

# Transportation Cost & Tariff Optimization

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## Background

The Carlstar Group

Leader in specialty tire and wheels industry



Dramatic changes in tariffs  
Volatility expected to continue  
Global MFG heavily impacted

Rising transportation costs  
Product demand fluctuations



## Key Question

Do changes across demand, tariffs, and transportation costs alter decisions on product flow and mode selection?

## Relevant Literature

Chandra, Charu, and Jānis Grabis. "Mathematical Programming Approaches." In Supply Chain Configuration: Concepts, Solutions, and Application  
Riopel, D., Langevin, A., & Campbell, J. (2005). Logistics Systems Design and Optimization



## Problem

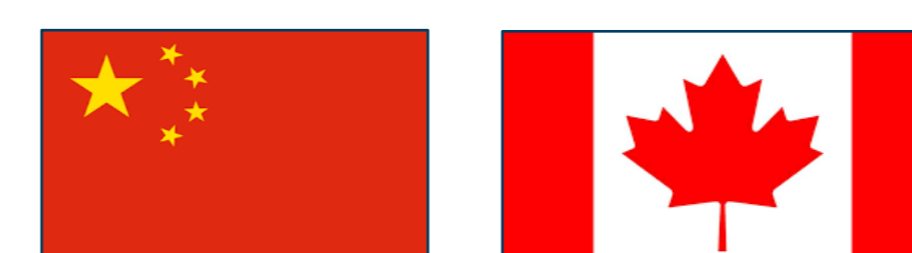
Dynamically identify optimal product flow and delivery mode that incorporates changes in demand, tariffs, and transportation costs to minimize total cost.

Option #1: US DC Consolidation



vs.

Option #2: Direct

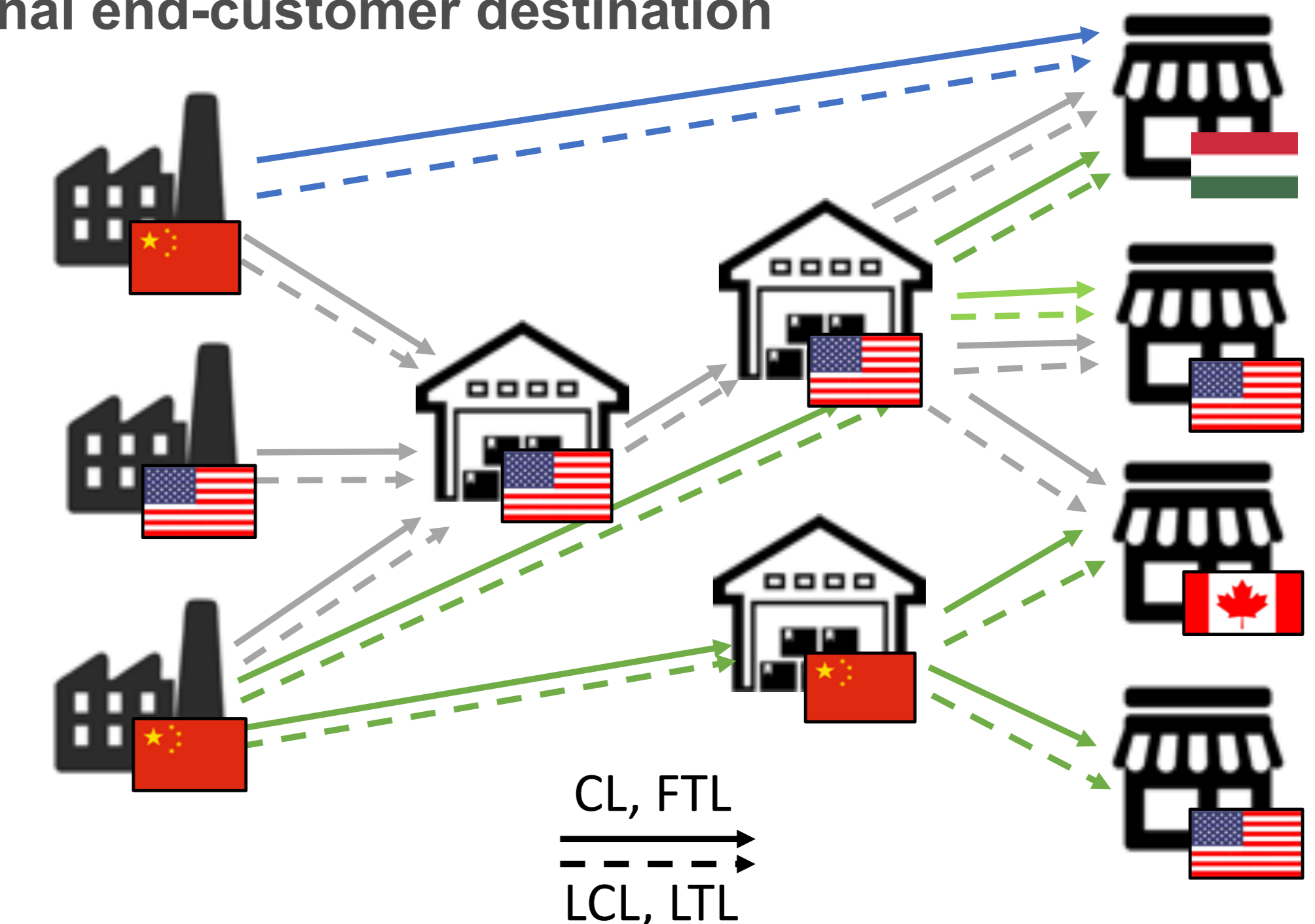


## Methodology

Build a Mixed Integer Linear Programming model to determine optimal product flow and mode selection for all seven market segments that minimizes total cost.

## Initial Results

Determined optimal modeling technique to identify the most cost effective product flows  
Identified six product flow options from manufacturer to final end-customer destination



## Expected Contribution

Provide a model that informs and enables more dynamic decision making regarding product flow and mode selection for cost minimization



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