

# *Championing the Inevitable Transformation in Materials Movement*

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MAKE YOUR BUSINESS  
 **FUTUREPROOF.**



## The WHAT?

- “*The Inevitable Transformation in Materials Movement*”
  - Safety and Increasing Costs are driving change
    - Why?
      - **Worker injury claims are highest cost to manufacturers**
        - » Cost affects Profitability
        - » Reduced Profitability affects Growth
        - » Inability to scale growth can KILL company performance
        - » **Poor financial results mean jobs lost.** Including C-Suite.
        - » Companies are making changes.

## How to Begin?

Each facility must have a **Champion to Manage the Change**

**Question: Can YOU be that Champion?**

- **Identify Opportunities**
- **Prepare for the Change**
- **Develop Plan for Change**
- **Implement the Change**
- **Evaluate Ongoing Results**

## Identify Opportunities: **Safety**

**#1 Cost in Manufacturing is Workplace Injuries**

Top Contributor: Fork Truck Use in High Foot Traffic Areas



## Identify Opportunities: **Safety**

Select the Low-hanging Fruit:

According to the U.S. Department of Labor, **95 million people miss work each year due to on-the-job injury** — and warehousing tops the list of dangerous occupations.

- The average work-related injury leads to \$38,000 in direct expenses and \$150,000 in indirect costs. This means that a single injury could cost your business a total of **\$188,000**.
- **20,000 workers** are injured in forklift accidents alone each year
- That's a total cost of **\$3.76 Billion due to ForkLift Accident Costs**

source: [Thelma Marshall](#), *TotalTrax*, posted April 25, 2017

Identify Opportunities: **Safety**

## Let's focus on limiting this costly RISK!

**YOU** can be the Champion. Here's How:

### Gather Data

- Forklift Accident Costs (previous slide)
- Your Company History of Forklift Accident Costs
- Numbers of Forklifts in Your Facilities
- Estimated Costs of Operating Your Forklifts
  - Cost of Each Forklift (purchase)
  - Cost of Maintenance
  - Cost of Manpower to Operate
  - Hours of Forklift Use Per Day

Identify Opportunities: **Safety**

## Cost Calculations (using Forklifts):

**TOTALS**

### PAST COSTS

History of Forklift Accidents Reported (Total # reported x \$188,000) = \$ \_\_\_\_\_

### PRESENT COSTS

A) Numbers of Forklifts in Your Facilities \_\_\_\_\_

Estimated Costs of Operating Your Forklifts

B) Cost of Each Forklift (avg. purchase) \_\_\_\_\_ x \$ \_\_\_\_\_ = \$ \_\_\_\_\_

plus C) Cost of Maintenance (each, annually) \_\_\_\_\_ x \$ \_\_\_\_\_ = \$ \_\_\_\_\_

plus D) Hours of Forklift Use Per Day \_\_\_\_\_ x (# units) = \_\_\_\_\_ hours

plus E) Cost of Manpower to Use each day (AxD+E) x 365 days/year = \$ \_\_\_\_\_

Total Annual Costs to Operate Forklifts (E+C+(B cost avg year) = \$ \_\_\_\_\_

Identify Opportunities: **Safety**

## Cost Calculations (using Tugger Trains):

Tugger and Tugger Train Costs:

- A) Tugger Cost: (1 Tugger per train x Cost each) \$ \_\_\_\_\_
- B) Train Cart Costs (Avg. \$ per cart x # of Carts) \$ \_\_\_\_\_  
 Identify # of Carts needed to replace forklift trips \_\_\_\_\_ carts
- Mother/Daughter Carts Avg. Cost per M/D Cart \$ \_\_\_\_\_  
or Tongue & Hitch Carts Avg. Cost per T&H Cart \$ \_\_\_\_\_
- C) Other:
  - Forklift Cost (if needed at line w/T&H) \$ \_\_\_\_\_
  - Forklift Operator Cost if needed using T&H) \$ \_\_\_\_\_
- D) Annual Maintenance Costs of Tugger and Trains \$ \_\_\_\_\_
- E) Manpower Costs of Tugger Train Operators \$ \_\_\_\_\_  
 (# of Operators x Trains needed)
  
- TOTAL Costs for Tugger and Train Operations \$ \_\_\_\_\_



Identify Opportunities: **Safety**

## Other Operational Costs

- Mother/Daughter vs. Tongue & Hitch
  - Type of Mother/Daughter
    - mechanical vs. hydraulic or pneumatic
      - Lift assist by air or pressure
      - Tugger needs for lift assist units
  - Lineside assistance (forklift), if needed

Identify Opportunities: **Safety**

## Make your Decision

- Mother/Daughter should quickly rise as the most effective way to deliver materials lineside.
- Repurpose forklift operators to Supermarket/Loading or Unloading use at docks and storage areas or as tugger operators, or eliminate unneeded manpower.

# Prepare for the Change

## Identify and Assess the Key Stakeholders

- Share Data or present to applicable leadership
- Outline strategy with plant managers
- Outline other Data needed to design change
- Get buy-in from plant personnel

## Agree on Degree of Risk and Cost of the Change

- Manage the Culture
- Manage the Resistance

# Develop Plan for Change

## Gather other baseline data

PFEP – Plan For Every Part

(descriptions, part classifications, quantities used, dimensions, lineside locations, storage locations, loading/holding areas, etc.

Data provides details to develop delivery strategy:

Replenishment Rates

Standard Routes (Plant Layout, Train Traffic Patterns)

Delivery Methods (Kitting, Sequencing, Bulk)

and more...

## Develop Plan for Change

### Calculate Direct Labor Savings

Spaghetti Diagrams (observe activity)

Reduce steps in current processes and NVAA (non-value added activity)

- Including Kitting material
- Including box preparation, dunnage/packing removal

Sequencing Material

- Planning the sequences of delivery according to a Master Schedule

### Plant Layout

Reduce lineside inventory

Reduce Inventory DOH (Days on Hand)

- Push materials back to Super Market or Warehouse
- Push SM or WH materials back to supplier
- Order less material more frequently to free up space

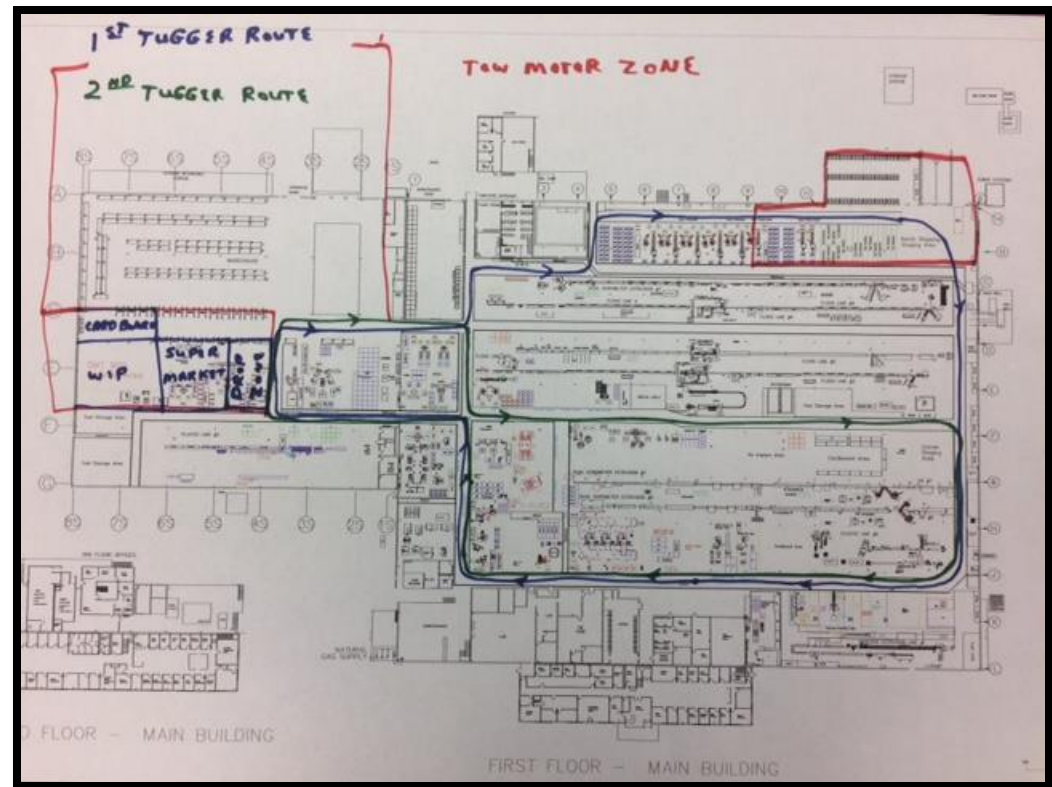
## Samples from the field

### Required Criteria

- Plant Layout changes to ensure efficient material flow
- Must have a Supermarket location and a Finished Good drop zone.
- Point of use flow racks on cells. (Parts flow in toward operator, and return out)
- PFEP for Supermarket Development.
- Route design, must include one way traffic
- Implementation plan.
- Work with corporate logistics to offload forklifts to other plants.

## Sample Plant Layout Changes/ Route Design

- Supermarket location is nearest receiving.
- Drop Zone is shipping
- Tugger route promotes 1 way traffic
- Foundation is developed to improve material flow and open up floor space for future business.



# Sample PFEP Document / Super Market Design

- Who will manage the PFEP document?
- Changes to the PFEP must be agreed upon by Production Control, Operations, Continuous Improvement.
- New Launches must have this data so the part can be added to the Super Market.
- Single Data element columns allows plants to analyze the data however they feel valuable.
- Goal is to reduce DOH on incoming components.

PFEP Data Elements	PFEP Data Elements
Part Number	1 Part Weight
Description	Total Package Weight
Daily Usage	Container Length
Usage Locations	Container Width
Storage Location	Container Height
Delivery Frequency	Usage per Assembly
Supplier	Hourly Usage
Supplier City	Standard Container Quantity
Supplier State	Containers per hour used
Supplier Country	Shipment Size ( In days) ( 1 week= 5 Days)
Container Type	Carrier
Container Weight	Number of Bins in Loop



## Sample Tugger System Cost Justification

Objective	Current	Projected	Improvement	Savings
Fork Lift Lease	\$54,648	\$53,348	3%	\$1,300
Fork Lift Repair	\$6,000	\$4,286	28%	\$1,714
Fork Lifts	7	5	28%	
DL Efficiency	5% +	9 DL		\$450,000
Fork Lift Related Incidents	3			
Ergo Related incident	17			

**Total Savings:\$453,014**

## Sample Tugger System Cost Analysis



Cart Type	Count
Daughter Carts	110
Mother Carts	12
Raymond 8610 Tugger	2

### Target loop pitch – 30 minutes

- Tugger 1 (Blue Route)
- Tugger 2 (Green Route)

**Total Cost: 137,400**

## Sample Implementation Plan

#	Opportunity	Action	Responsibility	Initial Completion Due Date	Actual Completion Date	Status	Comments
1	C520 and U553 QDS need to be moved to old breakroom location	Look at moving these machines to the old breakroom location. Workcells need to be designed with proper flow for incoming parts as well as outgoing finished goods.				🟡	
2	Create PFEP document for purchased components	Complete provided PFEP document template. This will help determine the space required for purchased components.				🟢	
3	Design Supermarket layout for current and future business	With space provided develop a layout that allows for proper FIFO of purchased parts. Goal would be to have flat storage and flow racks. See provided photos. Provide a space for overflow components. Be mindful of how the space flows for the tigger. Provide space for new business.				🟢	
4	Implement supermarket layout	Ensure that product has a defined location in the supermarket. This will be the only location that the product is stored. Anything that is deemed excess belongs in an overflow location.				🟡	
5	Design and implement finished goods drop zone	Identify all package variations. Set up area to store containers inside. This space will be used to transfer material from daughter carts to warehouse racking. It also will be the area where containers will be cleaned out, dried off, and prepared for the floor.				🟡	
6	Move Cardboard storage	Move cardboard storage location to old PPG rack locations.				🟡	
7	Open up location for extrusion WIP.	Disposition / re-locate obsolete machines in old 900 area. This will be the location for extrusion WIP.				🟡	
8	D2LC / E2LB finished goods need relocated.	Relocate FG to main warehouse where all other FG are stored.				🟡	
9	Machine and WIP moves in D2LC	Move hood to grill and hood to cover D2LC machines to current WIP storage area. Move WIP to Forklift zone.				🟡	
10	Carrier staging area needs to be relocated	Relocate carrier staging area to forklift zone near D2LC				🟡	
11	Relocate recycable scrap	Move scrap to forklift zone near D2LC				🟡	
12						🟢	

# Implement the Change

## BE THE CHAMPION!

Develop the Master Plan and Master Schedule

Consider “lessons learned” from customers:

- Implement in one “test” area – work out the bugs

- Have a Supermarket or at least a materials loading area

- Design aisle width for satisfactory train operations (8 ft. or larger)

# Evaluate Ongoing Results

Obtain new DATA after 6 months

Share with Key Stakeholders

Share with lineside operators and management

Celebrate your Success!

## Additional Information

PFEP Template (samples slide)

Cost Justification Template (samples slide)

## ***For More Information:***

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