TRANSPORTATION TRAVEL AND ENERGY DEMAND DATA CONSULTANT

EXHIBIT A

SCOPE OF WORK

This section describes the contract Scope of Work, including tasks, deliverables, and the corresponding due dates that the Contractor/Consultant will be asked to perform under the direction of the CCM. The Contractor/Consultant will be asked to provide, format, and document data for a variety of variables in our fuel demand forecasting, including appropriate parameters for various econometric and choice functions.

Definitions of Key Terms

Definitions, for purposes of this SOW:

"Data quality" or **"quality"** generally exhibits these characteristics

- Accuracy – using values correctly reflecting each dimension of a variable in DynaSim, measured by predefined qualitative or quantitative metrics
- External consistency – assurance that comparable definitions underlie data within the models and publications of other agencies, and that differences in data values can be explained
- Internal consistency – assurance that the same definition and values underlie corresponding inputs within and between DynaSim models, and that values for related inputs are compatible (for example, travel time corresponds to travel distance)
- Suitability – fit to contribute to accurate forecasts at statewide, region, and county resolutions, when viewed together as a set of inputs and outputs
- Timeliness – using the most recent data products available that satisfy the other characteristics of data quality, applied to the most contemporary time frame possible

"Dimension" in DynaSim, is as defined in the axis of a graph, or applied in matrix algebra. For example, the input *HouseholdPopulation* has the dimensions zone, household size, household workers, income bracket, and time.

"Planned resolution" is the geographic scale of the planned zone dimension, for example, state, regional, or county scales. The resolution for DynaSim models was intended to be either *county zones* or *regional zones*; however, completed runs have been at a statewide resolution, with the exception of the Freight model, which has been run using a regional zone.

"Resolution" is defined for DynaSim as a scale of geographic units, such as statewide, region, county, or transit district. Models in DynaSim can be run at different resolutions,

assuming input at those resolutions has been imported and associated with the scenario being run.[1]

"Valid forecasts":

- Use accurate data
- Use models subjected to a model validation process[2]
- Have the ability to project transportation energy demand and VMT within a known tolerance when applied to a historic period, and
- Produce probable, explainable deviation from forecast trends by others.

Detailed Requirements for Submitting Deliverables

The Contractor shall prepare and deliver to the CCM a draft of each written deliverable identified in each task by the due dates listed in Table 7 below. The CCM shall review each draft and may recommend changes to the Contractor. Generally, the Contractor shall review and discuss the CCM's response and any recommended changes to each draft with the CCM to achieve clarity, and shall submit a final version of the deliverable incorporating any agreed-upon changes within 7 days of receiving comments on the draft, except when specified otherwise in a Task or Subtask.

Each written deliverable shall be submitted as an electronic Microsoft Office 2003 or 2007 file (for example, *.docx *.xlsx). Data imported into DynaSim and stored as spreadsheets, working files, and documentation files must be in formats and locations approved by the CCM. Other electronic elements may be provided on media as agreed to by CCM and Contractor. Meetings can be held via conference call, web conference, or in person unless otherwise directed by the CCM.

[1] For instance, the Aviation model was designed to run best at region resolution, The Freight model was designed to use Freight Analysis Framework data, which for California is our 'region' resolution. With additional data, Freight may be run at county resolution. We intend other models to run at county resolution. The design of the Urban model also allows for Transit District runs.

[2] See, for example, "Validation and Sensitivity Considerations for Statewide Models," Transportation Research Board Accession number 01340462, or Boyce and Bar-Gera (2003) "Validation of multiclass urban travel forecasting models combining origin-destination, mode, and route choices," **Journal of Regional Science 43**: (3), pp 517-539. This is distinct from the data management definition of validity, to simply fall in the defined set of values.

Table 6: Tasks and Subtasks in the Statement of Work

Task Number	Task or Subtask Description
1. 1	**Contract Management**
1.1.	Kick-off Meeting
1.2.	Monthly *Progress Reports*
1.3.	Monthly Status Meetings
1.4.	Ad Hoc Requests
1.5.	*Project Report*
2. 2	**Project Plan**
3. 3	***Tracking Database* and *Solutions Report***
3.1.	Identify Input Data Solutions
3.2.	Identify Model Validation Solutions
3.3.	Prepare Drafts of *Solutions Report* and *Tracking Database*
4.	***Preferred Solutions and Pre-processing Plan***
4.1.	Update Input Solutions
4.2.	Update Model Validation Solutions
4.3.	*Preferred Solutions and Pre-Processing Plan*
4.4.	Itemize Data Purchases
5.	**Gather Data and Documentation, Transform and Port to DynaSim**
5.1.	Gather Data and Supporting Documents
5.2.	Transform, Format, and Port Data to DynaSim
5.3.	Prepare Documentation and Presentation on Data Transformations

Task 1 – Contract Management

Task 1.1 - Kick-off Meeting

The Contractor shall attend a kick-off meeting with the CCM and others as determined by the CCM. The Contractor shall include their entire project team, including their Project Manager, and others as agreed upon with the CCM. Both administrative and technical aspects of this contract will be discussed in the meeting. The Contractor will prepare and submit meeting minutes for the kick-off meeting within 7 calendar days of its occurrence.

Task 1.2 - Monthly *Progress Reports*

The purpose of this subtask is to periodically verify that satisfactory and continued progress is made towards achieving the objectives of this project. The Contractor shall prepare monthly progress reports which summarize all contract activities conducted by the Contractor for the reporting period, including an assessment of the ability to complete the contract within the current budget, any proposed changes to

the project schedule, and any anticipated cost overruns. Each progress report is due to the CCM within 7 calendar days of the end of the reporting period.

Task 1.3 - Monthly Status Meetings

The Contractor shall participate in monthly status meetings within 7 calendar days of the delivery of each *Monthly Progress Report*, along with the CCM and others as determined by the CCM. Any changes proposed in the monthly progress report will be discussed. The Contractor shall prepare and submit the meeting minutes within 7 calendar days of each monthly status meeting.

Task 1.4 - Ad Hoc Requests

The Contractor will respond to questions, as needed, and provide ad hoc status updates from the DynaSim team using the CCM as a the point of contact. These communications may include presentations to Energy Commission management and other stakeholders.

Task 1.5 - *Project Report*

The goal of this task is to prepare a comprehensive *Project Report* as a compilation of previous plans, reports, and the tracking database, each revised to reflect the work completed under this contract. The *Project Report* is intended to serve the DynaSim team after the end of this contract as live documentation for use updating and documenting data, as inclusions in other processes and documents. The final *Project Report* must be completed at least 14 calendar days prior to the termination date of the contract, and shall become a public document upon CCM approval.

The Contractor shall

- Prepare and submit a draft *Project Report* to the CCM for review and comment
- Schedule and hold a meeting with the CCM to discuss comments on the draft *Project Report*
- Prepare and submit a final *Project Report* within 7 calendar days of meeting with the CCM
- submit one print-ready copy, one electronic copy, and one bound copy with the final invoice, once the final *Project Report* has been approved by the CCM.

Task 1 Deliverables

- Minutes of the kick-off meeting
- Monthly *Progress Report*
- Minutes of Monthly Status Meeting
- Ad hoc requests, as necessary
- Draft and final *Project Report*

Acceptance Criteria
Task 1 cannot be considered complete until all *Progress Reports* are received, meetings are conducted, the final *Project Report* has been approved by the CCM, and all other contract work is accepted. The meetings and reports under this task will be considered complete and acceptable as each is received or completed and found to be sufficient for completing the work of the contract.

Task 2 – *Project Plan*

The goal of this task is to create a clear roadmap of the work to be performed under each task in this contract, and to gain familiarity with the work in Task 5 by transforming and porting to DynaSim two variables chosen by the CCM.

The CCM will provide

- two primary source data sets used to populate DynaSim inputs, with working files and documentation
- a summary of planned geographic resolutions for each model
- guidelines for and examples of DynaSim data documentation used by TEO
- any revisions to the list of inputs, outputs, and their dimensions from *Appendix I* to be included in this contract.

For the two input data sets provided by the CCM, the Contractor shall

- review the two provided primary source data sets, working data, and documentation
- transform, format, port to DynaSim
- document the transformation according to the guidelines defined by TEO.

In the *Project Plan*, the details of scope, timeline, Contractor and DynaSim team resources required, and dependencies among the tasks shall be reviewed and clarified. The *Project Plan* will serve as a reference throughout the course of the project. The project plan shall address, at a minimum

- confirmation of work assignments, by individual
- a set of metrics to characterize data quality for *Task 3* and *Task 4*
- assign data priorities and dependencies, using the data quality metrics with any existing results of sensitivity analysis provided by the CCM
- any changes agreed to at the kick-off meeting
- project schedule.

The Contractor shall attend a meeting with the CCM approximately 7 calendar days after submitting the draft *Project Plan* to the CCM. The CCM will provide written comments to the Contractor at the meeting. The purpose of the meeting is to discuss the comments and resolve details to be included in the final *Project Plan*.

Task 2 Deliverables

- Two data input instances transformed and ported to DynaSim

- Draft and final *Project Plan*

Acceptance Criteria

The *Project Plan* and two transformed, formatted, ported and documented variables will be considered acceptable if they are delivered on a timely basis, contain the requested information, DynaSim runs error-free with the data, and the CCM agrees it is sufficient to successfully complete the project.

Task 3 – *Tracking Database* and *Data Solutions Report*

The goal for this task is to have the Contractor independently identify data to aid model improvement, calibration, and as measures of validity. The objectives of this task are to

- identify possible solutions for the input variables in the most recent version of *Attachment I*, which may involve one or more data sources.
- identify projections and forecasts as solutions for validation of certain DynaSim outputs provided by CCM
- assess the data quality of each possible solution for data input, assign a rank using the data quality metric from the *Project Plan*
- identify the cost for each solution
- create a spreadsheet in database form showing work priority among inputs, with and without a cost constraint.

The CCM will provide

- the complete DynaSim Software Design Document
- any revision to the list in *Attachment I* of DynaSim inputs and outputs to be addressed by the Contractor (included as the "variables" worksheet in the *Tracking Database*) [3]
- access to the CCM and other DynaSim team members
- results of sensitivity analysis on DynaSim completed by the DynaSim team.

Task 3.1 - Identify Input Data Solutions

For each input to DynaSim identified with yellow highlighting for this subtask on the most current version of *Attachment I*, the Contractor shall

- create a new worksheet in the *Tracking Database* with a record for each possible input data solution. Include data from private sources, metropolitan planning

[3] At the discretion of the CCM, the list of inputs to be included in this analysis may be shorter than the list of all inputs. Some input data are drawn from existing Contracts at the Energy Commission, or have been identified by staff as the best available. Should the Consultant feel alternate data for inputs deemed to not be included are more appropriate, this will be addressed under Task 4.

organizations (MPOs)[4], and local, state, and federal governments. The best solution for a variable may be a combination of sources; note this as a single solution with all sources listed in the same tracking record. For instance, where an aggregated data source is the highest quality and another source can provide the desired dimensionality, include both in the solution, and note that a weighting, scaling, or other transformation process will be needed as pre-processing[5]

- note the cost, restrictions and/or confidentiality rules, and a URL link or other reference for each data source or sources comprising a solution in a field of the *Tracking Database*
- characterize the quality of each solution in a brief note, and assign a measure for the data quality from the metric in the Final Project Plan
- add results of any sensitivity testing conducted by the DynaSim team to a field for each input variable in the variable worksheet of the *Tracking Database*. Assign an ordered priority for work to each input
- highlight the data solution with the foremost data quality, using the data quality metric from the *Project Plan* (defined as "best available solution" in this Statement of Work)
- highlight the data source with the best quality available below $1,000 if the cost of acquiring the best quality data exceeds $1,000 (defined as "limited cost solution" in this Statement of Work)

Task 3.2 - Identify Model Validation Solutions

The Contractor shall identify data to support validation of certain DynaSim outputs. For each DynaSim output highlighted yellow in the most recent version of *Attachment I* provided by the CCM, the Contractor shall

- identify possible data solutions for their validation for DynaSim outputs highlighted in yellow in Attachment I. Solutions may be comprised of one or more data source(s)
- add a record in the *Tracking Database* for each possible solution. Include data from private sources, MPOs, and local, state, and federal governments. Note the cost, restrictions, and a URL link or other means of access for each source in a column of the *Tracking Database*
- record the cost of acquiring identified data, the data quality using the metric in the Final Project Plan, and other required information in separate columns of the

[4] Include at minimum Southern California Association of Governments (SCAG), Metropolitan Transportation Commission (MTC), San Diego Association of Governments (SanDAG), and Sacramento Area Council of Governments (SacOG).

[5] The Energy Commission intends to acquire the best quality data regardless of its native level of aggregation; travel models and surveys will generally have relatively disaggregated data as compared to DynaSim. For instance, we consider aggregate fuel sales data from the California Board of Equalization (BOE) to be more reliable than fuel consumption calculated bottom-up by vehicle class and fuel type. However, the bottom-up calculation can be used to allocate the BOE fuel volume to vehicle classes.

Tracking Database. Identify a best available solution, and if distinct, a limited cost solution

- identify and describe pre-processing needed to render a direct comparison to the DynaSim output, for the recommended solutions.

Task 3.3 - Prepare Drafts of *Tracking Database* and *Solutions Report*

Prepare drafts to document all information gathered in this task.

- Prepare the first draft *Tracking Database* to include all information acquired in Tasks 3.1 and Task 3.2. Create a new field to identify a best available solution, and if distinct, a limited cost solution. Also include a blank field for any input sensitivities provided by the CCM and for the work priority calculated using the means in the *Project Plan.*
- After CCM review, revise the draft *Tracking Database* to address any comments.
- Prepare and submit a draft *Solutions Report*. The items to be addressed include, but are not limited to
  - A list of all data solutions considered, and their ranking under the data quality metric from the *Project Plan*
  - The identity, cost, and disclosure restrictions of the best available solution, and if distinct, the limited cost solution.
- Revise and submit a final Solutions Report that addresses any comments received from the CCM.

Task 3 Deliverables

- Draft of and first revision to *Tracking Database*
- Draft of and first revision of *Solutions Report*

Acceptance Criteria

The *Tracking Database* and *Solutions Report* will be considered acceptable if they are delivered on a timely basis, contain the requested information, and the CCM agrees that each element in each deliverable is complete and accurate.

Task 4 – *Preferred data and Pre-processing Plan*

The goals of this task are, for inputs and outputs identified with yellow highlight or white background in Attachment I, to

- include and rank additional solutions for input or output identified by the CCM
- include those inputs currently used in DynaSim as additional solutions
- apply the data quality metric defined in the Task 2 *Project Plan* to these additional solutions
- create a *Preferred Data and Pre-processing Plan* that reflects the agreement on data solutions by the CCM and the Contractor.

The Energy Commission will provide

- access to the Energy Commission network as in-house user access from a desktop computer or other arrangement at the discretion of the CCM and IT Service Branch
- a spreadsheet of additional input and model validation solutions to be included in the evaluation. The list may include reference to data tables, survey results, or projections
- user access to DynaSim
- user access to the DynaSim Issue Tracker
- access to the existing DynaSim working data, data documentation, and model Matlab routines.

Task 4.1 - Update Input Solutions

Using the *Tracking Database*, the Contractor shall

- add the additional solutions and corresponding data sources
- consider combining the additional solutions and sources with those from the revised Task 3 *Tracking Database*. Identify new combinations as distinct solutions
- assign a rank for data quality to added solutions using the data quality metric in the *Project Plan*
- identify the cost of added solutions
- revise the solutions with the best available solution, and if distinct, the limited cost solution, for each variable with an added solution
- determine a total cost for all preferred data solutions and propose a complete data set available within the budget of the TEO work plans for FY 2013-14

- use the costs of acquiring data created under Task 3.3 and the work priority from Task 4.1 to plan a cost effective pattern of data purchases
- record confidentiality and or non-disclosure agreements required to acquire the best available and limited cost solution(s).

Task 4.2 - Update Model Validation Solutions

For each additional model validation solution provided by the CCM, the Contractor shall modify the *Tracking Database* to

- add the validation solutions to the *Tracking Database*
- consider combining these model validation solutions with those from the revised Task 3 *Tracking Database*. Identify new combinations as distinct solutions
- using the definition in the *Project Plan*, rank each solution for data quality
- add a brief note of the facts behind each data quality ranking
- identify the cost associated with the best available solution, and if distinct, the limited cost solution
- calculate a total cost for all preferred model validation solutions and propose a cost effective pattern of data purchases.

Task 4.3 - *Preferred Solutions and Pre-Processing Plan*

The CCM shall provide results of any sensitivity analysis completed by the DynaSim team. The Contractor shall revise the content and method for Task 4 work based on CCM comments. The Contractor shall prepare and submit a draft *Preferred Solutions and Pre-Processing Plan.*

- Find the best allocation of funds to make the greatest expected improvement in the quality of DynaSim output. Use results of any sensitivity analysis provided by the DynaSim team, along with the cost information from Task 4.2 to allocate funds across solutions. Absent any sensitivity analysis, allocate funds according to the cost and the likely influence on the forecast outcome due to the power of the operation (e. g., exponents first, then multiplication or division, and finally addition or subtraction)
- Write a concise written rationale for these choices using the data quality metrics and influence on the model outcome. Summarize notes recorded in the latest version of the *Tracking Database* completed in Tasks 4.1 and 4.2.
- Provide the CCM with a work in-progress rough draft of the deliverables after working on Task 4 for two weeks.
- Incorporate changes based on the CCM comments, and complete the draft Task 4 *Preferred Solutions and Pre-Processing Plan*. The Contractor shall meet with the CCM and Energy Commission staff to resolve details of the final solutions.

- Prepare an itemized list of data purchases and restricted data as part of the draft Task 4 *Preferred Solutions and Pre- Processing Plan*, showing the cost of data to be purchased and the process for acquiring restricted data.

- Prepare and submit the Task 4 *Preferred Solutions and Pre-Processing Plan* to address all of the CCM's comments on the draft, within 14 calendar days of receiving the comments.

- Revise the *Tracking Database* to reflect the solutions in the Task 4 *Preferred Solutions and Pre-Processing Plan.*

Task 4 Deliverables

- Rough draft in progress of *Preferred Solutions and Pre-processing Plan*
- Draft Task 4 *Tracking Database*
- Draft Task 4 *Preferred Solutions and Pre-processing Plan*
- Task 4 *Tracking Database*
- Task 4 *Preferred Solutions and Pre-processing Plan*

Acceptance Criteria

The revised *Tracking Database* and *Preferred Solutions and Pre-Processing Plan* will be considered acceptable if they are delivered on a timely basis, contain the requested information, and the CCM agrees that each element of each deliverable is complete and accurate.

Task 5 – Gather Data and Documentation, Transform and Port to DynaSim

The goal of this task is to ensure data is valid, accurate, updated, documented, and ported to DynaSim for successful model runs. The Energy Commission will purchase data as funding permits, through State procurement processes. Staff availability for assistance to the Contractor will be at the discretion of the Forecasting Unit Supervisor.

5.1 - Gather Data and Supporting Documents

The Contractor shall, with minimal assistance from the CCM, follow Energy Commission procedures to acquire all data and relevant documentation, within the budget set by the CCM in Task 4 Plan.

- Acquire all no-cost, unrestricted data.

- Advise the CCM on the paperwork, contact information, cost, and any other relevant information for the acquisition of purchased and/or restricted data. The CCM, or other Energy Commission staff will prepare all necessary paperwork and acquire purchased and/or restricted data.

5.2 - Transform, Format, and Port Data to DynaSim

The Contractor shall transform, pre-process, and format all data, including all purchased and/or restricted data acquired on schedule. Successfully port this data to DynaSim. Delays in the procurement process for purchase and/or restricted data occurring after timely completion of Task 4 may necessitate changes to this subtask.

5.3 - Prepare Documentation and Presentation on Data Transformations

The Contractor shall:

- make revisions to the *Tracking Database* and *Solutions Report* to reflect any changes since the completion of Task 4
- collect and file documents acquired along with the data in the appropriate DynaSim data directories
- prepare documentation of data transformations performed to pre-process data to the format of DynaSim input for review by the CCM, and revise to reflect comments received from the CCM
- prepare a draft and final presentation to guide the DynaSim team in data transformations in updates of data after the end of this contract
- narrate the slide presentation to Energy Commission staff

Task 5 Deliverables

- Acquire and file all no-cost data and associated documentation
- Transform, pre-process, & port available data to DynaSim
- Final *Tracking Database*
- Final *Solutions Report*
- Draft and final documentation of data transformations
- Draft and final slide presentation and narration on data transformations
- Narrate the slide presentation

Acceptance Criteria

Data and documentation, transformation, pre-processing and import to DynaSim, final documents and the presentation will be considered acceptable if they are delivered on a timely basis, contain the requested information, and the CCM agrees that each element is complete and accurate.

Table 7: Estimated Schedule and Deadlines

Task	Deliverables	Due Dates
1	• Minutes of the kick-off meeting • Monthly Progress Report • Draft and Final Project Report	11/27/2013 2 days before meeting 3/12/15; 4/9/15
2	• Two data input instances transformed and ported to DynaSim • Draft and final Project Plan	11/27/2013 12/4/14; 12/18/13
3	• Draft and first revision to Tracking Database • Draft and first revision to Solutions Report	1/20/14; 2/3/14 1/27/14; 2/10/14
4	• Second revision to Tracking Database • Second revision to Solutions Report • Draft and final Preferred Solutions and Pre-processing Plan • Procurement documents for purchased and restricted data	2/24/2014 3/3/2014 3/17/14; 4/1/14 3/24/2014
5	• Acquire and file all data and documentation • Transform, pre-process, and port data to DynaSim • Final Tracking Database • Final Solutions Report • Draft and final documentation of data transformations • Draft and final slide presentation • Narration of slide presentation	6/30/2014 8/15/2014 9/1/2014 9/17/2014 10/29/14; 12/3/14 11/5/14; 12/10/14 12/17/2014

Cost Proposal

Stanfield Systems has assigned resources to this project aligned with our CMAS labor categories as shown in **Table 1**.

Table 1: Resource Categories

CMAS Category	Project Categories	Resource Name
Senior Project Manager	Project Director, Data Manager	Tim Jacobs
Senior Technical Architect	Model Development Consultant	Brad Wagner
Product Architect	Energy Modeling Consultant	Phil Schoech
Functional Specialist	Transportation Analyst Mid	Michelle Bina
Product Architect	Market Researcher	Ron West
Product Architect	Transportation Analyst Senior	Michael Fischer
Functional Specialist	Transportation Planner	Mobashwir Khan
Functional Specialist	Transportation Analyst Mid	Chiranjivi Vhamidipati

Stanfield Systems has allocated hours to the various tasks and resources as shown in Table 2. While this provides our best estimate based on the information available, we expect that actual hours may vary from this estimate to some degree. We will reallocate resources as necessary to best satisfy the needs of the Energy Commission. This may result in a different number of hours being allocated to the resources and tasks than what is shown in Table 2. Our total estimated project cost is $177,789.31.

Table 2: Resource Allocation and Costs

	Staff Resource	Title	Estimated Number of Hours	Hourly Rate	Cost
Task 1	Tim Jacobs	Project Director	108	$160.00	$17,280.00
Task 1	Tim Jacobs	Data Manager	2	$140.00	$280.00
Task 1	Phil Schoech	Energy Modeling Consultant	20	$303.00	$6,060.00
Task 1	Brad Wagner	Model Development Consultant	20	$253.00	$5,060.00
Task 1	Michelle Bina	Transportation Analyst Mid	24	$162.00	$3,887.92
Task 1	Ron West	Market Researcher	8	$277.08	$2,216.61
Task 1	Michael Fischer	Transportation Analyst Senior	1	$308.23	$308.23
Task 1	Mobashwir Khan	Transportation Planner	16	$126.25	$2,019.94
Task 1	Chiranjivi Vhamidipati	Transportation Analyst Mid	10	$162.00	$1,619.97
Task 2	Tim Jacobs	Project Director	24	$160.00	$3,840.00
Task 2	Tim Jacobs	Data Manager	32	$140.00	$4,480.00

	Staff Resource	Title	Estimated Number of Hours	Hourly Rate	Cost
Task 2	Phil Schoech	Energy Modeling Consultant	12	$303.00	$3,636.00
Task 2	Brad Wagner	Model Development Consultant	12	$253.00	$3,036.00
Task 2	Michelle Bina	Transportation Analyst Mid	8	$162.00	$1,295.97
Task 2	Ron West	Market Researcher	8	$277.08	$2,216.61
Task 3	Tim Jacobs	Project Director	32	$160.00	$5,120.00
Task 3	Tim Jacobs	Data Manager	8	$140.00	$1,120.00
Task 3	Phil Schoech	Energy Modeling Consultant	24	$303.00	$7,272.00
Task 3	Brad Wagner	Model Development Consultant	40	$253.00	$10,120.00
Task 3	Michelle Bina	Transportation Analyst Mid	38	$162.00	$6,155.88
Task 3	Ron West	Market Researcher	38	$277.08	$10,528.92
Task 3	Michael Fischer	Transportation Analyst Senior	13	$308.23	$4,006.99
Task 3	Mobashwir Khan	Transportation Planner	128	$126.25	$16,159.54
Task 3	Chiranjivi Vhamidipati	Transportation Analyst Mid	24	$162.00	$3,887.92
Task 4	Tim Jacobs	Project Director	24	$160.00	$3,840.00
Task 4	Phil Schoech	Energy Modeling Consultant	24	$303.00	$7,272.00
Task 4	Brad Wagner	Model Development Consultant	20	$253.00	$5,060.00
Task 4	Michelle Bina	Transportation Analyst Mid	8	$162.00	$1,295.97
Task 4	Ron West	Market Researcher	4	$277.08	$1,108.31
Task 4	Michael Fischer	Transportation Analyst Senior	2	$308.23	$616.46
Task 4	Mobashwir Khan	Transportation Planner	4	$126.25	$504.99
Task 4	Chiranjivi Vhamidipati	Transportation Analyst Mid	2	$162.00	$323.99
Task 5	Tim Jacobs	Project Director	24	$160.00	$3,840.00
Task 5	Tim Jacobs	Data Manager	160	$140.00	$22,400.00
Task 5	Phil Schoech	Energy Modeling Consultant	6	$303.00	$1,818.00
Task 5	Brad Wagner	Model Development Consultant	20	$253.00	$5,060.00
Task 5	Michelle Bina	Transportation Analyst Mid	2	$162.00	$323.99
Task 5	Ron West	Market Researcher	2	$277.08	$554.15
Task 5	Mobashwir Khan	Transportation Planner	12	$126.25	$1,514.96
Task 5	Chiranjivi Vhamidipati	Transportation Analyst Mid	4	$162.00	$647.99
All Tasks	**Team**	**Total**	**968**		**$177,789.31**

Stanfield Systems will invoice monthly for actual hours expended by each resource during the month. Although not anticipated, other direct costs, such as travel, equipment, or third party software, that are incurred during the month will also be included on the invoice. Stanfield Systems will obtain written approval prior to incurring any such costs. For meetings involving consultants that reside outside of the Sacramento region, Stanfield Systems plans to use virtual Web meetings or teleconferences at no additional cost to the State