# TRANSIMS Version 6.0 – *February 2015*

### SysLib

### File Service

TRANSIT\_TIME\_PERIODS was added to File Service to support multiple programs and used to create new Route\_Nodes files. The default status of optional data fields in new Route\_Nodes files was changed from true to false.

### Data Service

ROUTE\_MODE\_MAP and MOVE\_VEH\_TYPE\_MAP keys were added to Data Service to standardize processing and support multiple programs. Trip Internal\_ID processing now checks for the inclusion of transit network files before generating warning messages about stops not being found. The Performance Flow\_Time function now retrieves the free flow speed from the link file if the current travel time is less than or equal to zero.

### ArcNet 6.0.6

TRANSIT\_TIME\_PERIODS was moved to File Service

### MatrixData 6.0.5

DATA\_FACTOR\_FIELD key was added to enable the program is identify the number of unique values of a specified field in the input data file to calculate the adjustment factor needed for data aggregation. This can be used to identify the number of days that are included in the dataset when calculating the daily average of each hourly count.

### NetPrep 6.0.18

ROUTE\_MODE\_MAP, MODE\_VEH\_TYPE\_MAP, and TRANSIT\_TIME\_PERIODS keys were moved to File\_Service and Data\_Service to standardize processing.

### PathSkim 6.0.12

A bug was fixed in generating location-based skims selected through zone-based criteria. The number of periods was properly identified when file partitioning is not used.

### RiderSum 6.0.7

A memory allocation bug was fixed in stop group processing.

### RoutePrep 6.0.12

ROUTE\_MODE\_MAP, MODE\_VEH\_TYPE\_MAP, and TRANSIT\_TIME\_PERIODS keys were moved to File\_Service and Data\_Service to standardize processing. TRANSIT\_PERIOD\_OFFSETS, PERIOD\_TRAVEL\_TIMES, and TRANSIT\_NODE\_TYPES keys were deleted and were replaced by the the standard File\_Service keys of ROUTE\_NODE\_OFFSET\_FLAG, ROUTE\_NODE\_RUN\_TIME\_FLAG, and ROUTE\_NODE\_TYPE\_FLAG. TRANSCAD\_ROUTE\_SYSTEM key was added to simplify the processing of native TransCAD transit route system binary files.

### Router\_Service

The Skim\_Processor class was adjusted to clear the working threads between time period processing and set the one\_to\_many flag to true each iteration. The thread-specific performance data was initialized to free flow travel times.

### Router 6.0.77

Logic for processing a plan file without a trip file was improved.

### TransitNet 6.0.13

The TRANSIT\_TIME\_PERIODS key was moved to File\_Service.

### TripPrep 6.0.4

The logic was enhanced to be able to create a Selection file without creating a new Trip file with new partitioning.

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### Static Service

SKIP was added to the Trip Priority options to distinguish unselected records from records with no travel time differences in convergence processing.

### Selection Service

The Select\_Priority options flags SKIP differently from other options.

### NetPrep 6.0.19

Logic was added to use an input Route Nodes file to expand service periods and flip route nodes in creating new Route Nodes files.

### PathSkim 6.0.13

A bug was fixed for configurations that create a Problem file without creating a Plan file. Integer overflow protection was added for skim processing with zone numbers greater than 65535.

### Router 6.0.78

The selection and convergence logic was modified to distinguish unselected trips from plans with differences that are less than the minimum selection criteria. The Priority SKIP option was added for this purpose.

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### PlanSum 6.0.9

SELECT\_PRIORITIES key was activated.

### RiderSum 6.0.8

NEW\_STOP\_LINES\_FILE key was added to summarize the ridership and load factors by time period for each transit line leaving selected transit stops.

### TripPrep 6.0.5

SHIFT\_END\_PERCENTAGE key was added to adjust the trip end time within a specified range.

### TripSum 6.0.5

SELECT\_PRIORITIES key was activated and the NEW\_TRIP\_TABLE\_FILE key was enhanced to generate zone-to-zone trip tables by time period in multiple file formats.

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### NetPrep 6.0.20

A bug was fixed in the link length calculation for splitting network loops. The SPLIT\_DUPLICATE\_AB\_LINKS key was added to identify multiple links between the same A node and B node and add a new node to one of the paths to ensure unique AB combinations.

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### SysLib

The Data\_Pack interface was expanded to read and write data structures directly to a binary file.

### Converge\_Service

NEW\_SAVE\_PLAN\_FILE, NEW\_SAVE\_PLAN\_FORMAT, and SAVE\_PLAN\_HOUSEHOLDS keys were added to save all plans or plans for selected household to one or more intermediate files after the path building is completed for all or selected feedback iterations.

### Gravity 6.0.6

ZONE\_PERIOD\_FIELDS key was added to input production and attraction fields by time period.

### TripPrep 6.0.6

ZONE\_FACTOR\_FILE, ZONE\_FACTOR\_FORMAT, NEW\_DESTINATION\_FLAG, and NEW\_HOUSEHOLD\_NUMBER keys were added to manipulate trip files based on zone-to-zone adjustment factors. This logic enables deleting a random subset of trips; replicating a random subset of trips; or moving a random subset of trips from one destination to another.

### TripSum 6.0.6

Adds X and Y coordinates to the NEW\_ZONE\_TRIP\_END\_FILE to facilitate using this file as an input zone file.

### Router 6.0.79

Plan output during convergence iterations was added.

### Simulator 6.0.19

NEW\_SIMULATION\_BACKUP\_FILE and BACKUP\_TIME\_POINTS keys were added to save the status and location of travelers at specified time points during a simulation. This is a precursor to enabling the Simulator to re-start from a given time point.

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### SysLib

The volume-delay equation class was modified to include a capacity constraint option.

### Flow\_Time\_Service

Methods were added to assist with detecting and processing capacity constraint functions.

### Router\_Service

Capacity constraint flags, processing checks, and path building problem types were added.

### Router 6.0.80

ALTERNATIVE\_DESTINATION\_FIELD key was added to implement capacity constraint processing that changed the trips destination when the capacity constraint was reached. A new destination location can be added to the location file to establish the re-try sequence.

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### SysLib

Db\_Header was modified to look for TransCAD definition files for matrices differently from text or binary files. The capacity constraint option was removed from the volume-delay equation class.

### Data\_Service

The plan input method was modified to include the option to create both a traveler and time sort index.

### Flow\_Time\_Service

The OUTPUT\_ALL\_RECORDS key was deleted.

### ModeChoice 6.0.8

DISTANCE\_VALUE, DIFFERENCE\_VALUE, and USER\_VALUE\_TABLE keys were added to accommodate additional variable and coefficient types into the mode choice model. A compile option called DUMP was added to write detailed model calculations to the print file.

### Validate 6.0.15

The ANALYSIS\_METHOD key was enhanced to recognize metric and English units.

### Router\_Service

Capacity constraint logic based on volume-delay equations was removed.

### Router 6.0.81

CAPACITY\_CONSTRAINT\_FIELD, NEXT\_DESTINATION\_FIELDS, and CONSTRAINTED\_ACTIVITY\_DURATION keys were added to implement destination capacity constraints based on field values in the activity location file. This logic adds additional trip to a traveler if their destination is full based on building paths in time sorted order.

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### Router\_Service

Path building logic was updated to include plan extension options for capacity constrained activity locations. The plan pointer interface was also cleaned up.

### Router 6.0.82

The capacity constrained process was reconfigured to extend or add to an existing plan record rather than add additional trip records to the plan file. This avoids a number of memory management and multi-thread interface issues and consolidates the intermediate stops into a single plan record. A new processing methods called EXTEND\_PLAN and EXTEND\_COPY were added to easily identify an extended path so it can be processed correctly during subsequent iterations and as part of gap calculations.

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### SysLib

LITERS and GALLONS were added to Static\_Service. USER\_FUNCTIONS key was added to Execution\_Service.

### File\_Data\_Service

The Vehicle\_Type file was changed to replace the Grade levels with a Grade function number and Fuel function number and Fuel capacity fields were added. Function numbers are defined by the USER\_FUNCTIONS keys. CHECK options were added to the External IDs for Plan Legs. Converge\_Service was moved to a separate library.

### Converge\_Service

New library that merged the original Converge\_Service functionality with the path building options and controls original included in the Router program. Separating this logic and making Converge\_Service inherit from Router\_Service make convergence logic and iterative path building functionality available to both the Router and the Simulator. New functionality was added for location capacity constraints and fuel supply path building. The new keys include: CAPACITY\_CONSTRAINT\_FIELD, NEXT\_DESTINATION\_FIELDS, CONSTRAINED\_ACTIVITY\_DURATION, NEW\_CAPACITY\_CONSTRAINT\_FILE, DESTINATION\_CHOICE\_TRAVELERS, FUEL\_SUPPLY\_FIELD, NEXT\_FUEL\_FIELDS, FUEL\_ACTIVITY\_DURATION, NEW\_FUEL\_CONSTRAINT\_FILE, and CONSTRAINT\_TIME\_INCREMENT. This logic selects a trip destination by following a sequence of possible locations until one if found with available capacity.

### Router\_Service

Some functionality was moved to Converge\_Service. Grade travel time impacts were modified to use a user function.

### Router 6.0.84

Most of the path building loops and gap processing logic was moved to Converge\_Service. The program now inherits from Converge\_Service rather than Router\_Service.

### Simulator\_Service

The service now optionally inherits from Converge\_Service rather than Router\_Service to facilitate iterative path building.

### Validate 6.0.16

The ADJUSTMENT\_FACTOR key was enabled to adjust the counts to correspond to the model year.

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### Converge\_Service

DESTINATION\_SHARE\_FIELDS key was added to read distribution shares for the next destination keys of the capacity constraint process. The fuel processing logic was modified to automatically identify near-by fueling locations. This removed the NEXT\_FUEL\_FIELDS key and added the MINIMUM\_INITIAL\_FUEL and SEEK\_FUEL\_LEVEL keys. The code was reorganized to streamline the processing and improve the Simulator interface.

### Router 6.0.85

The logic was adjusted to the new Converge\_Service methods and Fuel processing was added.

### Simulator 6.0.20

The logic was adjusted to the new Converge\_Service methods.

### PlanCompare 6.0.3

TIME\_DISTRIBUTION\_MINIMUM, TIME\_DISTRIBUTION\_COUNT, TIME\_DISTRIBUTION\_INCREMENT, COST\_DISTRIBUTION\_MINIMUM, COST\_DISTRIBUTION\_COUNT, and COST\_DISTRIBUTION\_INCREMENT keys were added to enable the user to control the values used for time and cost distribution reports and files.

### LineSum 6.0.7

The EACH\_LINE option was added to the LINK\_RIDER\_LINES key to create files that list data for each line separately for each link.

### Validate 6.0.17

ENTRY\_DATA\_FLAY key was added to use the Enter data rather than the Volume data from the Performance file as the estimated volume or VMT data.

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### Converge\_Service

The methods were simplified.

### Simulator\_Service

The integrated Router logic was improved in preparation for convergence processing.

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### ArcPlan 6.0.11

SELECT\_TRANSIT\_MODES key was added.

### ArcRider 6.0.11

SELECT\_MODES was replaced by SELECT\_TRANSIT\_MODES key.

### Converge\_Service

FULE\_INFORMATION\_TRAVELERS key was added and the fuel search logic was enhanced to select a location closer to the path ahead.

### FileFormat 6.0.7

NEW\_MERGE\_DATA\_FILE and NEW\_MERGE\_DATA\_FORMAT keys were added along with processing methods to enable merging multiple input files into a single output file.

### Select\_Service

Select\_Plan\_Route\_Modes method was added to select plans based on transit mode codes.

### PlanSum 6.0.10

SELECT\_TRANSIT\_MODES key was added.

### Router\_Service

Bugs were fixed in the departure time field when vehicles run out of fuel.

### Router 6.0.86

The fuel processing logic was enhanced.

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### ArcRider 6.0.12

Conflicts with bandwidth fields for multiple output files were addressed.

### FileFormat 6.0.9

Field statistics reports were implemented using selection criteria and regardless of output files. The time fields were also processed and formatted correctly based on user specified time formatting.

### LineSum 6.0.8

XY location formatting was standardized.

### RiderSum 6.0.9

NEW\_STOP\_VEHTYPE\_FILE key was added to summarize ridership by segment, route and vehicle type.

### TransitNet 6.0.15

Parking files are read if access links are processed. The stop name was initialized to blank to avoid copying names from other stops.

### TripSum 6.0.7

Origin and destination zone selection methods were implemented.

### Router\_Service

XY location formatting was standardized. Stop access logic was added to reschedule transit trips in order to minimize waiting time at a first or transfer boarding. Logic was added to avoid important plan data with walking legs traveling the wrong way on a one-way link. A flag was added to disable transit vehicle capacity checks for selected traveler types.

### Converge\_Service

SCHEDULED\_ACCESS\_TRAVELERS key was added to implement transit access timing for selected traveler types. Additional logic was added to identify and process travelers who run out of fuel. Destination choice options were added for destination constraints. Methods for coordinating fuel and lodging constraints were added.

### Router 6.0.89

The fuel, lodging, and transit access methods were refined.

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### File\_Data\_Service

Adjustments were made to the Performance Travel Time method to correctly handle links with travel time greater than one hour.

### Converge\_Service

Adjustments were made to the destination capacity and fuel consumption logic to enable both features to be selected at the same time.

### Router 6.0.90

The fuel and destination capacity logic was updated.

### TransitNet 6.0.16

LOT field was added as an option to the Park and Ride file to enable the user to specify an existing parking lot rather than create a new park-n-ride lot near the specified node. Station access logic was modified to create new access links for all stops if an input access file is not provided.

### TripSum 6.0.9

MODE\_PURPOSE\_GROUPS report and NEW\_MODE\_PURPOSE\_GROUP\_FILE/FORMAT keys were added to summarize the trip data by mode, purpose, and origin/destination zone group. Origin and destination zone selection logic was also added.

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### TRANSIMS Version 6.0

The software was migrated to Visual Studio 2013.

### Converge\_Service

Time sorting issues for trips with arrival time constraints were fixed.

### Router\_Service

Transit fare processing was added to the transit path building.

### Router 6.0.92

The fare and time sorting issues were addressed.

### SubareaPlans 6.0.4

Refinements were made to properly handle trips that start and end on a boundary link.

### TransitNet 6.0.17

The option to recreate the access links for transit stations was added.

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### SysLib

The NAN define was renamed to \_NAN to avoid conflicts with Visual Studio 2013 definitions. PNR\_STOP transit stop type was added to facilitate access link generation for bus park-n-ride lots. HOV2+ and HOV3+ codes were added to the lane use types to automate the generation of multiple HOV use classes.

### File\_Data\_Service

Corrections and enhancements were made to the transit fare read and write functions. Automatic data corrections were added to the transit schedule read function. The transit driver read function was enhanced to optionally add connections between links used by transit routes.

### NewFormat 6.0.13

TRANSIT\_TIME\_PERIODS, ROUTE\_NODE\_OFFSET\_FLAG, ROUTE\_NODE\_RUN\_TIME\_FLAG, and ROUTE\_NODE\_TYPE\_FLAG keys were activated to enable custom formatting of Route Nodes output files.

### Router\_Service

Problems with the multi-threaded queue class during transit path building were addressed by implementing a thread-safe Heap\_Queue template.

### Router 6.0.93

The thread-safe queue class was included to improve transit path building reliability.

### Simulator\_Service

MAXIMUM\_LANE\_USE\_WAIT key was added along with additional problem identification and resolution for vehicles that occupy a link when the lane use restrictions change. The new logic permits the vehicle to continue on the currently link, but not enter a restricted link. A vehicle attempting to enter a restricted link can be pulled out of the simulation with an access restriction problem message after a user defined waiting period.

### Simulator 6.0.21

The new lane-use logic was included.

### SubareaNet 6.0.11

Subarea codes were added to the output node files if they are not included on the input node file.

### SubareaPlans 6.0.5

Logic was added to detect and report plan conversion problems that start on short links where SubareaNet was unable to add an external parking lot and activity location.

### TransimsNet 6.0.21

Corrections were made to avoid problems caused by setting an update data flag without providing an update data file.

### TransitNet 6.0.22

The program was re-configured to enable transit file editing in addition to Route\_Nodes conversions. Route\_Nodes and new transit files are now optional inputs and outputs. PNR\_STOP\_TYPES, STATION\_TRANSFER\_DISTANCE, STOP\_FARE\_ZONE\_FILE/FORMAT, and ADD\_TRANSIT\_CONNECTIONS keys were added to automate several editing tasks. The program can update the connections file to accommodate transit route needs such as U-turns. It can replace transit fare zones and add stop specific fare zones. It can also refresh or replace all access links generated for park-n-ride lots and access to rail stations.

### SysLib

Record length checks were added to Db\_File. A MINUTES function was added to user programs to convert Dtime data to floating point minutes. User function methods were enhanced to check if a function is defined. Logic was added to automatically create definition files for TransCAD and Cube matrix files.

### File\_Service

A default definition file processing was added to the Fare file. Plan\_Skim file was added to facilitate reviewing and working with summary totals from a Plan file.

### ConvertTrips 6.0.7

TRIP\_TABLE\_NAME, ACTIVITY\_DURATION\_FUNCTION, PERCENT\_RETURN\_TRIPS, RETURN\_TRIP\_PURPOSE, and RETURN\_TRIP\_MODE keys were added to expand the capabilities of defining tours from trip tables. TRIP\_TABLE\_FILE input options were expanded to include TransCAD and Cube matrix files.

### ModeChoice 6.0.9

The program was expanded from a trip-based model application to include Monte Carlo mode choice with TRANSIMS Plan files. A few keys were renamed to accommodate this change.

TRIP\_FILE and NEW\_TRIP\_FILE were changed to TRIP\_TABLE\_FILE and NEW\_TRIP\_TABLE\_FILE to made a clear distinction between TRANSIMS Trip file and TransCAD or Cube matrix files. PLAN\_FILE and NEW\_PLAN\_FILE keys were added to support the TRANSIMS mode choice. MODEL\_NAMES key was added to enable the software to process multiple trip purposes at the same time. The \*\_VALUE keys were changed to \*\_VALUES to provide different values for different models. ADJUST\_FIRST\_MODE\_CONSTANTS key was added to control how the model calibration process addresses changes to the first mode of each nesting level.

### NewFormat 6.0.14

Additional logic was added to Route Nodes processing.

### NewLandUse 6.0.5

The FUNCTION\_PARAMETERS key was replaced by the global USER\_FUNCTIONS key.

### PlanPrep 6.0.4

NEW\_PLAN\_SKIM\_FILE/FORMAT keys were added to export plan files using the Plan Skim format.

### PlanSum 6.0.11

NEW\_PLAN\_SKIM\_FILE/FORMAT keys were added to export plan files using the Plan Skim format.

### Router 6.0.95

ROUTE\_WITH\_SPECIFIED\_MODE key was added to override the mode coded on the input trip file and build Plans for a given trip using different mode options.

### Router\_Service

A bug was fixed in the path tracing logic for transit trips with arrival time constraints that don’t require any walk distance between the alighting stop and the destination activity location. The option to include Shape file was added to improve the distance calculations used for park-n-ride and kiss-n-ride trips.

### Simulator\_Service

The link locking logic was removed in order to improve multi-threaded processing efficiency. A node-geographic-based locking mechanism will be added to avoid potential thread conflicts.

### TransitNet 6.0.26

SELECT\_TRANSIT\_MODES, SELECT\_VEHICLE\_TYPES, SELECT\_STOP, SELECT\_ROUTES, DELETE\_TRANSIT\_MODES, DELETE\_ROUTES, DELETE\_STOPS, and DELETE\_STOP\_FILE keys were added to select or delete records with a set of TRANSIMS transit network files. ZONE\_STOP\_ACCESS\_FILE/FORMAT keys were added to identify zones that should be connected to specified transit stops. A number of changes and improvements were added to the station access generation logic.

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### SysLib

The dBase file interface was corrected to handle fields with more than 9 decimal places. Num\_Zones method was added to the Db\_Matrix class to initialize memory. Additional Shape tools were included to simplify shape range searches. The ArcGIS projection resolution was enhanced to minimize drawing differences.

### ArcJoin 6.0.0

A new program for merging ArcGIS files was initiated.

### ConvertTrips 6.0.8

Return trip start times were reported separately in the new diurnal distribution file.

### ModeChoice 6.0.12

Optional Plan Skim input and output processing was added.

### TransitNet 6.0.27

Additional logic was added to select nodes closed to stations even if they do not have activity locations.

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### SysLib

Additional Shape and String methods were added. Several Db\_Header methods were relocated to Db\_Base and Db\_Field Size and Decimal functions were modified to accommodate more than 9 decimal places. DATA\_COORDINATE\_SYSTEM and DATA\_ADJUSTMENT\_FACTOR keys were added to the Projection services to facilitate distinctions between input coordinate conversions and output coordinate conversions. The Data projection permits the internal software calculations to be based on something different from the input and output coordinate systems. The projection methods were expanded and the Arcview interface was simplified based on these changes. String concatenation issues and print/list formatting controls were enhanced in the User Program logic.

### File\_Data\_Service

The Plan Skim class structure was reorganized to permit standard Db\_Array and Db\_Header options.

### ArcJoin 6.0.3

DATA\_INDEX\_FIELD, DIRECTION\_FIELD, SPLIT\_DIRECTIONS, DIRECTION\_OFFSET, SELECT\_DATA\_FIELDS, NEW\_ARC\_DATA\_FILE, LIKE\_MATCH\_FIELD, and INCLUDE\_DATA\_FIELDS keys were added to greatly expand the program’s functionality.

### ArcNet 6.0.7

The expanded Projection logic was included.

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### ArcPerf 6.0.13

The expanded Projection logic was included.

### ArcPlan 6.0.13

The expanded Projection logic was included. NEW\_ARC\_LOCATION\_DEMAND\_FILE was added to summarize productions and attractions by activity location.

### ArcRider 6.0.13

The expanded Projection logic was included.

### ArcSnapshot 6.0.6

The expanded Projection logic was included.

### NetPrep 6.0.21

The expanded Projection logic was included.

### ModeChoice 6.0.15

Format options were added to several input and output files and PLAN\_SKIMS\_IN\_MEMORY and REPORT\_AFTER\_ITERATIONS keys were added. The skims in memory key stores the Plan Skim data in memory during calibration iterations. I works for both Plan file and Plan Skim file input options. The report after keys enables the user to select a range or list of iteration numbers where output reports and summary files are generated.

### TripSum 6.0.10

NEW\_LOCATION\_SHARE\_FILE/FORMAT keys were added to generate production and attraction summaries at activity locations.

### Router 6.0.97

Logic was added to flip the park-n-ride and kiss-n-ride mode codes for the return trip of tours when routing by specified modes. The program now automatically adjusts the value of cost parameter based on auto occupancy levels.

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### SysLib

Parse\_XML method was added to the String class.

Map and Hash\_Map classes were added for data packing.

Data packing was added to Memory\_Pools.

### Converge\_Service

Arrive and Depart times were initialized for plan processing based on trip file inputs.

### ModeChoice 6.0.18

Split the mode constant file into mode constants and mode bias factors to add flexibility and multi-purpose applications of trip table based applications. IMPEDANCE\_VALUES key was added.

### PlanPrep 6.0.6

Added Origin Zone and Destination Zone selection options. Added PLAN\_SKIM\_FILE/FORMAT input options.

### PlanSum 6.0.12

Added Origin Zone and Destination Zone selection options. Added NEW\_STOP\_TRANSFER\_FILE/FORMAT and NEW\_PLAN\_SKIM\_FILE/FORMAT keys.

### Reschedule 6.0.4

Added Transit Mode and Route selection options. Added TRANSIT\_MODE\_FACTORS and NEW\_TIME\_CHANGE\_FILE/FORMAT keys and RUN\_TIME\_CHANGES report. Added logic to process without any Performance files (factors only) or with just the Performance Update file and mode factors.

### RiderSum 6.0.10

Added Transit Mode and Vehicle Type selection options.

### Router 6.0.99

Included improvements to Converge and Router services

### Router\_Service

Addressed issues with fare processing for backward path building. Added logic to calculate fares based on the first and last stop on a multiple leg path using the same mode.

### Simulator 6.0.22

Added SIMULATOR\_BACKUP\_FILE and RESTART\_TIME\_POINT to reload and continue simulation from the saved output of a previous application. Included the improved multi-threading logic from Simulator Service

### Simulator\_Service

Removed the link locking logic to improve multi-threaded processing. Replaced the locking with a new node sorting algorithm that minimizes conflicts between processing threads. Added process restart logic and expanded the data saved to the backup file.

### TransitNet 6.0.28

Enhanced the station matching and generation logic for rail and BRT lines.

### VissimNet 6.0.0

New program to convert VISSIM 7.0 XML networks to TRANSIMS format.

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### File and Data Services

Trip\_Sort\_Type and Plan\_Sort\_Type keys were moved from Data Service to File Service to facilitate including sort types in the definition files for new Trip and Plan files. Add\_Return method was added to Plan\_Skim\_File to facilitate calculation of total tour times and costs.

### ModeChoice 6.0.21

Tour\_Mode\_Choice key was added to base the mode choice on the total time and cost for a tour rather than each leg. The code was reorganized to consolidate the preparation of data for the choice into a single method.

### NetPrep 6.0.22

Link\_Script\_File was added as an alternative to Conversion\_Script to be consistent with the scripts used for node and zone processing.

### NewFormat 6.0.15

The Tour\_Sort\_Type processing was moved from Data to File services.

### PlanPrep 6.0.7

Trip\_Sort\_Type and Plan\_Sort\_Type keys were moved from Data to File services. The messaging logic was enhanced to avoid the impression the program failed while merging large plan files.

### Router 6.0.102

Trip\_Sort\_Type and Plan\_Sort\_Type keys were moved from Data to File services. Corrections were made to the way forward and backward park-n-ride and kiss-n-ride path building is implemented under special and with station-to-station fare zones.

### TransimsNet 6.0.23

Comment messages were stripped from warrant keys to avoid error messages.

### TripPrep 6.0.7

Trip\_Sort\_Type was moved from Data to File services.

### VissimNet 6.0.1

The XML processing was modularized and additional data types were converted.

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### SysLib

A bug was fixed in shape smoothing. Bool\_List was added. The Bool\_List version of Get\_Control\_List\_Groups was added.

### File\_Service

PARKING\_DEMAND\_FILE/FORMAT and NEW\_PARKING\_DEMAND\_FILE/FORMAT were added to the system file set. A bug was fixed in the way the data type for a Matrix\_File is created. Num\_Legs field was added to the Path\_Skim\_File to facilitate processing skims with a variable number of legs.

### Data\_Service

Park\_Demand structures were added to the system data interface to store Parking\_Demand data. PARKING\_PENALTY\_FUNCTION key was added to provide a user-defined function for calculating parking capacity restraint penalties.

### Link\_Data 6.0.5

SUM\_VOLUME\_FLAG key was added to enable merged link data to be summed rather than averaged.

### ModeChoice 6.0.22

New Parking\_Demand\_File and Parking Penalty Function were added. Trip processing was modified to consider the number of legs included a Plan\_Skim record. All legs of a tour are now summed into the Plan\_Skim record.

### NetPrep 6.0.23

Additional Speed field names were recognized automatically and converted properly.

### NewFormat 6.0.16

Parking Demand file processing was added with optional Parking Penalty Function updates.

### PlanSelect 6.0.5

SELECT\_STOPS, SELECT\_ROUTES, and SELECT\_TRANSIT\_STOPS key processing was added.

### PlanSum 6.0.13

New Parking\_Demand\_File and Parking Penalty Function were added.

### Router 6.0.104

Parking\_Penalty\_File was replaced by the System file interface of Parking\_Demand\_File, New\_Parking\_Demand\_File, and Parking\_Penalty\_Function processing was added. NUM\_PARK\_RIDE\_OPTIONS and NUM\_KISS\_RIDE\_OPTIONS keys were added to limit the number of parking lots that are considered by the path builder. Logic was added to select the nearest parking lots. Logic was added to capture parking demand and duration by time of day.

### SubareaNet 6.0.13

A bug was fixed in the way nested parking lots were processed on boundary links.

### TransitNet 6.0.30

ADD\_ROUTE\_STOPS\_FILE/FORMAT keys were added to specify transit stops to add to the end of a line. Some enhancements were added to the node path building logic used to connect transit stops.

### VissimNet 6.0.4

NEW\_ARC\_LINK\_FILE was added to create a shapefile image of the full VISSIM network. Processing of connections, stop signs, link speeds, zones, parking lots, activity locations, and detectors was added. Significant improvements were made to the way lane connectivity, link shapes and link processing logic.

### VissimTrips 6.0.0

New programs to convert VISSIM \*.fma trip files to TRANSIMS matrix format.

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### File\_Data\_Service

Plan Skim File I/O is now part of System File processing and Plan Skim files now include Parking field. The Parking File now includes Capacity and Cost fields on the base record and BUS\_PNR, RAIL\_PNR, and MAJOR\_PNR parking types were added. Nested records can still be used to override these fields and provide additional details. Parking Demand File I/O is now part of System File processing and Capacity and Ratio fields were added. PARKING\_DEMAND\_TYPE key was added – options include ALL, CAPACITY, PARKRIDE, RAIL\_LOTS

### NewFormat 6.0.18

Parking selection logic was added along with Parking Demand and Plan Skim file processing.

### PlanPrep 6.0.8

Plan Skim file processing with parking selection logic was added.

### ModeChoice 6.0.26

Input Parking Demand file is now available for calibration refinements.

### Router 6.0.108

Input Parking Demand file can be applied and used and updated during convergence iterations. BUS\_PARK\_RIDE\_OPTIONS, BUS\_PARK\_RIDE\_PERCENTS, RAIL\_PARK\_RIDE\_OPTIONS, RAIL\_PARK\_RIDE\_PERCENTS, MAJOR\_PARK\_RIDE\_OPTIONS, MAJOR\_PARK\_RIDE\_PERCENTS, and DRIVE\_DISTANCE\_PENALTIES keys were added to control the number of park-n-ride locations that are considered by the path builder.

### Simulator 6.0.23

A bug was fixed running the Simulator with a sorted plan file when the ROUTER compile option is active. DUMP\_DETAILS compile directives were added to active and control DUMP\_TRAVELER\_DETAILS and DUMP\_START\_TIME keys.

### VissimNet 6.0.4

Additional conversion refinements were implemented.

### VissimPlans 6.0.1

New program to convert VISSIM path files to TRANSIMS plan files.

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### File\_Data\_Service

A transit capacity function was added to the Vehicle Type file and data structure.

### LocationData 6.0.4

The transit weight processing was enhanced to include distance based service summaries for stations.

### Reschedule 6.0.6

MINIMUM\_MODE\_PERCENTS and MAXIMUM\_MODE\_PERCENTS keys were added to control the range of the change made to the schedules.

### TransitAccess 6.0.2

Matrix processing methods were updated.

### TransitNet 6.0.31

A bug was fixed in the Delete Route options.

### VissimNet 6.0.6

Significant logic changes were made to the node processing to improve the conversion to TRANSIMS.

### VissimPlans 6.0.3

TRANSIMS\_PATH\_FILE/FORMAT keys were added to output the path template as well as the full plan file.

### Router 6.0.117

Improvements were added to transit and parking penalties and constraint logic. Thread processing was rearranged to do more processing within the path building thread rather than in the Save\_Plan thread.

### Simulator 6.0.23

Compile directives were added to Dump\_Details for selected travelers by time of day.

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### ArcNet 6.0.9

TRANSIT\_TIME\_PERIODS key was added. Also now reports transit line when links beyond the first and last stop.

### ArcPlan 6.0.15

Plan Skim file processing was added plus parking lots and transit mode selection criteria. NEW\_ARC\_DRIVE\_ACCESS\_FILE was added to display the origin-parking-destination vectors.

### ArcRider 6.0.14

The crowding penalty field was added to the Arc Ridership file.

### Router 6.0.121

A bug was fixed in the Plan Update process. The option to write a Plan Skims file was added.

### ModeChoice 6.0.27

Input and Output Ridership file process was added. It includes transit crowding calculations.

### NewFormat 6.0.15

Logic was added to select routes from the input transit network for output or conversion to Router Nodes files.

### RiderSum 6.0.12

The number of links and the distance after the last stop to the end of the driver links were added to the warning message.

### TransitNet 6.0.32

Additional logic was added for adding stops at the end of lines. A bug was fixed in the schedule generated for new stops.

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### File Service

The memory allocated for leg travel times and lengths in the Plan file was increased to avoid integer overflow issues.

### ArcPlan 6.0.15

DRIVE\_ACCESS\_DISPLAY\_METHOD key was added to control the way the ArcGIS file is created for park-n-ride access presentations.

### LocationData 6.0.5

Logic was added to detect negative zone values and find the closest zone based on the coordinates of the location and zone centroid.

### PlanPrep 6.0.10

MERGE\_MODE\_FLAG, CONSTRAIN\_PARKING\_LOTS, MAX\_PARKING\_DEMAND\_RATIO, CONSTRAIN\_TRANSIT\_LOADS, and MAX\_ROUTE\_LOAD\_FACTOR keys were added to manipulate selected records in the Plan file. The Merge Mode flag ensures that the merging of two plan files matches the plan mode in addition to the traveler ID. The constrain options used Parking Demand and Ridership files to detect and delete plan records that arrive at parking lots or transit routes after the lots or vehicles have reached capacity ratios.

### PlanSelect 6.0.6

Additional optional input files were provided to expand the selection options for transit routes.

### RiderSum 6.0.13

NEW\_LOAD\_SUMMARY\_FILE key was added to create a summary file of transit load factors and link travel time and distance values for performance calculations.

### Router 6.0.24

Additional logic was added to check control key combinations and control the update logic based on the presents of Performance, Ridership, and/or Parking Demand input files. Distance calculations were also updated to avoid differences caused by integer overflows.

### TransitNet 6.0.33

Logic was added to avoid adding the same park-n-ride lot to the parking file multiple times.

### TripPrep 6.0.10

SELECT\_ORIGIN\_ZONES and SELECT\_DESTINATION\_ZONES keys were added to select trips based on their location zone values. The origin and destination zone numbers were also added to the trip records sent to the user programming script to enable the user to manipulate the trip records and data fields based on zone numbers.

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### SysLib

Control and Execution services were updated to accept imbedded control files and replacement variables (@variable@=value). Replacement variables have also been added to the command line.

### PlanPrep 6.0.11

SHIFT\_START\_PERCENTAGE, SHIFT\_END\_PERCENTAGE, SHIFT\_FROM\_TIME\_RANGE, and SHIFT\_TO\_TIME\_RANGE keys were added to shift the start or end time of selected trips.

### RiderSum 6.0.14

Congested duration, delay and crowding values and a summary report were added to the transit load summary file.

### Simulator 6.0.24

Logic was added to randomize the entry lane selections are boundary parking lots and scan ahead for a lead vehicle beyond the maximum move distance. The speed of the lead vehicle is used to establish a minimum following gap in order to avoid bunching. This helps the macroscopic intersection logic avoid stopping or slowing down vehicles unrealistically.

### TransitNet 6.0.34

The warning messages were enhanced to include additional diagnostic information.

### VissimNet 6.0.7

Boundary parking flags were added to each external entry and exit point.

### VissimPlans 6.0.4

Logic was added to designate the plan mode as HOV2+ if any link on the path has HOV2+ restrictions.

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### SysLib

The number of integer, real, and string lookup tables available within a user program was increased from 10 to 20.

### Converge\_Service

A bug was fixed in the household range selection logic. The logic was added to update the vehicle type when routing by drive-related modes are selected.

### ModeChoice 6.0.31

The APPLY\_AUTO\_OCCUPANCY key was added to instruct the program to convert person trips to auto driver or auto passenger trips/tours based on the auto occupancy and vehicle type of the chosen mode.

### NetPrep 6.0.24

The speed to link travel time rounding function was modified to more closely replicate the input speeds on very short links.

### PlanSum 6.0.15

NEW\_PLAN\_STOP\_FILE/FORMAT keys were added to list all of the transit stops a traveler uses and the route segment with the maximum ridership and maximum load factor experience along the path.

### RiderSum 6.0.16

A new Performance file can be generated that posts the transit passenger and transit vehicle loadings on links in 15 minute time increments. Selected stop logic was added to the stop group report and output stop group file processing.

### Router 6.0.125

The ROUTE\_WITH\_VEHICLE\_TYPE key was added to specify the vehicle type code that should be used when routing by a specified auto-related mode. This activates the appropriate lane-use restrictions and auto occupancy values for the specified mode.

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### SysLib

A bug was fixed in reading a binary integer fields as a string.

### ArcJoin 6.0.4

The integer index field processing was corrected.

### Validate 6.0.18

The comparison of a Link Data file to counts was modified to exclude records with zero volume in the Link Data file when the count file is non-zero.