

970:516 Methods of Planning Analysis II

Tuesdays 9:50 am – 12:30 pm
Spring 2007
Civic Square Building, Room CSB 113
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Class Sakai site: <<http://sakai.rutgers.edu>> 34:970:516:01 Sp 08

This course introduces a set of tools that are widely used in urban and regional planning practice. The focus is on the development of, first, confidence and competence in quantitative problem solving, and second, an operational understanding of techniques for applied demography, regional economics, urban applications of economics, and decision analysis. Major topics include the following:

1. Estimating Needs: Planners need to understand the characteristics of the population they serve. This requires learning how to describe the current size, age distribution, vital statistics, and composition of that population. It also means learning how to project the characteristics of the future population, using models of growth, migration, and interregional population dynamics. It further involves estimating the resulting demand for facilities and services ranging from housing to transportation.
2. Understanding Economic Conditions: The open nature of most urban and regional economies has led to the development of special tools for studying their performance. Simple methods will be learned for evaluating shopping behavior, regional industrial specialization (economic base multipliers) and change (shift-share analysis). The more complex tools of regional, interregional and multi-regional input-output analysis will be explored from the point of view of the information consumer. Students will also gain an understanding of the strengths and weaknesses of several measures of inequality.
3. Making Decisions: Informing real, risky decisions -- often nearly in real time -- is one of the key tasks of practicing planners. Quantitative analysis of planning options, relevant uncertainties, and decision-makers' preferences allows the effective management of information in the decision making process. Both the individual and multi-party decision contexts will be examined, and techniques beginning with cost-benefit analysis and culminating in planning support systems will be explored.
4. Gathering Your Own Data: In planning practice, it is frequently the case that standardized data are not available and you must collect your own. Students will receive a brief introduction to observation, interviewing, focus groups, and survey research methods.

There will be one three hour class session each week. Grades will be based on three major problem sets (30 percent each) and classroom participation (10 percent). The problem sets, most

involving microcomputer work, will consist of short exercises applying the methods learned to small data sets. Late assignments will lose points.

The lectures assume basic, non-calculus preparation in math, economics and statistics. The reading assignments assume a willingness to review but not replicate more advanced material. The problem sets assume familiarity with microcomputer spreadsheets such as Excel. If you do not remember logarithms and exponents you should buy a review book, and the same is true if you are new to Excel—see recommendations below.

Note that the Fall semester section of Methods II taught by Prof. Chatman focuses more on qualitative methods and less on quantitative methods compared to this version of the course.

Submitting assignments via Sakai

To submit problem sets, use the “Assignments with grades” link at the Sakai site (on the left hand side). Upload your assignment as an attachment. If you have any difficulty, please contact me or Kim via email.

Attendance

Students are expected to attend class regularly. Absent students are responsible for all material and course changes announced in class.

Academic integrity

Academic honesty and intellectual integrity are fundamental to the process of learning and to evaluating academic performance. This is the responsibility of all members of the university, and students share the responsibility for creating and maintaining an atmosphere of honesty and integrity. If you have any doubt about what constitutes academic integrity, consult <http://teachx.rutgers.edu/integrity/policy.html>. Students are encouraged to study together in this course, but the problem sets you submit must be entirely your own work.

Textbooks:

The readings are downloadable in pdf format from the class Sakai site. However, you should also consider buying the following recommended books because they make useful references.

Recommended:

Koomey, Jonathan G. 2001. *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Steiner, Frederick, and Kent Butler. 2007. *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

Berke, Philip R., David R. Godshalk, and Kaiser, Edward J. 2006. *Urban Land Use Planning*, 5th ed. Chicago : University of Illinois Press.

Recommended for those in need of a review:

Spiegel, M.R., and R.E. Moyer. 2005. *Schaum's Outline of College Algebra*, 3rd ed. New York: McGraw Hill.

CustomGuide, Inc. 2004. *Excel 2003 Personal Trainer*. O'Reilly Media.

Schedule of Classes

<u>WEEK</u>	<u>DATE</u>	<u>LECTURE TOPIC</u>
1	Jan. 22	Introduction and overview, Basic quantitative skills <u>Part I Estimating Needs</u>
2	Jan. 29	Demography: Census data, Describing static populations
3	Feb. 5	Demography: Population Projection Models, Migration
4	Feb. 12	Demand Models: Need for Infrastructure & Facilities
5	Feb. 19	Transportation: Trip Generation and Distribution Models <u>Part II Understanding Economic Conditions</u>
6	Feb. 26	Income Accounts, Economic Base & I-O Multipliers
7	March 4	Location Quotients, Shift-Share Analysis
8	March 11	Shopping: Gravity and Retail Market Models
	Spring Break	
9	March 25	Measuring Inequality <u>Part III Making Decisions</u>
10	April 1	Benefit-Cost Analysis
11	April 8	Development Finance
12	April 15	Fiscal Impact Analysis
13	April 22	Planning Support Systems <u>Part IV Gathering Your Own Data</u>
14	April 29	Observation, Interviewing, Focus Groups, Surveys

Schedule of Topics, Readings, and Assignments

January 22 Introduction and Overview, Basic Quantitative Skills

Koomey, Jonathan G. 2001. Chapters 1-4 (pp. 1-28) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Part I Estimating Needs

January 29 Demography: Census Data, Describing Static Populations

Koomey, Jonathan G. 2001. Chapters 5-10 (pp. 29-55) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Yen, Maria, and Grace York. 2003. "Information from secondary sources." Chapter 3 in *The planner's Use of Information*. Hemalata C. Dandekar, ed. Chicago: Planners Press.

February 5 Demography: Extrapolations (Top-Down Population Projections), Cohort-Component Models (Bottom-Up Population Projections), Migration

Koomey, Jonathan G. 2001. Chapters 11-15 (pp. 57-75) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Steiner, Frederick, and Kent Butler. 2007. "Projections and demand analysis," Pp. 299-302 in *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

Berke, Philip R., David R. Godshalk, and Kaiser, Edward J. 2006. "Population and Economy." Pp. 117-148 (Chapter 5) in *Urban Land Use Planning*, 5th ed. Chicago : University of Illinois Press.

Pandit, Kavita. (2000) "Regional variation in mobility levels and timing in the United States," *Professional Geographer* 52(3): 483-493.

Manson, Gary A., and Richard E. Groop. (2000) "U.S. intercounty migration in the 1990s: People and income move down the urban hierarchy," *Professional Geographer* 52(3): 493-504.

February 12

Demand Models: Estimating the Need for Infrastructures and Facilities

Koomey, Jonathan G. 2001. Chapters 16-20 (pp. 76-92) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Kelly, Eric Damian, and Barbara Becker. 2000. "How do we plan for public facilities?" Chapter 7 in *Community Planning: An Introduction to the Comprehensive Plan*. Washington, DC: Island Press.

Steiner, Frederick, and Kent Butler. 2007. "Housing needs assessment," and "Parks, recreation, and open-space needs assessment." Pp. 305-309 in *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

February 19

Transportation: Trip Generation and Distribution Models

Koomey, Jonathan G. 2001. Chapters 21-26 (pp. 93-110) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Berke, Philip R., David R. Godshalk, and Kaiser, Edward J. 2006. "Transportation and Infrastructure Systems." Pp. 225-263 (Chapter 8) in *Urban Land Use Planning*, 5th ed. Chicago : University of Illinois Press.

Sheppard, Eric (1986). "Modeling and predicting aggregate flows," pp. 91-118 in Susan Hanson, ed., *The Geography of Urban Transportation*, New York: Guilford.

Steiner, Frederick, and Kent Butler. 2007. "Traffic impact studies," Pp. 317-319 in *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

Part II Understanding Economic Conditions

February 26

**National and Regional Income Accounts,
Economic Base & Input-Output Multipliers**

Problem Set 1 due.

Koomey, Jonathan G. 2001. Chapters 27-28 (pp. 111-128) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Bendavid-Val, Avrom (1991), *Regional and Local Economic Analysis for Practitioners*, 4th Edition, Westport, CT: Praeger Publishers, pp. 41-52, 77-113 (chapters 5, 8-9).

Moore, Terry, Stuart Meck, and James Ebenhoh. 2006. "Evaluating a Local Economy" in *An Economic Development Toolbox: Strategies and Methods*, Planning Advisory Service Report No. 541. Chicago: American Planning Association.

Steiner, Frederick, and Kent Butler. 2007. "Economic base and econometric projections," Pp. 303-304 in *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

March 4 **Location Quotients
Shift-Share Analysis**

Koomey, Jonathan G. 2001. Chapters 29-31 (pp. 129-144) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Bendavid-Val, Avrom (1991), *Regional and Local Economic Analysis for Practitioners*, 4th Edition, Westport, CT: Praeger Publishers, pp. 67-76 (chapter 7).

March 11 **Shopping
Gravity and Retail Market Models**

Koomey, Jonathan G. 2001. Chapters 32-33 (pp. 145-160) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Krueckeberg, Donald, and Arthur Silvers (1974) *Urban Planning Analysis: Methods and Models*, John Wiley and Sons, New York. pp. 289-314 (chapter 9).

Shields, Martin (2001) *A Few Simple Tools for Assessing the Size and Performance of the Local Retail Market*, web tutorial available at http://www.cdtoolbox.net/economic_development/000202.html.

Spring Break

March 25 **Measuring Inequality**

Koomey, Jonathan G. 2001. Chapters 34-35 (pp. 161-172) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Cowell, F. (1995), *Measuring Inequality*, 2nd edition. New York, NY: Prentice Hall/Harvester Wheatsheaf, pp. 1-34 (chapters 1-2).

Massey, Douglas S., and Nancy A. Denton. 1988. "The dimensions of residential segregation," *Social Forces* 67(2): 281-315.

Glaeser, Edward L., and Jacob L. Vigdor. 2001. *Racial Segregation in the 2000 Census: Promising News*. Survey Series, Center on Urban and Metropolitan Policy. Washington DC: Brookings Institution.

Part III Making Decisions

April 1 Benefit-Cost Analysis

Problem Set 2 due.

Koomey, Jonathan G. 2001. Chapters 36-37 (pp. 173-184) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Schofield, J. (1987), *Cost-Benefit Analysis in Urban and Regional Planning*, London: Allen and Unwin, pp. 1-36, 112-131, 221-226 (chapters 1,2, 3, 10, and 17).

Gramlich, Edward M. 1990. Chapters 8 and 12 (pp.134-149, 197-222) in *A Guide to Benefit-Cost Analysis*, 2nd ed. Prospect Heights, IL: Waveland Press.

April 8 Development Finance

Koomey, Jonathan G. 2001. Chapters 38-Conclusion (pp. 185-199) in *Turning Numbers into Knowledge*. Oakland, CA: Analytics Press.

Steiner, Frederick, and Kent Butler. 2007. "Capital improvement programs," "Tax increment financing," "Financing methods and techniques," and "Financial planning and analysis: The pro forma," Pp. 401-414 in *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

April 15 Fiscal Impact Analysis

Steiner, Frederick, and Kent Butler. 2007. "Fiscal impact analysis," Pp. 314-316 in *Planning and Urban Design Standards, Student Edition*. Hoboken, NJ: John Wiley & Sons.

Edwards, Mary M. 2000. "Fiscal impact analysis." Pp. 9-27 in *Community Guide to Development Impact Analysis*. Madison, WI: Wisconsin Land Use Research Program.

April 22 Planning Support Systems

Berke, Philip R., David R. Godshalk, and Kaiser, Edward J. 2006. "Planning Support Systems." Pp. 85-115 (Chapter 4) in *Urban Land Use Planning*, 5th ed. Chicago : University of Illinois Press.

Janssen, R. (1991), *Multiobjective Decision Support for Environmental Problems*, Vrije Universiteit te Amsterdam, pp. 51-90, (chapter 3).

Part V Gathering Your Own Data

April 29 Observation, Interviewing, Focus Groups, Surveys

Problem Set 3 due.

Dandekar, Hemalata C. 2003. "Field methods for collecting information." Chapter 1 in *The planner's Use of Information*. Hemalata C. Dandekar, ed. Chicago: Planners Press.

Jacobs, Allan B.. 1985. "Starting to look" (pp. 1-13), "Clues" (pp. 30-84), and "Looking back" (pp. 133-141). In *Looking at Cities*. Cambridge, MA: Harvard University Press.

Nishikawa, Nancy. 2003. "Survey methods for planners." Chapter 2 in *The planner's Use of Information*. Hemalata C. Dandekar, ed. Chicago: Planners Press.

Babbie, Earl. 2004. "Qualitative field research." Chapter 10 in *The Practice of Social Research*, 10 ed. Belmont, CA: Thomson Wadsworth.

Following are recommended readings that provide more detail on the topics covered in this class. These are NOT required readings. They are useful resources if you want to learn more about a topic.

Demography (data sources)

Newell, C. (1988), *Methods and Models in Demography*, London: Belhaven Press (Pinter Publishers), pp. 1-34, 82-89 (Chapters 1,2,3 and 7).

Demography (projection models)

Klosterman, R. E. (1990). *Community Analysis and Planning Techniques*.
Savage, MD: Rowman and Littlefield.

McCullough, B.D., & Berry Wilson (1999), "On the accuracy of statistical procedures in Microsoft Excel 97," *Computational Statistics & Data Analysis*, Volume 31, pp. 27-37.

Newell, C. (1988) op. cit., pp. 180-189 (chapter 15).

Woods, R., and P. Rees (1986), *Population Structures and Models*, London: Allen and Unwin, pp. 1-20, 95-125 (Chapters 1, 2, 6).

Demography (migration, multiregional population dynamics, composite models)

Newell, C. (1988) op. cit., pp. 82-89 (chapter 7).

Rogers, A. (1985) *Regional Population Projection Models*, Beverly Hills, CA: Sage Publications, pp. 63-94.

Woods, R., and P. Rees (1986) op. cit., pp. 160-298 (chapters -11). [discusses industrialized country context]

Todaro, M. P. (1985). *Economic Development in the Third World*. 3rd edition. New York: Longman, pp. 247-284 (chapter 9). [discusses developing country context]

Regional Economics (income & product accounts, economic base model)

Bureau of Economic Analysis, U.S. Dept. of Commerce, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMS II)* (Washington, DC: U.S. Government Printing Office, 1992).

Pleeter, S. (1980), "Methodologies of Economic Impact Analysis: An Overview," in S. Pleeter ed., *Economic Impact Analysis: Methodology and Applications*, Boston, MA: Martinus Nijhoff Publishers, pp. 7-31.

Regional Economics (location quotients, shift-share)

Knudsen, Daniel C. (2000), "Shift-share analysis: Further examination of models for the description of economic change," *Socio-Economic Planning Sciences*, Volume 34, pp. 177-198.

Regional Economics (regional input-output model, multipliers)

Miller, Ronald E (1998), "Regional and interregional input-output analysis," pp. 41-133 in Walter Isard et al, eds. *Methods of Interregional and Regional Analysis*, Aldershot UK: Ashgate.

Schofield, J. A. (1987). *Cost-Benefit Analysis in Urban and Regional Planning*. London: Allen and Unwin, pp. 177-193 (chapter 14).

Urban Applications (measuring inequality)

Cowell, F. (1995), *Measuring Inequality*, 2nd edition. New York, NY: Prentice Hall/Harvester Wheatsheaf, pp. 35-134 (chapters 3-5, appendix).

Darden, Joe T., and Sameh M. Kamel (2000), "Black residential segregation in the city and suburbs of Detroit: Does socioeconomic status matter?," *Journal of Urban Affairs*, Volume 22, Number 1, pp. 1-13.

Urban Applications (shopping, gravity and retail location models)

Stewart, J. Q. (1940). "The Gravity of the Princeton Family." *Princeton Alumni Weekly*. February 9, 1940, pp. 409-410.

Isard, Walter (1998), "Gravity and spatial interaction models," pp. 243-279 in Walter Isard et al, eds. *Methods of Interregional and Regional Analysis*, Aldershot UK: Ashgate.

Urban Applications (transportation, trip generation and distribution models)

Putman, S. (1983). *Integrated Urban Models*. London: Pion Ltd., pp. 6-36 (chapter 2).

World Bank (1986), *Urban Transport*, World Bank, Washington, DC 61 pp.

Decision Analysis (optimization techniques)

de Neufville, Richard. (1990). *Applied Systems Analysis*. New York: McGraw-Hill, pp. 28-40, 139-172 (ch. 3, 7)

Decision Analysis (valuation, value tradeoffs, risk aversion)

Keeney, R. and H. Raiffa (1976), *Decisions with Multiple Objectives: Preferences and Value Tradeoffs*, New York, NY: John Wiley & Sons, pp. 66-130, 131-218 (chapters 3-4).

Decision Analysis (benefit-cost analysis)

Gramlich, E. (1990). *A Guide to Benefit-Cost Analysis*. pp. 1-114, 134-149 (chapters 1-6, 8).

Decision Analysis (multicriteria analysis)

Lai, S-K., and L. D. Hopkins (1989). "The meanings of tradeoffs in multi-attribute evaluation methods: a comparison." *Environment and Planning B: Planning and Design*. Vol. 16, pp. 155-170.

Gathering Your Own Data

Adler, Patricia A. and Peter Adler. 1998. "Observational techniques." In *Collecting and Interpreting Qualitative Materials*, edited by N.K. Denzin and Y.S. Lincoln. Thousand Oaks: Sage.

Ambert, Anne-Marie, Patricia A. Adler, Peter Adler, and Daniel F. Detzner. 1995. "Understanding and evaluating qualitative research." *Journal of Marriage and the Family* 57(4) 879-893.

Voogd, Henk. 2005. "Evaluation of visitability of public urban places." In *Beyond benefit cost analysis: Accounting for non-market values in planning evaluation*, edited by D. Miller and D. Patassini. Burlington, VT: Ashgate.

Salant, Priscilla and Don A. Dillman. 1994. "Practical surveys," "Cornerstones of a quality survey," "Deciding what information you need," and "Choosing a survey method." Chapters 1 to 4 in *How to Conduct Your Own Survey*. New York: John Wiley & Sons.

Fowler, Floyd J., Jr. 1993. "Designing questions to be good measures," "Designing and evaluating survey questions," and "Survey interviewing." Chapters 5 to 7 in *Survey Research Methods*. 2nd ed. Newbury Park, CA: Sage.