Delaware Valley
Regional Planning Commission

REQUEST FOR PROPOSALS FOR CONSULTANT SERVICES

for

Upgrade of the Delaware Valley Regional Planning Commission's Travel Demand Models

July 17, 2008

TABLE OF CONTENTS

I INTRODUCTION AND PURPOSE

The Delaware Valley Regional Planning Commission (DVRPC) is seeking proposals from qualified consultants to assist and advise staff in upgrading the commission's travel demand models. DVRPC would like to take advantage of improvements in commercial software packages that have occurred over the last 15 years. DVRPC would also like to improve its travel demand models in order to assist in the planning and implementing of smart transportation solutions, the analysis of transportation related climate change impacts, and the analysis of transportation responses to energy market changes.

Travel modeling is performed by DVRPC for a number of different purposes. The main purposes are the development of long and short range plans and programs, highway traffic studies, air quality conformity demonstrations, Federal Transit Administration (FTA) New Starts programs, and member government transportation studies. The travel forecasting models are guided by Federal Highway Administration (FHWA), Environmental Protection Agency (EPA), and FTA guidelines. The travel forecasting models are mostly run by DVRPC staff. The models are also used by outside consultants with DVRPC assistance.

The Delaware Valley region consists of Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania and Burlington, Camden, Gloucester, and Mercer counties in New Jersey. These nine counties together comprise over 3,800 square miles and are made up of 352 municipalities. Three municipalities in Berks County are also included for travel demand modeling. The region is home to 5.5 million residents and 2.8 million jobs. Land use varies from the dense urban core of Center City Philadelphia to the open rural areas of the New Jersey Pinelands.

DVRPC is the designated MPO for the nine county Delaware Valley region. Created in 1965, DVRPC provides continuing, comprehensive, and coordinated planning to shape a vision for the future growth of the Delaware Valley region. DVRPC also provides technical assistance and services, conducts high priority studies that respond to the request and demands of member state and local governments, fosters cooperation among various constituents to forge a consensus on diverse regional issues, serves the needs of the private sector, and implements public outreach efforts to promote two-way communication and public awareness of regional issues and the commission.

I.1 Description of the DVRPC Travel Demand Models

DVRPC uses a combined equilibrium travel demand model to simulate travel in the region. This is a traditional four-step trip based model where the last three steps are

combined into a single problem solved by the Evans algorithm. The DVRPC region is divided into 1,912 traffic analysis zones (TAZs) to facilitate travel modeling. These zones are classified into one of six different area types ranging from CBD to open rural in order to model the effects of land use density on travel patterns. Seventy-four county planning areas are used to aggregate TAZ level results for regional analysis. The 1,912 internal TAZs are augmented by 155 external cordon stations to model external travel.

The DVRPC region contains extensive and complex highway and transit systems. The modeled highway network contains over 20,000 directional route miles modeled by over 53,000 links. Links are grouped into one of twenty-eight functional classifications according to area and facility type. Delay is modeled using standard BPR type equations. No intersection delay models are used in the regional model. The DVRPC region contains numerous tolled road and bridge facilities that are included in the model. The DVRPC region contains a vast array of transit modes, run by three primary operators, including commuter rail, heavy rail (subway/elevated), light rail, BRT, and standard bus. DVRPC uses an integrated transit-highway network where street running transit modes reference the highway links over which they run. The modeled transit network contains nearly 700 separate service patterns.

DVRPC uses data from various sources in addition to the modeled highway and transit networks. Demographic and employment data is derived from the Census Bureau, local governments, and other sources. Household travel surveys provide data on levels of trip making, trip lengths, modal splits, and other travel characteristics. The year 2000 Household Travel Survey asked households to record their travel and activities for a 24-hour period. DVRPC conducts numerous traffic counts to support travel demand modeling and other activities. Transit ridership data are provided by the various transit operating agencies in the region. Numerous other travel surveys are conducted to measure levels of external travel, truck travel characteristics, and other travel behavior in the DVRPC region.

The DVRPC travel demand model contains three different time periods to capture the changing nature of travel in the Delaware Valley throughout the day. The peak period models the portions of the day from 7 AM to 9 AM and from 3 PM to 6 PM. The midday time period models the portion of the day from 9 AM to 3 PM. The evening time period models the portion of the day from 6 PM to 7 AM. Various factors and methods are used to model the effect of time-of-day on level of travel activity, transit service levels, vehicle occupancy, and highway speeds and capacities.

The four main models used in the DVRPC travel demand model are trip generation, trip distribution, modal split, and assignment. Trip generation determines the number of trip ends in the region. Trip rates classified by area type are determined from various surveys. Trip ends are determined by multiplying trip rates and socioeconomic variables. There are a total of 16 trip purposes or types used. Three internal motorized

person trip purposes are used – home-based work (HBW), home-based non-work (HBNW), and non-home based (NHB). The first two are generated in production-attraction format, while the later is generated in origin-destination format. Three trip types are used to model commercial internal vehicle trips – light truck, heavy truck, and taxi. All three are generated in origin-destination format. Four trip types are used to generate external motorized vehicle non-commercial trips. These are classified by facility type - turnpike external trips, freeway external trips, arterial external trips, and local external trips. External light and heavy truck trips are also generated, as are external transit trips.

DVRPC also generates HBW, HBNW, and NHB non-motorized trips. These trips are also generated by a combination of trip rates and socioeconomic variables. Trips are generated separately for bicycle and walking trips. These trips are not modeled further in the trip chain. It is, however, desirable to obtain a complete model that may consider the distribution, mode split, and assignment of these non-motorized trips.

Attractions and productions are matched in trip distribution. This is done through the use of travel propensity functions and a gravity model, which assumes that travel is more likely between zones where travel is easy. DVRPC uses 10 different gravity models to model differing trip length frequency distributions.

DVRPC uses a nested logit modal split model to divide trips between transit and highway. The model is nested by mode of approach to the transit station/stop – either drive or walk/bus. Transit sub-mode for each TAZ pair, either commuter rail, subway/elevated, or surface transit (light rail or bus), is determined by minimum impedance through the transit network. Separate mode split models are used for different trip purposes, transit sub-modes, and auto-ownership (0 car and 1+car households). Highway person trips are transformed into highway driver trips by auto occupancy models dependant on distance and trip purpose. While not a part of the current model, it is desirable that the modal split logit function be extended to estimate 1 person, 2 person and 3+ person auto vehicle trips.

Auto trips are assigned in highway assignment to specific paths in the highway network. This allows the determination of volumes on specific highway facility sections. An equilibrium assignment method is used. The highway assignment algorithm is run 22 times within each time period to assure convergence. Transit trips are assigned to specific transit routes and stations by the transit assignment model. This is done by all-or-nothing assignment after highway assignment is completed. Both the highway and transit assignment models assume that travelers pick the most desirable path from their origin to their destination considering time, cost, and other factors. While not a part of the current model, it is desirable to produce truck assignments by truck type (heavy and light) and peak hour assignments.

The DVRPC travel demand models use the Evans algorithm to assure that the travel decisions modeled in the trip distribution, modal split, and highway assignment models are in equilibrium with the loaded highway network impedances. The entire model chain is run 7 times to assure equilibrium. The Evans algorithm is used for FHWA, EPA, and regional plan related modeling.

DVRPC does not use the Evans algorithm for FTA New Starts modeling in order to comply with relevant regulations. A single iteration of the four main models is used to run the no-build alternative. Congested highway speeds and the trip table from the no-build alternative are used when modeling build alternative(s).

The regional travel demand model is run for conformity analysis and long range plan development. A focused simulation process is used for highway design studies and FTA New Starts analysis. The focused simulation process is used to refine and improve the regional results in a particular study area by splitting zones, adding more transportation facilities, and refining model input parameters.

DVRPC uses a post-processor to accurately determine congested link speeds when performing conformity demonstrations. Additional factors are used to determine link speeds based on simulated volumes. The post-processor interfaces with MOBILE6.2 to determine emissions for conformity demonstrations.

The DVRPC travel demand models are implemented in the TRANPLAN modeling software. DVRPC uses VIPER software for highway and transit network editing and maintenance. Various customizations have been performed on the standard TRANPLAN software modules in order to implement various parts of DVRPC's travel demand models, including the implementation of the Evans algorithm.

DVRPC has purchased a license to use the VISUM and VISSIM software packages. DVRPC also has a license to use the TransCAD package. The VISSIM package is being used to evaluate traffic operation. The DVRPC highway network has been implemented in VISUM.

DVRPC runs the TRANPLAN modeling software on Windows based PC desktop machines. The existing procedures for managing data and changes to data are largely ad-hoc. Modeling data is stored on local hard drives on a number of different computers. There is no single repository for all base data sets or project files. Inadequate conventions exist for naming project folders, storing data, or maintaining legacy data. Naming conventions for files are uniform to an extent, but lack adequate documentation. Data sets for new projects are often taken from previous projects or air quality conformity analysis, but planning assumptions for previously used data sets are not always well documented.

Additional information on DVRPC's travel demand models can be found in the report "2000 and 2005 Validation of the DVRPC Regional Simulation Models" (DVRPC Publication #08095). This report extensively documents the DVRPC travel demand forecasting process. Descriptions are given for input data, models, and outputs. For each model, theory is described, implementation is discussed, and results are presented. The 2000 and 2005 validation statistics are also included in this report. A copy of this report will be provided to interested consultants, along with an electronic version of the 2005 DVRPC travel demand models, upon request.

I.2 Description of Travel Demand Model Upgrade Project

DVRPC wishes to make several improvements in its travel demand models. These improvements can be grouped into three areas – software package, model improvements, and data storage and management.

The state of the practice in travel demand modeling is rapidly evolving. This has been caused by advances in the last 15 years in the state of the art and by the increasing demands placed on travel demand models by policy makers and planners. DVRPC requests consultant assistance to review DVRPC's current travel demand models and software, suggest potential upgrades, implement selected model upgrades, document the implemented models, and train DVRPC staff in their theory, use, and calibration.

DVRPC wishes to upgrade its software away from the TRANPLAN suite into an up-to-date travel demand modeling software package. It is anticipated that the switch to a new software package will bring numerous benefits including added efficiency in editing and maintaining highway and transit networks, better interface with GIS data, better display of model results, and access to updated models and techniques. DVRPC requests consultant assistance in reviewing its software needs and selecting an optimal package for DVRPC's needs, implementing the existing DVRPC travel demand models in the selected software package, and training DVRPC staff in the use of the new software package. It is anticipated that the existing DVRPC travel demand models will be implemented, as much as practical, in a new software package before upgrades and improvements to the models are implemented.

Travel demand modeling requires an immense amount of data. This includes surveys, calibration parameters, networks for regional analysis and alternatives analysis, and socioeconomic variables. The models also produce an enormous amount of data as interim and final results. DVRPC requests consultant assistance in creating and implementing data management solutions that allow DVRPC to effectively organize, track, use, maintain, and protect its travel demand modeling data. It is anticipated that this effort will increase efficiency, reduce mistakes, and protect against legal challenges.

The tasks required for each of these three areas, software package, model improvements, and data management, are fully described in the Scope of Services of this document. Qualified consultants are encouraged to submit proposals for this work. Consultants may form specialized teams if so desired.

DVRPC staff will oversee all work performed by the consultant and sub-consultants as described in the Scope of Services. DVRPC staff will be assisted in this effort by a local steering committee run by DVRPC staff. The steering committee will be comprised of stakeholder groups including representatives from state DOTs, local transit agencies, and local government representatives. The steering committee will meet no more than 7 times during the course of this project. DVRPC staff will organize and manage this committee, but the consultant will be required to meet with the committee and present results as needed. In addition, interim products may be distributed for review by a national group, but no meetings of that group are anticipated.

II SCOPE OF SERVICES

Four tasks will be performed by the selected consultant. The first task is to upgrade the DVRPC travel demand software and hardware. The second task is to determine which modeling improvements should be made to the DVRPC travel demand forecasting model. The third task is to implement the improvements determined in the second task. The fourth task is to upgrade the DVRPC modeling data management process. Each task is divided into several sub-tasks, each having specific products.

Consultants are encouraged to modify the tasks below as they deem appropriate to best meet DVRPC's objectives. This may include changing the order of tasks to increase efficiency, deleting and combining sub-tasks that do not contribute value, and adding new tasks that the consultant considers necessary to meet the overall goals of the project. Since the tasks involve more than modeling, the consultants are encouraged to form qualified teams to perform the tasks efficiently. The consultant may choose to have a sub-consultant for software selection or another sub-consultant for data management system creation.

All reports and other documents to be completed by the consultant as part of the Scope of Services should first be submitted to DVRPC staff in draft form. For each document t, DVRPC staff will review the draft and provide comments and recommend changes for incorporation in the final version.

II.1 Task 1 – Upgrade of the DVRPC Travel Demand Software

The consultant shall assist DVRPC in upgrading its travel demand software. The consultant shall perform the four sub-tasks described below. It is anticipated that all of the sub-tasks in Task 1 should be completed in 12 months.

Sub-task 1.1 - Review Existing DVRPC Travel Demand Forecasting Software and Recommend New Travel Demand Software Package and Hardware

The consultant shall perform a thorough review of the DVRPC travel demand modeling process, including the interface with related models and processes. This review shall consist of the travel demand models, input data used, implementation of the models in the TRANPLAN software suite, and typical outputs produced by the models. The consultant shall identify shortcomings with the existing software and procedures.

The consultant shall recommend a travel demand forecasting software package to replace DVRPC's current TRANPLAN implementation. The evaluation criteria for recommending a package should consist of but not be limited to the following:

- Ability to incorporate new modeling enhancements that are selected as part of Task 2
- Ability to and ease of porting the existing DVRPC modeling process into the new package
- Tendency of the software provider to incorporate new and cutting edge models into their package
- Full integration with ESRI GIS software
- Ability to easily code and maintain networks
- Ability to manage and document data
- Ability to customize software with scripting and other methods
- Quality of support
- Stability and reputation of vendor
- Interface with air quality model and post-processor
- Interface with land-use software
- Interface with microsimulation software
- Ability of outside consultants to use the software
- Computational performance
- Cost (initial, maintenance and support)

The recommendation should be in the form of a concise summary report. The consultant shall also recommend any new computer hardware for DVRPC to purchase that will support the recommended software. DVRPC will review the consultant's recommendations and select the software that is most appropriate for DVRPC's travel modeling needs.

Deliverable for Sub-task #1.1 – Summary report recommending travel demand forecasting software.

Sub-task 1.2 - Implement and Validate Existing DVRPC Travel Demand Models in New Software Package

The consultant and the software vendor, in close cooperation with DVRPC staff, will implement the existing DVRPC travel demand models in the new software package. The entire modeling chain is to be implemented in its current form with only minor changes, if any. Significant features, including the Evans algorithm, are to be retained and implemented. Routines and/or scripts for common output and evaluation measures are to be constructed, if not already a part of the software package. Also, an automatic link to or an implementation of the appropriate EPA air quality model and associated DVRPC post-processor, the DVRPC land use model, and the microsimulation software is to be constructed.

The model implementation shall use the 2005 validated version of the DVRPC travel demand models. This includes the 2005 versions of the highway and transit network, socioeconomic data, and calibration parameters. The DVRPC travel demand models, once implemented in the new software package, shall be validated by the consultant to ensure that they produce results of identical or superior quality to the current TRANPLAN implementation as documented in the 2005 validation report. Validation measures include number of generated trips, trip lengths, modal splits, highway and transit facility volumes, highway speeds, VMT, and travel times. The consultant shall demonstrate validation of the regional models.

The consultant shall also demonstrate effective tie in of the new travel demand software to the appropriate EPA air quality model, land use model, and traffic operations microsimulation software. The consultant shall also perform a demonstration project using the selected traffic operation package in conjunction with DVRPC staff. To reduce data collection effort, DVRPC will select an existing traffic operation study in the region for modeling and analysis. The newly implemented travel demand model should provide trip table and other inputs to the microsimulation.

Deliverables for Sub-task #1.2 – Validated implementation of the existing DVRPC travel demand model in new software package on DVRPC computers; tie-in to the air quality post-processor, the DVRPC land use model, and microsimulation package; and other scripts for the summary of model output.

Sub-task 1.3 - Document Model Translation and Produce User's Manual

The consultant shall produce a document detailing the model translation process. This report should include methods used and issues faced. The consultant shall document all custom software written as part of the model translation. This report shall also document all of the validation statistics.

The consultant shall also produce a user's manual to the new software. This document should detail all relevant features of the new software. The user's manual should be complete and well written so that new users with some or no modeling experience can begin to use the new software package.

Deliverables for Sub-task #1.3 – Model translation report and user's manual.

Sub-task 1.4 - Train DVRPC Staff in New Software

The consultant or the software vendor shall provide training to DVRPC staff on the use of the new travel demand software package. This training should cover all aspects of the new travel demand software package, as implemented at DVRPC.

Deliverables for Sub-task #1.4 – Training sessions on the new travel demand forecasting software.

II.2 Task 2 – Recommend Improvements to DVRPC's Travel Demand Models

The consultant shall recommend a set of improvements to be made to the DVRPC travel demand forecasting models. The consultant shall first review the requirements for DVRPC's travel demand forecasting models as well as deficiencies in the current models. The consultant shall also review recent improvements in the field of travel modeling. The consultant shall then recommend a set of improvements to DVRPC's travel demand forecasting models by matching functionality needs with the improvement(s) needed to meet those needs. The consultant shall perform the 3 sub-tasks listed below. It is anticipated that these sub-tasks should be completed in 12 months, and should be completed concurrently with Task 1 sub-tasks.

Sub-task 2.1 – Determined Policy Issues to be Addressed and Regulatory Requirements for Travel Model

The consultant shall work with DVRPC staff and model stakeholders to construct a vision of required future model functionality. The list of needed functionality should be constructed by reviewing the types of issues and policy questions that the DVRPC travel demand models will likely be asked to address in the next 10 years. This includes but is not limited to:

- Congestion pricing and other innovative tolling schemes
- Methods of increasing non-motorized travel
- Effect of land use policies, rail freight, and rapid transit on trip making
- Effect of transportation system changes on land use, including induced demand
- Telecommuting
- Highway and transit operations planning
- Climate change impacts of travel patterns
- Emergency and evacuation planning
- Energy pricing and technology

The policy issues to be addressed by the model should be prioritized. The list should also be constructed by reviewing federal requirements for travel demand modeling, both those that are current and those that are likely in the near future. FTA requirements for modal split modeling should be especially examined. The vision should also consider areas in which the current DVRPC model does not adequately represent travel patterns in the region. This visioning list will serve as a guide to direct the consultant and DVRPC staff in determining which feasible technical, structural, and methodological improvements are in-line with DVRPC's short and long term modeling needs.

There is no specific deliverable for Sub-task 2.1. The information gathered will be incorporated into the Sub-task 2.2 deliverable.

Sub-task 2.2 – Review Advances in the State of the Art and Practice in Travel Demand Modeling

The consultant shall review the state of the art and practice in travel demand modeling. The consultant shall perform this review with attention towards possible improvements to DVRPC's existing travel demand models as implemented in the new software package from Task 1. This review should include at least the following advances:

- Activity-based models and other disaggregate approaches
- Tour-based models
- Time of day choice and peak spreading models

- Disaggregate destination choice models
- Integrated land use / transportation models
- Use of dynamic highway and transit assignment
- Intersection delay models
- New highway and transit assignment algorithms
- Use of GIS data, such as state DOT data and NAVTEC, for highway coding
- Modeling of non-motorized transportation
- Freight modeling (trucks)
- Linking dynamic network and travel models
- Peak hour assignments
- Improved modal split models
- Environmental justice assessments

In reviewing various innovations in travel demand modeling, the consultant shall evaluate each innovation according to added functionality, difficulty of implementation, model complexity, and data requirements.

The consultant should combine the results of both the visioning exercise performed in Sub-task 2.1 and the modeling review conducted in this sub-task into a single document. The consultant shall present the visioning and review document to DVRPC staff and the steering committee.

Deliverable for Sub-task #2.2 – A visioning and review document detailing relevant regulatory requirements, listing and prioritizing policy issues for the model to address, and critiquing recent advances in travel modeling.

Sub-task 2.3 – Recommend Model Improvements

Based on the review of both DVRPC's model functionality needs and recent advances in travel demand modeling, the consultant shall prepare a summary report recommending essential improvements to the DVRPC travel demand forecasting models. The list of recommendations shall be determined by matching DVRPC's functional needs with model improvements. The report shall discuss the most important innovations in travel demand modeling from the Sub-task 2.2 report, including their advantages and disadvantages. The consultant shall recommend a set of improvements to upgrade the DVRPC travel demand models. These improvements should add needed functionality and be feasible in terms of implementation time, implementation cost, computational effort, and data requirements, as assessed by the consultant. The improvements should be ranked by priority. DVRPC staff has identified four improvements that may be considered by the consultants in the ranking of possible improvements:

1. Improve DVRPC's modal split model to ensure full compliance with FTA regulations

2. Full incorporation of non-motorized travel into the DVRPC modeling chain
3. Freight modeling (truck)
4. Peak hour assignments

The report should include a timeline, cost, and plan for the implementation of each of the travel demand model improvements. A selected number of improvements that are highly ranked by the consultant will be implemented as part of this project.

The consultant shall present the model improvement report to DVRPC staff and the steering committee.

Deliverable for Sub-task #2.3 – A summary report recommending model improvements required to meet modeling needs.

II.3 Task 3 – Implement Changes to DVRPC Travel Demand Models

Based on the Summary Report Recommending Model Improvements from Sub-task 2.3, DVRPC will select and prioritize those to be implemented in accordance with its funding resources. For each improvement or set of improvements, the consultant shall perform the 5 sub-tasks within Task 3. The work on Task 3 will be by negotiated agreement between DVRPC and the consultant, specifying a cost and delivery time, as constrained by DVRPC resources. Task 3 will not be preformed until after Task 2 is completed. This will be a collaborative effort between DVRPC staff and the consultant, and possibly the software vendor. However, the consultant is ultimately responsible for the final products.

Sub-task 3.1 - Implement Changes to DVRPC's Travel Demand Models

In cooperation with DVRPC staff, the consultant shall implement the recommended changes selected in Sub-task 2.3 in the new software package selected in Sub-task 1.1. Depending on the timeline and cost adopted in Sub-task 2.3, the improvements may be implemented in stages.

Deliverables for Sub-task #3.1 – Software implementation of recommended model improvement(s) in stages and installed on DVRPC's computers.

Sub-task 3.2 - Calibrate and Validate Improved Travel Demand Models

The consultant shall calibrate and validate the new travel demand models in cooperation with DVRPC staff after each stage of model improvement. Both the individual models and the entire modeling chain shall be validated. At the end of each stage, the consultant shall ensure that DVRPC has received functioning, validated models useful for the various modeling tasks performed by DVRPC including highway design studies, New Starts analysis, conformity demonstration, and long range plan development. Validation measures include those used in Sub-task 1.2, plus others deemed appropriate to the improved models. The consultant shall demonstrate validation of the improved models for the regional simulation.

Deliverables for Sub-task #3.2 – Validated implementation of model improvement(s), including both software installed on DVRPC's computers and validation measures.

Sub-task 3.3 - Document Model Improvements

At the end of each stage of model improvement validation, the consultant shall produce a report documenting the improvements and the results. The report shall include but not be limited to theory, implementation details, and validation statistics. The draft version of these reports will be reviewed by DVRPC staff and presented to the steering committee by the consultant.

Deliverable for Sub-task #3.3 – Report(s) on the implementation of the model improvements.

Sub-task 3.4 - Write User's Manual on Improved Models

The consultant shall produce a user's manual documenting the improved DVRPC model(s). In order to increase efficiency, the consultant shall update the user's manual produced in Sub-task 1.3 with the model improvement reports produced in the previous sub-task in order to produce a single, cohesive document of the improved, validated DVRPC travel demand model.

Deliverable for Sub-task #3.4 – Complete user's manual on improved DVRPC travel demand forecasting models

Sub-task 3.5 - Train Staff on Improved Models

The consultants shall provide training to DVRPC staff on the newly enhanced DVRPC travel demand models. The training shall include the theory behind the various

enhancements, software implementation, methods to run and update the new models, calibration and validation of the improved models, and model maintenance.

Deliverable for Sub-task #3.5 – Training sessions on improved travel demand forecasting models.

II.4 Task 4 – Data Management Process

The consultant shall assist DVRPC in devising a system to manage its travel demand modeling data. The consultant shall perform the following five sub-tasks. All sub-tasks in Task 4 should be completed within 30 months of Notice to Proceed. Work on Task 4 can occur simultaneously with Tasks 1, 2 and 3 as appropriate considering the selected modeling software package, but with the other Tasks taking precedence.

Sub-task 4.1 - Review DVRPC Data Management Needs

The consultant shall review DVRPC's modeling unit data management needs. This shall include a thorough investigation of the types of data stored and the current system for storing, managing, and documenting data. Both the existing data formats used by the current TRANPLAN modeling package and the data formats used by the modeling package selected and implemented in Task 1 should be considered. The consultant shall also review best practices for managing modeling data at other large MPOs and similar organizations.

Deliverable for Sub-task #4.1 – Summary report on DVRPC's data management needs.

Sub-task 4.2 - Recommend Data Management System

The consultant shall recommend a system and set of business practices that allow DVRPC staff to efficiently manage, track, document, create, and edit modeling related data. This includes but is not limited to network data sets, socioeconomic data, GIS data, model calibration parameters, model run outputs, and custom scripts. The recommended system should be consistent with the data storage formats for the software selected in Task 1 and the DVRPC IT system.

The data management system should include several parts – software tools for documenting and tracking data, hardware for physically storing data, and business processes and disciplines for properly working with data sets. The data management system should be feasible considering the timeframe and cost constraints of the overall project and DVRPC's IT budget.

The consultant shall produce a summary report with recommendations for a data management system.

Deliverable for Sub-task #4.2 – Summary report recommending new data management system and associated business practices.

Sub-task 4.3 - Implement Data Management System

The consultant in cooperating with DVRPC modeling and IT staff shall implement the data management system recommended in the report produced in Sub-task 4.2. Hardware and software costs, other than the consultant's work, are not part of this contract.

Deliverable for Sub-task #4.3 – Implemented data management system consisting of hardware, software, and business practices as installed at DVRPC's offices.

Sub-task 4.4 - Data Management Report

The consultant shall produce a report documenting the implemented data management system. The report should serve as a user's manual documenting the different software, hardware, and human systems for managing modeling data and their interactions. This can either be a stand-alone report or an addendum to the model user's manual produced in Sub-task 3.4.

Deliverable for Sub-task #4.4 – Documentation of data management report, either as a stand-alone document or an addendum to the model user's manual.

Sub-task 4.5 - Train DVRPC Staff in Implemented Data Management System

The consultant shall train DVRPC staff in the operation of the data management system implemented in Sub-task 4.3.

Deliverable for Sub-task #4.5 – Training sessions on data management system.

II.5 List of Deliverables

The consultant shall in the course of the project provide the following to DVRPC. The consultant shall provide a revised list of deliverables if any changes are deemed necessary in the submission.

- **Deliverable 1.1 –** Summary report recommending travel demand forecasting software.
- **Deliverables 1.2 –** Validated implementation of the existing DVRPC travel demand model in new software package on DVRPC computers; tie-in to the air quality post-processor, the DVRPC land use model, and microsimulation package; and other scripts for the summary of model output.
- **Deliverables 1.3 –** Model translation report and user's manual.
- **Deliverables 1.4 –** Training sessions on the new travel demand forecasting software.
- **Deliverable 2.2 –** A visioning and review document detailing relevant regulatory requirements, listing and prioritizing policy questions for the model to answer, and critiquing recent advances in travel modeling.
- **Deliverable 2.3** – A summary report recommending model improvements required to meet modeling needs
- **Deliverables 3.1 –** Software implementation of recommended model improvement(s) in stages and installed on DVRPC's computers.
- **Deliverables 3.2 –** Validated implementation of model improvements, including both software installed on DVRPC's computers and validation measures.
- **Deliverable 3.3 –** Report(s) on the implementation of the model improvement(s).
- **Deliverable 3.4 –** Complete user's manual on improved DVRPC travel demand forecasting models
- **Deliverable 3.5 –** Training sessions on improved travel demand forecasting models.
- **Deliverable 4.1 –**Summary report on DVRPC's data management needs.
- **Deliverable 4.2 –** Summary report recommending new data management system and associated business practices.
- **Deliverable 4.3 –** Implemented data management system consisting of hardware, software, and business practices as installed at DVRPC's offices.
- **Deliverable 4.4 –** Documentation of data management report, either as a stand-alone document or an addendum to the model user's manual.
- **Deliverable 4.5 –** Training sessions on data management system.

III ADMINISTRATION INFORMATION AND REQUIREMENTS

Proposals must be submitted by Friday, August 29, 2008, 4 P.M. EDT to:

John Griffies, Contracts Manager
Delaware Valley Regional Planning Commission, 8th Floor
190 N. Independence Mall West
Philadelphia, PA 19104

Proposals submitted after this time and date will not be considered. Eight (8) copies of the proposal are to be submitted. Submissions should be bound (including any cover letter) with no loose pages and no more than thirty-five (35) pages. An electronic copy of the proposal should also be submitted on CD. Brief and concise submittals are encouraged.

Project Schedule

Submission Deadline:	4:00 p.m. 08/29/2008
Oral Presentations (If required)	09/15/08 – 09/19/2008
Award Recommendation:	09/26/2008
NTP/Start of Project:	10/03/2008
Completion of Task 1:	12 Months from NTP
Completion of Task 2:	12 Months from NTP
Completion of Task 3:	[to be negotiated during task]
Completion of Task 4:	30 Months from NTP

Selection Criteria

A Consultant Selection Committee made up of representatives from DVRPC, PENNDOT, NJDOT, SEPTA and NJTransit will evaluate each proposal submitted and, at its discretion, recommend a firm to the DVRPC Board.

Upon satisfactory completion of the project DVRPC may retain the services of the selected consultant to perform related work as required. Contract length, scope of services, and costs of future services are to be negotiated by both parties.

Negotiations and award of the contract will be to the firm that provides the most advantageous proposal, all things considered, including price and costs. The selection

committee and DVRPC reserve the right to reject all proposals. The selection committee and DVRPC also reserve the right to suggest that several of the consultants form teams.

Criteria have been established to guide the evaluation of each consultant proposal. The top ranked firms with the highest numerical scores after evaluation may be asked to make oral presentations to the Selection Committee. Each firm's proposed project manager must take part in the presentation.

The criteria are weighted and are as follows:

1. Professional Qualifications (Weight 25%)

The firm and sub-consultants must establish qualifications to perform travel demand model development, travel demand model validation, training, and data management.

- Experience with the application of several types of models, various software packages, and evaluation of the results is required.
- A list of clients (including short project description) for whom the firm has performed work of a similar scale (i.e. large MPO) should be included with current contacts.
- Experience in the production and use of graphics and reports as a medium for documenting travel demand modeling data, theory, and practice for large MPOs and/or state agencies that perform travel demand modeling.
- Experience in working with large MPOs, transportation planners, and state agencies that perform travel demand modeling.

This should be no more than 9 pages.

2. Excellence of Narrative: (Weight 50%)

The narrative should cover issues and problems, and a discussion of the approach, including opportunities and alternatives to resolving or minimizing any impact on completion of the project. Please do not repeat the Scope of Services listed above – your narrative statement may be organized by tasks different from that in the Scope of Services, but you should detail how your firm would complete the Scope of Services. Your narrative should include a one page schedule and any special data needs. This section should be no more than 16 pages (15 page narrative plus 1 page schedule).

3. Application of Innovative Techniques: (Weight 25%)

The activities contained in the Scope of Services are but one approach to meet the study objectives. Consultants may: (1) develop alternative approaches; (2) offer suggestions for enhancing specific tasks or the overall work; and (3) propose innovative techniques to improve the results and reduce costs.

After review of the proposals, DVRPC may, at its discretion, select a short-list of respondents for team interviews.

Minority business enterprise

DVRPC complies with Title 49 CFR Part 23, "Participation of Minority Business Enterprises in Department of Transportation Programs" and has set a ten percent (10%) goal for minority business and women-owned business participation, and further encourages non-minority business firms to contract with minority business where subcontracting opportunities exist. Therefore, women owned and operated, small business enterprise or disadvantaged business participation is encouraged with this solicitation. Disadvantaged and minority owned business will be required to submit certification of eligibility ownership prior to execution of any agreements.

DVRPC provides links to the PA and NJ Unified Certification Programs at
http://www.dvrpc.org/about/RFP.htm
DVRPC encourages all prospective consultants to use these links to locate DBE firms to utilize as sub-consultants.

Contract

The contract will be between DVRPC and the selected firm who will be administratively responsible to DVRPC. DVRPC will authorize all payments to the selected firm. The contract will be cost reimbursable with a fixed fee, not to exceed type

Cost Proposal

The consultant and any subcontractor over $10,000 are required to submit the following cost information:

Exhibit "A" DVRPC Cost Proposal (Object Budget) - Available at
http://www.dvrpc.org/about/RFP.htm

Please provide these costs in a separate sealed envelope.

Title 41 Code of Federal Regulations limits the amount of profit or fee to 10 percent of the direct labor and indirect costs.

The estimated level of effort for all tasks is $600,000. DVRPC has budgeted $140,000 in FY09 (July 2008 - June 2009) for this project.

Funding for this project will be available in multi-year phases. Length of contract and availability of funds will be provided in the contract details. The work on Task 3 will be by negotiated agreement between DVRPC and the consultant before work on each improvement is begun. The agreement will specify a cost and delivery time, as constrained by DVRPC's resources.

In addition to the Object Budget please provide a budget for the following four tasks:

Task 1 – Upgrade of the DVRPC Travel Demand Software

Task 2 – Recommend Improvements to DVRPC's Travel Demand Models

Task 3 – Implement Changes to DVRPC Travel Demand Forecasting Models (generalized for typical type of model change)

Task 4 – Data Management Process

The cost of vendor services, such as the training of DVRPC staff and the implementation of the models should be included in the cost of tasks. The costs for the entire project should not include the cost of software and hardware, but these costs should be indicated separately.

CERTIFICATION OF ELIGIBILITY

A certificate is to be included in the proposal for each firm stating that:
"The firm is not ineligible to receive award of a contract due to the firm's inclusion on any federal, Pennsylvania or New Jersey State lists of debarred contractors, or otherwise ineligible to be awarded a contract using federal or state funds."
This statement can be written on your firm's letterhead and should be signed by an officer of the firm.

IV CHECKLIST OF PROPOSAL REQUIREMENTS

Proposals should include the following, not necessarily in the order presented:

1. Narrative Statement: Issues, Problems and Opportunities (Up to 15 pages): In addition to identifying the issues, problems and opportunities, you should include any special data needs, special methods of analysis, milestones, end products of proposed tasks, list of deliverables, and procedures that you believe will enhance the study effort.

2. Schedule: You are to include a schedule of events which corresponds to the sequence contained in your technical proposal (1 page).

3. Client List: A list of clients for whom travel demand model development, calibration, and validation; training; and data management have been performed (3 pages).

5. Study Team: A description of the study team, qualifications of the study team, and resumes of the key staff, including the role of all subcontractors (6 pages). The project manager should be designated in the description of the study team.

6. Task Effort: An estimate of the percent of effort and cost anticipated. This estimate should be broken down separately for each task (2 pages).

7. Certificate of Eligibility

8. Contract Cost Proposal with Supporting Schedule (Sealed in a separate package)

Inquiries

Inquiries related to the Scope of Services of the RFP should be submitted in writing via email to Christopher M. Puchalsky, Senior Transportation Engineer (cpuchalsky@dvrpc.org).

Inquiries related to contract provisions or other requirements should be submitted in writing via email to John Griffies, Contracts Manager (jgriffies@dvrpc.org).

All inquires and responses will be posted on the DVRPC web site at the location of the posting of the original RFP.