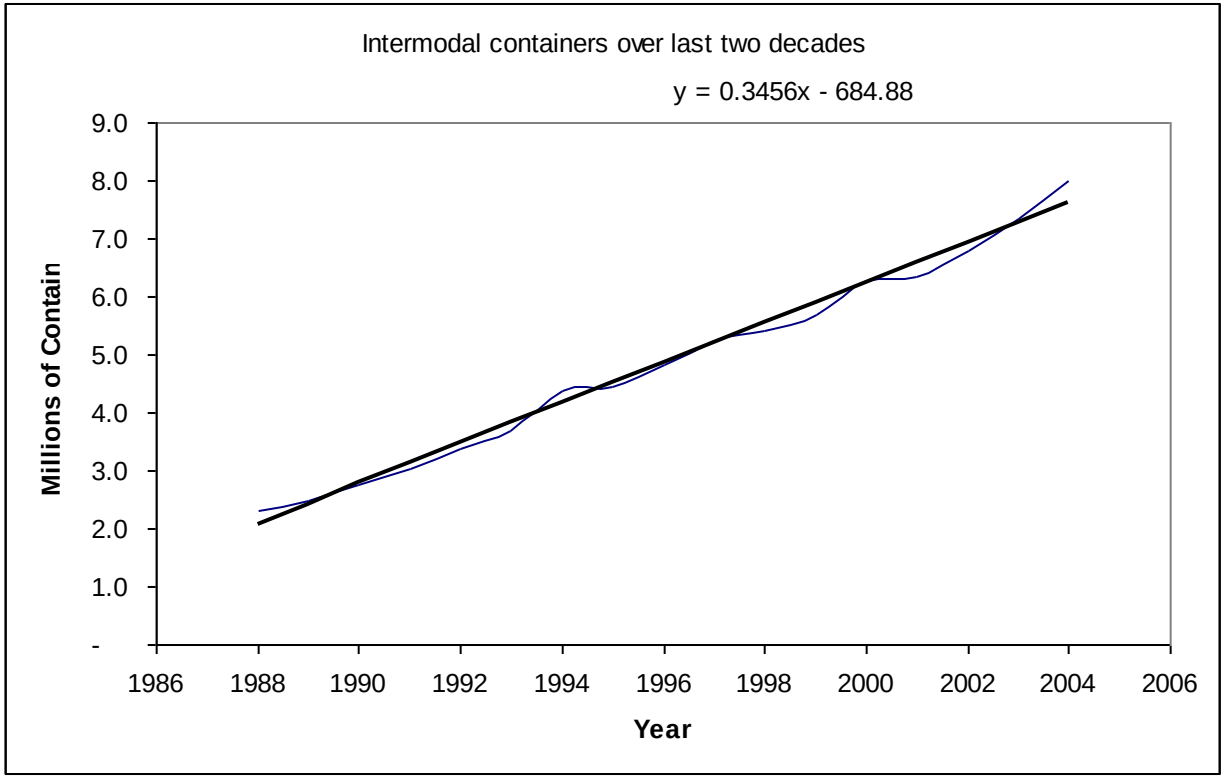
IPRO 307: Environmentally positive impact solutions for intermodal yards

ILLINOIS INSTITUTE OF TECHNOLOGY

Intermodal container traffic over the past two decades



18 Million Containers Worldwide

AAR/BTS

Problem

- Find environmentally positive solutions to lessen the impacts caused by necessities of intermodal yards
- Due to increase in intermodal travel we want to reduce the community impacts of intermodal yards and stay in front of the problem by anticipating complaints

MI-JACK PRODUCTS

Objective

- To design solutions for general and site specific settings
- Provide a means of distributing our solutions to the public as the sponsor requested

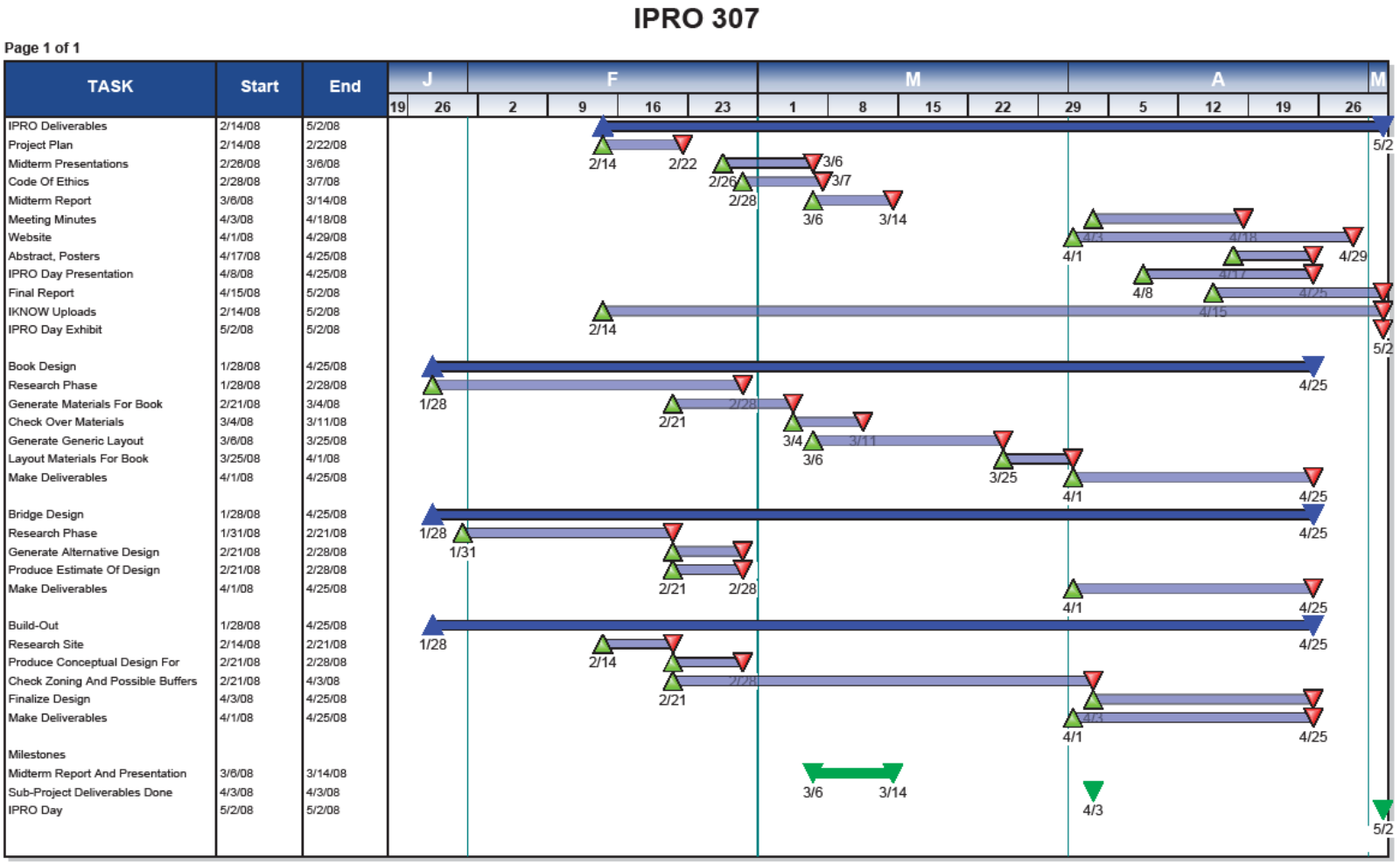
Project Management

- A project plan was updated and used to track objectives to be completed throughout the semester
- Assignments were divided among individuals who had knowledge in the area or showed interest in learning about the area
- Meeting minutes were used to help guide action items for the following meetings
- Our project had no monetary budget

Project Management

- Time sheets were not used because status reports were given twice a week by students during meetings
- Individual progress was also followed through the use of iGroups where work would be uploaded on a regular basis for others to review and critique
- Group meetings were handled by rotating leadership and secretarial responsibilities
- The group unanimously preferred this set of procedures and found it very effective

Project Plan



Ethics

- Entire project was based on ethical thinking
- Took into consideration not just the clients needs but also community and environmental needs
- Referenced different studies and used real world and local data as a basis for all of our designs

Ethics

- Recognized the limits of our designs
- Designs were thorough but not complete, they are not ready to be implemented as none of the project team is certified in the correct areas
- Reallocated work as needed due to a missing group member

Results and Solutions

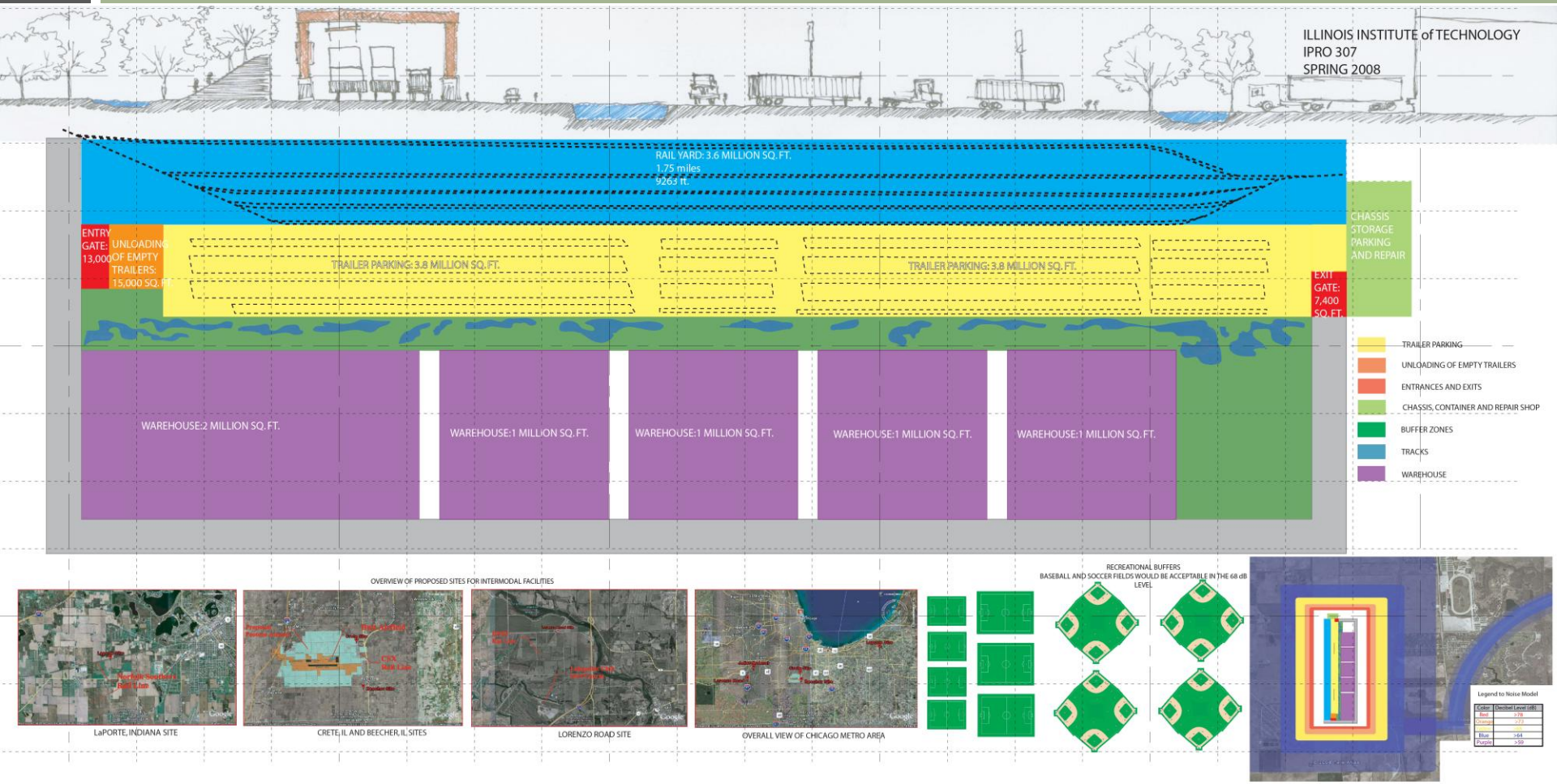
Our solutions to the problem came in 4 main areas:

- Build-out solution for a typical intermodal yard
- Zero excavation warehouse design
- Air, water and energy solutions
- Context sensitive bridge design

These are presented in two methods:

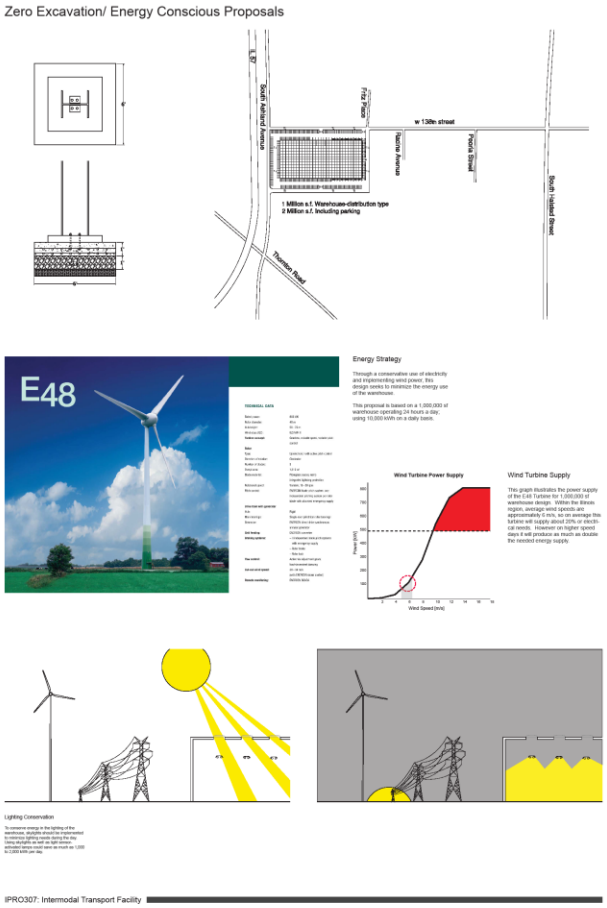
- Website
- Posters

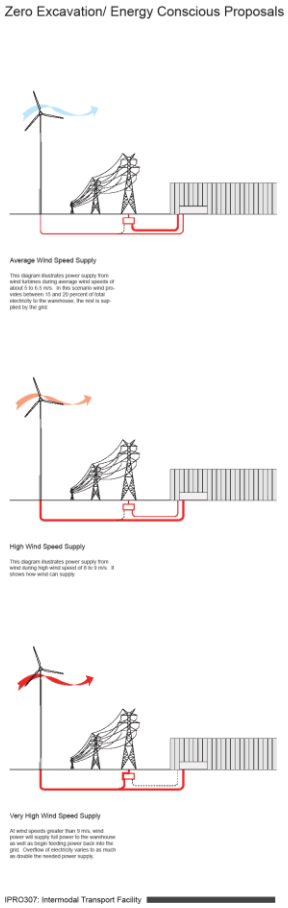
Buildout



- Recommended environmentally friendly intermodal design
- Uses grid structure with quantifiable layout

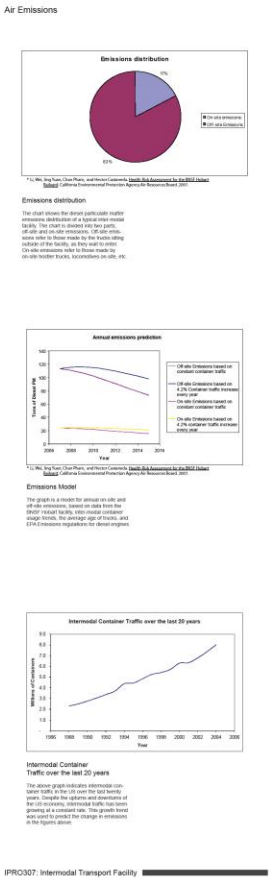
Warehouse and Energy Solutions

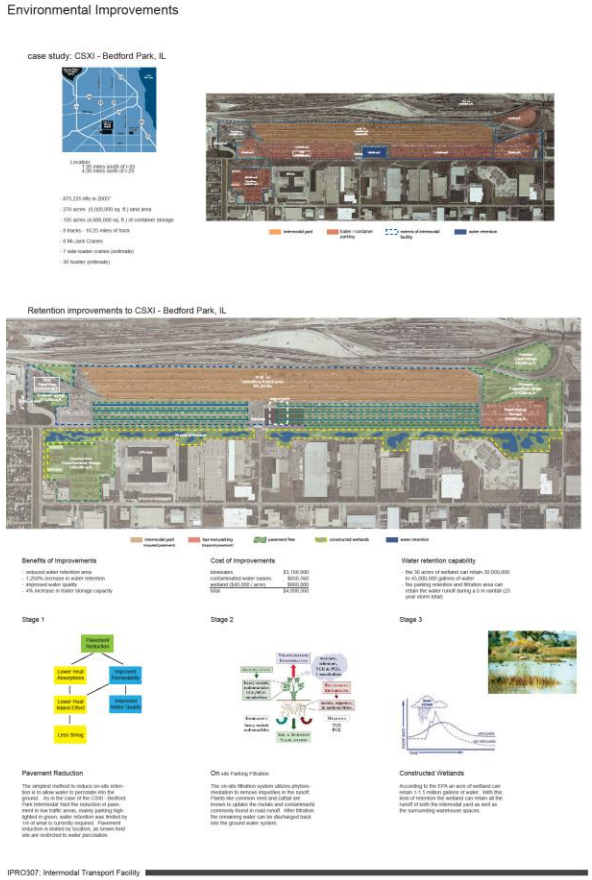


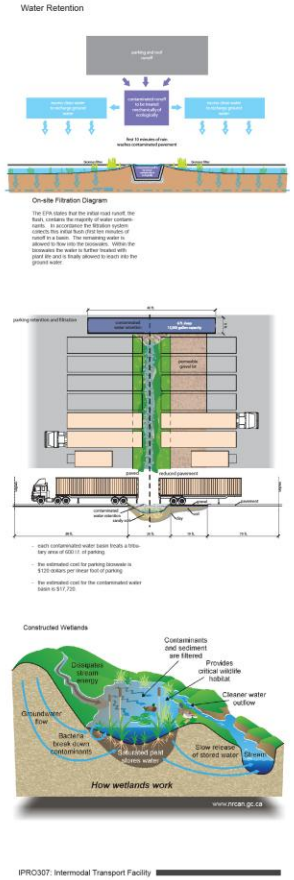


- Zero excavation-no dirt is moved offsite due to possible contaminations
- Energy reducing features including wind power, skylights and light sensors

Environmental Improvements

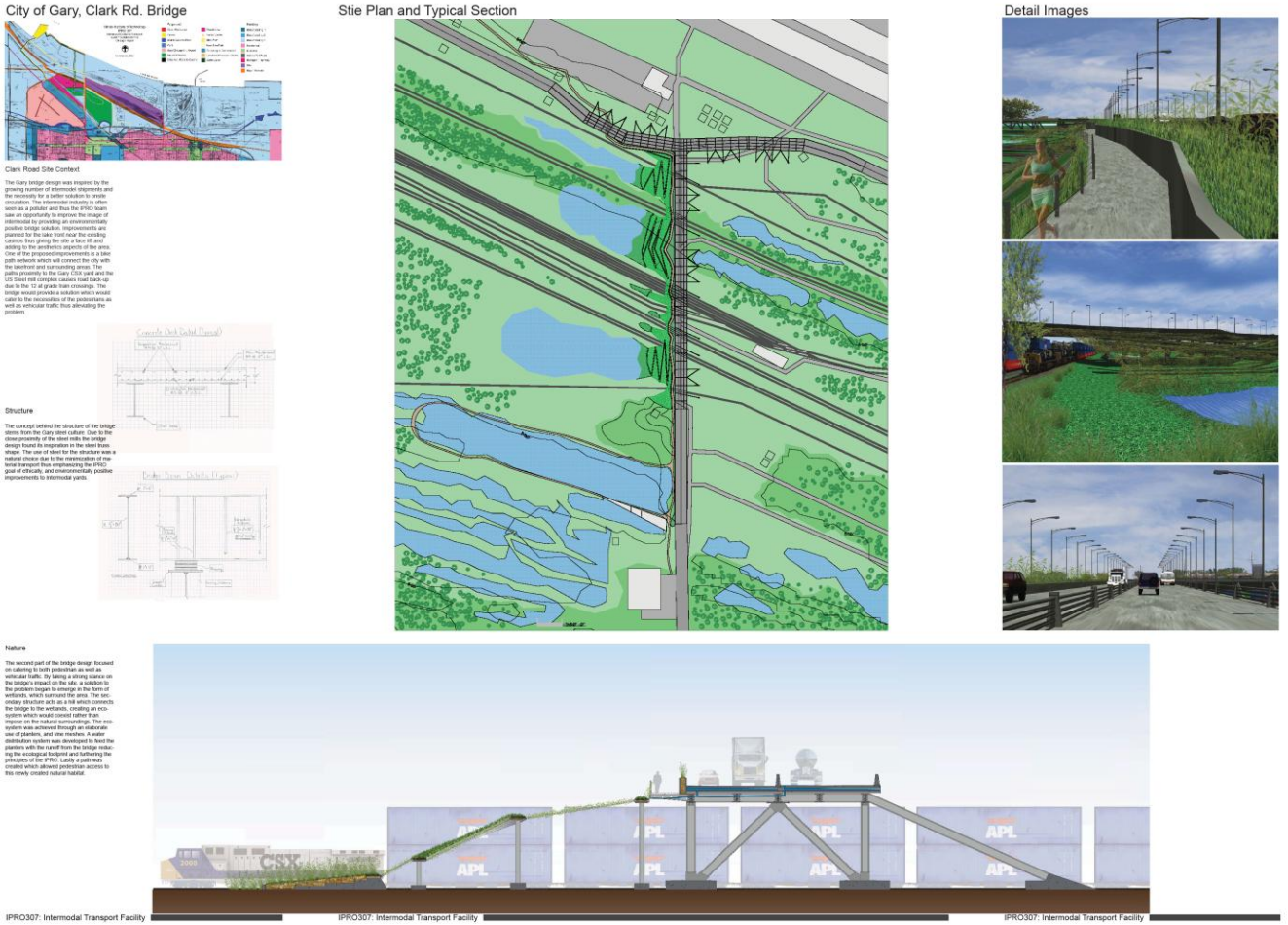






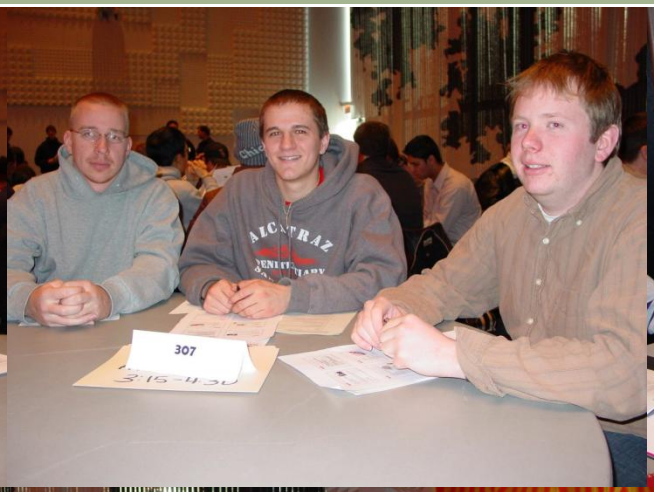
- Improved water retention
- Site specific improvements
- Improvements in air quality based on current standards

Bridge Design



- Meets needs of people and cars
- Two sided concept based design

The Team



The Team

- Buildout
  - Matthew Allen
  - Renee Bartosik
  - Anthony Carfang
  - Arnold Ibardaloza
  - Joseph Russell
- Warehouse Design
  - Daniel Fuentes
  - Matt Schulz
  - Jac Selinsky
- Bridge Design
  - Lukas Janulis
  - Marek Wisniewski
- Environmental Improvements
  - Algirdas Bielskus
  - Sebastian Jaromin
  - Ryan Maas
- Website
  - Matthew Allen
- Other
  - Tom Lis
- Advisors
  - Laurence Rohter- PE IIT
  - Peter Mirabella- MiJack

End Products

- Posters
- Website http://omega.cs.iit.edu/~intermodal
- Technical Presentations
  - Chuck Allen-Norfolk Southern Rail Road
  - John Bosca-Riverdale
  - Jim Kvaderas-Canadian National

Recommendations

- Investigate more into alternate energy including solar power
- Dynamic braking solutions
- Full brown site development
- More research to further improve warehouse design