



# Multi-vehicle Routing With The Vehicle Routing Problem Solver

Na An

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# Multi-vehicle Routing

with the Vehicle Routing Problem Solver

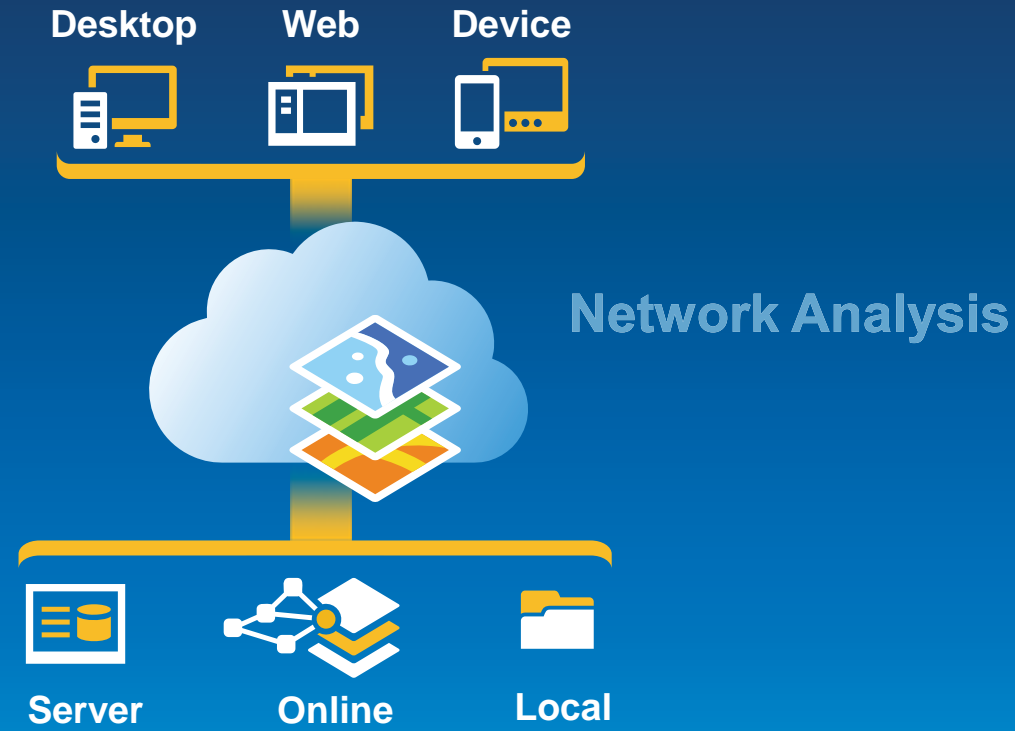
- Capabilities
- Modeling Real-World Problems
- Tricks and Tips for Complex Problems
  - incremental assignment
  - multiple-capacity routing



*30 Minute Demo Theater*

# Accessibility

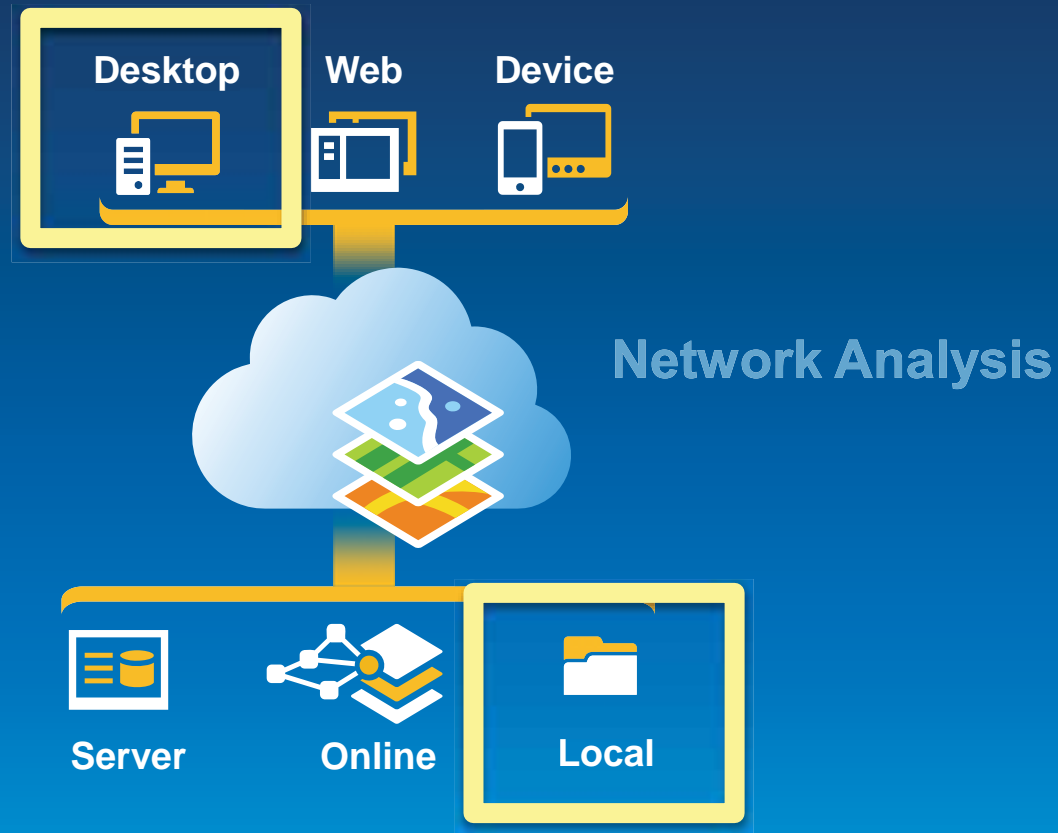
## Deployment Options



*Vehicle Routing Problem (VRP) Solver*

# Accessibility

## Deployment Options

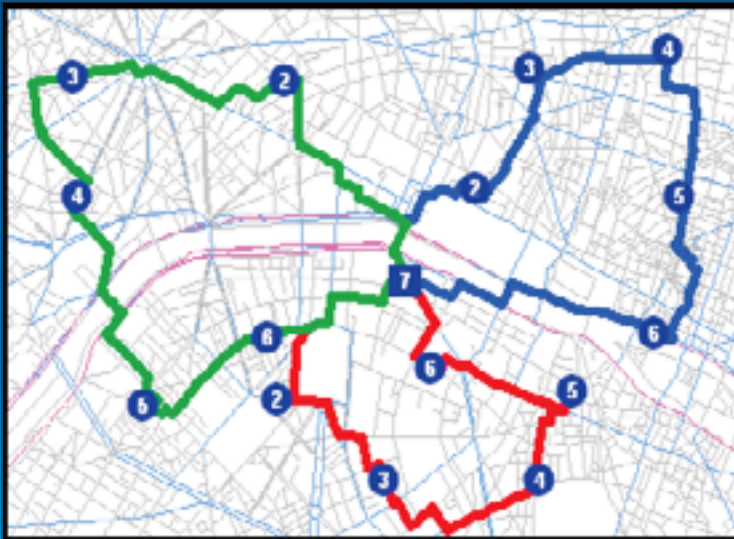


*Vehicle Routing Problem (VRP) Solver*

# 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

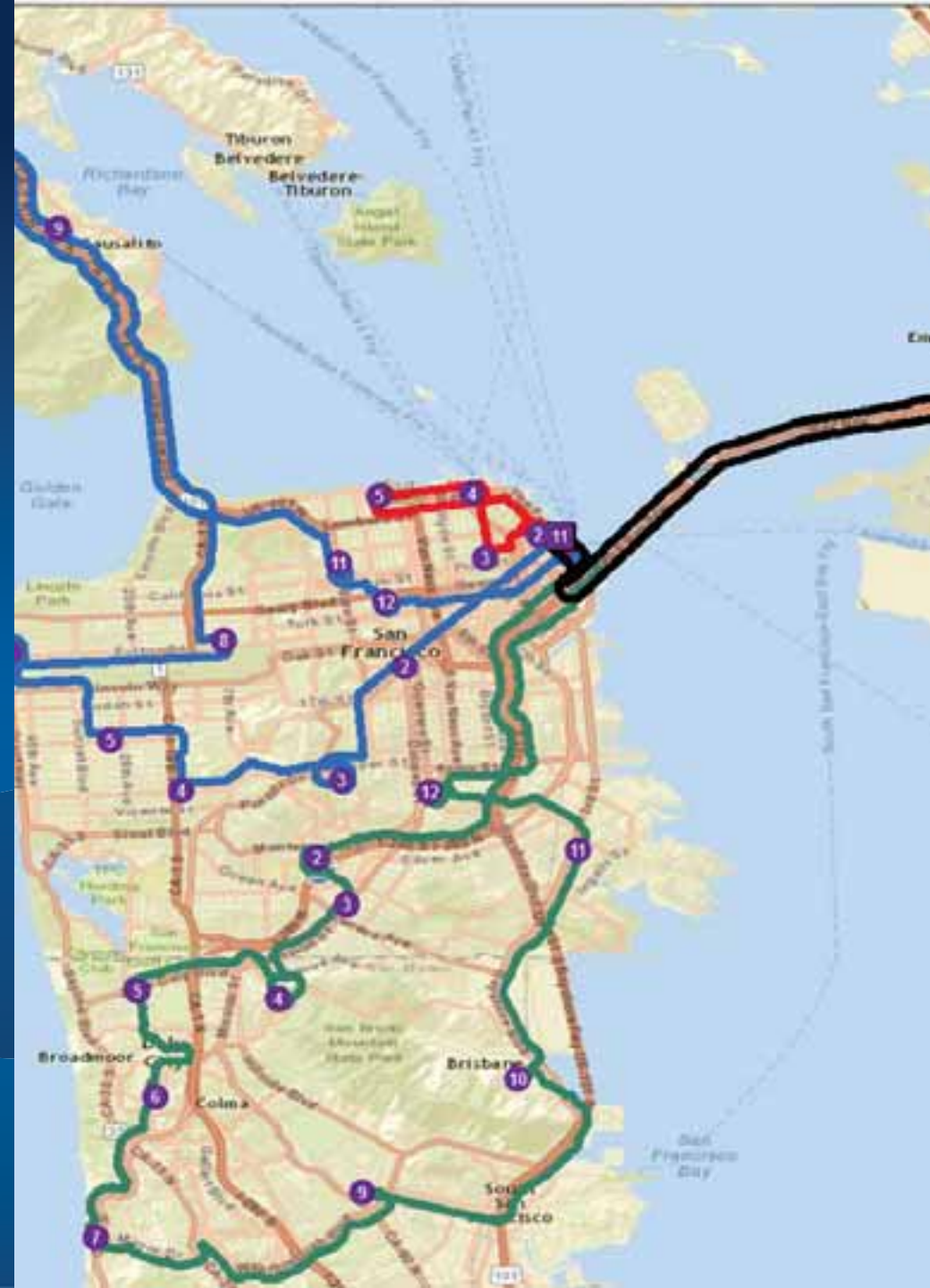
## *“The Story”*

- **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

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# Demo 1: Appliance Delivery

## Take-Away's

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

*Questions?*

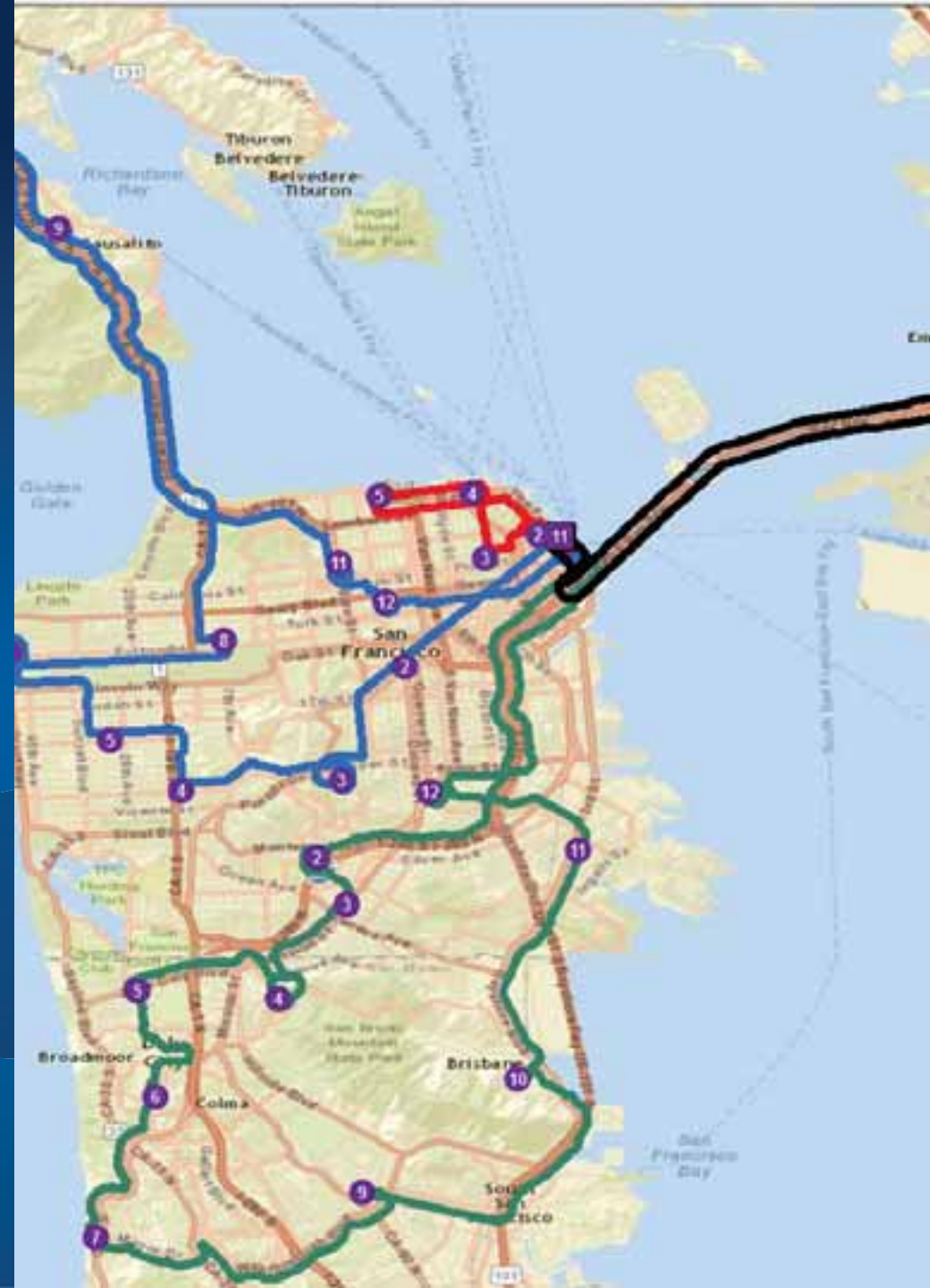
## Demo 2: Satellite TV Installation

### *“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

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# 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](http://resources.arcgis.com)
- **Tutorial:** [resources.arcgis.com](http://resources.arcgis.com)
- **Online Developer:** [developers.arcgis.com](http://developers.arcgis.com), [route.arcgis.com](http://route.arcgis.com)
- **Community:** [forums.arcgis.com](http://forums.arcgis.com)

*Documentation*



# 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?

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