1.0. Revised Objectives

There have many significant refinements to our original objectives. We have greatly clarified the scope of the project for this semester and its continuation into the future. We will now be focusing our time in the following ways:

Eco-Boulevard Subgroups

A. Existing functional BMP's (Best Management Practices) were researched, in order to investigate and share methods, techniques, practices, equipment, biology, etc. This knowledge was made available to the team via iGROUPS. The social sub-group has been a close collaborator throughout this process, to plan viable eco-boulevards with specific aspects to each that will meet both ecological and sociological criteria.
B. While obtaining original objectives, they have expanded as the research progressed – emphasis has been added to the creation of a web portal by which the accumulated knowledge will be available in the public domain. The visitors will have an opportunity to not only learn about the techniques available, but also to experiment with understanding the system as a whole, with the option of creating own eco-boulevards in a holistic approach.
C. A number of case studies have been carefully studied to gather, share, propose and document ideas on social considerations regarding the application of the Eco-Boulevard along 31st Street. Group discussions, peer-reviews and preliminary presentations have all contributed to the formulation of more refined proposals that will eventually be included in a catalog. The ecological subgroup has been a close collaborator throughout this process targeting proposals that will benefit both ecological and social criteria.

Living machine Subgroups

A. To research and share methods, techniques, practices, equipment, biology, etc. of functional living machines and make available that knowledge. To work with the social sub-group, to plan several separate, viable living machines with specific aspects to each that will meet certain criteria.
B. The original objectives still stand but have been improvised. The goals obtained and the progress reached is to be posted on a web page where users can design their own living machines and be able to learn about ways in which the environment can be saved using sustainable technologies.
C. The living machine social has redirected itself towards the creation of a catalog of social and eco logical programs and systems which a living machine pavilion can institute. We are addressing these issues for the scope of a completed eco boulevard on 31st street. We assist

in the impliementation of a web portal that will assists in education and implementation for the future of our ipro both in academic and public domains.

2.0. Results to Date

To date, each of the 4 sub groups have successfully produced notable results.

Eco-Boulevard Subgroups

A. The Eco – Eco Boulevard team has conducted relevant case studies of BMP's with examples from around the world. This has also been a crucial research phase, because it allowed from a critical approach to previous practices, in order to have a clearer approach toward future ones. The result of this research is a comprehensive knowledge of the different natural systems which create a catalog of sustainable techniques to be employed within the project. Different models of performance are now in working progress, regarding the locations of the eco-boulevards around Chicago's streets. First projections of the cost of the eco-tope have been estimated through EPA guidelines.
B. The breadth and depth of research allowed for a wide array for possibilities to be investigated through practical innovation throughout the rest of the course. Further plans include prototyping a catalogue of solutions, based on different locations, context and resources.
C. The accumulated knowledge and data will appear on the growing water website as a compendium of tools for making individual design proposals. This way, the students and visitors can engage themselves in not only understanding, but also utilizing the initiative of the iPRO.
D. As a government endorsed project, this iPRO will tackle infrastructural issues on the IIT campus, as well as for the City of Chicago as a whole. Conservation of water, as an overall initiative into a broad use of sustainable techniques, has the future aim of replenishment of the Great Lakes, and the eco-boulevards are a segment of such plan which we hope to employ at a larger scale.
E. The Eco-Boulevard Social team has conducted relevant case studies of BMP's with examples from around the world. An early set of plausible ideas has already been organized and presented to the group. The refinement process will continue in the next few weeks, putting special attention on the analysis and recommendations provided by the other subgroups in order to formulate ideas that go in tune with the ecological criteria the project should follow.

Living machine Subgroups

A. The Living Machine Social sub group has started a digital map of the

proposed area of construction. They have also compiled a list of potential programs that would occupy a section of the living machine to make it a social attraction instead of a standalone building. Diagrams of existing free bike programs that would tie all living machines together has been completed and catalogued. The social sub group has also started research on green building technologies that include green roofs, solar panels and permeable paving materials.

B. The team has worked together to gather statistics and data necessary for viable living machine operation. Information has been obtained regarding typical water consumption of a household as well as the type of waste output, such as green waste and black water. Estimates of the total cost of building a living machine have been acquired through research on the EPA's website. The layout and infrastructure of living machines have been analyzed and critiqued through numerous case studies of living machines and prototypes that exist throughout the United States. Functional options have also been proposed through discussions throughout the semester.
C. A wide array of alternatives for living machine designs now exist for a comprehensive growing water web page and final project. The preliminary research has been done and momentum has been created for a thorough design prototype.
D. The data gathered will appear on the growing water website for students and visitors to design their own living machine using feasible options investigated by the ipro.
E. This project will address current issues of Chicago's water infrastructure. A sustainable means of filtering water and sending it back to Lake Michigan is a government endorsed project. The aim of our ipro is not only to find natural means to filter water and return it to the Lake for further consumption but to also create a design precedent that will allow the living machine to use only sustainable technologies for its operations.

As a whole, the IPRO has compiled a catalogue of existing living machines, existing eco-boulevards and existing green construction methods to use as case studies for our own area. We can refer to these examples where they are applicable on our site and see how they handled potential problems of traffic and security.
The current results will be combined with their respective section. So the two living machine groups will get together and decide on how much square footage should be allotted for the actual living machine and how much can be social space. A structural system will also be decided upon. The two eco-boulevard groups will also combine their research in the same manner. The Living machine and eco-boulevard subgroups will then meet and decide on the optimal location of a living machine along 31st street as well as the optimal green building materials that could be implemented along the area.

3.0. Revised Task / Event Schedule

Revised Tasks

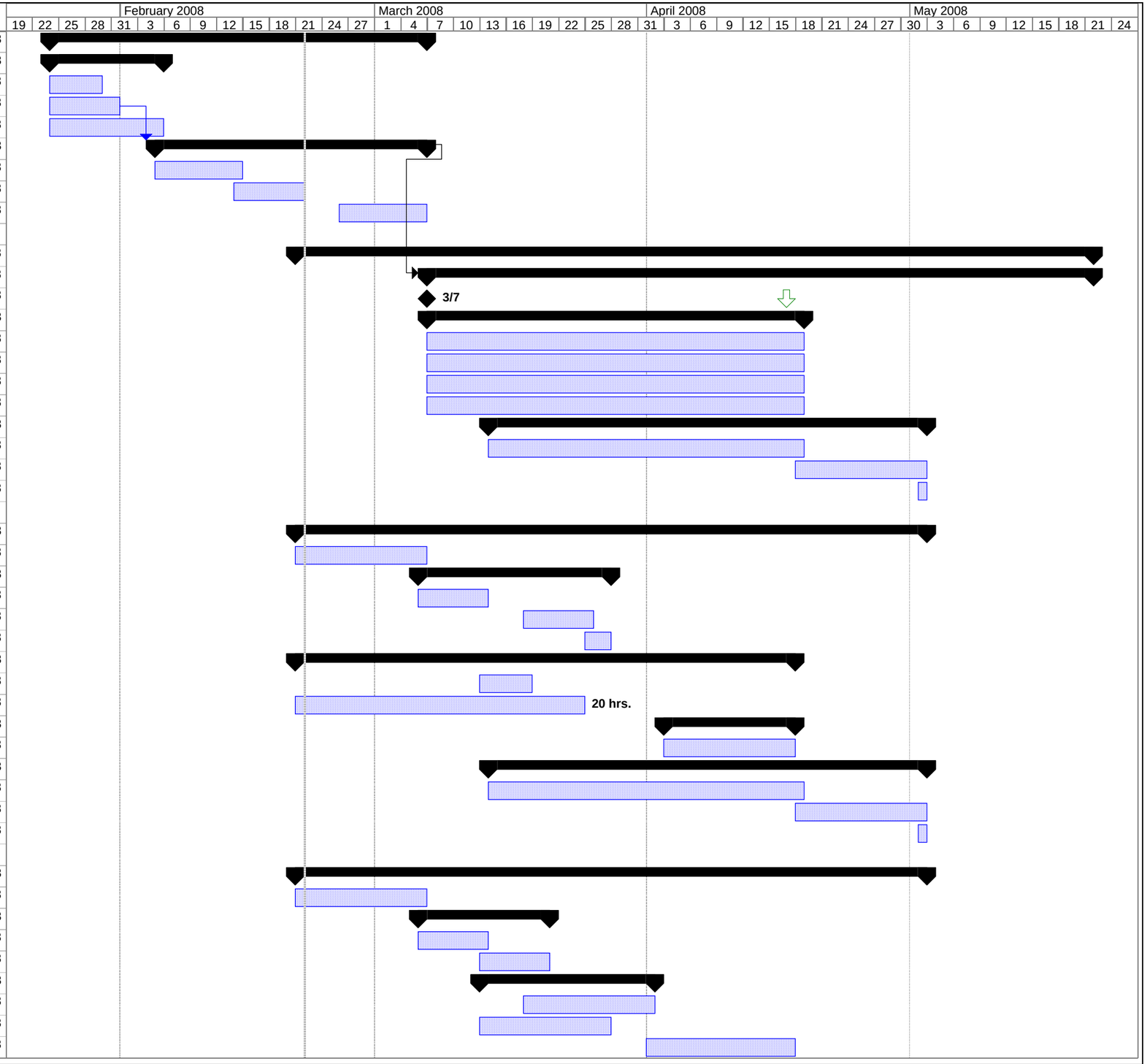
Last Name	Name	Major/Minor	Skills and Strengths	Experience and academic interests	Team	Assignments done for IPRO so far
De Vita	Niels	Architecture	CAD drafting Design skills Photoshop skills Model Building Hardworking	Teacher Assistant Architectural Guide to the IIT Campus Interest in building design innovative technologies and structures	Social aspect of Eco-Boulevard	Helped in the editing of the project plan Independent Research Provided suggestions for possible social components of Blvd.
Kreitzer	Michael	Computer Science	Software Design Java, C, C++, Visual Basic Programming Software Engineering Leadership	Teaching Assistant Interest in: · Real Estate Entrepreneurship · Modelling and Simulation	Social aspect of Eco-Boulevard	Project Plan editing, Readings, Research
Oh	Hyunjoo	Architecture	CAD drafting Design skills Adobe CS 3 skills Sketchup 3D skills Model Building Hardworking	Habitat for Humanity Architectural Practice as an Intern Interest in building design sustainable technologies	Social aspect of Eco-Boulevard	Editing project plan Research Reading Provided suggestions for possible social components of Blvd.
Vassi	Anna	Chemical Engineering	NMR, FTIR, GC, and IC analysis Chemical processes flowcharts HYSYS software Research	Researcher in a chem. lab Interest in: Process Control Engineering Environmental Engineering	Social aspect of Eco-Boulevard	Background Reading Research Editing project plan Came up with ideas to contribute to the social aspect of the eco-blvd.
Boder	Matthew	Architecture	Autocad 3ds max Photoshop/Illustrator Design Composition	Philosophy,Film, Literature,Architecture, Music,Sustainability	Social aspect of Living Machine	Research Helped develop project plan
Johnson	Drew	Architecture Minor CAE Minor CAD	CAD drafting Design skills Adobe CS 3 skills Maya, Rhino, 3ds max Leadership Hardworking	Lead Ipro 335 Architecture, Philosophy, Graphic Design, Travel	Social aspect of Living Machine	Background Reading Research Lead project plan Came up with ideas to

Fong	Patrick	Architecture	CAD drafting & 3D Modeling Design skills Adobe Illustrator/Photoshop 3ds max + Vray	Architecture, Industrial Design Graphic Design Intern Architect @ SCB	Social aspect of Living Machine	Research Edit Project Plan
Ramey	Ronald	Architectural Engineering	Structural design, Materials, General Design		Social aspect of Living Machine	Research Edit Project Plan Research alternative energy and how it can be applied and integrated into a living machine
Stopic	Milena	Architecture	Design Visualisaton	Intern Architect Parametric Design	Ecological aspect of Eco boulevard	Readings/Presentations Case studies BMP Research Strategy
De Marco	Juan	Architecture	Design Visualisaton	Intern Architect Parametric Design	Ecological aspect of Eco boulevard	Readings/Presentations Case studies BMP Research Strategy
Irish	Sean	Architecture	CAD drafting & 3D Modeling Design skills Adobe Illustrator/Photoshop 3ds max + Vray	Interest in building design innovative technologies and structures	Ecological aspect of Eco boulevard	Readings/Presentations Case studies BMP Research Strategy
Urdiales	Miguel	Civil Engineering	CAD drafting & 3D Modeling Pro-Engineer	Drafter/Designer work experience, interested in the design and analysis of structures.	Ecological aspect of Living Machine	Readings/Presentations Case studies project planning
Blackketter	Joshua	Mat. Eng.	Materials Selection, Copy Editing		Ecological aspect of Living Machine	Readings/Presentations Case studies project planning
Konwar	Riju	BME,CHE, MMAE			Ecological aspect of Living Machine	Readings/Presentations Case studies
Kuzmicki	Kamil				Ecological aspect of Living Machine	

Event Schedule

No Change in schedule. The change in focus doesn't directly change the tasks pursued.

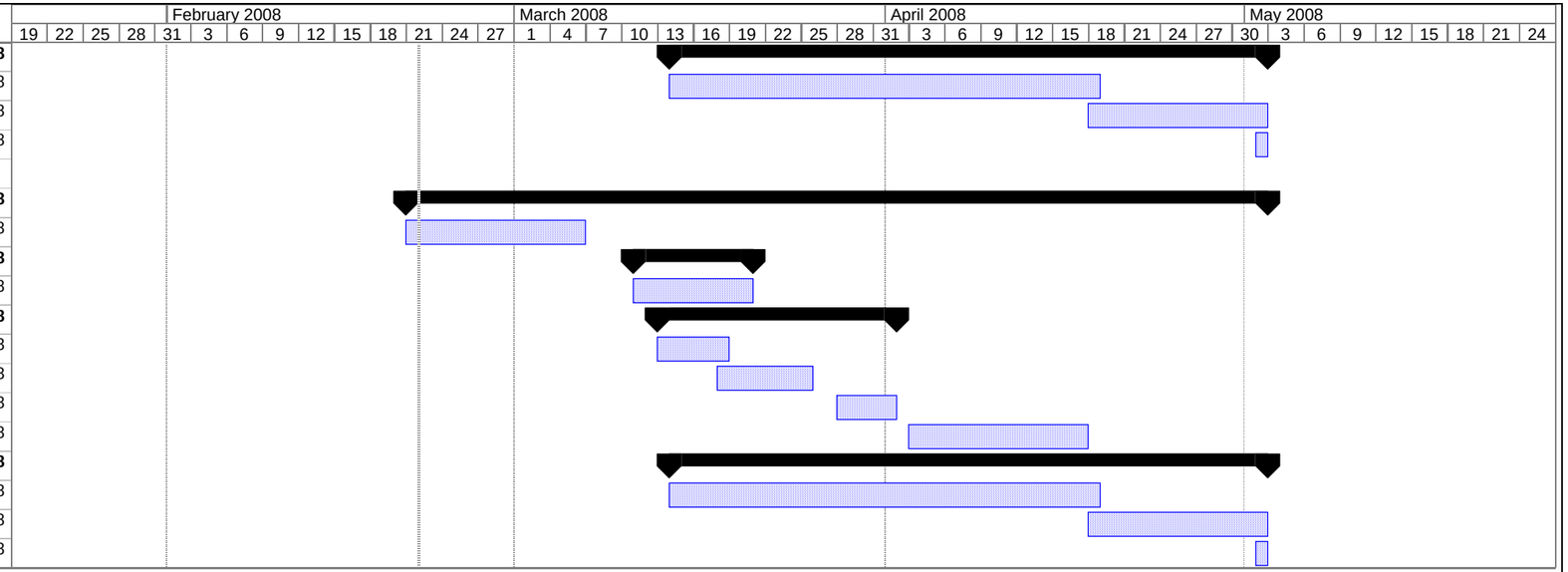
ID	Task Name	Duration	Start	Finish
1	**Ipro Start Up and Intial Phase**	**31 days**	**Thu 1/24/08**	**Thu 3/6/08**
2	**Backround**	**9 days**	**Thu 1/24/08**	**Tue 2/5/08**
3	reading 1	4 days	Thu 1/24/08	Tue 1/29/08
4	reading 2	6 days	Thu 1/24/08	Thu 1/31/08
5	reading 3	9 days	Thu 1/24/08	Tue 2/5/08
6	**Research**	**23 days**	**Tue 2/5/08**	**Thu 3/6/08**
7	Case Study 1	8 days	Tue 2/5/08	Thu 2/14/08
8	Case Study 2	6 days	Thu 2/14/08	Thu 2/21/08
9	Case Study 3	8 days	Tue 2/26/08	Thu 3/6/08
10				
11	**Subteam Semester Schedules**	**65 days**	**Thu 2/21/08**	**Wed 5/21/08**
12	**Eco Blvd Social**	**54 days**	**Fri 3/7/08**	**Wed 5/21/08**
13	Research	54 days	Fri 3/7/08	Wed 5/21/08
14	**Creation of Catalog**	**31 days**	**Fri 3/7/08**	**Fri 4/18/08**
15	Transportation	31 days	Fri 3/7/08	Fri 4/18/08
16	Facilities/Services	31 days	Fri 3/7/08	Fri 4/18/08
17	Community Outreach	31 days	Fri 3/7/08	Fri 4/18/08
18	Recreational Spaces	31 days	Fri 3/7/08	Fri 4/18/08
19	**Create Presentation and Website**	**36 days**	**Fri 3/14/08**	**Fri 5/2/08**
20	Layout	26 days	Fri 3/14/08	Fri 4/18/08
21	Assembly	11 days	Fri 4/18/08	Fri 5/2/08
22	Present	1 day	Fri 5/2/08	Fri 5/2/08
23				
24	**Eco Blvd Eco**	**52 days**	**Thu 2/21/08**	**Fri 5/2/08**
25	Preliminary Planning	11 days	Thu 2/21/08	Thu 3/6/08
26	**Research**	**16 days**	**Thu 3/6/08**	**Thu 3/27/08**
27	Biological/Ecological Research/Site Visits	6 days	Thu 3/6/08	Thu 3/13/08
28	Building: possible materials, greenhouse/r	6 days	Tue 3/18/08	Tue 3/25/08
29	Financial: Cost of operation, construction,	3 days	Tue 3/25/08	Thu 3/27/08
30	**Brainstorming**	**41 days**	**Thu 2/21/08**	**Thu 4/17/08**
31	Ecological Implications	4 days	Thu 3/13/08	Tue 3/18/08
32	Social Implications	23 days	Thu 2/21/08	Mon 3/24/08
33	**BMP Implementation**	**11 days**	**Thu 4/3/08**	**Thu 4/17/08**
34	Design	11 days	Thu 4/3/08	Thu 4/17/08
35	**Create Presentation and Website**	**36 days**	**Fri 3/14/08**	**Fri 5/2/08**
36	Layout	26 days	Fri 3/14/08	Fri 4/18/08
37	Assembly	11 days	Fri 4/18/08	Fri 5/2/08
38	Present	1 day	Fri 5/2/08	Fri 5/2/08
39				
40	**Living Machine Social**	**52 days**	**Thu 2/21/08**	**Fri 5/2/08**
41	Preliminary Planning	11 days	Thu 2/21/08	Thu 3/6/08
42	**Research**	**11 days**	**Thu 3/6/08**	**Thu 3/20/08**
43	Precedents for social pavilions	6 days	Thu 3/6/08	Thu 3/13/08
44	Chicago Zoning	6 days	Thu 3/13/08	Thu 3/20/08
45	**Brainstorming**	**14 days**	**Thu 3/13/08**	**Tue 4/1/08**
46	Diagramming Social interaction	11 days	Tue 3/18/08	Tue 4/1/08
47	Loctions of Living machines	11 days	Thu 3/13/08	Thu 3/27/08
48	Design	13 days	Tue 4/1/08	Thu 4/17/08



Project: Project1
Date: Fri 2/22/08

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ID	Task Name	Duration	Start	Finish
49	**Create Presentation and Website**	**36 days**	**Fri 3/14/08**	**Fri 5/2/08**
50	Layout	26 days	Fri 3/14/08	Fri 4/18/08
51	Assembly	11 days	Fri 4/18/08	Fri 5/2/08
52	Present	1 day	Fri 5/2/08	Fri 5/2/08
53				
54	**Living Machine Eco**	**52 days**	**Thu 2/21/08**	**Fri 5/2/08**
55	Preliminary Planning	11 days	Thu 2/21/08	Thu 3/6/08
56	**Research**	**8 days**	**Tue 3/11/08**	**Thu 3/20/08**
57	Living Machine capacity	8 days	Tue 3/11/08	Thu 3/20/08
58	**Brainstorming**	**14 days**	**Thu 3/13/08**	**Tue 4/1/08**
59	Living Machine Location	4 days	Thu 3/13/08	Tue 3/18/08
60	Layout of Living Machine	6 days	Tue 3/18/08	Tue 3/25/08
61	Biological/Ecological functions	3 days	Fri 3/28/08	Tue 4/1/08
62	Design	11 days	Thu 4/3/08	Thu 4/17/08
63	**Create Presentation and Website**	**36 days**	**Fri 3/14/08**	**Fri 5/2/08**
64	Layout	26 days	Fri 3/14/08	Fri 4/18/08
65	Assembly	11 days	Fri 4/18/08	Fri 5/2/08
66	Present	1 day	Fri 5/2/08	Fri 5/2/08



Project: Project1
Date: Fri 2/22/08

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

4.0. Changes in Task Assignments and Designation of Roles and Team Organization

There isn't no change to the designation of roles and team organization.

Team Leaders

- Drew Johnson- Living Machine
- Michael Kreitzer- Eco Boulevard

Sub- Teams

1. Eco Boulevard Social Team
   - Niels De Vita
   - Michael Kreitzer
   - Hyunjoo Oh
   - Anna Vassi
2. Eco Boulevard Eco Team
   - Sean Irish
   - Juan De Marco
   - Milena Stopic
3. Living Machine Social Team
   - Drew Johnson
   - Patrick Fong
   - Mathew Boder
   - Ronald Ramey
4. Living Machine Eco Team
   - Joshua Blackketter
   - Miguel Urdiales
   - Riju Konwar
   - Kamil Kuzmicki
   - Ron Ramey
5. Visual Interactive Model Team
   - Matthew Boder
   - Drew Johnson
   - Michael Kreitzer
   - Ron Ramey

Sub- Team Leaders

- Michael Kreitzer- Eco Boulevard Social Team
- Juan De Marco - Eco Boulevard Eco Team
- Drew Johnson- Living Machine Social Team
- Riju Konwar- Living Machine Eco Team

Sub Team Responsibilities

3. Living Machine Social Team
   - Research social uses for the living machine
   - Establish a catalog or "Growing Water Toolkit" of different possibilities for living machine pavilions.

- Prototype what several of these possible catalog solutions could be
- Design visually, a collaboration with the Visual Interactive Model Team, an easy to use interface that allows a user to pick different items from the "Growing Water Toolkit" to create their own living machine pavilion

5. Visual Interactive Model Team
    - Design visually, a collaboration with the Living Machine Social Team, an easy to use interface that allows a user to pick different items from the "Growing Water Toolkit" to create their own living machine pavilion
    - To research and integrate research from other groups into a web-based user interface to promote education about how people can get involved and learn about living machine pavilions and eco boulevards

Sub- Team Individual Responsibilities

3. Living Machine Social Team
    - Drew Johnson – Research, diagramming, and prototyping
    - Patrick Fong – Research, presentation, and design
    - Mathew Boder – Research , presentation, and design
    - Ronald Ramey – Research on sustainability and integration of alternative energy implementation

Designation of Roles

A. Assign Meeting Roles

- **Minute Taker:** Milena Stopic
- **Agenda Maker:** Michael Kreitzer
- **Time Keeper:** Riju Konwar

B. Assign Status Roles

- **Weekly Timesheet Collector/ Summarizer:** None. As a group, we decided that we will all keep track of our work by uploading outlines from the individual phases. We do this within our own sub groups which then get discussed with the group as a whole.
- **Master Schedule Maker:** Drew Johnson
- **IGroups:** Drew Johnson

5.0 Barriers and Obstacles

A. Since this is the first in a continuing series of IPRO classes investigating the possibility of an eco-boulevard on or close to the IIT campus, research has been and will continue to be the primary focus of our efforts. During the first half of the semester, we compiled a substantial amount of information and have not been rigorous enough in including proper references, citations, and other pertinent information. This information is extremely important because we are trying to develop an intelligent base of research that will be accessible and useful for future classes. This reference information will also be important when presenting the research to the IPRO

community and the public at large who may inspired to investigate the issues of water conservation themselves. This obstacle is overcome quite easily by quickly determining and recording the source of the research gathered thus far, and being more detailed and through in the identification of the source of future research and facts.

B. Another barrier that our team has faced so far this semester is the lack of efficient communication between the groups themselves and between the subgroups within the larger framework. As all IIT students are very busy, most IPRO classes face similar obstacles during the course of the semester, and we have already begun to address these issues. We have set up a standard meeting place on campus, which will be one less thing to remember for all those involved and will continue to use email and the IPRO network to communicate and share files.

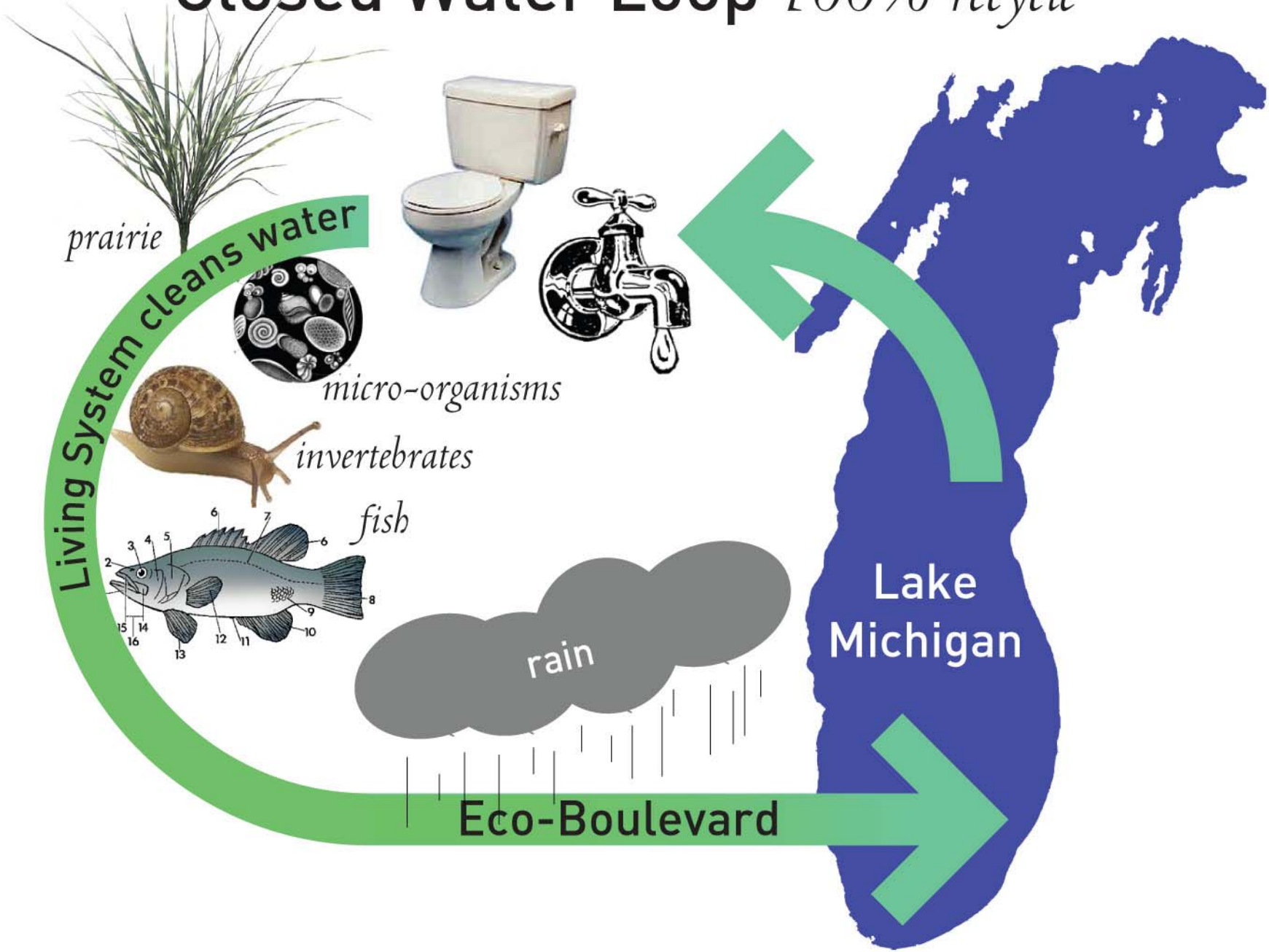
C. The last obstacle that we are facing so far this semester is the development of a coherent and user friendly design for the project website and presentation. It is important for the inaugural eco-boulevard team to create a simple system of graphic representation for the large amount of information that will be necessary to explain the project and inspire the audience. This system, along with the research will hopefully be well thought out enough that it will be useful for many semesters to come. It is also important to clearly and strongly convey the research and proposal on the class website so that the members of the public, especially those that live close to the proposed site, can be well informed without investing a lot of time. We have begun to set up a collection of simple and clear icons that will be used as the navigation theme for our website. These easily identifiable symbols will be accompanied by an interactive interface that allows for the user to effortlessly engage with the proposal, and develop their own idea of an eco-boulevard while learning about the concept at the same time.

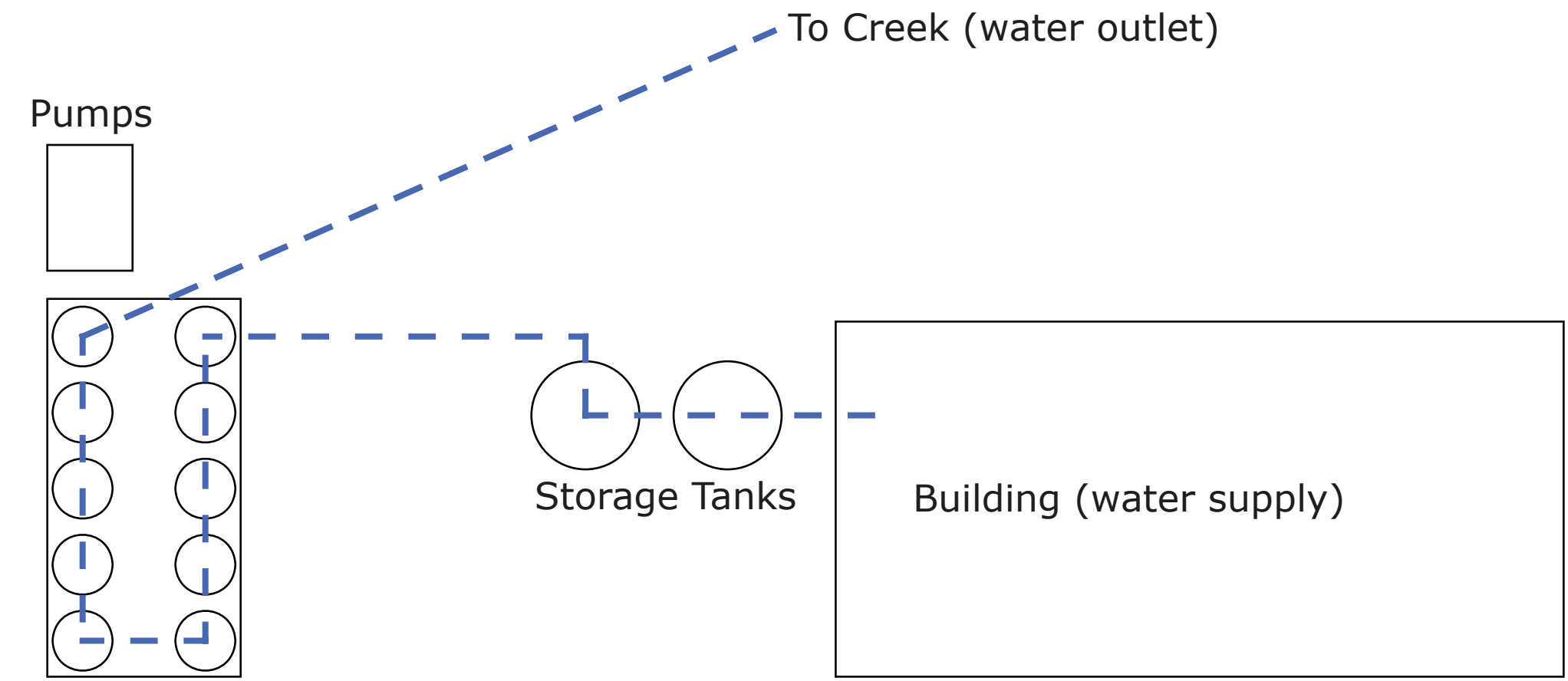
6.0. Midterm Presentation Slides

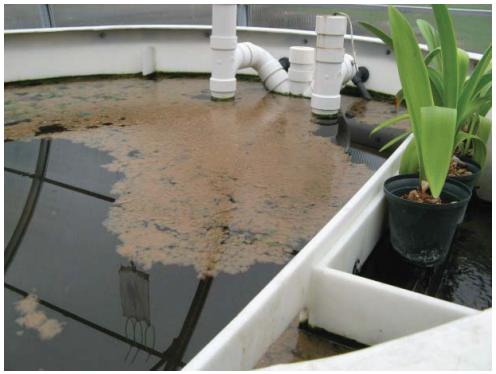
Fact:

"Two out of every three people in the world will be facing water shortages by 2025...
global conflict will inevitably result..."
-United Nations

Closed Water Loop *100% recycle*

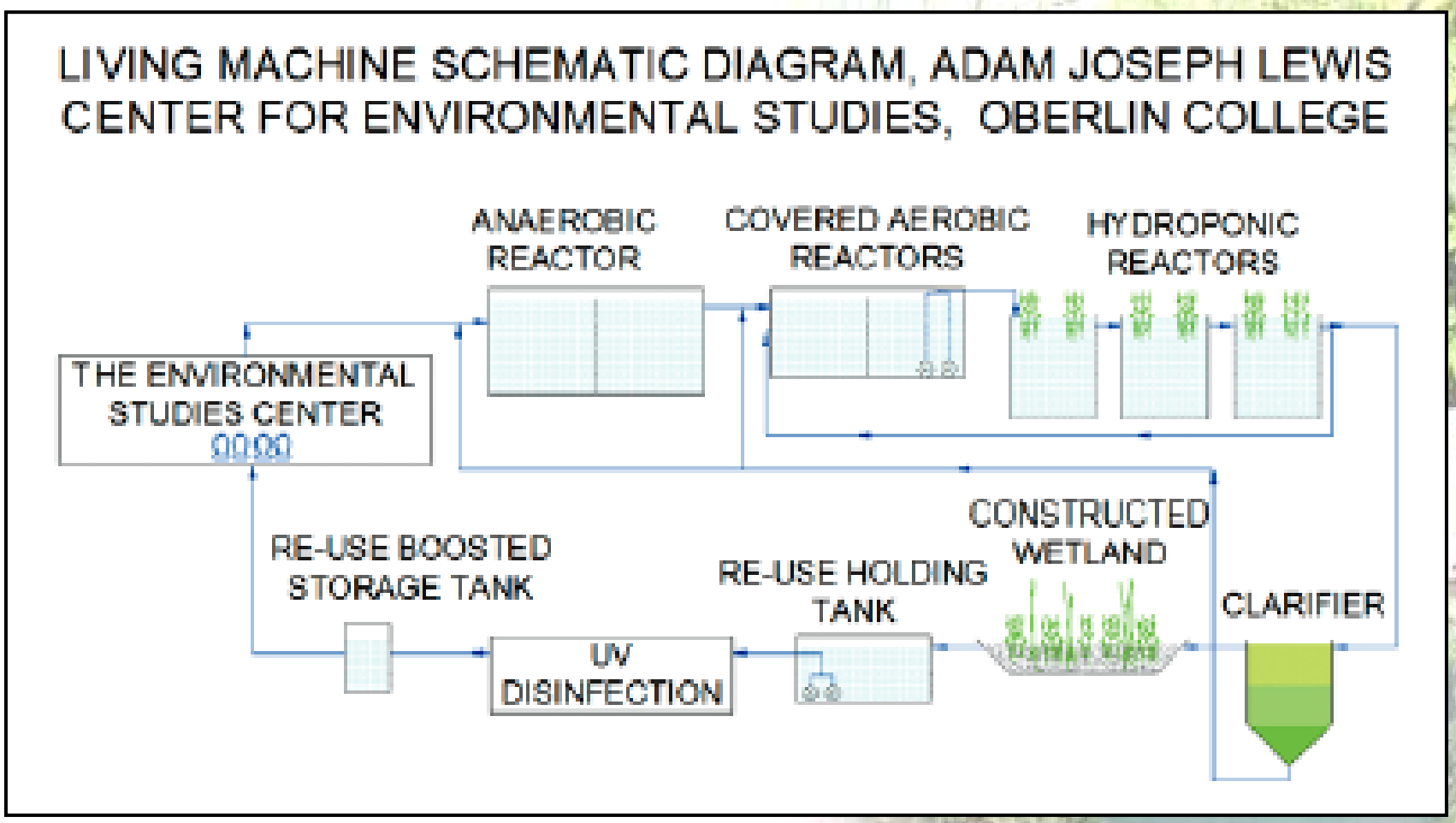



To Creek (water outlet)
Pumps
Storage Tanks
Building (water supply)
Living Machine
21,000 gallons
3 day cycle

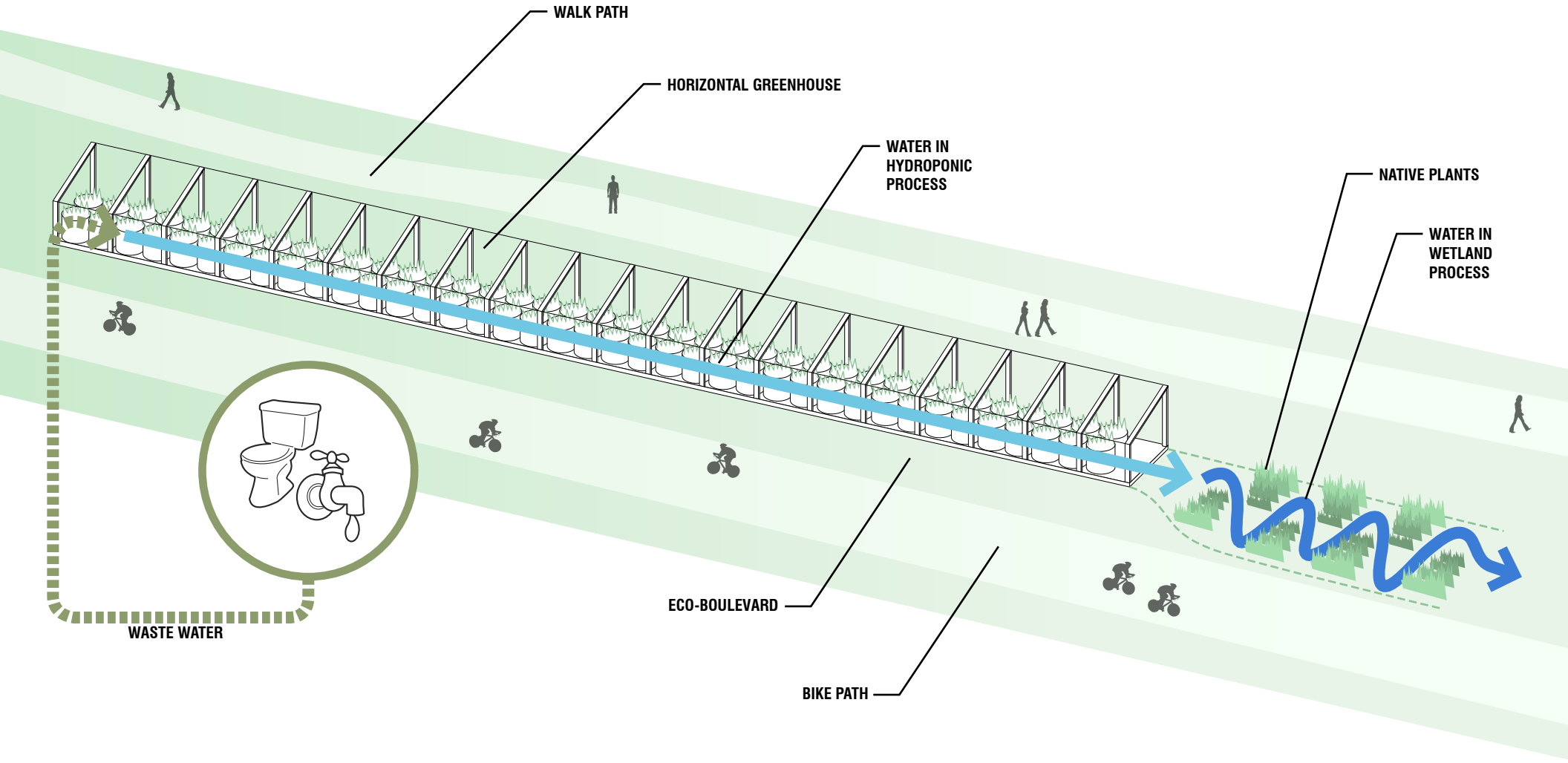



Case Study

Environmental Center Living Machine



Horizontal Greenhouse Diagram



31st Street Eco-Boulevard

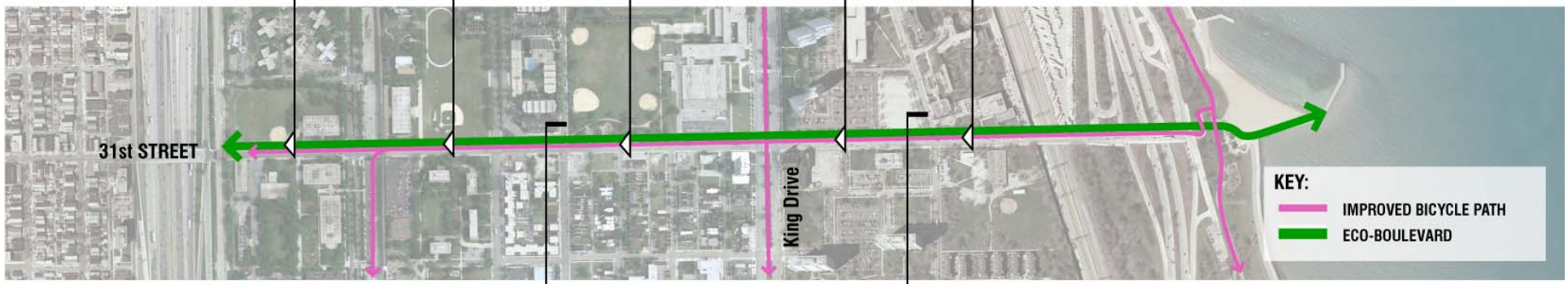
LaSalle

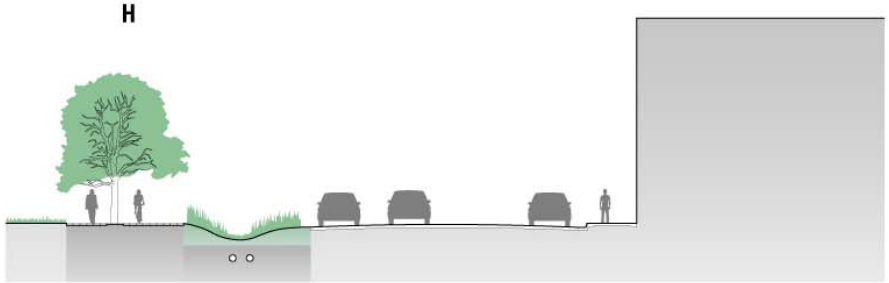
State

Prairie

King Drive

Cottage Grove





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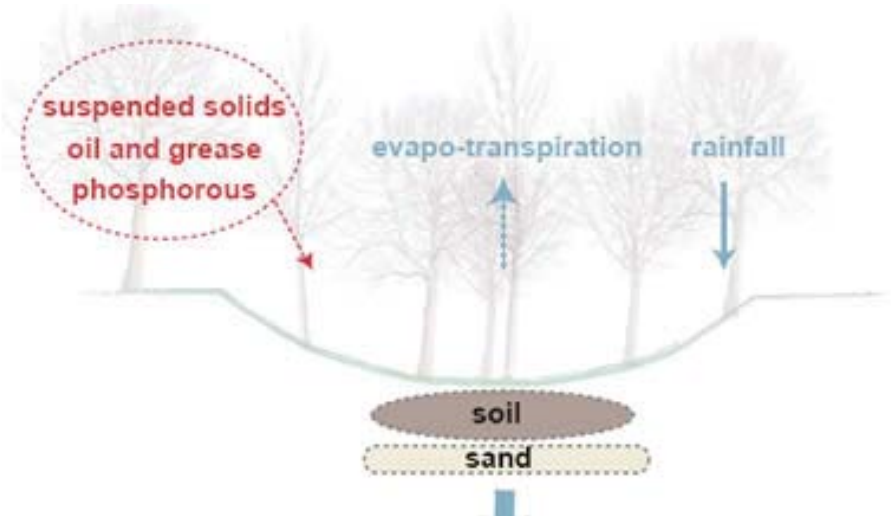

Eco-Boulevards, Ecological Benefits

Eco-Boulevards Use Available Urban Space For Stormwater Management, Typically Using Plants/Organisms to Filter and Clean Water

- Filters stormwater runoff from parking lots, bicycle and pedestrian pathways;
- Uses plants for sedimentation, absorption, filtration and microbial action
- Treated stormwater is reused or it replenishes Lake Michigan

Eco-Boulevards, Social Benefits

Wetland Living System, Cheonggye Stream, Seoul, Korea

Eco-Boulevards Provide New Social Spaces for:

- Recreation and leisure activities;
- Sports fields;
- Playgrounds;
- Walk/Bike trails;
- Open green space;
- Neighborhood micro-farm organic gardens;
- Improved connections to nature and sense of place for residents;
- Improved overall health for all species.

Eco-Boulevards, Social Benefits

Eco-Boulevards Improve Existing, and Create New Bike/Pedestrian Pathways; the Pathways:

- Contain safe bike-friendly pathways for leisure bicyclists;
- Create continuity between existing park and lakefront trails, public transport nodes and proposed Olympic venues;
- Foster reduction of auto use during special events on the lakefront (and connected parks) by increasing quantity and accessibility of interconnected, safe bikeways.

Eco-Boulevards, Social Benefits

Economic Benefits; well-planned Eco-Boulevards can:

- Forge alliances between public and private stakeholders to create a shared vision;
- Foster community buy-in that is lasting and sensitive to the economic value of land, while respecting private property rights and responsibilities, and unique neighborhood values.
- Stimulate development and increase property values;
- Decrease the long-term costs of public water-based infrastructure and public services, including the costs of stormwater management and water treatment systems;
- Protect our fresh water source today (in order to decrease the costs of improving water filtration treatment plants tomorrow).

Existing Implementation Examples

Potsdamer Platz
Berlin

SW 12th Ave. Green Street Project
City of Portland, Oregon