Planning for Peak Demand in Reverse Logistics

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Agenda

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Returnable Transport Items (RTIs)

Examples:

- **Bins**

- **Kegs**

- **Pallets**

- **Racks**

Uses:

Internal & external movement

- **Raw materials**

- **Semi-finished products**

- **Finished goods**

Returnable Transport Items (RTIs) : Objects used for the purpose of "transportation, storage, handling, and product protection in the supply chain, which are returned for further usage"

Returnable Transport Items (RTI): Examples

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High Volumes of RTIs used in Logistics Industry
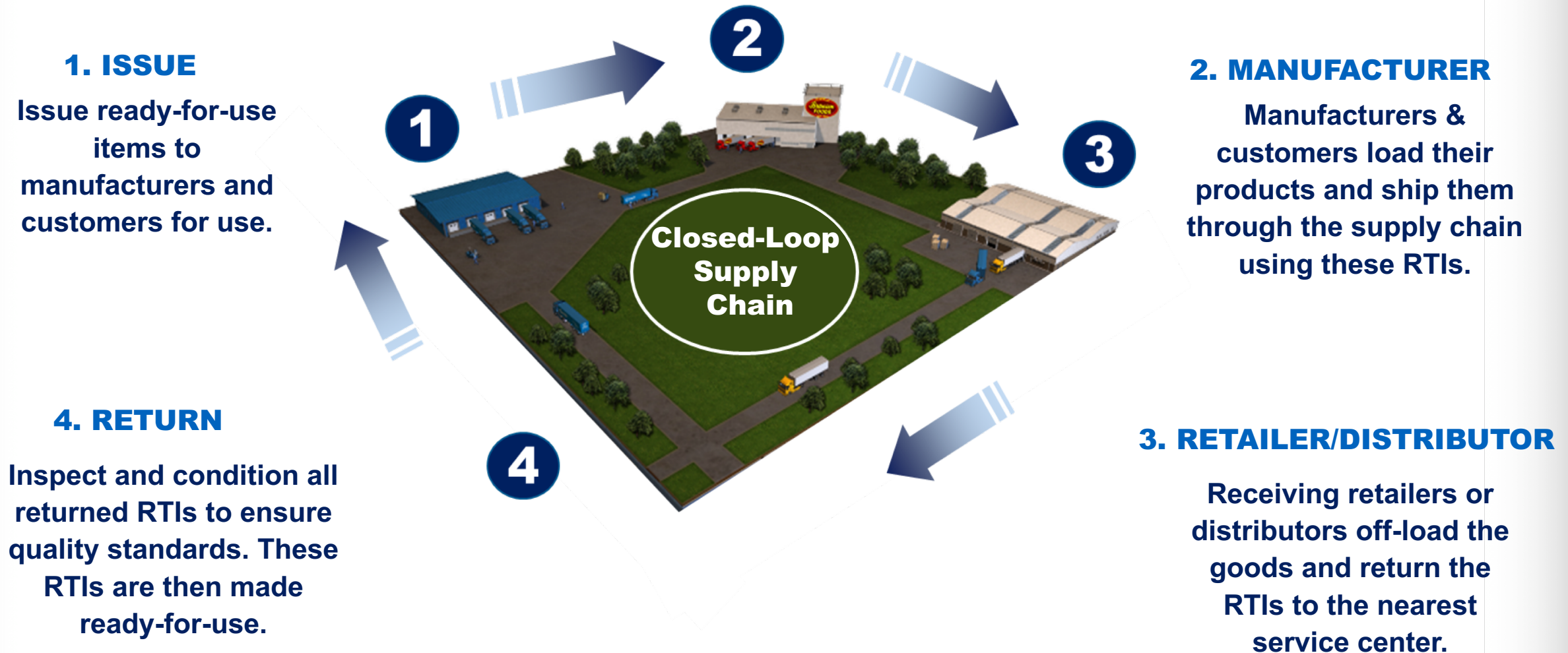

Active RTIs in US: **>2 bn units**

Transport trade: **80%** of the country's trade
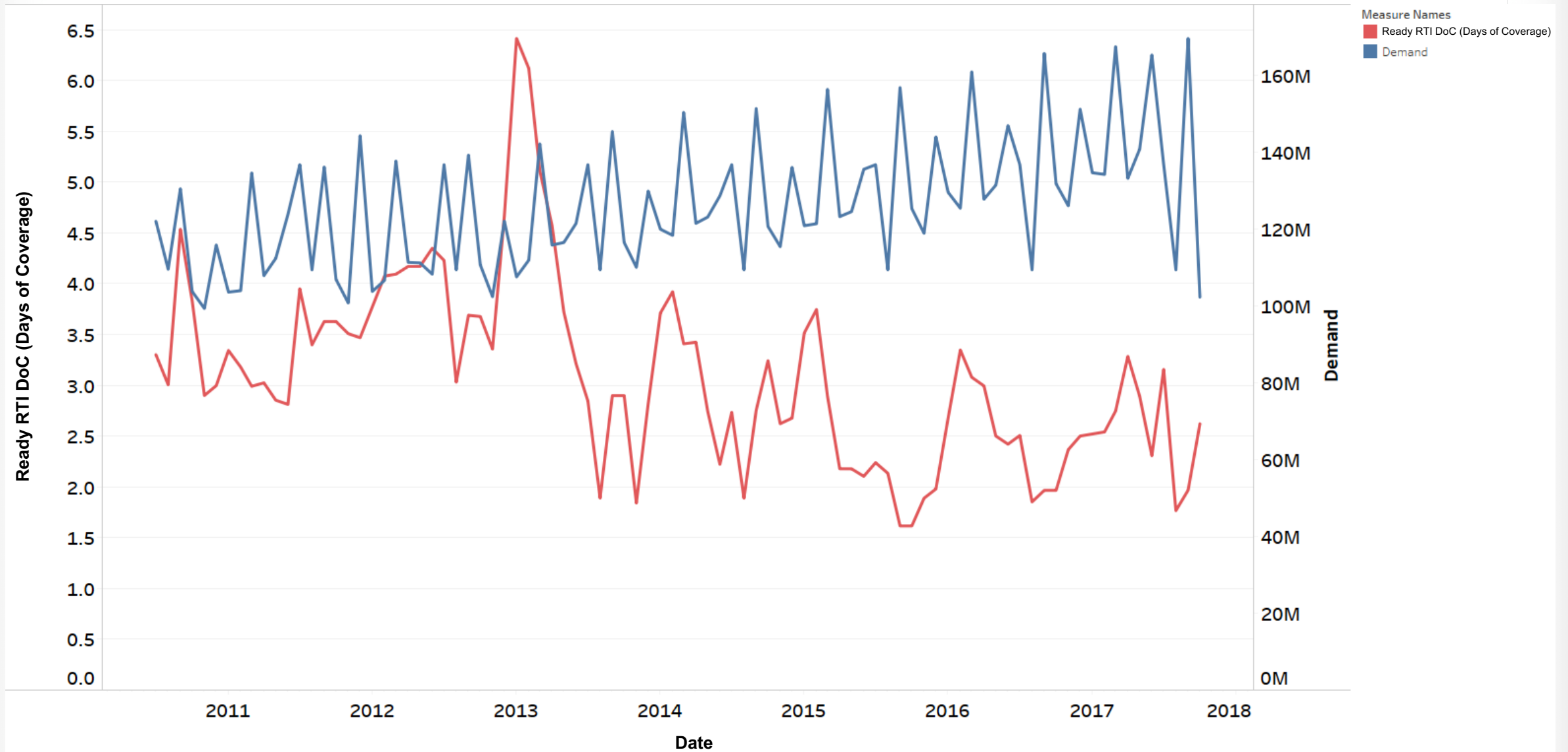
Global sales: **>5 bn units**

Global growth: **5%**

With such significant dependency on the RTI platform to move their materials, a ready supply of empty RTIs is vital to ensuring users' operational readiness.

Flow of RTI in a Closed-Loop Supply Chain

1. ISSUE

Issue ready-for-use items to manufacturers and customers for use.

2. MANUFACTURER

Manufacturers & customers load their products and ship them through the supply chain using these RTIs.

4. RETURN

Inspect and condition all returned RTIs to ensure quality standards. These RTIs are then made ready-for-use.

3. RETAILER/DISTRIBUTOR

Receiving retailers or distributors off-load the goods and return the RTIs to the nearest service center.

Demand is growing and supply is not keeping up

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Project Objectives

Key Question
- How does inventory position (days of coverage) affect supply chain costs and service levels?

Objective:
- Analyze historical key performance indicators
- Identify key drivers that impact service and cost
- Recommend inventory policy to minimize cost and achieve service levels
- Quantify the improvements in terms of cost and service levels

Project Contributions
- A regression model to identify correlations between cost, service levels and inventory position.
- Scenario Planning Tool (SPT) to find optimal inventory position to minimize supply chain costs and maximize service levels.

Methodology

Data Collection → Perform Regression → Analysed Results → Build Scenario Planning Tool

Main cost factors in a closed loop supply chain

Relocations (Internal Transport)

Issue (To Customer)

Collection (From Customer)

Collection (From Customer)

RTI Company

Manufacturer

Wholesaler

Retailer

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Main cost factors in a closed loop supply chain

Relocations (Internal Transport)

Inspection

Repair

Ready

RTI Company

Manufacturer

Wholesaler

Retailer

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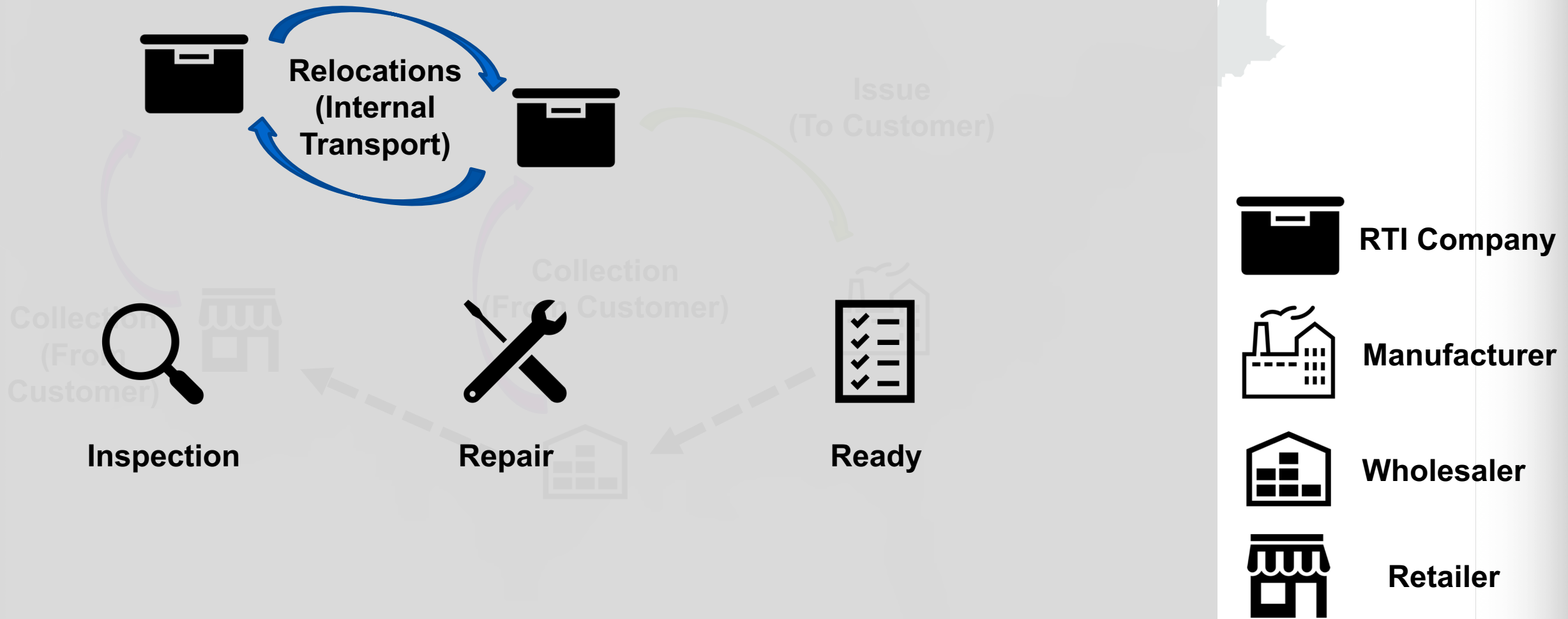
Cost factors have various weights of impact on total cost
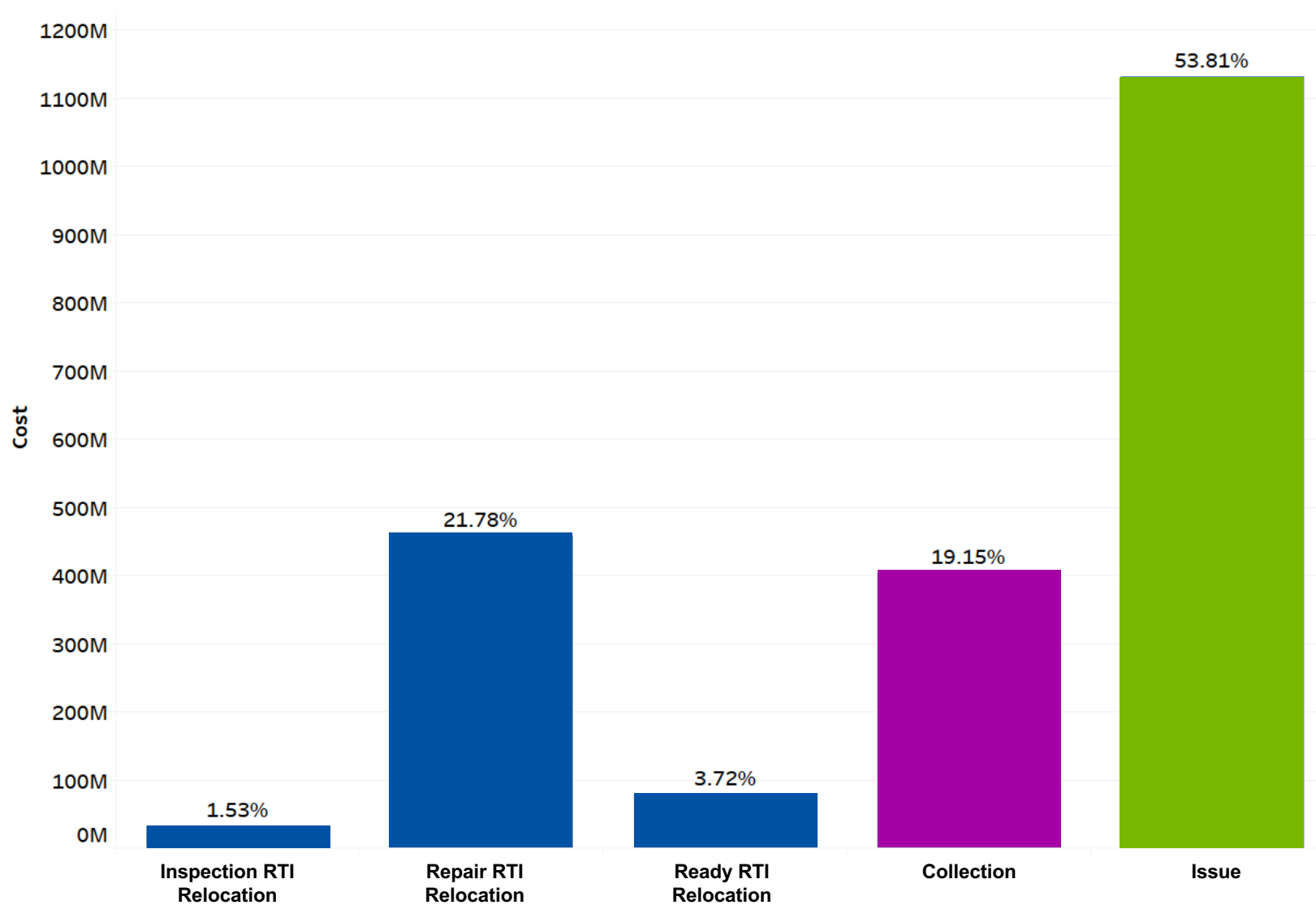
Increasing days of coverage reduces logistics cost
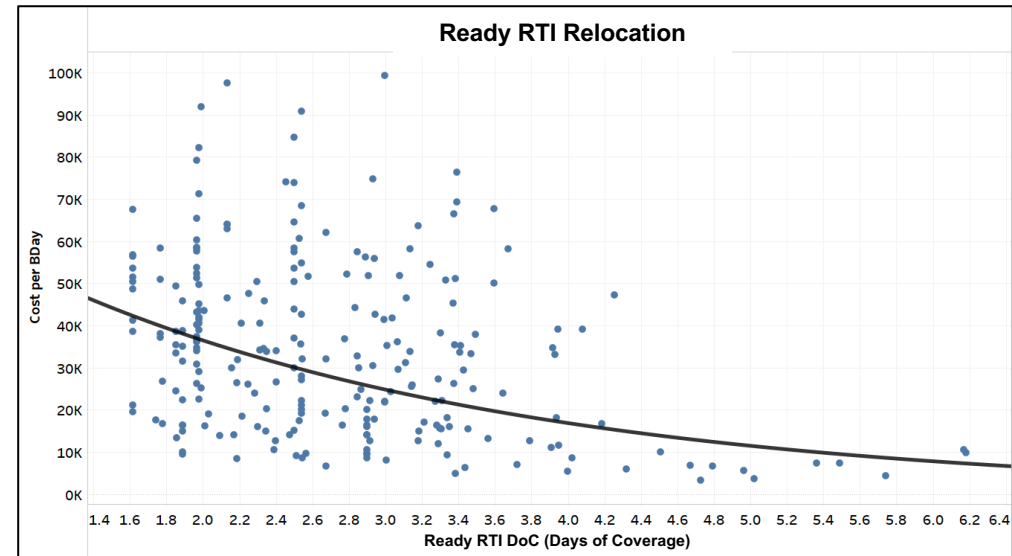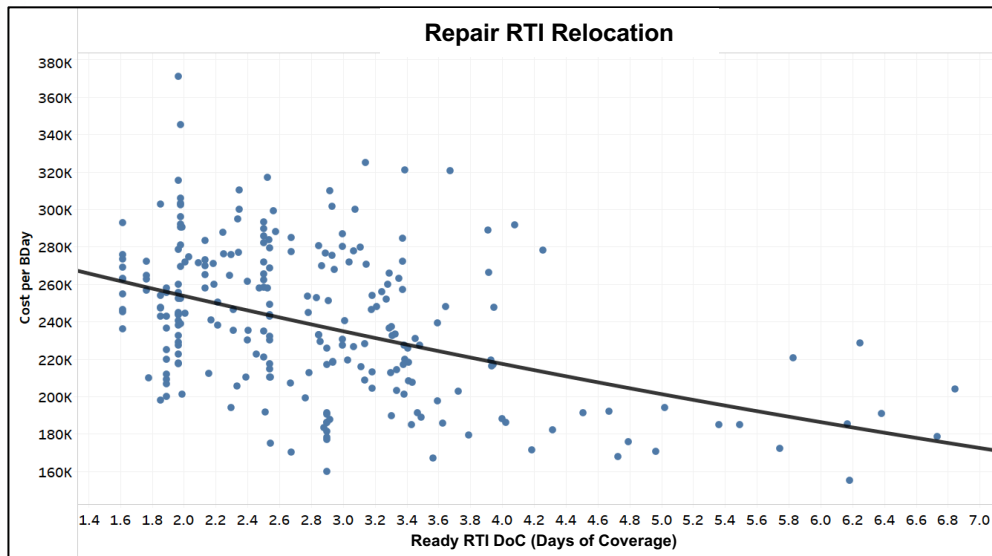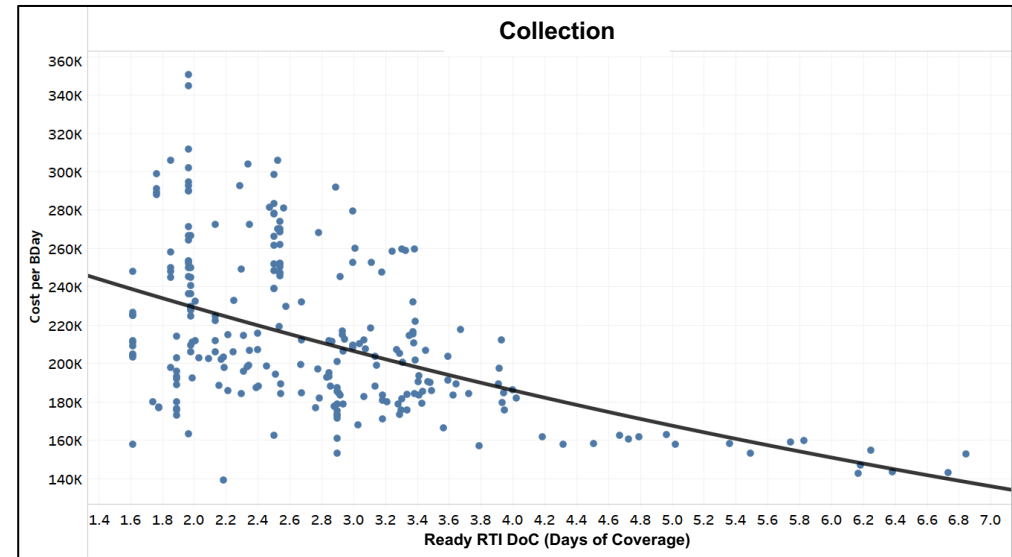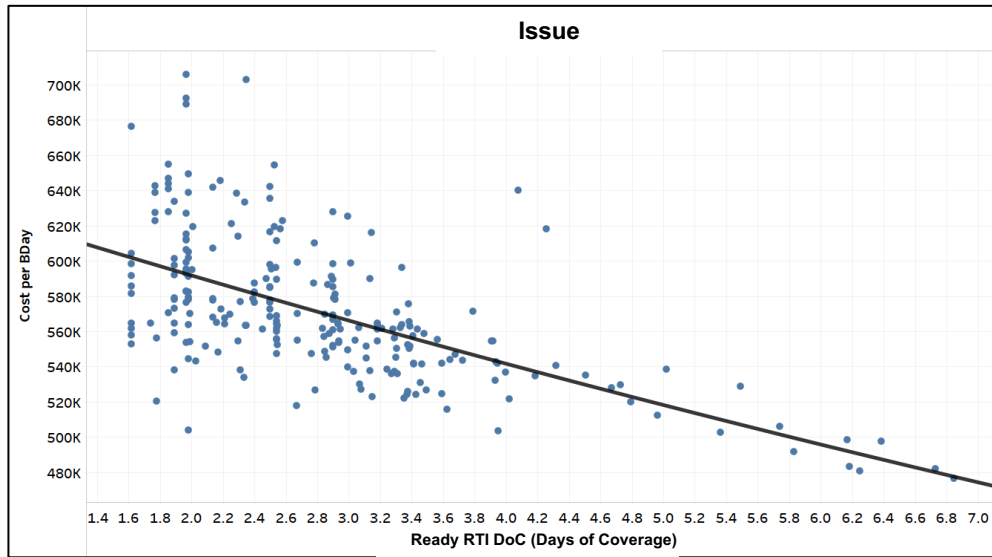
Opportunity to optimize minimal logistics supply chain cost

Cost (y-axis): 250M, 255M, 260M, 265M, 270M, 275M, 280M, 285M, 290M, 295M, 300M

Ready RTI DoC (Days of Coverage) (x-axis): 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0
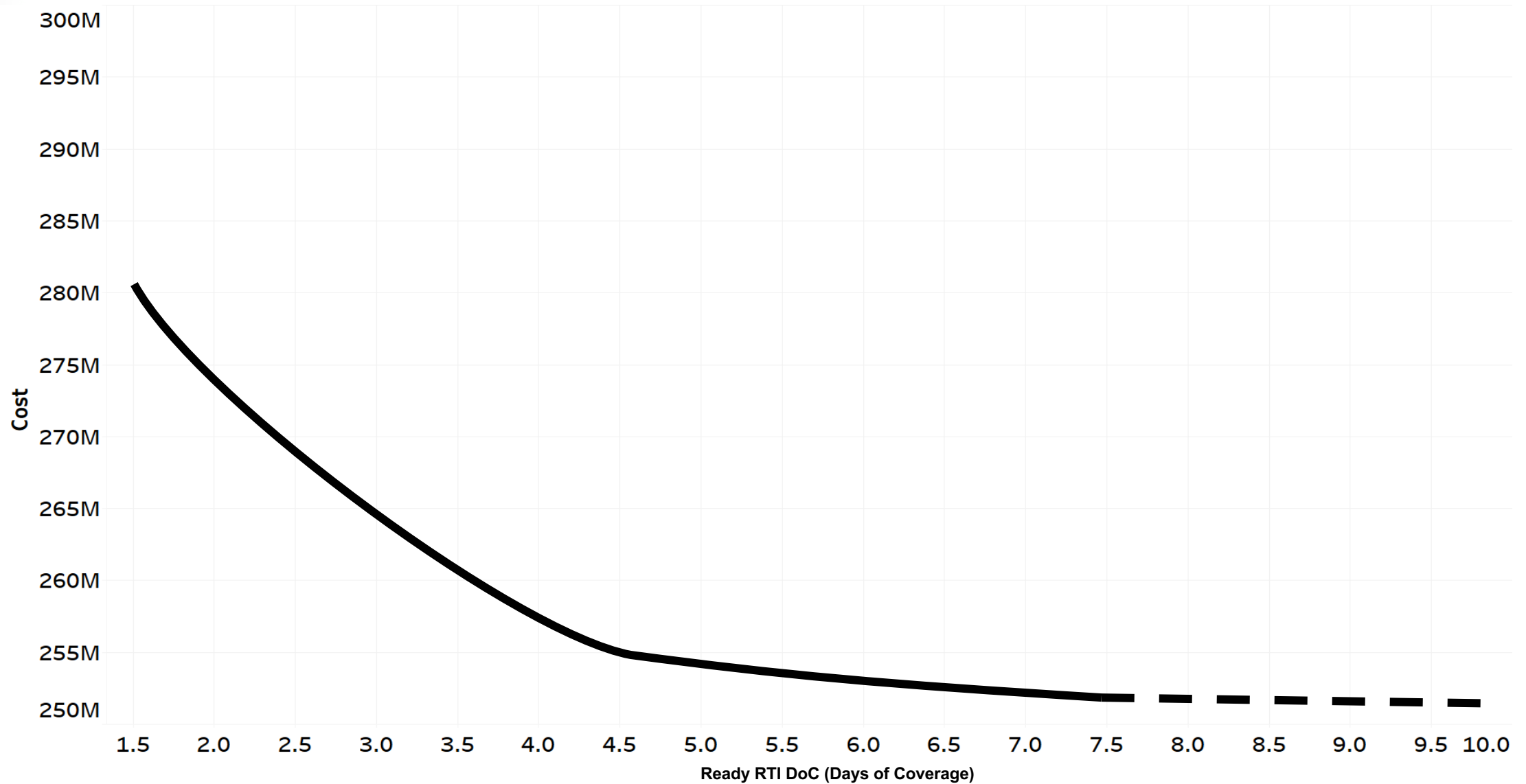
Increasing days of coverage increases service levels

Service Level: On Time Performance (OTP) is a ratio of successful orders fulfilled over total orders fulfilled and measures success when an RTI is delivered on time, failure if late (>3 days)
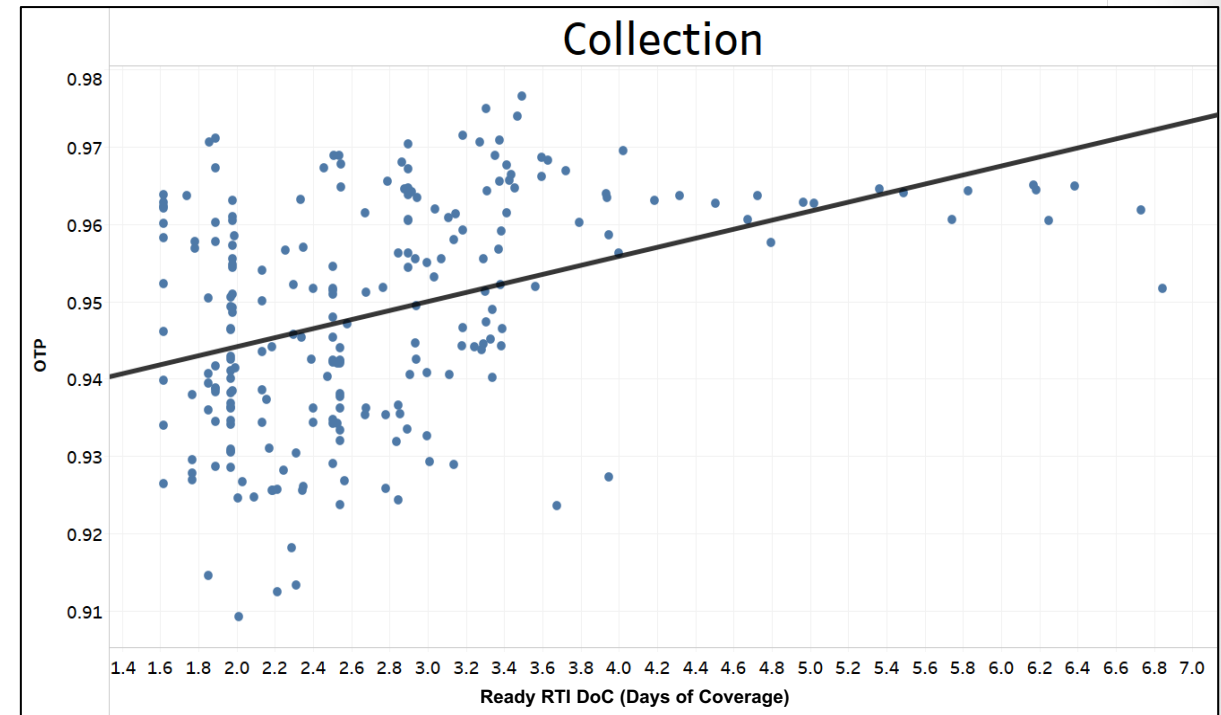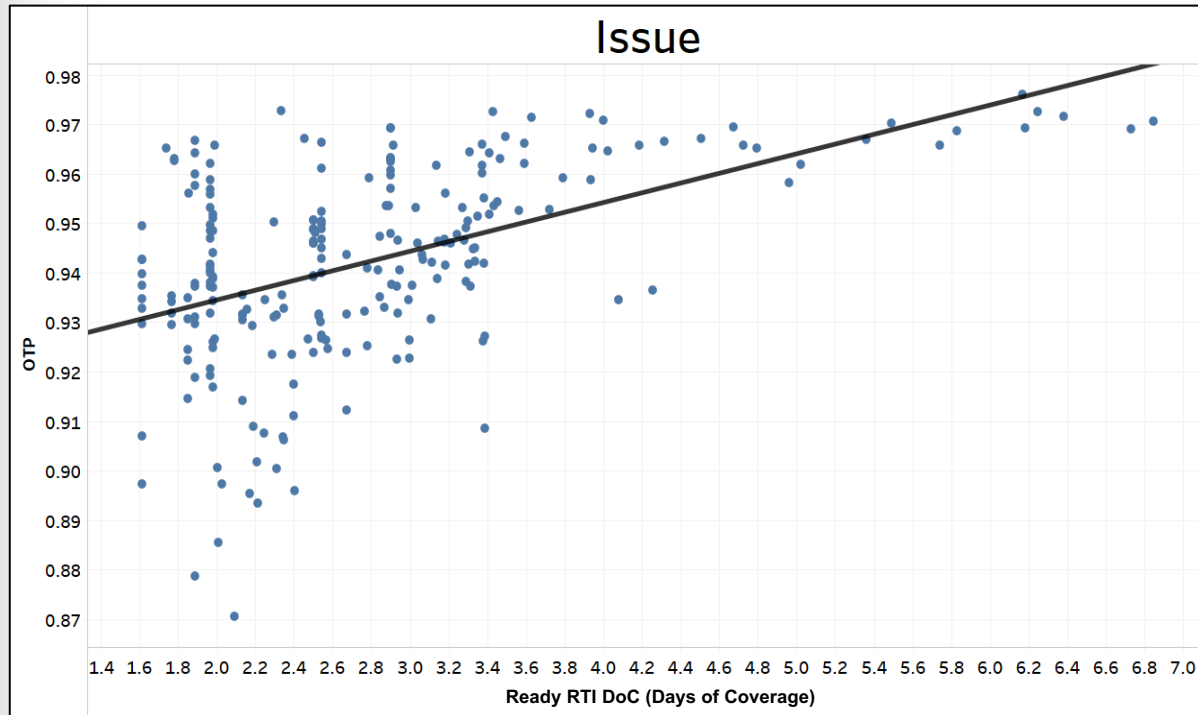
Diminishing marginal benefit on service levels
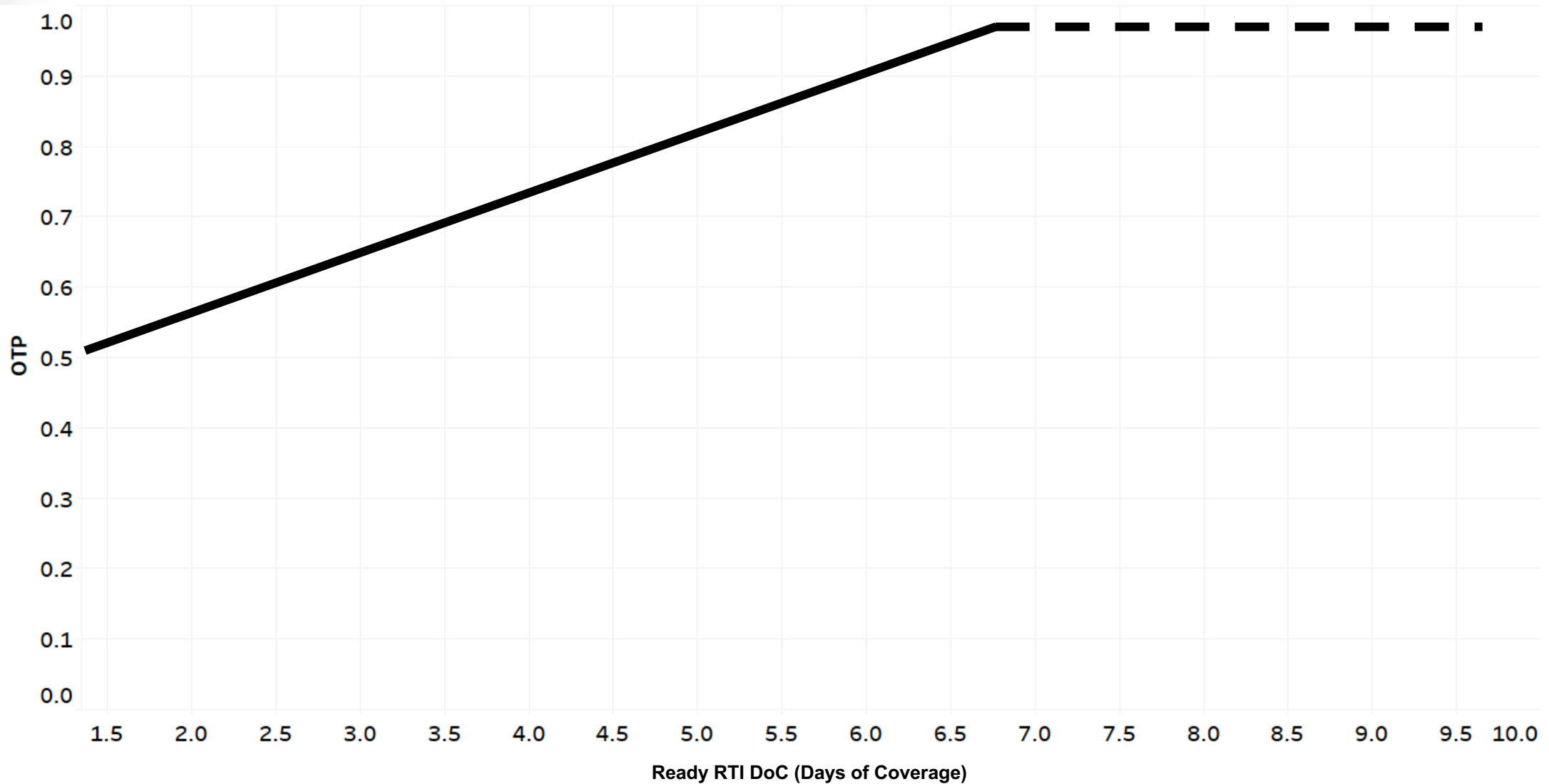
Service levels are met before minimum logistics costs are attained

Introduction | Objectives | Methodology | **Insights** | Conclusion

# Scenario Planning Tool

Key Takeaways

1. **Minimum logistics cost does not necessarily mean an optimal supply chain plan**

2. **Correlation between inventory policies and supply chain costs provides opportunity to minimize cost while achieving service level objectives**

3. **Planning horizon for supply has to be longer to account for high seasonality in demand and mitigate bullwhip effect**

Challenges faced in increasing days of coverage

- **New RTI: $2 per unit**
- **Labor ramp-up at 1%**
- **3-6 months lead time**
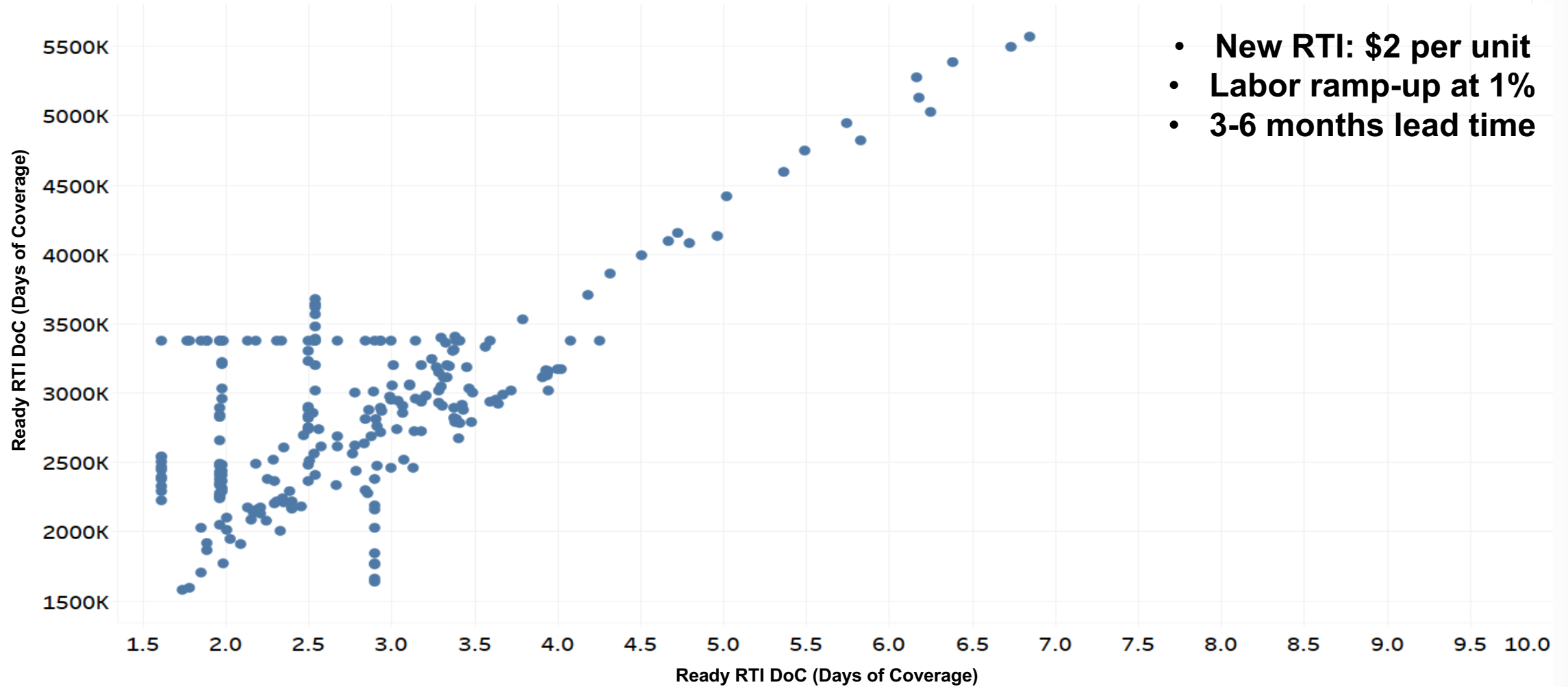
Trade-off between new RTI cost and logistics cost
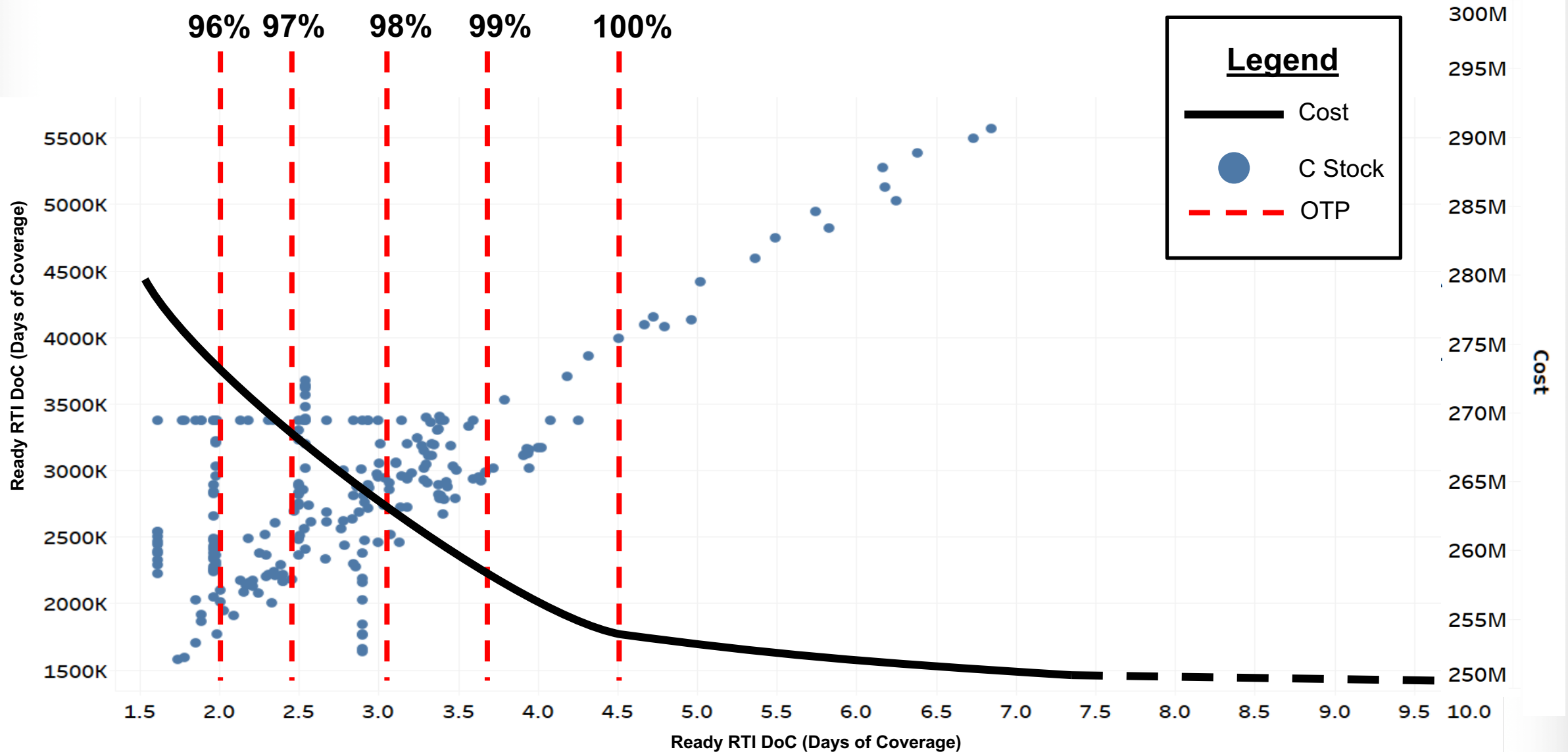
Benefits

1. Planning for peak demand for entire year, taking into account inventory policies when managing supply chain cost factor

2. Quantifying and justifying increase in inventory and service levels against costs

3. Optimal supply chain plan could have improved logistics cost up to 24% and service levels up 5%

THANK YOU