Linking Tax-lot and Student Record Data – Applications in School Planning

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This article was is based on the experience of providing demographic services for a number of Oregon school districts, some growing rapidly and needing to build new schools, and others, such as the Portland Public School District, with shrinking enrollment and needing to make painful decisions about school closings. School districts make large investments in facilities to accommodate future student populations. Accurate enrollment forecasts can help keep districts from building over capacity and incurring excess costs or suffering under capacity and crowding. Knowledge about local housing markets and their impact on the mix of households can assist in producing realistic enrollment forecasts. One way to explicitly consider the effects of housing is to link each student to the residential location, the tax-lot, where they reside. It is this theme that will be addressed in this paper.

Changes in Housing Markets Impacts School Enrollment

Understanding local housing markets and how they change can provide useful information about changing school aged populations. In the case of a school district that is growing it is apparent that housing growth will generate new school enrollment. However, even in this simple case, one should be aware that new single family housing may generate as much as 50 times as much school enrollment per unit as downtown apartments. In districts that are largely built-out, changing housing tenure, household types, and ethnic composition in existing housing are the major factors influencing enrollment changes. For example, rental single family housing tends to house more students than does owner occupied single family housing. Gentrification where there are conversions of rental single family housing to owner occupancy may result in declining school enrollments.

The focus of this article is on kindergarten through grade twelve enrollments in the public school systems. A common reason for using the linked student – tax-lot data is to establish the ratio of number of students to the number of housing units, by type of unit, subsequently, referred to as the yield of students. The individual unit of land ownership is referred to in this article as the tax-lot, also commonly referred to as a land parcel or cadastre. Much of this research has been done for Portland Public Schools, Oregon abbreviated subsequently as PPS. Geographic information system technology is abbreviated as GIS. Most of the GIS analyses discussed in this article were done using Environmental Systems Research ArcGIS software.

The analyses in this paper parallel some of those that can be carried out using the special school district tabulations from the 1990 and 2000 censuses and published by the National Center for Educational Statistics – but are at the person or household level. Comparison of selected tract level housing data tabulated from the tax-lot files with data from the 2000 census show that they do not differ greatly, not surprising in that local government used the tax-lot file data in the LUCA program to review the Census Master Address File. Earlier research on housing demography, especially that of Dowell

Myers, provided valuable insights for the analysis in this paper. The author also was guided by concepts from the earlier urban social ecology research.

The two principal data resources used in this paper are (1) a subset of the student record file for PPS with residential addresses and (2) a subset of the Multnomah Co., Oregon assessor's tax-lot file with parcel polygons and descriptive data about the parcels. Street centerline files with addresses were used as a supplemental reference for geo-coding of student addresses. Student record data can be linked to tax-lot data using standard tools in GIS software packages. The paper will illustrate how this is done.

Some of the Variables That We Have Analyzed

After the files are linked one can cross tabulate information about students such as a table of "year unit built" by "grade of student". Some of the attribute values of housing and students that we have analyzed include:

Property class – The various types of residential structures such as single family housing, condominiums, or large apartment developments have a major impact on numbers of school aged children.

Year built – One may wish to examine the differences between the student loading in recently built and older apartments.

Assessed value – Increasing housing values may exclude younger families with children

Rooms in structure – Units with more than two bedrooms tend to house larger families with more children.

Housing Tenure – Rental single family units tend to house more children than comparable owner occupied units.

Age and race of students – Changing housing circumstances impact families with younger children differently that older families. In Portland changes in housing markets likely accelerated the suburbanization of the Black population.

Mover status of students – We track the location of students from year to year and can identify in and out movers and track moves within the PPS district.

Case Studies

The paper will examine variations in housing characteristics as represented in the tax-lot files and show how they impact school enrollments and the characteristics of students. It also will examine the dynamics of housing trends and show how they inform changes in school enrollments. Three examples are provided:

- The first examines the yield of students from single family housing, comparing the student yield from owner occupied and renter occupied single family housing for the Portland Public Schools District (PPS).
- The second examines how detailed student-housing data was used to evaluate the numbers of students that would be housed in a subdivision of owner occupied market housing that was being built as part of a public housing development.

- The third shows how housing linked student-housing data were used to link comprehensive land use and housing planning in Bend Oregon to the Bend-LaPIne School District's facilities planning.

Problems in Using Assessor's Tax-lot Data

Using the tax-lot files presents a number of problems. They are public records, but some assessor's offices are better than others in making them available to the public. Normally the county's GIS coordinator will extract data from the files that will be useful to planners and other persons in county government. Not all of the housing attribute data that one may wish to use may be maintained in the assessor's database. The main purpose of the tax-lot files, from the assessor's viewpoint, is to fairly assess housing values in order to determine what tax is owed. One variable that planners and researchers would like to have is the housing unit count for each tax-lot. These data are obvious for single family housing units, but for apartment complexes building square feet might serve as well from the assessor's perspective. We found in our research that bedroom counts were very useful for predicting the number of school children, but the assessor's office stopped maintaining these data because they did not need them, it took resources, and the concept of "what is a bedroom" is becoming somewhat fuzzy. In Oregon property tax limitations have capped many property tax bills and increased assessments do not produce additional revenue for local government, reducing the incentive for an active updating of tax-lot data.

Conclusions

In spite of the frustrations of working with the tax-lot data and the large amount of GIS data crunching required the linked tax-lot student record data provide us with valuable geographically detailed and current data that we cannot get from other sources. The problems of sampling error in the tract and block group data from the American Community Survey will force us to look toward the use of administrative record data to find the up to data and sufficiently detailed data that we need for school planning and other applications.