

Greening the Buffalo Niagara Medical Campus

Summary of Key Recommendations for Medical Campus Institutions

- Create a sustainability plan and designate a green team, led by a sustainability officer, to implement it.
- Set and implement energy reduction goals for each member institution, and commit to having all new buildings and major renovations be Energy Star certified.
- Commit to annual, gradually increasing goals for use of renewable energy.
- Support permit parking on nearby city streets and offer all employees green transit incentives.
- Make Michigan Avenue a “connective corridor” comparable to that in Syracuse.
- Add green infrastructure to all parking lots and commit to handling all stormwater on-site.
- Adopt a campus-wide sustainable procurement policy and make the Smarter Purchasing pledge of the Healthy Hospitals Initiative.
- Form a campus-wide food policy and make the HHI Healthy Food in Health Care pledge.
- Do business only with local, sustainable food providers, eliminate red meat, and reduce dairy.
- Establish a comprehensive, campus-wide waste management policy that includes the recycling of all legally-mandated materials, ends or reduces incineration, and sets and implements goals for reduction, reuse, and recycling improvements.
- Hire a single waste and recycling vendor to maximize efficiency and reduce cost.
- Create a re-use/recycling center on campus, staffed by local residents.
- Compost all food and yard waste.
- Craft a unified landscaping policy that includes a ban on pesticides and lawn chemicals and prioritizes native, low-maintenance plants and edible fruit trees.
- Work with nearby residents to create a Green and Healthy Neighborhood plan that makes every home, lot, and public space in the neighborhood green and healthy, using techniques such as:
 - Whole house audits for repair needs, environmental health hazards, and opportunities for energy efficiency and renewable energy;
 - A capital pool and financing mechanisms such that every home can be renovated, regardless of the income, assets, and credit of the residents;
 - The greening of every vacant lot;
 - Complete Streets renovations for every nearby street.

What is the BNMC?

The Buffalo Niagara Medical Campus is a consortium of health care, life sciences, medical education institutions and community interests located in downtown Buffalo and created in 2001. The campus is rapidly expanding and has grown from 7,000 employees in 2003 to more than 12,000 employees in 2012, with an expected 17,000 jobs in 2017, by which time the John R. Oishei Children's Hospital and the SUNY Buffalo Medical School will have moved to the campus.¹ The Buffalo Niagara Medical Campus, Inc. is the non-profit corporation that the member institutions formed to help spur, guide, and manage the development of the campus.

BNMC Member Institutions Include

- Buffalo Hearing and Speech Center
- Buffalo Medical Group
- Center for Hospice & Palliative Care
- Hauptman-Woodward Medical Research Institute
- Kaleida Health
- Olmsted Center for Sight
- Roswell Park Cancer Institute
- University at Buffalo
- Upstate New York Transplant Services (UNYTS)

Why Green the Medical Campus?

- The Medical Campus is dedicated to improving health, and a sustainable campus will improve the health of the patients, visitors, workers, and neighbors of the campus, as well as that of the general public.
- Sustainability measures such as improving energy efficiency, promoting healthy transit, and reducing waste will provide long-term cost savings, freeing up dollars for research, treatment, and education.
- The Campus is well-poised to become a national model for the types of sustainable development that are necessary to reduce climate change.

I believe there is nothing more important than the work we all are doing to redefine human health to include a healthy environment, a healthy planet.

*Lloyd H. Dean, President and CEO,
Dignity Health, the largest hospital
system in California*

Sustainability Planning and Implementation

One vital technique used by businesses, non-profits, and governments around the world is to create a sustainability plan and designate a green team, led by a sustainability officer, to implement it. The plan should include aggressive but realistic targets for reducing greenhouse gas emissions, reducing waste, serving more healthy and sustainable food, increasing the use of public transit, buying more goods and services from local vendors, and improving environmental health in nearby neighborhoods. BNMC, Inc. should facilitate a team of sustainability officers or comparable staff from each member institution

in setting goals, implementing them, and measuring and reporting progress each year. Dignity Health, California's largest hospital system, offers a good example; it has committed to measure and report all greenhouse gas emissions.²

Peer learning is often the most helpful tool in sustainability efforts. Fortunately, there are organizations such as Health Care Without Harm, which offers a myriad of practical resources. Other examples include Practice Greenhealth, which works with over 1200 hospital members nationwide to improve environmental performance and community health while saving money, and the Healthier Hospitals Initiative, which aligns hundreds of hospitals around waste reduction, energy efficiency, healthier food, safe chemicals, and better purchasing.

Buildings: Electricity, Heating, and Cooling

The biggest impact that a medical campus has on the environment is through the ways that it powers, heats, and cools its buildings. Buildings account for about half of the nation's energy usage, well ahead of transportation (27%) and industry (25%).³ Health care is the second most energy intensive sector for buildings, with annual median energy costs per bed often exceeding \$10,000.⁴ Water heating accounts for 28% of the energy used in U.S. health care buildings, space heating 23%, lighting 16%, and office equipment 6%. Other energy needs like air conditioning, cooking, and refrigeration together make up the remaining 27%.⁵ The most important way to green the BNMC is to design and operate its buildings to use as little fossil fuel as possible, through use of renewable energy sources and energy conservation techniques.

LEED and Energy Star Certification

One common way to ensure sustainability is to attain LEED certification for new buildings and major renovations. LEED (Leadership in Energy and Environmental Design) is the certification program offered by the U.S. Green Building Council. The BNMC

BNMC Members should set and achieve targets for energy reduction and commit that all new buildings and substantial renovations will be certified Energy Star.

Innovation Center is LEED-Certified, the Roswell Park Center for Genetics and Pharmacology is LEED-Silver, the SUNY Educational Opportunity Center is LEED-Gold, and the SUNY Buffalo Medical School will be LEED-Gold. LEED-certified buildings are, on average, 25% more energy efficient than non-certified buildings.⁶ But because not all LEED buildings are energy efficient (some earn enough points in other areas of sustainability), it is wise to also seek Energy Star certification from the U.S. Department of Energy, which indicates that a building is more energy efficient than 75 percent of buildings of its type.⁷ If member institutions choose not to pursue LEED certification, they should at least commit to Energy Star and to specific energy efficiency measures (discussed more fully below).

Renewable Energy

BNMC members should emulate Gunderson Health Systems in Wisconsin, which is aiming for 100% renewable energy. Since 2008, Gunderson has implemented the following projects:

- Two wind turbine sites that generate nearly 13 million kW hours a year combined;
- A biomass boiler that provides 38 percent of Gunderon’s energy independence;
- A geothermal heat pump system used to heat and cool a new hospital;
- A large solar photovoltaic system;
- Two solar hot water systems;
- Two dairy manure digesters which create biogas electricity and help improve groundwater issues.⁸

BNMC members should commit to annual benchmarks for use of renewable energy, gradually increasing to 100 percent renewable.

Solar power has become dramatically more affordable, and, with the arrival in Buffalo of what will be the nation’s largest solar panel factory, the Solar City plant on RiverBend, Buffalo has the chance to market itself as an international capital of solar power. Existing assets to build on include the BNMC Innovation Center, which has a large solar array on its roof and solar- and wind-powered lights in its parking lot. SUNY Buffalo also has a remarkable, artist-designed Solar Strand at its North Campus location, which could serve as a model for a similar project on or near the Medical Campus. Because roof space can be hard to come by on medical buildings, the Medical Campus might consider working with community groups to install a community-owned solar array nearby and purchase power directly from it.

Buffalo is the fourth windiest major city in the U.S., with average wind speed of 11.9 miles per hour.⁹ BNMC members can promote wind energy in two ways. First, they can agree to buy a certain percentage of their electricity from wind-generated sources. Second, they can install artist-designed small scale wind turbines on the campus itself. While the power generated by these small turbines will not be huge, they will be a great way to educate the public and promote the Medical Campus’ identity as a hub of green innovation.

The Medical Campus should include micro wind turbines and an anaerobic digester that turns food and yard waste into energy.

Anaerobic digestion uses bacteria to consume organic matter such as food waste, grease, sewage, or manure and convert the methane and carbon dioxide that are produced into energy. Digesters can also produce usable compost and fertilizer as a byproduct. Michigan State University has a digester which uses 17,000 tons of organic waste to generate 2.8 million kilowatt hours of electricity per year.¹⁰ The UC Davis digester generates about 5.6 million kilowatt hours per year, or about 4% of the campus’ power.¹¹ Gunderson Health gets 20% of its power from digesters on local farms.¹² BNMC, Inc. is exploring the use of a digester on campus, inspired in part by Chicago’s The Plant, where a meatpacking facility is being converted into a net-zero energy food business incubator with indoor demonstration farms and educational facilities, creating 150 jobs in a distressed neighborhood. The Plant’s digester will divert over 10,000 tons of food waste from landfills each year to meet all of its heat and power needs.

Energy and Water Efficiency and Conservation

Energy efficiency and conservation save large amounts of money. In building the Gates Vascular Institute and the HighPointe facility, Kaleida received technical assistance and grants totaling \$532,000 from the New York State Energy Research and Development Authority (NYSERDA); the resulting measures will result in 1.6 million fewer kilowatt hours of electricity and 8,622 million fewer Btu of natural gas per year, with projected annual savings of \$245,000 per year.¹³ BNMC, Inc. is partnering with National Grid and others on a variety of energy efficiency measures, including high performance design, campus and neighborhood grid modernization, a set of charging stations for electric vehicles, and the creation of a Model Energy Home on the campus to showcase efficiency and renewable techniques to the public.

Water conservation is important for three reasons. First, clean water is itself a vital natural resource. Second, a great deal of energy goes into heating water in places such as hospitals. Finally, conserving water helps limit stormwater runoff (an issue discussed more fully below). All member institutions should commit to making energy and water reduction goals, forming and implementing the strategies to reach them, and monitoring and reporting progress to the public.

All BNMC property owners should commit to energy and water conservation goals.

Transit: Cars, Public Transit, Biking, and Walking

BNMC, Inc. is working hard to encourage staff and visitors to use public transit, biking, and walking with a variety of programs and incentives and a new mobility hub being created on the Campus. These green alternatives advance the health of individuals by promoting exercise and the health of the public by reducing pollution. Less vehicular pollution is particularly important for the nearby communities, which already bear large environmental burdens – especially the Fruit Belt, which is bordered by Route 33 and busy Michigan Avenue, and which feels the air and noise pollution impacts of the five to six hundred employees who park on neighborhood streets each day to avoid paying for parking on campus. BNMC, Inc. is currently working with residents and government officials to establish a residential permit parking for nearby streets to reduce employee parking and, ideally, to channel profits from permits back into neighborhood improvements.

BNMC, Inc. charges market rate for its parking, but some other employers still charge their staff below market rates. Subsidizing parking is not environmentally sustainable; but the workers, many of whom receive low pay, should not bear the costs of the transition. At the heart of a program to eliminate worker parking on city streets while reducing the demand for on-campus parking should be an aggressive program by member institutions to provide their employees with green transit incentives. Already, the GoBNMC program offers discounted NFTA passes, discounted carshare memberships, secure bike parking, emergency rides home, and other incentives to carpool, bike, and walk to work.

The member institutions should work with BNMC to broaden and deepen these programs. For example, a monthly NFTA pass costs \$75; whereas a monthly parking pass costs roughly \$90 at BNMC or Kaleida lots but only \$45 at Roswell’s ramp and lots (for which there is a one year wait list). All BNMC members should make sure that a transit pass is substantially cheaper than a parking pass. Employees who use green options should receive special rewards and recognition.

BNMC members should subsidize transit passes and other green transit, not parking.

Seattle’s Children’s Hospital offers some good examples. In addition to their Livable Streets Initiative and bike loan program (free bike, helmet, training, and lock for any staff who commit to biking two days a week), Seattle Children’s uses 22 minivans with bike racks to take passengers between transit hubs and workplaces. Employees get free transit passes and cash payments for each day they do not use the parking lot. Seattle Children’s has reduced vehicle miles travelled by 6.5 million miles, saved 235,000 gallons of gas, and eliminated 2100 metric tons of greenhouse gas emissions.¹⁴

The NFTA and the City should work closely with BNMC, Inc. and its members and other partners on ways to make public transit more appealing, healthy and safe. The NFTA should ensure that all the busses passing through this environmentally burdened area are hybrids or low-emission vehicles, thus limiting the air pollution impacts to the neighborhood. BNMC members and the NFTA should work together to improve safety at bus stops and transit stations with simple techniques such as mirrors that increase patron visibility. A great model is the Connective Corridor that Syracuse University helped to create between its campus and the city’s downtown. By investing capital, faculty time, and student time, the University catalyzed the city’s biggest public works project in years and turned a blighted route with 5,000 riders per year into a vibrant corridor with 190,000 riders per year.¹⁵ Key interventions included:

- New busses with custom “wraps” designed by Syracuse art students;
- New technology and apps to make it easy to track busses and schedules;
- Art, music, and poetry on busses, at stops, and along routes;
- A dedicated bike lane.

BNMC is bounded by two important corridors: Main Street and Michigan Avenue. The Michigan Avenue African American Heritage Corridor includes landmarks such as the Michigan Avenue Baptist Church, the Jesse Nash House, the Langston Hughes Institute, and the Colored Musicians Club, making it a natural site for “Connective Corridor” improvements that would link the Campus to present and future downtown residential, artistic, and commercial developments and encourage the use of busses, bikes, and walking along the corridor. BNMC, Inc. is currently working on a study of crucial corridors leading to and from the Campus which can serve as a basis for this type of progress.

Roughly 60% of Medical Campus employees live in the suburbs, making it more difficult for them to use public transit, biking, or walking. Strategies to address this barrier include promoting and incentivizing the use of the UB South Campus park-and-ride metro stop; recruiting and hiring more city residents; and promoting and incentivizing car pooling and the use of alternative fuel vehicles. BNMC members may also want to use Employer Assisted Housing to encourage staff to live within one mile of the campus. BNMC, Inc. has commissioned a study of the housing situation that will help to inform future strategies. Any housing program that results should be carefully planned and implemented to avoid displacing current residents either directly or through gentrification.

BNMC members should help turn Michigan Avenue into a “Connective Corridor” filled with heritage, arts, and green features.

Water Management

Water quality is a serious health concern in Buffalo as in the nation. The U.S. Environmental Protection Agency (EPA) has estimated that up to 3.5 million people get sick every year from swimming in waters contaminated by sewer overflows.¹⁶ Older cities such as Buffalo tend to have combined sewer systems, in which the sanitary sewage flows into the same pipes as the stormwater that enters from streets, parking lots, and the gutters and downspouts of buildings. The pipes and tunnels lead to sewage treatment plants. On dry days, all of the sanitary sewage can be treated at the plants. On wet days, however, the combination of the sanitary sewage and stormwater is too much for the treatment plant to handle, and so the combined sewage is discharged directly into local rivers and lakes through combined sewer outflows. In Buffalo, this happens over 50 times each year. As health institutions, BNMC members have a special duty to “do no harm” by managing their stormwater on site, through various types of green infrastructure, rather than discharging it into the combined sewer system.

Following the example of BNMC, Inc., each member institution that operates a parking lot should add green infrastructure to absorb all stormwater. BNMC members should commit to handling all their stormwater onsite through rain gardens, green roofs, and other means, and performing necessary and ongoing maintenance and testing to ensure effectiveness.

BNMC members control two key types of impervious surface: parking lots and roofs. The BNMC parking lot on Ellicott Street offers a good example of a green parking lot: the stormwater is diverted into bioswales planted with native vegetation which absorb the stormwater, while also offering other environmental and aesthetic benefits. The next step is for the member institutions that own parking lots to follow the BNMC, Inc.’s lead.

There are many options for handling stormwater from roofs, instead of directing it via downspouts into the combined sewer system. Building owners can divert the water into rain gardens, absorb it on site with green roofs, collect it for use on-site to flush toilets and provide other water needs, or capture it in cisterns which then release it slowly into the combined sewer system on dry days, when the sewage

treatment plants can handle it. For all green infrastructure practices installed, it is imperative that the BNMC and its members perform the ongoing maintenance and testing necessary to ensure their long-term operation and effectiveness. As PUSH Buffalo has shown, green approaches to stormwater management are an excellent source of entry-level, living wage jobs for disadvantaged workers. BNMC members should work closely with community groups to make sure that green infrastructure jobs go to those who need them most.

Procurement

One of the most important ways that institutions affect the environment is through the goods and services that they buy. Sustainable procurement policies assess the environmental consequences of the full life-cycle of each product – from securing the raw materials to manufacturing, packaging, transporting, storing, handling, using, and disposing of the product. As explained by Health Care Without Harm, environmentally preferable products are generally:

- Less toxic;
- Minimally polluting;
- More energy efficient;
- Safer and healthier for patients, workers, and the environment;
- Higher in recycled content;
- Packed in less packaging material; and
- Fragrance-free.¹⁷

BNMC members should adopt a campus-wide sustainable procurement policy and make the Smarter Purchasing Pledge of the Healthy Hospitals Initiative.

As part of the national Healthier Hospitals Initiatives (HHI), the University Hospitals in Cleveland developed a smarter purchasing program to select healthy and safe products, minimize toxicity and waste, minimize the use of nonrenewable resources, and support the local economy.¹⁸ Sustainable procurement policies often include features such as lists of chemicals to avoid, lists of approved products, preferences for recycled products, and preferences for local suppliers (which help minimize transportation pollution). BNMC, Inc. is already facilitating a procurement council; all member institutions should join it and commit to a campus-wide policy that includes making HHI's Smarter Purchasing Pledge.

Sample policies from Health Care Without Harm include:

- Buying recycled products, such as paper that is 100% post-consumer recycled. See the California Integrated Waste Management Board's *Recycled-Content Product Directory*.

- Buying reusable products. See Health Care Without Harm’s *Sample Policy for Purchasing Reusable Products*.
- Having vendors deliver supplies in re-usable totes. See Kaiser Permanente’s *Reusable Totes* program.
- Banning certain materials, such as mercury, PVC/DEHP plastics, certain flame retardants, latex, and polystyrene foam (often referred to as Styrofoam), except where there is no reasonable alternative.¹⁹

Food Policies

BNMC member institutions have a special duty to make sure that the food on the campus is healthy for the patients, staff, and visitors who consume it, and healthy for the environment and the general public in the way that it is raised, transported, packaged, and served. BNMC, Inc. has shown a strong interest in food policy, including the development of procurement policies that favor local, sustainably grown produce. BNMC, Inc. is creating a Food Hub Incubator as part of its Green

BNMC members should form a campus-wide sustainable food policy, including taking HHI’s Healthy Food in Health Care pledge.

Commons project, which will include a greenhouse, equipment, training, mentorship, and office space to aid in the development of neighborhood food hubs throughout the region. The Hub will feature a community kitchen and dining areas offering easy access to healthy, sustainable food on campus. It may also partner with the Mobility Hub to deliver healthy food throughout the campus and nearby neighborhoods by bicycle. BNMC members should embrace and help expand these efforts, building on best practices from around the country.

In California, Kaiser Permanente physicians can offer patients “prescriptions” (i.e., coupons for free food) for fresh produce from local farmers markets.²⁰ In Grand Rapids, Michigan, Spectrum Health pays for a special city bus route to take people from a food desert neighborhood to farmers markets; Spectrum also partnered with Americorps to build a community garden on its medical campus that is open to the community and offers therapeutic interventions for mental health patients.²¹ In Cleveland, the trailblazing Evergreen Cooperatives include GreenCity Growers, a worker-owned cooperative that sells greens and herbs to health care facilities, using a 3.25 acre hydroponic greenhouse to raise the produce.

BNMC members should jointly adopt a sustainable food policy. It is ironic that Kaleida and Roswell have unhealthy foods in their vending machines, along with a Tim Horton's and a Dunkin Donuts – both large chains that pay poverty-level wages while purveying unhealthy foods. It is jarring to find on the Roswell website a section promoting an on-site convenience store with “candy, and fresh donuts as well as New York State Lotto and Lottery tickets.” Kaleida contracts with Sodexo for its

BNMC members should pledge to do business only with local, sustainable food providers, rather than companies such as Sodexo with poor records in health and human rights. They should also eliminate red meat and reduce dairy products.

food services. Sodexo is a multi-national company with heavy investments in the European private prison industry and, despite annual revenues of \$25 billion, “a lengthy record of paying workers poverty wages, overcharging clients, opposing unions, and violating food and safety standards.”²² For example, in 2010 Sodexo paid a \$20 million settlement after overcharging 21 New York state school districts and the SUNY system.²³ In 2013, Sodexo had to withdraw all its frozen beef products in Great Britain after they were found to contain horse meat.²⁴ In 2012, over 11,000 German school children fell sick in an outbreak that, according to Reuters, was “very likely” caused by tainted strawberries Sodexo imported from China.²⁵ Over eleven universities, including SUNY-Albany, have cut ties with Sodexo, citing its involvement in private prisons and its violation of workers' rights.²⁶

One simple way to make food more sustainable and healthy is to eliminate red meat and reduce meat and dairy consumption. Over 450 hospitals in the nation are now explicitly reducing the amount of meat they serve and/or buying more sustainably raised meat.²⁷ The United Nations has reported that cattle rearing generates more greenhouse gases than transportation, as well as being a major source of land and water degradation. Cattle rearing accounts for 9% of the carbon, 65% of the nitrous oxide, 64% of the ammonia, and 37% of the methane that human activities produce; and a University of Chicago study found that the average American diet produced the equivalent of 1.5 more tons of carbon emissions than a vegan diet.²⁸

Eating less meat and dairy is also good for individual health. According to Center for a Livable Future studies, the regular consumption of meat and high-fat dairy products increases the risk of chronic diseases, especially heart disease, stroke and some cancers, the leading causes of death in the United States.²⁹ A Harvard School of Public Health study of mortality among 37,000 men found that one additional serving per day of unprocessed red meat over the course of the study raised the risk of total mortality by 13%. An extra serving of processed red meat (such as bacon, hot dogs, sausage and salami) raised the risk by 20%.³⁰ Therefore, some hospitals, like Loma Linda University Medical Center, promote a fully vegetarian diet and menu, while others have “meatless” days or otherwise limit meat and dairy consumption.³¹

Waste

A comprehensive, campus-wide waste management policy would deliver great sustainability benefits and would probably save the member institutions money, as well. Currently, the member institutions

contract for waste and recycling services separately. Health care facilities tend to generate large amounts of waste, mostly of the same type that other large institutions do – for example, two billion pounds of paper and cardboard each year.³²

Roswell Park, apparently, sends its waste to an incinerator. Incinerating solid and medical waste creates toxic air emissions and toxic ash residue. According to the EPA, medical waste incineration is the third largest source of dioxin emissions and also contributes 10% of human mercury emissions.³³ Dioxin, a carcinogen, is one of the most toxic chemicals on earth.³⁴ Hospitals sometimes choose incineration over landfilling specifically because of medical waste, but (i) most hospital waste is ordinary solid waste such as paper, cardboard, and food; (ii) there are many alternatives even for medical waste, including thermal, chemical, and biological processes; and (iii) doing a better job separating out medical waste can reduce the need to incinerate. According to Practice Greenhealth, improved segregation of Regulated Medical Waste (RMW) is considered a “low hanging fruit” in healthcare sustainability, due to its potential for significant cost savings.³⁵

City of Buffalo law requires all businesses and institutions to recycle all recyclable materials, such as paper, plastic, metal, and glass.³⁶ Many organizations, however, still have the mistaken impression that recycling is voluntary, and they fail to recycle many of the mandated materials. Often, they recycle only paper and cardboard. Some organizations may still wish to separate out paper from other recyclables, because it has more value when clean and dry, but many places are moving toward single stream methods, because they are much easier for the user. In other words, rather than asking people to put different recyclables in different containers, many institutions now offer a single receptacle for all recyclables.

A good waste policy follows the classic hierarchy of reduce, reuse, recycle, with reduction as the most preferred path. Many best practices exist, including “Strategies for Effective Waste Reduction” from Practice Green Health, and “Waste Reduction and Responsible Waste Treatment Strategies” from Health Care Without Harm. Good policies include:

BNMC members should join to create a unified waste management plan and hire a single contractor to help implement it. The plan should include an end or reduction of incineration and a set of goals for reduction, reuse, and recycling improvement.

- Buy only two-sided printers and set default mode to be two-sided printing; require two-sided copying whenever feasible.
- Make sure that all waste receptacles have separate compartments for trash and recyclables, with the recyclable compartment clearly labeled and larger than the trash compartment.
- Stop offering and using bottled water; promote the use of tap water, instead.

- As many universities, including SUNY Buffalo, have done, eliminate cafeteria trays. Rutgers University found that in the first 10 weeks since trays were eliminated in three of the four dining halls, Rutgers saved \$300,000 in food costs and saw a 20 percent reduction in the amount students toss after they eat.³⁷
- In cafeterias, provide slop containers so that people can pour liquids out of recyclable containers such as milk and juice cartons and bottles before recycling them.
- Collect food scraps and yard waste and use them on-site for composting or anaerobic digesting.
- Where possible, donate goods instead of throwing them out. Donate medication samples that are soon to expire to clinics serving vulnerable populations.³⁸ Donate used furniture and office supplies to local non-profits through the United Way. Give used medical equipment and supplies to groups such as Direct Relief International and Global Links.
- Measure waste monthly, set reduction/reuse/recycling goals, and monitor progress toward them. See Project Greenhealth for an excellent set of tools to help healthcare facilities track their progress.

BNMC members could save substantial amounts of money by joining together to hire a single waste/recycling contractor and then creating the infrastructure and training necessary to reduce waste and increase re-use and recycling. The Buffalo Recycling Alliance has a wealth of materials and resources available to help companies and non-profits better manage their waste.³⁹

Composting presents an immediate opportunity for improvement and savings. The Medical Center Hospital of Vermont delivers roughly 90% of its food preparation scraps and steam table leftovers to an off-site composting facility. The hospital also donates produce to a food bank and sends old grease to a rendering facility. Its food discard recovery program saves approximately \$1,400 per year in landfill hauling and tipping fees and helps support a local farm.⁴⁰ In Buffalo, local urban farms such as Massachusetts Avenue Project, Community Action Organization, and Farmer Pirates all have composting operations that can serve as expert resources and collaborators.

BNMC should also investigate creating a small re-use/recycling center on the campus, where member institutions and nearby residents could bring those items that are not handled by a typical recycling contract, such as e-waste, textiles, hazardous materials (paints, oils, chemicals, etc.), furniture, and appliances. (In California, Kaiser Permanente has partnered with Goodwill to collect 65,000 pounds of e-waste in just two Earth Day events).⁴¹ The center could also coordinate medication take-back events, in which people can anonymously drop off old medications and get information about safe medication disposal.⁴² BNMC could hire local residents to staff the center, which could also provide educational resources on recycling and become the hub for campus-wide recycling efforts.

Landscaping

Landscaping is another area where simple, inexpensive methods can greatly increase sustainability. One key is to make smart decisions about planting, choosing only hardy, native vegetation that requires no pesticides or lawn chemicals and a minimum of mowing and maintenance. St. Joseph's Hospital in Ann Arbor is an example of a health facility that has prioritized native plantings to reduce the use of harmful chemicals as well as water consumption.⁴³

BNMC members should make a unified landscaping policy and plan that includes a ban on pesticides and lawn chemicals and a prioritization of native plants with low maintenance needs, including edible fruit trees.

Filling the campus with trees will improve air quality, stormwater management, aesthetic appeal, and even patient recovery. In a famous study, Robert Ulrich found that "patients with bedside windows looking out on leafy trees healed, on average, a day faster, needed significantly less pain medication and had fewer postsurgical complications than patients who instead saw a brick wall."⁴⁴ Various studies have shown that, in the words of Deborah Franklin, "just three to five minutes spent looking at views dominated by trees, flowers or water can begin to reduce anger, anxiety and pain and to induce relaxation."⁴⁵ Planting trees with edible fruits can complement the campus' food policy and provide healthy food to patients, visitors, workers, and neighborhood residents.

Green and Healthy Neighborhoods

BNMC members have recognized that they have a special duty and a great opportunity to improve health and sustainability outcomes in the immediately adjacent neighborhoods, which are bearing negative impacts from campus development in terms of parking congestion, traffic, noise pollution, air pollution, and land speculation, but not seeing many benefits in terms of greater access to health care, jobs, or community wealth building.

BNMC members and the developers and financial institutions that are benefiting from BNMC area development should collaborate with neighborhood residents and other partners on a plan to make every home, lot, and street in the neighborhood green and healthy.

These equity considerations are heightened by the way surrounding neighborhoods are already burdened with poverty, disinvestment, and environmental health hazards. Of the 44,000 people who live in the 15 census tracts within one mile of the campus, 36% live below the poverty line, 50% spend more than 30% of their income on housing, 18% are unemployed, and 22% lack vehicle access.⁴⁶ Of particular concern is the Fruit Belt neighborhood, which faces some of the most severe challenges and feels the most immediate impact from issues like off-campus parking, and of special note are the two affordable housing complexes located immediately adjacent to the Campus: McCarley Gardens⁴⁷ and Pilgrim Village.⁴⁸

BNMC, Inc. has developed a variety of forms of outreach to the neighborhoods and programs and projects to improve quality of life, as have some of the member institutions. Examples include

community health fairs, job fairs, leadership training programs, and a micro-grant program for home repairs. BNMC members should seize the opportunity to build on these efforts and make the adjacent neighborhoods national models for how health care institutions can directly advance the health and wellness of their immediate neighbors. Many of these health interventions have sustainability overlays. For example, BNMC members and BNMC developers should collaborate with neighborhood groups and other partners on a plan to make every home, lot, and public space in the neighborhood green and healthy. This plan should include:

- Whole house audits that identify repair needs, environmental health hazards (lead, radon, asbestos, mold, asthma triggers, etc.), and opportunities for energy efficiency and renewable energy (insulation, sealing, solar power, solar hot water, etc.). One example is furnished by Yale-New Haven Hospital, which operates a home health hazard assessment program targeted at lead and 28 other hazards, including mold, allergens, carbon monoxide, and pesticides.⁴⁹
- A capital pool and a set of financing mechanisms such that every home can be renovated, regardless of the income, assets, and credit of the residents. One financing method, already in use in programs such as Green Jobs/Green NY, is to repay low-interest or no-interest loans with the utility bill savings created by energy efficiency and renewable energy. Another key is aligning existing programs that fund housing repairs with programs that fund energy efficiency and renewable energy, so that residents can access them simultaneously – for example, to both repair a rotting roof and add solar panels to it.
- Free or deeply discounted high efficiency appliances, light fixtures, and light bulbs, and water conservation measures such as low-flow shower heads and low-flow faucet aerators for neighborhood residents with low or moderate incomes.
- District-based renewable energy and energy-efficiency projects, such as using steam heat from the Medical Campus to heat Fruit Belt homes.
- An inventory of every vacant lot in the neighborhood with a resident-guided plan for greening it, drawing on a menu that includes urban farms, community gardens, rain gardens, tree farms, playgrounds, and public art, as well as simple, low-cost “clean and green” treatments.
- “Complete Streets” renovations of all neighboring streets, including plantings, traffic calming, bike lanes, and green infrastructure, along with artist-designed renovations of the pedestrian overpasses over Route 33. Complete Streets is the policy that prioritizes walking, biking, transit, and green infrastructure when streets are built or repaired.
- Free or discounted memberships for neighborhood residents in car share and bike share programs (something BNMC, Inc. piloted in its neighborhood canvas program).

In addition to Buffalo’s own Green and Healthy Homes Initiative, models worth consulting include the

Healthy Homes program in King County, Washington, Detroit's Healthy Environments Partnerships, and the Rhode Island Department of Health Healthy Homes Collaborative.

Conclusion

The BNMC, Inc. has shown a strong commitment to sustainability and has developed or is developing many ways to green the Medical Campus. Many more opportunities are readily available, however. In general, what they require is a strong commitment to sustainability from all the BNMC member institutions so that, rather than an array of demonstration projects, the Medical Campus has a set of comprehensive strategies that make large, measureable impacts on the health of the surrounding communities and the environment. The best way to forge and implement those strategies is through a community benefit agreement with community groups that value sustainability and neighborhood improvement. The seeds have been planted; now is the perfect time to make the Medical Campus a national model for sustainability.



Appendix A: Health Effects of Climate Change

*From “Health Problems Heat Up: Climate Change and the Public Health”
a report by the Trust for America’s Health*

According to the U.S. Environmental Protection Agency (EPA), as the environment changes, people will be at a higher risk for a range of threats to our health, including:

Temperature Effects: Severe heat waves are projected to intensify, which can increase heat-related deaths and sickness.

Air Quality Changes: Worsening regional ozone pollution, with associated risks of respiratory infections, aggravation of asthma, increased allergens, and premature death.

More Extreme Weather Events: Storm impacts, particularly hurricanes and tropical storms, are likely to be more severe. Heavy rainfall associated with these storms can increase the risk of flooding and lead to greater runoff and erosion, which can have adverse water quality effects. These can lead to an increase in the number of people at risk from disease and injury related to floods and storms. Other areas will be afflicted by declines in annual precipitation, leading to an increase in the number of people at risk from disease and injury related to droughts and wildfires.

Climate-Sensitive Diseases: Certain vector-, food-, and water-borne diseases are expected to occur more often and affect new populations, as a result of changes in temperature and precipitation, which allow these pathogens to expand into new geographic regions.

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Notes

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- ¹ Buffalo Niagara Medical Campus, Master Plan Update (Buffalo Niagara Medical Campus 2010) iii. Available from: Buffalo Niagara Medical Campus, http://www.bnmc.org/wp-content/uploads/BNMC-Master-Plan-Update-FINAL_12-3-10.pdf.
 - ² Catholic Health Association, "Healing Communities and the Environment: Opportunities for Community Benefit Programs" (Catholic Health Association, 2013), 12.
 - ³ Neil Pierce, "Do Sustainable Cities Have a Future," American Prospect, February 2007.
 - ⁴ Chicago Green Healthcare Initiative, "Executive Summary." Available from Health Care Without Harm, www.noharm.org.
 - ⁵ Health Care Without Harm, "Addressing Climate Change in the Health Care Setting," 5. Available from Health Care Without Harm, www.noharm.org.
 - ⁶ Energy Innovation Plan for the Buffalo Niagara Medical Campus and Surrounding Neighborhoods, 28.
 - ⁷ "Energy Star," United States Department of Energy, accessed January 12, 2015 at <http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification>.
 - ⁸ Gundersen Health Systems, accessed January 12, 2015 at <http://www.gundersenenvision.org/renewable-energy>
 - ⁹ University at Buffalo Department of Planning, "Wind Energy Initiatives for Greater Buffalo," 33. Cited in Partnership for the Public Good, "Greening Buffalo," available from www.ppgbuffalo.org.
 - ¹⁰ Tom Oswald and Diana Kirk. "New MSU Anaerobic Digester to Supply Power for South Campus Buildings." MSU Today, August 13, 2013, <http://msutoday.msu.edu/news/2013/new-msu-anaerobic-digester-to-supply-power-for-south-campus-buildings/>.
 - ¹¹ Celeste Bolt, "New digester used to power portions of south campus." The State News, September 5, 2013, <http://statenews.com/article/2013/09/new-digester-used-to-power-portions-of>.
 - ¹² Jessica Vanegeren, "Going off the grid: How Dane County manure digesters are helping a hospital achieve energy independence." The Cap Times, July 2, 2014, http://host.madison.com/news/local/writers/jessica_vanegeren/going-off-the-grid-how-dane-county-manure-digesters-are/article_e04d5acc-0faf-513d-a414-ce7586d98c4f.html.
 - ¹³ "Kaleida Health Designs Energy Efficiency into Two Buildings," New York State Energy and Research Development Authority, accessed January 12, 2015 at <https://www.nyserdera.ny.gov/About/Newsroom/2013-Announcements/2013-09-12-Kaleida-Health-Designs-Energy-Efficiency-into-Two-Building-Projects.aspx?p=1>.
 - ¹⁴ Catholic Health Association, "Healing Communities and the Environment: Opportunities for Community Benefit Programs" (Catholic Health Association, 2013), 20. Available from www.nchh.org.
 - ¹⁵ The Daily Orange, February 27, 2014, <http://issuu.com/dailyorange/docs/02.27.14>.
 - ¹⁶ Ibid.,
 - ¹⁷ "Environmentally Preferable Purchasing," Health Care Without Harm, accessed February 5, 2015, <https://noharm-uscanada.org/issues/us-canada/environmentally-preferable-purchasing>.
 - ¹⁸ More information on the Healthier Hospitals Initiative may be found at: <http://healthierhospitals.org/>.
 - ¹⁹ Exposure to toxic chemicals is estimated to cause 5 percent of childhood cancer, 10 percent of diabetes, Parkinson's disease, and neurodevelopmental deficits, and 30 percent of childhood asthma. See Practice Green Health, <https://practicegreenhealth.org/webinars/what-does-chemical-contamination-cost-health-care-new-report-details-how-reduce-disease-and>

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- ²⁰ Catholic Health Association, “Healing Communities and the Environment: Opportunities for Community Benefit Programs” (Catholic Health Association, 2013), 18. Available from www.nchh.org.
- ²¹ Ibid.
- ²² Source Watch, accessed January 12, 2015 at www.sourcewatch.org.
- ²³ Associated Press, [Sodexo to pay \\$20M for overcharging NY schools](http://www.boston.com), *Boston.com*, July 21, 2010.
- ²⁴ David Brown, [Horsemeat scandal spreads to top catering firm, Sodexo](http://www.thetimes.com), *The Times*, February 23, 2013.
- ²⁵ Michelle Martin, [11,000 German schoolchildren probably laid low by strawberries](http://www.reuters.com), *Reuters*, October 5, 2012.
- ²⁶ Source watch, accessed January 12, 2015 at www.sourcewatch.org/index.php/Sodexo#Eleven_Universities_Cut_Sodexo_Contracts_Following_Release_of_Human_Rights_Watch_Report_.282011.29
- ²⁷ “2014 Highlights from the Healthy Food in Health Care Program” Health Care Without Harm, accessed February 5, 2015, <https://noharm-uscanada.org/articles/blog/us-canada/2014-highlights-healthy-food-health-care-program>
- ²⁸ Steve Koppes, “Study: vegan diets healthier for planet, people,” University of Chicago News Office, April 13, 2006, citing Gidon Eshel, “Diet, Energy, and Global Warming,” <http://www-news.uchicago.edu/releases/06/060413.diet.shtml>.
- ²⁹ Health Care Without Harm, “Addressing Climate Change in the Health Care Setting,” 10, available at https://noharm-uscanada.org/sites/default/files/documents-files/67/Addressing_Climate_Change.pdf
- ³⁰ National Institutes in Health, “Risk in Red Meat?” <http://www.nih.gov/researchmatters/march2012/03262012meat.htm>.
- ³¹ Health Care Without Harm, “Addressing Climate Change in the Health Care Setting,” 10.
- ³² “Solid Waste,” Practice Green Health,, accessed February 5, 2015, <https://practicegreenhealth.org/topics/waste/waste-categories-types/solid-waste>.
- ³³ “What’s Wrong with Incineration,” Health Care Without Harm, accessed February 5, 2015, https://noharm-uscanada.org/sites/default/files/documents-files/13/Whats_Wrong_w_Incineration.pdf.
- ³⁴ Ibid.
- ³⁵ “RMW Minimization Strategies,” Practice Green Health, accessed February 5, 2015, <https://practicegreenhealth.org/topics/waste/waste-categories-types/regulated-medical-waste/rmw-minimization-strategies>.
- ³⁶ City of Buffalo Code § 216-43.
- ³⁷ Andrea Alexander, “Rutgers Drops Cafeteria Trays to Reduce Food Waste,” Rutgers Today, December 17, 2014, <http://www.mycentraljersey.com/story/news/local/middlesex-county/2014/12/17/cafeteria-trays-food-wasted/20537129/>
- ³⁸ See the Columbia St. Mary’s Ascension Health Program in Milwaukee, cited in Catholic Health Association, “Healing Communities and the Environment: Opportunities for Community Benefit Programs), August 2013, p. 17.
- ³⁹ See the Buffalo Recycling Alliance web page, <http://www.ppgbuffalo.org/issues/hot-issues/recycling/>.
- ⁴⁰ United States Environmental Protection Agency, “Fletcher Allen Health Care,” (EPA, 1998). Available from: EPA, <http://www.epa.gov/osw/conserves/pubs/food2.pdf>. <http://www.epa.gov/osw/conserves/pubs/food2.pdf>
- ⁴¹ Catholic Health Association, “Healing Communities and the Environment: Opportunities for Community Benefit Programs (Catholic Health Association 2013), 18. Available from National Center for Healthy Housing, http://www.nchh.org/Portals/0/Contents/HCF_healing-communities-and-the-environment.pdf.
- ⁴² See the MicroWest Medical Center (Framingham, MA) program cited in Catholic Health Association, “Healing Communities,” 17.
- ⁴³ Ibid., 11.
- ⁴⁴ Deborah Franklin, “How Hospital Gardens Help Patients Heal,” *Scientific American*, 1 March, 2012.
- ⁴⁵ Ibid.
- ⁴⁶ U.S. Census Bureau American Community Survey 2008-2012 5-year estimates.
- ⁴⁷ McCarley Gardens is owned by one of the development arms of nearby St. John Baptist Church. Built in 1978 with HUD Section 8 assistance, it includes some 150 units.
- ⁴⁸ Pilgrim Village was also built with HUD subsidies. It is owned by a private, for-profit developer and includes 90 units. When HUD inspected it in 2009, it earned a housing quality score of 15 out of 1000 (a property must earn a score of 86 or above to be considered healthy and safe). The owner is proposing an ambitious mixed-income, mixed use redevelopment of the site, which would maintain the affordable units but add substantially to them with other uses. See Find The Best Section 8 Housing, Pilgrim Village, Accessed October 15, 2014, <http://section-8-housing.findthebest.com/1/5346/Pilgrim-Village>. Also, Deidre Williams, Owner eyes expansion of Pilgrim Village Housing Complex, *The Buffalo News*, January 20, 2014.
- ⁴⁹ Catholic Health Association, “Healing Communities ,”17.

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