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LRRP and LCP

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LRRP and LCP

1. Purpose of LRRP

Logistics Resource Requirements Planning (LRRP) determines the logistics resources needed to meet a future distribution or transportation plan. It evaluates demand forecasts, shipment volumes, warehouse workloads, and transportation flows to identify future requirements for labor, equipment, storage space, and carrier capacity. LRRP provides visibility into resource gaps before they become operational bottlenecks. Its purpose is to ensure that logistics functions have the right people, tools, and capacity to support demand, thereby improving service reliability, reducing bottlenecks, and enabling better budget planning.

2. Purpose of LCP

Logistics Capacity Planning (LCP) focuses on determining whether existing logistics capacity is sufficient to handle projected demand. This includes evaluating warehouse throughput, storage space, transportation fleet capacity, dock operations, and carrier availability. LCP identifies potential constraints—such as peak-season surges or labor shortages—so proactive measures can be implemented. Effective LCP prevents service failures, reduces overtime and expedite costs, and ensures smooth logistics execution. Understanding its purpose is crucial for balancing demand variability with efficient operations.

3. Relationship Between LRRP and LCP

LRRP identifies the resources required (labor, space, equipment), while LCP evaluates whether available capacity can support these resource requirements. They work as an

integrated planning framework: LRRP defines “what is needed,” and LCP verifies “whether it is doable.” Together, they support decisions on hiring, outsourcing, equipment investment, warehouse expansion, or transportation contracting. Understanding their relationship ensures cohesive logistics planning and prevents mismatches between demand and operational capabilities.

4. Inputs to LRRP

LRRP relies on detailed inputs such as demand forecasts, order profiles, shipment frequency, picking and storage requirements, transportation routing plans, and customer service expectations. It also considers product characteristics such as cube, weight, handling needs, and packaging formats. Accurate inputs ensure realistic resource planning. Errors in inputs lead to miscalculated resource requirements, resulting in congestion, delays, and fixed-cost inefficiencies. Understanding LRRP inputs is essential for proactive logistics planning.

5. Inputs to LCP

LCP inputs include facility layout, equipment availability (forklifts, pallet jacks), warehouse slotting patterns, staffing levels, conveyor capacities, dock doors, fleet size, carrier contracts, and shift patterns. Transportation lead times, throughput rates, and labor productivity assumptions are also key inputs. Correct and current inputs ensure accurate capacity assessments. This enables logistics teams to detect constraints early and plan mitigation strategies such as peak season hiring or capacity expansion.

6. Demand Forecasting for LRRP and LCP

Forecasts provide the volume of orders, shipments, and workloads that LRRP and LCP must evaluate. High forecast accuracy reduces the risk of under-capacity or overcapacity. Forecasts are translated into activity measures such as lines picked, pallets moved, truckloads required, or dock throughput volume. Understanding the linkage between demand forecasts and resource or capacity planning ensures logistics operations remain responsive and cost-effective.

7. Time-Phased Planning in LRRP

LRRP uses time-phased planning to evaluate resources required weekly or monthly. This ensures visibility into upcoming peaks and seasonal patterns. By projecting workload intensity over time, LRRP allows logistics leaders to hire seasonal labor, adjust shifts, schedule preventive maintenance, or revise transportation contracts. Time-phased planning strengthens planning accuracy and stabilizes operations during high-demand cycles.

8. Throughput and Capacity Calculations

Capacity depends on throughput rates—how much product can be processed per hour or shift. Throughput calculations involve pick rates, pallet movement rates, receiving capacity, dock door utilization, fleet loading time, and transportation cycle time. LCP evaluates whether these throughput limits align with projected demand. Understanding these calculations allows planners to interpret whether capacity is adequate or if constraints may emerge.

9. Bottleneck Identification

A bottleneck is any point where the demand for processing exceeds capacity (e.g., receiving docks, packing stations, carrier availability). LRRP and LCP aim to identify bottlenecks before they affect service. Bottleneck analysis examines flow rates, cycle times, layout inefficiencies, and labor constraints. Understanding bottleneck identification helps logistics teams prioritize improvement projects with the highest operational impact.

10. Resource Planning for Labor

Labor is a critical component of logistics capacity. LRRP evaluates labor hours required for picking, packing, loading, and transportation tasks. LCP assesses if available labor meets upcoming workload requirements. This may involve planning seasonal hiring, cross-training, shift adjustments, or overtime policies. Understanding labor planning ensures productivity and service-level stability.

11. Material-Handling Equipment Planning

LRRP determines equipment needs such as forklifts, pallet jacks, conveyors, and automated systems. LCP checks if the current equipment fleet can support the projected workload. Equipment shortages slow down warehouse throughput and transportation loading. Understanding equipment planning ensures operational readiness across storage and movement activities.

12. Space and Storage Capacity Planning

LCP analyzes whether available warehouse space, racking configurations, and yard areas meet projected inventory levels. LRRP defines how much space is required based on

demand and replenishment cycles. Capacity issues such as peak-season overflow must be anticipated. Understanding space planning ensures efficient layout design and avoids costly overflow storage.

13. Transportation Capacity Planning
Transportation planning includes evaluating fleet size, carrier availability, loading dock capacity, trailer availability, and driver schedules. LRRP calculates transportation workload; LCP checks if current transportation assets can handle it. Understanding transportation capacity planning ensures deliveries remain on schedule and transportation costs remain efficient.

14. Scenario Analysis and What-If Planning
LRRP and LCP involve scenario analysis to test different demand conditions, such as sudden spikes, supply shortages, or new customer requirements. Scenario planning helps logistics organizations evaluate alternative resource allocations, outsourcing strategies, or capacity expansions. Understanding this concept improves resilience against unpredictable events.

15. Peak Season Planning
Peak seasons create spikes in workload that strain labor, equipment, and transportation capacity. LRRP and LCP help anticipate these surges and develop plans to manage them—seasonal hiring, shift increases, carrier contracts, or automation. Understanding peak season planning is essential for maintaining service levels during high-demand periods.

16. Outsourcing and Third-Party Logistics (3PL) Considerations

When internal capacity cannot meet demand, outsourcing becomes an option. LRRP identifies resource shortfalls; LCP evaluates capacity deficits. Planners may engage 3PLs for warehousing, labor, or transportation support. Understanding when and how outsourcing fits into LRRP and LCP improves strategic flexibility and cost management.

17. Constraints Management

Constraints include labor shortages, equipment downtime, space limitations, carrier capacity, dock congestion, and regulatory restrictions. LRRP and LCP must account for these constraints to ensure feasible plans. Understanding constraints management ensures logistics operations remain stable even when limitations exist.

18. Performance Metrics for LRRP and LCP

Key metrics include labor productivity rates, capacity utilization, warehouse throughput, transportation efficiency, on-time performance, resource cost per unit, and service level compliance. These metrics are used to evaluate whether LRRP and LCP outcomes are effective. Understanding these metrics ensures continuous improvement.

19. Continuous Improvement in Capacity Planning

LCP and LRRP are ongoing processes, not one-time calculations. Continuous improvement involves revising planning parameters, incorporating new technologies, refining data accuracy, and adjusting processes for better

efficiency. Mastering this concept ensures logistics operations remain adaptive and competitive.

20. Integration with S&OP and Master Planning
LCP and LRRP must be aligned with Sales & Operations Planning (S&OP), Master Scheduling, and DRP/MRP processes. Integration ensures that logistics capacity matches the organization's production, inventory, and distribution plans. It also ensures cross-functional alignment across supply chain teams. Understanding integration is essential for end-to-end planning accuracy.

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www.Fhyzics.net

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XEFHYZ88

Certifications@Fhyzics.net

+91-900-304-9000

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