

Interactive Highway Safety Design Model (IHSDM)

Running IHSDM Software Manual

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1. Introduction

This document is a brief introduction to using the IHSDM software. This document assumes you have successfully installed and configured IHSDM. If not, refer to the Getting Started Guide and the Installation Manual.

2. Graphical User Interface

IHSDM is a set of highway safety analysis software tools that share a common graphical user interface (GUI). The GUI can render tooltips for data entry and control items. The mouse right-click action invokes a pop-up menu with menu items related to data entry and context sensitive help. Details on the structure of the GUI are discussed in Using the IHSDM Graphical User Interface. The primary application window, the Master Control Module, has a menu and toolbar. Many look-and-feel attributes of the GUI can be tailored by the user via user properties.

3. IHSDM Data Organization Concepts

This section discusses in detail how the data is organized in the IHSDM. It also looks at how external two-lane rural highway data interacts with the data organization levels.

3.1 IHSDM Data Organization

The data associated with IHSDM processing can be organized in a number different ways by using installation configuration options. IHSDM provides a three level data organization framework. The following figure shows the relationship between these three levels, Users, Projects, and Analyses.

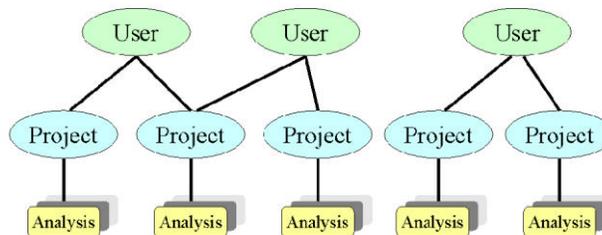


Figure 1 IHSDM Data Organization Levels

Users

The User level is at the top of the data organization framework. In many organizations, this will represent an individual user of IHSDM. However, this level can also be associated with a work group, or any other top level organization category of workflow. IHSDM can support multiple users on a single computer. IHSDM users can have a different Windows login identifier or IHSDM can be configured to provide support for multiple users within a single Windows login identifier using an IHSDM login. The typical case is a single Windows user without any IHSDM login. Associated with each IHSDM user is a home directory (folder) and a set of user configurable properties and defaults (see user properties, and default values).

User identification can be associated in three ways:

- *Automatic* - The user identifier is obtained from the operating system. Note that a user identifier is not available from Windows when the computer is not operating in a network environment.
- *Command Line* - The user identifier can be specified on the command line of the invocation of the IHSDM batch file. This can also be encapsulated in a Windows shortcut.

- *Login* - The user identifier can be queried at invocation. A system-wide configuration parameter controls the login process.

IHSDM can be configured for usage only by known user identifiers. The user identifiers are added to the system properties file using the *configuration Utility*.

Currently, only one instance of an IHSDM module can be running for a specific user identifier/home directory pair. The user identifier is used to scope IHSDM and user properties (name, address, etc.) and preferences (font size, etc.).

Projects

A project is in the second level of the data organization framework. A project is somewhat analogous to a file system directory or folder. Projects can be shared by multiple users. A project is the parent of a number of analyses, the third level of the data organization framework. A project also contains a list of highway datasets that are referenced by the project's individual analyses. A project is identified by a name and optional comment. All files and data associated with a project are contained in a single directory, referred to as the project directory. Generally, the project directory is a subdirectory of the user's IHSDM home directory. A project defines a station notation (e.g. 1+233.000, 12+33.000 or 1233.000) and a unit system, either Metric or English.

Analyses

An analysis is the lowest level, the third level, of the data organization framework. More than one user may access an analysis (not simultaneously). The parent project of an analysis may not be changed. Each analysis is required to have a null associated with it. Other highway datasets may also be defined in an analysis, but are not required. An analysis is identified by a name and optional comment. An analysis also defines a maximum superelevation (e_{\max}) and an analysis year, used for specification of annual daily traffic (ADT) volumes.

3.2 External Data Relationships

Two-lane rural highway data resides external to the IHSDM data organization framework. The following figure shows the relationship between the external highway data and the IHSDM data organization. External highway data is represented at two distinct levels, Highway Data Files, and Highway Datasets.

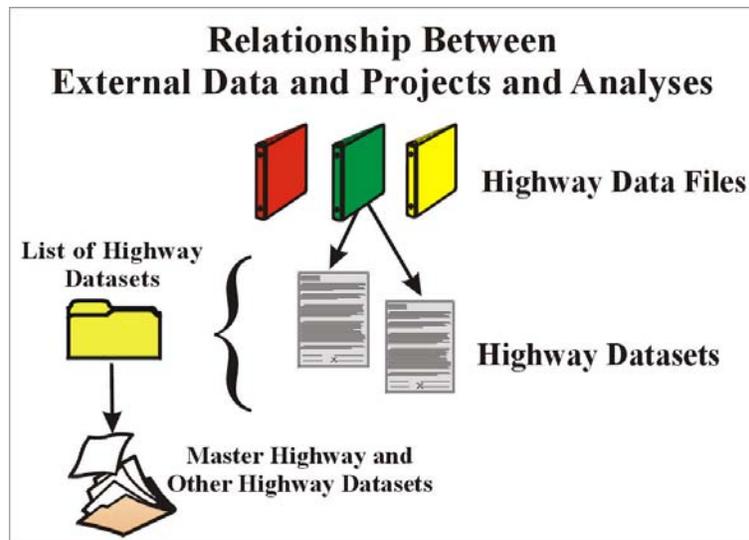


Figure 2 IHSDM External Data Relationships

Highway Data Files

Highway data files contain at least one two-lane rural highway design. Two formats for a highway data file are currently supported: (1) IHSDM standard comma separated value (CSV) format; (2) LandXML 1.0 format. More than one highway dataset can be stored in one highway data file or they can be stored in separate highway data files. Key words (header records) within the highway data file identify where data related to a given highway dataset begins. Highway data files may contain data from the following categories/types of data:

- Highway Data - Basic horizontal and vertical alignment data required as a minimum to perform IHSDM evaluations. Additional data requirements vary by safety module (see IHSDM Highway Model for details).
- Intersection Data - See IHSDM Intersection Model for details.
- Crash data - See Using Crash History Data for details.

Highway Datasets

A highway dataset contains data for one highway (see Editing Highway Elements manual for more details). A list of highway datasets are associated with a project. A highway dataset can be associated with more than one project and analysis.

NOTE: Each highway dataset in a project must have a unique name. If any highway datasets already exists in the current project with the same name as that in the import dataset, the import operation overwrites the existing highway data. Any modifications made to the existing dataset will be lost.

A **highway element** is a characteristic or attribute of the highway, e.g., horizontal tangent, through lane width, shoulder type, cross-slope, ADT, functional classification, etc. A highway dataset contains values for a set of highway elements for a specific highway.

A **master highway** is the highway dataset assigned to an analysis that the user wishes to evaluate. The user selects one of the highway datasets from the list of project highway datasets as the master highway in the analysis attributes. All or part of the master highway can be evaluated (An analysis identifies the section of the master highway to be evaluated in an IHSDM session). A master highway may be a major road or a minor road at an intersection. If a master highway

contains more than one intersection, the master highway could be defined as a major or a minor road at each intersection. For example, for a master highway with two intersections, the master highway could be designated as the major road at the first intersection, and as the minor road at the second intersection.

The highway dataset identified as the master highway for a given analysis can be changed by the user. For example, given Route A that intersects with Route B, the user could choose Route A as the master highway, then, after using IHSDM to evaluate Route A, change the master highway to Route B to evaluate that highway dataset.

A **base highway** serves as a point of reference for intersecting highways, i.e., points of intersection are referred to by the location of the intersection on the base highway. For additional information, see IHSDM Intersection Model.

A **highway segment** is a homogeneous section of highway created by the CPM algorithm, for which a crash frequency is predicted. For additional information on segment data, see Crash Prediction Module (CPM) Engineer's Manual.

An **intersecting highway** is a highway that intersects a base highway. For additional information on intersecting highways, see IHSDM Intersection Model.

4. Project, Analysis and Master Highway Operations

The user can configure how an IHSDM project/analysis is selected on startup by setting the Session Project/Analysis Startup property, accessed through the *Edit/Edit User's Properties* menu item with one of the following options.

- **Start with Wizard** - Start the session with the Project/Analysis/Highway Wizard.
- **Start with Previous** - Start the session with the project/analysis/highway selected in the previous session.
- **Start with none** - Start the session with no project/analysis selected.

The following is a list of available commands for creating, selecting and modifying projects, analyses and master highways. Some of these commands are explained in more detail in later sections.

After a project, analysis and an associated master highway have been successfully setup the user may conduct a safety analysis.

- **Welcome to IHSDM Wizard** - The first time IHSDM is launched, or if no project has been created the Welcome to IHSDM Wizard will be displayed. The user can cancel out of this wizard at any time. Doing so will launch the IHSDM with a blank project. See the other options for instructions on how to create a project without the wizard.
- **Project/Analysis/Highway Wizard** - Launches the Project/Analysis/Highway Wizard. Accessed from the *File/Project/Analysis/Highway* menu item or the *Project/Analysis/Highway* toolbar button.
- **Open a Previous Analysis** - Displays a menu containing all previous defined analyses. Accessed from the *File/Open a Previous Analysis* menu item.
- **Open Project** - Displays the Select Project Identification Dialog. Accessed from the *File/Project/Open Project* menu item.
- **New Project** - Displays the New Project Information Dialog. Accessed from the *File/Project/New Project* menu item.

- **Close Project** - Closes the current project. Accessed from the *File/Project/Close Project* menu item.
- **Open Analysis** - Displays the Select Analysis Identification Dialog. Accessed from the *File/Analysis/Open Analysis* menu item.
- **New Analysis** - Displays the New Analysis Information Dialog. Accessed from the *File/Analysis/New Analysis* menu item.
- **Clone Analysis** - This displays the Clone Analysis Information dialog with a new name for the cloned analysis. All other information is the same as the current analysis. Accessed from the *File/Analysis/Clone Analysis* menu item.
- **Close Analysis** - Closes the current Analysis. Accessed from the *File/Analysis/Close Analysis* menu item.
- **Import IHSDM Highway Data** - This displays the same wizard panels found in the Welcome to IHSDM wizard for importing highway datasets into the project highway dataset list, starting with the Select the file to import Panel. Accessed from the *File/Import Highway Data/IHSDM Highway Data* menu item.
- **Import TWOPAS Input Data** - Displays the TWOPAS Input Import dialog. Accessed from the *File/Import Highway Data/TWOPAS Input Data* menu item.
- **Edit/View Master Highway** - Brings up a new window to edit the master highway elements. For additional information, see Editing Highway Elements. Accessed via the *Edit/Edit/View Highway Data/Select Master Highway* menu item and the *Edit/View Master Highway Elements* toolbar button.
- **Edit/View Selected Highway from Available Highways** - Brings up a dialog to select a highway dataset by name and then a new window to edit the elements of the selected highway dataset. For additional information, see Editing Highway Elements. Accessed via the *Edit/Edit/View Highway Data/Select from Available Highways* menu item.
- **Create Highway Data** - Brings up a dialog to create a new highway dataset by name which invokes a new window to create the elements of the new highway dataset. For additional information, see Editing Highway Elements. Accessed via the *Edit/Edit/View Highway Data/Create Highway Data* menu item.
- **Clone Highway Data** - Brings up a dialog to select a highway dataset by name and creates a new name for the cloned highway dataset. For additional information, see Editing Highway Elements. Accessed via the *Edit/Edit/View Highway Data/Clone Highway Data* menu item.
- **Edit/View Intersection** - Brings up a dialog used to add, edit or delete intersections associated with a null dataset. For additional information, see IHSDM Intersection Model. Accessed via the *Edit/Edit Intersections* menu item and the *Edit/View Intersections* toolbar button.

5. Safety Analyses

Before a user can perform a safety analysis with IHSDM, a project, analysis and an associated master highway must be specified, refer to Section 4., *Project, Analysis and Master Highway Operations*. There are five safety analyses currently supported by the IHSDM: Crash Prediction Model (CPM) safety analysis, Design Consistency Model (DCM) safety analysis, Intersection Review Model (IRM) safety analysis, Policy Review Model (PRM) safety analysis, and Traffic

Analysis Model (TAM) safety analysis. The safety analysis data is entered on the Crash Prediction tab, Design Consistency tab, Intersection Review tab, Policy Review tab, and Traffic Analysis tab. The following is a list of action commands available for creating safety analyses.

- **Run Selected Checks** - This button is found on the Policy Review, Evaluation sub-tabs. If this button is found on the Policy Review, Evaluation, Policy sub-tab, it runs all selected PRM policy checks from all categories of policy checks for the current analysis. If this button is found on one of the other Policy Review, Evaluation sub-tabs (Cross Section, Horizontal Alignment, Vertical Alignment, or Sight Distance) it runs only the displayed sub-tabs selected PRM policy checks for the current analysis. If this button is found on the Intersection Review, Evaluation, Policy Check sub-tab, it runs IRM selected policy checks for the current analysis.
- **Run All Checks** - This button is found on the Policy Review, Evaluation Policy sub-tab. It runs all policy checks for the current analysis.
- **Cancel Any running Checks** - This button is found on all of the Policy Review, Evaluation sub-tabs. It cancels any running policy checks for the current analysis.
- **Run analysis Summary** - This button is found on all of the Policy Review, Evaluation sub-tabs. It launches the user's preferred HTML browser to display the current analysis report summary.
- **Run analysis** - This button is found on the Crash Prediction, Evaluation sub-tab. It starts the Crash Prediction safety analysis for the specified analysis data.
- **Create Graph** - This button is found on the Crash Prediction, Evaluation sub-tab, and Design Consistency, Evaluation sub-tab. It starts the Create Graph Output dialog that allows the user to create and display a graph of the results of the safety analysis. If the safety analysis has not yet been run, this button is disabled.
- **Perform Selected Checks** - This button is found on the Design Consistency, Evaluation sub-tab. It processes the highway element data and generates the results of the Design Consistency Model (DCM).

6. Reports

After a project, analysis and an associated master highway have been successfully setup the user can display several types of reports: log files, analysis reports, an analysis report index, or graphs.

The Analysis Log contains a history of informational, error, and warning messages about the operation of the IHSDM associated with the current analysis. It does not contain engineering results from a safety analysis. Information is appended to the Analysis Log until it is cleared.

The analysis report contains a table of contents, information about the current project, analysis, and master highway, followed by engineering results (including graphs) from executed safety analyses. As new safety analyses are executed information is modified and appended to the file until it is cleared.

The analysis report index contains a table of contents, listing all data available for the current analysis.

Graphs can be generated, customized and saved separately from an Analysis Report.

The user can configure how reports are generated and displayed by setting the options found on the User Properties Report tab accessed through the *Edit/Edit User's Properties* menu item. To

change when a new analysis report is started the user needs to set the Start New Report property to one of the following options.

- **On project/analysis change** - A new analysis report is started each time the analysis or project is changed. Multiple safety analysis runs are saved in the same file.
- **For new safety analysis** - Each new safety analysis run will generate a new analysis report file.
- **Query at new safety analysis** - A query dialog will be generated to ask if a new report should be started at each new safety analysis.

Various commands for accessing these reports are provided through the *View* menu item, various toolbar buttons, and buttons found on each safety analysis', Evaluation sub-tab. Buttons will be enabled or disabled according to availability. Some of the buttons do not require data to exist, while others, like the *View Current Analysis Report* menu item, requires data to exist.

- **View Analysis Log** - Launches the user's specified text editor with the current analysis log. Accessed via the *View/View Analysis Log* menu item.
- **Start a New Analysis Report** - Causes a new analysis report file to be started. Accessed via the *View/Start a New Analysis Report* menu item.
- **View Current Analysis Report** - Launches the user's specified analysis report display tool with the current analysis report. Accessed via the *View/View Current Analysis Report* menu item, the *View Current Analysis Report* toolbar button, and the *View Current Analysis Report* button on the Policy Review, Evaluation sub-tab, Crash Prediction, Evaluation sub-tab, and Design consistency, Evaluation sub-tab. This menu item, toolbar button and the Evaluation sub-tab buttons are disabled until a safety analysis is executed for the current user session.
- **View Analysis Report Index** - Launches the user's specified HTML browser to display an index of analysis reports available within the current analysis. Accessed via the *View/View Analysis Report Index* menu item, the *View Analysis Report Index* toolbar button, and the *View Analysis Report Index* button on the Policy Review, Evaluation sub-tab, Crash Prediction, Evaluation sub-tab, and Design consistency, Evaluation sub-tab.
- **Clear Analysis Log** - Clears (erases) the current analysis log. Accessed via the *View/Clear Analysis Log* menu item.
- **Clear Analysis Report** - Clears (erases) the current analysis report. Accessed via the *View/Clear Analysis Report* menu item.
- **Open Saved Graph** - Invokes a dialog to open and display a previously saved graph. The graph file may be created from a CPM, DCM, or TAM analysis. Accessed via the *View/Open Saved Graph* menu item, and the *Open Saved Graph* buttons on the Crash Prediction, Evaluation sub-tab, and Design consistency, Evaluation sub-tab.
- **Show Results** - This button displays exceptions generated in the last policy check run. Accessed via the *Show Results* button on the Policy Review, Evaluation sub-tab.
- **View the Current Highway in 2D** - This button opens the highway viewer to view the current highway dataset. Accessed via the *View Current Highway in 2D* toolbar button.
- **Display Sight Distance Graphs** - Displays a list of available Sight Distance graphs. Accessed via the *Display Sight Distance Graphs* button on the Policy Review, Evaluation, Sight Distance sub-tab.

- **View highway Segment Data** - This button starts the HTML browser, displaying the current highway segment data in the current Analysis Report. For additional information on segment data, see Crash Prediction Module (CPM) Engineer's Manual. Accessed via the *View highway Segment Data* button on the Crash Prediction, Evaluation sub-tab.

7. User Properties and Default Values

IHSDM properties are used to control the runtime behavior of the system.

- **System Configuration Properties** - The IHSDM configuration (Install) Utility sets the System Configuration Properties. These properties have the same value for all users of the configuration.
- **User Properties** - The User Properties are set by the *Edit/Edit User Properties* menu item in the IHSDM main (Master) window. In addition, individual IHSDM modules may have properties. The module specific properties are maintained in the user's properties file. With a few exceptions, the value of any property in a user's property file will override the value of the property set in the system properties file.
- **Default Values** - User Default Values are similar to user properties. The User Default Values are set by the *Edit/Edit User Defaults* menu item in the IHSDM main (Master) window.

8. Creating a Project, Analysis and Master Highway Using the Welcome to IHSDM Wizard

This wizard will be displayed whenever IHSDM is started and no projects have been defined by the user. The purpose of the wizard is to guide the user through the process of defining an initial project, analysis and associated master highway. A few of the key user properties that are related to this process may also be edited by this wizard. The **Welcome to IHSDM** frame includes the following menu items: Help. The **Welcome to IHSDM** frame includes the following wizard panels: User Properties, Project Information, Analysis Information, Highway Data Source, Select the file to import, Edit the highway dataset attributes and Create a highway dataset from scratch.

8.1 Menu Items

The Welcome to IHSDM Frame includes the following menu items:

- **Help** - This menu includes various help menu items. The **Help** menu includes the following menu items: About User Properties, About Projects, About Analyses, IHSDM User's Manual, Master Index and Search Master Index.
 - **About User Properties** - This menu item displays help about setting user properties.
 - **About Projects** - This menu item displays help about setting the current project.
 - **About Analyses** - This menu item displays help about setting the current analysis.
 - **IHSDM User's Manual** - This menu item launches the HTML browser to display the IHSDM User's Manual.
 - **Master Index** - This menu item launches the HTML browser to display the **IHSDM Documentation Master Index**.
 - **Search Master Index** - This menu item launches a dialog to allow a keyword search of the **IHSDM Documentation Master Index**.

8.2 Wizard Panels

The Welcome to IHSDM Frame includes the wizard panels described in the following sections.

8.2.1 User Properties Panel

This is the initial panel of the wizard. This panel allow a few key user property values related to project/analysis/highway management to be set.

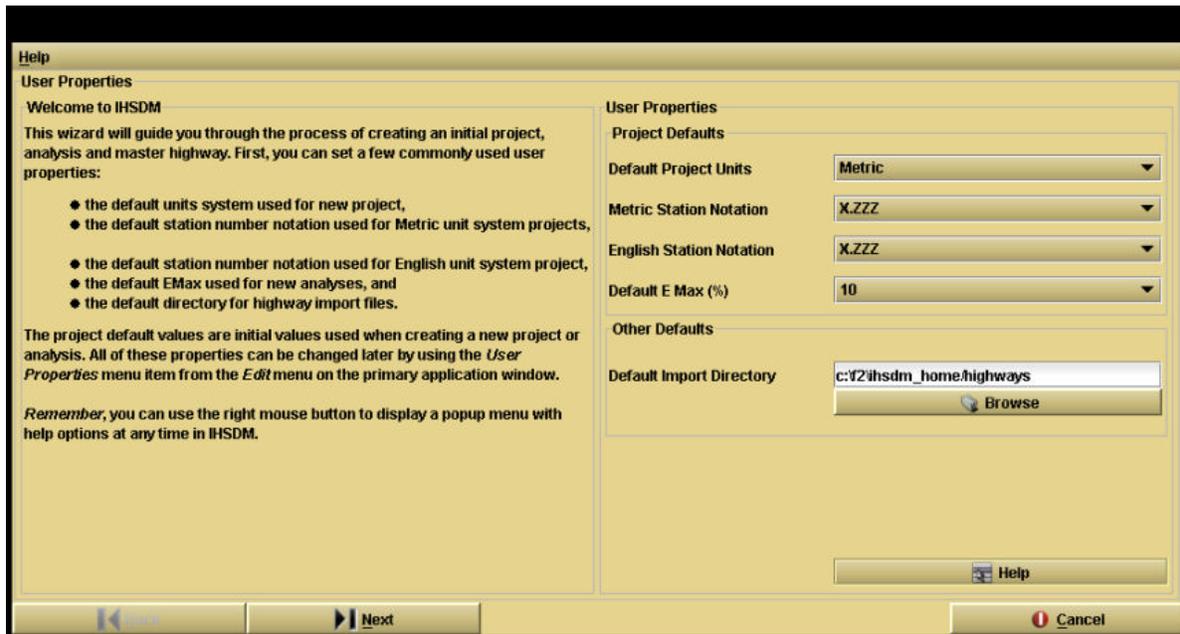


Figure 3 User Properties Panel

The **User Properties** wizard panel includes the following widgets: Help, Default Project Units, Metric Station Notation, English Station Notation, Default E Max and Default Import Directory.

- **Help** - This button displays a menu of relevant help items. When clicked, this button provides the following menu items:
 - **About User Properties** - This menu item displays help about setting user properties.
- **Default Project Units** - Widget type: combo box. Tag: `ihsdm.default.units`. This value is used as the default unit system (referenced as 'user default') used for all new project definition. Changing this value does not change the unit system of any existing project. The enumeration values are:
 - **Metric** (Metric unit system) and
 - **English** (English (Imperial) unit system).

For additional information, see IHSDM Unit Systems.

- **Metric Station Notation** - Widget type: combo box. Tag: `ihsdm.default.metric.station.notation`. The default station notation used as the initial station notation when creating new Metric system projects. The enumeration values are:
 - **X+YYY.ZZZ** (e.g., 23+234.980),

- **X+YY.ZZZ** (e.g., 232+34.980) and
- **X.ZZZ** (e.g., 23234.980).
- **English Station Notation** - Widget type: combo box. Tag: `ihsdm.default.english.station.notation`. The default station notation used as the initial station notation when creating new English system projects. The enumeration values are:
 - **X+YY.ZZZ** (e.g., 23+234.980),
 - **X.ZZZ** (e.g., 23234.980) and
 - **X.ZZZZZZmi** (e.g., 4.400564mi).
- **Default E Max** - Widget type: combo box. Unit of measure: percent. Tag: `ihsdm.prm.default.emax`. The default becomes the 'user default' value for the maximum design superelevation. Superelevation rates are determined using the design maximum superelevation rate. This rate would be used for the sharpest curve recommended (shortest radius) for a given design speed. Longer radii curves have lower superelevation rates. Default maximum superelevation should be entered as a percentage (%). The enumeration values are: **4, 6, 8, 10** and **12**. The unit of measure for this item is percent.
- **Default Import Directory** - Widget type: text field (w/button). Tag: `ihsdm.roadway.import.dir`. This item is the full directory (folder) name that specifies the initial file chooser directory in the data import browser.

8.2.2 Project Information Panel

This panel solicits the attributes of the project. Only the project name must be specified in this panel.

Figure 4 Project Information Panel

The **Project Information** wizard panel includes the following widgets: Project Name, Project Comment, Project Unit System, Station Notation, Project Directory and Help.

- **Project Name** - Widget type: text field. The value of this item is the name of the project. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual.
- **Project Comment** - Widget type: text field. This is an optional comment about the project.
- **Project Unit System** - Widget type: combo box. This item specifies the unit system used for the entry and display of all values associated with the project. This unit system is used to control all outputs as well as the unit system assumed for imported datasets if no unit system is explicitly specified in the imported file. The enumeration values are:
 - **user default** (user default unit system),
 - **Metric** (Metric unit system) and
 - **English** (English (Imperial) unit system).
- **Station Notation** - Widget type: combo box. This item specifies the project station notation used for display of station numbers. The enumeration values are: **user default** (e.g. 23+234.980), **X+YYY.ZZZ** (e.g. 232+34.980), **X+YY.ZZZ** (e.g. 23234.980) and **X.ZZZ**.
- **Project Directory** - Widget type: text field (w/button). This is a unique directory (folder) associated with the project. All files related to this project will be contained within the directory specified by this item. If no name is specified by the user, the system will create a directory name based on the project name.
- **Help** - This button displays a menu of relevant help items. When clicked, this button provides the following menu items:
 - **About Projects** - This menu item displays help about setting the current project.

8.2.3 Analysis Information Panel

This panel solicits the attributes of the analysis. Only the analysis name must be specified in this panel.

Help

Analysis Information

About the Analysis Information

Now you need to specify some information about an analysis, the second level data organization construct. An IHSDM analysis is some what analogous to a file. Each analysis belongs to a single project. In IHSDM, an analysis has four attributes which you will specify on this panel:

- A name,
- An optional analysis comment,
- an EMax (maximum superelevation) value, and
- an analysis year, user for calculating average daily traffic values.

Only the analysis name must be specified. All other attributes have a default value.

Each analysis is associated with a master highway. The source of the data for the master highway for this analysis will be set on the next panel.

Analysis Attributes

Analysis Name

Analysis Comment

Analysis E Max (%)

Default Normal Cross Slope (%)

Analysis Year

Figure 5 Analysis Information Panel

The **Analysis Information** wizard panel includes the following widgets: Analysis Name, Analysis Comment, Analysis E Max, Default Normal Cross Slope, Analysis Year and Help.

- **Analysis Name** - Widget type: text field. This is the name of the analysis. The name of the analysis is unique within a project. If the user does not specify a name, the system will create one. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual.
- **Analysis Comment** - Widget type: text field. This is an optional comment about the analysis.
- **Analysis E Max** - Widget type: combo box. Unit of measure: percent. The value of this item is the maximum superelevation, as a percentage, for this analysis. The enumeration values are: **4, 6, 8, 10** and **12**. The unit of measure for this item is percent.
- **Default Normal Cross Slope** - Widget type: text field. Unit of measure: percent. The value of this item is the default normal cross slope, as a percentage, for this analysis. Once a highway dataset is imported, normal cross slope elements can be defined to vary the value along the alignment. The unit of measure for this item is percent.
- **Analysis Year** - Widget type: text field. Unit of measure: YEAR. The value of this item is the year of the analysis. It is used to compute the average daily traffic volume (ADT).
- **Help** - This button displays a menu of relevant help items. When clicked, this button provides the following menu items:
 - **About Analyses** - This menu item displays help about setting the current analysis.

8.2.4 Highway Data Source Panel

This panel solicits the source of the highway dataset. Currently, two sources are supported: importing a file or creating a dataset from scratch.

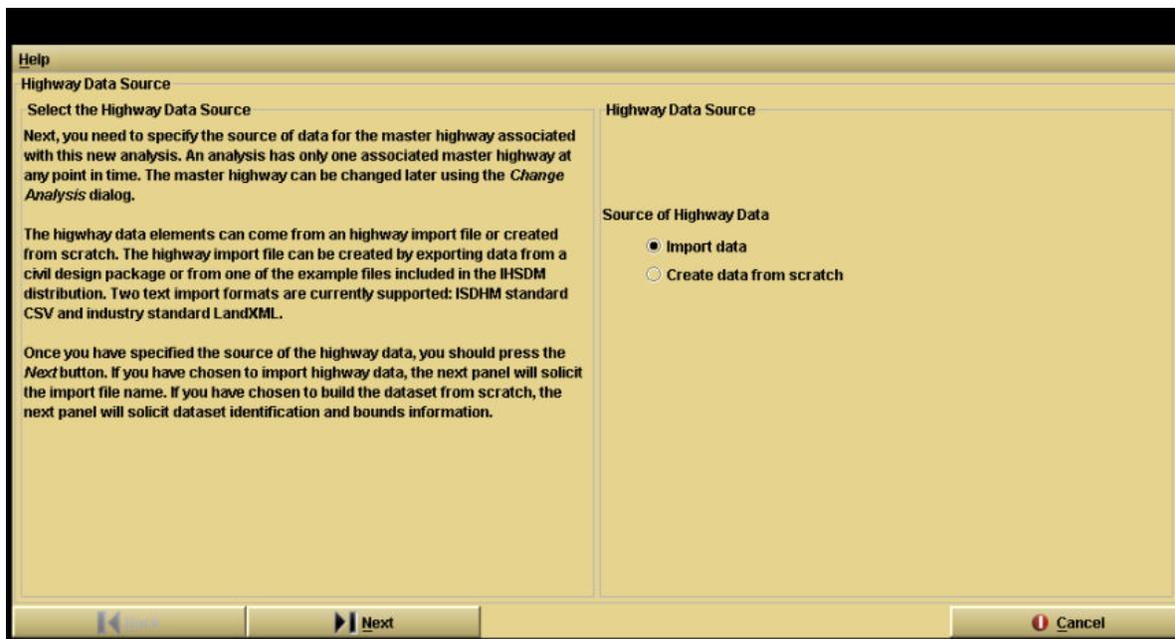


Figure 6 Highway Data Source Panel

The **Highway Data Source** wizard panel includes the following widgets: Source of Highway Data.

- **Source of Highway Data** - Widget type: radio button. This item is used to specify the source of the highway dataset. The enumeration values are:
- **Import data** (import data from a civil design package or an example highway file (CSV or LandXML)) and
- **Create data from scratch** (create a highway dataset from scratch).

8.2.5 Select the file to import Panel

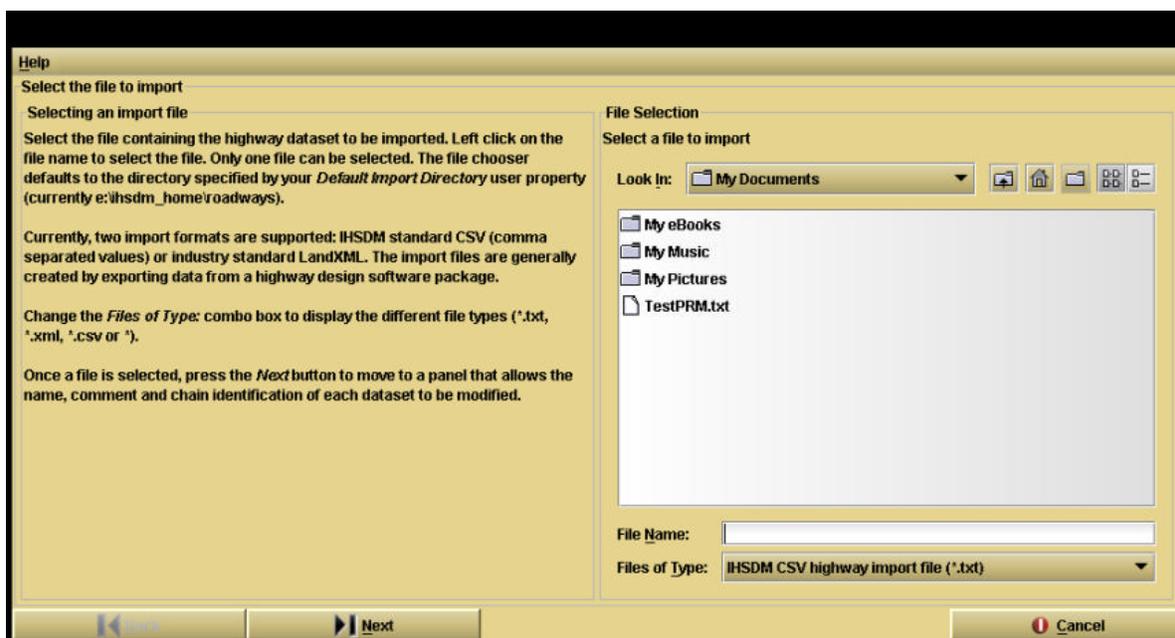


Figure 7 Select the file to import Panel

The **Select the file to import** wizard panel includes the following widgets: Select a file to import.

- **Select a file to import** - Widget type: file chooser. The value of this item is the full path name of the text file containing the dataset to be imported.

8.2.6 Edit the highway dataset attributes Panel

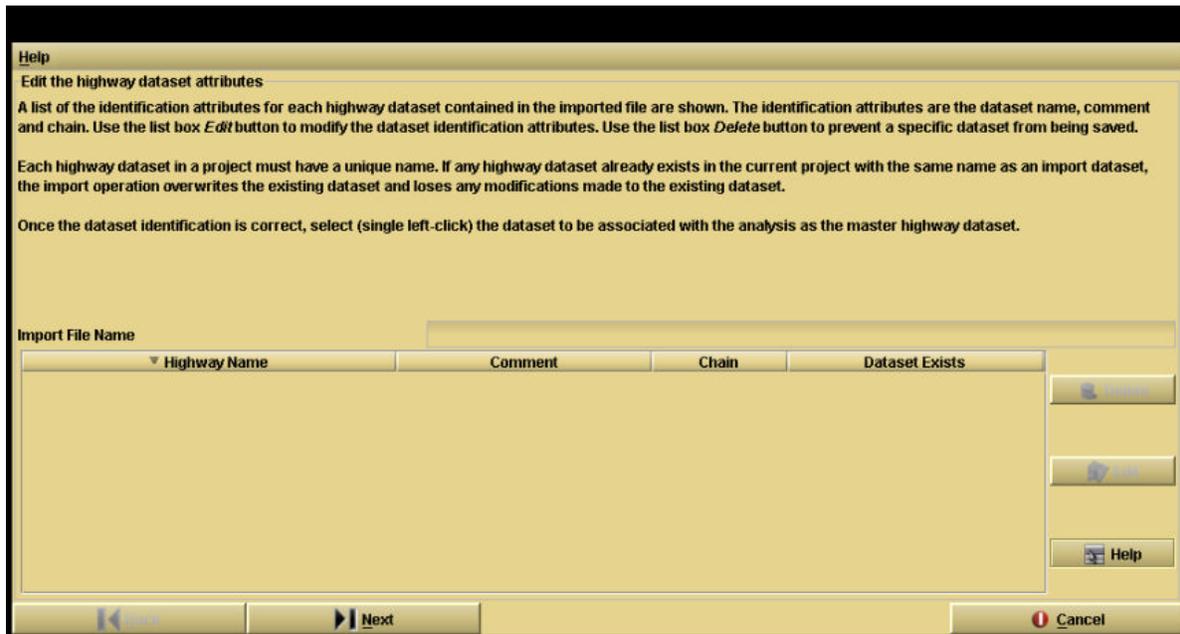


Figure 8 Edit the highway dataset attributes Panel

The **Edit the highway dataset attributes** wizard panel includes the following widgets: Import File Name and Edit the highway dataset attributes.

- **Import File Name** - Widget type: text field (read-only). The value of this item is the name of the imported ASCII file. The value of this item is the full path name of the text file containing the dataset to be imported.
- **List Box** - Widget type: list box. This list box includes the following items: Highway Name, Comment, Chain and Dataset Exists.
 - **Highway Name** Item - The value of this item is the name of the master highway associated with the analysis.
 - **Comment** Item - The value of this item is an optional comment for the highway dataset.
 - **Chain** Item - The value of this item is an optional chain name for the alignment associated with the highway dataset.
 - **Dataset Exists** Item - This item displays whether a highway dataset with the specified name already exists. If highway dataset already exists, the import operation overwrites the existing dataset and loses any modifications made to the existing dataset. The enumeration values are: **no** and **yes**.

8.2.7 Create a highway dataset from scratch Panel

Help
Create a highway dataset from scratch

Creating a new highway dataset
You have selected to create a highway dataset from scratch. You must specify a highway dataset name and the station number limits of the highway dataset.

The initial dataset includes a horizontal tangent element at the start and end stations. The vertical alignment is initialized to a tangent element with zero grade from the start to end stations.

This initial dataset does not contain enough data to run any of the IHSDM safety analyses. You can run the edit/view highway data editor to add additional elements. You can also run a safety analysis module and it solicits the required data elements.

New highway dataset attributes

Identification Attributes

Highway Name

Comment

Chain

Dataset Limits

Start Sta.

End Sta.

Start Edit/View Highway Data Editor

Back Next Cancel

Figure 9 Create a highway dataset from scratch Panel

The **Create a highway dataset from scratch** wizard panel includes the following widgets: Start Edit/View Highway Data Editor, Highway Name, Comment, Chain, Start Sta. and End Sta..

- **Start Edit/View Highway Data Editor** - Widget type: check box. This item toggles launching the edit/view highway data editor on the specified highway dataset.
- **Highway Name** - Widget type: text field. The value of this item is the name of the master highway associated with the analysis.
- **Comment** - Widget type: text field. The value of this item is an optional comment for the highway dataset.
- **Chain** - Widget type: text field. The value of this item is an optional chain name for the alignment associated with the highway dataset.
- **Start Sta.** - Widget type: text field. Unit of measure: STATION. The value of this item is the starting station for this highway or design element.
- **End Sta.** - Widget type: text field. Unit of measure: STATION. The value of this item is the ending station for this highway or design element.

9. Project/Analysis/Highway Wizard

The purpose of the wizard is to guide the user through the process of selecting a project, analysis and a master highway. The **Set a Project, Analysis and Master Highway** frame includes the following menu items: Help. The **Set a Project, Analysis and Master Highway** frame includes the following wizard panels: Select a Project, Select an Analysis and Select a Master Highway.

9.1 Menu Items

The Set a Project, Analysis and Master Highway Frame includes the following menu items:

- **Help** - This menu includes various help menu items. The **Help** menu includes the following menu items: About Projects, About Analyses, IHSDM User's Manual, Master Index and Search Master Index.
 - **About Projects** - This menu item displays help about setting the current project.
 - **About Analyses** - This menu item displays help about setting the current analysis.
 - **IHSDM User's Manual** - This menu item launches the HTML browser to display the IHSDM User's Manual.
 - **Master Index** - This menu item launches the HTML browser to display the **IHSDM Documentation Master Index**.
 - **Search Master Index** - This menu item launches a dialog to allow a keyword search of the **IHSDM Documentation Master Index**.

9.2 Wizard Panels

The Set a Project, Analysis and Master Highway Frame includes the wizard panels described in the following sections.

9.2.1 Select a Project Panel

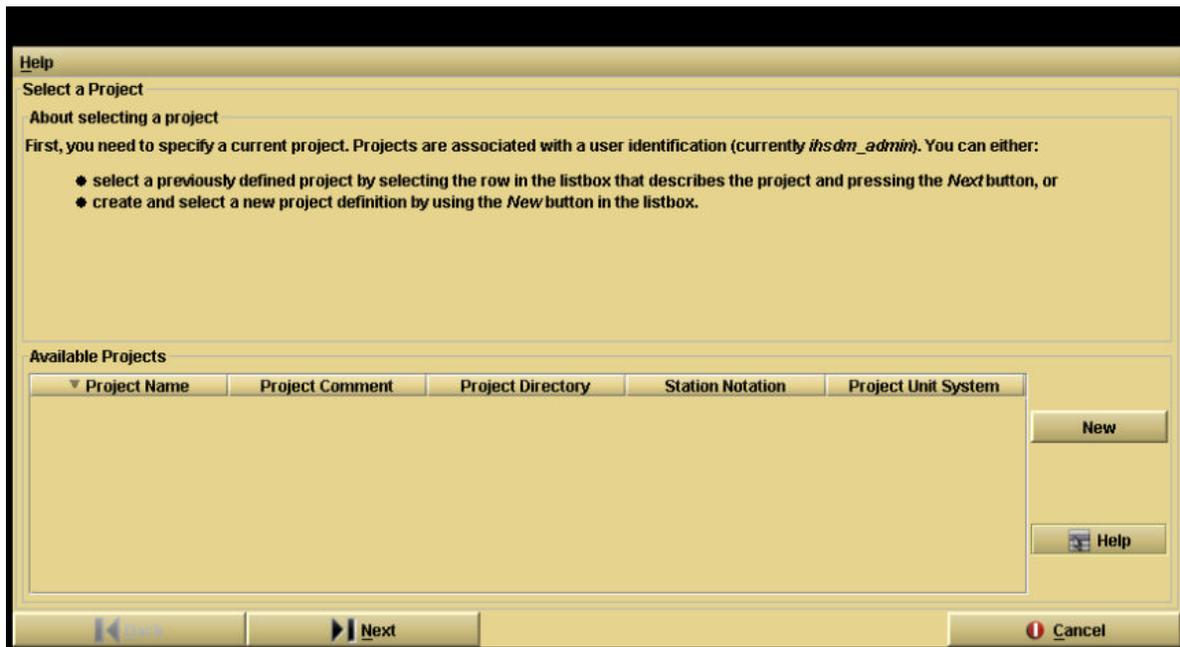


Figure 10 Select a Project Panel

The **Select a Project** wizard panel includes the following widgets:

- **Project Identification** List Box - Widget type: list box. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual. The **Project Identification** list box includes the following items: Project Name, Project Comment, Project Directory, Station Notation and Project Unit System.
 - **Project Name** Item - The value of this item is the name of the project. For additional information, see Project, Analysis and Master Highway Operations in the Running

IHSDM Software Manual.

- **Project Comment** Item - This is an optional comment about the project.
- **Project Directory** Item - This is a unique directory (folder) associated with the project. All files related to this project will be contained within the directory specified by this item. If no name is specified by the user, the system will create a directory name based on the project name.
- **Station Notation** Item - This item specifies the project station notation used for display of station numbers. The enumeration values are: **user default** (e.g. 23+234.980), **x+YYY.ZZZ** (e.g. 232+34.980), **x+YY.ZZZ** (e.g. 23234.980) and **x.ZZZ**.
- **Project Unit System** Item - This item specifies the unit system used for the entry and display of all values associated with the project. This unit system is used to control all outputs as well as the unit system assumed for imported datasets if no unit system is explicitly specified in the imported file. The enumeration values are:
 - **user default** (user default unit system),
 - **Metric** (Metric unit system) and
 - **English** (English (Imperial) unit system).

For additional information, see IHSDM Unit Systems.

9.2.2 Select an Analysis Panel

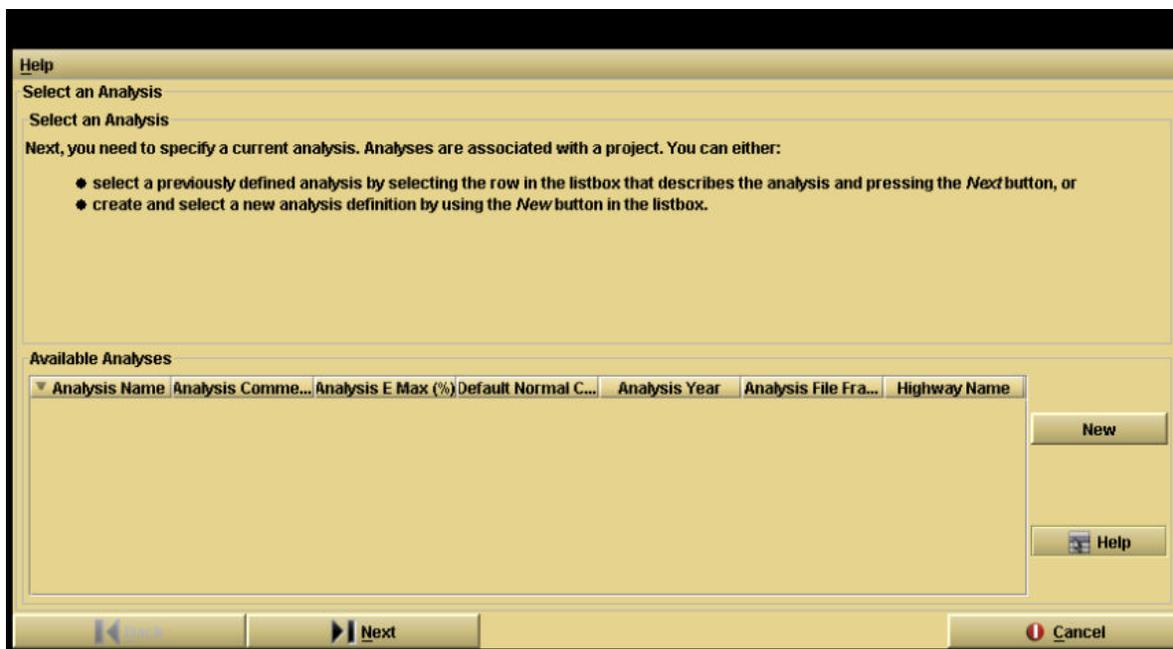


Figure 11 Select an Analysis Panel

The **Select an Analysis** wizard panel includes the following widgets:

- **Analysis Information** List Box - Widget type: list box. The **Analysis Information** list box includes the following items: Analysis Name, Analysis Comment, Analysis E Max, Default Normal Cross Slope, Analysis Year, Analysis File Fragment and Highway Name.

- **Analysis Name** Item - This is the name of the analysis. The name of the analysis is unique within a project. If the user does not specify a name, the system will create one. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual.
- **Analysis Comment** Item - This is an optional comment about the analysis.
- **Analysis E Max** Item - Unit of measure: percent. The value of this item is the maximum superelevation, as a percentage, for this analysis. The enumeration values are: **4, 6, 8, 10** and **12**. The unit of measure for this item is percent.
- **Default Normal Cross Slope** Item - Unit of measure: percent. The value of this item is the default normal cross slope, as a percentage, for this analysis. Once a highway dataset is imported, normal cross slope elements can be defined to vary the value along the alignment. The unit of measure for this item is percent.
- **Analysis Year** Item - Unit of measure: YEAR. The value of this item is the year of the analysis. It is used to compute the average daily traffic volume (ADT).
- **Analysis File Fragment** Item - The value of this item is a system generated fragment string based on the analysis name. The fragment is used as part of the name for all files generated by IHSDM that are associated with this analysis.
- **Highway Name** Item - This item displays a list of all currently available highway datasets. The enumeration values are: (**none**).

9.2.3 Select a Master Highway Panel

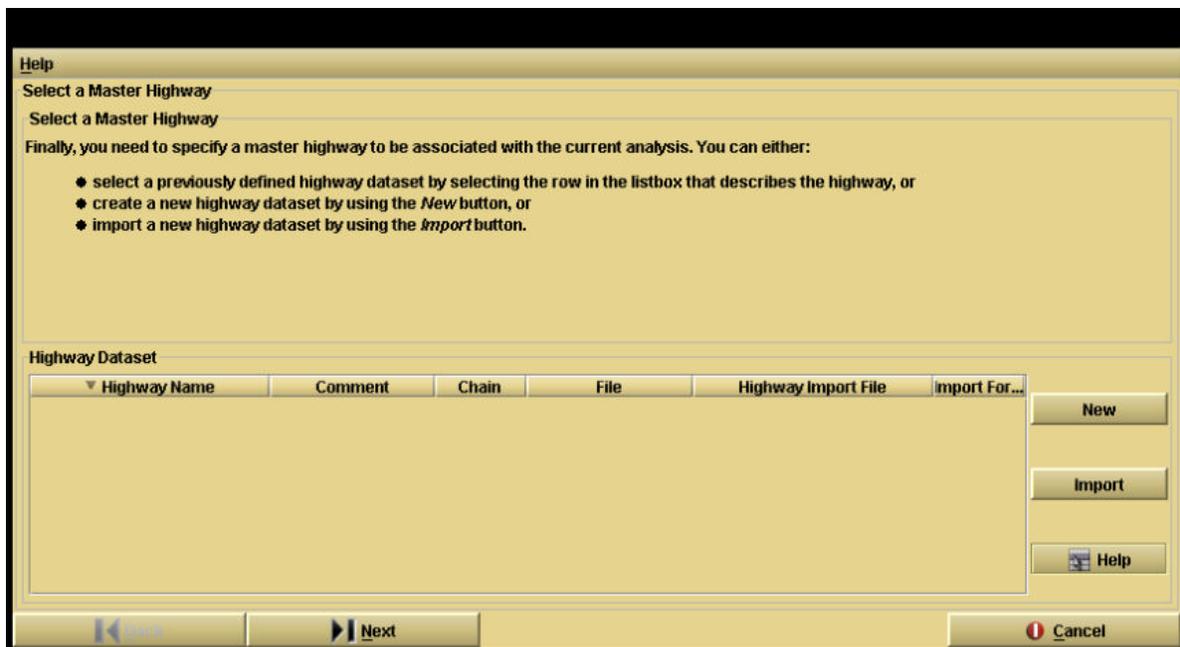


Figure 12 Select a Master Highway Panel

The **Select a Master Highway** wizard panel includes the following widgets:

- **Available Highway Datasets** List Box - Widget type: list box. The value of this item is the highway name/comment available on the server. The **Available Highway Datasets** list box includes the following items: Highway Name, Comment, Chain, File, Highway Import File and Import Format.

- **Highway Name** Item - The value of this item is the name of the master highway associated with the analysis.
- **Comment** Item - The value of this item is an optional comment for the highway dataset.
- **Chain** Item - The value of this item is an optional chain name for the alignment associated with the highway dataset.
- **File** Item - The value of this item is the system generated base name of the highway file containing this highway dataset.
- **Highway Import File** Item - This item specifies the full path name of the import file that was the source of the highway dataset. More than one highway dataset may be defined in this file.
- **Import Format** Item - This item specifies the data format of the file that the highway dataset was imported from. More than one highway dataset may be defined in this file. The enumeration values are:
 - **CSV** (standard IHSDM comma separated value format),
 - **LandXML** (standard LandXML format),
 - **TWOPAS** (standard TWOPAS (traffic simulation) input format) and
 - **none** (dataset was not imported and has no import format).

10. Open Project

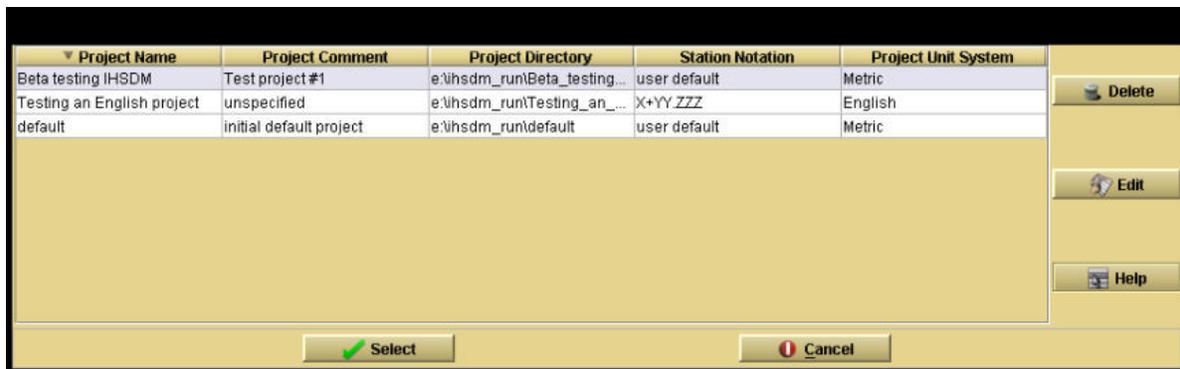


Figure 13 Open Project Dialog

The Open Project Dialog listbox displays rows of *Project Identification* elements. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual. The columns in the Open Project Dialog listbox are:

- **Project Name - Project Name** - The value of this item is the name of the project. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual.
- **Project Comment - Project Comment** - This is an optional comment about the project.
- **Project Directory - Project Directory** - This is a unique directory (folder) associated with the project. All files related to this project will be contained within the directory specified by this item. If no name is specified by the user, the system will create a directory name based on the project name.

- **Station Notation - Station Notation** - This item specifies the project station notation used for display of station numbers. The enumeration values are: **user default** (e.g. 23+234.980), **x+YYY.ZZZ** (e.g. 232+34.980), **x+YY.ZZZ** (e.g. 23234.980) and **x.ZZZ**.
- **Project Unit System - Project Unit System** - This item specifies the unit system used for the entry and display of all values associated with the project. This unit system is used to control all outputs as well as the unit system assumed for imported datasets if no unit system is explicitly specified in the imported file. The enumeration values are:
 - **user default** (user default unit system),
 - **Metric** (Metric unit system) and
 - **English** (English (Imperial) unit system).

For additional information, see IHSDM Unit Systems.

10.1 Listbox Control Buttons

The buttons on the right of the list box are used to control the contents of the list box. Various Any combination of the following buttons will be displayed. The combination is determined by the list box and the user property, Use List Box Edit Dialog. If the Use List Box Edit Dialog user property is enabled, generally, a button action displays a dialog containing entry items. If the Use List Box Edit Dialog user property is enabled, a button action displays a dialog containing entry items. Otherwise the user is required to modify each item directly in the list, refer to each item's widgets to determine how it should be edited.

- **Add** - The **Add** button creates a new entry in the listbox. Either a dialog to allow the user to enter the items associated with the new entry will be displayed, or a new row in the list box will appear.
- **Clone** - The **Clone** button creates a new entry in the listbox from another, selected, entry (row) of the list box. Either a dialog to allow the user to modify the items associated with the new entry will be displayed, or a new row in the list box containing the data from the selected entry, will appear.
- **Delete** - The **Delete** button deletes the selected entry (row) from the list box. A dialog will be displayed to request confirmation of the delete operation.
- **Edit** - The **Edit** button edits a selected row in the list box. This button displays a dialog to allow the user to modify the items associated with the selected entry.
- **Select** - The **Select** button selects the highlighted row in the list box and closes the dialog.
- **Cancel** - The **Cancel** button closes the dialog without specifying the selection of any entry.

11. New Project

Figure 14 New Project Information Dialog

This dialog is used to query the user for the attributes of an IHSDM Project. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual. The **New Project Information** dialog includes the following widgets: Project Name, Project Comment, Project Unit System, Station Notation, Project Directory, Help, Save and Cancel.

- **Project Name** - Widget type: text field. The value of this item is the name of the project.
- **Project Comment** - Widget type: text field. This is an optional comment about the project.
- **Project Unit System** - Widget type: combo box. This item specifies the unit system used for the entry and display of all values associated with the project. This unit system is used to control all outputs as well as the unit system assumed for imported datasets if no unit system is explicitly specified in the imported file. The enumeration values are:
 - **user default** (user default unit system),
 - **Metric** (Metric unit system) and
 - **English** (English (Imperial) unit system).
- **Station Notation** - Widget type: combo box. This item specifies the project station notation used for display of station numbers. The enumeration values are: **user default** (e.g. 23+234.980), **X+YYY.ZZZ** (e.g. 232+34.980), **X+YY.ZZZ** (e.g. 23234.980) and **X.ZZZ**.
- **Project Directory** - Widget type: text field (w/button). This is a unique directory (folder) associated with the project. All files related to this project will be contained within the directory specified by this item. If no name is specified by the user, the system will create a directory name based on the project name.
- **Help** - Widget type: button. This button starts the HTML browser to display information about project operations.
- **Save** - This button closes the element add/edit dialog and saves any changes or additions.
- **Cancel** - This button closes the element add/edit dialog and discards any changes or additions.

12. Open Analysis

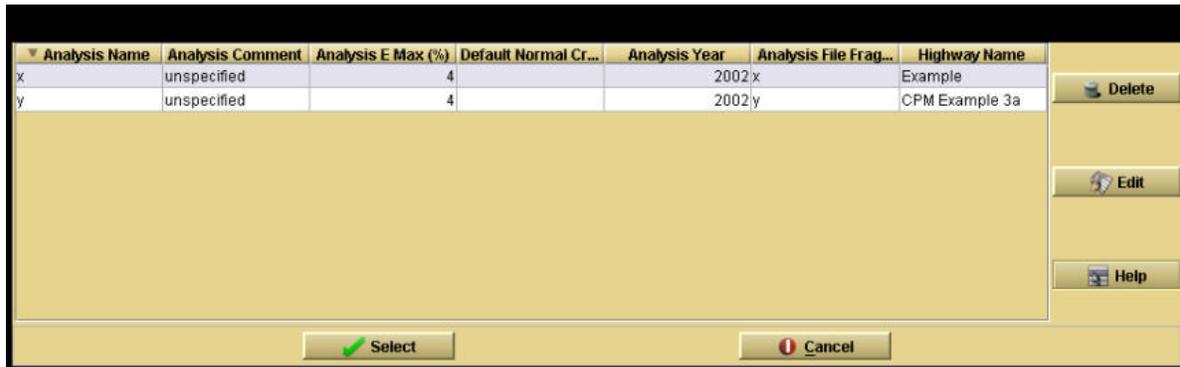


Figure 15 Open Analysis Dialog

The Open Analysis Dialog listbox displays rows of *Analysis Information* elements. The columns in the Open Analysis Dialog listbox are:

- **Analysis Name - Analysis Name** - This is the name of the analysis. The name of the analysis is unique within a project. If the user does not specify a name, the system will create one. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual.
- **Analysis Comment - Analysis Comment** - This is an optional comment about the analysis.
- **Analysis E Max** - Unit of measure: percent. **Analysis E Max** - The value of this item is the maximum superelevation, as a percentage, for this analysis. The enumeration values are: **4**, **6**, **8**, **10** and **12**. The unit of measure for this item is percent.
- **Default Normal Cross Slope** - Unit of measure: percent. **Default Normal Cross Slope** - The value of this item is the default normal cross slope, as a percentage, for this analysis. Once a highway dataset is imported, normal cross slope elements can be defined to vary the value along the alignment. The unit of measure for this item is percent.
- **Analysis Year** - Unit of measure: YEAR. **Analysis Year** - The value of this item is the year of the analysis. It is used to compute the average daily traffic volume (ADT).
- **Analysis File Fragment - Analysis File Fragment** - The value of this item is a system generated fragment string based on the analysis name. The fragment is used as part of the name for all files generated by IHSDM that are associated with this analysis.
- **Highway Name - Highway Name** - This item displays a list of all currently available highway datasets. The enumeration values are: **(none)**.

12.1 Listbox Control Buttons

The buttons on the right of the list box are used to control the contents of the list box. Various Any combination of the following buttons will be displayed. The combination is determined by the list box and the user property, Use List Box Edit Dialog. If the Use List Box Edit Dialog user property is enabled, generally, a button action displays a dialog containing entry items. If the Use List Box Edit Dialog user property is enabled, a button action displays a dialog containing entry items. Otherwise the user is required to modify each item directly in the list, refer to each item's widgets to determine how it should be edited.

- **Add** - The **Add** button creates a new entry in the listbox. Either a dialog to allow the user to enter the items associated with the new entry will be displayed, or a new row in the list

box will appear.

- **Clone** - The **Clone** button creates a new entry in the listbox from another, selected, entry (row) of the list box. Either a dialog to allow the user to modify the items associated with the new entry will be displayed, or a new row in the list box containing the data from the selected entry, will appear.
- **Delete** - The **Delete** button deletes the selected entry (row) from the list box. A dialog will be displayed to request confirmation of the delete operation.
- **Edit** - The **Edit** button edits a selected row in the list box. This button displays a dialog to allow the user to modify the items associated with the selected entry.
- **Select** - The **Select** button selects the highlighted row in the list box and closes the dialog.
- **Cancel** - The **Cancel** button closes the dialog without specifying the selection of any entry.

13. New Analysis

Figure 16 New Analysis Information Dialog

The **New Analysis Information** dialog includes the following widgets: Analysis Name, Analysis Comment, Analysis E Max, Default Normal Cross Slope, Analysis Year, Highway Name, Import/Create/Clone Highway Data, Help, Save and Cancel.

- **Analysis Name** - Widget type: text field. This is the name of the analysis. The name of the analysis is unique within a project. If the user does not specify a name, the system will create one. For additional information, see Project, Analysis and Master Highway Operations in the Running IHSDM Software Manual.
- **Analysis Comment** - Widget type: text field. This is an optional comment about the analysis.
- **Analysis E Max** - Widget type: combo box. Unit of measure: percent. The value of this item is the maximum superelevation, as a percentage, for this analysis. The enumeration values are: **4, 6, 8, 10** and **12**. The unit of measure for this item is percent.
- **Default Normal Cross Slope** - Widget type: text field. Unit of measure: percent. The value of this item is the default normal cross slope, as a percentage, for this analysis. Once a

highway dataset is imported, normal cross slope elements can be defined to vary the value along the alignment. The unit of measure for this item is percent.

- **Analysis Year** - Widget type: text field. Unit of measure: YEAR. The value of this item is the year of the analysis. It is used to compute the average daily traffic volume (ADT).
- **Highway Name** - Widget type: combo box. This item displays a list of all currently available highway datasets. The enumeration values are: (**none**).
- **Import/Create/Clone Highway Data** - This button displays a menu that provides items to import, create or clone a highway dataset. When clicked, this button provides the following menu items:
 - **IHSDM Highway Data** - This menu item imports either IHSDM CSV or LandXML highway data files.
 - **Create** - This menu item starts a dialog that creates a new (empty) highway dataset.
 - **Clone** - This menu item starts a dialog that clones an existing highway dataset.
- **Help** - Widget type: button. This button starts the HTML browser to display information about analysis operations.
- **Save** - This button closes the element add/edit dialog and saves any changes or additions.
- **Cancel** - This button closes the element add/edit dialog and discards any changes or additions.

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