

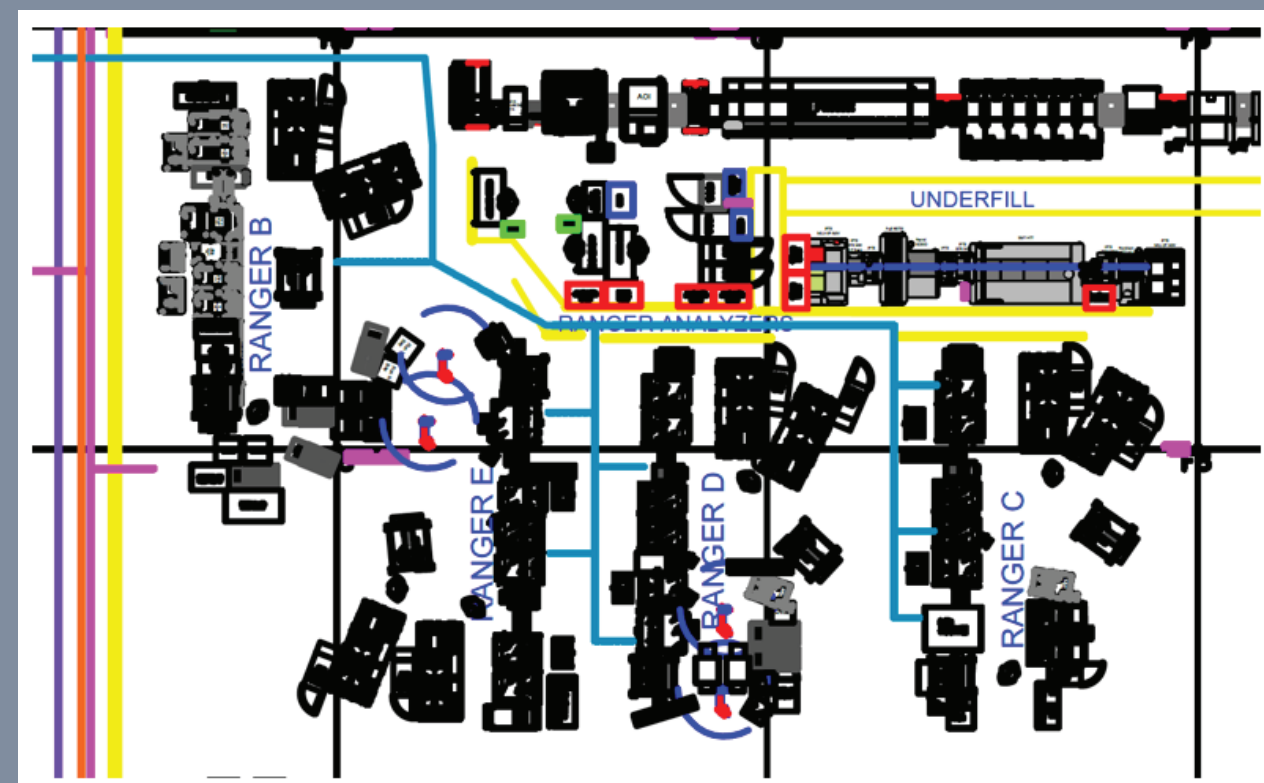
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Problem Statement

Vitesco Technologies' current mechanical material delivery process is completely manual with milk run drivers needing to visually observe material and quantity requirements on the production floor then return to the stockroom to de-trash and load racks/totes for their routes. This process is heavy on manpower, inefficient, and takes up excess space on the production floor.

Project Purpose

- Decrease Production Floor Clutter
- Increase Plant Efficiency
- Reevaluate Material Flow



Facility Ranger Layout



De-trashing

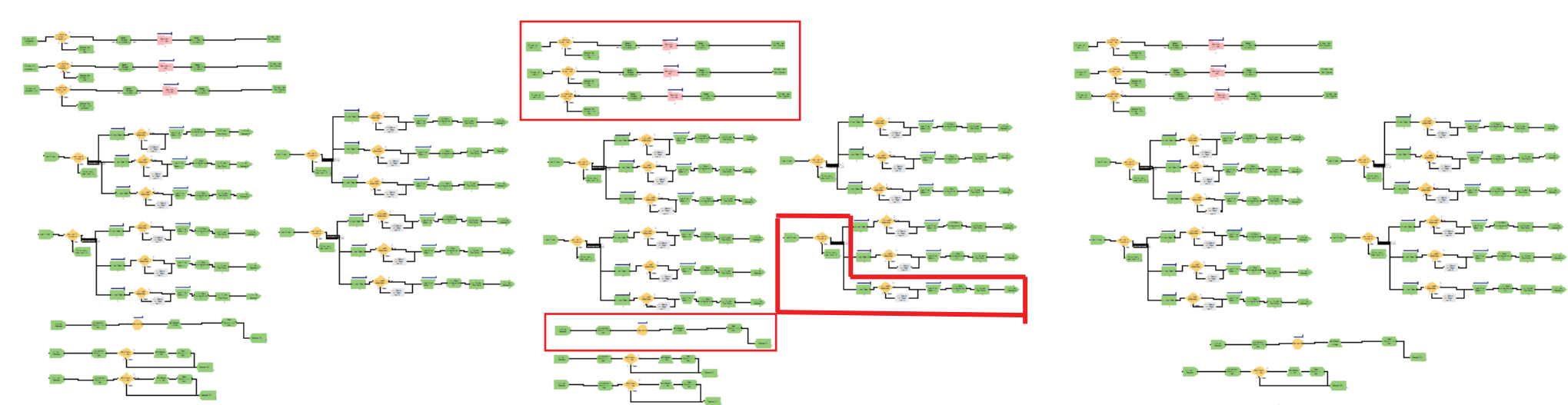


Milk Run

Objectives/Evaluation

Product Functions:	Design Specifications (Performance Targets)
Cycle Time Data	Material Consumption Milk Run Routes De-Trashing
Data Analysis	Automatable Parts Determination Kanban Levels Efficiency of Process' Safety Cost Savings
Design (Stretch)	Warehouse Re-Design Milk Run Rerouting Production Floor Re-Design

Simulation



Line Mode	System	Rows	Checked	
1 LineModeE	String	System	1 rows	<input type="checkbox"/>
2 LineModeD	String	System	1 rows	<input type="checkbox"/>
3 LineModeC	String	System	1 rows	<input type="checkbox"/>
4 LineModeB	String	System	1 rows	<input type="checkbox"/>
5 IA_Lids_Order	Real	System	1 rows	<input checked="" type="checkbox"/>
6 IA_Lids_Order	Real	System	1 rows	<input checked="" type="checkbox"/>
7 IA_Lids_Order	Real	System	1 rows	<input checked="" type="checkbox"/>
8 IA_Lids_Box_Max	Real	System	1 rows	<input checked="" type="checkbox"/>
9 IA_Lids_Empty_Max	Real	System	1 rows	<input checked="" type="checkbox"/>
10 IA_Lids_Empty_Current	Real	System	0 rows	<input checked="" type="checkbox"/>
11 IA_Lids_Busy	Real	System	0 rows	<input checked="" type="checkbox"/>
12 IA_Lids_Dettrash_Initial	Real	System	0 rows	<input checked="" type="checkbox"/>
13 IA_Lids_Dettrash_Unit	Real	System	0 rows	<input checked="" type="checkbox"/>

Design Approach



- | | | | | |
|---|--|--|--|---|
| <ul style="list-style-type: none"> • Statement of Work (SOW) • Project Statement • Project Purpose | <ul style="list-style-type: none"> • Identify part numbers and dimensions • De-trash cycle times • Production rates | <ul style="list-style-type: none"> • Simulation Software (Arena) • Determine Kanban Levels | <ul style="list-style-type: none"> • Output Based Ordering System • Barcode/RFID Scanning System | <ul style="list-style-type: none"> • Checking and adjusting of Kanban min/max • Utilize |
|---|--|--|--|---|

Measurements

Ranger Line D							
GPEC Model	Housing	Lid	Delivery Method and Dimensions (housings)	Delivery Method and Dimensions (lids)	Tote Weights (lbs.)	Pallet Size	Average Detrashing Cycle Times (min)
2A	A2C7331280000	A2C7331290300	ST40 Tote: 15SinX23.75SinX11In outer 13.25SinX21.75SinX10.5in inner	Magrack: holds 8 mags, 10 lids each 57.5SinX24.5SinX27.5in	Housings: 57.2 Lids: 17.4	Housings: 20 boxes, 24/box or 24 boxes, 30/box Lids: 16 boxes, 54/box	Housings in totes: 1.47 Lids in totes: 1.58
2	A2C533585100	A2C533585200	ST40 Tote: 15SinX23.75SinX11In outer 13.25SinX21.75SinX10.5in inner	Magrack: holds 8 mags, 10 lids each 57.5SinX24.5SinX27.5in	Housings: 51.2 Lids: 18.2	Housings: 20 boxes, 26/box Lids: 25 boxes, 60/box	Lids in magracks: 5.01



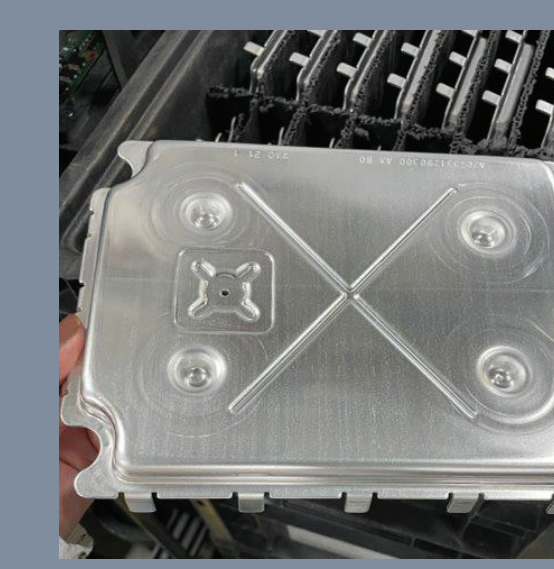
Rack



ST40 Tote



Housing

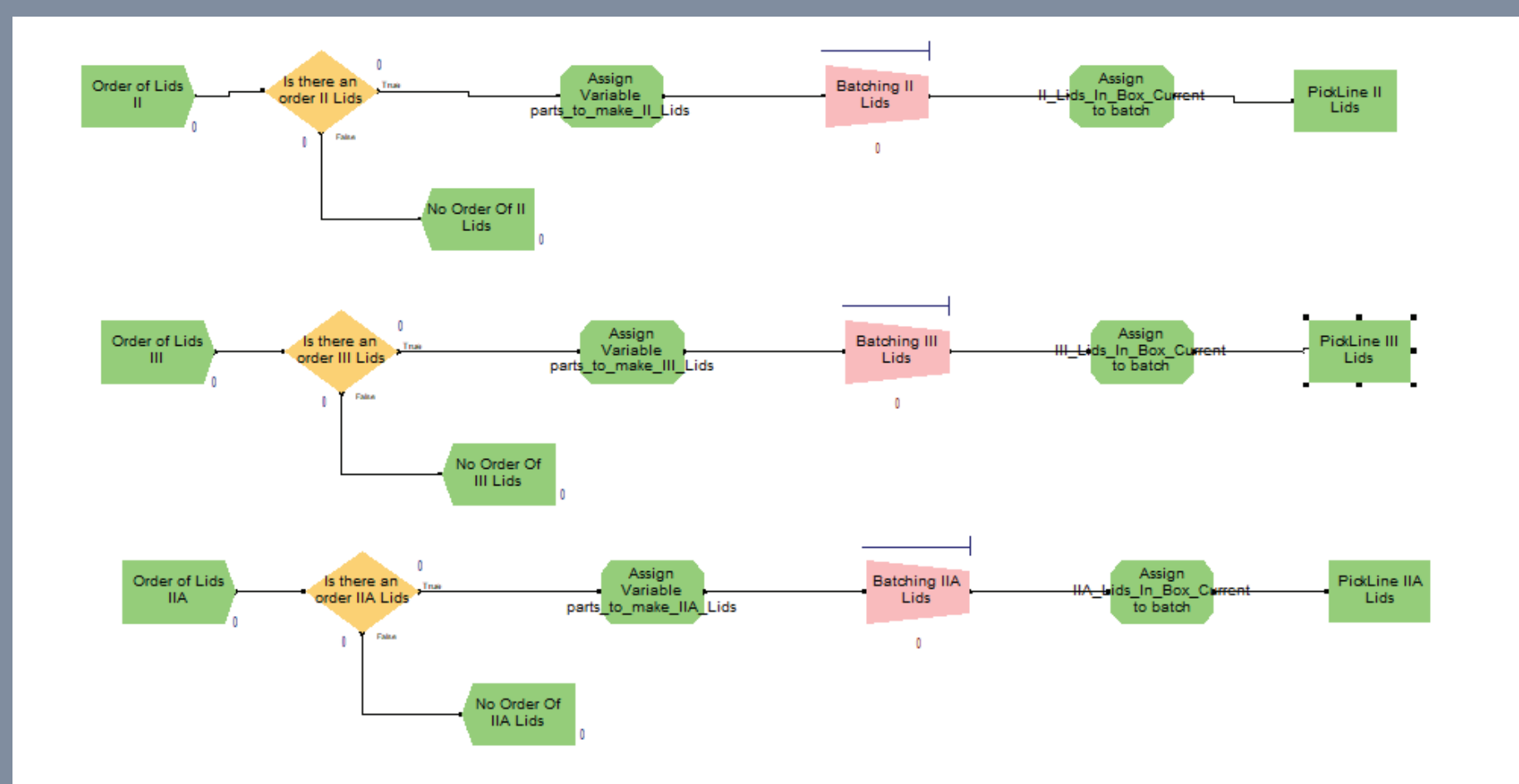


Lid

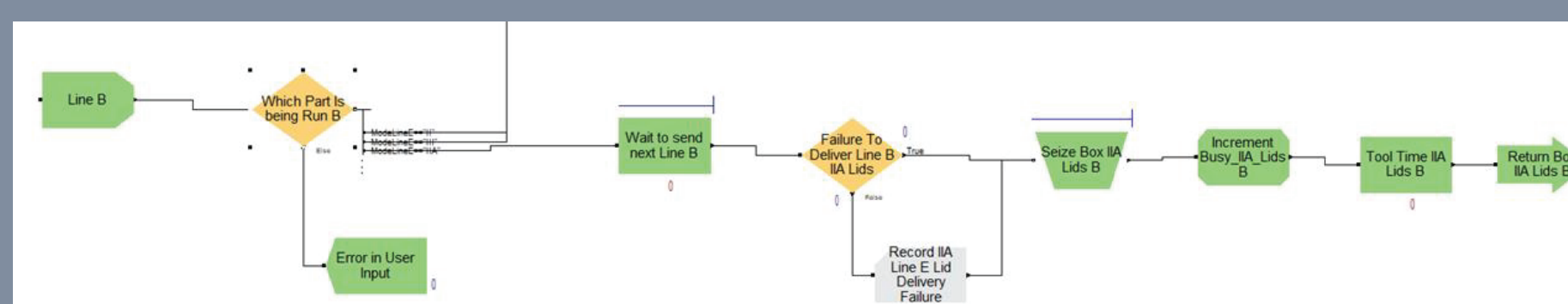
Simulation/Warehouse

Simulation Breakdown

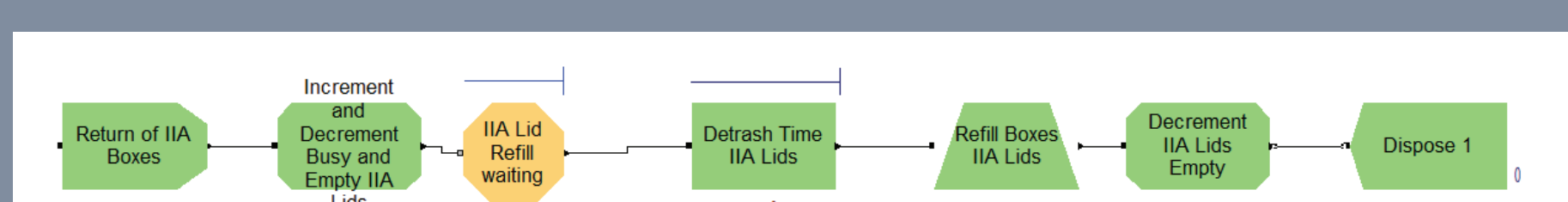
Order Handling



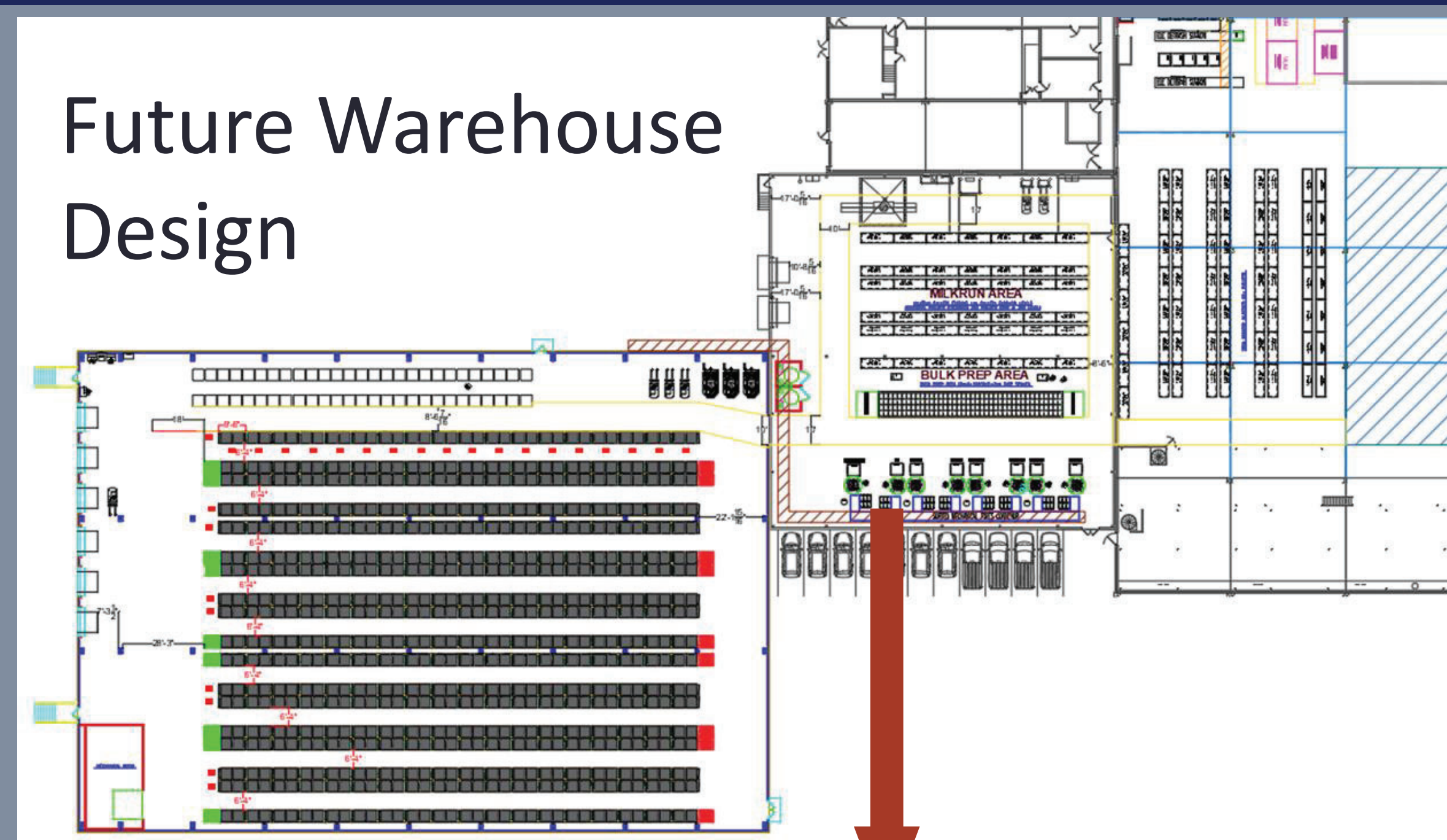
Processing



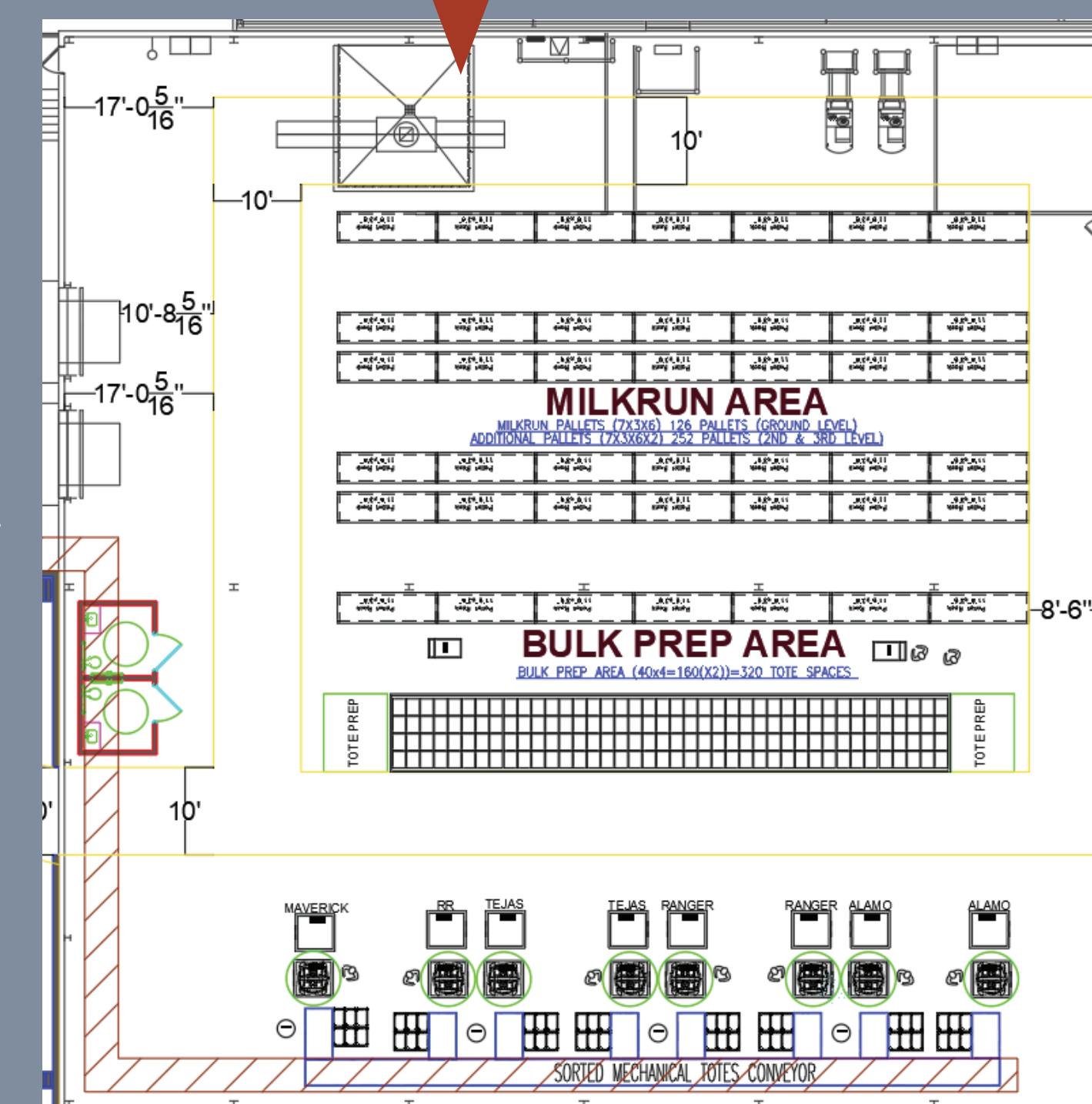
Kanban Refill



Future Warehouse Design



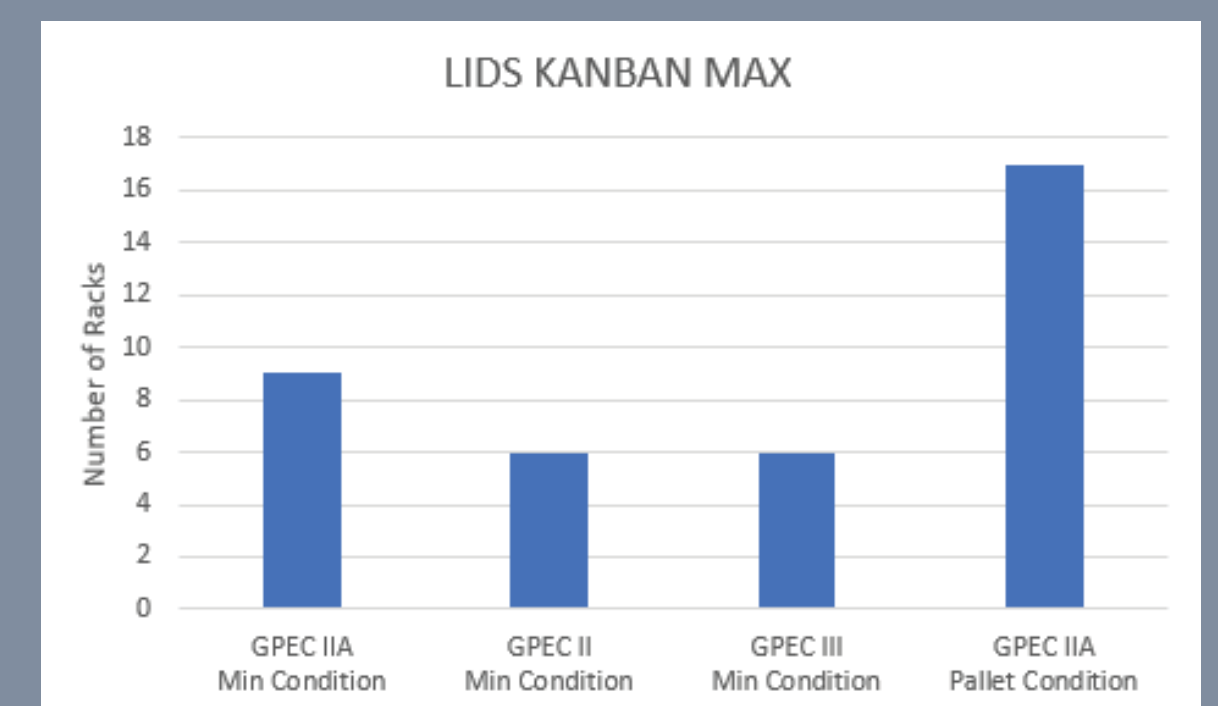
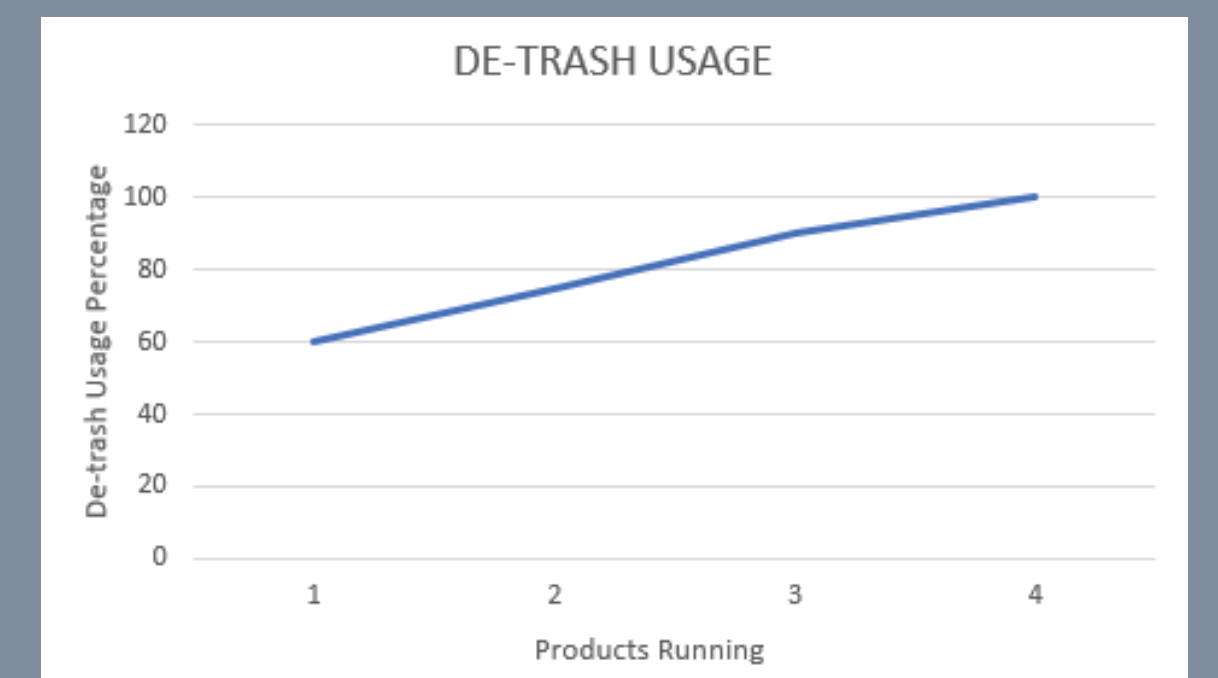
Warehouse 2 Exploded View



Human Factors

- Loads should be kept under 51 lbs.
- Loads should be kept close to the body, <25 in
- Heavy totes should be kept at 30 in from the floor when lifting
- Vertical distance from the floor should be between 30 in and 70 in
- Torso twisting should be minimized, < 135°

Results



- Assuming minimum Kanban maximums are desired; The minimum condition that we acquired only works for up to 3 unique products running at once.
- Assuming the Pallet Condition; where full de-trash of individual pallets is desired then the Kanban Maximums will be much higher

Team Members



- From Left to Right
- BJ Iroha
 - Rosa Rodriguez
 - Brandon Willis
 - Eric Brady

Acknowledgements

Sponsor: Katie Esparza
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Technical Advisor: Dr. Eduardo Perez