Synchro Studio 8

Summary of Version 8 Releases

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Chapter 1 – Release 801

The initial release of **Synchro Studio 8** and **Warrants 8** occurred in June 2011. Since this time, Trafficware's developers and engineers have continued to enhance both the functionality and capability of Synchro, SimTraffic, Warrants, and 3D Viewer. This document was created to provide a brief description of the enhancements included within each new "*build*" release of the software.

Synchro

This new release includes a few revisions based on issues reported on the support site, as well as the addition of two new analysis modules reflecting the operational analysis of stop-controlled intersections based on the methodologies of the HCM 2010. A brief description related to the enhancements within Synchro is provided below.

1. *HCM 2010 All-Way Stop Control (AWSC) Module* – The revised 2010 HCM methodology for analyzing All-Way Stop Control intersections are now available within the *HCM 2010 Tab* within Synchro. For additional details, refer to the **Synchro Studio 8 Getting Started** and **Synchro Studio 8 User Guide Changes**.

2. *HCM 2010 Two-Way Stop Control (TWSC) Module* – The revised 2010 HCM methodology for analyzing Two-Way Stop Control intersections are now available within the *HCM 2010 Tab* within Synchro. For additional details, refer to the **Synchro Studio 8 Getting Started** and **Synchro Studio 8 User Guide Changes**.

3. *Detector maximum size increased from 50 feet to 100 feet* – The maximum size of a detector has been increased from 50 feet to 100 feet. For additional details related to detectors, refer to Chapter 10 of the **Synchro Studio 8 Users Guide**.

4. *Differences in Percentile Intersection Delay Calculations Between Synchro Versions 7 and 8* – In some instances, lane utilization factors were calculated incorrectly in Version 8. The calculations within Version 8 have been modified to correctly calculate lane utilization.

5. *HCM 2010 signal module crash at "T" intersections* – Depending on a "T" intersection's configuration, the initial release of Synchro 8 would sometimes crash upon selecting the *HCM 2010 Tab*. Within this new build, upon selecting the *HCM 2010 Tab*, the signal module will no longer crash when analyzing "T" intersections.

6. *Multi-Select Intersection* – The initial release of Synchro 8 would drop some intersections when multiple intersections were selected by the user. Intersections are no longer dropped with this new release.

SimTraffic

Most of the enhancements within SimTraffic improved a few issues related to traffic flow and the recording of animation files. A brief description related to the enhancements within SimTraffic is provided below.

1. *Right turn vehicles not moving at "T" intersections* – Right turning vehicles with certain "T" intersection configurations would not move even if a green signal indication was displayed. All vehicles at "T" intersections will now move upon receiving green signal displays.

2. *Improved quality of video recordings* – The initial release of SimTraffic automatically defaulted to specific settings for pixels per inch and frame rate/second during the creation of a video. During the creation of a video with the new release, SimTraffic will set these parameters to the highest quality based on the machines' capabilities used to create the video file.

3. *Video recording at additional speeds* – Video recordings within the initial release of SimTraffic were only allowed at *1x* viewing speed. The new release will also allow video recordings at *2x*, *4x*, and *8x* viewing speeds.

4. *Arterial report with one-way road and bends on an arterial* – The *Arterial Report* within SimTraffic has been modified to now include links beyond a "*bend*" node as long as the arterial names are the same. The initial release would not include data for links beyond a bend node.

5. *When selecting multi-run, you are prompted about deleting old hst files* – An enhancement to the multi-run feature has been added. This feature is automatically implemented when only one history file was created prior to choosing the multi-run option. SimTraffic is confirming that the user is OK with overwriting the initial history file that was created.

3D Viewer

Two enhancements have been implemented within this build release of 3D Viewer.

1. *Location of Signal Head Display along elevated roadways* – The location of signal head displays along evaluated roadways have been modified to display even with the elevated roadway rather than at the base elevation of the model.

2. *3D Columns and Pillars Category has been added* – A new category, **Columns and Pillars**, is now available when *Add Model* is selected. Four choices are currently available. Once inserted, each of the columns can be scaled and placed based on user preference.

3. *3D Basic Shapes Category has been added* – A new category, **Basic Shapes**, is now available when *Adding a Model*. Once inserted, each of the shapes can be adjusted in width, height, and length to allow walls and abutments to be inserted within a file.

4. *Ability to Add Elevation to 3D Object* – 3D Objects can now be assigned a "Z" value to represent the elevation of an object placed on an elevation roadway.

Warrants

Two enhancements have been implemented within this build release of Warrants.

1. *Plotting of data within Warrant* – On occasion, data from a previous file would populate the graph instead of newly input data. Modifications within this release have eliminated this issue.

2. *Zero input values within Warrant 2* – The initial release of Warrants would mistake a Zero input value as a "blank" and would not correctly calculate the time of the peak hour time or the correct peak hour volume. Zeros directly input by the user will now be used properly in the determination of the correct peak hour information.

Chapter 2 – Release 802

This is the third Synchro Studio and Warrants update offered by Trafficware. This document highlights the enhancements included within this new "*build*" release. Enhancements include the addition of a floating palette, more Map Screen display options, improved HCM 2010 analysis methods, and improved traffic flow within SimTraffic.
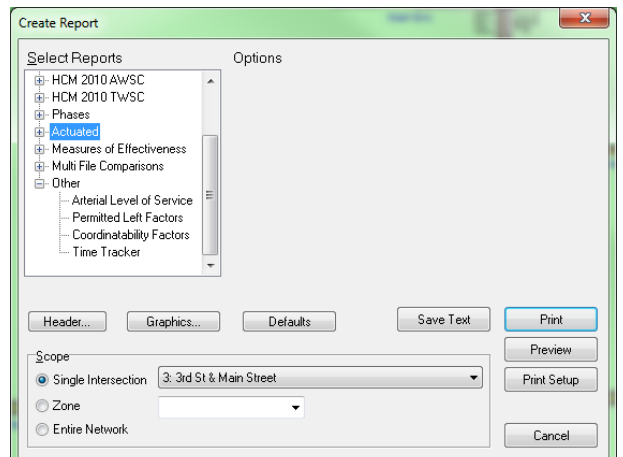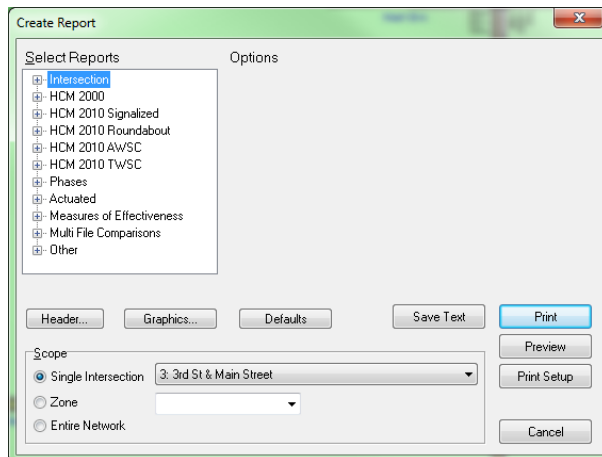
Synchro

Several new features have been added to improve the user experience and functionality within Synchro. A brief description related to the enhancements within Synchro is provided below.

1. ***New Floating Palette*** – The Tool Bar that could be moved to the left or right of the Synchro Map Screen has been replaced with a "Floating Palette." This new feature has been a popular request by Synchro users. New Icons have also been added to the palette, thus allowing users more options to display information within the Map Screen.

   a. ***Zoom/Pan*** – The icons within this menu allow users to adjust the view within the Map Screen. Various zoom options are available to the user.

   b. ***Mapping*** – Icons used for creating and/or editing a roadway network, such as adding/deleting links and moving nodes, are located here.

   c. ***Nodes*** – The icons within this menu can be used to display intersection data (i.e. node number, cycle length, and zone ID's). New icons have been added to allow users to display HCM 2010 intersection delay and LOS.

   d. ***Links*** – Link-based data can be found using these icons (i.e. travel speed and link distance).

   e. ***App/Move*** – The Approach/Movement menu provides several icons that allow users to display information related to volumes, signal phasing, v/c ratios, movement delay, etc. Users can display signalized intersection results based on Percentile Delay or HCM 2010.
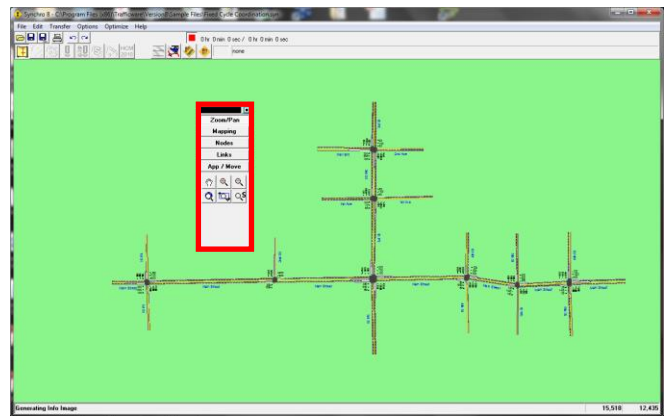
   It should be noted that pressing your right mouse button on the map background will bring up , thus allowing you to pan within the Synchro network.

2. ***New Report Interface*** – The various reports within Synchro have been organized into 11 categories. Upon pressing the appropriate (+) next to the category name, the available reports within the selected category will be displayed. Hold down the ***Ctrl*** button to select multiple categories.

3. ***HCM 2010 Signalized Intersection Module*** – Previous versions of Synchro 8 included the code from the HCM 2010 Computational Engine. The computational engine did not account for traffic flow from adjacent intersections (within 0.60 mile) operating within a coordinated network. Synchro now incorporates the various methodologies related to coordinated signals as presented within Chapter 17 of the HCM 2010. In addition, the following issues have been resolved within this release:
   i. *Revised Computation Engine* – The latest version of the TRB's computational engine has been incorporated within Synchro.
   ii. *"T" Intersections* – Delay values at some T intersections were not calculated correctly. These issues have been resolved.
   iii. *One-Way Roadways* – Delay values at some one-way intersections were not calculated correctly. These issues have been resolved.
   iv. *Treatment of Right Turning Vehicles* – Right turning vehicles that *are not* controlled by a signal indication have been updated to incur zero delay.
   v. *Automatic Calculation of Platoon Ratio* – This release includes an automatic calculation for Platoon Ratio based on the HCM 2010. The user can adjust this value if necessary.
   vi. *New HCM 2010 Report* – A new report has been added to the HCM 2010 Signalized category. In addition to the three-page report, a one-page summary report is now available.

4. ***HCM 2010 Two-Way Stop Control (TWSC) Module*** – Synchro, Build 563, did not account for delay adjustments based on adjacent coordinated intersections (within 0.60 mile). The appropriate methodologies (determining percent blocked) included within Chapter 17 (of 2010 HCM) for analyzing Two-Way Stop Control intersections are now accounted for within the *HCM 2010 Tab*. Synchro calculates a value for *Time Blocked by Platoon (%)* based on the offset and reference phase coded at the upstream/downstream signalized intersection. The signalized intersection must be within 0.60 miles of the study intersection. For additional details, refer to the **Synchro Studio 8 Getting Started** and **Synchro Studio 8 User Guide Changes**.

5. ***Revised Percentile Delay Calculations*** – Under certain geometric and/or phasing conditions, various output parameters were unrealistic. The following calculations have been updated:
   i. *Right Turn Overlap Delay* – Upon creating a HCM 2000 Report (for the same network) in Version 7 and 8, the values listed for loss time, in certain instances, would be different. In addition, a negative value for loss time may also have been observed upon creating a report. Both of these issues have been resolved.
   ii. *Minimum Sat Flow for Right Turns* – In highly congested networks, the calculated value for the *Saturation Flow for Right Turns* was unrealistic. The calculations have been revised to include a minimum value.
   iii. *Queue Delay* – Queue delay may be calculated if traffic volumes are high and platoons of vehicles arrive on red.

6. ***Automatic Channelization When Adding Links*** – Upon adding a link to an existing roadway segment, Synchro would automatically redraw the existing roadway segments at the newly created node. This has been revised so that the existing roadway segments at the new node are ***not*** automatically re-channelized.

7. ***Various Report Updates*** – The following issues have been resolved:
   i. *Loss Time* – Upon creating a HCM 2000 Report (for the same network) in Version 7 and 8, the values listed for loss time, in certain instances, would be different. In addition, a negative value for loss time may have been observed upon creating a report, while a different value was displayed within the Timing window. Both of these issues have been resolved.
   ii. *Footer Titles* – Upon creating a HCM 2000 Report within Version 8, the title in the footer would sometimes display Version 7. This issue has been resolved.
   iii. *New Notations* – Four new symbols have been added to describe a few HCM 2010 calculation-related issues within the AWSC and TWSC methodologies.
      1. *$* - Delay more than 300 seconds.
      2. *** - All conflicting volume is present in crossing platoon. No conflicting volume in random arrival phase.
      3. *!* - Computation is not supported by HCM 2010 Methodology.
   4. *(-)* - Not applicable.

8. *Various Graphical Enhancements* – The following issues have been resolved:
    i. *Free Right Turn* – The graphical display of right turn lanes has been improved.

9. *Symbols Added to Phasing Diagram* – Two symbols have been added to the Phasing Diagram for intersections operating in a coordinated mode. The symbols indicate the *Reference Phase* and *Reference to:* selections.

SimTraffic

Several enhancements affecting traffic flow within SimTraffic have been updated. In addition, several updates (including the definition of various measures of effectiveness) to the creation of reports within SimTraffic have also been revised. A brief description of each enhancement is listed below.

1. *Various Enhancements to Traffic Flow* – A variety of traffic flow issues presented themselves in Build 563. Several enhancements to the traffic flow algorithms within SimTraffic have been updated. The following issues have been resolved:
    i. *Vehicles Stop To Make Lane Change* – Vehicles may continue to stop while conducting a lane change maneuver but should not remain stopped as in the previous released version.
    ii. *Vehicles Stop With Green Indication* – Vehicles should continue through an intersection during a green indication.
    iii. *Right Turn Overlap Phase* – Vehicles should react to the overlap portion of a signal phase properly.
    iv. *Vehicles not Obeying Red Indication* –Vehicles should stop during the red indication.
    v. *Left Turn Permitted Phase* – Vehicles should react to a permitted left turn phase as expected.
    vi. *Improved Lane Choice Selection* – As vehicles enter the network, their initial choice in lanes has been improved, thus reducing the number of lane changes and improving overall traffic flow. The average delay reported at intersections that included external links may have been affected by this and should be reviewed by the user.
    vii. *Flow Through Channelized Right Turns* –Vehicles should react to on-coming vehicles and yield appropriately.
    viii. *Pedestrians at Two-Way Stop Control (TWSC) Intersections* –If coded in the Volume window, pedestrians will now be simulated at TWSC intersections.

2. *Improved SimTraffic Driver Parameters* – Additional refinement to various algorithms within SimTraffic has improved traffic flow. The following issues have been resolved:
    i. *Improved Lane Choice* – The initial lane choice for vehicles has been improved. Users may still need to adjust Lane Alignment within the Simulation Settings Menu to improve lane balancing in certain situations.
    ii. *Lane Change Timer* – Two new parameters have been added to *Driver Parameters* to allow users the ability to adjust time-related aspects of lane change maneuvers. Users can adjust the time between successive (optional lane changes only) as well as the variance by Driver Type. These parameters can be found within the SimTraffic Parameters Menu.

3. *Various Report Enhancements* – The following revisions have been completed:
    i. New Report Interface – The various reports within SimTraffic have been organized into 11 categories. Upon pressing the appropriate (+) next to the category name, the available reports within the selected category will be displayed. Hold down the *Ctrl* button to select multiple categories.
    ii. *Arterial Report* – The measures of effectiveness have been updated.
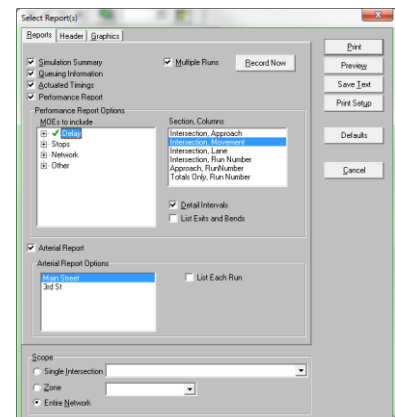
4. ***Revised Delay Definitions*** – The following types of delay have been updated and redefined:
    i. *Denied Delay* – Delay attributed to vehicles "*denied*" entry into the network. A vehicle could be denied entry if queuing extends to the end of a roadway link. In addition, a vehicle within an uncongested network may experience denied delay if, during the instant it is being generated, it cannot enter the network as desired.
    ii. *Speed Delay* – Previously defined as delay caused by acceleration, deceleration and stops. This value is no longer included as an option when creating a report.
    iii. *Total Delay* – Previously defined as sum of Speed Delay and Denied Delay. Denied Delay is no longer included within this delay parameter.

External intersections are more likely to be affected by these revisions. The reporting of Denied Delay as a separate value is the main difference from previous versions of SimTraffic.

Delay Value	Delay Reporting	
	Prior to V8 Build 563	**V8 Release 802**
Denied Delay	Internally calculated, but not listed in SimTraffic reports.	Same definition as previous versions, but is now an Option when creating SimTraffic reports.
Speed Delay	Included in SimTraffic reports.	Not included as an Option when creating reports within SimTraffic.
Total Delay	Speed Delay + Denied Delay	Includes acceleration, deceleration, and stopped delay. This value closely matches "control delay".

5. ***Various Graphical Enhancements*** – The following issue have been resolved:
    i. *Vehicles Driving On Background* – Vehicles will only travel within the roadway segment.

6. ***Vehicles entering within a Metric Network*** – In some metric networks, vehicles were not input properly at external links.

3D Viewer

One enhancement has been implemented within this build release of 3D Viewer.

1. ***Import 3D Models from Another 3D Viewer File*** – The user can import all 3D models from one 3D Viewer file with similar reference coordinates into another. The models will be imported at the same coordinates.

Warrants

Three enhancements have been implemented within this build release of Warrants.

1. ***2012 California MUTCD Warrants*** – Changes within the 2012 California MUTCD did not affect any of the current Warrants being analyzed. The titles have been updated to include 2012.

2. ***Plotting of Data Within Warrants*** – On occasion, data from a previous file would populate a graph instead of newly input data. Modifications within this release have eliminated this issue.

3. ***Zero Values*** – On occasion, zero values were not recognized as a viable input. Modifications within this release have eliminated this issue.
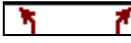
Chapter 3 – Release 803

This is the fourth Synchro Studio and Warrants update offered by Trafficware. This document highlights the enhancements included within this new "*build*" release. Most of the enhancements are related to the methodologies of the HCM 2010.

Synchro

Several new features have been added to improve the user experience and functionality within Synchro. A brief description related to the enhancements within Synchro is provided below.

1. *General Updates* – The following issues have been resolved:

    i. *Floating Palette* – Within the *Options* Menu, users now have the option to *Hide the Toolbar* or *Show the Toolbar*.
    ii. *HCM 2010 Pop-Up Windows* – Several new Pop-Up windows have been added to provide the user with a message related to why the intersection is not compatible with the HCM 2010.

2. *HCM 2010 Signalized Intersection Module* – Previous versions of Synchro 8 included the code from TRB's HCM 2010 Computational Engine Version 4.1. Build Release 803 has been updated to include the current computational engines. Although the computational engines are based on the HCM 2010 methods, they do not permit coding of all phasing and geometric configurations. For more information, refer to *the Implementation of the 2010 Highway Capacity Manual within Synchro Version 8* white paper located on Trafficware's website.

    i. *Revised Computational Engine* – The latest versions of TRB's computational engines (Versions 4.2 & 4.3) have been incorporated within Synchro. Most of the changes affected calculations regarding shared left turn/through travel lanes. Some issues have been addressed, but there are still some outstanding issues being addressed by TRB.
    ii. *"T" Intersections* – Since Trafficware is mimicking the methods of the HCM 2010, many of the limitations outlined within the 2010 manual also apply within Synchro. There are, however, a few scenarios when the user can determine if they are willing to deviate slightly from the manual in order to obtain results. The "slight deviations" are based on reasonable assumptions based on the overall intent of the HCM 2010. The table below includes a few of these instances.

Geometric Configurations	Methodology	
	HMC 2010 Computational Engine V 4.3	**V8 Release 803**
	Not Supported	Permitted
	Permitted	Permitted
	Not Supported	Not Supported

    iii. *One-Way Roadways* – Delay values at some one-way intersections were not calculated correctly. These issues have been resolved.
    iv. *Treatment of Right Turning Vehicles* – Right turning vehicles that *are not* controlled by a signal indication have been updated to incur zero delay. A user must code a right turn island for this computation to occur if the phasing is set to *Free*.
    v. *Automatic Calculation of Platoon Ratio* – The user can now adjust this value if necessary.

3. ***HCM 2010 Two-Way Stop Control (TWSC) Module*** – The following issues have been resolved:
    i. *Include upstream Signal?* – Within the HCM 2010 Intersection screen, the user has the option whether to include or not include the effects of nearby signalized intersections. If the user selects *Yes*, Synchro will calculate a value for *Time Blocked by Platoon (%)*.
    ii. *HCM 2010 Calculation for Conflicting Flow during the Unblocked Period* – When the results from HCM 2010 Equation 19-33 caused $v_{c,u,x}$ to equal zero (0), unrealistic capacity values were calculated in HCM Equation 19-34. To avoid this, a value of one is set (instead of zero) for HCM 2010 Equation 19-33. This leads to realistic capacity values from HCM 2010 Equation 19-34.
    iii. *One-Way Roadways* – Delay values at some one-way intersections were not calculated correctly. These issues have been resolved.

4. ***Various Report Updates*** – The following enhancements have been added:
    i. *HCM 2010 Signalized Intersection Summary & Detail Reports* – The calculated Percentile Back of Queue (*%ile Back of Q (#%)*) has been added to both reports. Be sure to adjust the *#%* value within the HCM 2010 Signalized Intersection Tab.
    ii. *HCM 2010 Signalized Intersection Report* – A label indicating that the overall intersection control delay is based on the methods of the HCM 2010 has been added.
    iii. *HCM 2000 Signalized Intersection Report* – A label indicating that the overall intersection control delay is based on the methods of the HCM 2000 has been added.
    iv. A note was added to remind users to press the ***Ctrl*** button for multiple printing selections.

SimTraffic

This build release includes a few minor enhancements within SimTraffic. A brief description of each enhancement is listed below.

1. ***Mandatory and Positioning Distances*** – Various enhancements to the traffic flow algorithms were implemented to improve driver behavior. Users should see improved lane utilization when adjustments to the *mandatory* and *positioning distances* are made. The process of adjusting these parameters is typically iterative.

2. ***Start of Minimum Green*** – The start of minimum green now occurs at the beginning of green regardless if a conflicting call occurs.

3. ***Enhancements to Vehicles Traveling Through a Channelized Right Turn*** – Under certain geometric conditions, right turning vehicles were not proceeding through channelized right turn. Vehicles should now react appropriately.

4. ***Report Update*** – Users have the option to include *Denied Entry Before* and *Denied Entry After* as a Network measure of effectiveness (MOE).

3D Viewer

No substantial enhancements have been implemented within this build release.

Warrants

No substantial enhancements have been implemented within this build release.

Chapter 4 – Release 804

This is the fifth Synchro Studio and Warrants update released by Trafficware. This document highlights the enhancements included within this new "*build*" release. ***TripGen 2013*** was first released within Revision 790. Revision 795 included several updates based on user feedback. Unless otherwise noted, all of the enhancements listed below were included in Revision 790.

Synchro

Several new features have been updated to improve the user experience and functionality within Synchro. A brief description related to the enhancements within Synchro is provided below.

1. ***General Updates*** – The following issues have been resolved:
    i. *MrSid* – The conversion of MrSid files within Synchro has been updated. Upon selecting ***Convert SID Files*** within the ***Select Backgrounds*** window, a bitmap file should be created for use within Synchro.
    ii. *Shortcut Key for Adding U-Turn Lane* – Within the ***Lanes*** window, upon pressing ***Ctrl U,*** a U-Turn lane will be added to the appropriate approach.
    iii. *Export to HCS 5.1* – The exported file structure has been updated for use in HCS 5.1.
    iv. *UTDF CSV Export* – Exporting data using the UTDF feature has been updated.
    v. *Zero Detector Length Warning* – Warning be displayed for zero length detector only.
    vi. *HCM 2010 MOE Displays* – MOE data will be displayed appropriately.
    vii. *Offset Optimization Routine* – Revision 795 includes enhancements to the offset optimization routine.

2. ***HCM 2010 Signalized Intersection Module*** – Build Release 804 has been updated to include Version 4.4 of the computational engine. For more information, refer to *the Implementation of the 2010 Highway Capacity Manual within Synchro Version 8* white paper located on Trafficware's website.
    i. *Revised Computational Engine* – The latest version of TRB's computational engine (Version 4.4) has been incorporated within Synchro. Minor enhancements were implemented by TRB.
    ii. *Exclusive Turn Lanes with Shared Through/Turn Lanes* – A new feature has been added to permit calculations for various configurations of <u>exclusive turn lanes with shared through/turn lanes.</u> A pop-up window is displayed informing users that the method is not strictly based on HCM 2010. Currently, the HCM 2010 methods do not explicitly accommodate all possible lane configurations. For more information, refer to *the Implementation of the 2010 Highway Capacity Manual within Synchro Version 8* white paper located on Trafficware's website. Revision 795 includes refinements to the methodology for specific geometric configurations with high left or right turning movement volumes.
    iii. *Lagging Left Turn Phasing* – Results within the HCM 2010 tab will now be displayed.
    iv. *Speed Limits in Metric Units* – The conversion from km/hr has been updated for speeds up to 55 mph.
    v. *V/C Ratio > 1.0* – At the movement level, V/C ratios greater than 1.0 will return LOS F.

3. ***HCM 2010 Roundabout Module*** – Revision 795 includes the following enhancement:
    i. *User Adjustable Critical & Follow-Up Headway* – Synchro will allow user adjustments to the critical and follow-up headway values.

4. ***HCM 2010 Two-Way Stop Control (TWSC) Module*** – The following issues have been resolved:
    i. *Right Channelization Conflicting Volume* – The calculations have been updated to account for the appropriate conflicting flow values.
    ii. *Median Drop-Down Menu* – A new drop-down menu within the HCM 2010 Tab has been added. Users can select one or two vehicles to be stored within the median.
    iii. *HCM 2010 TWSC Report* – The Major Approach LOS has been added to the report in Revision 795.

5. *Various Report Updates* – The following enhancements have been added:
   i. *HCM 2010 Signalized Intersection Platoon Ratio* – The calculated Platoon Ratio displayed within the HCM 2010 tab matches the value within the report.
   ii. *HCM 2010 Unsignalized TWSC Intersection Report* – The calculated values within the HCM 2010 tab match the values within the report.
   iii. *HCM 2010 Roundabout Report* – The calculated values within the HCM 2010 tab match the values within the report.

SimTraffic

This build release includes a few minor enhancements within SimTraffic. A brief description of each enhancement is listed below.

1. *Right Turn Islands with Two Lanes* – Traffic flow through channelized dual right turn lanes has been improved.

2. *Protected/Permitted Operations* – Traffic flow within left turn lanes with protected/permitted phasing has been improved.

3D Viewer

No substantial enhancements have been implemented within this build release.

Warrants

This build release includes a few minor enhancements within Warrants. A brief description of each enhancement is listed below.

1. *Various Report Updates* – Report values were updated to match results displayed in the *Warrants* windows.

2. *Reading Volume Files* – Upon reading subsequent volume files, *Warrants* will clear old data and use the most recent volume data.

TripGen 2013, Version 8

This was the first release of *TripGen 2013, Version 8*. Users can demo this application upon activating and selecting Demo. *TripGen 2013* provides engineers and planners with an easy to use application to assist in determining the number of trips (vehicles) generated by a variety of land uses. The trip generation rates are based on the 9th Edition of ITE's Trip Generation Manual. Revision 795 includes updates to a few land use parameters.

Chapter 5 – Release 805

This is the sixth Synchro Studio and Warrants update released by Trafficware. This document highlights the enhancements included within this new "*build*" release. *TripGen 2013* has been significantly updated as part of this release to provide the user with additional custom features as well as access to trip generation rates from both the 8th and 9th Editions of ITE's Trip General Manual.

Synchro

Several new features have been updated to improve the user experience and functionality within Synchro. A brief description related to the enhancements within Synchro is provided below.

1. *General Updates* – The following issues have been resolved:
    i.   *Custom Turn Type* – The user input turn type will now display appropriately and will not default to custom.
    ii. *HCM 2000 AWSC Degree of Saturation* – The maximum allowable value for this parameter has been updated to 1.0.
    iii. *HCM 2010 Movement Delay on Map Display* – The calculated values are now displayed appropriately.

2. *HCM 2010 Signalized Intersection Module* – Build Release 805 has been updated to include Version 7.11 of the computational engine. For more information, refer to *the Implementation of the 2010 Highway Capacity Manual within Synchro Version 8* white paper located on Trafficware's website.
    i.   *Revised Computational Engine* – The latest version of TRB's computational engine (Version 7.11) has been incorporated within Synchro.
    ii.   *Intersection Saturation Flow* – A new check box now appears within the *HCM 2010 Intersection* pane of the *HCM 2010* Tab. Placing a checkmark within this box will allow the user to enter a saturation flow that will be used for all lane groups within the HCM 2010 analysis.
    iii. *Actuated Coordinated Intersection Cycle Length* – In some instances, especially intersections with low side street volumes, the splits would not sum to the input cycle length. This has been resolved.
    iv.   *"T" Intersections* – Delay values at some T intersections were not calculating correctly. These issues have been resolved for most T intersections.
    v.   *Right Phase Turn Type* - Protected phase with Pedestrian volume is not compliant based on the HCM 2010 methods. A note will be displayed asking the user to allow the turn type to be converted to a Permitted phase. Similarly Overlap + Protected will be changed to Overlap + Permitted, and Overlap will be changed to Overlap + Permitted if the user permits.
    vi.   *Split-Phased Timing* – Results are calculated for intersections with two split-phased approaches.
    vii. *Lane Utilization Factor* – In some instances, this factor was not being used appropriately in the calculations. This has been resolved.
    viii. *RTOR Text* – Since the User should input this value, the color of the text has been changed to black.
    ix.   U-Turns – U-Turns are now being calculated appropriately.
    x.   *Right Turn Influence on Left Turn Delay* – This parameter has been added within the HCM 2010 screen to allow users to include the effects of right turns within the calculations or not.
    xi.   *Phase Duration* – Calculations have been updated for prot+perm from shared lanes and between phases within ring 1 & 2.

3. *HCM 2010 TWSC Module* – The following enhancement have been added:
    i.   *User Adjustable Headways* – The critical and follow-up headways can now be adjusted by the user.
    ii. *Two-Stage Gap Analysis* – Adjusting the median with within the Simulation Settings will automatically update the *Vehicles in Median Storage (#)* value within the HCM 2010 screen. Entering a median width value between 13' and 37' will modify the value of *Vehicles in Median Storage (#)* to one (1). Entering a median width value greater than 38' will modify the value of *Vehicles in Median Storage (#)* to two (2). The HCM 2010 method allows a maximum of two vehicles within the median.

4. ***Various Report Updates*** – The following enhancement have been added:
   i. *U-Turns* – The reports have been updated to show U-Turns.
   ii. *HCM 2010 TWSC Report* – The notes section will only be displayed if they apply to the intersection being analyzed.

SimTraffic

This build release includes a few minor enhancements within SimTraffic. A brief description of each enhancement is listed below.

1. ***Flashing Yellow Arrow*** – The User can now choose to display flashing yellow arrow within SimTraffic. Within the *Timing Settings* screen, once a user selects the *Perm*, *Pm+Pt.*, *D. Pm*, or *D. P+P* Turn Type, the user can then elect to allow a *Permitted Flashing Yellow* display by clicking the check box.

3D Viewer

No substantial enhancements have been implemented within this build release.

Warrants

No substantial enhancements have been implemented within this build release.

TripGen 2013, Version 8

This is the second release of ***TripGen 2013, Version 8***. Users will notice that the program has undergone several changes since the initial release. ***TripGen 2013*** provides engineers and planners with an easy to use application to assist in determining the number of trips (vehicles) generated by a variety of land uses. A few of the enhancements include;

- Trip generation rates based on the Institute of Transportation Engineer's (ITE) Trip Generation Manual 8th & 9th Editions are now available

- Land uses categorized by alternatives and/or phases

- Create and save custom pass-by & internal capture rates for future use

- Create and save custom labels for alternatives, phases, and land uses

- Viewable charts and graphs displaying various trip generation attributes

- Driveway volumes determined based on user entered percentages

Chapter 6 – Release 806 (8.0.806)

This is the latest Synchro Studio, Warrants, and TripGen update for legacy version 8 editions of Synchro released by Trafficware (October 2014). This document highlights the enhancements included within this new release. This version is a primarily a maintenance release that includes a number of bug fixes. The highlighted new enhancement is focused on easing the permission restrictions for the install requirements for Windows 7 and newer Operating System platforms.

Release 8.0.806 (.60/61): October 9, 2014

Synchro Installation

1. The Synchro products now include the personal edition of SQL Server Express (LocalDB) for the database backend. This is a full feature version of SQL Server Express that installs local to the user. This version of SQL Server Express precludes the more restrictive administrative permission issues that some customers encountered with the general SQL Server Express edition during the install process. This enhancement is not available for Windows XP platforms. Availability is for Windows 7 and newer Windows operating systems. There will now be two different installation packages: one for XP and one for current Windows platforms.

2. The Synchro installer can now setup the database component on both 32 and 64 bit platforms.

Synchro

1. Implement HCM Comp Engine 7.12 (as released by the Transportation Research Board)

2. Multiple changes to improve / enhance the Bing integration (see the "User Guide Changes" document for detailed User Guide instructions on adding a background image).

    i. Hide All, Show All, and Refresh buttons added to Background Images

    ii. Bing should re-load cache when cache is wiped out

    iii. Bing background should show up in SYN files when loaded on different machines

3. Corrected an issue in HCM 2010 where the cycle length at some actuated-coordinated intersections was estimated less than the actual cycle length.

4. HCM 2010 TWSC Reports included some new U-Turn columns which required a format change to prevent report spanning two pages.

5. Corrected an issue with Approach Delays on a two way stop control sometimes showing a negative number.

6. Corrected the calculation for phase duration in the HCM 2010 report on a T-intersection. In certain situations the value would show 0 in the Timer section.

Release 8.0.806 (.77): December 18, 2014

This release is available for users on Windows 7 or higher.

1. Correction to 'Emissions Factors' that didn't transfer from 805 to newer build.

2. Addition of a utility at startup to pro-actively check the database state & make any necessary corrections.

3. Changes to the location of the database files to make them accessible across all profiles.