Shipping Optimization

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BACKGROUND

About Devils Backbone

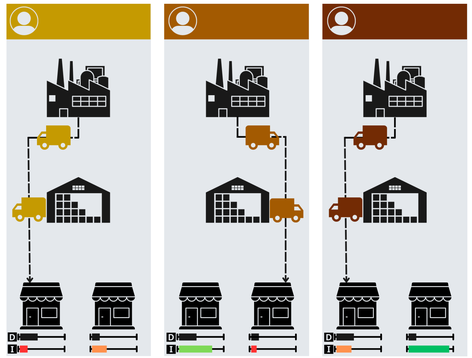
Devils Backbone Brewing Company is a large-scale beer brewing and distribution company owned by Anheuser Busch.

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.

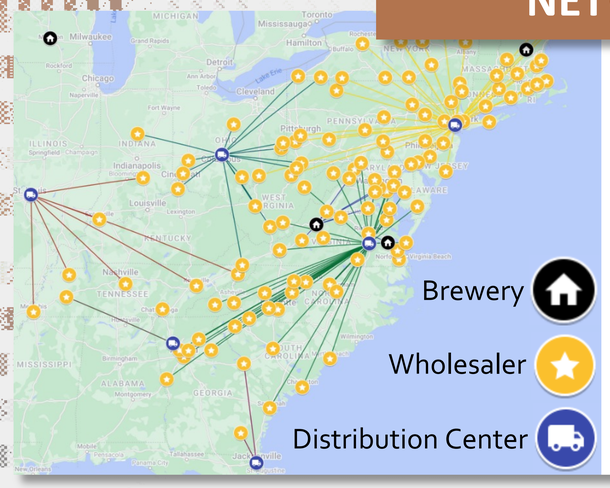
Decisions Made by "Rules"

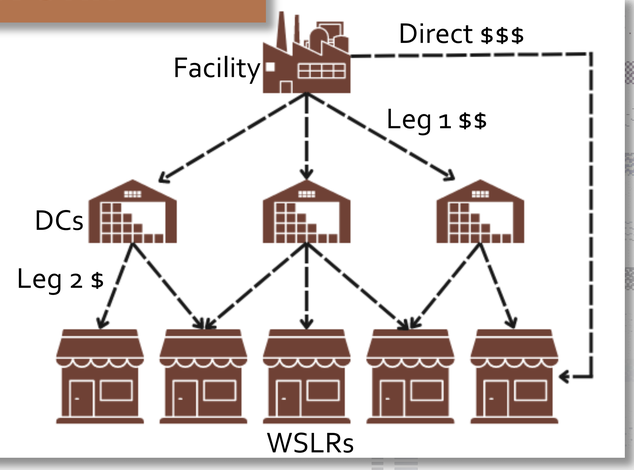


The current "rules" system mandates that **only six** specific **wholesalers** receive **direct shipments** while all others are routed through an intermediary **distribution center**.

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

NETWORK





PROJECT APPROACH

- **Defining Problem & Data Preparation**
- **Mathematical Model Development**
- **Solving Algorithm**
- **Validation of Results**

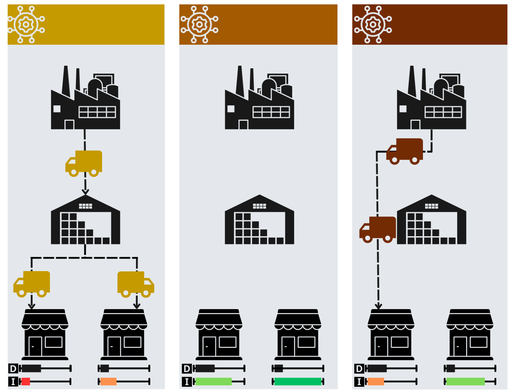
1. **Analyzed** existing outbound shipment **data** and created a **math model** by examining network and determining **decision variables**, the **objective function**, **constraints**, and **requirements**.
2. Used Gurobi **software to solve** the linear programming model.
3. **Validated results** by ensuring **constraints** were met and new **total network cost** was reasonable.

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.**

Reduce network cost | Determine optimal shipment routes | Data-driven decision-making



RESULTS & IMPACT

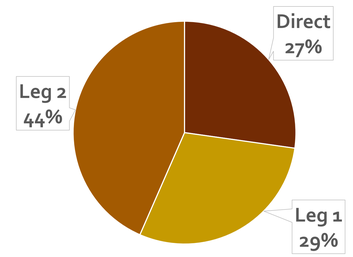
Total Cost Savings:

$42,418

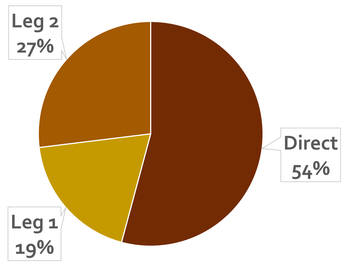
Our solution algorithm **reduced** the total outbound network cost by **28.02%** for the 13-week period compared to current operations after assigning new routes.

Cost Comparisons

Cost Allocation: Using Shipping Rule



Cost Allocation: Using Solution Model



Network Cost