



**Location**  
70 acres facility located in the industrial park in Lawton, Oklahoma.

**Product**  
Paper products to make gypsum wallboard, shopping bags, boxes and other industrial and consumer products.

**Market**  
Over 70 facilities across 21 states. Serves customers in Canada, United States, and Mexico.

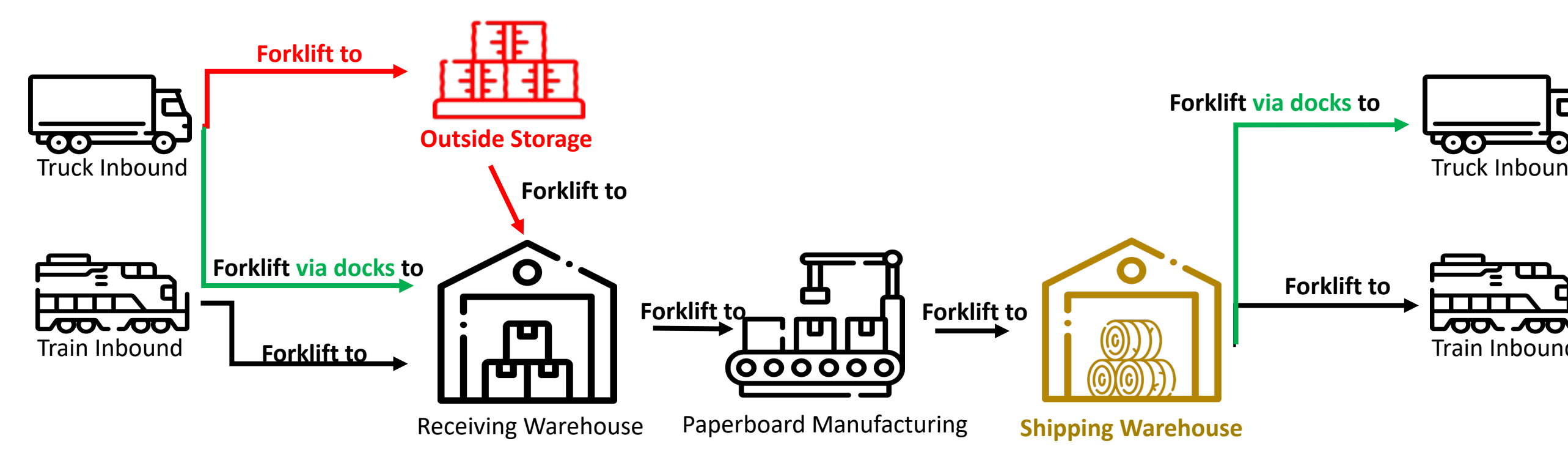
**Parent Company**  
Is a subsidiary company to Eagle Materials Inc. (NYSE: EXP).

### Problem Statement

The Republic paper mill operation encounters significant inefficiencies in inventory management, material flow, and handling of raw materials and finished goods

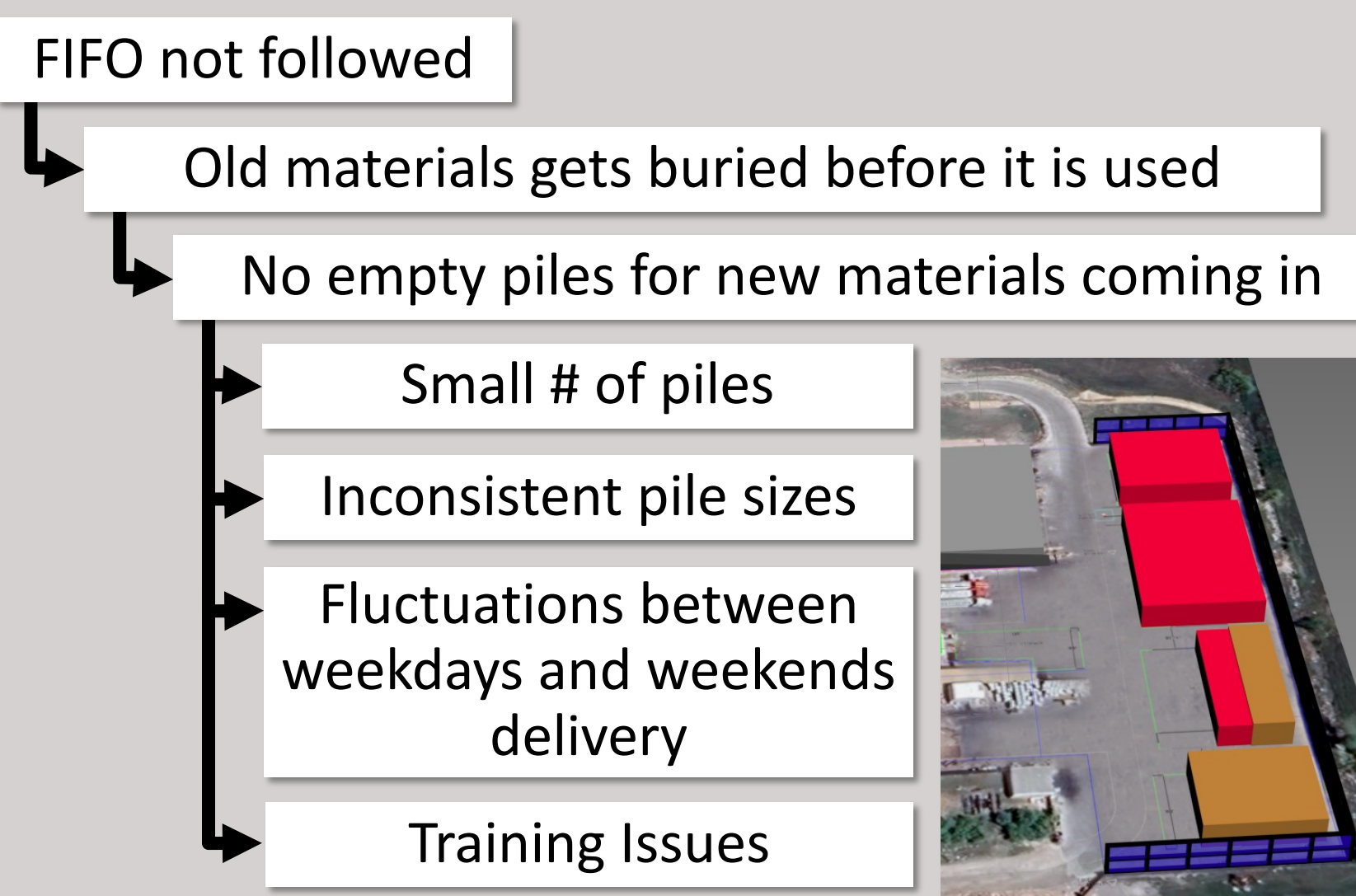
- Outside raw materials:** FIFO not followed as receiving is faster than consumption with the current layout
- Finished goods materials:** Overflowing warehouse causing operational inefficiencies
- Inoperable shipping dock:** Lost shipping capacity

### Current System Model



## Outdoor Raw Material Layout

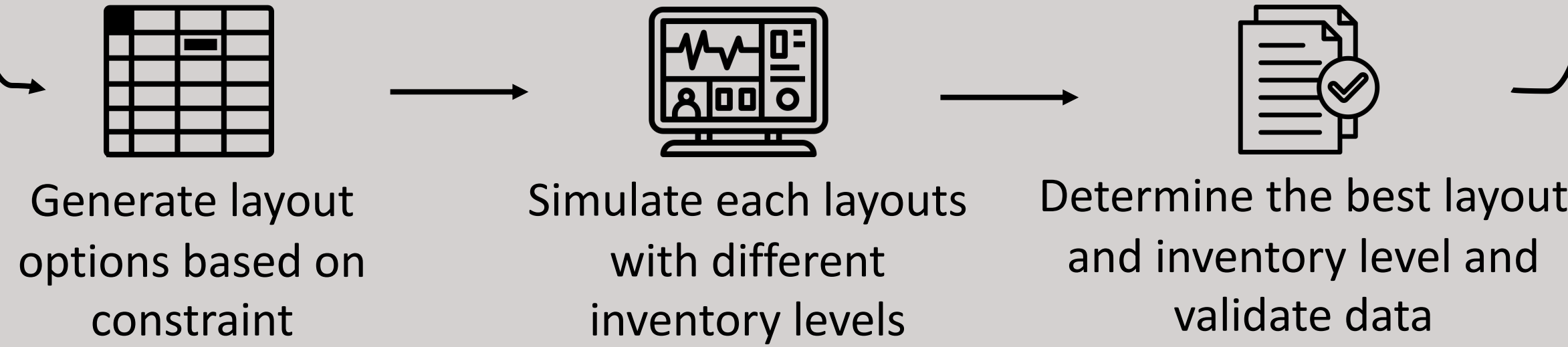
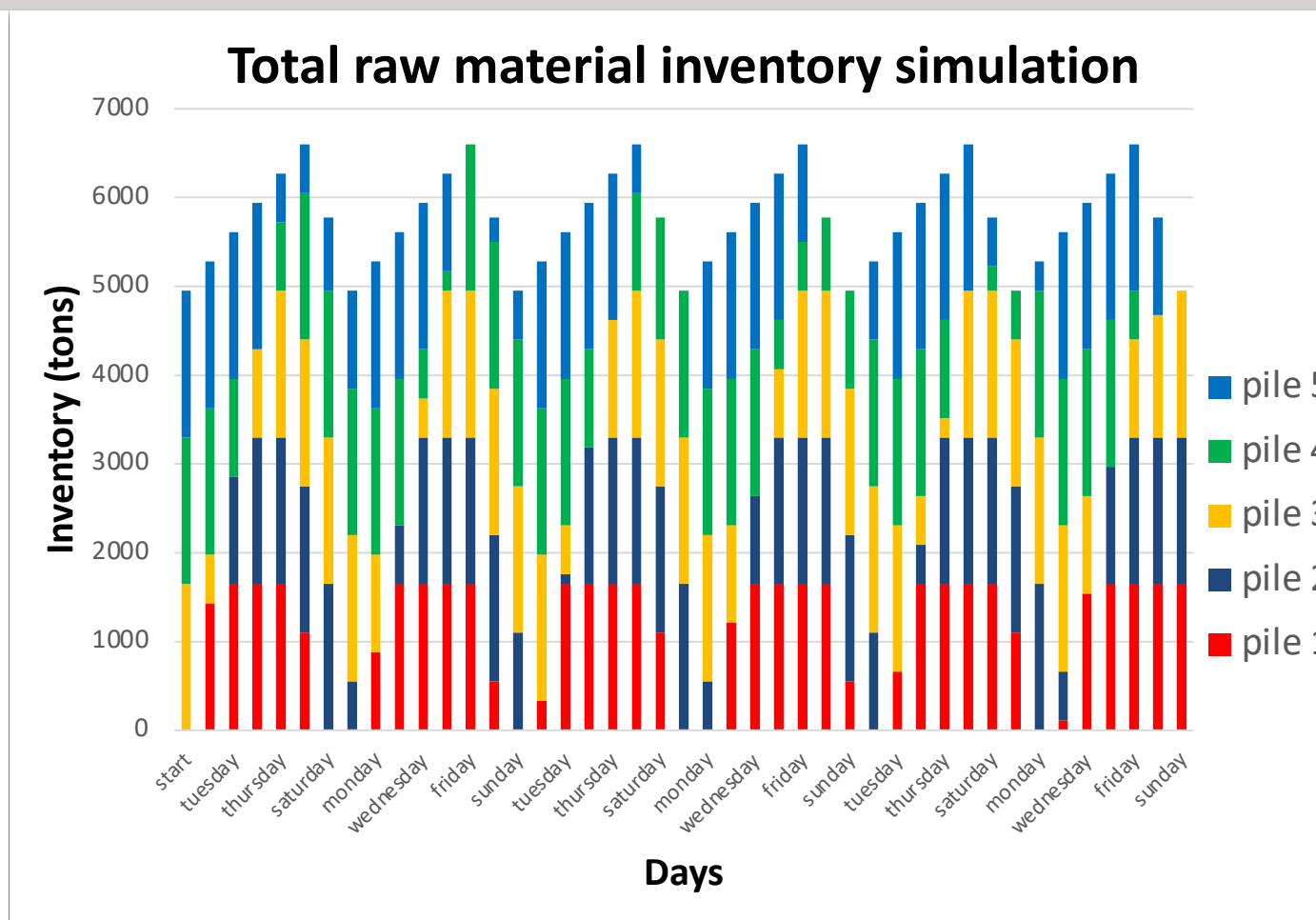
### Root Cause Analysis:



### Methodology:

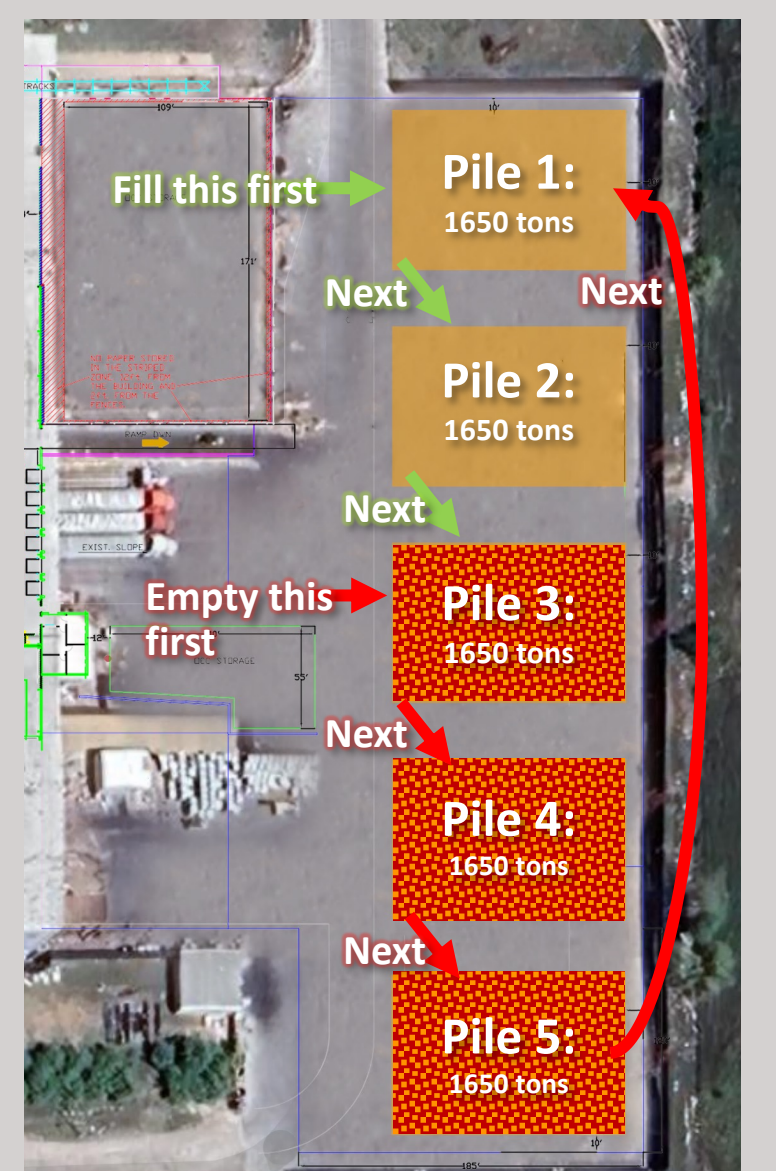
#### Constraints:

- Material flow rate
- Land Area: 568ft x 135ft
- Fire 30ft fire lane in between piles
- 10ft border each sides required
- Bale size: 72" x 48" x 30"
- Weight: 0.65 tons each
- Stackable to 6
- ~5 days of inventory minimum



### Solution:

- Added an extra pile without reducing % space usage
- Consistent pile sizes; each will be cleared every 36 hour
- Any material will be used within 7 days from placement
- Established a cycle-based loading and picking system



Reduced max turnover rate from 3 months to 7 days

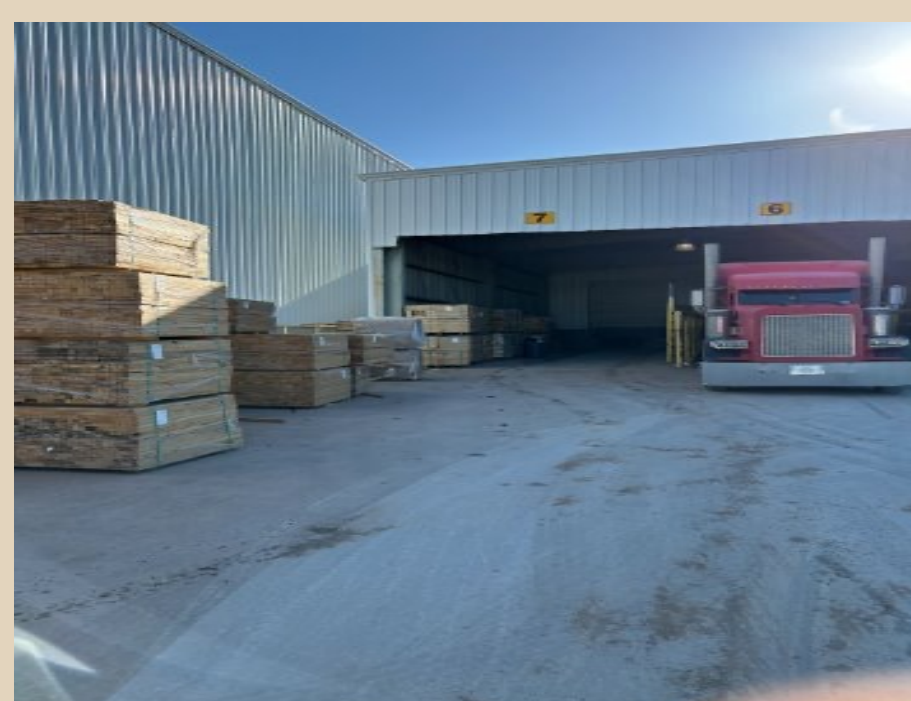
## Improving Material Movement

### Tarping Station



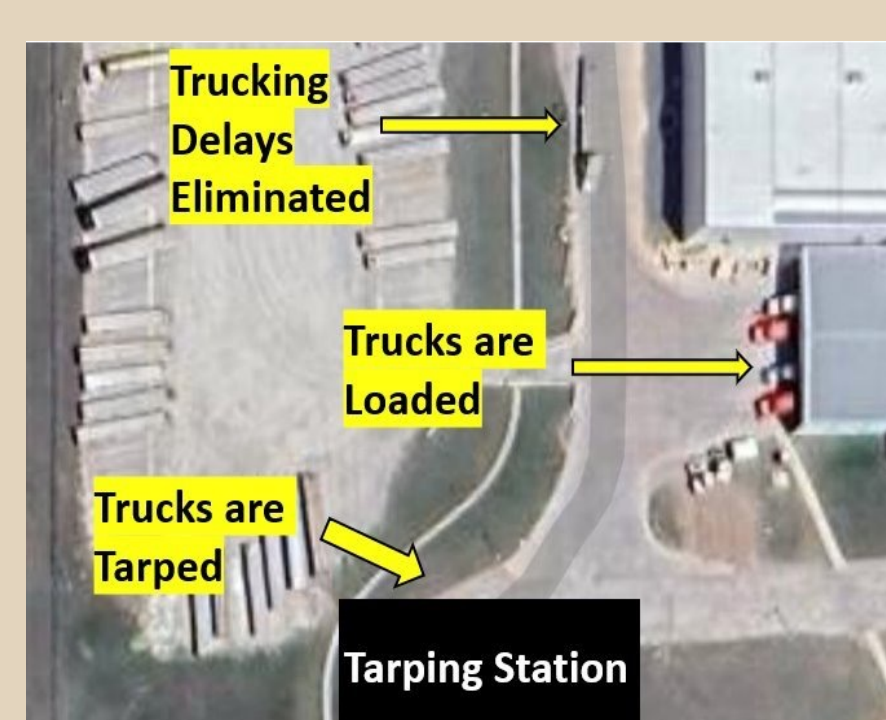
- Trucks are loaded and tarped at shipping docks
- "Detention Costs" start 2 hours after trucks arrives, \$55 per hour over the limit.
- Clock stops once truck is loaded, but still waiting to be tarped, causing other truck delays.

### Shipping Dock



Only 6 of 7 docks are functional due to displacement of bundles of heavy packing materials in front one.

### Tarping Station



Tarping Station Cost (Estimate)	\$120,000
Annual Tarping Delay Costs	\$50,000
Savings Per Year	\$50,000
Years	3
Interest Rate	8%

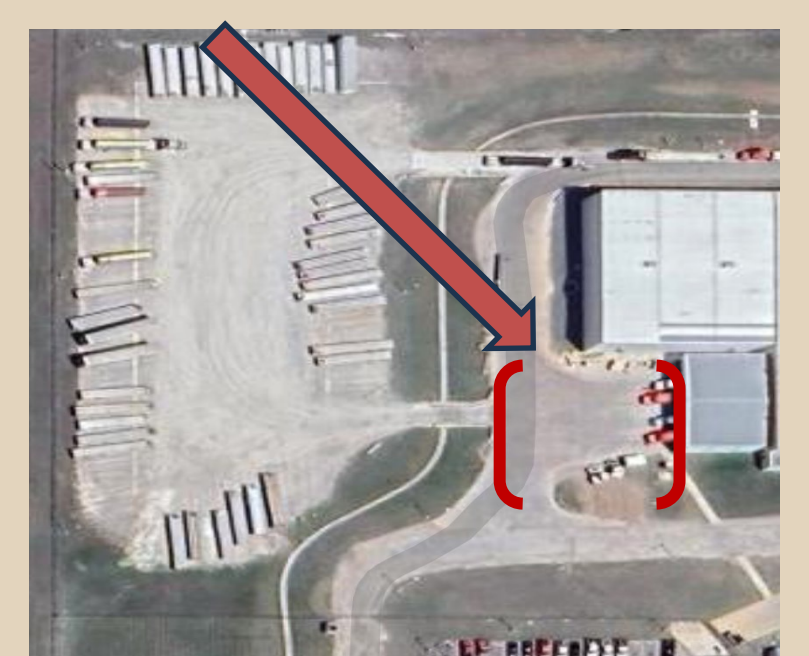
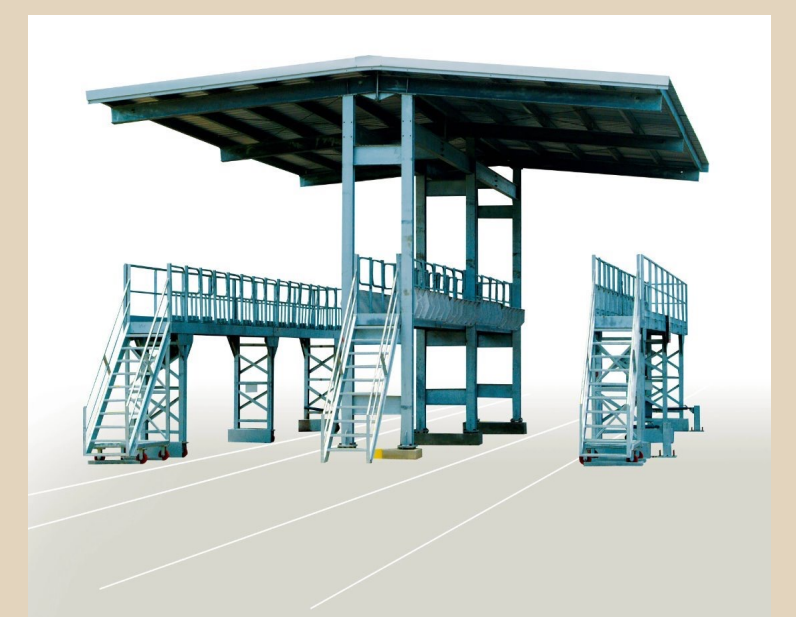
### Shipping Dock



\$1000 to \$2000 investment can enable an extra 8 paper rolls every 2 hour out of the facility

### Solution:

- Invest In Tarping Station
- Shipping Dock: Add Additional Van Station
- Place Shipping Materials in gravel lot next to dock
- Receiving Dock: Expand Dock Capacity

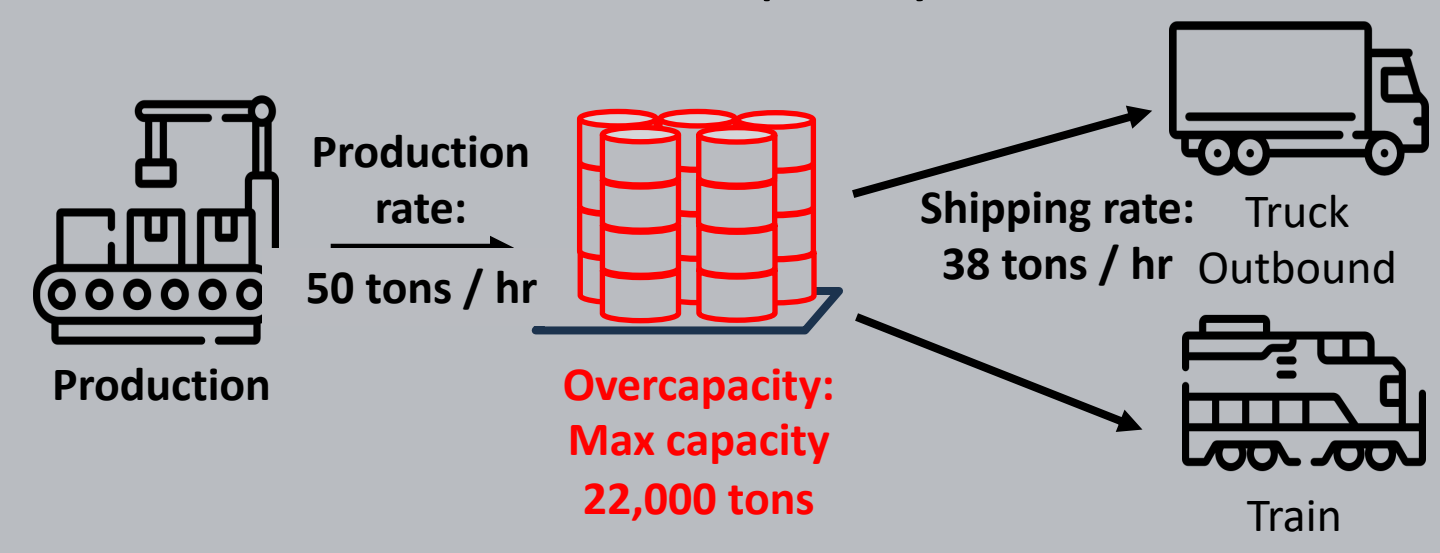


ROI: +7.38% on Tarping Station 16.67% Shipping Capacity Increase at the docks

## Finished Goods Layout

### Current state

- Demand for products fluctuate with the housing market
- Recent market conditions have resulted in reduced orders
- Warehouse is over capacity – Between 102 to 115 % of maximum capacity



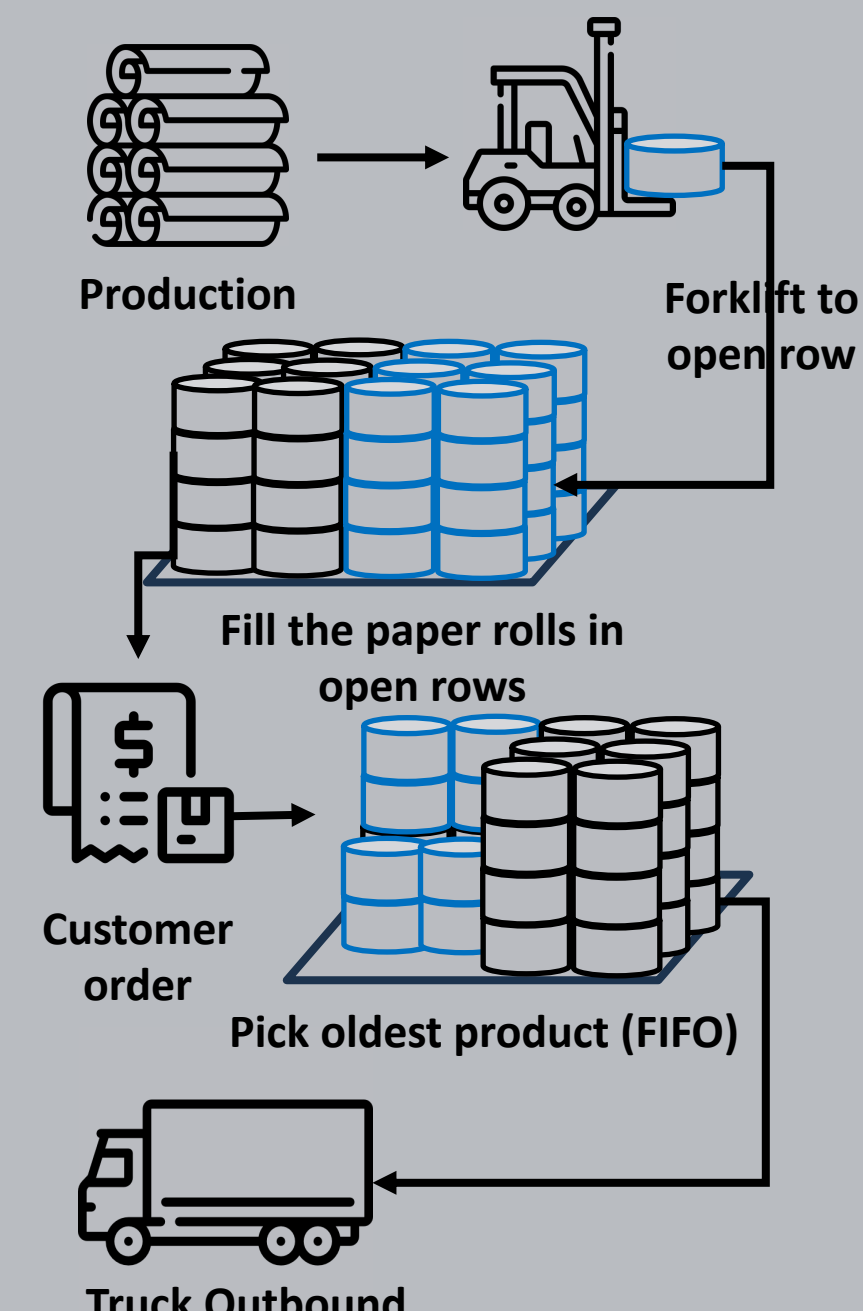
### Why not slow down production?

- Planned 8-day shutdown in June (will reduce inventory by 32%)
- A major client is moving 24,000 tons of product to their own warehouses
- Recent production issues led to buildup of downgraded product

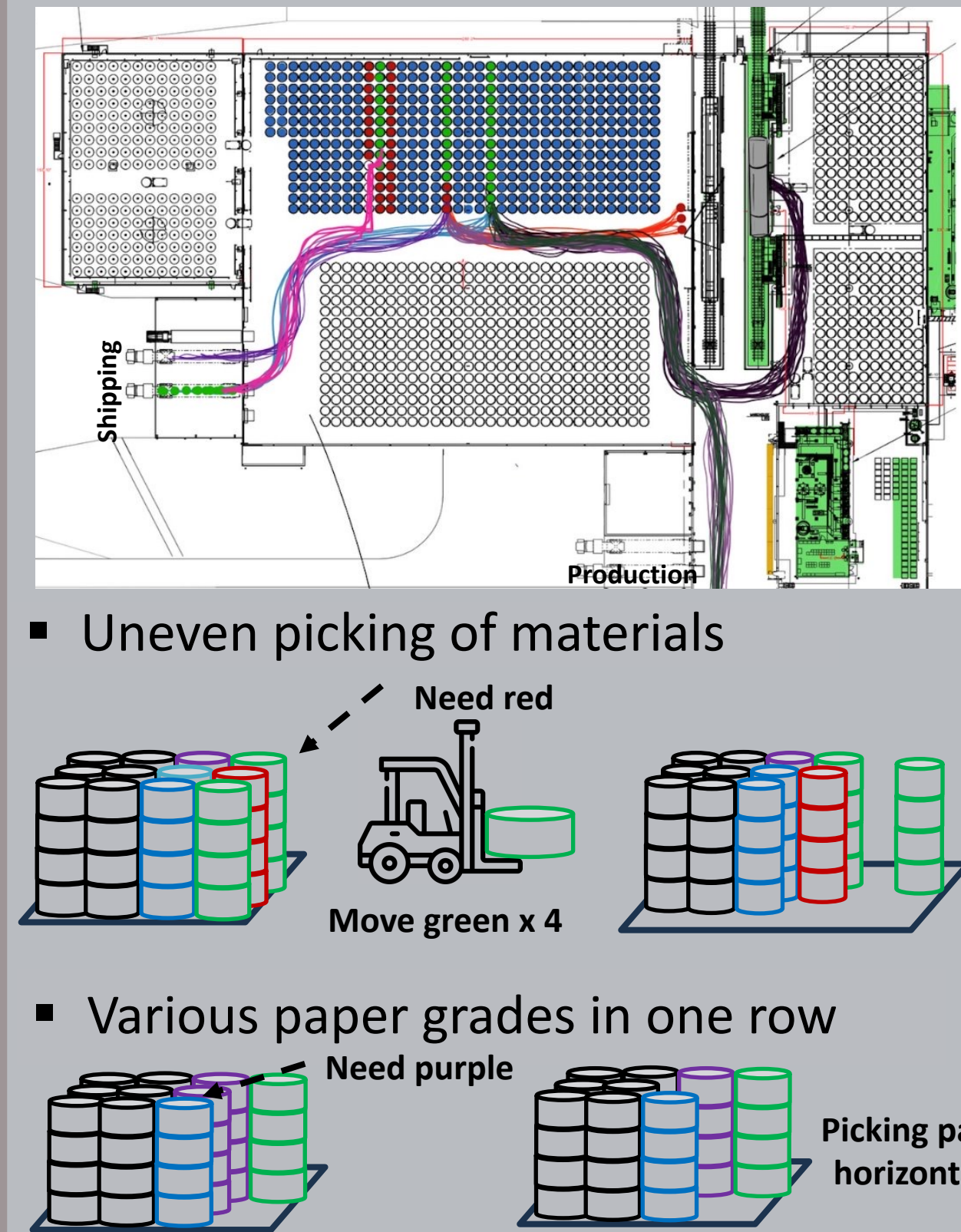
### Implications

- Warehouse layout is not being followed to to overcapacity.
- Material is stored at any open spot, increasing inefficiencies.

### Ideal storage process



### Actual storage process



### Methods and solution

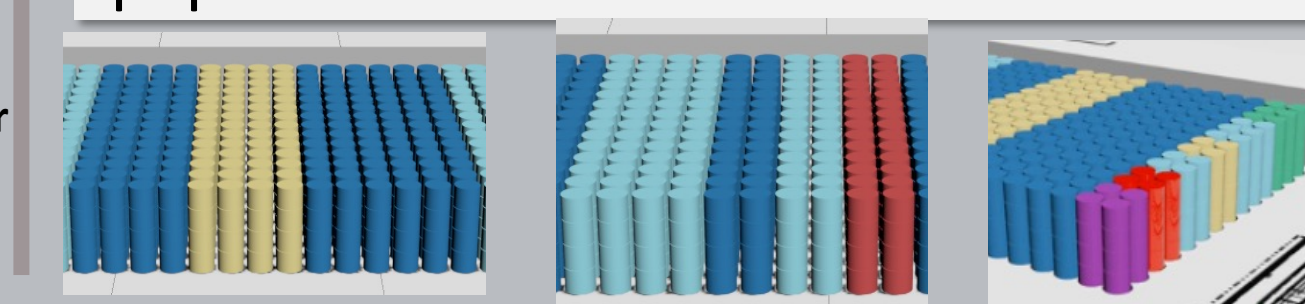
#### ABC Analysis (Pareto Principle)

- Categorized products by forecasted demand

- A products:** represents 80% of demand - Closely monitor and prioritize
- B products:** represents 15% of demand - Prioritize operational efficiencies
- C products:** represents 5% of demand - Cost cutting measures

#### Solution: Dynamic layout

- A Products:** Break up large quantities and place it across the warehouse
- B products:** Strictly store in rows of two (50– 120 rolls)
- C products:** Store in blocks of 16 /24 paper rolls



### Benefits

- Reduction in detention costs of \$135,000 / year
  - Allows the facility to adapt the layout to the production schedule
  - Reduced material movement
  - increased efficiency and safety safety
  - Limitations:**
    - Need updated inventory system
    - Training of employees on new process
- Reduced costs due to delays amounting \$135,000

