Exhibit No.:	
Issue(s):	Economic Benefits from Construction
Witness:	Geoffrey J. D. Hewings, Ph.D.
Sponsoring Party:	Ameren Transmission Company of Illinois
Type of Exhibit:	Direct Testimony
Case No.:	EA-2015-0146
Date Testimony Prepared:	May 29, 2015

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. EA-2015-0146

DIRECT TESTIMONY

OF

GEOFFREY J. D. HEWINGS, Ph.D.

ON

BEHALF OF

AMEREN TRANSMISSION COMPANY OF ILLINOIS

St. Louis, Missouri
May 2015

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DIRECT TESTIMONY

OF

GEOFFREY J. D. HEWINGS, Ph.D.

CASE NO. EA-2015-0146

I. INTRODUCTION AND WITNESS QUALIFICATIONS

Q. Please state your name, business address and present position.

A. My name is Geoffrey J. D. Hewings, Ph.D., and my business address is 607 S. Mathews #318, Urbana, Illinois 61801-3671. I am the Director of the Regional Economics Applications Laboratory ("REAL") of the University of Illinois.

Q. Please summarize your professional experience and educational background.

A. I obtained my B.A. from the University of Birmingham (UK) and my M.A. and Ph.D. from the University of Washington (Seattle). Prior to coming to the University of Illinois in 1974, I was on the faculty of the University of Kent at Canterbury (UK) and the University of Toronto (Canada). I have also served as a visiting professor at the University of Queensland (Australia), Bar Ilan University (Israel), Tianjin University (China), and University of Indonesia and Kagawa University (Japan). A copy of my curriculum vitae is attached as **Schedule GH-01**.

Q. What are your duties and responsibilities in your position?

A. As the Director of REAL, I am responsible for the overall direction of REAL, which includes coordination with clients and the supervision of graduate students who work for REAL on the Urbana campus of the University of Illinois. In addition to my position with REAL, I am an Emeritus Professor of Geography and Regional Science, of Economics, and of Urban and Regional Planning.

Q. Would you describe REAL in more detail?

A. REAL's mission is to provide timely, high quality analytical economic information for a variety of uses, including public policy decision-making by public sector agencies and strategic marketing in the private sector. REAL's capabilities revolve around comprehensive state and regional models that integrate econometric and input-output analysis to provide for both impact and forecasting analysis.

II. PURPOSE AND SCOPE

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address the economic impact of the proposed Mark Twain Project (the "Project") on the Missouri economy. My testimony will rely upon a study that was performed using a well-established econometric model developed by REAL using data provided by IMPLAN to estimate the economic impact of ATXI's expenditures for the construction of the Project. MIG, Inc. (formerly "Minnesota IMPLAN Group, Inc.") is the corporation that is responsible for the production of IMPLAN (**IM**pact analysis for **PLAN**ning) data and software. Using classic input-output analysis in combination with regional specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. The IMPLAN database contains county, state, zip code, and federal economic statistics which are specialized by region, not estimated from national averages and can be used to measure the effect on a regional or local economy of a given change or event in the economy's activity. That is useful in examination of questions such as the one under consideration here: what are the economic consequences of this project?

Q. Briefly describe the Project.

A. As I understand it, ATXI is proposing to construct the Project, which consists of a 95-mile long 345-kV transmission line in Missouri, running from a switching station near

Palmyra, to a new substation near Kirksville, and then running north to the Iowa state line. I also understand that the Project includes construction of a 161-kV connector line from the new substation near Kirksville to a nearby existing substation.

Q. Are you sponsoring any schedules in support of your direct testimony?

A. Yes. A copy of my curriculum vitae is attached as **Schedule GH-01**. A copy of the study titled "Impacts of the Mark Twain Project" is attached as **Schedule GH-02**.

III. ECONOMIC IMPACTS TO MISSOURI

Q. Please describe the IMPLAN model used in your analysis.

A. For this project, since the primary foci were on estimating impacts at the county, transmission region (an aggregation of the five counties through which the Project will be built) and the state of Missouri as a whole, it was decided to use commercially available modeling databases provided by IMPLAN to ensure consistency across different geographical areas.

One of the primary uses for the models that IMPLAN has developed is for impact analysis, such as that being used for the present Project, which estimates the impact of an event (e.g., an expenditure) on the region or community in which it is located. When activity changes in one sector, it generates impacts on other sectors of the economy. In many cases, the original sector undergoing change and the group of sectors that are impacted often have little or no direct connection. Because it would be very labor intensive and costly to capture the nature and strength of these connections on a case-by-case basis, analysts prefer to create models of the economies under consideration, which is what REAL has done for this Project.

As I describe in more detail below, the analysis REAL performed in this case records the direct impact of any change and then enters it into the model to estimate the ripple effect in other sectors.

Q. What do you mean by "ripple effect"?

A. The ripple effect is actually comprised of two effects—indirect effects and induced income effects, which are defined as follows:

- **Indirect Effects** are those generated by the expenditures of a company on a variety of goods and services.
- **Induced Income Effects** are those generated by consumer expenditures made by employees of the company itself and those employees in the value chain.

The sum of the direct effects, indirect effects and induced income effects generates the total impact. When the total impact is divided by the direct effect, the result is the multiplier or ripple effect. For example, assume that Company A spends $100 on construction projects (i.e., the direct effect), which generates $50 in indirect effects and $50 in induced income effects. By dividing the total impact ($200) by the direct impact ($100), the ripple effect is 2. Put another way, the analysis shows that the expenditure doubles the direct production impact.

Q. How are the results of your analysis organized?

A. I examined the impacts of ATXI's annual expenditures during construction. For each category, I analyzed the impact on output (the value of produced goods and services), income (wages and salaries), employment (job creation), and then calculated the multiplier, or ripple effect. The complete analysis for each category is set forth in the report attached to my direct testimony as **Schedule GH-02**.

IV. CONCLUSION

Q. Please describe your findings.

A. As shown below, in most instances our analysis found that the ripple effects of ATXI's expenditures generally almost double the direct impact. The total job impacts in Missouri over the life of the Project would be a total of 1,880 job-years (a job held for one year).

In the Transmission Region (the five counties of Adair, Knox, Marion, Schuyler and Shelby), total (direct, indirect and induced) job creation would amount to 1,160 job years. At the county level, total job-year creation would vary from 123 (Knox) to 487 (Adair). Marion, Schuyler and Shelby would experience job-year gains of 194, 136 and 178 respectively.

The results are summarized in Tables 1through 4 in **Schedule GH-02**. As shown in those tables, ATXI's spending of nearly $185 million over the life of the Project results in about $323 million in production throughout the economy, with approximately 1,880 job-years and over $104 million in associated salaries and wages.

Q. Does this conclude your direct testimony?

A. Yes.

CURRICULUM VITAE

NAME	Geoffrey John Dennis Hewings	
CURRENT POSITION	Professor and Director,	
ADDRESS	**Regional Economics Applications Laboratory** University of Illinois at Urbana-Champaign, 607 S. Mathews, #236, Urbana, Illinois 61801-3671 www.real.illinois.edu	
PHONE/FAX	(217) 333-4740/(217) 244-9339	
e-mail	hewings@illinois.edu	
EDUCATION	B.A.(Honors)	University of Birmingham, England 1965
	M.A.	University of Washington, Seattle 1967
	Ph.D.	University of Washington, Seattle 1969
	Docteur Honoris Causa	University of Bourgogne, France 2003

M.A. Thesis: "Persistence of Precipitation and No Precipitation Described by a Markov Chain Probability Model: Case Studies from Selected Stations in Washington State"
Ph.D. Dissertation: "Regional Interindustry Models Derived from National Data: The Structure of the West Midlands Economy"

PRIMARY POSITIONS HELD

2010-2011 Interim Head, Department of Economics, Professor, Institute of Government and Public Affairs, Departments of Geography, Economics, Urban and Regional Planning, and Agricultural and Consumer Economics
Principal Affiliate Scientist, Illinois State Water Survey

2008 Professor, Institute of Government and Public Affairs, Departments of Geography, Economics, Urban and Regional Planning, and Agricultural and Consumer Economics
Principal Affiliate Scientist, Illinois State Water Survey.

2005 Professor, Departments of Geography, Economics, Urban and Regional Planning, and Institute of Government and Public Affairs
Principal Affiliate Scientist, Illinois State Water Survey.

1999- Professor, Departments of Geography, Economics and Urban and Regional Planning
Principal Affiliate Scientist, Illinois State Water Survey.

1996- Professor, Departments of Geography, Economics and Urban and Regional Planning

1989- Director, Regional Economics Applications Laboratory [*Joint venture between the Federal Reserve Bank of Chicago and the University of Illinois, 1989-2004*]

1983-1990 Head of Geography Department, University of Illinois, Urbana, Illinois.

1983- Professor, Departments of Geography and Urban and Regional Planning.

1982-1983 Associate Professor, Departments of Geography and Urban and Regional Planning, University of Illinois, Urbana, Illinois.

1982 (Jan-Jun) Acting Head, Department of Geography, University of Illinois, Urbana, Illinois.

1974-82 Associate Professor, Department of Geography, University of Illinois, Urbana, Illinois.

1971-1974 Assistant Professor, Division of Social Sciences, Scarborough College and Department of Geography, St. George Campus, University of Toronto, Ontario

1970-1971 Senior Research Associate, Center for Research in the Social Sciences and Seminar Instructor, Economics, University of Kent, Canterbury, England

1969 Instructor (fall), Olympic College, Bremerton, Washington

SCHEDULE GH-01

1968-69 Woodrow Wilson Dissertation Fellow, Department of Geography, University of Washington, Seattle

1965-68 Teaching Assistant/Pre-Doctoral Associate, Department of Geography, University of Washington, Seattle

SHORT-TERM POSITIONS HELD

1998 Visiting Professor, IDEAR, Universidad Catolica del Norte, Antofagasta, Chile
1997 Consultant (April), Bappenas/USAID, Jakarta, Indonesia
1996 Consultant (May-June, December), Bappenas/USAID, Jakarta, Indonesia
1995 Visiting Scholar (October), Faculty of Economics, Kagawa University, Takamatsu, Japan
1994 Guest Professor (May), Institute of Economics, Nankai University, Tianjin China
1989 [July], **1990** [July], **1991** [February and June] Visiting Scholar, Interuniversity Center in Economics, Universitas Indonesia, Jakarta
1987 Visiting Scholar (January) Department of Geography, Bar Ilan University, Ramat Gan, Israel
1985 Visiting Scholar (May-August) Department of Economics, University of Queensland, St. Lucia, Queensland, Australia.
1983 Visiting Scholar, (May-June) Korea Research Institute for Human Settlements, Seoul, Korea
1981 Visiting Scholar (May-August) Department of Economics, University of Queensland, St. Lucia, Queensland, Australia.
1968 Visiting Lecturer (Summer Session), Department of Geology and Geography, University of Massachusetts, Amherst

AWARDS

Fulbright Travel Grant, 1965
Woodrow Wilson Dissertation Fellowship, 1968-1969
Award for **Service to Regional Science**, 1995
Geoffrey J.D. Hewings Junior Scholar Award, Regional Science Association International, 1995-
(annually awarded to exceptional scholars less than 10 years from completion of his/her Ph.D; visit http://www.regionalscience.org/index.php/NARSC/)
University Scholar, University of Illinois, 1996-1997
Best Paper Award (joint authorship with Eduardo Haddad), *II Encontro Regional de Economia*, Banco do Nordeste, Fortaleza, Brazil, 1998
2003 John Dickinson Memorial Award [Best Paper Award] *Australasian Journal of Regional Studies* Vol. 9
Walter Isard Award for distinguished scholarly achievements in the field of Regional Science, 2003
Fellow, Regional Science Association International (2003)
Award for Service to Regional Science, by Associação Brasileira de Estudos Regionais, 2004
Honarary Member, Japan Section, Regional Science Association International, 2008
Adjunct Professor, University of Indonesia, Jakarta, 2009-
Fellow, International Input-Output Association, 2010
Fellow, Western Regional Science Association, 2010

RESEARCH EXPERIENCE

Consultant, National Park Economic Impact Study, University of Washington, 1969

Consultant, *Research in the Application of Input-Output Interregional Analysis to State Planning and Program Activities: Subarea Economic Analysis*, University of Washington, 1969

Senior Research Associate, *South-East Kent Input-Output Study*, University of Kent, Canterbury, England 1970-71

Co-Principal Investigator, *Development of a System for Projecting Sub-State Employment and Population for the State of Illinois*, 1975, University of Illinois ($16,000)

Co-Principal Investigator, *Macro-Economic Impact of Environmental Legislation*, 1975-1976, University of Illinois ($26,000)

Consultant, *Macro-Economic Impact of Environmental Legislation*, Illinois Institute of Environmental Quality, 1976-77

Consultant, *Evaluation of the Rational Threshold Value System of the Economic Impact Forecast System*, U.S. Army Construction Engineering Research Laboratory, 1977

Associate Investigator, *Ohio River Basin Energy Demand Study*, USEPA 1977-1978 ($108,000)

Consultant, *Measurement of Regional Development Indicators*, U.S. Army Corps of Engineers Waterways Experimental Station, 1978.

Principal Investigator, *Evaluation of Methods for Generating Sub-State Input-Output Tables from State Input-Output Models*, Bureau of the Budget, State of Illinois, 1978 ($2,500).

Principal Investigator, *Space-Time Employment Modeling*, NSF, 1978-1980 ($46,000).

Consultant, *Organization of Regional Centers for the Provision of Energy Management and Conservation Assistance to Communities*, Argonne National Laboratory, 1978

Consultant, *Development of a Model for Monitoring and Evaluation of Regional Development Projects*, Ministry of Coordination, Athens, Greece, 1979-1980

Principal Investigator, *Preparation and Testing of Alternative Methods for Disaggregating County Data*, U.S. Army CERL, 1980 ($13,000)

Co-Principal Investigator, *Development of Regional and Interregional Accounting Systems for Project Selection, Monitoring and Evaluation in Developing Rural Economies*, US AID Title XII Strengthening Grant, 1980-1981 ($20,000)

Principal Investigator, *Holistic and Partitive Accuracy in Regional Input-Output Analysis*, NSF, 1982-84 ($76,000)

Principal Investigator, *Feasibility Analysis for Incorporation of Sector Specific Input-Output Type Multipliers in EIFS*, U.S. Army CERL, 1982 ($9,600)

Principal Investigator, *Sensitivity Analysis in Regional Interindustry Modeling*, NSF 1984-86 ($56,000)

Principal Investigator, *Incorporation of Migration Impacts into EIFS* U.S. Army CERL, 1985 ($9,800)

Co-Principal Investigator, *Assessing the Impacts of Increased Agricultural Value-Added on the Illinois Economy: an Input-Output Model Application*, College of Agriculture, University of Illinois, 1987-88 ($37,500)

Co-Principal Investigator, *Economic and Physical Impacts from Extreme Fluctuations in Lake Michigan Levels along the Illinois Shoreline*, US EPA, 1987-88 ($36,000)

Principal Investigator, *Development of a Chicago Input-Output-Econometric Forecasting Model*, Federal reserve Bank of Chicago, 1988-89 ($50,000)

Principal Investigator, *New Directions in Input-Output Modeling*, NSF 1988-1991 ($114,000)

Co-Principal Investigator, *Development of an Integrated Forecasting Model of the Chicago Economy*, Chicago Economic Development Commission, 1989-90 ($45,000)

Principal Investigator, *Development of a Prototype Computable General Equilibrium Model to Estimate the Impacts of the US-Canada Free Trade Agreement on the Midwest and Northeast Economies*, Economic Development Administration, US Department of Commerce, 1989-1991 ($117,000)

Principal Investigator, *Development of an Integrated Forecasting Model for the State of Iowa*, Legislative Fiscal Bureau, State of Iowa, 1990-1991 ($100,000)

Principal Investigator, *Scenario Development and Occupational Forecasts for the Chicago Economy*, Chicago Economic Development Commission, 1990-1991 ($35,000)

Principal Investigator, *Comparison of Alternative Regional Economic Impact Models*, Construction Engineering Research Laboratory, 1992-1993 ($90,000)

Principal Investigator, *Extensions to the Interregional CGE Model of Canada-US Free Trade*, Canadian Embassy, 1992-1993 ($10,000)

Principal Investigator, *Development of Econometric-Input-Output Models for Wisconsin and Illinois*, Ameritech Foundation (through the Institute of Government and Public Affairs), 1992-93, ($50,000)

Principal Investigator, *Evaluation of the Economic Impact Forecasting System and Development of New Programs and Methodology: Part II: Demographic and Demo-Economic Concerns* US CERL, 1993-94, ($83,000)

Principal Investigator, *Development of a Midwest Model, Phase I*, Ameritech Foundation, 1994 ($100,000)

Principal Investigator, *Development of Occupational Forecasting System*, City Colleges of Chicago, 1994-1996 ($101,000)

Principal Investigator, *Development of a Regional Econometric Input-Output Model for Minas Gerais, Brasil*, Fundação João Pinheiro, Belo Horizonte, 1994-95 ($65,000)

Principal Investigator, *Development of a Regional Econometric Input-Output Model for São Paulo, Brasil*, FIPE, São Paulo, 1994 ($65,000)

Principal Investigator, *Impact of the Proposed Central Circulator on the Chicago Region*, City of Chicago, 1994 ($5,000)

Principal Investigator, *Development of a Regional Econometric Input-Output Model for Ceará, Brasil*, IMPLANC, Fortaleza, Ceará, 1995-96 ($65,000)

Principal Investigator, *Impact of a Proposed Chicago-St. Louis High Speed Rail Line*, Illinois Department of Transportation, 1995-1996 ($41,000)

Principal Investigator, *Economic Impact of the DuPage Airport on the Regional Economy*, Du Page Airport Authority, 1995-1996 ($35,000)

Principal Investigator, *Development of a Regional Econometric-Input-Output Model for Jakarta, Indonesia*, LPEM/Jakarta Metropolitan Government, 1995-96 ($65,000)

Principal Investigator, *Development of a Regional Econometric-Input-Output Model for Indiana*, School of Business, Indiana University, 1995-96 ($25,000)

Principal Investigator, *Development of a Regional Econometric-Input-Output Model for St. Louis, Missouri*, Policy Centers, University of Missouri-St. Louis, 1995-96 ($25,000)

Principal Investigator, *Economic Impact of the Claude Monet Exhibition on the Chicago Region*, Art Institute of Chicago, 1995 ($2,000)

Principal Investigator, *Economic Impact of the Democratic National Convention on the Chicago Region*, City of Chicago, 1995 ($5,000).

Principal Investigator, *Economic Impacts of (1) The Chicago Region Airport System (2) The Illinois Airport System on the State's Economy*, Illinois Department of Transportation, 1996 ($30,000)

Principal Investigator, *Impact Evaluation System for Tourism in Illinois*, Illinois Bureau of Tourism Research, 1996 ($35,000)

Principal Investigator, *Development and Testing of an Interregional Model for the Midwest US*, Bureau of Transportation Statistics, US Department of Transportation, 1996-1997 ($93,000)

Principal Investigator, *Economic and Fiscal Impact of River Boat Gambling in Illinois, 1991-1995*, Phase I 1996 ($10,000)

Principal Investigator, *Economic Impact of the Chicago Marathon, 1995, 1996*, LaSalle National Bank ($20,000)

Principal Investigator, *Economic Impact of Long Distance Carriers on the Midwest*, Summit Group, 1996 ($15,000)

Principal Investigator, *Economic and Fiscal Impact of River Boat Gambling in Illinois, 1991-1995*, Phase II 1997 ($16,600)

Principal Investigator, *Creating and Expanding Trade Partnerships in the Chicago Region*, MacArthur Foundation through Chicago United, 1997-1998 ($51,000)

Principal Investigator, *Development of a Regional Model for Styria, Austria*, 1997-1998, Joanneum Research, Graz, Austria ($35,000)

Principal Investigator, *Economic Impact of the Chicago Marathon, 1997*, LaSalle National Bank ($10,000)

Principal Investigator, *Development of a Regional Model for Caribbean Region of Colombia*, 1997-1999, Fundesarollo, Barranquilla, Colombia ($75,000)

Co-Principal Investigator, *Potential Economic Impacts of the New Madrid Earthquake*, 1998, NSF/University of Illinois Midwest Earthquake Center ($70,000)

Principal Investigator, *Economic Evaluation of the Impact of Air Service on Small Metropolitan and Rural Communities*, 1998-1999, Department of Aviation Analysis, US Department of Transportation ($156,000)

Principal Investigator, *Cooperative Research on the Structure of Regional Economies in Japan and the USA, Phase I*, Central Research Institute for Electric Power Generation, Tokyo, Japan, 1998-1999 ($35,000)

Principal Investigator, *Economic Impacts of The Illinois Airport System on the State's Economy, 1998* Illinois Department of Transportation, 1999 ($26,000)

Principal Investigator, *Development of a Midwest Impact and Forecasting Model*, 1999-2000, National Institute of Statistical Sciences, ($25,000)

Principal Investigator, *Creating and Expanding Trade Partnerships in the Chicago Region*, Phase II MacArthur Foundation through Chicago United, 1999-2000 ($55,000)

Co-Principal Investigator, *Potential Economic Impacts of the New Madrid Earthquake, Phase II* 1999-2001, NSF/University of Illinois Midwest Earthquake Center ($70,000)

Principal Investigator, *Cooperative Research on the Structure of Regional Economies in Japan and the USA, Phase II*, Central Research Institute for Electric Power Generation, Tokyo, Japan, 1999-2000 ($35,000)

Principal Investigator, *Economic Impacts of Railroad Infrastructure Improvements: Phase I: General Analysis*, Elizabeth Morse Chaitable Trust/Union League Club of Chicago 2000 ($20,000)

Principal Investigator, *Analysis of Lifeline Damages and Economic Impacts of an Earthquake*, NSF-US-Japan Common Agenda program, 2001-2003 ($260,000)

Principal Investigator, Trajectories for the NE Economy under Resource Constraints, Banco do Nordeste, Fortaleza, Ceará, Brazil, 2001-2002 ($120,000)

Principal Investigator [in collaboration with City of Chicago, USDA-Forest Service and Chicago Academy of Sciences], *Development of a Decision-Making Tool for Assessing Alternative Strategies for the Calumet Region*, NSF/EPA, 2001-2003 ($275,000)

Principal Investigator, *Provision of Forecasts for the Chicago Region*, Chicago Metropolis 2020, 2001-2002 ($62,000)

Co-Principal Investigator, *Sensitivity Analysis for Earthquake Economic Modeling*, NSF/MidAmerica Earthquake Center 2002-2004 ($70,000/year for 3 years)

Principal Investigator, *Economic Impact of "Repowering the Midwest*," Joyce Foundation, 2001-2002 ($88,000)

Co-Principal Investigator, *Development of a Methodology for Determining Air Pollution Emissions Relative to Geophysical and Societal Changes*, USEPA 2004-2006 ($750,000)

Associate Investigator, *Linking Development, Demographics and Technology Changes to Stationary and Mobile Source Emissions*, Sub-contract (USEPA via The University at Buffalo) 2006-2007 ($136,000)

Principal Investigator, *Regional Economic Modeling in support of the CMAP 2010 Comprehensive Plan Development*, Chicago Metropolitan Agency for Planning, 2007-2008 ($171,000)

Principal Investigator, *Linking Economic indicators with the Real Estate Market*, Illinois Association of Realtors, 2007-2010 ($66,000/year)

Principal Investigator, *Demographic Challenegs to Regional Development*, NSF, 2007-2011 ($303,000)

Principal Investigator, *The Impact of the Ford Motor Company on Illinois*, Illinois Manufacturers' Association, 2008 ($41,000)

Principal Investigator, *The Impacts of Alternative Coal Transformations on the Illinois Economy*, Illinois Chamber of Commerce, 2009 ($45,000)

Co-Principal Investigator, *Impacts of Energy Efficiency and Renewable Energy on the Midwest, Energy Foundation* (subcontract), 2009 ($60,000)

PUBLICATIONS

(1) Monographs

Geoffrey J.D. Hewings (1977) *Regional Industrial Analysis and Development*, Methuen, London, St. Martin's Press, N.Y.

John Rees, Geoffrey J.D. Hewings and Howard A. Stafford (eds.) (1981) *Industrial Location and Regional Systems*, Bergin, New York and London, Croom Helm.

Geoffrey J.D. Hewings: (1985, 1988) *Regional Input-Output Analysis*, Beverley Hills.

I. Orishimo, Geoffrey J.D. Hewings and P. Nijkamp (eds.) (1988) *Information Technology and Urban-Environmental Systems***,** Heidelberg, Springer-Verlag,)

John J. Ll. Dewhurst, Geoffrey J.D. Hewings and Rodney C. Jensen (eds.) (1991) *Regional Input-Output Modelling: New Developments and Interpretations*, Avebury.

Geoffrey J.D. Hewings and Moss Madden (eds.) *Social and Demographic Accounting* (1995) [Collection of original articles in honor of the 1984 Nobel Laureate in Economics] Cambruidge, Cambridge University Press.

Geoffrey J.D. Hewings, Michael Sonis, Moss Madden and Yoshio Kimura (eds) (1999) *Understanding and Interpreting Economic Structure*, Advances in Spatial Sciences, Springer-Verlag, Heidelberg, Germany.

Joaquim J.M. Guilhoto and Geoffrey J.D. Hewings (eds.) (2001) *Structure and Structural Change in the Brazilian Economy*, London, Ashgate.

Geoffrey J.D. Hewings, Michael Sonis and David E. Boyce (eds.) (2002) *Trade, Networks and Hierarchies*, Advances in Spatial Sciences, Springer-Verlag, Heidelberg, Germany.

Patricio Aroca and Geoffrey J.D. Hewings (eds) (2006) *Structure and Structural Change in the Chilean Economy* Palgrave-Macmillan.

Werner Baer and Geoffrey J.D. Hewings (eds.) (2006) *Latin American Business: Equity Distortion in Regional Resource Allocation in Brazil*, New York, Haworth Press.

Russel J. Cooper, Kieran P. Donaghy and Geoffrey J.D. Hewings. (eds.) (2007) *Globalization and Regional Economic Modeling*, Heidelberg, Springer-Verlag.

Michael Sonis and Geoffrey J.D. Hewings (eds.) (2009) *Tool Kits in Regional Science*, Heidelberg, Springer-Verlag.

Hadi Esfahani, Giovanni Facchini and Geoffrey J.D. Hewings (eds.) (2010) *Economic Development in Latin America*, Palgrave-Macmillan.

(2) Chapters in Books

Geoffrey J.D. Hewings and Breandan O'hUallachain (1983) "The Role of Industrial Factors in the Development of Regional Systems," in F.E.I. Hamilton and G.R. Linge (eds) *Spatial Analysis, Industry and Industrial Environment*, Volume 3 Wiley, pp. 41-57.

Geoffrey J.D. Hewings and Peter Dicken (1982) "The Changing Organisational Structure of Regional Economies and the Role of Transnational Corporations: Some Research Issues in B. T. Robson and J. Rees (eds.) *Geographical Agenda for a Changing World* SSRC, London, pp. 57-77.

Geoffrey J.D. Hewings (1983) "Regional and Interregional Accounting Systems for Development Planning under Conditions of Limited Information" in P. Nijkamp and L. Chatterji (eds.) *Urban and Regional Policy Analysis in Developing Countries* Croom Helm, London, pp.181-202.

Geoffrey J.D. Hewings and Yong-Jae Lee (1983) "National-Regional Accounting Systems for Regional Development for Regional Development in Developing Countries" in G-C. Lim (ed.). *Urban Planning and Spatial Strategies in Rapidly Changing Societies*, Princeton: Woodrow Wilson School, pp. 187-206.

Geoffrey J.D. Hewings (1984) "Limited information in spatial analysis and development planning" in G. Bahrenberg, M. Fischer and P. Nijkamp (eds.), *Theory and Measurement in Spatial Data Analysis*, Gower, London, pp. 145-162.

Geoffrey J.D. Hewings (1986) "Problems of Integration in the Modelling of Regional Systems" in P. Batey and M. Madden (eds.) *Integrated Analysis of Regional Systems* London, Pion.

Geoffrey J.D. Hewings and R.C. Jensen (1986) "Regional and Interregional Input-Output Models" in E.S. Mills and P. Nijkamp (eds.) *Handbook in Urban and Regional Economics* Amsterdam, North Holland, pp. 295-355

Geoffrey J.D. Hewings (1986) "Transportation and Energy" in S. Hanson (ed.) *Urban Transportation* Guildford Press, New York, pp. 280-300

Geoffrey J.D. Hewings (1988) "Industrial Complex Analysis" in J. Clapp and S. Messner (eds) *Real Estate Market Analysis* New York, Praeger, pp. 17-46

Geoffrey J.D. Hewings, R.C. Jensen and M. Sonis (1988) "Fields of influence of technological change in input-output models," in I. Orishimo, P. Nijkamp and G.J.D. Hewings (eds) *Information Technology and Urban-Environmental Systems* Springer-Verlag, New York & Berlin, pp. 163-194

M. Sonis and Geoffrey J.D. Hewings, (1988) "Superposition and decomposition principles in hierarchical social accounting and input-output analysis," in F. Harrigan and P. McGregor (eds.) *Recent Advances in Regional Economic Modelling* London, Pion, pp. 46-65

M. Sonis and Geoffrey J.D. Hewings (1989) "Error and sensitivity input-output analysis: a new approach," in R.E. Miller, K.R. Polenske, A. Rose (eds.) *Frontiers of Input-Output Analysis* New York, Oxford, pp.

M. Sonis and Geoffrey J.D. Hewings (1990) "The `Matrioshka Principle' in the hierarchical decomposition of multiregional social accounting systems," in L. Anselin and M. Madden (eds.) *New Directions in Regional Analysis: Integrated and Multiregional Approaches* London, Pinter, pp.

A.J. Reynolds and Geoffrey J.D. Hewings, (1990) "Airline network structure and regional economic development: US case studies," in K. Peschel (ed) *Infrastructure and the Space Economy* Berlin: Springer-Verlag.

Geoffrey J.D. Hewings, (1991) "Introduction," in John J. Ll. Dewhurst, Geoffrey J.D. Hewings and Rodney C. Jensen eds: *Regional Input-Output Modelling: New Developments and Interpretations* (Aldershot, Avebury.

Rodney C. Jensen, John H. Ll. Dewhurst, Guy R. West and Geoffrey J.D. Hewings, (1991) "On the concept of fundamental economic structure,' in John J. Ll. Dewhurst, Geoffrey J.D. Hewings and Rodney C. Jensen eds: *Regional Input-Output Modelling: New Developments and Interpretations* Aldershot, Avebury.

Michael Sonis and Geoffrey J.D. Hewings, (1991) "Fields of influence and extended input-output analysis: a theoretical account," in John J. Ll. Dewhurst, Geoffrey J.D. Hewings and Rodney C. Jensen eds: *Regional Input-Output Modelling: New Developments and Interpretations* Aldershot, Avebury.

Michael Sonis, Geoffrey J.D. Hewings and Rodney C. Jensen, (1991) "Structure of Regional Economic Activities: Input-Output Analysis Perspectives," in Frank Dietz, Willem Heijman and Daniel Shefer (Eds.) *Location and Labor Considerations for Regional Development* Aldershot, Avebury.

Edison Hulu, Geoffrey J.D. Hewings and Iwan Jaya Azis, (1992) "Spatial implications of the export promotion strategy in Indonesia," in T. John. Kim. Gerrit Knaap, Iwan J. Azis (Eds.) *Spatial Development in Indonesia: Review and Prospect,* Aldershot, Avebury.

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MANUSCRIPTS UNDER REVIEW (*revised and resubmitted)

*Michael Sonis and Geoffrey J.D. Hewings "Miyazawa meet Christaller: Spatial Multipliers within a Triple Decomposition of Input-Output Central Place Systems (*Geographical Analysis*)

Patricio Aroca, Freddy Higuera and Geoffrey J.D. Hewings "Spatial Econometric Model for Chilean Growth," (*Journal of Geographical Systems*)

*Seryoung Park and Geoffrey J.D. Hewings "Does a change in retirement age affect a regional economy: evidence from the Chicago economy," (*Population Research and Policy Review*)

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Miguel Marquez, Julian Ramajo and Geoffrey J.D. Hewings "The Role of Trade Linkages in Regional Economic Growth and Spatial Spillovers: an Analysis for the Spanish Regions," (*Papers in Regional Science*)

Geoffrey J.D. Hewings, Chokri Dridi and Joaquim J.M. Guilhoto, ""Impacts of Reallocation of Resource Constraints on the Northeast Economy of Brazil" (*Water Resources and Rural Development*)

Tae-Jeong Kim and Geoffrey J.D. Hewings "Endogenous Growth of the Ageing Economy with Intra-Generational Heterogeneity over Migration Status" (*International Regional Science Review*)

ADMINISTRATIVE EXPERIENCE

Departmental (Geography)
- Awards and Admissions Committee 1975-78
- Chairman, Cartography Position Search Committee 1976-77
- Advisory Committee, 1977-79 1980-83 1991-95
- Acting Head, January-June, 1982 May-August 1983
- Head, August 1983-1990

Departmental (Economics)
- Interim Head (2010-2011)

School of Social Sciences/College of Liberal Arts and Science
- Courses and Curricula Committee 1975-79
- Public Policy Analysis: Ph.D. Program Establishment Committee
- Executive Committee, January-June 1982; May 1983
- Advisory Committee, Science and Technology Program, 1983-
- Chair, Political Science Headship Search Committee, 1986

Evaluation of the Social Science Departments, 1992
General Eduaction Committee, 2005-2007

University

Transportation Research Committee
Evaluation of the Impact of the University of Illinois on the State 1975-76
Committee on Program Evaluation: Evaluation of Landscape Architecture
Regional Science Program Committee, 1978-
Vice Chancellor's Committee to Evaluate College of Education 1984-85
Vice Chancellor's Committee on Campus Priorities 1985-87
Faculty Advisory Committee, Office of Arms Control, Disarmament and International Security 1984-
Boechenstein Chair in Political Economy Search Committee, 1987-1993
Graduate College Research Board, 1991-1995
Committee on European Studies, 1991-
Vice-Chancellor's Committee to Evaluation Health and Social Work Programs, 1992-1993
Director, Regional Economics Applications Laboratory, 1989-

PROFESSIONAL ASSOCIATIONS

American Economic Association
MidContinent Regional Science Association
Western Regional Science Association
Royal Economic Society
Southern Regional Science Association
Regional Science Association International
International Input-Output Association

PROFESSIONAL POSITIONS

Regional Science Association International

President, *Regional Science Association International*, 2001-2002
Vice-President and President-Elect, *Regional Science Association International*, 2000
Executive Director, *Regional Science Association International*, 1990-1996
Executive Secretary, *Regional Science Association (International)*, 1978-1990
President, *North American Regional Science Council*, 1998
President *Western Regional Science Association*, 2007-2008

Association of American Geographers

Vice-Chairman, (1982-84), Chairman (1984-86) Industrial Systems Specialty Group
Research Grants Committee, 1980 (member), 1981 (Chairman)
Development Committee, 1991-1996

International Input-Output Association

Councilor and Vice-President, 2007-2009
President, 2010-2012

Other

Secretary-Treasurer, *Mid-Continent Regional Science Association* 1975-1979
Book Review Editor, *Regional Science Perspectives*, 1977-1981
American Editor, *Australian Journal of Regional Studies*, 2000-

Member, Editorial Board

Annals Association of American Geographers (1981-1984) *Growth and Change* (1984-1993)

International Regional Science Review (1980-1995)
Annals of Regional Science (1989-
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Universidad Catolica del Norte, Chile
University of Groningen, The Netherlands
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Federal University of Rio de Janeiro, Brazil
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Federal Reserve Banks of Chicago and New York
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1. Breandan O'hUallachain (Professor, Arizona State University) (G)
2. Randall W. Jackson (Professor and Director Regional Research Institute, West Virginia University) (G)
3. C. Taylor Barnes (Professor, Northwest Missouri State University) (G)
4. Sarwar Jahan (Professor, Bangladesh University of Engineering and Technology, Dhaka) (G)
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6. Suknam Ko (Professor, Gyeongsang National University, Korea) (E)
7. Adrian Esparza (Associate Professor, University of Arizona) (G)
8. Aisling Reynolds (Senior Lecturer, University College, Dublin, Ireland) (G)

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16. Patricio Aroca (Professor, Universidad Catolica del Norte, Chile) (E)
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SCHEDULE GH-02

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Glossary of Terms and Models Used in the Analysis

To assist the reader in the interpretation of the results, a brief introduction to impact analysis and a glossary of terms is provided in this section.

Linkages

A regional economy like the one characterizing the state of Missouri has several important features. First, sectors in an economy are linked – some directly, others indirectly. For example, a sector producing automobile parts that are shipped to the final assembly line would represent a ***direct linkage*** between two sectors. Assume the automobile component supplier purchases some fabricated metals products from another supplier; this too represents a direct linkage. However, the fabricated metals producer has an ***indirect linkage*** to the automobile assembly producer. Although not directly dependent on automobile production, the fabricated metal producer is clearly indirectly dependent on the production levels of the assembler. Hence, while many sectors of the economy are linked directly, many if not more are linked indirectly. In short, no one is independent in the economic system. In the case of Ameren Transmission Company of Illinois (ATXI), the company has little direct connection with supermarkets; yet, indirectly, many supermarket jobs are dependent on the expenditures made by ATXI employees or those employed by suppliers to ATXI.

Ripple or Multiplier Effects

Consider the case just reviewed; assume automobile production increases. Now, the assembler will require more components: this will generate a direct effect – and a column in the tables in this report will indicate the size of these direct effects. But we know that the impacts will not stop here; the component supplier will purchase more fabricated metal products, the fabricated metal producer will buy more steel, the steel producer will buy more iron ore or scrap and so forth. What we have described here are the multiple levels of the ripple effect – a direct change in one sector leads to expansion in other sectors of the economy. These sector-to-sector effects are referred to as ***indirect effects*** – and these too are shown in the summary tables.

During this whole process, firms need to purchase not only components and materials from other sectors, but they also have to pay wages and salaries to their employees. In turn, these employees will generate their own ripple effect. For example, an assembly line worker will use

the extra income earned from overtime (assumed to occur to meet the additional demand) to take his/her family to dinner. Part of this expenditure becomes income to the waiter; he spends some of this income at the dry cleaners and part of that expenditure is then used by the owners of the dry cleaning business to buy lumber to renovate their house. Part of this expenditure will be used by employees in the lumber yard to enjoy an evening at the cinema – and so the process continues until the impact diminishes to zero. This part of the ripple effect is referred to as ***induced income impacts***.

So we have direct effects and two types of indirect effects – one generated by industry-industry purchases and sales and one generated by expenditures by employees from wages and salaries. The summation of these impacts is revealed in the tables as ***total impacts***. If the total impacts are divided by the direct impacts, we obtain the ***ripple or multiplier effect***. Consider the employment multiplier of 1.5; the interpretation is as follows, for every direct job, an additional 0.5 jobs are generated through a combination of the indirect and induced impacts.

Models Used

In this report, the analysis was conducted using IMPLAN, a proprietary suite of models that has been offered for several decades by a North Carolina-based company. These are input-output models that describe the relationship between sectors in an economy and also capture the impacts of consumer spending from wages and salaries. Separate models were constructed for the state of Missouri as a whole, the five-county region through which the transmission line would be built and for each of the constituent five counties.

1. Introduction

This report provides an analysis of the expected direct, indirect and induced impacts from to construction of an electricity transmission line through the counties of Adair, Knox, Marion, Schuyler and Shelby in Missouri. The project is anticipated to begin in 2016 and conclude in 2019. The impact analysis was conducted for three geographical scales:

1. Missouri as a whole (hereafter Missouri)
2. The region comprising the five counties through which the transmission line would pass (hereafter, Transmission Region)
3. Each of counties separately.

Data on the construction profile, by county and context, as well as the time phasing of the project were provided by ATXI. The data were entered into the appropriate sectors in models for the three geographical scales and impacts on employment (number of jobs created), income (wages and salaries associated with those jobs) and output (the value of production of goods and services). The income generated is a subset of the total value of output.

2. Data Preparation

The data provided by ATXI were allocated to major sectors; roughly 60% of the expenditures were for construction and the remaining expenditures for specific materials associated with the project including wire, steel poles, relay and other electrical equipment.

Table 1: Project Allocation by County and Year, 2016-2019

	Percentage of Total Project	***2016***	***2017***	***2018***	***2019***	***Total Allocation***
Adair County	31.83%	5.73%	28.88%	65.39%	0.00%	100.00%
Knox County	13.29%	5.00%	25.00%	70.00%	0.00%	100.00%
Marion County	19.29%	5.00%	25.00%	70.00%	0.00%	100.00%
Schuyler County	15.65%	5.00%	25.00%	70.00%	0.00%	100.00%
Shelby County	19.94%	5.00%	25.00%	70.00%	0.00%	100.00%
Total	100.00%	5.73%	28.88%	65.39%	0.00%	100.00%

Table 1 shows the allocation of the proposed expenditures by year and across the five counties. The bulk of the expenditures, almost 94%, would occur in 2017 and 2018; Adair County would receive almost 32% of the total expenditures with the other counties sharing from 13 to almost 20% of the total.

Table 2 provides the dollar values of the expenditures across the counties and over time based on a total of $185.279 million[1] to be expended for the project as a whole. The final two columns of Table 2 estimate the allocations between construction and materials in total for each of the counties. In turns out that this distinction is important since few of the materials are available in the Transmission Region; hence the economic impacts are almost entirely generated by the construction expenditures. For Missouri, this is not the case since the state has a more diversified economic structure than the Transmission Region.

Table 2: Expenditures by County and Year, 2016-2019

	2016	*2017*	*2018*	*2019*	*Total*	*Construction*	*Materials*
Adair County	$4,307,135	$21,717,631	$49,164,114	$0	$75,188,880	$41,593,462	$33,595,418
Knox County	$1,073,205	$5,366,024	$15,024,866	$0	$21,464,094	$11,873,644	$9,590,450
Marion County	$1,557,878	$7,789,389	$21,810,289	$0	$31,157,556	$17,235,935	$13,921,622
Schuyler County	$1,263,612	$6,318,060	$17,690,568	$0	$25,272,240	$13,980,258	$11,291,982
Shelby County	$1,609,807	$8,049,035	$22,537,299	$0	$32,196,141	$17,810,466	$14,385,676
Total	$9,811,637	$49,240,139	$126,227,136	$0	$185,278,912	$102,493,764	$82,785,148

3. Results

A summary of the results is provided in this section; more details can be found in a set of tables in the Appendix that provide information on the impacts across an aggregation of two-digit NAICS sectors of the economy. The impacts are divided into employment, income (wages and salaries) and output. Table 3 reveals the impacts by year for Missouri and the Transmission region. Recall that, according to IMPLAN, few industries are available in the Transmission Region to provide the materials required; accordingly, almost all the impact can be ascribed to the construction activities.

[1] These are the total estimated Project expenditures other than for real estate and overhead.

As a result, it is estimated that 1,880 total jobs (direct, indirect and induced) would be created by the project (last column of Table 3) in Missouri; it would be appropriate to consider these as job-years (a job held by a person for one year) since it is highly likely that a large number of the members of the construction team would remain with the project through its lifetime. The estimates shown by year provide a more appropriate sense of the job creation, with the bulk of jobs created in 2017 and 2018. In the peak year (2018), wages and salaries associated with these jobs would amount to $70.996 million and the value of output would be $220.1301 million.

In the Transmission Region, total job creation would be 1,160 with a peak of 791 in 2018; again, this reflects the absence of suppliers of the bulk of the materials used in the project and hence reliance on the impacts generated by the construction expenditures. In the peak year (2018), wages and salaries associated with these jobs would amount to $33.624 million and the value of output would be $101.933 million.

Table 3: Summary Impacts by Year for Missouri and the Transmission Region

State of MO	***2016***	***2017***	***2018***	***2019***	***Total***
Employment	99.5	499.6	1280.8	0.0	**1880.0**
Income	$5,518,535	$27,695,015	$70,996,195	$0	**$104,209,746**
Output	$17,110,750	$85,871,066	$220,130,549	$0	**$323,112,365**

Trans Line	***2016***	***2017***	***2018***	***2019***	***Total***
Employment	61.4	308.4	790.5	0.0	**1160.3**
Income	$2,613,566	$13,116,299	$33,623,644	$0	**$49,353,510**
Output	$7,923,245	$39,763,160	$101,932,894	$0	**$149,619,299**

Table 4 provides results in a similar format for the individual counties. The magnitude of the impacts is obviously related to the shares of the project shown in Tables 1 and 2, with Adair commanding the lead. The progress of the impacts follows the pattern for Table 3 with the peak year being 2018.

In the Appendix, the tables reveal how the totals shown in Tables 3 and 4 can be broken down into direct jobs (those on site), indirect jobs (in the supply chains) and induced jobs (generated by the expenditures of wages and salaries by those in direct and indirect jobs). Further, the analysis allocates the jobs across major sectors of the economy. The entries in the Appendix

tables are based on total expenditures across the whole project; one disadvantage of IMPLAN is that the input-output model is only available for one year and thus the impacts across time – in terms of indirect and induced effects) will share a similar pattern.

Table 4: Summary Impacts by Year for Individual Counties

Adair	*2016*	*2017*	*2018*	*2019*	*Total*
Employment	25.8	129.5	331.9	0.0	**487.2**
Income	$831,201	$4,171,422	$10,693,443	$0	**$15,696,066**
Output	$3,061,585	$15,364,703	$39,387,430	$0	**$57,813,719**

Knox	*2016*	*2017*	*2018*	*2019*	*Total*
Employment	6.6	32.9	84.3	0.0	**123.7**
Income	$173,469	$870,560	$2,231,682	$0	**$3,275,711**
Output	$762,076	$3,824,511	$9,804,137	$0	**$14,390,724**

Marion	*2016*	*2017*	*2018*	*2019*	*Total*
Employment	10.3	51.5	132.0	0.0	**193.8**
Income	$529,517	$2,657,402	$6,812,253	$0	**$9,999,172**
Output	$1,402,773	$7,039,881	$18,046,742	$0	**$26,489,397**

Schuyler	*2016*	*2017*	*2018*	*2019*	*Total*
Employment	7.2	36.2	92.9	0.0	**136.4**
Income	$228,541	$1,146,943	$2,940,189	$0	**$4,315,673**
Output	$877,694	$4,404,748	$11,291,576	$0	**$16,574,019**

Shelby	*2016*	*2017*	*2018*	*2019*	*Total*
Employment	9.4	47.2	121.1	0.0	**177.7**
Income	$313,400	$1,572,812	$4,031,906	$0	**$5,918,118**
Output	$1,157,824	$5,810,593	$14,895,460	$0	**$21,863,877**

4. Conclusions

The analysis reveals that the project has the potential to create 1,880 jobs in Missouri, of which 1,160 can be expected to occur in the Transmission Line Region (Adair, Knox, Marian, Schuyler and Shelby counties). Since many of these jobs would be held over the lifetime of the project by the same persons, it would be better to consider them as job-years. The project would see with a

peak job creation of 1,280 for Missouri, and in the Transmission Region the total job creation would be 1,160 with a peak of 790 in 2018.

Appendix: Detailed Impact Tables

Economic Impact on State of Missouri

Employment

Description	Direct	Indirect	Induced	Total
Total	**908.2**	**433.7**	**538.1**	**1,880.0**
11 Ag, Forestry, Fish & Hunting	0.0	4.6	2.8	7.4
21 Mining	0.0	2.0	0.3	2.4
22 Utilities	0.0	1.7	1.9	3.7
23 Construction	664.2	4.0	5.8	674.0
31-33 Manufacturing	244.0	23.2	5.5	272.6
42 Wholesale Trade	0.0	62.2	15.5	77.7
44-45 Retail trade	0.0	77.7	82.2	159.9
48-49 Transportation & Warehousing	0.0	26.4	12.9	39.3
51 Information	0.0	9.3	8.1	17.4
52 Finance & insurance	0.0	31.0	39.9	70.9
53 Real estate & rental	0.0	23.0	28.4	51.4
54 Professional- scientific & tech svcs	0.0	65.4	20.4	85.8
55 Management of companies	0.0	17.4	4.2	21.6
56 Administrative & waste services	0.0	48.0	28.0	76.0
61 Educational svcs	0.0	0.3	18.9	19.2
62 Health & social services	0.0	0.0	118.6	118.6
71 Arts- entertainment & recreation	0.0	2.7	15.3	18.1
72 Accommodation & food services	0.0	14.1	71.1	85.3
81 Other services	0.0	14.2	52.3	66.5
92 Government & non NAICs	0.0	6.6	5.8	12.4
Multiplier	2.07			

Income

Description	Direct	Indirect	Induced	Total
Total	**$57,184,698**	**$24,150,971**	**$22,874,077**	**$104,209,746**
11 Ag, Forestry, Fish & Hunting	$0	$69,953	$38,294	$108,247
21 Mining	$0	$134,045	$12,359	$146,404
22 Utilities	$0	$213,524	$233,376	$446,900
23 Construction	$42,077,785	$254,799	$371,787	$42,704,371
31-33 Manufacturing	$15,106,914	$1,352,722	$363,351	$16,822,986
42 Wholesale Trade	$0	$4,727,373	$1,178,818	$5,906,190
44-45 Retail trade	$0	$2,055,490	$2,540,013	$4,595,503
48-49 Transportation & Warehousing	$0	$1,418,244	$650,380	$2,068,624
51 Information	$0	$1,062,110	$764,098	$1,826,208
52 Finance & insurance	$0	$1,741,769	$2,287,140	$4,028,909
53 Real estate & rental	$0	$741,497	$469,703	$1,211,200
54 Professional- scientific & tech svcs	$0	$4,999,845	$1,357,720	$6,357,565
55 Management of companies	$0	$2,016,948	$484,272	$2,501,220
56 Administrative & waste services	$0	$1,632,845	$918,071	$2,550,916
61 Educational svcs	$0	$10,271	$694,860	$705,130
62 Health & social services	$0	$146	$6,245,913	$6,246,059
71 Arts- entertainment & recreation	$0	$80,112	$399,272	$479,383
72 Accommodation & food services	$0	$303,965	$1,561,999	$1,865,965
81 Other services	$0	$810,857	$1,876,769	$2,687,625
92 Government & non NAICs	$0	$524,457	$425,883	$950,340
Multiplier	1.82			

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Output

Description	Direct	Indirect	Induced	Total
Total	**$185,278,920**	**$68,161,936**	**$69,671,508**	**$323,112,365**
11 Ag, Forestry, Fish & Hunting	$0	$230,458	$224,561	$455,020
21 Mining	$0	$637,717	$63,632	$701,349
22 Utilities	$0	$1,962,634	$2,051,579	$4,014,213
23 Construction	$102,493,768	$704,421	$1,069,577	$104,267,766
31-33 Manufacturing	$82,785,152	$7,243,112	$2,920,376	$92,948,640
42 Wholesale Trade	$0	$13,357,708	$3,330,878	$16,688,586
44-45 Retail trade	$0	$5,835,821	$6,084,680	$11,920,502
48-49 Transportation & Warehousing	$0	$3,892,536	$1,859,226	$5,751,762
51 Information	$0	$3,898,354	$3,680,269	$7,578,623
52 Finance & insurance	$0	$5,041,077	$7,793,841	$12,834,917
53 Real estate & rental	$0	$5,949,877	$12,711,185	$18,661,062
54 Professional- scientific & tech svcs	$0	$8,927,484	$2,689,708	$11,617,192
55 Management of companies	$0	$4,049,247	$972,231	$5,021,478
56 Administrative & waste services	$0	$3,072,498	$1,765,916	$4,838,414
61 Educational svcs	$0	$19,993	$1,318,275	$1,338,268
62 Health & social services	$0	$260	$11,428,834	$11,429,094
71 Arts- entertainment & recreation	$0	$213,755	$1,306,032	$1,519,788
72 Accommodation & food services	$0	$753,839	$3,957,742	$4,711,581
81 Other services	$0	$1,355,215	$3,205,970	$4,561,185
92 Government & non NAICs	$0	$1,015,928	$1,236,997	$2,252,925
Multiplier	1.74			

SCHEDULE GH-02

Economic Impact on the Transmission Line Region

Employment

Description	Direct	Indirect	Induced	Total
Total	**737.2**	**203.6**	**219.5**	**1,160.3**
11 Ag, Forestry, Fish & Hunting	0.0	4.4	0.7	5.0
21 Mining	0.0	1.3	0.0	1.3
22 Utilities	0.0	0.5	0.7	1.2
23 Construction	737.2	1.4	2.6	741.2
31-33 Manufacturing	0.0	6.9	0.7	7.5
42 Wholesale Trade	0.0	22.2	5.1	27.3
44-45 Retail trade	0.0	77.8	40.3	118.0
48-49 Transportation & Warehousing	0.0	9.1	3.4	12.5
51 Information	0.0	2.1	2.2	4.3
52 Finance & insurance	0.0	5.6	12.2	17.8
53 Real estate & rental	0.0	8.0	8.1	16.1
54 Professional- scientific & tech svcs	0.0	32.5	7.6	40.1
55 Management of companies	0.0	0.6	0.3	0.9
56 Administrative & waste services	0.0	17.7	7.9	25.6
61 Educational svcs	0.0	0.2	7.2	7.4
62 Health & social services	0.0	0.0	58.0	58.0
71 Arts- entertainment & recreation	0.0	0.6	4.6	5.3
72 Accommodation & food services	0.0	3.7	35.6	39.3
81 Other services	0.0	7.5	20.2	27.7
92 Government & non NAICs	0.0	1.6	2.2	3.7
Multiplier	1.57			

Income

Description	Direct	Indirect	Induced	Total
Total	**$35,553,562**	**$6,891,817**	**$6,908,131**	**$49,353,510**
11 Ag, Forestry, Fish & Hunting	$0	$66,260	$8,802	$75,063
21 Mining	$0	$117,619	$1,893	$119,512
22 Utilities	$0	$58,555	$71,172	$129,727
23 Construction	$35,553,562	$67,542	$124,957	$35,746,061
31-33 Manufacturing	$0	$353,106	$32,585	$385,691
42 Wholesale Trade	$0	$1,516,452	$350,964	$1,867,416
44-45 Retail trade	$0	$1,684,327	$1,038,498	$2,722,826
48-49 Transportation & Warehousing	$0	$609,371	$174,217	$783,588
51 Information	$0	$87,273	$93,368	$180,641
52 Finance & insurance	$0	$110,113	$256,089	$366,202
53 Real estate & rental	$0	$244,562	$66,719	$311,281
54 Professional- scientific & tech svcs	$0	$959,717	$205,228	$1,164,945
55 Management of companies	$0	$25,780	$11,955	$37,735
56 Administrative & waste services	$0	$473,720	$202,397	$676,116
61 Educational svcs	$0	$5,569	$219,758	$225,327
62 Health & social services	$0	$11	$2,515,702	$2,515,712
71 Arts- entertainment & recreation	$0	$8,845	$68,471	$77,317
72 Accommodation & food services	$0	$57,308	$560,320	$617,628
81 Other services	$0	$340,800	$754,022	$1,094,823
92 Government & non NAICs	$0	$104,886	$151,013	$255,899
Multiplier	1.39			

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Output

Description	Direct	Indirect	Induced	Total
Total	**$102,493,764**	**$23,188,331**	**$23,937,204**	**$149,619,299**
11 Ag, Forestry, Fish & Hunting	$0	$258,940	$50,782	$309,722
21 Mining	$0	$460,741	$7,416	$468,157
22 Utilities	$0	$550,254	$622,319	$1,172,573
23 Construction	$102,493,764	$226,709	$439,701	$103,160,173
31-33 Manufacturing	$0	$2,030,812	$205,367	$2,236,180
42 Wholesale Trade	$0	$4,596,004	$1,063,688	$5,659,692
44-45 Retail trade	$0	$5,535,373	$2,782,959	$8,318,332
48-49 Transportation & Warehousing	$0	$1,502,568	$438,067	$1,940,634
51 Information	$0	$807,723	$867,092	$1,674,815
52 Finance & insurance	$0	$764,154	$1,738,394	$2,502,548
53 Real estate & rental	$0	$1,528,102	$5,132,203	$6,660,306
54 Professional- scientific & tech svcs	$0	$2,772,778	$700,503	$3,473,281
55 Management of companies	$0	$97,452	$45,191	$142,643
56 Administrative & waste services	$0	$1,000,405	$451,466	$1,451,871
61 Educational svcs	$0	$13,579	$534,863	$548,442
62 Health & social services	$0	$18	$5,061,652	$5,061,670
71 Arts- entertainment & recreation	$0	$49,223	$311,823	$361,047
72 Accommodation & food services	$0	$174,606	$1,742,590	$1,917,196
81 Other services	$0	$623,266	$1,310,117	$1,933,384
92 Government & non NAICs	$0	$195,624	$431,011	$626,635
Multiplier	1.46			

Economic Impact on Adair County

Employment

Description	Direct	Indirect	Induced	Total
Total	**335.2**	**80.0**	**71.9**	**487.2**
11 Ag, Forestry, Fish & Hunting	0.0	1.5	0.2	1.7
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.0	0.1	0.1
23 Construction	335.2	0.6	0.9	336.7
31-33 Manufacturing	0.0	2.4	0.1	2.5
42 Wholesale Trade	0.0	8.6	1.4	10.1
44-45 Retail trade	0.0	37.4	13.8	51.2
48-49 Transportation & Warehousing	0.0	2.3	0.8	3.1
51 Information	0.0	1.2	0.7	1.9
52 Finance & insurance	0.0	1.9	3.4	5.3
53 Real estate & rental	0.0	5.5	3.1	8.6
54 Professional- scientific & tech svcs	0.0	4.7	1.3	5.9
55 Management of companies	0.0	0.8	0.3	1.0
56 Administrative & waste services	0.0	7.5	2.7	10.2
61 Educational svcs	0.0	0.1	2.6	2.7
62 Health & social services	0.0	0.0	19.0	19.0
71 Arts- entertainment & recreation	0.0	0.4	1.4	1.8
72 Accommodation & food services	0.0	1.3	12.8	14.1
81 Other services	0.0	3.4	6.8	10.1
92 Government & non NAICs	0.0	0.5	0.5	1.0
Multiplier	1.45			

Income

Description	Direct	Indirect	Induced	Total
Total	**$11,204,795**	**$2,288,970**	**$2,202,302**	**$15,696,066**
11 Ag, Forestry, Fish & Hunting	$0	$15,414	$1,654	$17,068
21 Mining	$0	$0	$0	$0
22 Utilities	$0	$2,973	$5,467	$8,440
23 Construction	$11,204,795	$22,487	$31,537	$11,258,819
31-33 Manufacturing	$0	$113,110	$5,097	$118,207
42 Wholesale Trade	$0	$372,607	$62,076	$434,683
44-45 Retail trade	$0	$769,057	$364,577	$1,133,633
48-49 Transportation & Warehousing	$0	$190,097	$45,338	$235,435
51 Information	$0	$53,227	$34,913	$88,140
52 Finance & insurance	$0	$39,548	$87,065	$126,613
53 Real estate & rental	$0	$190,103	$27,218	$217,321
54 Professional- scientific & tech svcs	$0	$192,304	$51,100	$243,404
55 Management of companies	$0	$36,145	$12,800	$48,944
56 Administrative & waste services	$0	$116,650	$41,316	$157,966
61 Educational svcs	$0	$2,732	$78,872	$81,604
62 Health & social services	$0	$14	$863,824	$863,838
71 Arts- entertainment & recreation	$0	$4,965	$22,261	$27,226
72 Accommodation & food services	$0	$20,467	$196,067	$216,534
81 Other services	$0	$110,596	$236,369	$346,964
92 Government & non NAICs	$0	$36,475	$34,751	$71,225
Multiplier	1.40			

SCHEDULE GH-02

Output

Description	Direct	Indirect	Induced	Total
Total	**$41,593,464**	**$8,640,205**	**$7,580,050**	**$57,813,719**
11 Ag, Forestry, Fish & Hunting	$0	$95,032	$10,584	$105,616
21 Mining	$0	$0	$0	$0
22 Utilities	$0	$17,016	$31,294	$48,310
23 Construction	$41,593,464	$91,767	$136,599	$41,821,830
31-33 Manufacturing	$0	$631,577	$40,553	$672,130
42 Wholesale Trade	$0	$1,578,803	$263,027	$1,841,830
44-45 Retail trade	$0	$2,574,097	$947,663	$3,521,760
48-49 Transportation & Warehousing	$0	$381,872	$94,895	$476,767
51 Information	$0	$509,424	$319,028	$828,452
52 Finance & insurance	$0	$259,756	$512,442	$772,197
53 Real estate & rental	$0	$1,114,279	$1,750,043	$2,864,323
54 Professional- scientific & tech svcs	$0	$492,771	$137,150	$629,920
55 Management of companies	$0	$123,371	$43,689	$167,060
56 Administrative & waste services	$0	$359,274	$129,948	$489,222
61 Educational svcs	$0	$6,536	$193,242	$199,778
62 Health & social services	$0	$23	$1,727,991	$1,728,014
71 Arts- entertainment & recreation	$0	$31,533	$102,842	$134,374
72 Accommodation & food services	$0	$63,959	$626,556	$690,515
81 Other services	$0	$244,510	$413,169	$657,680
92 Government & non NAICs	$0	$64,603	$99,337	$163,940
Multiplier	1.39			

Economic Impact on Knox County

Employment

Description	Direct	Indirect	Induced	Total
Total	**101.5**	**15.6**	**6.6**	**123.7**
11 Ag, Forestry, Fish & Hunting	0.0	0.8	0.1	0.8
21 Mining	0.0	0.3	0.0	0.3
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	101.5	0.1	0.1	101.7
31-33 Manufacturing	0.0	0.4	0.0	0.4
42 Wholesale Trade	0.0	1.9	0.2	2.1
44-45 Retail trade	0.0	7.7	1.5	9.2
48-49 Transportation & Warehousing	0.0	0.8	0.1	0.9
51 Information	0.0	0.4	0.2	0.6
52 Finance & insurance	0.0	0.5	0.6	1.1
53 Real estate & rental	0.0	0.2	0.0	0.3
54 Professional- scientific & tech svcs	0.0	0.6	0.2	0.8
55 Management of companies	0.0	0.2	0.0	0.2
56 Administrative & waste services	0.0	0.2	0.0	0.2
61 Educational svcs	0.0	0.0	0.2	0.3
62 Health & social services	0.0	0.0	1.3	1.3
71 Arts- entertainment & recreation	0.0	0.0	0.1	0.1
72 Accommodation & food services	0.0	0.2	1.1	1.3
81 Other services	0.0	1.2	0.7	1.9
92 Government & non NAICs	0.0	0.2	0.2	0.4
Multiplier	1.22			

Income

Description	Direct	Indirect	Induced	Total
Total	**$2,681,869**	**$423,658**	**$170,184**	**$3,275,711**
11 Ag, Forestry, Fish & Hunting	$0	$12,805	$867	$13,672
21 Mining	$0	$16,577	$137	$16,714
22 Utilities	$0	$0	$0	$0
23 Construction	$2,681,869	$2,395	$3,231	$2,687,496
31-33 Manufacturing	$0	$11,882	$160	$12,041
42 Wholesale Trade	$0	$62,342	$6,227	$68,569
44-45 Retail trade	$0	$153,527	$35,128	$188,655
48-49 Transportation & Warehousing	$0	$45,842	$4,306	$50,148
51 Information	$0	$16,415	$9,487	$25,902
52 Finance & insurance	$0	$7,886	$12,636	$20,523
53 Real estate & rental	$0	$8,348	$521	$8,869
54 Professional- scientific & tech svcs	$0	$30,452	$8,717	$39,169
55 Management of companies	$0	$3,480	$487	$3,967
56 Administrative & waste services	$0	$3,288	$667	$3,955
61 Educational svcs	$0	$81	$1,042	$1,123
62 Health & social services	$0	$0	$33,149	$33,149
71 Arts- entertainment & recreation	$0	$363	$1,282	$1,645
72 Accommodation & food services	$0	$2,288	$17,098	$19,386
81 Other services	$0	$31,022	$17,654	$48,677
92 Government & non NAICs	$0	$14,664	$17,386	$32,051
Multiplier	1.22			

SCHEDULE GH-02

Output

Description	Direct	Indirect	Induced	Total
Total	**$11,873,644**	**$1,693,530**	**$823,550**	**$14,390,724**
11 Ag, Forestry, Fish & Hunting	$0	$44,737	$5,038	$49,775
21 Mining	$0	$92,052	$760	$92,812
22 Utilities	$0	$0	$0	$0
23 Construction	$11,873,644	$11,765	$17,872	$11,903,282
31-33 Manufacturing	$0	$88,299	$2,040	$90,338
42 Wholesale Trade	$0	$325,370	$32,501	$357,870
44-45 Retail trade	$0	$543,770	$99,811	$643,581
48-49 Transportation & Warehousing	$0	$126,399	$12,120	$138,519
51 Information	$0	$108,800	$63,775	$172,575
52 Finance & insurance	$0	$71,493	$81,892	$153,385
53 Real estate & rental	$0	$52,489	$259,145	$311,634
54 Professional- scientific & tech svcs	$0	$57,739	$18,026	$75,765
55 Management of companies	$0	$22,752	$3,182	$25,934
56 Administrative & waste services	$0	$12,644	$2,471	$15,114
61 Educational svcs	$0	$431	$5,553	$5,984
62 Health & social services	$0	$0	$65,015	$65,015
71 Arts- entertainment & recreation	$0	$3,562	$4,223	$7,785
72 Accommodation & food services	$0	$7,361	$53,885	$61,245
81 Other services	$0	$89,901	$47,595	$137,496
92 Government & non NAICs	$0	$33,968	$48,648	$82,616
Multiplier	1.21			

Economic Impact on Marion County

Employment

Description	Direct	Indirect	Induced	Total
Total	**111.6**	**37.4**	**44.8**	**193.8**
11 Ag, Forestry, Fish & Hunting	0.0	0.4	0.0	0.5
21 Mining	0.0	0.1	0.0	0.1
22 Utilities	0.0	0.1	0.2	0.3
23 Construction	111.6	0.2	0.5	112.4
31-33 Manufacturing	0.0	0.9	0.2	1.1
42 Wholesale Trade	0.0	4.8	1.4	6.3
44-45 Retail trade	0.0	12.1	7.8	19.8
48-49 Transportation & Warehousing	0.0	1.7	0.6	2.4
51 Information	0.0	0.2	0.3	0.5
52 Finance & insurance	0.0	1.2	2.8	4.0
53 Real estate & rental	0.0	1.3	1.7	3.0
54 Professional- scientific & tech svcs	0.0	8.5	2.0	10.5
55 Management of companies	0.0	0.0	0.0	0.1
56 Administrative & waste services	0.0	3.5	1.9	5.4
61 Educational svcs	0.0	0.0	1.2	1.2
62 Health & social services	0.0	0.0	12.6	12.6
71 Arts- entertainment & recreation	0.0	0.1	1.1	1.2
72 Accommodation & food services	0.0	0.8	6.8	7.6
81 Other services	0.0	1.1	3.2	4.2
92 Government & non NAICs	0.0	0.3	0.5	0.7
Multiplier	1.74			

Income

Description	Direct	Indirect	Induced	Total
Total	**$7,080,347**	**$1,445,594**	**$1,473,231**	**$9,999,172**
11 Ag, Forestry, Fish & Hunting	$0	$7,179	$663	$7,843
21 Mining	$0	$29,461	$573	$30,034
22 Utilities	$0	$11,375	$17,980	$29,355
23 Construction	$7,080,347	$13,618	$28,614	$7,122,580
31-33 Manufacturing	$0	$50,603	$7,880	$58,483
42 Wholesale Trade	$0	$429,375	$124,444	$553,819
44-45 Retail trade	$0	$259,480	$192,534	$452,014
48-49 Transportation & Warehousing	$0	$122,149	$38,794	$160,943
51 Information	$0	$9,361	$12,558	$21,919
52 Finance & insurance	$0	$22,863	$51,453	$74,316
53 Real estate & rental	$0	$33,614	$12,885	$46,499
54 Professional- scientific & tech svcs	$0	$235,277	$47,228	$282,505
55 Management of companies	$0	$1,492	$854	$2,345
56 Administrative & waste services	$0	$120,181	$61,542	$181,723
61 Educational svcs	$0	$964	$44,046	$45,009
62 Health & social services	$0	$0	$542,656	$542,656
71 Arts- entertainment & recreation	$0	$1,215	$15,057	$16,273
72 Accommodation & food services	$0	$12,171	$110,326	$122,498
81 Other services	$0	$64,867	$133,090	$197,957
92 Government & non NAICs	$0	$20,348	$30,052	$50,400
Multiplier	1.41			

SCHEDULE GH-02

Output

Description	Direct	Indirect	Induced	Total
Total	**$17,235,936**	**$4,318,265**	**$4,935,196**	**$26,489,397**
11 Ag, Forestry, Fish & Hunting	$0	$28,292	$3,325	$31,617
21 Mining	$0	$69,041	$1,342	$70,383
22 Utilities	$0	$110,887	$157,603	$268,490
23 Construction	$17,235,936	$39,680	$86,476	$17,362,091
31-33 Manufacturing	$0	$272,736	$38,196	$310,932
42 Wholesale Trade	$0	$1,100,332	$318,905	$1,419,237
44-45 Retail trade	$0	$855,130	$533,088	$1,388,219
48-49 Transportation & Warehousing	$0	$298,138	$98,687	$396,825
51 Information	$0	$87,300	$123,038	$210,338
52 Finance & insurance	$0	$155,740	$379,436	$535,176
53 Real estate & rental	$0	$213,618	$991,950	$1,205,568
54 Professional- scientific & tech svcs	$0	$681,090	$181,832	$862,922
55 Management of companies	$0	$6,616	$3,785	$10,401
56 Administrative & waste services	$0	$218,420	$117,723	$336,143
61 Educational svcs	$0	$2,203	$100,723	$102,926
62 Health & social services	$0	$0	$1,101,415	$1,101,415
71 Arts- entertainment & recreation	$0	$4,986	$70,727	$75,714
72 Accommodation & food services	$0	$35,820	$331,848	$367,668
81 Other services	$0	$102,377	$214,403	$316,779
92 Government & non NAICs	$0	$35,860	$80,694	$116,554
Multiplier	1.54			

Economic Impact on Schuyler County

Employment

Description	Direct	Indirect	Induced	Total
Total	**112.1**	**15.9**	**8.4**	**136.4**
11 Ag, Forestry, Fish & Hunting	0.0	0.7	0.1	0.8
21 Mining	0.0	0.0	0.0	0.0
22 Utilities	0.0	0.1	0.0	0.1
23 Construction	112.1	0.2	0.2	112.5
31-33 Manufacturing	0.0	0.3	0.0	0.3
42 Wholesale Trade	0.0	2.0	0.3	2.3
44-45 Retail trade	0.0	8.2	2.1	10.4
48-49 Transportation & Warehousing	0.0	1.3	0.2	1.5
51 Information	0.0	0.1	0.1	0.2
52 Finance & insurance	0.0	0.8	1.1	1.9
53 Real estate & rental	0.0	0.0	0.0	0.1
54 Professional- scientific & tech svcs	0.0	0.0	0.1	0.1
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	1.2	0.4	1.6
61 Educational svcs	0.0	0.0	0.4	0.4
62 Health & social services	0.0	0.0	1.2	1.2
71 Arts- entertainment & recreation	0.0	0.0	0.0	0.1
72 Accommodation & food services	0.0	0.0	0.4	0.4
81 Other services	0.0	0.6	1.5	2.1
92 Government & non NAICs	0.0	0.2	0.3	0.5
Multiplier	1.22			

Income

Description	Direct	Indirect	Induced	Total
Total	**$3,821,224**	**$295,042**	**$199,407**	**$4,315,673**
11 Ag, Forestry, Fish & Hunting	$0	$5,675	$529	$6,204
21 Mining	$0	$0	$0	$0
22 Utilities	$0	$8,876	$5,423	$14,299
23 Construction	$3,821,224	$6,606	$9,340	$3,837,170
31-33 Manufacturing	$0	$17,694	$178	$17,871
42 Wholesale Trade	$0	$28,821	$3,599	$32,420
44-45 Retail trade	$0	$95,326	$45,402	$140,728
48-49 Transportation & Warehousing	$0	$87,644	$10,639	$98,283
51 Information	$0	$94	$93	$187
52 Finance & insurance	$0	$5,000	$11,269	$16,269
53 Real estate & rental	$0	$1,430	$694	$2,125
54 Professional- scientific & tech svcs	$0	$585	$2,987	$3,572
55 Management of companies	$0	$0	$0	$0
56 Administrative & waste services	$0	$3,652	$1,218	$4,870
61 Educational svcs	$0	$52	$747	$799
62 Health & social services	$0	$0	$30,500	$30,500
71 Arts- entertainment & recreation	$0	$225	$1,037	$1,262
72 Accommodation & food services	$0	$591	$10,371	$10,962
81 Other services	$0	$18,890	$50,419	$69,308
92 Government & non NAICs	$3,821,224	$295,042	$199,407	$4,315,673
Multiplier	1.13			

SCHEDULE GH-02

Output

Description	Direct	Indirect	Induced	Total
Total	**$13,980,259**	**$1,506,357**	**$1,087,404**	**$16,574,019**
11 Ag, Forestry, Fish & Hunting	$0	$31,474	$3,457	$34,930
21 Mining	$0	$0	$0	$0
22 Utilities	$0	$78,381	$47,887	$126,268
23 Construction	$13,980,259	$24,181	$36,942	$14,041,382
31-33 Manufacturing	$0	$82,460	$813	$83,273
42 Wholesale Trade	$0	$311,153	$38,857	$350,011
44-45 Retail trade	$0	$539,286	$137,357	$676,643
48-49 Transportation & Warehousing	$0	$217,174	$27,103	$244,277
51 Information	$0	$25,750	$25,434	$51,184
52 Finance & insurance	$0	$79,677	$140,944	$220,621
53 Real estate & rental	$0	$2,992	$353,025	$356,017
54 Professional- scientific & tech svcs	$0	$2,273	$8,029	$10,301
55 Management of companies	$0	$0	$0	$0
56 Administrative & waste services	$0	$26,366	$8,792	$35,158
61 Educational svcs	$0	$560	$8,081	$8,641
62 Health & social services	$0	$0	$72,454	$72,454
71 Arts- entertainment & recreation	$0	$3,048	$3,794	$6,842
72 Accommodation & food services	$0	$1,378	$25,057	$26,435
81 Other services	$0	$44,633	$87,709	$132,342
92 Government & non NAICs	$0	$35,570	$61,670	$97,240
Multiplier	1.19			

SCHEDULE GH-02

Economic Impact on Shelby County

Employment

Description	Direct	Indirect	Induced	Total
Total	**142.7**	**21.1**	**13.9**	**177.7**
11 Ag, Forestry, Fish & Hunting	0.0	0.7	0.1	0.8
21 Mining	0.0	0.3	0.0	0.3
22 Utilities	0.0	0.0	0.0	0.0
23 Construction	142.7	0.1	0.2	143.0
31-33 Manufacturing	0.0	0.8	0.0	0.8
42 Wholesale Trade	0.0	2.1	0.3	2.3
44-45 Retail trade	0.0	9.5	3.0	12.5
48-49 Transportation & Warehousing	0.0	2.0	0.5	2.5
51 Information	0.0	0.4	0.3	0.7
52 Finance & insurance	0.0	0.4	0.6	1.0
53 Real estate & rental	0.0	0.4	0.4	0.7
54 Professional- scientific & tech svcs	0.0	1.8	0.5	2.2
55 Management of companies	0.0	0.0	0.0	0.0
56 Administrative & waste services	0.0	0.6	0.2	0.9
61 Educational svcs	0.0	0.0	0.6	0.6
62 Health & social services	0.0	0.0	3.0	3.0
71 Arts- entertainment & recreation	0.0	0.0	0.1	0.1
72 Accommodation & food services	0.0	0.3	2.8	3.1
81 Other services	0.0	1.4	1.4	2.8
92 Government & non NAICs	142.7	21.1	13.9	177.7
Multiplier	1.25			

Income

Description	Direct	Indirect	Induced	Total
Total	**$4,876,027**	**$680,647**	**$361,445**	**$5,918,118**
11 Ag, Forestry, Fish & Hunting	$0	$15,245	$1,991	$17,236
21 Mining	$0	$13,112	$105	$13,217
22 Utilities	$0	$2,628	$1,907	$4,534
23 Construction	$4,876,027	$4,398	$7,065	$4,887,489
31-33 Manufacturing	$0	$37,967	$324	$38,291
42 Wholesale Trade	$0	$61,409	$8,385	$69,794
44-45 Retail trade	$0	$275,753	$89,365	$365,118
48-49 Transportation & Warehousing	$0	$101,900	$18,560	$120,460
51 Information	$0	$9,222	$5,988	$15,210
52 Finance & insurance	$0	$9,550	$18,793	$28,343
53 Real estate & rental	$0	$5,107	$4,353	$9,460
54 Professional- scientific & tech svcs	$0	$62,875	$12,457	$75,333
55 Management of companies	$0	$0	$0	$0
56 Administrative & waste services	$0	$8,783	$3,050	$11,833
61 Educational svcs	$0	$214	$6,934	$7,148
62 Health & social services	$0	$0	$76,376	$76,376
71 Arts- entertainment & recreation	$0	$744	$1,415	$2,159
72 Accommodation & food services	$0	$4,374	$44,594	$48,968
81 Other services	$0	$54,902	$50,964	$105,866
92 Government & non NAICs	$0	$12,462	$8,819	$21,280
Multiplier	1.21			

SCHEDULE GH-02

Output

Description	Direct	Indirect	Induced	Total
Total	**$17,810,467**	**$2,440,825**	**$1,612,586**	**$21,863,877**
11 Ag, Forestry, Fish & Hunting	$0	$42,633	$11,189	$53,822
21 Mining	$0	$91,999	$738	$92,737
22 Utilities	$0	$18,168	$13,185	$31,353
23 Construction	$17,810,467	$18,210	$31,697	$17,860,373
31-33 Manufacturing	$0	$237,465	$2,167	$239,632
42 Wholesale Trade	$0	$348,218	$47,547	$395,766
44-45 Retail trade	$0	$791,107	$221,204	$1,012,311
48-49 Transportation & Warehousing	$0	$296,411	$51,873	$348,284
51 Information	$0	$110,943	$95,139	$206,082
52 Finance & insurance	$0	$74,637	$113,678	$188,315
53 Real estate & rental	$0	$84,416	$530,611	$615,027
54 Professional- scientific & tech svcs	$0	$158,237	$39,930	$198,166
55 Management of companies	$0	$0	$0	$0
56 Administrative & waste services	$0	$34,209	$10,895	$45,104
61 Educational svcs	$0	$1,067	$34,509	$35,576
62 Health & social services	$0	$0	$153,605	$153,605
71 Arts- entertainment & recreation	$0	$3,876	$11,804	$15,680
72 Accommodation & food services	$0	$14,021	$136,351	$150,372
81 Other services	$0	$94,872	$84,118	$178,990
92 Government & non NAICs	$0	$20,337	$22,346	$42,683
Multiplier	1.23			

SCHEDULE GH-02