

# Development of the Franklin Travel Demand Model

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# Introduction

## Development of Model

## Model Validation



# Purpose

- A travel demand model was created for the City of Franklin for use in the development of the Hampton Roads Rural Long Range Transportation Plan (RLRP)
- The model will be used as a tool to produce traffic forecasts and identify deficiencies within the City of Franklin as well as evaluate alternatives for the RLRP

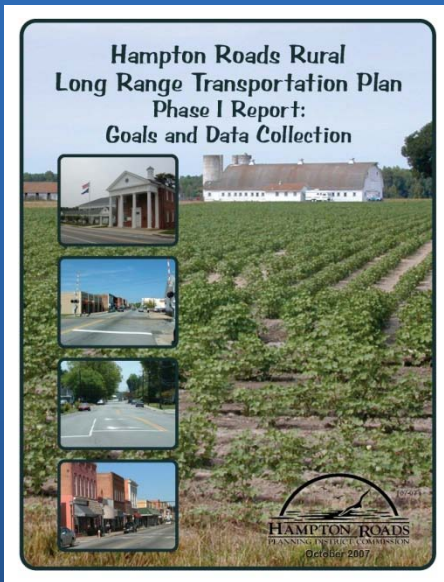


# Background - RLRPs

- **Instituted by VDOT in FY07**
- **Modeled after the MPO planning process**
- **Establish regional transportation plans in rural areas to complement planning efforts in the metropolitan areas**
  - 20 year planning horizon
  - Updated every 5 years
- **Will be used as a foundation for identifying transportation priorities**
  - Six-Year Improvement Program
  - Statewide transportation planning process



# Background - RLRPs



- **Phase II Tasks:**
  - Identify Current and Future Demand (Roadway & Transit)
    - Analyze current and future traffic forecasts
  - Review Performance Measures
    - Capacity and Mobility
    - Safety
  - Identify Current and Future Year Deficiencies





# Introduction

# Development of Model

# Model Validation

# Development of Input Data

- **Transportation Network**
  - Franklin centerline file
  - Most traveled roadways
- **Transportation Analysis Zones (TAZs)**
  - Used census blocks, road network, and aerial photos as reference
  - 30 TAZs
- **Socioeconomic Data**
  - Households, Population, Vehicles, Total and Retail Employment
  - Used GIS to calculate & distribute data to TAZs
- **External Trip Table**
  - Traffic Counts
  - Input from local city staff





# **3 Step Model**

## **Trip Generation**

## **Trip Distribution**

## **Trip Assignment**



# Trip Generation

- **Inputs:**
  - Households, Population, Vehicles, Employment
- **Output:**
  - Productions and Attractions by Trip Purpose
    - Home Based Work
    - Home Based Other
    - Non-Home Based

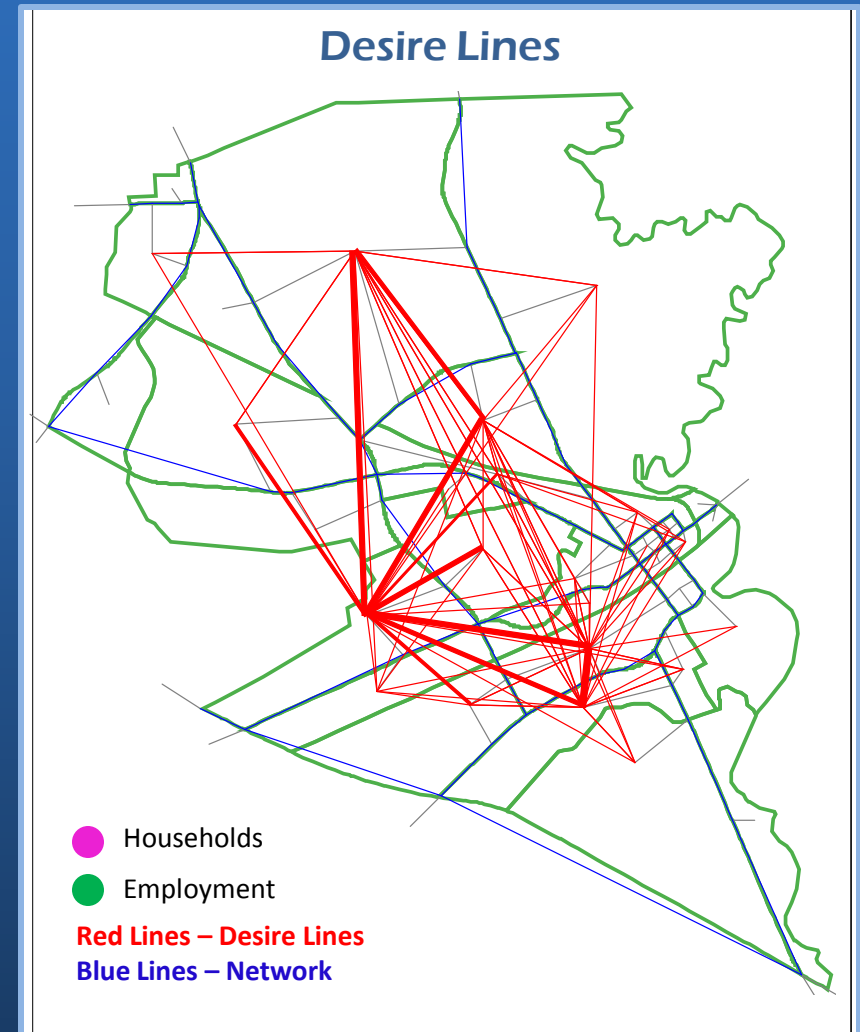
## Households and Employment

- Households  
1 Dot = 5
- Employment  
1 Dot = 5



# Trip Distribution

- **Inputs:**
  - Productions & Attractions from Trip Generation
- **Output:**
  - Origin-Destination Matrix

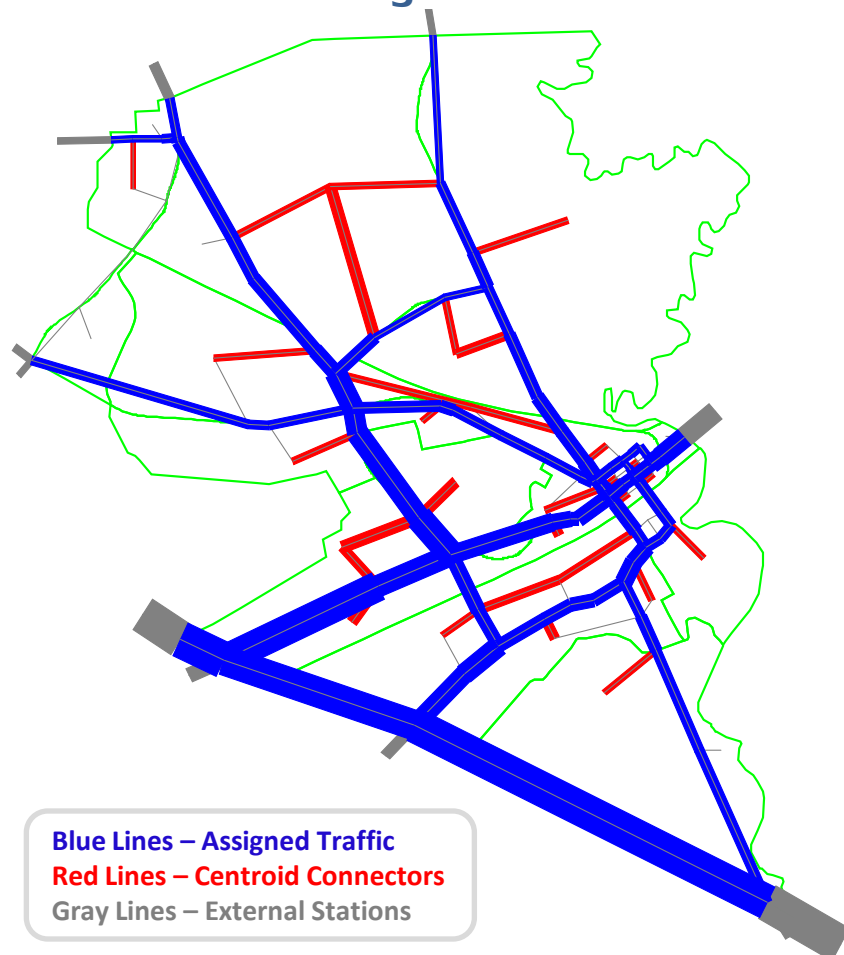




# Trip Assignment

- **Inputs:**
  - Origin-Destination Matrix from Trip Distribution
  - Highway Network
  - Turn Prohibitions
- **Output:**
  - Traffic Forecasts

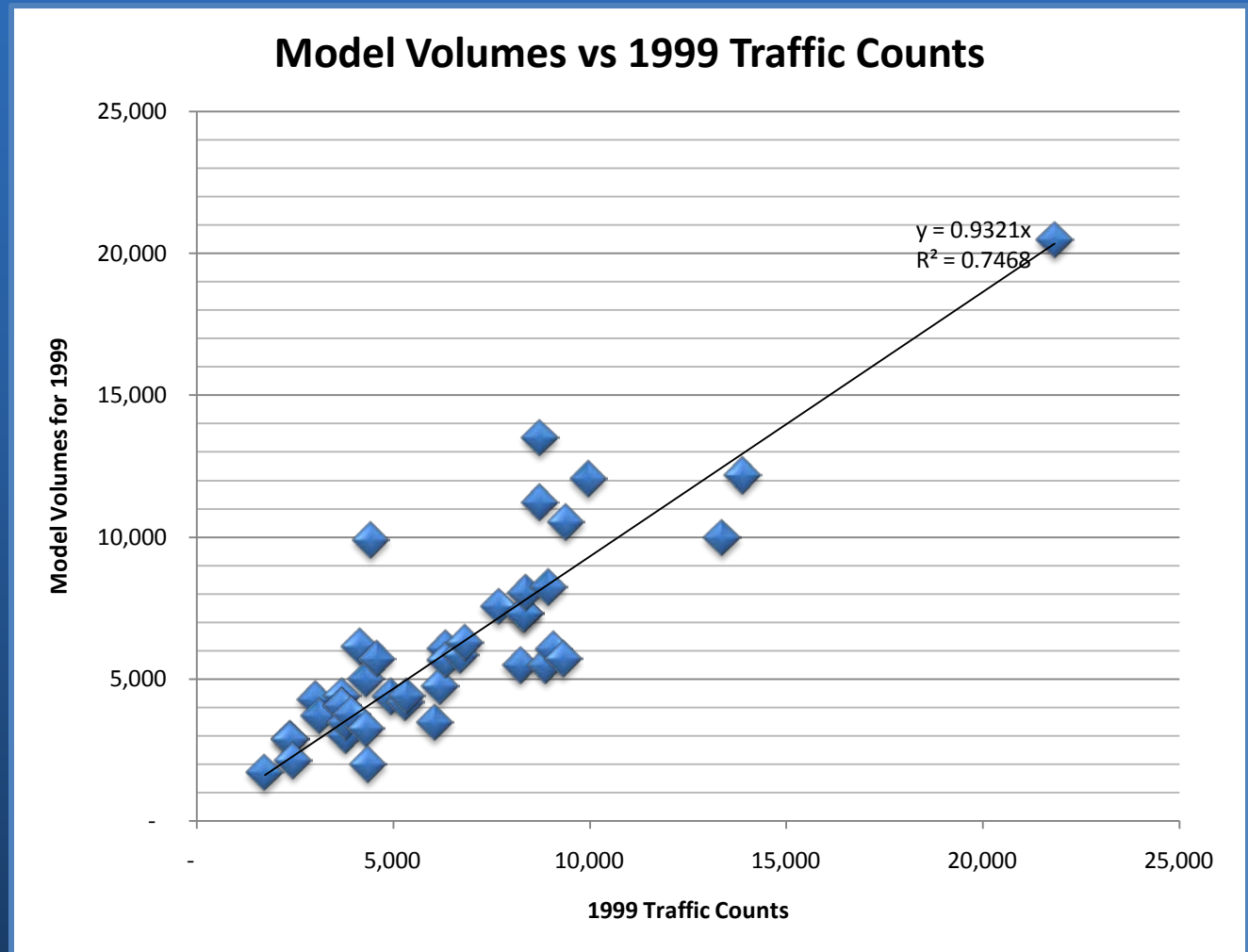
Bandwidth of Assigned Traffic Volumes





# Model Validation

- **Model  $R^2 = 0.75$**
- **% RMSE = 29%**
- **Based on 43 links with counts**



# Next Steps

- **RLRP 2035**
  - Forecast future traffic congestion
  - Test candidate projects