LONG-RANGE TRANSPORTATION MODELING
IN THE BRISTOL URBANIZED AREA
March 2008
Good planning is essential to the transportation process
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- Smallest urbanized area population in either Tennessee or Virginia
- One of the smallest MPOs in Tennessee (among 11 MPOs) or Virginia (among 14 MPOs)
- Among four MPOs nationwide threatened with loss of urbanized status prior to 2000 Census (along with Dover, DE; Brunswick, GA; and Ithaca, NY) because of loss of whole-place exclusion ruling; ended up retaining urbanized status anyway without whole-place exclusion
URBANIZED AREAS WITH METROPOLITAN PLANNING ORGANIZATIONS IN TENNESSEE AND VIRGINIA
Tennessee's largest 20 cities by population
2005 population, 50 weekends of the year
Tennessee's largest 20 cities by population

2005 population, Race Weekend at BMS
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- MPO established following 1980 Census (after establishment of Kingsport and Johnson City MPOs)
- Currently includes three incorporated cities:
  - Bristol, Tennessee
  - Bristol, Virginia
  - Bluff City, Tennessee
- Includes only Tennessee unincorporated county seat (Blountville, Tennessee)
- Includes portions of Sullivan County, Tennessee, and Washington County, Virginia
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- Two-state status in Tennessee and Virginia
  Both TDOT and VDOT very helpful in providing necessary network and other data
- No problems encountered in working on transportation modeling issues across the state line
- Unique status of State Street running along state boundary longitudinally did not pose additional network representation problems
Picture of a Mountaineer in Virginia . . . His Ass in Tennessee
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- 1990 model developed using QRS software that could not be translated to TransCAD; new model developed from scratch for 2000 Census in TransCAD
- 2000 model parameters, demographics, and network developed by MPO
- Demographic projections by UT
- Model developed by consultant (Louis Berger Group) of Cary, NC
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- Model Parameters

  TAZs: 137 total (87 Tennessee, 50 Virginia)

  TAZ ranges:

  Area: 0.06 mi$^2$ to 8.6 mi$^2$

  Dwelling Units: zero to 1,410 DU

  Employment: zero to 4,217 employees
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- Mode Choices: 1 (for conservative error)

motor vehicles
Freight was considered as a trip purpose, not as a mode
Aviation was not analyzed as a mode choice (Bristol study area borders, but does not include, Tri-Cities Regional Airport and Virginia Highlands Airport)
Railroads were considered based on impacts to the roadway network, not as a mode.
Pedestrians and bicyclists were considered, but not analyzed as a mode choice.
Mode analysis did not include transit
Mode analysis did not include marine operations
Mode analysis did not include the Weinermobile
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- Network parameters

Trip types: 5 (HBW, HBO, NHB, trucks, internal)
Trip generation equations use formulae developed specifically for Bristol by VDOT
Trip generation equations based on number of households and employment only
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- Trip Generation parameters

Population: 89,700 persons (40,318 DU)

Bristol, Tennessee: 28 percent

Bristol, Virginia: 19 percent

Bluff City, Tennessee: 2 percent

unincorporated Sullivan County, Tennessee: 38 percent

unincorporated Washington County, Virginia: 13 percent
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- Trip Generation parameters

Employment: 46,433 persons

Bristol, Tennessee: 38 percent
Bristol, Virginia: 30 percent
Bluff City, Tennessee: 1 percent
unincorporated Sullivan County, Tennessee: 17 percent
unincorporated Washington County, Virginia: 14 percent
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- Network parameters

2000 network: 889 links representing 622 lane-miles in Tennessee and 386 lane-miles in Virginia

2030 network: up to 963 links based on future scenario (no-build E+C and 7 future scenarios)
BRISTOL PLANNING AREA
LONG-RANGE TRANSPORTATION
PLAN 2005 MAP

VIRGINIA
TENNESSEE

Bristol Central City Inset

2 0 2 4 6 8 10 12 Miles
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**Modeling Challenges in Bristol**

- Impacts of railroad operations (link capacity)
- Impacts of weight-posted bridges and low underpasses in network
- Low level of detail in employment data
- Calibration of parallel facilities
- Modeling of SR 357 extension project that is partially in Bristol network and partially in Kingsport network
- Special event considerations
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- Results of transportation network model in long-range transportation plan (adopted Jan 06):

  27 roadway projects (one almost complete, and parts of four others nearing completion)
  - 15 in Tennessee
  - 10 in Virginia
  - 2 joint Tennessee/Virginia projects
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- Results outside of transportation network model in long-range transportation plan:
  - bicycle and walking route plan
  - transit plan
Questions?