Shipping Optimization
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**BACKGROUND**

**About Devils Backbone**
Devils Backbone Brewing Company is a large-scale beer brewing and distribution company owned by Anheuser Busch.

- **206** Products
- **~100,000** Barrels/yr
- **125** Wholesalers

**Problem Description**
Our client believes their outbound product shipment network is suboptimal due to the use of a subjective and standardized decision-making process.

**Decisions Made by “Rules”**
The current “rules” system mandates that only six specific wholesalers receive direct shipments while all others are routed through an intermediary distribution center.

Standardizing route assignments may restrict adaptation to market changes, real-time wholesaler demand, and inventory levels, leading to missed opportunities and costly transportation routes.

**PROJECT APPROACH**

1. **Defining Problem & Data Preparation**
2. **Mathematical Model Development**
3. **Solving Algorithm**
4. **Validation of Results**

**OBJECTIVES & SOLUTION**

**Model-Informed Decisions**
Our linear programming solution finds optimal shipment routes that minimize transportation costs and ensure timely delivery to final destinations during peak demand over 13 weeks.

**RESULTS & IMPACT**

**Total Cost Savings:**
$42,418

Our solution algorithm reduced the total outbound network cost by 28.02% for the 13-week period compared to current operations after assigning new routes.

**Cost Comparisons**

**Cost Allocation: Using Shipping Rule**
- **Direct**: 44%
- **Leg 1**: 29%
- **Leg 2**: 27%

**Cost Allocation: Using Solution Model**
- **Direct**: 54%
- **Leg 1**: 19%
- **Leg 2**: 19%

**Network Cost**

- **Total Network**
- **Direct**
- **Leg 1**
- **Leg 2**