



## PROFESSIONAL SERVICES AGREEMENT

**Project Name: MISSOULA MPO TRAVEL DEMAND MODEL UPDATE**

**THIS AGREEMENT** is made and entered into this October 23, 2023, by and between the **CITY OF MISSOULA, MONTANA**, a municipal corporation organized and existing under the laws of the State of Montana, 435 Ryman St., Missoula, MT 59802, referred to here as “City,” and **LSA Associates, Inc.**, whose principal place of business is located at 1500 Iowa Avenue, Suite 200, Riverside, CA 92507, hereinafter referred to as “Contractor.”

### RECITALS

**WHEREAS, the City desires to utilize Contractor to furnish independent services in connection with MISSOULA MPO TRAVEL DEMAND MODEL UPDATE; and**

WHEREAS, Contractor has represented to the City that Contractor has the necessary expertise to furnish said services and has available to Contractor the necessary staff and resources to perform the independent services in a timely manner consistent with the nature of the project.

NOW THEREFORE, in consideration of the mutual covenants and agreements herein contained, the parties agree as follows:

**1. Purpose**

City desires to have Contractor update and enhance the Missoula Metropolitan Planning Organization (MPO) Travel Demand Model (TDM).

**2. Effective Date**

This Agreement is effective upon the date of its execution by both parties and will terminate on the 31<sup>st</sup> of December, 2026, or upon 30 days’ notice by the City to Contractor of its desire to terminate the Agreement by giving such notice to Contractor’s designated liaison identified below.

**3. Scope of Work**

**a.** Contractor will perform the work and provide the services in accordance with the requirements of the Scope of Services attached here to as Exhibit A; and

**b.** If authorized in writing as provided in this subsection, Contractor shall also furnish additional services. To the extent additional services have been identified at the time of executing this Agreement, they are itemized in Exhibit A and will be paid for by City as indicated in Section 4. As further additional services are requested of Contractor, this Agreement may be modified and subject to mutual consent by execution of an addendum by authorized representatives of both parties, setting forth the additional scope of services, their performance time schedule, and the compensation for such services.

#### **4. Payment**

a. City agrees to pay Contractor for services outlined in Exhibit A in accordance with the terms and conditions laid out in Exhibit B – Compensation, and Contractor shall be compensated for additional services authorized pursuant to Section 3.b. above, which have not been identified at the time of executing this Agreement as more particularly described in a fully approved and executed addendum to this Agreement. Payment for work beyond that described in Exhibit A or as contained in a fully approved and executed addendum to this Agreement is expressly denied without prior written authorization from City. Such authorization must include signature of the Mayor.

b. Contractor shall submit monthly statements for basic and additional services rendered. City shall pay Contractor within 30 days of receipt of an itemized invoice for the services rendered or shall notify Contractor of any dispute by City concerning the performance of any services and the basis therefore and shall pay Contractor within thirty days for the services not in dispute. If any items are disputed by City, Contractor and representatives of City shall meet and confer regarding the disputed items within ten business days after City notifies Contractor of the services in dispute. City shall pay for any disputed services for which the dispute has been resolved to the satisfaction of the City within thirty days after such resolution.

#### **5. Independent Contractor Status**

The parties agree that Contractor, is an independent contractor for purposes of this agreement and the parties agree that Contractor is and shall be an independent contractor when performing services pursuant to this agreement. Contractor is not subject to the terms and provisions of the City's personnel policies handbook and may not be considered a City employee for workers' compensation or any other purpose. Contractor is not authorized to represent the City or otherwise bind the City in any dealings between Contractor and any third parties.

Contractor shall comply with the applicable requirements of the Workers' Compensation Act, Title 39, Chapter 71, MCA, and the Occupational Disease Act of Montana, Title 39, Chapter 71, MCA. Contractor shall maintain workers' compensation coverage for all members and employees of Contractor's business, except for those members who are exempted by law.

Contractor shall furnish the City with copies showing one of the following: (1) a binder for workers' compensation coverage by an insurer licensed and authorized to provide workers' compensation insurance in the State of Montana; or (2) proof of exemption from workers' compensation granted by law for independent contractors.

#### **6. Indemnity and Insurance**

For other than professional services rendered, to the fullest extent permitted by law, Contractor agrees to defend, indemnify, and hold the City harmless against claims, demands, suits, damages, losses, and expenses connected therewith that may be asserted or claimed against, recovered from or suffered by the City by reason of any injury or loss, including but not limited to, personal injury, including bodily injury or death, property damage, occasioned by, growing out of, or in any way arising or resulting from any intentional or negligent act on the part of Contractor or Contractor's agents or employees.

For the professional services rendered, to the fullest extent permitted by law, Contractor agrees to indemnify and hold the City harmless against claims, demands, suits, damages, losses, and expenses, including reasonable defense attorney fees, to the extent caused by the negligence or willful misconduct of the Contractor or Contractor’s agents or employees.

For this purpose, Contractor shall provide City with proof of Contractor’s liability insurance issued by a reliable company or companies for personal injury and property damage in amounts not less than as follows:

- Workers’ Compensation Statutory
- Commercial General Liability \$1,000,000 per occurrence;  
\$2,000,000 annual aggregate
- Automobile Liability \$1,000,000 property damage/bodily injury;  
\$2,000,000 annual aggregate
- Professional Errors and Omissions Liability \$1,000,000 per claim;  
\$2,000,000 annual aggregate

City shall be included or named as an additional or named insured on the Commercial General and Automobile Liability policies. The insurance must be in a form suitable to City.

**7. Professional Service**

Contractor agrees that all services and work performed under this agreement will be accomplished in a professional manner, in accordance with the accepted standards of Contractor’s profession.

**8. Compliance with Laws**

Contractor agrees to comply with all federal, state and local laws, ordinances, rules and regulations.

**9. Nondiscrimination and Affirmative Action**

Contractor agrees and shall comply with the following Non-Discrimination and Affirmative Action policies:

**NON-DISCRIMINATION**

All hiring shall be on the basis of merit and qualification and there shall be no discrimination in employment on the basis of race, ancestry, color, physical or mental disability, religion, national origin, sex, age, marital or familial status, creed, ex-offender status, physical condition, political belief, public assistance status, sexual orientation, or gender identity/expression, except where these criteria are reasonable bona fide occupational qualifications.

**AFFIRMATIVE ACTION POLICY**

Contractors, subcontractors, sub grantees, and other firms doing business with the City of Missoula must be in compliance with the City of Missoula’s Affirmative Action Plan, and Title 49 Montana Codes Annotated, entitled “Human Rights” or forfeit the right to continue such business dealings.

**The City’s Affirmative Action Policy Statement is:**

The Mayor of the City of Missoula or the Mayor’s designee may adopt an affirmative action plan to provide all persons equal opportunity for employment without regard to race, ancestry, color, handicap, religion, creed, national origin, sex, age, sexual orientation, gender identity or expression, or marital status. In keeping with this commitment, we are assigning to all department heads and their staff the responsibility to actively facilitate equal employment opportunity for all present employees, applicants, and trainees. This responsibility shall include assurance that employment decisions are based on furthering the principle of equal employment opportunity by imposing only valid requirements for employment and assuring that all human resource actions are administered on the basis of job necessity.

Specific responsibility for developing, implementing, monitoring and reporting are assigned to the City Personnel staff under the supervision and direction of the Chief Administrative Officer and the Mayor.

It is the policy of the City of Missoula to eliminate any practice or procedure that discriminates illegally or has an adverse impact on an “affected” class. Equal opportunity shall be provided for all City employees during their terms of employment. All applicants for City employment shall be employed on the basis of their qualifications and abilities.

The City of Missoula, where practical, shall utilize minority owned enterprises and shall ensure that subcontractors and vendors comply with this policy. Failure of subcontractors and vendors to comply with this policy statement shall jeopardize initial, continued, or renewed funds.

Our commitment is intended to promote equal opportunity in all employment practices and provide a positive program of affirmative action for the City of Missoula, its employees, program participants, trainees and applicants.

**10. Default and Termination**

If either party fails to comply with any condition of this agreement at the time or in the manner provided for, the other party, may terminate this agreement and be released from all obligations if the default is not cured within ten (10) days after written notice is provided to the defaulting party. Said notice shall set forth the items to be cured. Additionally, the non-defaulting party may bring suit for damages, specific performance, and any other remedy provided by law. These remedies are cumulative and not exclusive. Use of one remedy does not preclude use of the others. Notices shall be provided in writing and hand-delivered or mailed to the parties at the addresses set forth in the first paragraph of this agreement.

**11. Modification and Assignability**

This document contains the entire agreement between the parties and no statements, promises or inducements made by either party or agents of either party, which are not contained in this written agreement, may be considered valid or binding. This agreement may not be enlarged, modified or altered except by written amendment signed by both parties hereto. The Contractor may not subcontract or assign Contractor’s rights, including the right to compensation or duties arising under this agreement, without the prior written consent of City. Any subcontractor or assignee will be bound by all of the terms and conditions of this agreement.

**12. Ownership and Publication of Materials**

All reports, information, data, and other materials prepared by the Contractor pursuant to this agreement are the property of the City. The City has the exclusive and unrestricted authority to release, publish or otherwise use, in whole or part, information relating thereto. Any re-use without written verification or adaptation by the Contractor for the specific purpose intended will be at the City’s sole risk and without liability or legal exposure to the Contractor. No material produced in whole or in part under this agreement may be copyrighted or patented in the United States or in any other country without the prior written approval of the City.

**13. Liaison**

Designated liaison with Contractor is Ambarish Mukherjee, and Contractor’s designated liaison with City is Aaron Wilson.

**14. Previous Agreements**

This Agreement constitutes the entire understanding of the parties and is intended as a final expression of their agreement and a complete statement of the terms thereof. There are no promises, terms, conditions, or obligations, other than contained herein. This Agreement shall supersede all previous communications, representations, or agreements, either oral or written, between the parties.

**15. Applicability**

This agreement and any extensions of it shall be governed and construed in accordance with the laws of the State of Montana.

**16. Force Majeure**

Neither party shall be deemed to be in default on account of any delays or failure to perform its obligations under this Agreement which directly results Acts of God, accident, riots, war, terrorist act, epidemic, pandemic, quarantine, civil commotion, breakdown of communication facilities, breakdown of web host, breakdown of internet service provider, erroneous data provided to consultant, natural catastrophes, governmental acts or omissions, changes in laws or regulations, national strikes, fire, explosion, generalized lack of availability of raw materials or energy.

WITNESS, the parties here have executed this instrument the day and year first above written.

**CONTRACTOR:**

**MAYOR:**

**City of Missoula, Montana**

\_\_\_\_\_  
**LSA Associates, Inc.**

\_\_\_\_\_  
**Mayor**

**ATTEST:**

**APPROVED AS TO FORM:**

\_\_\_\_\_  
**City Clerk**

\_\_\_\_\_  
**City Attorney**

**(SEAL)**

**EXHIBIT A – SCOPE OF SERVICES**



## Work Plan

LSA has provided an expanded discussion in the following sections for each task included in the Request for Proposals (RFP). This information demonstrates our understanding of the project and provides insight into the approach that will be used if we are fortunate to be selected for this work. LSA can complete all work requested in the RFP by July 2024 except Task 5.0: Forecast Data. It is anticipated that development of forecast data will be conducted in coordination with the MPO's LRTP and MUTD's strategic plan. Therefore, LSA will be able to complete all work under this contract by April 20, 2025 as requested in the RFP.

### Task 1.0: Project Management

The update and enhancement of the Missoula MPO Travel Demand Model will require a close working relationship among Missoula MPO staff, possibly local government representatives (Mountain Line transit), state agency representatives (Montana Department of Transportation), and LSA. LSA will form a project stakeholder/technical advisory committee (TAC) that will guide the model update process and may include representatives from the MPO and possibly representatives from the MUTD, City of Missoula, Missoula County, and Montana Department of Transportation (MDT). The stakeholder group may also include members from the Transportation Technical Advisory Committee (TTAC) and Transportation Policy Coordinating Committee (TPCC) depending on the MPO's desire. Throughout the duration of this project, it will be important to maintain communication with these and other project stakeholders. This working relationship begins with the initial kickoff meeting and continues throughout the duration of the project. The project management tasks that we will implement to achieve a successful project are as follows:

#### Task 1.1: Project Initiation

At the onset of the project, it will be necessary to establish the details of the travel model objectives, schedule, data availability, and other technical and procedural issues. Since it is important to have this dialog at the beginning, we will hold a kickoff meeting within 2 weeks of the notice to proceed. Topics at the kickoff meeting will include refinement of the overall project scope and schedule, discussion of specific modeling tasks, and the availability of relevant data and studies.

#### Task 1.2: Meetings

LSA proposes that regular coordination meetings be established monthly as needed to ensure that project coordination, issues, deliverables, and work efforts are being continually addressed. These meetings will be conducted via web-conference or conference calls. Meetings will include the pertinent LSA team members required by the agenda. Participation on behalf of the MPO will be at the discretion of the MPO's Project Manager. In addition to the formal meetings, LSA staff will be available for informal meetings and discussions as needed throughout the project. The MPO may cancel these meetings when they are not necessary.

Most of these meetings will be held to 1 hour in length. Key milestone dates, such as review of technical products and review of model documentation, may require longer meetings. LSA's Project Manager will develop meeting agendas in advance of the meeting. LSA shall notify the MPO staff whenever discoveries or new information has the potential to require changes in the scope or limits of the project.

At the completion of each month, LSA will also provide a monthly progress report, along with each invoice, that summarizes the work performed and key deliverables during the previous month.



## Task 2.0: Model Input Updates

LSA proposes to update and enhance the existing model in a stepwise fashion. This approach begins with updates of input datasets of the model such as traffic analysis zone data, socioeconomic data, and transportation networks and moves forward to each individual model step and is completed with a comprehensive validation process. Remarks addressing each part of this stepwise approach are provided in the sections below.

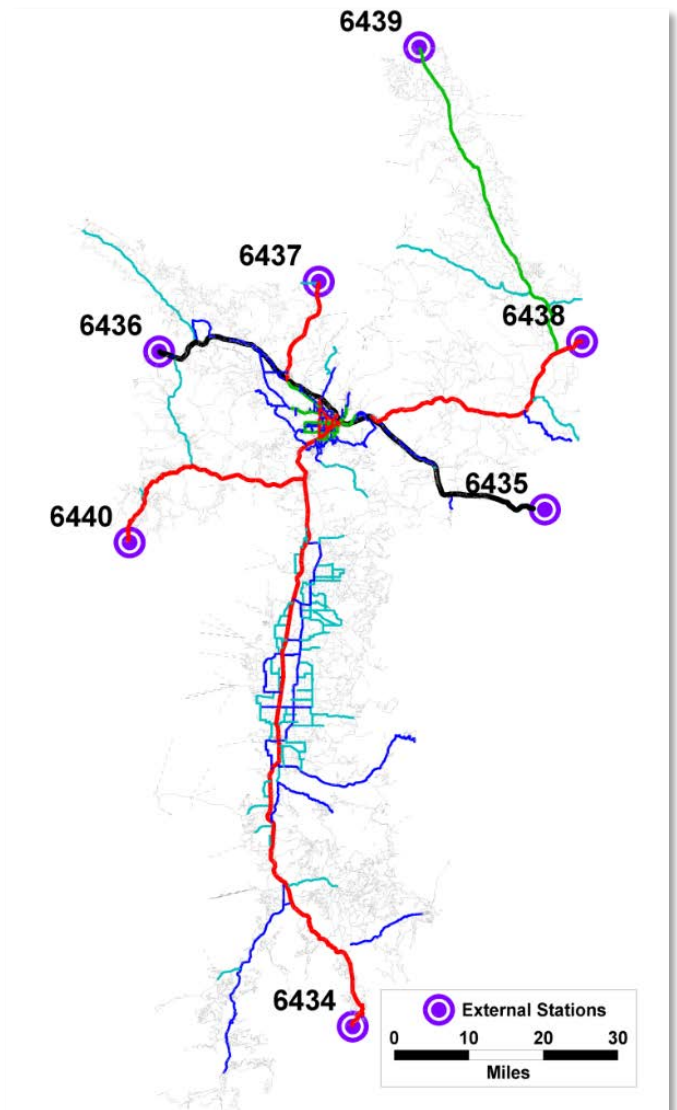
### Task 2.1: Traffic Analysis Zone (TAZ) Updates

The Missoula Model currently has just over 4,000 internal zones and 7 external zones. The TAZ structure for the Missoula Model is generally identical to the 2010 Census Blocks; however, additional zone splits have been included to account for greenfield developments, especially in the Mullan area of the region. LSA in coordination with the MPO will review the most recent census geographies (2020) to determine if significant changes have occurred. In addition to changes in census geographies, LSA will coordinate with the MPO on any additional zone splits in the developing areas of the region. New and large development information will be reviewed to identify any potential new zonal splits. Similar to the development proposals, review of roadway and transit infrastructure improvements from the current LRTP and transit strategic plan will be conducted to identify possible zone splits.

Zone boundaries will also be coordinated with the local jurisdictional boundaries to allow accurate subarea reporting, as well as with City water and sewer utilities to facilitate modeling of other services. Proposed zone splits will be presented to the MPO for their review and will be implemented in the model once they are approved. Other model inputs such as roadway network, socioeconomic data, and other input variables will be appropriately addressed for proposed zonal disaggregation.

#### Task 2.1: Deliverables

- *Maps and shape file of updated TAZs for MPO review.*
- *Updated TAZ layer files for model inputs*



## Task 2.2: Socioeconomic Data Updates

The Missoula Model is a socioeconomic data model and therefore uses households and employment to generate trips. Household variables include household size and income, whereas employment is disaggregated into six employment categories.

The travel model is calibrated and validated to existing conditions, which is referred to as the base year for the model. The existing base year for the model is 2018. LSA recommends updating the base year to year 2022 depending on the availability of various model inputs. Availability of the most recent important model inputs such as household data, employment data, and traffic counts will assist the MPO and LSA in determining the appropriate model base year.

Development of base year (2022) household data will be conducted using a bottom-up approach. Household data for the model base year will be developed using 2018 household data from the existing model and adding all new building permit data from 2018 up to the model base year (2022). Jurisdictional building permit data, recent American Community Survey (ACS) data, 2020 Census data, and current 2050 forecast data will be used to identify the amount and spatial allocation of household growth from 2018 to 2022. The household totals for the model base year will be compared against household counts from the latest ACS data. In case of significant differences between the new base year model data and ACS data, LSA will coordinate with the MPO to resolve the differences. 2020 Census data and the most recent version of Public Use Microdata Sample (PUMS) data will be used to develop household variables – household size and income at a TAZ level. LSA will develop growth maps to demonstrate the household growth (2018–2022) for MPO review before including it in the model dataset. While a detailed bottom-up approach will be conducted for Missoula County, a simple linear growth approach will be used to develop household data for Ravalli County.

Employment data for the previous model updates were provided by the MPO. Similarly, LSA understands that the MPO will provide 2022 employment data in geographic information system (GIS) format. The data will include North American Industry Classification System (NAICS) code. LSA will use the NAICS code to disaggregate the employment into the six model categories, while the GIS format will be used for aggregation to the model TAZ system. LSA will review the new employment data for reasonableness by comparing the data with current base year 2018 employment, with estimates from the Bureau of Labor Statistics (BLS), and other available data sources.



The Missoula Model uses households with household size and income to develop trip productions and six employment types to develop trip attractions. As suggested in the RFP, LSA will retain the household attributes (income and household size) and the employment types from the existing model as they provide adequate sensitivity in the model's trip generation.

LSA will review the updated household and employment information with the MPO before its incorporation into the travel model. Miscellaneous TAZ data, such as area types and jurisdictional boundary definitions, will be adjusted appropriately.

## Task 2.2: Deliverables

- Maps and summary tables of residential and non-residential growth for MPO review.
- Base year model socioeconomic data development technical memorandum.
- Base year model socioeconomic data inputs.

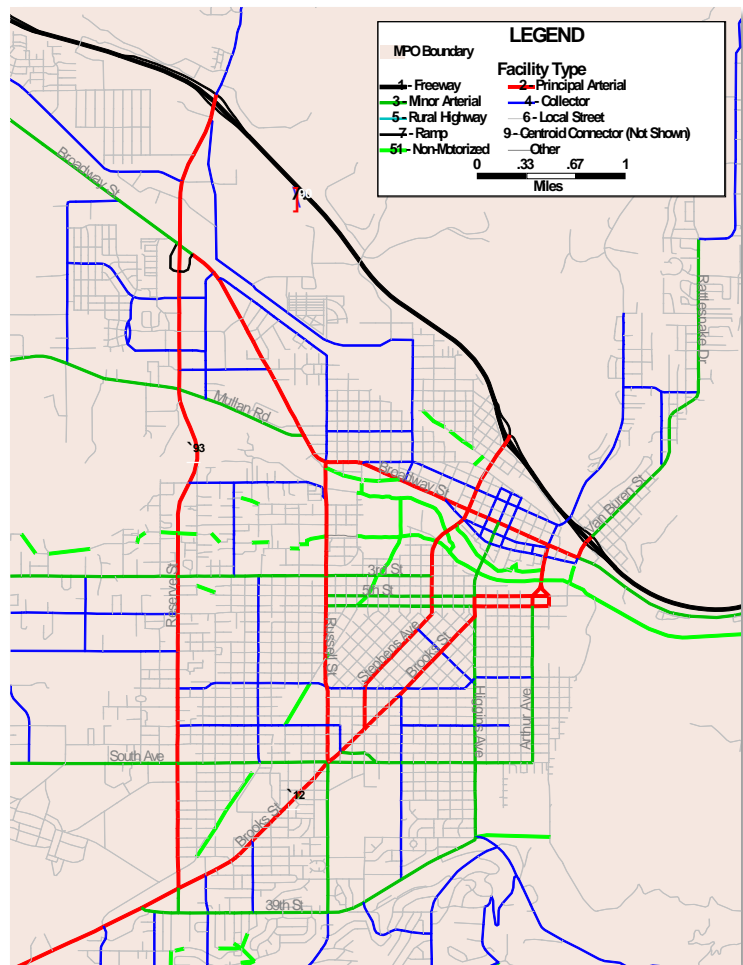
## Task 2.3: Network Updates

### Roadway Network Update

Roadway Network Update: The Missoula Model roadway network is in an integrated database format and includes information for all modeling years in the same network file. Multiple alternatives can also be coded on the network, which can be turned on or off using the model interface.

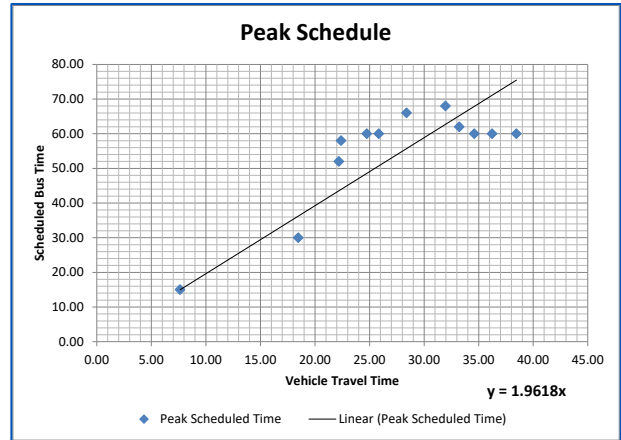
LSA will update the roadway network to reflect the base year (2022) conditions. The roadway network updates will be focused on changes that have occurred since the previous model's base year (2018) along with any TAZ changes that might be identified in Task 2.1. LSA will obtain the list of roadway improvements constructed since the model's base year (2018) and will update the network accordingly. LSA will review the list of improvements along with the MPO's Transportation Improvement Program (TIP) to identify capacity improvements to include in the updated network. Network maps identifying those improvements will be provided for the MPO's review. Capacity improvements identified in the current LRTP will be reviewed and included in the base year (2022) network if any of those improvements have been constructed.

The roadway network will also be kept consistent with any TAZ modifications and transit route system updates. The base year network will be reviewed for accuracy, connectivity, and consistency. The existing network approach of an integrated database (legacy network) will assist in maintaining network consistency for base and future years.



### Transit Network Changes

LSA will update the transit route system to accurately represent the existing transit service for the Mountain Line bus service. This route system will be updated based on the updated roadway network and will be sensitive to roadway network variables, including freeflow and congested speeds and travel times. LSA will update the model route system, route headways, and route alignments with changes from Mountain Line’s route schedules. Transit stops are coded on the transit route system as route stops, and transit stops will be updated based on route system updates.



### Bicycle/Pedestrian Network Update

The Missoula MPO Model roadway network includes attributes that describe the presence and quality of non-motorized facilities on roadway links within the MPO. LSA will explore the most recent best practices in the industry for representation of bike and pedestrian facilities in the travel models that would improve the model’s sensitivity for non-motorized facilities. LSA will provide recommendations to the MPO regarding the enhancements that can be conducted to improve the model’s sensitivity. LSA will also conduct a detailed review of the existing non-motorized facilities and will update the network accordingly, in coordination with the MPO. Improvements to the bicycle and pedestrian network, such as addition of new facilities and changes in alignments, will be updated in the model network accordingly.



### Compilation of Counts

Count data are critical in validation of the model’s results and calibration of locally specific parameters. Count data include traffic counts, ridership counts, and bike and pedestrian counts for roadway, transit, and non-motorized validations, respectively.

One of the important aspects in review of count data (traffic, transit, and non-motorized) for consistency and reasonableness would be consideration of the effects of the COVID-19 pandemic.

LSA will obtain the latest traffic count data from the MPO. The count data will be reviewed for consistency and reasonability by comparing them with historical count data that are available on the roadway network. The latest traffic count data along with historical data will be plotted on maps for easy review of the count data for reasonableness. Locations with multiple year counts will be used to estimate the traffic growth rates and will be helpful in the count review process. Review of the count data will also include verification that the model network and screenlines are sufficiently covered for validation. For screen line locations where new count data are not available, growth rates from traffic counts or socioeconomic data will be used to adjust 2022 counts. A similar approach may be used to adjust counts in Ravalli County in case 2022 counts are not available. LSA will review the counts at



external stations and update them appropriately. This will also include modification of internal/external (IE) trips and external-external (EE) trips accordingly. IE and EE trips are also discussed in detail in Task 3.1 below.

LSA will also obtain the most recent observed ridership data from MUTD/Mountain Line for transit validation. The ridership data should represent the weekdays when the University of Montana is in session. Similar to traffic counts, the latest ridership data along with recent service changes will be compared with historical ridership data for reasonableness.

LSA will request and obtain the most recent bicycle and pedestrian counts from the MPO. The latest counts will be reviewed with historical count data on the network for reasonableness. Non-motorized counts will be used in the recalibration of the mode-choice coefficients and constants. These counts and the trip information provide validation data that ensure non-motorized trips are modeled with reasonable lengths and in the correct locations.

As mentioned previously, traffic and non-motorized counts will be coded onto the network. Coding of counts on the network will not only assist with model validation but also review of the counts with historical data. LSA has retained counts from the previous model update efforts on the network, which will make the comparison a relatively easy and seamless process.

### Task 2.3: Deliverables

- *Maps and shape files of model networks and counts for MPO review.*
- *Technical memorandum of network development methodology for roadway, transit, and non-motorized networks.*
- *Updated base year model networks – roadway, transit, and non-motorized networks.*

## Task 3.0: Model Update

Update of the regional travel model includes updates to all 4 steps/components of the model – trip generation, trip distribution, mode choice, and traffic assignment. LSA will update all the components of the model with the most recent input data as described above. The model will be calibrated and validated to the most recent observed data. Observed data for model validation will be obtained from multiple sources such as publicly available data such as the 2020 Census, most recent Census Transportation Planning Package (CTPP), and local data sources such as traffic, transit, and non-motorized count data. A detailed description for each of the modeling steps and update process is provided below.

### Task 3.1: Trip Generation

As suggested in the RFP, LSA will continue use of existing cross-classification/bivariate trip production methodology for households. Currently the model uses household variables such as household income and household size for trip generation. Similarly, the current model disaggregates employment into six employment categories that provide sufficient sensitivity for generation of the model's attractions. LSA will review trip production and attraction rates and update them for model calibration and validation. Potential adjustments to trip rates will occur during the entire calibration and validation process.

Missoula is home to the University of Montana (UM), which is modeled as a special generator in the model. The UM campus is separated into four traffic analysis zones. The most recent enrollment and employment data for UM will be requested from UM. Total enrollment will be divided into on-campus and off-campus enrollment based on data from the previous model. Special generator values will be updated based on changes in student enrollment and employment.

LSA will review the latest available PUMS data and ACS data sets to identify any updates to the regional household distributions by income and size.



LSA will obtain the most recent traffic counts from MDT at the model external stations. The traffic counts will be disaggregated into internal-external/external-internal (IE/EI) and external-external trips. LSA will use the same approach utilized in the previous model updates. LSA is recommending the purchase of big data, described in detail in Task 3.2, which can be used to update the IEEI/EE splits based on the most recent external trip patterns.

### Task 3.1: Deliverables

- *Trip generation update methodology technical memorandum.*
- *Updated model trip generation rates, special generator, and external trip tables.*

### Task 3.2: Trip Distribution

As indicated in the RFP, the previous model development and update efforts relied heavily on the CTPP, which includes a Journey to Work dataset that was useful in calibration of trip distribution for work trips. CTPP data along with other household surveys from similar regions to Missoula, and big data (Streetlight) were used in the previous model calibration for non-work trip purposes using a pivot-point analysis. LSA will review available data sources such as the latest Census data, CTPP data, and 2017 National Household Travel Surveys, etc., for calibration of trip distribution.

LSA will validate the trip distribution for each of the trip purposes using the standards found in the following document: Travel Model Validation and Reasonability Checking Manual, Second Edition (Sept. 2010), Federal Highway Administration (FHWA) Travel Model Improvement Program.

The following validation and reasonableness checks will be performed:

- Implied speeds for each zone-interchange (consider high and low values, frequency distribution);
- Compare average trip time and/or length by trip purpose;
- Compare average trip time and/or length by production/attraction and by area type;
- Compare trip time and/or length distribution plots;
- Compare normalized friction factors by trip purpose;
- Compare percent of intrazonal trips by trip purpose; and
- Compare district-to-district trip interchanges to any observed data.



### Optional Data Purchase

LSA strongly recommends obtaining new global positioning system (GPS)-based Origin-Destination (O-D) data for calibration of trip distribution especially to understand post-pandemic travel patterns. Most of the publicly available data sources are pre-pandemic, which raises questions on the validity of using pre-pandemic data sources for post-pandemic model validation. LSA understands that this is an expensive endeavor, but lack of post-pandemic travel data limits the number of data sources that can be used in the travel model calibration and validation. Proposed big data will provide detailed trip information specific to the Missoula region for pre-pandemic and post-pandemic conditions, which will help in a better calibration and validation of a travel model and capture appropriate changes in trip making characteristics of the region for post-pandemic conditions. For example, one of the long-term impacts of the pandemic was acceleration of work from home and online shopping. These trends of decreased work and shopping trips will not be captured in the pre-pandemic data sources. Therefore, purchase of these commercially available data is being recommended and has been included as an additional cost in this proposal.

The data purchase option includes unlimited use of the data for the entire Missoula region for 1 year. Given the MPO is embarking on the update of its LRTP and MUTD's transit plan, this big data source can be used in both model development and LRTP efforts. LSA has already conducted review of available big data sources for their data, disaggregation levels, and costs and has identified a best fit for the MPO for this effort. Therefore, LSA can coordinate with the MPO in selecting the big data source and its purchase.

The dataset will include disaggregate trip and population tables, trip origin and destination, and trip purpose and mode by disaggregate time periods. Relationships between pre-pandemic and post-pandemic trip making characteristics – trip purpose, trip mode, and trip time of day – will be used to update the model calibration and validation. Costs to obtain these data are included in the cost proposal as an optional line item.

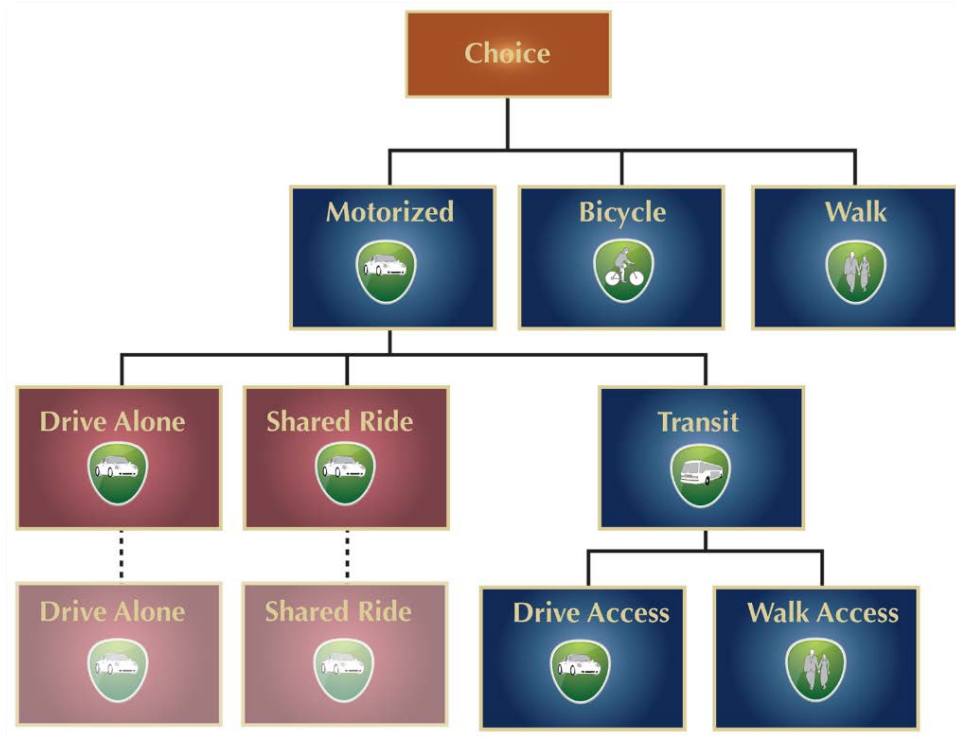
### Task 3.2: Deliverables

- *Trip distribution update methodology technical memorandum.*

### Task 3.3: Mode Choice

The Missoula Model includes a mode choice component that separates the person trip tables into the drive alone, shared ride (i.e., carpool), transit (walk access and drive access), and non-motorized (bicycle and walk) modes. The Missoula mode choice model is a nested logit model. LSA will update mode choice parameters of the model as the MPO does not anticipate any changes to the structure of the mode choice model. The observed mode share for transit will be based on the number of boardings from Mountain Line's Automatic Passenger Counts (APC) data, whereas the non-motorized shares will be obtained from the most recent CTPP data. LSA will review CTPP and 2017 National Household Travel Survey (NHTS) datasets to develop the mode share targets for the home-based work trips in the model as CTPP data are only available for work trips. Pivot point analysis similar to previous model updates will be conducted to develop mode share targets for the other trip purposes in the model. LSA will make modifications to alternative specific constants during the mode choice calibration. Other attributes such

as mode choice coefficients, value of times, and any of the cost variables will be reviewed and updated accordingly during the calibration effort.



### Task 3.3: Deliverables

- *Mode choice update methodology technical memorandum.*

### Task 3.4: Time of Day

Trip tables resulting from trip distribution and mode choice will represent all trips made within a 24-hour period in production/attraction format. The Missoula Model includes a time-of-day component where the trip tables are distributed into a.m. peak, p.m. peak, and off-peak periods. Directional time of day factors are used in the Missoula MPO Model to convert trips from Production/Attraction (PA) format to Origin/Destination (OD) format and into peak and off-peak time periods used in the model. The time-of-day factors, during 2010 model development, were developed using the traffic count data and from other models with similar travel characteristics that were available at that time. LSA will review available count data and modify existing time of day factors if sufficient hourly count data are available. In case detailed count data are unavailable, as mentioned in the RFP, LSA will retain existing time of day factors in the model.



### Task 3.5: Validation

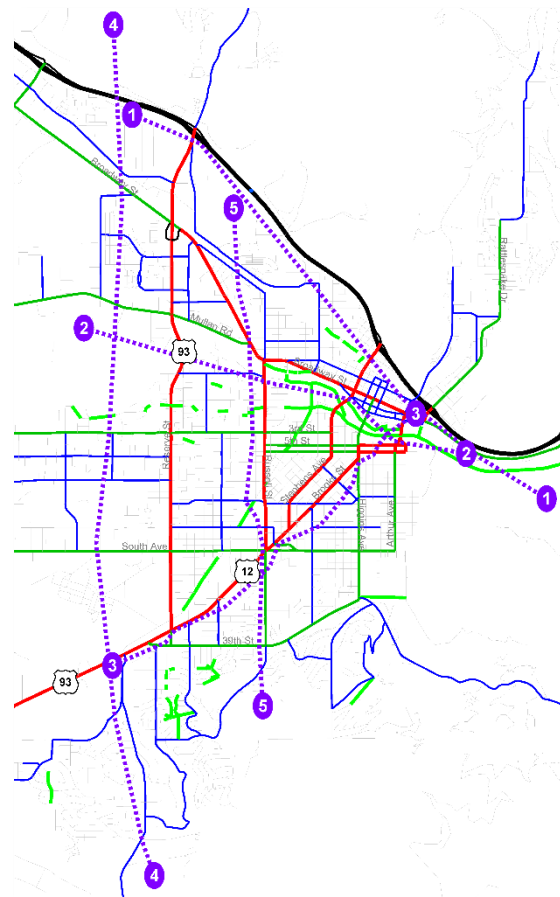
LSA will validate the base year model to observed conditions using available traffic count data and survey data (e.g., CTPP data). The validation process looks at the results of the complete model operation in a more detailed and comprehensive fashion than the calibration process that addresses each model step individually. The model validation begins with the review of model trip rates and continues forward to trip length analysis, mode analysis, and traffic assignment. As a result, it may be desirable to adjust trip generation, trip distribution, or other model parameters to match overall vehicle miles traveled (VMT) results or other regional travel characteristics. Validation will be carried out to meet the guidance of nationally recognized guidance documents such as the FHWA Model Reasonableness and Checking Manual (Travel Model Validation & Reasonableness Checking Manual, 2nd Edition). In this regard, LSA will apply a comprehensive assortment of statistical measures to verify the model’s validation.

Screenlines will be defined or updated for the model so that the larger regional travel patterns can be understood, and the model validated to match them as closely as possible. LSA will work with the MPO staff to identify any modifications to existing screenlines based on available traffic count locations and any potential changes in major movements.

Screenlines will be validated to the standards defined in the National Cooperative Highway Research Program (NCHRP) report for 24-hour traffic volumes. The following standards by facility type are suggested for validation:

Facility Type	Allowable Link Volume Error
Freeway	7%
Major/Principal Arterials	10%
Minor Arterials	15%
Collector	25%
All Roadways	7%

LSA will calibrate/validate transit assignment to observe boarding data, any transit survey, and recent Census data. Standard validation criteria will be applied when trying to match observed transit trips. Another important target is the transfer rate. LSA will look at the estimated transit trips from mode choice and then consider the number of boardings occurring on the system in transit assignment.





### Task 3.5: Deliverables

- *Validation maps and validation summary metrics for MPO review.*
- *Validated base year model inputs/outputs.*

### Task 3.6: Sensitivity Tests

Sensitivity testing is a valuable tool for confirming that changes to model input variables and assumptions result in predictable changes to travel behavior. These variables may include socioeconomic growth, land use policy, and planned changes to transportation facilities. Sensitivity testing should be applied to both base year and future year scenarios. This is an important step in the validation process that is often overlooked until the first planning application of the model. Sensitivity testing can also draw out any problems or inconsistencies in the model dataset and algorithms prior to application of the model for planning purposes. LSA will coordinate with the MPO in the development of sensitivity testing scenarios. For example, the scenarios might include:

- **Large-Scale Sensitivity:** LSA will develop a forecast/horizon year scenario including development of forecast socioeconomic and network datasets as part of Task 5.0 of this proposal. This forecast/horizon year scenario can be used as a sensitivity test by comparing the growth in VMT, congested Vehicle Hours Travel (VHT), VHT, and congestion delay with a base scenario in the context of population growth and increase in network capacities. Similar comparisons can be conducted in case alternative forecast datasets are developed.
- **Small-Scale Roadway Sensitivity:** This sensitivity testing would consist of a scenario with a localized or corridor level roadway network change (e.g., roadway widening) and evaluate the changes in traffic patterns, VMT, VHT, and congested speed. These tests can be based on a base or forecast scenario.
- **Small-Scale Transit Sensitivity:** Similar to roadway sensitivity testing, this sensitivity testing will include evaluation of a localized transit improvement (e.g., increased headway or added service) and evaluate the effect on transit ridership. These tests can be based on a base or forecast scenario.
- **Small-Scale Non-Motorized Facility Sensitivity:** This sensitivity test will consist of evaluation of a non-motorized improvement in the model and evaluate the attractiveness of the facility in terms of bike/pedestrian usage. This sensitivity test will also help to evaluate non-motorized mode choice discussed in the following task.

LSA, in coordination with the MPO, will compare the results from the above sensitivity tests with appropriate base scenarios to evaluate the reasonableness of the results in regard to the input changes.

### Task 3.6: Deliverables

- *Model sensitivity scenarios testing technical memorandum.*



## Task 3.7: Non-Motorized Mode Choice and Network Update

As indicated in the RFP, LSA agrees that one of the challenges with the existing model is a lack of desired sensitivity to changes in the non-motorized network, such as addition of bicycle and pedestrian facilities. LSA will work with MPO staff to update the non-motorized transportation network to address issues such as lack of intersection barrier tools and will ensure sufficient coding of different levels of non-motorized facility types. The model currently uses an approach of assigning a subjective walk/bike score to roadways. The scores represent level of comfort in using the facility and can range from good bike/pedestrian design (5) to bad pedestrian or bicycle design (1) with a separate score (0) for facilities where bikes/pedestrians are prohibited, such as freeways. As indicated above, LSA will conduct a detailed review of the non-motorized network system and will review and refine the current mode choice component to improve sensitivity to proposed non-motorized improvements.

Better validation of facilities in existing conditions will be an important aspect in updating the mode choice component and increasing the model's sensitivity for non-motorized modes. Sufficient pedestrian and bike count coverage will help in the calibration and validation of the mode choice components. LSA will review the industry best practices and latest research to improve the non-motorized sensitivity in the model.

The model will also provide the capability to test installation of improved bicycle and pedestrian facilities. Users will be able to modify non-motorized scoring on roadway links or add new non-motorized connections to the roadway network. This information will be used by the mode choice model to approximate the impact on mode share. While the travel model can be designed to do this, the resulting data should be used with caution. Fewer data sources are available to quantify the impact of increased non-motorized facilities on mode share.

Other model outputs can also be used to assist in non-motorized planning. LSA proposes to provide a simple unconstrained traffic assignment of all short trips (e.g., ½, 3-, 6-, and 9-mile trips). The resulting travel demand can be viewed in GIS along with bicycle and pedestrian facilities to help planners identify locations where new facilities would be most effective. This approach can also help planners locate gaps in the non-motorized transportation system that need to be addressed.

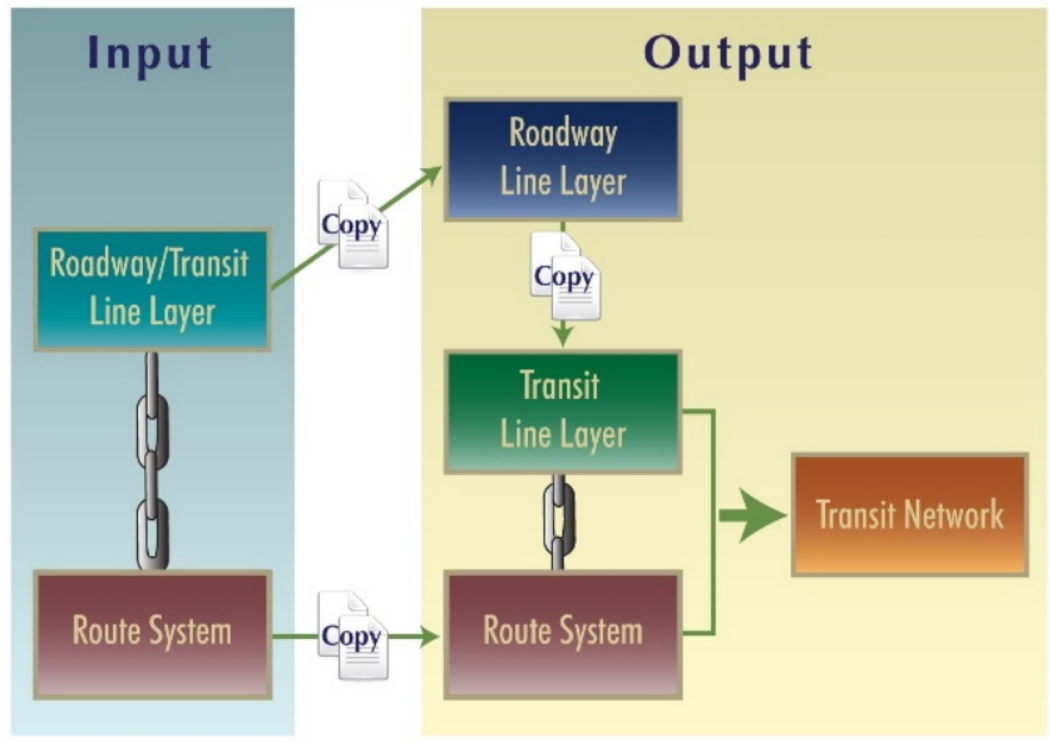
It has long been recognized that transportation mode choice is dependent not just on available transportation facilities, but also on the land use, density, and design of the surrounding environment. LSA has developed multimodal corridor assessments that correlate land use and design with base travel characteristics so that shifts to walk, bike, and transit modes can be better understood and predicted. In addition, we have prepared and integrated functions within travel models that increase sensitivity to higher density, multimodal developments and other Smart Growth/New Urbanist developments. These functions include production end household activity density variables, attraction end employment activity and density variables in mode choice models, walkability factors, walk access to transit enhancements, and other improvements.

### Task 3.7: Deliverables

- *Deliverables for this subtask are included in subtasks - Task 2.3: Network Updates and Task 3.3: Mode Choice*

### Task 3.8: Transit Network Integration

The current Missoula Model is a mode choice model and hence allows for detailed representation of the Missoula Urban Transportation District/Mountain Line’s fixed route system. LSA understands that the Missoula MPO is currently collaborating with the MUTD to recruit a joint planning team to conduct



updates to both the Long-Range Transportation Plan and Transit Strategic Plan. LSA will update the transit route system in the model to represent the existing service for base year validation. Similarly, LSA will work with the MUTD to integrate the agency’s existing strategic plan into the forecast transit route system. It should be noted that the current model includes an intuitive user interface that allows testing various transit alternatives similar to the roadway alternatives. This is implemented through modification of new transit route systems and roadway network layers.

#### Task 3.8: Deliverables

- *List of transit improvements to be included in forecast transit network for MPO and MUTD’s review.*
- *Updated forecast transit network including improvements from the Transit Strategic Plan.*

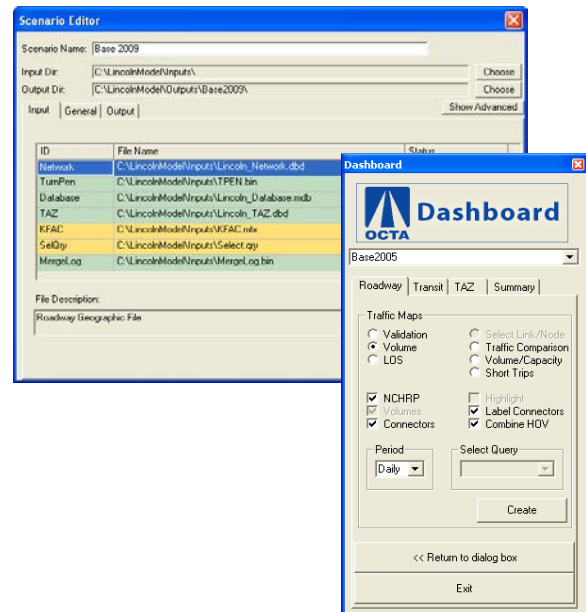
## Task 4.0: System Update

LSA created the intuitive and easy to use interface as part of the 2010 Missoula Model update. The user interface and the modeling tools were updated to TransCAD 8.0, the latest version at the time, during the previous model update in 2019. Updates also included improved capabilities for automatic mapping and performance reporting tools of the model.

### Task 4.1: Modeling System Update

The current Missoula Model is developed in TransCAD 8.0. LSA will update the model macros to use the latest scenario management system and to run in the current version of TransCAD 9.0, which now is in full release. As part of the model system update, LSA will work with the MPO to identify any specific changes that should be made to the model system and summary report.

LSA maintains a suite of TransCAD Add-Ins that streamline model post processing, reporting, and analysis. We will include any of these missing tools, packaged into the existing Dashboard interface, as part of this model update. These tools enable us to more efficiently update and validate the model, allowing us to deliver them with the travel model without significantly increasing project cost.



#### Task 4.1: Deliverables

- Updated model interface for TransCAD 9.0.

### Task 4.2: Air Quality

The Missoula MPO was previously designated as a non-attainment area for both carbon monoxide (CO) and particulate matter (PM10). However, the designation was recently changed to a maintenance area for both CO and PM10. The current Missoula Model includes tools to aid the MPO with air quality modeling. The model outputs can be directly imported into the Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator (MOVES) model. Given the recent change in designation, the LRTP is not required to demonstrate conformity with air quality regulations. However, the model's air quality tools will be updated to make the model outputs compatible with the most recent version of MOVES4. The current cost proposal (attached) does not include MOVES runs for LRTP conformity due to the change in designation. An augment will be required to conduct MOVES runs if desired. LSA will coordinate with the Montana Department of Environmental Quality and the Missoula Health Department to develop additional inputs that will be required for MOVES.

## Task 5.0: Forecast Data

As indicated in the RFP, the current horizon year for the model is 2050, which is the same as the horizon year for the MPO's current LRTP. LSA developed two alternative socioeconomic datasets as part of the current LRTP. LSA will develop model inputs for 2055 which will include updates to both demand and supply sides of the model. The model socioeconomic datasets, roadway, transit, and non-motorized networks will be updated to horizon year 2055. Detailed methodology for the development of these model datasets is described in detail below.

### Task 5.1: Forecast Socioeconomic Data

LSA developed the current 2050 socioeconomic data for the model as part of the previous model update. The modeling area contains two counties: Missoula and Ravalli. The two counties vary significantly in the amount and detail of data sources they have available for the development of forecast socioeconomic datasets. Previous methodology included development of annual growth rates for households and employment in the counties. The growth rates were used to estimate the 2050 household and employment control totals for the two counties separately. Once the countywide control totals are developed, the growth will be allocated to the model TAZs.

For urbanized areas of Missoula County, development of current forecast socioeconomic datasets involved sophisticated land use capacity analysis based on the region's previous housing and land use plans. Household capacities and the most recent development patterns were used to allocate the growth to different areas of the urbanized area. However, during the development of MPO's LRTP, an alternative socioeconomic dataset with inward growth emphasis (higher growth in the urbanized area instead of suburban development) was developed and analyzed. LSA will coordinate with the MPO and its LRTP consultant in determining appropriate methodology for spatial allocation of growth (e.g., grow inward or development in the urban fringes). The most recent versions of available resources such as "Our Missoula Growth Policy" and Code Reform project and future land use designation map (Missoula Urban Area Future Land Use Designation Map, Amended December 14, 2020) will be used in the growth allocation. For example, the City of Missoula is currently conducting a community survey seeking input on housing and development priorities. Results of this survey can be included as one of the inputs during growth allocation in the region. While detailed information was available for the urbanized area of Missoula County, no information was available for census designated places (CDPs) and unincorporated areas of Missoula County. Once growth is allocated to the urbanized area, the remainder of the growth will be allocated to CDPs and unincorporated county based on recent TAZ growth rates.

Historical growth rates, similar to Missoula County, will be used to develop forecast household and employment growth for Ravalli County. A simple linear extrapolation growth approach will be used to allocate countywide growth to individual TAZs.

LSA will review growth rates, forecast jobs/housing ratios, and average household size, etc., for the updated forecast year and compare them with current forecast data from the model and also with areas of similar size and trip making characteristics. Also, the review will focus on potential localized problems such as decrease over time, unexpectedly high densities, and areas with very high growth rates. LSA will develop various materials such as growth maps and summary and comparison tables to assist the MPO with the review process. Any potential problems will be identified for discussion with the MPO. Once the socioeconomic data have been finalized, LSA will incorporate the new data into the travel model database. The assumptions and input data used for the process will be available for review by the MPO before its use in the model update.



### Task 5.1: Deliverables

- *Forecast socioeconomic data development methodology technical memorandum.*
- *Maps and summary tables illustrating forecast growth for MPO's review and approval.*
- *Updated model forecast socioeconomic dataset.*

### Task 5.2: Horizon Year Networks

Transportation networks in the model include different modes of transportation – auto/roadway, transit, and non-motorized. LSA will review data sources such as the current LRTP, MUTD's strategic plan, and MPO's current TIP to identify network improvements that can be included in the model network.

#### Roadway Network

The input roadway network for the Missoula Model is a legacy format network which allows multiple network years (e.g., 2018, 2030, 2040) and alternatives to be coded in one roadway network file. As indicated in the RFP, the model roadway network includes the current LRTP improvements as alternatives. LSA will review the currently coded LRTP improvements for consistency, current TIP, and any other studies available to identify roadway improvement projects to include in the forecast network. LSA will update the roadway network with the addition of a forecast network year and code up the improvements provided by the MPO.

#### Transit Network

As previously indicated, the model includes a transit network for forecasting transit ridership. LSA understands that the MUTD currently has developed a strategic plan to assist it with short-term service changes and is also looking to update its strategic plan along with MPO's LRTP. LSA will review the current strategic plan and will identify transit improvements that can be included in the model network. LSA will coordinate with the MPO and MUTD to identify short-term and long-term transit improvements and will include them in the model networks.

#### Non-Motorized Network

LSA will review the current LRTP and will include proposed non-motorized improvements in the network for future scenarios. Similar to the roadway network, LSA will review available data sources such as the regional TIP, LRTP, and other studies to identify future non-motorized improvements. The improvements will be reviewed by the MPO before their inclusion in the network.

### Task 5.2: Deliverables

- *Maps and shape files of model networks for MPO review.*
- *Updated forecast year model networks – roadway, transit, and non-motorized networks*



## **Task 5.3: Horizon Year Alternative Scenario Analysis (Optional Task)**

The Missoula MPO may require development of a few Horizon Year alternative scenario analyses during preparation of the LRTP update and the MUTD strategic plan. The Missoula model includes a mode choice component including a transit component in the model. In case the MPO and MUTD require running multiple alternative Horizon Year model scenarios during the plan update process, LSA would be able to conduct these model runs to provide assistance as part of the plan updates. As such, this has been included as an optional task as part of this scope of work. This optional task includes up to three model run scenarios that include developing alternative socioeconomic datasets and/or network/transit related alternatives, and conducting model runs for evaluation of these alternative scenarios.



## Task 6.0: Documentation

Clear, comprehensive, and accurate documentation is one of the most important components of any travel model. Throughout the course of the update, LSA will document the model update process, in the form of technical memoranda, as work is performed in a detailed manner.

### Model Documentation

LSA will prepare a final model calibration report based on at a minimum the scope of work contained herein and the necessary documentation and technical memoranda as required. The model calibration report will detail all changes and updates made to the Missoula Model including all assumptions and decisions. This report will also explain the new processes developed as part of this project.

Technical memoranda will be developed for each of the model update tasks such as model inputs, model updates, system updates, and development of forecast data. The technical memoranda/sections will be provided to the MPO for review and will be updated to address the comments/questions. Technical memoranda created throughout the course of the project will be collected and integrated into a complete document detailing travel model processes, parameters, and assumptions. This document will be provided with the intention that a person with basic understanding of the travel modeling process would be able to fully understand the Missoula Model and the validation process. Furthermore, it is the intent that a person with good understanding of the travel modeling process could implement the Missoula Model using only the model documentation and any off-the-shelf travel modeling software package.



### Model User Guide

LSA will provide an updated User's Guide document that outlines the process required to prepare and run travel model scenarios, defines the data structures used in the model, and documents standards required to correctly maintain and modify travel model inputs. The User's Guide will also include updated graphical depictions of the user interface, as well as a data dictionary describing the input and output files and parameters.

#### Task 6: Deliverables

- Updated model documentation – compilation of technical memorandums from the tasks above.
- Updated model user guide.

## Task 7.0: Training

LSA has provided a variety of modeling training sessions for different audiences, including modelers and non-modelers interested in using model data. Our extensive model training experience will be invaluable when it comes time to deploy the new Missoula Model. LSA will prepare model training sessions that are tailored to the specific skill sets of participants.

LSA recommends a 2-day training session that will include all requested software and model training. LSA will discuss the program and agenda with the MPO prior to the training to confirm the topics. LSA will prepare presentations and exercises for the multiple day training sessions. Day 1 will include basic and advanced TransCAD training. Day 2 will mostly include hands-on training of the Missoula Model. Separate presentations and exercises will be created for each of the two days.

### Day 1: TransCAD Training

Day 1 of the training session will include a brief introduction and overview on Travel Demand Modeling, TransCAD, and GIS followed by hands-on training about how to use the software. The session will include planning basics in TransCAD with explanations and exercises on the 4-step modeling process. Through hands-on exercises the training will focus on how to use the various TransCAD tools, utilities, data management processes, extraction of output data, skim matrices, and advanced highway assignment processes. Upon completion of the training session, participants will be able to successfully use and run TransCAD and perform basic modeling tasks using the software.

### Day 2: Missoula Travel Demand Model Training


Day 2 of the training session will focus primarily on hands-on training with the Missoula Travel Demand Model (MTDM). LSA will prepare MTDM training sessions that are tailored to the specific skill sets of participants. The training session will be imperative in ensuring that staff planning to use the model will have a full understanding of the model data, processes, and parameters. The interactive training sessions will include detailed instructions on the use of the model, along with interactive examples and exercises to help reinforce the material. Upon completion of the training session, participants will be able to successfully install and run the travel model; edit and maintain model inputs; view model outputs; and test proposed roadway and demographic alternatives.

### Optional Task 7.1: On-Call Travel Model Support and Maintenance

LSA has included an on-call travel model assistance task to assist the staff with any ongoing questions about the model. Through the training process, MPO staff will be trained in the use and operation of the travel model and can perform basic travel model scenario analysis. However, some questions asked of the model require a more thorough analysis. LSA can provide the staff with ongoing support and impromptu training as needed. This task also includes troubleshooting the travel model for any version changes in the travel model platform – TransCAD or any other computer-related upgrades such as changes in operating systems, or changes in staff's machines. The MPO will be billed on a time and material basis for this task.



**EXHIBIT B – COMPENSATION**

20230796.P000 Missoula Metropolitan Planning Division 2023 Missoula MPO Travel Demand Model Update  		LSA						Total LSA Hours	Total LSA Fees
		Principal in Charge / Project Manager Ambarish Mukherjee	Project Advisor Kristine Cai	Senior Transportation Engineer Ravi Palakurthy	Senior Transportation Planner Deb Sinha	Transportation Engineer Shuqi Hao	Word Processor/Admin		
11/9/2023									
Hourly Rate (\$/ hour)		\$87.31	\$84.13	\$73.71	\$48.86	\$38.23	\$33.47		
ICR: Overhead Rate		241.62%							
Profit		10.00%							
Multiplier		3.7578							
100%	Weighted Average	\$328.10	\$316.15	\$276.99	\$183.61	\$143.66	\$125.77		
<b>Task 1.0 Project Management</b>									
1.1	Project Initiation and Meetings	10.00	4.00	10.00	4.00	4.00		32.00	\$8,624.50
<b>Task 1.0 Project Management Subtotal</b>		<b>10.00</b>	<b>4.00</b>	<b>10.00</b>	<b>4.00</b>	<b>4.00</b>	<b>0.00</b>	<b>32.00</b>	<b>\$8,624.50</b>
<b>Task 2.0 Model Input Updates</b>									
2.1	Traffic Analysis Zone (TAZ) Updates			2.00		4.00		6.00	\$1,128.62
2.2	Socioeconomic Data Updates	1.00	1.00	6.00	6.00	16.00		30.00	\$5,706.40
2.3	Network Updates	1.00		4.00	4.00	20.00		29.00	\$5,043.71
<b>Task 2.0 Model Input Updates Subtotal</b>		<b>2.00</b>	<b>1.00</b>	<b>12.00</b>	<b>10.00</b>	<b>40.00</b>	<b>0.00</b>	<b>65.00</b>	<b>\$11,878.73</b>
<b>Task 3.0 Model Update</b>									
3.1	Trip Generation			4.00	2.00	8.00		14.00	\$2,624.46
3.2	Trip Distribution	2.00	2.00	6.00	4.00	12.00		26.00	\$5,408.78
3.3	Mode Choice	2.00		8.00	4.00	16.00		30.00	\$5,905.11
3.4	Time of Day				2.00	4.00		6.00	\$941.86
3.5	Validation	2.00		4.00	4.00	12.00		22.00	\$4,222.51
3.6	Sensitivity Tests			4.00		12.00		16.00	\$2,831.89
3.7	Non-Motorized Mode Choice and Network Update	2.00		8.00	4.00	16.00		30.00	\$5,905.11
3.8	Transit Network Integration			8.00		12.00		20.00	\$3,939.85
<b>Task 3.0 Model Update Subtotal</b>		<b>8.00</b>	<b>2.00</b>	<b>42.00</b>	<b>20.00</b>	<b>92.00</b>	<b>0.00</b>	<b>164.00</b>	<b>\$31,779.58</b>
<b>Task 4.0 System Update</b>									
4.1	Modeling System Update			16.00		4.00		20.00	\$5,006.47
4.2	Air Quality			8.00		8.00		16.00	\$3,365.20
<b>Task 4.0 System Update Subtotal</b>		<b>0.00</b>	<b>0.00</b>	<b>24.00</b>	<b>0.00</b>	<b>12.00</b>	<b>0.00</b>	<b>36.00</b>	<b>\$8,371.67</b>

20230796.P000		LSA							
Missoula Metropolitan Planning Division									
2023 Missoula MPO Travel Demand Model Update									
11/9/2023		Principal in Charge / Project Manager Ambarish Mukherjee	Project Advisor Kristine Cai	Senior Transportation Engineer Ravi Palakurthy	Senior Transportation Planner Deb Sinha	Transportation Engineer Shuqi Hao	Word Processor/Admin	Total LSA Hours	Total LSA Fees
<b>Taks 5.0 Forecast Data</b>									
5.1	Forecast Socioeconomic Data	2.00		6.00	4.00	8.00		20.00	\$4,201.84
5.2	Horizon Year Networks	2.00		6.00	4.00	8.00		20.00	\$4,201.84
<b>Taks 5.0 Forecast Data Subtotal</b>		<b>4.00</b>	<b>0.00</b>	<b>12.00</b>	<b>8.00</b>	<b>16.00</b>	<b>0.00</b>	<b>40.00</b>	<b>\$8,403.69</b>
<b>Task 6.0 Documentation</b>									
6.1	Model Documentation and User Guide	2.00	2.00	4.00		4.00	4.00	16.00	\$3,474.18
<b>Task 6.0 Documentation Subtotal</b>		<b>2.00</b>	<b>2.00</b>	<b>4.00</b>	<b>0.00</b>	<b>4.00</b>	<b>4.00</b>	<b>16.00</b>	<b>\$3,474.18</b>
<b>Task 7.0 Training</b>									
7.0	Training	16.00		16.00				32.00	\$9,681.35
<b>Task 7.0 Training Subtotal</b>		<b>16.00</b>	<b>0.00</b>	<b>16.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>32.00</b>	<b>\$9,681.35</b>
<b>Subtotal Labor:</b>		<b>42.00</b>	<b>9.00</b>	<b>120.00</b>	<b>42.00</b>	<b>168.00</b>	<b>4.00</b>	<b>385.00</b>	<b>\$82,213.70</b>
<b>Optional Tasks</b>									
(1)	Optional Task 7.1 - On-Call Travel Model Support and Maintenance (Time & Material Not to Exceed \$5,000 Annually)								\$0.00
									<b>\$0.00</b>
<b>Reimbursable Expenses (Training)</b>									
	Lodging/Meals								\$1,200.00
	Mileage / Airfare								\$1,500.00
<b>Subtotal Reimbursable Expenses</b>									<b>\$2,700.00</b>
								<b>Total</b>	<b>\$84,913.70</b>

**EXHIBIT C - MDT NONDISCRIMINATION AND  
DISABILITY ACCOMMODATION NOTICE**

Montana Department of Transportation (“MDT”) is committed to conducting all of its business in an environment free from discrimination, harassment, and retaliation. In accordance with State and Federal law MDT prohibits any and all discrimination and protections are all inclusive (hereafter “protected classes”) by its employees or anyone with whom MDT does business:

Federal protected classes  
**Race, color, national origin, sex, sexual orientation, gender identity, age, disability, income-level & Limited English Proficiency**

State protected classes  
**Race, color, national origin, parental/marital status, pregnancy, childbirth, or medical conditions related to pregnancy or childbirth, religion/creed, social origin or condition, genetic information, sex, sexual orientation, gender identification or expression, ancestry, age, disability mental or physical, political or religious affiliations or ideas, military service or veteran status, vaccination status or possession of immunity passport**

For the duration of this contract/agreement, the PARTY agrees as follows:

**(1) Compliance with Regulations:** The PARTY (hereinafter includes consultant) will comply with all Acts and Regulations of the United States and the State of Montana relative to Non- Discrimination in Federally and State-assisted programs of the U.S. Department of Transportation and the State of Montana, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

**(2) Non-discrimination:**

- a. The PARTY, with regard to the work performed by it during the contract, will not discriminate, directly or indirectly, on the grounds of any of the protected classes in the selection and retention of subcontractors, including procurements of materials and leases of equipment, employment, and all other activities being performed under this contract/agreement.
- b. The PARTY will provide notice to its employees and the members of the public that it serves that will include the following:
  - i. A statement that the PARTY does not discriminate on the grounds of any protected classes.
  - ii. A statement that the PARTY will provide employees and members of the public that it serves with reasonable accommodations for any known disability, upon request, pursuant to the Americans with Disabilities Act as Amended (ADA).

- iii. Contact information for the PARTY's representative tasked with handling non-discrimination complaints and providing reasonable accommodations under the ADA.
  - iv. Information on how to request information in alternative accessible formats.
- c. In accordance with Mont. Code Ann. § 49-3-207, the PARTY will include a provision, in all of its hiring/subcontracting notices, that all hiring/subcontracting will be on the basis of merit and qualifications and that the PARTY does not discriminate on the grounds of any protected class.

**(3) Participation by Disadvantaged Business Enterprises (DBEs):**

- a. If the PARTY receives federal financial assistance as part of this contract/agreement, the PARTY will make all reasonable efforts to utilize DBE firms certified by MDT for its subcontracting services. The list of all currently certified DBE firms is located on the MDT website at [mdt.mt.gov/business/contracting/civil/dbe.shtml](http://mdt.mt.gov/business/contracting/civil/dbe.shtml)
- b. By signing this agreement, the PARTY assures MDT that:

*The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.*

- c. The PARTY must include the above assurance in each contract/agreement the PARTY enters.

**(4) Solicitation for Subcontracts, Including Procurement of Materials and**

**Equipment:** In all solicitations, either by competitive bidding, or negotiation, made by the PARTY for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the PARTY of the PARTY's obligation under this contract/agreement and all Acts and Regulations of the United States and the State of Montana related to Non-Discrimination.

- (5) Information and Reports:** The PARTY will provide all information and reports required by the Acts, Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information and its facilities as may be determined by MDT or relevant US DOT Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the PARTY will so certify to MDT or relevant US DOT Administration, as appropriate, and will set forth what



efforts it has made to obtain the information.

- (6) Sanctions for Noncompliance:** In the event of a PARTY's noncompliance with the Non-discrimination provisions of this contract/agreement, MDT will impose such sanctions as it or the relevant US DOT Administration may determine to be appropriate, including, but not limited to:
- a. Withholding payments to the PARTY under the contract/agreement until the PARTY complies; and/or
  - b. Cancelling, terminating, or suspending the contract/agreement, in whole or in part.

- (7) Pertinent Non-Discrimination Authorities:** During the performance of this contract/agreement, the PARTY, for itself, its assignees, and successor in interest, agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

*Federal*

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airways Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients, and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibits

discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;

- The Federal Aviation Administration's Non-Discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which prevents discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English Proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 *et seq.*).
- Executive Order 13672 prohibits discrimination in the civilian federal workforce on the basis of gender identity and in hiring by federal contractors on the basis of both sexual orientation and gender identity.

*State*

- Mont. Code Ann. § 49-3-205 Governmental services;
- Mont. Code Ann. § 49-3-206 Distribution of governmental funds;
- Mont. Code Ann. § 49-3-207 Nondiscrimination provision in all public contracts.

**(8) Incorporation of Provisions:** The PARTY will include the provisions of paragraph one through seven in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and/or directives issued pursuant thereto. The PARTY will take action with respect to any subcontract or procurement as MDT or the relevant US DOT Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the PARTY becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the PARTY may request MDT to enter into any litigation to protect the interests of MDT. In addition, the PARTY may request the United States to enter into the litigation to protect the interests of the United States.