University of Wisconsin-Stevens Point

Applied Natural Resources Planning

Joshua Andreske, William Hutt, Sammi Yonan

Green Partner's Sustainable Business Park

"The Village of Amherst - small town atmosphere with big city possibilities."

Playground

A playground would provide a place for children to enjoy themselves while providing a place for parents to meet and converse. This fits in with our goal of creating a place for the community to come together.

Along with adding to the recreation opportunities, the playground itself can be created with fully recycled material and designed in an ecologically friendly way to use surrounding natural landscapes for the playground.

The image on the map is taken from an example in Wausau, WI called Jo Jo's Jungle. The size of the playground is 1.5 acres. A playground this size is expensive, however, Jo Jo's Jungle was funded by the United Way and the Community Foundation. The total cost of the project was 2.4 million. A smaller playground in Amherst would be more realistic. To make the project more affordable, cheaper options such as a soccer field or basketball court would still provide opportunities for outdoor recreation and a variety of options for all ages.

Distributed Energy Generation Solar Farm

The addition of an 8-acre, 1.15 MW solar farm to the business park would be enough to completely cover the energy needs of the businesses within the business park. The remaining unused energy would allow for the village of Amherst to sell the energy for extra profit.

Due to the make-up and design of solar farms, native plants as well as pollinator plants can be added as to help increase the vegetation acreage of the park as well.

This will allow for the businesses within the business park to work independently of the grid even when there are problems within the grid such as blackouts.

Similar in size and production of the Santa Rita Union School District, this microgrid would be able to make each building on the site much more efficient through HVAC systems and grid stability.

Ecological Bandshell

The large stage provides the opportunity for the Village to host events such as concerts that can bring in revenue to the community businesses. It would also help create a sense of community as it provides a place for community members to come together.

The bandshell will be modeled and designed in an eco-friendly way with murals on stage from local central Wisconsin artists. One possible artistic partner we could work with is Trailblazers & Art Sisters. They painted the RBG mural in downtown Stevens Point.

Low Impact Development Storm Water Management

The term low impact development (LID) refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat.

Rain gardens are an attractive tool to accomplish the goal of LID, they are sunken gardens which help process and treat runoff water that accumulates on impervious surfaces like roofs, roads and walking/ biking paths.

As well as processing and treating run off, rain gardens can be an effective tool to use to fight against storm water problems such as flash floods or regular flooding on a site. The addition of rain gardens can be placed along all roads, parking lots, buildings and paths within the business park to help facilitate rainwater.

Gazebo or Outdoor Classroom

These would provide the community a place to gather and grill out or a place for the school to bring students to learn while being outdoors. Some research has shown that getting outside helps students to improve their emotional, intellectual, and behavioral development.

Biking and Walking Paths

Creating paths around the business park provides residents the opportunity to enjoy the outdoors while also providing them access to the businesses in the park. There will also be sidewalks and designated crosswalks with flashing lights to ensure safety for pedestrians who enter the business park. This increases the walkability of the business park.

The planned pathways go all the way around the business park, through the recreation park and out and into the adjacent residential area.

Along the pathways there will be natural features such as native vegetation and flower gardens.

Sustainability

Sustainability is one of the main focuses of the master plan. Throughout the business park, it is easy to see multiple design features which improve and add to the sustainability of the Amherst business park.

Creation of an open space low impact park. The creation of a sustainably designed park adds to sustainability in many ways. Open green space helps by promoting nature focused activity while protecting biodiversity by promoting natural habitats.

Low impact development principles in the design of the park emphasize the storm water drainage on the site. Water management of the site helps regulate the water which drains back into the aquatic habitats around the business park like the Tomorrow River.

Creation of a Solar energy microgrid and storage system for the business park. The master plan shows locations of solar panels on the southwest and northeast portion of the business park. 1.15 MW of energy will help to keep the business park sustainable by reducing fossil fuel usage, increase the efficiency of energy usage such as HVAC systems and add to the grid's stability and safety against cascading failures.

Addition of more walking/biking paths and routes. The master plan lays out new pathways imagined for the business park. Included are paths around the entirety of the business park as well as through the open space low impact park and out into the residential areas adjacent to the businesses. These walking and bike paths will help lessen the use of automobiles within the business park, lowering emissions from cars, as well as increasing the health of the community adding to the community's resiliency.

Community Garden

A community garden in the park would give another great opportunity for individuals to come together outdoors. It gives nearby residents a space to grow their own food or businesses to grow food for their restaurants.

Goals

1. Create a public recreation and meeting space for the whole community to come together.

2. Encourage the creation of an environmentally friendly, renewable energy focused independent business park.

3. Make the area walkable, bikeable and provide ease of access for pedestrians in adjacent neighborhoods.

University of Wisconsin-Stevens Point

Applied Natural Resources Planning

Joshua Andreske, William Hutt, Sammi Yonan

Research and Development Concepts for the Amherst Business Park

"The Village of Amherst - small town atmosphere with big city possibilities."

Goal 1: Create a public recreation and meeting space for the whole community to come together.

The use of low impact development, as well as the addition of open green space supports sustainable design especially focused on the drainage of water within the business park.

The addition of a sustainable low impact, open space park to the village of Amherst business park gives the public a place to recreate, meet and come together in a sustainable way.

Goal 2: Encourage the creation of an environmentally friendly, renewable energy focused independent business park.

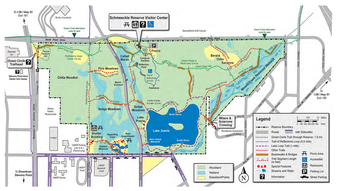
The master plan shows Solar panel fields along the northeast and southwest sides of the business park. These on site distributed energy generation applications would be able to provide energy for the entire business park and potentially sell remaining energy back into the grid.

Advocation and encouragement of renewable energy alternatives will assist in reduction of energy costs as well as the carbon footprint for the village of Amherst.

Goal 3: Make the area walkable, bikeable, and provide ease of access for pedestrians in adjacent neighborhoods.

The new master plan of the business park takes smaller transportation methods like bikes and walking and gives them more emphasis. Using newly designed pathways and connecting existing pathways from the adjacent neighborhoods, the new business park will help increase the walkability and overall flow of the Village of Amherst.

Stevens Point, WI



Stevens Point, WI has a population size of 25,666 people. This community houses a large green space filled with mixed use purposes. This green space is known as Schmeeckle Reserve, and it is roughly 280 acres of protected conservancy land. This green space houses trails for jogging and walking. It houses a pavilion for the public to be able to recreate at, along with an outdoor exposed pavilion and an amphitheater. Trees, grasses, and wildlife are preserved in this natural landscape. There is also a drainage lake in the middle of this space where the public can canoe, kayak, and fish. This space created a large outdoor space that people from in and out of the community can enjoy. Its sustainable design with wooden pathways and bridges, and wild grasses and flowers along roadways and paths that provide a space for drainage and preservation of the natural landscape.

Salinas, CA

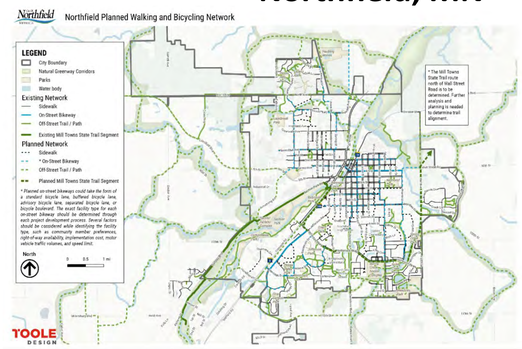
The Santa Rita Union School District consists of 3,400 students near Salinas, CA. In 2016, the school district implemented a 1.05 MW solar microgrid along with a 1.09 MW energy storage unit.

Using net metering, the school district is able to pay off the costs of the system by selling unused energy back to the grid. Companies such as Northwind Solar in Amherst are involved in net metering of their own energy. The storage system is able to cover the energy usage for the day while the solar system is able to recharge the batteries creating a full solar microgrid focused on a school district.

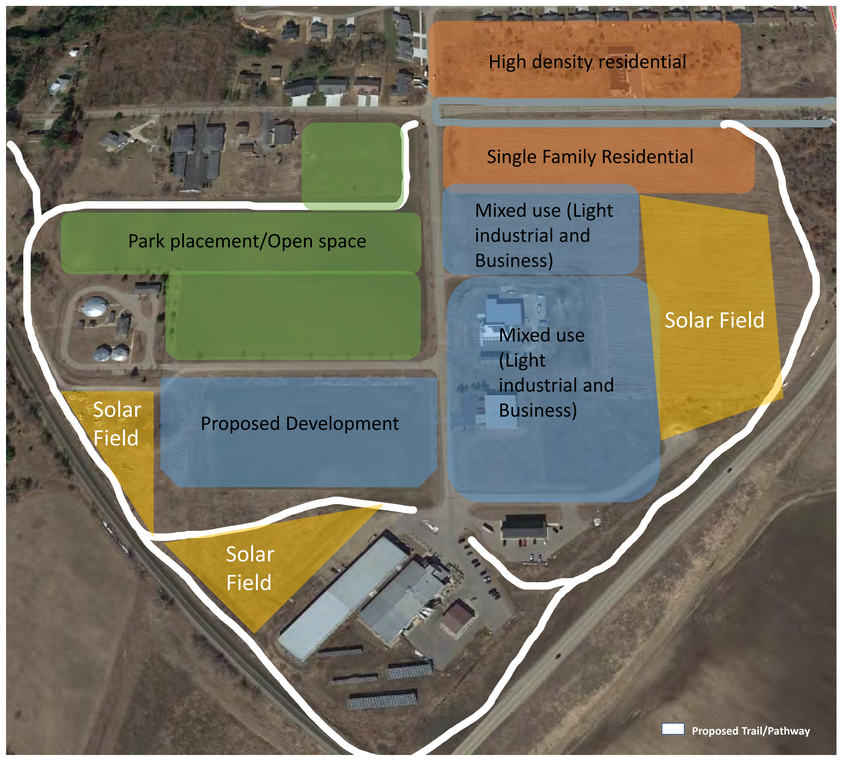
Along with the benefits of environmental protection by avoiding using fossil fuels for energy and HVAC systems, the school district avoids cascading failures in the energy system by having on site storage. The onsite storage allows for the sites to operate even after a grid wide failure/blackout.

The design of the energy system on the sites allow for ease of access as well as foot traffic, these panels include roof top solar, car park solar as well as tall pole ground mounted panels.

Northfield, MN



Northfield, MN is a small community with around 20,000 residents. In 2008, they began work on incorporating walkable blocks into their comprehensive plan. In 2012, they adopted "Complete Streets," a MnDOT policy that is an approach to road planning and design that considers and balances the needs of all transportation users. It prioritizes walking and pedestrians first, cyclists and transit users second, and lastly motor vehicles. Since then, they have worked to identify bicycling and walking system gaps, connect existing trails, and update designs of sidewalks, bike lanes, and other street elements as seen in their street chart table that contains development codes.



Green Business Parks Towards Sustainable Cities

In a study by the environmental engineering department of the University of Science and Technology of Egypt, they reviewed the design and engineering of "Green" or sustainable focused business parks from different sites all around the world, from America to Europe to Egypt. In this study they found that design features seen in business parks can cause outcomes that are not easily seen by the public.

The table to the right shows environmental goals and their respective outcomes on social and economic sectors of the business parks/community.

The benefits of sustainable focused business parks compared to traditional business parks are multidimensional and expansive. Through ecological design it can benefit not only the economy and ecosystem, but human, physical and mental health.

"Green business parks are a natural and logical extension of green buildings. These parks, by their nature, help to protect the quality of life in the community. Contact with nature can contribute to the physical and spiritual well-being of persons. In addition to lower rates of heart and respiratory diseases, as a result of the reduced pollution, another potential benefit is a more active life and work style." - Sara Mohamed Atwa et. al

Table 1: Benefits of Business Parks

Environmental Goals	*Social Outcomes*	*Economical Outcomes*
Reduce energy resource consumption, raw materials	Show social and environmental commitment	Reduce operational, production and disposal costs
Healthier working environment	Attract talent	Avoid environmental taxes and penalties
Increase energy independence	Promote local employment	Business efficiencies
Recycling, revalorization, elimination of waste products	Image of responsible and sustainable company	Innovative and sustainable investments can be financially supported
Reduction of emissions of greenhouse gases and other polluting gases and substances	Expanding local business opportunities	For a large number of sustainable technologies, investments are paid back even in the short term
Protection of the local environment via site design	Partnership with businesses	Excess energy as export product
Efficient movement of people and goods	Good jobs, larger tax base	New initiatives possible
Efficient energy usage in operations and reduced emissions	Enhance quality of life in areas near development	Income from sale of by-products
Efficient water usage and protection of freshwater resources	Positive impact on employee health	Positive impact on productivity
Provision of reserves, tracks, etc.	Community pride	Enhance corporate image