

***Pikes Peak Area  
Council of Governments  
Regional Travel Model Briefing***



**May 2, 2006**

# Why a Regional Travel Model?

- **Mandated for Funding Eligibility**
  - Federal 3-C Planning Process
  - Area Size – 200,000+ Population
  - CAAA (Clean Air Act Amendments) Attainment Status
- **Supports NEPA Compliance**
  - Basis for NEPA Studies
  - Support for Project-Level Analysis/PE Studies
- **Air Quality Conformity**

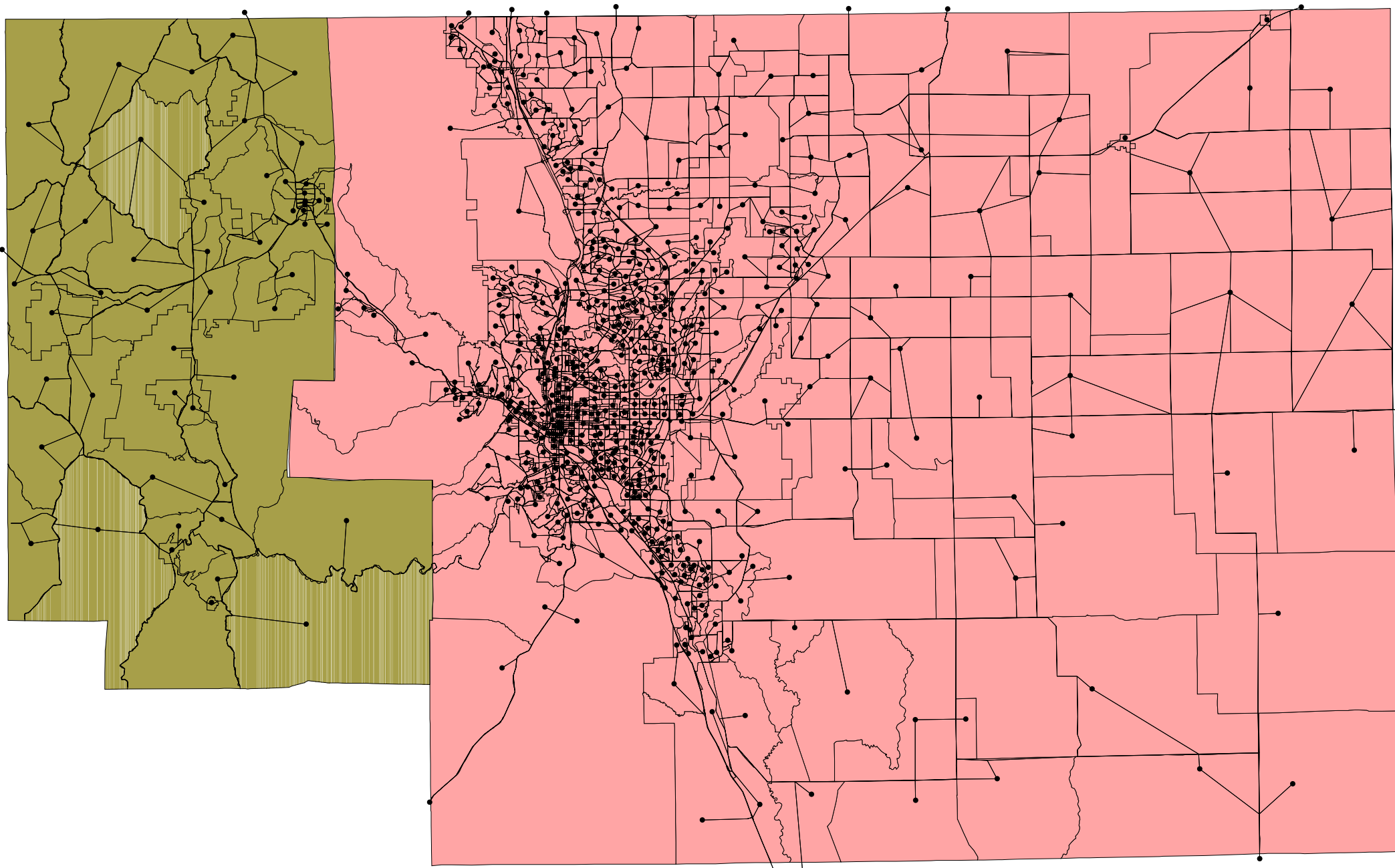


# Structure of Regional Model

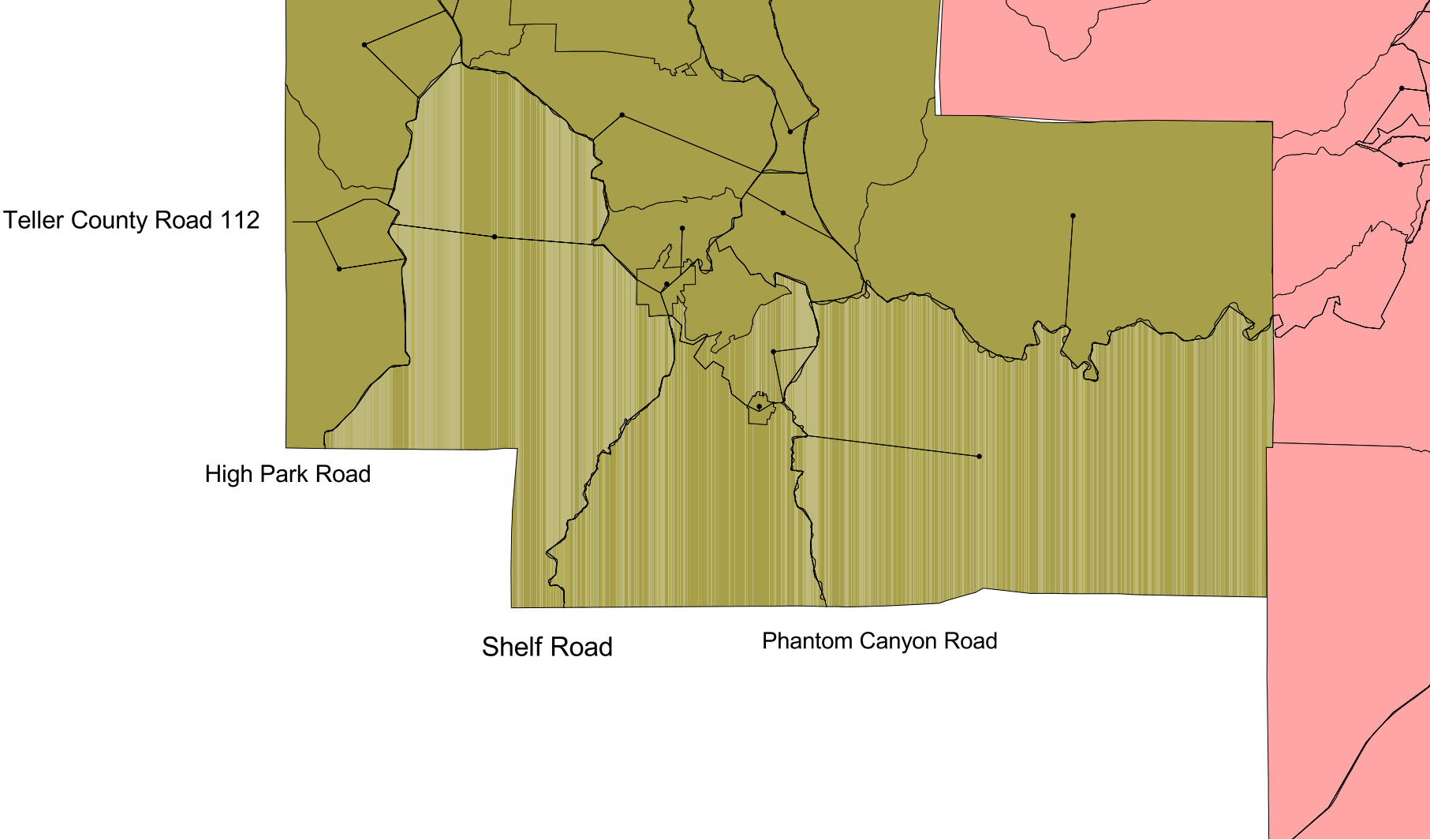
- **Supply Side**
  - **Major Transportation Facilities**
    - Major Roadway Network
    - Public Transit System
    - Non-Motorized Mode Facilities
  - **Network Characteristics**
    - Capacity
    - Speed
    - Mode/ Functional Classification
- **Demand Side**
  - **Trips By Geographic Travelshed (TAZs Generating < 10,000 Trips/Day)**
    - Trips by Tripmaker – i.e. Student, Household, Employee
    - Trips by Mode
    - Trips by Time of Day
    - Trips by Purpose
  - **External Trips**



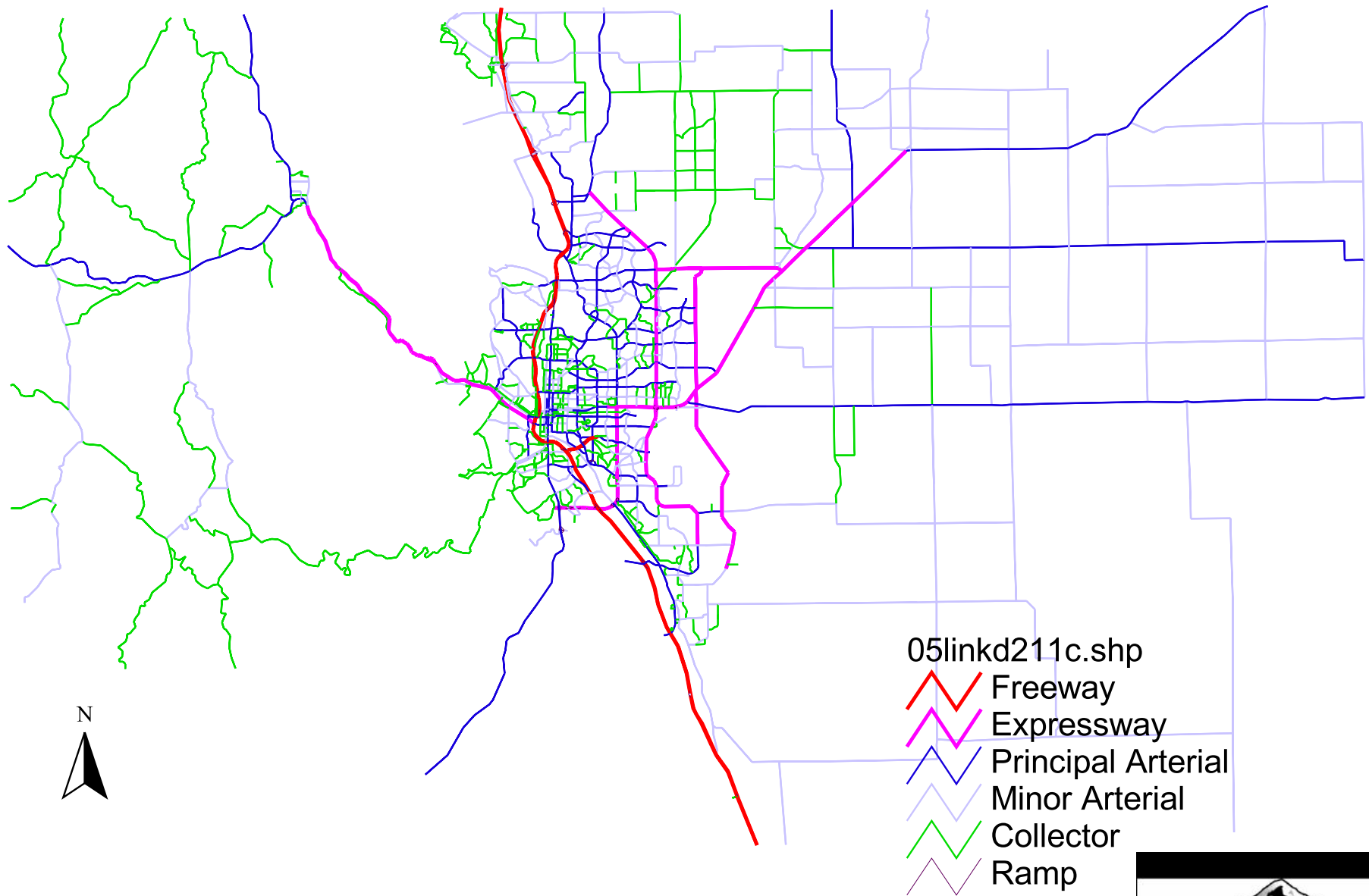
# 2005 TAZ and Network



# External Trips



# Functional Class

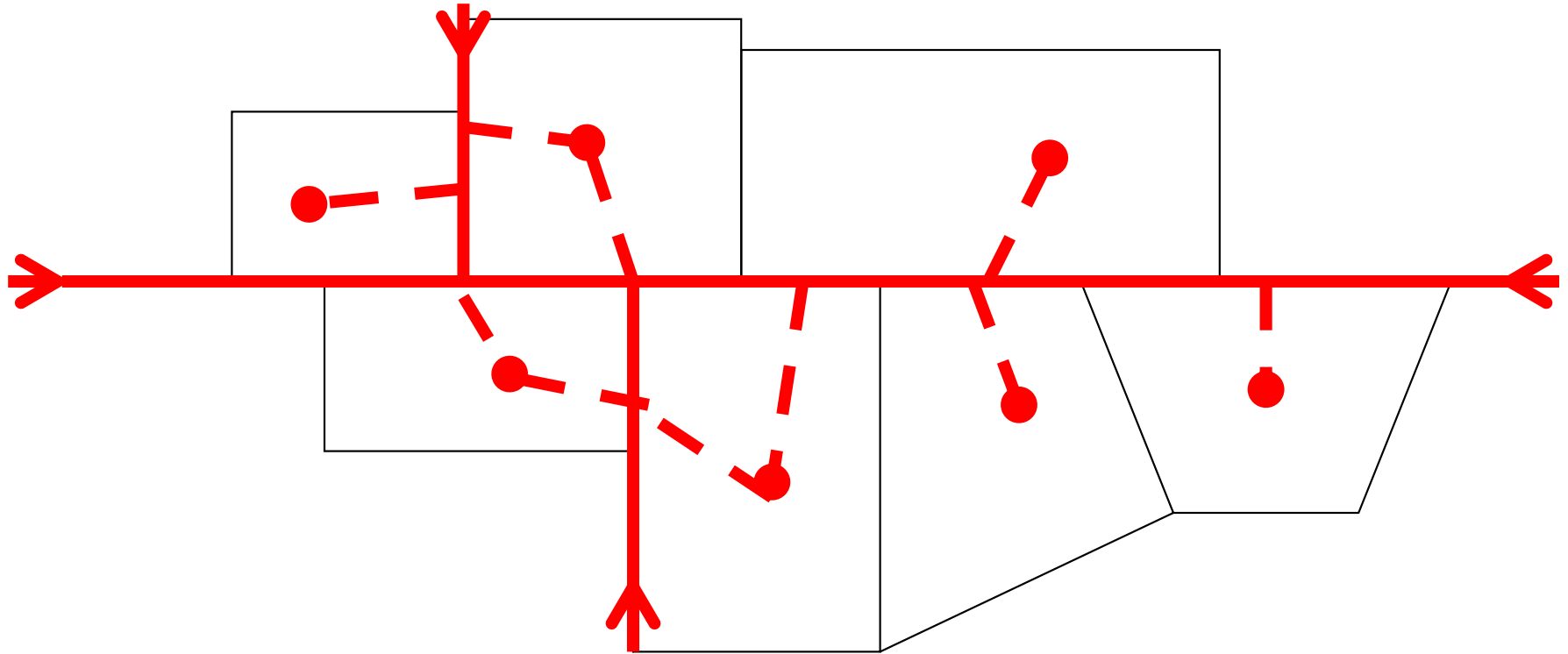


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- Freeway
- Expressway
- Principal Arterial
- Minor Arterial
- Collector
- Ramp



# How Network Links Supply & Demand



- **Trips Produced by/Attracted to Zone Calculated based on zonal population, households, employment, etc.**
- **Trip Origin-Destinations Calculated**
- **Trip Paths Calculated – Multi-path Assignment**
- **Trips Loaded to Major Roadways via Connectors (dashed) representing local roads**



# Travel Simulation 4-Step Process

- **Forecast Regional Demographics**
  - **By Traffic Analysis Zone**
    - Population
    - HH by Income Group
    - Students
    - Employment by SIC Class
- **Trip Generation – Zonal Matrix of Trips Produced/Attracted**
- **Trip Distribution – Zone to Zone Trip Interchanges (Zonal Trip Origin-Destination Matrix)**
- **Mode Choice/Split – Separate Matrices by Travel Mode**
- **Assignment to Networks by Mode**





# Validation & Maintenance of Model

- **Validation Basis**
  - **HH Travel Characteristic Surveys**
  - **Traffic Counts**
  - **Transit On-Board Surveys**
  - **O-D Surveys**
  - **Speed Studies**
- **Validation Schedule**
  - **3-Year RTP Update/ Model Validation**
  - **Variable Supporting Data Collection Schedule**



# Regionwide Travel Model Application

- **Regional Transportation Plan Development**
- **Air Quality Conformity Demonstrations**
- **Transit New Starts Applications**
  - Ridership Forecasts
  - SUMMIT Benefit/Cost Calculations
- **Support of Project-Level Analysis**



# Project-Level Travel Model Application

- **Uses Regional Model as Basis for Forecasts**
  - Mandated for NEPA
  - Preserves Consistency with 3-C Planning Process
- **Enhances Regional Model for Forecasts**
  - Sub-area Project Model
  - Project-Level “Smoothing”
  - Peak Hour Balancing of “Smoothed” Volumes
- **Uses “Smoothed”/Balanced Volumes for Analysis**
  - Traffic Operations – Micro-simulation
  - Noise Analysis
  - Project-Level Air Quality Analysis



# “Smoothing” Travel Model Volumes

## Example “Smoothing” Process:

- Collect base year traffic count data
- Compare base year model assignment to counts
- If the percent difference between the base year count and base year assigned volume is >15%, then the absolute difference is added to the future assigned volume.

$$\text{Smoothed Future Volume} = AV + ABS$$

*where; AV = Future Modeled Volume, ABS = Absolute Difference (Base Year Count vs. Base Year Modeled Volume)*

- If the percent difference between the base year count and assigned volume is  $\leq 15\%$ , then the average of the relative difference and absolute difference is used.

$$\text{Smoothed Future Volume} = ((AV * (1 + (\%/100))) + (ABS + AV))/2$$

*where; AV = Future Modeled Volume, ABS = Absolute Difference (Base Year Count vs. Base Year Modeled Volume), % = Percent /Relative Difference (Base Year Count vs. Base Year Modeled Volume)*

