Supply Chain Correlation & Improvement Report

1. Key Correlation Insights from Dataset

• Transportation Modes: Air is fastest (≈16 days). Road is most expensive (≈54 units). Lead time and cost not strongly correlated.
• Routes: Route C = most cost-efficient; Route A = fastest. Different routes optimize different KPIs.
• Inspection Results: Pass = lower defects and costs. Fail = higher hidden waste. Defects vs Cost correlation ≈ 0 (weak).
• Cost per Unit: Strongly influenced by Production Volumes. Higher volume reduces unit cost (economies of scale).

2. Improvements by Supply Chain Cycle Step

Demand Forecasting & Planning

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Problem: Demand uncertainty increases unit cost.
Improvement: Use regression/forecasting (Excel LINEST, Power BI What-If) to predict costs from volumes.
Impact: Accurate volume planning reduces unit costs.
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Production Planning

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Problem: High defect rates and failed inspections raise waste.
Improvement: Standardize processes & apply Six Sigma. Track Cost vs Defects in dashboards.
Impact: Lower scrap, smoother throughput, reduced rework.
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Material Planning

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Problem: Over-reliance on expensive Road transport.
Improvement: Allocate more to Route C (cost leader) or Air (urgent orders).
Impact: Saves logistics cost and shortens cycle time.
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Budgeting

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Problem: Costs not linked to operational drivers.
Improvement: Link budgets to KPIs (Cost/unit = Cost ÷ Volume).
Impact: Proactive, scenario-based budgeting.
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Logistics

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Problem: Road costs high without proportional lead-time benefit.
Improvement: Shift to multimodal or optimized route allocation.
Impact: Lower costs, maintain delivery reliability.
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Reverse Logistics

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Problem: Defects & failed inspections increase returns/rework.
Improvement: Track inspections in Power BI; feedback loops to suppliers.
Impact: Better supplier quality reduces reverse logistics cost.
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3. Strategic Recommendations

• Build dual-route strategy: Route A for urgent, Route C for bulk orders.
• Mode optimization: Reduce dependency on Road; shift to Air (urgent) or Rail/Sea (bulk).
• Strengthen quality control: Reduce failed inspections → improve yield.
• Forecast-driven budgeting: Link financial models to demand forecasts.
• Power BI dashboard: KPIs for Avg Lead Time, Cost/unit, Defect %, Route/Mode efficiency.

■ *This report links dataset insights directly to actionable improvements across the supply chain cycle.*