Motivation

- Increasing adoption of internet and smartphones
- Consumer preferences changing to online shopping
- Consumers want flexibility in delivery schedule
- eCommerce growth creates challenges for last-mile delivery
- CDPs enable reductions in travel time, travel distance, delivery cost, and emissions

Key Question

- Create an optimal distribution network design which:
  - Integrates CDPs in network flow
  - Consolidates return flow and re-delivery attempts at CDPs

Relevant Literature


The Problem

- CDPs aggregate part of the customer demand
- CDPs can also be used as nodes to streamline return flow and redelivery attempts
- Location routing problem - Combines location and routing optimization
- Large scale / NP-hard problem

Methodology

- Continuum approximation based route length and routing cost estimation
- Multi-stage non-linear optimization model

Expected Contribution

- Optimal network design to deliver sustainable cost savings