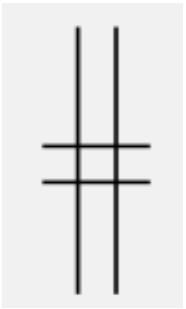
ARGO NEW PATHS TO PROFIT/ABILITY

Value Analysis Case Study: Rail Road Turnout Process & Greenfield Facility

2012 Canadian Society of Value Analysis (CSVA) Conference

What is a Turnout?

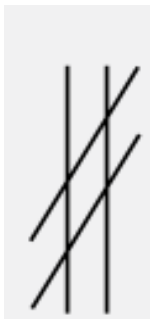
Turnouts are constructed in a manufacturing facility in order to achieve the required high tolerances.



Straight Crossing

Left Hand Turnout

Right Hand Turnout

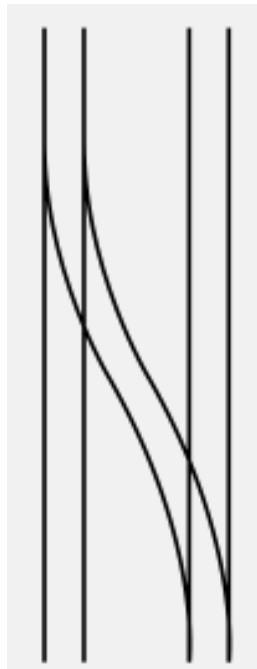


Frog Crossing Under 30°

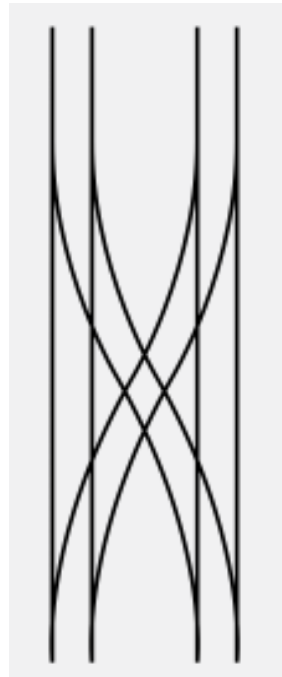
Equilateral Turnout

Three-way Turnout

Right Hand Crossover



Left Hand Crossover

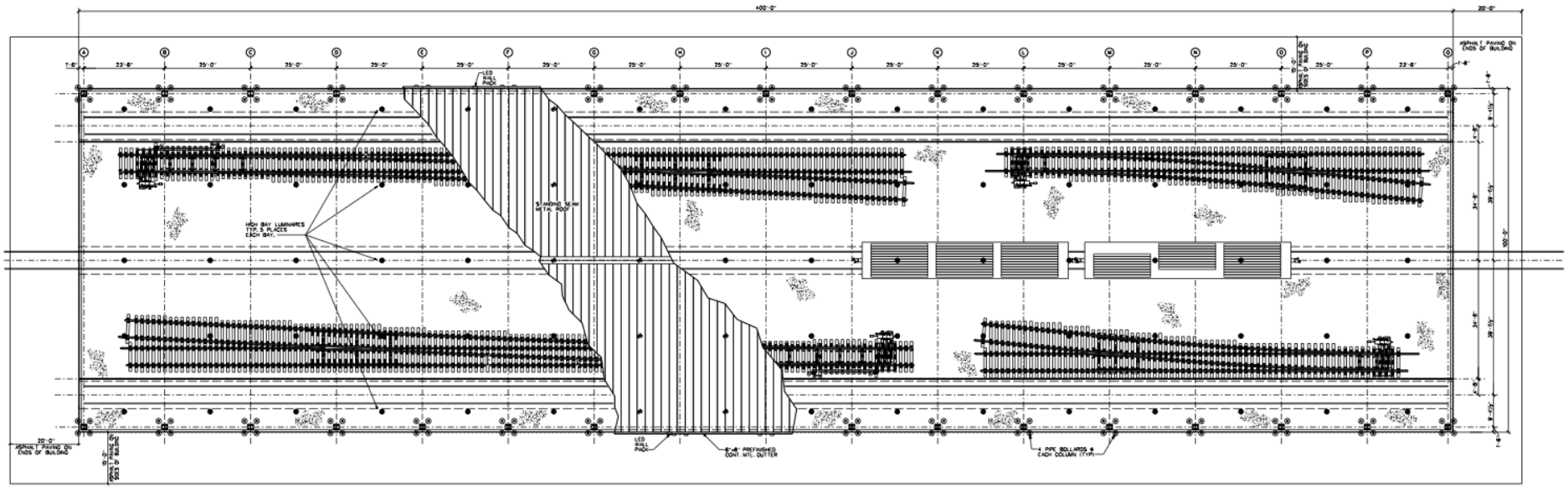


Double Crossover

What is a Frog?

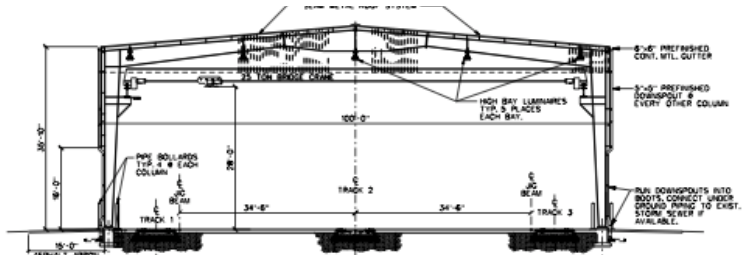
Setting the Stage

Planned Design



TURNOUT BLDG. FLOOR PLAN

Mfg. Facility ~50,000 Square Feet
Overhead Crane
Three Through Tracks



BUILDING SECTION

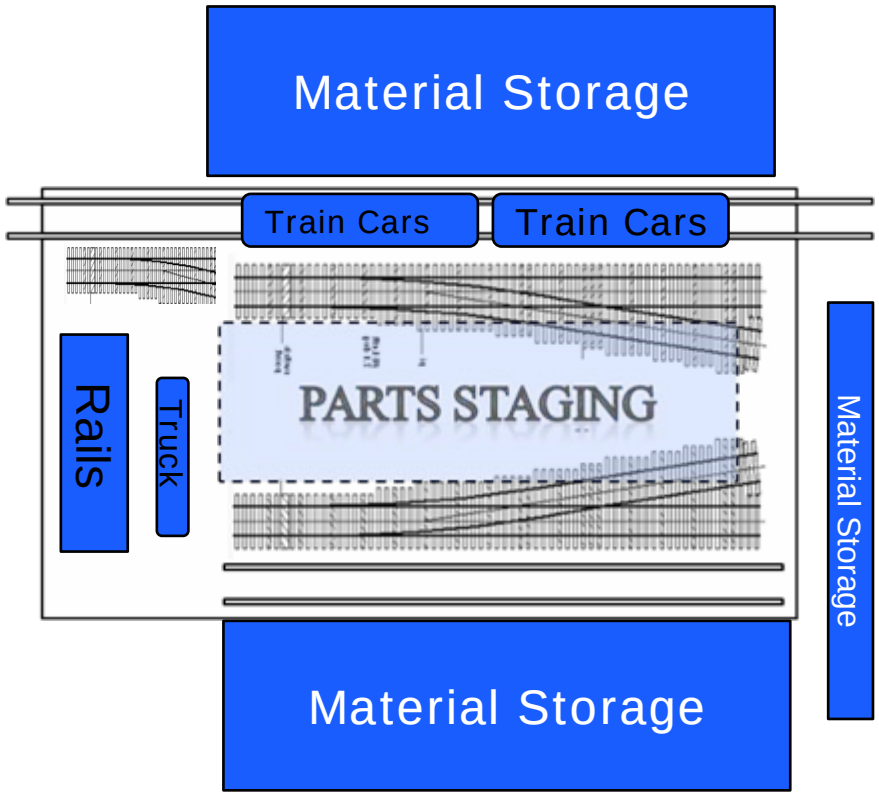
Project Objectives

Three project objectives were to:

1. Assess existing turnout manufacturing sites
2. Create potential future state scenarios
3. Propose options to save CapEx

Turnout Facility

Current turnout process is a known process in the railroad industry but it is inefficient with safety and ergonomic issues.



Approach – Job Plan

- Information
- Function
- Creative
- Evaluate
- Development
- Presentation

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Approach

A key to the success of this project was to view it from both an Opex and Capex point of view.

OpEx		CapEx
• Often overlooked • Operating costs exceed capex costs	VS.	• Initial investment • Important because it requires cash flow now

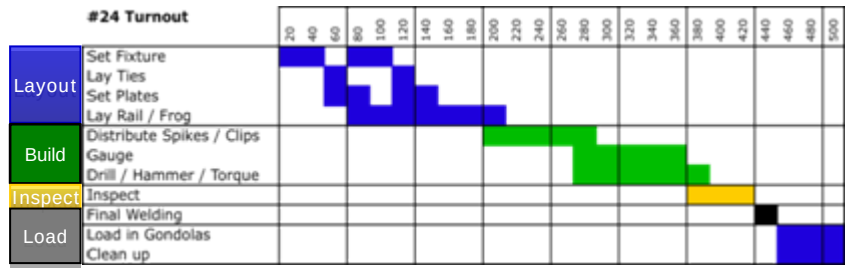
Synergies of Taking into Account Both

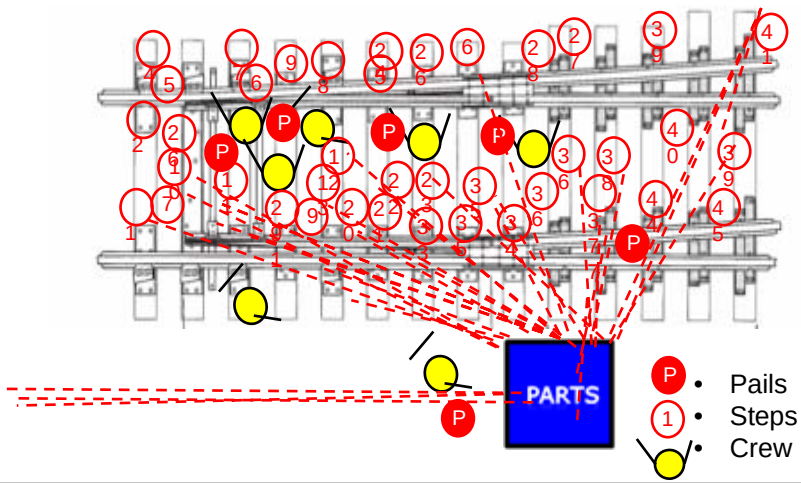
- Capital investments are solid & current cash flow is utilized effectively
- Operational expenses in the long-term are minimized

Industrial Engineering Studies

A series of industrial engineering studies was performed.

- Material Flow
- Process Steps
- Cycle Time vs. Takt Time
- Process Layout
- Process Build
- Current Assembly Practices
- Parts Preparation/ Presentation
- Tool Preparation/ Presentation
- Ergonomics
- Safety





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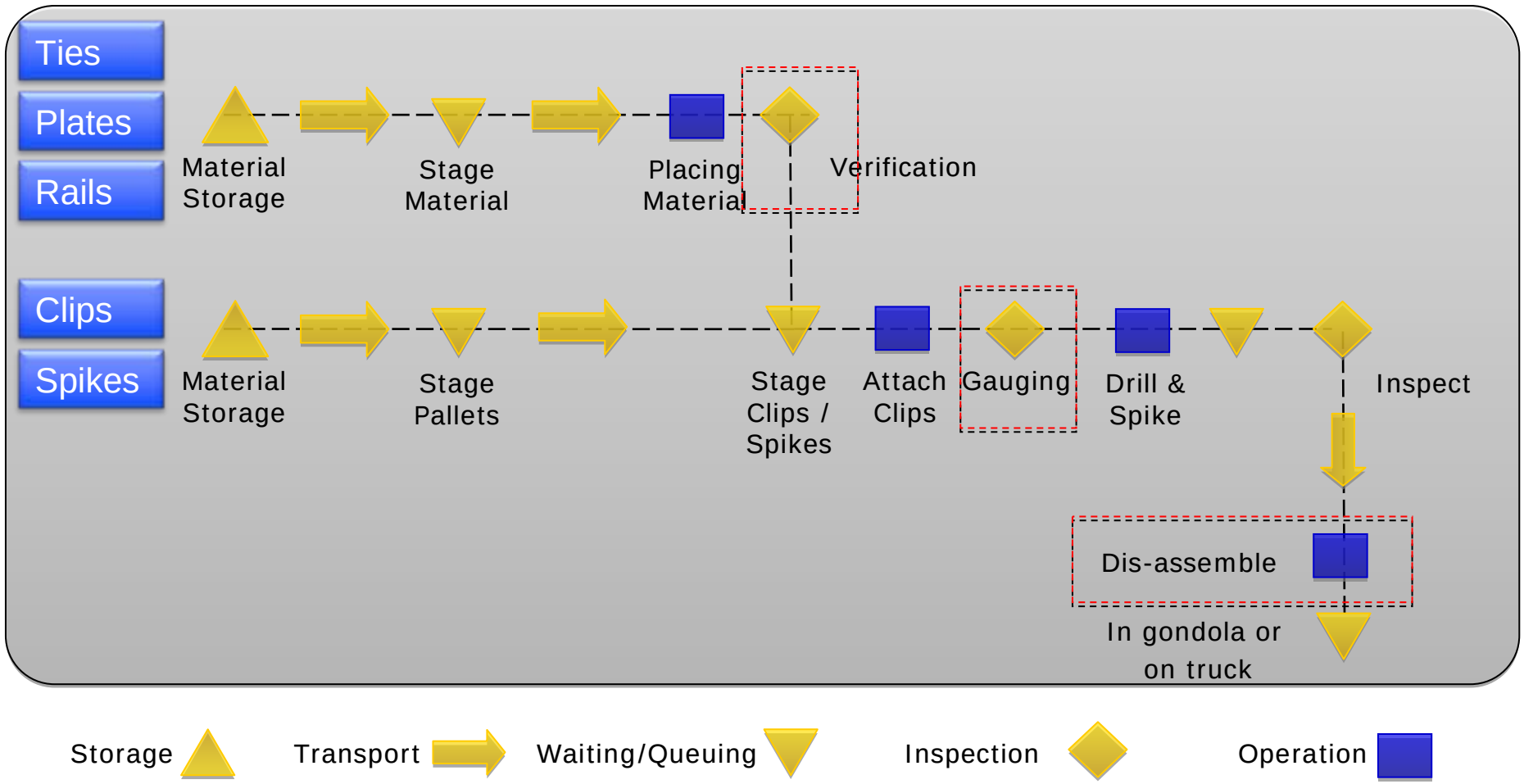
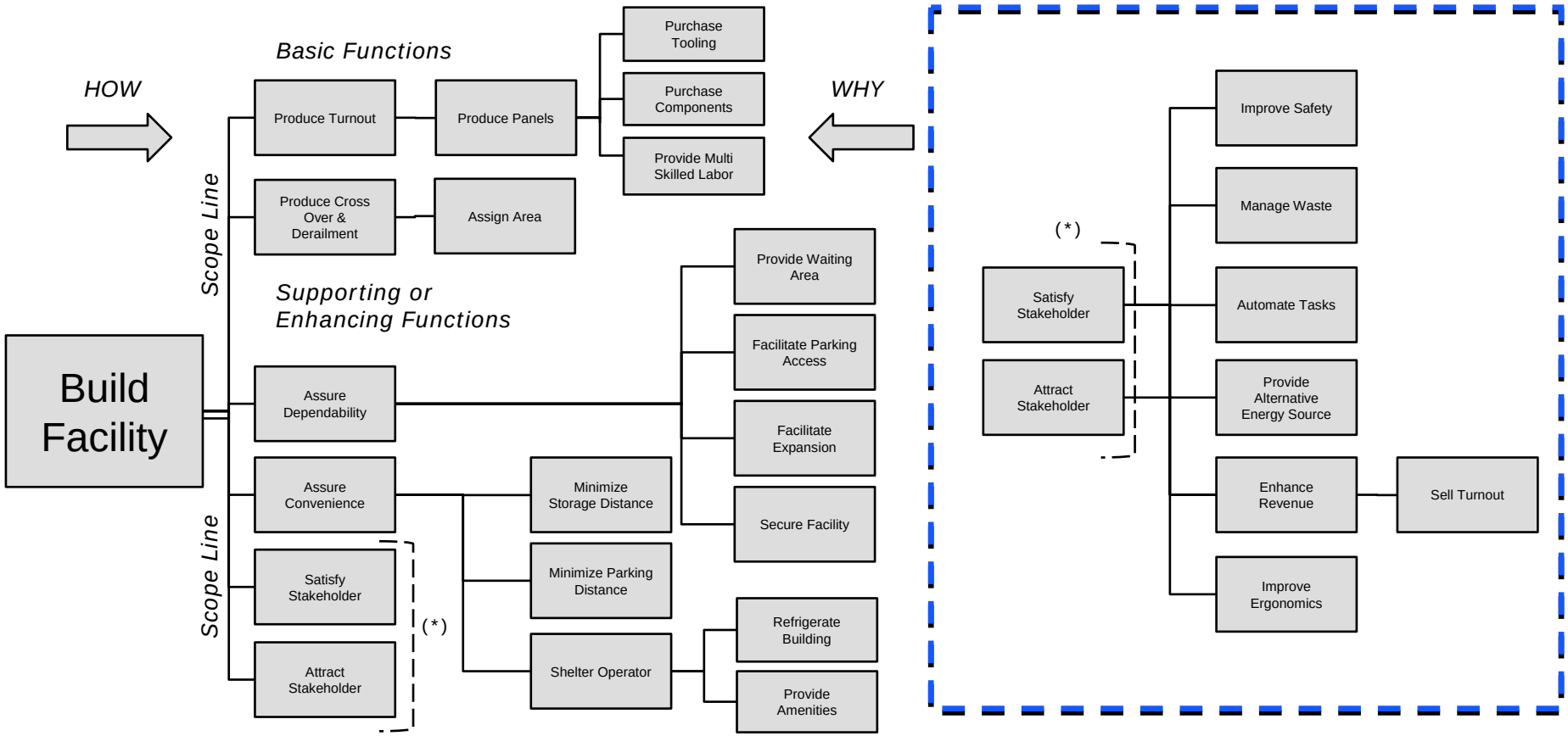
Turnout Assembly Process

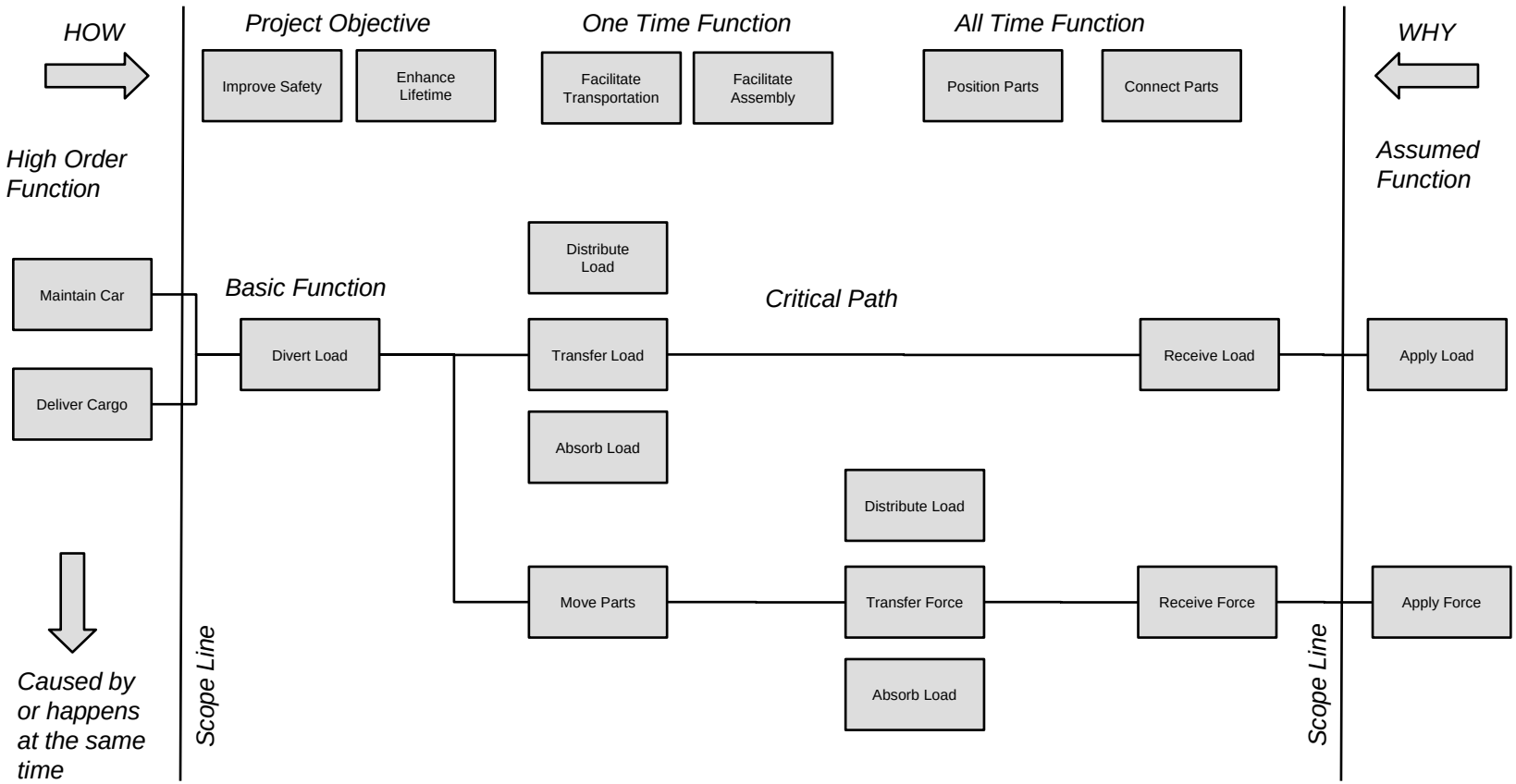


Crane Move to Gondola

Customer FAST Diagram



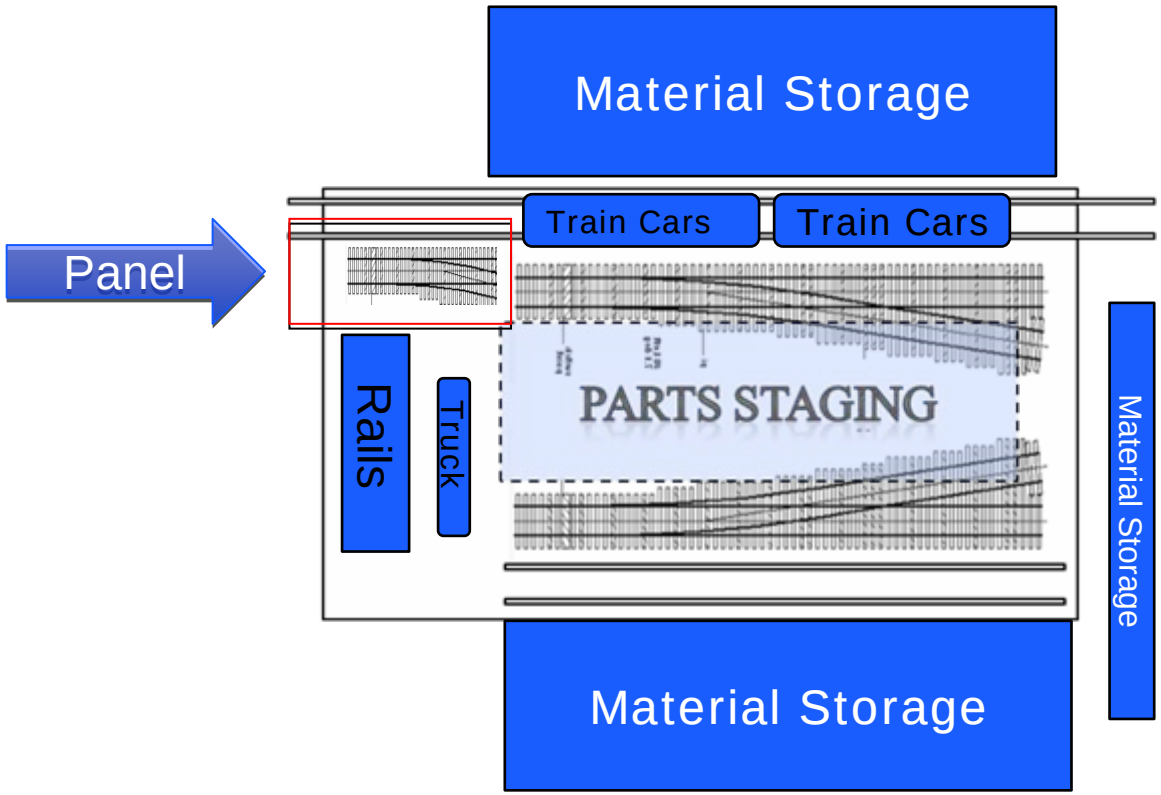
Technical FAST



Value Mismatches

VI=Function Cost/Worth	Vi=Function Cost/Worth	Value=Function/Cost
Function: Connect Parts	Function: Connect Parts	Function: Produce Parts
Pre-plated ties vs. MOA	Welded Plates vs. Castings	~ Units/26 workers vs. 21 workers

Turnout Process- Before

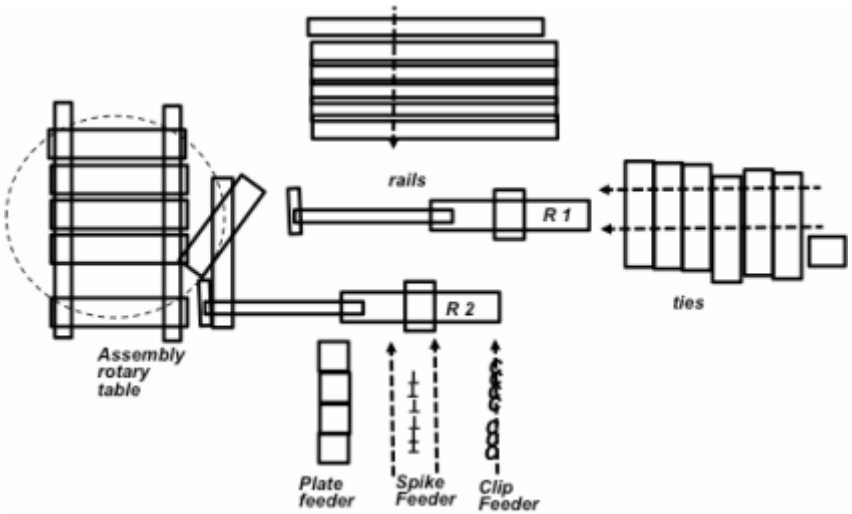


Panel – Aha Moment

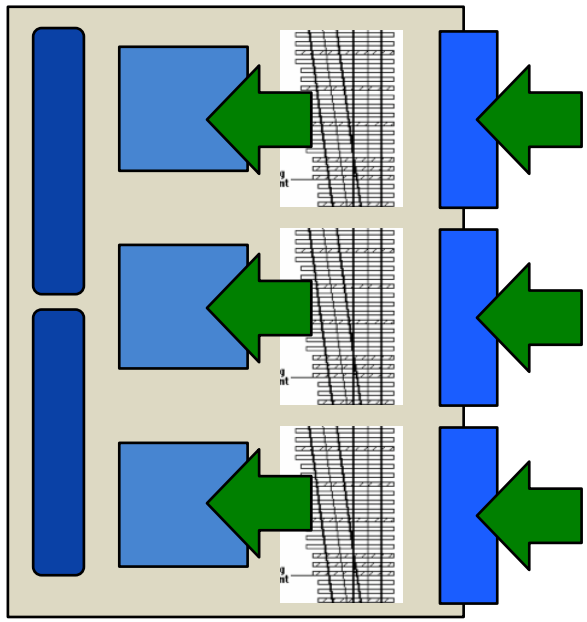
Function:
Facilitate
Transportation

Turnout Process- Ideas

(6) Fully Automated Assembly



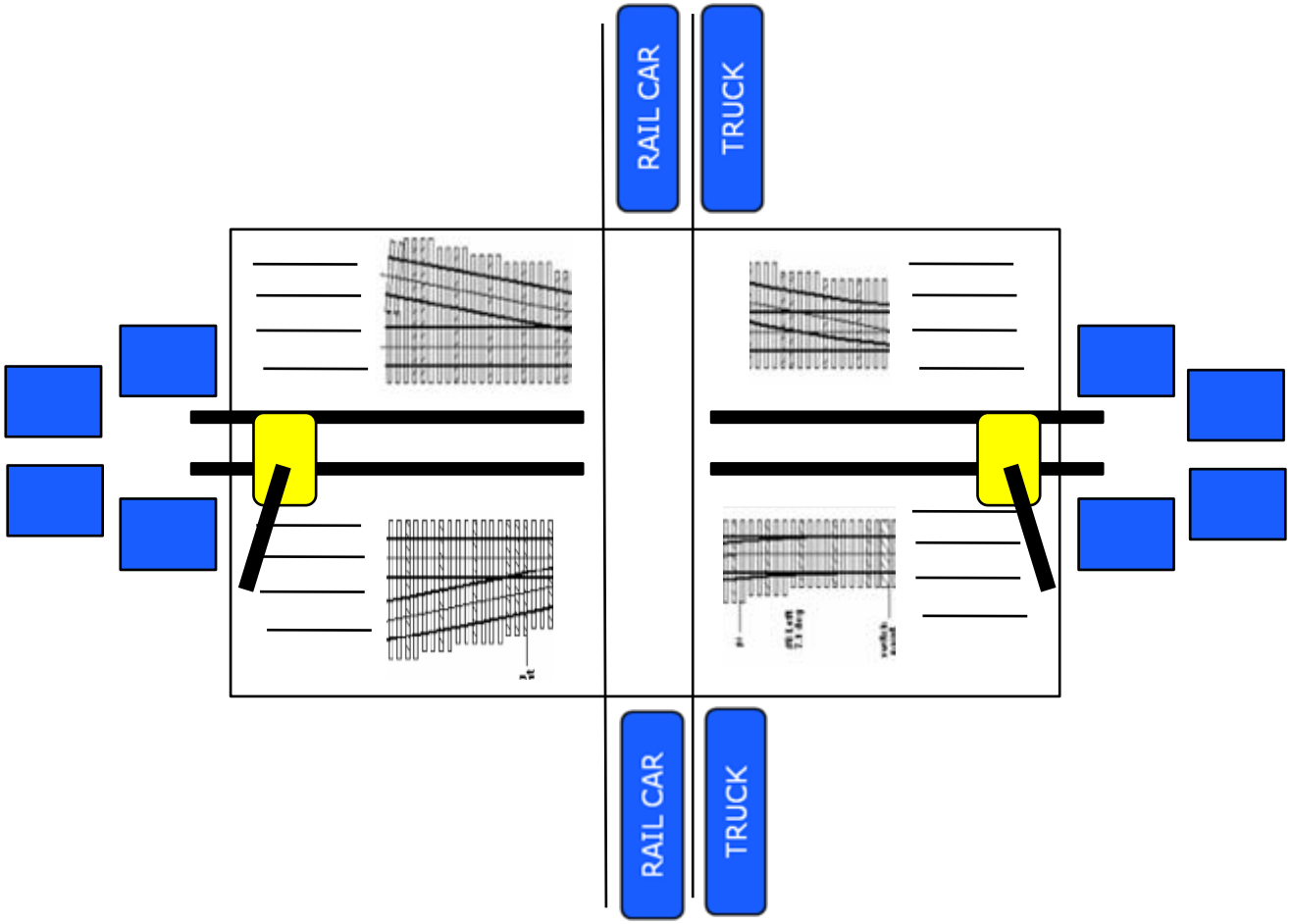
(3) Moveable Panel Assy



Selection Matrix

Parameter	Definition	Weight
Safety	• Potential hazards (fork lift, crane, operator area, traffic flow, etc.)	9
Ergonomics	• Easy for operator	8
Automation	• Degree of automation vs labor	2
Foot Print	• Area to be used compared to other facilities	5
Scaleability	• Being able to adjust to changes in demand	6
Material Flow	• From raw material to finished good (number of touches)	5
Aux. Equipment	• Equipments (outside automation) added to the process	6
Inventory	• Additional RM, WIP and FG	3

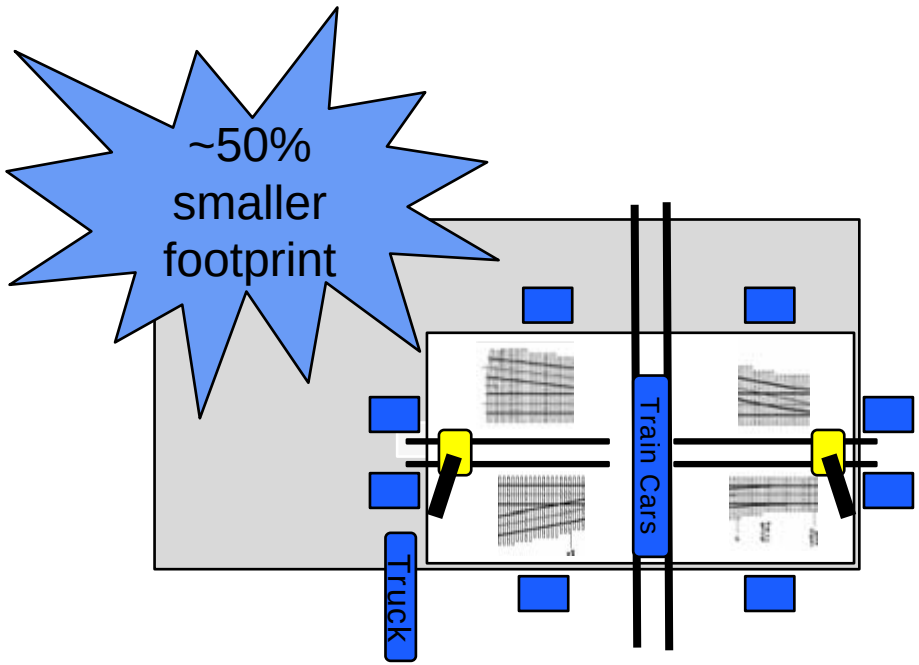
Turnout Process- After



Quantifiable Benefits

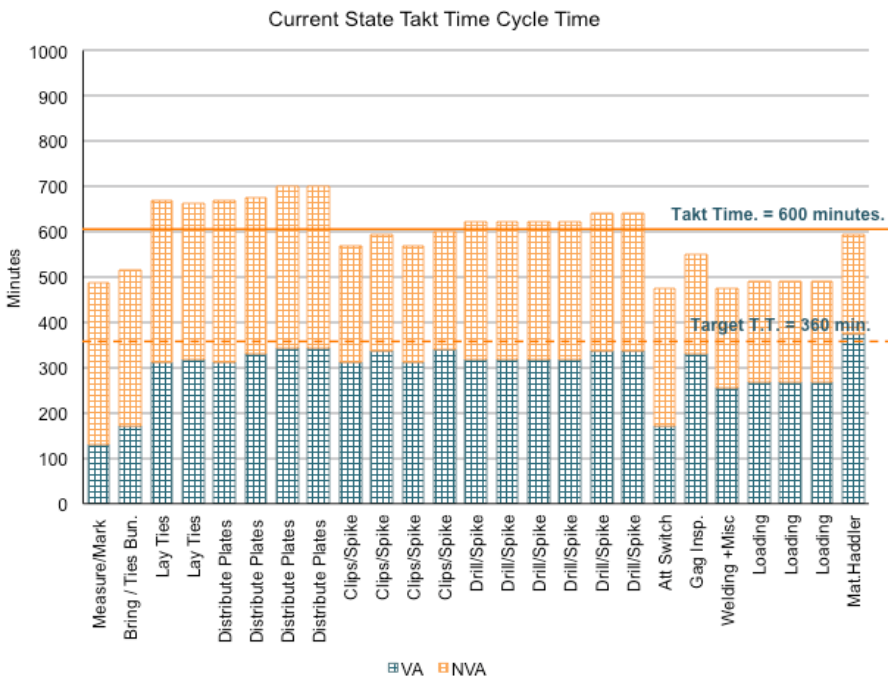
Benefits

- Increased Flexibility
- Reduced Lead Time
- Reduced Footprint
- Improved Safety
- Reduced Op Ex and Cap Ex

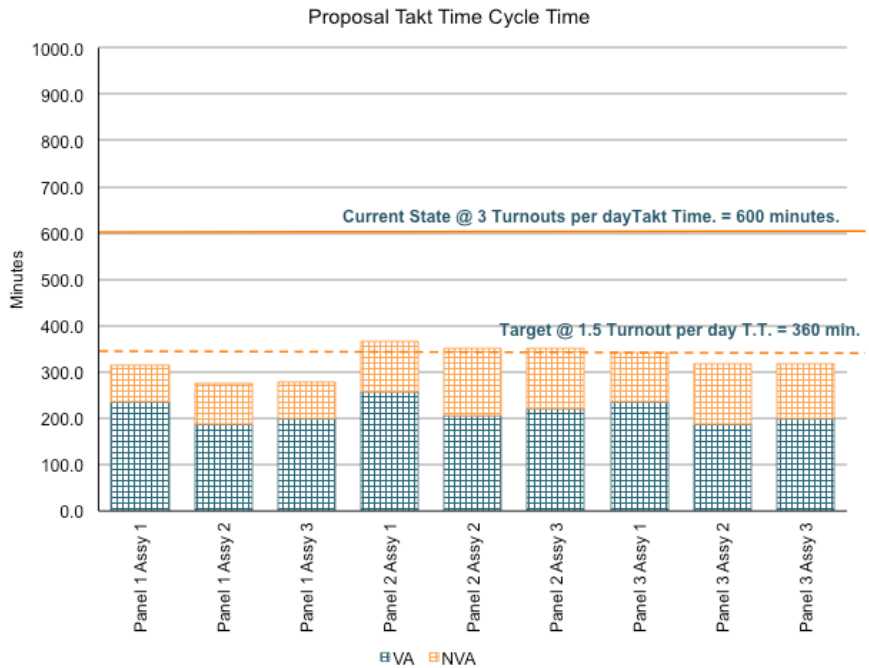


Quantifiable Benefits

~ 26 FTEs



~ 9-12 FTEs*



* Loaders not shown on this graph

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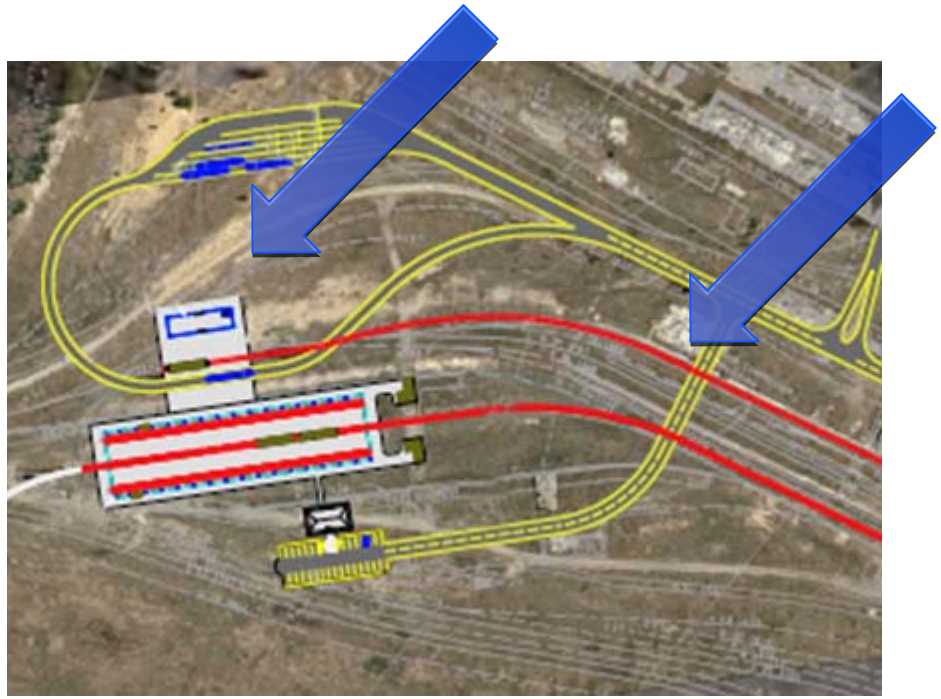
Quantifiable Benefits

- Office and Locker Room can be adjacent to manufacturing facility
- Employees and suppliers will not have to cross rail roads tracks
- Materials can be stored closer to the manufacturing site
- *End users had input into their new facility*



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