# NX Advanced FEM environment for LS-Dyna solver

NX CAE

Benefits
- Enables engineers using NX Advanced FEM and NX Advanced Simulation to generate finite element models for the LS-Dyna solver
- Simplifies the LS-Dyna modeling process by enabling engineers to create analysis models based on geometry
- Reduces or eliminates intermediate manual processing of data files by generating run-ready decks directly from NX Advanced FEM
- Immerses engineers in the LS-Dyna environment by using familiar LS-Dyna terminology and extensive support of LS-Dyna-specific elements and entities

Summary
The LS-Dyna environment for NX™ Advanced FEM and NX Advanced Simulation enables engineers to build finite element models and define solution parameters for the LS-Dyna solver. The environment immerses engineers with familiar LS-Dyna language for element definitions, loads and boundary conditions, solution parameters and other common LS-Dyna nomenclature. In addition to model definition capabilities, the LS-Dyna environment enables bi-directional import/export capabilities that enable you to import current or legacy LS-Dyna data files and results, as well as export run-ready LS-Dyna input data files.
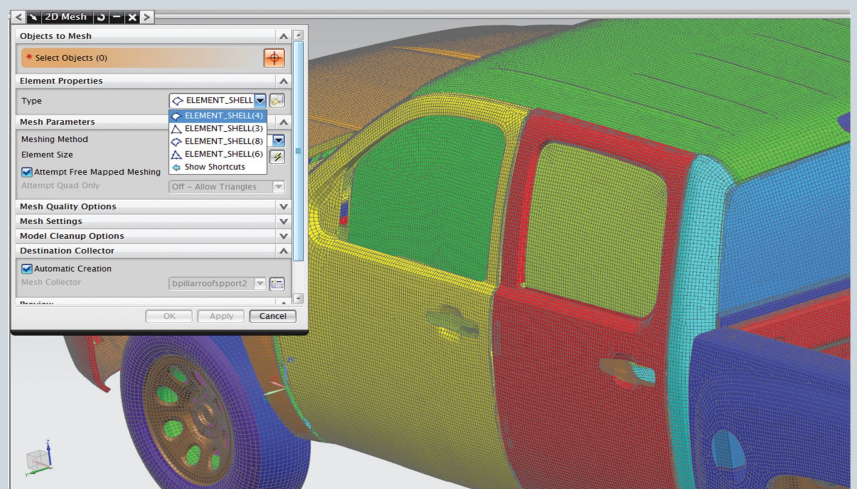
Dataset courtesy of the National Crash Analysis Center at George Washington University.

Using NX to create LS-Dyna models
The power of NX Advanced FEM pre/postprocessing is an ideal partner for creating LS-Dyna models and solutions. NX Advanced FEM simplifies the modeling process by integrating high-end analyst modeling tools with world-class geometry capabilities that assist you with developing analysis models faster than with traditional CAE preprocessors. Adding the LS-Dyna environment to NX Advanced FEM enables you to build LS-Dyna run-ready input data files, so little or no intermediate processing is ever needed. In

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addition to building LS-Dyna models, the NX LS-Dyna environment imports solution results directly from LS-Dyna results files into NX for postprocessing. The environment delivers import/export capabilities so you can import LS-Dyna data decks into NX for modification and then export run-ready decks for solution.

Elements and other entities

A wide variety of elements and other model entities are supported.

Structural element types:

Element/LS-Dyna keyword

0D elements

- Element mass: Structural mass element
- Element inertia: Lumped inertia element assigned to a node

1D elements

- Element beam: Two-node 1D linear beam element (beam, truss)
- Element beam offset: Section properties (created automatically when you define offset and use default orientation)

- Element beam orientation: Section properties (created automatically when you define orientation but not offset)
- Element beam offset orientation: Section properties (created automatically when you define both orientation and offset)
- Element discrete: Two-node 1D element (spring, damper)

2D elements

- Element shell (3), (4), (6), (8): Three, four, six and eight node 2D thin-shell elements
- Element shell thickness: Thickness extracted from midsurface (created automatically)
- Element shell offset: Thickness offset (created automatically when you define offset)
- Element shell beta: Material orientation (created automatically when you define the angle in element associated data)
- Element shell MCID: Material orientation (created automatically when you define material coordinate system in element associated data)
- Part composite keyword is supported in NX Laminate Composites
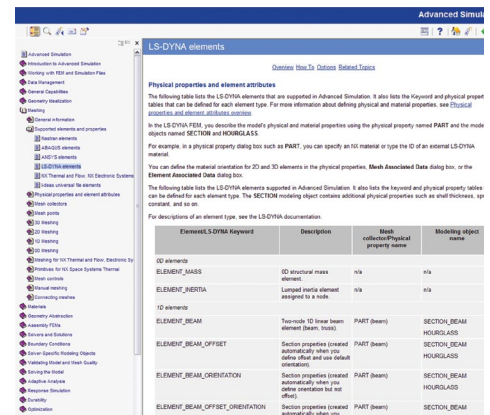
3D elements

- Element tshell (6), (8): Six-node and eight-node 3D solid Hex6 and Hex8 elements
- Element solid (4), (6), (8), (10): Four, six, eight and ten node 3D solid elements for isotropic materials
- Element solid ortho: Material orientation for orthotropic/anisotropic materials (created automaticaly when you define material orientation). Material orientation is defined by two vectors
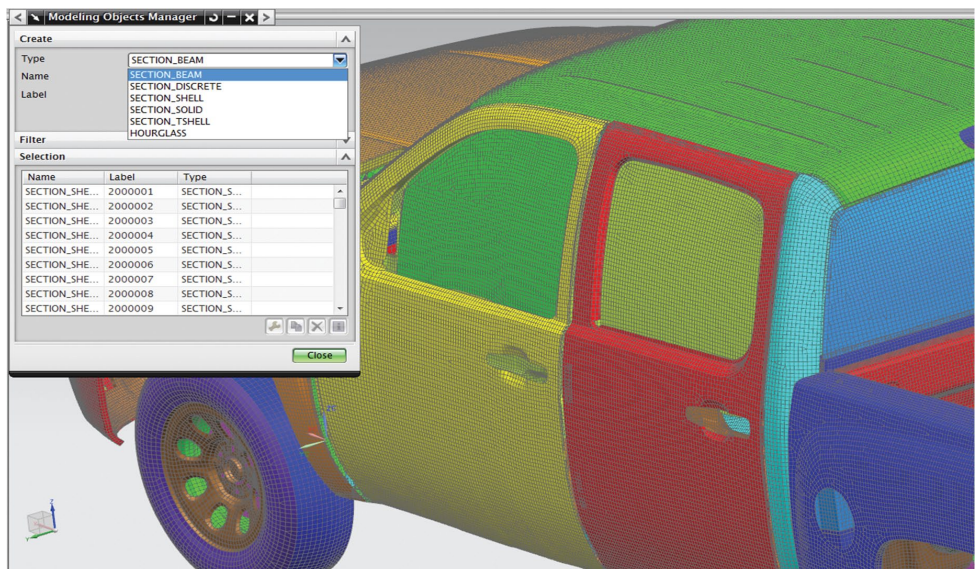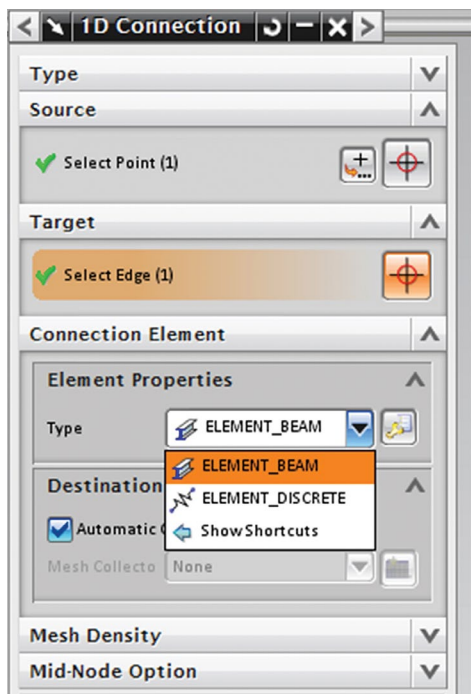
Note:
A complete list of LS-Dyna export entity support is provided in the NX online help documentation under the following header: Advanced Simulation/Solving the Model/Importing and Exporting Model Data/.

Compatibility
The LS-Dyna environment is compatible with the following LS-Dyna releases:
- LS-Dyna v971R5.0 or earlier

Supported hardware/OS
The LS-Dyna environment is an add-on module within the NX CAE product suite. It requires a license of NX Advanced FEM as a prerequisite. It is available on all NX supported hardware/OS platforms (Windows and Linux) including selected 64-bit platforms.
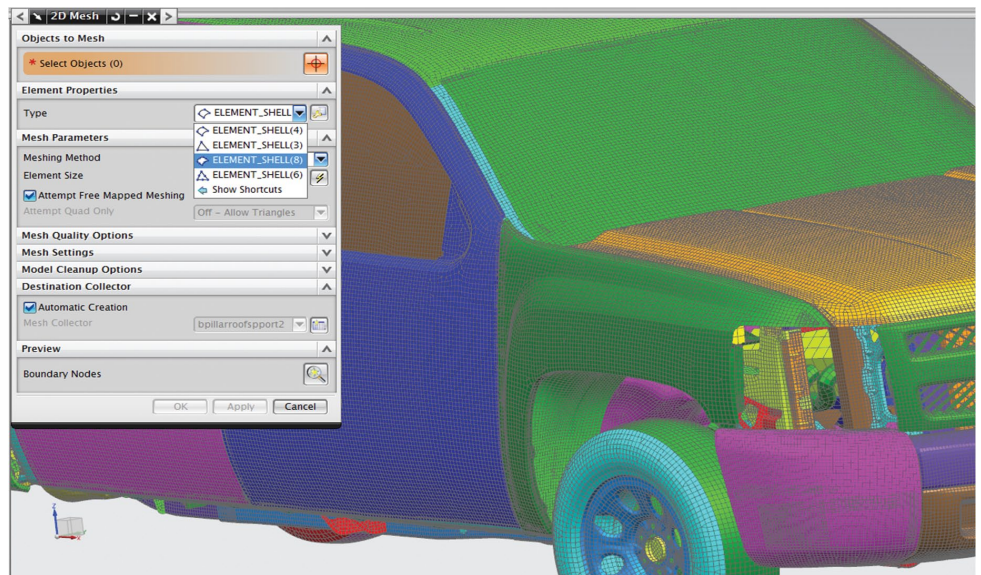
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