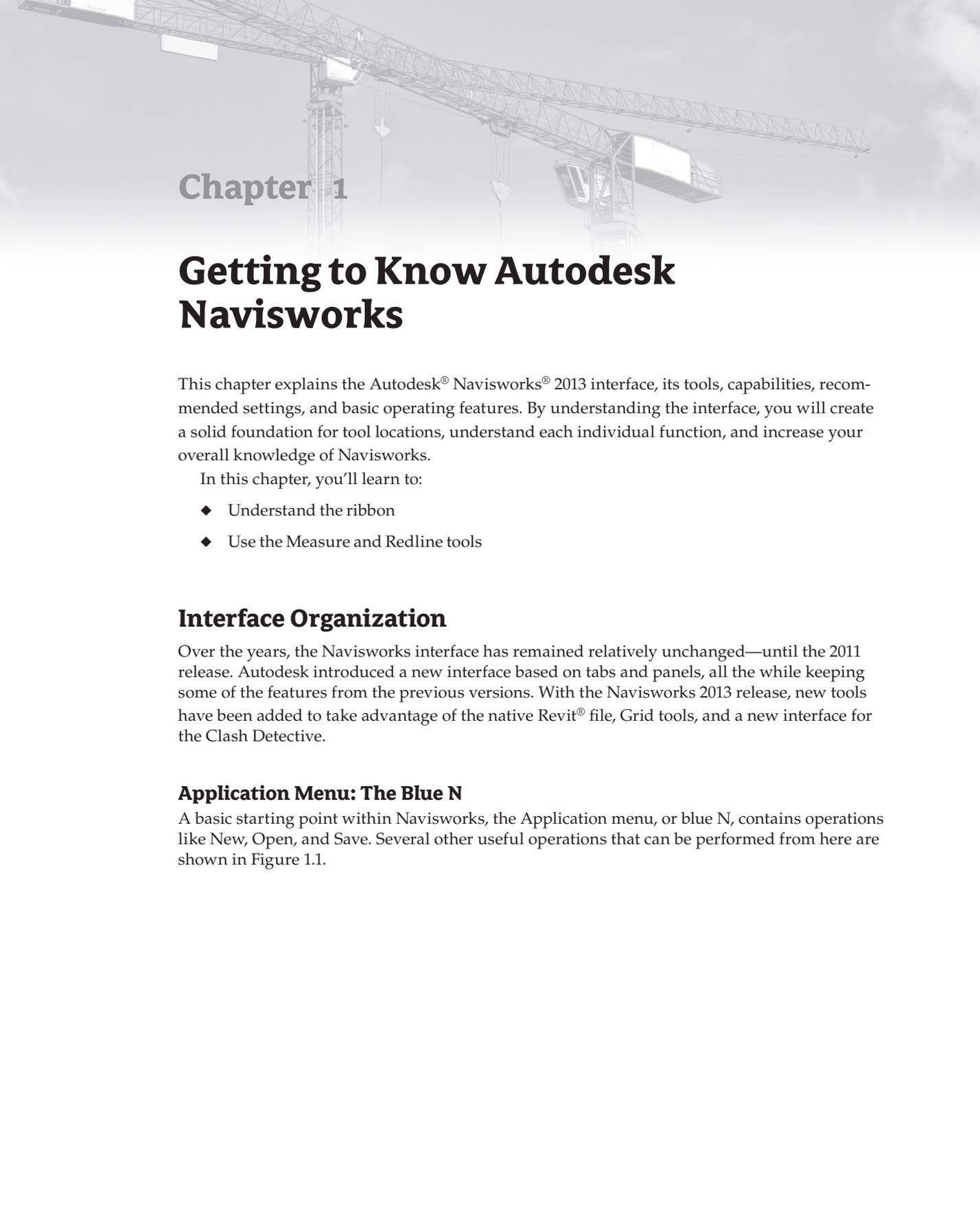


Part 1

Navisworks Basics

- ◆ **Chapter 1: Getting to Know Autodesk Navisworks**
- ◆ **Chapter 2: Files and File Types**
- ◆ **Chapter 3: Moving around the Model**
- ◆ **Chapter 4: Climbing the Selection Tree**
- ◆ **Chapter 5: Model Snapshots: Viewpoints, Animations, and Sections**



Chapter 1

Getting to Know Autodesk Navisworks

This chapter explains the Autodesk® Navisworks® 2013 interface, its tools, capabilities, recommended settings, and basic operating features. By understanding the interface, you will create a solid foundation for tool locations, understand each individual function, and increase your overall knowledge of Navisworks.

In this chapter, you'll learn to:

- ◆ Understand the ribbon
- ◆ Use the Measure and Redline tools

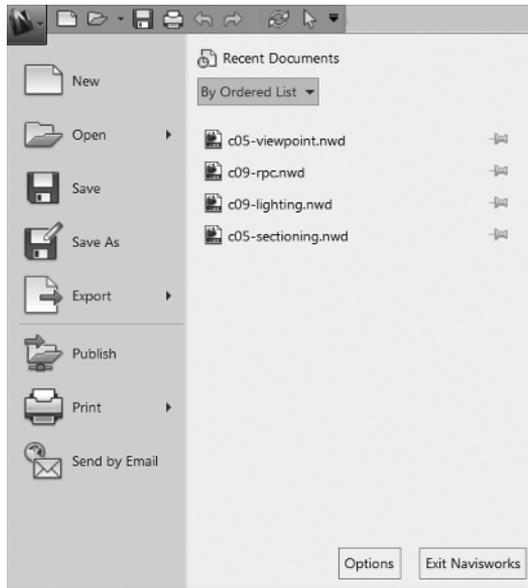
Interface Organization

Over the years, the Navisworks interface has remained relatively unchanged—until the 2011 release. Autodesk introduced a new interface based on tabs and panels, all the while keeping some of the features from the previous versions. With the Navisworks 2013 release, new tools have been added to take advantage of the native Revit® file, Grid tools, and a new interface for the Clash Detective.

Application Menu: The Blue N

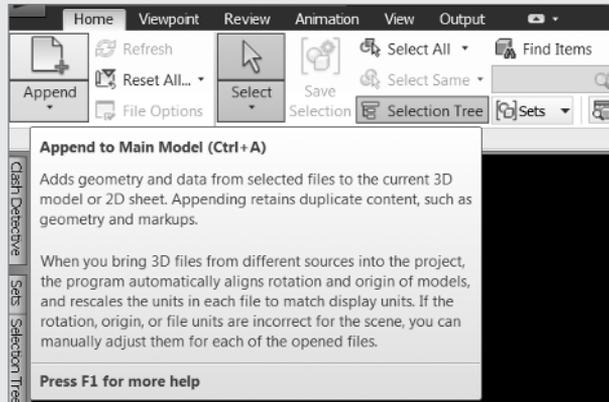
A basic starting point within Navisworks, the Application menu, or blue N, contains operations like New, Open, and Save. Several other useful operations that can be performed from here are shown in Figure 1.1.

FIGURE 1.1
The blue N, or
Application menu



TOOLTIP

If you pause and hover your mouse cursor over any area in Navisworks, you get a tooltip, as shown here. Tooltips briefly explain the tool and may contain information about shortcuts (such as pressing Ctrl+A for Append). Also, if you leave your mouse in place a little longer, you will gain a longer explanation of the tool—the tooltip will expand into a definition from the help file.



New Closes the currently open file and opens a new file.

Open Opens a new file (see Figure 1.2). Note that using Open while another file is already open will close that currently open file. You want to use Append and Merge to add additional files. Options include:

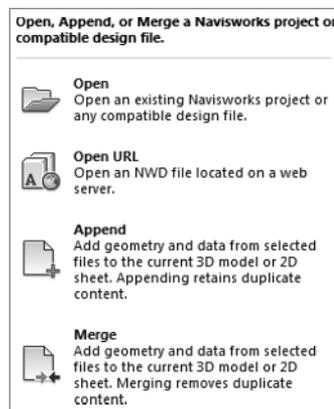
Open Opens a new file while closing the currently open file.

Open URL Opens a file from a URL, usually a website location.

Append Appends additional files into already open files and merges duplicate geometry.

Merge Merges a selected file into other files and adds only new information such as new geometry, new viewpoints, and new clashes.

FIGURE 1.2
Additional Open
operations



Save Saves the current file.

Save As Allows you to save the file in a different location or as a different file type (for example, as an NWD or NWF file). It allows you to save up to three versions back.

Export Contains the Export operations (see Figure 1.3). Many of the other operations are located on the Output tab, explained later in this chapter.

Publish Creates an NWD file. (An NWD file contains all model geometry together with Navisworks-specific data, such as review markups, viewpoints, or timeline sequence.) Also available on the Output tab.

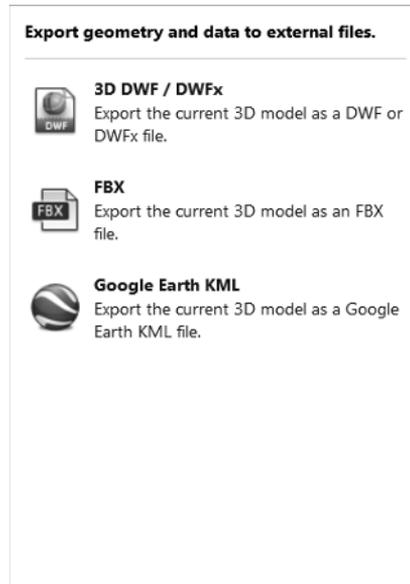
Print Contains Print, Print Preview, and Print Setup operations. Also available on the Output tab.

Send By Email Saves the current file as an NWD and uses your default email application to prepare an email to send. Also available on the Output tab.

Recent Documents This list shows all of the recently opened documents. You can control the order by Size, Access Date, Type, or Ordered List (default). Projects are only added to this list with the Normal view selected. If Classic view is used to open a file, no project will be added to this list. All appended files will be added to this list when brought into a project.

Options Opens the Options Editor. You can also access the Options Editor by using Ctrl+F12.

FIGURE 1.3
Export flyout



Quick Access Toolbar

The Quick Access toolbar (Figure 1.4), located adjacent to the Application menu, is a series of predefined operations. By default, you can find New, Open, Append, Merge, Save, Print, Refresh, Undo, and Redo.

FIGURE 1.4
Quick Access toolbar



The Quick Access toolbar is customizable. You can remove tools by right-clicking the item you wish to remove or by clicking the down arrow to the right of the bar and clicking the option you wish to remove. You can add tools by selecting them from the tab and panel locations, right-clicking, and then choosing Add To Quick Access Toolbar.

Help Toolbar

Another useful toolbar in Navisworks, the Help toolbar (Figure 1.5), provides a central location for Search, Subscription Center access, Communication Center, Favorites, general Help, and the About page. This menu cannot be customized.

FIGURE 1.5
Help toolbar



Search Enter information in the search field to begin searching within Navisworks, online, and within the help file. You can customize the locations with additional sites.

Subscription Center By clicking the key icon, you can get access to the Subscription Center (membership required), where you can create support requests and view the e-learning catalog as well as other Subscription Center items.

Communication Center By clicking the satellite dish icon, you can access controls to get Navisworks product updates and announcements.

Favorites Click the star icon to store information from Search and the Subscription and Communication Centers.

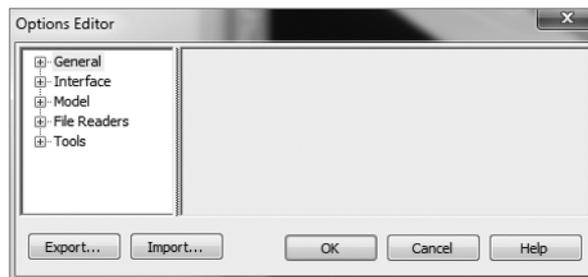
Help The question mark icon connects you to Help, the Getting Started Guide, and the New Features Workshop. Help also contains information about the version of Navisworks you are using in addition to providing access to the license checkout function, if you are using a networked license.

About The small drop-down arrow at the right end of the Help toolbar connects you to information about the current version of Navisworks you are running. About also allows you to check out or return a license file on a network license.

Navisworks Options

Options, or the Options Editor (sometimes referred to as Global Options), is used to adjust the program settings for Navisworks. The settings that you change here are retained across different Navisworks sessions. Settings can also be shared across a project team via the import/export feature (Figure 1.6).

FIGURE 1.6
Navisworks Options Editor



Let's look at each page of the Options Editor.

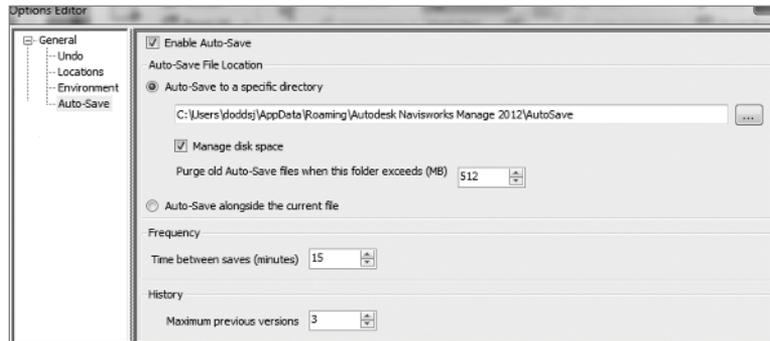
GENERAL

Use the General settings (see Figure 1.7) to adjust the buffer size, file locations, number of recent file shortcuts you want Navisworks to store, and the Auto-Save options. Additional options include:

Undo Specifies the amount of space Navisworks uses for undo/redo operations.

Locations Enables the sharing of centralized project information for the project directory and site directory.

FIGURE 1.7
General options,
with the Auto-Save
settings shown



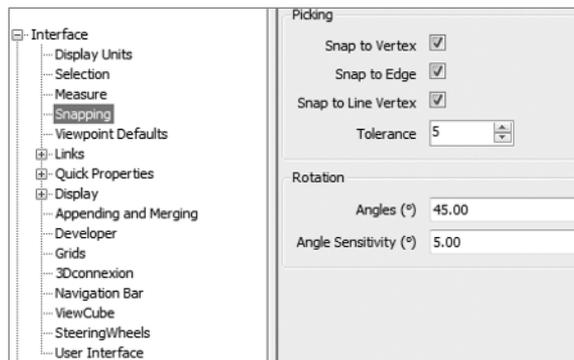
Environment Specifies the maximum number of recently opened files for Navisworks to display. The default setting is 4 with a maximum of 16.

Auto-Save Controls the settings for the Navisworks Auto-Save feature. From here, you can specify the save interval (30 minutes is recommended), the save location, and the number of save versions you want to maintain.

INTERFACE

Use the settings on the Interface page (see Figure 1.8) to customize the behavior of Navisworks. Additional information includes:

FIGURE 1.8
Interface options,
with the Snapping
options shown



Display Units Changes the Navisworks display units. Meters are the default setting for new Navisworks files.

Selection Configures the way geometry is selected and highlighted within Navisworks.

Pick Radius Specifies the radius that an object has to be within to be selected.

Resolution Specifies the level of selection. If you have problems selecting objects, you might try changing these settings.

Compact Tree Specifies the level of detail to display on the Compact tab of the selection tree.

Highlight Controls the Highlight settings. When the Enabled box is unchecked, selected items are no longer highlighted.

Measure Use these options to adjust the settings for the Measure tools.

In 3D Allows accurate measurements in 3D. This tool allows you to find the distance of 3D objects in a view. When 3D is not selected, Navisworks defaults to a 2D object defined by the points you select. In 3D changes the way the measurements are shown. If the measurement line is obscured by model geometry, it will be hidden when In 3D is selected.

Use Center Lines With this check box selected, the Shortest Distance measurements snap to the center lines of the selected object. When Use Center Lines is not selected, the surface of the object is used.

Snapping Enables Snaps within Navisworks (Vertex, Edge, and Line Vertex). Enabling this tool is useful in conjunction with Measure tools.

Viewpoint Defaults These options define the attributes that are saved with saved viewpoints.

Settings Opens the Default Collision dialog box. Allows you to control settings from the Third Person avatar. This dialog box can also be accessed from the Viewpoint tab under Edit Viewpoints.

Links This page allows you to customize how links are displayed within Navisworks.

Quick Properties Customizes the way Quick Properties are displayed. Use this page to set up additional Quick Properties categories or choose to hide Quick Properties using this tab.

Developer Select this option if you want to enable the Geometry tab and the Transform tab within the Properties palette. This tab also enables the use of Hard Conservative clash tests.

Display Adjusts display performance.

Occlusion Culling Select this check box to enable or disable the Culling feature. Enabling Culling means that Navisworks draws only visible objects and ignores other objects.

Grids Grids allow you to change the options for the Grids and Levels tool found on the View tab. Here, you can change options such as color, font size, and grid transparency (X-Ray mode).

3Dconnexion Controls the settings for a 3D mouse or motion controller mouse, often referred to as a space mouse (including speed). A space mouse can be used as an alternative (or in addition) to the mouse to move around the scene view.

Navigation Bar Used for customizing the Navigation Bar and legacy navigation tools.

ViewCube Customizes the behavior of the ViewCube® tool.

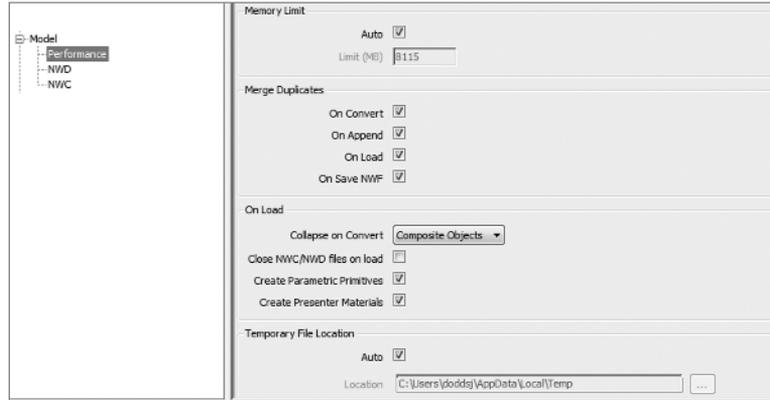
SteeringWheels Customizes the behavior of the SteeringWheels® tool.

User Interface Used to switch between Standard (ribbon) and Classic (toolbars) interface mode.

MODEL

Use the Model settings (see Figure 1.9) to optimize the performance of Navisworks and to customize parameters for NWD and NWC files. Additional options include:

FIGURE 1.9
Model options,
with Performance
options shown



Performance Optimizes the performance of Navisworks.

Memory Limit Specifies the amount of physical memory that Navisworks uses.

Merge Duplicates Allows you to control how and when information is merged into Navisworks.

On Load Optimizes the performance of Navisworks when loading files into Navisworks.

- ◆ **Collapse On Convert:** Collapses the tree structure.
- ◆ **Close NWC/NWD Files On Load:** Controls whether or not the NWC/NWD files are locked for editing. When this box is unchecked, the files will be locked for editing. Checked means that these files are closed once loaded into memory and can be edited.
- ◆ **Create Parametric Primitives:** Improves speed and performance by using Parametric objects.
- ◆ **Create Presenter Materials:** Allows you to create and use materials when an NWC file is loaded.

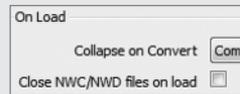
NWD Enables and disables geometry compression for the NWD file format.

NWC Use this page to manage the file options for the NWC file format.

Caching With these boxes checked, Navisworks creates and saves to a cache file, or NWC. This is a recommended setting because NWC files are typically smaller than their original files.

THE CLOSE NWC/NWD FILES ON LOAD OPTION

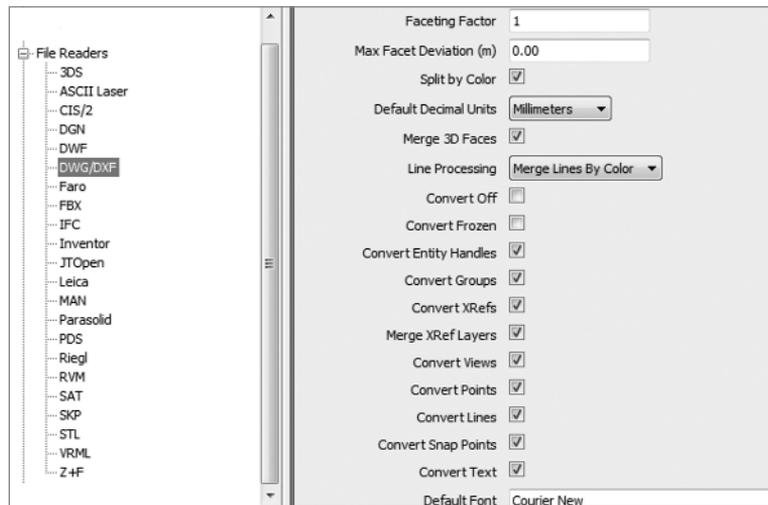
Depending on your workflow and what your needs are, you should give this check box careful consideration. If you leave Close NWC/NWD Files On Load unchecked, you will not be able to update your NWC/NWD files on the fly. In other words, if you are working on an active project (coordination meetings, for example) and find yourself updating files often, you would have to close Navisworks in order to update the NWC/NWD files loaded in the project. With this box checked, you can modify your files during the project.



FILE READERS

Use the File Readers settings (see Figure 1.10) to configure the file readers required to open native CAD, BIM, and scanning application file formats in Navisworks.

FIGURE 1.10
File Readers page,
with options for
DWG/DXF shown



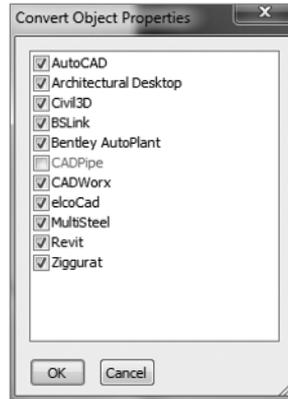
DWG/DXF Adjust options for the DWG™/DXF™ file reader.

Merge 3D Faces Allows the file reader to merge the 3D faces of DWG/DXF objects into a single item in the selection tree. This helps to lessen the number of items selected.

DWG Loader Version Allows Navisworks to select which version of the Autodesk object enablers to use when loading a DWG file. If the DWG Loader Version needs to change, Navisworks must be restarted for this setting to take effect.

Advanced Use the Convert Object Properties dialog box (click Advanced to open this dialog) to select third-party applications for the file reader to read additional options from (Figure 1.11).

FIGURE 1.11
Convert Object
Properties
dialog box

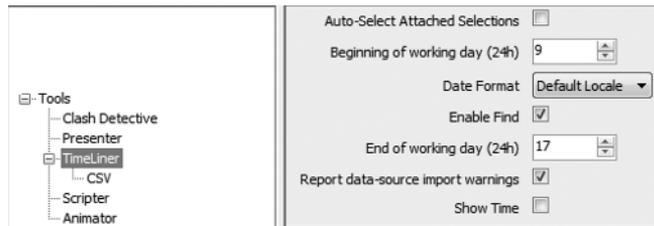


All other file readers adjust the options for the file type they are associated with.

TOOLS

Use the Tools settings (see Figure 1.12) to adjust the options for Clash Detective, Presenter, TimeLiner, Scripter, and Animator. Options include:

FIGURE 1.12
Tools options,
with settings for
TimeLiner shown



Clash Detective Customizes Clash Detective options.

Presenter Customizes Presenter options.

Profile You can adjust Presenter profiles to reflect your level of comfort or knowledge. The Basic setting is the Navisworks default and has a limited editing functionality. Standard has some advanced Presenter features. Advanced gives you access to such features as extra materials, lights, and render styles.

Interactive Materials When this check box is cleared, materials are not displayed during navigation. This decreases the load on the video card and can improve performance.

Interactive Lighting When this check box is cleared, lights are not displayed during navigation. This decreases the load on the video card and can improve performance.

TimeLiner Customizes TimeLiner options.

Auto Select Attached Selections When enabled, automatically selects attached objects in TimeLiner.

Display Synchronization Errors When enabled, indicates that error messages will display when synchronizing tasks from eternal links in TimeLiner.

CSV File: Read and Write Encoding Specifies the file format of the imported or exported CSV file.

Scripter Use these options to customize the Scripter settings.

Animator A check box indicates whether or not a manual entry is shown in the Animator.

IMPORT AND EXPORT

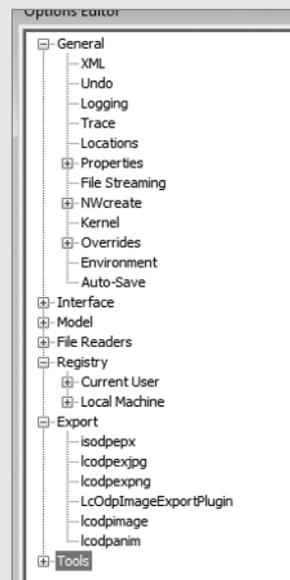
These settings allow you to export the current Options settings into an Options XML file; you can choose which categories are exported. These items may also be imported using the Import feature.

From a workflow perspective, it may be useful to save individual files for each category (General, Interface, and so forth) per project. This way, specific settings are retained as needed and can be shared among users quickly and easily.

For additional information on the Options Editor, see “External Options Editor” in Appendix B, “Additional Resources and Tips.”

SHIFT + GLOBAL OPTIONS = ADVANCED OPTIONS

There might come a time when you need to expose more options than you are given by the standard Options Editor. To access more Global Options, right-click, hold down the Shift key, and select Options.



This will expose additional tools like the Navisworks Windows Registry. But be warned you will be making changes to the Windows Registry at this level. This should be reserved for only the advanced users.

You can find other useful additions here like changing the default image size to the Clash Detective so you are able to export larger images when sending out clash reports.

Exploring the Ribbon

The ribbon, located at the top of the user interface, is a palette that groups the entire Navisworks toolset into an easy-to-find and -use location. The ribbon is divided into tabs, with each tab supporting a specific activity or task. Within each tab is a series of panels that contain the available tools.

While you are not able to add to or remove custom commands from the ribbon, you can customize the appearance and location of the panels using these methods:

- ◆ Right-click the tab or panel to open the context menu. From here, you can turn tabs or panels on or off.
- ◆ Left-click and hold a specific panel to move its location. You can change its location to a new place within the tab or drag it out into the workspace to make it more accessible. Panels may not be moved to other tabs.
- ◆ To reset the panel to its default position, right-click on an empty location on the panel and click Restore Default Ribbon.

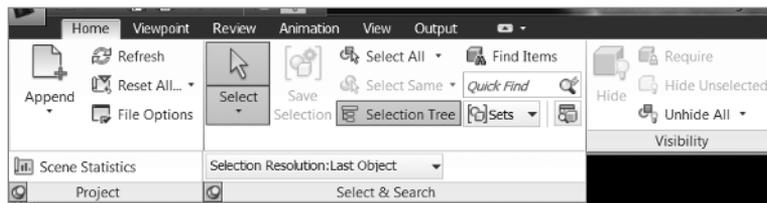
PUSHPINS

Any time you see a pushpin icon, you can click it to pin an item to the screen. This will allow the panel or palette to stay on top and remain open as you move to other tools in Navisworks.

Home

The Home tab contains Project, Select & Search, Visibility, Display, and Tools panels (Figure 1.13 and Figure 1.15).

FIGURE 1.13
Home tab, showing additional tools enabled



PROJECT

Append Appends, or combines, files. The drop-down also contains Merge.

Refresh To ensure that you are working with the most current information, Navisworks contains a Refresh feature.

Reset All Uses the various tools to reset changes applied in Navisworks.

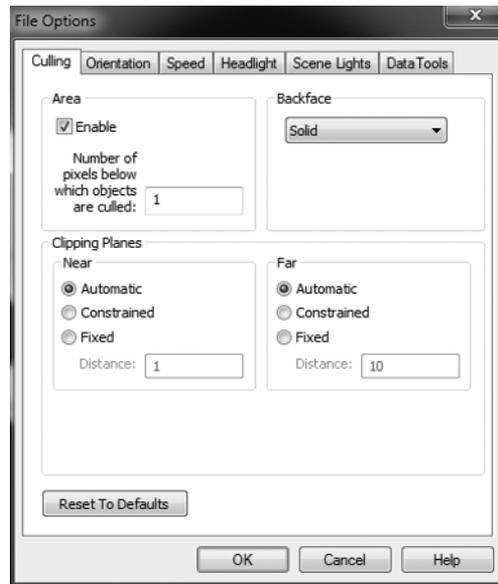
Appearance Returns all color and transparency overrides to their original state.

Transforms Resets all Transforms overrides to their original state.

Links Resets all links applied to their original state. Deletes all links made in Navisworks and retains only links inherited from the original files.

File Options This dialog box (see Figure 1.14) controls the appearance of the model as well as the speed of navigation around it. Changes made in this dialog box are for the current session only, and options are returned to the defaults when the model is closed.

FIGURE 1.14
File Options
dialog box



Culling Use this tab to adjust geometry culling (that is, the ability to navigate large areas) in the open Navisworks file.

Orientation Use this tab to adjust the real-world orientation of your model.

Speed Use this tab to adjust the frame rate speed to reduce the amount of dropout during navigation.

Headlight Use this tab to change the intensity of the scene's ambient light and headlight for Headlight mode. This setting is useful to customize the lighting as you navigate.

Scene Lights Use this tab to change the intensity of the scene's ambient light for Scene Lights mode. This setting is useful to define a different lighting scheme as you navigate the model.

Data Tools Use this tab to create and manage links between open Navisworks files and external databases. You will not likely use this setting often.

Scene Statistics An extremely useful tool, Scene Statistics lists all of the files contributing to aggregated elements, or the “scene.” It also shows the various graphic elements that help to make up the scene. Use Scene Statistics when an object enabler appears to be missing or when certain objects are not showing up properly.

SELECT & SEARCH

Select Allows you to select objects with your mouse. Also available within the drop-down list is Select Box, which allows you to select all items within a defined box.

Select All Selects all objects within the model.

Select None Deselects the current selection. Pressing the Esc key has the same function.

Invert Selection Deselects the currently selected items and selects the currently unselected items. In short, it selects the opposite of what you had selected.

Save Selection Saves the currently selected objects as a selection set and opens the Sets window. The set can then be renamed and modified.

Select Same Allows you to select multiple instances of the selected item or group of items. Also opens to the Select Same drop-down for additional selection criteria and options.

Selection Tree Toggles the selection tree on and off. The selection tree is a palette that displays a variety of categorized views of the structure of the model depending on the loaded model.

Find Items Toggles the Find Items palette on and off.

Quick Find A simplified version of Find Items, Quick Find allows you to search the scene using the Quick Find dialog box.

Sets Displays a list of defined search and selection sets. You can access the Sets palette from this drop-down.

Selection Inspector Displays a list of all selected objects showing their Quick Properties information. Quick Properties information can be customized in the Options Editor.



VISIBILITY

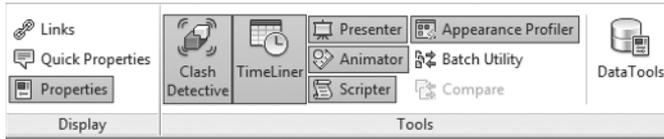
Hide Hides selected items from display. You can select multiple items to hide them and at different intervals. The items also appear grayed out in the selection tree to represent hidden.

Require Forces an item to remain visible regardless of performance settings, such as culling. When an item is set to Required, it will appear red in the selection tree. Required items can still be hidden; the Required setting is mainly to help ensure that items will not be dropped from view when you have to change your performance settings.

Hide Unselected Hides all items except those that are currently selected. This tool is useful when you’re trying to build a selection set and ensure the items that you have selected.

Unhide All Reveals all hidden items in the scene. The drop-down also contains Unrequire All, which sets required items back to optional.

FIGURE 1.15
Home tab
continued



DISPLAY

Links Displays or hides links. Several types of links display in Navisworks: Hyperlink, Label, Viewpoints, Clash Detective, TimeLiner, Sets, Redline tags, and user-defined links. You can use the Options Editor to toggle the display of each of the link categories and also to control their appearance.

Quick Properties When enabled, Quick Properties displays brief information about the object in a tooltip type of display. You can edit the type of information that is displayed in the Options Editor.

Properties Toggles the Properties palette on and off. The Properties palette displays available properties for a selected item. If more than one item is selected, the Properties palette will display only the total number of selected items and no additional property information.

TOOLS

Clash Detective Toggles the Clash Detective palette on and off. Clash Detective enables you to interactively search your model for clashes or interferences.

TimeLiner Toggles the TimeLiner palette on and off. TimeLiner allows you to create 4D simulations of your project, linking time with modeled objects.

Presenter Toggles the Presenter palette on and off. Presenter allows you to apply materials and lighting to your model to aid in creating renderings.

Animator Toggles the Animator palette on and off. Animator allows you to animate objects to bring realism to your project.

Scripter Toggles the Scripter palette on and off. Scripter adds interactivity to your animated objects.

Batch Utility Opens the Batch Utility dialog box. From here, you can create a list of all design files, append multiple design files into a single NWD or NWF file, and convert multiple design files into individual NWDs.

Appearance Profiler Toggles the Appearance Profile palette on and off. This tool lets you create custom appearance profiles for items based on properties or sets (Search and Selection). Then you can use the appearance profiles to essentially color-code the objects in your model to help identify or differentiate status or type.

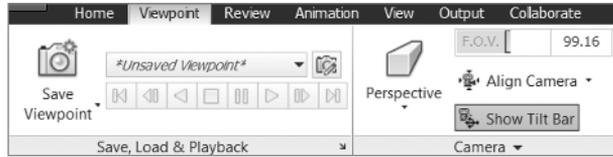
Compare Opens the Compare dialog box. You can look for differences between any two items selected in the model. These items can be files, layers, instances, groups, or geometry.

Data Tools Opens the Data Tools dialog box. From here, you can connect Navisworks to external databases and create links to objects within the model.

Viewpoint

The Viewpoint tab contains the Save, Load & Playback panel as well as the Camera, Navigate, Render Style, Sectioning, and Export panels (Figure 1.16 and Figure 1.17).

FIGURE 1.16
Viewpoint tab



SAVE, LOAD & PLAYBACK

Save Viewpoint Saves a viewpoint of the current view. The saved viewpoint retains the properties and attributes of the current view when the Save Attributes setting in the Options is selected. There is also a Record feature to record your actions (Walk, Fly, Zoom, and other actions in Navisworks). The recording is saved in the Saved Viewpoints window.

Animation Controls See “Playback” in the section “Animation.”

Edit Viewpoint Opens the Edit Viewpoint dialog box. This dialog box allows you to edit any viewpoints attributes, including camera position, field of view, speed of motion, and saved attributes. The Collision dialog box is located within the Edit Viewpoint dialog box, allowing you to adjust collision settings for the current viewpoint.

Saved Viewpoints Dialog Launcher Toggles the Saved Viewpoints palette.



CAMERA

Perspective Allows you to choose between Orthographic or Perspective mode. Walk and Fly navigation tools are not available in Orthographic mode. Tip: If the view becomes distorted when you switch between modes, undo the switch, use the Focus tool, and then switch modes.

Field Of View (F.O.V.) Defines the area of the scene that the camera can view. The lower the number, the narrower the camera angle or the closer you are to the object being viewed. You can you edit existing or saved Field Of View settings using the Edit Viewpoint dialog box. The higher the number is, the more distorted the model looks.

Align Camera Opens the Align Camera drop-down, which allows you to use these tools to align the camera to the chosen axis:

Align X Aligns the camera to the x-axis.

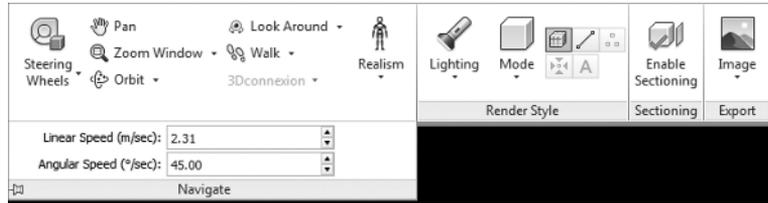
Align Y Aligns the camera to the y-axis.

Align Z Aligns the camera to the z-axis.

Straighten A useful tool to straighten the view when you find yourself askew, which can often occur when using some of the navigation tools such as Fly and Orbit. It works only when the view is within 13 degrees of a face of the ViewCube.

Show Tilt Bar Toggles the Tilt Bar off and on. Tilt adjusts the vertical angle of the camera.

FIGURE 1.17
Viewpoint tab
continued



NAVIGATE

Navigate Tools Included on the Viewpoint tab are Navigation tools to help to move around the model. Here, you can find tools for Pan, Zoom Window, Orbit, Look Around, Walk, and SteeringWheels. Most of these tools can also be found on the Navigation Bar.

Realism Toggles the Realism settings on and off for the following options. Figure 1.18 shows one result of working with Realism settings: a construction worker avatar in a crouching position.

Collision Enabling Collision allows you to navigate the model with mass. As you interact with the model and come into contact with objects like doors or columns, you stop or are unable to pass through that object. You can change or customize the size of the Collision Volume to reflect the needs of the user or collision requirements. Collision can only be used with the Walk and Fly tools.

Gravity This tool gives you the appearance of weight. When you are using the Walk tool and you begin to move, you will “fall” until you reach a surface. Gravity works best when Collision is also active so that when a surface is contacted, the falling stops. Use Gravity in conjunction with Collision to walk up or down stairs. Gravity can only be used with the Walk tools. If Gravity is selected, Collision is automatically turned on. You cannot have Gravity without Collision.

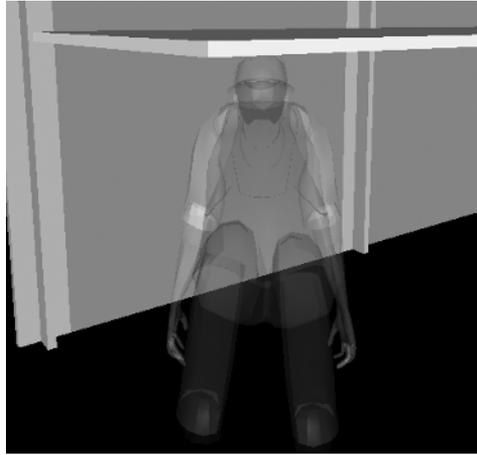
Crouch With Crouch activated, you will automatically crouch under any objects that you cannot freely walk under at the specified avatar height. This can be useful for checking clearance heights under pipes and other equipment.

Third Person When Third Person is active, it turns on Third Person view, or an avatar, which you can use as a representation of yourself while navigating the model. Third Person has other added benefits like working with Gravity, Collision, and Crouch. When you’re using the avatar for Collision, it will turn red when it approaches another item. Also, you can customize Third Person by changing the avatar selection and dimensions.

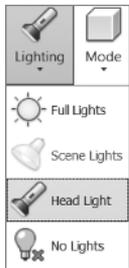
Linear Speed Sets the linear speed, which is the speed the Walk and Fly tools use when navigating through the model. The 5–10 ft/sec range is ideal for an average walking pace. This is a temporary setting specific to the view. If you change views, this setting will go back to the project default.

Angular Speed Sets the angular speed, which is the speed at which the Walk and Fly tools turn when navigating through the model. The 45–60 deg/sec range is ideal for an average walking pace.

FIGURE 1.18
Third Person with
Gravity, Collision,
and Crouch enabled



RENDER STYLE



Lighting Changes the Lighting mode within Navisworks to control how the 3D scene lighting is displayed.

Full Lights Uses the highest quality lighting available. Controlled by Presenter.

Scene Lights Uses the lights supplied with the appended files. If no lights are added, Navisworks will add two opposing lights. You can change the ambient lighting options using the File Options tool.

Headlights Uses a light that comes from the camera location. You can change the ambient lighting option using the File Options tool.

No Lights Does not use any lights in the view; geometry is rendered with flat lights.

Mode The Mode drop-down controls the options for displaying the scene geometry rendering and the level of materials to display.

Full Render In Full Render mode, the model is shown with materials and textures along with edges and smooth shading.

Shaded The model is shown with additional edges and smooth shading. Materials and textures are not included in this mode.

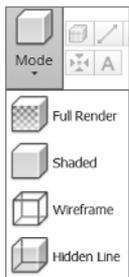
Wireframe The model is shown in Wireframe mode only. Materials and textures are not included in this mode.

Hidden Line The model is shown in Wireframe mode but only outline and facet edges are displayed; this hides additional lines over Wireframe mode. Materials and textures are not included in this mode.

Surfaces Toggles 3D surface geometry on and off.

Lines Toggles on and off the 2D lines that come from an appended file.

Points Toggles on and off the points that come from appended files. When you are inserting point cloud or laser scan data, it may be necessary to have the points enabled.



Snap Points Toggles on and off the rendering of snap points within the model.

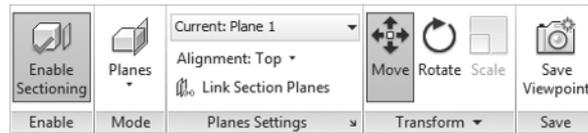
Text Toggles on and off 2D or 3D text that comes from appended files.

Using a combination of these tools when bringing in an AutoCAD® file or other vector-based file types helps to clean up the scene in Navisworks and create a display of only 3D geometry.

SECTIONING

Enable Sectioning Opens the Sectioning Tools tab (Figure 1.19). The Sectioning tools allow you to create cross-sections of your model. Sections can be enabled and disabled as needed.

FIGURE 1.19
Sectioning Tools tab



EXPORT

Image Saves an image file of the current view.

Rendered Image Saves a rendered image of the current view.

Piranasi EPix Saves a Piranasi EPix file of the current view.

Review

The Review tab contains Measure, Redline, Tags, Comments, and Collaborate panels (Figure 1.20).

FIGURE 1.20
Review tab



MEASURE

Measure Navisworks has tools that allow you to measure between points, calculate area, and convert measurements to redlines. The Measure tools are independent of Navigation tools. If you activate the Navigation tools (walk, fly, orbit, pan), you will have to go back to your Measure tools after using any of the Navigation tools. However, you can use the mouse tools for navigation (mouse orbit, pan and zoom) without affecting the Measure tools. Using the mouse tools can help you to also move to better align your measurement.

Use right-click or the Esc key to cancel any of the Measure tools. To clear the screen of the measurement after placement, use Clean as explained below.

Point To Point Measures the distance between two points.

Point To Multiple Points Measures the distance between a starting point or base point and any number of additional selected points.

Point Line Measures consecutive linear distances.

Accumulate Measures the total length of nonconsecutive linear measurements (keeps a running total of the linear measurements) until cleared or canceled.

Angle Measures the angular distance as defined by three selected points.

Area Measures the area of selected points.

Shortest Distance Measures the shortest distance between two selected objects (two objects must be selected; use the Ctrl key to select the objects as needed).

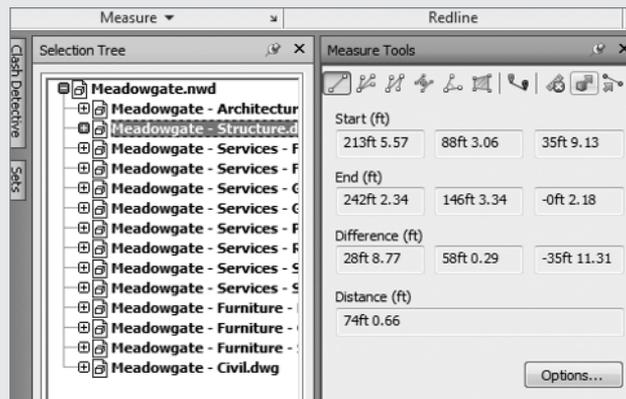
Convert To Redline Clears the measurement and converts it to a redline. The redline will be saved as part of the active viewpoint. If no viewpoint is selected, the Convert To Redline tool will create a new viewpoint automatically.

Clear Clears the current measurement from the screen.

Transform Selected Items Moves or rotates the currently selected object the distance specified by a measuring tool. Use Transform Selected Items to move the object in the direction that you specified. For example, if you selected the bottom of an object and then the top of an object with a measuring tool, your object will be moved up. Keep in mind that this is not a temporary transform that can be reset by using Reset Transform, but that it affects the file units and transforms; this is a permanent change to the object.

MOVING AN INCORRECT ELEMENT

Learning to use the Measure Transform tool can sometimes mean the difference between a project moving smoothly and a project with additional conflicts because of a misplaced appended item. There are times during an Append or Merge operation when objects could be improperly aligned, even given the best efforts of the project team. There is good news, though; all items in Navisworks can be moved. In most cases, entire file sets are selected and transformed to a new location.



Using the Measure Transform tool in conjunction with the selection tree lets you specify a distance to relocate the object. It helps to know a good reference or common location between the items when selecting your points. Another good idea is to have your snaps enabled when using the Measure Transform tool to help with selecting points.

REDLINE

Draw Allows you to add redline shapes and text notes to your model. Redlines can only be added to a saved viewpoint or to a clash, which has a saved viewpoint. If there are no saved viewpoints, adding a tag will automatically create and save a viewpoint for you. Otherwise, you will receive an error, and you'll have to save a viewpoint before adding any redlines.

Color Allows you to change the color of redlines.

Thickness Changes the line thickness of the redlines being added; 9 is the maximum thickness.

TAGS

Add Tag Inserts a tag into your model. If you have a viewpoint selected, the tag will be created within that viewpoint; otherwise, the tag will create its own viewpoint.

Tag ID Allows you to enter the tag ID or number to use with Go To Tag.

Go To Tag Once you enter the desired number, you can use the Go To Tag tool to take you to the tag.

Tag Selection Scrolls through the tag and its associated viewpoints.

Renumber Tag IDs Used to renumber the tag IDs; removes duplicates. This tool is useful when you're appending or merging files that may have existing tag IDs.

COMMENTS

View Comments Toggles the Comments palette on and off. From here, you can manage the comments created throughout the model.

Find Comments Opens the Find Comments palette. You can search through both comments and tags for text, author, comment ID, status, comment, and date modified.

Renumber Comment IDs Used to renumber the comment IDs; removes duplicates. This tool is useful when you're appending or merging files that may have existing comment IDs.

COLLABORATE

Collaborate Enables a collaboration session using Windows NetMeeting.

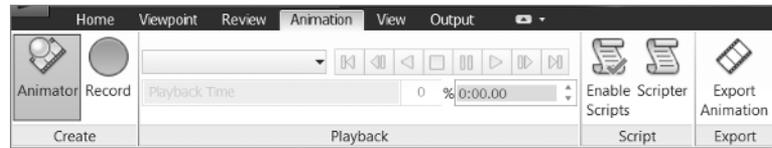
Drive Enables the user to become the driver of a remote computer.

Refresh Shares model updates with each member of the team.

Animation

This tab contains the Create, Playback, Script, and Export panels (Figure 1.21).

FIGURE 1.21
Animation tab



CREATE

Animator Toggles the Animator palette on and off (same as the Animator located on the Home tab). Animator allows for the animation of objects to bring realism to your project.

Record Begins to record your actions (Walk, Fly, Zoom, and other actions in Navisworks). The recording is saved as an animation in saved viewpoints that you can later edit or add to as needed.

PLAYBACK

After an animation has been created, you gain access to the Playback tools. From the drop-down, select the animation that you wish to play, and use the tools available to play the animation. You can also use the slide at the bottom of Playback to manually change the display of the playback.

SCRIPT

Enable Scripts Enables and disables scripts. Once a script has been created, it has to be enabled before the action created can be utilized. For example, if you created a script to operate a door on approach, enabling scripts will allow this to occur.

Scripter Toggles the Scripter palette on and off (same as the Scripter located on the Home tab). The Scripter adds interactivity to your animated objects.

EXPORT

Export Animation Exports the current animation.

View

The View tab contains Stereo, Navigation Aids, Grids & Levels, Scene View, and Workspace panels (Figure 1.22).

FIGURE 1.22
View tab



STEREO

Enable Stereo Stereo, or stereoscopic viewing, allows you to view the 3D model through stereo-enabled hardware (i.e., in true 3D), including active and passive stereo viewing glasses. This option is only available if you have the required hardware as well as the correct driver and display settings.

NAVIGATION AIDS

Navigation Bar Toggles the Navigation Bar on and off. Contains ViewCube, SteeringWheels, Pan, Zoom, Orbit, Look, Walk, and Fly tools.

ViewCube Toggles the ViewCube on and off. The ViewCube allows you to switch between views of your model. Use ViewCube to set a Home view that you can easily get back as you navigate around your model.

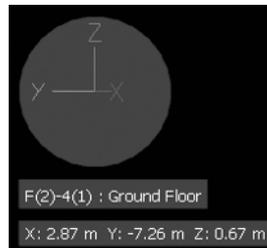
HUD In Head Up Display, or HUD for short, the x-, y-, and z-axes, the position readout, and the grids display on and off. All of the HUDs are displayed in the lower-left corner of the screen.

XYZ Axes As you can see in Figure 1.23, this option shows the X, Y, Z visual orientation of the camera (or the Third Person position if Third Person has been enabled).

Position Readout As you can see in Figure 1.23, this option shows the X, Y, Z textual position of the camera (or the Third Person position if Third Person has been enabled).

Grids Displays the Grid location HUD, as shown in Figure 1.23. With the Grid HUD turned on, you can see your level as well as the grid reference.

FIGURE 1.23
XYZ axes, position
readout, and grids



Reference Views Toggles the Plan and Section views on and off. Both reference views allow you to gain perspective and location within your model, especially in large models. To use this feature, drag the white triangle to move yourself around. Additional tools are available on the context menu to aid in navigation.

GRIDS & LEVELS

Show Grid Toggles the grid on or off.

Mode Allows you to change how the grid is displayed in Navisworks. Choose from Fixed, Below, Above, or Above And Below.

File Permits you to choose the active file and change settings for the grids as needed.

Level Controls the default level based on the active file.

SCENE VIEW

Full Screen Clears away all tabs and palettes and displays Navisworks in Full Screen mode. Press F11 to exit Full Screen mode and return to your tools.

Split View Allows you to add horizontal and vertical screen splits. Each view can be set to represent a different view of the model. Only one view can be active at a time.

Background Opens the Background Settings dialog box, which allows you to change the background color and scheme.

Window Size Opens the Window Size dialog box, which allows you change the size of the Navisworks canvas. If you change the size and want to return to the default, change back to Use View.

Show Title Bars Show or hides the title bars on secondary display view windows.

WORKSPACE

Windows Serves as a central list all of the palettes and toggles them on and off.

Load Workspace Workspaces retain information about which windows are open, their positions, and the size of the application window. The Load Workspaces drop-down contains predefined workspaces as well as any custom workspaces. Workspaces do not maintain changes to the ribbon but do include changes made to the Quick Access toolbar.

Safe Mode Opens the workspace with minimal features.

Navisworks Minimal Loads the workspace with the fewest tools and most space in the scene.

Navisworks Standard Loads the workspace with the most commonly used tools and palettes.

Navisworks Extended Opens the workspace with the most tools. This workspace is recommended for advanced users.

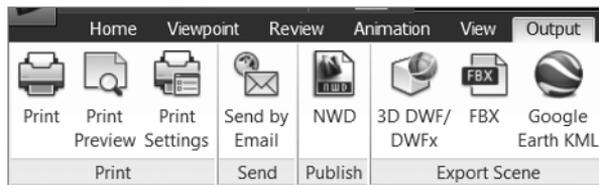
More Workspaces Opens previously saved workspaces.

Save Workspace Saves the current workspace as an XML file.

Output

The Output tab contains Print, Send, Publish, Export Scene, Visuals, and Export Data panels (Figure 1.24 and Figure 1.26).

FIGURE 1.24
Output tab



PRINT

Print Sends the current view to a printer.

Print Preview Creates a preview of the view to be printed.

Print Settings Allows you to specify the printer settings.

SEND

Send By Email Saves the current file and uses your default email application to prepare an email to send. It can be used to send either an NWF or NWD file, but an NWD file is considerably larger. Make sure the file size meets the requirements of the email provider.

PUBLISH

NWD Creates an NWD file (NWD is a file that contains all model geometry together with Navisworks-specific data, such as review markups, viewpoints, or timeline sequence). You can also set options such as May Be Re-saved or set the file to expire within a certain time-frame (Figure 1.25).

FIGURE 1.25
Publish dialog box

The image shows the 'Publish' dialog box with the following fields and options:

- Title: [Dropdown menu]
- Subject: [Dropdown menu]
- Author: [Dropdown menu]
- Publisher: [Dropdown menu]
- Published For: [Dropdown menu]
- Copyright: [Dropdown menu]
- Keywords: [Dropdown menu]
- Comments: [Dropdown menu]
- Password: [Text field]
- Display at password
- Expires: 9/21/2010
- May be re-saved
- Display on open
- Embed Textures
- Embed Database Properties
- Prevent Object Property Export
- OK button
- Cancel button

When using Publish to create an NWD file, you can't save to previous versions of Navisworks, but you have access to all the other features and functions of Publish. If you need to create an NWD file for an older version of Navisworks, you will have to use Save As instead. The downside is that you will no longer have access to the Publish options.

EXPORT SCENE

3D DWF Exports all materials and geometry into a 3D DWF file.

FBX Exports an FBX® file out of Navisworks. Allows you to include things like lights, cameras, and textures in your export.

Google Earth KML Google Earth KML files can be exported from Navisworks. The exporter creates a compressed KML file with the extension .kmz.

VISUALS

FIGURE 1.26
Output tab
continued

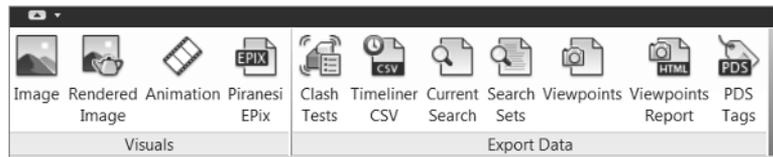


Image Opens the Export Image dialog box. This dialog box allows you to export an image of the current scene.

Rendered Image Opens the Rendered Image dialog box, which allows you to export a rendered image.

Animation Opens the Animation Export dialog box. You can choose from Source, Renderer, Output Type, and Size.

Piranesi EPix Exports an EPX file for rendering in Piranesi from Informatix.

EXPORT DATA

Clash Tests Exports the settings for all of the clash tests created in Clash Detective into an XML file.

TimeLiner CSV Exports the current TimeLiner tasks into a CSV file.

Current Search Saved Find Items criteria can be exported from Navisworks into an XML file and imported into other sessions of Navisworks.

Search Sets Saved search sets can be exported from Navisworks into an XML file and imported into other sessions of Navisworks.

Viewpoints Exports all of the viewpoints into an XML file. This is a text-based XML file and the images are not exported. This file contains all associated data, including camera positions, sections, hidden items, material overrides, redlines, comments, tags, and collision-detection settings. The XML file can be imported into other Navisworks files, and it creates all the views from the original project.

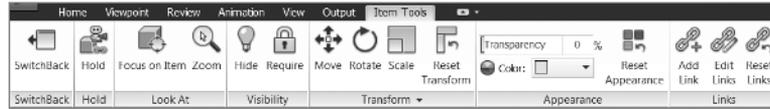
Viewpoints Report Creates an HTML file or report of JPEG files of all saved viewpoints. The report contains camera position, comments, and other associated data. If you have created an animation, the report will also include the animation frames as individual images as part of the report.

PDS Tags Exports all PDS tag data from the model into a TAG file.

Item Tools

The Item Tools tab (Figure 1.27) gives you a centralized location for several useful tools, such as Hold, Zoom, and SwitchBack. When you select an item from the selection tree or canvas, Item Tools will appear and let you take advantage of the following tools:

FIGURE 1.27
Item Tools tab



SwitchBack SwitchBack allows you to select an object and open a similar view for editing in its authoring program; in this case, it would be Revit, AutoCAD and AutoCAD-based programs, and MicroStation and MicroStation-based programs. You must have the corresponding program installed on the same computer as Navisworks in order for SwitchBack to work.

In Navisworks 2011 and earlier, you could only access SwitchBack from the Clash Detective Results tab. It was added to the Item Tools tab in Navisworks 2012 to improve workflow.

Hold The Hold function allows you to pick an object and physically “hold” onto it as you navigate through your model. That means that when you have an object selected and you’re using a tool like Walk or Fly, you could have an object Walk along your path with you.

The object itself does not respect things like Gravity and Collision, but at least you have a visual representation of your item as you navigate through the model.

The Hold function can be useful for things like equipment moving down a hallway or moving a duct run briefly to understand the impact farther down the line. Let’s briefly explore the concept of how to use Hold:

1. Select an object.
2. Select Hold from the Item Tools tab.
3. Use a Navigation tool (Walk, Fly, Orbit, Pan, Zoom, etc.) to move around your model. Your object will move with you.
4. When you are finished, you can select the object again and use Reset Transform to return the object to its original location.

Look At Provides quick and easy access to the Focus On Item and Zoom tools, which are also located on the Navigation Bar.

Visibility Provides additional access to Hide and Require, which are also located on the Home tab.

Transform Within Navisworks, you have the ability to both visually and dimensionally move objects. The Transform tools located here allow for moving, rotating, and scaling objects. You also have access to the Dimensional drop-down as well.

When objects have been transformed, you can select the object later and use Reset Transform to return the object to its original position.

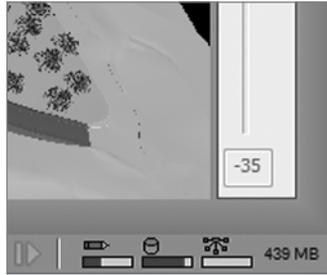
Appearance Gives you access to object appearance tools so you can change things like color and transparency of your objects. Use Reset Appearance to restore an object to its original state.

Links Gives you a centralized location for the Link tools, where you can add, edit, and reset the links for your model.

Status Bar, Performance Indicators, and Context Menus

Located in the bottom-right corner of the screen is the status bar, which contains four performance indicators that give you feedback on the performance of your computer and currently loaded Navisworks model (Figure 1.28).

FIGURE 1.28
Status bar



Pencil Bar Indicates how much of the current view is drawn, that is, how much image dropout there is in the current view. When the progress bar is at 100 percent, the scene is completely drawn, with no dropout. The icon changes color when a redraw is in progress. While the scene is being drawn, the pencil changes to yellow. If there is too much data to handle and your computer cannot process this quickly enough for Navisworks, then the pencil changes to red, indicating dropout.

Disk Bar Indicates how much of the current model is loaded from the local hard drive. When the progress bar is at 100 percent, the entire model, including geometry and property information, is loaded into memory. The icon changes color when a file load is in progress. While the data is being read, the disk changes to yellow. If there is too much data to handle and your machine cannot process it quickly enough for Navisworks, then the disk changes to red, indicating a potential problem.

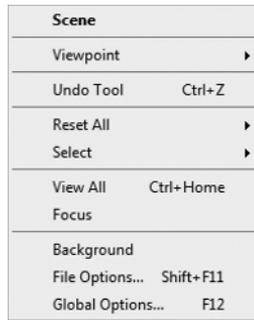
Web Server Bar Indicates how much of the current model is downloaded from a web server. When the progress bar is at 100 percent, the entire model has been downloaded. The icon changes color when a file load is in progress. While data is being downloaded, the web server changes to yellow. If there is too much data to handle and your computer cannot process it quickly enough for Navisworks, then the web server changes to red, indicating a potential problem.

Memory Bar Indicates the amount of system memory being utilized by Navisworks.

Navisworks uses a few context menus that contain various tools. These tools can help you save time once you master when and how to leverage them.

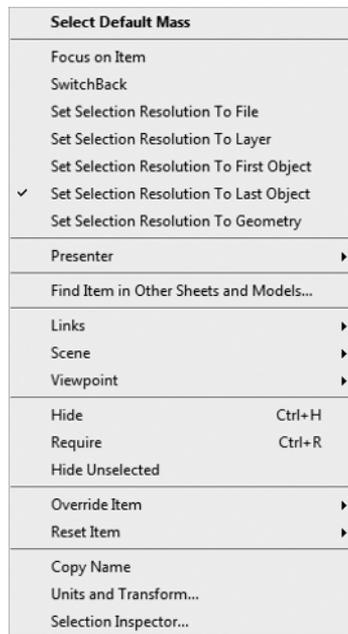
No Item Selected This context menu (Figure 1.29) has a variety of tools that are found across various tabs and toolbars within Navisworks but that have been centralized for easy access. Access this menu by right-clicking in white space away from geometry. Once the menu is open, select your tool.

FIGURE 1.29
Context menu, with
no items selected



With Item Selected The With Item Selected context menu contains even more tools to help you along your way. Access this menu (Figure 1.30) by right-clicking once you've selected the geometry. If you right-click when no geometry is selected (right-clicking on the object instead of selecting it first), Navisworks will select that single piece of geometry and open this context menu as well, saving you the step of having to select the object first.

FIGURE 1.30
Context menu, with
an item selected



Notice that under the Scene flyout, the No Item Selected context menu can still be accessed. Take note of the additional flyout tools available as well: Links, Viewpoint, Override Item, and Reset Item.

The Bottom Line

Understand the ribbon. Knowing the locations of various tools within the Ribbon provides a good foundation for being able to quickly access items across the Navisworks interface.

Master It Can you quickly locate Gravity and Collision?

Use the Measure and Redline tools. The Measure and Redline tools are useful in Navisworks throughout a project, and having a basic understanding of these tools is essential.

Master It Locate two columns and use the Measure Shortest Distance tool. Can you create a viewpoint and convert this to a redline?