2017 Master Plan Update and Retrospective

Middlebury

CONTENTS

1. Introduction

In offering this update to the 2008 Middlebury College Campus Master Plan, we reaffirm the "fundamental and elusive" linkage between the physical form of the campus and the College's academic mission and strategic goals. We also recommit to the general principles laid out in the 2008 plan, especially the idea that a successful master plan is "an organic, or dynamic, instrument that lends itself to reinterpretation." This last point deserves special emphasis since the institution is in the early stages of a strategic planning process that may have implications for the College's built and natural environment. As we consider the possibility of future growth and change, we expect the Master Plan will serve as a guide to planning rather than a prescriptive template.

Middlebury as an institution has continued to evolve over the last decade. At the time of the master planning process, Middlebury had just begun to evolve from a "liberal arts institution of the first rank" to a more complex institution, most visibly through the affiliation with the Monterey Institute for International Studies in California. Since that time Monterey—now the Middlebury Institute of International Studies at Monterey—has been fully integrated into our operation, joining the Middlebury Bread Loaf School of English, the Middlebury Language Schools, and the Middlebury C.V. Starr Schools Abroad as part of an increasingly global enterprise.

For the purposes of this retrospective and update, however, we are focused on the campus in Middlebury, Vermont. We will make note of significant changes to the built environment, substantive shifts in planning assumptions, and progress made toward recommendations laid out in the 2008 plan. We will update key data points, such as maps of college buildings and information on progress toward a carbon neutral campus. Where we have made progress in meeting goals outlined in the plan, we will note them. We will also set aside space in some chapters to identify recommendations that are not included in the 2008 document. Our small working group recognizes that these new recommendations will require additional discussion by the senior administration and the Board of Trustees before they can be formally adopted. Finally, we will also add two new sections on issues that bear greater consideration than they were given in the original Master Plan document: accessibility, and real estate and lands.

It is important to note that the Master Plan is intended to provide guidance first and foremost to the College, but it may also help the town in making assessments regarding campus development. In this respect the Master Plan is intended to serve as a planning document and not as a contract. It functions more as a compass, guiding the way in a broad direction, rather than as a roadmap outlining a specific way forward.

* * *

2. Background

Since the creation of the Middlebury College Master Plan in 2008, two major new construction projects in the town have reframed the town-gown context, while several smaller initiatives have served to advance town-planning priorities.

With College support in 2010, the town built a second in-town bridge. Middlebury College contributed $9 million toward the total project cost of $16 million, and a local option tax provides the balance of funding, which has allowed the bridge to be built without federal or state funding. The College's financing takes the form of an annual payment to the town in the amount of $600,000 per year for a 30-year term. The project has significantly improved traffic flow in the downtown and provided additional access to Route 7, thus addressing a variety of safety concerns for the College and the town.

A property exchange agreement between the town and the College provided the site for the new municipal building adjacent to the Ilsley Public Library. The new town hall was completed in April 2016. It is intended to be the first "net zero" municipal building in Vermont. In exchange for the new building site, which was owned by the College, the town has ceded the site of the former municipal building and gymnasium to the College. This resulted in a new open civic space on the south side of downtown, where the town connects to the College. A new park has been constructed on the site of the former municipal building and visually leads to Twilight Hall, the first college building one encounters when approaching campus from downtown. The College agreed to contribute $4.5 million of the $6.5 million total cost for the new municipal building and a new town recreation center. Additionally, the College contributed $1 million for the removal of the old municipal building and the construction of the new public park.

In accordance with the Master Plan, the College has made a concerted effort in the last eight years to help sustain the integrity of residential neighborhoods in town. In particular, the College has supported the following projects:

- Fletcher House, at 7 South Street, was converted in 2011 from student housing to a faculty apartment building, in part to address noise complaints and to add faculty housing options.
- The College undertook an inventory of College-owned houses used as faculty rentals in the Chipman Park neighborhood and other locations. Based on this, the College sold several Chipman Park properties to Middlebury College faculty members.
- The town's emergency services were relocated to College-owned land in order to better serve the community.
- The College completed the construction of a new student housing complex called Ridgeline Suites and Townhouses in 2016. The addition of these beds allows the College to reduce the number of students living in non-College-owned housing within the town of Middlebury.
- A number of administrative offices such as Human Resources, the Budget Office, Business Services, and the Office of Advancement have moved off campus,

increasing the functional density and economic vitality in the Marble Works District and along Exchange Street.

Big or small, these projects are part of the historical and physical background that continues to inform the development of what we call the "Town's College."

* * *

3. The Campus Today

The principles that guide campus planning at Middlebury remain unchanged from the 2008 Master Plan. However, two of the five assumptions that informed the development of the plan have changed. First, the size of the student body—which was not expected to grow—expanded from 2,350 to approximately 2,500 over the past eight years. Second, the number of full-time faculty at Middlebury increased by more than the 25 projected in 2008.

These changes have had an impact on the College's infrastructure needs, which we describe in the next section.

* * *

4. The Campus Plan

Two significant projects have been completed on campus since the 2008 Master Plan. The first, which was envisioned in the plan, included major construction at the athletics complex. A new Squash Center was added in 2013, followed by the completion of the Virtue Field House in 2015.

The design of the Squash Center as new construction appended to the Peterson Family Athletics Complex was not recommended in the 2008 Master Plan. The decision to construct an addition for the squash facility with a separate entrance, rather than including squash courts within the new field house, was driven by logistical considerations related to the squash program.

The newly constructed Virtue Field House includes not just athletic facilities, but also offices, a new primary entrance to the athletics complex, classrooms, and improved interior circulation and visitor amenities. Virtue Field House was constructed on the site of the former Bubble—a temporary inflatable structure—according to the recommendation of the 2008 Master Plan.

The second major addition to the campus since 2008, yet one that was not discussed in the Master Plan, is the Ridgeline student housing project. This project was completed in

September 2016. The Ridgeline project provides small-scale student housing in four new buildings, totaling 60,000 square feet and creating 158 new beds.

With the completion of the Ridgeline residences, a total of approximately 350 students reside in the western Ridgeline area of campus. Additionally, a student parking area totaling 375 spaces is located adjacent to the student residences. Per the Master Plan, upon completion of the project the student modular housing was removed, and the site where the mods once stood has been converted to additional student parking.

The Ridgeline housing project is designed for group living of four to eight students, which is similar to off-campus house and apartment rentals. One recommendation of the Master Plan was to reduce the number of students living off-campus, and this project will help the College achieve that goal. Additionally, replacing the modular houses with the Ridgeline residences will bring a portion of student housing closer to the core of campus, which aligns with the goals of the Master Plan.

Besides the routine and customary upgrades to building systems and envelopes, the replacement of underground utilities, and the ongoing upkeep and replacement of roads and sidewalks, the College undertook several other capital projects—mostly renovations—since the completion of the Master Plan:

- Kitchel House on College Street, built in 1867, was purchased and renovated to provide offices for College Communications staff.
- Fletcher House at 7 South Street was completely renovated and converted from student housing to faculty apartments, improving the quality of one of the town's central residential neighborhoods.
- The artificial turf at Kohn Field was replaced and lighting was added.
- Forest Hall, a 65,000-square-foot student residence, was completely renovated.
- The President's House at 3 South Street was completely renovated.
- Meeker and Munford Houses on South Main Street were renovated and converted from staff use to student residences.
- The Kirk Center, located at the golf course and host to a wide range of social and other events, was renovated, and a new kitchen was provided.
- Proctor Dining Hall was renovated.
- Wilson Hall in McCullough was renovated, and a new entrance was added to the Grille, including a new outpost for the Box Office.
- The biomass gasification plant was completed.
- The Mahaney Center for the Arts was renovated to allow for relocation of the History of Art and Architecture Department to a space adjacent to the College's Museum of Art.
- Two Solar Decathlon houses were designed and built by student teams that participated in an international competition sponsored by the U.S. Department of Energy.
- An office building on Exchange Street at the north end of town was fully renovated in 2014–15 to accommodate Advancement staff and a new data center.

In the same vein, staff involved with financial and real estate operations were relocated to offices in the Marble Works complex in downtown Middlebury.

* * *

5. Sustainability

The 2008 Master Plan was one of the first in higher education to focus on sustainability as a guiding principle. While Chapter 5 is dedicated entirely to sustainability goals and practices, the principle of sustainability is woven throughout the document.

Since the Master Plan's adoption, the fundamental elements of sustainability and environmental stewardship are even more relevant, as is the important role that Middlebury College plays through its commitment to being a sustainability leader in higher education. Since 2008, there has been broader global recognition that climate change is occurring and that the changes are taking place at a greater pace than previously modeled by the best science available. Today climate action planning also includes adaptation and resilience. The College has been at the forefront of higher education institutions in taking responsibility for addressing climate change through its carbon emissions with a commitment endorsed by the Board of Trustees to achieve carbon neutrality by 2016. This goal was achieved during the fall of 2016 and was announced to the broader Middlebury community on December 8, 2016.

Middlebury continues to track its carbon emissions through an annual greenhouse gas inventory since the Master Plan was adopted. A summary of the inventory from FY07 to FY15 appears in the appendix. The College has reduced its carbon emissions by 50 percent due primarily to the biomass gasification system and energy efficiency measures that have resulted in using less electricity per square foot of building space. It has also added solar electricity to its energy portfolio and partnered with two projects that are currently producing about 5 percent of the electricity the College uses annually.

However, there has been a significant increase in carbon associated with College-related travel. There is also an increase associated with the electricity purchased from Green Mountain Power (GMP) due to a change in their source of electricity generation (less nuclear power). Further, there has been a change in GMP's accounting for the renewable energy sources they purchase because GMP sells the credits from such projects and therefore cannot count them as carbon neutral electricity as they had in the past. Finally, there has been little progress in transitioning the College-owned fleet to electric and other low- or no-carbon emitting vehicles.

The College now receives and burns natural gas but continues to work on a proposed

manure digester project which would, if built, supply carbon neutral biomethane through the existing local natural gas distribution network.

In 2015, the College conserved 2,100 acres of Bread Loaf forest lands and campus in Ript on, Vermont, and has contracted for the verification and registration of the amount of carbon that those lands and other forested lands will sequester. Middlebury will use those credits toward achieving its carbon neutrality goal.

On Middlebury's campus, choices are constantly being made about the amount of fuel used to maintain the campus landscape, and about the numbers of trees planted and maintained, which has an effect on carbon sequestration. The use of organic versus synthetic fertilizer and pesticides is also an important consideration in managing campus lands.

With respect to energy conservation and efficiency, the need for thermal comfort during the summer when cool spaces are required is a challenge. The College supplements its existing system with the installation of window units in places of greatest need. The number has increased to ~500 units, which is a very inefficient way to provide cooling. While a study was conducted to consider the feasibility of installing additional central air conditioning, and a task force looked at options for keeping people comfortable within the bounds of the College's Thermal Comfort Policy, not much has changed with this situation since 2008. This issue will require further consideration.

Many countries, states, municipalities, and institutions have expanded climate action plans to include adapting to and becoming more resilient to the higher risks of climate change and extreme weather events. The College has done some work related to its disaster preparedness planning, including a student-led study of the feasibility of creating a campus microgrid that could function in a power outage. The chapter on Natural Systems that follows includes considerations and recommendations that would partially address the need for climate change preparedness through mitigation of climate impacts.

An energy audit on campus buildings was conducted in conjunction with the 2008 Master Plan, and it continues to be a useful guide for identifying the greatest potential opportunities for energy-efficiency upgrades. Some of these upgrades have been implemented, yet there is more work to be done.

Since 2008, not much has changed in terms of transportation planning upgrades. Still, an electric vehicle charging station has been installed at the Franklin Environmental Center.

In 2009, the College adopted a new assessment tool for sustainability in higher education—the Sustainability Tracking Assessment and Rating System (STARS) which provides a comprehensive and standardized means of sustainability tracking and benchmarking. Assessments are conducted regularly and data is used for outreach with

the College community to set priorities and to develop new projects to achieve new goals. A 2016 update of the STARS assessment is included in the Appendices.

Several new building projects that have been completed since 2008 have made use of the sustainability guidelines developed in conjunction with the 2008 Master Plan. These include a new squash facility, which received LEED Platinum certification; the Virtue Field House, which achieved LEED Gold certification; and the renovation of the President's House, which also achieved LEED Platinum certification. By contrast, the new Ridgeline student houses were not designed according to the College's sustainability guidelines, nor was the winterization of the Bread Loaf Inn, a major project that was completed in 2015.

Key Recommendations:

- Oversight and Implementation of Master Plan
  - Consult with sustainability specialists at the College on each project.
- Sustainable Building Design and Construction
  - Review the USGBC LEED 4.0 and other guidelines to incorporate them into an update of the MC-LEED-+ sustainable design and construction guidelines.
  - Consider making third-party certification of buildings standard practice.
  - Apply guidelines to all buildings on the main and Bread Loaf campuses, including those built or owned by a third party, so all buildings meet Middlebury's sustainability standards.
  - Consider adopting a net-zero energy policy for new buildings.
  - Continue to deconstruct, reuse, and recycle campus buildings that must be removed.
- Sustainability Assessment and Benchmarking
  - Use the STARS assessment and reporting process as a means of annually tracking and benchmarking sustainability progress across the campus.
- Climate Adaptation and Resilience Planning
  - Build on the work of climate change scenarios from the Middlebury School of the Environment to develop plans for being more resilient to climate change.
- Energy Efficiency, Carbon Neutrality, and Carbon Negativity
  - Collaborate with Efficiency Vermont on a plan and schedule for increasing the energy efficiency of low-performing buildings on campus.
  - Use the Green Revolving Loan Fund (a fund used for energy and resource conservation projects at Middlebury College, providing money for campus projects that have quantifiable savings and that meet return-on-investment criteria) and enlist student engagement as well as Facilities. Also, review all information regarding thermal comfort and resolve the issue of how to balance cooling needs with energy efficiency and carbon neutrality goals.
  - Develop a diversified energy profile with specific targets for renewables, especially in the solar energy area. Trade-offs, particularly in land use and

aesthetic impacts of ground-mounted systems, should be analyzed.
    - Explore new technology and financing alternatives that could be adopted to help maintain carbon neutrality and move toward carbon negativity—including a focus on reducing or offsetting emissions from College-related travel as well as shifting the College vehicle fleet to a renewable fuel.
- Transportation Planning and Pedestrian/Bike Friendliness of the Campus
    - Make the campus more pedestrian and bike friendly. More electric charging stations should be considered.

A matrix of the 80 recommendations with information on progress and current status can be found in the Appendices.

* * *

6. Built Systems

Circulation routes on campus have evolved since 2008 so that some of the challenges described in the Master Plan have been alleviated. At the time the Master Plan was completed, Old Chapel Road consisted only of roadway and parking on both sides. Since then, a sidewalk has been added on the eastern side of the road. This sidewalk now ranks among the busiest on campus. Parking, while not banned, has been reduced considerably. All parking spots on the east side of Old Chapel Road have been removed. These two interventions have improved pedestrian safety and flow as well as the spatial dynamics of the main quad. The redesign for Old Chapel Road does not follow the precise solution prescribed in the Master Plan, yet it adheres to the principles described in the plan. As such, this project used the Master Plan as a compass and not as a road map, with positive results and a meaningful impact on the campus overall.

Improvements in the parking and traffic situation that have been made according to the recommendations of the 2008 Master Plan include the following:

- Virtue Field House project provided additional event/visitor parking. There is no longer any assigned student parking in athletics.
- Bus parking and circulation have been added and enhanced in the athletics complex.
- The expansion of the Ridgeline parking lot has allowed student parking to be shifted from the Mahaney Center for the Arts (MCA) lot to this more peripheral location, allowing for more event and visitor parking at MCA.

However, the most dramatic transformation in building systems since the completion of the Master Plan has come in the area of renewable energy. In 2009, shortly following the completion of the 2008 Master Plan, the biomass gasification plant began operation at the

College's Central Heating and Power Plant (CHP). The biomass plant utilizes locally sourced wood chips as fuel to generate steam, which then passes through turbine generators located in the CHP. Approximately 20 percent of the College's annual electrical use is generated through this cogeneration process. The operation and efficiency of the biomass plant, despite a sharp learning curve during its early years online, has exceeded expectations. The goal of reducing by 50 percent the use of No. 6 fuel in the CHP has been exceeded, with annual use reduced to approximately 800,000 gallons of No. 6 fuel compared to 2 million gallons prior to the completion of the biomass plant.

A second goal of the long-range CHP plan has been to diversify the fuel types used in the CHP to heat and cool the campus. When Vermont Gas announced plans to deliver natural gas to Addison County in 2013, the conventional boilers in the CHP were modified to burn both No. 6 fuel and natural gas. Currently, natural gas, in addition to No. 6 fuel oil, is being utilized in the CHP. Vermont Gas extended its pipeline distribution network through the campus during the summer and fall of 2016, but as of the end of 2016 the pipeline connection to Chittenden County has not been completed. The College and Vermont Gas are in the process of planning the conversion of College buildings not on the CHP steam network to natural gas. These buildings include Twilight Hall, the Ridgeline social houses, the new Ridgeline Suites and Townhouses, and other College properties. Moving forward, the College will continue to identify ways to diversify its fuel supply.

A critical component of the College's infrastructure is the underground steam distribution network. Some sections of the network, in particular branch lines serving individual buildings, date to the 1950s. While energy loss from older steam lines is relatively minor, the consequences of steam-line failure, especially in the winter months, could be catastrophic.

In 2011 the Steam Line 10-Year Reliability Improvement Project was implemented at an estimated cost of $5 million. As of the end of 2015, eight segments of the steam network had been replaced at a cost of approximately $2 million. Additionally, the main steam line serving MCA and the athletics complex was replaced during the construction of the Virtue Field House and the Squash Center.

* * *

7. Natural Systems

The College has made good progress following up on the Master Plan's vision for enhancing the natural systems that sustain and surround the Middlebury campus. Some of

these improvements were responses to concrete recommendations, while others derived from the principles outlined in the Landscape Plan found in the introduction to Chapter 7 (Natural Systems).

The College's efforts to reduce the impact of the campus on the local and global environment—goal No. 2 of the Landscape Plan—were reinforced by the passage of the Vermont Clean Water Act (Act 64) in 2016. The Act calls for new regulations to govern storm-water management and reduce polluted runoff from developed lands. The state's Final Proposed 2017 Stormwater Management Rule was submitted by the Agency of Natural Resources at the end of November 2016 and is expected to be effective July 1, 2017. The College's construction and landscaping activities are well aligned with the proposed regulations.

Little has changed since 2008 to alter the essential shape of the Middlebury campus, though the natural landscape has been enhanced in various ways. Between 2008 and 2016, the College horticulturist and the landscaping crew planted 475 new trees to replace previously existing trees, better define spaces, create shade, and provide other benefits. Open lawn continues to define the campus, but the amount of regularly cut grass has been decreased by plantings that create new parkland and the advent of low-mow zones that diversify the landscape and reduce greenhouse gas emissions. Substantial tree pruning and shrub replanting have also changed the campus landscape.

Lawn maintenance requires labor and a significant use of fossil fuel. Converting to alternative landscape covers could eventually mitigate the impact to the environment, but in the short term, developing cover types other than parkland (canopy with groundcover herbs and/or shrubs) would be extremely resource-intensive with respect to labor, machinery, and fossil fuel inputs. Diversifying plant species, improving soil and drainage channels, and enhancing water quality maintenance are the primary means by which the College has sought to meet the objectives outlined in the Landscape Plan.

Besides the general goals described in the Landscape Plan, the Master Plan includes 22 specific recommendations for improving the campus's natural systems. The following list details the progress the College has made in addressing many of those recommendations:

- Lawns have been rejuvenated some by the application of compost, which continues to be part of the fertilization regime. A new grass seed mix, developed by a campus lawn specialist, is now being used and is expected to stand up to heavy use and winter weather.
- Rain gardens have been constructed in the Axinn Winter Garden and Virtue Field House areas. Improvements to the Garden of the Seasons have been made to filter storm-water drainage from the campus landscape to Otter Creek.
- Native vegetation is always used when available, although there is some use of nonnative species for smaller, "specialized" plantings.

- In some locations, where appropriate, nonnative invasive plants have been removed. Resource constraints are taken into consideration in making such decisions.
- New tree plantings (e.g., north of Carr Hall, north of Battell Hall, between Adirondack House and Forest Hall, around the new Ridgeline dorms) and new sidewalks (e.g., Axinn to Davis Family Library) have been developed to support the campus's civic structure.
- Pruning for view preservation has been done on the main quad and in front of Mead Chapel. The trade-off between preserving views and protecting vegetation is weighted when pruning decisions are made.
- Examples of landscape work that have improved campus microclimates include clearing shrubs (largely invasive species) on the Ridgeline houses and planting windbreaks and screens in the Atwater area.
- Low-mow zones have been created in selected areas to reduce lawn maintenance, increase populations of insect pollinators, slow storm-water runoff, and enable student/faculty research opportunities.
- Great effort goes into the protection of valuable trees during construction projects.
- Many new trees have been planted to diversify the urban forest on campus.
- Work has been done along the Red Kelly Trail on the periphery of the Ralph Myhre Golf Course to control for invasive vegetation and to sustain the natural condition of the clayplain forest and the transition hardwood limestone forest.
- Landscaping efforts continue to reduce the use of herbicides, pesticides, and inorganic fertilizers. This is a long-term effort that must also take into consideration labor trade-offs.
- Synthetic pesticide use is limited to very specific applications of Roundup to control weeds and chemical fungicide to address Dutch Elm disease. Integrated Pest Management (IPM) is practiced to reduce chemical interventions.
- The College always considers sustainability when selecting site materials and furnishings.
- Use of the landscape for educational purposes has increased over the past 10 years, as witnessed by natural history walks, tree-pruning workshops, and courses that treat the campus landscape as an outdoor classroom.

* * *

8. Social and Academic Programs

The 2008 Master Plan projected that there would be a "significant increase in the College's academic facilities" with the opening of the Axinn Center at Starr Library. While initially accurate, that prediction was soon contradicted by growth in the faculty that necessitated the repurposing of classrooms for offices and other uses. The Master Plan assumed that between 2008 and 2018, the size of the faculty would grow by 25 Full-Time Equivalents (FTEs), a rate of three new positions per year. In fact, we have added 37 faculty positions since 2008. We have also added 73 FTE staff members since 2009,

which has placed significant pressure on our inventory of offices. As of fall 2015, Middlebury College had a total of 1,048 offices, including administrative departments both on campus and in town. The fall 2015 demand for offices was 1,031, resulting in a small surplus of 17 offices, all but three of which are located off the main campus. The current vacancy rate is 2 percent.

In order to expand the number of offices available for staff, the College leased and renovated a building on Exchange Street in Middlebury, which now houses the Office of Advancement, the Davis United World College Scholars Programs, the networking staff of Information and Technology Services, and a second data center. Still, the College continues to face a shortfall in office space, making it difficult to establish proper work settings for some staff. Although the Master Plan calls for an office "migration study," that analysis has not yet been conducted.

The pressures on academic space are perhaps more acute, especially in McCardell Bicentennial Hall, where lab space is in short supply. Meanwhile, other classroom buildings are in need of updating and renovation. Munroe Hall and the Johnson Memorial Building are prime examples of this need. To address these challenges, the administration has formed an Academic Space Planning Committee to consider the construction of a new academic building. The Master Plan estimates that the next new academic building will need to be 20,000–25,000 gross square feet. The Academic Space Planning Committee is currently considering a building of 40,000 square feet. It is also looking at a variety of short-term solutions to address the space shortage in Bicentennial Hall and reviewing options for renovating outdated classroom buildings.

As a year-round campus, Middlebury also has summer programs it must consider. Here, too, the ground has shifted since the Master Plan was completed. The Language Schools no longer run programs from six to nine weeks; they now operate anywhere from three to eight weeks. In 2009, the Language Schools began leasing space at Mills College in Oakland, California, to relieve some of the space pressures on the Middlebury campus. The future of the relationship with Mills is regularly evaluated, and regardless of whether the Language Schools remain at Mills, a second site will be required as the Language Schools have outgrown the Vermont campus. In 2014, the School of the Environment held its first six-week summer session. A year later, the College added the option of summer study courses for undergraduates, which has had a limited impact on the campus.

We expect that as the institution moves forward with the process of Envisioning Middlebury and other forms of strategic planning, it will develop a vision for how it intends to support these summer programs over the course of the next decade.

* * *

9. Accessibility

Since the Master Plan accessibility audit was completed, the College has set aside an annual fund to reduce barriers in and around buildings and along pathways. While progress has been made toward enhancing accessibility across campus, financial restrictions have limited the scope of barrier removal each year. Still, there is a great deal of interest in the community—and within the administration—for following up on the recommendation in the 2008 Master Plan that the College "create a cohesive vision for a universally accessible campus."

Universal Design (UD) looks beyond compliance with the law to create a state where all are welcomed regardless of ability or stage of life. This concept does not focus on disability in particular; rather, it removes specific users from the conversation and considers everyone. This type of inclusive design takes into account the aesthetics as well as the functionality of the built environment. It is user-focused and embraces the highest ideals of inclusivity. Designing and constructing a building according to UD principles also greatly reduces the need to retrofit the building after it has been created. In this respect, UD is a cost-effective strategy as it mitigates the need to make costly renovations years after a building is constructed.

Curb cuts are a simple example of UD elements on the Middlebury campus. While they make it easier for wheelchair users to access the sidewalks, they also improve access for the whole population, including people with delivery carts, visitors with strollers, and people walking bikes along our sidewalks, among others.

We can also see the impact of UD on some of the entryways on campus. When the entrance of Wright Theatre was redesigned, the retrofitted ramp was removed and a slightly sloped walkway was added to allow wheelchair users to enter through the main door. The stairs underneath the retrofitted ramp were maintained for those that prefer that type of access. The redesigned entrance is beautiful and accessible for all, and matches the look of the original building.

In the summer, as in the regular academic year, we have a diverse student population, and we need to ensure that our residence halls are accessible to all. Here any consideration of accessibility must address parking, paths of travel, entrances, and bathroom facilities. As we continue to renovate existing buildings or design new buildings, it will be important to keep UD principles in mind. On this point, it is unfortunate that the new Ridgeline

residences are ADA compliant but were not built according to UD principles. The result is that certain populations on our campus cannot access sections of those residences.

The same principles should also be applied to the academic spaces on campus, whether we are thinking about the design of a new building or the modification and/or creation of classroom and laboratories. There is likewise an important conversation to be had about how UD principles might inform the development of websites and other virtual spaces.

Middlebury's 2006 accessibility audit identified multiple buildings on campus that were in need of upgrades. We have addressed several of these projects over the course of the past decade. In addition to the work at Wright Theatre, an accessible entrance was added to the second floor of Stewart Hall, and a ramp was installed for wheelchair users to access the mailroom in McCullough Student Center. More significant accessibility upgrades have been undertaken during projects such as the renovation of the Peterson Family Athletics Complex and the Inn at Bread Loaf. Forest Hall was made accessible through renovation with a ground-level entrance and the installation of an elevator.

Progress has been made with emergency evacuation and safety protocols on campus. We have created a procedure for students to request emergency evacuation, and students can now receive training on evacuation procedures from the environmental health and safety coordinator. However, additional reviews of the emergency evacuation procedures would be beneficial; practice drills for emergency protocols could also help identify areas of concern for people with and without disabilities. We must likewise review signage on the exterior and interior of all Middlebury buildings to ensure that it is accessible to all of our community members.

The College has set aside an annual fund for accessibility upgrades, and we have used these funds to address important ADA needs on campus. That said, renovating and building according to UD principles—a standard that goes beyond compliance requirements—is likely to require an additional outlay of resources. As Middlebury engages its next strategic planning process, it will want to give careful thought to the principles of inclusivity that lie behind UD, and assess the relative costs of building and renovating according to UD, as opposed to being ADA compliant, a threshold that may not be as supportive as UD.

* * *

10. Lands and Real Estate

Stewardship of College lands entails balancing numerous ecological, economic, social, and educational values. The Land Stewardship Initiative, approved by the College administration in 2008, establishes seven Guiding Principles that are meant to inform the College's use of land and real estate. These principles are listed on the College website

and are consistent with the goals articulated in the Master Plan, especially the Landscape Plan laid out in Chapter 7 (Natural Systems). They also inform this discussion of land and real estate.

It would be difficult to overstate the importance Middlebury's property holdings have for the local environment. The approximately 6,000 acres of College-owned lands contribute to a variety of ecosystem functions—from water quality maintenance and carbon sequestration to biodiversity and wildlife habitat connectivity. The College lands also contribute to the local economy and food and timber production. Agricultural land is leased to area farmers, and forested lands occasionally contribute to the forest products economy. The lands also contribute directly to Middlebury's educational mission, as they are used by College and local K–12 classes and for student and faculty research.

These functions and activities are all recognized within the Master Plan, and the Guiding Principles underscore the College's need to weigh their relative importance when making land-use decisions. In terms of potential impact to the environment and society, some of these activities may be compatible with one another, while others may seem to conflict. In land stewardship, the College strives to look broadly across all lands and manage competing outcomes and interests. To that end, the College has made a special effort to document the ecological and agricultural value of its lands so that it can responsibly assess the impacts to competing values when evaluating prospective land-use decisions.

The College leases roughly 1,700 acres to local dairy farmers who grow hay and/or corn, with about one-quarter of the leased acreage in pasture. Beginning in 2016, agricultural lands came under regulation through the Vermont Clean Water Act (Act 64). Changes in land use and agricultural methods will need to be made in accordance with the new Required Agricultural Practices (e.g., livestock exclusion, cover-cropping, manure stacking, etc.), effective in early 2017. The new regulations will require farmers to change how they have been using the leased land, and they will require the College to be more involved in managing its agricultural lands to ensure compliance by the lessees. All this will be new territory for farmers, landowners, and state regulators, with the changes resulting in better water quality and improved habitats for plants and animals.

Middlebury College owns 872 acres of wooded uplands and wetlands in the Champlain Valley. Among these areas are significant rare, uncommon, and exemplary ecosystems, including the mesic clayplain forest at the Quesnel Farm and red/silver maple-green ash swamp at the Lussier and Gorham Farms. These lands include numerous uncommon plant and animal species. Additionally, the area between the Legion fields and the College baseball and softball fields—known informally as the "bird sanctuary"—is a long-term bird research site and banding station. The woodlands and wetlands also have high aesthetic and recreational values, as evidenced by the Trail Around Middlebury, some of which runs through College-owned property. Two parcels of woodland have

been enrolled in the Use Value Appraisal taxation program and have management plans approved by the county forester.

In 2015 Middlebury College conserved, by easement, 1,458 acres that include the Bread Loaf Campus and adjacent fields and forest (known as the Bread Loaf Conservation Project). By 2024, an additional 600 acres will be added to the Bread Loaf Conservation Project, either from parcels received in trade with the U.S. Forest Service or lots that the College owns in Ripton. The primary purposes of the project are to maintain the conserved lands in a relatively natural state, to conserve recreational resources, and to support the College's educational mission. By prohibiting the development of these lands, the project also aims to protect their values of scenic open space and historic and cultural resources. The conserved lands are managed according to a plan that must be approved by the easement holder—the Vermont Land Trust—and updated every 10 years.

The College owns additional forest parcels in the Green Mountains that support ecologically significant features, namely the Middlebury College Snow Bowl in Hancock, Battell Research Forest in Middlebury, and Clapp Lot in Bristol. Formal management plans for these areas do not currently exist, though they are expected to be written in conjunction with the Bread Loaf Conservation Project.

The Middlebury College Organic Farm is situated in Cornwall on a knoll of loamy soil surrounded by leased agricultural fields approximately one-half mile west of Bicentennial Hall. Established in 2002, the farm grows crops as part of a larger program that cultivates well-being in people, place, and community. Agricultural practices used by the farm emphasize building soil and organic matter, sequestering carbon, and efficient use of water. The farm sells produce to College Dining Services and operates an on-campus farm stand; it also donates vegetables to the local HOPE food shelf. The farm is equipped with an outdoor classroom and is an educational resource for the College, local schools, and other community members.

In 2012, Willard Jackson gifted to the College his home and 377 acres of woods, fields, and ponds located in Cornwall. Future use of the lands and buildings has not yet been determined, though in 2014, Maclay Architects and Andropogon Associates were contracted to develop the "Jackson Lands—Middlebury College Master Vision." The document presents suggestions for how the property might be used, along with a discussion of opportunities related to education, ecological management, human habitation, and operations and maintenance.

College lands include a 10-acre willow test site that is managed by SUNY-ESF Professor Tim Volk. The site is west of the Organic Farm and was established to evaluate the use of willow in the College biomass plant. The willow was deemed unsuitable for the plant's

operation, but the test plots remain, and Professor Volk continues his research there. Once the research project concludes, the College will need to determine the status of the site.

A butternut seed orchard was established in 2012 on College-owned property—on South Street Extension—as part of a four-state initiative to investigate resistance to butternut canker. Vermont Department of Forests, Parks, and Recreation's Forest Health Program and Dr. Dale Bergdahl (University of Vermont) are coordinating this project.

The College's philosophy as it relates to real estate is to maintain adequate property holdings so that the College can meet the needs of the College community and fulfill its educational mission. To that end, Middlebury has developed a large inventory of real estate over the years. These properties are a mix of residential and commercial, with the vast majority being residential.

The acquisition of these properties has been driven by a diverse set of factors related to institutional strategy, housing needs, and the shortage of office space on campus. The College has a strong need to identify suitable housing for faculty, especially faculty on the tenure track who are potentially long-term members of the community. The College must also look after the housing needs of the Language Schools faculty who require short-term, family-style housing proximate to campus.

The College recognizes that real estate purchases and sales affect the local market and that the College's needs must always be balanced with the impact that they have on the town. These considerations have prompted the College to acquire properties only when there is a need that cannot be addressed through existing property holdings or when the acquisition serves a key strategic purpose. An example of a key strategic purpose would be the "buffering" of the campus from residential neighborhoods as a way to mitigate the impact of a community of 18–22-year-olds who operate with a very different daily rhythm from a typical family neighborhood. Since 2008, a modest effort has been made to purchase properties that are sited along the perimeter of campus. These acquisitions have been made through opportunistic purchases as properties have become available.

The College also recognizes the potentially positive impact it can have on local development. The creation of the industrial park on Exchange Street serves as an example of a collaborative project undertaken to advance a community goal (identifying an area for industrial development and expediting permitting). Other examples include the leasing of 51 Main. Occasionally, the College has acquired real estate to prevent other uses and to improve the aesthetics of a property. An example of this type of acquisition would be the purchase of Kitchel House.

Like land stewardship, real estate management means balancing various assets and values. Central to this balancing effort is strong and regular communication with town

leadership. In 2012, as part of the Town Plan, the College and town formalized several agreements and procedures to ensure regular communication and promote effective collaboration. Going forward, the College must continue to evaluate how potential real estate transactions might affect the town, and whether these transactions are compatible with the town's development framework. This work should also take into account the land holdings of the Delineation Corporation (College-governed entity that holds lands). At the same time, it is important to stress that the College will continue to be opportunistic and to work to balance the needs of the College community with those of the Town of Middlebury.

Recommendations:

1. Apply the Land Stewardship Guiding Principles when making decisions about management and sale of College lands.
2. Promote exemplary land stewardship in support of research, student work, and local and regional initiatives.
3. Explore state-of-the-art nutrient retention and carbon sequestration practices.
4. Evaluate the College-owned woodlands, wetlands, and fields with respect to the Green Reserve presented on page 107 of the Master Plan.
5. Consider the role of the Bread Loaf Conservation Project (and the Green Reserve) for protecting the nationally significant Battell Research Forest.
6. Uses of and practices on adjacent agricultural fields should consider the organic practices of the Middlebury College Organic Farm to ensure that the soils and products of the farm are not contaminated by nonorganic inputs.

* * *

11. Conclusion: The Future of the Master Plan

The 2008 Master Plan includes many recommendations, and although the College has not always adhered to the plan's implementation guidelines in following up on these recommendations, it has operated within the spirit of the plan. Shortly after completion of the Master Plan, an Implementation Committee began to meet regularly to consider how the College might achieve the goals described and to evaluate building projects to ensure that they were consistent with the plan's guidelines. However, as the College navigated the recession, the committee's work was curtailed.

Looking ahead, we must ensure we have a robust governance structure and clear procedures for considering how the Master Plan will guide future building and landscape projects and current operations. No matter how articulate or persuasive the Master Plan and the Master Plan Update may be, these documents will have little meaning without

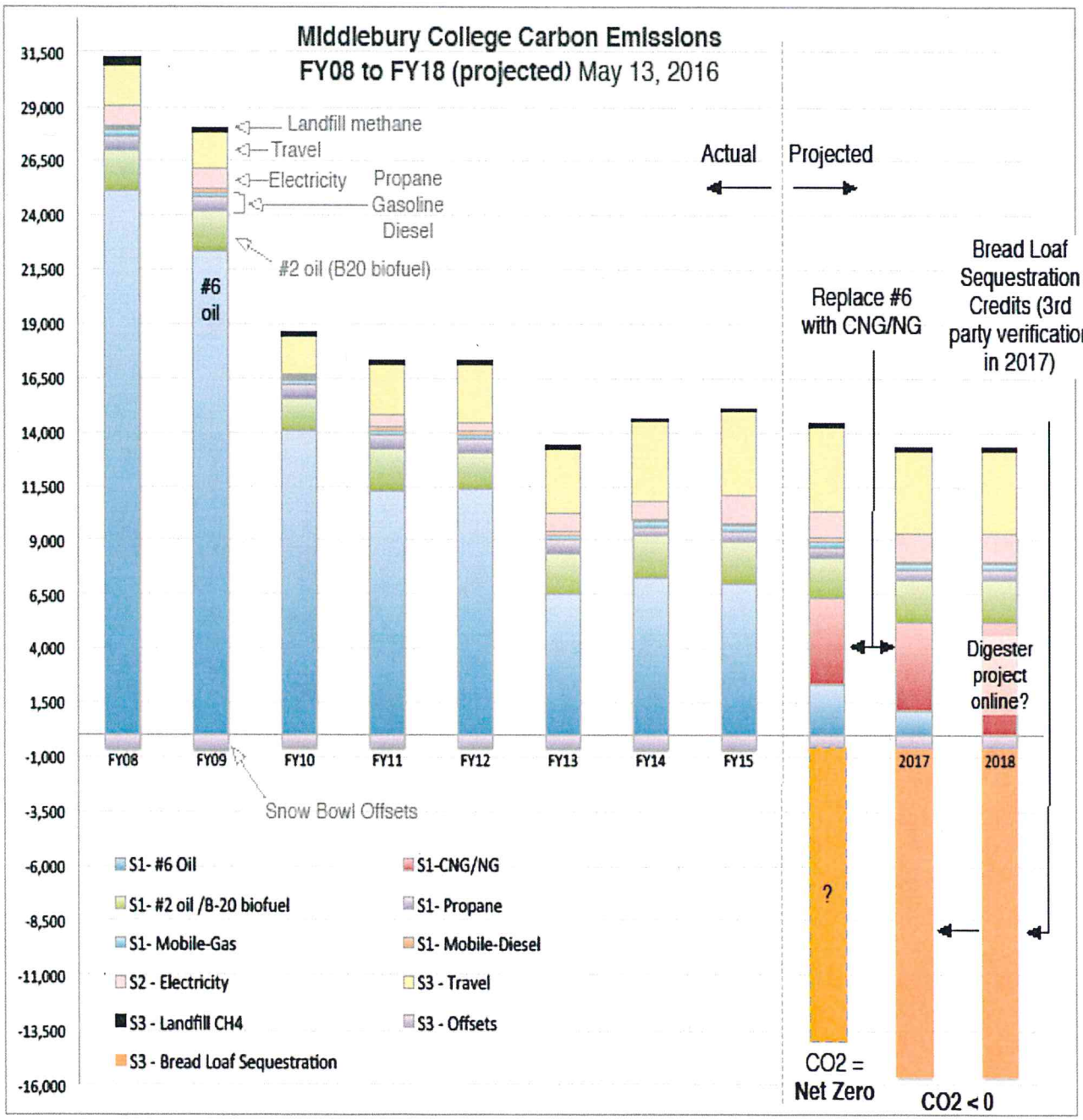
widely understood processes to support the recommendations and guidelines contained within them.

A Master Plan Implementation Recommendation is included as an appendix to this update. In short, we believe the administration should appoint an advisory group that meets periodically to review any construction or landscape projects to ensure that plans are in keeping with the Master Plan and the additional recommendations noted in this update. We also suggest that the Resources Committee of the Board of Trustees receive an annual update on the status of the Master Plan.

APPENDICES

A. Middlebury College Carbon Emissions 2008–2018
B. Sustainability Chapter Recommendation Status Report (as of 3/1/17)
C. Master Plan Implementation Recommendation
D. Map

APPENDIX A: MIDDLEBURY COLLEGE CARBON EMISSIONS 2008–2018 (projected)



APPENDIX B: SUSTAINABILITY CHAPTER RECOMMENDATION STATUS

KEY: P=Progress; O=Ongoing; C=Complete; N=Not complete; S=Some progress

SUSTAINABILITY CHAPTER RECOMMENDATIONS		
General	**STATUS**	**NOTES**
1. Establish a process by which decisions affecting the sustainability of the campus are made, and to resolve conflicts involving sustainability	N	Needs to be reconstituted
2. Consider the impact of decisions about facilities and operations on Carbon Neutrality and other aspects of sustainability, and assess costs and benefits over the long term	P	Being done
Buildings		
1. Adopt the LEED MC-Plus guidelines system for all renovation and new construction projects	C	Update needed
2. Design new buildings to be as energy efficient as possible	P	Generally doing well
3. Improve the energy performance of existing campus buildings through improvements to their envelopes and building systems	S	Standard part of the process when a building renovation is being planned
4. Assign priorities for improvements based on the energy audit of buildings on campus and on academic program and availability	S	Not being done systematically or proactively; audit that was done was not detailed enough to assign priorities
5. Encourage behavioral changes for students, faculty, and staff, including adjustments to indoor temperatures and use of air-conditioning	P	Several initiatives have been done; ongoing effort, relatively small impacts
6. Meter all buildings for water, power, and steam	S	Not true for all buildings; need a list of which buildings are metered for what
7. Install Building Dashboards and Campus Dashboards: displays that show building and campus energy use and production in real time, and the corresponding greenhouse gas emissions, along with water	S	Not necessary to do all buildings; focus on dorms and high-traffic spaces

use, comparative historical data, environmental conditions, etc.		
8. Minimize the use of air-conditioning in campus buildings	P	
o Increase the air-conditioning set point	C	Done in '08: 75 F
o Minimize the need for air-conditioning by using shading, natural ventilation, and mechanically assisted ventilation	S	Done partially on limited basis; options are limited
o Strategically plant deciduous shade trees on south side of buildings to help reduce daytime solar heat gain during summer months	P	Regular ongoing issue with regard to planting and replacements
9. Where appropriate, utilize energy-efficient means of cooling, such as geothermal, shading, natural and mechanical ventilation, etc.	S	Done to limited extent
10. Utilize refrigeration gases in air-conditioning and refrigeration systems that are as benign as possible, both in terms of their global warming potential and their ozone depletion potential	P	Being done as part of maintenance cycle for A/C and refrigeration
11. Consider energy-efficient alternative systems for specialized functions in individual buildings, such as these:	P	
o A purified water system for Kenyon Arena's ice sheet, which will reduce the energy required to create the ice	N	Not done; some discussion with VEIC/Efficiency Vermont about this
o A solar hot water heating system for the Natatorium	N	Not done; some discussion with VEIC/Efficiency Vermont about this
o Heat exchangers for the recapture of waste heat, for example, at the campus data center and if possible in food service areas	P	Being done as part of major service intervals
12. Investigate the feasibility of solar heating for domestic hot water	P	Have two systems on house on Shannon St.; need to study them and make a determination about feasibility
13. Develop a life-cycle assessment for construction materials, considering cost, longevity, environmental damage caused by production, embodied energy, potential for recycling, disposal, hazards, etc.	N	Not done; info is probably available elsewhere and would need some analytic tools and people to develop

14. Adaptive reuse of buildings should be considered before removal	P	Standard practice for most buildings
15. Building deconstruction	P	
o Building removal should minimize the quantity of materials entering the waste stream by employing deconstruction and reuse/recycling	C	Standard practice for the most part
o Materials salvaged from deconstruction should be considered for future use in anticipated building projects	C	Standard practice for any salvageable materials
o New construction projects should incorporate salvaged material	S	Not being done routinely (check)
16. Continue collaborating with Efficiency Vermont to obtain greatest efficiency for both new and renovated buildings	C	Standard practice and ongoing
Utilities		
1. Improve the efficiency of utility systems by upgrading steam lines, etc., as necessary	P	In progress and ongoing
2. Introduce monitoring and metering devices so that leaks and losses can be readily identified and excessive usage can be curtailed	P	Lines are regularly monitored visually during winter for signs of leakage/melted snow on surface above lines
3. Develop a reporting log for comparing end-use measurements over time and verifying that the systems are performing as designed	S	Not done systematically; problems are addressed when discovered
Energy Sources		
1. Conduct an alternative energy assessment of the campus to better understand what forms of alternate energy are feasible and how best to employ them	S	Some large solar projects have been done; no campuswide assessment done
2. Pursue the procurement of responsibly planted and harvested wood chips for the biomass gasification boiler by partnering with wood chip suppliers, the State of Vermont Department of Forests, Parks, and Recreation, professional logging and forestry associations, and others	P	Several attempts have been made to implement a data collection and reporting system but still not anything comprehensive in place
3. Pursue the feasibility of using local agricultural land for the purpose of growing	C	Willow project done and conclusion was not feasible

biomass for the biomass gasification boiler coming online in 2008		
4. Develop a portion of Middlebury College's own agricultural land for the purpose of self-sufficient generation of biomass for the biomass gasification boiler	N	Some research done on feasibility by Applied Ecological Services; need to do test plots on land that would have to come from leased farmer
5. Reforest a portion of Middlebury's agricultural land with clayplain forest to sequester carbon	N	Not done; not sure it would have much impact on carbon picture
6. Continue to participate in Central Vermont Public Services Cow Power program, which uses methane produced by cow manure to generate electricity, and partner with local farms engaged with manure to methane projects	C	Being done (now Green Mountain Power is owner)
7. Increase Middlebury's on-campus generation of electricity from alternative renewable sources: wind power, photovoltaic panels, exercise machines	P	Progress with solar on and off campus: ~700kW of solar projects
8. Participate in the development of a hydroelectric plant at Otter Creek; this could generate a significant portion of the electricity that Middlebury College uses	N	Tried but difficult to work with owner; on hold for now
9. Consider participating in the Landfill Gas to Energy program at the Moretown Landfill	N	Opportunity passed
10. Collaborate with Central Vermont Public Service (CVPS) to install alternative energy generators under the Regional Global Gas Initiative	N	Have had discussions with Green Mountain Power but no specific projects in the works
11. Carbon offsets will be a part of the effort to achieve carbon neutrality; Middlebury will look for opportunities to purchase or establish bona fide offsets with a preference for those that are local and regional	P	EC is developing guidelines for this
Vehicular Travel and Commuting		
1. Secure offsets for 100% of outsourced travel	N	Not done; looking at options this summer

2. Prioritize local meetings and conferences or utilize teleconferences to minimize air travel	S	Not being done in any comprehensive way
3. Begin shifting campus fleet vehicles where appropriate from gasoline or diesel fuels to electric power or hybrid fuel	N	Not being done in any comprehensive way
4. Institute transportation demand management strategies to reduce private vehicular use by faculty, staff, and students	N	Not being done
o Establish a target for a reduced level of carbon emissions due to regular commuting	N	We have estimated employee commute carbon but no incentive programs have been tried
o Develop a hub system with ACTR to connect campus shuttles with the county shuttles for scheduling purposes	S	Have worked closely with ACTR and some changes made; check with ACTR on status of route changes
o Provide incentives for faculty and staff who would typically commute to campus via private car to instead utilize public transportation, walk, or bike	S	Some incentives but not actively doing outreach about them
o Provide incentives for using shuttle services such as passes or financial compensation	C	Being done
o Provide financial incentives for carpooling	N	Not being done
o Provide vehicles for emergency use by faculty and staff who use public transit or carpooling for their daily commutes	C	Available through Go Vermont
o Provide an "on-call" shuttle system for on-campus travel	N	Tried a regular shuttle for off-campus staff but did not get used
o Introduce parking fees for on-campus parking	C	Done for students
o Provide the majority of parking spaces in peripheral campus lots to reduce car use during the day	S	Done to a fair extent
o Eliminate parking in the central campus (with the exception of ADA requirements)	N	Not being done
o Relocate all student parking to the West Ridgeline lot to discourage students from using their cars for short trips during the school year	C	Being done
5. Purchase offsets for the remaining carbon emissions due to regular commuting	N	Not being pursued

6. Subsidize the purchase of alternative fuel and/or hybrid vehicles by faculty and staff (see Appendices)	N	Not being pursued
7. Encourage outside vendors (e.g., private bussing companies) to use alternative fuel or hybrid vehicles	N	Not being done
8. Develop a non-idling policy for campus deliveries, outside vendors, athletics buses, etc.	S	In place for athletic team buses at games
9. Continue offering an hourly/daily car rental program to students, faculty, and staff	C	Done
10. Advocate the reestablishment of passenger train service to the town of Middlebury	P	In progress
11. Encourage faculty and staff to live close to campus	C	
o Develop Middlebury College property in the town to house as many faculty and staff as possible within walking distance	P	Done when possible
o Subsidize the cost of purchasing housing in the town of Middlebury by faculty and staff	S	Benefit in place for mortgage rates
12. With few exceptions, continue to limit student housing to on-campus facilities	C	Being done
13. Consider banning first-year cars from campus	N	Explored and little support
Bicycle Transportation		
1. Develop a comprehensive bicycle program for both the regular academic year and the summer that includes access, maintenance, information, safety, and a reinvigorated free campus bicycle program	P	Have done a lot with bike repair shop and fixing and selling abandoned bikes
2. Make the campus more bicycle friendly	N	Not being done
o Provide sufficient parking for bicycles, with attention to number, location, and type of bike racks	P	Being done
o Widen pathways to accommodate bicycle use along major corridors	N	Not being done
o Construct curb cuts at all locations where pathways intersect roads	P	Done when there is a project requiring it

o Replace all storm sewer drain covers that are not bicycle friendly	C	Already are bike friendly
o Provide showers in more locations for bicycle commuters	S	Limited progress
o Provide secure indoor storage locations for bicycle commuters	S	Limited progress
3. Develop an incentive program to promote bicycle commuting by employees	N	Not being done
4. Integrate the college's bicycle transportation initiatives with efforts by the town to promote bicycle transportation	N	Not being done
5. Provide or rent bicycles and helmets to members of the summer Language Schools	C	Done
Landscape and Open Space		
1. All new construction at Middlebury College should be planned within the existing developed area of the main campus	P	Generally being done
2. New buildings and hardscape should not be built in green areas remote from the core campus	P	Generally being done
3. Plant materials should be local species if possible	P	Being done
4. Reduce the amount of lawn by converting it to greensward, meadow, trees with groundcover, and forest as appropriate in different areas of campus	P	Some progress
5. Increase the amount of habitat suitable for indigenous plants and animals	N	Not being done to any great extent
6. Increase the interconnectedness of plant and animal habitat by linking currently isolated areas	N	Not being done to any great extent
7. Continue to reduce the amount of herbicides and pesticides used	P	Good progress; very limited use
8. Improve soils and drainage, particularly in heavily used areas of campus	N	Not being done
9. Conduct a land value survey for all of Middlebury College's land holdings in Addison County to assess existing conditions, environmental practices, environmental connectivity, economic possibilities, and social benefits	C/P	Eco assessment completed

10. Protect sensitive or critical areas by establishing a Green Reserve	N	Not being done
11. Provide summer shade for building facades with trees and shrubs	C/P	A criterion used when choosing tree locations
12. Design the campus landscape to encourage social interactions and a variety of uses	O	Wilson outdoor seating, other areas, but ongoing needs exist
o Orient plazas and terraces outside of academic and residential buildings to maximize daylight and solar heat gain	P	Being done where feasible
o Provide seating in protected areas and in locations best suited to capture the panorama of the Green Mountains	N	Not being done
Water Management		
1. Implement a rainwater collection system for water from the athletic buildings, and use it to supply water for irrigation of fields	N	Not being done
2. Create additional raingardens and bios-wales, appropriately located, to reduce storm-water runoff and to improve water quality	N	Not being done
On-Campus Operations Guidelines		
1. Develop Sustainable Campus Operations Guidelines in conjunction with the Strategic Plan that consider the following:		
o Maintenance and operations schedules for campus grounds and buildings including building envelope upgrades	N	Not being done systematically
o Dining Services storage capacities, relative to the locations of dining operations and food delivery schedules	C/O	Dining Services has fixed coolers and freezer, looking at scale
o Reduced energy use by building equipment	P	Some work done with Efficiency Vermont
o Parking policies and transportation management	C/O	Parking policy has been revised and conversation with partners on broader transportation issues

Off-Campus Operations		
1. Develop Sustainable Off-Campus Guidelines that address the abroad program, Bread Loaf, the Snow Bowl, and the management of the College's other properties	N	Not being done
2. Chart travel emissions for these activities and include them in carbon reports	N	Not being done
3. Strive to reduce carbon emissions due to travel	S	Some work to be done on travel carbon surcharge options this summer
Supply Chain Management		
1. Initiate a purchasing plan that prioritizes sustainable materials and supplies, and prioritizes purchases from companies invested in maintaining their own sustainability standards	P	Policy research under way this summer
2. Strive to use suppliers located within 500 miles of the final point of delivery	N	Not being done; discussions with Corinne Noelke about policies for sustainable purchasing
3. Encourage suppliers to use recyclable and returnable packaging as shipping materials	S	Not being done; discussions with Corinne Noelke about policies for sustainable purchasing
4. Ensure that Middlebury College does not engage in unfair trade or limit growth opportunities in the region	S	Not being done; discussions with Corinne Noelke about policies for sustainable purchasing
5. Support and serve as a catalyst for sustainable Vermont businesses	N	May be happening but not being tracked
Reporting, Record-Keeping, and Guidelines		
1. Institute a formalized record-keeping and reporting system for issues of sustainability, such as that developed by the Global Reporting Initiative	C	Using STARS for this purpose
2. Develop formal guidelines, including performance benchmarks, for capital projects, maintenance, deconstruction, and operational activities	N	Not being done

3. Utilize the reporting and record-keeping system to monitor successes, areas for improvement, and costs and benefits, and to more accurately attribute costs and benefits to actions taken	N	Not being done
4. Report performance against guidelines and principles through an annual report	S	STARS provides some of this
5. Develop maintenance guidelines and schedules to meet the recommendations for improving energy efficiency and thermal comfort by upgrading the envelopes of existing buildings	N	Not being done
6. Revise the energy accounting system to equitably allocate the greenhouse gases associated with the production of steam and cogenerated electricity	C	Done
7. Work with suppliers and encourage them to conduct their own greenhouse gas inventory and life cycle assessments; estimate the full greenhouse gas emissions associated with materials and energy purchased and produced, including the embodied energy of supplies and construction materials, and the energy consumed in the production, refinement, processing, shipping, and combustion of energy sources	N	Not being done
College Finances		
1. Make every effort to invest in environmentally friendly, socially responsible areas	P	Significant progress here
Carbon Neutrality		
1. Develop a carbon offset purchase and management program to compensate for irreducible greenhouse gas emissions	P	EC is developing guidelines
2. Purchase carbon offsets as a last resort to compensate for irreducible greenhouse gas emissions.	P	EC is developing guidelines
3. Offset 100 percent of all remaining emissions by 2016	C	Completed late 2016; ongoing efforts to improve mix of energy

APPENDIX C: MASTER PLAN IMPLEMENTATION RECOMMENDATION

1) Establish a Master Plan Implementation Group (MPIG), to be appointed by the president, with no more than five persons.

2) Clarify the charge to the group:

    a. To review progress made on recommendations contained in the 2008 Master Plan
    b. To review progress made on recommendations contained in the 2017 Update and Retrospective
    c. To evaluate the need for new recommendations
    d. To participate in the planning process for major capital projects

3) Establish an annual timeline for the group's work, as follows:

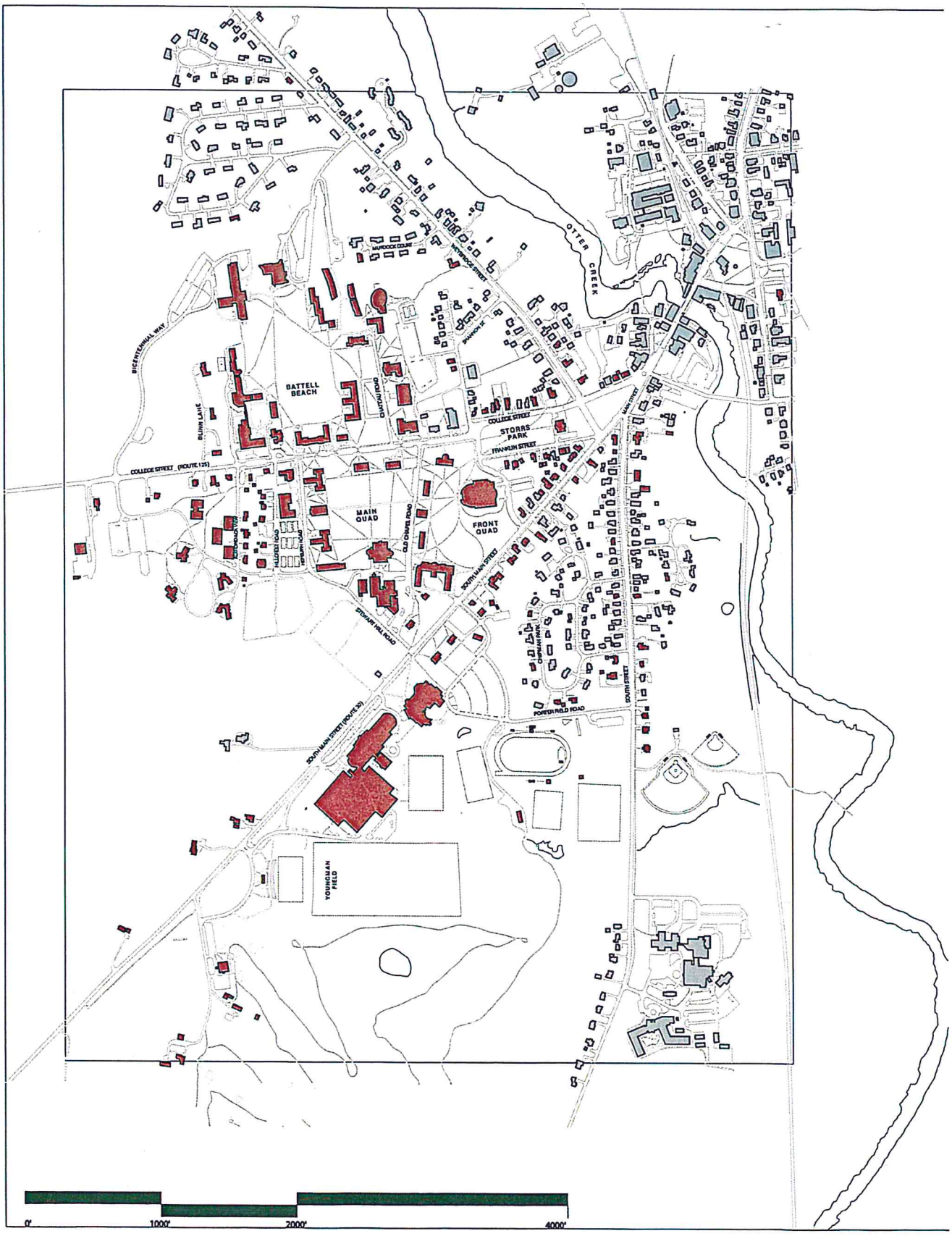
January 1
Submit request to facilities for list of upcoming RRR projects for fiscal year (set $ mark); and plans for any major capital projects within a 3-year horizon (in theory all of these projects should be coming from the 10-year capital projects list). Deadline for receiving materials is July 1.

February 1
MPIG chair receives information, submits additional requests, pulls together information pack for MPIG summer meeting.

No later than March 15
MPIG summer meeting to review plans for the materials shared by facilities and to determine the role of the Master Plan in the project(s).

November (meeting of MPIG)
Review recommendations from 2008 and 2017. Consider areas for additional recommendations. Determine any follow-ups for summer meeting.

APPENDIX C: UPDATES TO MAPS FROM ORIGINAL MASTER PLAN (2008)


BICENTENNIAL WAY
BUHN LANE
COLLEGE STREET (ROUTE 125)
BATTELL BEACH
MAIN QUAD
FRONT QUAD
STORRS PARK
COLLEGE STREET
TRANNUN STREET
SOUTH MAIN STREET
STEWART HILL ROAD
SOUTH MAIN STREET (ROUTE 32)
POMEROY FIELD ROAD
SOUTH STREET
OTTER CREEK
YOUNGMAN FIELD
0'
1000'
2000'
4000'