LEE, David Jung-Hwi, Ph.D.

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RESEARCH / TEACHING INTERESTS

- **Planning Methods**: Quantitative Methods, Forecasting, Econometrics, Optimization, Linear/Non-linear Programming, Regional Income and Employment Analysis
- **Urban Modeling**: Urban Patterns, Spatial Interaction, The Lowry model, Competing Destinations Models, Residential & Employment Allocation Models, Operationalization of Urban Models
- **Transportation Planning**: Location and Travel Behavior, Integrated Land Use and Transportation System, Network Analysis, Graph Theory, Travel Demand Forecasting, 4-Step Transportation Models, Intervening Opportunity Models, Commuting Patterns, Land Use Modeling, Megaregions, Economic Competitiveness, Freight Movement
- **Planning Support System**: Geographic Information System (GIS) and Planning Applications, Spatial Analysis, Visualization

EDUCATION

2010 **PH.D.**
- **THE OHIO STATE UNIVERSITY, COLUMBUS, OH**
- City and Regional Planning @ Austin E. Knowlton School of Architecture
- Advisor: Jean-Michel Guldmann, Ph.D.

2001 **M.U.P.**
- **THE STATE UNIVERSITY OF NEW YORK, BUFFALO, NY**
- Urban and Regional Planning Program
- Advisor: Sam Cole, Ph.D.
- Specialization: GIS for Planning and Information Technology (IT)

1998 **B. S.**
- **HANYANG UNIVERSITY, SEOUL, SOUTH KOREA**
- City Planning and Design Program, College of Engineering
- Advisor: Jeong-Hee Moon, Ph.D.
- Specialization: City Planning & Urban Design

TEACHING EXPERIENCE

2009 – 2010 **ADJUNCT FACULTY**
- ***Department of Geography, University of Mary Washington, VA***
- GEOG 410N: Transportation Planning

2002 – 2002 **TEACHING ASSISTANT**
- ***School of Urban Studies and Planning, PSU Portland***

- USP 531: Geographic Data Analysis and Display (Prof. Irina Sharkova)
- Served two courses as an assistant and lab sessions

2001 – 2001 **TEACHING ASSISTANT**

- ❑ ***School of Architecture and Planning, SUNY Buffalo***
- PD 356: Computing for Environmental Analysis (Prof. G. William Page)
- Teaching how to use ArcView3.2 and Analysis, Site Planning
- Full charge in lab sessions

1991 – 1993 **PRIVATE TUTOR**

- For Junior-High/High School Students (Several groups and individuals)

PLANNING/RESEARCH EXPERIENCE

2012 – Present

RESEARCH SCIENTIST II (RESEARCH FACULTY)

- ❑ ***Center for Quality Growth and Regional Development, Georgia Institute of Technology***
- The Architecture of the Megaregion project – FHWA grant project
- Georgia SPLOST Database and Clearinghouse for Transportation Finance
- Accepted Grant Proposal to the National Center for Transportation System Productivity and Management: "Bringing Freight Components into Statewide and Regional Travel Demand Forecasting"

2010 – 2011

PRINCIPAL PLANNER

- ❑ ***George Washington Regional Commission, Fredericksburg, Virginia***
- ❑ ***Fredericksburg Area Metropolitan Planning Organization***
  http://www.gwregion.org; http://www.FAMPO.gwregion.org
- Modeling Manager: Managing Regional Models, GIS Technical Support
- Developing CUSIM-M Model (Land Use Model 1)
- Developing a CUBE LAND Model (Land Use Model 2)
- Travel Demand Modeling and Forecasting
- Integration of Land Use and Transportation Modeling Project
- Participating Technical Advisory Committee Meetings
- Presentations in Monthly Policy Board Meetings
- Running Transportation Advisory Group Meetings
- Project Manager for various projects
- Active participation in Virginia Transportation Modeling (VTM) activities
- Participation in TRB, Travel Demand Improvement Program (TMIP), VAGIS

2007 – 2010

SENIOR REGIONAL PLANNER

- ❑ ***George Washington Regional Commission, Fredericksburg, Virginia***
- ❑ ***Fredericksburg Area Metropolitan Planning Organization***
- Modeling Manager: Managing Regional Models, GIS Technical Support
- Long Range Planning Project
- Constrained Long Range Plan (CLRP)
- Integration of Land Use and Transportation Modeling Project
- CUSIM-M Model building (Land Use Model)
- Travel Demand Modeling and Forecasting
- Technical Advisory Committee
- Presentations in Monthly Policy Board Meetings

- Participation in conferences (TRB annual meeting, Innovations in Travel Demand Model, 5th Oregon Symposium of Land Use and Transportation Integration, etc)
- 2009 National TMA/MPO Modeling Survey
- Project Manager for FAMPO Park & Ride Study
- Active participation in Virginia Transportation Modeling (VTM) activities
- Participation in TRB, Travel Demand Improvement Program (TMIP), VAGIS

2006 – 2007

REGIONAL PLANNER

- ***George Washington Regional Commission, Fredericksburg, Virginia***
- Data collection of region wide socio-economic indicators
- Constrained Long Range Plan (CLRP)
- Integration of Land Use and Transportation Modeling Project
- DRAM/EMPAL/LANCON Model building
- Travel Demand Modeling, GIS Technical Support
- Active participation in Virginia Transportation Modeling (VTM) activities
- Participation in TRB, Travel Demand Improvement Program (TMIP), VAGIS

2003 – 2006 **RESEARCH ASSOCIATE**

- ***Community Research Partners, Columbus, Ohio***
- Full responsibility on GIS system and Data Management
  - Franklin County Community DataSource (CDS)
- Data Collection, Analyses, and Report Writing
  - Community Planning Indicators development
  - United Way of Central Ohio 2003 Racial Disparities Report
  - Columbus Public School Student Mobility Research Project 2003-2005
  - 2004 Central Ohio Home Mortgage Disclosure Act Report (The Columbus Urban League)
  - Columbus Central City Housing Research
  - Neighborhood Typology for Central Ohio
  - United Way Community Assessment
  - Vision Council Indicators

2001 – 2002 **RESEARCH ASSISTANT**

- ***The Center for Population Research and Census, PSU Portland***
- GIS and Data Management, Analyses, and Report Writing
  - Telesis "San Diego County: Demographic" Project
  - Telesis "San Diego County: Quality of Life" Project
  - Developing "Quality of Life" indicators, Calculations, mappings, etc.

2000 – 2001 **INTERN (GIS MANAGEMENT)**

- ***Central Referral Services, Inc.***
- Data management and Visualization for the Regional Social & Human Service Agencies
- IRIS 2.0 Data System Management
- ArcView3.2, MapObject2.0, SQL Connection, Data Conversion

2000 – 2000 **GRADUATE RESEARCH ASSISTANT (GIS CONCENTRATION)**

- ***The Center for Urban Studies*, SUNY Buffalo**
- The Masten Neighborhood Planning Project (Dr. Minoo S. Amini)
- Rockefeller Project, Hamlin Park (Dr. Minoo S. Amini)
- Mapping, Spatial Analysis and Data Manipulation with GIS applications

1999 – 2000 **GRADUATE RESEARCH ASSISTANT**

- ***B. Arnold & Associate/ Planning & Design Management***

- UB Landscape Master Plan Project
- Survey & Data Analysis / Statistics (Excel, Access, Powerpoint)

OTHER EXPERIENCE

1999 – 1999 **STAFF (TASK-FORCE)**

- ❑ ***Brooke Hillier Parker Korea*** (Real Estate Consulting Firm)
- Non-Performing Loan Project
- Prepared Presentation using HTML and DBMS and Location Mapping/GIS
- Manager for temporary staff

1998 – 1999 **STAFF**

- ❑ ***Food for the Hungry International***
- Project Coordinator for A National Office Meeting of "Food for the Hungry"
- Translation of Annual Reports
- Fund-raising
- Charity Marathon Projects
- Hunger Corps Training

1993 – 1995 **MILITARY SERVICE**

- ❑ ***R.O.K. Army***
- Demilitarized Zone Guardman (DMZ Area, Between South and North Korea)
- Assistant for Orthopedic Surgical Operations (Military Hospital)
- Data Management and Charting, First Aid, Scrubbing

THESIS/DISSERTATION

LEE, David J.-H. 2010. "Optimal Regional Allocation of Population and Employment: Application of a Spatial Interaction Commuting Model". Ph.D. Dissertation, City and Regional Planning Program, Knowlton School of Architecture, The Ohio State University, Columbus, Ohio. (http://etd.ohiolink.edu/view.cgi?acc_num=osu1276787325)

LEE, Jung-Hwi. 2001 "Inter Organizational GIS Data Sharing in Local Governments". Master's Thesis, Urban and Regional Planning Program, School of Architecture and Planning, The State University of New York, Buffalo, New York.

LEE, Jung-Hwi. 1997 "Location Analysis & Urban Design for the Elderly". Thesis, Urban Planning and Engineering, HANYANG University, Seoul, Korea.

PUBLICATION & PRESENTATION

LEE, David J.-H. 2012. *Trends in Southeast Regional Freight Movement*. Freight Growth and Livable Communities Workshop, Southeast Diesel Collaborative, Atlanta, Georgia

LEE, David J.-H.; Brown, Colby; Hightower, Troy. 2011. *Bi-Coastal Comparison and Transfer of Land Use Modeling Methods*. 13th TRB Transportation Planning Applications Conference http://www.trbappcon.org/2011conf/TRB2011presentations/Session5/01_LEE_v3.pdf

LEE, David J.-H.; Noonkester, Matt. 2011. Your Vision Our Future. 2011 AMPO Annual Conference. https://www.ampo.org/assets/1435_lee.pdf

LEE, David J.-H. 2009. *FAMPO 2009 Nationwide TMA/MPO Modeling Activity Survey* http://www.fampo.gwregion.org/pdf/Modeling/2009%20MPO%20Modeling%20Survey.pdf

LEE, David J.-H. 2008. *CUSIM-M: Competing-destinations Urban Spatial Interaction Model in MATLAB* http://www.fampo.gwregion.org/pdf/Modeling/LandUseModel_CUSIM_M.pdf

LEE, David J.-H. 2007. Nov. *A Modified Operational Garin-Lowry Model with Competing Destinations.* Presented at the 54th Annual North American Meetings of the Regional Science Association International, in Savannah, Georgia

LEE, David J.-H. 2003. Mar. *Inter-organizational GIS Data Sharing in Decentralized Local Governments*. KEIEI RONSHU Vol.50-3: 1-52 OCLC: 12731715; ISSN: 0387-298X

LEE, David J.-H. 2003. Jan. *Planners' Roles in Democratic Political System.* KEIEI RONSHU Vol.50-2: 281-290 OCLC: 12731715; ISSN: 0387-298X

SYNERGISTIC ACTIVITIES

UTC Project: Bringing Freight Components into Statewide and Regional Travel Demand Forecasting

Dates: 2012 - Present *Role:* Principal Investigator
Sponsors: U.S. Department of Transportation, Research & Innovative Technology Administration (RITA)

This study will explore the possibility of a tour-based freight demand model at the state/regional level utilizing (1) recently available nationwide GPS-based truck movement data, in conjunction with existing data sources such as TRANSEARCH, FAF, etc. (2) detailed employment databases, such as Claritas dataset that provide NAICS sector breakdowns, and (3) regional transport networks, which can show all possible paths of freight movements. The study will investigate the current state of the practice and construct a transferrable framework for state/regional freight demand models, including one or two case studies. Many DOTs and MPOs seek a standardized freight demand model to apply to their state or region. This study is intended to eventually lead to such a freight demand model, laying out long-term guidelines for how to develop a real-world commodity flow-based freight demand model (FDM). The results will inform and examine data sharing, modeling, and collaborative planning and integration of MPO freight activity in statewide freight planning.

UTC Project: Freight movement, port facilities, and economic competitiveness

Dates: 2012 - Present *Role:* Co-Principal Investigator
Sponsors: U.S. Department of Transportation, Research & Innovative Technology Administration (RITA)

This study will focus on the regional and national impacts of port-related freight movement to lay the groundwork for regional planning activities at the megaregion scale that accommodate increased port-related freight. To understand how increased port activity will affect regional transportation networks in the future, it is first important to understand how the network is currently behaving. Given that trucking accounts for 68% of freight movement in the United States (by tonnage) (American Trucking Associations, 2011), trucking will be the subject of the study. The first part of the study will focus on characterizing the behavior of trucking operations once a vehicle departs a port facility. Case studies of select East Coast ports will be conducted to identify the routes that trucks use once they leave the port and understand how the demand along those routes have changed seasonally and year-over-year. These routes will address the freight movement within and between megaregions. Additionally, the study will address a key safety component of truck movement: truck parking. Truck drivers are required by federal regulations to rest after a certain period of on-duty time. An increase in truck traffic will result in an increased need for rest areas in order to operate safely and legally.

The Architecture of the Megaregion

Dates: 2012 - Present *Role:* Co-Principal Investigator

Sponsors: U.S. Department of Transportation, Federal Highway Administration

This project outlines the application of megaregional practice within U.S. planning and policy structures, analyzing the broad spectrum of possibilities of integrating the megaregion concept into current decision-making processes for federal, state, regional and local transportation investment in the U.S. Specifically, the project examines current and historic structures and function of regional and statewide transportation planning and provision in the United States and internationally and analyzes implications of changing approaches to and structures of current transportation planning frameworks, especially those incorporating the megaregions concept in transportation planning.

Georgia SPLOST Database and Clearinghouse for Transportation Finance

Dates: 2012 - Present *Role:* Investigator

Sponsors: Woodruff Foundation

In Georgia, the Special Purpose Local Option Sales Tax (SPLOST) has been enacted since 1985 to enable counties to levy a one percent sales tax to support a variety of local capital projects, such as roads, streets, bridges. In addition, to address regional transportation problems and meet increasing demand for transportation infrastructure at this scale, the Georgia General Assembly in 2010 passed legislation that will allow counties to establish 12 special tax districts throughout the state to create transportation regional SPLOSTs. Given the need of the comprehensive information and guidance for success of the SPLOST implementation, this project develops a clearinghouse of SPLOSTs, including a web portal for data repository and web-based Geographic Information Systems to facilitate the exchange of information and knowledge and providing access to government officials and local and county decision makers and legislators.

GWRC/FAMPO Land Use Forecasting Model Development

Dates: 2006 – 2012 *Role:* Principal-Investigator/Model Developer

Sponsors: Virginia Department of Transportation, Federal Highway Administration

Competing-destinations Urban Spatial Interaction Model (CUSIM) is FAMPO's first land use modeling attempt. The model is based on spatial interaction theories, which handle aggregate level data (TAZ level) rather than individual level data. The model has some extended components from the conventional gravity based general urban models which are often represented as Lowry-type models. That is, incorporating 'competing destinations' concept, the operational land use model, CUSIM-M, can reflect spatial structure issues. The model has been used for forecasting of future land use activities and inter-connected to regional travel demand model to prepare 2035 long range transportation plan (LRTP).

GWRC/FAMPO Travel Demand Model Application and Integration

Dates: 2006 – 2012 *Role:* Principal-Investigator/Modeling Manager

Sponsors: Virginia Department of Transportation, Federal Highway Administration

Initial Travel Demand Forecasting Model for George Washington Region has been developed by Virginia Department of Transportation and MPOs. Once the initial models developed, each MPO takes its primary role for its applications for various projects and studies. The Travel Demand Forecasting Model has been integrated with FAMPO Land Use Forecasting Model.

Park & Ride Lot Siting Feasibility Study

Dates: 2010– 2012 *Role:* Project Manager

Sponsors: Virginia Department of Transportation, Federal Highway Administration

Recent planning studies and long-range transportation plans have identified a need for additional park and ride lot capacity within our region. This study sought to identify locations in the region to be pursued as potential park and ride locations and develop park and ride lot concept plans for each. A total of seven "nodes" were identified throughout the region where additional parking needs were demonstrated.

I-95 Rest Area Access Study

Dates: 2009– 2011 *Role:* Investigator

Sponsors: Virginia Department of Transportation, Federal Highway Administration

For the past several years, the Fredericksburg Area Metropolitan Planning Organization (FAMPO) and its member communities have worked to develop a Long Range Transportation Plan and strategy to address the growing demands on the region's transportation network. Central to this planning has been the need for modernizing existing access to I-95 and adding new access points in the I-95 corridor. One new access location identified in the Long Range Transportation Plan is near the Virginia Welcome Center (Route 3 Area) in the City of Fredericksburg, along with the construction of a new toll limited access facility to serve commuters and commercial center customers. Evaluation of the feasibility and benefits of this access point is the purpose of this study.

INVITED PRESENTATION

- One day lecture for MPO and Modeling at Department of Civil Engineering in UVA for Transportation Planning Course.
- Presentation for CUSIM-M model at Metropolitan Washington Council of Governments (MWCOG).
- Presentation for CUSIM-M model at Virginia Transportation Modeling (VTM) meeting.
- Presentation for FAMPO Modeling Activities at Virginia Transportation Research Council (VTRC): Transportation Planning Research Advisory Committee.