



# Analysis of Supply Chain Operations at Dispension Industries Incorporated

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## 1. Problem Statement

Dispension Industries does not have a standardized method of fulfilling product orders of varying sizes.

## 2. Original State

No standardized method to gauge fulfillment costs

Relied heavily on contractor to source parts

Approach was not scalable & too expensive

## 3. Problem Scope

- Transportation and sourcing costs associated with Dispension's supply network.
- All Dispension's products' supply chains simulated and evaluated
- Pre-COVID transportation & sourcing times and costs not considered
- Inventory and refurbishment of products not considered

## 5. Final Product

### Dashboard & Quote Generator

Dispension Industries Inc. Order Fulfillment Guide	
What product needs to be fulfilled?	MySafe
How many units must be fulfilled?	30
Do the units need an additional screen?	Yes -
Do the units need a pay terminal?	Yes
What is the maximum desired lead time (days)?	100

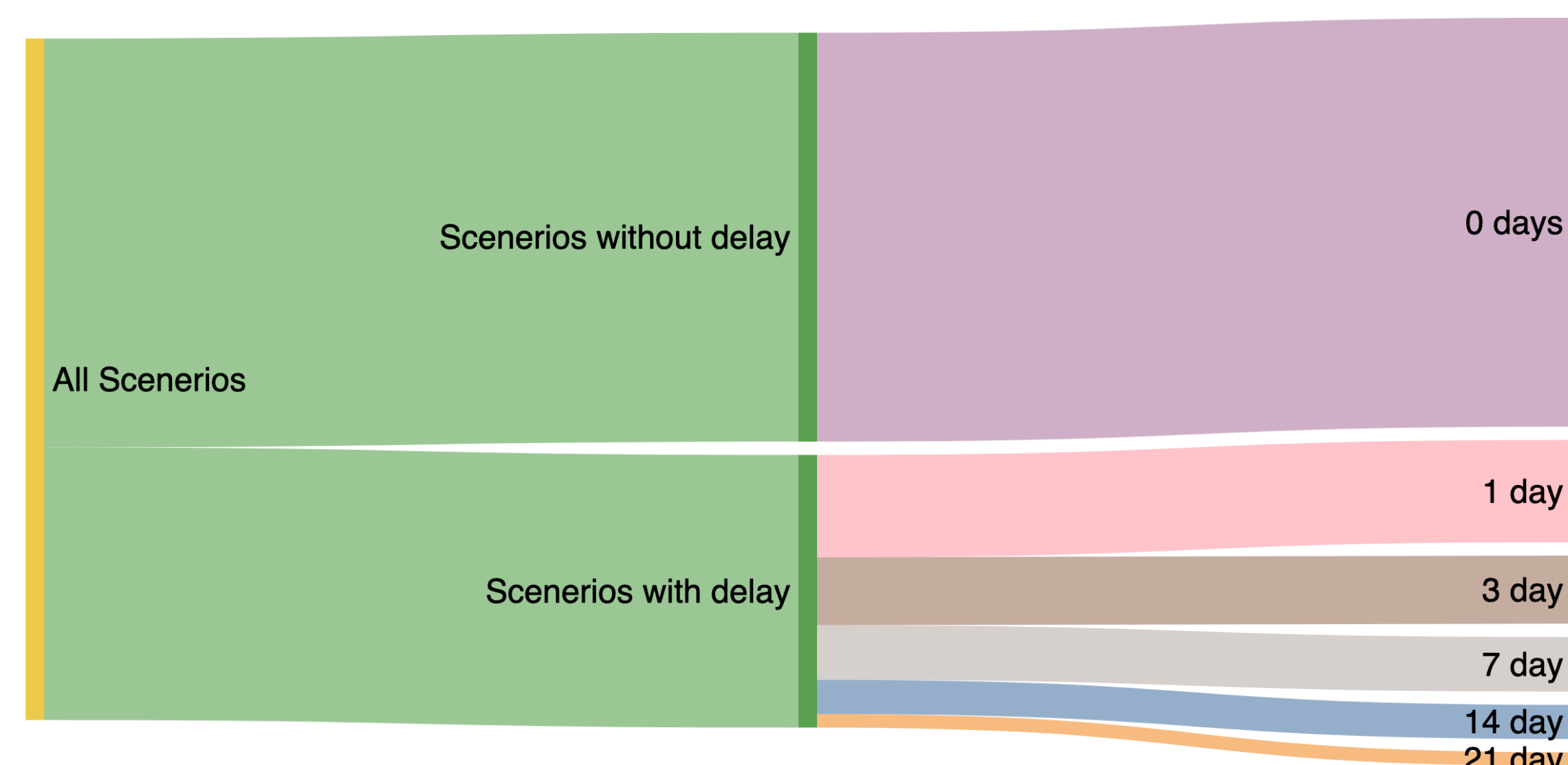
- Fulfillment database was formed with simulated data
- Dashboard gathers user inputs through the form table
- It then uses those inputs to apply advanced filters to database
- Output table displays all possible fulfillment methods that satisfy user's inputs

Product	Order Size	Screen type	Pay Terminal?	Total Cost	Cost/ Unit	Transp. Cost	Max. Lead Time (days)	Fulfillment Model	Where is base unit sourced from?	Where is the base unit sent to?	Where is the door fabricated?	First Container type	Second Container type	Data Type
MySafe	30		Yes					MS1	Doral	Toronto	Toronto	FCL	FCL	Simulated
Mysafe	30		Yes					MS2	Doral	Halifax	Toronto	FCL	FCL	Simulated
Mysafe	30		Yes					MS3	Doral	Halifax	Halifax	FCL	FCL	Simulated
Mysafe	30		Yes					MS4	Spain	Halifax	Halifax	FCL	FCL	Simulated
Mysafe	30		Yes					MS5	Spain	Halifax	Toronto	FCL	FCL	Simulated
Mysafe	30		Yes					MS6	Doral	Toronto	Toronto	FCL	FCL	Simulated

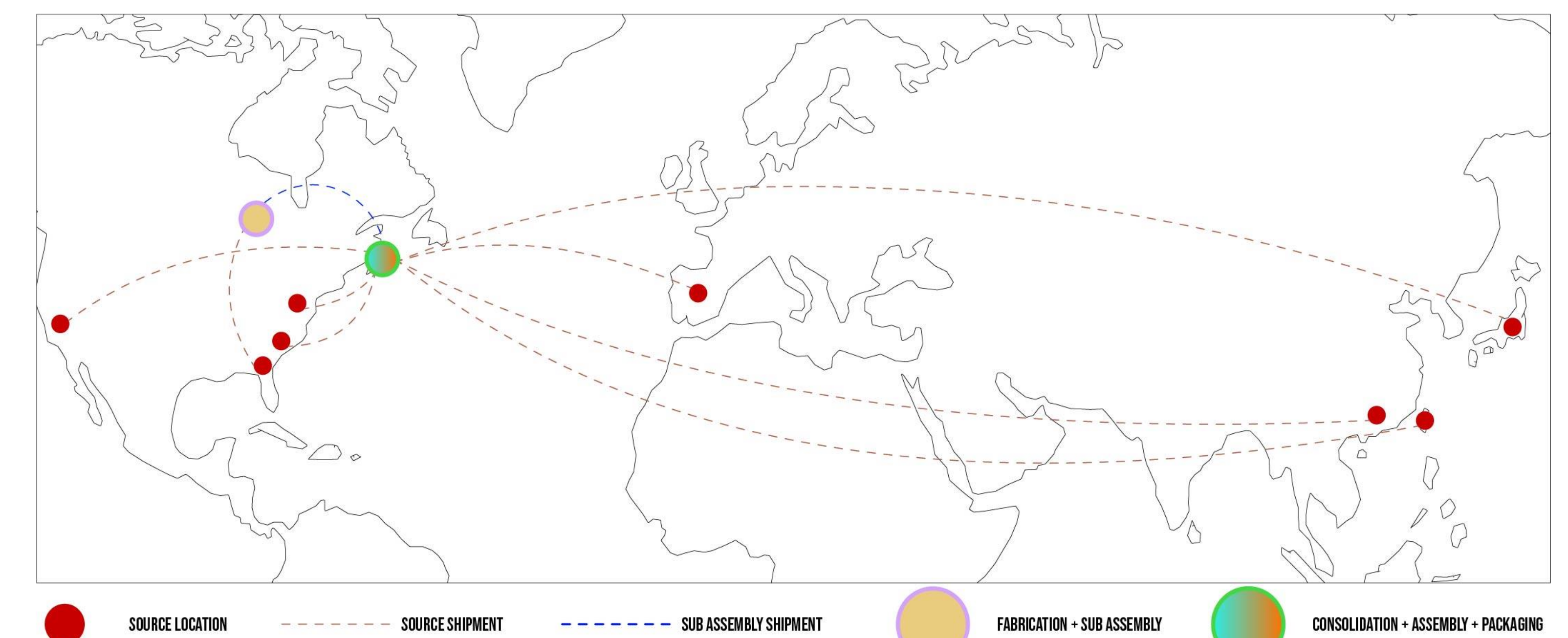
## 4. Methodology

### Delays

- Probabilities and delay durations were obtained by background research
- Stochastic approach for probability of delays

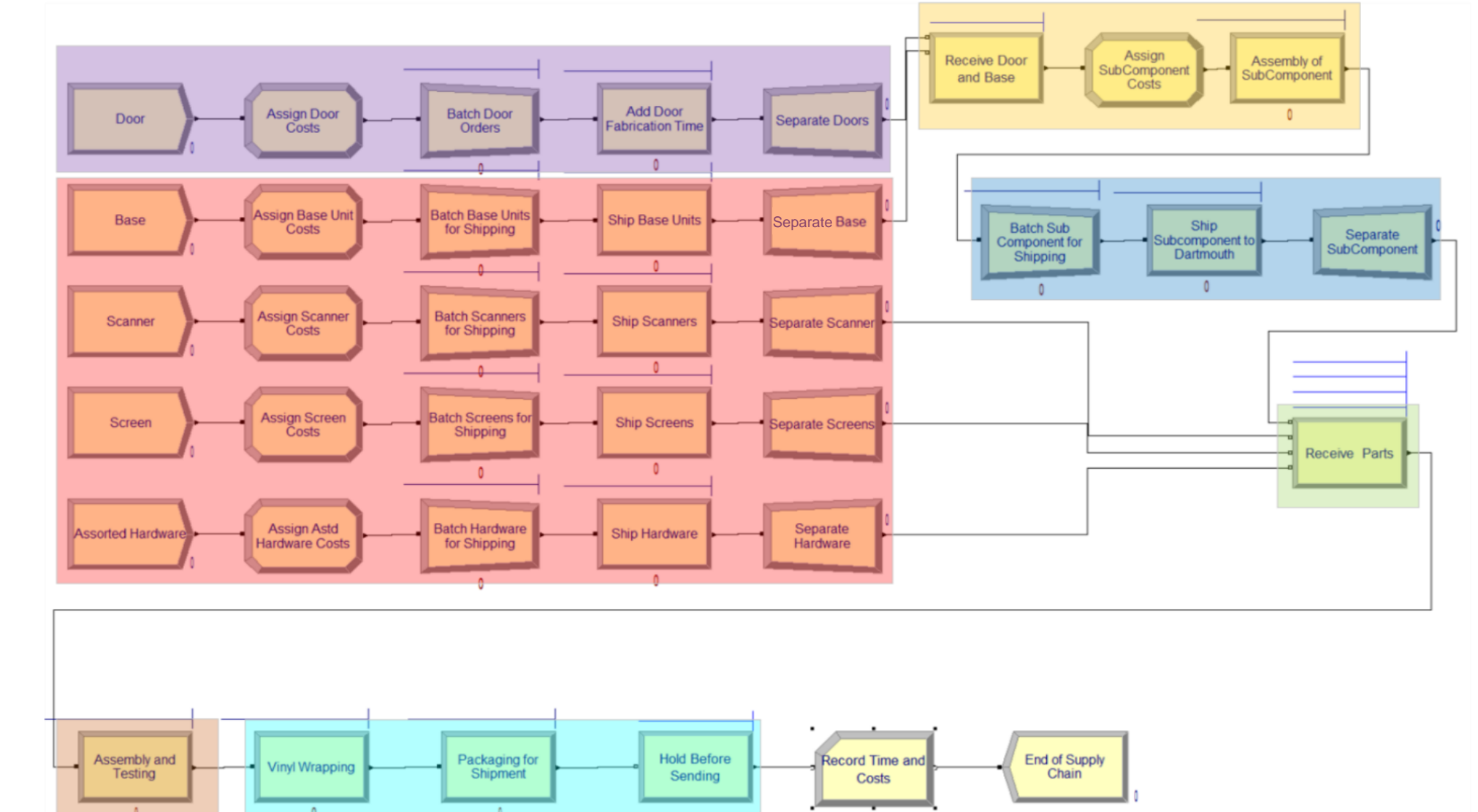


### Simulations



### Simulation Model Considers

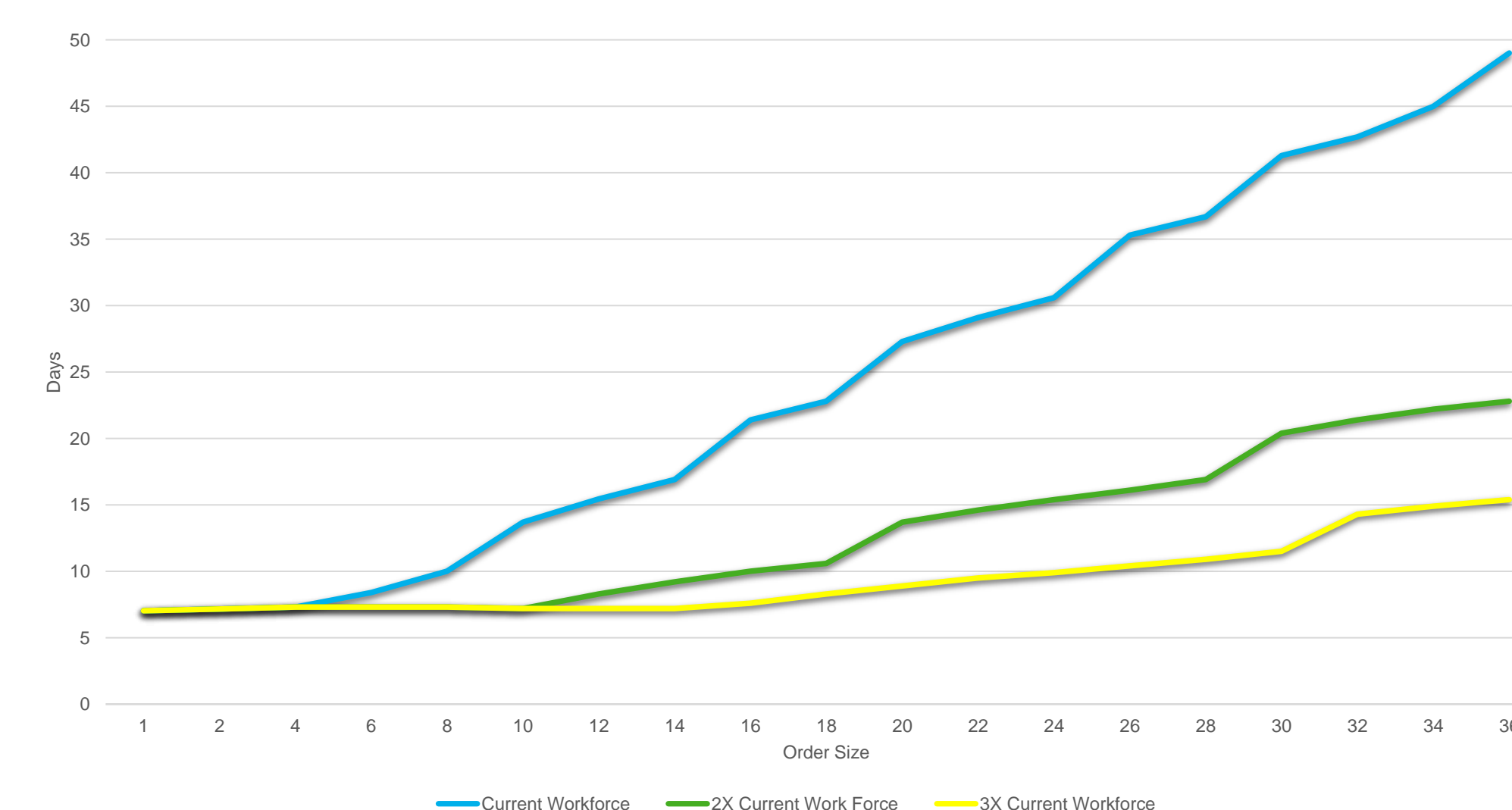
- Sourcing
- Fabrication
- Subassembly
- Intermediaries
- Consolidation
- Assembly
- Packaging



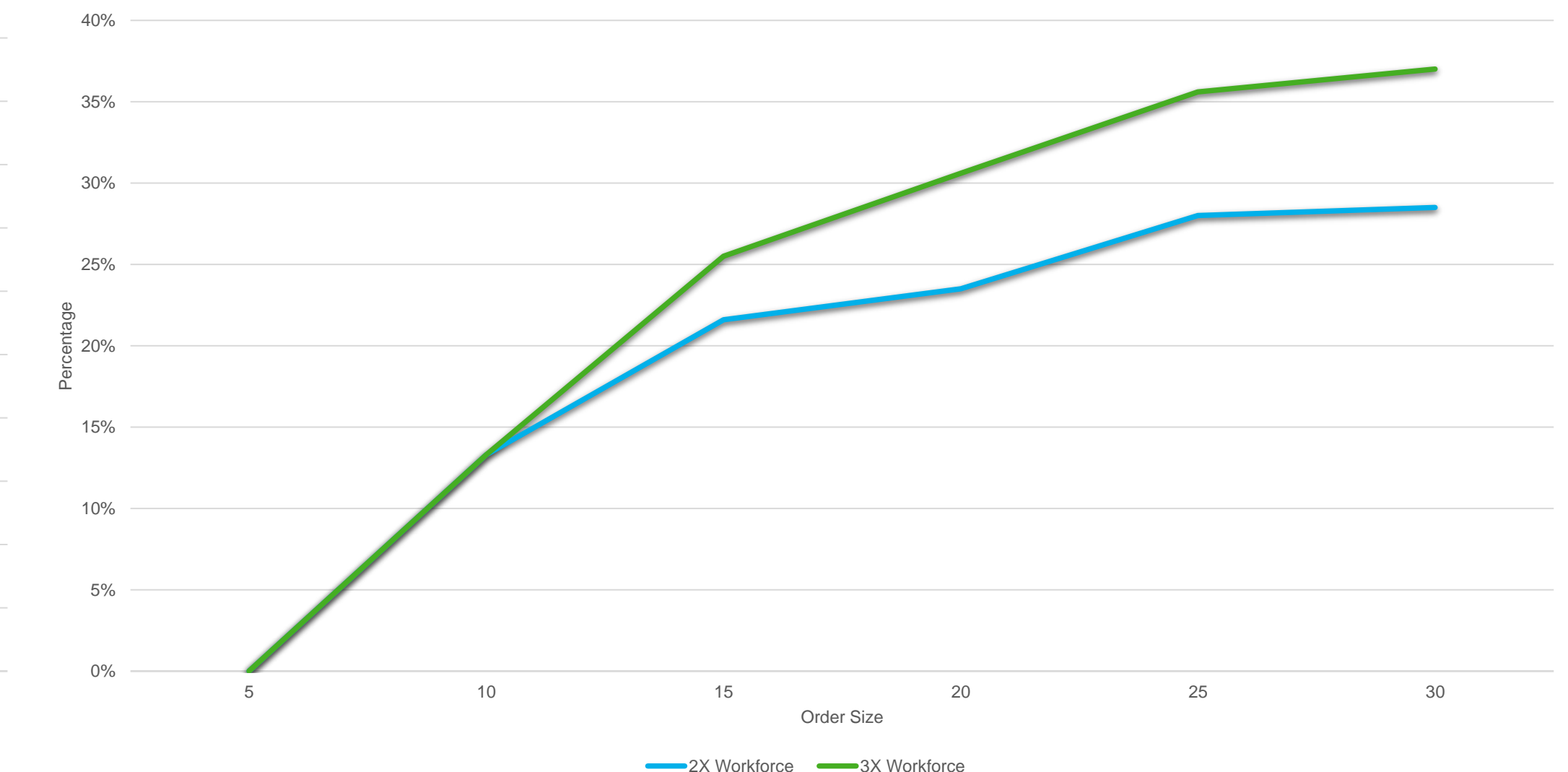
## 6. Recommendations

### Workforce Size Impact on Lead Time

Production Leadtime in Various Workforce Sizes



Percent Decrease in Lead Time with Larger Workforce Capacity



- As order size increases, a larger workforce dampens the increase in lead time
- Much bigger improvement from 1X to 2X current work force than from 2X to 3X current workforce