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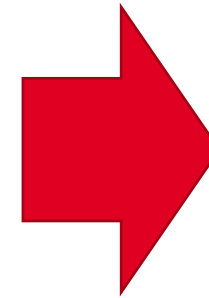
# Unique Challenges of Service Parts Logistics

UNT Logistics Executive Lecture Series

October 30, 2020

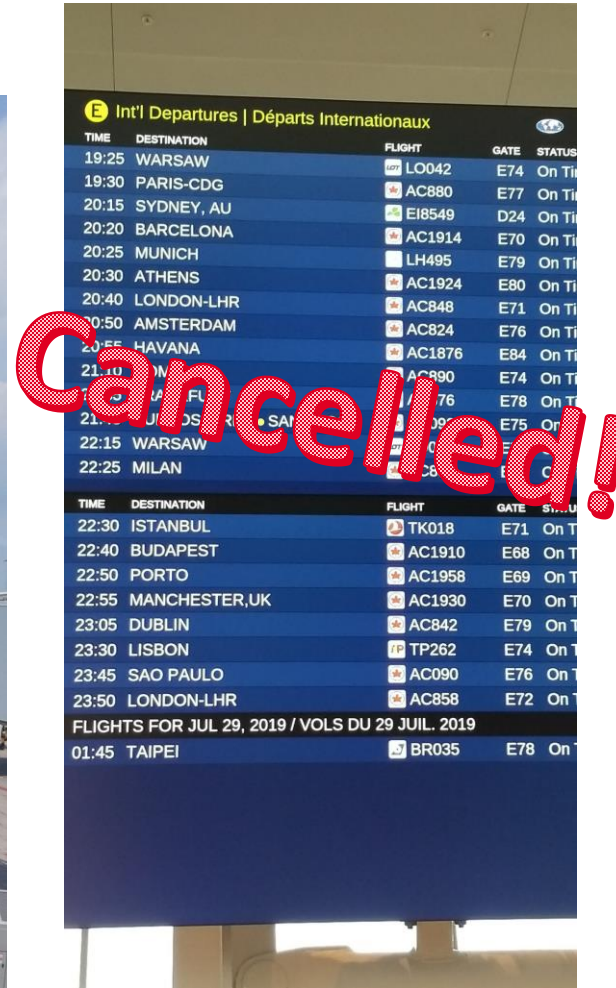
# What is Service Parts Logistics?

- We've all experienced "waiting for a part" to get something fixed
  - It can be inconvenient, annoying, and expensive!
  - If your refrigerator is broken, and the repair person says you need to wait a week for a part, what happens?



# What is Service Parts Logistics?

- The business costs to an airline of a cancelled flight



- Airline Costs:

- Rebooking everyone
- Hotel Vouchers
- Food Vouchers
- Refunds/Penalties
- Other cancellations
- Crew rescheduling

- It's a lot of money

# What is Service Parts Logistics?



- Now think about the costs when a part isn't available:
  - A chemotherapy device is broken and someone can't get a cancer treatment
  - The internet is down in an office building with 2,000 employees
  - A robotic arm in a factory making computer chip wafers stops working
- In all of these examples, there's a high cost of "downtime"
  - Companies pay a premium to get high levels of service
  - They expect the needed replacement parts to be available the same day!

## Service Parts Logistics

- Making sure the right spare parts are in the right place to fix things that break
- Building a supply chain network that allows for near immediate, sometimes global availability of key parts





Service Parts Exist  
in Almost Every  
Industry

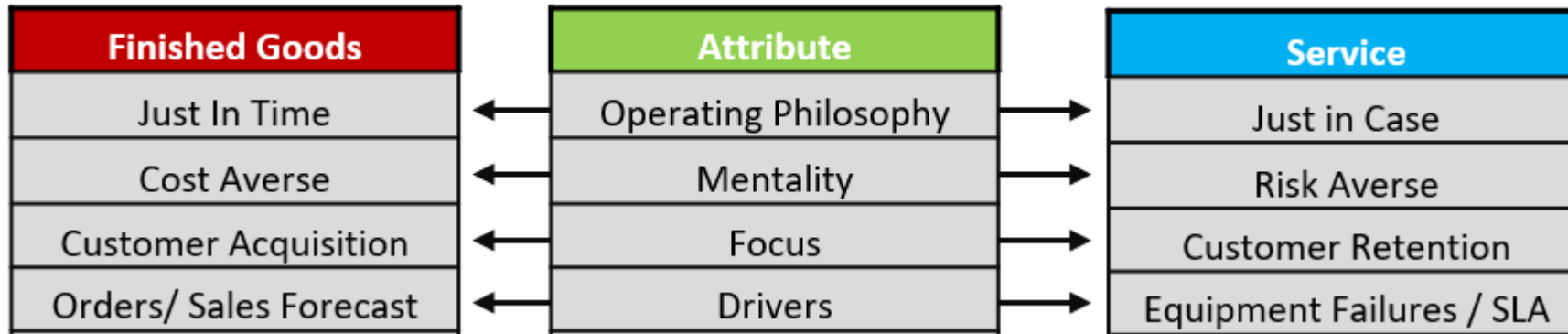
## In Manufacturing/Retail:

- Demand is often a “buy” decision from a consumer
  - Retail Inventory Goal: **Just in time** availability at retailer or warehouse
  - Too much inventory means unsold product and lost profit margins
- Manufacturing builds products based on a sales forecast
  - Manufacturing Inventory Goal: **Just in time** delivery of raw materials from suppliers
  - Too much raw materials in inventory awaiting manufacturing ties up company capital
- Retail demand may be influenced by:
  - Forecasted sales to consumers
  - Advance orders from retailers
  - Promotions, advertising, and other demand-enhancement events
  - Economy



# Service Parts Supply Chain is Different

- Demand occurs when something important stops working and a part is needed to fix
  - Parts need to be available to support a service event

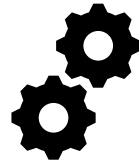


- Customers with critical equipment expect parts to be immediately available
  - They likely have purchased Service Contracts with same-day fix commitments
- Demand is not typically influenced by sales or promotions
  - Failure events are random!
- A large portion of service parts is business to business (B2B) rather than business to consumer (B2C)

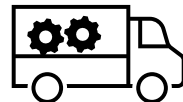
# Lifecycle of a Critical Service Event



- An airport has purchased a service contract with a “fix it within 4 hours” clause for key escalators
- An escalator at the airport fails someone calls or uses a web portal to request service
- A service rep or an automated system sends a tech



- The technician arrives on site and troubleshoots
- They need part(s) to fix the issue
- They call or enter a critical parts order
- A system or call center finds the closest warehouse with the right parts and dispatches the needed parts



- Then nearby warehouse picks the part
  - The tech drives to get the part –or–
  - A special courier delivery is made
- The tech has the part and fixes the escalator within 4 hours of the original service call



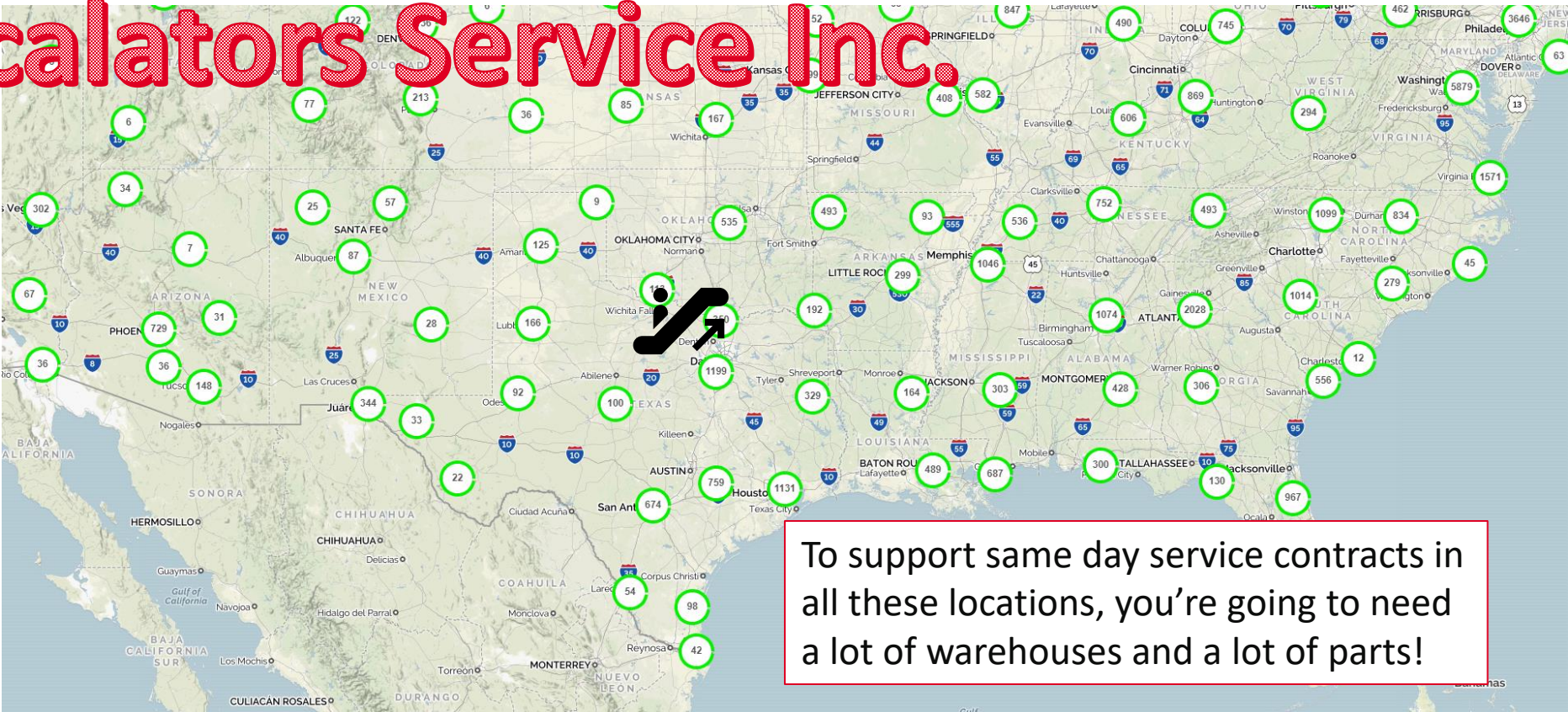


# Warehousing Implications of Same Day Service



- Many companies sell “same day” service contracts on their products
- Think about that 4HR service contract again
  - Multiply that by tens of thousands of service contracts

## Escalators Service Inc.





# A Typical North American Service Parts Network



The Problem?  
Too many warehouses!



- Warehouses are needed in 50 – 100 cities to achieve 2 – 4 parts delivery
- That's a lot of warehouses and leases to manage!
  - Warehouse employees in each facility
  - Different leases in every city, each with its own renewal terms
  - Computer equipment
  - Racking
  - Lifts and other equipment needs
- Most companies that offer service don't want to manage all of this
- They contract third-party logistics companies (3PLs) that provide "multi-tenant" warehousing
- They pick and choose the cities and space they need

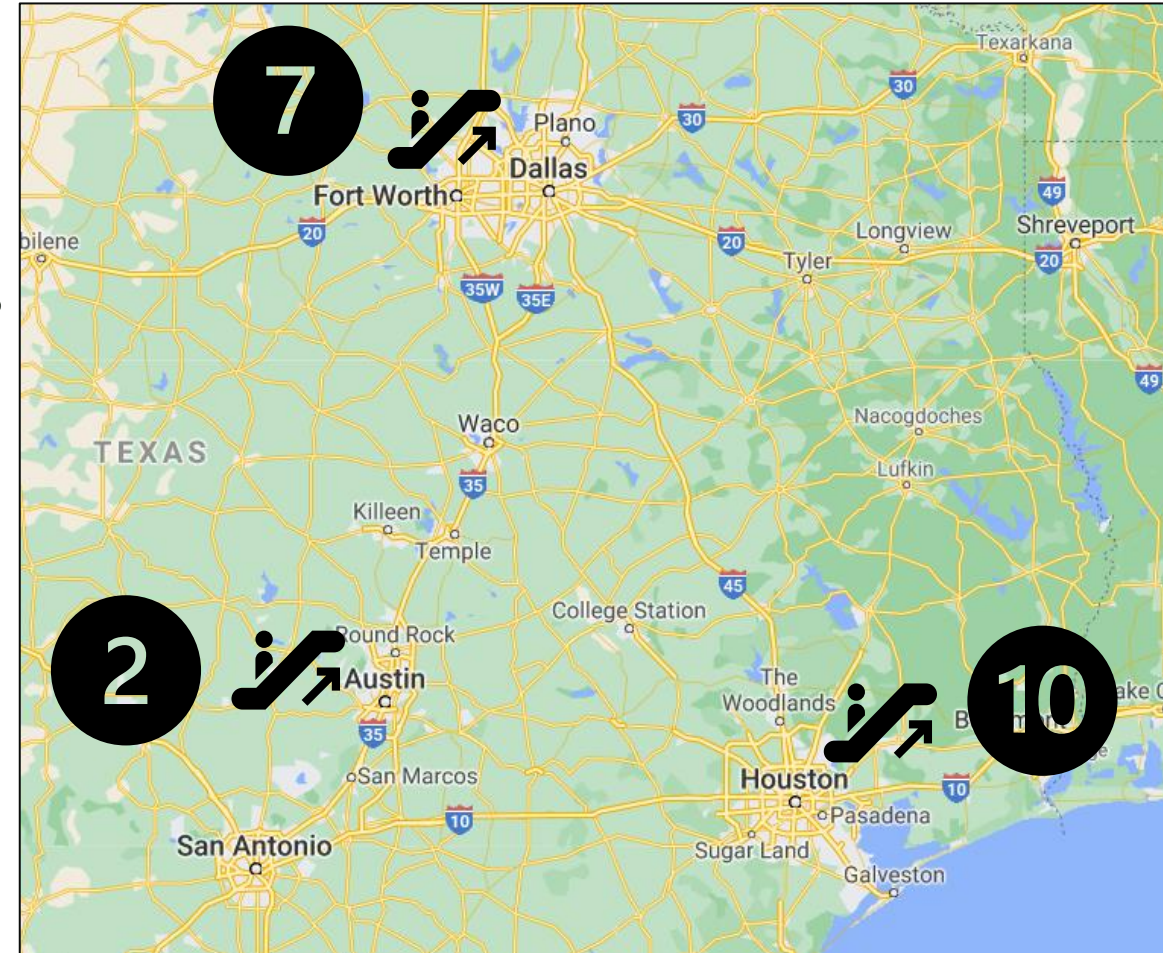
The Solution?  
3PLs!



# Forecasting and Planning Service Parts Needs



- Challenge #1: Demand Forecasting - Where are part failures going to occur?
  - Consider our escalator example
- Key Terminology:
  - **Installed Base**: The number of installs of a specific product
  - **Bill of Material** (BOM): The components of that product that could fail
- Austin only has 2 installs of a specific escalator model
- Austin might not have any history of part failure of a key component
  - You still need a forecast for Austin, even though there's no history there!

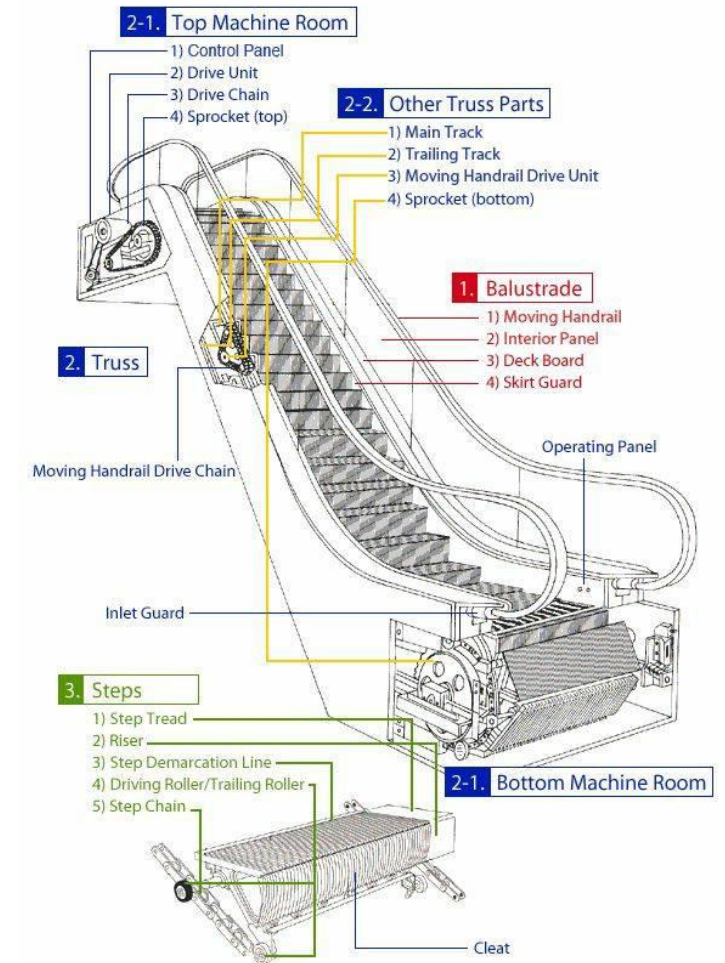




# Forecasting and Planning Service Parts Needs

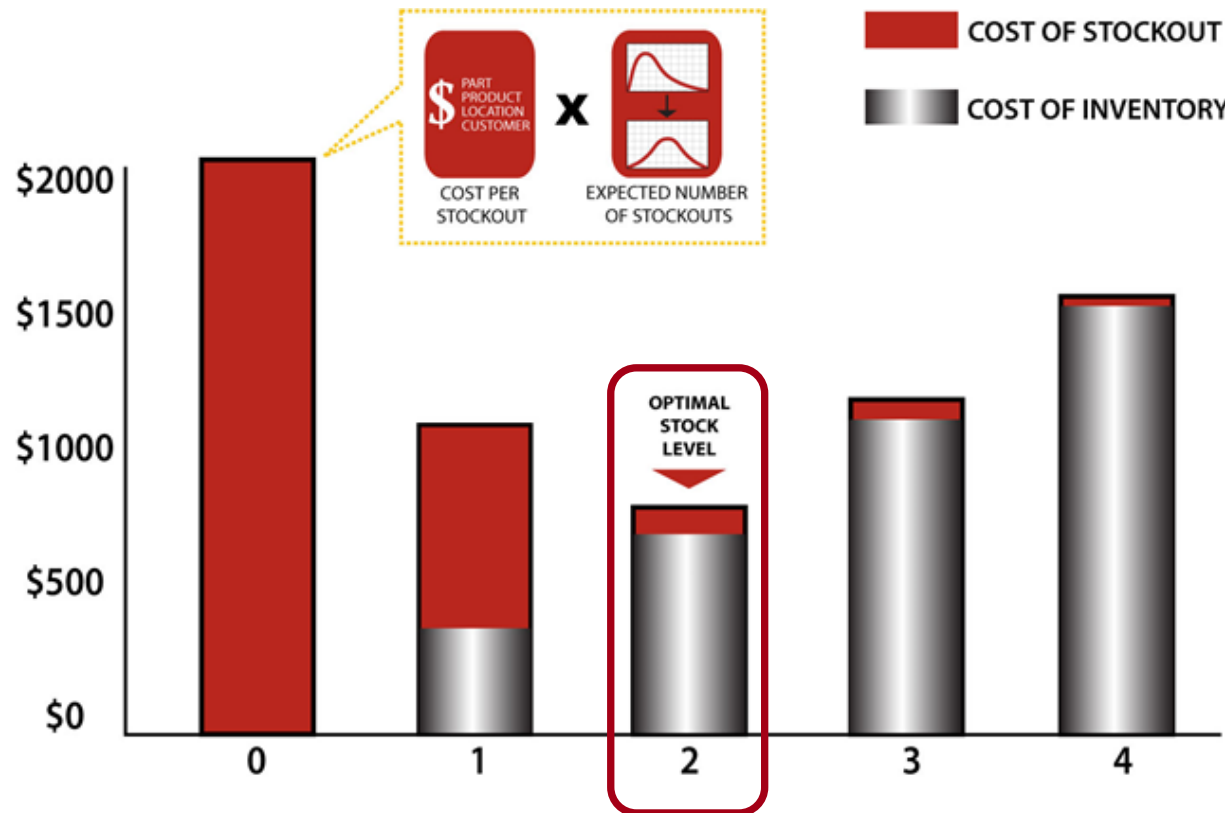


- Challenge #2: Where to place parts (and how many)?
  - Every escalator has 100s of parts that could fail
  - Some are very expensive
  - Some fail very infrequently
- Determining correct stocking is a balancing act!
  - Inventory costs
  - Downtime costs
- The solution? A Service Parts Planning System!
  - High usage parts are stocked locally
    - Reduces transportation
  - Medium usage / expensive part stocked regionally
    - Longer delivery time, more expensive
  - Low usage / very expensive / critical parts are flown in
    - Very expensive, but rare



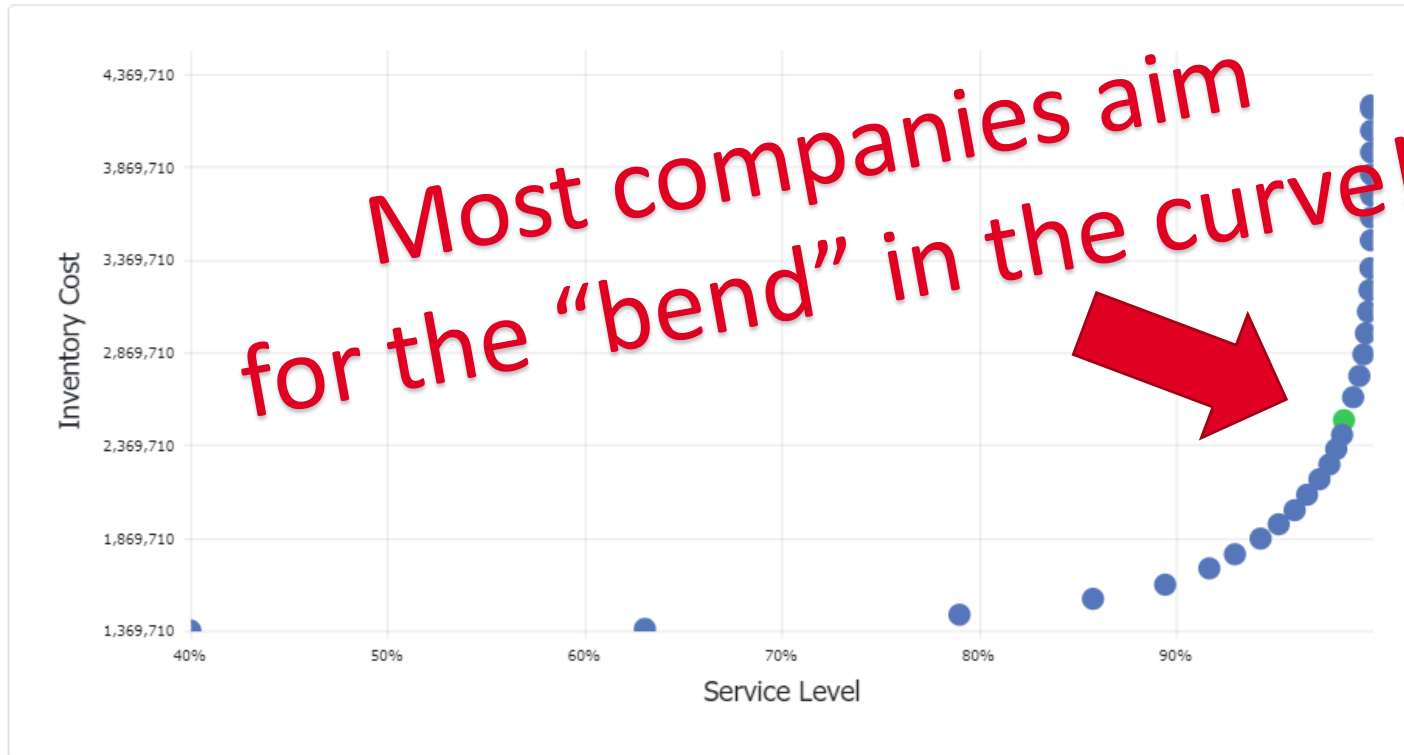


# The Balancing Act, Part 1: Inventory Costs vs Costs of Downtime



- Key Terminology:
  - **Stockout:** When you need a part and it's NOT on the shelf
- Even though inventory for service is "Just in Case" doesn't mean you want to spend more than you need
- You only want to carry enough inventory to minimize downtime risk

# The Balancing Act, Part 2: Inventory Costs vs Service Level

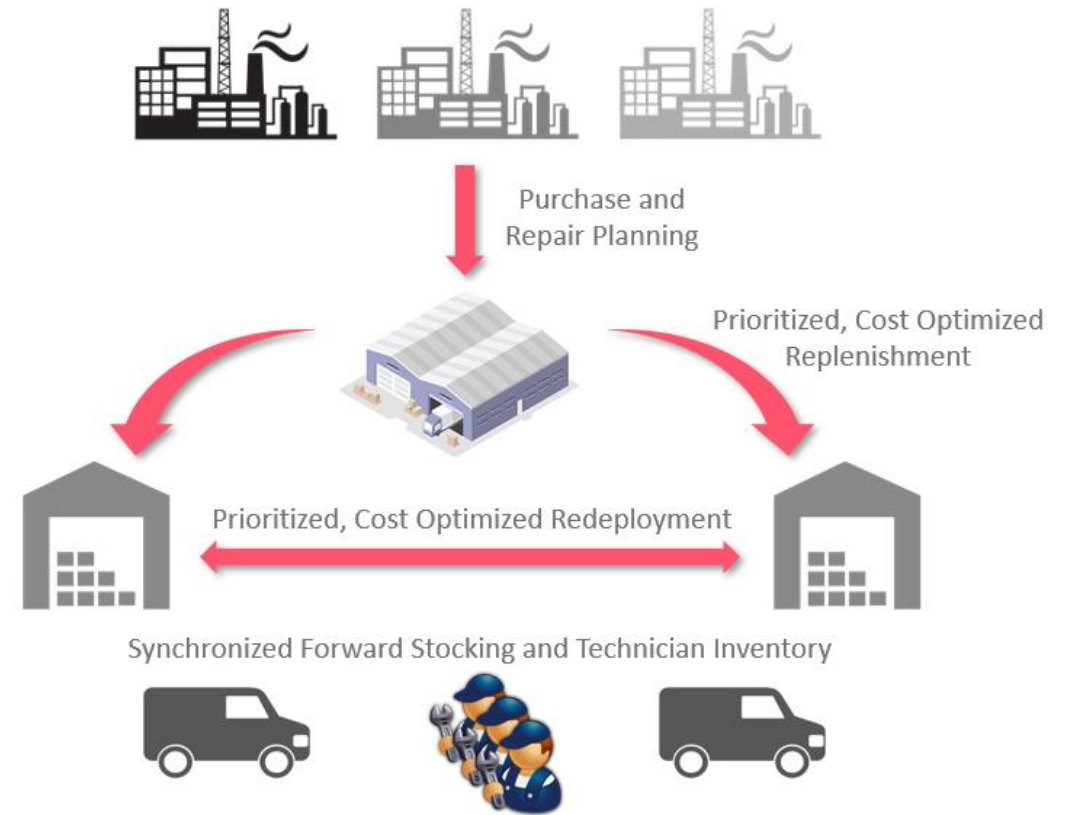


- More terminology
  - **Service Level**: The percent of time a part is immediately available on the shelf when it
- The closer you try to get to 100% service level, the faster inventory grows with less benefit!
- The closer you get to zero inventory, the faster service level also approach zero!

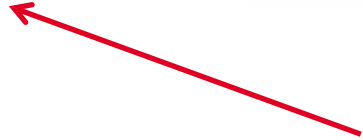
# Reverse Logistics and Repair

- Many service parts are fixed and re-used
- When a broken part is removed, it isn't just thrown away
  - Returned to a main warehouse
  - Repaired instead of buying/building a replacement
- This saves money!
  - Repairs are cheaper
- This is green!
  - Repair is much more environmentally friendly than throwing it in the garbage

Reverse Logistics  
Returns Forecasting  
Scrap/Yield Calculation



# Part Chaining / Substitution



- In service parts, often a company ends up supporting multiple generations of the same product
- In this example, two models of a cash register
  - One model has a keyboard with a track ball
- The keyboard with the track ball is backwards compatible
  - You can use the newer keyboard on the older cash register if needed
- The new model **MUST** have the keyboard with the track ball
- This is a substitution relationship
  - Also called “part chaining”
  - It adds complexity to parts planning



# Summary



- Service Parts Logistics is very different from retail or manufacturing
  - Parts held as insurance against failures
  - Inventory investment is a hedge against high downtime costs
- Many companies use third party logistics providers for warehousing
  - Global, flexible warehouse network
  - No need to own warehouse space and employees in 100s of cities around the world
- Planning service parts inventory is complicated
  - Lots of low demand items
  - Many stocking decisions are 0 or 1
  - When a part is needed and not available, downtime costs can be very high
- Service Part Logistics has other unique needs
  - Reverse logistics and part repair/re-use is common
  - Multiple part revisions and part chaining is common



- We are a Service Parts Planning software & service company based in Austin
  - We develop service parts planning software used by some of the world's largest companies



- We are growing rapidly!
  - We hire new college grads with a supply chain focus
  - You learn fast and contribute immediately
  - New supply chains college grads do consulting, spare parts planning services, and software implementation support

- We're a great place to work!
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Austin Business Journal



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PLANNING

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Q & A

Thank You!

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