1.0 CCMPO 2004 MODEL UPDATE METHODOLOGY

1.1 RECOMMENDED MODEL SOFTWARE

The CCMPO model will be converted from ITM/TModel to TransCad.

1.2 MODELING TIME PERIODS

The current CCMPO model is calibrated to the 1998 AM and PM peak hours. Under this project, the AM and PM peak hour models will be recalibrated to the year 2000 base year.

1.3 LAND USE DATA COLLECTION/ANALYSIS & MODEL AREA

The CCMPO and CCRPC have taken the lead on collecting and validating the year 2000 land use data for this model update project. The employment is "covered" and thus may not include part-time or self employed individuals. This is partially rectified through trip generation rates and the balancing mechanism used in trip generation. In addition, some of the trips generated by uncovered employees do not occur during peak hours. Zones suspected to have large uncovered employment, such as those representing the UVM campus, will be reviewed. The MPO and RSG will meet to discuss which zones will be included in the review. The selected zones will be based on local knowledge as to which TAZ's contain land uses that may be likely to have high levels of uncovered employment.

1.3.1 Transportation Analysis Zones and Model Extensions

For this model update, we will consider extending the model area to incorporate the I-89 Exit 18 area in Georgia, VT (Franklin County). This area is important to incorporate in the model due to its importance in providing access to the Husky plant. It would be advisable to consider the inclusion of 2-8 TAZs in this area, plus the extensions of the major roadways serving this area, in order to better estimate the travel associated with the Husky plant. We do not recommend extending the model beyond the Exit 18 enhancement described above.

Deliverables

- ArcView GIS shapefile of all Model TAZ Boundaries with 2000 base year housing and employment.

1.4 BASE AND FUTURE YEAR MODEL NETWORKS

In building new network files, we need to import as much of the 1998 TModel files as possible into a geographically correct shape file. To do this, we can use a method RSG developed to link the TModel files to an existing shape file using ITM. The resulting shape file could then be enhanced by conflating it to either the Vermont Center for Geographic Information TransRoads GIS database

and/or the GDT Dynamap 2000 Transportation data file, which is enhanced for transportation routing.

Unlike the 1998 ITM model, we will build separate networks for the transit system. We will also convert many of the delay files, such as the link and node delay files and the turning penalty files, into file structures supported by TransCad. RSG has already coded the committed projects for the long range planning study which can be converted using a similar process to the base network. Finally, the CCMPO Metropolitan Transportation Plan network will be constructed.

As part of the Circumferential Highway recalibration, RSG has developed a year 2000 sub-area count set for calibration purposes. We will ensure that these count data are imported into the new network along with the count data.

All network files will be accompanied by detailed metadata explaining the source of the geographic files, model attributes of the roadway links, and descriptions of new transportation facilities or routes included in the future networks which are not included in the base networks.

Deliverables

- Base TransCAD vehicle and transit networks
- "Committed Project" TransCAD vehicle and transit networks
- MTP TransCAD vehicle and transit networks

1.5 SURVEY DATA COLLECTION AND ANALYSIS

The Census Transportation Planning Package (CTPP) will be used to validate/update data from the 1998 model. The Chittenden County Transit Authority (CCTA) ridecheck survey will be invaluable in calibrating the transit portion of the mode choice model. In addition, RSG will perform a rest area intercept survey.

In order to estimate the externally related traffic, we will perform an intercept survey at the Williston Rest Area. The survey will be brief and will cover origin, destination, and trip purpose. These data will be used to estimate through traffic on Interstate 89. The data could be factored using permanent count data collected by VTrans.

Deliverables

- Rest Area intercept survey technical memorandum.

1.6 LAND USE MODEL COMPONENT

Developing automated future land use scenarios in the CCMPO model can be done through either the ITM Land Use Allocation Model (LUAM) or through the CCMPO/CCRPC Decision Support System (DSS) to ITM linkage. We propose to maintain the DSS and enhance the LUAM capability.

1.6.1 ITM Land Use Allocation Model

The LUAM will be converted from ITM to TransCad. Several enhancements have been made to the LUAM including growth centers which provide greater control over how employment and housing is allocated. Using this feature one could, for instance, allocate on a town-by-town basis rather than on a region only basis. Additionally, we have added an ability to “share” land use between residential, retail, and non-retail types. This means that land zoned across these types can allow the model to decide what growth will occur.

Because we will have year 2000 and previous year data for the same TAZ structure, we will re-estimate the LUAM parameters to reflect the recent growth trends. The previous model parameters were estimated using town-level land use because there were no data available at a greater level of disaggregation.

1.6.2 DSS Linkages

Resource Systems Group helped Criterion (the authors of DSS) develop a link between DSS and ITM. The process involves launching DSS which then invokes ITM and passes a command line argument specifying the method for ITM to use along with the input and output files. DSS “sleeps” while ITM is running and then ITM hands control back to DSS. DSS then looks for a series of output files from ITM.

There are three options for maintaining functionality between the CCMPO model and the DSS. The first would be to develop a TransCad model environment that supported the same I/O features as ITM. TransCad would launch from the command line, read the input files, and perform a conversion to the new model format. Once complete, TransCad would export the output files back into ITM format for DSS to read. This would be done using GISDK programming within TransCad.

A modification of this approach would be to have a “wrapper” program called by DSS to handle all the file conversions between the old ITM format and the TransCad format. This program would make the appropriate conversions and launch TransCAD. This way, the CCMPO model would not contain undue extra code for the DSS process.

Finally, we could alter some of the DSS code to read and write different file formats. RSG owns both Visual Basic and MapObjects 2.0. We do not, however, own NetEngine, which is a $12,000 software package. In preparing for this proposal we talked to Elliot Allen at Criterion who is willing to act as a subconsultant to RSG and compile any code we develop. This seems like the most likely option.

Before determining a final course of action, RSG will spend up to 16 hours of time to review the DSS source code and determine the potential for transferring operation of the DSS software from a standalone MapObjects platform to an extension to ESRI ArcView GIS software. CCMPO staff will be consulted once this work is complete and a final decision will be made on how to proceed with work this task.

1.7 TRIP GENERATION

1.7.1 Cross-Classification

We feel the cross-classification approach used in the current model provides a relatively rich method of estimating zone-based trip productions. Cross-classification associates trip generation with household characteristics.

In the current model, the cross-classified household characteristics are the number of people in the household and the number of vehicles owned. The existing cross-classification approach provides a 4X4 matrix, with 16 individual cells each describing a rate at which that household type makes a particular type of trip for the hour of interest (i.e. AM peak hour, PM peak hour). Households within each TAZ are placed into one of sixteen cells based on the prevailing characteristics of the Census Block or Tract in which the TAZ is located.

The table at right shows the total PM peak hour person trips that are included in the existing CCMPO model. In the model application, these trip numbers are split out among the five trip types.

Table 1: Total PM Peak Hour Person Trips Included in the Existing CCMPO Model

	Automobiles per Household			
Household Size	**0**	**1**	**2**	**3+**
1	0.255	0.447	0.481	0.352
2	0.527	0.885	0.799	0.792
3	0.734	0.789	1.247	1.261
4+	0.808	1.424	1.810	1.622

The logical progression in arriving at these trip rates introduces some error into the modeling system. For example, a Census Tract may contain 5 separate TAZs. In reality, those TAZs may have different demographic profiles. At the Census Tract level, these differences are smoothed out and are ascribed back to the TAZ level. This process erases what might be important distinctions from one TAZ to another. Some of this error can be corrected during model calibration and validation.

We will validate the trip generation rates from the existing model with information from the American Travel Survey (ATS, formerly the National Personal Transportation Survey). This dataset will provide a basis for comparing the total peak hour trip rates and the peak hour work trip rates for the 16 classes of households in the cross-classification matrix.

1.7.2 Employment Categories

The 1998 MPO model used four aggregate employment categories classified by trip generation intensity: Low Generation, Medium Low Generation, Medium High Generation, and High Generation. In addition, residences, school employment, and hotel employment were used as attraction land uses. This categorization method was an effort to align the trip attraction rates with those of the standard ITE Trip Generation Manual.

This approach represented a departure from past modeling efforts, where employment was categorized along major descriptors, such as retail, commercial, industrial, and institutional. The

problem with these designations is they often combine very different types of establishments. For example, “institutional” employment can include medical centers such as Fletcher Allen Health Care and school districts. Similarly, “retail” can encompass big box retailers, convenience stores, and downtown boutiques. Combining these different uses into one category can average out the differences. As a result, some TAZs generate more trips than traffic counts indicate, while others produce less.

We have found the approach used in the 1998 model is very serviceable, and we recommend the approach used in 1998 be kept for this model update. However, it would be important to review the SIC classifications to determine whether improvements can be made. Table 2 shows the correspondence of SIC employment categories to trip generation type used in the 1998 model.

Table 2: Correspondence of SIC Employment Categories with Generator Type, 1998 Model

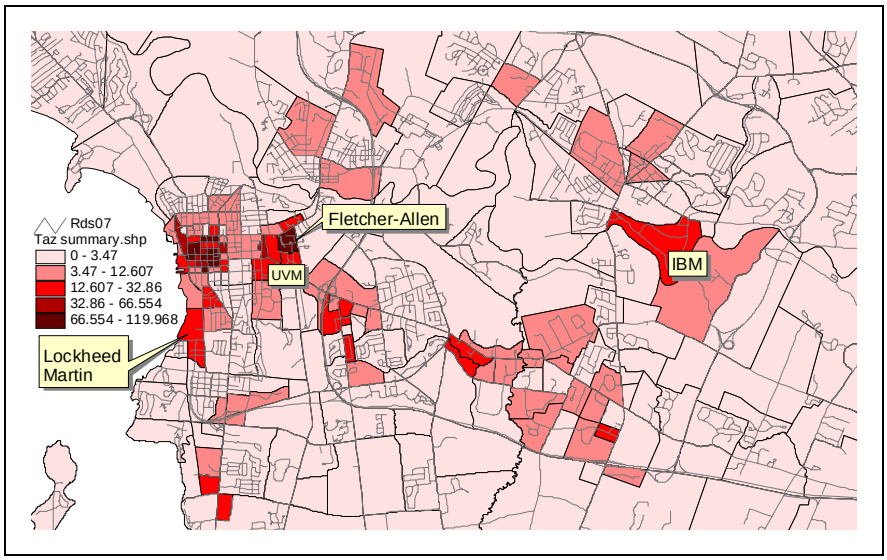
Employment Type	From SIC	To SIC	Generator Type
Agriculture, Mining, Construction, Heavy Manufacturing, Transportation	1	4299	Low
Postal Service	4300	4399	Medium High
Water/Air Transportation, Pipelines, Transportation Services, Communications	4400	4999	Low
Wholsale Trade	5000	5199	Medium Low
Building Materials	5200	5249	Medium High
Hardware Stores,k Retail Nurseries, Garden Supply	5250	5269	High
Mobile Home Dealerships	5270	5299	Medium Low
Department Stores, Big Box Retail	5300	5329	High
Variety Stores	5330	5339	Medium High
General Merchandise	5340	5419	High
Market, Spec Food Stores	5420	5539	Medium High
Gas Svc Stations	5540	5549	High
Vehicle Dealers	5550	5599	Medium Low
Apparel Stores, Home Stores	5600	5729	Medium High
Music, Electronics, Computer Stores, restaurants, drug stores, liquor stores	5730	5929	High
Used Merchandise	5930	5939	Medium High
Sporting Goods, bookshops	5940	5942	High
Stationary, Jewelry stores	5943	5944	Medium High
Hobby, Toy, Game, Camera Stores	5945	5946	High
Gift, Novelty Shops, Luggage, Sewing Stores	5947	5959	Medium High
Nonstore Retailers, Fuel Dealers	5961	5989	Medium Low
Other Retail, Not Elsewhere Classified	5990	5999	Medium High
Financial, Insurance, and Real Estate	6000	6799	Medium Low
Hotels and Motels	7000	7011	Medium High
Other Lodging places, Misc Business Svcs	7012	7999	Medium Low
Health Services	8000	8199	Medium High
Elem & Sec Schools/Coll & Univ	8200	8229	High
Other Educational	8230	8299	Medium High
Social Services	8330	8349	Medium High
Day Care	8350	8359	High
Social Services	8360	8399	Medium High
All Other	8400	9999	Medium Low

We recommend this list be reviewed jointly by the MPO and RSG for the upcoming model update.

1.7.3 Special Generators

We recommend the model update incorporate several special generators within the trip generation portion of the model. Incorporating special generators will allow us to avoid the smoothing out of unique characteristics that inevitably results from the employment aggregations described above.

Figure 1: Location of Select Special Generators



RSG has done significant traffic research in Chittenden County over the past 15 years. Based on our experience, the following institutions/companies should be handled outside of the normal trip generation approach:

- IBM (Essex and Williston)
- Taft Corners Big Box Retailers
- University of Vermont
- Fletcher Allen Health Care
- Park and Shuttle Facilities (e.g. General Dynamics, UVM Commuter Student lot)

We will discuss special generators with the CCMPO early in the project to obtain a complete list. We will develop a Trip Generation worksheet (implemented in Excel) that will explicitly handle Special Generators and will enable the MPO to add Special Generators when they use the model for analysis.

1.7.4 Trip Types

The existing MPO model utilizes 5 trip types for the AM and PM peak hours, as shown in Table 3.

Table 3: Trip Types for the AM and PM Models

AM Trip Types	PM Trip Types
Home Destination	Home to Other
Home to Work	Work to Home
Home to School	Nonwork to Home
Home to Other	Work to Nonhome
Nonhome-Based	Nonwork Nonhome

These trip types were selected initially based on responses on the 1998 household trip diary survey. A guiding rule in selecting trip types was to define trip types such that a statistically valid sample would result for estimation purposes. Trips within each trip category are used to estimate trip generation rates and trip lengths, a key input to estimating the trip distribution model.

The decision on whether to change trip type designations should be dependent on the decision whether to conduct a new trip diary survey as part of this model update. New trip diary data would prompt a new look at the trip type designations. If a new trip diary survey is not pursued, we recommend revisiting the 1998 trip types and considering whether a simplification of these trip types is justifiable. For example, it would be possible to merge the Home Destination trip type with the Home to Other trip type for the AM model without sacrificing model accuracy.

In the 1998 work, we evaluated including a shopping trip type and decided against this. Trips involving shopping are broken out into several trip types depending on whether they originate at home (Home to Other), work (Work to Nonhome), or at the shopping location (Nonhome-Based or Nonwork to Home). We believe this approach is suitable for capturing shopping trips.

1.7.5 Balancing Productions/Attractions

It is common practice in transportation network modeling to balance attractions to productions. Because there are two different methods employed for estimating Productions and Attractions, it is common for the two trip end types to be out of balance (unequal) at the end of the estimating process. The rationale for balancing attractions to productions is productions are more fundamental, and the data on which productions are estimated are more reliable. More housing will produce more trips; more retail space may draw customers from other retail space.

We have developed a modeling process for dealing with modeling scenarios where it is reasonable to expect increased region-wide trip making stemming from adding attraction-based land use. Under the current modeling system, this is accomplished by increasing productions, and we will train CCMPO staff in the use of this process. This methodology will be included in the model documentation.

1.7.6 External Trips

As part of the model update, new traffic counts should be obtained on all external roadways that are represented in the model. This effort will ensure the model area is being appropriately primed with vehicle trips from outside the region.

The second step will be to estimate the number of trips that travel between external stations (external to external). This information is very important in modeling, but also extremely costly to measure

directly.[1]

In the past, external-to-external trips have been based on traffic engineering judgment. In our opinion, it would be ideal to supplement this judgment with data from a simple intercept survey conducted at the Williston Rest Area on I-89 proximate to the County boundary. Interstate 89 will have the highest external-to-external flows of the model. We have budgeted an optional 2-day intercept survey to help estimate the amount of external-to-external traffic.

Lacking direct survey data, we propose using the Vermont Statewide model to help estimate external-to-external traffic for each external station pair. Once estimated, external-to-external traffic is subtracted from the traffic counts at each external station. What remains is traffic that originates externally with destinations inside the model area (X-I) or traffic that originates internally and exits the model area (I-X). These trips are added in at the trip generation stage of the modeling chain.

1.7.7 Feedback from Assignment

Considering feedback from assignment to trip generation involves a consideration of how congestion affects people's travel choices. In congested urban areas, this is referred to as peak shifting, where people choose to travel earlier or later than the peak hour in order to avoid congestion.

RSG's Tom Adler has estimated a peak shifting model which is now incorporated into the Orlando (FL) travel demand model. This peak shifting model will be re-estimated for the CCMPO model update. The model documentation will provide a detailed description of the operation and methodology of the peak shifting model. This feature will be user-selectable to be on or off depending on the type of analysis desired.

Deliverables

- Microsoft Excel spreadsheet with Trip Generation parameters and methodology.

1.8 TRIP DISTRIBUTION

The trip distribution model shown at right incorporates a logsum gravity

[1] The current state-of-the-practice for measuring external-to-external trip making is to use high speed cameras or video with character recognition software. Cameras would need to be installed above the travel way, one per lane. Traditional license plate origin-destination studies would not be practical for Interstate travel due to high speeds.

model as part of the Friction Factor (Fij). The 1998 model incorporated 3 gravity models for work trips, nonwork trips, and nonhome-based trips. The parameters for these models were estimated from the 1998 trip diary survey.

For the current model update, we recommend staying with the gravity model approach. We will use journey to work travel data from the CTPP to validate the work trip distribution model.

The nonwork and nonhome-based trip gravity model parameters will be reviewed for consistency with observed travel patterns and may be adjusted using survey data available for other metropolitan areas with transportation and demographic characteristics similar to Chittenden County.

Figure 2: Trip Distribution Model Equation

$$T_{ij} = \frac{P_i \left(\frac{A_j}{F_{ij}} \right)}{\sum_j \left(\frac{A_j}{F_{ij}} \right)}$$

1.9 MODE CHOICE

The existing mode split model incorporated into the MPO's travel demand model has been very serviceable. It has been used to evaluate light rail transit opportunities, commuter rail ridership, commuter rail station location, new bus transit routes, and new bus transit cost structures. The mode split model was estimated from primary stated and revealed preference data collected in Chittenden County in 1993 and was validated using bus ridership data from CCTA in 1994 and 1998.

In 1996, the MPO's travel demand model was used to estimate ridership for the then-proposed Shelburne Road commuter rail service. Ridership estimates from this model were controversial due to the polarizing nature of the commuter rail discussion. However, ridership experience on the Champlain Flyer validated the RSG mode split model. For the base service utilizing four station stops in Charlotte, Shelburne, South Burlington, and Burlington, the MPO model projected peak hour ridership of 70 – 120 boardings, depending on fare and frequency assumptions. This compares favorably with the actual ridership for the PM peak period, which averaged 50 – 85 boardings.

We will review the modeling results from the recent stated preference data acquired for the Seacoast (NH) model update to help validate the existing CCMPO mode split model.

The RFP also discusses the 100% ridecheck survey CCTA conducts annually. This information will prove invaluable in calibrating the mode split model for transit usage. Our objective in calibrating transit usage will be to accurately estimate system-wide peak hour boardings within 5% and to estimate boardings by route within 15%.

Finally, we will add enhancements for the walk/bike mode. Specifically, we will develop a Pedestrian Environmental Factor (PEF) that identifies the pedestrian and bicycle friendly parts of the network. In addition, we will improve the process of developing walk/bike travel times which currently rely heavily on the auto network.

1.10 NETWORK ASSIGNMENT

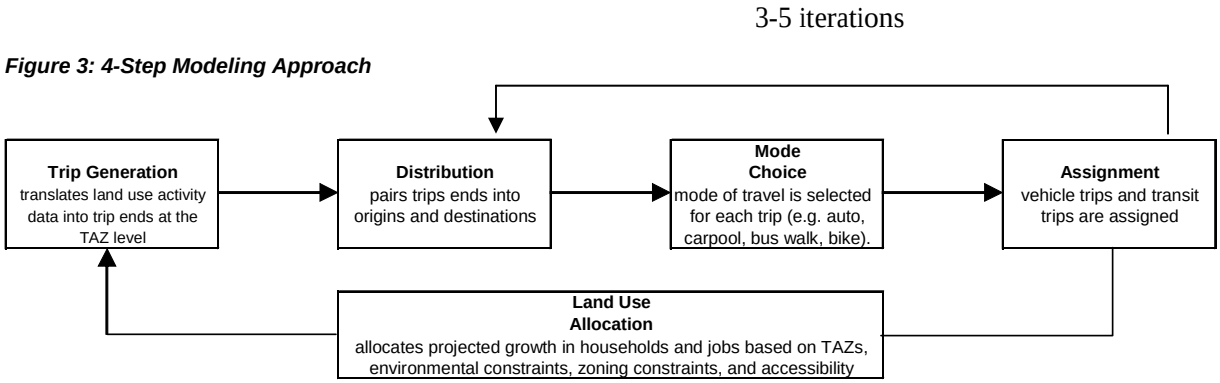
The current CCMPO model performs assignment in TModel using an incremental loading method. The ITM also has a Frank-Wolf multi-path assignment process which does not support intersection level modeling. TransCad has developed a multi-path stochastic user equilibrium (SUE) assignment process that has turning penalties and intersection modeling. In implementing this method, RSG found several bugs in the code and are currently working with developers at Caliper to resolve this. Current users of this feature only implement the fixed turn penalties (not volume sensitive) and model intersection delays using approach link delays. A model can be calibrated using these methods but it complicates the analysis of intersection improvements. Volume-based intersection delays allow modeling of intersection improvements. The previous 1998 model includes intersection-based volume delays at signalized and unsignalized intersections.

We recommend using SUE assignment as it best reflects travel behavior. The nature of a user equilibrium solution is that, once converged, no driver can improve their travel time by changing to an alternate route. TransCad implements the same UE Frank-Wolf algorithm that ITM does. The stochastic effect, however, adds a variability to account for imperfect information and traveler variability. Although SUE generally assigns optimal routes, it does allow travelers to use less attractive routes.

Currently, ITM uses a “parking allotment” method for shifting people from their ultimate destination to the vehicle destination (a parking lot). We propose to maintain this functionality, which is critical to associating vehicle trips with the correct TAZ.

Following a conventional 4-step modeling approach, shown in Figure 3, the results of the assignment method will iterate back to the distribution step. This iteration occurs until changes in distribution reach equilibrium.

Figure 3: 4-Step Modeling Approach



1.11 TRANSPORTATION SYSTEMS MANAGEMENT/TRANSPORTATION DEMAND MANAGEMENT

Transportation Systems Management (TSM) and Transportation Demand Management (TDM) prescriptions are often difficult to evaluate with a regional model. TSM initiatives often involve improvements to signal timing or control technology, which are best estimated through a microsimulation model. To the extent that TSM involves creating new capacity, as in designating an HOV lane or in designating one-way pairs, such initiatives can be successfully modeled in a typical travel demand modeling system.

Many TDM initiatives are focused on minimizing vehicle trips. As such, TDM initiatives operate at the trip generation end of the modeling process. The difficulty from the modeling standpoint is to accurately represent the effects of a TDM initiative. For example, telecommuting can reduce work commutes. However, the simple existence of a telecommuting program does not mean that it will have high participation.

Thus, the travel modeler must transform the TDM program into a "what if" question: "What if a telecommuting program for a major employer reduced work commutes by 10%?" This question can be answered through the travel modeling process by reducing work trips to the TAZ of interest and evaluating the traffic before and after the reduction. A 10% reduction can be achieved by reducing the work trip attraction rates for the employment type of concern and by reducing overall work trip productions by an equal amount.

Our experience in both designing TDM programs for major employers in Chittenden County and in modeling their effectiveness will be invaluable in advising the MPO in this area.

This model update will provide additional functionality by incorporating a park and shuttle capability, which is an important TDM initiative being successfully used by the Campus Area Transportation Management Association (CATMA). Park and shuttle operations at UVM's commuter student lot and at the General Dynamics site are important features in the region's transportation landscape. We have specified a process for modeling these explicitly and will include this feature within the core model.

1.12 FREIGHT ANALYSIS

As an add-on to this project we have engaged Jack Faucett Associates to provide truck/freight modeling capabilities. The Faucett Associates Urban Truck Trip Analyzer (UTTA) estimates truck trip tables from commodity flow data disaggregated to the TAZ level.

Faucett has agreed to provide the CCMPO with a license for the UTTA software, and will be available for technical consultation throughout the project. Our intent is to integrate UTTA into the basic menu-driven framework of TransCad so that it is a tool that is available to the modeler at all times. VTrans and CCMPO classification count data will be used to validate the assigned truck trips from the UTTA trip tables. If the UTAA add-on is not chosen for this round of modeling, RSG will use the classification data to ensure that truck traffic are well represented in the model assignment – there would be no freight-specific reporting.

Because Faucett Associates is still in Alpha testing of the UTTA we will wait until either they are in Beta or the project schedule requires that we move forward with another approach. At that time we will evaluate options and provide a recommendation to the CCMPO along with a budget.

Deliverables

- UTTA Freight model, documentation, and training for CCMPO model or other CCMPO approved methodology for forecasting freight flows.

1.13 AIR QUALITY ANALYSIS

The EPA Mobile6 model estimates emission factors to be used for air quality analysis. These emission tables contain emission amounts at varying speeds. The ITM outputs the link operating speeds and volumes and then calculates total emissions by criterion pollutant. ITM also has an option for modeling idling at intersections. With Mobile6, the latest EPA model, idling is less important than acceleration. Model links that contain significant acceleration (such as ramps) use a different emission table. By modeling AM, PM, and off-peak periods, the impact of peak congestion will be better modeled (the model will be more sensitive). Note also that with Mobile6, particulate emissions, air toxics, and carbon dioxide can also be modeled.

Deliverables

- All of the necessary data files to support the operation of the air quality model.

1.14 CALIBRATION/VALIDATION OF 2000 BASE YEAR MODEL

The Federal Highway Administration (FHWA) has developed guidelines for calibration standards.[1] These guidelines include Root Mean Squared Error, Correlation Coefficient, Sum of Differences by Link Class, among others. The AM, PM, and off-peak models will be calibrated to these standards using methods outlined in the technical sections of this proposal. We will use screenline counts where necessary to capture major flow movements. Every model developed by Resource Systems Group for Chittenden County has exceeded the FHWA standards.

Deliverables

- Technical memorandum documenting the estimation of trip generation, trip distribution, mode split, and network assignment model parameters, including summary results from all survey data used in calculating these parameters. The memorandum will also include a summary of the validation results of the model parameter estimation, including estimates of RMS error and other factors listed in the above scope.

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[1] Dane Ismart, *Calibration and Adjustment of System Planning Models* (Washington, DC: U.S. Department of Transportation, Federal Highway Administration Publication FHWA-ED-90-015, December 1990).

1.15 GIS OPERATION

TransCad has an extremely deep set of GIS tools that are fully ESRI compatible. Manipulating networks, matrices, and transportation data, such as routing information, can all be done using a GIS interface and tools. No time has been added to be budget because these features are available in TransCad.

1.16 MODEL MAINTENANCE PROCEDURES AND TOOLS

A chapter in the report will cover suggested steps for model maintenance. Generally, we recommend minor updates to the model every 3-5 years and major updates every 10 years that leverage the census process.

TransCad has tools for associating all model output files with a given analysis. In addition, RSG will build a TransCad front end to the model that supports documentation of each model file used in a run and the type of run performed. This control file can be printed out to maintain documentation of the scenario.

In the years that we have been modeling, we have yet to see a foolproof method of sharing files. Our best suggestion is to burn the calibration files and every project specific file to a separate CD. While others may make changes and run the model the “gold” copy always resides at the CCMPO. Atlanta has done a nice job of generating a model community with email newsletters and groups which may also be worth considering. One long-term consideration would be to implement the TransCad-for-the-Web capability that would provide several of the TransCad features remotely. The application could run on a server at the CCMPO.

1.17 POST MODEL RUN ANALYSIS TOOLS

The current ITM generates a series of Measures of Effectiveness (MOE) statistics used during the long range plan to compare alternatives. RSG will reprogram these MOE statistics into TransCad where appropriate. RSG will also build tools for analyzing the model calibration within TransCad. Most other features for analyzing results using GIS and database features are readily available within TransCad. These include analysis of turning movement volumes, select link analyses, shortest path analysis, vehicle miles traveled, vehicle hours of delay, etc.

1.18 TRAINING AND SUPPORT

Resource System Group will conduct intermittent training sessions throughout the project and two full days of training at the end. Our goal is to develop not only a detailed knowledge of the model mechanics but a feel for how to use the model and analyze the results that best supports policy considerations.

We also highly recommend attending the training sessions put on by Caliper in Boston for those who will be using the model on a regular basis.

1.19 FINAL DELIVERABLES OF UPDATED MODEL

The TransCad model, all the GISDK code, and all the calibrated model files and future files will be delivered to the CCMPO. RSG will also develop a CCMPO model user manual with details on how to run the model.

Deliverables

- Model Files on CD-ROM.
- CCMPO Model User Manual.

1.20 PUBLIC OUTREACH

For model results to be understood and accepted by federal, state and local officials along with the general public there needs to be a successful public outreach effort for the transportation model. RSG will attend two (2) TAC meetings to discuss the purpose and use of the model. We will also assist Diane Meyerhoff (who is currently retained by the CCMPO for public outreach) in developing public outreach materials. Finally, RSG will develop a web-based dynamic training tool for explaining the important model interactions. This tool can be used to demonstrate the complexity transportation system encompassed in the model.

Deliverables

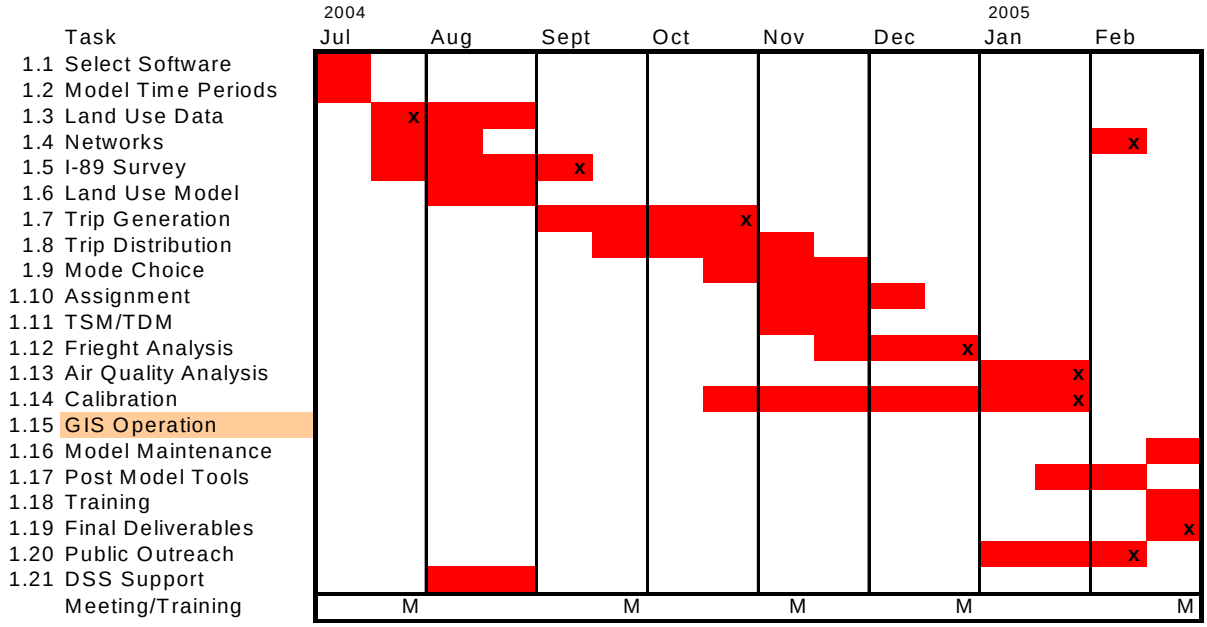
- Web-based transportation model training tool.

1.21 DSS SUPPORT

RSG will perform an initial software review of the DSS tool. During this effort, RSG will review the level of effort required to implement the DSS with ArcMap as a front-end graphical user interface. After an initial review, RSG will document its findings and, if appropriate, provide a budget to the CCMPO for completing this transition to ArcMap.

1.22 SCHEDULE & MILESTONES

CCMPO Model Update for Year 2000
Resource System Group
Modified: 7/21/2004 - after letter to proceed



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