Transit Coding and the Asheville Travel Demand Model

Model User's Group

Greenville MPO Conference

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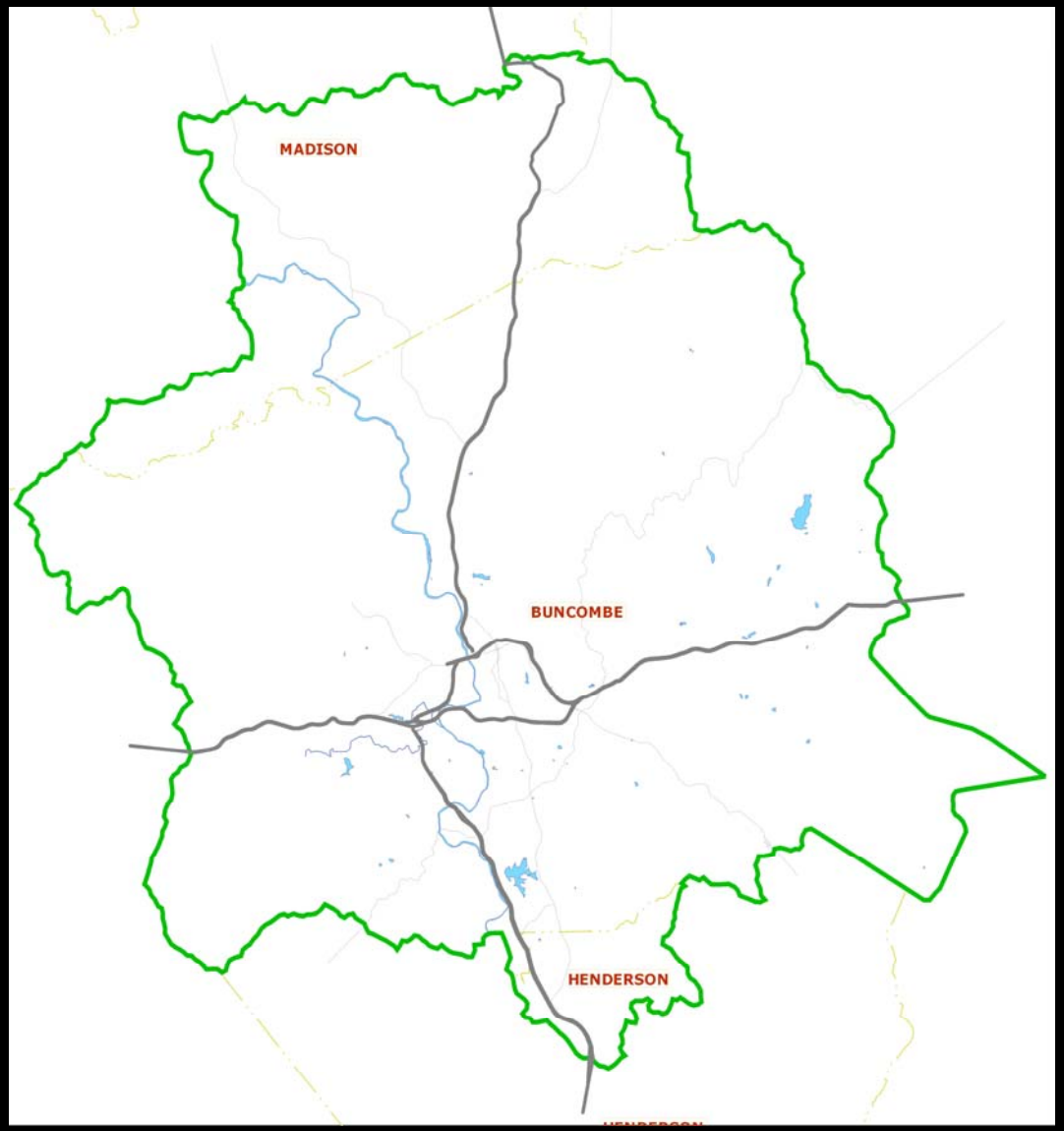
Outline

- Overview of model
- Asheville Model Transit
- LRTP Scenarios
- Lessons Learned

Asheville Travel Demand Model

- Mode choice model with borrowed coefficients
- Calibrated to 2000 (BY) ridership data
- BY transit = route structure in 2000
- No FY scenario beyond routes as existed when coded (2003)



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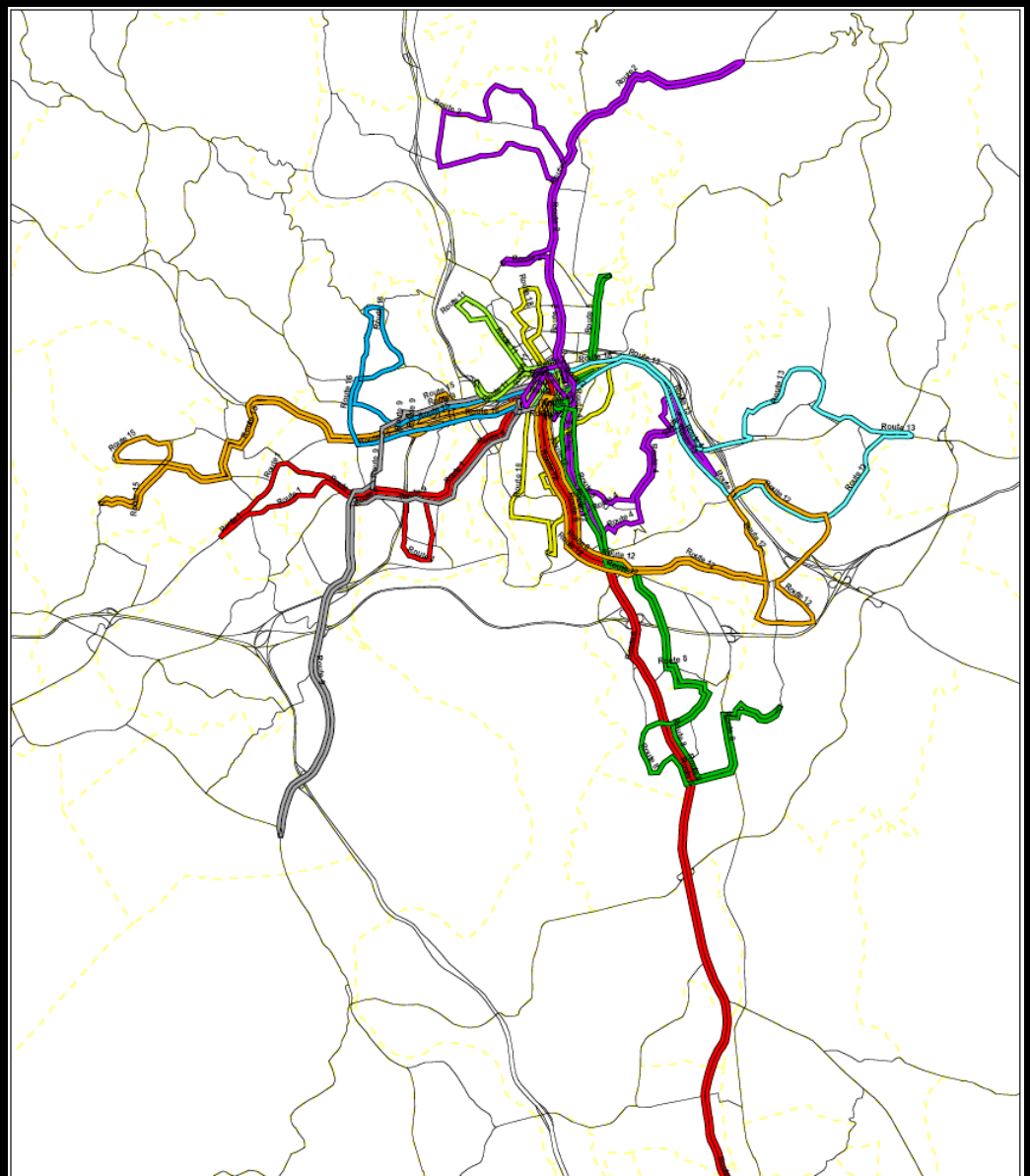
Base Year Transit Network

- Consisted of 14 routes
- Fare free downtown
- Fixed fare for rest of network
- Pulse-timed system



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How was it Modeled?

- Simple system with few path choices
  ⇨ Shortest Path method
- High headways coupled with pulsed (i.e. timed-transfer) at downtown
  ⇨ Low initial and transfer max wait times
- Because TransCAD calculates zonal fares on a link basis (rather than entire trip)
  ⇨ A fixed fare system was used (and the downtown fare free zone ignored)
  - Note that correct fares are used in the mode choice

How was it Modeled?

- To improve accuracy of travel times, “transit only” links were included
- Special “walk only” centroid connectors were added in several instances to these transit only links

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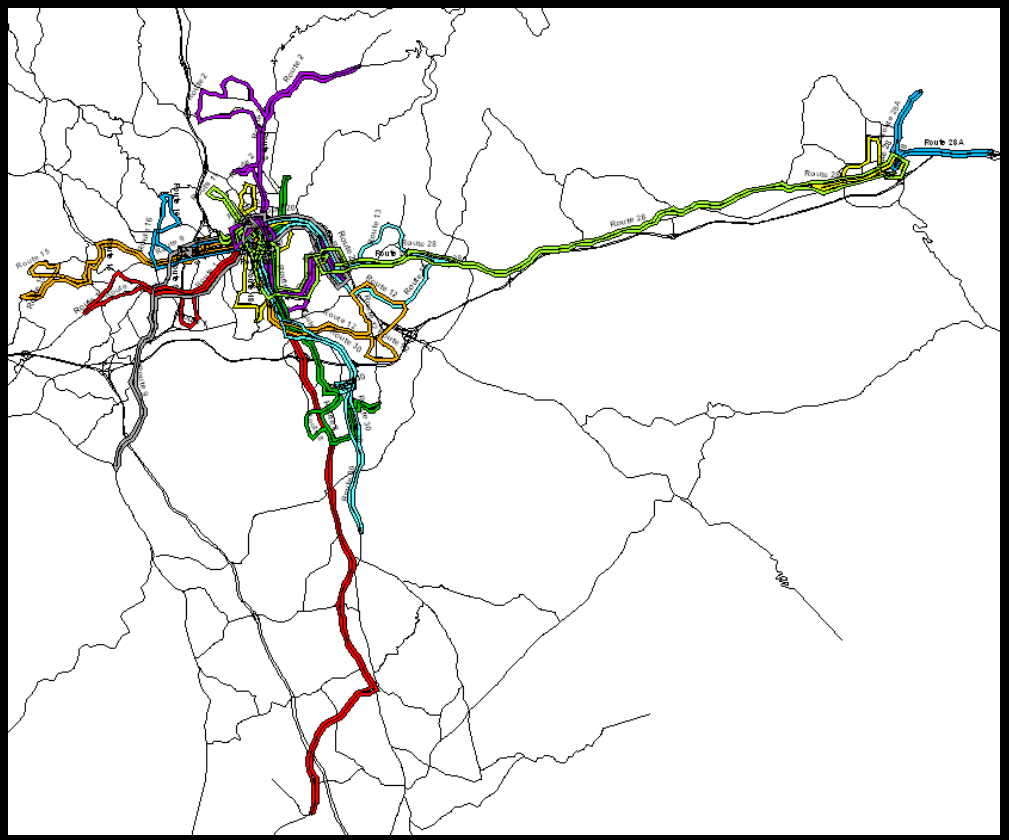
Future Year Transit

- Service added to Black Mountain including feeder routes
- Switched to mixed fare system
  - Correctly modeled downtown
  - Known issue of per-leg vs per-trip
  - Manually corrected fare for Mode Choice
  - Switched because of bug at time related to fixed fare system



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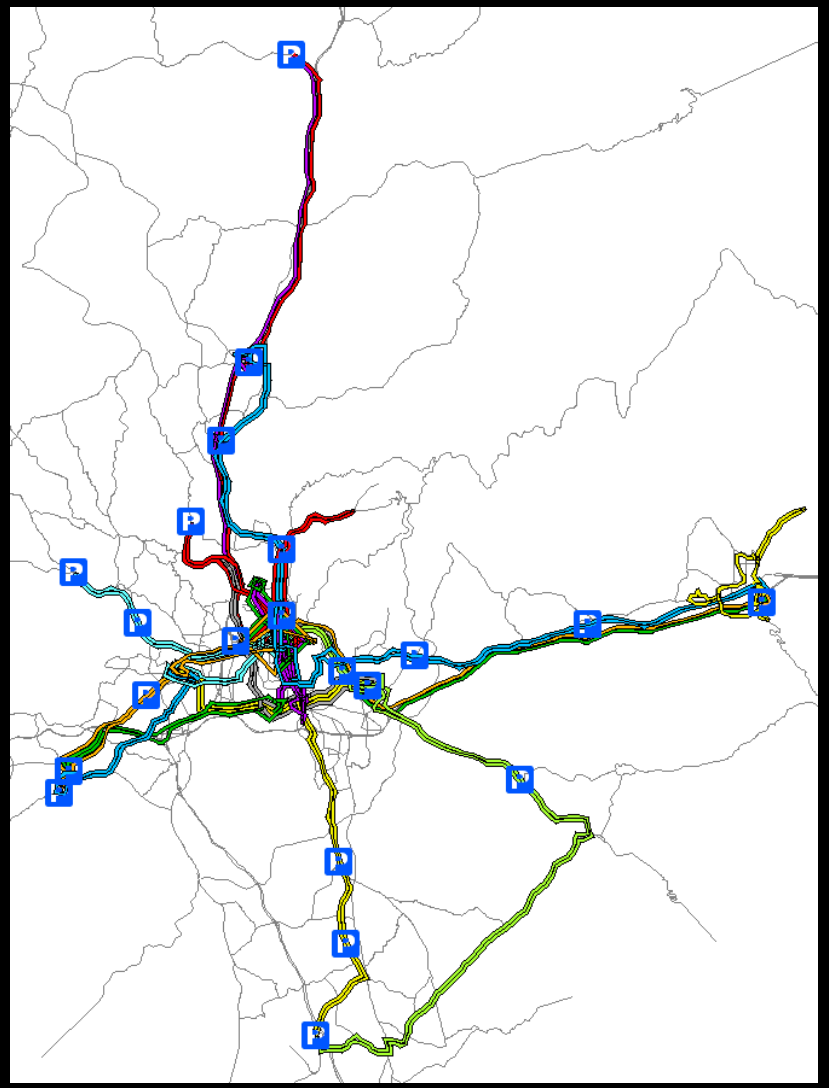
LRTP Transit Scenarios

- Examined "High Growth" scenario for LRTP
- Complete overhaul of route structure
- Addition of Express Bus service
- Addition of Park & Ride



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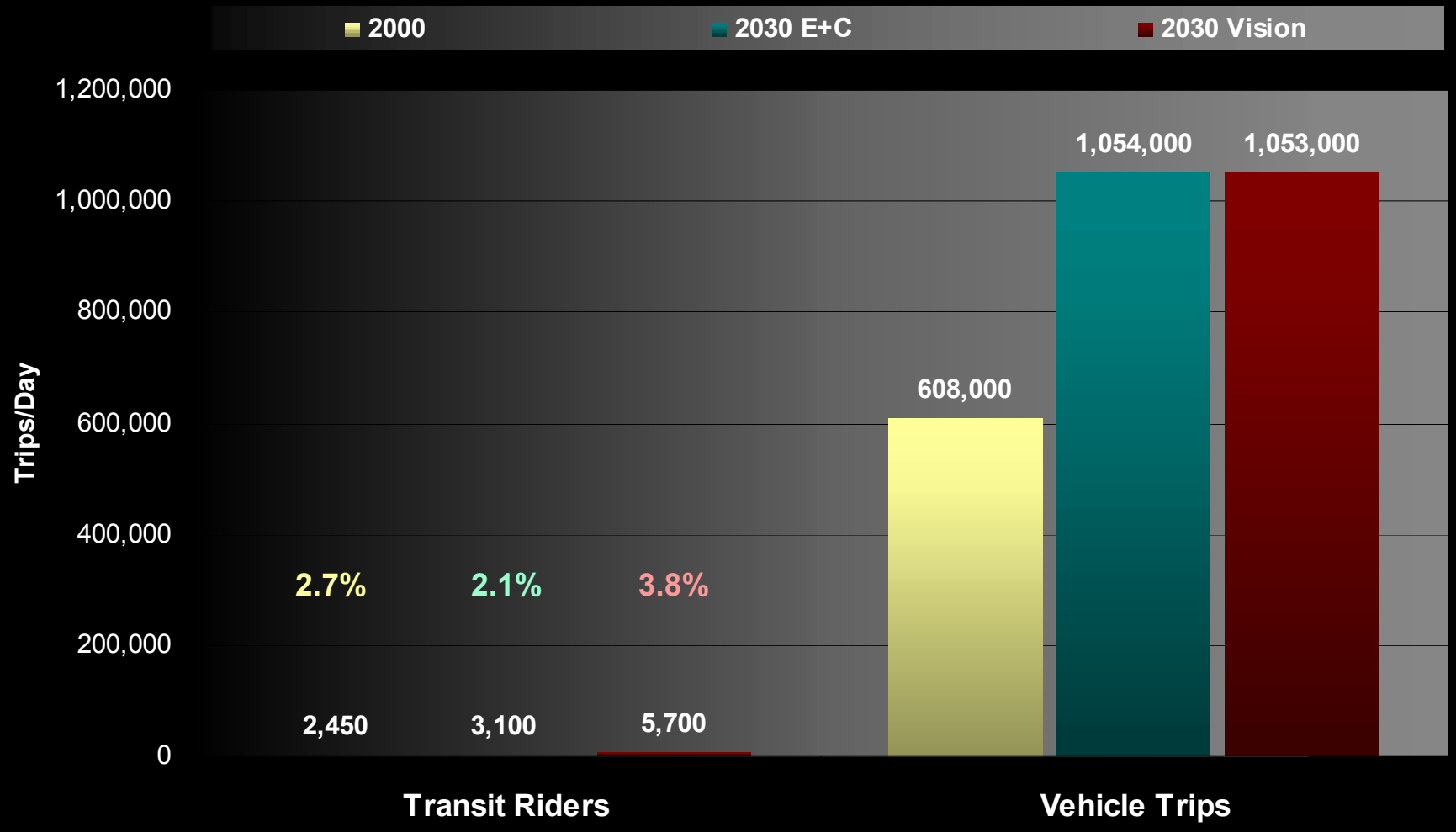
Transit Riders vs. Vehicle Trips



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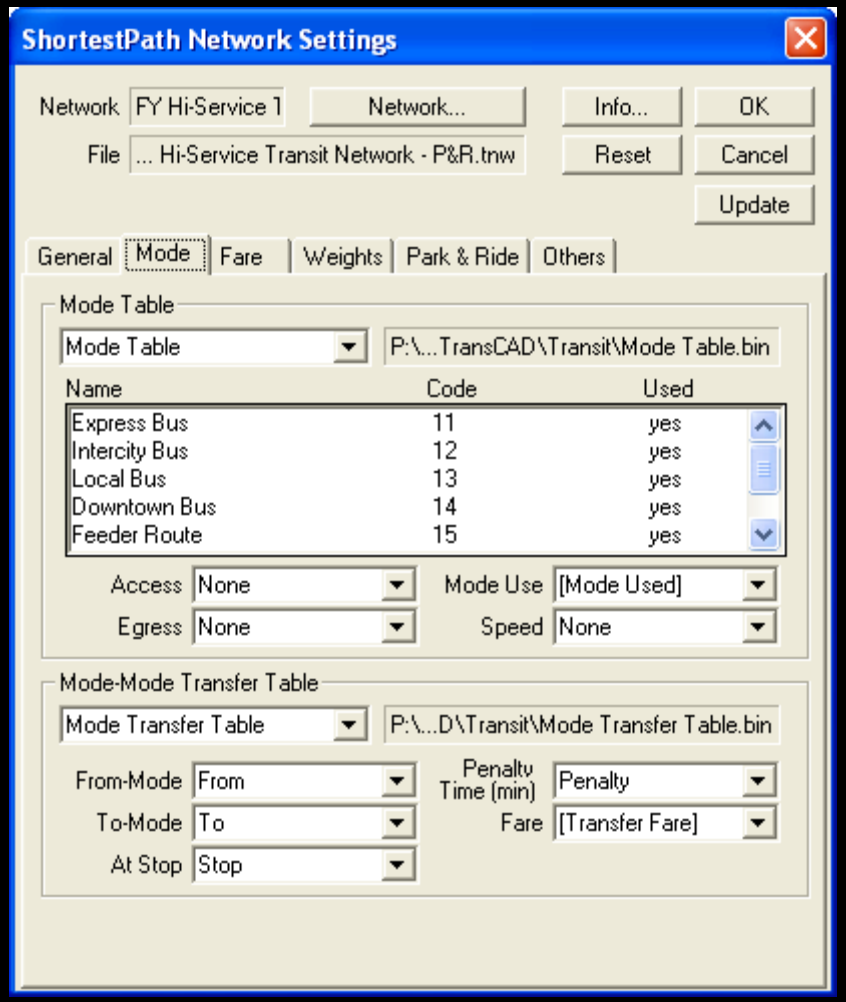
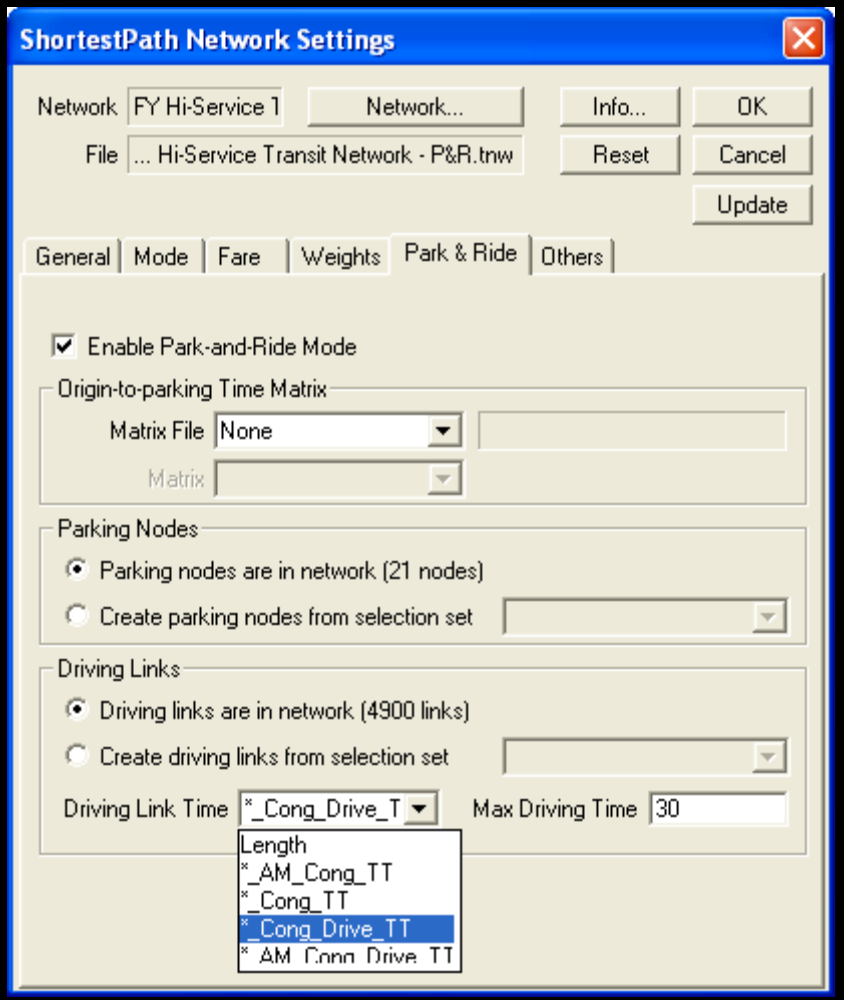
How was it Modeled?

- Five transit modes were used plus walk
- Modes coded with additional detail:
  - dwelling times, initial wait times, transfer penalties
- Park and ride locations identified
  - Express bus stops
  - New nodal centers
  - Existing shopping centers



Park and Ride Modeling

- Park and ride requires special treatment
- Either walk or drive to transit
  ⇨ two sets of assignments
- If walk access times are mapped, so are drive times
  ⇨ must include separate drive time field
- Must use "on-the-fly" calculations to get full skims



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Next Steps

- Expand Asheville model to French Broad River MPO (Henderson, Haywood Counties) in addition to Transylvania Co.
- Model local and intercity transit service in these areas
- Include possibility of rail service between Asheville (Biltmore Village) and Black Mountain
- Consider focused survey to revise local coefficients & weights

Lessons Learned

- Minimal effort to increase sophistication (single mode to multi-mode)
- Park and Ride can result in a noticeable shift in mode ridership
  - Promising for more rural areas
  - More detailed calibration may ultimately be warranted
- Check skim outputs (manual and automated) to ensure behaving as you expect
- Remember to combine walk and drive to transit to get total flows

Benefits of Transit Models

- Don't have to generate mode choice model from scratch – especially for small to medium areas
- BUT a mode choice model is important to allow scenario testing
- Transit share is small enough does not affect roadway projects – model allows us to confirm
- Individual transit scenarios are easy to test
  - Provide general feasibility
  - Need additional calibration for detailed analysis