

Oregon Symposium on Integrated Land Use and Transport Models



Data Collection and Information Systems

Presented by

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Data Collection and Information Systems for Land Use-Transport Modeling



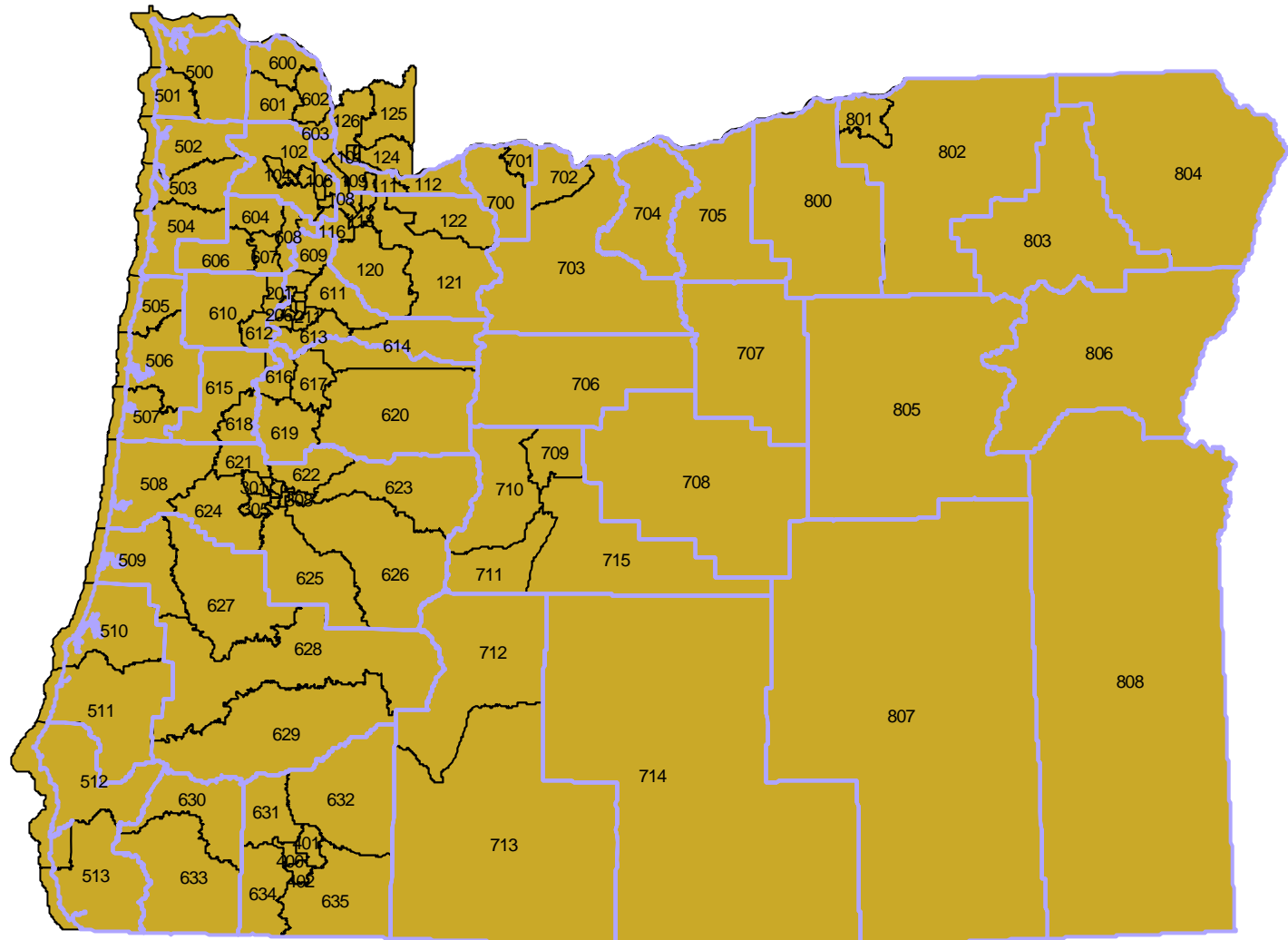
- ⌘ Data Requirements
- ⌘ Data Collection Challenges
- ⌘ Statewide/Substate Model Vs. Urban Area Model
- ⌘ Lessons Learned
- ⌘ Data Problems Solved
- ⌘ Data Sources

Data Requirements

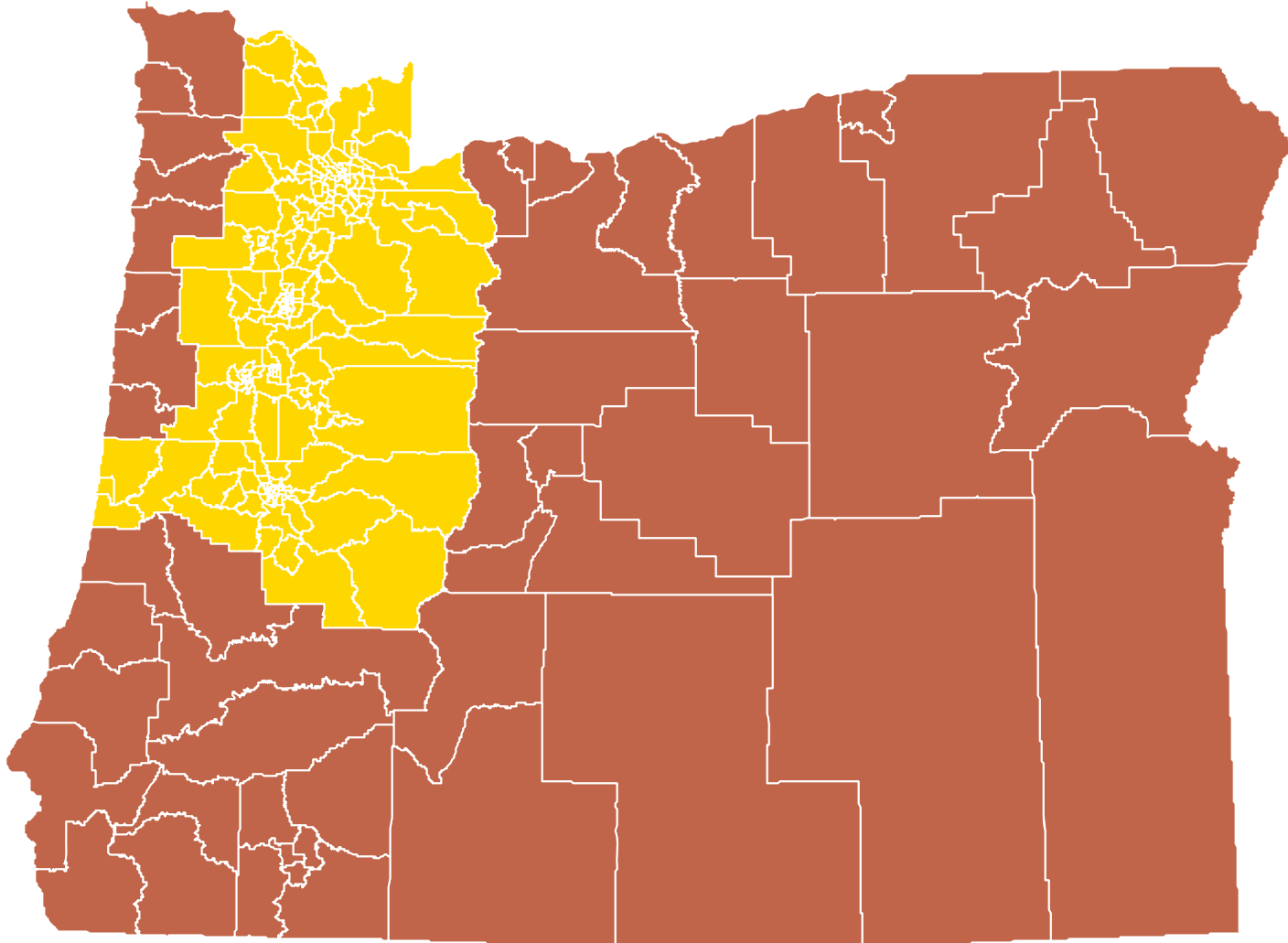


- ⌘ Analysis zone structure (TAZs)
- ⌘ Transportation network
- ⌘ Input-Output matrix - Economy
- ⌘ Employment by sector by TAZ
- ⌘ Households by income by TAZ
- ⌘ Land area and price by TAZ

Statewide TAZs - 126 Internal Zones



Substate TAZs - Willamette Valley



Statewide vs. Substate



⌘ 126 internal zones

⌘ 25 external stations

⌘ 151 total zones

⌘ Census tract-based aggregations to urban areas

⌘ 26 zones represent METRO

⌘ Large variation in population, employment and area

⌘ 257 internal zones

⌘ 25 external stations

⌘ 282 total zones

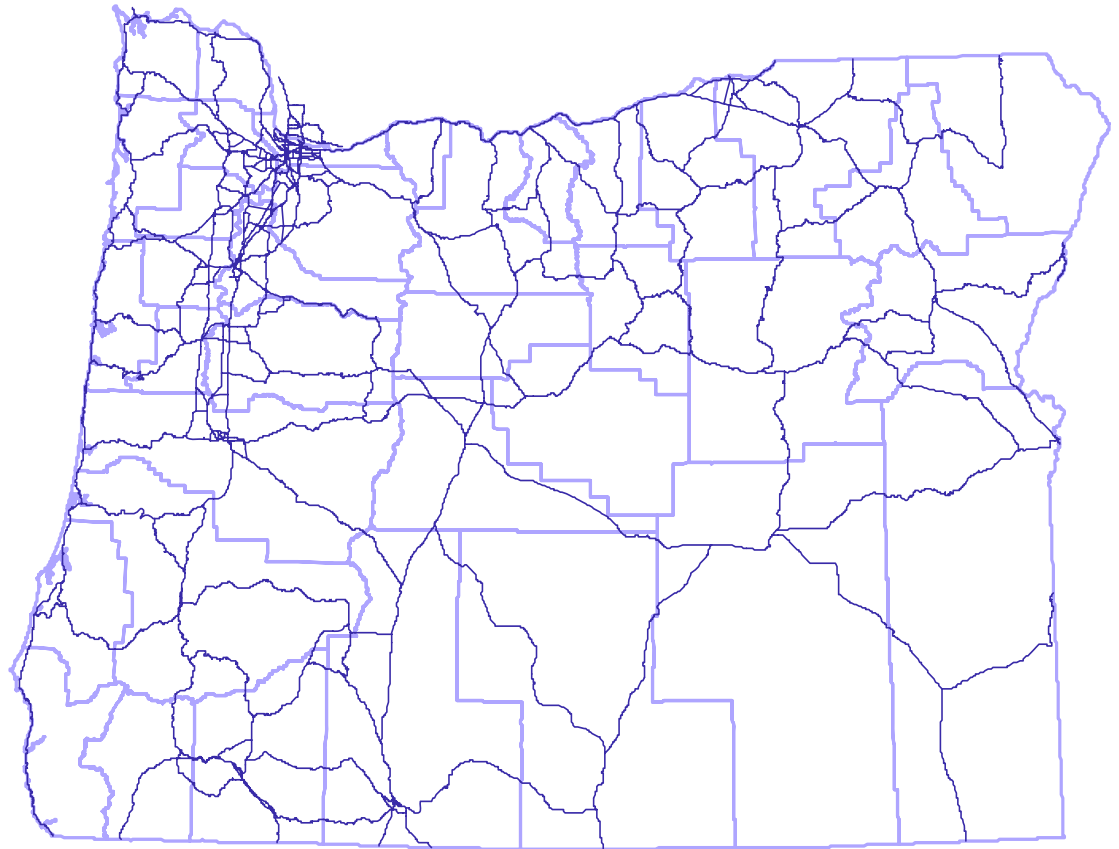
⌘ Census tract aggregations to city/sub-city urban areas

⌘ 61 zones represent METRO

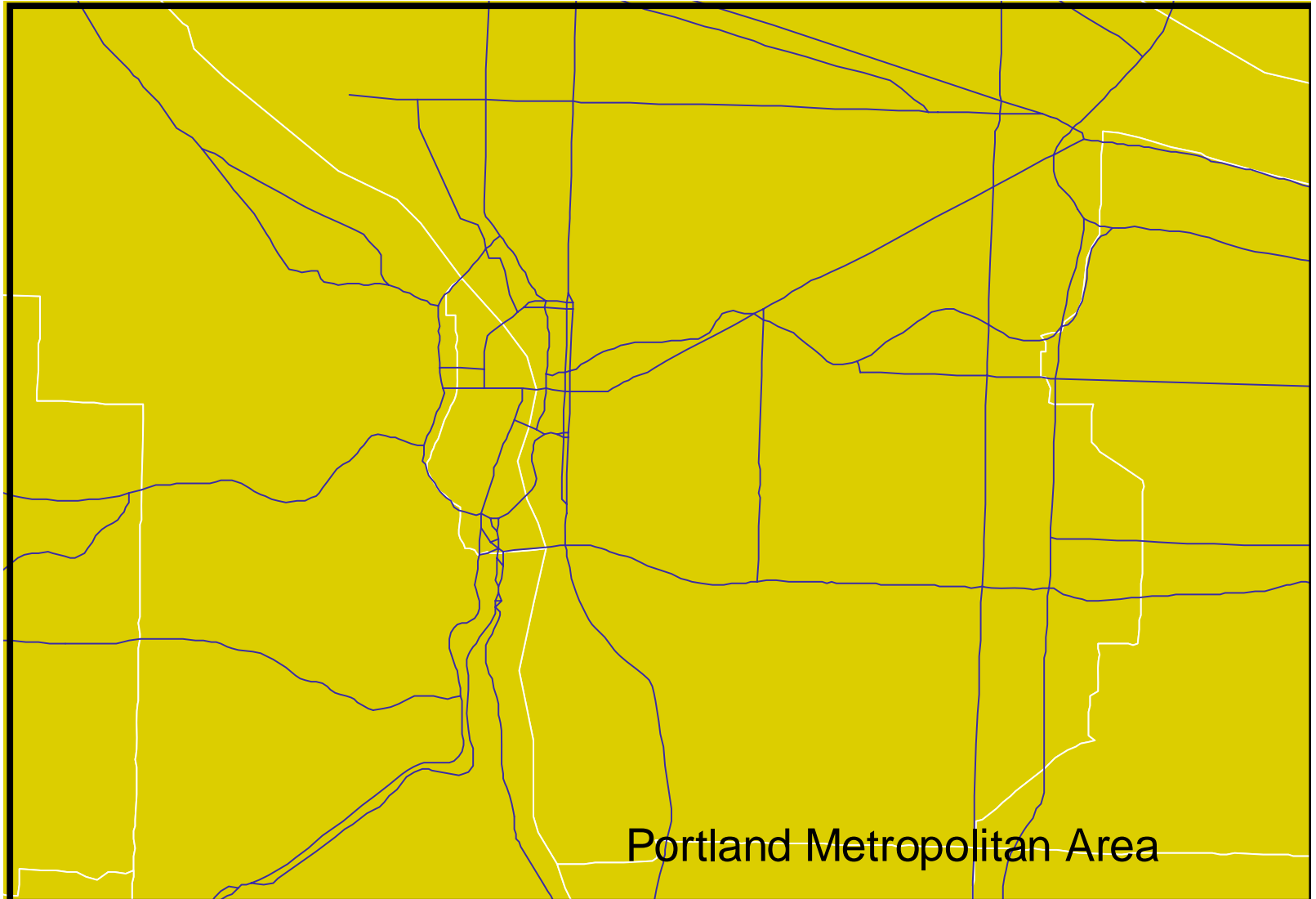
⌘ Less variation in population, employment, area

Highway Network

- ⌘ Primarily = National Highway System (NHS)
- ⌘ Some included roads not maintained by ODOT and not part of NHS (to link isolated TAZs)
- ⌘ Urban area arterials taken from MPO traffic model networks.



Example Urban Network Detail



Input-Output Matrix



- ⌘ Models economic flows for Oregon
- ⌘ Basis for traffic generation on model network
- ⌘ 12 economic and 3 household aggregate sectors (High, Middle and Low Income)
- ⌘ 4,530 cell matrix values used to calibrate model
 - (15 sectors) x (151 zones) x (2 time periods)
- ⌘ I-O matrix will be discussed in more detail in presentation following this one...

Employment by Sector



- ⌘ Primarily source site level employment figures - ES202 files supplied by Oregon Employment Department for 1990 and 1995 (approx. 90% of all employment)
- ⌘ ES202 file based on unemployment insurance data, used under confidentiality agreement
- ⌘ Additional employment estimates from 1990 PUMS and other census and employment records
- ⌘ Geo-coding to TAZ based on county ID and zip code, refinement with TIGER files as needed
- ⌘ Aggregated to TAZ

Households by Income Group



- ⌘ 1990 base year census tract data from decennial U.S. Census
- ⌘ 1995 census tract estimates from Claritas
- ⌘ Income groups approximate IMPLAN (USFS policy analysis software) groups
- ⌘ All income figures adjusted to 1990 dollars
- ⌘ Data were then aggregated to TAZ

Land Supply and Market Prices



- ⌘ Largest data collection task
- ⌘ Seven land markets: 4 urban & 3 rural
- ⌘ Urban Markets: Single family residential, (SFD), Multi-family residential (MFD), commercial (COM) , and industrial (IND)
- ⌘ Rural markets: Rural single family residential (RUR), agricultural (AGR), and forest (FOR)
- ⌘ Collected and/or estimated by TAZ

Metropolitan Area Land Prices



- ⌘ Preferred data source - sales records for vacant land by land market
- ⌘ Sparse availability and/or few actual transactions for TAZs or land market sectors
- ⌘ 1989-90 land sales data available in 8 counties
- ⌘ 1994-95 land sales data available in 11 counties

Residual Land Value Technique



- ⌘ Calculates value of land market for areas with missing data
- ⌘ Assumes that as a given structure depreciates, value is accrued to the land it occupies
- ⌘ 67-year, straight-line depreciation
- ⌘ Improvement value estimated from building square footage and age (year built)
- ⌘ Per square foot cost from FW Dodge

Urban Data Refinement



- ⌘ Delphi Process: Consensus enhancement of data through expert opinions
- ⌘ Local appraisers - Metro, Salem, Eugene
- ⌘ Surveyed for three land markets:
 - Multi-family Residential (MFD),
 - Commercial (COM) and Industrial (IND)

Rural Land Price



- ⌘ Rural areas' land prices not based on sales data - unavailable
- ⌘ Historical tax assessment records and Tax Code Summaries
- ⌘ New construction from FW Dodge backed out of summaries to develop “deflator”
- ⌘ 1995 values “deflated” to derive 1990 prices
- ⌘ Use county tax code maps to allocate parcels with derived prices to individual TAZs

Data Collection Challenges



- ⌘ TAZ structure and amount of data by area
- ⌘ Missing data - not in digital databases
- ⌘ Format of datasets available (digital vs. printed, also different computer systems)
- ⌘ Geo-referencing collected datasets - spatial resolution, mismatched boundaries
- ⌘ Data from specific years - GIS data generally available only after 1993

Statewide Model vs. Urban Area Model



- ⌘ Urban Model - finer level of spatial detail - based on tax parcel, better time-series data
- ⌘ 260 TAZs in urban area model cover the same area as 10 Statewide TAZs
- ⌘ Wider variety of data needed - examples include building square footage, employment at firm level, cost of land development
- ⌘ Longitudinal model calibration process beginning with 1980 data

Key Lesson Learned



⌘ Data collection efforts in support of statewide land-use and transportation modeling must be:

- ☑ Cooperative
- ☑ Long-term (on-going)
- ☑ Interjurisdictional
- ☑ Interdepartmental

Data Problems Solved



- ⌘ Selection of census tracts for TAZ aggregations
- ⌘ Modeled network roadway characteristics
- ⌘ Generalizations of IMPLAN categories
- ⌘ Employment distributions (missing data estimations, ZIP code lookup table)
- ⌘ Households and income for non-census year
- ⌘ Land area and price estimation process

Data Sources



- ⌘ TAZs: 1990 census tract geography
- ⌘ Network: ODOT NHS submittal file, supplemented by data from Metro-Portland concerning road detail in Clackamas, Multnomah, Washington, and Clark (WA) counties, some generalization in Marion Co.
- ⌘ Input-output matrix: Technical coefficients from IMPLAN (USFS policy analysis software).

Data Sources



- ⌘ Employment by sector (by TAZ): ES202 files from Oregon Employment Agency, 1990 PUMS data, and other special estimates by Oregon Employment Agency.
- ⌘ Households by income (by TAZ): 1990 US Census, Claritas dataset (commercial)
- ⌘ Land price and area (by TAZ): County assessor transaction data, expert opinion (Delphi process), Dept. of Revenue records