

REPORT TO SHASTA COUNTY RTPA

SUBJECT	MEETING DATE	ITEM NUMBER
Authorize Distribution of Traffic Model Request for Qualifications	7/27/04	7

RECOMMENDATION

It is recommended that the Agency approve a Request for Qualifications (RFQ) for modeling services to update, calibrate and validate the Shasta County Travel Demand Model (TDM).

SUMMARY

Approval and distribution of the RFQ will allow staff to move forward with the update process needed to bring the model base to current conditions and increase the level of accuracy of the existing databases and related outputs.

DISCUSSION

The current Travel Demand Model was last updated in 1999. The previous update was 1994. It is the current state of the practice to perform an update approximately every five years. The update is warranted due to residential and commercial growth in the region and the need to remain prepared for a possible air quality non-attainment designation.

The purpose of this request is to revalidate and recalibrate the Shasta County RTPA base year model to 2004 conditions using higher standards and current data sets. The consultant budget was approved in the 2004/05 Overall Work Plan (OWP) for \$200,000 for this effort (see task 701.01, page 22).

Calibration targets, or acceptable margins of error, will be increased significantly with this update. This will improve the reasonableness of model output.

Since the last update, better data is available for the region. For example, Census 2000 Data is now available. The Household income by census tract influences travel behavior, and currently the estimate per Traffic Analysis Zone (TAZ) is understated in today's dollars. The census also provides updated ownership by household of autos to more current estimates that will improve zone-to-zone transportation movements.

The work will encompass improving Geographical Information System (GIS) layers, land and employment data bases, updating trip generation procedures, external travel assumptions, new functionality and output reports. The project will deliver audit trail documentation of decisions made, and a new user guide to help users of all levels.

ALTERNATIVES

If the Agency decides to approve this request, it will ultimately provide the RTPA with expert support from contractors who have experience in performing model updates using an increased level of calibration standards. The Agency could decide to not approve the RFQ at this time and eliminate these budgeted

planning efforts in the OWP. Another alternative would be to attempt the work using in-house staff. This would not be cost efficient since the current staff responsible for the model have not performed an update of this magnitude. A third alternative would be to not approve the RFQ and delay the update for a future period. This is not recommended because the next edition of the Regional Transportation Plan (RTP) requires the use of the model to prioritize improvements, and it is likely that at the same time the region will need to generate air quality inputs for non-attainment purposes.

OTHER AGENCY INVOLVEMENT

The Technical Advisory Committee (TAC) and our agency partners have worked together to prepare the RFQ. TAC has reviewed this recommendation and concurs with the Agency's approval.

FINANCING

As stated earlier, the RTPA currently has a \$200,000 consultant budget appropriated in the 2004/5 OWP to update the model.

Daniel J. Kovacich, Executive Officer

TLH/jac

Attachment: Request For Qualifications

REQUEST FOR QUALIFICATION

**LAND USE UPDATE AND RE-CALIBRATION/VALIDATION
OF THE SHASTA RTPA TRAVEL DEMAND MODEL**

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JULY 2004

REQUEST FOR QUALIFICATIONS

LAND USE UPDATE AND RE-CALIBRATION/VALIDATION OF THE SHASTA COUNTY TRAVEL DEMAND AND FORECASTING MODEL

The Shasta County Regional Transportation Planning Agency (Shasta MPO) is requesting proposals from qualified consultants to update the Shasta County Travel Demand Model (SCTDM) land use to 2004 conditions, using U. S. Census 2000 data, updated 2001 Caltrans Travel Survey data and other databases described in the RFQ. This update will include re-calibration/validation of the model to a 2004 base year at higher standards, increasing TAZ zones, adding reporting features and updating GIS layers.

The Shasta RTPA Transportation Model

The Shasta County Travel Demand Model is a conventional "four step" travel demand model that operates using the TP+ software from Citilabs. The model includes all of Shasta County. The transportation analysis zones (TAZs) have been expanded to a maximum of 887 (approximately 666 active). Areas outside Shasta County are represented by traffic counts on 17 "gateway" routes at the county line.

The socioeconomic inputs include three household classifications (single-family and multiple family, mobile home, each stratified into 0-auto, 1-auto and 2+ autos and Household Income by U. S. Census Tract), nineteen employment types (retail (low, medium and high intensity), government (low, medium and high intensity), education, college, highway commercial, institutional, manufacturing, restaurant (low, medium and high intensity), office, (low, medium and high intensity) highway commercial, truck stop and utility/warehouse, and recreational special generators. There are nine trip purposes (home-work, home-shop, home-school, home-social and recreational, home-other, commercial vehicle, through stop, work-other, and other-other). Socioeconomic data inputs have been created for a five-year period by bands from 2000 to 2025.

The road network is coded as a single master network containing the base network road improvements with adjustments in each succeeding 5-year implementation year. Current base Transit networks representing all fixed-route bus services in Shasta County are coded on the road network.

Trip generation uses standard cross-classification rates derived from the 1994 "Procedure and Findings of the Origin/Destination Surveys on State Highways in Shasta County". Trip distribution uses a gravity model for each trip purpose. The mode choice step uses multinomial logit choice models to divide person trips into auto, transit walk access, transit drive access and non-motorized (walk/bicycle) person trips. The mode choice model for work trips further divides auto person trips into vehicles with one, two or three or more occupants. The non-work auto trips are assumed to have constant average auto occupancy. Traffic assignments are made for the A.M. and P.M. peak 3-hour periods, and the A.M. and P.M. peak hours. The current model script files will be made available to all requestors.

Background on Current Travel Demand Model Land Use Data

1994 MINUTP Model

The starting point for the current model's socioeconomic data by traffic analysis zone (TAZ) was the 1990 and 2025 land use used in the Shasta RTPA peak period MINUTP model development in 1994.

Base year 1990-population and housing unit inputs were based on the 1990 U. S. Census. Single-family and multiple-family households were each split into three auto-ownership categories to improve trip generation estimates:

- Households with zero autos (0 Auto HH)
- Households with one auto (1 Auto HH)
- Households with two or more autos (2+ Auto HH)

Auto ownership data were available from the 1990 U. S. Census. The percentages of 0, 1 and 2+ auto households were calculated for single-family and multiple-family housing units and applied to the housing units in the corresponding Shasta County TAZs.

Future year (out to 2025) projections were based on California Department of Finance (DOF) population projections and from General Plan land use data applying estimates of market absorption rates and past growth patterns. As part of the General Plan development, Shasta County jurisdictions distributed the population and employment growth based on local data and a consensus process.

2000 Model Update

The current travel model's land use data set was developed as part of the 2000 update effort using updated population projections from the State Department of Finance and on population projections developed by the Economic and Planning Systems (E & PS) for the Shasta County Model Steering Committee.

Housing growth from 1990 to 1999 was based on detailed review of building permit information from each of the local jurisdictions. New housing and population increments from 1990 to 1998, represented by building permits, were assigned to model TAZs by the consultant and reviewed by staff. The growth factors were estimated by jurisdiction to match official state estimates for January 1, 1998. Auto ownership was based on the 1990 U. S. Census at the Census block level for 1990.

The 2000 employment data was based originally on the 1990 land use database from the previous version of the model. As with the housing, employment growth from 1990 to 1999 was based on detailed review of building permit information from each of the local jurisdictions. New employment increments from 1990 to 1999, represented by building permits, were assigned to model TAZs by the consultant and staff. A set of conversion factors were statistically developed from existing land uses to estimate the numbers of each of the employee types associated with each zoning category of land use development between 1990 and 1999.

The current travel model's future horizon year (2025) land use estimates were developed based on the DOF County Population Projections for 1990-2040, on population projections developed by the E & PS for the Shasta County Model Steering Committee and on previous travel demand model inputs for 2025, including General Plan assumptions and trends in population, housing and employment relationships. Housing units and employment estimates were distributed geographically based on previous model growth assumptions by TAZ (these were based on a combination of overall county growth and local community plans).

The resultant assumptions by TAZ for base and horizon years were provided to each of the Shasta RTPA local jurisdictions for review and comment.

WORK TO BE UNDERTAKEN IN THIS REQUEST

Scope of Work

The purpose of this work plan is to revalidate/calibrate the Shasta RTPA base year model to 2004 conditions with higher standards, using a newly developed 2004 Shasta County parcel level database, 2001 Caltrans Household Travel Survey data and data from the 2000 U. S. Census,

residential finalized building permit information, and employment data from InfoUSA and the State of California Employment Development Department.

Task 1 Update GIS Layers and Attributes by node and link

The model road network overlays a street centerline GIS layer from Shasta County that is in a NAD 27 projection. The current TAZ map is a Geographic Information System (GIS) layer. Caltrans data layers for the State Routes are in NAD 83.

The model road network and TAZ layer should be updated to coincide precisely with the County's most current street centerline file and City of Redding GIS department archives. The TAZ layer should also be reviewed and revised to eliminate illogical TAZ boundaries derived from the U. S. Census geography. The number of TAZ boundaries in Shasta County, with the majority in City of Redding, will be increased by approximately 100-200 zones. A comprehensive list will need to be developed jointly with the consultant and the Shasta Model Users Group (SMUG).

A review of all current speed class and capacity class assignments by link is required. The consultant will suggest additional and or revised categorization of facilities for approval by SMUG and make the necessary assignments. Road names should be assigned to each link.

Task 2 Base Year Land Use Update

The purpose of this task is to develop an updated land use database for the 2004/5 model calibration year which includes the categories: population, single family and multiple family households by zero automobile ownership, one automobile and two or more automobiles, and employment by the categories: retail; services; government; education; agriculture; mining, construction; manufacturing; transportation and public utilities; wholesale trade; and finance, insurance, and real estate.

Obtain Detailed Data Sources

The first task of the Shasta RTPA land use update will be to obtain the data sources necessary to support the update efforts. The following data can be provided by Shasta RTPA or should be readily available on the web or through Shasta County local jurisdictions:

- Most recently available aerials (for review of existing land uses and available land by TAZ)
- 2000 U. S. Census Data (block and tract boundaries, SF1, SF3 and CTPP data)
- Population Estimates for Shasta County developed by the Economic & Planning Systems for the Shasta County Model Steering Committee.
- State of California Employment Development Department (EDD) employee (wage and salary, self-employment, unpaid family, and private household workers) estimates by category for Shasta County as a whole (to be used to determine control totals)
- Electronic version of the County Assessor's parcel database, with updated parcel map
- Most up-to-date General Plans and, if available, electronic spreadsheets of land use data (both County and Cities) based upon prior model inputs.

Employment Databases

The following databases shall be used in the land use update process:

- 2004 Info USA business information for Shasta County. Business Records including Company/Tradestyle Name, Street Address, Phone #, Numbers of Employees at Site for Shasta County and SIC code. (Geocoding by the consultant)

- 2004 EDD confidential data as a more accurate source of governmental employment information.

The InfoUSA employment data will provide data records of employers in Shasta County, including their name, address, 4-digit standard industry classification (SIC) code, employees (total and “employees here”). The data shall be geocoded and aggregated by Shasta RTPA’s Traffic Analysis Zones by the consultant. The EDD confidential data shall also be geocoded, if necessary, to supplement the government sector information.

The Economic & Planning System data provided historical, current, and projected estimates of countywide employment by 5-year increments from 1970 to 2025. This data set will be updated for 2030. Estimates include county totals of population, employment (jobs) by SIC code and major category (e.g., farm, agricultural, construction, manufacturing, wholesale trade, retail trade, service, government, etc.), households, etc. These projections can be used for comparison to the employment forecasts prepared by RTPA.

Estimate 2004 Number of Households and Income levels

Use the 2000 U. S. Census block data, any other appropriate database, and DOF data to estimate 2004 number of households and their respective income levels by individual TAZ, as well as totals for each jurisdiction.

Since the Shasta RTPA travel model splits single-family and multiple-family households into three auto-ownership categories to improve trip generation estimates (households with zero autos, with one auto, and with two or more autos), U. S. Census data should be used to distribute households by auto ownership for the year 2004/5. Shasta RTPA Staff will coordinate the obtainment of building permit information from member cities and the county for 2001, 2002, 2003 and 2004 and the consultant will add them to the appropriate TAZs on top of the 2000 data. Effort to confirm the accuracy of the existing data utilizing new GIS information is needed. Auto ownership data should be available from the 2000 U. S. Census at the Census block group level. The percentages of 0, 1 and 2+ auto households should be calculated for single-family and multiple-family housing units in each U. S. Census block group and these percentages should be applied to the housing units in the corresponding Shasta County TAZs. The same percentages should be applied to 2004 data. The resulting data should be compared with the single/multiple family household and auto ownership data by block group from the 2000 U. S. Census.

Estimate 2004 Employment by Travel Model Category

Estimating employment is typically the most difficult part of the development of a land use database. While the commercial employment database will provide a very strong starting point (covers approximately 95% of the employment in the county), it will be necessary to make phone calls, perform field surveys, and develop reasonable processes to estimate employment by TAZ and jurisdiction.

First, use the commercial database “employees here” data to estimate 2004 employment by individual TAZ, as well as totals for each jurisdiction. Second, categorize the employment using the relationship between the standard industrial classifications (SIC) codes and the employment categories in the Shasta RTPA model. Using this relationship and the updated TAZ file correspondence to U. S. Census block, the employment data can be converted and aggregated to Shasta RTPA TAZs.

The resultant employment totals should be compared with EDD estimates to determine reasonableness of totals. Since the “employees here” data includes part time and full time employment, a factoring process may need to be developed to match EDD and commercial database employment totals.

Other reasonableness checks include reviewing resulting employees per population for the county and for each by jurisdiction, employment trend lines, and overall employment distribution.

Meetings

This task should include adequate meetings to obtain information from local jurisdictions, discuss base year land use issues, and conduct field review to assist with TAZ allocations. At each major milestone it is expected that the SMUG will approve the deliverable within 10 working days to insure agreement of assumptions and use in downstream calculations. It is expected that no more than four meetings should be required.

Products

The base year socioeconomic data shall be provided in formats specified by RTPA staff so that it can be readily used for the model validation as well as forecasts prepared by Shasta RTPA staff.

Task 3 Update factors and/or method to convert land areas to employment

The RTPA needs and currently uses employment per square foot factors by plan use designations (office, middle school, light industry, golf course, fire station, etc.) by nine employment categories types (retail (low, medium and high intensity), government (low, medium and high intensity), education, college, highway commercial, institutional, manufacturing, restaurant (low, medium and high intensity), office, (low, medium and high intensity) highway commercial, truck stop and utility/warehouse, and recreational special generators. The currently used factors were derived from a survey conducted by the State of California for the Shasta area many years ago, and may need to be modified to more accurately represent future conditions. The Consultant shall recommend modifications to these factors and/or other methods to enhance verify or replace these factors.

SMUG will approve the deliverable within 10 working days to insure agreement of assumptions and use in downstream calculations.

Task 4 Identify and Update Special Generators

Special generators represent primarily recreational sites that attract trips unrelated to housing or employment, such as parks, golf courses, sports complexes, etc. The special generators within Shasta County should be reviewed to ensure that they are assigned to the correct updated TAZ. For these zones, estimated vehicle trips (using ITE trip generation), year of project opening, and trip purpose assumptions can be input directly to the model in the "Spec Gen" worksheet of the Excel workbook.

Existing special generators should be reviewed for correctness and the possibility of new additional special generators developed. Example: Convention Center, Win River Casino, Field of Dreams, fairgrounds, etc.

SMUG will approve the deliverable within 10 working days to insure agreement of assumptions and use in downstream calculations.

Task 5 Update Population and Employment Forecasts

Task 5.0 Socioeconomic Data Estimates and Projections

In updating the Shasta County TDM it will be necessary to allocate base year (2004) development estimates and future year (2010, 2015, 2020, 2025 and 2030) development projections to the TAZs. The consultants will select and define a preferred projection of regional growth in population, housing, and employment. This work will require that existing development and estimated holding capacity be compared to both published growth projections and historical growth trends. The preferred growth projections will be the basis for the base and horizon year TAZ inputs prepared for the TDM.

The growth projections will include a forecast of residential and non-residential land uses in the format already used by the Shasta County TDM model. The growth projections will distinguish between growth for Shasta County as a whole and the Cities of Redding, Anderson and Shasta Lake. The consultants will also conduct a “reality test” of the overall growth forecast, in terms of whether the expected population growth is supportable given the potential job growth in the County and its historical commute shed.

Task 5.1 *TAZ Development*

The consultant will continue to refine the TAZ boundary definitions of the previous traffic model. Considerable data complications can be introduced when TAZs do not conform to U. S. Census geography or jurisdictional boundaries. It is expected that the jurisdictions, with the majority within the City of Redding, will increase the number of TAZs by approximately 200.

Task 5.2 *Map Major Active and Proposed Projects*

The consultant will collate and map major development projects “in-the-pipeline” provided by the City and County planning agency staff. This information will be used to identify residential and employment generating uses that may currently be under construction, approved, or proposed for specific locations in the region. The data, and the associated timelines and estimates of potential new dwelling units and employment, are all vital for grounding the TAZ projections of future socioeconomic conditions in reality.

The consultant will expect the cooperating planning staff to be able to provide dwelling unit and employment or gross building area estimates for approved projects, and the appropriate development densities and Floor Area Ratios (FAR) being considered for those projects which are pending approval. The focus of this effort will be on projects likely to be significant sites of trip attractions or productions and is not intended to be a comprehensive inventory of development applications Countywide.

Task 5.3 *Employment Data Estimates*

Small-area housing counts and population estimates are relatively easy to obtain and extrapolate from public sources such as the 2000 U. S. Census, housing construction statistics, and California Department of Finance demographic reports; but the same is not true for employment estimates by place of work. The consultant should consider being consistent with the prior update and determining existing employment conditions by obtaining a comprehensive, up-to-date listing of establishments from American Business Information, Inc. (ABI). ABI currently maintains records for establishments in Shasta County. Each of these records includes establishment name and type of business by expanded Standard Industrial Classification; an estimate of the actual number of employees working on-site; and geographic coordinates for the individual worksites.

We have found ABI listings very helpful in providing detailed and reasonably accurate snapshots of current employment conditions, and a practical and affordable substitute for a comprehensive special U. S. Census of local employers. The consultant will screen the ABI listings to identify outliers and anomalous entries, checking information for the largest employers against independent estimates from other sources. The edited and enhanced ABI data will be recorded as a DBF database file for use in this study.

Task 5.4 Allocate Base Year Scenario to TAZS

U. S. Census block data will be used to allocate base year (2004) population and housing estimates to each TAZ using the household types defined for the TDM. A combination of journey-to-work employment statistics from the 2000 U. S. Census, the most recent County Business Patterns reports, and up-to-date ABI establishment listings and place-of work employment estimates will be used to allocate base year employment estimates to the TAZs, again using the employment types required for modeling.

Task 5.5 Review Selected Land Use Plans

The consultant will review selected land use plans provided by the local planning agency staff, including General Plans, approved land use maps, existing market studies, residual development capacity estimates, and land absorption reports. This information will be reviewed in order to understand the anticipated development trends and build out limits for the County and its sub-regions and to provide an available land supply context for evaluating alternative projections of growth in the subsequent task.

Task 5.6 Compare Regional Growth Projections

The consultant will compare available projections of population and employment for Shasta County. The analysis will compare County level projections prepared by California State Agencies, such as the Department of Finance, to projections prepared by other regional agencies and economic forecasting services (i.e., those prepared by the Bureau of Economic Analysis, Center for Continuing Study of the California Economy (CCSCE), and National Planning Association), as well as the growth expectations (embodied in general plans) of the local jurisdictions. This comparison will provide an understanding of the degree to which the different projections for the study area are relatively conservative or aggressive.

All of the examined projections will also be reviewed for underlying assumptions. The appropriateness of these assumptions for this project will be considered, and consultant professional judgment will be applied in evaluating the projections in the light of historical growth trends and Northern California market conditions. Summary descriptions of each of the existing projections and the underlying assumptions will be described in a technical memorandum. The adoption and/or adaptation of one of the reviewed projections will be proposed as the basis of the preferred Countywide Growth Projections for this project. These projections will be for each five years band from 2005 to 2030.

Task 5.7 Select Preferred Growth Projection

The consultant will work with RTPA staff (and SMUG) to select and finalize the preferred Growth Projections and the related future transportation network scenario. The proposed growth projections from the previous sub-task will be refined based on the input from staff (and TAC) that reviews the information. The preferred Growth Projection will be defined in terms of population, housing, and employment growth by major industrial sector. Housing projections will be expressed in terms of households and dwelling units. The housing types defined will be consistent with the needs of the TDM. The employment projections will distinguish retail, service, and other employment categories, consistent with the required TDM inputs.

Task 5.8 Allocate Future Year Scenario to TAZS

Using the base year data set as a starting point, the incremental growth defined for the preferred Countywide Growth Projections for 2004/5 to 2030 will be allocated to the TAZs defined for the model. Allocations will be primarily made on the basis of existing development and the residual development capacity information obtained in Task 5.3, but it will also factor in data on approved and proposed projects gathered during Task 5.2. The consultant requires extensive experience in large-scale allocation and normalization of growth projections to small-area analysis zones, and will select appropriate methods and algorithms based on the nature and detail of residual development capacity information that is readily available from the local planning departments. The Draft allocations will be delivered to the RTPA (and SMUG) in tabular and map form to allow examination and comment before the allocations are finalized and delivered for input to the TDM.

Shasta RTPA staff and SMUG will review and approve the future housing and employment forecasts prepared by the consultant. Staff will review local General Plans, develop overall growth rates by land use category, allocate growth to TAZs, and review growth assumptions with local jurisdictions.

The Consultant shall provide on call assistance in an amount not to exceed \$ 5,000. Consultant tasks may include:

- Provide mapping and quantitative information on vacant land using GIS
- Recommend updates to factors used to convert land area to employment
- Recommend format for improving transfer of land use information to the travel model

NOTE- SMUG will review and confirm the accuracy and adequacy of the documentation of assumptions for each sub-task before it is considered complete.

Task 6 Update Trip Generation

Calibration should include the review of trip generation procedures. This review should include the consideration that some local jurisdictions believe that the model under-estimates traffic generation for newer residential areas. Use available 2000 U. S. Census Journey-to-Work and CTPP data and Caltrans 2001 Household Travel Survey data to verify, and if needed modify, trip generation rates.

Use the most recently available data to review, and if needed modify, the average vehicle occupancy rates and transit percentage assumptions.

Task 7 Update External Travel Assumptions

Use 2000 U. S. Census and Caltrans survey data as well as the most current Caltrans statewide model estimates and web site traffic counts to update 2000 base year through trip (X-X) and internal-external/external-internal (I-X/X-I) trip assumptions. Use updated growth rate information from historical traffic counts and growth rates from adjacent counties to estimate growth rates for each Shasta County "gateway." Update the gateway Excel workbook to include the revised base year and growth assumptions. Gateway information on the state highway will need to be approved by agency Caltrans partners

Task 8 Shasta County Travel Model 2004 Revalidation

The model revalidation plan assumes the following:

- The Base year (2004/5) socioeconomic input data will be developed by the consultant.
- Future year (2005 - 2030) socioeconomic input data will be developed by consultants with the Shasta RTPA staff assistance;
- Shasta RTPA and SMUG will oversee local jurisdiction review of land use and network assumptions prior to model revalidation;
- Shasta RTPA and SMUG will compile the relevant daily and peak hour traffic count data from the local jurisdictions, which will be provided. If additional screen lines are required this action needs to be defined early in the project.
- A calibration target summary will be provided by the consultant and approved by RTPA and SMUG, it is expected that this will be an iterative process. The maximum desirable deviation percent error should be within 90% of the maximum deviations set by the reference "Travel Forecasting Guidelines". The summary will include the following facilities
 - Freeway & Expressway
 - Principal Arterials
 - Minor Arterials
 - Collector
 - Local
 - By volume group – 1-1,000; 1,001 – 2,500; 2,501 – 5,000; 5,001 – 10,000; 10,001 – 25,000; 25,001 – 50,000.

Using the base year socioeconomic and roadway assumptions use an iterative process of applying the base year model to validate the trip generation and assignment assumptions. Based on results of iterated model forecasts compared with volume counts and HPMS VMT data modify specific model components as appropriate to revalidate/calibrate the base year model.

Validation shall be consistent with procedures described in the; "Model Validation and Reasonableness Checking Manual June 2001", TMIP, "Travel Forecasting Guidelines", California Department of Transportation, 1992 and "A Manual of Regional Transportation Modeling Practice for Air Quality Analysis", National Association of Regional Councils, 1993.

Validation to ground counts should include total percent deviation and RMSE by facility type and screen lines. Screen lines to be used will need to be reviewed for appropriateness by RTPA and SMUG and the consultant; currently there are 25 screen lines.

Validation criteria

MAXIMUM DESIRABLE DEVIATION		
Base Year ADT	% Error	
	Caltrans	Criteria for this Update
< 1,000	65-?	50
1,000	65	50
3,000	53	40
5,000	46	33
7,500	40	28
10,000	36	25
20,000	28	20
30,000	25	15
40,000	22	13
50,000	19	10
Validation Criteria:	75% within maximum deviation	90% within maximum deviation

FUNCTIONAL CLASSIFICATION PERCENT ERROR LIMITS	
Base Year ADT	Criteria for this Update
Facility	Less than 7%
Freeway	Less than 10%
Arterials	Less than 20%
Collectors	Less than 25%
Local	Less than 25%
Validation Criteria:	Total assigned traffic volume divided by the total counted traffic volumes for all links that have counted volumes, disaggregated by functional classification.

Percent RSME overall and by Functional Class will remain 40% in this update consistent with prior updates.

Vehicle Miles of Travel Comparisons

Consultant will compare the appropriate estimate of modeled vehicle miles traveled (VMT) with the relevant year of Caltrans Highway Performance Monitoring System (HPMS) data. Base year VMT shall be within 3% of the HPMS data and/or approved ground counts. Consultant will work with Shasta RTPA and SMUG to determine the acceptable variance of the modeled data from the HPMS survey data. The final comparisons will be documented.

Review, and if necessary modify, the speed-flow curve assumptions used in the model.

Validation Runs and Adjustments

Perform a series of validation runs, making the above referenced comparisons with the model results and making adjustments in model parameters and modules until the target validation goals are met, or are met as nearly as possible within the constraints of the accuracy of available data and the limitation of the project budget.

Task 9 Apply Updated Model and provide Output Net files by Five-Year Bands

Apply the updated model components to create a 2030 horizon year model, using socioeconomic data generated by the project as well as land use and network inputs for specific milestone years. The appropriate milestone years will be determined by RTPA and SMUG it will consist of 5 year starting with 2004/5bands to the 2030 horizon year, consistent with the current modeling practice.

Task 10 New Functionality

The calculation of level of service for urban streets (excluding state highways) should be automated within the model to create an attribute of A to F LOS assignment to any link and any band of year based upon the current service volume tables within the transportation element in each cities respective general plan.

Generation at the TAZ level of output reports that can itemize reporting of the following from a menu selection:

1. Average Trip Lengths and roll up to Regional Vehicle Miles traveled
2. Average Trip Rates and roll up to Regional Vehicle Miles traveled
3. Average Mode Share and roll up to Regional Vehicle Miles traveled
4. TAZ and roll up to Regional Vehicle Miles traveled

Standard output reports, that are currently unavailable, are needed that provide detail of transit rider ship produced by the model as a standard selection to aid in analysis of proof of sensitivity to changes in fares, stops, etc.

Select Link and Select Zone capabilities need to be activated within the model for site specific analysis needs.

Task 11 Documentation

Provide monthly progress reports to the Shasta RTPA project manager. These monthly status reports will include descriptions of work tasks completed that month, and will identify any issues that may affect project schedule or project deliverables.

Prepare a draft report documenting the model update process, resultant changes and validation results. Prepare a Shasta RTPA TDM Model User's Guide. The user guide should contain all elements that will be provided by RTPA and SMUG. Provide Shasta RTPA with five (5) copies of the draft reports for review by RTPA staff and other interested or affected jurisdictions.

After receiving one set of non-conflicting comments from Shasta RTPA prepare the final project report and the final User's Guide. Provide Shasta RTPA with ten (10) copies of each final report, as well as original copies and all of the relevant electronic data files associated with the project.

The organization of the documentation should contain all elements of the Oregon Modeling Improvement Program Model Documentation Guidelines dated June 30, 2002.

Task 12 Meetings and Presentations

In addition to meetings required to perform previously mentioned task activities, the consultant will participate in additional meetings/presentations as outlined below:

- Meetings with Shasta RTPA (as needed), and
- Meetings with the Shasta County RTPA Technical Advisory Committee (TAC) or Shasta Model Users Group (two). These meetings are to present information regarding the model validation to the committee and present the final validated model for approval of the committee.
- One meeting of the Shasta Model User's Group (SMUG) to present and describe the process for updating the Shasta RTPA model.

Task 13 Provide Training

Provide two 4-hour on-site training sessions in the use of TP+/Viper as applied to the Shasta RTPA model. These do not have to be consecutive days. Provide 6 months telephone support after completion of model validation.

COORDINATION

The consultant will take primary direction from the Shasta RTPA Project Manager. It is intended that all work will be completed by end of fiscal year 2004/2005 and that the consultant's work will begin immediately upon receiving a notice to proceed.

The selected consultant will best demonstrate the ability to deliver quality work on schedule and in a cost-effective manner, consistent with the tasks and deliverables in this RFQ.

File copies of all correspondence, technical memoranda and reports should be delivered to the Shasta RTPA Project Manager on disk in MS Word 2000 or later and MS Excel 2000 or later.

All data, maps and all other materials prepared or collected under this contract will become the property of Shasta RTPA.

PROPOSAL REQUIREMENTS

Proposal content and completeness are important. Clarity and succinctness are essential and will be considered in assessing the consultant's capabilities. Proposals that show creativity and new ideas will be highly considered.

One reproducible and three copies of the proposal must be received at Shasta County RTPA by 4:00 p.m., on Tuesday August 24, 2004. Proposals received after that date and time would not be considered. In order to simplify the review process and to obtain the maximum degree of comparability, the proposal should be organized in the following manner:

1. Transmittal Letter

The transmittal letter should be signed by an official authorized to bind the consultant contractually and will contain a statement to the effect that the proposal is a firm offer for

90 days. The letter accompanying the proposal will also provide the following: name, title, address, and telephone number of individuals with the authority to negotiate and contractually bind the company.

2. Table of Contents

Include identification of the material by section and page number.

3. Overview

This section should clearly convey the consultant's understanding of the nature of the work and the general approach to be taken to its performance. This section should include, but not be limited to, a discussion of the purpose of the project, the organization of the project effort, and a summary of proposed approach.

4. Detailed Work Plan

This section should include:

- **Task description:**
Include a full description of each step to be followed in carrying out the project. The work description should be presented in sufficient detail (tasks, subtasks, etc.) to show a clear understanding of the work and the proposed approach.
- **Deliverables:**
Descriptions of the format, content and level of detail that can be expected for each deliverable.
- **Schedule:**
A schedule showing the expected sequence of tasks, subtasks, etc., should accompany the work description. Important milestones should be shown on the schedule.

5. Management Approach

This section should describe the consultant's management approach. If the proposal is a team effort, the distribution of work among the team members should be indicated. Describe the organization of the management, the structure of the work assignments and any specific features of the management approach that requires explanation.

The prospective Consultant will designate by name the project manager to be employed. The selected Consultant will not substitute the project manager without prior approval of Shasta RTPA.

Include the names and qualifications of all professional personnel to be employed, a resume for each professional (limit to 1 page per employee and include in an appendix), a statement indicating how many hours each professional will be assigned to the contract and what tasks each professional will perform. Staffing assignments should be specific enough to demonstrate understanding of skills required and commitment of proper resources. The Consultant will not substitute members of the project team without prior approval of Shasta RTPA.

6. Summary of Qualifications

Provide a short description of previous projects that significantly relate to your qualifications for this project. Provide names, addresses, and telephone numbers for at least three clients for whom the firm has performed services similar to those described in this request for proposal.

7. Budget & Billing Format

RTPA staff will do a cost analysis of the proposed budget. Under various circumstances the budget could be subject to Preaudit and/or the final cost subject to Post audit by RTPA or Caltrans division of Audits and Investigations. The allowability of individual items of cost will be determined by 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31 et. Seq. The Contractor will also be required to comply with 49 CFR, Part 18, and Uniform Administrative Requirement for Grants and Cooperative Agreements to State and Local Governments. The contractor should have an accounting system capable of segregating direct cost from indirect costs per the above-cited regulations. The Contractor and Subcontractors will comply with all applicable laws and maintain books, documents, papers, and accounting records for a period of three years from the date of the final payment.

A. Method of Payment

The cost proposal must be prepared consistent with the method of services provided under this agreement and will be reimbursed, by one of, or a combination of the methods below. The proposer must clearly state the method used to prepare the cost proposal.

Lump Sum payment
Actual Cost plus Fixed Fee
Specific Rates of Compensation

Lump Sum proposals will be paid per milestone of completed work or at the end of the contract upon acceptance of the final product. Actual Cost plus Fixed Fee agreements shall be billed at actual payroll costs and include a fixed fee for profit. In agreements reimbursed by Specific Rates of Compensation, billing rates containing a component for profit will be negotiated that will not change during the term of the contract.

B: TASK BUDGET

A schedule of estimated costs to compete each task should add down to the total cost of the project (see Table 1 & 2). The task budget should include a subsidiary breakdown by task of hours and billing rate charges. To ensure a full understanding of the resources committed to the project the schedule should clearly indicate the amount of hours key personnel will be used in each task.

C. BUDGET AND COST BREAKDOWN

The prospective consultant will prepare a detailed cost breakdown for the work to be performed during the project regardless of the method of reimbursement chosen. This will include all task required to complete the project including final reports and presentation.

1. Direct Labor Costs – A schedule of billing rates and hours worked by employee or category of employee is required of the prime contractor and all subcontractors. Billing rates shall be based on actual pay rates and should cover all costs associated with the employee (salary, benefits, and anticipated cost of living and/or merit increases during the term of the contract). Depending on the individual cost structure, overhead may be

applied as a component of the billing rate or applied separately. The proposer should be prepared to validate billing rates with payroll registers, wage agreements, or other payroll documentation.

2. Overhead Rates – The overhead rate should include all indirect cost not readily assignable to cost objectives specifically benefited. Typically an overhead rate is calculated on a company or division wide basis by segregating expenses into direct cost and indirect cost categories and then dividing the indirect costs by a direct cost base such as direct labor to arrive at an overhead rate. The overhead rate is then applied on a contract by contract basis to recapture the indirect costs that are not chargeable directly to a final objective such as general and administrative, facilities, equipment, supplies, accounting, maintenance, materials, etc. Some cost structures may be broken into various overhead rates that are applied to different bases. The proposer should be prepared to provide supporting documentation such as prior agreements with government agencies or audits of prior year activities to validate overhead rates structures.

3. Direct Cost – Direct cost are those incremental costs that can be identified specifically with a particular final cost objective. Although in some instances direct cost and indirect cost may include similar categories, incremental direct cost attributable to final objectives must be separated and not included in the overhead calculation. All direct cost specifically attributed to the project and not included in the billing rates must be itemized by budget category to be eligible for reimbursement. Once contractually authorized, direct cost budgets may not be substituted without prior written consent of RTPA.

4. Sub consultant Fees – Sub consultants must provide the same cost data detail as the prime contractor (see Table I and Table 2).

5. Fixed Fee – A fixed fee is calculated as a basis of total direct and indirect costs. The State of California allows a 10% maximum fee.

The hypothetical cost format example given below is to illustrate required components of the cost proposal only, and may have to be tailored to fit individual cost structures.

Table 1. - Direct cost by Task

Cost Items	Task 1	Task 2	Task 3	Total
1. Direct Labor	3,700	17,053	5,502	26,255
2. Overhead (___% of Line 1)	1,480	6,821	2,201	10,502
Total Salary Burden	5,180	23,874	7,703	36,757
3. Direct Expenses				
Telephone/FAX	35	28	15	78
Postage/Shipping	12	8	35	55
Graphics/Printing	11	11	75	97
Travel	350		500	850
Misc.	45	45	45	135
Total Direct Expenses	453	92	670	1,215
4. Subconsultant Fees *	4,244	22,276	2,726	29,246
5. Fixed Fee (___% of Lines 1,2,3)	764	1,524	1,132	3,420

Total	10,640	47,766	12,231	70,638
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Table 2 - Project Task Costs by Key Personnel

Task No. and Description	Key Staff #1	Key Staff #2	Staff Support	Total Hours
Task 1. Establish Parameters	25	75		100
Task 3. Data Collection and Analysis		400	250	650
Task 4. Final Report and Presentation	15	50	175	240
Total Hours	40	525	425	990
Billing Rate	\$75.00	\$44.06	\$25.00	
Memo Total	3,000	23,132	10,625	36,757

* Subconsultants must provide required cost components found in Tables 1 & 2

8. Insurance Requirements

Without limiting Shasta RTPA's right to obtain indemnification from CONTRACTOR or any third party, CONTRACTOR, at its sole expense, shall maintain in full force and affect the following insurance policies throughout the term of the contract:

- a. Comprehensive general liability insurance with coverage of not less than \$1,000,000 combined single limit per occurrence for bodily injury, personal injury, and property damage. Comprehensive general liability insurance policies shall name Shasta RTPA, it's officers, agents, and employees, individually and collectively, as additional insured, but only insofar as the operations under the terms of the contract are concerned. Such coverage for additional insured shall apply as primary insurance or self insurance and any other insurance, maintained by Shasta RTPA, it's officers, agents, and employees, shall be given excess only and not contributing with insurance provided under the CONTRACTOR's policies herein.
- b. Comprehensive automobile liability insurance with limits for bodily injury of not less than \$25,000 per person, \$250,000 per accident, and for property damages of not less than \$50,000, or such coverage with a combined single limit of \$250,000.
- c. Professional liability insurance of at least \$1,000,000.
- d. Worker's compensation insurance as required by law.

This insurance shall not be cancelled or changed without a minimum of (30) thirty days advance written notice given to Shasta RTPA. CONTRACTOR shall provide certification of said insurance to Shasta RTPA within twenty-one (21) days of the date of the execution of the contract. Such certification shall show, to Shasta RTPA's satisfaction,

that such insurance coverage's have been obtained and are in full force; that the Shasta RTPA, its officers, agents, and employees will not be responsible for any premiums on the policies; that as and if required such insurance names Shasta RTPA, its officers, agents and employees individually and collectively as additional insured (comprehensive and general liability only), but only insofar as the operations under the contract are concerned; that such coverage for additional insured shall apply as primary insurance and any other insurance, or self insurance, maintained by Shasta RTPA, its officers, agents, and employees, shall be excess only and not contributing with insurance provided under the CONTRACTOR's policies herein; and that this insurance shall not be cancelled or changed without a minimum of thirty (30) days advance, written notice given Shasta RTPA.

In the event CONTRACTOR fails to keep in effect at all times insurance coverage as herein provided, Shasta RTPA may, in addition to other remedies it may have, suspend or terminate the contract upon the occurrence of such event.

9. Disadvantaged Business Enterprise (DBE) Participation

DBE Attachment B - Bidders listing must be completed for all contractors and subcontractors regardless of DBE affiliation.

The RTPA fully anticipates that it will consistently meet and exceed its adopted DBE overall goal under 49 CFR Part 26 using race-neutral measures exclusively.

Only DBE firms currently certified per 49 CFR Part 26 will participate as DBEs in our program. Such certification must be issued by Caltrans, FHWA, FTA, DOT, MPO, City, County, or State in accordance with 49 CFR Part 26.

RTPA will not deny award to contractors on the basis of DBE participation, who demonstrate that they have used good faith efforts to achieve DBE participation.

Contractors selected on the basis of DBE participation must provide the following information with the initial proposal or before entering into a contractual agreement with RTPA:

1. The names and addresses of the DBE firms.
2. A description of the work each DBE will provide.
3. The dollar amount of participation by each DBE.
4. Proof of DBE certification.
5. Written confirmation that the DBE will participate.
6. If DBE participation is not achieved, evidence of good faith efforts must be provided.

Prime contractors are required to maintain records and document payments to all subcontractors for three years following the performance of the contract. These records will be made available for inspection upon request by any authorized representative on SCRTA, Caltrans, FHWA, or DOT. This reporting requirement also extends to any certified DBE subcontractor. The contractor shall maintain records showing the name and address of each subcontractor, the date of payment, and total dollar figure paid to each subcontractor.

COFCG will safeguard from disclosure to third parties information that may reasonably be regarded as confidential business information, consistent with federal, state, or local laws.

10. Conflict of Interest

The prospective contractor shall disclose any financial, business, or other relationship with Shasta RTPA that may have an outcome on the selection.

CONSULTANT SELECTION

A Technical Selection Committee will be established.

The Selection Committee will screen all proposals submitted in response to this request. The Selection Committee reserves the right to make a final selection based on the written proposal only. Proposal evaluation considers both graphic and writing quality.

PROPOSAL SUBMITTAL

One reproducible and four copies of all proposals must be delivered to Shasta RTPA no later than 4:00 p.m. Pacific Daylight savings Time on Tuesday, August 24, 2004. Proposals will not be accepted after 4:00 p.m. PST. Postmarks will not be accepted. Proposals should be mailed or delivered to:

Daniel J. Kovacich, Executive Director
Shasta County Regional Transportation Planning Agency
1855 Placer Street
Redding, CA 96001

Attn: Thomas Hays, Project Manager

All proposals will remain firm for a period of 90 days following the final date for submission. All proposals will become the sole property of Shasta RTPA and a part of its official records without obligation on the part of Shasta RTPA.

This RFQ is not to be construed as a contract or commitment on the part of Shasta RTPA. Shasta RTPA reserves the right to reject all proposals, to seek additional information from each proposer, or to issue another RFQ, if deemed appropriate.

PROPOSED TIMELINE

Proposals Due: August 24, 2004
Interviews (if held): August 26, 2004 (tentative date)
Notification of award by: August 31, 2004
Anticipated contract approval at Shasta RTPA board meeting: October 26, 2004
Notice to Proceed: October 27, 2004

Attachment A

TITLE VI ASSURANCE

Shasta County, in accordance with the Title VI of the Civil Rights Act on 1964, 78 Stat. 252, 42 U.S.C. 2000d-4 and Title 49, Code of Federal Regulations, department of Transportation, Subtitle A, Office of the Secretary, Part 21 Nondiscrimination in Federally Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or nation origin in consideration of an award.

DBE - Attachment B

Bidders Listing

Name of Firm	Address	Project Budget \$\$	DBE Status Yes/No	Age of Firm	Annual Gross Receipts

Total Budget _____

1. All contractors/subcontractors bidding on the project must provide the requested information.
2. Bidders claiming DBE status must attach a copy of a current Certification issued pursuant to 49 CFR Part 26.
3. Bidders claiming DBE status must attach written affirmation that they will participate in the project.
4. Each bidder must designate if Gross Annual Receipts are greater or equal to \$750,000.