IPRO 307

INTERMODAL CONTAINER TRANSPORT SYSTEM SOLUTIONS FOR THE CHICAGO REGION

Team Members

John Allen
Sasha Bajzek
Aaron Davis
Anca Gruita
Jeremy Levin
Aaron Pollack
Izydor Radzik
Jessica Roth
Gabriel Williams
Bryan Woods

Faculty Advisor

Laurence Rohter, P.E.

OVERVIEW

IPRO 307 has followed the path of its predecessors in order to help improve the shipping transportations and facilities in the immediate region, specifically Crete, IL.

PROJECT OBJECTIVES

- To integrate high speed rail and intermodal freight systems
- To design a space in Crete, Illinois, that would support an intermodal freight rail yard that will undergo one million lifts per year
- To design a viaduct system that stacks and includes three different modes of transportation (high speed passenger rail, freight rail, and automobile highway)
- To incorporate these three preceding objectives in order to create a newer and more efficient mode of transporting and shipping using an ATMS system

ATMS

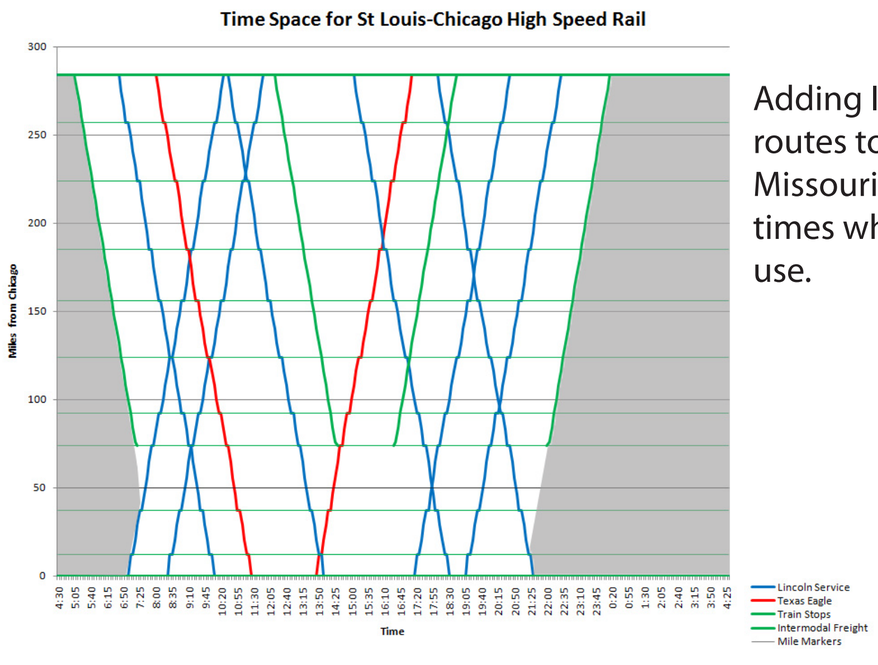
ATMS utilizes a crane that spans over 4 lanes of track. Lining the 4 lanes of track are container storage racks that stack 2 high like the trains. ATMS reduces inefficiencies in crane lifting by making sure each lift has a container. It reduces the footprint of unloading and storage areas for containers waiting to be picked up. It reduces confusion in finding your container to pick up and speeds up the process of dropping a new container off.

HIGH SPEED

Members:

John Allen (Arch. Engineer)
Jeremy Levin (Mech. Engineer)
Izydor Radzik (BME)

The high speed rail team determined, by use of the Davis Equation, that in order to move a 10,000 foot double-stacked intermodal train, 4 Acela Express Engines would be required.



Adding Intermodal Freight routes to Amtrak Illinois/ Missouri Corridor route at times when no trains are in use.

SITE DESIGN

Members:

Anca Gruita (Arch.)
Aaron Pollack (Arch.)
Gabriel Williams (Arch.)
Bryan Woods (Arch.)

Site Efficiency:

	Old Site Design	New Site Design
Site Size in Acres	1000 Acres	1000 Acres
Site Size in Million SqFt	43.5 Million SqFt	43.5 Million SqFt
Intermodal Area in Acres	300 Acres	86.8 Acres
Intermodal Area in Million SqFt	13 Million SqFt	3.75 Million SqFt
Total Building in Acres	137.75 Acres	220.5 Acres
Total Building in Million SqFt	6 Million SqFt	9.6 Million SqFt
Acres of Intermodal to one Acre of Building	2.17 Acres per building Acre	.39 Acres per building Acre

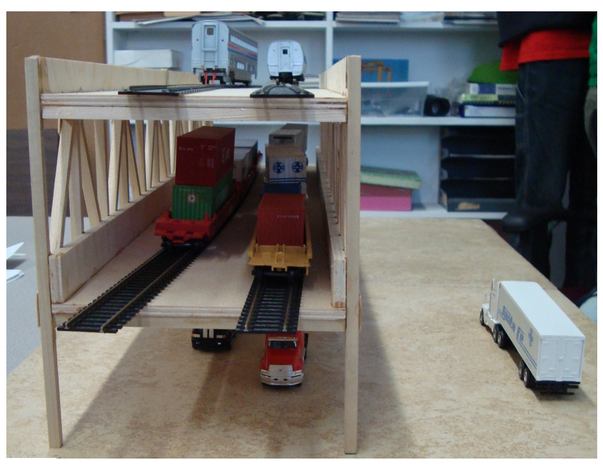
- The capacity of the intermodal area (in lifts per day) stays the same in both designs.
- The original design had little room for future alterations.
- The original design had no room for trucks on site to alleviate traffic isssues.
- The ratio of intermodal to building acres was made 5.5 times better.

VIADUCT DESIGN

Members:

Sasha Bajzek (Civil Engineer)
Aaron Davis (Mech. Engineer)
Jessica Roth (Civil Engineer)

Total Viaduct Cost Estimate:
$17,000,000.00



Chicago • St. Louis

Train Name	Lincoln Service	Lincoln Service	Texas Eagle	Lincoln Service	Lincoln Service
Train Number	301	303	21	305	307
Normal Days of Operation	Daily	Daily	Daily	Daily	Daily
On Board Service	R B	R B	R	R B	R B
Chicago, IL (CT) — Rockford, Madison—see back (Mile 0, Dp)	7 00A	8 25A	1 45P	5 15P	7 05P
Summit, IL (12)	7 10A	8 35A	1 55P	5 25P	7 15P
Joliet, IL (37)	7 30A	9 55A	2 15P	5 45P	7 35P
Dwight, IL (74)	7 55A	9 20A	2 40P	6 10P	8 00P
Pontiac, IL (92)	8 10A	9 35A	2 55P	6 25P	8 15P
Bloomington–Normal, IL — Davenport, Indianapolis—see back (124)	8 35A	10 00A	3 20P	6 50P	8 40P
Lincoln, IL (156)	9 00A	10 25A	3 45P	7 15P	9 05P
Springfield, IL (185)	9 20A	10 45A	4 05P	7 35P	9 25P
Carlinville, IL (224)	9 45A	11 10A	4 30P	8 00P	9 50P
Alton, IL (257)	10 10A	11 35A	4 55P	8 25P	10 15P
St. Louis, MO–Gateway Station (284, Ar)	10 25A	11 50A	5 10P	8 45P	10 30P

St. Louis • Chicago

Train Name	Lincoln Service	Texas Eagle	Lincoln Service	Lincoln Service	Lincoln Service
Train Number	300	22	302	304	306
Normal Days of Operation	Daily	Daily	Daily	Daily	Daily
On Board Service	R B	R	R B	R B	R B
St. Louis, MO–Gateway Station (Mile 0, Dp)	6 40A	8 00A	10 35A	3 05P	6 05P
Alton, IL (27)	7 00A	8 20A	10 55A	3 25P	6 25P
Carlinville, IL (60)	7 25A	8 45A	11 20A	3 55P	6 55P
Springfield, IL (99)	7 50A	9 10A	11 45A	4 15P	7 15P
Lincoln, IL (128)	8 10A	9 30A	12 05P	4 35P	7 35P
Bloomington–Normal, IL — Davenport, Indianapolis—see back (160)	8 35A	9 55A	12 30P	5 00P	8 00P
Pontiac, IL (192)	9 00A	10 20A	12 55P	5 25P	8 25P
Dwight, IL (210)	9 15A	10 35A	1 10P	5 40P	8 40P
Joliet, IL (247)	9 40A	11 00A	1 35P	6 05P	9 05P
Summit, IL (272)	10 00A	11 20A	1 55P	6 25P	9 25P
Chicago, IL (CT) — Rockford, Madison—see back (284, Ar)	10 05A	11 25A	2 00P	6 30P	9 30P

St. Louis • Dwight

Train Number	308	310
Normal Days of Operation	Daily	Daily
St. Louis, MO–Gateway Station (Mile 0, Dp)	5 05A	12 15P
Dwight, IL (210, Ar)	7 20A	2 30P

Dwight • St. Louis

Train Number	309	311
Normal Days of Operation	Daily	Daily
Dwight, IL (Mile 0, Dp)	4 30P	10 00P
St. Louis, MO–Gateway Station (210, Ar)	6 45P	12 10A

A SPECIAL THANKS TO

- The Entire IPRO Team
- Mi-Jack Products, Inc.

IPRO It takes a team!
INTERPROFESSIONAL PROJECTS PROGRAM

ILLINOIS INSTITUTE OF TECHNOLOGY