

D.16 CHANGES IN SATURN 10.7

DATE OF LAST UPDATE: 4 MARCH 2007

SATURN 10.7 was first released in Beta version from July 2006 (with purely temporary version numbers 10.7.1, 10.7.2 etc..) and as a full release (official 10.7.9) in March 2007. The following new features are to be noted. (Note as well that the documentation has been extensively updated to take account of these new features and references to the relevant sections of the manual are given.)

D.16.1 P1X

- 1) "Default" link capacity-restraint records may be defined for simulation links under Network Editing. I.e., you define simply a capacity index and the parameters of the speed-flow curve are taken from a "default" (D) record defined under the 33333 data records. 20/06/06.
- 2) Link travel times and/or speeds as calculated by **P1X** during tree building and/or joyrides and displayed in the banner now (optionally) include the effect of CLICKS. 10.7.1 09/06/06
- 3) Options added within **P1X** network editing of simulation nodes/links such that a default speed-flow curve (i.e., one based only on the capacity index and curves defined under 33333) can be created for a simulation link rather than explicitly setting a free-flow speed, capacity speed, etc. etc.. 10.7.1 14/06/06
- 4) Banned turns displayed within **P1X** as "blocked arrows" previously only included turns with zero saturation flow as coded under 11111 but not any turns for which a banned movement was defined under 44444. The latter turns are now included as well. 16/08/06
- 5) Filenames as listed under "Show A-Z" now contain up to 24 characters on 2 lines in the banner if necessary. 24/08/06
- 6) The (text-based) options within SATDB to input data (e.g., flows) for ALL user classes now allow the total number of user classes to be greater than 4 and data for ALL classes are added to the data base. 06/10/06
- 7) Nodes may now be "marked" with a small circle to indicate where either (any) warnings or certain **specific** warnings, etc. have occurred during the network processing in SATNET. This can therefore act as a guide to locating nodes where particular errors have occurred so as to make it easier to correct those errors through Network Editing. 30/10/06
- 8) The use of the "mouse" has now been effectively turned off when **P1X** is run with both KEY and VDU options on so as not to interfere with the use of the mouse by any other currently running windows. 01/11/06

- 9) The number of scatter plots and tables within windows which appear under the Validation of Counts disaggregated by count sets is now strictly limited since, with up to 120 different count sets now permitted, the number of active windows created becomes prohibitively large.
- 10) The total number of individual Warnings, Serious Warnings, etc. etc. generated within **SATNET** along with informative titles may be displayed in a window as an option under Information. A summary table of warnings etc. by data input segment is also included. 11.8.4.9. 06/12/06
- 11) The option under Information to display "Convergence errors etc." has been replaced by a shorter option that simply list CPU times and other miscellaneous network data such as elasticities etc. since Convergence statistics are provided within their own main menu and the error messages are now given separately under #10 above. 11.8.4.8. 07/12/06.
- 12) User Class Flows may now be optionally annotated in units of vehicles per hour as opposed to PCUs per hour provided that: (a) the user class has been assigned a vehicle class and (b) that that vehicle class has a value of VCPCU different from 1. N.B. This option does **not** apply to total flows where, for certain components such as PASSQ flows, it is more difficult to establish PCU factors. 16/12/06
- 13) Extra link and turn data annotations have been made available, for example the average queue lengths associated with V>C queuing may now be displayed in addition to the total average queue length previously available. Full lists available in App. J. See also D.16.3 (3). 28/01/07.
- 14) A new set of options has been added under Tree Building to identify the "Worst O-D routes"; i.e., those paths where the difference between the path cost and the minimum O-D cost is maximised. Identifying such paths may help to pin-point the sources of convergence problems. 11.8.3.4.
- 15) The default "user class" for SLA has been set to zero so that, for multiple user classes, all user classes are analysed. For a single user class it defaults to 1. Also added as a parameter MADSLA in the preferences file. Similar changes are made in **SATDB**. 10.7.8. 17/02/07.

D.16.2 MX

- 1) The MXM5 options now allow zones to be deleted from an existing matrix. (Or, strictly speaking, the documentation makes it a bit more clear how to do it.) See Appendix W.3. 03/06/07
- 2) MXM5 permits newly created zones to have user-defined row, column and intra values set; previously all new zones had their cell values set to zero. Appendix W.3.

- 3) MXM5 will now operate on both “simple” square matrices and stacked or blocked matrices. Appendix W.3.
- 4) The “interactive” zonal editing options within **MX** now allow you to create an equivalent input file for MXM5 to make it easier to repeat the same editing operation on other matrices. 10.4.1.
- 5) The numerical Trip Length Distribution options have been extended (a) to allow more options (e.g., include/exclude intra-zonals) and (b) to output directly to an external ascii file or to a window to make accessing the results easier.
- 6) An option to dump data from more than one matrix to an ascii text file has been added but only under the specific formats of Tuba-3 or “one IJ record per line”.
- 7) Dumping SATURN .UFM files to EMME-2 formatted text files previously excluded any output for matrix rows which contain **all** zeros. 10.7 adds a text record consisting of only the row origin in the case of all-zero rows. 18/12/06.

SATNET

- 1) Bus routes are now allowed to make a U-turn at **all** types of simulation nodes, not just simulation type 5 roundabouts or buffer nodes as before. The U-turn is treated as a “free turn” with no delay added.
- 2) Bus routes are now allowed to exit the network at one external node and re-enter at another (where an “external node” in this context may be either an external simulation node which does not lead into the buffer network or a buffer node which exits only to a zone. This will probably have more applications within cordoned networks where routes in the main network may snake in and out of the cordoned network.
- 3) If a parameter WRIGHT is set to T then certain existing warnings, serious warnings and/or non-fatal errors may be upgraded to semi-fatal (NAFF) on the basis that there is no conceivable reason that could explain these errors even though **SATURN** can manage to run with them included in the network coding without crashing. At the moment only a small number of Serious Warning (139 and 140) and Non-Fatal Error 227 have been so identified but the number will increase. N.B. The default value for WRIGHT has been set to .TRUE. in the release version 10.7.8: attention! 6.12.2. 09/10/06
- 4) All warnings, serious warnings, etc. that occur at nodes are now cross-classified by node numbers so that the final error summaries in the .LPN files not only list the number of times a particular error occurred but also the nodes at which those errors occurred. The information is also added to the .uf* files for display in P1X under Information. 26/10/06

- 5) Links which appear in more than one set of 77777 counts are now recorded as appearing in **both/all** sets and will appear as such within the Validation etc. summary statistics in **P1X**, **SATLOOK** etc. However links which appear twice within the **same** count segment are still errors. 30/10/06
- 6) The maximum number of individual 77777 count sets has been increased from 20 to 120. 12/11/06
- 7) Setting ERRYES(437) = F converts a Semi-Fatal Error for an unidentified link within the 77777 records into a Serious warning 269 such that the assignment stage may still be invoked. 11/11/06
- 8) A logical namelist &PARAM parameter CROWCC has been introduced to control whether zero-distance buffer centroid connectors are assigned a non-zero crow-fly distance. See E.4, # 29 and 15.10..3 03/12/06
- 9) The number of individual Warnings, Serious Warnings etc. generated within **SATNET** are now stored on the output .uf* files and may be displayed in **P1X**. See D16.1 #10. 06/12/06
- 10) A summary table giving the number of Warnings, etc. by input data segment (i.e., 11111, 22222 etc.) is now included near the end of the .LPN files and is also interactively printed on request in **P1X**. 09/12/06
- 11) A new option "UNIQUE" has been introduced to minimise the double-counting of V>C delays in buffer networks in certain circumstances. Consider a series of links A-B-C-D... in the buffer network such that traffic on A-B can only exit to C (ignoring U-turns to A), traffic on B-C can only exit to D, etc. etc. Hence all links will be assigned the same demand flow V. At the moment if, say, all links have the same capacity C and $V > C$ then the same queuing delay will be imposed on all links – "double-counting". However, if UNIQUE = T, the extra delay is imposed at only **one** of the links (that with the minimum capacity which therefore represents the "bottleneck"). This option is useful if, say, an existing buffer link A-C is split by a mid-link node B with no other changes and the same link properties apply on both A-B and B-C. See 15.48. 01/02/07.
- 12) Default speed-flow curves by capacity index under 33333 may now be defined directly in terms of COBA-10 speeds and flows such that the best-fit value of the power n is calculated by **SATNET** rather than being input directly by the user. 15.9.6 10/02/07.

D.16.3 SATALL

- 1) The simulation summary statistics such as total pcu-hrs etc. may differ marginally from those calculated previously due to a bug discovered in previous releases. See Appendix E.4, #26. 14/11/06.

- 2) .The CLICKS option to allow differential speeds by user class has been extended to allow CLICKS to be disaggregated by link capacity index. As selected by setting an &PARAM parameter KLUNK = 1. 15.47.2. 03/12/06.
- 3) The number of simulation data arrays stored by **SATALL** on the .ufs file has been extended to include:, e.g., queues due to V>C per simulation link and/or turn. These new data arrays may be viewed within **P1X**. Many of them make use of the extra space available for DA codes in 10.7 as noted D.16.9 below. 28/01/07
- 4) The rules for using a stacked trip matrix under MUC have been tightened up so that if, for example, the trip matrix has 5 levels but the network has only 3 user classes or if one of the levels of the trip matrix is not selected by any of the user classes it is a fatal error. Check the definitions of matrix levels in the 88888 records of the network .dat file.

D.16.4 SIMULATION

- 1) The procedures by which delays are calculated for X-turns at priority junctions which share lanes have been revised slightly in order to remove a possible discontinuity in the outputs which was adversely affecting the assignment-simulation convergence. 02/07/06.

D.16.5 SATLOOK

- 1) Comparison statistics between modelled flows and input counts may optionally **not** appear on the terminal screen in otherwise interactive modes but only in the LP files. This can be useful when there are a very large number of counts and/or count sets. 12/11/06.
- 2) The tests for DETR-compliance have been (correctly) extended to include the separate category of counted flows above 2700 and the default is now for DETR compliance to be **included** by default (but this may be changed, if desired, via the preferences file). 21/11/06
- 3) A number of other improvements have also been made to the comparison of observed and modelled flows, particularly when the counts have been divided into multiple count sets under the 77777 network data. In particular a CSV file containing "headline statistics" for each input count set has been introduced and which contains a summary of all the most important statistics in a CSV format. 03/12/06
- 4) It is possible to carry out count comparisons using an **input** file of count data rather than relying on counts input under the 77777 data records in the original network .dat file. See 11.11.13. 04/03/07
- 5) Extra options which indicate when and how much the link capacity, as defined on a link speed-flow record, "actively" restricts the junction stop-line capacities. See 8.4.4. 23/12/06

D.16.6 SATTUBA

- 1) New versions of the batch file sattuba0 and sattuba3 added to request output files in .ufm format or tuba-3 format respectively. 15/08/06
- 2) Files for **all** user classes may be output from a single command by using "UC *". 27/08/06

D.16.7 SATME2/SATPIJA

- 1) A new method to "freeze" cells has been introduced whereby a matrix of frozen cells may be input in much the same way that frozen cells may be introduced into the elastic functions within **SATALL**. 13.1.6. 26/11/06

D.16.8 SATWIN

- 1) The initial SATWIN start-up screen as been replaced by a new menu to select the various versions of SATURN Executables installed on the machine. See 3.6. 18/02/07

D.16.9 DA Codes

- 1) The conventions by which DA codes represent different styles of data have been extended such that "real" data (i.e., numerical data which includes decimals) can be stored in codes ending with an **8** as well as a 3. Effectively this doubles the number of available codes and the number of data arrays that can be stored. See 15.21. 28/01/07

D.16.10 SATDB

- 1) An alternative method of representing bus route data in the data base has been introduced whereby the new data column stores the **order** of the link or turn in the route, i.e., the first link in the route is 1, the second is 2, etc. etc.. The old method simply stored the route number. This option is useful if you wish the data display on, e.g., the screen to appear in route order.
- 2) SATRAP (full multiple route re-assignment) now allows a sub-matrix of O-D trips to be specified in terms of sectors in addition to zones. This permits one to calculate, in effect, a "forest" of loaded trips between two sectors. 10.7.4. 15/12/06
- 3) If there are more than six columns of data to be displayed to the terminal screen then Left and Right control buttons have been added to the menu bar. Equally a Formats button has been included to directly change the format (number of decimal places) of an individual column. 10.7.8. 21/02/07



D.16.11 Documentation

- 1) The Manual has been extensively upgraded and extended to cover not only the new options listed above but also to explain in greater detail existing features of **SATURN**. Note, in particular, Appendices I and J, which document what is contained in DA codes and what P1X annotation consists of, and Appendix K, a list of all available batch files, has been added.
- 2) The Manual is now in A4 PDF format and is updated on a regular basis – typically every quarter – and is available for download from the SATURN website.



D.17 Version Control

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