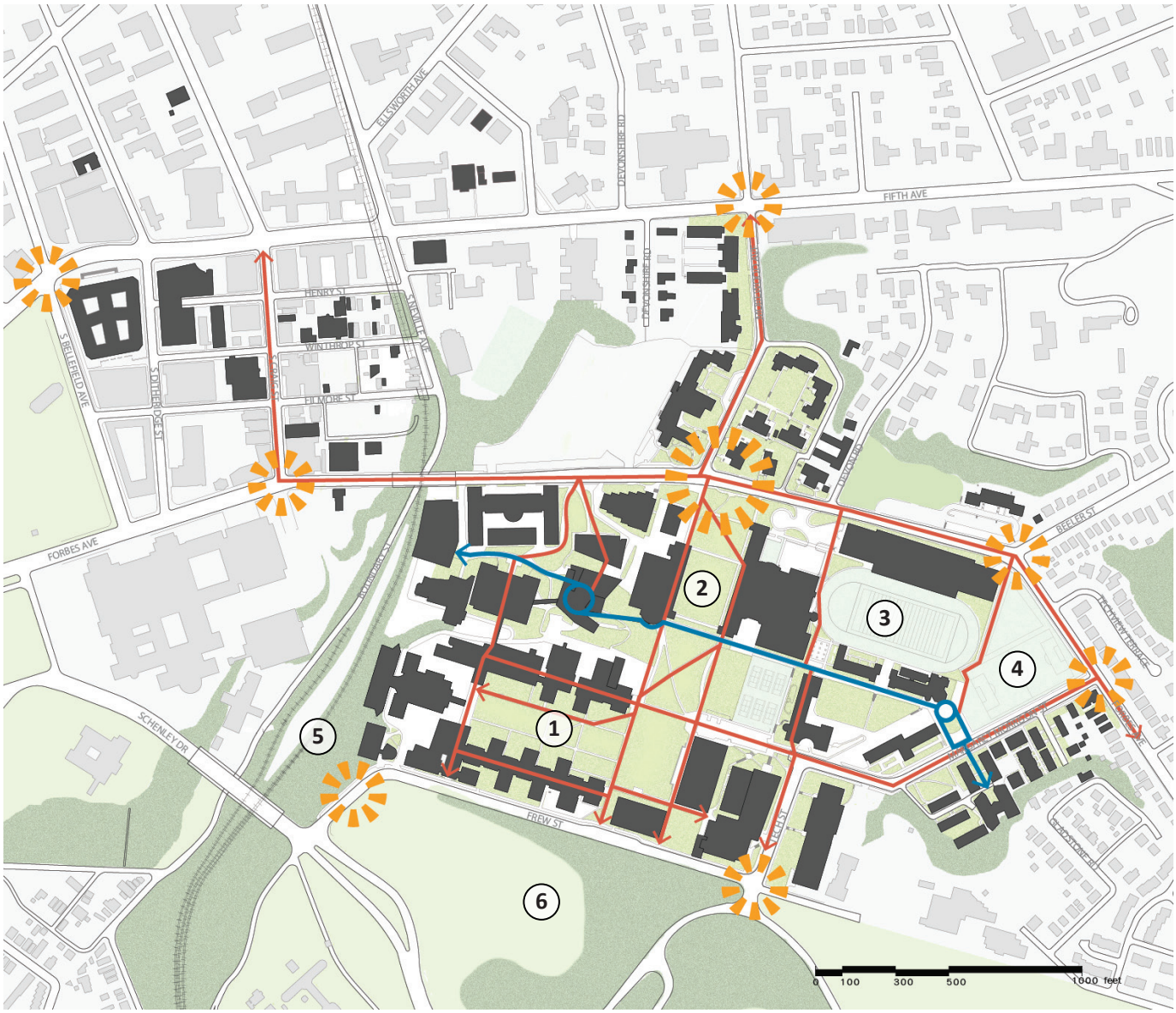
- Academic & Research
- Community & Athletics
- Administrative & Library
- Residential
- Corporate & Commercial
- Structured Parking

2.6 TRANSPORTATION NETWORK

Transportation Network

- Major Arterial
- Collector
- Bike Lane
- On-street Parking
- Signalized Intersection (inside study area)
- Signalized Intersection (outside study area)
- Vehicular Gateway
- Z — Zip Car Parking
- C — Covered Parking
- S — Surface Parking

2.7 OPEN SPACE & PEDESTRIAN CIRCULATION



Open Space & Pedestrian Circulation

- East-West Walkway
- Main Pedestrian Corridors
- Campus Open Space
- Public Parks
- Wooded Slopes
- Pedestrian Gateways

1. The Mall
2. The Cut
3. Gesling Stadium
4. Athletic Fields
5. Junction Hollow
6. Flagstaff Hill (Schenley Park)

2.8 SITE IMPROVEMENTS

The last decade, since the 2002 Campus Master Plan, has been a period of exceptional dynamism and opportunity for Carnegie Mellon University.

Recent investment in the existing campus inventory supports many aspects of the campus, from academics and research to student housing and corporate partnerships. The university's investment from 2000 to 2010 has resulted in significant new construction, additions and major renovations.

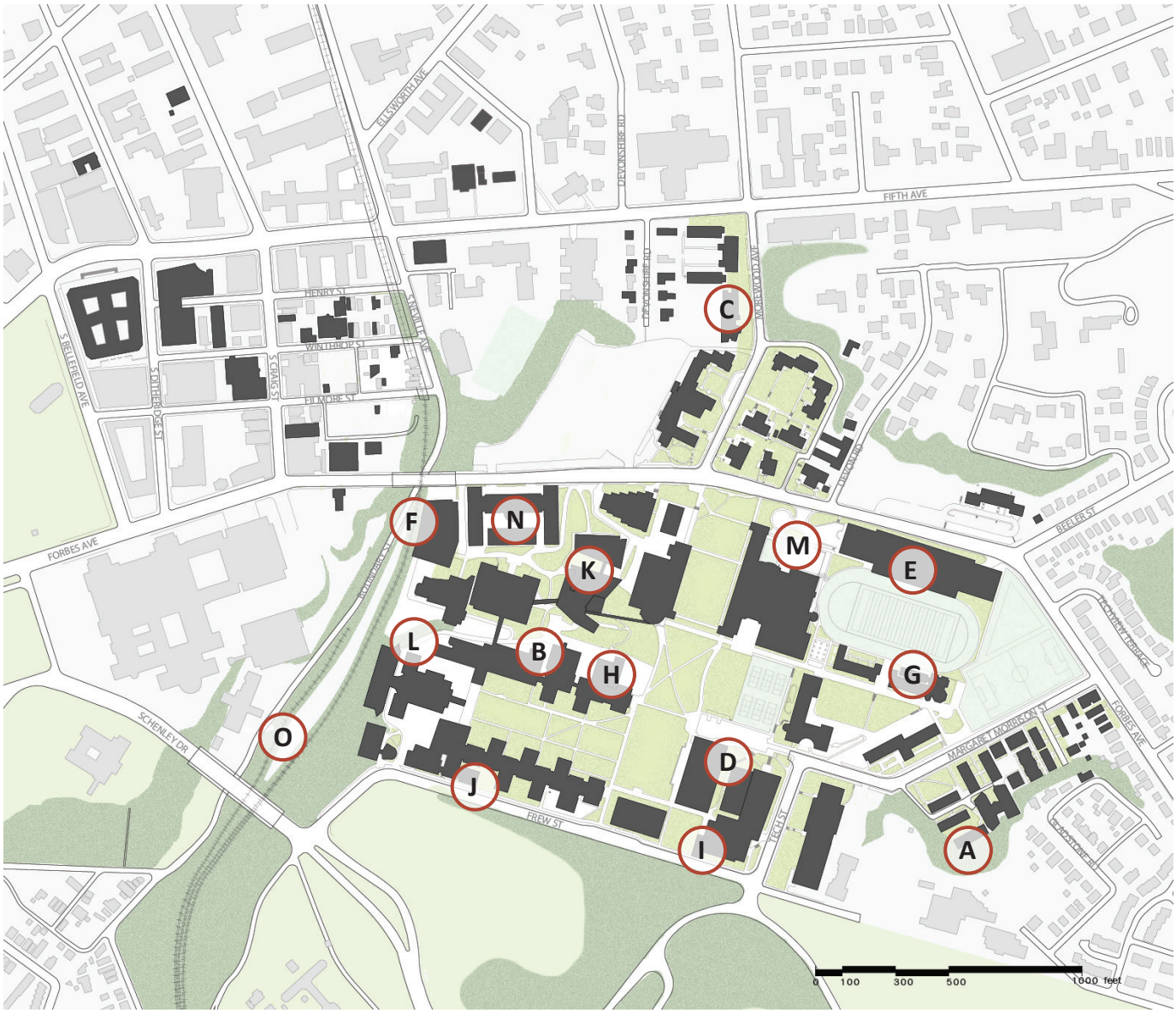
Projects Completed since 2002

Map	Project	Description	Year
A	Henderson House renovations	12,500 gsf/60 beds	2002
B	Doherty Hall Phase 1	150,000 gsf	2002
C	Stever House (formerly New House)	63,000 gsf/261 beds	2004
D	Posner Center/Kraus Campo Garden	8,000 gsf	2004
E	East Campus Garage addition	220 additional parking spaces	2005
F	Collaborative Innovation Center (CIC)	135,000 gsf and 220 parking spaces	2005
G	Tartans Pavilion	6,000 gsf	2007
H	Doherty Hall Phase 2	100,000 gsf	2008
I	Tepper School West Entry Addition	6,000 gsf	2009
J	Porter 100 Renovation	6,000 gsf	2009
K	Gates & Hillman Centers	216,000 gsf and 150 parking spaces	2009
L	Scott Hall (under construction)	95,000 gsf	2016
M	Cohon Center Addition (under construction)	66,000 gsf	2016
N	Heinz College Expansion (under construction)	5,000 gsf new / 45,000 gsf renovated	2016
O	S Neville Support Facility (under construction)	8,000 gsf new and 135 parking spaces	2016

Kraus Campo Garden

Inside the Gates & Hillman Centers

2.8 SITE IMPROVEMENTS



Projects Completed Since 2002

A Projects

CMU Buildings

2.9 PROPERTIES ACQUIRED

While pursuing an aggressive improvement program to the campus physical inventory, Carnegie Mellon has also taken advantage of new opportunities for real estate growth in targeted areas.

Over the last century, Carnegie Mellon has made strategic acquisitions that have set the path for the growth and vitality of the university. Following the direction set forth in the *2002 Campus Plan*, the university has focused real estate acquisitions on the north and south sides of Forbes Avenue, working to connect the core of the campus to Mellon Institute and SEI along Fifth Avenue.

Carnegie Mellon does not anticipate growth or the acquisition of properties in Squirrel Hill and Shadyside, specifically in the Forbes Avenue, Techview Terrace, Beeler Street and Devon Road areas. For additional information on the Neighborhood Protection Strategy, see Section 3.11.

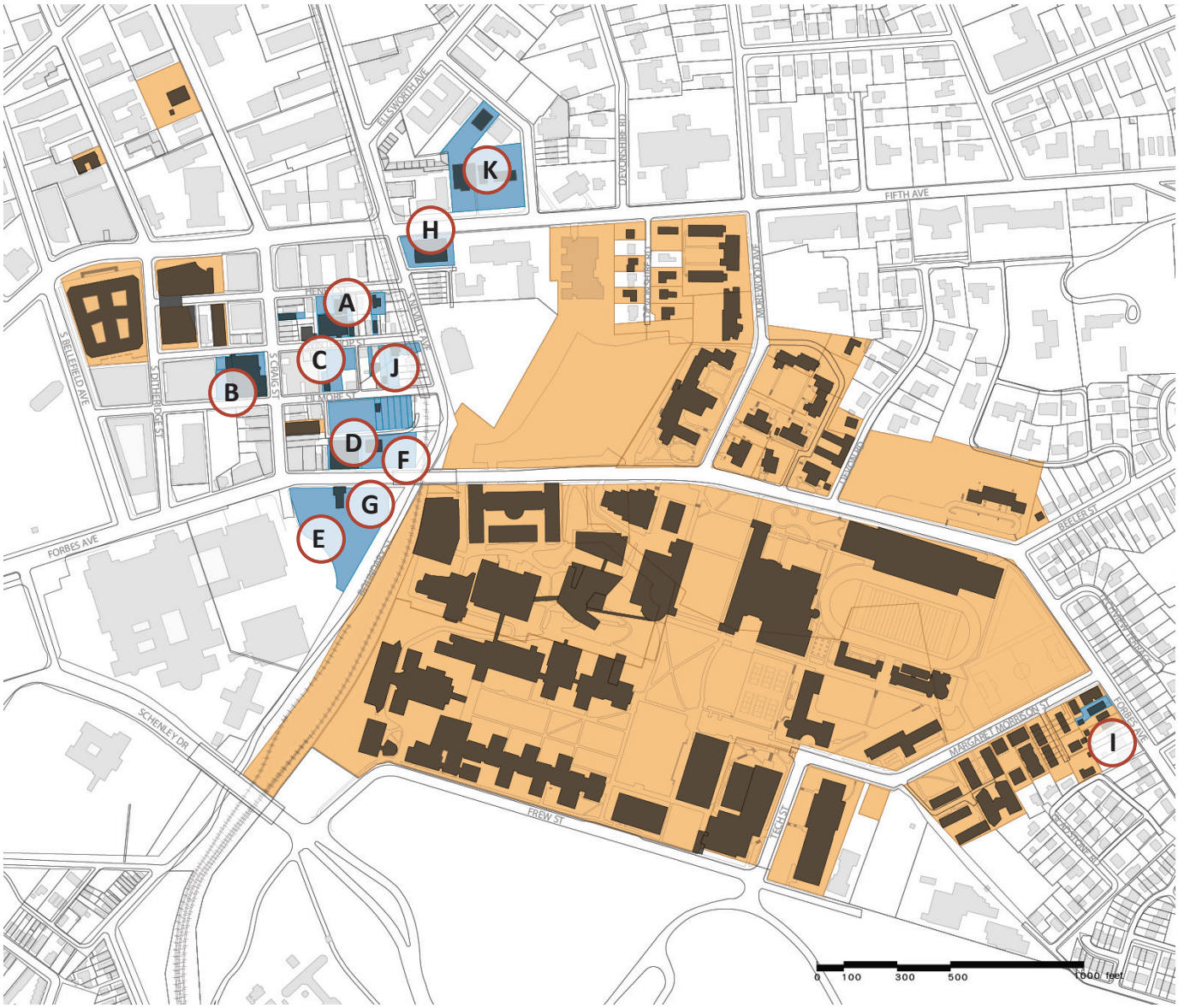
Major Acquisitions Since 2002

Map	Project	Description	Year
A	4616 Henry St. (INI)	22,000 gsf (building)	2005
B	300 S. Craig St. (former Vision Service Center)	72,000 gsf (building)	2005
C	Zebina Way Parking Lot	30 parking spaces	2007
D	GATF and Parking Lot	40,000 gsf (building), 81 parking spaces	2009
E	South of Forbes Parcels	74,905 gsf (property)	2007-09
F	Former Exxon Station	26,000 gsf (property)	2009
G	Former PNC Bank	2,500 gsf (building)	2009
H	The Residence of Fifth	65,000 gsf, 155 beds, 38 parking spaces	2010
I	5210 Forbes Ave	4,000 gsf (property)	2010
J	Filmore, Winthop & Craig Properties	16 residential properties	2010-15
K	Dearden Center	4 buildings + 50 parking spaces	2012

The Residence on Fifth

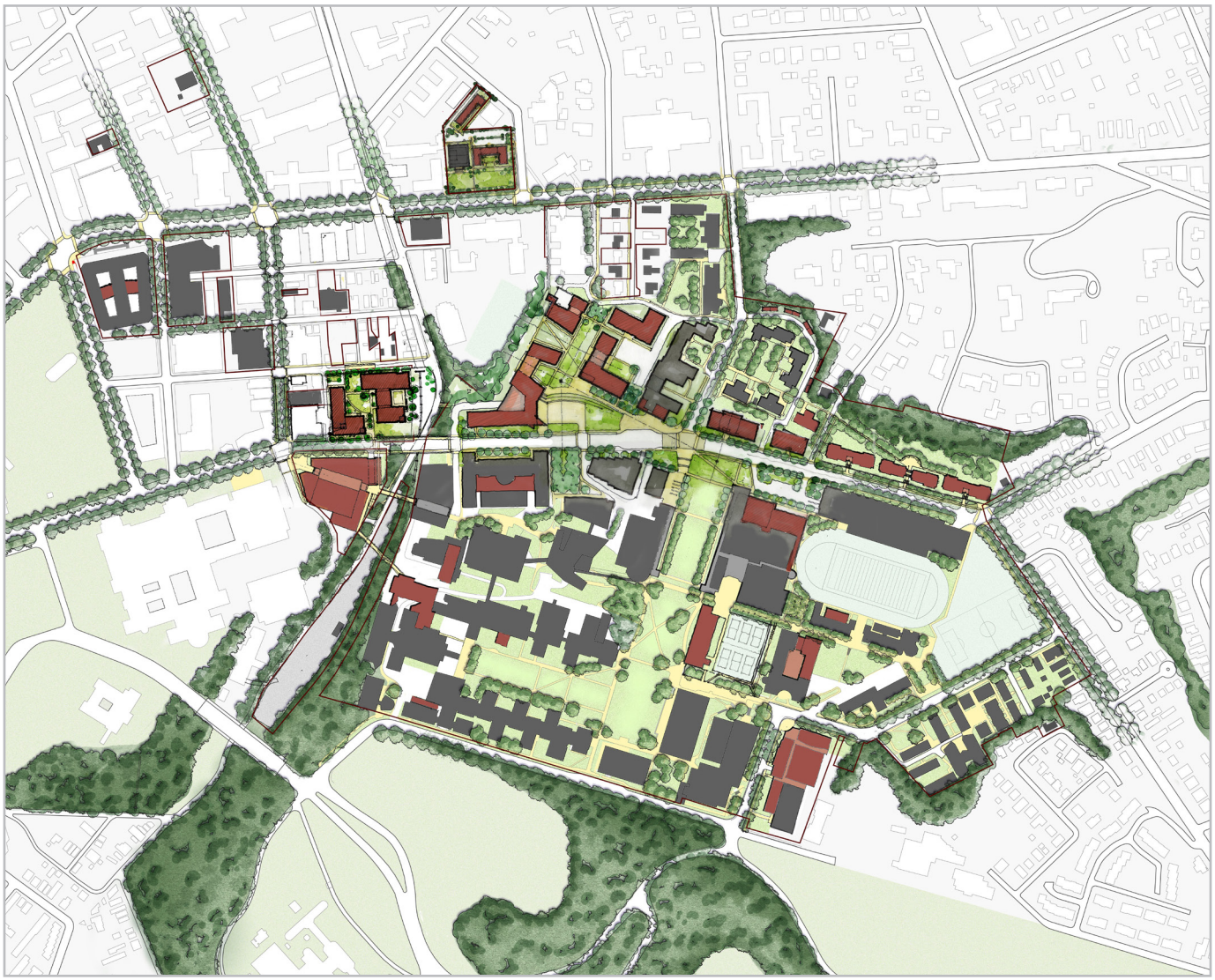
ArtPark at South of Forbes parcels

2.9 PROPERTIES ACQUIRED



Properties Acquired Since 2002

- CMU Parcels (owned pre-2002)
- CMU Parcels (acquired since 2002)
- CMU Buildings



Institutional Master Plan, 2015

3. INSTITUTIONAL MASTER PLAN

3.1 MASTER PLAN PROCESS

Phases

The Institutional Master Plan (IMP) planning process began in February 2010 with the intent of adoption by City Council in 2012. From the start, the intention of the Plan was to build upon the strengths of the previous *2002 Campus Plan* while directing campus growth onto new properties to support the university's growth needs. The planning process, which took place largely in 2010 and 2011, had three phases: Analysis, Problem Solving and Proposals.

- **Phase I: Analysis**
  The analysis component studied the history of master planning at Carnegie Mellon and its effects on the campus over time. This phase also looked at current and emerging trends and how the master plan could work to meet the trends and accomplish the university's mission.

- **Phase II: Problem Solving**
  The second phase of the planning process addressed the university's needs, its physical resources, and trends in the campus' development with the intent of laying the groundwork for the evolution of the campus. Major themes from this phase include the need for a flexible plan, the need to maximize on recent investments, the need to tame Forbes Avenue, and the ultimate need to provide the means for the growth of the university over the next 100 years.

- **Phase III: Proposals**
  The final, proposal phase of the process is reflected in this document and establishes the direction and intent of the university for the next 10 years and beyond.

Team

The *Institutional Master Plan* is the result of a collaborative process managed by the IMP Steering Committee, and including the involvement of a Master Plan Working Group made up of the university's Campus Design & Facility Development division and consultants from the School of Architecture's Remaking Cities Institute (RCI). The Working Group directly managed the professional consultants that supported the planning process. See Appendix A for more information.

Schedule

Throughout the master planning process, the university met with a range of institutional and community stakeholders with the goal of gaining insight from City, campus and community constituents regarding the master plan and to develop the plan to reflect their own needs and continue to foster healthy relationships. Appendix A includes a timeline.

Public Outreach

With the acknowledgement that a thorough planning process includes stakeholder input, the university met with institutional, city and community stakeholders. Over the course of the 16 month process, over 80 outreach meetings were held to allow for comment and input on the Master Plan. The insight gained from these sessions with constituents helped shape the master plan. More importantly, the planning and outreach process has helped build and foster healthy relationships between the university and its neighbors. Appendix B includes a full list of meetings and dates.

3.2 MASTER PLAN OBJECTIVES

Underpinning the *Institutional Master Plan* is a series of objectives and design principles. The objectives inform the overall direction of the IMP, and make the most of the university's existing assets while also building on contextual strengths.

The IMP campus design principles are intended to reinforce a sense of place that is unique to Carnegie Mellon University. They provide continuity with the institution's rich architectural and spatial heritage, while allowing for change and innovation as society evolves. They promote an ethos of community, creativity, accessibility and sustainability, and they ensure that campus design and facilities are designed in harmony with nature, and surrounding communities

The design of individual buildings is governed by the university's Design Review Committee (DRC), made up of faculty, staff and students who review proposed designs by consultant architects and engineers.

1. **Continue the Growth of the Campus**

- Maximize recent investments in real estate
- Preserve and enhance the historic core
- Develop at a higher density outside the core

2. **Increase Connectivity of Real Estate Holdings**

- Extend the east-west spine from Mellon Institute to Hillside
- Create additional paths from Forbes to Fifth Avenue
- Capitalize on Forbes Avenue being the center of campus
- Improve connections to Oakland

3. **Increase Capacity and Flexibility**

- Support program adjacencies (academic, research, athletics, housing, dining, etc.)
- Be responsive to opportunities (grants, corporate partnerships, funding sources)
- Continue pattern of upper-class housing at edge of campus

Working Group meeting

Inside the Gates/Hillman Centers

3.3 INSTITUTIONAL NEEDS

As the university moves into its second century, the institutional needs of this master plan are driven by the following strategies:

Strategy for Campus Growth
To continue to be a world leader in research and education, the university will strategically utilize campus resources, will enact a development strategy to optimize the use of existing land and buildings and will connect the historic core of campus to expansion areas.

Strategy for Academic Spaces
To further strong academic traditions, the university will systematically upgrade and enhance teaching space, will create academic spaces that maximize flexibility, and will seek opportunities to add new classroom space to the campus.

Strategy for Quality Public Spaces
To attract and retain the best and brightest, the university will preserve and create dynamic and innovative open spaces, will develop the "front door" to the campus at Forbes Avenue and will continue to increase quality housing, dining, athletic and recreational spaces.

Strategy for a Sustainable Campus
The university will continue to strive to innovate and be a leader in sustainable building and operating practices and the development of emerging sustainable technologies.

To achieve these goals, the following primary needs of the institution are embedded in the development of the IMP:

1. Develop all-purpose, high-tech classrooms and interdisciplinary spaces
2. Create additional academic and research space in engineering, arts and professional programs
3. Improve and expand athletic, fitness and recreational facilities
4. Optimize the potential of development sites, including the Morewood lot, recent acquisitions along Forbes Avenue, and the tennis courts
5. Improve pedestrian safety on Forbes Avenue and improve bicycle facilities throughout campus
6. Enhance campus open spaces, especially at Forbes and Morewood Avenues, to create identity and a sense of arrival

University Center pool


The Starling Quartet

3.4 CAMPUS DESIGN PRINCIPLES

Principle 1: Open Space
Respect the central organizing function of open space on Carnegie Mellon University campus, by preserving and enhancing the Mall, the Cut, surrounding wooded slopes and pedestrian pathways, and similarly carefully considering the relationship of buildings to open space and topography in any new expansion.

Principle 2: Edges and Entrances
Define and celebrate the campus' edges and entrances, and promote more visible and sympathetic connections to surrounding neighborhoods and districts.

Principle 3: Multi-Modality
Design the campus for multi-modal transportation, with an emphasis on amenities and infrastructure for pedestrians, bus riders, car-sharing programs and cyclists.

Principle 4: Sustainability
Integrate natural environmental processes into the design of buildings and landscape, with particular consideration for energy and water efficiency, the life cycle of materials, biodiversity and stormwater management.

Principle 5: Architecture
Preserve Carnegie Mellon University's architectural heritage while promoting innovative, contemporary and contextual buildings and structures.

Principle 6: Mixed-Use
Encourage interaction and collaboration through the inclusion of community amenities, and shared-use and flexible spaces.

Principle 7: Universal Design
Increase access for all by following universal design principles in campus improvement projects and new development.

Principle 8: Public Art
Enhance the quality of the campus environment by including quality public art that reflects the spirit and creativity of Carnegie Mellon University.

Principle 9: Neighborhood Compatibility
Respect and contribute to the character of the neighboring communities and work as partners with neighbors to improve the quality of life in the East End.


Walking along the Mall towards the College of Fine Arts


Walking to the Sky

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.1 Overview

Throughout the planning process, three core planning areas were studied in depth by an assortment of consultants in partnership with Campus Design and Facility Development. In each case, representatives from the City of Pittsburgh, including staff and elected officials, and neighborhood groups were engaged in the iterative process. These three core planning areas are at the foundation of the IMP.

1. ***Major Development Area Framework***
   The framework organizes the composition of the overall campus and sets the parameters and vision for the major development sites along Forbes at Craig and at the Morewood parking lot.

2. ***Campus Precinct Planning***
   Precinct planning looked at the feasibility of important projects located in each precinct: the Nano-Bio-Energy Technologies Building, improvements to athletics and recreation, a new facility for the Tepper School of Business, expansion of Margaret Morrison Carnegie Hall, expansion of Heinz College, and a feasibility study of development on the tennis courts site.

3. ***Transportation Analysis***
   Funded by the Pennsylvania Department of Transportation (PennDOT), this study assessed and analyzed the problems and proposed solutions for pedestrian safety and multi-modal transportation in and around the campus.

   The master planning process involved analyzing the university's institutional needs over the next 25 years, its current relationship to Oakland and its surroundings, its mission and values, and its real estate holdings in order to determine the best options for success in Pittsburgh.

The major outcomes of the process are:

- The university does not have sufficient space on its traditional campus to accommodate anticipated future growth over the next 25 years.

- Programmatically, Carnegie Mellon University has crossed Forbes Avenue but there is still a disconnect with the main campus. The university has also increased its portfolio of existing real estate investments along Forbes Avenue.

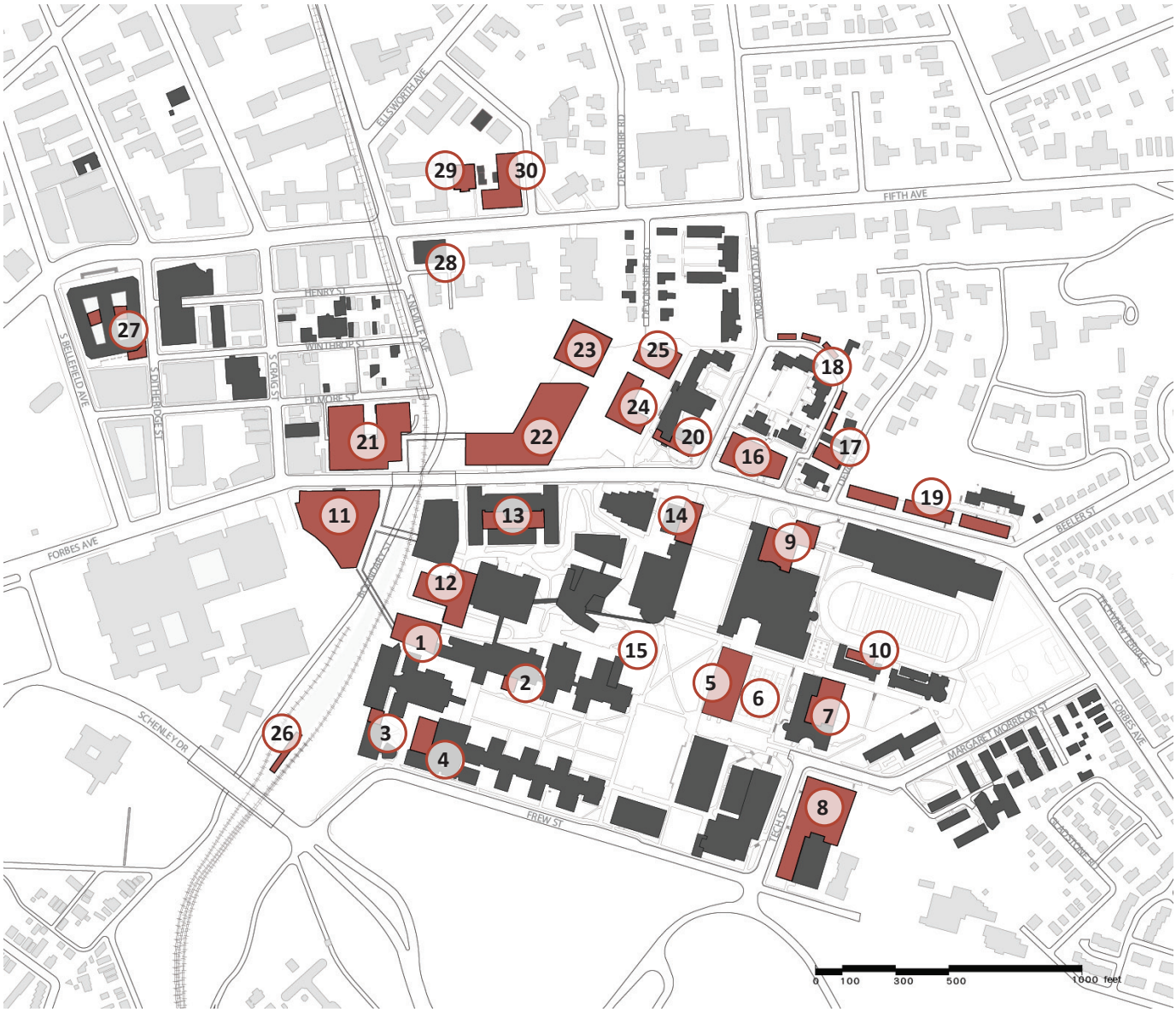
- The university has traditionally turned its back on Forbes Avenue but with expansion onto the north side and south sides of Forbes Avenue west of Junction Hollow, and the planned redevelopment of the Morewood parking lot, Forbes Avenue needs to be reconsidered as an integral part of Carnegie Mellon University's campus.

- Analysis of transportation in and around campus has found an outdated arrangement of traffic, a fluctuating capacity of parking, an under capacity of bicycling infrastructure, inadequate amenities for bus riders and dangerous pedestrian conditions along Forbes Avenue and at several intersections.

- In certain cases, the university does not meet student expectations regarding intercollegiate and intramural athletics facilities and student recreation which supports a high quality of life on campus.

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.1 Overview



10-Year Master Plan

New Developments

CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.2 Precincts

A. Historic Core

The Historic Core extends along the length of Frew Street. At its center are two large open space axes, the Cut and the Mall, around which are arranged the university's engineering, humanities and arts schools. This is the traditional center of Carnegie Mellon University and contains its most iconic buildings, including the College of Fine Arts and Hammerschlag Hall. The opportunities for expansion in the traditional center of the campus are mostly limited to additions and reuse of existing buildings. Interventions should continue to preserve the integrity of the university's iconic open spaces and its views, and create a friendlier facade along Forbes Avenue.

B. East Campus

The East Campus is made up of CMU's main athletics and intramural facilities, as well as a concentration of undergraduate student dormitories and apartments. There have been many improvements to the East Campus in recent decades, including Gesling Stadium, renovations to the Roselawn Terrace apartments, and a new artificial turf intramural field. Future actions will continue to enhance athletics and recreational facilities. Long-term planning includes additional student housing at the corner of Forbes and Margaret Morrison.

C. West Campus

Newly redeveloped, the West Campus hosts Carnegie Mellon University's information technology and public policy research and academic programming. Notable buildings are the Collaborative Innovation Center, the Gates and Hillman Centers and Heinz College. Future pedestrian bridges across Junction Hollow will grow the West Campus towards Craig Street.

D. Morewood Avenue

The Morewood Avenue area is home to undergraduate students living in dormitories and Greek housing. The Morewood Avenue area recommendations focus on a capstone building at the northeast corner of Forbes and Morewood, facing the Cut. This building would be the visual terminus to one of the campus' most important outdoor common spaces and pedestrian gateways. The plan also calls for improvements to student housing, and infill along Forbes.

E. North Campus

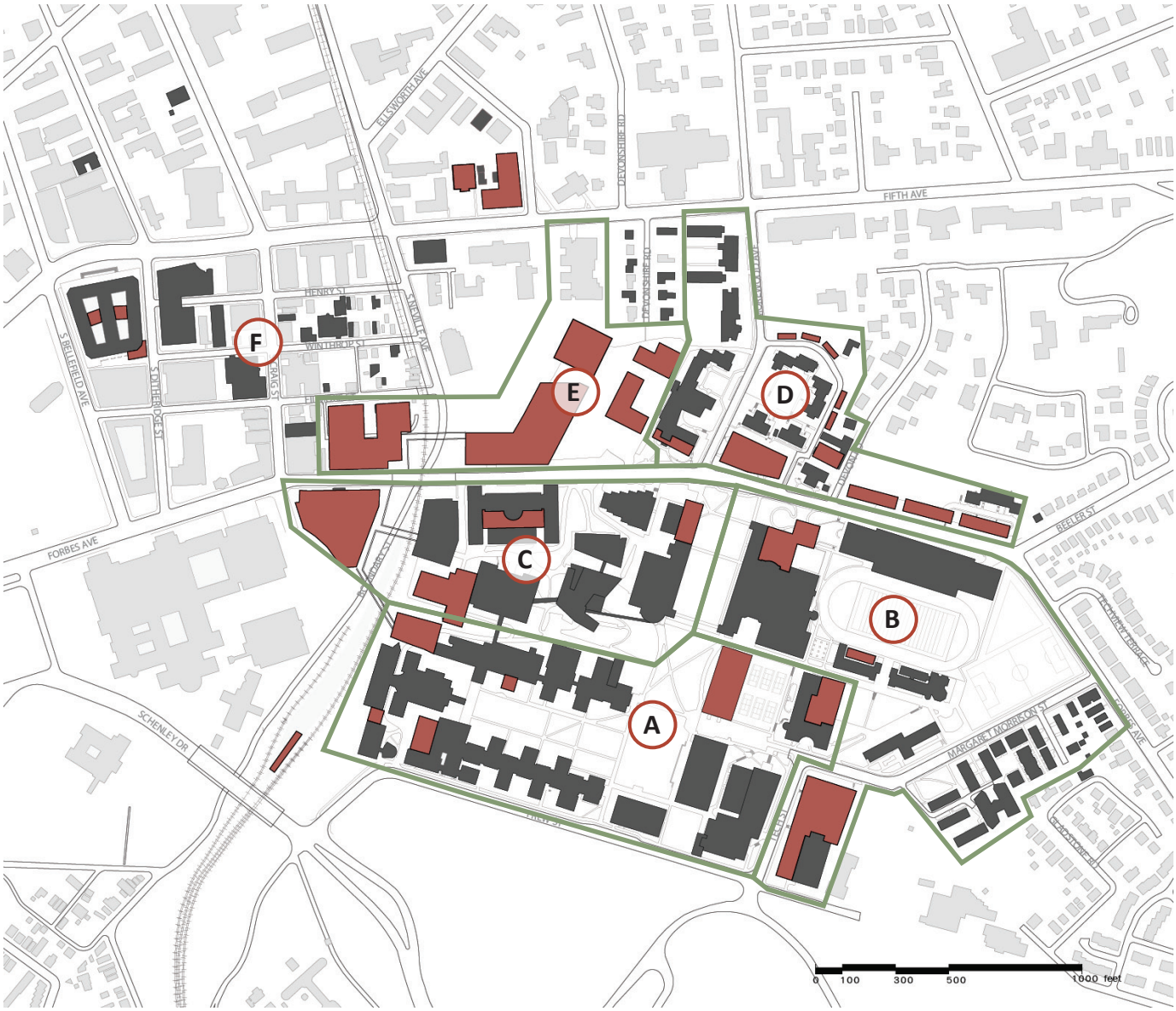
The plan recommends the redevelopment of the 737-space Morewood parking lot into the North Campus. This development will relieve pressure for space by providing a new and exciting extension to the traditional campus. The site will primarily feature new academic and research facilities centered around a green quadrangle, in keeping with the original Hornbostel campus design. The development will additionally allow for greater pedestrian connectivity between Fifth and Forbes Avenues. Buildings along Forbes Avenue will both frame and address the street.

F. Campus Neighborhood

The Campus Neighborhood area is a mixed-use commercial district dotted with institutional buildings. Carnegie Mellon University owns and leases several properties and has acquired two significant parcels along both sides of Forbes Avenue at a critical juncture between Craig Street and Junction Hollow. In redeveloping these properties, Carnegie Mellon University has the opportunity to create a gateway entrance to an expanded campus and to Oakland, as well as to improve pedestrian linkages between Oakland and the Historic Core.

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.2 Precincts



Campus Precincts Overlaid on 10-Year Plan

- (A) Historic Core
- (B) East Campus
- (C) West Campus
- (D) Morewood
- (E) North Campus
- (F) Campus Neighborhood

- New Developments
- CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.3 Historic Core

1. Scott Hall *(Under Construction)*

DESCRIPTION	New engineering / research building
USES	Academic, research, laboratories, office
SQUARE FEET	120,000 gsf
HEIGHT	7 stories (no taller than Scaife Hall) & 1 infill story in courtyard between Hamerschlag and Wean
SETBACK	North: match furthest projection of Wean South: no closer than 40 ft to Hammerschlag above courtyard elevation East: west edge of Wean West: match west side of Scaife

2. South Wing of Wean Hall

DESCRIPTION	Addition to Wean Hall
USES	Classroom, library
SQUARE FEET	10,000 gsf
HEIGHT	3 stories (50 ft)
SETBACK	Match existing building extension on Baker Hall facing the Mall

3. Scaife/Roberts Connector

DESCRIPTION	Infill connector between Scaife and Roberts
USES	Academic, research and/or office
SQUARE FEET	10,000 gsf
HEIGHT	2 stories (1 above grade)
SETBACK	North and South: adjacent buildings East: edge of Hamerschlag Dr West: west face of Scaife Hall

4. Addition to Porter Hall

DESCRIPTION	Courtyard infill and rooftop addition to Porter Hall
USES	Academic, research and/or office
SQUARE FEET	50,000 gsf
HEIGHT	4 stories (+1 story addition to roof)
SETBACK	Same as existing building

5. New Academic Building

DESCRIPTION	New building on terraced lawn west of tennis courts
USES	Academic, adminstrative, support and/or office
SQUARE FEET	125,000 gsf
HEIGHT	4 stories (no higher than belt course on CFA)
SETBACK	North and South: 10 ft from East West Walkway / CFA parking lot West: match UC and CFA East: edge of tennis courts

6. Below-Grade Academic Facility

DESCRIPTION	New support facility under current tennis courts
USES	Academic support, performance space
SQUARE FEET	40,000 gsf
HEIGHT	1 story (20 ft) with rooftop tennis courts
SETBACK	Same footprint as tennis courts

7. Margaret Morrison Extension (MMX)

DESCRIPTION	Addition to Margaret Morrison Carnegie Hall (MMCH)
USES	Academic, research, office, performance, shops
SQUARE FEET	110,000 gsf
HEIGHT	7 stories (3 below grade) to match existing building
SETBACK	North and East: same as existing MMCH setbacks South and West: adjacent to existing building

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.3 Historic Core

Historic Core Projects

1. Nano/Bio/Energy Technologies Building
2. South Wing of Wean Hall
3. Scaife-Roberts Connector
4. Addition to Porter Hall
5. New Academic Building
6. Below-Grade Support Facility
7. Margaret Morrison Extension

New Developments

CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.4 East Campus

8. Skibo Gym Improvements

DESCRIPTION	Expansion and renovation of existing gymnasium
USES	Athletics, recreation, performance space
SQUARE FEET	200,000 gsf (100,000 new)
HEIGHT	4 stories (80 ft) at Margaret Morrison St 2 stories (50) ft at Tech St (to match existing)
SETBACK	North and West: 15 ft from property line South: same as existing main Gym (to remain) East: 15 ft from property line *Note: Residential Compatibility Standards apply*

9. Cohon University Center Addition *(Under Construction)*

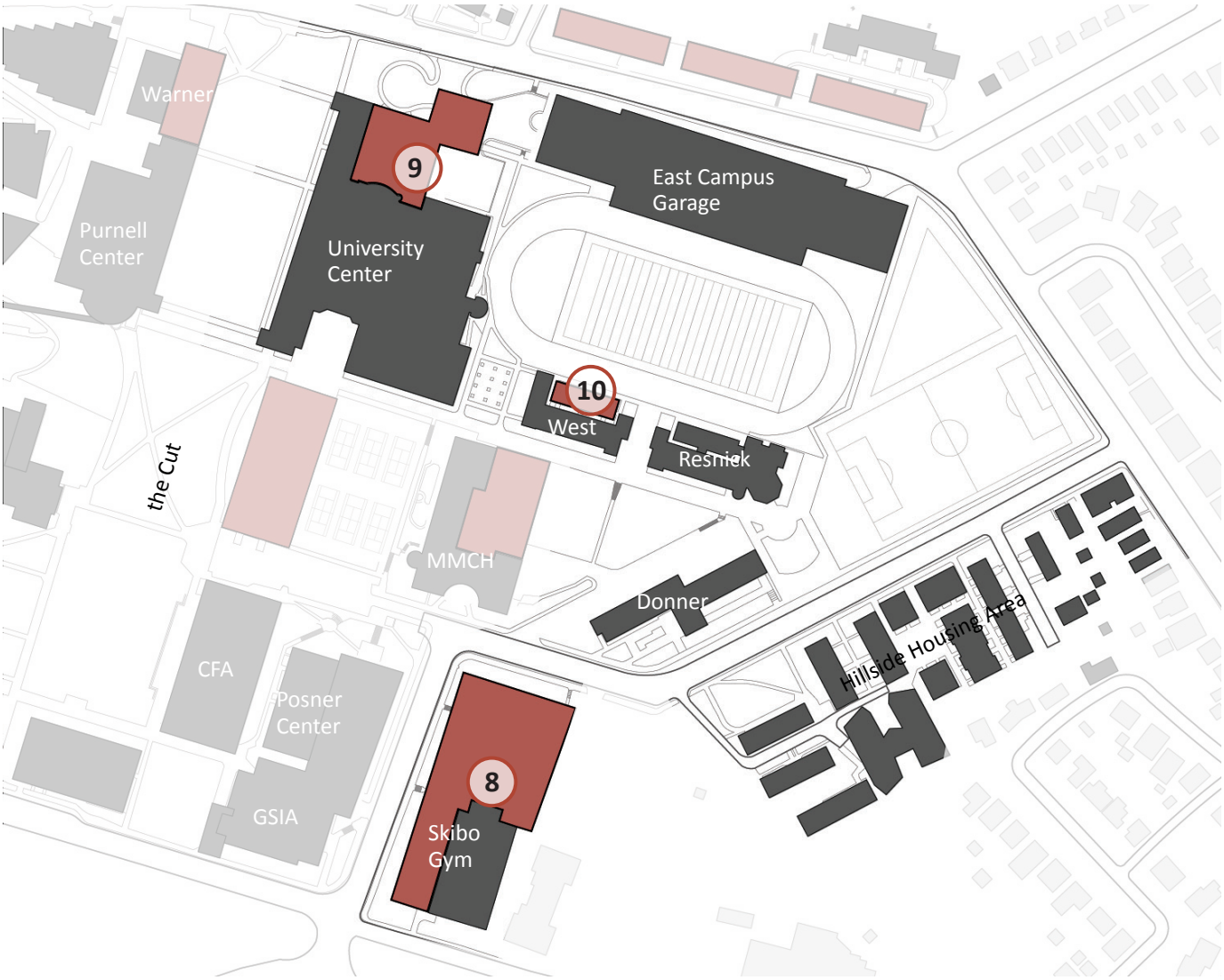
DESCRIPTION	Addition of new fitness facility; new entry to UC; enclosure of existing loading facility
USES	Office, student space, athletics & recreation, performance space
SQUARE FEET	75,000 gsf (new)
HEIGHT	3 stories (no higher than existing building)
SETBACK	North: 25 ft from Forbes Ave South and West: adjacent to existing building East: align w/easternmost existing wall

10. West Wing Addition

DESCRIPTION	Addition to existing West Wing
USES	Office, student space & athletics & recreation
SQUARE FEET	7,500 gsf
HEIGHT	1 story (15 ft)
SETBACK	North: align w/north wing of West Wing South and West: 5 ft from West Wing East: align w/existing wall

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.4 East Campus



East Campus Projects

8 Skibo Gym Improvements

9 University Center Addition

10 West Wing Addition

New Developments

CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.5 West Campus

11. South of Forbes Development Site

DESCRIPTION	New mixed use building, 600 surface and structured parking spaces
USES	Office and research, hotel, academic, ground floor retail , residential, surface and structured parking
SQUARE FEET	425,000 gsf
HEIGHT	6 stories (90 ft) first 50 feet from Forbes Ave and S Craig extension; 4 stories (50 ft) first 50 feet from Lower Museum Drive 10 stories (150 ft) beyond stepbacks
SETBACK	North: 5 ft from property line to (create minimum 10 ft sidewalk) South and West: 5 ft from Museum lower drive East: 15 ft from property line *Note: includes extension of East-West Walkway*

12. Building Expansion/Addition

DESCRIPTION	Addition and expansion at FMS site for academic, research and campus support service
USES	Academic, research, administration and support
SQUARE FEET	100,000 gsf
HEIGHT	No taller than adjacent buildings
SETBACK	North: 20 ft from CIC South: 20 ft from Wean/Site 1 East: 5 ft from Newell-Simon West: setback to match Collaborative Innovation Center (CIC)

13. Hamburg Hall Addition *(Under Construction)*

DESCRIPTION	Infill between Hamburg and Smith Halls
USES	Academic, office, social space
SQUARE FEET	60,000 gsf
HEIGHT	3 stories (no higher than existing roof of Hamburg Hall)
SETBACK	Built within space created by Hamburg and Smith Halls

14. Warner Hall & Loggia Expansion

DESCRIPTION	Warner Hall expansion / completion of Purnell Loggia
USES	Academic, administration, dining and student support
SQUARE FEET	70,000 gsf
HEIGHT	3 stories (to match existing loggia) for 50 feet from the Cut 6 stories (height of existing Warner Hall) beyond 50 feet from the Cut 1 story (20 ft) below grade along Forbes Ave
SETBACK	North: align w/end of UC loggia South and West: adjacent to existing buildings East: align w/Purnell loggia

15. Below Ground Purnell Extension

DESCRIPTION	Below ground Purnell Center addition
USES	Academic, administration, storage, performance
SQUARE FEET	100,000 gsf
HEIGHT	2 stories (below grade)
SETBACK	North: south end of Purnell Center South: north end of Doherty hall East: align w/Purnell loggia West: bottom of slope

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.5 West Campus

West Campus Projects

11 South of Forbes Development Site

12 Building Expansion/Addition

13 Heinz College Expansion

14 Completion of Purnell Loggia

15 Below-grade Purnell Extension

New Developments

CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.6 Morewood

16. Capstone Building

DESCRIPTION	New building facing the Cut, up to 150 surface and structured parking spaces
USES	Administrative, research, support, parking
SQUARE FEET	200,000 gsf
HEIGHT	8 stories (120 ft)
SETBACK	North: 20 ft from existing buildings South: 10 ft from property line East: 10 ft from North Loop Dr West: 10 ft from property line *Note: projections may be built in south setback up to 40% of façade*

17. Relocation of Greek House

DESCRIPTION	New fraternity/sorority building
USES	Residential
SQUARE FEET	25,000 gsf
HEIGHT	4 stories (45 ft)
SETBACK	North and South: align to existing building to west East: 40 ft from Devon Road West: 40 ft from adjacent building *Note: Residential Compatibility Standards apply*

18. Garage Relocations

DESCRIPTION	Relocation of existing garage spaces
USES	Parking and support space
SQUARE FEET	10,000 gsf (up to 20 garage units of 500 gsf each)
HEIGHT	1 story (15 ft)
SETBACK	Front: aligned to North Campus Drive Rear: no more than 25 from North Campus Drive *Note: Residential Compatibility Standards apply*

19. Doherty Apartments Site

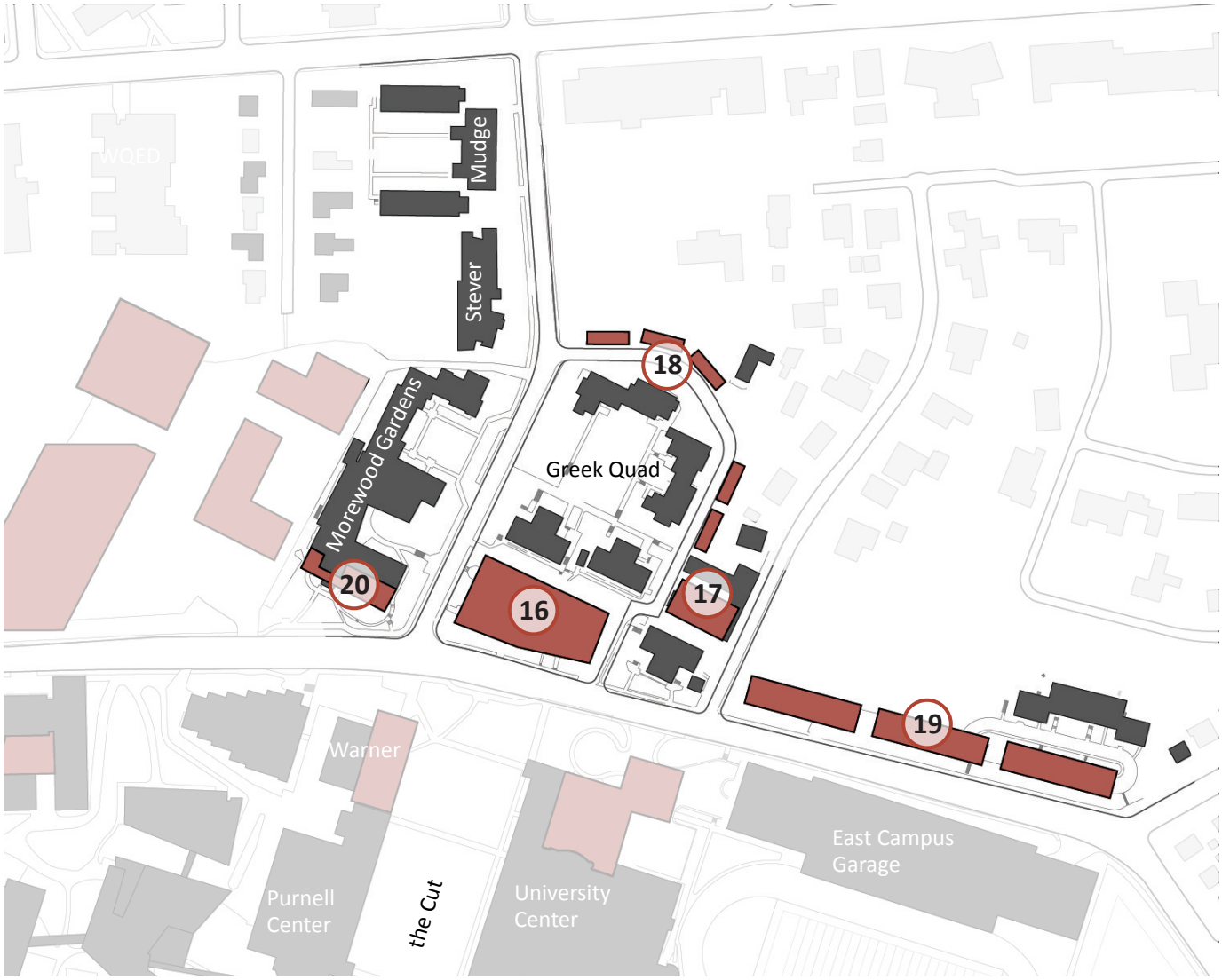
DESCRIPTION	Up to 3 new buildings and up to 100 additional surface parking spaces
USES	Residential, academic, research and support space, surface parking
SQUARE FEET	120,000 gsf (in 3 buildings)
HEIGHT	4 stories (60 ft) on Forbes; 2 stories (25 ft) on uphill side
SETBACK	North: 45 ft from adjacent properties South: 15 ft from property line East, West: 40 ft from adjacent properties *Note: Residential Compatibility Standards apply*

20. Morewood Gardens Addition

DESCRIPTION	Adddition to Morewood Gardens E Tower for Student Support
USES	Residential, academic, student support space and dining
SQUARE FEET	80,000 gsf
HEIGHT	3 stories (50 ft) from Forbes + 1 story below ground
SETBACK	North: adjacent to existing building South: 15 ft from Forbes Ave East and West: align with existing building

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.6 Morewood



Morewood Projects

- 16 Capstone Building
- 17 Relocation of Greek Housing
- 18 Garage Relocations
- 19 Doherty Apartments
- 20 Morewood Gardens Addition

- New Developments
- CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.7 North Campus

21. North of Forbes Development Site

DESCRIPTION	New mixed use building, up to 500 surface and structured parking spaces
USES	Office and research, hotel, academic, ground floor retail, residential, surface and structured parking
SQUARE FEET	385,000 gsf
HEIGHT	6 stories (90 ft) first 25 ft from Forbes Ave; 4 stories (50 ft) first 50 ft on Filmore St frontage 10 stories (150 ft) beyond stepbacks
SETBACK	North and East: 15 ft from property line South and West: 5 ft from property line *Note: Residential Compatibility Standards apply*

22. New Academic Building - Tepper School of Business *(in development)*

DESCRIPTION	New academic/research building, up to 250 surface and structured parking spaces
USES	Academic, research, support, surface and structured parking
SQUARE FEET	400,000 gsf
HEIGHT	5 stories (75 ft) on Forbes frontage 8 stories (120 ft) on North Campus Green
SETBACK	North: 25 ft from Site 20 South: match Hamburg setback on Forbes East and West: match Hamburg side on Forbes; 15 ft from property line with Central

23. New Academic Building / Parking Structure

DESCRIPTION	New building, up to 400 surface and structured parking spaces
USES	Academic, research, support, surface and structured parking
SQUARE FEET	180,000 gsf
HEIGHT	8 stories (120 feet)
SETBACK	North: 20 ft from property line South: 25 ft from Site 20 East: adjacent to North Campus Green West: 5 feet from top of slope

24. New Academic Building

DESCRIPTION	New building; may include a transit waiting facility
USES	Academic, research, residential, administrative, support, surface parking
SQUARE FEET	200,000 gsf
HEIGHT	6 stories (90 feet)
SETBACK	North: 15 ft from aite 25 South: 5 feet from new Quad walkway West: adjacent to North Green

25. New Academic Building

DESCRIPTION	New building with a service court and surface parking lot
USES	Academic, research, residential, support, athletics, surface parking
SQUARE FEET	200,000 gsf (in three buildings)
HEIGHT	6 stories (90 feet)
SETBACK	North: 25 ft from property line South: 15 ft from site 24 West: adjacent to North Campus Green *Note: Residential Compatibility Standards apply*

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.7 North Campus

North Campus Projects

21 North of Forbes Development Site

22 New Academic Building

23 New Academic /Parking Building

24 New Academic Building

25 New Academic Building

New Developments

CMU Buildings

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.8 Campus Neighborhood

26. S Neville Support Facility and Parking *(Under Construction)*

DESCRIPTION	University support and parkign facility; up to 150 surface parking spaces; trail connection to Junction Hollow trail
USES	Campus support, surface parking and trail
SQUARE FEET	50,000 gsf (building)
HEIGHT	2 stories (50 ft)
SETBACK	North and East: 10 ft from railroad tracks South: 5 ft from property line West: 10 ft from Neville Avenue

27. Mellon Institute Entry and Infills

DESCRIPTION	New entry pavilion and east and west cross spaces internal to courtyard
USES	Academic, research, office
SQUARE FEET	30,000 gsf (10,000 gsf for pavilion and 10,000 per side)
HEIGHT	3 stories
SETBACK	South and East: 0 ft from property line Other: n/a

28. The Residence of Fifth

DESCRIPTION	New office and dining/restaraunt uses in existing Residence of Fifth building
USES	Residential, office, administrative, dining, structured parking
SQUARE FEET	70,000 gsf (exisiting building)
HEIGHT	6 stories (70 ft) (existing building)
SETBACK	Maintain existing building setbacks

29. North of Fifth Multi-Use Renovation

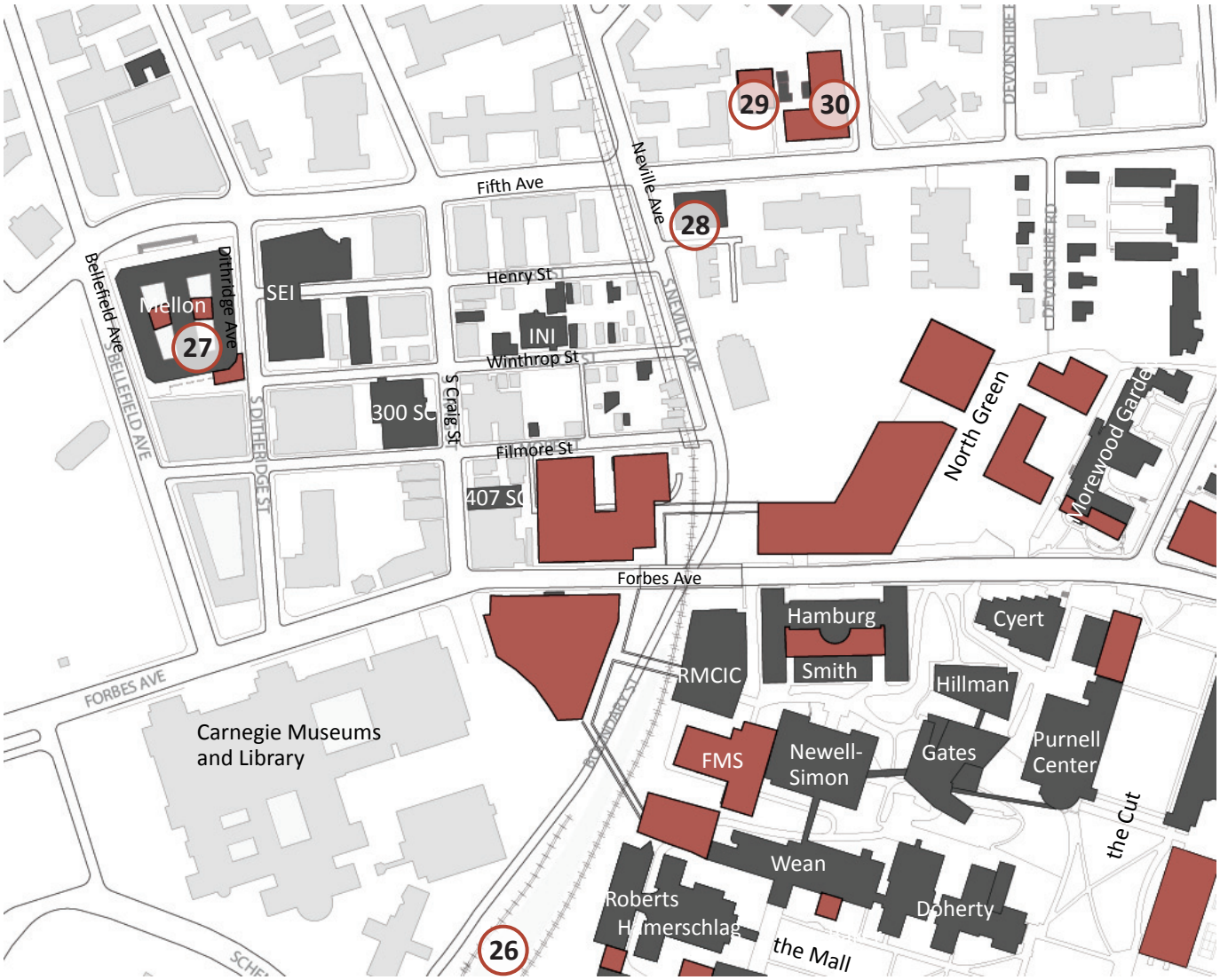
DESCRIPTION	Renovation of existing building for mixed use with up to 150 surface and structured parking spaces
USES	Academic, research, residential, conference, administrative, support, child care and surface & structure parking
SQUARE FEET	25,000 gsf (existing building)
HEIGHT	4 stories (50 ft), including basement (existing building)
SETBACK	Maintain existing buliding setbacks

30. North of Fifth New Multi-Use Building

DESCRIPTION	New mixed use building with up to 150 surface and strutured parking spaces
USES	Academic, research, residential, conference, administrative, support, surface & structure parking
SQUARE FEET	120,000 gsf (building)
HEIGHT	3 stories (45 ft) at north end for first 50 ft 6 stroies (85) ft beyond stepback
SETBACK	North: 15ft from property line South: 15 ft from Fifth Ave East: 20 ft from Clyde St West: 15 ft from site 29 *Note: Residential Compatibility Standards apply*

3.5 10-YEAR DEVELOPMENT ENVELOPE BY PRECINCT

3.5.8 Campus Neighborhood



Campus Neighborhood Projects

26 S Neville Support Building & Parking

27 Mellon Institute Entry & Infill

28 Residenence on Fifth Dining Facility

29 Renovated Mixed Use Building

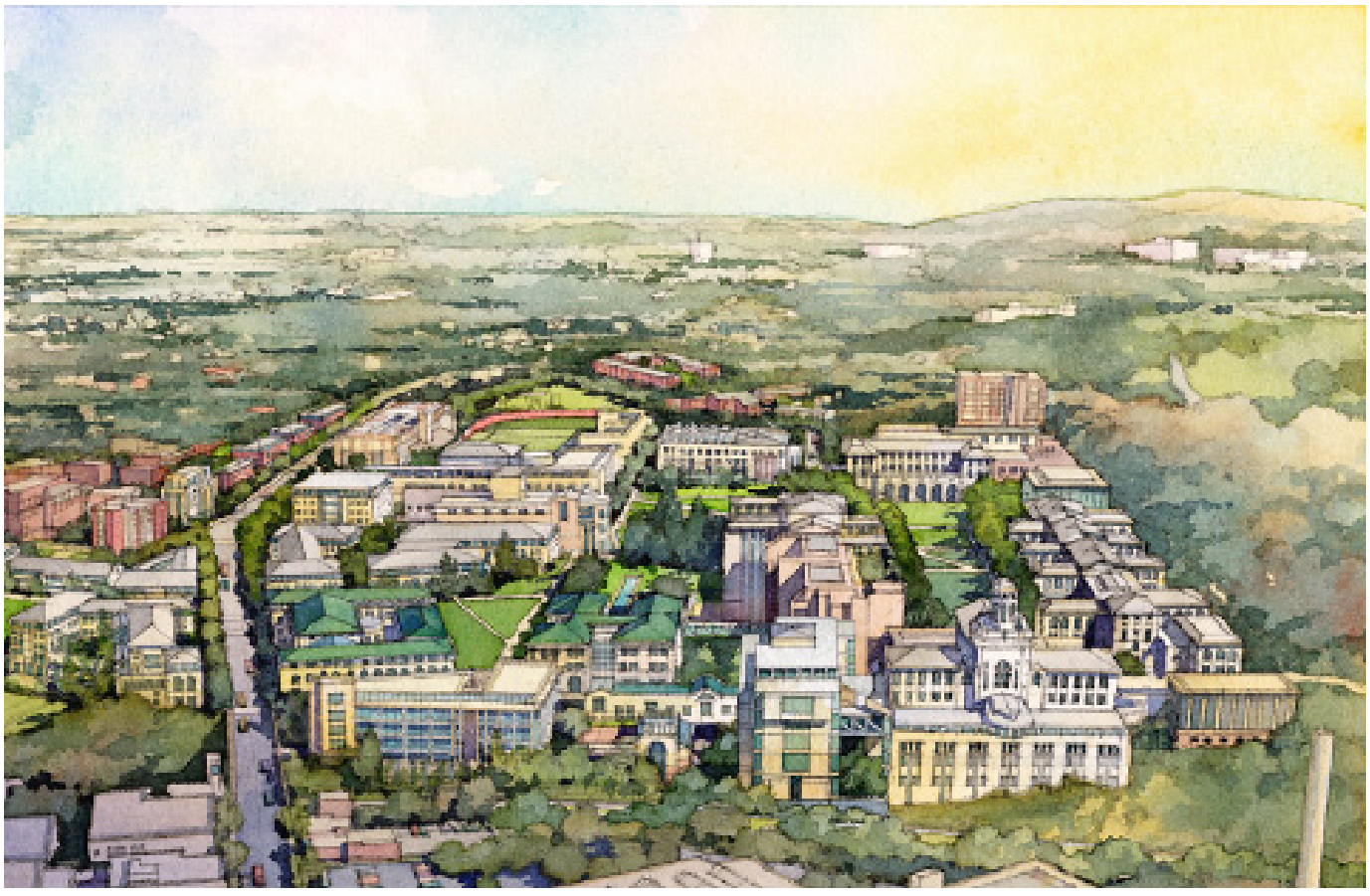
30 New Mixed Use Building

New Developments

CMU Buildings

3.6 25-YEAR DEVELOPMENT SITES

Although the 25-year development sites are not likely to be built over the next 10 years, their importance for the long-term vitality of the university warrants consideration. As the university continues to evolve, the long-term redevelopment of these sites and the ability to adapt the facilities to new needs will be necessary. Therefore, the consistent and deliberate upgrading of facilities may warrant that these sites, many of which will be nearing the 75-year mark, may be better suited for new considerations. Although there are no specific plans for these sites, their location and under-optimization may require new facilities and/or major rehabilitation.



Illustrative View of campus to the east

3.6 25-YEAR DEVELOPMENT SITES

25-Year Development Sites

- 31 Donner House/Donner Dell
- 32 Margaret Morrison Street Housing
- 33 Northwest Cut Site
- 34 Greek Quad Housing Site
- 35 Morewood Garden Housing Site
- 36 Winthrop/Filmore Infill Sites

New Developments

CMU Buildings

3.7 TRANSPORTATION MANAGEMENT PLAN

Carnegie Mellon University is served by regional connections and local arterials, a dense network of public and institutional transit, a walkable campus and an emerging network of bicycle lanes and trails. To build upon these systems, to improve pedestrian safety and to better use existing parking resources, the university, with its partner the Oakland Transportation Management Association (OTMA), utlized a PennDOT Pennsylvania Communities Transportation Initiative (PCTI) grant to analyze and assess the campus transportation system for the IMP's Transportation Management Plan.

The university promotes alternatives to single occupancy vehicle transportation through a variety of programs and incentives; for example, bus passes are provided to all full-time Carnegie Mellon University students, staff and faculty and the university has a free shuttle bus that circulates in and around Oakland.

The major conclusions of the Transportation Management Plan is that there is not sufficient pedestrian safety along city streets and a fluctuating capacity of parking supply on campus. The study identified intersections with safety and mobility concerns and noted that perceptions of the high traffic speeds along Forbes Avenue are impediments to pedestrian safety. The study's needs/demand analysis found that the utilization rate for surface lots was 82% and for garages was 75% and that the parking inventory could be optimized through system management.

The study identified the following six major issues:

- Lack of ADA and traffic signal standards compliance at intersections
- Lack of long-term pavement markings at intersections
- Lack of wayfinding/destination signage
- Narrow sidewalks, far below required capacity
- Lack of buffer between sidewalks and vehicle travel lanes
- Excessive speeds along Forbes and Fifth Avenues

The PCTI study recommendations focus on creating a multi-modal, safe transportation system that serves all sectors of the East End and campus. The transportation managment recommendations are the following:

Pedestrian Safety Recommendations

- Pedestrian safety improvements on Forbes including wider sidewalks and street trees
- New Forbes pedestrian crossings to North Quad
- Urban design improvements on S Craig
- Safety improvements on Neville including sidewalks, trail extension and transit
- Enforcement of traffic regulations

Traffic Calming Recommendations

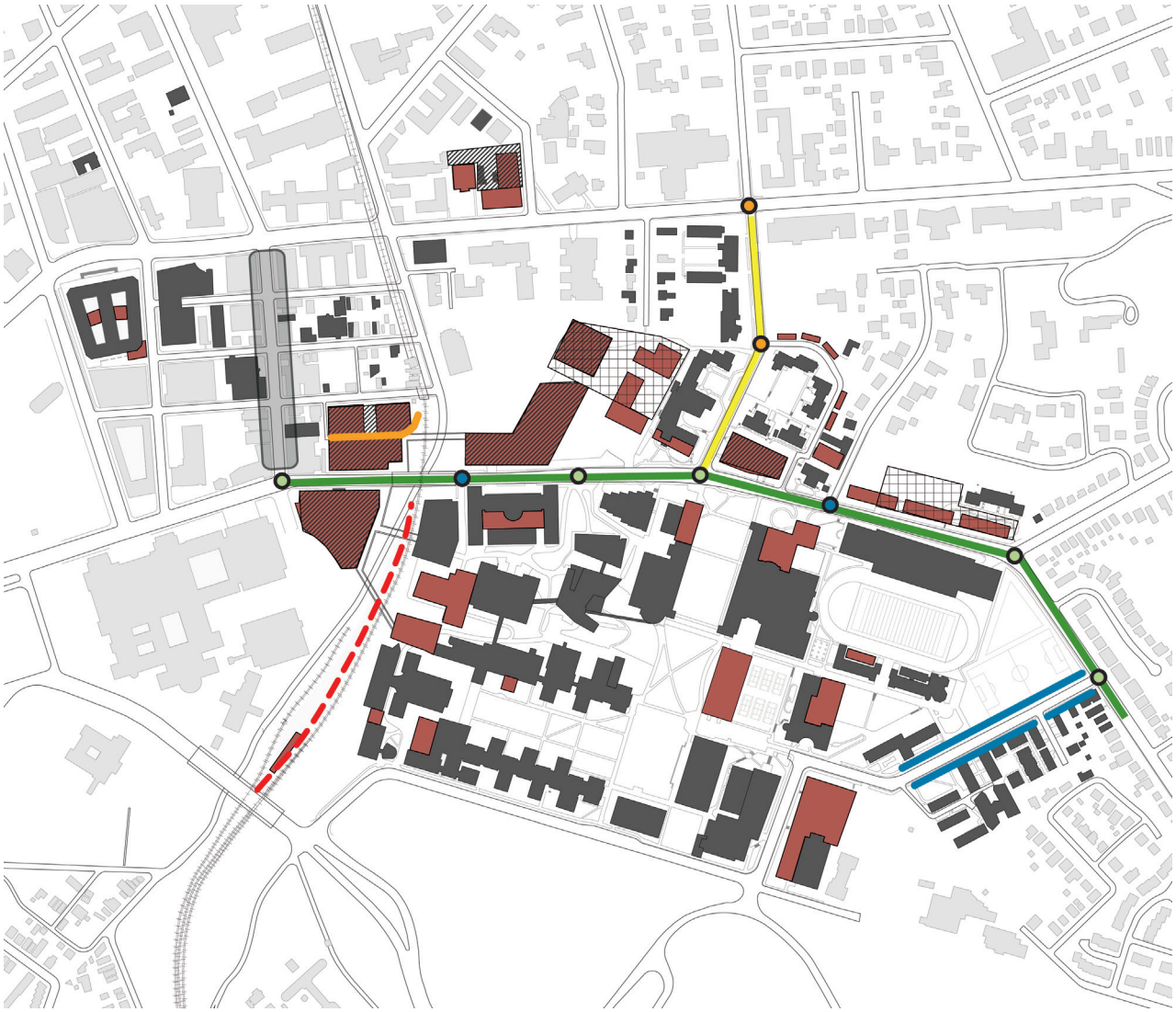
- Traffic calming on Forbes and Fifth
- Bicycle connections to and through campus
- Intersection reconstruction on Fifth

Parking Recommendations

- Parking management and enforcement
- New structured parking resources at North Quad and in Forbes & Craig area
- New parking meters on Margaret Morrison
- Wayfinding and signage for campus parking
- Support for public transportation

The university also supports the multi-agency recommendations in the PCTI study which advocates to pedestrian comfort and safety, improved aesthetics, additional bicycle facilities and managed parking; for further details on the Transportation Analysis, see Appendix F.

3.7 TRANSPORTATION MANAGEMENT PLAN



Transportation Network and Management Plan

- Safety Upgrades at Existing Intersections
- New Intersection & Pedestrian Safety Upgrades
- Intersection Reconstruction
- Sites Permitting Structured and Surface Parking
- Sites Permitting Surface Parking
- Urban Design Improvements on S Craig
- Pedestrian Upgrades and Traffic Calming on Forbes
- Pedestrian Upgrades on Morewood
- Installation of Parking Meters on M. Morrison
- Pedestrian and Trail Upgrades on Neville
- Vacation of Flossy Way

3.8 ENVIRONMENTAL PROTECTION PLAN

Carnegie Mellon University is committed to a sustainable future and strives to be a leader in the research and application of sustainable practices. Recognizing the impacts of major construction projects, the university has become a national leader in the design and construction of sustainable buildings. Carnegie Mellon built the nation's first LEED-certified dormitory in 2003, and currently has 10 LEED-certified buildings and additions, and two LEED-registered buildings on campus.

In addition to applying sustainable practices to development projects, the university has also implemented campus-wide operations initiatives through the Green Practices Committee (GPC). The GPC develops, implements and regulates campus practices that improve environmental quality. In addition, Carnegie Mellon is home to 19 environmental and energy-related interdisciplinary research centers.

Stever House, the nation's first green dormitory

Environmental Overlay Districts

As described in Chapter 906 of the *Zoning Code of the City of Pittsburgh*, the following Environmental Overlay Districts do not apply to the Carnegie Mellon campus:

- FP-O/*Flood Plain Overlay District*
- RF-O/*Riverfront Overlay District*
- LS-O/*Landslide-Prone Overlay District*
- UM-O/*Undermined Area Overlay District*
- VP-O/*View Protection Overlay District*
- SM-O/*Stormwater Management Overlay District*

As the Carnegie Mellon campus does include properties that are sloped, as depicted in Section 2.2 Existing Zoning. As such, the SS-O/*Steep Slope Overlay District* may apply to future campus developments. Therefore, developments in the Institutional Master Plan that are adjacent to hillsides will be subject to the development standards and review criteria of Section 908.8 and slope protection measures will be utilized and defined for applicable sites.

Sustainable Construction

Carnegie Mellon University works to conserve resources and reduce the ecological footprint of the campus by documenting, researching and integrating sustainable systems and designs into campus operations and infrastructure. Since 2000, university policy has been to achieve LEED Silver certification for new construction and major renovations. To-date, Carnegie Mellon has certified the following buildings and renovations:

- Stever House, LEED Silver/2003
- Henderson House, LEED Silver/2004
- The Posner Center, LEED/2005
- Mehrabian Center, LEED Gold/2006
- 407 South Craig Street retrofit, LEED Silver/2007
- 300 South Craig Street retrofit, LEED Silver/2007
- Carnegie Mellon Cafe, LEED Gold/2008
- Porter Hall 100, LEED Silver/2009
- Doherty Hall Phase 2, LEED Silver/2010
- GSIA West Entry Addition, LEED Gold/2010
- Gates & Hillman Centers, LEED Gold/2011
- Mellon Institute Central Lab, LEED Silver/2012
- GSIA First-Floor Addition, LEED Silver/2013
- Doherty Hall MSE Lab, LEED Silver/2014

3.8 ENVIRONMENTAL PROTECTION PLAN

Water Conservation & Management

The university employs green rooftops, rain water collection tanks, grey water recycling, and landscape features for reducing the amount of rain water flowing into the City's Combined Sewer Overflow (CSO) system. There are rain water collection tanks in the CIC Building, Gates and Hillman Centers and the GSIA West Entry Addition and, to mitigate the Morewood surface parking lot, a water retention feature was installed. As well, Carnegie Mellon has more than 41,000 square feet of green roofs on the following buildings:

- Gates and Hillman Centers
- The Posner Center Kraus Campo garden
- Porter Hall
- Hammerschlag Hall Living Roof
- Mellon Institute
- Doherty Hall
- Hammerschlag Hall

The redevelopment of the Morewood surface lot into the North Campus is expected to significantly reduce stormwater runoff through the use of green rooftops, rain water collection and permeable ground surfaces.

Energy

In 2010, Carnegie Mellon was ranked as a top 10 purchaser of renewable energy, receiving the US EPA's Green Power Leadership Award, and purchased 87 million kilowatt-hours renewable power to meet 75 percent of the institution's demand. Also, in 2009, the Bellefield Boiler Steam Plant (of which Carnegie Mellon is a member) converted steam boilers from coal to natural gas.

Waste Reduction/Recycling

To reduce impacts on landfills, the university diverts 20% of potential waste through recycling and composting programs.

Transportation

Understanding that transportation of people can have significant impacts on the environment, Carnegie Mellon has implemented several policies to reduce such impacts. To reduce single-occupant vehicle use, all full-time students, faculty and staff can use the Port Authority of Allegheny County bus and rail facilities free of charge, as well as the university's local shuttle buses. Additionally, bicycle lockers and parking, carpool priority parking, and market-pricing parking facilities are provided on campus.

61A Oakland-Downtown

Inside the Intelligent Workplace, a laboratory for energy-efficient interior spaces

3.9 OPEN SPACE & PEDESTRIAN CIRCULATION PLAN

From its very beginnings, the Carnegie Mellon University campus has been defined by its open spaces. The original Hornbostel campus plan of 1904 organized the new Carnegie Institute of Technology around a large quadrangle, named the Mall. The buildings that were constructed during the following decades defined the edges of the Mall and reinforced the original vision of the common open space.

During the second major wave of master planning, Dennis & Associates extended a new quadrangle of the campus north to Forbes Avenue with new buildings sited to define this space, called the Cut. Together, the Mall and the Cut create a strong formal spatial organization for the campus; their scale, proportions and view corridors reinforce their primary role on campus.

The Dennis Plan (1987) also created the East Campus, a precinct of the university defined by Gesling Stadium and a playing field. The East Campus has become the heart of athletic and public functions for the university. On the west side of the Cut, the recently complete West Campus serves a focal point for new programs and activities. This space, much more informal in design, has become the center of the dynamic technology-based growth of the university.

Also created with the East Campus, and then extended with the West Campus, the East-West walkway has become a major connection across campus. The extension, via the Pausch Bridge, allows for full access from the west side of campus to the east without having to walk along Forbes Avenue.

To build upon this rich landscape of open space, new spaces, with accompanying connections are proposed. These proposed spaces are intended to further integrate the campus, to create identity to new spaces and to become the center of campus.

Town Square

Currently, the northern end of the strong axis of the Cut terminates in an underwhelming open space centered on a bus shelter. The proposed redevelopment of this space will:

1. Create a clear front door to the campus
2. Take advantage of the strength of the space (i.e. *Walking to the Sky* sculpture and the Cut)
3. Establish future connections to new growth areas, especially the North Campus

Tepper Quad and North Green

Building upon the precedent of the Mall and the Cut, the new Tepper Quad will be the defining green center of the redevelopment of the Morewood parking lot. The proposed open space will connect to the open space in front of the Hillman Center and will also connect to Forbes and Morewood Avenues. The future North Green will extend from the Tepper Quad towards Fifth Ave creating pedestrian connections to properties on Fifth Ave.

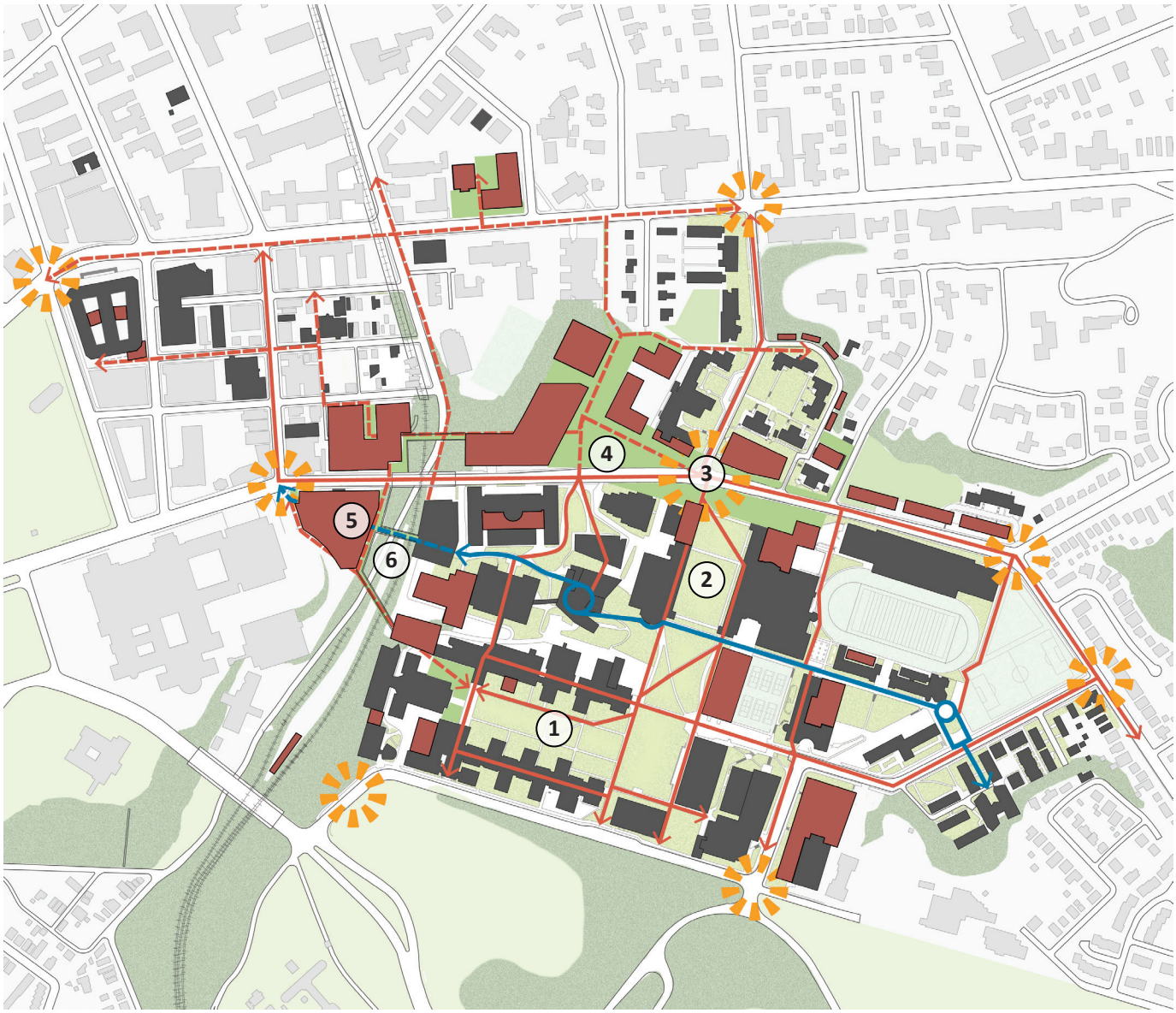
Cross-Hollow Connections

Three new pedestrian crossings across Junction Hollow are planned: One north of Forbes Avenue, connecting the North Campus to the Campus Neighborhood, and two south of Forbes, completing the cross-campus pedestrian spine, the East-West Walkway. Upon completion, the East-West Walkway will permit a pedestrian-friendly path from Mellon Institute to the dormitories along Margaret Morrison Avenue.

Wayfinding

Carnegie Mellon University supports the Innovation Oakland wayfinding proposal, which includes improving signage throughout Oakland, improving the legibility of gateways, and integrating digital technology into transportation and pedestrian navigational systems.

3.9 OPEN SPACE & PEDESTRIAN CIRCULATION PLAN



Open Space Network and Pedestrian Circulation

- East-West Walkway
- Existing Pedestrian Connections
- New Pedestrian Connections
- New Green Space
- Campus Open Space
- Public Parks
- Wooded Slopes

1. The Mall
2. The Cut
3. The Square
4. Tepper Quad
5. East-West Walkway Extension
6. Cross-Hollow Connections
- Pedestrian Gateways

3.10 URBAN DESIGN GUIDELINES

The Carnegie Mellon University campus is a highly planned environment made up of a variety of buildings and open spaces. It is a 24 hour live-work-play environment for students, faculty, and staff. The campus as a whole is meant to convey an image of reflection and scholarly purpose in a beautiful, safe, and sociable setting. The original campus, developed early in the 20th Century, was organized around Beaux Arts principles of symmetry, axes connecting monumental buildings, and open space quadrangles edged by architecturally significant structures. Certain landmark buildings, such as Hammerschlag Hall, have a unique image and site because of their position at the terminus of a significant view corridor. The 1988 and 2002 Institutional Master Plans carried these classic design principles forward in the design and siting of new buildings on campus, primarily in the central and east campus precincts.

Carnegie Mellon University is committed to the preservation of the original buildings designed by architect Henry Hornbostel between 1900 and 1930. All the Hornbostel buildings have been awarded Historic Preservation plaques by the Pittsburgh History & Landmarks Foundation. Buildings constructed during the 1988 and 2002 master plan periods made direct contextual connections to the Hornbostel buildings in massing, materials, and color. With a critical mass of new contextual buildings now constructed in the core campus, buildings proposed outside the central area can be designed to display their unique functions through architectural forms and materials that are less historicist in the Hornbostel tradition but still contextual in massing and landscaping.

The design of individual campus buildings is given regular oversight by an internal Design Review Committee (DRC) made up of Carnegie Mellon University staff, faculty, and students who review and comment on the designs of consultant architects and engineers. The DRC review process is guided by the master plan principles and urban design guidelines of this Master Plan. The work of design consultants and construction contractors is coordinated by the staff of the Campus Design and Facilities Department (CDFD).

Considering the long-term potential of the West and North Campus precincts (the Morewood lot, North of Forbes and South of Forbes) specific urban design and development standards have been created to guide the development of those precincts. The proscriptive guidelines inform materials, massing and other building factors to develop appropriate expansion of the campus - see Appendix G: Major Development Sites Design Guidelines. Additionally, all building designs will incorporate the following Urban Design Guidelines in addition to the IMP Design Principles in Section 3.4 of this report:

Setbacks

Many Carnegie Mellon University buildings do not front on public streets. Such buildings within the internal campus will be aligned to form and contain landscaped open space of large-scale quadrangles or small-scale gardens. Buildings on streets or public right-of-ways will generally be aligned with existing adjacent buildings. Street-facing buildings will be set back a minimum of ten feet from sidewalks but usually more to allow a safe and pleasant pedestrian environment, including sidewalks, bikeways, street trees, landscaping, and lighting. Where university property abuts property zoned Residential, buildings will be set back to equal or exceed the residential compatibility standards in Chapter 916 of the *Zoning Code of the City of Pittsburgh*.

Massing

Buildings will be designed and sited to be compatible in bulk and massing with existing adjacent buildings, and to provide appropriate external area for landscaping and open space. Buildings will be designed to maximize natural daylight, and to provide an exterior view and natural ventilation for all occupants. Some buildings will have a top floor setback to be in context with similar adjacent buildings. Pitched roofs and flat roofs will be used as appropriate, including green roofs where feasible. Rooftop mechanical equipment will be enclosed in penthouse structures.

3.10 URBAN DESIGN GUIDELINES

Height

Academic, research, and dormitory buildings on campus are generally three to five stories above grade. Some future buildings may be higher because of unique program or site, or if it the building is at the terminus of an important view corridor.

Landscaping

Carnegie Mellon University is committed to a sustainable environment including the use of plant materials native to Western Pennsylvania. A more formal landscape will be used for the major quadrangles such as the historic Hornbostel Mall and Cut and new North Campus quadrangles to be developed in the future. These open lawns complement the campus architecture and serve as informal recreation fields. A less formal garden environment will be the standard for smaller campus spaces between buildings. Best Management Practices (BMP) for storm water management will be incorporated into all landscaping design and construction.

Parking

Parking is an integral part of the Carnegie Mellon Transportation Management Program (TMP). The overall goal is to reduce vehicle miles traveled, the number of cars on campus, and carbon emissions. Carnegie Mellon issues PAT bus passes to all full time faculty, staff, and students. Bicycle commuting is supported by numerous bike racks and shower facilities. Ride-sharing and car-pooling are also encouraged. A multi-modal transit, bike, and parking facility may be a feature of future development along the north side of Forbes Avenue between Morewood Avenue and Craig Street.

On-campus parking requires payment of a monthly permit. There is no free parking on campus. Parking garages and surface lots are considered a shared resource to be used system-wide by a variety of parkers, rather than assigning specific parking facilities to specific buildings.

Surface parking lots will employ Best Management Practices (BMP) for storm water management, including, as appropriate for the location, such techniques as pervious pavement, bio-swales, and retention areas.

New parking structures will be located under buildings or encased in buildings where possible so that they are not visible from public rights of way, especially Forbes Avenue and Schenley Park. Where parking garage facades may, for reasons of design practicality, face a public street, enhanced architectural features and landscaping will be added to screen and mitigate the view, such as was done for the East Campus Garage at Forbes Avenue and Beeler Street.

Hamerschlag Hall

Intersection of the Mall and the Cut

3.11 NEIGHBORHOOD PROTECTION STRATEGY

Carnegie Mellon University is a uniquely situated urban campus, with strong residential, institutional and recreational neighboring uses. To the east, the university borders Squirrel Hill, a long-stable residential neighborhood with quiet residential streets. To the north, Shadyside and North Oakland provide a variety of housing types, from high-rises to row houses. To the west lies Central Oakland, anchored by the University of Pittsburgh, UPMC and Carlow University; these institutions and others, along with the university, are the economic engine of Southwestern Pennsylvania. To the south, Schenley Park provides over 400 acres of valuable green and recreational space.

Carnegie Mellon is an integral part of Oakland, Shadyside and Squirrel Hill. Many faculty, staff and students choose to live in the surrounding neighborhoods or visit local shopping districts, while neighboring residents can be found using the campus' athletic and cultural amenities. While the university houses nearly 4,000 of its 5,800 undergraduate students on campus, many graduate students choose to live in nearby housing in Squirrel Hill, Shadyside and Oakland.

In order to maintain appropriate transitions from university property to adjoining residential properties, new developments will equal or exceed both *Section 916, Residential Compatibility Standards* and *Section 917, Landscape and Screening Standards* of the Zoning Code. Additionally new developments will contribute to the quality of life, will strengthen intellectual, social, and commercial ties with neighboring communities.

Communication

Carnegie Mellon has long taken a position that discourse, both on-campus and off, is vital to understanding, and therefore has been a consistent partner in neighborhood discussions. Under the leadership of the ombudsperson for neighbor relations, Carnegie Mellon engages several strategies to enhance the relationship between the university and its neighbors. The university clearly communicates its expectations to students regarding their behavior in off-campus settings, while partnering with the City to appropriately engage and follow-up when student conduct adversely impacts the quality of life in the neighborhoods near campus. The university cultivates opportunities to amplify personalized connections between students and neighbors through student participation at neighborhood association meetings. Going forward, Carnegie Mellon will work with students searching for off-campus housing to help ensure that they are well-informed about their responsibilities and rights as tenants and community members. Additionally, the university will better publicize its resources that are available to assist students and neighbors in addressing concerns and jointly creating a positive neighborhood experience.

Rezoning

Recognizing the need to create clear and defined edges, the master plan includes a request to rezone several properties owned by the university, as illustrated in Section 3.12. Some of these properties have been owned by the university for many years, some only recently acquired. The overall intent is to have, to the maximum extent possible, the boundaries of the EMI district match the land owned by the university and to appropriately zone academic and support uses as EMI. The proposed rezoning will represent the current conditions of activities and will clearly demonstrate future growth, allowing neighboring residences to be secure in the interests of the university.

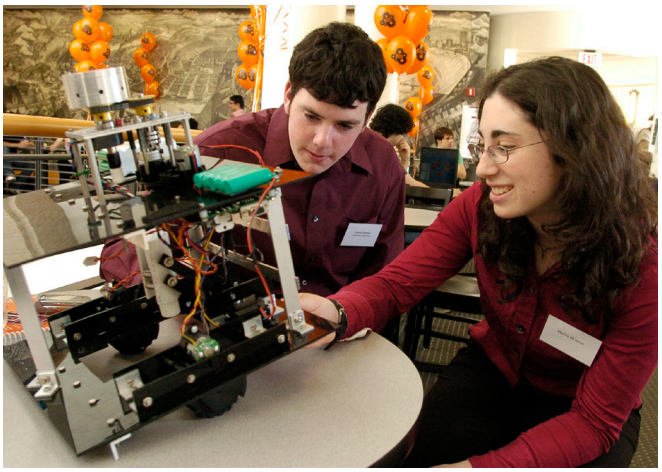
The two areas for rezoning are propertues acquired after the apporval of the Institutional Master Plan in 2012 and include properties in the South Craig area and on Fifth Ave. The rezoning also includes properties of Central Catholic High School that are zoned residential - the rezoning has been approved the CCHS Board.

3.12 PROPOSED ZONING CHANGES

Proposed Zoning Change

	Existing EMI District
	Proposed Zoning Change to EMI
EMI	Educational Medical Institutional
OPR-B	Oakland Public Realm
P	Park
H	Hillside
RP	Residential Planned Unit Development

R1D-VL	Residential Single-Unit Detached, Very Low Density
R1D-L	Residential Single-Unit Detached, Low Density
R1A-H	Residential Single-Unit, High Density
R2-L	Residential Two-Unit, Low Density
RM-M	Residential Multi-Unit, Moderate Density
RM-H	Residential Multi-Unit, High Density
RM-VH	Residential Multi-Unit, Very High Density



Meeting of the Minds Symposium

The Cut

Buggy race

Margaret Morrison Carnegie Hall rotunda

Campus life

Cricket on the Cut

APPENDICES

APPENDIX A

Master Plan Team and Schedule

IMP Steering Committee

Don Carter, Remaking Cities Institute
Lucian Caste, Board of Trustees & Design Review Committee
Cheri Hays, University Management Team
Ralph Horgan, Campus Design and Facility Development
Tod Hunt Jr, Board of Trustees & Design Review Committee
Mark Kamlet, Provost & Chair
Patrick Gage Kelly, Graduate Student Assembly
Pradeep Khosla, Carnegie Institute of Technology
Susan Kinchelow, College of Humanities & Social Sciences
Madelyn Miller, Environmental Health and Safety
Michael Murphy, Vice President for Campus Affairs
Lea Simonds, Board of Trustees & Public Art Committee

IMP Staff & Consultants

Todd Brandt, GAI Consultants
Karen Branick, Remaking Cities Institute
Sally Foster, Ayers Saint Gross
Elise Gatti, Remaking Cities Institute
Luanne Greene, Ayers Saint Gross
Glenn Neighbors, Ayers Saint Gross
Bob Reppe, Campus Design and Facility Development
Bynum Walter, Ayers Saint Gross
John Wojtyna, GAI Consultants

Master Plan Schedule

February 2010	Property & Facilities Committee sign-off on process
March 2010	Initial brief with Department of City Planning
April 2010	Present overview to campus & community groups
May-September 2010	Master planning and project planning workshops
October 2010	Update presentation to campus & community groups
November 2010	Update presentation to Board of Trustees
January 2011	Master Plan outline complete
February 2011	Final review by IMP Steering Committee
March-April 2011	Final presentation to campus & community groups
May 2011	Final presentation to Board of Trustees
July 2011	Pre-submission review with City Planning
August 2011	Master Plan document complete
September 2011	Submission of Master Plan and rezoning to City
October 2011	Department of City Planning and CDAP review
January 2012	Planning Commission hearing and action
February 2012	Legislation introduced to City Council
April 2012	City Council hearing and final action

APPENDIX B

Master Plan Outreach

Campus Stakeholder Meetings	Overview	Options	Final
Management Team	20 Jan 2010	3 Aug 2010	5 Jan 2011
Property & Faculty Committee	11 Feb 2010	4 Nov 2010	24 Feb 2011
IMP Steering Committee	23 Apr 2010	4 June 2010	3 Aug 2010
Design Review Committee	27 Apr 2010	10 Sep 2010	21 Mar 2011
President's Council	20 Feb 2010	26 Oct 2010	5 Jan 2011
Faculty Senate	6 Apr 2010	2 Nov 2010	11 Jan 2011
Undergraduate Senate	8 Apr 2010	26 Oct 2010	27 Jan 2011
Graduate Student Assembly	7 Apr 2010	6 Oct 2010	27 Jan 2011
Campus Affairs	17 Feb 2010		16 Feb 2011
Staff Council	28 Jan 2010	21 Oct 2010	20 Jan 2011
Green Practices Committee	24 May 2010	8 Nov 2010	31 Jan 2011
Alumni	1 Oct 2010		4 Jun 2011
Housing & Dining	23 Apr 2010		20 Apr 2011
Athletics	3 Jun 2010	1 Nov 2010	9 May 2011

Community Meetings			
Pittsburgh City Council	4 Apr 2010	10 Feb 2011	1 Mar 2011
Department of City Planning	19 Mar 2010	4 Oct 2010	29 Apr 2011
Bellefield Area Citizens Association (BACA)	6 Apr 2010	5 Oct 2010	1 Mar 2011
Oakland Community Council (OCC)	12 Apr 2010	11 Oct 2010	15 Feb 2011
Squirrel Hill Urban Coalition (SHUC)	20 Apr 2010	19 Oct 2010	15 Feb 2011
Craig Street Merchants	20 Apr 2010	19 Oct 2010	24 May 2011
Central Catholic High School	3 May 2010	8 Oct 2010	25 Feb 2011
Pittsburgh Park Conservancy (PPC)			12 Feb 2011
Beeler Street		24 Aug 2010	
Gladstone Road	22 Oct 2010	20 Jan 2011	9 Mar 2011
Craig Street Area	16 Nov 2010	26 Jan 2011	24 May 2011
Devon Road		21 Jun 2011	
Park Mansions		3 Jun 2011	

Town Hall Meetings	
Working Open Forum Session (Transportation)	18 Nov 2010
Institutional Master Plan Open House	2 & 3 March 2011
Transportation Study Public Meeting	19 Jul 2011
Public Rollout of Master Plan	26 Sep 2011

Transportation Study Meetings	
Carnegie Museums & Library	29 Oct 2010
Central Catholic High School	22 Oct 2010
Craig St Merchants	27 Oct 2010
Oakland Community Council	2 Nov 2010
Pittsburgh Board of Education	29 Oct 2010
Port Authority of Allegheny County	29 Oct 2010
Shadyside Action Coalition	27 Oct 2011
Squirrel Hill Urban Coalition	27 Oct 2011
University of Pittsburgh	22 Oct 2010

APPENDIX C

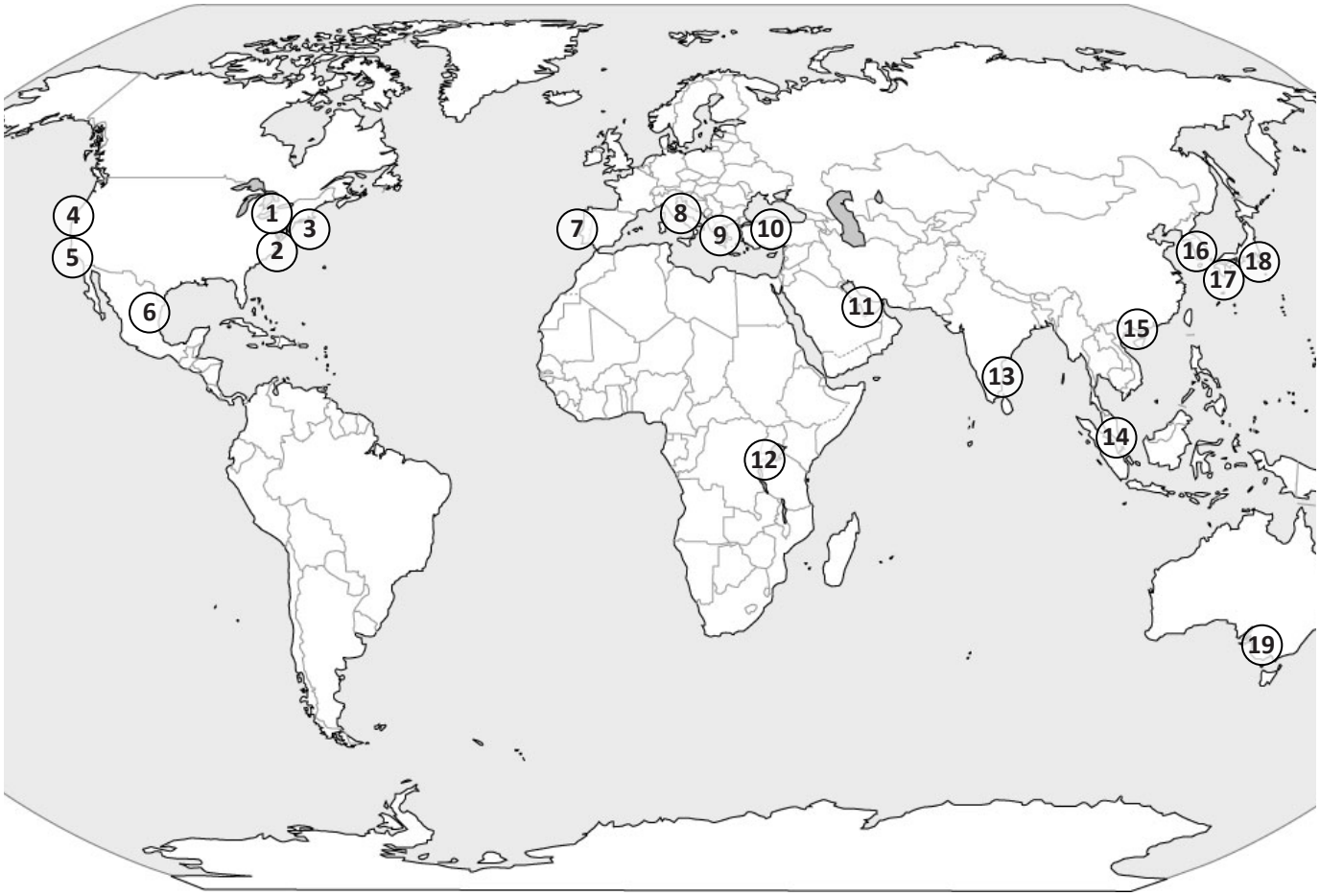
Pittsburgh Facilities and International Locations

Pittsburgh Operations

- (A) Oakland Campus
- (B) 6 PPG Place, Downtown
- (C) Pittsburgh Technology Center (PTC), Oakland
- (D) Field Robotics Center/Robot City, Hazelwood
- (E) National Robotics Engineering Center (NREC), Lawrenceville
- (F) Warehouse, Penn Avenue, Larimer/Point Breeze

APPENDIX C

Pittsburgh Facilities and International Locations



Degree Locations

1. Pittsburgh, USA
2. Washington, USA
3. New York, USA
4. Silicon Valley, USA
5. Los Angeles, USA
6. Monterrey, Mexico
7. Porto, Portugal
8. Bologna, Italy
9. Athens, Greece
10. Ankara, Turkey
11. Doha, Qatar
12. Kigali, Rwanda
13. Chennai, India
14. Singapore
15. Guangzhou, China
16. Daejeon, South Korea
17. Kobe, Japan
18. Osaka, Japan
19. Adelaide, Australia

APPENDIX D

2010 Building Inventory

Completed	Building	Architect/Planner	Sq Feet
1903-1911	**Campus Master Plan**	**Hornbostel**	
1906	Porter Hall (Industries Hall)	Hornbostel	125,000
1907	Margaret Morrison College (MMCH)	Hornbostel	110,000
1908	Doherty Hall (School of Applied Science)	Hornbostel	180,000
1912, 1916	College of Fine Arts (School of Applied Design)	Hornbostel	125,000
1913	Hammerschlag Hall (Machinery Hall)	Hornbostel	117,000
1914	Baker Hall (Administration Hall)	Hornbostel	120,000
1915	Hamburg Hall (US Bureau of Mines, acquired 1984)	Hornbostel	102,000
1915-1918	Hill Dorms (Henderson, Boss, McGill, Scobell, Welsh)	Hornbostel	65,000
1922	Mudge House (acquired 1960s)	Henry D Gilchrist	67,000
1924-1932	Skibo Gymnasium/Thistle Hall	Hornbostel	65,000
1925	Roselawn Terrace Apartments (acquired 1957)		19,000
1927	Morewood Gardens (acquired 1940s)	Farrar, Marks & Kann	135,000
1931	Mellon Institute (acquired 1967)	Janssen & Cocken	357,000
1935	300 S Craig (Vision Service Center, acquired 2005)	n/a	87,000
1938	**Campus Master Plan**	**Githens & Keally**	
1939	Smith Hall (US Bureau of Mines, acquired 1984)	Lawrence Wolfe	22,000
1950	Doherty Hall addition	Francis Keally & Palmgreen, Patterson & Fleming	50,000
1952	Graduate School of Industrial Administration (GSIA)	Marlier & Johnstone	55,000
1954	Donner House	Mitchell & Ritchey	52,000
1957-1959	**Campus Master Plan**	**Rice, Schweiker**	
1959	Doherty Apartments	Franklin Douden Associates	34,000
1960	Lower Greek Quad	Lawrence & Anthony Wolfe	80,000
1960	Hammerschlag House	Celli-Flynn	31,000
1960	Studio Theater (demolished 2005)	Paul Schweiker	
1960	Skibo Hall (demolished 1994)	Lawrie & Green	
1961	Hunt Library	Lawrie & Green	101,000
1962	Morewood Gardens E-Tower	Alfred Reid & Associates	60,000
1962	Scaife Hall	Altenhof & Brown	37,000
1966	Warner Hall	Charles Luckman Associates	46,000
1966	Graphic Arts Technical Foundation (acquired 2009)	WTW	49,000
1968	**Campus Master Plan**	**Sasaki, Dawson & Demay**	
1970	Upper Greek Quad	Curry and Martin	45,000
1971	Wean Hall (Computer-Science Building)	Deeter Ritchey Sipple	295,000
1982	Margaret Morrison Plaza & Tennis Courts	Damianos & Pedone	
1983	Cyert Hall (University Computer Center)	Deeter Ritchey Sipple	64,000
1984	Margaret Morrison Apartments & Sororities	Damianos & Pedone	28,000
1985	4616 Henry/INI (acquired 2005)	Damianos & Pedone	25,000

APPENDIX D

2010 Building Inventory

Completed	Building	Architect/Planner	Sq Feet
1985	**Campus Master Plan**	**CRS Sirrine**	
1986	Residence at Fifth (acquired 2010)	Tasso Katselas Associates	65,000
1987	Software Engineering Institute	Bohlin Powell Larkin Cywinski Burt Hill, Kosar Rittleman	129,000
1987	**Campus Master Plan**	**Dennis Clark & Associates**	
1988	FMS Building (Physical Plant)	IKM, Inc.	48,000
1990	West and Resnik Houses	Dennis, Clark & Associates	122,000
1990	East Campus Parking Garage and Gesling Field	Dennis, Clark & Associates	
1992	Posner Hall (GSIA addition)	Kallmann McKinnell Wood	70,000
1995	Pittsburgh Technology Center (formerly CMRI)	Bohlin Cywinski Jackson	81,000
1996	Cohon University Center	Michael Dennis & Associates Urban Design Associates	214,000
1996	Roberts Hall	Payette Associates	65,000
1997	Intelligent Workplace (MMCH Addition)	Bohlin Cywinski Jackson	7,000
1999	Purnell Center for the Arts	DDF Associates, Inc. Damianos + Anthony Michael Dennis & Associates	105,000
2000	Baker Hall Addition	Burt Hill Kosar Rittelman	24,000
2000	Posner Hall Fourth Floor Addition	The Design Alliance	20,000
2000	Doherty Hall Addition Phase 1	Burt Hill Kosar Rittleman	45,000
2001	Newell Simon Hall	WTW Architects	155,000
2002	**Campus Master Plan**	**Ayers Saint Gross**	
2003	Stever House (formerly New House)	Bohlin Cywinski Jackson	63,000
2004	Posner Center and the Kraus Campo	WTW & Mel Bochner	8,000
2005	Collaborative Innovation Center (CIC)	Davis, Gardner, Gannon, Pope	135,000
2005	Addition to East Campus Garage	Landmarks Design Associates	
2007	Tartans Pavilion	Springboard	6,000
2008	Doherty Hall Addition Phase 2	Burt Hill Kosar Rittleman	15,000
2009	Tepper School West Entry Addition	Edge Studio	6,000
2009	Gates & Hillman Centers	Mack Scogin & Merrill Elam	216,000
2012	**Institutional Master Plan**	**Ayers Saint Gross, GAI Consultants, Remaking Cities Institute and CDFD**	
2016	Scott Hall	Office 52 / Stantec	105,000
2016	Cohon University Center Addition	Cannon Design	68,000
2016	Hamburg Hall Expansion	GBBN / Edge Studio	6,000
2016	S Neville Support Facility & Parking	Klavon Design / Baker	8,000
2018	Tepper Quad	Moore/Ruble/Yudell	315,000

APPENDIX E

2010 Parking Inventory

The current vehicle parking capacity in Oakland and around Carnegie Mellon University is over 10,000 parking spaces in garages, lots and on-street. Carnegie Mellon University alone has 2,900 spaces in its garages and lots in Oakland.

The Pennsylvania Community Transportation Initiative (PCTI) Study found that parking utilization rates of 72 percent of Carnegie Mellon's surface lots and 77 percent of its garages in October 2010 and recommended capacity management of the parking inventory.

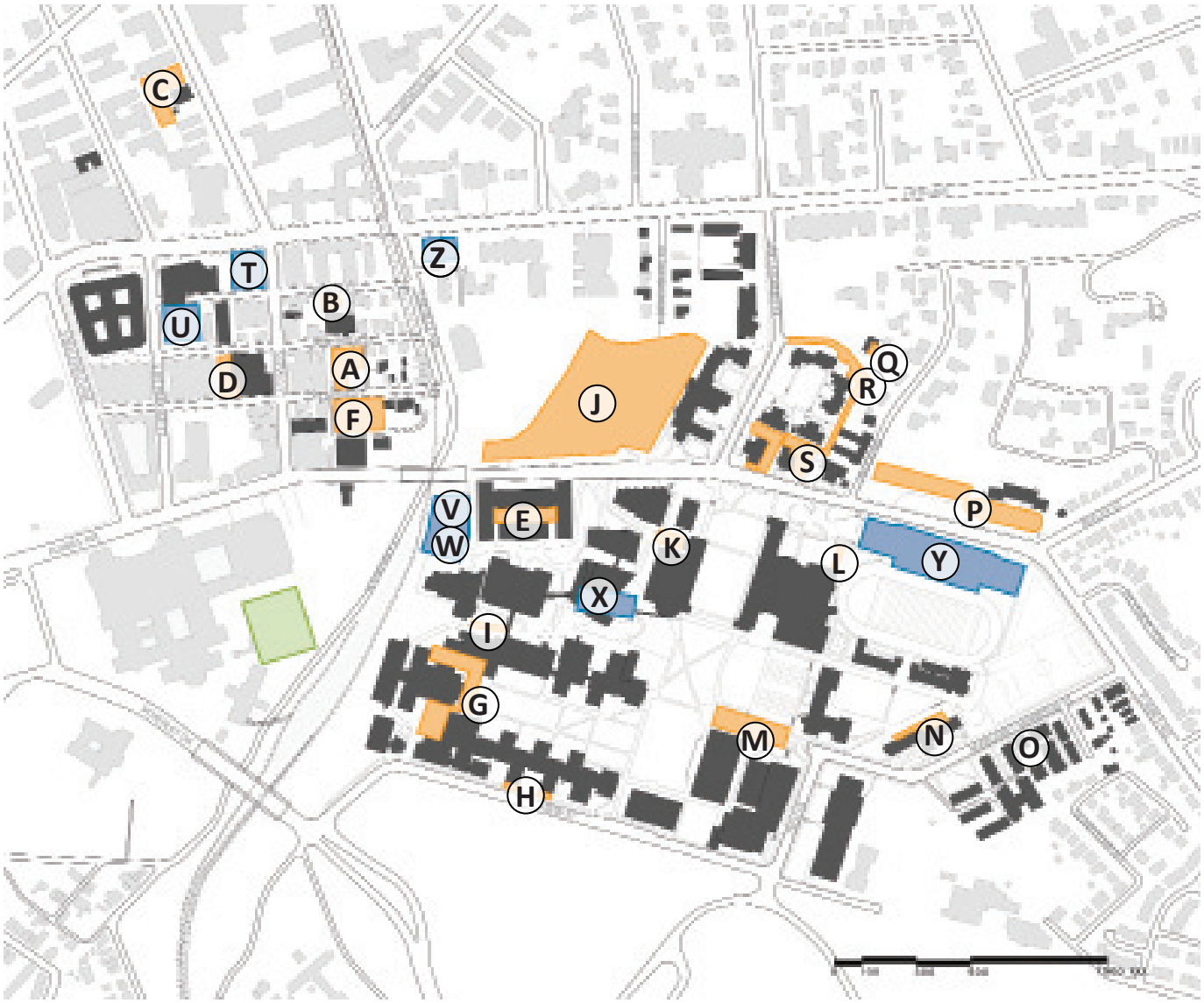
There are no official numbers for bicycle parking infrastructure in Oakland or on Carnegie Mellon University's campus. The latest campus audit (2010) listed 57 racks but did not include all racks. The City of Pittsburgh has installed a number of bike racks in Oakland.

Map	CMU Surface Lots	Spaces	Utilization Rate
A	Zebina Way Lot	30	*90 %*
B	Henry Street Lot	9	*78 %*
C	Whitfield Hall Lot	61	*56 %*
D	300 South Craig Lot	12	*83 %*
E	Hamburg Hall Lot	24	*33 %*
F	GATF Lot	81	*80 %*
G	Porter-Hammerschlag-Wean Lot	68	*79 %*
H	Frew Street Meters	9	*67 %*
I	West Campus Lot	6	*100 %*
J	Morewood Lot	737	*92 %*
K	Warner Hall Lot	11	*73 %*
L	University Center Lot	10	*50 %*
M	Fine Arts Lot	60	*72 %*
N	Donner House Lot	25	*48 %*
O	Margaret Morrison St	15	*100 %*
P	Doherty Apartments Lot	118	*79 %*
Q	Bramer House Lot	7	*80 %*
R	Fraternities Lot	75	*63 %*
S	Alumni House Lot	18	*39 %*
	CMU Garages		
T	5th and Craig Street Garage	25	*100 %*
U	Dithridge Garage	328	*82 %*
V	CIC Garage (Gated)	235	*61 %*
W	CIC Garage (Ungated)	11	*91 %*
X	Gates Garage	147	*46 %*
Y	East Campus Garage	822	*79 %*
Z	Residence at Fifth Garage	40	*65%*
	Total Spaces	**2949**	

Data from *CMU Pedestrian Safety Mobility Study* (GAI Consultants, October 2010).

APPENDIX E

2010 Parking Inventory



Parking Options around Carnegie Mellon University

- CMU Garage
- CMU Surface Lot
- Public Garage (Non-Permit)

APPENDIX F

PCTI Transportation Study

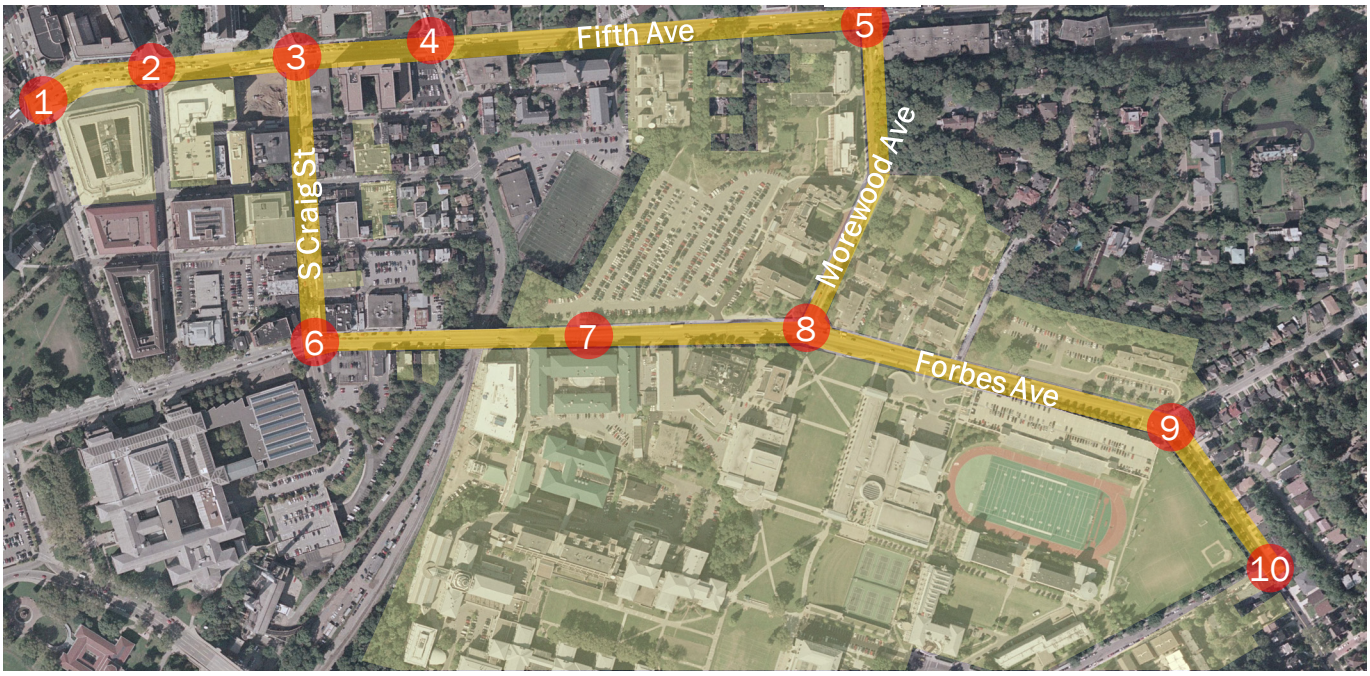
Carnegie Mellon University is served by regional connections and local arterials, a dense network of public and institutional transit, a walkable campus and an emerging network of bicycle connections. To build upon these systems, to improve pedestrian safety and to better utilize existing parking resources, the university, with its partner the Oakland Transportation Management Association (OTMA), received a PennDOT Pennsylvania Communities Transportation Initiative (PCTI) grant to analyze and assess the campus transportation system for the Transportation Management Plan.

The recommendations of the study focus on transforming Forbes Avenue into a multi-modal urban avenue, the campus "main street", via the addition of new buildings fronting onto Forbes, traffic calming and increased pedestrian and cyclists safety. Recommendations include reducing the vehicle lanes on Forbes from four to two and adding bike lanes; widening sidewalks and adding a buffer with street trees and improving and increasing pedestrian crossing across Forbes Avenue.

PCTI Transportation Study

The PCTI Study, which provides a system-wide assessment and analysis of campus transportation, accomplished the following goals.

- Identify major transportation, safety and mobility issues
- Analyze traffic counts and turning movements at each intersection and throughout the corridor analyze accident report data
- Provide a needs / demands assessment that includes an inventory of parking lots, number of spaces and overall capacity of the university's parking reservoir
- Analyze current parking utilization and provide recommendations for future parking management and development strategies
- Identify pedestrian and bicycle corridors and counts at each intersection
- Provide an urban design and land use analysis that assesses the relationship between planning and transportation issues
- Provide concept designs and schematics for improvements



PCTI Study Area

APPENDIX F

PCTI Transportation Study

Major Transportation Issues

The PCTI study found that there is an overall deficit in pedestrian and cyclist safety and amenities along nearby city streets, and changing patterns of parking on campus. The study broke the issues down to the following six major issues.

1. **Lack of ADA and Traffic Signal Standards**
   All intersections have at least some form of curb ramp and pedestrian signal heads, but none are fully compliant with current crosswalk standards or have countdown pedestrian signals.

Lack of ADA /Crossings Standards

2. **Lack of Long Term Markings at Intersections**
   While most intersections, as well as several unsignalized locations, have marked crosswalks, none feature high-visibility striping which represents a significant safety and mobility issue.

Lack of Pavement Markings

3. **Lack of Way Finding/Destination Signage**
   As current way finding is directed exclusively to drivers, there is opportunity to implement detailed information for bicyclists and pedestrians as well.

Lack of Wayfinding Signs

4. **Narrow Sidewalks**
   Much of Forbes and Fifth Avenues have relatively narrow sidewalks which are immediately adjacent to the travel lane. Wider sidewalks and more separation between pedestrian and cars would make a safer and attractive pedestrian environment.

Narrow Sidewalks

PCTI Transportation Study

5. **Lack of Buffer at Sidewalks**
   Sidewalks on campus do not provide sufficient separation between pedestrians and vehicles. Wider sidewalks and/or separation between pedestrians and cars would create a safe pedestrian environment. Possible separation method could include landscaped strips, on-street bicycle lanes and/or on-street parking.

Lack of Buffer at Sidewalks

6. **Excess Speeds on Forbes and Fifth Avenues**
   Forbes and Fifth Avenues create an opportunities for vehicles to move at high speeds, especially in an attempt to "beat" the next red light. This is a substantial risk for slower moving bicyclists and to crossing pedestrians. The lack of safe on-street bicycle alternatives causes many cyclists to ride on the sidewalk. The exclusive pedestrian phases, which can improve safety, result in intersection delay for pedestrians and motorists alike, so pedestrians often choose to ignore the signal and cross against the light or at mid-block locations.

Excessive Speeds

Options for Corridor Improvements to Enhance Safety, Movement, and Aesthetics.

- Upgrade ADA ramp access, upgrade signal hardware.
- Upgrade all signals at ten intersections.
- Install special emphasis crosswalks at all intersections.
- Implement a three (3) tier system:
  a) Static on campus signage
  b) A system linked to the city-wide plan
  c) Interactive wayfinding system
  d) Mimic the "ParkPgh" system.
- Develop tree lawns where feasible. Relocate sidewalks away from curb line.
- Develop a plan to provide a road diet on Forbes. Recommend a lower speed limit on Fifth Avenue in the study area.
- Upgrade signal, signing, and pavement markings, and potentially reduce speed limit to 25 MPH from 35 MPH.
- Upgrade signal, signing, and pavement markings, lower speed limit, realign southbound Morewood Avenue to reduce/eliminate lane offset across intersection.
  Tree canopy decline exists along Craig Street Provide standard unpaved tree planting areas, 3 ft. x 7 ft., for all healthy trees, per the Forestry Dept. standards.
- Implement on campus wayfinding mimicking and perhaps linking to the "ParkPgh" system for Downtown Pittsburgh.
- Facilitate vehicle passage on Craig Street via complete street resurfacing, provide full special emphasis pedestrian crosswalk markings at all cross streets, Filmore and Winthrop, on Craig Street from Forbes Avenue to Fifth Avenue.

APPENDIX F

PCTI Transportation Study

Options for Pedestrian Enhancements

- Modify overall campus-wide sidewalk replacement program to utilize 10-ft. wide sidewalks as a standard replacement width where feasible.
- Create tree buffer as part of sidewalk replacement program in Option 1 above.
- Relocate sidewalk along western curb line of Morewood to directly serve the dormitories.
- Widen sidewalks to uniform width and eliminate offset curb alignment.
- Widen sidewalk to full 10 foot width as part of Morewood Avenue sidewalk Alternative.
- Replace all crosswalk markings.
- Upgrade traffic signals and add pedestrian signals.
- Implement studies to expand existing pedestrian crosswalks and determine future crosswalk/signal locations.
- Consideration of widening of sidewalks on Forbes Avenue bridge is not practical due to structural design constraints.
- Create separate sidewalk bypass of bus stops on Forbes at Morewood Avenue.

Options for Improved Bicycle Facilities

- Increase bike rack placements for all locations with greater than 80% utilization. Develop wayfinding application for smart phones per Section 1, Item 4 for directions to underutilized bicycle facilities.
- Implement Forbes road diet; implement Morewood Avenue Sidewalk Alternative; provide connectivity to City bicycle route system
- Develop a complete, continuous bicycle routing plan for bicycles within the campus environment with links to routes penetrating from outside the campus

Options for Bus Stop Relocations or Eliminations

- Expand Morewood at Forbes stops to accommodate both layover and regular stop functions.
- Expand bus stops into full transit center configurations during the implementation of building and site developments as part of the 2012 Master Plan.
- Relocate bus stops where such action would facilitate increased student population utilization of services and/or would reduce heavy loads at stops which increase boarding and discharge times and/or which impact schedules of the bus routes.
- Relocate Forbes Avenue westbound stop to far side of intersection at Craig Street.
- Relocate eastbound stop to Dithridge Street.
- Reschedule school buses to minimize layover time on Fifth Avenue to 10 minutes or less.
- Relocate layover entirely to other less traveled city street, i.e. Ellsworth Avenue.

APPENDIX F

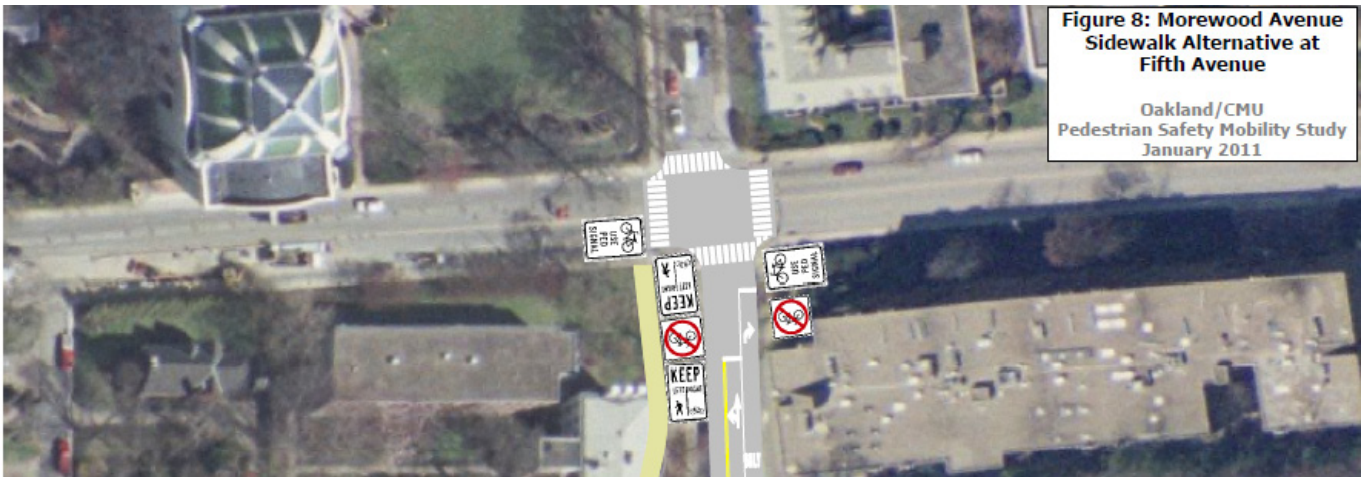
PCTI Transportation Study

Recommended Improvements

The Transportation Study findings result in a series of recommended improvements, both for systems operations and for physical improvements. As the master plan works to connect land use and development patterns with transportation improvements, the following improvements are recommended.

A. Immediate Action Recommendations

1. Complete upgrade of the signal system at all ten (10) of the study intersections. This recommendation evolved from an initial observation that pavement markings and all of the existing signal equipment within the study area did not meet current standards. A suggested immediate action recommendation was to only upgrade the crosswalk pavement markings only at the ten (10) intersections to achieve immediate safety improvements at minimal cost. It became apparent at the December 8, 2010 Project Sponsor meeting that this would not achieve the overall objectives of the study, to achieve greater overall pedestrian safety and mobility, and that the benefits of only upgrading the crosswalks were felt to have moderate effect on mobility across an intersection, but minimal or no effect on overall mobility. Therefore this initial recommendation was expanded to include the complete upgrade of all signals within the study area to current standards for pedestrians and motorized vehicles. Conceptual drawings are not presented, but cost estimates are presented for typical four and three-leg approaches.



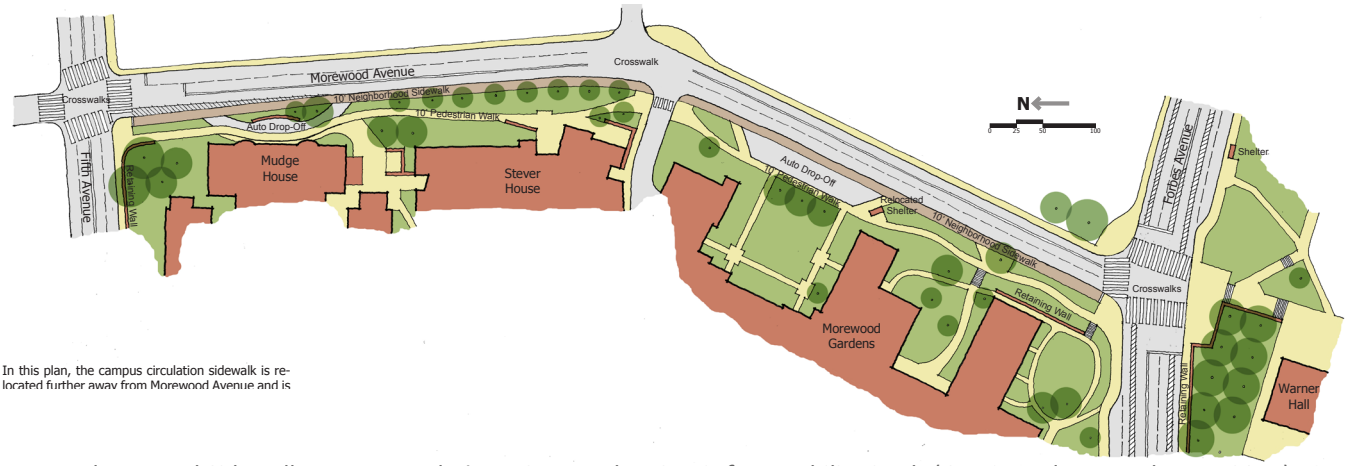
Fifth and Morewood intersection improvements. *CMU Pedestrian Safety Mobility Study* (GAI Consultants, February 2011).

APPENDIX F

PCTI Transportation Study

2. The second immediate action recommendation is to implement a road diet on Forbes Avenue. This plan would involve the reduction in the number of travel lanes on Forbes Avenue and the creation of bike lanes in both directions on Forbes Avenue. This recommendation fulfills multiple objectives of the study at very low cost, while not reducing capacity along Forbes Avenue as demonstrated in Appendix C. It achieves increased pedestrian safety by creating a buffer of a bicycle lane between pedestrian movements along Forbes Avenue and vehicle traffic. It acts as a traffic calming strategy while not reducing capacity on Forbes Avenue, recognizing that additional turning lanes will be provided as needed to maintain capacity. It also provides a bicycle routing system through the heart of campus as well as connections to Oakland and Squirrel Hill beyond campus, which immediately compliments the overall flow of the bicycle routing plans of the City of Pittsburgh. In addition, further details on scope and costs can also be found in Section 6, Table 2. Validation of the minimal effects of implementation of this Immediate Action item is contained in Appendix C

3. The third immediate action recommendation is the development of a sidewalk and bicycle trail system along Morewood Avenue from Forbes Avenue to Fifth Avenue. This concept achieves numerous objectives of the study as well. It provides well connected routes to the largest on campus dormitory facilities along Morewood Avenue, and provides a safe alternative for bicyclists formerly traveling along Morewood Avenue by removing them totally from the narrow lanes along heavily congested Morewood Avenue. The bicycle trail will be safely connected to the bike lanes on Forbes Avenue via appropriate signage along with appropriate signage for crossing Fifth Avenue at its northern terminus. This concept also achieves major objectives of the study by providing a significantly improved pedestrian route between the main campus and dormitories, as well as providing mobility and significantly enhanced safety for the rapidly growing bicycle commuters within and beyond campus. Details of this recommendation are presented in Section 6, Table 3.

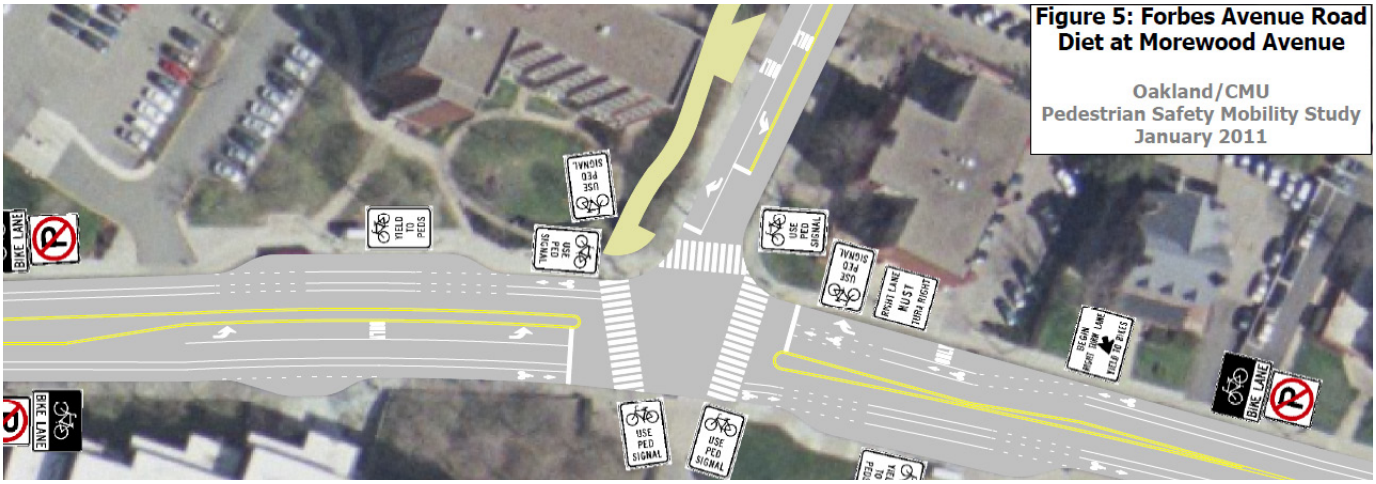


Morewood Ave Dual Sidewalk Recommendation. *CMU Pedestrian Safety Mobility Study* (GAI Consultants, February 2011).

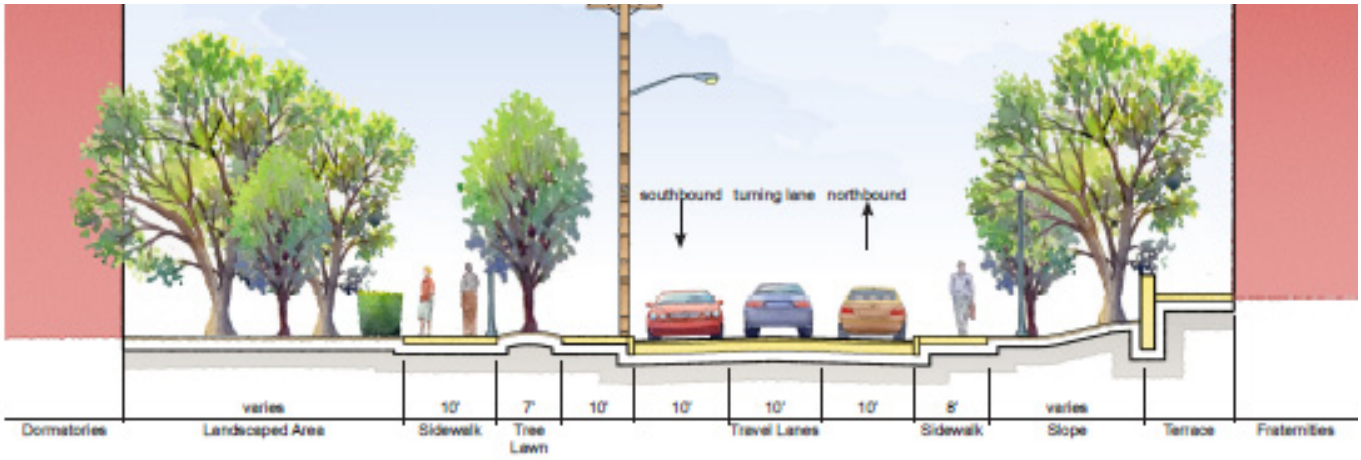
APPENDIX F

PCTI Transportation Study

Forbes Avenue and Craig Street intersection. *CMU Pedestrian Safety Mobility Study* (GAI Consultants, February 2011).



Forbes Avenue and Morewood Avenue intersection. *CMU Pedestrian Safety Mobility Study* (GAI Consultants, February 2011).



Forbes Avenue Section. *CMU Pedestrian Safety Mobility Study* (GAI Consultants, February 2011).

APPENDIX F

PCTI Transportation Study

B. Near Term Recommendations

1. Pedestrian and vehicular enhancements to the entire length of Craig Street within the consisting primarily of three (3) elements, resurfacing of the street, elimination of individual parking meters and rehabilitation of streetscape elements.

2. Improvements to Fifth Avenue intersections at Neville Street and Morewood Avenue. These intersections have the highest number of vehicle accidents over the five-year period covered in this study (2005-2009) with 25 and 28 total accidents, respectively. Improvements at Neville would include not only a complete upgrade of the signals, ADA accommodations, but also significant signage upgrades on all approaches, and curb and sidewalk bulb outs where feasible, to reduce lengths of pedestrian crossings. Improvements at Morewood would include realignment of the southbound through movement of Morewood Avenue crossing Fifth Avenue, along with complete upgrades of signal hardware and ADA accommodations. Further study will be needed to determine the exact nature of the contributing causes of the accidents including the effects of speed on accidents which, of all six major issues, received the most significant feedback at the public workshop on November 17, 2010.

3. Implement studies to consider additional pedestrian crossings along Forbes Avenue within the study area. This element is the direct result of the major expansion of the Carnegie Mellon University Campus as embodied in the 2010 Master Plan currently underway. As the campus expands north of Forbes Avenue, the demand for north-south crossings will greatly increase and will result in the need to identify future planned signals/crossings. In their review of the Phase 1 Report, the City of Pittsburgh Engineering and Construction Department on December 12, 2010, noted that "Proper development of the site plan (master plan) should include encourage crossing at existing/planned signalized intersections…." . As the build out of the 2010 Master Plan occurs it is imperative that concurrent studies be conducted to study the need for additional crossings to provide a smooth evolution of pedestrian desire lines into well defined efficient, safe crossings for the future campus population.

APPENDIX G

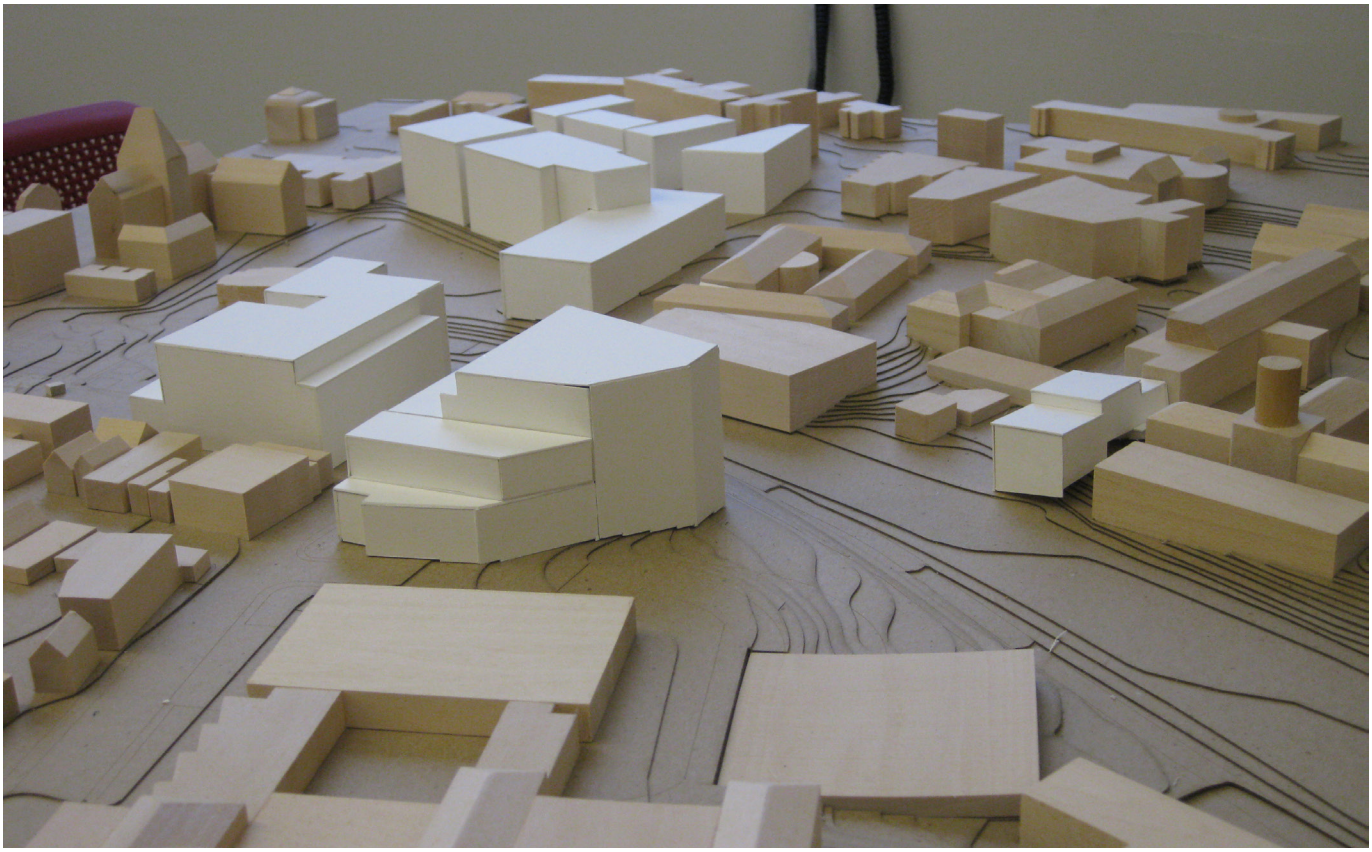
Major Development Site Design Guidelines

Carnegie Mellon is defined by campus open spaces, by the scale and quality of buildings and by the integration of historic and contemporary architecture. And, as the campus expands into the three major landholdings (the North Quad, the Forbes/Craig Area and the North of Fifth Area) it is important that new buildings and open spaces continue that tradition.

The Major Development Site Design Guidelines recognize the importance of these three sites and therefore establish a flexible framework to meet future needs and encourage innovation. These Guidelines will ensure that new developments are of a high quality and will continue to support the mission of the University well into the future.

The Guidelines are intended to augment the 2012 Institutional Master Plan; together the documents establish the principles and guidelines to guide the development of the two major campus sites. As future projects are implemented in these districts, the identity of the campus will be reinforced and enhanced with buildings and open spaces .

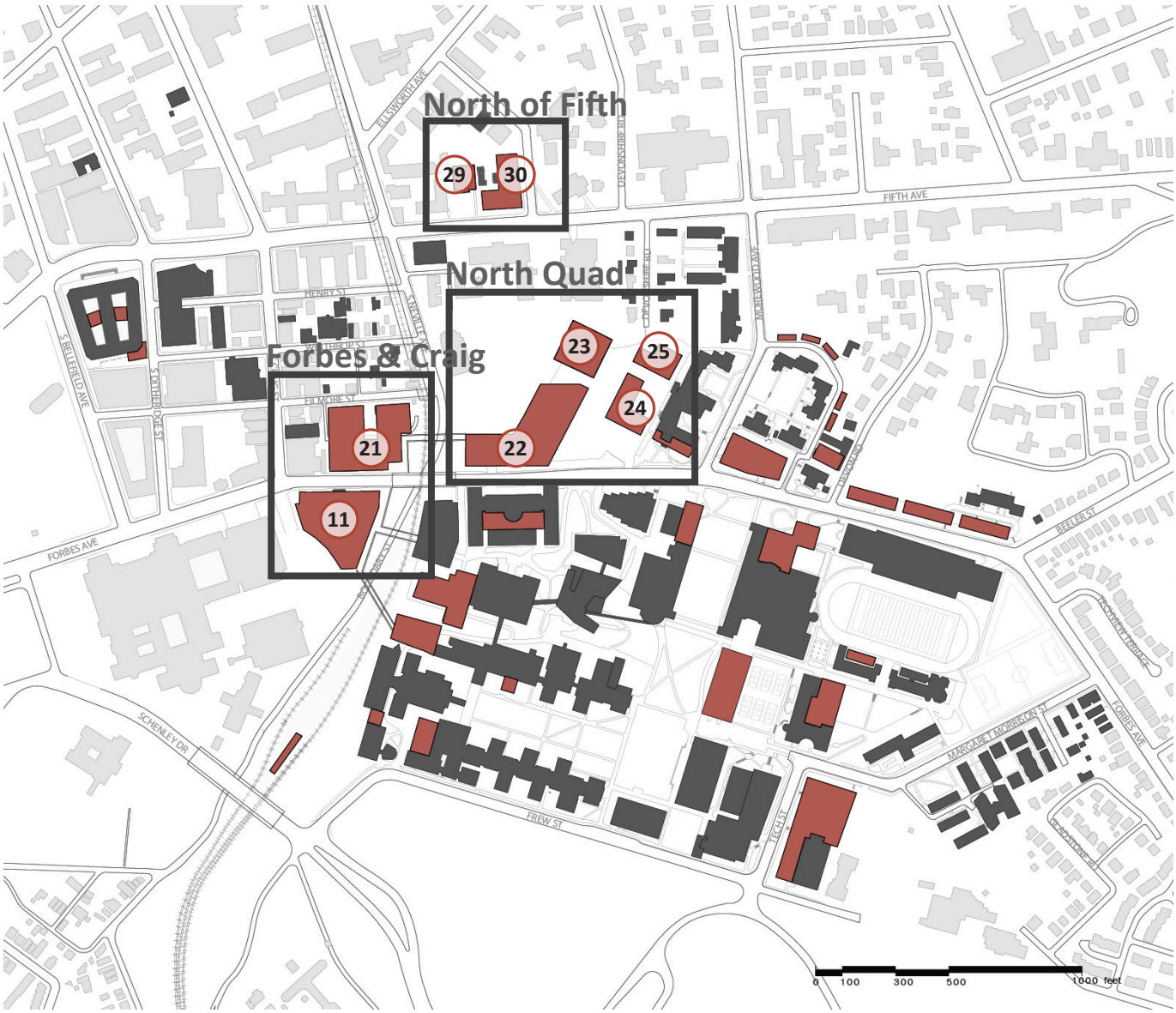
While Carnegie Mellon encourages creative solutions to planning, design and engineering conditions, there are specific elements that are prohibited in the major development sites. Building designs shall not employ horizontal banding, solid or opaque ground floors, hidden entrances or artificial protrusions. Synthetic materials (such as EFIS), reflective or mirrored glass, vinyl or aluminum siding are prohibited. Drive-thru facilities of any kind are prohibited. New surface parking lots shall not exceed more than 150 spaces. No parking shall be located between the building and the sidewalk.



View of Site Massing Model to the northeast

APPENDIX G

Major Development Site Design Guidelines



Forbes & Craig Projects

- 21 North of Forbes Development Site
- 11 South of Forbes Development Site

North of Fifth Projects

- 29 Mixed Use Renovation
- 30 New Mixed use Building

North Quad Projects

- 22 New Academic Building
- 23 New Academic/Parking Building
- 24 New Academic Building
- 25 New Residential Quad

APPENDIX G

North Quad

The redevelopment of the Morewood parking lot into the North Quad will be an extension to the existing Carnegie Mellon campus. Much like the existing campus, the North Quad will be defined by an open space that will be created by the new buildings of the quad.

As the North Quad will be a campus extension, uses will be collegiate in nature, including academics, classrooms, research, student housing and other university related functions. Depending on market conditions and demand, a hotel and conference center, to support executive education could also be a part of the North Quad. To replace the existing surface parking, both below-ground and structured parking resources will be created, although there may be small parking courts that serve specific uses.

Morewood lot at Morewood Gardens

Morewood lot at Hamburg Hall

Building Standards

Carnegie Mellon is dedicated to the creation of high-quality contemporary buildings that work within the greater campus context. Buildings should be of their time, yet should respect the context and physical relationships of the campus. All building components, including form, design and function, shall be reviewed and approved by the Design Review Committee.

Siting

Buildings shall frame the North Green and the northwest connection to the Cut.

Height and Massing

The height and massing of structures must not only conform to the IMP, but should also respect adjoining buildings. Building heights facing Forbes should relate to buildings across the street. Architectural features are permitted, provided that they comply to the IMP height restrictions.

Setbacks and Stepbacks

Under certain circumstances buildings may be further from the IMP setback requirements. Additionally, buildings may include architectural features, such as tower elements, that exceed the base height restrictions.

Entrances and Transparency

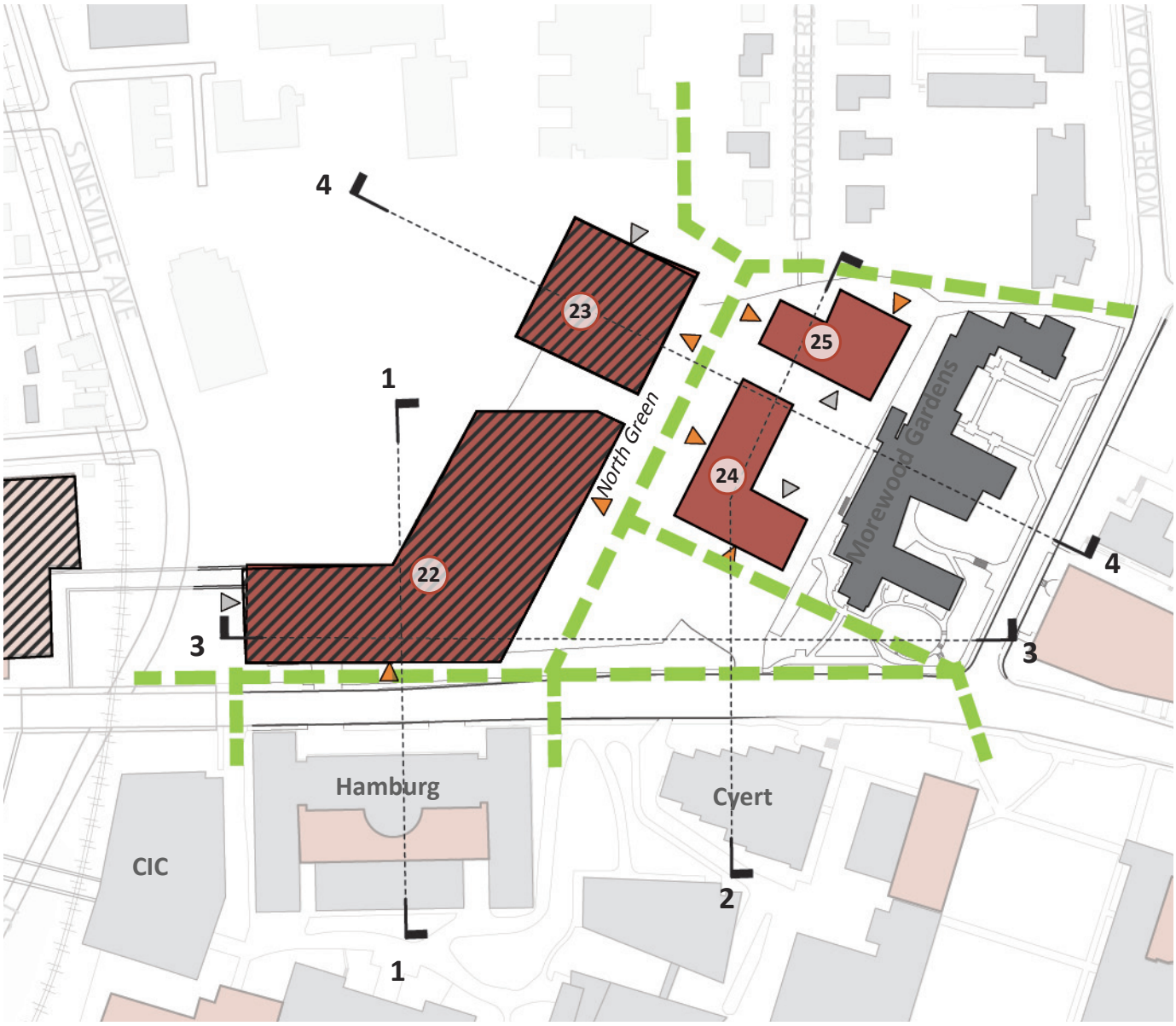
Buildings shall feature prominent and identifiable entrances. When buildings face a public street or open space, a main entrance shall face that street. Buildings may have more than one main entrance. Buildings shall be transparent on ground levels and shall employ fenestration patterns that allow for natural daylight, ventilation and visual interest.

Materials and Composition

Buildings shall employ durable and low-maintenance envelops. Natural materials are encouraged, as are proven contemporary materials. Buildings facing Forbes should relate to the composition and materials of Hamburg Hall. Buildings on the east side of the North Quad should sympathetic to the materials and forms of adjacent residential buildings; those on the west side of the Quad should respect and frame the backdrop of Central Oakland landmarks.

APPENDIX G

North Quad



North Quad Projects

- 22 New Academic Building
- 23 New Academic/Parking Building
- 24 New Academic Building
- 25 New Residential Quad

- Proposed Buildings
- Circulation Paths
- Primary Entrances
- Service Entrances
- Structured Parking

APPENDIX G

North Quad

Transportation Standards

Parking

To minimize the impacts of surface parking, vehicle parking shall be either underground, structured or in small service courts. Above-ground parking structures shall be designed as buildings and shall not employ horizontal banding. Surface lots should be minimized and shall be in service courts not on major public spaces.

Curb Cuts

To minimize impacts on the pedestrian circulation system, curb cuts should be strategically located and, where applicable, consolidated.

Service and Loading

Service areas are to be treated with consideration, and shall be integrated into the building or in a service court. All service areas are subject to screening standards and shall be screened from pedestrian zones. When appropriate, short-term drop-off pull outs may be employed.

Transit Facilities

Buildings that are located along public transit routes should integrate transit waiting facilities where feasible. Such waiting facilities should be located on the ground floor of the building and should be transparent and provide amenities.

Bicycles

New buildings shall include bicycle parking facilities, which should be either integral to the ground floor or covered.

Public Realm Standards

Carnegie Mellon has a long tradition of quality public open spaces that organize the campus. The development of the North Quad will continue that tradition by creating public open space that is both respectful of the overall campus and iconic in its own right.

Landscaping

Landscaping should take cues from the space in front of the Hillman Center and should be simlialr on both sides of Forbes Ave to unify the campus. All landscape development shall incorporate sustainable, low-maintenance materials in an artful manner. Materials that demand excessive water or fertilizer are prohibited.

Circulation

Pedestrian walkways shall follow the Open Space Plan of the IMP and serve to connect the new buildings to the campus. The northwest connector, which will extend from the Cut at Morewood to the North Green, should be a wide pedestrian promenade in the manner of the East-West Walkway.

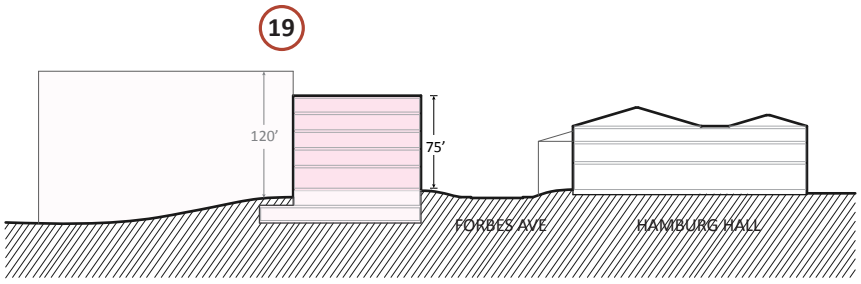
Furniture and Art

The quality of public space is often determined by pedestrian scaled amenities, including furniture, lighting and art. All such installations shall be of high-quality materials and shall be designed to be both beautiful and long-lasting. Any permanent art installations shall be approved by the Public Art Committee.

APPENDIX G

North Quad

Section 1



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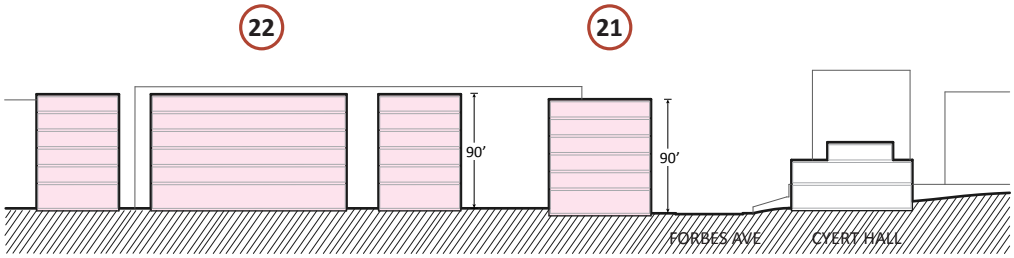

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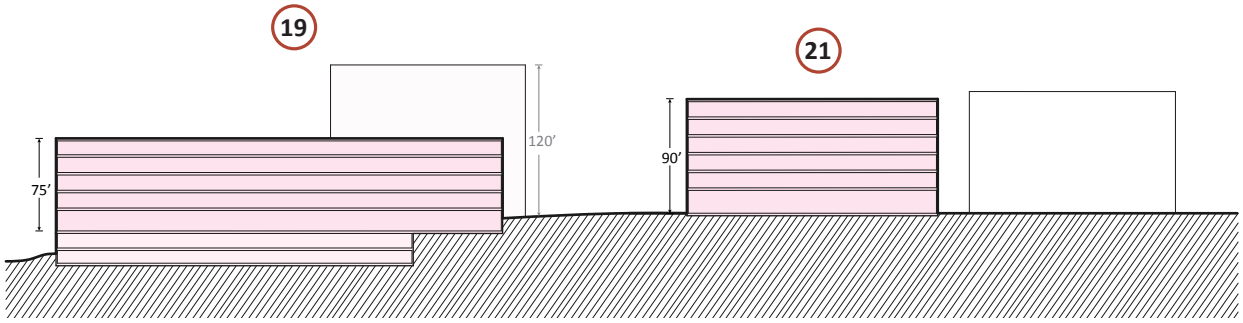

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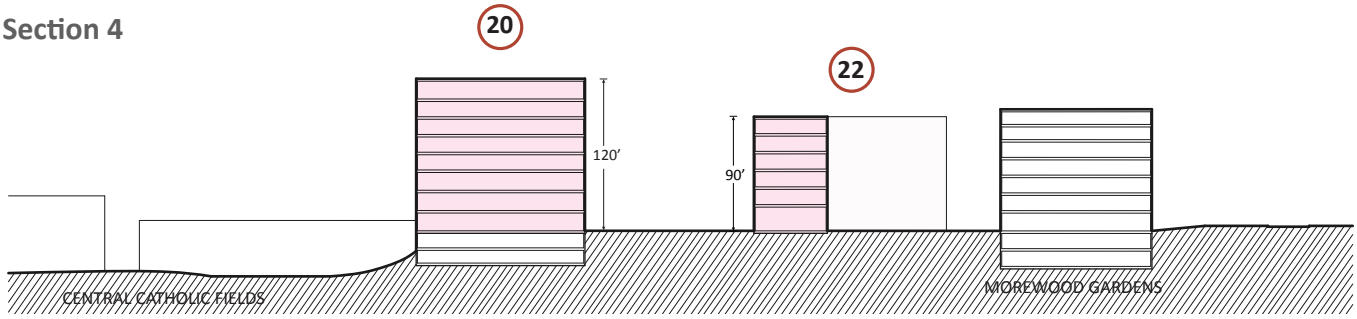


APPENDIX G

Forbes & Craig

The recently acquired properties in the Forbes and Craig area represent a significant opportunity for research and technology industries that desire to co-locate with the university. Located between campus and the S Craig business district, the development area allows for a transition from the academic buildings to the denser, urban context of the commercial district of S Craig Street.

As the Forbes and Craig area may support corporate partners, as well as academic facilities, permitted uses include traditional office, academic and research uses with active ground floor retail. Depending on market conditions and demand, hotel and conference center uses are also permitted. To support the ultimate development of the site below-ground structured parking will be implemented as the sites are developed.

North of Forbes Site

South of Forbes Site

Building Standards

Carnegie Mellon is dedicated to the creation of high-quality contemporary buildings that enhance the urban context. Buildings should be of their time, yet should respect the context and relationships of the Craig St business district. All building components, including form, design and function, shall be reviewed and approved by the Design Review Committee.

Siting

Buildings shall maintain the Forbes streetwall between grade and the fourth story and shall include wider sidewalks approaching the Forbes Ave bridge.

Height and Massing

The height and massing of structures must not only conform to the IMP, but should also respect the urban context of the Craig Street area. Building mass on Forbes shall not be taller than 6 stories; buildings may have additional height if stepped back from the property line. Architectural features are permitted that comply with the stepback requirements.

Setbacks and Stepbacks

Taller buildings above the frontage heights are required to either be stepped further back from established build-to lines and/or be stepped back from the main plain of the building. Additionally, buildings may include architectural features, such as tower elements, that exceed the base height restrictions.

Entrances and Transparency

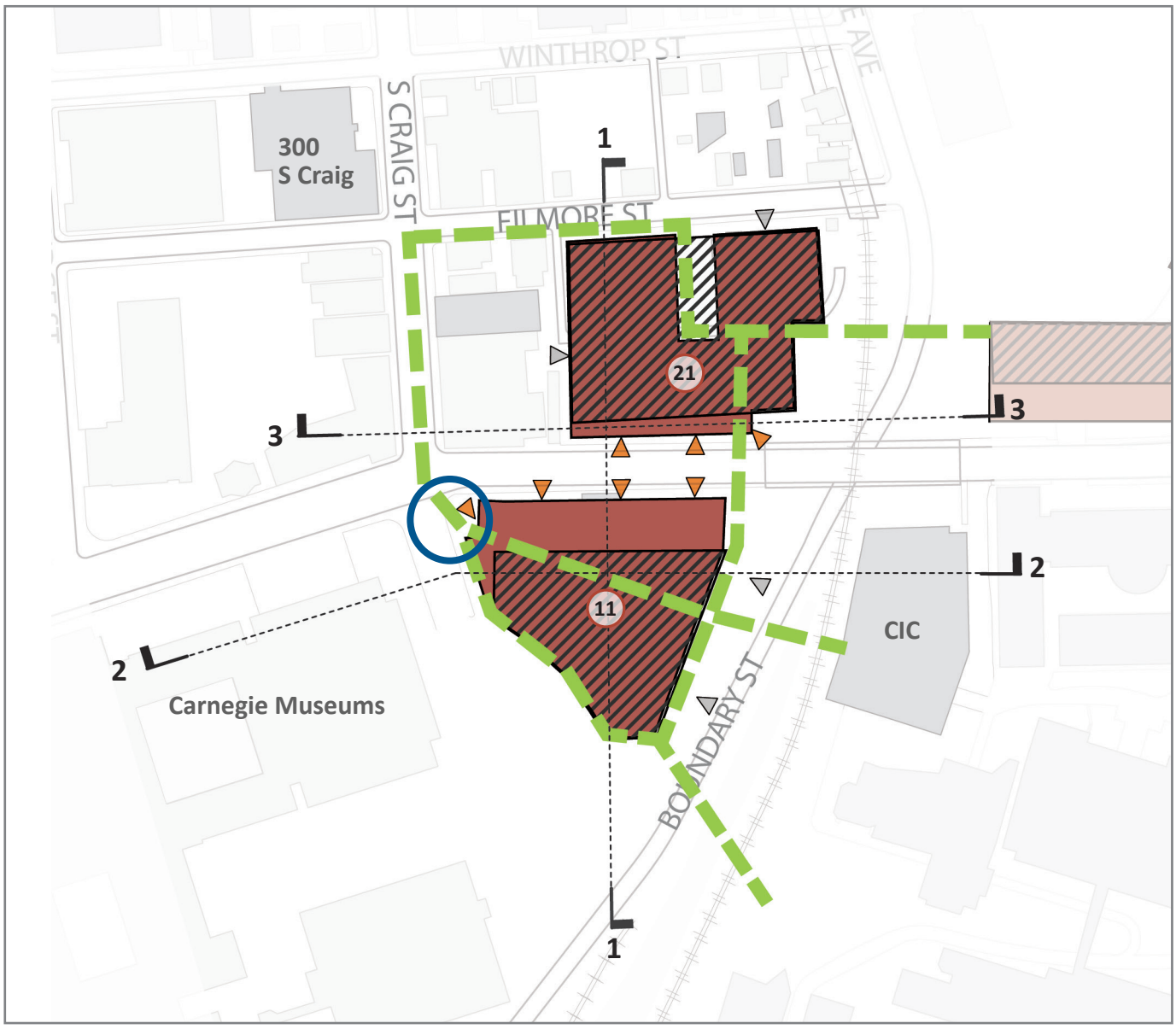
All buildings shall feature prominent and identifiable entrances on Forbes . Ground floor active uses shall have direct access to the sidewalk and not to interior lobby spaces. Buildings shall be transparent on ground levels and shall employ fenestration patterns for natural daylighting and ventilation, as well as visual interest.

Materials and Composition

As buildings in this district may not be built by Carnegie Mellon, it is especially important that all buildings shall employ durable, tested and low-maintenance envelops and systems, including natural materials as well as proven state-of-art contemporary systems.

APPENDIX G

Forbes & Craig



Forbes & Craig Projects

- (11) South of Forbes Development Site
- (21) North of Forbes Development Site

- Proposed Buildings
- Circulation Paths
- Primary Entrances
- Service Entrances
- Structured Parking
- Public Open Space

APPENDIX G

Forbes & Craig

Transportation Standards

Parking

To minimize the impacts of surface parking facilities, vehicle parking shall be underground to the maximum extent possible. The creation of parking resources that serve many buildings shall be employed.

Curb Cuts

To minimize impacts on the pedestrian circulation system, curb cuts should strategically located, where applicable, consolidated. Only one curb cut is permitted on either side of Forbes between S Craig and the bridge.

Service and Loading

Service areas are to be treated with care to avoid negative impacts on adjoining properties and when possible, shall be integrated into the building or located in a service court. All service areas are subject to the screening standards and shall be screened from the general pedestrian zones. When appropriate, short-term drop-off pull outs may be employed.

Transit Facilities

Buildings that are located along public transit routes should integrate transit waiting facilities where feasible. Such waiting facilities should be located on the ground floor of the building and should be transparent and provide amenities.

Bicycles

New facilities shall include bicycle parking facilities integral to the ground floor or covered.

Public Realm Standards

Open spaces in the Forbes and Craig area will serve to transition from campus. Developments on both sides of Forbes will employ pedestrian bridges over the hollow, including the extension of the East-West Walkway. Development on the south side of Forbes shall include an appropriately scaled open space to compliment the open space of the Carnegie Museum. Additionally, the connections shall be pedestrian-scaled and open to the public. On the north side, development shall create a open space that connects Forbes to Filmore St.

Landscaping

Sidewalks along public right-of-ways shall include street trees. Plantings that demand excessive water or fertilizer are prohibited.

Circulation

Pedestrian walkways shall connect the new buildings to the campus. The East-West Walkway extension, as well as the other bridges, should be wide enough for circulation and served with necessary seating. Sidewalks along Forbes Ave are to be wide enough to accommodate pedestrians and shall be a minimum of 8 feet wide.

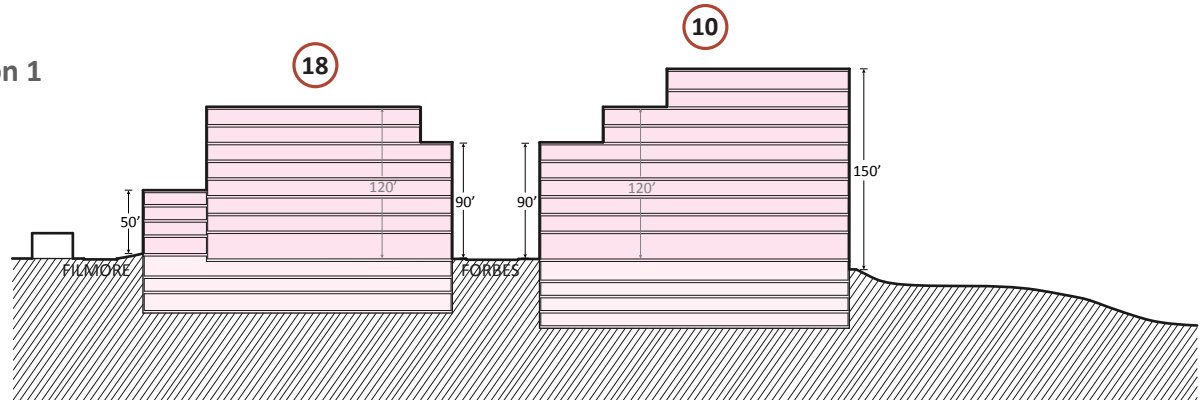
Furniture and Art

Public space is determined by pedestrian scaled amenities, including furniture, lighting and art. All such installations shall be of high-quality materials and shall be designed to be both beautiful and long-lasting. Any permanent art installations shall be approved by the Public Art Committee.

APPENDIX G

Forbes & Craig

Section 1



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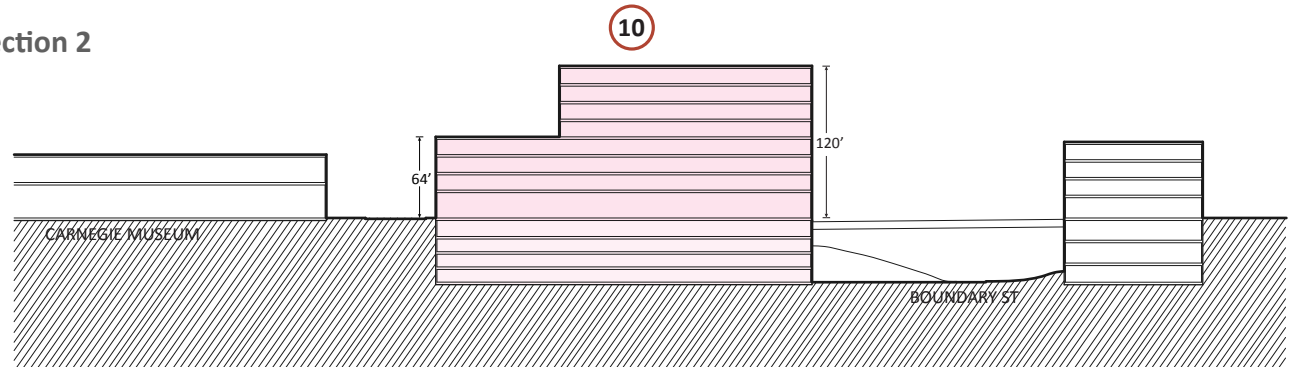

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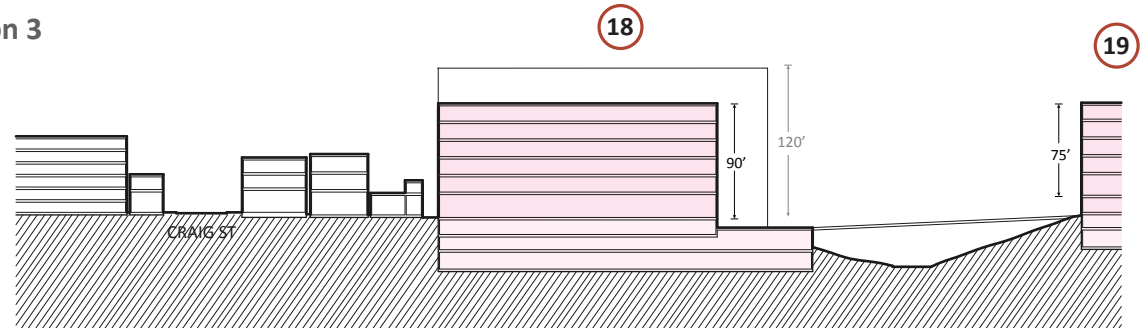
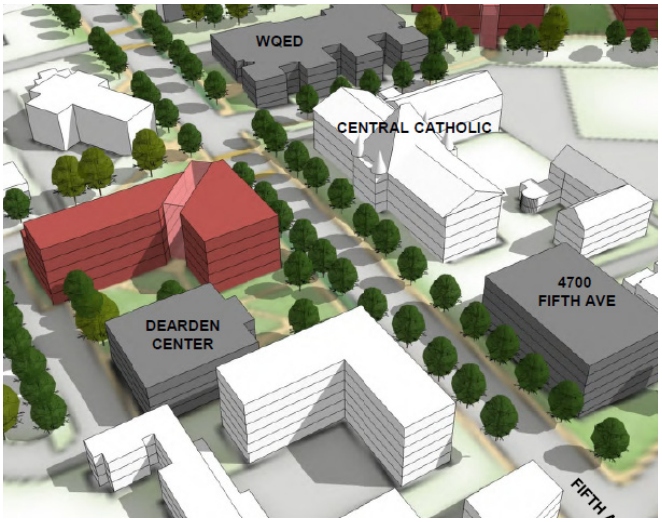


APPENDIX G

North of Fifth

The recently acquired property North of Fifth Avenue presents a significant opportunity for mixed use academic and residential space that transistions to the adjacent neighborhood. Located along Fifth Ave, the development area allows for a transition the monumental institutional buildings on Fifth to the adjacent Shadyside neighborhood.

The development of the site will include both renovation of the historic building (the former Dearden Center) and the development of new mixed facilities, including, academic and research uses, residential, administrative and university support. To support the development of the site both surface and structured parking are anticipated.



North of Fifth Massing Model

North of Fifth Site

Building Standards

Carnegie Mellon is dedicated to the renovation of inportant buildings and the creation of high-quality contemporary buildings. New buildings should be of their time and respect the context and relationships of the Fifth Ave corridor. All building components, including form, design and function, shall be reviewed and approved by the Design Review Committee.

Height and Massing

The height and massing of structures must not only conform to the IMP, but should also respect the transition from the monumental scale on Fifth Ave to the neighborhood context of Shadyside. Building mass on Clyde should step down to the residential context. Architectural features are permitted that comply with the stepback requirements.

Setbacks

Because of the monumental nature of the institutional buildings on Fifth Ave, the new mixed use building should maintain the streetwall setback of other institution buildings.

Entrances and Transparency

New and renovated buildings shall feature prominent and identifiable entrances on Fifth. New buildings shall be transparent on ground levels and shall employ fenestration patterns for natural daylighting and ventilation, as well as visual interest.

Materials and Composition

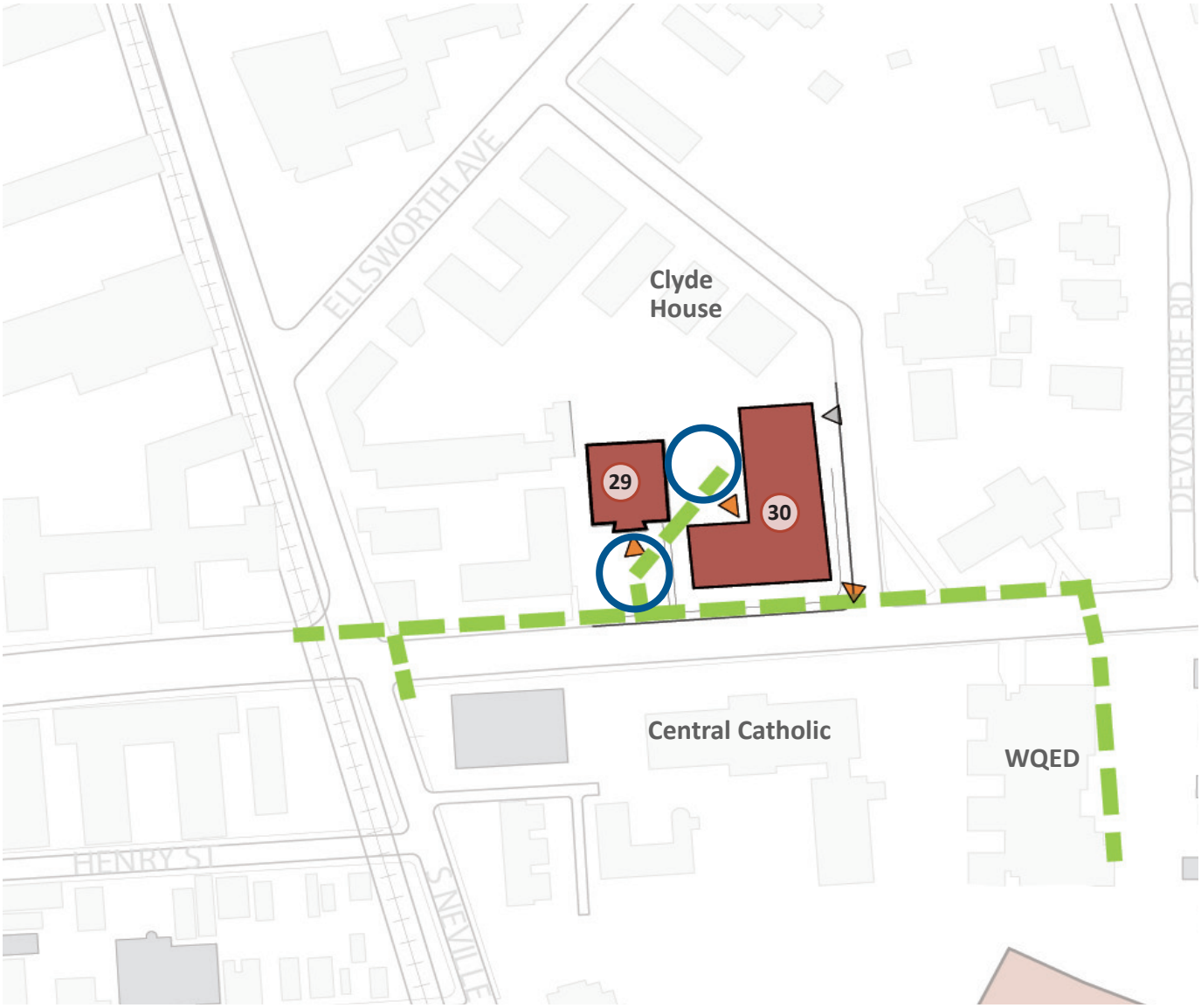
The Fifth Ave corridor includes several classically designed buildings, including Mellon Inst, St Pauls Cathedral and Central Catholic HS and thus the new mixed use building should relate contexturally. Traditional materials, such as stone and brick, should be incorporated rather than more modern materials such as metal panels.

Open Space

The significant open space that serves as a forecourt to eth former Dearden Center should be maintained. Additionally, the development of the new mixed use building should include an interior courtyard that provides a more quiet open space.

APPENDIX G

North of Fifth



Forbes & Craig Projects

29 South of Forbes Development Site

30 North of Forbes Development Site

Proposed Buildings

Circulation Paths

Primary Entrances

Service Entrances

Open Space