

Date: August 31, 1998

To: William J. Upton

From: Paul Waddell

Cc: Bill Davidson
Doug Hunt
Rick Donnelly
Pat Costinett
Larry Conrad
Bud Reiff

Re: Technical Memorandum 2, Task 3E:
Interim Year Data Preparation for Longitudinal Calibration

1 Overview

This technical memorandum is the second of three specifying data needed for the longitudinal calibration of the Eugene-Springfield metropolitan model. It specifies data for interim years (1981-1994) needed as inputs to run the metropolitan model as part of the calibration of its longitudinal-temporal dynamics.

The interim year data needed are:

- Regional Control Totals
- Urban Growth Boundary Changes
- Land Use Plan Changes
- Development Cost Changes
- Travel model outputs for at least two interim years

2 Regional Control Totals

The metropolitan model is driven by exogenous regional population and employment control totals for the study area, which is the Lane COG metropolitan planning area (TAZ 25-295). In a forecasting period, these data would be derived from the DAS County-level forecasts or alternative sources of aggregate economic and demographic forecasts for the metropolitan area. Given

the nature of the longitudinal calibration process, however, historical observed totals from local data collection and the census are available to use for this purpose.

The following data are needed for as many individual years as the data can be obtained between 1980 and 1994:

At a minimum:

- Total Employment
- Total Population

If possible:

- Total Households
- Households by Income Group
- Employment by Sector (Basic, Retail, Service, and Govt/Educ)

The data should be provided in a simple spreadsheet format, using Excel or a compatible spreadsheet (*ControlTotals80-94.xls*)

3 Urban Growth Boundary Changes

If there have been any significant changes in the Urban Growth Boundary since 1980, then a GIS coverage representing the Urban Growth Boundary immediately after the change(s) must be obtained. A GIS overlay with 1980 parcels would be required to identify parcels that had a change in status of coverage by the UGB. These changes should be formatted in a simple ASCII file (*UGBChanges80-94.tab*), with the following fields separated by tabs:

Name	Format	Description
Parcel	Character	Unique Parcel ID
Year	Integer	Year of Status Change
UGB	Dummy	New Status (1=Outside UGB, 0=Inside UGB)

4 Land Use Plan Changes

If there have been significant changes in the Metropolitan Land Use Plan since 1980, then a GIS coverage representing the Metropolitan Land Use Plan immediately after the change(s) must be obtained. A GIS overlay with 1980 parcels would be required to identify parcels that had a change in status of the

Metropolitan Land Use Plan. These changes should be formatted in a simple ASCII file (*PlanChanges80-94.tab*), with the following fields separated by tabs:

Name	Format	Description
Parcel	Character	Unique Parcel ID
Year	Integer	Year of Status Change
PLU	Integer	Planned Land Use

5 Development Cost Changes

Any significant changes in development costs between 1980 and 1994 need to be identified. Note that all costs in the model are treated in constant (1994) dollars, so these changes need to be adjusted for inflation in the metropolitan area using a local Consumer Price Index (the all urban consumers CPI). The formula for adjusting these costs from an individual year t to the target year T (1994) is:

$$\text{Cost}_{tA} = \text{Cost}_{tU} * (\text{CPI}_T / \text{CPI}_t)$$

where Cost_{tA} is the year t costs adjusted to year T constant dollars, and Cost_{tU} is the year t cost unadjusted for inflation (in nominal year t dollars).

If the CPI had increased by 5% between year t and year T, then the cost figures for year t would be inflated by that percentage to make them comparable in constant year T dollars.

As described in the previous memorandum, the three types of costs used in the model are construction costs, demolition costs, and soft costs. All are measured per residential housing unit for residential land uses (single-family, residential 2-4 unit, and multi-family), and per square foot of building floorspace for non-residential land uses (industrial, warehouse, retail, office, and special purpose). There may be a zonal adjustment of the soft development costs to reflect spatial variation in development impact fees and other similar costs of development influenced by localized policies. The construction and demolition costs are assumed not to vary by location within the metropolitan area.

These changes should be formatted in a simple ASCII file (*CostChanges80-94.tab*), with the following fields separated by tabs:

Name	Format	Description
ALU	Integer	Aggregate Land Use Type
Year	integer	Year of Status Change
Hardcost	Float	Hard Construction Cost per (unit or sqft)
Softcost	Float	Soft Construction Cost per (unit or sqft)
Democost	Float	Demolition Cost per (unit or sqft)

6 Auxiliary Cost Data

As additional documentation for assessing the exogenous regional inputs to the UrbanSim model, the following two data series are needed on an annual basis from 1990 through 1994:

CPI – all urban consumers
Average Household Income in constant 1994 dollars

These data should be formatted in a simple ASCII file (CostData90-94.tab). with the following fields separated by tabs:

Name	Format	Description
Year	integer	Year
CPI	Float	Value of Consumer Price Index
Income	Integer	Average Household Income (or per capita income)

7 Travel Model Output

Travel model runs will be needed for at least two years between 1980 and 1994. Plausible dates for these runs would be 1985 and 1990, which would divide the forecasting period into approximately five year steps between travel model runs. These dates may be adjusted, however, based on the availability of travel networks at LCOG.

Note that these runs should not be executed at this time, since the travel model should be provided a land use forecast for the appropriate year from UrbanSim as input to the trip generation procedure in the Eugene-Springfield travel model. At the present time, only the networks need to be retrieved or prepared, in anticipation of running the travel model at some time within the next two months.

In the interim, procedures should be developed to take the outputs from the UrbanSim model and reformat them for input to the travel model system, so that any automation that is feasible can be readily implemented for quickly iterating between the land use and travel model components.