Project Plan

IPRO 307:

Finding Uses for Alternative Fuels in Intermodal Transportation Hubs

September 11, 2009

Team Charter

I. Team Information

	Name	Contact	Major	Strengths, Needs/Expectations
1	Konstantin Balakirev	kbalakir@iit.edu [redacted]	CAEE	Architectural engineering. To gain an experience in working on a project.
2	Ryan Beau-Luby	rbeaulu@iit.edu	CAEE	Team orientated and good time management. Would like to get good engineering experience and learn more about railroad systems.
3	John Bouikidis	jbouikid@iit.edu	MMAE	Good team player. To obtain engineering design experience.
4	Matthew Cargill	mcargill@iit.edu [redacted]	ARCH	Design, 3d modeling and image software. Improve communication skills and help in organizing group efforts.
5	David Dziuba	ddziuba@iit.edu [redacted]	ARCH	Architectural, video and image software. Hoping to improve my ability to work with people.
6	Matthew Kehoe	mkehoe@iit.edu	CSCI	Communication and computer skills. Learn more about Intermodal Transportation and learn a new skill.
7	Bryan Slonski	bslonski@iit.edu	ARCH	AutoCAD and design skills. Learn about Intermodal Transportation and achieve goal as a group.
8	Melat Tesfaye	mtesfaye@iit.edu	BMED	Research, responsible, organized and works well with people. Learn about intermodal transportation and achieve the goals we have set for this project as a group and hopefully, satisfy our sponsors.
9	Matthew Wiese	mwiese@iit.edu	CSCI	Good time management. To be challenged, stay focused and works effectively with the group to accomplish goals.
10	Christopher Wiseman	cwiseman@iit.edu	CHBE	Team and time management skills. Achieving goals as a group.
11	Joel Zook	zookjoe@iit.edu	ARCH	Works well with teams, responsible, leadership. To be challenged, stay focused and works effectively with the group to accomplish goals.

Advisor:
Laurence Rohter

Our team colors are pink, red, grey and blue: the pink and red represent the love that is within our hearts for intermodal transportation and the things it allows us as consumers, the grey represents our current cloudy understanding of the topic, and blue represents our clear and enlightened destination. Our motto is "We're all in this together," referring to our collective enthusiasm and admiration we have for our tasks.

II. Team Purpose and Objectives

Chicago is the third largest intermodal freight hub in the world. Joliet, being so close, makes a great place as a depot to intercept much of Chicago's goods, it is also far enough away to avoid further congestion in the city. Currently one hub exists in Joliet (Elwood BNSF), another is being developed (Centerpoint), and one is being proposed off of Lorenzo road. Our sponsor, Mi-Jack, has asked us to come up with solutions to make these freight hubs more efficient.

Objectives:

- Define what an Intermodal Facility is, give examples
- Define consumption at an Intermodal Facility- data specific or estimated
- Perform simulations to compare the operations of a Wide Span Gantry terminal with or without Pathfinders
- Analyze what can be adapted for alternative fuel usage
- Determine pros/cons of alternative fuel usage (identity tradeoffs and win/wins)
    - Environmental
    - Financial
    - Legal

III. Background

Intermodal freight is the movement of containers and trailers by rail, truck or water carriers is the fastest growing segment of the US freight rail industry. It stands as one of the most utilized ways to transport large shipments of cargo across the country. The movement of goods plays a crucial role in the US economy; $29 billion worth of goods travel on the nation's transportation network on an average day. Moreover, freight shipments are growing, as domestic freight movement is expected to increase 90% by 2020. Studies have shown that national infrastructure has not kept up pace with the growing freight demand. Urban freight is a particular concern, as the high population density of cities creates high demand for goods in a confined space to deliver them. (Miodonski, Daniel)

Most of this intermodal traffic is moved in containers. As mentioned above, Chicago is the third largest intermodal port in the world and as a result, there are currently 19 intermodal yards in the Chicago region. These 19 intermodal yards allow for approximately 700 miles of loading and unloading tracks over 2200 acres of land. Unfortunately, these intermodal yards often waste space and provide an influx of traffic to the surrounding area. As a result, intermodal yards can be inefficient, costing money to both rail road and trucking companies. Instead of trying to expand the intermodal yards to allow for the increased amount of freight, the current approach is to make improvements to the intermodal yards that can optimize performance with low cost and positive environmental benefits.

IPRO 307 is sponsored by Mi-Jack Products based in Hazel Crest, IL (http://www.mi-jack.com). Mi-Jack Products is the largest manufacturer and operator of intermodal equipment and produces products that increase the efficiency of intermodal yards around the country. Because of the interest Mi-Jack Products have in the efficiency of intermodal yards, the company could benefit from proposals provided by IPRO 307 on improving the movement of containers within an intermodal freight facility. Ideally, our solutions will reduce business and societal costs, being more efficient generally reduces consumption therefore reducing costs.

Some ethical issues may include: The transformation of farmland and countryside into steel and concrete complexes spanning several square miles for the purpose of serving our growing consumer society, the streamlining of a process that makes it cheaper to buy food from Chile rather from within your town or city, the large amounts of "externalized" costs that happen within the production and shipping tons of goods around the country and the world.

IV. Team Values Statement

Desired Behaviors for group members include:

- Treat all other team members with respect.
- Be on time for class meetings. (3:15 Tues and Thurs)
- Come prepared to meetings.
- Present information either as PowerPoint presentation or in handout form.
- Provide updates weekly on their project tasks.
- Speaking loudly and clearly for all to hear.
- Clearly articulate goals and accomplishments
- Actively participate within the team.

If one fails to uphold these values and does not work up to their potential they will be called out on it. “We’re all in this together.”

Project Methodology

I. Work Breakdown Structure

1. *Define the problems:*

   Our foremost task is to immediately identify the broad scope of our project, finding out exactly what our sponsor wants for their pathfinder technology (since they just sent us an update on September 8th) and solidifying subgroups to implement this. Other major tasks include defining current techniques for intermodal facilities and transportation logistics at Joliet, and investigating alternative fuel types and applications for intra facility vehicles. We believe we can fulfill all these tasks if we make sure we stay organized and work to our potential.

2. *Team Structure:*

   Each meeting is run by a Meeting Leader, who was secretary at the prior meeting. At the beginning of each meeting, a secretary is appointed for the next meeting who will in turn become the meeting leader in two meetings time. The role of secretary rotates through so that each member of the group will have the chance to lead and take notes. The group will be divided into sub-groups with three major areas of focus.

   Major Tasks and Sub Tasks

   Define current techniques for intermodal facilities and transportation logistics at Joliet. (Bryan Slonski, Konstantin Balakirev, David Dziuba)

   i. Existing Facilities
   ii. Truck/Train/Barge/Pipeline
   iii. Intra facility transportation
   iv. Regulations

   Investigate alternative fuel types and applications. (Matt Cargill, Matt Kehoe, Melat Tesfaye, Chris Wiseman)

   i. Availability
   ii. On site Biodiesel reactor
   iii. Hydrogen (used in cranes)
   iv. Emissions and environmental effects
   v. Efficiency comparison
   vi. Laws, regulations, restrictions

MiJack- Pathfinder technology (Ryan Beau-Luby, Joel Zook, Matt Wiese)

3. Work Breakdown Structure

Task	Start Date	End Date	Team Members Needed	Hours Needed
Research Joliet	9/1/2009	9/10/2009	1	2
Project Plan	9/8/2009	9/22/2009	2	5
Research current techniques for intermodal facilities	9/15/2009	10/1/2009	3	8
Research alternative fuel types	9/15/2009	10/1/2009	4	7
Research MiJack- Pathfinder technology	9/8/2009	10/1/2009	3	6
Determine pros and cons	9/24/2009	10/1/2009	2	4
Midterm Review	9/22/2009	10/5-15/2009	3	6
Design intermodal system with graphics	10/8/2009	11/10/2009	3	7
Abstract/Brochure	11/17/2009	11/30/2009	1	3
Exhibit / Poster	11/17/2009	11/30/2009	2	4
Final Oral Presentation	11/17/2009	12/2/2009	3	10
Final Report	11/17/2009	12/4/2009	3	8
			Slack Time	20
Bold=IPRO Deliverable				
			Total Hours	214

II. Expected Results

a. Explain how the IPRO deliverable reports will be generated:

i. The deliverables will be assigned to teams and/or individuals. They will then be submitted to iGroups for peer review and final submission.

ii. Individual research and presentations will be prepared and presented at specific dates established by the group. They will be reviewed and discussed by the group as a whole.

iii. Assignments of deliverables will be decided by volunteers or the IPRO group as a whole.

III. Project Budget

Pizza for pre-IPRO day practice presentation:	$ 80.00
Drinks for pre-IPRO day practice presentation:	$ 20.00
Printing/Office Supplies	$ 100.00
Total:	$ 200.00

IV. Designation of roles

Current Team Members and Completed / In Progress Tasks

	Name	Tasks
1	Konstantin Balakirev	Environmental effects of alternative fuels, concepts for the new area
2	Ryan Beau-Luby	Diesel and Gasoline consumption in Chicagoland data
3	John Bouikidis	Information about center point
4	Matthew Cargill	Fuel data for Iowa 80 truck stop
5	David Dziuba	concepts for the new area
6	Matthew Kehoe	Hydrogen engine, Presentation on Bio-diesel
7	Bryan Slonski	Joliet Information, Information about center point
8	Melat Tesfaye	Alternative Fuels
9	Matthew Wiese	Mi-Jack Pathfinder
10	Christopher Wiseman	CNG ppt from last year, Presentation on Bio-diesel,
11	Joel Zook	Freight Villages, Surrounding Area Zoning

As stated above, assigned meeting role positions will be rotated through every member of the group each meeting session.

Assigned Meeting Roles:

- Minute Taker: Each meeting time the Minute Taker position rotates between IPRO team members.
- Agenda Maker: The Agenda Maker is assigned to the person who had taken minutes at the previous meeting and rotates between IPRO team members same as the Minute Taker.
- Time Keeper: This position is assumed by the Agenda Maker for the meeting they are running.
- Igroups Moderator: Individuals assigned to deliverables and other subtasks will be responsible for uploading their own work and/or research.