NARSC NEWS

Words from the Executive Director

Welcome to the June 2016 issue of NARSC News. I hope that everyone is having a productive summer. This November (9th-12th) the 63rd Annual North American Meetings of the RSAI will take place in Minneapolis, Minnesota. I hope that you will join us for what promises to be another enjoyable and stimulating meeting. Our host will be the Mid-continent Regional Science Association. This year's local organizers are John Leatherman and Katherine Nesse of Kansas State University and the Program Chair is Haifeng Qian of The University of Iowa. The deadline for abstract submissions is July 1. Registration rates have been kept at the same level as the last two years. Also please note that the deadline for submissions to the student paper competitions, is different than in the past. It has been moved up to August 1st to provide the judging panel with more time to review papers. More information about the conference can be found at http://www.narsc.org/newsite/conference/. In closing I'd like to thank our newsletter editors Liz Mack and Ran Wei for putting together yet another informative newsletter. I look forward to seeing you in Minneapolis.

Words from the Editors

This issue marks the start of the third year of the newsletter. Thanks to the great membership, it has been possible to feature important contents and updates in the field of regional science. Thank you to all that have contributed. If you have ideas please feel free to contact Ran Wei (ran.wei@utah.edu) or Liz Mack (emack@msu.edu).

This June 2016 edition of the newsletter contains a reflection on the fifty years of the Regional Research Institute, an invitation to nominate candidates for William Alonso Memorial Prize, and a welcome from the Applied Economic, Regional and Urban Studies (AERUS) group. The profiles of junior members of NARSC in this issue are Insu Hong from West Virginia University, Katherine Nesse from Kansas State University, Hao Huang from the Institute of Illinois Technology, and David Folch from Florida State University.

In addition to this information, the newsletter highlights recently funded research and published books of the membership. We wish all of you a pleasant summer and look forward to seeing you all at the NARSC meeting in Minneapolis this November.

Elizabeth Mack and Ran Wei, Newsletter Co-Editors

ISSUE 1, JUNE 2016

Would you like to contribute to the newsletter?
Contact editors Elizabeth Mack (emack@msu.edu) or Ran Wei (ran.wei@utah.edu)

Celebrating 50 Years of Commitment to the Regional Research

by Regional Research Institute (RRI)

On September 1, 1965, the Regional Research Institute (RRI) at West Virginia University was founded by Dr. William H. Miernyk, an astute and learned man universally revered by all in the field of regional science. His objectives for the Institute were captured by four propositions:

- The Regional Research Institute (RRI) exists for scholarly research. Scholars define the research projects, and scholars evaluate the proposals and results. The overall objective is to increase knowledge through publication of journal articles and books.
- Graduate students are an integral part of the Institute. As their educations progress, so do their roles on research projects. They learn research skills, conduct and publish research, and present papers at conferences in the U.S. and worldwide.
- The scope of the Institute extends beyond the economic and social problems of Appalachia to similar regions elsewhere. It incorporates an enduring focus on quantitative methods for studying regions and evaluating policy directions.
- The Institute encourages and nurtures international and multidisciplinary research. It organizes conferences and seminars, initiates research activities, creates research opportunities abroad, and hosts visiting scholars.

Over the years, the RRI has met these objectives and continued to flourish to become an internationally recognized center for the advancement of regional science. In fact, a recent report ranked the RRI as number two in the U.S. and number seven in the world based on the numbers of articles published from 2010 to 2014 in the Top Ten Core Regional Science Journal Publications, e.g., Journal of Regional Science and The Review of Regional Studies.

The Institute has been led by nine regional researchers who have been either RRI director, acting director or interim director. They are William Miernyk (1965-1983), Robert Saunders (1969-1970), Patrick Mann (1983-1984), Andrew Isserman (1985-1997), Brain Cushing (1991), Luc Anselin (1997-1998), Scott Loveridge (1999-2000), Ronald Lewis (2000-2001) and Randall Jackson (2002-present).

This year marks the Institute's 50th Anniversary. Dr. Randall Jackson, current director of the RRI said, "While the Institute maintains a special focus on the Appalachian region, our research interests are both national and international in scope. For Appalachia, for example, the Institute has been involved in research to combat early childhood obesity in WV; and it has worked with the Appalachian Regional Commission to assess the region's water assets, energy efficiency options, and also to conduct an economic analysis of the Appalachian Regional Commission's work and progress since 1965."

[1] Ranking authors and institutions by publications in regional science journals: 2010-2014; https://mpra.ub.uni-muenchen.de/65593/1/MPRA_paper_65593.pdf

Nationally, researchers at the Institute have collaborated with scholars at the Universities of Pittsburgh, Carnegie Mellon, Washington (Seattle), Georgia Tech, Arizona State, George Mason, Florida International, Pennsylvania State, The Ohio State, and Virginia Polytechnic Institute. Many of these collaborations have involved sponsored funding from the National Science Foundation, the Department of Energy, National Energy Technology Laboratory, U.S. Department of Agriculture's National Research Initiative and NIFA, and the Economic Development Administration to name a few, from whom the Institute has received millions of dollars in funding. The resulting research has produced hundreds of publications in regional science journals and journals in cognate disciplines."

Internationally, the Institute has Memoranda of Understanding with the Korean Institute for Industrial Economics and Trade (KIET), Andong University in Korea and the University of Bologna in Italy. Additionally, the RRI has past and current research staff from Hungary, Italy, Iran, Colombia and China while scholars from our Visiting Foreign Scholar Program have hailed from Korea, Japan, China, Brazil, Hungary, Uzbekistan and Turkey.

Although not an academic unit, the RRI supports WVU's goal of engaging students in a challenging academic environment where they are conducting groundbreaking regional science research using state-of-the-art spatial science methods. Through the coordinated efforts of a diverse faculty, WVU has emerged as a leader in applied and theoretical spatial statistics and economics. In fact, the RRI has offered spatial econometrics courses taught by two world-renowned specialists in spatial econometrics.

RRI is home to the Web Book of Regional Science, which is equivalent to over fifteen hundred pages of traditional text. Contributions to the Web Book can be categorized as methods or empirical issues, topical or policy oriented topics, and regional science classics. Researchers from more than 90 countries visit the Web Book during a typical year; often these materials are used in introductory, upper division undergraduate and graduate courses and by practitioners.

RRI GRA Jing Chen points out, "For the past 50 years, the RRI has been a home for numerous scholars, including faculty research associates (FRAs) and graduate research assistant (GRAs), providing them with opportunities to network and learn new ideas in various forms, ranging from seminars and workshops to the Web Book of Regional Science and team research."

As we look forward to the next 50 years, we believe that regional research will only grow in importance. In fact, we will be celebrating our first half century with the upcoming release of a book called Regional Research Frontiers, with contributions that are not reviews or retrospectives but instead are forward looking. So many of today's and tomorrow's challenges are regional in scope, so their solutions will need to be identified at the regional level. In some cases, the appropriate regional scale will be supranational, while in others it will be subnational, and many global problems will require solutions that vary locally. We believe

that there will be an increasing recognition of the importance of integrating human and physical systems models, recognizing that economic and environmental sustainability are inseparable. We expect to continue to seek regional solutions, although we also expect that our approach to regional modeling will move away from individual efforts and toward projects that leverage new technologies that support group development and intelligence. The cumulative knowledge-building promise of open source and open science dwarfs that of the individual and small team research silos of the past. The collective development of software tools like Linux, Python and R libraries, and PySal, to name just a few, is well underway, and fledgling human and environmental systems models are clearly on the horizon. Indeed, we at the RRI are in the early stages of developing an object-oriented, dynamic interindustry model of the U.S. and its regions that we plan to release as an open source, open science project within the coming year, and we invite the larger regional research community to join with us when we do!

The University of Illinois at Urbana-Champaign hosted on April 23rd-24th the ninth annual Midwest Graduate Student Summit on Applied Economics, Regional, and Urban Studies (AERUS). The summit had the objective of initiating intellectual dialogue on a wide array of research areas and spurring future research collaborations among participating young scholars. Conference presentations addressed a variety of areas of growing importance to regional science, applied economy, urban planning and geography.

The summit had the honor to include Professor Arthur Getis from San Diego State University and Professor Joshua Woodard from Cornell University as keynote speakers. Additionally, there were two special panels on Climate Change and International Development. The summit also included 75 presentations of graduate students and scholars from 16 different universities, and a special workshop on Spatial Econometrics with R offered by the Econometrics Lab at the University of Illinois.

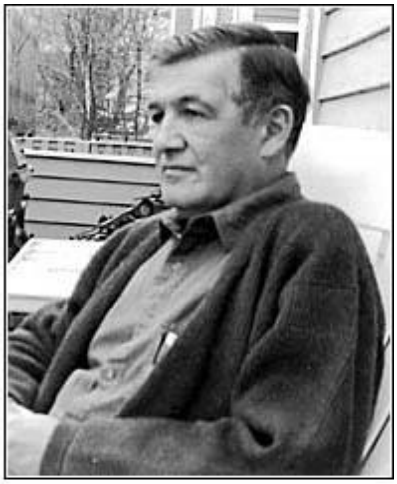
The conference had the support of The North American Regional Science Council (NARSC), and the Departments of Economics, Urban and Regional Planning, Agricultural and Consumer Economics and the Office of International Programs from the University of Illinois. The organizing committee was exclusively composed by graduate students from the University of Illinois. Additional information about the Summit can be found at www.aerus.illinois.edu.

Next year, the 10th Summit will be hosted by the Ohio State University. Researchers and graduate students from the Midwest and all over the world are invited to attend this rewarding congress. We are all looking forward to one more successful event.

Sincerely,

Renato Schwambach Vieira
AERUS 2016 Organizing Committee

Nomination deadline coming up, July 31!
The William Alonso Memorial Prize for Innovative Work in Regional Science



William Alonso, 1933-1999

The William Alonso Memorial Prize for Innovative Work in Regional Science was established in 1999 to honor the memory of a revered, pioneering scholar. In 1960 William Alonso was awarded the first Ph.D. in Regional Science by the University of Pennsylvania. The book based on his dissertation, *Location and Land Use* (Harvard University Press, 1964), is often credited with launching the field of urban economics. He made numerous major contributions to the study of migration, regional development, and the politics of numbers, and his work ranged from meticulous mathematical theory to far-ranging think pieces. William Alonso was Assistant and Associate Professor of Regional Planning at Harvard University (1959-67), Professor of Regional Planning at the University of California, Berkeley (1966-76), and Richard Saltonstall Professor of Population Policy at Harvard (1976-99).

The objective of the Prize is to recognize the recent innovative research contribution of Regional Science scholars in the spirit of Dr. William Alonso. Previous Prize Winners are:

2002 Masahisa Fujita and Paul Krugman, *The Spatial Economy* (MIT Press, 1999)
2004 Jacques-François Thisse, *Economics of Agglomeration* (Cambridge University Press, 2002)
2006 Luc Anselin, *Local Indicators of Spatial Association* (Geographical Analysis, 1995)
Ann Markusen, *Sticky Places in Slippery Space* (Economic Geography, 1996)
2011 Michael Batty, *Cities and Complexity* (MIT Press, 2007)
2013 Robert Sampson, *Great American City* (University of Chicago Press, 2012)

The next prize, the 2017 Prize, is scheduled to be announced in 2016 at the North American Meetings in Minneapolis.

Nominations for the 2017 prize to be announced in 2016 are invited by the Alonso Prize Committee. They may come from any individual or organization including book publishers, university departments, government agencies, and other public or private entities. Each organizations is limited to make two nominations for each occasion. The deadline for nominations is July 31, 2016.

- The nominated work must be a book published in 2011 or later. An edited book will be considered only if it is tightly-integrated, not a loose collection of chapters.
- The nominated work may have single or multiple authors.
- Authors are encouraged to self-nominate, and jurors will not know which books were self-nominated.
- Previously nominated books may be re-nominated and will be considered anew.

- Six copies of the book must be received by the deadline. Please send books to Neil Reid, Department of Geography and Planning, Mail Stop 140, University of Toledo, Toledo, Ohio 43606
- To nominate a book (1) send an e-mail to neil.reid@utoledo.edu with citation information, such as William Alonso, *Location and Land Use,* Harvard University Press, 1964, (2) attach up to three published book reviews, if available, using pdf files, and (3) arrange for the six copies to be sent, usually by the author or publisher. No letters of nomination or support are required, and, if provided, will not be sent to jurors. The selection criteria are innovation and expected impact.

Although occasionally awarded to an article, the Alonso Prize is primarily a book prize. A book's key idea might have been presented first in a journal article, such as Alonso's "A Theory of the Urban Land Market," *Papers of the Regional Science Association,* 1960, but its fuller development and synthesis with other work can make the book innovative and eligible for the Prize.

Members of the Prize Committee include:

Professor David Plane, Chair, University of Arizona, plane@email.arizona.edu
Professor Kyung-Hwan Kim, Sogan University, stamitzkim@gmail.com
Professor Janet Kolhase, University of Houston, kohlhase@central.uh.edu
Professor Philip McCann, University of Groningen, p.mccann@rug.nl
Professor Emeritus, Gordon Mulligan, University of Arizona, mulligan@email.arizona.edu

Member Profile:
Insu Hong, West Virginia University

Dr. Insu Hong has been working as Assistant Professor in the Department of Geology and Geography in West Virginia University. He has explored of questions about improving spatial analytical methods for better understanding of spatial phenomena and of utilization of spatial knowledge and GIS approach/functionality for the spatial problems and decision making processes that underutilize spatial aspects. His primary foci are algorithm development for spatial analysis with GIS and exploiting spatial knowledge and GIS functionalities in developing solution approaches for spatial optimization. Innovative algorithmic advancements in spatial analytical methods can facilitate new opportunities and can further understanding and exploration of spatial patterns and processes. GIS-aware spatial solution approaches for spatial optimization can produce solutions with higher computational efficiency while reflecting the context of a given problem.

In this context, Dr. Hong has pursued development of spatial optimization models and spatial solution approaches for urban planning and disaster management. His optimization model and heuristic technique suggested optimized alternatives for tsunami warning sirens along the eastern coast regions of Korea, with geovisualization. Dr. Hong's other research proposed a novel spatial network optimization model for the drone package delivery system in urban area, which integrates an innovative shortest path derivation algorithm of his.

Other important strands of his research include the development of the shortest path derivation algorithm in continuous space. The shortest path is crucial information for spatial analysis, transportation, wayfinding, and optimization. Continuous space with impediments, which does not have pre-defined network for movements, adds layers of complexity for derivation of the shortest path. Dr. Hong has developed a new algorithm based on spatial perspectives. By exploiting spatial knowledge and the functionality of GIS, his insights and advances have enabled identification of the shortest path more efficiently then was possible using existing, non-spatial methods. These advances now enable real time planning and decision making, aided by spatial filtering techniques and high performance computing approaches.

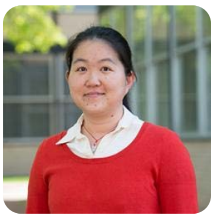
Katherine Nesse, Kansas State University

"But how many kids need Head Start here in Aurora, Illinois right now?" It was easy enough to answer quite accurately with a high-quality household survey. Indeed, Katherine was working with the Illinois Early Childhood Asset Map (IECAM), a program within the Early Childhood and Parenting Collaborative at the University of Illinois at Urbana-Champaign, to provide these types of estimates using data from the American Community Survey (ACS). But for very small areas—small towns, neighborhoods, rural counties—the ACS was noticeably off about 10 percent of the time. That is a reasonable amount of error unless you are one of those small areas with an inaccurate estimate. The little agencies and nonprofits didn't have the money or expertise to implement a high-quality survey on a regular basis, even for their neighborhood. Kate pondered, how could these organizations get frequent, reliable data about a relatively rare characteristic of the population?

If you have been around kids, you have probably noticed that they leave physical evidence of their existence everywhere they go, but especially at home. In fact, Kate noticed, we all do. For the past five years, Kate has been working on a way to leverage that information to estimate the demographics of residential areas. If one of the agencies that was concerned about data on preschool-aged children could walk around their service area and count strollers or playground equipment or trikes and be able to create a fairly accurate estimate of the number of children that qualify for Head Start, they could track that characteristic of the population over time. Kate has been working with community groups to gather demographic data in Kansas, where she is currently an assistant professor at Kansas State University in the department of Landscape Architecture and Regional & Community Planning. This fall she will be moving to Seattle Pacific University to start an urban studies program (in the Sociology department) and she plans to build connections with community groups in Seattle to continue the research.

Kate describes her research as at the intersection of people and the economy. She is interested in demographic methods and how they impact policy and the economy. She has researched how policy-makers use the ACS and is developing the passive survey method described above. Her work also looks at how economic interventions impact people. Does the construction of a stadium or the opening of a brewery change the earnings or economic development dialog in a city? Kate received her PhD from the University of Illinois at Urbana-Champaign in Urban and Regional Planning. This fall, she will be an assistant professor at Seattle Pacific University. She has served as the representative from MCRSA to NARSC since 2015.

Hao Huang, Illinois Institute of Technology



Growing up in Wuhan, China, and working there in local government departments in urban planning and land administration for projects regarding GIS applications, economic development strategies, and urban housing planning, Dr. Hao Huang developed a strong interest in economic and urban development and the topics of globalization, urbanization, and sustainability. She received her master degree in urban planning from the State University of New York at Buffalo, in which her thesis developed hedonic house price models to examine the relationships between housing prices and urban and environmental amenities to develop strategies for creating sustainable urban built environments in Wuhan, China. While pursuing her PhD at the Department of Geography at University of Utah, as both a student and a postdoctoral researcher, she conducted a significant amount of research on foreign direct investment (FDI) to understand causes and effects of FDI across different spatial levels in China. She is particularly interested in multi-scalar changes in spatial patterns, dynamics, and processes of FDI, understanding how FDI transforms cities and regions in terms of spatial, economic, and environmental development, and how policies can be implemented or improved to reduce inequality and poverty, and promote economic growth.

Her research interests are focused on spatial patterns, dynamics, and mechanisms of economic activities, and their effects at different space-time scales. Specifically, at the international and regional levels, she is interested in locational choices and determinants of global economic activities including foreign direct investment and trade, and their effects on countries and metropolitan regions with respect to inequality and poverty, job creation and unemployment, and innovation and technology. At the local level, she is interested in residential and industrial location choices and their effects on cities and places with respect to agglomeration economies, housing, and built environment and health. To examine the locational decisions of individuals and firms, she uses a variety of spatial techniques, data-driven analysis, quantitative methods to visualize, simulate, and analyze their behaviors on locational decisions. Her area of specialty is on China and the United States.

One project Dr. Hao Huang is working on is to examine the effects of urbanization agglomeration economies on foreign direct investment location, and to assess the roles of population and migration in global economic activities in China. The goal is to provide policy implications on population, migration, and economic development in the process of Chinese urbanization, especially the migration between core cities and periphery cities, in order to create and promote spread effects of core cities in terms of both labor and capital. The other project she is working on is to examine the effects of FDI on innovation and technology spillovers in Chicago. This project is to investigate both FDI and innovation activities according to both geographical spillovers and relational spillovers. This research analyzes the geographic distribution of innovation in the Chicago metropolitan area, estimates a model of the factors explaining variations in the location of innovation, and understands the mechanisms and processes of innovation through FDI.

David C. Folch, Florida State University

The U.S. Census Bureau (BOC) estimates that over $400 billion in federal spending is allocated based on American Community Survey (ACS) and other BOC data. These data are also critical to private sector decision making, state and local public policy implementation and academic research. However, much of the data have high margins of error (MOE). For example, nearly two-thirds (64.5%) of census tract estimates of uninsured children have an MOE at least as large as the estimate itself. Investigations of MOEs more broadly show that the uncertainty varies both by attribute and location, and that the variation in uncertainty is not spatially random (Folch, Arribas-Bel, Koschinsky and Spielman; *Demography* forthcoming).

Data quality improvements could come via changes to internal ACS processing. In a 2014 article in *Applied Geography*, Seth Spielman, Nicholas Nagle and I outline how the ACS computes over 11 billion estimates each year. It is an extraordinarily complex process where small changes to data collection, estimation or dissemination could result in substantial improvements in the quality of final estimates. Since the population is continually being surveyed, innovative ideas from the research community could be implemented relatively quickly.

Since research cannot wait for internal improvements, data users can address the challenges themselves. In tabular presentations, ACS estimates can be accompanied by published MOEs. When estimates are presented graphically, uncertainty can be conveyed using error bars or other visual ques. Ran Wei and Daoqin Tong and David Wong and Min Sun have developed strategies for incorporating uncertainty when mapping ACS data.

Holding all else equal, data quality typically deteriorates as the data are cut thinner and thinner: smaller geographic areas (census tracts vs. counties), shorter time frames (1-year estimates vs. 5-year estimates) and attribute cross-tabulations (Hispanic males over 65 vs. all Hispanics) all have higher uncertainty. A researcher can mitigate data quality problems by *sacrificing* one or more of these dimensions. The temporal dimension is most restrictive since 1-year data are only offered for geographic areas with more than 65,000 people. Sacrificing the attribute dimension is relatively straightforward to implement by simply swapping a detailed attribute for a higher level one; although the new attribute may not adequately address the research question. Adjusting spatial granularity is not as straightforward since census geographies can be grouped in a nearly infinite number of configurations. Spielman and I introduce an approach in PLOS ONE and International Journal of Geographical Information Sciences that intelligently combines small geographies (e.g., census tracts within a metropolitan area) into the maximum number of demographically homogeneous regions, where the attributes on each region meet or exceed a user defined quality threshold. This *regionalization* approach trades

spatial granularity for improved data quality on detailed demographic attributes. The regionalization code is freely available on GitHub (github.com/geoss/ACS_Regionalization).

Despite the challenges outlined above, the ACS is the only source for spatially and demographically detailed data across the entire U.S. The federal budget for implementing the ACS is unlikely to increase significantly; in fact the entire program regularly comes under threat when U.S. legislators propose to make the ACS voluntary. Therefore, it is important that the research community uses these data with eyes wide open, and also continues exploring opportunities for improvements to the data itself.

NARSC Members' Recent Grant Awards

Tom Fullerton and Adam Walke win $260,000 grant from Water Research Foundation

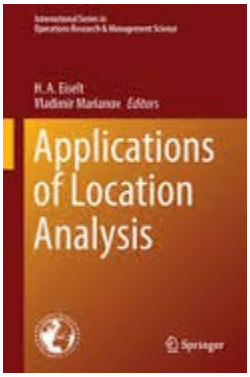
Investigators:
Tom Fullerton, University of Texas at El Paso; Adam Walke, University of Texas at El Paso

Project Summary:
Unexpected changes in the demand for water can have damaging consequences for municipal water utilities. Droughts may lead to demand spikes that overtax utility resources. Conversely, metropolitan business cycle downturns such as those of 2007-2009 may cause unforeseen reductions in water consumption and revenue shortfalls for many utilities. Reliable demand forecasts are, thus, a high priority. Utilities can promote revenue stability and sustainable usage through effective planning. Tools include temporary surcharges, permanent rate changes, public awareness campaigns, and various conservation incentives. Model simulations can help clarify the effects of such tools on revenue and water consumption. Short-term water demand forecasts can also be useful in planning routine operations and expenditures, arranging maintenance, and managing the supply of water from existing sources. Accurate forecasts can help avert costly resource misallocations. An array of methods are available to utility planners. For practitioners facing resource constraints, a full evaluation of the strengths and weaknesses of each methodological approach may be infeasible. This project summarizes some of the advantages and disadvantages of available techniques and the relevance of these methods to water utility needs. Case studies are also used to illustrate how to analyze utility forecasting track records and develop usage models.

NARSC Members' Recent Books

Title: *Applications of Location Analysis, Springer*

Editors: Eiselt, H.A. and Marianov, V.



Description:

"This book, companion to *Foundations of Location Analysis* (Springer, 2011), highlights some of the applications of location analysis within the spheres of businesses, those that deal with public services and applications that deal with law enforcement and first responders. While the *Foundations* book reviewed the theory and first contributions, this book describes how different location techniques have been used to solve real problems. Since many real problems comprise multiple objectives, in this book there is more presence of tools from multi-criteria decision making and multiple-objective optimization."

Springer

Title: *Chicago: An economic history, Routledge Advances in Regional Economics, Science, and Policy*

Author: John F. McDonald

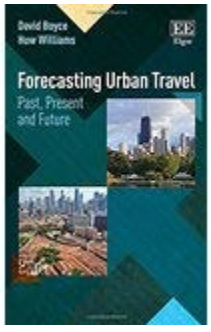
Description:

"Chicago went from nothing in 1830 to become the second-largest city in the nation in 1900, while the Midwest developed to become one of the world's foremost urban areas. This book is an economic history of the Chicago metropolitan area from the 1820s to the present. It examines the city in its Midwestern region and compares it to the other major cities of the North. This book uses theories of the economics of location and other economic models to explain much of Chicago's history."

Amazon.com

Title: *Forecasting Urban Travel: Past, Present, and Future*

Authors: David E. Boyce and Huw C.W.L. Williams



Description:

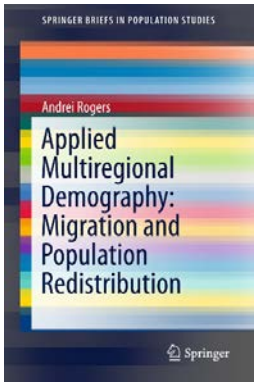
"From original documents, correspondence and interviews, especially from the United States and the United Kingdom, the authors seek to capture the spirit and problems faced in different eras, as changing information requirements, computing technology and planning objectives conditioned the nature of forecasts. With over 1000 references, the book charts the key ideas relating to land use, travel demand, network costs and flows, and their interactions, from both research and practice to the present states of the art. The authors examine the widening scope and variety of models for analyzing and forecasting personal travel and goods movement, identifying contributions from economics,

psychology, geography, regional science, operational research, transportation engineering and mathematics. Finally, they offer their views of the future directions and requirements facing the field."

Amazon.com

Title: ***Applied Multiregional Demography: Migration and Population Redistribution***

Author: Andrei Rogers



Description:

"This book shows the effectiveness of multiregional demography for studying the spatial dynamics of migration and population redistribution. It examines important questions in demographic analysis and shows how the techniques of multiregional analysis can lead to answers that sometimes contradict conventional wisdom."

Springer

Title: ***Broadband Telecommunications and Regional Development, Routledge Advances in Regional Economics, Science, and Policy***

Authors: Tony H. Grubesic and Elizabeth A. Mack

Description:

"Broadband is one of the most transformative technologies of the 21st century, yet our understanding of its regional impacts remains somewhat rudimentary. Not only are issues of broadband pricing and speed relevant in this context, but the overall quality of service for broadband can often dictate its impacts on regional development. This book illuminates the regional impacts of this pervasive and important technology."

Amazon.com