Predict that biomass will generate 4.5% of the kilowatt-hours consumed in the U.S. annually by 2030, which is equivalent to 75% of current gasoline demand. Energy forecasters believe it possible to produce biofuel from inedible bio-mass. Traditionally biofuel was manufactured from food crops like corn, sugarcane and soy. Renewable energy technologies such as solar panels, wind turbines, and hydroelectric generators are being used to generate electricity from biomass.

This system can be applied for several facilities including industrial manufacturers, institutions, commercial buildings, municipal and residential buildings. This is an efficient, clean and reliable approach to generating power and thermal energy from a single fuel source. A conceptual calculation done for assumed available land that can be dedicated to the production of energy crops is shown below. For the purpose of calculation, a single crop, switchgrass, has been considered.

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PITTSFIELD TOWNSHIP 2010 MASTERPLAN

INFRASTRUCTURE / BUS SYSTEM

bus lane typology #1: WASHTENAW AND CARPENTER
street section: WASHTENAW NEAR CARPENTER

country bus: NEW BUS TRANSIT SYSTEM
street section: OAK VALLEY NEAR ANN ARBOR-SALINE
street section: STATE NEAR MICHIGAN
street section: MICHIGAN NEAR STATE

bus lane typology #2: ELLSWORTH AND CARPENTER
bus lane typology #3: MICHIGAN AND STATE

ROUNDABOUT
E. WASHTENAW
CARPENTER
CARPENTER
E. ELLSWORTH
E. MICHIGAN
S. STATE
BUS STOP
BUS STOP
BUS STOP
BUS LANE
BUS LANE
BUS LANE
BUS LANE
BUS LANE
BUS LANE

15000 3000
150 150
0 300
0 150
0 300
0 150
0 300

legend
route #1
route #2
route #3
AATA lines
bus stop
bus transfer to AATA
bus coverage

MEDIAN TO YIPSILANTI TO MICH AVE.BIKE LANETO ANN ARBOR
SIDEWALK SIDEWALK SIDEWALK SIDEWALK SIDEWALK SIDEWALK BUS LANE
BUS LANE
BUS LANE
BUS LANE
BUS LANE
BUS LANE
OBJECTIVES

1. The overarching goal is to enhance this site as a suitable environment for living, working, shopping and recreation. This site is a larger footprint for the development of a comprehensive green and sustainable development for the focus area.

2. Integrate the three predominant uses (that is housing, shopping, and recreation) by deploying the landscape as a sustainable channel of connecting one domain to the other.

3. Make Carpenter Road safe for all users especially the pedestrian. One measure is to provide sidewalks along the entire stretch of Carpenter Road as well as along all main corridors of movement.

4. Create a complete but non-motorized system to facilitate opening, movement of passengers using the public transit system.

5. Reduce the coverage of impervious surfaces in this focus area by developing an extensive use of locally available landscape materials. Plant materials.

6. Create a cultural park between Ellsworth and Packard Road as well as between Meijer and Target. This will serve as a bridge between Showcase entertainment center and play-ground (parking lot).

7. Provide access to the greenspace to facilitate opening, movement of passengers using the public transit system.

8. Promote the adoption of green-roof systems and leisure urban farms in complement of the overall landscape design.

9. To aim at creating a green and sustainable shopping centers developed with the big-box retail outlet in mind.

10. To aim at creating a green and sustainable shopping centers developed with the big-box retail outlet in mind.
OBJECTIVES

UTILIZE THE AVENUE AS DESTINATION by identifying nodes and promoting diverse development within them in addition to creating linear nodes as public points of gathering.

CREATE A UNIQUE IDENTITY for Pittsfield by reinforcing and celebrating the landscape.

ENCOURAGE PEDESTRIAN AND BICYCLE use by installing sidewalks and bicycle paths along the entire stretch of Washtenaw Avenue and incorporating public connection points across the avenue into adjacent neighborhoods.

PROPOSE A GREEN SYSTEM to bring back biodiversity to the area, reconnecting existing wetlands and adjacent areas to the landscape of Pittsfield.

INTRODUCE AN EFFICIENT TRANSPORTATION SYSTEM linking a dedicated bus lane with secondary uses of pedestrian & bicycle paths, car shares and points of interest.

ASSETS

NATURAL RESOURCES: lakes, streams, woodlands offer unique landscape for Pittsfield.

DIVERSE foundation of commercial/retail development.

PROXIMITY to major universities and their resources; faculty & students.

ECONOMIC potential offers the opportunity for improvement of existing systems.

ENVIRONMENTAL assets allow for the introduction of sustainable systems.

PROGRAM

Concentrate new density in pockets along Washtenaw Avenue.

Retail: 75,940 SF

Commercial/Office: 93,500 SF

Affordable Housing: 84,400 SF

High-End Housing: 105,900 SF

Multi-Family Housing: 216,000 SF
1. Landscape work as a preamble to architecture and planning

The existing condition of the high-tech zone is that it is isolated from the surrounding environment. The first goal of the design is to create connections among the zone, existing residential areas, and the surrounding environment through natural and water systems. The design thus emphasizes the relationship among the greenery, drainage pattern, and building pattern.

2. Layout

Based on the topography & water and drainage system in the site, the design figured out the direction of drainage and water flow system in the site which is related to the natural watersheds. The landscape and building patterns are organized in the same direction. The design thus integrated road networks by following the natural water system in a reasonable way.

3. Ecology-friendly design

The second goal of the design is to create an ecologically friendly and healthier environment for the site to attract more diversified business and a denser development happened on the site, especially along S. State Rd. So that people who live and work here can enjoy the benefits of a water system.

4. Energy efficiency

The plan also employed a more efficient design of energy as a strategy to reinforce the compact form of development in the future and to achieve a win-win situation.

5. Program

Based on existing situation, mixed-use development and new types of businesses are needed to make the neighborhood more efficient. Mixed-use development can make work live in this site very well. So that people who work in the high-tech and businesses can also live here, making full use of the benefit of surrounding natural environment such as parks, trails, fitness centers, buildings, and restaurants. The program is integrated into the new and old development along S. State Rd and other surrounding public transportation into the archipelagos.
goals\nOBJECTIVES
• focus development along natural wetland edge
• provide daily needs within walking distance
• provide pedestrian greenways for township-wide access
• form direct connections with high school
• provide density to support fixed-route bus service

section\nGREENWAY APARTMENTS
103520 12 16 12 10 35 20

section\nRESIDENTIAL STREET
10
(bike) shed
2540 - 60 10 10 10 11 14 40 - 60
entry
• 1.5 parking spots per household distributed throughout neighborhood
• parking spaces are shared, therefore more efficient than private spaces
• auto traffic disconnected from bus traffic
• drivers proceed with caution on narrow streets and shared auto-pedestrian space

transportation\nSECONDARY CIRCULATION

concept\nLANDSCAPE EDGE
• 170 residential units
• 1/3 rental apartment units (1000 sf)
• 2/3 single family homes (2000 sf)
• 6,000 sf for pub-cafe & corner-general store
• density of 8 dwelling units (DU) / Acre supports bus service

density\nNEW & OLD proposed
existing

transportation\nPRIMARY CIRCULATION
• dedicated bus route provides efficient, low-cost service throughout township
• centrally located bus stop serves auto traffic, pedestrians, and bikers
• greenways connect bikes and pedestrians to school, work, and shopping on safe, car-free routes

opportunities\nSUSTAINABLE ENERGY

siteplan\nTHE GREEN COAST

perspective\nRESIDENTIAL STREET
• energy efficient, modern housing
• small, curbless streets are safe play spaces for children and social places for adults
• wild landscaping utilizes Pittsfield’s native vegetation

perspective\nNEIGHBORHOOD SQUARE
• a place where many paths cross
• residents walk to the neighborhood pub to meet for coffee, beer, or a meal
• make a quick trip to the general store for some milk, toilet paper, and duct tape

perspective\nLANDSCAPE EDGE
• celebrate Pittsfield’s beautiful wetlands - one of the earth’s most productive landscapes
• preserve habitat for native plants and wildlife
• enjoy a bike ride or walk along the ‘landscape edge’
PITTSFIELD TOWNSHIP 2010 MASTERPLAN

goals
OBJECTIVES
Building connections between park, place, and people

Park
Enhance Wooded Landscape
Create Circular Path of Wooded Landscape
Integrate Pedestrian & Bike Path
Build Physical Connections to Adjacent Pittsfield Preserve

Place
Build Sense of Place with Three Distinct Landscapes
Grassland & Agricultural Lands
Heavily Forested Grounds
The Clearing in the Woods
Build Site as a Multi-modal Transit Connection

People
Increase Density of Built Environment
Concentrate Development at Transit Hub
Provide a Variety of Uses

site location
STATE & ELLSWORTH
STATE STREET
ELLSWORTH ROAD
AIRPORT
RESEARCH & EDUCATION
LOHR ROAD
ZINGERMAN'S
TRANSIT HUB
FIRE DEPT.
RECREATION FIELDS
AATA BUS
PITTSFIELD BUS

EXISTING CONDITION
PROPOSED LOOP OF PARK

aerial

the LOOP

siteplan
**OBJECTIVES**

- Creation of two "hard" urban edges along Michigan Ave. to contain development, define the landscape, provide points of attraction, and create a quality for the Township.

- Creation of a vibrant, medium-density, mixed-use township center with a new focal public space for the Township - "Pittsfield Green".

- The development of a new sustainable (energy self-sufficient) housing subdivision model for the Township.

- Utilizing the existing administrative center as an attraction point and anchor for civic development.

- Extending productive landscapes through development sites to promote social interaction and provide integrated solutions for stormwater management and energy production.

- Creating points of attraction and density at the intersections of regional greenways and dedicated bus routes (i.e. Transit Oriented Development).

**LAND USE PROGRAM**

- Medium Density Housing
- Work-Live Units
- Rental and/or Condos
- Affordable Housing
- Mixed Use "Edges" and Pittsfield Green
- New Focal Public Space
- Retail
- Housing (Apartment Lofts)
- Intersection of Transit & Greenways
- Bike Rental/Service
- Restaurant/Cafe
- Grocery
- Municipal Complex
- Retail
- Housing (Attached Lofts)
- Market Space
- Community Training/Jobs Center
- "Mosaic Gardens" - Community Gardens
- "Energy Crops" and Cogeneration Plant (poplar, willow, switchgrass)

**Harwood Farms**

- Approx. 55 acres
- 400 dwelling units
- 7.3 dwelling units/acre
- 190,000 s.f. non-residential space
- Approx. 10% site coverage

**Harwood Farms Housing & Gardens**

- Proposed Density: 50 units, 3.0 dwelling units/acre
- Proposed Site Coverage: 300,000 sq. ft. non-residential space
- Proposed Site Coverage: 110% site coverage