

## **TRANSIMS Version 4.0**

### ***August 2009 Release***

Change Log edited: 9/1/2009

#### **SysLib**

Activity Problem Data class was added to summarize and report activity related problem types by mode and trip purpose.

The Smooth Data method was expanded to include smoothing values at floating point increments interpolated from input data points. The Smooth Data method was expanded to include additional control parameters for smoothing a variable length list of input records and duplicating rather than distributing input data to output bins when the number of subdivisions is greater than one. This is needed for speed smoothing. An additional parameter was added to the Smooth Data interpolation method to control how the interpolated values are output -- consistent with the input units or normalized to the same total as the input units.

The Output Speed Bin class was modified to calculate the number of bins based on the cell size and generate a warning message if the control key does not include speeds up to 80 mph.

Major bug fixed to the recent change to the time period processing for a link delay file.

Time difference distributions were modified to create a true zero difference cell to avoid reporting the 85 percentile as a one minute difference when all of the trips actually have no difference.

The Performance data class was updated to implement the new time period control parameters.

The Traveler data and array classes were added.

The warning/error message about missing signal coordinator records when reading the signalized node file was reclassified as a simple warning to enable the signal data to be processed.

The trip summary report and time difference report classes were enhanced to avoid integer overflow errors caused by very large application regions. A bug was fixed in the 85th percentile and average index calculations in the time difference output utility.

Driver\_Process was modified to avoid a potential null pointer problem when the path link-node combinations are node included in the network.

OUTPUT\_SUMMARY\_VEH\_TYPES\_# key was added to the filter the data stored in a link delay or performance file to a specified set of vehicle types.

The RELATE field was added as a default field in the population file and data structures

Min\_Value and Max\_Value methods were added to the Lookup\_Data class.

The read processing methods for link delay and performance files was modified to apply minimum and maximum time range values to the time period calculations. A division by zero error was fixed when reading link delay or performance files with time range data.

An additional calling option was added to the vehicle shape function to enable the procedure to draw vehicles with more than two shape points.

### **TripSum 4.0.18**

CREATE\_INDEPENDENT\_TRIPS, NEW\_HOUSEHOLD\_LIST, STARTING\_HOUSEHOLD\_ID, STARTING\_VEHICLE\_ID, and NET\_PROCESS\_LINK\_TABLE keys were added to break the trips in an activity file into single trip household/vehicle records. The logic to convert an activity file to independent trips was modified to properly convert the auto driver and passengers modes in the activity file to the SOV, HOV2, HOV3, and HOV4 codes used in a trip file.

### **ArcSnapshot 4.0.13**

CELL\_SIZE key was added to adjust the occupancy cells when cell size is less than the smallest vehicle in the vehicle type file. SELECT\_VEHICLE\_TYPES, NEW\_LINK\_SUMMARY\_FILE, and NEW\_LINK\_SUMMARY\_FORMAT keys were added. The link summary file is an aggregation of the number of vehicles and passengers on each link at the time period boundary. The link summary file output was modified to include in addition to the total vehicles and persons for the selected vehicle types, the fields containing the number of vehicles and persons by vehicle type as well. The vehicle shapes for vehicles that are more than two cells long was modified to draw an articulated vehicle based on the shape of the link.

### **TransimsNet 4.0.25**

CELL\_SIZE key was added for adjusting the maximum speed and minimum link length calculations.

### **ActGen 4.0.36**

ACTIVITY\_PROBLEM\_REPORT was added to summarize problem types by mode and trip purpose. MAXIMUM\_WALK\_DISTANCE key was added to modify the way activity locations are selected within the selected destination zone. If the travel mode is walk (1), the algorithm gives preference to activity locations closer to the origin location rather than further away as it does by default for all motorized travel modes. Activity locations that are further away than the maximum walk distance (default is 2000 meters) are not considered. Activity locations that are less than the maximum are weighted by subtracting their distance from the maximum walk distance. TIME\_SCHEDULE\_VARIANCE key was added to include random variance in the activity schedule assigned to each synthetic household.

### **ActivityPattern 4.0.2**

TIME\_SCHEDULE\_VARIANCE key was added to include random variance in the activity schedule assigned to each synthetic household.

### LocationChoice 4.0.6

ACTIVITY\_PROBLEM\_REPORT was added to summarize problem types by mode and trip purpose. MAXIMUM\_WALK\_DISTANCE key was added to modify the way activity locations are selected within the selected destination zone. If the travel mode is walk (1), the algorithm gives preference to activity locations closer to the origin location rather than further away as it does by default for all motorized travel modes. Activity locations that are further away than the maximum walk distance (default is 2000 meters) are not considered. Activity locations that are less than the maximum are weighted by subtracting their distance from the maximum walk distance.

### Emissions 4.0.15

SMOOTH\_GROUP\_SIZE, SMOOTH\_TO\_MOVES\_SPEED\_BINS, SMOOTH\_SPEED\_INCREMENT, PERCENT\_MOVED\_FORWARD, PERCENT\_MOVED\_BACKWARD, and NUMBER\_OF\_ITERATIONS keys were added to optionally calculate the VMT and VHT for output speed bins based on smoothed moving average interpolated values at user-defined speed increments. A special case is provided to automate the processing of speed bins defined by EPA's MOVES software. WEEKEND\_TRAVEL\_FACTOR key was added to adjust the distribution of speeds and VMT for weekend travel estimates. MOVES output data records were sorted by day of the week. Additional refinements were included related to speed bin distribution. RATE\_AREATYPE\_FIELD, RATE\_ROADTYPE\_FIELD, RATE\_AREATYPE\_FIELD\_#, RATE\_ROADTYPE\_FIELD\_#, AREATYPE\_NUMBER\_#, ROADTYPE\_NUMBER\_#, ROAD\_TYPE\_LABELS, and ROAD\_TYPE\_MAP keys were added. EMISSIONS\_BY\_ROAD\_TYPE and EMISSIONS\_BY\_ROAD\_AND\_VEHICLE reports were added. NEW\_MOVES\_VMT\_ROAD\_FILE and NEW\_MOVES\_VMT\_ROAD\_FORMAT keys were added to output MOVES road type distributions. The Activity Location file was added as an alternate method of assigning zone numbers to link segments. REGION\_EQUIVALENCE\_FILE key was added to equate zone numbers to region (county) codes. PRINT\_LINK\_EQUIVALENCIES, PRINT\_ZONE\_EQUIVALENCIES, and PRINT\_REGION\_EQUIVALENCIES reports were added. The option to provide a link data file as an alternative to speed bin files was implemented. This option includes the following new keys: VOLUME\_SPEED\_FILE, VOLUME\_SPEED\_FORMAT, VOLSPD\_LENGTH\_FIELD, VOLSPD\_LENGTH\_UNITS, VOLSPD\_FACILITY\_FIELD, VOLSPD\_AREATYPE\_FIELD, VOLSPD\_PERIOD\_FIELD, VOLSPD\_PERIOD\_UNITS, VOLSPD\_SPEED\_FIELD, VOLSPD\_SPEED\_UNITS, and VOLSPD\_VOLUME\_FIELD\_#. HPMS\_NUMBER\_#, HPMS\_TYPE\_MAP, NEW\_MOVES\_HPMS\_VMT\_FILE, NEW\_MOVES\_HPMS\_VMT\_FORMAT, NEW\_MOVES\_RAMP\_FRACTION\_FILE, NEW\_MOVES\_RAMP\_FRACTION\_FORMAT and VOLSPD\_RAMP\_FACILITY keys were added to generate additional MOVES input files. The code was also reorganized to streamline the file processing and facilitate applications that include both MOVES input file generation and emissions inventory reports. NEW\_MOVES\_LINK\_SUMMARY\_FILE, NEW\_MOVES\_LINK\_SUMMARY\_FORMAT, NEW\_MOVES\_LINK\_VEHICLE\_FILE, NEW\_MOVES\_LINK\_VEHICLE\_FORMAT, NEW\_MOVES\_LINK\_SPEED\_FILE, NEW\_MOVES\_LINK\_SPEED\_FORMAT, NEW\_MOVES\_LINK\_OPERATIONS\_FILE, and NEW\_MOVES\_LINK\_OPERATIONS\_FORMAT keys were added to generate MOVES project

level analysis files from data in Speed Bin files. `SPEED_BIN_FACTOR`, `SPEED_BIN_FACTOR_#`, and `VOLUME_SPEED_FACTOR` keys were added to adjust the volume data in the input files. `NEW_SMOOTH_SAMPLE_FILE`, `NEW_SMOOTH_SAMPLE_FORMAT`, `PERCENT_SAMPLE_SIZE`, and `RANDOM_NUMBER_SEED` keys were added to write a sample of the input and output speed bin distributions generated by the smoothing process. `USE_AVERAGE_SEGMENT_SPEEDS` key was added to write the link speed file using the average speed of the link segment rather than the speed bin distribution. `TRAVELER_FILE` and `TRAVELER_FORMAT` keys were added to enable the problems to process the second-by-second data for individual vehicles. These data are used to write the MOVES link speed file. The link equivalence logic was expanded to impact both the Traveler and Speed Bin input options. `NEW_TRAVELER_FILE` and `NEW_TRAVELER_FORMAT` keys were added to export the selected, sorted, and/or smoothed traveler records. The traveler processing logic was improved and corrected to properly expand the zero speed time points. `Vol_Spd` data and array classes were added to store data from the volume-speed input file for use in generating link-based output files. The Traveler, Volume-Speed, and Speed Bin input files now generate each of the MOVES project level (link) output files. The processing for the link operating mode file was updated for all input file formats. `VEHICLE_FILE` key was added for converting the Traveler vehicle IDs to vehicle types. `USE_SIMPLE_INTERPOLATION` key was added to control the method of allocating average speeds to MOVES speed bins. Additional refinements to the way zero speed bin data was read and processed by the VHT smoothing process. General improvements were made in the way project level link data are processed. Emission rates are applied to the traveler data for emissions summary reports. `REPORT_TRAVEL_UNITS` and `REPORT_EMISSIONS_UNITS` keys were added to control the units in the output emissions reports. Options for Travel units include MILES, KILOMETERS, METERS, and FEET. Options for Emissions units include KILOGRAMS and GRAMS. The default is KILOMETERS and KILOGRAMS. The VMT and VHT generated by the speed smoothing process was normalized to equal the VMT and VHT generated by speed bin seconds and cell sizes.

#### **GISNet 4.0.9**

`UPDATE_LINK_LENGTHS` key was added to simplify the options for replacing the link length data with the calculated length of the link shape.

#### **Router 4.0.58**

A bug related to the way the Router manipulates the time period calculations was fixed to be compatible with the new lookup table logic. `LINK_DELAY_START_TIME` and `LINK_DELAY_END_TIME` keys were added to control the way time periods in the input link delay file are used for travel time calculations. By default, volume and travel time after midnight are added to the corresponding early morning time periods and trips on the network after midnight use these early morning travel times. The new keys can be used to extend the time period processing beyond 24 hours.

**PlanSelect 4.0.29**

A bug was fixed in the way high V/C ratio paths were selected. Logic was added to check that the new household list or new household record files can be partitioned if the plan file is partitioned.

**Microsimulator 4.0.64**

A bug was fixed in the origin and destination stop IDs written to the problem file for a transit passenger trip. For these problems, the LINK file is also now populated with the transit route number to help identify the transit leg where the problem occurred. Logic was added to constrain the offset and length of lane use restrictions to the cells between the setbacks at both ends of the links. This eliminates problems caused by lane connectivity / lane use conflicts when entering a new link. OUTPUT\_SUMMARY\_VEH\_TYPES\_# key was added to filter the data stored in a link delay or performance file to a specified set of vehicle types. The data processing logic was updated to pass vehicle type codes into the output summary class methods.

**DynusTPlan 4.0.4**

VEHICLE\_FILE and VEHICLE\_TYPE\_FILE keys were added to assign trips to the auto, truck, or HOV vehicle types.

**DynusTNet 4.0.4**

SATURATION\_FLOW\_RATES and SERVICE\_FLOW\_RATES keys were added set the link capacity attributes as a function of the TRANSIMS facility type.

**PlanCompare 4.0.30**

Logic was added to compare transit paths as well as drive paths. The dump path changes report now lists the transit stops and route for each transit leg. A bug was fixed in processing the first input plan when the traveler ID is less than the first compare plan. The logic was modified to base the selection on each trip rather than each traveler. This means that the traveler's trips that did not change are no longer selected for output if one of the traveler's trips did change. This only impacts travelers that make multiple trips. New gap statistics were added to report the total, percent and average absolute travel time difference for those travelers that are not considered "nearly equal". COMPARE\_GENERALIZE\_COSTS key was added to base the difference comparison on generalized data rather than travel time data.

**ArcTraveler 4.0.2**

TRAVELER\_FILE, TRAVELER\_FORMAT, and SELECT\_TRAVELERS keys were added to output traveler paths from the Microsimulator Traveler file. Logic was added to create separate share records for travelers that make multiple trips in order to accurately calculate the trip travel time and average speed.

**Progression 4.0.5**

Logic was added to improve the protection against infinite loops in building progression corridors.

**ArcNet 4.0.22**

Errors in the transit driver path for a given route were changed to warning messages to continue processing the routes that include valid data.

**LinkSum 4.0.27**

NEW\_PERFORMANCE\_DATA\_FILE and NEW\_PERFORMANCE\_DATA\_FORMAT keys were added to enable the user to write the Performance Detail Report information to a file that can more easily be imported to spreadsheet analysis software.

**Reschedule 4.0.7**

RANDOM\_SCHEDULE\_SHIFT and RANSOM\_NUMBER\_SEED keys were added to randomize the start times between routes. A bug was fixed in the travel time calculation for far side stops.

**PlanSum 4.0.49**

For applications that re-skim and update plan travel times, the estimates for the generalized cost value are also updated.

**LineSum 4.0.9**

NEW\_RUN\_SCHEDULE\_FILE key was added to summarize the number of transit runs that start and end by time period increment.