# **CONSULTANT SERVICES PROPOSAL**

FOR

# 2008/2009 ON-CALL TRANSPORTATION MODELING ASSISTANCE (RFP No. R08055)

FOR THE

# LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING OFFICE





APRIL 10, 2008



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April 10, 2008

Ms. Davonna Moore **Transportation Planner** Lawrence-Douglas County MPO 6 East Sixth Street Lawrence, KS 66044

#### RE: Consultant Services Proposal – On-Call Transportation Modeling Services (RFP R08055)

Dear Ms. Moore:

Thank you for your favorable review of LSA's Statement of Qualifications. On behalf of my colleagues at LSA Associates, Inc., I am pleased to submit this Consultant Services Proposal for your consideration in response to your Request for Proposal (RFP) for consultant services to assist the MPO in providing asneeded travel demand modeling service.

The planners, modelers, and engineers at LSA are excited about the prospect of assisting the Lawrence-Douglas County MPO on this important project. Our interest in this project is generated by the fact that long-range transportation planning and travel demand modeling have been the focus of LSA's Fort Collins office since we opened for business. These planning and modeling projects are what we like to do and what we do best.

As presented in the attached proposal, LSA has prepared or is in the process of developing numerous regional and city-based models for clients around the country over the recent past. We have successfully developed and applied models for planning activities in several communities, from small urbanized areas and municipalities to major metropolitan regions, such as the entire southern California region. Although TransCAD has been a focus of ours due to its modern platform and integrated GIS capabilities, our staff has expertise and supports all of the modern modeling software, including VISUM, TModel2, EMME/2, QRSII, Cube/Voyager, and others.

Some of the highlights of our proposal include:

- **TransCAD Expertise** Our significant experience with TransCAD will make this modeling experience occur smoothly and efficiently. We have been developing and customizing TransCAD models for several years and have the in-depth expertise to respond to the MPO staff's desires for accuracy and simplicity.
- **National Experience** LSA has developed, partially developed, and/or applied all of the regional, TransCAD-based travel demand models in the State of Colorado and numerous models in the State of California. In fact, LSA is currently developing a model for the Southern California Association of Governments (SCAG). Our experience extends beyond Colorado and California to Ann Arbor, Michigan; Flagstaff, Arizona; Lawrence, Kansas; and several other communities of various sizes. Our knowledge of travel patterns, trip-making characteristics, and transportation agency data in different regions across the nation will allow us to apply your model in the most efficient, reliable manner.

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- Planning Experience While LSA excels at TransCAD and travel demand modeling, we also have conducted numerous long-range planning studies for regions, communities, corridors, downtown development associations, and many other public and private sector clients. In other words, we are uniquely qualified not only on the technical aspects of the modeling tasks, but also on the results and real-world applications of the model. As a testament to our planning experience, LSA has been the fortunate recipient of the Institute of Transportation Engineers (ITE) Best Practices Plan of the Year Award twice in the last six years.
- Flexibility All aspects of our work efforts are flexible to meet your specific needs.
- Quality Products and Documentation Our Mason Street model documentation has been used by the Federal Transit Administration as a best practices example for other areas to utilize in developing models suitable for transit New Starts funding. The model update we are currently conducting for the Ann Arbor, Michigan, Transportation Management Area (TMA) includes numerous examples of detailed technical memoranda that may be of interest and applicable to your project.
- **Model Enhancements** LSA has extensive experience in developing travel model enhancements. These enhancements provide a higher degree of function for the model to address additional planning issues. The cost estimator and air quality modules we have developed for the Lawrence model are just two examples of the extensive list of enhancements we have developed.
- **Travel Survey and Data Collection** LSA has unprecedented travel survey experience that includes household travel diary O/D surveys, transit on-board surveys, external travel surveys, and many others. While all of these skills may not be required on your project, it is important to note that LSA has the unique ability to utilize existing data to the fullest extent, the experience to collect additional data as necessary, and the knowledge to optimize the MPO's resources in this regard.
- University Town Experience We have developed special generator models for several communities with major universities (e.g., University of Michigan, Colorado State University, University of Northern Colorado, University of Kansas, University of Wyoming, etc.). LSA fully understands the unique character and travel impacts of these major trip generators. In some cases, we also conducted a special generator study at the university to support the model's development.
- FTA New Starts/Small Starts Experience LSA has developed models to be used for the Federal Transit Administration's New Starts/Small Starts program, which has very rigorous technical requirements. LSA has developed close working relationships with FTA's modeling staff and has prepared model documentation that was used by FTA as a best practices example for New Starts applicants.

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We believe that the skills and vision of LSA not only respond to your needs, but our personal service will exceed your expectations. As a Principal in LSA's Fort Collins offices, I can personally commit the necessary resources needed to achieve the goals and objectives you desire for your travel demand modeling needs. LSA will make available our respective transportation planning and modeling staffs so they are at your disposal as your needs warrant.

Thank you for your consideration of LSA for your modeling needs.

Sincerely,

LSA Associates, Inc.

Everett Bacon Principal/Project Manager



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# Work Team Qualifications and Experience



### **FIRM OVERVIEW**

LSA Associates, Inc. (LSA) is a diversified consulting firm specializing in transportation, environmental, and community planning. Our staff offers comprehensive planning services for local governments, regional planning agencies, transportation providers, and the development community. LSA is recognized as an innovator in the fields of service we offer; and we have developed a reputation among clients and peers as being thorough, innovative, and objective.

Owned by its approximately 280 employees, LSA has offered to its client's professional excellence, reliability, and continuity since 1976. Each Principal of the firm is personally responsible for the quality and timeliness of work. Our professionals build longstanding relationships with our clients through sound decisionmaking, collaboration, and creative solutions in all 10 of our offices in California and Colorado.

LSA's Principals maintain significant involvement in all projects that LSA undertakes and provide leadership for the firm. This involvement ensures high quality standards, enhances communication between clients and LSA, and provides consistency and coordination among the LSA offices.

A final measure of LSA's ability to deliver quality products on time and within budget can be confirmed by our long list of valued clients.

## FORT COLLINS OFFICE PROFILE

### FOCUS AREAS

Our primary focus in LSA's Fort Collins office has been to provide quality technical and planning services for 1) long-range multi-modal transportation planning projects, 2) travel demand model development, and 3) infrastructure and development activities.

Complementary to these focus areas, our staff also specializes in corridor studies, land use/transportation planning solutions, air quality analysis, travel behavior surveys, environmental analysis and documentation, web design and development, graphics, and other related services. We utilize the most comprehensive analysis techniques; and our staff is expert in applying the most modern travel demand modeling and geographic information systems (GIS) software to support our projects.



Since opening our Fort Collins office in May 2000, LSA has twice been selected for the coveted Institute of Transportation Engineers (ITE) Transportation Planning Council's "Best Practices Plan of the Year Award" in 2001 and 2004.

### AWARDS

Our first ITE Best Practices Plan Award was received at the ITE International Conference in 2001 for the Mason Street Transportation Corridor Study in Fort Collins, Colorado. LSA again received the ITE Best Practices Award in 2004 for the Transportation Master Plan in the City of Boulder, Colorado. In addition, we recently received the 2006 FHWA/FTA Transportation Planning Excellence Award for *PlanCheyenne,* Cheyenne, Wyoming region's long range transportation plan.

All of these awards were for multi-modal transportation plans that involved the development and application of a detailed travel demand model. LSA encourages our prospective clients to solicit input from our past and present clients regarding their satisfaction with our work and LSA's track record for delivering innovative products on time and within budget.

### **TRANSPORTATION SOLUTIONS**

Mobility is one of the major forces that have structured our present environment and that will shape future directions. Achieving the efficient movement of people and goods is essential for maintaining a desirable quality of life and for accommodating future growth. With this goal as a guiding principle, LSA offers comprehensive multi-modal transportation planning services to support the needs of the public and private sectors.

LSA has provided transportation services to government agencies and private industry throughout the United States. We have applied our expertise to the planning of major regional and interstate highways, projecting future communitywide traffic improvements, development of rapid transit corridors, and identifying solutions to neighborhood traffic impacts. The staff at LSA is committed to finding positive solutions to mobility issues that are sensitive to the community and local environment. In addition to exemplary planning services, LSA provides comprehensive transportation funding and financing services – from regional transportation authorities to communitywide impact fees and small area infrastructure improvement programs.

### LSA's Transportation Planning Services

- Long Range Multi-Modal Transportation Plans
- Travel Demand Model Development and Applications
- Transportation Infrastructure and Development Services
- Transportation Cost Estimates, Funding, and TIP/CIP
- Roadway and Intersection Design, including Modern Roundabouts
- Micro Simulation/Operations Simulation Modeling
- Parking Supply/Demand Studies
- Signal Timing and Progression Analysis
- Traffic Impact Studies
- Transportation Corridor Studies
- Transit Planning
- Bicycle and Pedestrian Plans
- Air Quality Conformity, Emission Inventories, SIP/TCMs

LSA works to apply the proper level of transportation modeling technology to match the needs of the proposed project. We use leading edge traffic modeling software to forecast future traffic growth and use the latest computerized quantitative applications for transportation planning, design, and preliminary engineering. We use customized applications in cases where standard traffic modeling is not appropriate.

LSA staff pays special attention to the interpretation and presentation of highly technical analyses in a manner

that is easy to understand and meaningful for decision-makers and the public. We have an excellent reputation for taking the complex and often confusing issues and presenting them in a way that is clearly understood, without the usual jargon that often prohibits mutual understanding of the problems and possible solutions.



# LSA

### SOPHISTICATED SIMPLICITY

We have successfully completed a wide-range of projects from long-range transportation plans to mixed-use center street design standards, corridor studies, travel forecasting models, traffic impact studies, and many more. Our services are targeted toward sophisticated simplicity. We are sophisticated in our innovation, the use of cutting edge integration and linkage techniques, and expertise in modern software applications for GIS, travel demand modeling, and micro-simulation. We are also simplistic in delivering of our findings and conclusions to the public and decision-makers through understandable figures and exhibits, and user-friendly reports, graphics, and standards.

LSA's Fort Collins office has prepared over 30 long-range transportation plans since 2000. Several of these long-range transportation plans were for Metropolitan Planning Organizations (MPO) and required model development and applications. Over the same time period, our office has also developed and/or updated numerous travel demand models. Many of these models were developed for MPOs in Colorado and across the nation. Several of these areas are air quality non-attainment areas and/or Transportation Management Areas (TMA). Through these efforts, LSA has acquired exceptional capabilities with regard to developing models that meet the requirements of SAFETEA-LU and its State and Metropolitan Planning Regulations.

Our models not only meet the stringent requirements of federal and state legislation, but they are also very user friendly, consistent, and intuitive to provide value-added capability to the planning activities of our clients. In addition, we have successfully implemented models that have withstood the stringent modeling quality of the Federal Transit Administration's (FTA) New Starts program. In fact, one of our documentation efforts was used by FTA as a best practices example for preparing model reports.

A partial listing of the transportation planning and travel demand modeling projects conducted by the LSA Fort Collins office since 2000 is shown on the following map. The table that follows identifies the characteristics and planning emphasis areas of each of the representative projects.



# LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING OFFICE

S	A

Projects (May 2000 to Present)	Comprehensive Long- Range Transportation Plan	Model Development	Model Application	Multi Modal	Access Management	Synchro Signal Timing/Intersection/ LOS	Funding/Fee Programs	Capital Improvements	Public Participation	Air Quality Mobile 5/6	Bicycle and Pedestrian Plans
Arvada Transportation Master Plan	•		•	٠		•					
Boulder County Transit Study			•	•							
Boulder Transportation Master Plan Update & TransCAD Model	•	•	•	•				•	•	•	
Development											
Casper Area MPO Walkability Study	٠			٠					٠		٠
Champaign, III Transportation Master Plan	٠		•	•	٠	•	•	٠	٠		
Chapel Hill Comprehensive				-					-		
Transportation Plan	•			•		•			•		
Cheyenne, Wyoming PlanCheyenne (MPO)	•	•	•	٠	•	•	•	•	•		
Colorado Springs Comprehensive Plan,	•		•						٠		
Durango/La Plata County, Colorado											
I RTP and TransCAD Model	•	•			•	•		•	•		
Development	•	•	•	•	•	•		•	•		
El Paso County Major Transportation											
Corridor Plan	٠	•	•	•	•		•	٠	٠	٠	
Erie Transportation Master Plan	٠		•	٠		•					
Farmington, NM (MPO) Transportation			_								
Plan	•	•	•	•	•			•	•		
Flagstaff (MPO) TransCAD Model Update		٠									
Fort Collins Mason Street Transportation		-		-				-	-		
Master Plan	•	•	•	•	•	•		•	•	•	
Fort Collins Pedestrian Plan	•			•					•		
Grand Valley/Mesa County Model Update		•	•			•					
Irvine LRTP Vision Plan	•		•	٠	•				•		
Jefferson County FasTracks Assessment			•	•							
Kansas City Focus Transportation Plan	•			٠				•	٠		
Kansas City Walkability Plan	•			٠					•		•
Lake Elsinore, California TransCAD		•						•			
Travel Model and Road Fee Program		•				•		-			
Laramie, Wyoming Long-Range	•	•	•			•		•	•		
I ransportation Plan	-	-				-		-	-		
Lawrence Kansas Transportation 2025	•		•	•	•			•	•		
Long-Kange Transportation Plan (MPO)								-			
LINCOIN/Lancaster County Long-Kange	•		•	•	•			•	•		
I ransportation Plan (MPO)											
TransCAD Model Development	٠		•			•			•	•	
I oveland Multi-Modal Transportation Plan				•			•	•			

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# LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING OFFICE

Projects (May 2000 to Present)	Comprehensive Long- Range Transportation Plan	Model Development	Model Application	Multi Modal	Access Management	Synchro Signal Timing/Intersection/ LOS	Funding/Fee Programs	Capital Improvements	Public Participation	Air Quality Mobile 5/6	Bicycle and Pedestrian Plans
Metroplan/Central Arkansas 2030 Long- Bange Transportation Plan (MPO)	•		•	•	•			•	•	•	
North Front Range Summit/Regional Transportation Authority			•	•							
North Front Range MPO TransCAD Development and Update		٠		٠						٠	
Pikes Peak Area Council of Governments Long Range Transportation Plan	•			•			•	•	•		
Rapid City Area MPO Long Range Transportation Plan	•		٠	٠		٠	٠	٠	٠		
SCAG Weekend Travel Demand Model		•	•			•				•	
Thornton Long-Range Transportation Plan and TransCAD Model Development	•	•	•	•		•		•	•		
Washtenaw Area Transportation Study Model Improvements		٠	٠								
West Cheyenne Long-Range Transportation Plan	٠		٠					•	٠		

### TRAVEL DEMAND MODELING SERVICES



### **Travel Model Enhancements**

In addition to traditional model development, LSA has prepared proprietary, value-added enhancements that process model results to efficiently and consistently report reliable information to support planning, design, engineering, alternatives analysis, and other needs.

These menu driven enhancement modules are designed to allow the occasional model user to simply make land use and network changes, run the model, and obtain meaningful information to determine the effect of the change.

LSA has developed the following enhancement modules for prior clients and offers these capabilities on all modeling projects we conduct: LSA offers our clients unsurpassed support for one of land use and transportation planning's most important tools: travel demand models. Our staff has significant experience in all aspects of travel modeling, from study applications to multi-modal enhancements, travel surveys, and comprehensive model development. We know that several people besides just model practitioners, such as elected officials and the public, have an interest in model results. That's why we provide our clients with high quality presentation graphics of model results that are simple and clear in their message. Our clients appreciate our knowledge of the modeling process and our understanding of the abilities and limitations of travel demand models. We routinely analyze and interpret model results and enhance their meaning with performance summaries of relevant measures to support the decision-making process.

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LSA supports all of the modern, popular modeling software systems, including TransCAD, Cube/Voyager, VISUM, Emme, and older platforms such as UTPS, TranPlan, MinUTP, QRSII, TP+/Viper, and TModel. In our model development projects, we routinely convert travel models from older software packages to the more modern software environments.

NFR Performance Report	
NRR Performance Report         Scenario:       Calibrated Base         Dutput:       P:NFRMP0_ModelUpdate06_NFT537\mo         Basic Reports:       Input Files and Parameters         Image:       Input Files and Parameters         Image:       Input Network Summary*         Socioeconomic Data Summary       All         Validation Reports:       Input Summary         Image:       Image: Summary         Image:       Count VMT Summary         All       None	del\Model Runs\Test\Dutput\{         Performance Reports:             ✓ Trip Generation Summary             ✓ Trip Distribution Summary             ✓ Non-motorized Mode Split Summary             ✓ Motorized Mode Summary             ✓ Assigned Trips Summary             ✓ Daily Assignment Summary             ✓ Daily Assignment Summary             ✓ Assignment Speed Summary             ✓ Air Quality Summary             ▲ Air Quality Summary
* Create Reports For: ✓ Entire Model ✓ NFR Boundary ✓ Fort Collins ✓ Fort Collins AQ ✓ Greeley ✓ Greeley AQ ✓ Loveland ✓ RSC in NFR ✓ Other	Global Selection: Select All Reports Select No Reports Select All Areas Select No Areas

- Menu Driven Scenario Manager and Dialogue Boxes: Streamlines the modeling process and assures accuracy of data file inputs. Provides a simplified menu driven approach for running the model without having to memorize the more complicated input procedures and file requirements.
- **Standardized Performance Report Module**: Provides a series of consistent data summaries such as vehicle miles of travel, hours of congestion and performance by roadway classification and Level of Service.
- **Standardized Mapping**: Maps include bandwidth volume and color-coded level of service map for each alternative that can visually be compared between alternatives.
- NCHRP Post Processing Module: Standardized and automated procedures to adjust forecasts based on differences between existing counts and base year model results.
- Cost Estimator Module: A GIS interface that utilizes planning level linear costs and calculates total and phased alternative improvement costs.
- Intersection Turn Movement Estimator and Synchro Intersection Evaluation Module: Calculates forecasted level of service and provides for an intersection evaluation of future conditions.
- **Project Tracker**: This is a select zone assignment module that determines the amount and distribution of traffic from a particular zone or project throughout the

network.



• Facility Tracker: Similar to the Project Tracker except in this module, the traffic traveling along a given link or through a specific intersection is assessed as to which

project or zone the traffic originates.

- **Transit Trip Tables**: Extracted trip table along transit corridors for estimating transit trips for mode split models without mode choice enhancements.
- **Bicycle/Pedestrian Trip Tables**: Short and moderate distance trip table extraction to identify priority areas for bicycle and pedestrian connections.
- MOBILE6.2/EMFAC Air Emissions Module: State-ofthe-art link, area and aggregate based air emissions analysis.
- Model Documentation/ Training: Highquality model documentation and training program.



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### **Model Conversion and Development**

LSA staff has significant experience developing new models and converting existing models to the newer software environments, customizing them for the unique desires and needs of each client, and thoroughly testing them to meet rigorous calibration and validation standards. LSA believes that a strong technical foundation is the key to developing a model that provides reliable, consistent, defendable results. We understand the large audience that uses model results in their decision-making, be it the public, client staff, or elected officials.

1: YEAR 2000 TEST SCENARIO
Setup Scenarios
LSA Associates, Inc.
4 - Pathbuilding
5 - Trip Distribution
6 - Traffic Assignment

One key to a good travel model is the ability to easily and reliably produce results to support alternatives analysis. For each model that LSA creates, a scenario manager stores all of the file names for every alternative and any necessary parameters. This keeps all the file names organized in an easy to use format. Each model also has a main dialog box from which the model is run from start to finish or through intermediate steps. This dialog box is controlled by a resource file that contains the exact steps, procedures, and variables for every model run. Thus, every model run is completed in the same way, yielding comparable results.

LSA

### Model Training

One feature unique to LSA's travel model services is the training we offer to all of our clients for which we prepare travel modeling tools. Near the completion of a travel model development project, we trail the client staff according to their desires, resources, and needs. Each training session is tailored to the specific client with the combined use of PowerPoint presentations and the new travel model. Shorter sessions (2-4 hours) provide an overview of the capabilities of the model and can be provided for a wide-range of interests and technical ability. Longer sessions (1–3 days) providing detailed specifics of the new model can be arranged for more technical audiences and staff expected to run the model. Training is recommended to all clients for whom LSA has completed a new model.

LSA staff also provides training to agencies and MPOs on the "Tips, Trips, and Traps of TransCAD Modeling." This training tool is designed to help communities understand the full benefits and limitations of performing transportation modeling in TransCAD. In addition, several of our projects involve the evaluation of software



platforms to meet the needs of a specific client. With our expansive modeling experience, we are able to provide an unbiased evaluation of the merits and limitations of each package relative toe the client's needs.

### Land Use, Transportation, and Design Sensitivity

It has long been recognized that transportation mode choice is dependent not just on the available transportation facilities, but also on the land use mix, density, design, and walkability of the local environment. LSA has prepared and integrated functions within travel models that increase sensitivity to Transit Oriented Developments (TOD), Traditional Neighborhood Design, and other Smart Growth/New Urbanist development patterns. These include production end household activity and density variables and attraction end employment activity and density variables in mode choice models. It also includes the specification and development of socioeconomic variables to support modeling with enhanced land use parameters and multi-modal sensitivity. In addition, LSA has developed multi-modal corridor assessments that correlate land use and design with base travel characteristics from which to predict mode shifts to walking, bicycling, and transit.

### **Micro-Simulation**

Micro-simulation modeling of transportation conditions is fast becoming the preferred method for presentation and analysis of various transportation alternatives. Software such as Synchro, CORSIM, and VISSIM allow for a technically accurate operational analysis as well as



attractive visual representation of the results. VISSIM in particular allows for a realistic, 3D view of an intersection, interchange, or planning area. It combines the simulation of vehicles, pedestrians, and bicyclists in context to the



roadway network and surrounding buildings. LSA is also involved in a project that will test the new TransModeler software capability that integrates with the TransCAD software. TransModeler offers promising opportunities to simulate a larger regional transportation network.

### **Travel Survey Services**



Travel surveys are a foundational element of the transportation planning process. Among their wide variety of uses, they support the development of travel demand models by providing the behavioral aspects of travel as they relate to socioeconomic characteristics, the transportation supply, and localized land use densities and mixes.

LSA offers comprehensive survey support services that include not only survey analysis but also their design and implementation. Our experience includes household travel diary surveys, onboard transit surveys, origin-destination surveys, external travel studies, special generator studies, travel time/speed studies, and others. LSA develops and applies travel models and conducts long-range transportation planning activities, so we understand the application of travel data and appreciate the complexity and resources necessary to obtain it. Our staff's survey experience, combined with our strategic working relationships with national survey design and implementation experts and high quality data collection firms, allows us to provide the best service for virtually every type of travel survey need.

### LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING OFFICE

### MULTI-MODAL TRANSPORTATION PLANNING SERVICES

### Long Range Transportation Plans

LSA specializes in the development of long-range transportation plans for communities that prioritize planning in their land development and transportation improvement processes. They know that these plans can provide a fundamental basis for decisionmaking to improve the quality of life for their citizens. As we've said, "plan your work and work your plan." With their implementation, our transportation plans elevate the status of pedestrian, bicycle, and transit systems and address the needs of the roadway system as well. LSA's extensive knowledge of SAFETEA-LU and the Clean Air Act has allowed us to develop long-range plans for several Metropolitan Planning Organizations and local governments. Visionary plans must be community-based to be effective, so we have refined our public involvement tools and techniques to listen and respond to the citizenry, elected officials, and staff in each community we serve. Inclusive techniques and outstanding graphical



capabilities add quality to the public process and enhance the plan documents.

### Land Use/Transportation Connections

The relationships between land use, transportation, and the environment provides a complex series of challenges and opportunities as communities struggle to cope with the impacts of growth. LSA has focused on these complex relationships and has developed creative tools that assist jurisdictions with their unique problems in obtaining a balanced vision for the future. Each community's definition of balance is different. While the choices can be difficult, LSA makes it easy to understand the trade-offs using high-quality presentation graphics, technically sound analysis, and realistic interpretation of the results.





### Multi-Modal Transportation Plans

Alternative transportation modes such as transit, cycling, and walking provide choices for the traveling public and enhance a community's guality of life. LSA can show our clients how to incorporate multimodal considerations in every aspect of the land use and transportation planning process. We have developed pedestrian level of service methodologies and neighborhood assessment surveys, developed guidelines for multi-modal streets and intersection design standards, made recommendations for subdivision regulations, development standards, and traffic impact analysis guidelines to elevate the status of alternative modes in several progressive communities.



LSA has been an innovator in pedestrian and bicycle planning. A brief summary of our work efforts and accomplishments include:

- Pedestrian Level of Service: In preparing the pedestrian plan for the City of Fort Collins, Colorado, we prepared five pedestrian levels of service measurements for directness, continuity, street crossing and visual interest, and amenities. This initial work effort has been refined and has been adopted by other jurisdictions across the United States.
- Neighborhood Walking Surveys: In preparing the City of Kansas City, Missouri's Walkability Plan, LSA developed procedures for evaluating the pedestrian system at the regional, community, district, and neighborhood level. The hands-on neighborhood pedestrian assessment has been extremely successful and is currently identified in the winter 2006 edition of the Planning Commissions Journal list of Top 21 Bright Ideas to Plan our Cities.

mode split, the City of Boulder wanted to further increase



the use of alternative modes to address their transportation needs. This work effort focused on the details of what constitutes a multi-modal corridor, including both the details and design of the pedestrian and bicycle facilities along the corridor. This project received the Institute of Transportation Engineers' 2004 Plan of the Year Award and a DRCOG MetroVision Award.

- Mobility Report Cards: As a product of the Town of Chapel Hill's Comprehensive Plan, LSA prepared the third Mobility Report Card that measured and evaluated the success of the plan's implementation to achieve modal shifts to pedestrian, bicycle, and transit.
- Pedestrian and Bicycle Demand Estimating: Because traditional travel models do not forecast pedestrian and bicycle trips, we needed a method for determining where potential pedestrian and bicycle trips might occur. A technique that we have developed and used successfully on a number of projects is to assign only the short trips in increments of less then  $\frac{1}{2}$  mile,  $\frac{1}{2}$  to 3 miles, and 3-6 miles. Using GIS overlays, the potential bicycle and pedestrian trips stand out and are effective in determining connections and prioritization. We also developed a GIS parcel based short trip assignment methodology for the City of Kansas City which compared potential walk trip activity with the pedestrian system to determine investment areas at the regional scale.

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 Pedestrian and Bicycle Transportation Impact Analysis: Jurisdictions typically have traffic impact analysis guidelines that address vehicle trip impacts. LSA has developed traffic impact guidelines for communities across the United States that incorporate procedures for evaluating their pedestrian and bicycle network. In the City of Kansas City, this approach was refined through testing with local traffic engineers and real projects. Communities that have been using these requirements have seen a marked improvement in the pedestrian and bicycle infrastructure with new development.



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Multi-Modal Standards and Guidelines: Over the past ten years, LSA has prepared pedestrian and bicycle standards and guidelines for jurisdictions throughout the Untied States. With each new client, we have been refining and adding new elements to where we now have a comprehensive list of standards and guidelines that we can share with new clients that have withstood the scrutiny of traffic engineers, transportation planners, planning commissioners, and city councils across the United States.



• Transit Oriented Development/Smart Growth Modeling: A particular area of concern in the traditional modeling process is that the travel model cannot distinguish between a traffic analysis zone that is made up of stand alone uses or a new urbanism/ transit oriented development traffic analysis zone with the same number of jobs and population. LSA is currently working with the North Front Range on an innovative approach at distinguishing the differences of the urban design and mix of uses within a zone and refining the assignment process to address pedestrian, bicycle, and transit travel.



### **Corridor Studies**

Corridor studies lay the groundwork for land use planning and multi-modal improvements that can greatly enhance a community's appeal and quality of life. These days, however, multiple interests and close public scrutiny require innovative ideas, technically based solutions, and a high degree of public involvement that brings neighborhoods, businesses, and other corridor stakeholders to the table in an informed, collaborative manner. Consideration of alternative mode opportunities, technology, mixed-use/ transit oriented land uses, and detailed design elements allow LSA to build quality into each corridor solution.



### Facilitation/Training/Workshops



LSA has embraced the new era of enhanced public participation by advancing the tools and techniques of the transportation planning process. Our inclusive methods and hands-on approach bring varying interests to the table to expose good ideas in a collaborative manner. We have conducted focused workshops for bicycle and pedestrian planning, travel demand management, transit, and travel demand modeling among others. As proven experts in our field, we facilitate the generation of good ideas and evaluate them based on merit in an open forum. We can "carry the water" on many controversial issues in order to alleviate some of the burden from our client's shoulders.



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## **REPRESENTATIVE PROJECTS**

### TRAVEL DEMAND MODELING

### SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS WEEKEND TRAVEL MODEL

### Irvine, California

The Southern California Association of Governments (SCAG) has a need for a weekend travel model in order to better analyze ozone-producing travel behavior on the weekend that causes exceedences of air quality standards early in the work week. LSA was selected by SCAG to prepare the weekend model due to our unique TransCAD modeling capabilities, knowledge of the region, and extensive modeling experience in large, medium, and small communities. Everett Bacon is serving as project manager and Sean McAtee is the chief modeler. As this project progresses, we will be working with SCAG, Caltrans, and numerous local governments and agencies to coordinate this effort for a modeling area that includes about 18 million people in one of the largest and most diverse regions in the country.

### SAN LUIS OBISPO TRAFFIC MODEL SERVICES

### San Luis Obispo, California

LSA was recently selected to prepare a citywide model for the City of San Luis Obispo, California. Although a regional model exists through the MPO, the City desired a more detailed model that utilized locally collected data. One of the key components of this effort is to identify what data is available and what might be collected. For example, Cal Poly, a nationally-ranked 4-year university, has a large measurable influence in the city, but very little data exists with regard to travel patterns. The university, along with transit travel and tourist/visitor activity, will be focuses of the effort. LSA is leading this project in collaboration with Cambridge Systematics.

### 2008 Springfield Travel Demand Model

### Springfield, Illinois

LSA was recently selected for developing a new regional travel demand model for the Springfield region's metropolitan planning organization (MPO). The MPO has made significant investments in staff, hardware, and training to develop a model and have dedicated staff available to maintain and utilize it. With these goals in mind, LSA developed a model development program that will take full advantage of these investments by utilizing local staff and preparing a customized and automated model that will not require significant out year maintenance expenses.

### TRAVEL DEMAND MODEL FOR THE WASHTENAW AREA TRANSPORTATION STUDY Ann Arbor, Michigan



LSA is currently updating and enhancing the regional travel demand model for this federally-designated Transportation Management Area (TMA) and air quality non-attainment area. Several enhancements are being incorporated into this TransCAD-based model, including enhanced mode choice treatment of external auto trips accessing transit via park and ride lots. In addition, special processing for University of Michigan trips will more accurately depict the unique travel to and from this major multimodal traffic generator. All aspects of model are being updated in this significant effort due to the stringent TMA requirements imposed on the region. Mr. Everett Bacon serves as project manager, leading a team of modelers that are preparing approximately twenty technical memoranda on detailed topics that will culminate in the model's update.

### 2005 VALIDATION REPORT FOR THE IRVINE TRANSPORTATION ANALYSIS MODEL Irvine, California



The City of Irvine recently contracted with LSA to conduct an independent review of the updated validation of their Irving Transportation Analysis Model (ITAM). The model uses an interface that takes advantage of the regional and countywide models of SCAG and Orange County to maintain consistency in model processes and results. The updated validation includes modifications to this interface, additional traffic counts, and updated socioeconomic data. LSA used the CUBE software platform to review the model's validation. Validation tests included statistical comparisons and analysis for several parameters, including root mean squared error, scattergram plots, R-squared computations, screenline analysis, and others. The final product was a validation report for the 2005 model.

# 2005/2035 MESA COUNTY REGIONAL TRAVEL MODEL UPDATE – GRAND JUNCTION, CO Mesa County, Colorado

LSA recently updated the Regional Travel Model for the Metropolitan Planning Organization (MPO) of the Mesa County area. Several enhancements were made to this TransCAD model, including new trip purposes, increased trip generation sensitivity to household sizes and incomes, expansion of the model's boundary, special University trip processing, and streamlined network processing. New external travel estimates were made based on a 2006 External Travel Study conducted by LSA during the model's development. Performance reporting enhancements include NCHRP post processing and forecasting of intersection turning movements for level of service analysis. As part of this project, LSA will be providing annual on-call modeling services to the MPO. The model will be used by the MPO to support the development of the regional transportation plan,

Mesa County Regional Travel Mode			>
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─ Model Steps		C	reate report when done
1 · Prepare Networks		4 - Trip Distri	oution
2 · Trip Generation		5 - Traffic Assi	gnment
3 - Impedance Matrix		6 - Post-Proc	essing
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	LSA Associat	es, Inc.	

transportation improvement program, corridor studies, and other planning activities in this fast-growing region.

### COLORADO NORTH FRONT RANGE MPO REGIONAL TRAVEL MODEL North Front Range Metropolitan Planning Organization, Colorado



LSA has been retained over the past three years to both develop and update the North Front Range Metropolitan Planning Organization travel model. With eleven municipalities, two counties and two universities, this effort has presented some unique challenges and opportunities. Census 2000 data forms the basis of the base year socioeconomic dataset. Numerous enhancements were incorporated into the model, including speed feedback, emissions processing for conformity and State Implementation Plan needs, system performance measures, distance-based allocation models for bike, walk, and school trips, and automated NCHRP post processing. The final product is a fully automated and customized TransCAD model that streamlines the processing requirements for testing and

evaluating land use and transportation alternatives and minimizes errors associated with manual operations. LSA continues to work with the MPO to update and enhance the North Front Range Regional Travel Model.

# 2005/2030 LAWRENCE AREA REGIONAL TRAVEL MODEL CONVERSION AND UPDATE Lawrence/Douglas County, Kansas



LSA recently completed the conversion and update of the travel demand model for the Lawrence/Douglas County Metropolitan Planning Organization. This effort involved converting the model from QRSII to TransCAD and the addition of several enhancement functions. Enhancements include NCHRP 255 volume-count error adjustments, intersection turning movement and level of service analysis, and others. In addition, a special home-based university trip purpose was added to the model to provide additional sensitivity to the unique trip-making characteristics associated with the University of Kansas, which is a major generator of traffic and has significant influence on the community in many ways. The updated model is anticipated to play an important role in the update of the region's 2030 long-range transportation plan.

### FLAGSTAFF MPO TRAVEL MODEL UPDATE

### Flagstaff Metropolitan Planning Organization, Arizona

LSA provided assistance to the Flagstaff MPO to update and recalibrate the MPO's TransCAD travel model. This update included the addition of enhancements such as summary reports, automated mapping functions, an integrated network database, traffic impact study capabilities, and a peak hour model. As with most TransCAD models LSA designs, the Flagstaff model included an enhanced user friendly graphical user interface and scenario manager. LSA staff provided a one-day training session to familiarize additional staff with the travel model and to help the City and MPO move towards a consolidated GIS and Travel Model database. Once development of the updated travel model was complete, LSA provided assistance in running alternatives analysis to evaluate potential future roadway improvements.



### LAKE ELSINORE TRAFFIC MODEL AND ROAD FEE PROGRAM City of Lake Elsinore, California

City of Lake Elsinore	1: YEAR 2000 TEST SCENARIO			
Road Fee Program Transportation Model	Setup Scenarios			
Stop after each step	LSA Associates, Inc.			
1 - Create Networks	4 - Pathbuilding			
2 - Land Use Conversion	5 - Trip Distribution			
3 - Trip Generation	6 - Traffic Assignment			

LSA prepared the traffic model and road fee program for the City of Lake Elsinore, in Riverside County, California. The traffic model was developed consistent with the regional Riverside – San Bernardino Area Comprehensive Transportation Plan Model, but with increased zone and network detail in the City and surrounding area. In addition, the traffic model utilized land use instead of socioeconomic data as a basis for trip generation. These enhancements allow for the analysis of impacts from the City's General Plan build-out scenario so that road improvements fees could be allocated to future developments. The model was

developed in the TransCAD environment to take advantage of the software's GIS and Windows capabilities.

### MASON STREET MULTI-MODAL TRAVEL MODEL City of Fort Collins, Colorado

In January 1999, the City of Fort Collins initiated the Mason Street Transportation Corridor study. Extending north and south through the center of the city, it was envisioned to enhance opportunities for pedestrians, bicyclists, and transit riders through the provision of multimodal transportation improvements along its five mile length. To support this project, LSA staff led an effort to enhance the North Front Range Regional Travel Model so that transit alternatives could be simulated and evaluated. The model development component of the Mason project also provided for the conversion of the model to

Mason Street Multi-Modal Travel Model - Phase 3 Model - 10/00	1 - 1998 PHASE 3 WITH MOST CURRENT DATA
TRANSPORTATION CORRIDOR	Setup Scenarios
Stop after each step	LSA Associates, Inc.
Create Networks	Run Trip Distribution
Prepare Socioeconomic Data for Trip Generation	Run Mode Models
Run Trip Generation	Transform PA to OD and Time of Day
Create Impedance Matrix	Run Trip Assignment
ρ	uit Run Speed Feedback

## LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING OFFICE

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TransCAD. LSA applied the fully developed TransCAD model as part of the alternatives analysis for the Mason Street project. Results were used to assist in the selection of transportation improvement options in the corridor and to guide the refinement and phasing of the preferred transit alternative. The success of the Concept Plan was further complemented with the Plan being selected by the Institute of Transportation Engineers for the International 2001 Best Practices Award. Another note is that FTA has distributed the Mason Models Documentation Report as an example to other jurisdictions submitting FTA New Starts.

# FARMINGTON, NEW MEXICO REGIONAL MPO MODEL Farmington, New Mexico

LSA prepared the Farmington Metropolitan Planning Organization Long Range Transportation Plan. Having exceeded the minimum MPO population criteria in the 2000 Census, this was the MPO's first Plan. The preparation of the Transportation Plan included conversion of the City's travel model from the TMODEL2 platform to the VISUM software package. The City's model was also expanded to include the nearby cities of Aztec and Bloomfield and was recalibrated to properly reflect the characteristics of this larger area. The updated travel model was then applied in the development of the MPO's Long Range Transportation Plan.



### KANSAS CITY MODEL TRAINING Kansas City, Kansas



LSA has provided the City of Kansas City's Transportation staff with a three day TransCAD Model Training Workshop. Kansas City staff was trained to edit, run, and interpret results of the Kansas City Peak Hour Travel Model. The training workshop included both information on basic use of the TransCAD software and detailed information about use of the City's travel model. LSA also discussed the modeling process and suggested adjustments to the existing algorithms. During the course of the training, several examples were explored, including investigation of potential bridge closure. This workshop provided Kansas City Staff with knowledge and skills that will allow greater utilization of the City's TransCAD travel model.

### BOULDER VALLEY TRAVEL MODEL City of Boulder, Colorado

A preliminary TransCAD model, based on a MinUTP model, was created for the Denver Regional Council of Governments (DRCOG) by the TransCAD developer, Caliper Corporation. LSA modified, enhanced, and applied this model for the City of Boulder and the surrounding Boulder Valley. Review of the preliminary TransCAD model script included the identification and repair of several algorithms and the scripting of additional modules. With its high growth and unique development patterns combined with a community focus on alternative modes and environmental awareness, the Boulder modeling effort provided several challenges. LSA responded with innovative GIS-based applications to assess the relationships

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between service attributes and potential markets. The DRCOG mode choice procedure was replaced with a customized model that estimated effects of multimodal approaches to transportation planning such as travel demand management and bicycle and pedestrian facility enhancement. LSA also incorporated EPA's Mobile emission factor model so that air quality impacts could be measured easily for specific projects or transportation control measures.

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### LAND USE/TRANSPORTATION PLANS

The following is a small selection of our extensive list of long-range, multi-modal plans.

### IRVINE LONG RANGE TRANSPORTATION VISION PLAN Irvine, California



The City of Irvine has been recognized around the world as one of the great planned cities of the late 20<sup>th</sup> Century. Visions of connected villages to live, work, shop and play were part of the original design that created the magnificent City it is today. As the City entered the 21<sup>st</sup> Century and still onethird of the City yet to be built, the City of Irvine retained the services of LSA Associates, Inc. to prepare a mobility report card of how they are doing today and develop a "Vision" for future transportation. This vision expands on the General Plan Circulation Element goal "to provide a balanced transportation system." Keeping the City of Irvine as an oasis of mobility is extremely challenging with being nestled in a growing and populous Orange County. With

increased local and regional growth, the original master street plan still works well but needs tweaking. The vision of pedestrian and bicycle trails that connects all parts of the City remains viable. The next major undertaking is in the area of transit to serve the growing and aging population. Critical to the success of transit is the regional air and rail connections with local transit connections to home, work, services, and play.

### CITY OF CHAMPAIGN TRANSPORTATION MASTER PLAN City of Champaign



LSA Associates, Inc. is currently preparing the City of Champaign, Illinois Multi-Modal Transportation Master Plan for the City and its growth areas. This Transportation Master Plan will become an element of the Comprehensive Plan and will replace the existing Transportation Plan developed in 1992. The Plan will create a vision for a multi-modal transportation system that helps achieve the City's goals of sustainable growth. The Plan will also give both technical and policy direction for decisions related to the planning for transportation facilities. Because of strong public input for seeking a different growth direction instead of the recent dispersed development patterns, LSA's work effort includes the development of land use guidelines and policies to promote multi-modal

development and travel, and a multi-modal transportation plan integrated with the proposed mixed use walkable community.

### NORTH FRONT RANGE REGIONAL TRANSPORTATION AUTHORITY FEASIBILITY STUDY North Front Range Metropolitan Planning Organization

Recognizing the severe funding limitations for implementing the regions transportation system, coupled with the successes of the FasTracks and Pikes Peak Region Regional Transportation Authority (RTA), the North Front Range Metropolitan Planning Organization Council established an RTA subcommittee made up of mayors and commissioners of the member jurisdictions to assess the feasibility of an RTA for the North Front Range. LSA Associates, Inc. is the lead consultant retained to solicit public dialog and identify the types of regional improvements that might be included in an RTA. To solicit input to this request, LSA held a North Front Range Transportation Summit to explore future transportation choices for the



region, including opportunities for highway and interchange improvements, regional bus and rail transit connections between cities and activity areas, bicycle and pedestrian mobility, system maintenance, and others. The Summit was held with over 300 representatives from the business community, environmental groups, local governments, elected officials, and others from the general public. Many of these groups co-sponsored the event along with the North Front Range Metropolitan Planning Organization. The Summit event focus was on "Connections," an interactive exercise

**On-Call Travel Demand Modeling Services Proposal** 

developed exclusively for this event where players explored future transportation priorities by identifying needs, purchasing transportation improvements, and evaluating trade-offs. Each group was given resources to negotiate, spend, and build their future transportation vision for the region. This Transportation Summit was unprecedented in the North Front Range in bringing together diverse geographic and political interests to begin a conversation on our transportation needs.

### LONGMONT MULTI-MODAL TRANSPORTATION PLAN City of Longmont, Colorado

This Multi-Modal Transportation Plan (MMTP) was developed to accommodate future growth and provide an integrated transportation system that offers residents, employees, and visitors multiple means of efficient travel. It incorporates bicycle, pedestrian, transit, and automobile modes of travel, as well as travel demand management programs to reduce traffic congestion and support alternative modes. Key components of this Multi-Modal System Plan include a Bicycle Vision Plan and Pedestrian Vision Plan. The Bicycle Vision Plan integrates on-street bicycle facilities, such as lanes and routes with a seamless, comprehensive off-street system to encourage bicycling. The Pedestrian Vision Plan identifies pedestrian

districts and zones throughout the City. These districts bring together all modes and provide a unique opportunity to focus attention on areas that are or should be particularly walkable. The Pedestrian Vision Plan set forth desirable characteristics for different types of pedestrian districts and zones (downtown, transit centers, shopping/mixed use centers, and schools/parks).

### **BOULDER TRANSPORTATION MASTER PLAN UPDATE**

### City of Boulder, Colorado

In 1979, the City of Boulder changed directions in how to plan for transportation by focusing on pedestrian, bicycle, and transit mobility rather than further investments in roadway widenings. Since that decision, the City has become nationally recognized as a leader in providing alternative modes for effectively addressing mobility. LSA was retained to update their Transportation Master Plan (TMP). The TMP update focused on four unique and related areas. The first was defining and planning for multi-modal corridors, which included understanding the dynamics of transportation facilities, land use and the design on solving transportation demand. The second area was regional connections, where emphasis on partnerships with Boulder County and adjacent cities is being undertaken. The third area, "Travel Demand Management" emphasis was not just to identify a toolbox of programs and improvements, but to also include methods

of implementation and performance measuring through Transportation Management Organizations. The fourth area was creative and innovative funding strategies. In addition to the preparation of the TMP, LSA was responsible for the development of a TransCAD Model developed from the regional transportation model. The final product was an electronic, web-based Transportation Master Plan with "Map-It" technology for examining Plan elements and implementation schedules at different levels of detail from City overview to neighborhood improvements. LSA was the winner of the National 2004 ITE "Best Practices Award" for this project, as well as the Metro Vision Award for the Denver Regional Council of Governments.



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### FORT COLLINS TRANSPORTATION MASTER PLAN UPDATE City of Fort Collins, Colorado



LSA was part of the consultant team in preparation of the City of Fort Collins Transportation Master Plan Update. LSA was responsible for the land use socioeconomic data for the TransCAD TAZ's, model runs and analysis. An innovative concept included in this work effort was the interface between TransCAD and Synchro (signal timing software) from which the 150 signalized intersections level of service are calibrated to link capacities level of service. Utilizing TransCAD modeling capabilities, alternatives were compared through differential mapping of congested and un-congested intersections and links.

### RAPID CITY AREA 2030 LONG RANGE TRANSPORTATION PLAN Rapid City, South Dakota

LSA prepared the Long Range Transportation Plan for this dynamic community in the Black Hills of South Dakota. The Long Range Transportation Plan identified future transportation investments for all modes of transportation. Although the region's mobility continues to be dominated by the automobile, other modes such as public transit, pedestrian, and bicycle transportation are becoming increasingly important means of travel and were addressed in this Long Range Transportation Plan. Aviation travel, railroads, trucks, and freight movement were also included in the planning process, but to a lesser extent. In addition to the usual requirements for



regional transportation plans, this Plan included a detailed implementation timeline for priority projects, objectives, and planning activities of the Metropolitan Planning Organization.

Programs for Plan implementation.

### CITY OF LINCOLN-LANCASTER COUNTY LONG RANGE TRANSPORTATION PLAN City of Lincoln, Nebraska



LSA assisted the Lincoln–Lancaster County Planning Department with the development of the region's Long Range Transportation Plan for this area of approximately 240,000 residents. This effort was conducted in conjunction with the preparation of the Comprehensive Plan, which the inter-relationship between land use and transportation impacts were integrated through an iterative conceptual analysis. Mobility for University of Nebraska students, managing growth on the urban fringe through strategic infrastructure improvements, alternative transportation modes, preservation of mature neighborhoods, and smart growth strategies were among the key issues. The work effort was based on extensive modeling in

which land use futures were assessed at a conceptual level and transportation improvements analyzed at a detailed level. Criteria for measuring the performance and impacts of each alternative transportation improvement included the cost per hour of delay savings, VMT reductions, congestion benefits, and others. Throughout this project, LSA prepared and presented numerous electronic slideshows addressing multi-modal topics of interest to the community. Bicycle, pedestrian, and transit workshops were conducted by LSA to further establish the Transportation Plan as a reflection of the community's interest and desires.

### TRANSPORTATION 2025 – THE LONG RANGE TRANSPORTATION PLAN City of Lawrence, Kansas

As a bustling community with two universities, a unique downtown character, and sophisticated small-town charm, Lawrence has a lot to be proud of. When LSA completed the region's Long-Range Transportation Plan, *Transportation 2025*, these positive community attributes were reinforced with new guidelines and programs to enhance the role of the transportation system. Lawrence's new citywide bus system builds on the trolley, bus, and commuter rail history of the community and is strengthened through *Transportation 2025's* commitment to alternative modes. The Plan responds to the public's demand for equity for cyclists and pedestrians by incorporating significant changes in the way the City makes



transportation and land use decisions. LSA recommended access management guidelines, proposals for new multimodal street design standards, corridor preservation policies, and development review procedures for walk and bike connections to activity centers. We also incorporated funding shifts towards alternative modes to firm up these commitments.

### LARAMIE TRANSPORTATION PLAN City of Laramie, Wyoming



LSA prepared the Transportation Element of the Comprehensive Plan for the City of Laramie, Wyoming. In an effort to address increasing congestion and a growing population, the City was considering several innovative transportation options with LSA's guidance. One-way couplets, interchange improvements, and bypass facilities coupled with strategic land use changes and a revitalized downtown were all part of the study. To augment Laramie's frontier heritage and university town character, LSA pursued new pedestrian amenities and citywide bicycle and transit systems.

# MASON STREET TRANSPORTATION CORRIDOR STUDY Fort Collins, Colorado

LSA prepared the plan and conceptual design of a five-mile urban multimodal corridor in this University town of 120,000 residents that linked a downtown with a University, neighborhoods with employment and commercial centers, through alternative transportation modes including pedestrian sidewalks and paths, bicycle trails, and bus rapid transit. That was the vision of the City of Fort Collins for the Mason Street Transportation Corridor in which LSA was retained to develop the concept plan for. Through an 18-month process, LSA led the Consultant Team from initial idea to concept plan. Utilizing right-of-way along an active BNSF Railroad, exclusive transitway, bike trails, and separate pedestrian paths were designed that connected the predominate corridor activities within the City. The vision came to life with aerial overlays and micro simulation. The success of the concept plan was further complemented with the Plan being selected by the Institute of Transportation Engineers for the 2001 Best Practices Award. The Plan centered on improvements to the City's downtown and access to the downtown. The Plan evaluated use by vehicles, buses, pedestrians, and bicycles. To demonstrate the interrelationships between automobile, transit, bicycle and pedestrian transportation



within the corridor, LSA developed a VISSIM simulation of the entire corridor, illustrating a drive or bike trip through the corridor, pedestrians walking across a street and evaluating intersection levels of service. LSA staff coordinated the

urban, transportation, and environmental planning, and conducted an extensive public participation and outreach effort. The analysis required LSA staff to convert the North Front Range Regional Transportation Model to the TransCAD modeling platform. The Plan was unanimously approved by the City Council.

### **ORANGE COUNTY GREAT PARK – THE PROJECT OF A LIFETIME** *City of Irvine and Orange County, California*



The opportunity to be part of a design team to build one of the great parks of the world, such as Central Park, New York; Grant Park, Chicago; Regents Park, London; Stanley Park, Vancouver; or Parc André-Citroën, Paris is a once in a lifetime project. That opportunity presented itself to LSA Associates, Inc., when in 2002 the citizens of Orange County, California voted on the creation of the Great Park as the preferred reuse of the El Toro Marine Air Corp Station. The Orange County Great Park will become the "Jewel of Orange County" and will be greater in size then Central Park and Golden Gate Park put together. The Orange County Great Park is actually three park experiences in one, as laid out by the Great Park Master

Plan, including the Canyon, the Habitat Park, and the Fields & Memorial Park. Designing the transportation system for the park is a major undertaking that will be prepared by LSA. The Orange County Great Park will provide connections of several kinds, from the City of Irvine and Orange County, to regional connections for Southern California and the world. The Great Park is strategically situated at the intersection of the 5 Freeway, the 405 Freeway, and the 133 Toll Road, giving automobile travelers easy access to this regional amenity. Its unique location is also nestled against the Irvine Transportation Center, which means that park-goers can use public transportation, such as trains and busses, to reach the Orange County Great Park. The Great Park will also link existing and create new riding, hiking, and multi-use trails for the Southern California region. LSA is responsible for all aspects of the transportation and parking plan for the Great Park. Transit shuttles, bike and walkway trails, integrated shared parking, and regional access are part of LSA's ongoing work effort as part of the Great Parks Design Team. This is a "Project of a Lifetime."

### REFERENCES

### 2005 VALIDATION REPORT FOR THE IRVINE TRANSPORTATION ANALYSIS MODEL

Mr. Peter Anderson City of Irvine One Civic Center Plaza Irvine, CA 92606-5208 (949) 724-7370

#### 2005/2030 LAWRENCE AREA REGIONAL TRAVEL MODEL CONVERSION AND UPDATE

Mr. Bill Ahrens (Former Employee) City of Lawrence Lawrence-Douglas County MPO P.O. Box 708 Lawrence, KS 66044-0708 Mr. Ahrens is a former employee and can be now reached at the City of Olathe, Kansas at (913) 971-8600

### 2005/2035 MESA COUNTY REGIONAL TRAVEL MODEL UPDATE

Mr. Ken Simms Mesa County - Planning Department 544 Rood Avenue Grand Junction, CO 81501 (970) 255-7151

### COLORADO NORTH FRONT RANGE MPO REGIONAL TRAVEL MODEL

Mr. Cliff Davidson and Mr. John Daggett North Front Range MPO 419 Canyon Avenue, Suite 300 Fort Collins, CO 80521 (970) 416-2258

### FARMINGTON METROPOLITAN ORGANIZATION TRANSPORTATION PLAN AND MODEL DEVELOPMENT

Ms. Charity Fechter City of Farmington 800 Municipal Drive Farmington, New Mexico 87401 (505) 599-1392

### FLAGSTAFF MPO TRAVEL MODEL UPDATE

Mr. David Wessel Flagstaff Metropolitan Planning Organization City of Flagstaff 211 West Aspen Avenue Flagstaff AZ 8601 (928) 226-4841

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# **Project Organization and Approach**

### **KEY PERSONNEL**

LSA is pleased to present the following modeling staff to provide assistance in developing and applying travel demand models in communities and regions nationwide. Full resumes for key modeling staff are provided at the end of this proposal and on the proposal CD. The following identifies key personnel for this project.

### RAY MOE

### Fort Collins Managing Principal (Fort Collins)



Mr. Moe has 35 years of experience in comprehensive multi-modal transportation planning, land use/transportation planning, traffic operations, corridor studies, traffic impact studies, and access analysis. Mr. Moe has assisted communities throughout the United States in the development of regional transportation plans, land use/transportation plans, transit and non-motorized transportation planning, corridor studies, and route location studies. Mr. Moe's expertise includes preparation of traffic impact analysis for new development, fair-share traffic mitigation and fee programs, phasing and the development of trip budgets geared toward maintaining flexibility for land use market orientation. Mr. Moe has developed transportation guidelines, which address all transportation modes that integrate with local community standards and regulations. Mr. Moe has prepared traffic

impact analysis guidelines and provided on call transportation development review for numerous municipalities. He promotes visual presentation techniques for presentations to elected officials and the public. Mr. Moe developed "Connections", an interactive public process exercise where teams develop alternative transportation solutions based on a defined budget. He also developed pedestrian level of service procedures that are being used in communities throughout the United States and a bicycle demand estimator. Mr. Moe has managed three major transportation projects which have been distinguished with national awards including the 2001 and 2004 International Best Practices Planning Study Award by the Institute of Transportation Engineers and the 2006 FHWA/FTA Transportation Planning Excellence Award.

Ray will provide management oversight and direction on this project and be responsible for allocation of office resources to ensure that appropriate staff is available to complete tasks on a timely basis.

#### EVERETT L. BACON Principal/Project Manager (Fort Collins)



Mr. Bacon is a transportation planner with over 15 years of experience in multimodal transportation planning, travel demand modeling, and air quality planning. His transportation planning experience includes several long-range transportation plans, major investment studies, corridor studies, comprehensive plan support, and analysis of roadway and transit alternatives. In addition, he has designed and administered travel behavior surveys to support the development of travel models. Mr. Bacon has developed several travel demand models and their components using software such as TransCAD, MinUTP, TRANPLAN, UTPS, TP+, and others. This experience includes work in Dallas-Ft. Worth, Denver and other Colorado communities, Southern California, and other areas across the country. He

managed the team developing the multi-modal model for Fort Collins, Colorado in support of their Mason Street Corridor Study and Bus Rapid Transit FTA New Starts application. He is currently managing the development of travel models in Flagstaff, Arizona; Lawrence, Kansas; and the Colorado North Front Range region. He has designed and implemented speed feedback loops, time-of-day traffic assignments, distance-based allocation and non-motorized mode split models, and performance/air quality reporting modules. His current modeling efforts include an automated traffic signal warrant module, model adjustments for increased sensitivity to transit oriented developments, a mode choice model, and a freight (truck) model. Everett will serve as the Project Manager and primary contact person for this project. He will coordinate tasks and issues with the MPO's Project Manager, prepare invoices and progress reports, and oversee the technical and planning aspects of each task.

### SEAN P. MCATEE

### Chief Modeler/Assistant Project Manager (Fort Collins)



Mr. McAtee is a transportation planner with 5 years experience in computer modeling, simulation and multimodal transportation planning. He is skilled in the operation, development, and applications of various travel model software packages including TransCAD, VISUM, Cube, EMME/2, TRANPLAN, and QRS II. He is experienced in the design and development of travel models using tried and true methodology that produces defensible models and informative forecasts. He is skilled in the programming and development of innovative model add-ins, interfaces, and performance reporting over a broad range of software packages. He is an expert in GISDK, the programming language for TransCAD, and Microsoft Visual Basic, the programming language used for creation of macros in MS Office applications, ESRI ArcGIS, and the VISUM modeling package. While not a programmer by

trade, he is proficient in programming and scripting to automate repetitive or complex tasks and to develop user friendly interfaces that allow others to utilize these programs that produce reliable, consistent and understandable results. Each of the models he has prepared has dialog menus that facilitate easy use by the client to test various land use and transportation alternatives.

Sean will serve as the Chief Modeler on this project and manage many of the modeling tasks that are requested. Sean will coordinate all TransCAD related modeling issues, be responsible for training, and review the technical aspects of each modeling scenario that is conducted.

### RAVIKUMAR PALAKURTHY Model Analyst (Fort Collins)



Mr. Palakurthy has experience with transportation demand modeling software, geographic information systems (GIS) and various signal modeling programs. His experience includes long-range plan development, corridor studies, traffic impact studies, level of service analysis, and air quality analysis for signalized intersections. He is skilled in the operation and applications of TransCAD transportation GIS software. He has programmed model add-ins, interfaces, and performance reporting. Ravi has extensive experience with the Synchro/SimTraffic software packages.

### PRITAM DESHMUKH Model Analyst (Irvine, California)



With over seven years of transportation engineering and planning experience, including transportation systems analysis, transportation facilities design and operations, highway operations, traffic safety planning, transportation planning, traffic engineering, and analytical modeling, Mr. Deshmukh is currently responsible for supervising a variety of transportation planning projects and traffic impact studies. He is competent in the use of GIS (ARCINFO, ArcView), traffic modeling software (TRAFFIX, SYNCHRO, HCS), CAD software (AutoCAD), Microstation, forecast modeling software (TRANPLAN, EMME2), and a variety of computer operating systems (UNIX, Windows NT).

#### SANDIPAN BHATTACHARJEE

#### Model Analyst (Riverside, California)

Primary responsibilities include development of forecast future traffic volumes and analysis of traffic operations for project-specific traffic impact studies, Congestion Management Program (CMP), traffic impact analyses (TIAs), parking studies, and Environmental Impact Reports (traffic section). Emphasis was on analysis of alternatives that provide transportation solutions in the context of land use and demographic considerations under existing as well as forecast and cumulative conditions. Responsibilities include analysis of traffic operations of freeways and local arterials in conjunction with proposed interchange and roadway improvements.

### **STEPHANI SCHUPBACH**

### GIS Specialist: Land Use/Socioeconomic Data Forecast (Fort Collins)



Ms. Schupbach has more than 14 years of diverse experience in geographic information systems (GIS) analysis, database design, and project management. Her professional experience includes extensive spatial data modeling, database design and analysis, data conversion, land use/socioeconomic data conversion, and natural resource management. She has expertise in presenting complex processes and concepts through maps and diagrams. She will be available for the project's duration to provide technical support, spatial analysis, and land use/socioeconomic data analysis.

### **CURRENT WORKLOAD AND AVAILABILITY**

As a private consulting firm, it is imperative that we stay busy and billable as part of our business model. As such, our staff has learned to manage multiple projects and tasks successfully at any given time. Therefore, we are constantly working to build backlog to provide additional stability and continuity for our employees, firm, and clients. Our modeling staff is currently working on a rather large weekend travel demand modeling project for the Southern California Association of Governments. Although this is a large and extended project, it only supports about 25% of our modeling workload capacity. The benefits of this project to our clients are obvious – big model/big region experience, cutting edge technology and methodologies, national experience, etc. In addition to this project, we are currently developing two models in medium sized communities such as Lawrence; and we are currently finishing a large model development project in Ann Arbor, Michigan. Besides those, we have several smaller modeling tasks that are being conducted on a regular basis.

All in all, our modeling staff's average workload is 95% for April, 90% for May, 80% for June and July, and then tapers off from there. As such, we not only have the availability to conduct on-call modeling for the Lawrence MPO, but our business model necessitates just this type of work to fill in the gaps on our larger projects. Similarly, we are the on-call modeling consultant for the Orange County Transportation Authority (OCTA), the City of Irvine (California), the Colorado North Front Range MPO, and the Mesa County (Colorado) MPO. We allocate staff resources to projects on a monthly basis at the large-scale level and on a weekly basis with regard to details. As we have done in the past, any tasks that are requested by the Lawrence MPO will immediately be entered into our resource allocation database for prioritization. It is our hope that our past performance for the Lawrence MPO in this regard serves to demonstrate the high priority we assign on-call modeling tasks that are requested.

### **ISSUES AND APPROACH**

The planners, modelers, and engineers at LSA are excited about the prospect of assisting the Lawrence-Douglas County MPO on the application and potential further development of the regional travel demand model. When we work on a project, we like to consider ourselves as extensions of the client's staff so that a free exchange of information and ideas can lead to a successful project with quality products delivered and budgets and schedules met. Travel model development and transportation planning are what we like to do and what we do best. We appreciate the opportunity to be considered for this important project.

Our basic philosophy is simple – if selected for this effort, we want to develop quality products and continue our working relationships so that MPO would consider LSA for future services. We value our repeat clients and hope they will continue to value our services in the future.

LSA believes that a strong technical foundation should support the transportation planning process that identifies transportation infrastructure and service improvements for the Lawrence region. Transportation investment decisions represent a great expense to the public that require us as stewards of those public investments to be efficient and effective with them.

The following information is offered to provide insight into our understanding of issues associated with applying and developing travel demand models and our overall philosophy in providing these services to our valued clients. It is our understanding that the MPO model is performing satisfactorily for the MPO, having been used most recently in the development of the region's transportation plan. While we understand that this is primarily an applications-oriented effort, there may be model enhancements that are desired by the MPO or issues and questions that require a higher level of technical sophistication that go beyond the typical planning firm's expertise that LSA can address.

### **MODEL DOCUMENTATION**

LSA provides the highest quality documentation for regional travel model development efforts. This is evidenced by the FTA's use of our Mason Street model documentation as a best practices example for New Starts applications. Past examples include extensive efforts in preparing technical memoranda that thoroughly describe the data, development, and results associated with model development. The extensive use of high quality graphics and figures further supports the quality that we try to achieve.

### MODE CHOICE OPTIONS AND COMPLEXITY

LSA understands that the Lawrence model does not currently include mode choice algorithms for processing transit and other alternative modes. However, if this capability were desired, LSA has extensive experience in analyzing transit ridership data, estimating mode choice model structures, and developing mode choice model parameters. This might be a useful and desired component of Lawrence's future model direction.

At LSA, we have found that for many transit analyses, a mode choice model is not necessary. There are several options for conducting a GIS-based analysis of potential transit markets using household and employment datasets. The model could provide information on trip purposes, trip lengths, and other information. Furthermore, inter-regional transit system testing is often not readily accommodated in a county-based model even if a mode choice model is available.



If, on the other hand, a mode choice model is desired by the MPO, LSA can accommodate with a variety of options for doing so. Numerous permutations of probability and utility functions can be considered in mode choice model development. Level of complexity can vary from a simple binomial logit model to a complex multi-level nested model.

Transit results may not be required for all uses of the model. In cases where only roadway results are required or where no transit system changes are to be tested, the mode choice model can be replaced by a mode split factoring process that applies results from a previously completed mode choice model run such as the official base and horizon year runs of the Regional Transportation Model. This will reduce the amount of time required to run the travel model as well as reduce the complexity of the input data that must be prepared for a model scenario. In any case, whether a mode choice model is developed or not, a mode split factoring process will be incorporated into the model to simulate transit mode shares and auto occupancy factors as necessary.

### EASE OF USE

Simply put, LSA has experienced staff that is expert in assembling a final model product that is easy to use, intuitive, and easily manageable for numerous scenarios at a time. We would invite comparison between our model products and any other product of any other consultant, including model applications from Caliper Corporation, the developers of TransCAD. We can say this because we not only develop models, but collect and analyze the data to build them; and we apply models in planning projects as well. Therefore, LSA fully understands the need for simplicity and ease of use. In addition, we back up our products with practical, relevant training sessions for our customers.

### **AUTOMATED, CUSTOMIZED MODELS**

For most MPOs and local governments, travel models are used as a tool for many projects in transportation planning. It is important that both experienced modelers and general practitioners are able to use this tool to produce consistent and reliable results. All models developed by LSA are designed to provide a balance of flexibility and usability. Input data files are designed in such a way that they can be edited easily through the use of spreadsheets or straightforward user forms, while roadway and transit networks are designed so they can be edited with a minimum opportunity for error. Once data have been prepared, the model is run from a graphical user interface. The automated graphical approach reduces opportunity for error by eliminating the need for multiple tedious steps, while retaining an open format that allows the user to monitor and control as much or as little of the model process as desired. Once the model run is complete, automated maps and reports are produced. These will be customized to contain information that is most important to the MPO.

### **SCENARIO MANAGEMENT**

Through the application life of any travel model, many scenarios are created, analyzed, and stored. Due to the large amount of data that is often generated, it is vital that a logical and organized system is used to keep track of scenarios. LSA has developed scenario management systems that facilitate the creation and organization of large number of scenarios. This system relates the vast amount of input and output data associated with each modeled scenario to a single entry in the scenario management list. Through the use of the scripting, the scenario management system can be interfaced seamlessly with the rest of the travel model.

### SOFTWARE UPGRADES

Caliper Corporation periodically releases updates to the TransCAD software. The most recent update, TransCAD 5.0, provides vast improvements in usability as well as new technological improvements. LSA has tested several models developed for TransCAD 4.8 and determined that most models can be updated to the new version with a minimum of effort. We are currently developing and running models in TransCAD 5.0 and are very familiar with the new version of the software. This is not to say that there is any problem with the TransCAD 4.8 software the Lawrence model is currently using, but there may be some desire to migrate to the newest platform to take advantage of its new functions.

One improvement included in TransCAD 5.0 is new support for Akcelik Volume Delay functions, which provide a method to implement junction-based delay that is reasonably consistent with methods described in the Highway Capacity Manual. This new approach is much less data-intensive than volume delay techniques supported in previous versions and strikes a good balance between complexity and accuracy.

### **TECHNICAL FOUNDATION**

A key element of our approach to travel demand model development and application efforts is a strong technical foundation. Observed data and available surveys provide the basis for this technical foundation; and LSA's expertise solidifies the approach with analysis, results, and reporting that will stand up to the scrutiny of the MPO policy body of elected officials, technical committees, and public constituency. We understand the complexity associated with growth and development, proposed roadway improvements, and traffic projections; and we will ensure that the updated model provides the appropriate level of sensitivity to remain useful and relevant. As LSA updates the travel model, steps will be taken to identify any errors or problems. Any corrections that can be accommodated under this project scope will be made as part of the model update. LSA will work closely to identify supplemental sources of data to develop the model. Where local sources are not available, LSA will rely on our significant experience in collecting data and developing models in medium-sized communities to use for this application. In addition, we will obtain data from national sources (e.g., Census Transportation Planning Package, National Household Travel Survey) for use in developing the regional model.

### **SPEED FEEDBACK**

Our staff has designed and implemented several speed feedback mechanisms. In fact, our proposed project manager implemented the first speed feedback loop in the complex model of the Dallas-Fort Worth, Texas region. With this significant and relevant experience along with our ongoing research and testing of new feedback and closure methodologies, we can provide the MPO with comprehensive services in this regard. Although addition of a speed feedback loop is not specifically included in the RFP, we feel that this addition to the model provides valuable capability and defensibility.

### **CREATIVE SOLUTIONS AND LESSONS LEARNED**

With each new model development project, LSA strives to create new and innovative features that build on and enhance the features included with the product software. Features we have developed include an intersection turn movement forecaster and level of service module, link-based level of service evaluations, automated NCHRP-255 volume adjustments, customized and automated model performance reports, infrastructure cost estimators, signal warrant module, refined custom user interfaces, and others. LSA continually improves the base user interface and add-on models and strives to remain up to date with the most current travel modeling technology.

### MPO/TMA PLANNING FUNCTIONS AND MODEL APPLICATIONS

From day one, the strategic plan for the LSA Fort Collins office was to target the preparation of travel model development, model applications, and long-range transportation plans for public jurisdictions and agencies as our primary market to complement our professional experience, expertise, and interest. Travel model development provides unique challenges and opportunities, which in turn challenge us professionally. These projects often require us to probe the use of travel models and the underlying transportation issues, such as the relationship between land use, urban design and transportation; growth; and identification and prioritization of transportation improvements, which requires a broad dialogue and creativity in approach.

Our staff has worked for large MPOs and TMA's both in the role of the employee and the consultant. We are aware of the requirements placed on TMA's by the federal transportation legislation, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). LSA is proud to be able to provide a solid technical model development process in order to support these and other planning requirements of MPOs and TMAs. We will

## LAWRENCE-DOUGLAS COUNTY METROPOLITAN PLANNING OFFICE

develop a model that will provide consistent, reliable, and accurate results to support these activities. We are also keenly aware of the SAFTEA-LU funding mechanisms and program eligibility requirements that MPOs must address in project selection and prioritization and also financial constraint requirements for transportation plans and programs.

It is LSA's extensive transportation planning experience that allows us to better understand the issues and needs facing MPOs in today's supercharged planning environment. In turn, this challenges us to provide models that are sensitive to the client's particular needs and desires while being accurate, consistent, reliable, and intuitive to use.

### **DATA COLLECTION/TRAVEL SURVEYS**

To support our transportation planning and travel model development services, LSA has invested in acquiring knowledge, experience, and equipment to collect data and travel behavior information. Some of the data collection services we offer include the following:

- Origin-destination surveys,
- Travel time/speed studies,
- Onboard transit surveys,
- Travel behavior studies,
- Special generator studies, and
- Management of the collection of traffic counts and turning movements.

LSA feels that it is important for the MPO's model consultants to have the background knowledge and experience collecting travel behavior data for model development because of the insight that the data collection effort provides regarding a better understanding of the model's uses and limitations.

### ISSUES FACING THE LAWRENCE REGION IN MAINTAINING AND APPLYING THE REGIONAL TRAVEL DEMAND MODEL

In many respects, we believe that many of the model objectives desired by the MPO are similar to those we have addressed in the past. In general, we have found that it is often a benefit to examine the region's travel model with fresh eyes and provide an independent assessment and recommendations for our clients. We also believe that by having the opportunity to have worked for a variety of communities of varying size and character, we can provide a comprehensive and creative approach to the model. In addition, we do not have any actual or perceived conflicts or biases by representing other public agencies or private clients in the Lawrence area. Our focus would be the needs of the MPO and its member governments.



# Level of Effort

The Lawrence/Douglas County MPO Project Manager will initiate work tasks on a periodic basis throughout the project's duration. These will be similar in nature to previous work tasks performed by LSA for the MPO in that they will be relatively small, self-contained assignments issued on an approximately monthly or bi-monthly basis. Although it is not possible to predict specific work tasks, budgets, and schedules for on-call work, with sufficient coordination LSA can accommodate virtually any modeling or planning task of any size or duration that the MPO desires. LSA's direct and indirect labor rates and direct/reimbursable costs updated for the current calendar year are shown below.

Personnel	Hourly Rate
Ray Moe, Managing Principal	\$175.00
Everett Bacon, Principal	\$140.00
Pritam Deshmukh, Senior Transportation Engineer	\$130.00
Sandipan Bhattacharjee, Senior Transportation Planner	\$125.00
Sean McAtee, Transportation Planner/Engineer	\$110.00
Shanna Guiler, Senior Planner	\$100.00
Stephani Schupbach, GIS Database Specialist	\$90.00
Ravi Palakurthy, Transportation Planner	\$90.00
Scott Ladzinski, Graphic Designer	\$90.00
Elissa Palmer, Office Manager	\$80.00
Amy Robben, Transportation Intern	\$35.00
Expenses	Unit Rate
Mileage	\$0.505 per mile
Reproduction	\$0.10 per page
Reproduction (8 1/2 X 11 - Inch Copies)	\$0.10/Page
Reproduction (8 1/2 X 11 - Inch Color Copies)	\$1.00/Page
Reproduction (11 X 17 - Inch Copies)	\$2.00/Page
Reproduction (II X I7 - Inch Color Copies)	\$3.00/Page
Facsimile	\$1.00 per page
Plotting	\$5.00 per linear ft.
Facsimile Transmittals	\$1.00/Page
CD-Rom Data Transmittal	\$5.00/CD
Expandable Supplies & Other Direct Costs	Cost + 5%

### FEE SCHEDULE FOR LSA ASSOCIATES, INC. RATES AND REIMBURSABLE EXPENSES

# Resumes

### EVERETT L. BACON PRINCIPAL

### **EXPERTISE**

Transportation Planning Travel Demand Modeling Air Quality Planning Travel Surveys Traffic Analysis



### **EDUCATION**

University of Texas at Arlington, M.E., Civil Engineering, 1993 Texas A&M University, B.S., Civil Engineering, 1989

### **PROFESSIONAL EXPERIENCE**

Principal/Senior Transportation Planner, LSA Associates, Inc., Fort Collins, Colorado, 2000-present Senior Transportation Planner, Parsons Transportation Group, Inc., Denver, Colorado, 1998-2000 Senior Transportation Planner/Intergovernmental Relations Coordinator, Denver Regional Council of

Governments, Denver, Colorado, 1998

Principal Transportation Planner, North Central Texas Council of Governments, Dallas-Fort Worth, Texas, 1990-1997

Transportation Planning Intern, Texas Transportation Institute, College Station, Texas, 1987-1989

Transportation Planning Intern, North Central Texas Council of Governments, Dallas/Fort Worth, Texas, 1986-1989

### PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Mr. Bacon started employment with LSA in 2000 and has been a Principal since 2006. He has a diverse background in long-range transportation planning and traffic engineering, having worked for both large regional metropolitan planning organizations and in private consulting. Everett has gained considerable experience in operational analysis, data collection and analysis, travel demand model development, transportation infrastructure improvement funding, traffic studies, traffic impact fees, and air quality planning. His career has been dedicated to the implementation of efficient and effective transportation solutions to support the mobility goals and public works implementation efforts of communities in Colorado and across the United States.

Everett's transportation planning experience includes several long range transportation plans, major investment studies, corridor studies, comprehensive plan support efforts, and analysis of roadway and transit alternatives. In addition, he has designed and administered travel behavior surveys to support the development of travel models. Mr. Bacon has specialized experience related to longrange visioning and practical traffic solutions, as evidenced by the conduct of a Transit Vision Design Charrette, a Neighborhood Streets Design and Traffic Calming Forum, and an Interchange Feasibility Study. Other noteworthy projects that he had conducted include large-scale traffic studies, road fee programs, and audits of transportation infrastructure improvement programs. With his background in engineering, Everett's experience includes large-scale traffic studies that include an operational analysis and improvement of over 40 signalized intersections using the Synchro intersection level of service analysis software.

Augmenting his transportation planning and operations analysis experience, Mr. Bacon has developed several travel demand models and their components using software such as TransCAD, MinUTP, TRANPLAN, UTPS, TP+, and others. This experience includes work in Dallas-Ft. Worth; Denver and other Colorado communities; Flagstaff, Arizona; Lawrence, Kansas; Ann Arbor, Michigan; Southern California; the Colorado North Front Range region; and other areas across the country. He managed the team developing the transit-capable, multi-modal model for Fort Collins, Colorado in support of their Mason Street Corridor Study and Bus Rapid Transit FTA New Starts application. He has designed and implemented speed feedback loops, time-of-day traffic assignments, distance-based allocation and non-motorized mode split models, and performance/air quality reporting modules. Some recent modeling efforts include an automated traffic signal warrant module, model adjustments for increased sensitivity to transit oriented developments, a mode choice model, and a freight (truck) model.

Mr. Bacon's air quality planning experience includes managing the air quality program for the metropolitan planning organization in Dallas-Fort Worth. Through this effort, he was responsible for the modeling of on-road and off-road mobile source emission inventories; initiation, funding, and implementation of an ozone alert program; and air quality conformity determinations for regional transportation plans and transportation improvement programs. In addition, he was responsible for the selection, programming, and implementation of transportation control measures to meet Air Quality State Implementation Plan requirements. He managed and implemented an alternative fuels program for public fleets. Everett has overseen the integration of EPA's MOBILE model into travel demand models. He has extensive experience developing modeling applications with EPA's MOBILE emission factor model. He conducted the evaluation of project submittals by local governments for the North Front Range CMAQ program, and he has prepared successful applications for CMAQ funds for various communities in Colorado and Texas.

Prior to LSA, Everett gained several years of planning experience managing regional transportation programs and projects, including the development of transportation plans and improvement programs in Dallas/Fort Worth, Texas and Denver, Colorado.

### **PROJECT EXPERIENCE**

### LONG RANGE TRANSPORTATION PLANNING

**Erie Transportation Plan:** Mr. Bacon prepared the transportation plan for this fast-growing community on the urbanized fringe of the Denver metro area. The town's close proximity to regional highways and activity centers has significantly increased development pressures, which the town is trying to balance with quality developments and the existing small town character. Trucks are a concern due to the relationship the town has with major landfills in the area. Some of the goals of the transportation plan are to plan for a

multi-modal transportation system that accommodates growth, contributes to the high quality of life residents enjoy, and is financially sustainable.

**Rapid City Area 2030 Long Range Transportation Plan:** Mr. Bacon served as the project manager for this dynamic community in the Black Hills of South Dakota. In addition to the usual requirements for regional transportation plans, this plan included a detailed implementation timeline for priority projects, objectives, and planning activities of the metropolitan planning organization.

**City of Thornton, Colorado Transportation Plan:** Everett served as project manager for the development of this long-range transportation plan. This city of about 100,000 residents is growing very rapidly and has a buildout population estimated at 300,000. The City's proximity to Denver International Airport, Interstate 25, E-470 tollroad, and downtown Denver make the City and its transportation network an important component of the regional system. For the first time, the City's transportation plan will include multi-modal components, including planning for the North Metro commuter rail line of the regional FasTracks program. Due to the intense development pressures, a long-term Buildout scenario was modeled and evaluated so the City could preserve the necessary amount of right-of-way in developing corridors. A vision plan and financially constrained plan will be developed with detailed prioritization of projects to facilitate capital investment planning for the city. As part of this effort, Everett directed the development of a TransCAD travel demand model for the city based on the regional model maintained by the Denver MPO.

**METRO 2030 – The Long Range Transportation Plan for Central Arkansas:** Mr. Bacon assisted in the development of the regional transportation plan for the Little Rock/Central Arkansas area. This region of over 500,000 people is experiencing congestion and air quality problems associated with steady growth, sprawl development, and other factors. Everett's role included extensive public outreach efforts with a diverse population. He designed, conducted, and documented a Transit Design Charrette in which 80 local elected officials, business leaders, the media, and general public participated in a day-long event to identify a transit vision for the region. Special focus was placed on alternative mode issues bicycle, pedestrian, and travel demand management workshops. Land use concepts were tested with an eye toward long-range transit-supportive opportunities based on the vision plan resulting from the transit design charrette. Everett conducted the analysis long-range land use scenarios for the region by applying over 30 detailed, diverse evaluation criteria.

Lawrence - Douglas County, Kansas Long Range Transportation Plan: Mr. Bacon served as project manager for the development of the transportation plan for this area of about 100,000 residents, which includes large university student populations. His responsibilities included coordination of the public involvement process, multi-modal analysis, preparation of a year 2025 travel model using QRSII software, forecasts of future socioeconomic activity, and development of the overall Plan document. The result of this effort was a graphics-based, issues-oriented, user-friendly plan document. Access management, corridor preservation, and alternative transportation modes were among the key issues in the project. LSA made recommendations for incorporating multi-modal amenities in the development review process, traffic impact analysis guidelines, and street and subdivision design standards.

Laramie, Wyoming Long-Range Transportation Plan: Mr. Bacon served as project manager for the development of a long-range transportation plan for the City of Laramie, Wyoming. In an effort to address increasing congestion and a growing population, the city considered several innovative transportation options with LSA's guidance. One-way couplets, interchange improvements, and bypass facilities coupled with strategic land use changes and a revitalized downtown were all part of the study. Pedestrian amenities

and citywide bike and transit systems were included as well. Everett also managed the public involvement component for the plan's development.

**Transportation Component of the Longmont (Colorado) Area Comprehensive Plan:** As part of their comprehensive plan update, LSA provided transportation consulting support for the City of Longmont to refine recommendations for the future transportation system. A series of future Buildout land use scenarios were evaluated at a conceptual level based on transportation and other impacts. Once determined, the transportation system recommendations were developed to balance the impacts of growth. Several options were evaluated, including alternative mode improvements, intersection and roadway capacity, and the street functional classification and access needs. As part of this process, LSA converted the existing MinUTP model to a TransCAD platform.

Lincoln - Lancaster County, Nebraska Long Range Transportation Plan: LSA assisted the Lincoln-Lancaster County Planning Department with the development of the region's Long Range Transportation Plan for this area of approximately 240,000 residents. This effort was conducted in conjunction with the preparation of the Comprehensive Plan in which the inter-relationship between land use and transportation impacts was considered through an iterative conceptual analysis. As project manager for the transportation plan, Mr. Bacon was responsible for incorporating federal requirements into the planning process, preparing multi-modal analysis of conceptual land use plans and alternative scenarios, and overall development of the Plan document. Key issues in the study included alternative travel modes, neighborhood preservation, smart growth, environmental justice, and mobility for student populations.

**Denver Regional Transportation Plan (prior to LSA):** Also at DRCOG, Mr. Bacon conducted cost estimate and revenue projection activities associated with the development of the Denver metropolitan area's Year 2020 Regional Transportation Plan. In addition, he evaluated performance criteria associated with project selection for this effort.

**Dallas-Fort Worth Regional Transportation Plan (prior to LSA):** Mr. Bacon conducted model calibration, air quality analysis, and project evaluations for the Dallas-Ft. Worth regional transportation plan, Mobility 2020. Several departmental teams participated in the effort. Mr. Bacon's group focused on the speed feedback refinement process and the calibration of trip distribution model parameters.

### MULTI-MODAL PLANNING

Longmont Multi-Modal Transportation Plan: Mr. Bacon served as project manager for this long-range transportation plan that focused on multi-modal planning for the City. This was the first transportation plan ever developed for this community of approximately 86,000 residents. The City is very active from a multi-modal standpoint, with an extensive and growing network of bike lanes and off-street trails, a walkable downtown, and existing bus service to Boulder, Denver, and other communities in the metro area. Everett managed an extensive public involvement program in this active community. One of the key issues associated with the plan's development was the recent approval by the voters of the regional FasTracks rail program which will bring commuter rail into Longmont by 2015. To support these efforts, the study reviewed and recommended changes to the land uses surrounding proposed transit stations. In addition, transit oriented design characteristics for the proposed stations were recommended as part of the plan's development. Pedestrian districts and their associated design characteristics were also identified for the downtown, transit stations, parks and schools, and shopping areas. The plan also included policies to update the City's development review process to include full consideration of bicycle, pedestrian, and transit modes.

**Transit Vision Design Charrette – Little Rock, Arkansas:** As part of the development of the Long Range Transportation for the Central Arkansas region, Everett prepared and conducted a Transit Design Charrette. Over 80 local elected officials, business leaders, local planners, the media, and the general public participate in a day-long event in which a long range transit vision for the region was established. Mr. Bacon prepared the materials for the event, which included a booklet that provided information on transit technologies, including light rail, bus rapid transit, commuter rail, and others. A brochure was developed that identified the transit technology for each corridor and in the downtown. The future system built off of the light rail streetcar system currently being constructed in the downtown river area of the region.

**Multi-Modal Improvements to the North Front Range Travel Model**: The North Front Range MPO is evaluating long term growth and transportation strategies for the region, and LSA is assisting in many areas of this effort, including enhancements to the regional travel model to support the MPO's multi-modal planning activities. As project manager for the effort to update the North Front Range Regional Travel Model, Mr. Bacon oversaw the development of a mode choice model and other adjustments to increase the model's sensitivity to transit oriented developments (TOD). Several methods will be reviewed for implementation, including adjustment to the model's transit walk access times, auto terminal penalties, and intrazonal travel times. Post processing techniques will also be reviewed for the TOD sensitivity enhancements.

**North Front Range Truck Model** – As part of the enhancement of the North Front Range model, Mr. Bacon worked with the MPO and their economic forecasting consultants to develop a truck model. The truck model takes advantage of statewide truck trip data based on national freight movements that was available to the MPO as well as a coordinated external station study in which vehicle classification data and origin-destination data was collected. This is the first truck/freight model implemented in a travel model in the North Front Range. This capability enhances the MPO's planning activities with regard to truck routes and intermodal planning.

### **OPERATIONS/TRAFFIC ANALYSIS**

**Canyon View Traffic Analysis, Grand Junction, CO:** This proposed site in northwest Grand Junction resides in an area of town that is largely undeveloped. As a result, the typical traffic study methodology that builds on existing traffic count turning movements was not deemed appropriate for a buildout analysis. LSA was hired to develop background and project-influenced traffic volume and turning movement estimates to support the analysis. LSA has integrated an intersection turning movement forecasting module in the regional model for the Mesa County Regional Planning Office, the metropolitan planning organization (MPO) for the region. This module was instrumental in estimating the future turning movements. Turning movement forecasts were prepared for evening weekday and Saturday peak hour conditions. Mr. Bacon developed the methodology for this project and served as Project Manager.

**Polo Square Traffic Study:** Everett conducted a detailed analysis of traffic operations for a proposed development in the fast-growing Coachella Valley of southern California. The development is a major mixed-use site that integrates commercial retail and office uses with several residential products that will provide higher densities along a major travel and transit route. During the study, Mr. Bacon analyzed over 25 ongoing development proposals and 42 signalized intersections in the travel shed. Traffic mitigations were developed based on a traditional weekday peak hour analysis, a weekend sensitivity analysis, and a signal coordination analysis along a major urban highway. The study was conducted under the regulatory setting of the California Environmental Quality Act (CEQA).

**Longmont Neighborhood Streets/Traffic Calming Design Forum:** The City of Longmont contracted with LSA to prepare and conduct a community forum in response to numerous concerns made by citizens with regard to traffic speeds and volumes in residential areas. The City had experimented with temporary traffic calming installations in residential areas of Longmont with varying success. LSA brought in national experts in the field of traffic calming to meet with citizens of the City to discuss problems and potential solutions. This resulted in changes in the City's program to include elected officials and department heads in a coordinated, concise process to prioritize and address these specific traffic problems.

**Erie Landfill Expansion Traffic Analysis:** Everett assisted the Town of Erie, Colorado with the sensitive issue of truck routes for trash haulers associated with the expansion of a major landfill within the town limits. Development is closing in on the area surrounding the landfill, including the construction of new homes and a new high school. The purpose of the study was to evaluate and recommend truck routes to maintain the economic viability of the landfill while maintaining sensitivity to the residential developments and other sensitive receptor locations in the study area.

**Laramie Interchange Study:** Mr. Bacon was hired by the City of Laramie to conduct an evaluation of several interchange locations along I-80 to provide additional access between the city and the interstate. Several factors were considered in the analysis, including application of the Federal Highway Administration's requirements for new or revised access to the interstate system. Final recommendations included the location and configuration of recommended interchanges along with conceptual design improvements and potential environmental and social impacts associated with each.

### TRAVEL DEMAND MODELING

**Springfield, Illinois Regional Travel Model:** LSA was recently selected for developing a new regional travel demand model for the Springfield region's metropolitan planning organization (MPO). The MPO has made significant investments in staff, hardware, and training to develop a model and have dedicated staff available to maintain and utilize it. With these goals in mind, LSA developed a model development program that will take full advantage of these investments by utilizing local staff and preparing a customized and automated model that will not require significant out year maintenance expenses. Everett is leading this effort as Project Manager.

**San Luis Obispo, California Citywide Model:** LSA was recently selected to prepare a citywide model for the City of San Luis Obispo, California. Although a regional model exists through the MPO, the City desired a more detailed model that utilized locally collected data. One of the key components of this effort is to identify what data is available and what might be collected. For example, Cal Poly, a nationally-ranked 4-year university, has a large measurable influence in the city, but very little data exists with regard to travel patterns. The university, along with transit travel and tourist/visitor activity, will be focuses of the effort. Everett is serving as Project Manager of this effort, which LSA is leading in collaboration with Cambridge Systematics.

Southern California Association of Governments Weekend Travel Demand Model: In order to ascertain the on-road mobile source travel-related impacts on ozone air quality in the Los Angeles basin on weekends and early in the work week, SCAG contracted with LSA to develop a weekend travel model. LSA was selected based largely on our proposal to include both Saturday and Sunday specificity in the model as well as the ability to switch special events and other important weekend activities on and off. In addition, LSA's extensive experience in analyzing travel behavior inforamtion and survey data contributed to the

award. The weekend model's development is being led by Mr. Bacon in his role as Project Manager. The model will be utilized by SCAG and environmental agencies in Southern California to develop transportation control measure strategies that target weekend congestion and ozone formation as well as to support photochemical modeling of the entire region to identify weekend transportation strategies to reduce emissions of criteria pollutants and their precursors that occur early in the work week.

Washtenaw Area Transportation Study Model Updates, Ann Arbor, Michigan: LSA is currently updating and enhancing the regional travel demand model of for this Transportation Management Area (TMA). Several enhancements are being incorporated into the model, including enhanced mode choice treatment of external auto trips accessing transit via park and ride lots. In addition, special processing for University of Michigan trips will more accurately depict the unique travel to and from this major multi-modal traffic generator. All aspects of model are being updated in this significant effort due to the stringent TMA requirements imposed on the region. Mr. Bacon serves as project manager, leading a team of modelers that are preparing approximately twenty technical memoranda on detailed topics that will culminate in the model's update.

**Mesa County Regional Travel Model Update:** LSA recently updated the Regional Travel Model for the Metropolitan Planning Organization (MPO) of the Mesa County area. Several enhancements were made to this TransCAD model, including new trip purposes, increased trip generation sensitivity to household sizes and incomes, expansion of the model's boundary, special University trip processing, and streamlined network processing. New external travel estimates were made based on a 2006 External Travel Study conducted by LSA and its subconsultant during the model's development. Performance reporting enhancements include NCHRP post processing and forecasting of intersection turning movements for level of service analysis. As part of this project, LSA will be providing annual on-call modeling services to the MPO. The model will be used by the MPO to support the development of the regional transportation plan, transportation improvement program, corridor studies, and other planning activities in this fast-growing region. Everett served as project manager for this effort.

Lawrence/Douglas County Regional Travel Model Conversion: The Lawrence/Douglas (Kansas) Metropolitan Planning Office retained LSA to convert their regional travel model from QRSII to TransCAD software. Everett is managing this project, which includes a detailed comparison of the initial conversion to the new platform and a series of enhancements that will address planning issues being raised in the community. Improvements include significant refinements to the traffic analysis zones, expansion of the modeling domain to include some smaller towns outside of Lawrence, a performance module, an intersection forecasting and analysis process, and a cost estimator. The new model is being prepared in order to support the development of the region's next long range transportation plan.

North Front Range Regional Travel Model: Mr. Bacon is currently managing an effort to update the North Front Range Regional Travel Model (NFR RTM). The model base year will be updated to 2005 conditions, a mode choice model will be incorporated, and a freight model is being added as well. In addition, special processes will be included in the model to provide increased sensitivity to the unique characteristics of transit oriented developments. Mr. Bacon designed an external station study to collect important travel information for use in the model. He will oversee the analysis of data and the development of the model for subsequent use in the preparation of the region's 2035 long range transportation plan.

**Flagstaff Regional Travel Model:** Mr. Bacon served as project manager for the recent development of the Flagstaff Regional Travel Model (FRTM). Through this effort, LSA updated the model to 2004 base year conditions and developed a PM peak hour. Several parameters and algorithms were adjusted, including the

roadway networks, intrazonal travel times, external trips, and time of day conversion factors. In addition, LSA incorporated a model volume adjustment process based on the procedures described in NCHRP 255. The model will be used to support planning activities in this fast-growing region.

**Colorado North Front Range Regional Travel Model:** Working for the North Front Range Metropolitan Planning Organization, LSA prepared a base year model for this fast growing, environmentally-sensitive area. With two universities and three medium-sized cities surrounded by rural lands and open space areas, this effort has presented some unique challenges. Census 2000 data will form the basis of the base year socioeconomic dataset. Under Mr. Bacon's direction, numerous enhancements were incorporated into the model, including speed feedback, emissions processing for conformity and State Implementation Plan needs, system performance measures, distance-based allocation models for bike, walk, and school trips. Land use feedbacks were reviewed but not incorporated. The final product was a fully automated and customized TransCAD model that streamlined the processing requirements and minimizing of errors associated with manual operations.

**Mason Street Multi-Modal Travel Model Development:** Mr. Bacon managed a team responsible for the conversion of the regional model from the MinUTP to the TransCAD modeling platform and the subsequent development of the Mason Street Multi-modal Travel Demand Model, which included significant model enhancements and calibrations for the testing of transit alternatives in the Mason Street corridor. Time-of-day traffic assignments, speed feedback, mode choice, and implementation of detailed trip purposes were among the enhancements that were incorporated in the model.

Lake Elsinore Traffic Model and Road Fee Program: LSA prepared a traffic model and road fee program for the City of Lake Elsinore in Riverside County, California. As project manager responsible for model development, Mr. Bacon designed a local, land use-based traffic model for implementation in TransCAD 4.0. The model is consistent with results from the regional model maintained by the Southern California Association of Governments. It provides for the analysis of impacts from the City's General Plan buildout scenario so that road improvement fees can be allocated to future developments.

**Denver Regional Transportation District Model Applications Improvement Program (prior to LSA):** Mr. Bacon developed a non-work high occupancy vehicle (HOV) model and new HOV coding techniques in order to streamline the coding process and enhance model estimation procedures. This work was conducted for the Regional Transportation District (RTD) through their application of the Denver Regional Travel Model.

**Dallas-Fort Worth Regional Travel Model (prior to LSA):** Through his duties as program manager at NCTCOG, Mr. Bacon was responsible for several areas of development for the regional travel model. For example, he incorporated a speed-feedback loop to ensure consistency of speeds throughout the modeling chain. Also, he calibrated friction factor curves in the trip distribution model, developed a time-of-day traffic assignment routine, and estimated a module for determining final loaded speeds by time period. He designed enhancements to the performance summary module to include emission estimates by vehicle type and time of day as well. Through his efforts, the capability to analyze transportation control measures, such as reduction of nonrecurring congestion, has been included in the model.

### **TRANSPORTATION FUNDING/IMPACT FEES/IMPROVEMENT PROGRAMS**

Falcon Area Traffic Fee Program Audit, Colorado Springs: Mr. Bacon is conducting an audit and maintenance update for this six year old fee program. At issue are development patterns that differed from original plans, outdated unit costs, and inconsistent collection and recording of fees as developments have occurred. As a result, infrastructure improvements have not kept pace with development and several improvements are necessary but funding is not available. In addition, there is some eligibility issues associated with some improvements made outside of the original study area. The audit will address these issues as well as update the study assumptions and develop a infrastructure and development phasing that will be sustainable financially.

Lorson Ranch/Rolling Hills Ranch Transportation Improvement Fee Program, El Paso County, Colorado: Mr. Bacon is assisting El Paso County and representatives of two major residential developments in preparing a transportation infrastructure fee program for this area of unincorporated county lands. Development pressures have recently increased due to the changes expected at Fort Carson due to the Base Realignment and Closure (BRAC) recommendations which will significantly increase personnel at the base. The fee program will include a financially sustainable phasing plan for paying fees and constructing about \$80 million in new roadway infrastructure as development continues. The Fee Program is flexible so that new participants can join in as development proposals occur in the remainder of the study area.

**Denver Regional Transportation Improvement Program (prior to LSA):** While with Denver Regional Council of Governments (DRCOG), Mr. Bacon provided program management and oversight for the 1999-2000 Denver Metropolitan Transportation Improvement Program (TIP). This included the evaluation and programming of projects from local governments, departments of transportation, and transportation authorities through the process set up by the Intermodal Surface Transportation Efficiency Act and the Transportation Equity Act for the 21<sup>st</sup> Century.

**Dallas-Fort Worth Metropolitan Area Transportation Improvement Program (prior to LSA):** Working for the North Central Texas Council of Governments (NCTCOG), Mr. Bacon provided program management and oversight for the Dallas-Fort Worth Metropolitan Area Transportation Improvement Program (TIP). As TIP program manager, he was responsible for the development of project selection criteria, evaluation and programming of submitted projects, financial analysis, public involvement activities, and project monitoring and implementation.

### **CORRIDOR STUDIES**

**I-225 Major Investment Study (prior to LSA):** Mr. Bacon conducted model development efforts and performance evaluations based on the application of the MinUTP-based Denver Regional Travel Model for the alternatives analysis component of the I-225 Major Investment Study in Aurora and Denver, Colorado.

**SH82 Corridor Investment Study (prior to LSA):** Mr. Bacon developed socioeconomic baseline and forecast scenarios to coincide with the development and application of a travel demand model for the SH82 corridor between Glenwood Springs and Aspen, Colorado.

**Trinity Parkway/Santa Fe Bypass MIS (prior to LSA):** Mr. Bacon was project manager for NCTCOG on this important major investment study near downtown Dallas, Texas. High occupancy vehicle lanes, reversible facilities, and toll roads were among the alternatives studied. Mr. Bacon was responsible for development of daily and peak hour subarea travel models for the major investment study.

**East/West Connector Feasibility Study (prior to LSA):** Mr. Bacon led the travel modeling and alternatives analysis efforts for a transportation corridor across the southern end of the Dallas-Ft. Worth International Airport. Several land use development scenarios were tested, including relocation of land-side airport facilities and rental car operations. Freeway and parkway alternatives were examined along with the integration of future rail operations serving the airport.

### TRAVEL SURVEYS

**Grand Junction External Travel Study:** During the update of the Mesa County travel model, LSA and its subconsultant conducted an external travel study of the Grand Junction region. High-speed camera and radar equipment were set up at major highway access points to the region in both the incoming and outgoing directions to record data. License plate information was matched through a time-delay function so that travel patterns by time-of-day could be recorded. Everett managed this effort, designed the study methodology, and analyzed the raw data.

**North Front Range Regional Travel Surveys:** The North Front Range Metropolitan Planning Organization has a dedicated program in place to periodically collect data and update their regional travel model. Recently the MPO selected LSA to conduct the data collection effort associated with a comprehensive update of the regional travel model. The data collection efforts was managed and designed by Mr. Bacon and included statistically significant surveys for the following needs:

- Onboard transit survey of the three local transit agencies in the region,
- Special generator study at the University of Northern Colorado,
- Regional travel time/speed study, and
- External station study.

**Fort Collins' Transportation Surveys:** As part of the Mason Street Transportation Corridor study, Mr. Bacon designed and implemented four transportation surveys in support of model development efforts. These included the following surveys:

- Mason Street/College Avenue Vehicle Intercept Survey,
- Colorado State University Special Generator Study,
- TransFort On-Board Transit Survey, and
- Regional Travel Time Study.

### AIR QUALITY PLANNING

**North Front Range CMAQ Program:** The Congestion Mitigation and Air Quality Improvement Program (CMAQ) is a federal initiative aimed at transportation strategies that reduce traffic congestion and air quality impacts from motor vehicles. Every two years, the North Front Range Metropolitan Planning Organization requests project proposals from affected local governments for CMAQ program funding. The MPO contracted with Mr. Bacon in 2005 to evaluate, score, and rank order proposed projects as an independent consultant with no vested interest in the projects. In addition, Everett screened potential submittals and met with project sponsors to maximize air quality benefits and funding opportunities.

**Mason Street New Starts Application:** As part of the Mason Street Corridor study, LSA was retained by the City of Fort Collins to prepare an application for federal funding through the Federal Transit Administration's New Starts program. Mr. Bacon led the efforts to quantify mobility, air quality, and energy consumption benefits due to implementation of the five-mile bus rapid transit corridor through the heart of the City. Ozone precursors, greenhouse gases, and other criteria pollutant emissions were estimated for the report.

**Dallas-Fort Worth Air Quality Conformity Analysis (prior to LSA):** Mr. Bacon's air quality program management responsibilities at NCTCOG included the air quality conformity analysis for the Dallas-Fort Worth region's transportation plan and improvement program; coordination and development of transportation control measures to meet State Implementation Plan requirements; development of mobile source emission inventories; the alternative fuels program; and the ozone alert program. He also coordinated efforts with the State air pollution control commission to develop and apply the Urban Airshed Model for regulatory and planning purposes. Much of this work required the application of EPA's Mobile Emission Factor Model for which Mr. Bacon has developed an expertise.

**Transportation Control Measure Effectiveness Study (prior to LSA):** Mr. Bacon designed, managed, and implemented a study that used real-world performance measurements to refine and validate planning tools used to estimate emission reductions for transportation control measures. The study was especially useful in identifying the best control measures for specific situations, and it provided a solid technical foundation for verifying State Implementation Plan emission credits for the Dallas-Fort Worth region. Signal timing, intersection improvements, HOV lanes, alternative fuel vehicles, and travel demand management (TDM) techniques were among the air quality strategies studied in the effort.

Alternative Fuels Feasibility Study (prior to LSA): In order to properly implement a large, public fleet program of alternative fuel vehicles, a feasibility and implementation study was undertaken by the North Central Texas Council of Governments. Mr. Bacon served as the project manager in this study that examined the costs, available technology, emission reductions, and operating issues associated with fleet program. Recommendations included natural gas, propane, and electric vehicles. Existing and planned refueling site locations were identified, and a market analysis provided additional recommendations for site locations. A fuel technology task force made up of fleet managers, vehicle and fuel providers, and industry specialists provided direction for the study.

### SEAN P. McATEE SENIOR TRANSPORTATION PLANNER/ENGINEER

### **EXPERTISE**

Transportation Planning Transportation Demand Modeling

### **PROFESSIONAL REGISTRATION**

Engineer in Training (EIT), 2002

### **EDUCATION**

Colorado State University, B.S., Civil Engineering, Magna Cum Laude, 2002

### **PROFESSIONAL EXPERIENCE**

Transportation Planner/Engineer, LSA Associates, Inc., Fort Collins, Colorado, 2001–Present

### PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Mr. McAtee is a senior transportation planner with 6 years experience in computer modeling, simulation and multimodal transportation planning. He is skilled in the operation, development, and applications of various travel model software packages including TransCAD, VISUM, Cube, EMME/2, TRANPLAN, and QRS II. He is experienced in the design and development of travel models using tried and true methodology that produces defensible models and informative forecasts. He is skilled in the programming and development of innovative model add-ins, interfaces, and performance reporting over a broad range of software packages. He is an expert in GISDK, the programming language for TransCAD, and Microsoft Visual Basic, the programming language used for creation of macros in MS Office applications, ESRI ArcGIS, and the VISUM modeling package. While not a programmer by trade, he is proficient in programming and scripting to automate repetitive or complex tasks and to develop user friendly interfaces that allow others to utilize these programs that produce reliable, consistent and understandable results. Each of the models he has prepared has dialog menus that facilitate easy use by the client to test various land use and transportation alternatives.

Sean has extensive experience with the Synchro/SimTraffic and Vissim simulation software packages. He has prepared visually appealing simulations depicting corridors, interchanges, roundabouts, intersections, parking lots, and downtown pedestrian areas. Through the use of travel model results, these simulations can be used to represent forecast results that are based on generally accepted methodologies.

Sean has a strong understanding of the EPA's latest mobile source emission model, MOBILE6.2. He has implemented the MOBILE6 model using various methodologies, and has worked with the Colorado Air Pollution Control Division (APCD) to ensure consistency between state and local procedures. He has created automated modules that feed travel model data into MOBILE6.2 for analysis and apply emission factors to travel model results. These modules produce a concise report that can be used to evaluate alternatives and are a valuable tool in the conformity process. These modules have been developed using tools such as Access, Excel, Visual Basic, and GISDK.



### **PROJECT EXPERIENCE**

**Southern California Association of Governments Weekend Travel Demand Model:** In order to ascertain the on-road mobile source travel-related impacts on ozone air quality in the Los Angeles basin on weekends and early in the work week, SCAG contracted with LSA to develop a weekend travel model. LSA was selected based largely on our proposal to include both Saturday and Sunday specificity in the model as well as the ability to switch special events and other important weekend activities on and off. In addition, LSA's extensive experience in analyzing travel behavior information and survey data contributed to the award. Mr. McAtee will serve as assistant project manager in this effort and will oversee the technical work involved in preparing and implementing this model. The model will be utilized by SCAG and environmental agencies in Southern California to develop transportation control measure strategies that target weekend congestion and ozone formation as well as to support photochemical modeling of the entire region to identify weekend transportation strategies to reduce emissions of criteria pollutants and their precursors that occur early in the work week.

**Springfield, Illinois Regional Travel Model:** LSA was recently selected for developing a new regional travel demand model for the Springfield region's metropolitan planning organization (MPO). The MPO has made significant investments in staff, hardware, and training to develop a model and have dedicated staff available to maintain and utilize it. With these goals in mind, LSA developed a model development program that will take full advantage of these investments by utilizing local staff and preparing a customized and automated model that will not require significant out year maintenance expenses. Sean will lead the technical effort on this project and will work closely with MPO staff to ensure that the resulting travel model meets the MPO's needs.

**San Luis Obispo, California Citywide Model:** LSA was recently selected to prepare a citywide model for the City of San Luis Obispo, California. Although a regional model exists through the MPO, the City desired a more detailed model that utilized locally collected data. One of the key components of this effort is to identify what data is available and what might be collected. For example, Cal Poly, a nationally-ranked 4-year university, has a large measurable influence in the city, but very little data exists with regard to travel patterns. The university, along with transit travel and tourist/visitor activity, will be focuses of the effort. Mr. McAtee will oversee technical aspects of this effort, which LSA is leading in collaboration with Cambridge Systematics.

Washtenaw Area Transportation Study Travel Model Update, Ann Arbor MI: LSA is currently updating and enhancing the regional travel demand model of for this Transportation Management Area (TMA) and air quality non-attainment area. All model methods and parameters are being updated based on two recently conducted household travel surveys covering Washtenaw County and the entire Detroit metropolitan area. Several enhancements are being incorporated into the model, including enhanced mode choice treatment of external auto trips accessing transit via park and ride lots. In addition, special processing for University of Michigan trips will more accurately depict the unique travel to and from this major multi-modal traffic generator. Mr. McAtee lead the analysis of household survey data and is implementing the updated model in the TransCAD software package. Sean has written and contributed to many of the technical memoranda that provide complete, clear, and accurate documentation of the travel model development process and resulting travel model processes, parameters, and assumptions.

**Shoal Creek Transportation Studies:** LSA is currently preparing traffic impact analysis studies for the Shoal Creek Valley Community in Kansas City, Missouri. This master planned community consists of seven distinct neighborhoods, each of which requires a separate traffic study prior to commencement of development activities. These traffic studies fall under a larger community plan that evaluates impacts in a larger sphere of influence that can be attributed to the developing community. LSA has also prepared several smaller studies that address operational concerns with particular access points. One such study utilized the VISSIM software package to create a computationally accurate and visually appealing simulation of the Missouri State Route 152 (MO 152) Corridor that traverses the community. Mr. McAtee oversaw the technical analysis and prepared the studies submitted to the City for consideration.

**Mesa County Regional Travel Model Update:** LSA recently updated the Regional Travel Model for the Metropolitan Planning Organization (MPO) of the Mesa County area. Several enhancements were made to this TransCAD model, including new trip purposes, increased trip generation sensitivity to household sizes and incomes, expansion of the model's boundary, special University trip processing, and streamlined network processing. New external travel estimates were made based on a 2006 External Travel Study conducted by LSA and its subconsultant during the model's development. Performance reporting enhancements include NCHRP post processing and forecasting of intersection turning movements for level of service analysis. As part of this project, LSA will be providing annual on-call modeling services to the MPO. The model will be used by the MPO to support the development of the regional transportation plan, transportation improvement program, corridor studies, and other planning activities in this fast-growing region. Mr. McAtee provided guidance to technical staff involved with this project, assisted with implementation, and provided training to MPO staff on operation and interpretation of the updated travel model.

**Cheyenne Area MPO Comprehensive Plan (PlanCheyenne):** LSA assisted with the development of this comprehensive plan by preparing the transportation section of the report, as well as a standalone long range transportation plan called "PlanTransportation." This combined effort allowed for collaboration between land use planners and transportation planners to provide a comprehensive plan that considers impacts of land use on transportation as well as impacts of the transportation system on land use decisions. Sean worked with the Wyoming Department of Transportation, the Cheyenne MPO, and land use planners involved in the project to aid in the development of plan that includes short-term, 25-year, fiscally constrained, and long term components. Considerations involved in the development of the plan included land use patterns, multi-modal corridors and activity centers, previously prepared neighborhood studies, and previous transportation plans. Sean was also responsible for leading the development of a capacity constrained TransCAD based travel model based on the travel model maintained by the Wyoming Department of Transportation as a tool in the transportation planning process.

La Plata County and City of Durango Transportation Plan: LSA assisted La Plata County and the City of Durango, Colorado in preparing a transportation plan and travel model for the City and County. Dubbed "2030 TRIP," this plan provides guidance to both city and county in designing a transportation system that will accommodate future growth. Mr. McAtee led the development of a TransCAD based travel model for use as a tool in the development of this plan and for future use by City and County staff. This model uses a 4-step process based on locally available data as well as data from other similarly sized communities. Due to high levels of congestion in the forecast years, a speed feedback loop was implemented to ensure consistency between trip distribution and traffic assignment. The mode split model uses a GIS-based processor that relates transit availability to transit ridership without requiring the rigorous maintenance associated with a mode choice model. As with all models developed by LSA, this model

provides an intuitive and flexible user interface, a customized scenario management system, and automated reporting and mapping tools. The socioeconomic data and transportation network databases for this project have been designed using a consistent and self-contained system that enhances GIS integration. Sean provided a two-day training session to City and County staff to introduce the TransCAD software and travel model concepts and to train staff in basic operation of the travel model created for this plan.

**Flagstaff MPO Travel Model Update:** LSA provided assistance to the Flagstaff MPO in Flagstaff, AZ to update and recalibrate the MPO's TransCAD travel model. This update included the addition of model enhancements such as increased TAZ detail, updated networks and data, updated model parameters, and an integrated network database. User enhancements included informative summary reports, automated mapping functions, traffic impact study capabilities, and a PM peak hour sub-model. As with most models LSA designs, the Flagstaff model includes an enhanced user friendly graphical user interface and scenario manager. Sean worked with City of Flagstaff employees to provide training on the use of TransCAD throughout the course of the project. Much of the training provided to staff came in the form of assistance from LSA in a production environment. Towards the end of the project, Sean provided a one day training session to familiarize additional staff with the travel model and to help the City and MPO move towards a consolidated GIS and Travel Model database.

North Front Range MPO Travel Model Refresh: LSA is providing ongoing assistance and advice to staff at the North Front Range MPO (NFR MPO) during their efforts to continually update, maintain, and apply their regional travel model. The most recent update to the travel model included a 2005 base year and elimination of the need for a separate travel model in the City of Fort Collins through the merging of these separate models. This included expansion of the City of Fort Collins mode choice model to encompass the entire North Front Range region. This required re-estimation/specification of the nested logit mode choice model using data from a recently completed transit on-board survey and data from other regions. Recent results from a university special generator survey, speed survey, and external station survey were also used in this model refresh. A primary element of this project has been the training of MPO staff. Mr. McAtee has provided training in the operation of TransCAD and on the methodology to be used in updating and maintaining the model.

In a previous effort the North Front Range Regional Travel Model was refreshed to represent base-year 2000 conditions and to provide an improved technical foundation. A thorough review of consistency between the MPO model and a similar version maintained by the member city of Fort Collins was conducted and used as a guide in deciding where changes were to be made to the MPO model. Additional modifications and upgrades to the previous model were identified by a Peer Review Team and implemented in the refreshed model. Updates to parameters and procedures were largely based on the 2001 Household Travel Survey performed by the MPO and analyzed by LSA. This completed model was provided with an interface designed so that the model can be run by various local governments for planning purposes. Automated utilities were designed to create standard sets of maps and to run a Mobile6 air quality conformity process. Through coordination with the Colorado Air Pollution Control Division (APCD), the automated conformity process was verified to be consistent with state-approved methodologies.

**El Paso County (Colorado) Major Transportation Corridors Plan:** LSA prepared an update to the County's Major Transportation Corridors Plan, and helped implement a development fee program in the unincorporated county. Mr. McAtee extended a TRANPLAN model encompassing the most urbanized portion of the county to include the entire county and designed TransCAD utilities to import TRANPLAN model results. He worked with other LSA staff to implement a land use to socioeconomic data conversion process into the model. In addition to providing modeling services, Sean aided in the development of a

project website. This website was designed to provide the general public with all of the materials that was available at public meetings, as well as additional, more detailed information. The website also provided multiple opportunities for visitors to become involved in the project. Mr. McAtee created a Common Gateway Interface (CGI) program, which captured user input in the form of survey answers and general comments. Visitor input was then be distributed to interested parties through email. Site visitors were also able to subscribe to an email distribution list and receive periodic updates on project progress and results.

**City of Thornton Transportation Plan:** Mr. McAtee assisted in the development of this long-range transportation plan. This city is growing very rapidly, with an increase over three years of 15,000 people from the 2000 Census population of 85,000. Thornton is a suburb of Denver and part of a rapidly growing region consisting of over 2.5 million people. With a buildout population estimated of about 300,000 for the City of Thornton, there were considerable challenges facing the plan's development. The study began with a focus on the northeast area of the city, which is currently sparsely developed but growing quickly with the opening of the E-470 tollroad in the vicinity. The City's proximity to Denver International Airport, Interstate 25, and downtown Denver make its transportation network an important component of the regional system. As part of this effort, Sean developed a TransCAD-based travel demand model for the city based on the regional model maintained by the Denver Regional Council of Governments (DRCOG). The regional model was modified in the Thornton area to include a greater level of network and zone detail while maintaining regional consistency.

**Farmington MPO (New Mexico) Metropolitan Transportation Plan Update:** The region surrounding Farmington, NM has recently been designated as an MPO. LSA helped this new MPO in developing its first long range transportation plan. Sean helped the MPO collect and inventory available data while suggesting areas for additional data collection. The public process for this project was carried out through a series of public meetings, as well as through a comprehensive website designed by LSA for the MPO. Prior to the start of this project, a TMODEL2 travel model was developed for the City of Farmington. LSA converted this model to the VISUM platform and expanded the model to include the entire MPO. As part of this effort, Sean assisted with recalibration and validation of the expanded model. The model was used as a tool in the development of the transportation plan for alternatives analysis and to present forecast traffic conditions to the public.

**Boulder County Transit Study:** The City of Boulder, CO and the surrounding Boulder County is well known for innovative transit planning. LSA prepared a study for a consortium of county and city governments in Boulder County that investigated the benefits of alternative transit service enhancements. LSA performed alternative analysis and sensitivity analysis using the Mode Choice component of the Denver Regional Council of Governments regional travel model. Potential improvements included increased frequency on bus and commuter rail lines, extension of existing bus routes, and the addition of new local and express bus lines. Results were presented to and discussed with a technical advisory committee to arrive at a set of preferred improvements that will move forward to the implementation stage.

**Boulder Transportation Master Plan Update:** A preliminary TransCAD model, based on a MinUTP model, was created for the Denver Regional Council of Governments (DRCOG) by the TransCAD developer, Caliper Corporation. It covers the entire Denver Metropolitan Area. Mr. McAtee reviewed and adapted this preliminary model into a working tool for use in the Transportation Master Plan (TMP) Update for the City of Boulder. Adaptation of this model consisted of adjusting parameters and algorithms in the preliminary model, adding detail to the street network and TAZ layer in the vicinity of Boulder, and implementing updates to the socioeconomic data used in the simulation. A customized mode split algorithm was developed to account for TDM and transit improvements and replace the mode choice process used in

the regional model. Review of the preliminary TransCAD script included the identification and repair of several algorithms and the scripting of additional modules. To ensure consistency between regional and local model results, an automated performance report was created to summarize important input and output data, as well as to compare model results to observed ground counts. Consistency, ease of use, and economy of scale are important factors in this work effort.

**City of Arvada Comprehensive Plan:** LSA prepared the transportation section of the comprehensive plan for this suburb of Denver. Arvada is an integral part of the West Denver suburbs and has direct regional connections to Denver, Lakewood, Golden, Broomfield, and other Denver suburbs. This city is expected to reach buildout before 2030, but will continue to experience effects of growth elsewhere in the metro area. Sean adapted the regional travel model developed and maintained by the Denver Regional Council of Governments (DRCOG) to provide better detail in the Arvada area. Multiple land use and transportation alternatives were evaluated using the adapted travel model. Once a small set of options was determined, travel model results were exported to Synchro for an intersection analysis of several preferred alternatives.

**Fort Collins Transportation Master Plan Update:** The City of Fort Collins maintains a TransCAD based transportation model that includes a nested logit mode choice module. Mr. McAtee applied this model for use in the city's Transportation Master Plan update. Application included adjustment socioeconomic data for input to the model and summarization of model performance measures. Mr. McAtee developed an automated NCHRP 255 volume adjustment procedure that uses base year counts and volumes to adjust forecast model results. He as also developed a link-based Mobile6 air quality module using Access and TransCAD which applies hourly link-based emissions factors to model results.

**City of Lawrence–Douglas County, Kansas, Long-Range Transportation Plan:** LSA assisted the City of Lawrence with the development of the Lawrence/Douglas County 2025 Long-Range Transportation Plan. In order to efficiently analyze and graphically display output from the Lawrence QRSII model maintained by KDOT, Mr. McAtee developed a post-processing procedure using TransCAD and Microsoft Excel. This procedure consists of developing interfaces using GISDK in TransCAD and Microsoft Visual Basic in Excel. This automated post-processing procedure includes link-specific level-of-service analysis, air quality analysis, and system-wide analysis, and is efficient enough to be used to easily evaluate, summarize, and compare multiple model runs demonstrating the effects of various alternative projects.

**City of Lincoln–Lancaster County, Nebraska, Long-Range Transportation Plan:** LSA assisted the Lincoln–Lancaster County Planning Department with the development of the region's Long-Range Transportation Plan for this area of approximately 240,000 residents. This effort is being conducted in conjunction with the preparation of the Comprehensive Plan in which the inter-relationship between land use and transportation impacts is considered through an iterative conceptual analysis. Mr. McAtee has been responsible for maintaining, running, and post-processing the TP+ traffic model at LSA. This included modification of current-year networks to create future-year alternative networks, evaluation of model results to determine their validity, air quality analysis, level-of-service analysis and system-wide alternatives analysis. Additionally, Mr. McAtee converted TP+ model output to a format compatible with TransCAD and ArcView GIS for analysis and presentation purposes.

**Longmont, CO Area Comprehensive Plan**: LSA has conducted traffic analysis to examine issues and develop the transportation component of Longmont's Comprehensive Plan. As part of this work effort, Mr. McAtee converted the City's MinUTP traffic model to TransCAD. This work effort addressed issues concerning various land use and growth scenarios, benchmarks including intersection level of service, vehicle

miles of travel average delay, and air quality. A customized TransCAD script was used and refined to provide adjusted intersection turn movement forecasts, and export these forecasts from TransCAD to a format readable by Synchro.

**Palmdale Airport Study:** LSA assisted the City of Palmdale in evaluating the impacts of increased traffic at an airport site using the City's EMME/2 based travel model. Sean's analysis required refinement of the zone and matrix structure in the vicinity of the airport, adjustments to nearby freeway configurations, and identification and correction of several network coding errors that were present in the previous version of the model. The updated EMME/2 databank was documented and provided to the City of Palmdale for future use.

**Fort Collins Model Support:** LSA is under contract to assist the City of Fort Collins in operation, maintenance, and application of their TransCAD based travel model. Recent tasks include development of a SUMMIT analysis for an FTA new starts submittal, staff training, and preparation of plots of model inputs and results. Sean also assisted the City in an effort to migrate from an older version of the model developed for the City to a regional model that incorporates the City's model and is maintained by the MPO.

Lake Elsinore Road Fee Program: Mr. McAtee adjusted and reviewed the TransCAD travel demand model that was developed by LSA for the City of Lake Elsinore, California. Mr. McAtee also assisted in the creation of a turn movement module to interface between TransCAD and Synchro using NCHRP 255 procedures.

**Mason Street FTA New Start Application**: As part of an LSA work effort for the City of Fort Collins, Colorado, Mr. McAtee performed an air quality analysis for the Mason Street Federal Transit Administration New Start Application that evaluated the impacts of various methods of implementation based on TransCAD, MOBILE, and PART model output. In addition, he assisted with the interpretation of model transit ridership and performance results.

Western Resort North Village: To help visualize a plan for a proposed development in Mammoth, CA, Sean created a VISSIM simulation that included a roundabout intersection, a traditional intersection, and a pedestrian-friendly streetscape that included diagonal parking. This three dimensional simulation was used to help visualize a concept that was new to the area.

**Farmington Roundabout Simulation:** Sean created a VISSIM simulation for the City of Farmington that presented the operation of a proposed roundabout. This simulation was used to introduce the idea of a roundabout solution and demonstrate the expected operational characteristics.

### **PROFESSIONAL ASSOCIATIONS**

American Society of Civil Engineers Chi Epsilon Civil Engineering Honor Society

### RAVIKUMAR PALAKURTHY TRANSPORTATION PLANNER/ENGINEER

### **EXPERTISE**

Transportation Planning Transportation Demand Modeling Traffic Operations Analysis

### **PROFESSIONAL REGISTRATION**

Engineer in Training (EIT), 2004

### **EDUCATION**

University of Louisiana, Lafayette, M.S., Civil Engineering (Transportation), 2002

### **PROFESSIONAL EXPERIENCE**

Transportation Planner/Engineer, LSA Associates, Inc., Fort Collins, Colorado, 2004–Present Transportation Planner, Capital Region Planning Commission, Baton Rouge, Louisiana 2002-2004

### PRINCIPAL PROFESSIONAL RESPONSIBILITIES

Mr. Palakurthy is a transportation planner with 5 years of experience in transportation planning, travel demand modeling, geographic information systems (GIS) and signal modeling software programs. His professional experience as a transportation planner includes travel demand model development, traffic impact studies, corridor studies, level of service analysis, and air quality analysis. He is experienced in various travel demand software packages such as TransCAD, VISUM, EMME/2 and QRS II. He has programmed and developed travel models with interfaces containing dialog menus that facilitate easy testing of various land use and transportation alternatives by the client. He has programmed various model add-ins, interfaces and performance reporting in GISDK, the programming language for TransCAD. He is skilled in GISDK, Microsoft Visual Basic and ESRI ArcGIS. Mr. Palakurthy has expertise in Synchro/SimTraffic and VISSIM microsimulation software packages.

### **PROJECT EXPERIENCE**

Washtenaw Area Transportation Study Model Updates, Ann Arbor, Michigan (2006 – 2008): LSA is currently updating and enhancing the regional travel demand model for Washtenaw County Transportation Management Area (TMA). As part of this travel model update, two universities present in the area were identified for Special Generators. Ravi has developed the special generator values as an input for the new model. He also calibrated the new friction factors by trip type for both peak and off-peak periods as a part of the trip distribution of auto trips.



# LSA

**Mesa County Regional Travel Model Update, (2006-2007):** LSA recently updated the Regional Travel Model for the Metropolitan Planning Organization (MPO) in Mesa County and Grand Junction, CO. Several enhancements were made to this TransCAD model, including an enhanced user interface, new trip purposes, increased trip generation sensitivity to household sizes and incomes, expansion of the model's boundary, special University trip processing, and streamlined network processing. As a part of this project, Ravi developed the user interface and performance reporting enhancements for the new travel model. He also developed the roadway networks and populated the networks with counts for validation. Performance reporting enhancements include NCHRP post processing, forecasting of intersection turning movements for level of service analysis, automated mapping, and standardized HTML performance reporting. The model will be used by the MPO to support the development of the regional transportation plan, transportation improvement program, corridor studies, and other planning activities in this fast-growing region.

**Polo Square Traffic Study (2006-2007):** LSA conducted a traffic operations analysis for a proposed development in the fast-growing Coachella Valley of southern California. The development is a major mixed-use site that integrates commercial retail and office uses with several residential products that will provide higher densities along a major travel and transit route. Ravi has developed the turn movements for the development at 42 intersections. He also analyzed those intersections in Synchro for a weekday peak hour and identified the mitigations necessary. A weekend sensitivity analysis and a signal coordination analysis along a major urban highway were also conducted as a part of this project. The study was conducted under the regulatory setting of the California Environmental Quality Act (CEQA).

**City of Lawrence–Douglas County, Kansas, Transportation Model Conversion and Update** (2006): LSA has assisted the City of Lawrence with the conversion and update of City of Lawrence Transportation Model from QRS II to TransCAD. The update included increased TAZ detail and updates to network and socioeconomic data. Ravi converted the model from QRS II to TransCAD, developed a graphical interface to run the TransCAD model, and developed a comparison of the QRS II and TransCAD model processes and results. The graphical interface includes automated mapping and creation of summary reports for the model runs. He also developed a cost estimator module integrated into the travel model that will assist the city in determination of costs associated with different types of roadway improvements based on input unit costs. He also added a module to run Mobile 6 air quality conformity process as a part of this travel model.

**Erie Comprehensive Plan (2006):** LSA has prepared the transportation plan for the Town of Erie, which is a fast-growing community on the urbanized fringe of the Denver metro area. Ravi adapted the regional travel model developed and maintained by the Denver Regional Council of Governments (DRCOG) to provide better detail in the Erie area. He also assisted in the development of a transportation plan for Town of Erie by identifying and prioritizing various roadway improvements necessary for the region. A signal warrant analysis was also conducted for the town for different forecasting scenarios.

North Front Range MPO Travel Model Refresh (2006): LSA provided assistance and advice to staff at the North Front Range MPO (NFR MPO) during their efforts to continually update and maintain their regional travel model. The travel model has been updated to a 2005 base year and has eliminated the need for a separate travel model in the City of Fort Collins through the merging of these separate models. This includes expansion of the City of Fort Collins mode choice model to encompass the entire North Front Range region. Ravi has been a part in re-estimation of nested logit mode choice variables using data from a recently completed transit on-board survey and data from other regions. He also assisted in the data collection for university special generator survey, transit on-board survey and speed survey which will also

be used in this model refresh. He has also integrated a module for turn movement forecasting of intersections, into the new travel model.

**Flagstaff MPO Travel Model Update (2005–2006):** LSA provided assistance to the Flagstaff MPO in Flagstaff, AZ to update and recalibrate the MPO's TransCAD travel model. This update included the addition of model enhancements such as increased TAZ detail, updated networks and data, updated model parameters, and an integrated network database. Ravi updated the TAZ structure and networks for the model. He also assisted in updating the graphical interface and scenario manager for the model using GISDK scripting. User enhancements included informative summary reports, automated mapping functions, traffic impact study capabilities, and a PM peak hour sub-model.

La Plata County and City of Durango Transportation Plan (2005-2006): LSA was retained by La Plata County and the City of Durango, Colorado to prepare a transportation plan and travel model for the City and County. Dubbed "2030 TRIP," this plan provides guidance to both the city and county in designing a transportation system that will accommodate future growth. Ravi worked on the development of a TransCAD based travel model, created the roadway network from street centerline file and developed a TAZ structure for the model. He also created GIS maps for the reports and public meetings. As with all models developed by LSA, this model provides an intuitive and flexible user interface, a customized scenario management system, and automated reporting and mapping tools.

**Rapid City Area 2030 Long Range Transportation Plan (2005):** LSA was contracted to update the Rapid City 2030 Long Range Transportation Plan using their existing TransCAD travel model. Mr. Palakurthy updated the roadway network with the alternatives to be tested. He automated the model run using GISDK scripting and assisted in evaluating the alternatives.

**Longmont Multi-Modal Transportation Plan (2004-2005):** LSA assisted in developing Longmont's first Multi-Modal Transportation Plan. As part of this effort, Ravi developed a TransCAD-based travel demand model for the city based on the regional model maintained by the Denver Regional Council of Governments (DRCOG). The regional model was modified in the Longmont area to include a greater level of network and zone detail while maintaining regional consistency.

**Farmington MPO Metropolitan Transportation Plan Update (2005):** The region surrounding Farmington, NM has recently been designated as an MPO. LSA was contracted to help this new MPO in developing its first long range transportation plan. Ravi has prepared maps, graphics, and data using ArcMap8.3. He also created GIS layer of traffic count data combining the data from different sources.

**Fort Collins Northside Neighborhood Plans (2004):** The primary two-lane arterials serving the Northside Neighborhood of Fort Collins include Lemay Avenue, Vine Drive, and Lincoln Avenue. Lemay Avenue (9<sup>th</sup> Street) is a north-south arterial that travels throughout the City of Fort Collins. The recent growth has resulted in significant transportation impacts within the neighborhoods regarding congestion, access, and safety. Ravi has prepared drawings of two roadway design alternatives for the expansion of Lemay Ave from Vine Dr to Lincoln Ave and presented them in visual form on the existing aerials of the area.

### **EXPERIENCE PRIOR TO LSA**

**2004 Long-Range Plan and Air Quality Conformity Update for Baton Rouge MPO:** The Baton Rouge MPO updated their Long-Range Plan along with their air quality conformity report. Mr. Palakurthy composed the list of projects for the plan using State Transportation Improvement Program (STIP) of LADOTD (Louisiana Department of Transportation and Development), letting list, and requests from the local governments in the MPO area. Mr. Palakurthy, with the help of LADOTD and FHWA, identified the regionally significant projects for air quality analysis of the MPO. He also helped in forecasting the funding for future plan years.

**Signal Synchronization Study on LA44 in Gonzales:** Gonzales, Louisiana has one of the country's highest growth rates in population. LA44 is a major arterial running through town. Ravi led the data collection team to collect turning movements at 11 signalized intersections during the peak hours. He developed the corridor model using SYNCHRO 5.0, and optimized the signal timings and developed three alternatives along with signal synchronization plan for the corridor. Air quality analysis done on the new intersection delays showing reductions in the emissions and the synchronization plan, was approved by LADOTD for implementation using CMAQ (Congestion Mitigation for Air Quality) funds.

**Transportation Summits for East Baton Rouge and Ascension Parishes:** Local elected officials of East Baton Rouge and Ascension parishes wanted different innovative funding sources for transportation network improvement in the region. Mr. Palakurthy helped area elected officials in coordinating with local consultants and various federal and local government representatives. He also prepared the final reports summarizing the results of those summits.

**2000 Baton Rouge MPO Study Area Update:** Baton Rouge MPO updated their urbanized area and study area boundaries based on new 2000 census data. Ravi has worked with LADOTD and FHWA officials to delineate the boundary for the urbanized and study areas for the MPO. The new boundaries were presented to the Transportation Policy Committee (TPC) and Transportation Advisory Committee and were approved by them.

**Impact of New Signal Timing Plan on Urban Street Network using GPS:** City of Lafayette, Louisiana implemented a new signal timing plan for all of its major corridors. Mr. Palakurthy has collected data using GPS to analyze the speed and intersection delay for those major corridors. Data was downloaded to computer, exported to GIS format, and a group of GISDK macros were run to summarize and analyze the data. The final report was submitted to Lafayette Consolidated Government.

**Traffic Flow Simulation Models For Evaluation of Alternative Lafayette I-49 Designs:** Mr. Palakurthy was responsible for data collection and assisted in the development of simulation models for various alternatives of I-49 designs in Lafayette, Louisiana, using Synchro and SimTraffic.

Webpage Development and Maintenance: Mr. Palakurthy has experience with various web development soft wares such as HTML, JSP, ASP and graphics soft wares such as adobe Photoshop and macro media flash. He developed and maintained the website for Department of Civil Engineering at University of Louisiana, Lafayette.