



# South to North Indiana Rail Potential

Indiana Center for Coal Technology Research

Thomas F. Brady, Ph.D.  
Purdue University North Central

September 6, 2007



# Agenda

- ☀ Project 1 Review
- ☀ Project 2 Proposal



# A Prescriptive Analysis of the Indiana Coal Transportation Infrastructure

## ☀ Project Rationale

- ☀ Use Indiana coal for economic development

## ☀ Issues

- ☀ Technology – Coal composition
- ☀ Infrastructure
  - Indiana has the coal
  - Indiana is at the center of the national rail infrastructure
  - Does Indiana have the rail infrastructure to support coal movement?

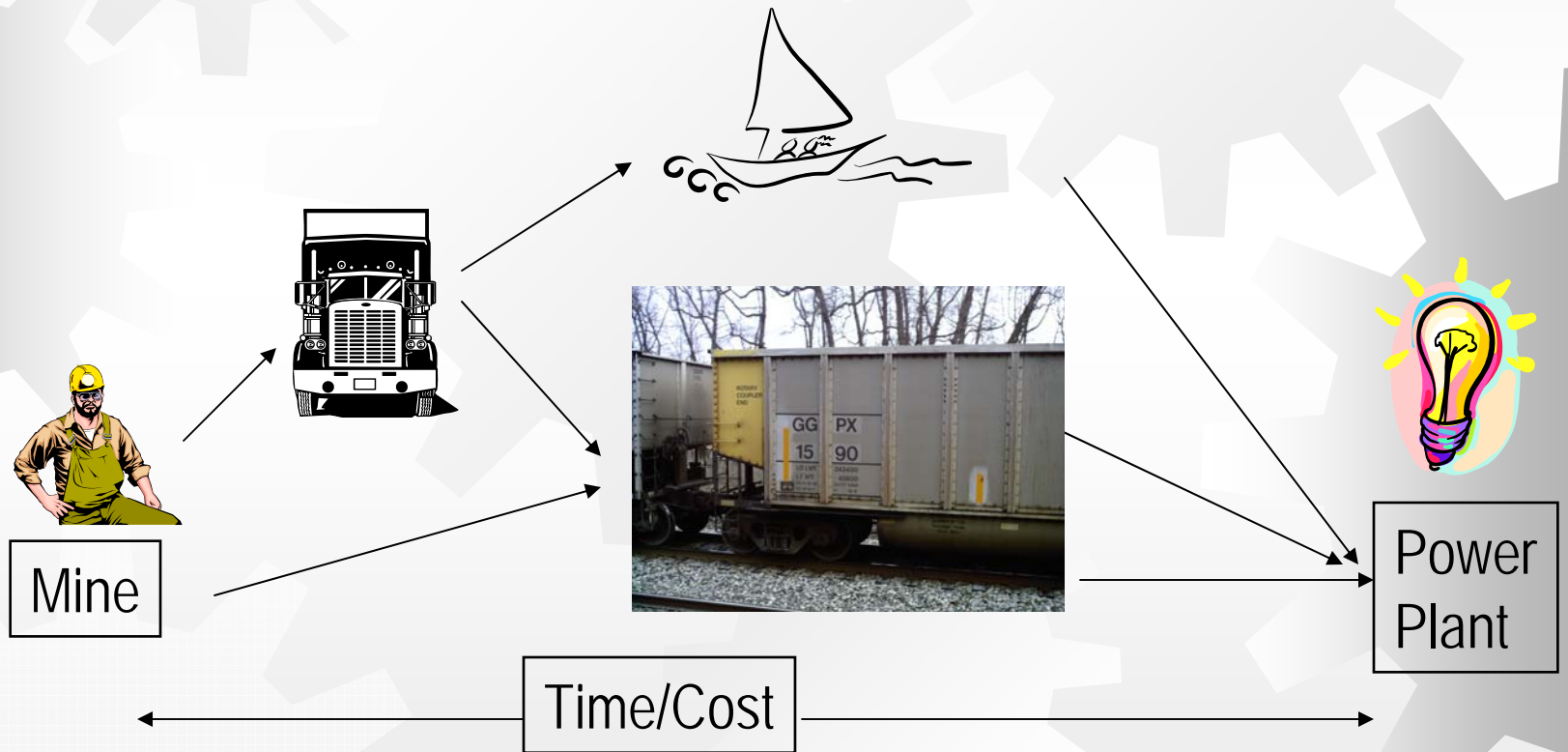
## ☀ Final Report issued May 2007



# Project Tasks

- ☀ Characterize the demand and supply states of Indiana coal usage
- ☀ Characterize the transport methods of Indiana coal supply and demand
- ☀ Develop a simulated environment of Indiana coal supply and demand
- ☀ Develop a set of transportation infrastructure improvements to address bottlenecks in current Indiana coal Transportation Network
- ☀ Develop a Return on Investment Methodology and simple Portfolio Optimization Model

# Infrastructure Supply Chain Concept



# Modeling Process

- ☀ Develop a Scenario
  - ✳ Source, Destination, Rate
- ☀ Overlay the route using timetable information from 10 by 10
- ☀ Determine performance metrics
- ☀ Experiment
  - ✳ Set parameters
  - ✳ Model generates long run expected performance estimates
  - ✳ Iterate

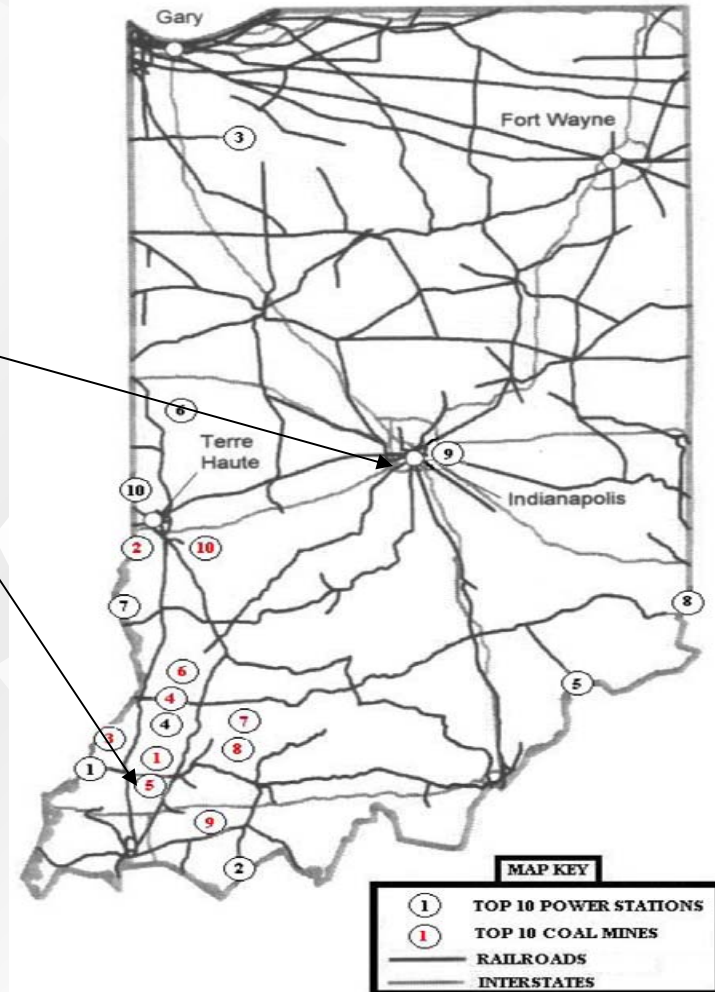
# Model Architecture

INDIANA COAL RAILROAD TIMETABLE: ROUTE 2

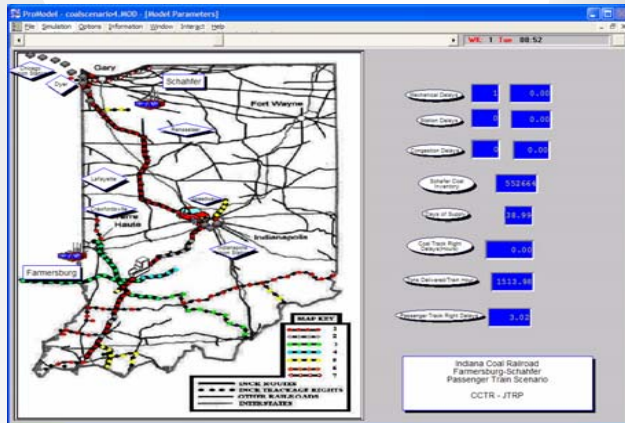
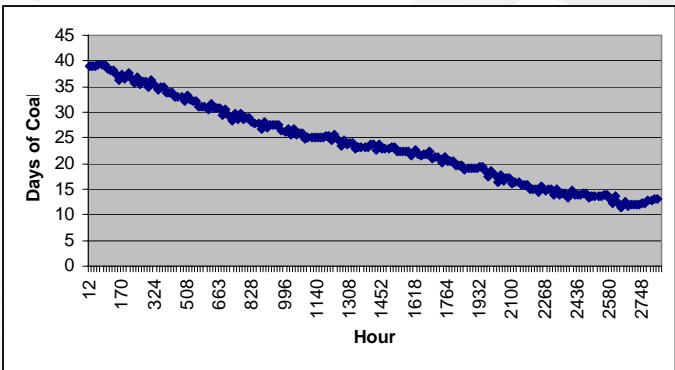
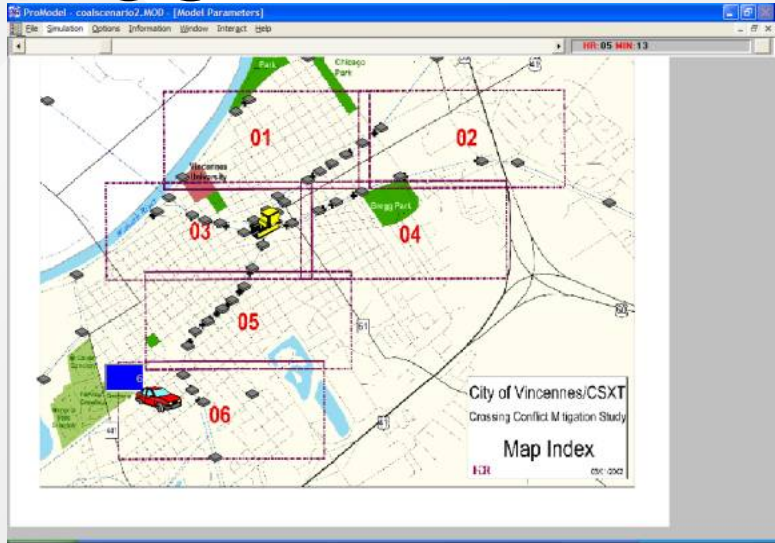
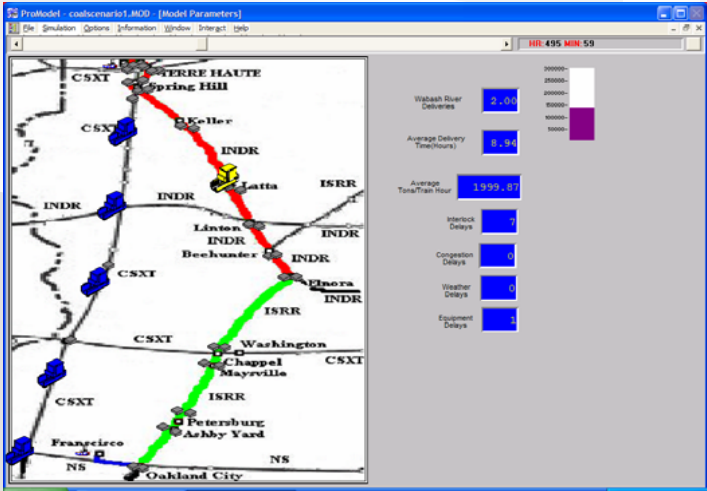
STATION NAME	MILE POST	OWNER	TRACK			NOTATION	INTERLOCKS
			NUMBER	CLASS	SPEED		
READ DOWNWARD FOR SOUTHBOUND							
CP HOLT	172.5	IN, INCR	1	1	10	T	1, CIND, CSXT
MOORESVILLE	185.0	INCR	1	2	25		
MARTINSVILLE	199.0	INCR	1	2	25		
WHITAKER	209.0	INCR	1	2	25	P	
SPENCER	221.5	INCR	1	2	25		
WORTHINGTON	240.5	INCR	1	2	25	P, Y	
SWITZ CITY	247.5	INCR	1	2	25	A	3
BEEHUNTER	254.5	INCR	1	1	40	A	4, 6
ELNORA	260.5	INCR	1	1	40	A	5
CHAPPEL	279.5	INCR	1	2	25	M	CSXT
PETERSBURG	296.5	INCR	1	2	25		
ASHBY YARD	298.0	INCR	1	2	25	B, E, Y	
OAKLAND CITY	308.5	INCR	1	2	25	A	NS
GRAY JCT	309.5	INCR	1	2	25		
BUCKSKIN	317.5	INCR	1	2	25	T	7
STRAIGHT LINE JCT	337.5	CSXT, INCR	1	2	25		
BETWEEN STRAIGHT LINE JCT AND WANSFORD YARD CSXT TIMETABLE GOVERNS.							
WANSFORD YARD	338.0	CSXT	1	1	10	Y	CSXT
READ UPWARD FOR NORTHBOUND							

SOURCE: Comprehensive Railroad Atlas of North America, compiled by Chad Pfitzer

Parameter	Type	Location
Speed Factor		
Weather Factor		
Mechanical Delay		
Congestion Delay		
Station Delay		
Train Length		
Car Size		
Days of Supply		



# Scenarios



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# Project 1 Conclusions

- ☀ This project was defined as a scoping study to:
  - ☀ Demonstrate ‘proof of concept’ for simulation analysis of rail infrastructure
  - ☀ Build awareness of the transportation aspect of the coal economy



# Project 1: The Future

- ☀ Widen the scope to examine import and export rail entry points and routes
- ☀ Develop an in-depth scenario with CCTR partner
- ☀ Develop/Analyze more scenarios
- ☀ Expand the optimization model(Task 5) to the entire 10X10
- ☀ Expand to include all coal consumption(Steel Industry)

# Project 2 Plan

- ☀ A 2 year comprehensive project examining the movement of Indiana coal
  - ✳ NiSource
  - ✳ INDOT/Energy Office
  - ✳ Congressman Joe Donnelly
- ☀ Main Objectives
  - ✳ Expand Scope of Project 1
    - ✳ From IN coal to IN Power Plants to IN coal to IN export sites(Ports, rail carriers) & industries(steel)
  - ✳ Expand Modeling Details of Project 1



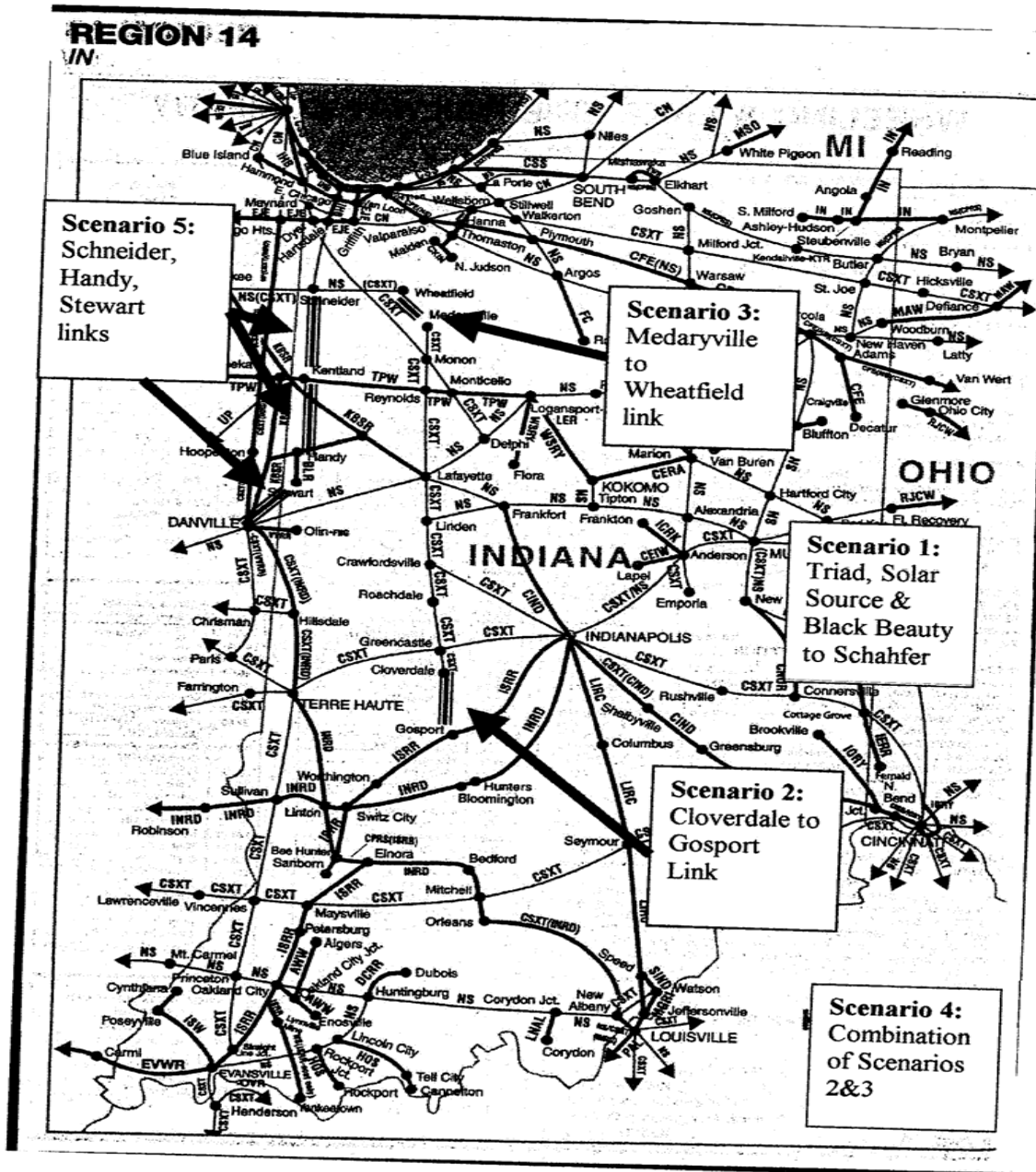
# Project 2 Plan

- Phase I: Detailed Scenario Modeling
- Phase II: “Wicked Problem” definition
- Phase III: Scenario Modeling



# Phase I: Nisource Schahfer

- ☀ Indiana coal sourcing
- ☀ Hypothetical infrastructure investment



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# Phase II: “Wicked Problems”\*

- ☀ “Wicked Problem” characteristics

- ☀ No definitive formulation
- ☀ No agreed-upon solution criteria
- ☀ Definition determines the solution

- ☀ Phase II activity

- ☀ Develop formulation
- ☀ Develop performance criteria

\*Harmon, Mayer 1986



# Phase III: “Wicked Problem” Modeling

- ☀ South to North coal movement
  - ☀ Southern coal to Port of Indiana
  - ☀ Southern coal to steel mills
  - ☀ Southern coal to North Power Plants(Nisource)
- ☀ Intermodal Corridors?