

## 1 Client Background

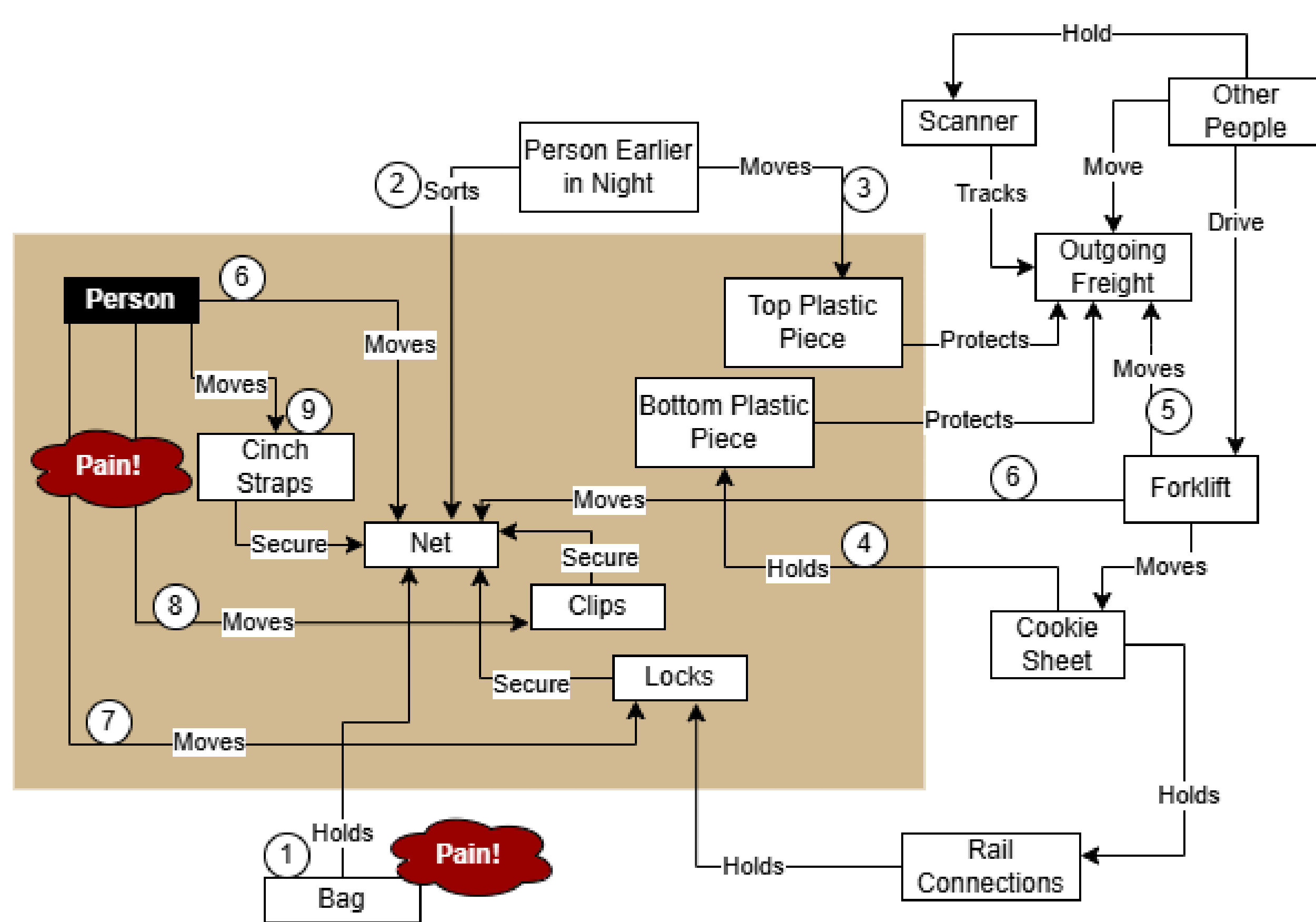
- FedEx operates in the global shipping, logistics, and supply chain industry.
- Millions of shipments are moved daily through an extensive network of trucks, aircraft, and sorting facilities.
- The Indianapolis hub processes nearly 500 thousand packages each day.

## 2 Problem Statement

The freight tie-down process at the FedEx Indianapolis hub is inefficient, taking one worker an average of 17 minutes to complete.

- Inconsistent Performance**
- Physically Demanding**
- Time Consuming**
- Safety Risks**

## 3 Initial System Model



## 4 Methodologies

### Time Studies

Between 3 in-person site visits and other data collection, we studied over 50 instances of the tie-down process.

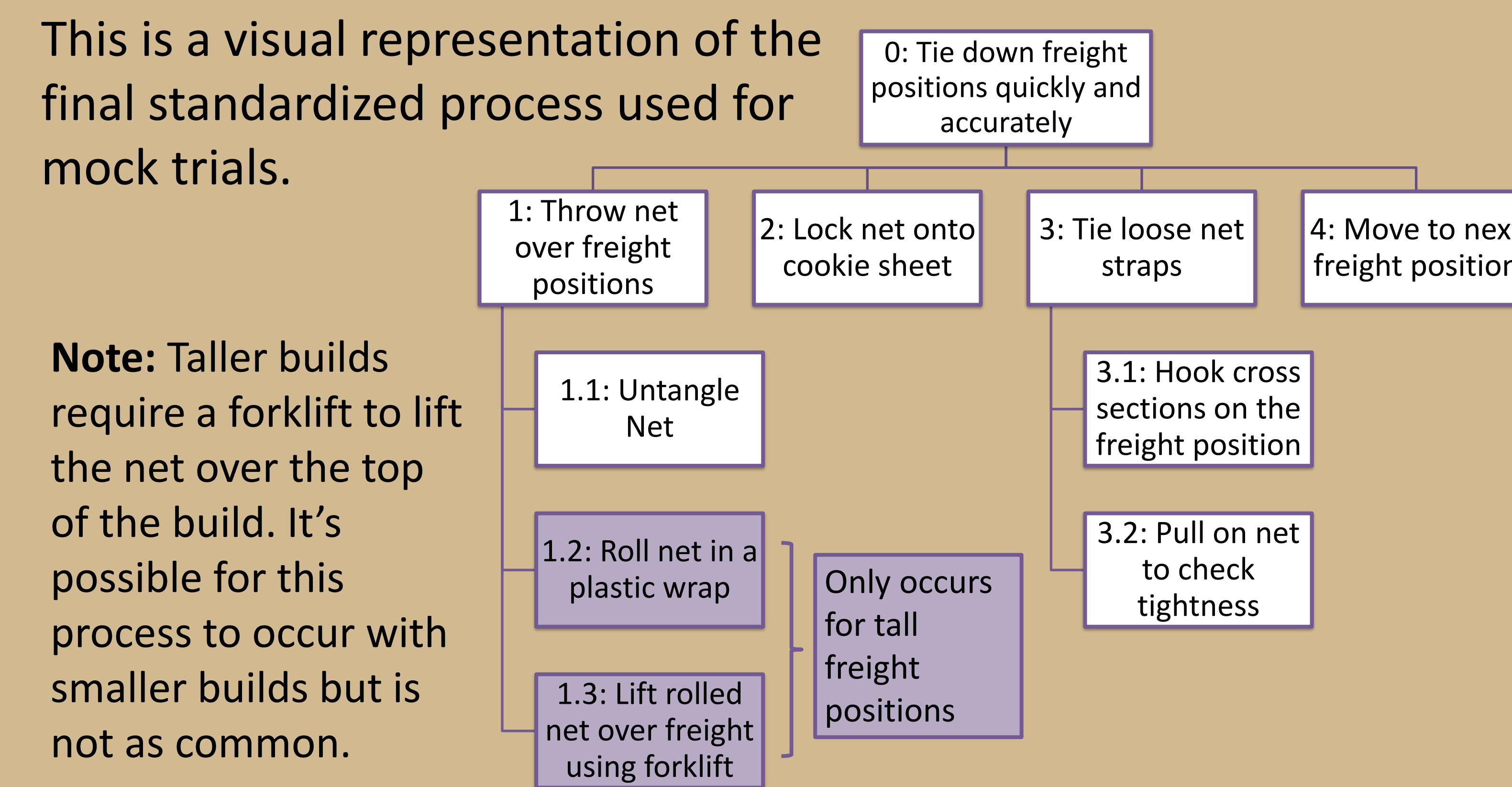


- Compared findings with current data model for different number of workers
- Iterated after key learnings from each site visit
- Helped identify room for improvement

Date:					
Time:					
Observer:					
Sort Shift:	<input type="checkbox"/> Day <input type="checkbox"/> Night				
Use the format mm:ss for recording durations (e.g., 02:15). If the workers complete the steps in a different order, record the actual sequence in the "Notes/Observations" section.					
Step	Task Description	Number of Employees	Start Time	End Time	Notes/Observations
1	Net preparation: Plastic and Net are deployed over the build				Was the net... (circle) Pre-rolled Not pre-rolled Deploy Method (circle): Forklift Manual
2	Lock and Clip: Net is locked into place on all 4 sides and clips are attached				
3	Cinch and Finish: Cinch straps are tightened				

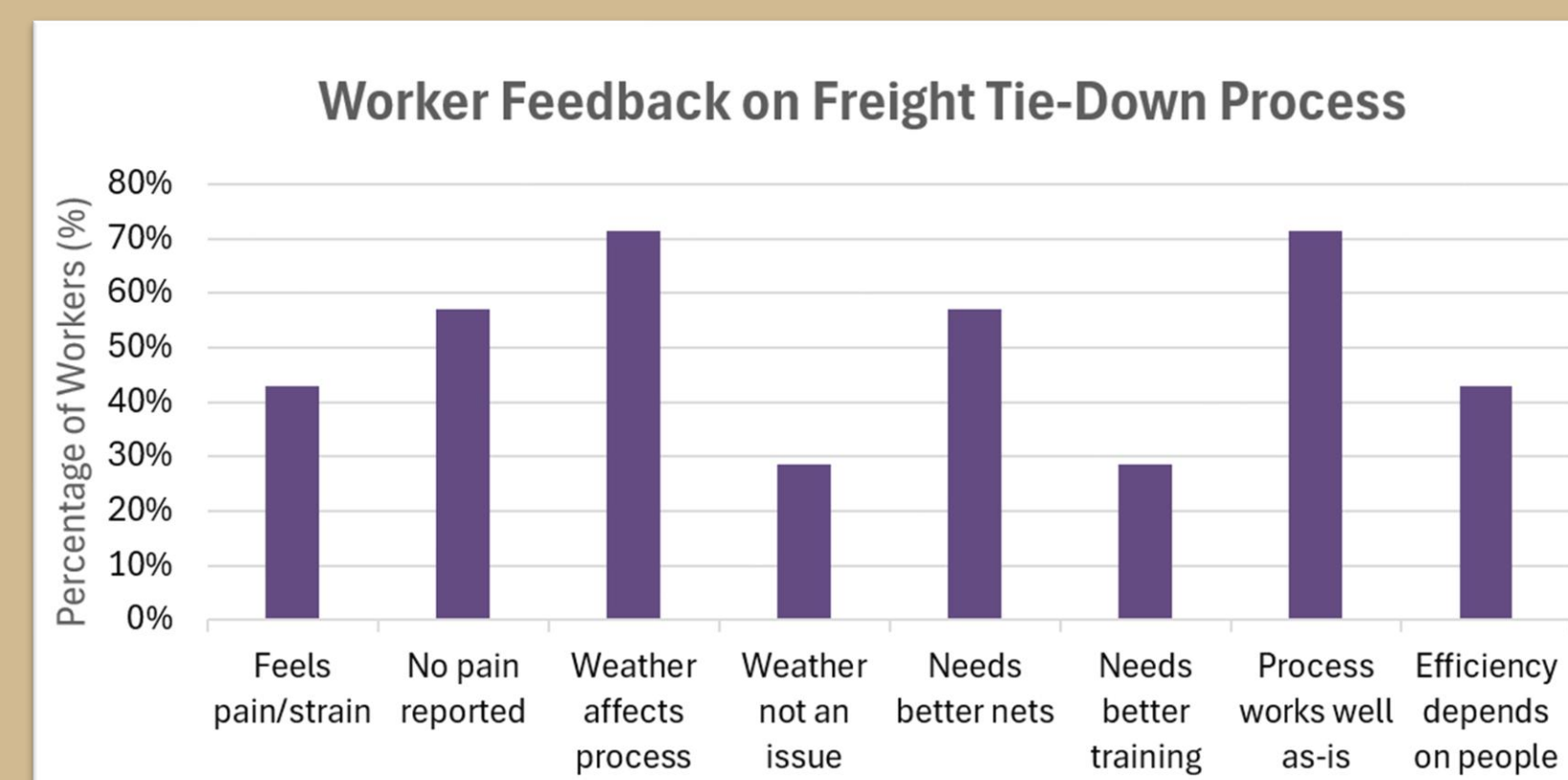
### Hierarchical Task Analysis

This is a visual representation of the final standardized process used for mock trials.



**Note:** Taller builds require a forklift to lift the net over the top of the build. It's possible for this process to occur with smaller builds but is not as common.

### Semi-Structured Interviews

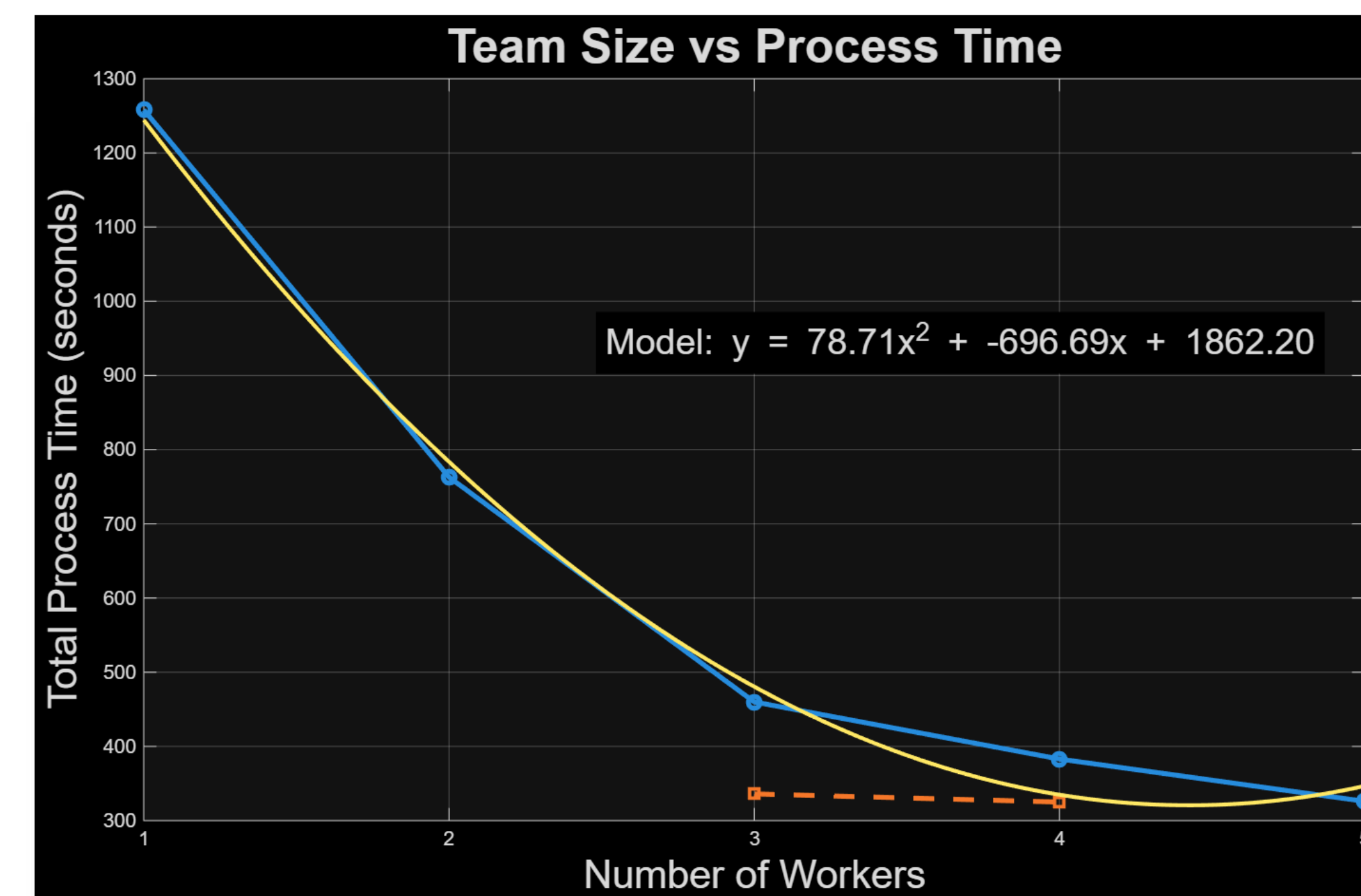


**71%** Say the tie-down process works well as-is

"If you're not careful, you'll pull your back so you gotta learn how to avoid the twisting motion"

## 5 Results

3-person teams are **balanced in time and cost**; adding a 4th member surpasses marginal utility gain



Upper Build  
Lower Build  
Quadratic Model

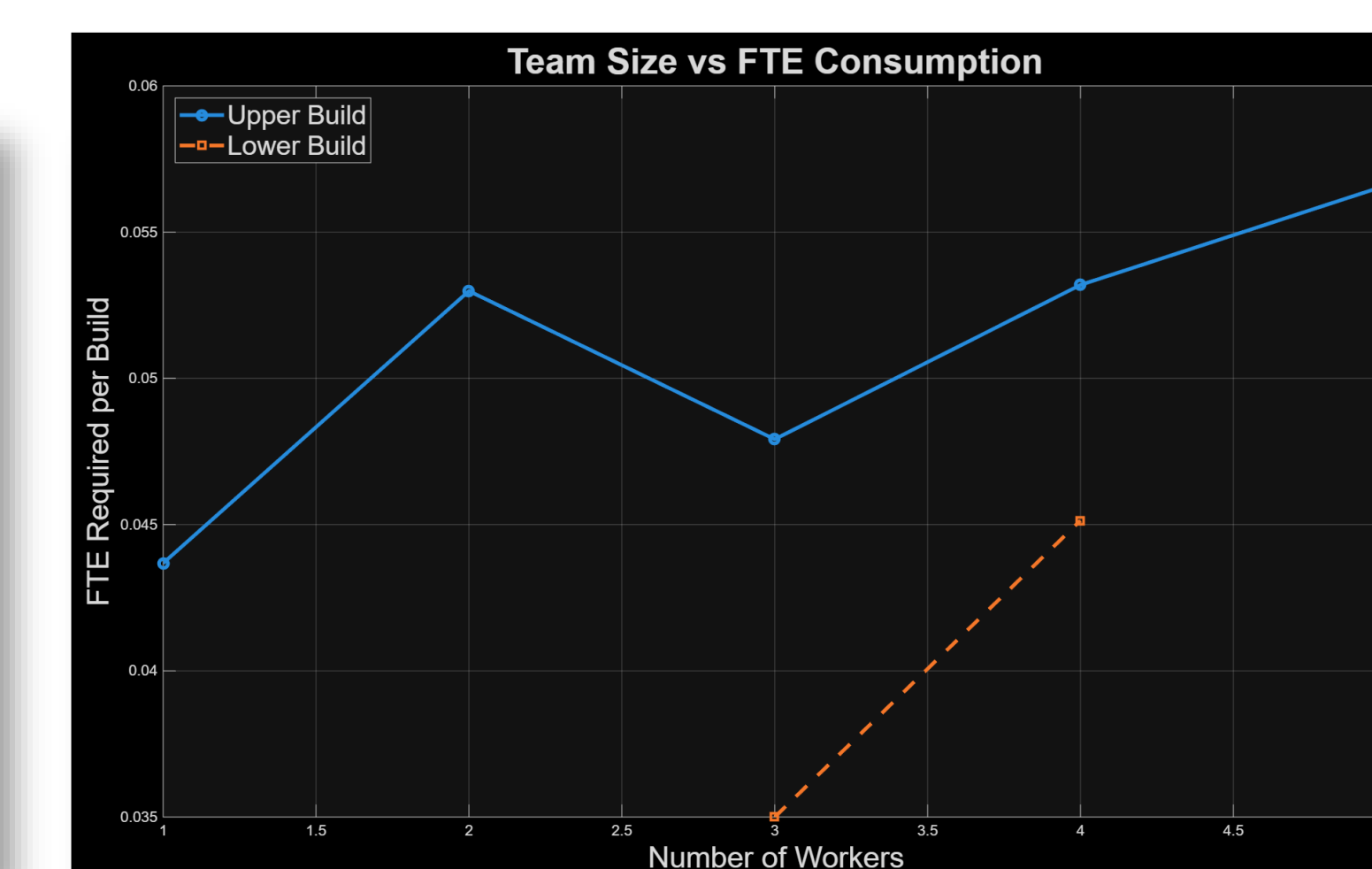
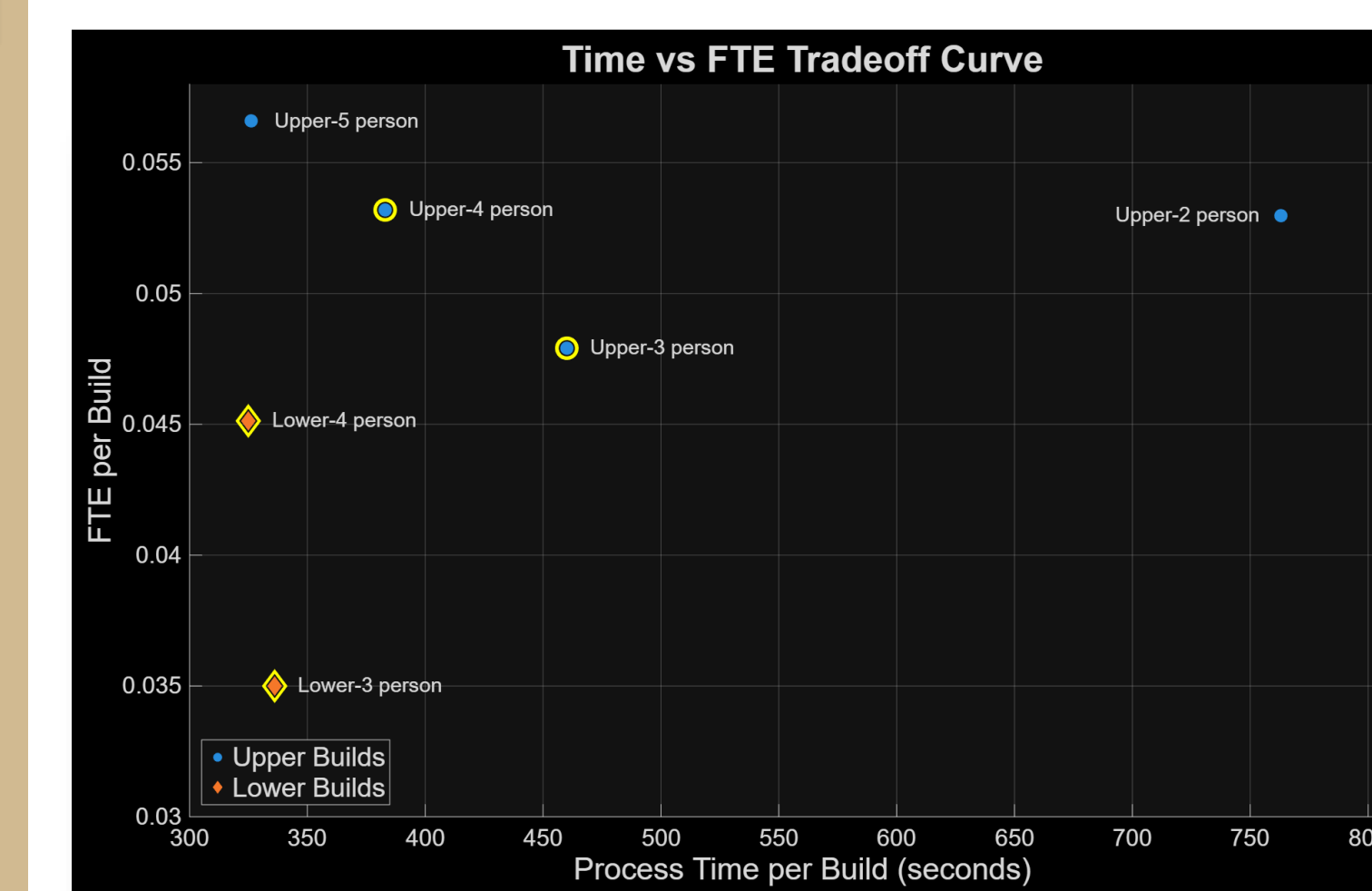
**Note:** 4-person teams should be utilized on high demand shifts where slack is less

## 6 Company Impact and ROI

Savings from utilizing 3-person teams instead of 4-person teams:

85.41 FTE

9.92% FTE Per build



## 7 Future Work

- Reallocating staff to match demand
- Continue the 5s approach for net storage
- Investments in net technology
- Enforce standard operating procedures
  - Respond to "Clear" when tossing net

