Multi-vehicle Routing With The Vehicle Routing Problem Solver

Na An
Scott Sandusky
Multi-vehicle Routing
with the Vehicle Routing Problem Solver

- Capabilities
- Modeling Real-World Problems
- Tricks and Tips for Complex Problems
  - incremental assignment
  - multiple-capacity routing
Accessibility
Deployment Options

Vehicle Routing Problem (VRP) Solver

Network Analysis
Accessibility
Deployment Options

Vehicle Routing Problem (VRP) Solver
Capabilities
What can it do?

Assign many stops to many routes, and sequence them in the lowest-cost way, given business rules.

1. Minimize operating costs
2. Account for constraints
3. Assign orders to routes and sequence

Vehicle Routing Problem (VRP) Solver
Modeling the Problem

Data Elements

- Orders
- Depots
- Routes
- Breaks
- Zones
- Seed Points
- Renewals
- Specialties
- Order Pairs
- Barriers
- Network Dataset

Unassigned Orders

Least-Cost Solution
Demo 1: Appliance Delivery

“The Story”

- Delivery, pick-up, and exchange of large appliances
- Cost per hour and cost per mile

Constraints:
- Truck capacity: volume and weight
- Truck cannot make u-turns; park on correct side-of-street for residential customers
- 10-hour workday and lunch breaks
- 2-hour or 4-hour time window at customers
Appliance Delivery

Na An
Demo 1: Appliance Delivery

Take-Away's

- Pickup & Delivery
- Multiple capacities
- U-turns & curb approach
- Time Windows
- Breaks
- Balancing work load

Questions?
Demo 2: Satellite TV Installation

“The Story”

• Install satellite TV dish and configure service

• Route starts from technician’s home and has flexible start time

• Constraints:
  - Important wait-listed customers
  - Customer requests: long ladder, Mandarin-speaking, Japanese-speaking
  - 4-hour time window at customers
  - 10-hour workday and lunch breaks
Satellite TV Installation

Na An
Demo 2: Satellite TV Installation

Take-Away’s

• Order Assignment Rules
• Specialties

Questions?
VRP Summary

• Flexible modeling

• Optional inputs
  - progressively increase complexity

• Different deployment options
  - application integration
For More Info

Resources Available

- Desktop & Server Help: resources.arcgis.com
- Tutorial: resources.arcgis.com
- Online Developer: developers.arcgis.com, route.arcgis.com
- Community: forums.arcgis.com
What To Do Next

Now What?

1. Try it!
2. Read the documentation and try the tutorial
3. Start simple with your data and scenario

* Please fill out the survey: [www.esri.com/ucsessionsurveys](http://www.esri.com/ucsessionsurveys)
  - Wednesday: 1730
  - Thursday: 1758

* Questions?

Scott Sandusky: ssandusky@esri.com

Na An: nan@esri.com