Release Notes for 2018 Public Release Update

Summary of Changes

Significant improvements/changes were made to the IHSDM software from the 2018 Release (Version 14.0.0; September 2018) to the 2018 Release Update (Version 14.1.0; March 2019) in the following areas:

- Output / Reporting
- IHSDM Economic Analyses Tool (EA Tool)
- Data
- IHSDM Modules
- System Administration Tool (AdminTool)
- Help/Documentation
Output / Reporting

Crash Prediction Module (CPM) Evaluation Reports

**CPM Evaluation Reports for Site Set Data**

Major enhancements were made to the CPM Evaluation Reports for Site Sets. For **non-EB evaluations**, enhancements include:

- All references to “Expected” Crashes were changed to “Predicted” Crashes.
- Predicted Crash Frequencies and Rates by Site tables:
  - Columns were added for:
    - Predicted Total Crash Frequency
    - Predicted FI Crash Frequency
    - Predicted PDO Crash Frequency.
  - A row was added at the bottom of the table for Total.

- A Predicted Crash Frequencies by Year table was added.
For **EB-evaluations**, enhancements to CPM Evaluation Reports for Site Sets include:

- In Crash Frequencies and Rates by Site tables, columns were added for:
  - Total Predicted Crashes for Evaluation Period
  - Expected Total Crash Frequency
  - Expected FI Crash Frequency
  - Expected PDO Crash Frequency
  - Predicted Total Crash Frequency
  - Predicted FI Crash Frequency
  - Predicted PDO Crash Frequency
  - (Expected-Predicted) Total Crash Frequency
  - (Expected-Predicted) FI Crash Frequency
  - (Expected-Predicted) PDO Crash Frequency
Tables were added for:
- Predicted Crash Frequencies by Year
- Expected Crash Frequencies by Year
- Comparing Predicted and Expected Crashes for the Evaluation Period

<table>
<thead>
<tr>
<th>Table 4. Predicted Crash Frequencies by Year (Freeway)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2019</td>
</tr>
<tr>
<td>2020</td>
</tr>
<tr>
<td>2021</td>
</tr>
<tr>
<td>2022</td>
</tr>
<tr>
<td>2023</td>
</tr>
<tr>
<td>2024</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Average</td>
</tr>
</tbody>
</table>

Injury Crashes and Property Damage Only Crashes do not necessarily sum up to Total Crashes because the distribution of these three crashes had been derived independently.

<table>
<thead>
<tr>
<th>Table 5. Expected Crash Frequencies by Year (Freeway)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2019</td>
</tr>
<tr>
<td>2020</td>
</tr>
<tr>
<td>2021</td>
</tr>
<tr>
<td>2022</td>
</tr>
<tr>
<td>2023</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Average</td>
</tr>
</tbody>
</table>
CPM Evaluation Reports for Location-Based Data

Ramp Terminals are now included in Evaluations of cross-road, similar to Intersections (see figure below).

<table>
<thead>
<tr>
<th>Segment Number/Intersection Name/Cross Road</th>
<th>Start Location (Sta. ft.)</th>
<th>End Location (Sta. ft.)</th>
<th>Length (mi)</th>
<th>Total Crashes for Evaluation Period</th>
<th>Predicted Total Crash Frequency (crashes/yr)</th>
<th>Predicted FI Crash Frequency (crashes/yr)</th>
<th>Predicted PDO Crash Frequency (crashes/yr)</th>
<th>Predicted Crash Rate (crashes/ml/yr)</th>
<th>Predicted Travel Crash Rate (crashes/million veh)</th>
<th>Predicted Intersection Travel Crash Rate (crashes/million veh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intersection SR 3037 and Connector Rd / SR 3014</td>
<td>1+00.000</td>
<td>4+90.000</td>
<td>0.0739</td>
<td>100.898</td>
<td>4.8047</td>
<td>2.0708</td>
<td>2.7339</td>
<td>0.7687</td>
<td>0.4299</td>
<td>0.7990</td>
</tr>
<tr>
<td>Ramp Terminal SR 3037 and Ramp G</td>
<td>4+90.000</td>
<td>10+55.000</td>
<td>0.1020</td>
<td>25.806</td>
<td>1.2288</td>
<td>0.4299</td>
<td>0.7990</td>
<td>0.4299</td>
<td>0.7990</td>
<td>0.4299</td>
</tr>
</tbody>
</table>

Other CPM Evaluation Report Enhancements

- The “Evaluation Message” in Evaluation Reports for freeways was improved, by adding messages if the inside/outside shoulder width, barrier offset, median width, and other values are outside the bounds of the model.
- Minor enhancements/corrections were made in Location-Based Evaluation Reports.
- Some inconsistencies in terminology and behavior between the Location-based CPM and the Site-based CPM were resolved.
IHSDM Economic Analyses Tool (EA Tool)

EA Tool capabilities were extended to allow the selection of Site Set Evaluations. Previously, only Evaluations of Location-Based Highways/Intersections/Ramp Terminals could be selected in the EA Tool.
When a Site Set Evaluation is selected, the results for all Sites in the Site Set are used by the EA Tool. For example, if a Site Set contains data for rural 2-lane highways, urban arterials, and freeway segments, then an Evaluation of that Site Set would contain results for all of those facility types. If that Evaluation is selected in the EA Tool, then results for all of those facility type (in this case, for rural 2-lane highways, urban arterials, and freeway segments) would be used in the Economic Analysis.

For guidance in using the EA Tool, see IHSDM Economic Analyses Tool Help in the IHSDM Help Browser.

See the IHSDM Economic Analyses Tool Tutorial lesson for a sample exercise in using the EA Tool.
Data

Ramps

- Ramp Type was added as a data element for Freeway Ramps. The new item specifies whether the Ramp is an Entrance or Exit Ramp. It is optional in that Ramp Type can also be set through the Ramp Connection element of the roadway that the Ramp connects to. The major benefit of this new element is that the Ramp Type can be assigned even if the Ramp is stand alone and does NOT connect to another element; or for a Ramp that connects at both ends as an Exit and an Entrance. The Ramp Type set here takes precedence over the Ramp Connector designation.

LandXML Import

- Bug fix: Roadside Foreslope elements in LandXML files were being ignored upon data import.

Intersections

- The software now warns about and does not allow two intersections (or an intersection and a ramp terminal) to be defined at the same location.

Highway Viewer

- Bug fix: for Two-Way Left Turn Lanes (TWLTL), Centerline Offset values were not being reflected in the Highway Viewer.
- Bug fix: Curve widening was not always properly represented in the Viewer.

Versions

- Bug fix: Corrected a problem that occurred when a project that has network elements with multiple versions was archived by a user and then unarchived by a different user. The "current version" was done properly and the related network elements were mapped correctly. However, the other versions were not adjusted correctly for the new location. When a different version was selected as the current version, the embedded relations such as RampConnector:rampName was not correct. Therefore, those relations were lost.

Other Data Changes

- Added "Direction" as an attribute to the crash data exclusive XML schema used in the "Export" and "Import" of crash data (available through the Site-Specific Crash Data element in the Highway Editor).
NOTE: If the IHSDM 2018 Release Update is installed over an older version, existing projects will not be updated automatically. After opening a network, select Update or Save to save the changes "permanently."
IHSDM Modules

Crash Prediction Module

- Added the capability to evaluate a Ramp without establishing Ramp Connections to a Freeway, C-D Road, or other Ramp. This can be accomplished by setting the Ramp Type for the Ramp in the Highway Editor.
- Ramp Terminals are now included in Evaluations of cross-roads, similar to Intersections (see Output/Reporting section of Release Notes).
- Correction: The number of lanes for a taper section adjacent to a lane drop or a lane add on a freeway segment should be equal to the number of lanes downstream of the taper section. In other words, the taper is counted in the number of lanes if it is a lane add and is not considered as a lane in a lane drop. The taper was not being considered as an additional lane in either case.
- Intersections were removed from the list of elements that can be evaluated in an Interchange Evaluation, since intersections must be evaluated as part of a Highway evaluation.
- A negative effective length was generated for certain freeway segment conditions (e.g., if an exit ramp follows an entrance ramp and the total "Gore-Taper lengths" of the two ramp connections is longer than the distance between the two gore points.) A negative effective length then resulted in a negative number of crashes predicted for the segment. Logic was added to prevent negative effective lengths.
- Vertical Tangents will now cause segmentation when the vertical grade changes between the categories of less than 3%; 3% to 6%; and greater than 6%.
- Bug fixes:
  - Corrected a problem with crash rates reported in the horizontal design element table.
  - Corrected a problem in the Freeway Segment Summary table (Effective Length was not being used.)
  - Corrected a problem with freeway clear zone calculations when the defined zones are adjacent.
  - For Type B weaving sections on freeway segments, corrected a problem that occurred when two weaving sections in different directions were in the same freeway segment. The weave in the decreasing direction was not being considered in the CMF calculation.

Policy Review Module

- Bug fix: Curve widening was not always properly recognized in the Policy Review Module.
System Administration Tool (AdminTool)

Crash Prediction > Model Data Sets

- Enhancement: The field for the "a" parameter in the Model Dataset for 2-lane rural highways previously only accepted integer values. Now, all parameter fields accept up to 6 decimal places.
Help/Documentation

Documentation was added / updated, including:

- Engineers Manuals > Crash Prediction (for all facility types) (updated, including to reflect enhancements to Site Set Evaluation Reports)
- Economic Analyses Tool > Economic Analyses was updated to include Site Set evaluations
- Frequently Asked Questions (updated)
- Other sections were revised, as needed.

IHSDM Tutorial:
- Revised Lesson 11 (Economic Analyses Tool).

Archived Projects and Sample Highways:

- All project archives were updated to reflect changes to the software.
- The Example Freeway Site Set provided in the “highways” folder (ihsdm.siteset.Example Freeway SiteSet.xml) was updated to match previous updates to the location-based Example Freeway archived Project (ihsdm.project.Example Freeway.zip; located in the Tutorial folder).