

# iMap for Inventor

## TECHNOLOGY PREVIEW

iMap for Autodesk® Inventor® provides intuitive, graphical views to help Inventor software users easily visualize, understand and control important relationships and constraints in Inventor assemblies – especially those that were originally created by someone else.

iMap complements existing Inventor display concepts by providing innovative new capabilities to help you work with information that has traditionally been thought of as non-graphical. With iMap, you can:

- Identify and edit complex constraint relationships
- Repair broken relationships
- Create relationships between components without having to select topology
- Identify and edit complex skeletal modeling designs
- Create export new objects to support skeletal modeling and create relationships.

Together these enhancements make it possible to work with larger views, do more design tasks around interfaces, and provide a wealth of information not easily found otherwise. This helps enable Functional Design – allowing Inventor users to spend more time on the functional aspects of their designs, while spending less time on tedious geometry-based tasks and confusing relationships between components.

## Getting Started

Follow this helpful information to get started with iMap:

### System Prerequisites

Autodesk Inventor 2009 (as part of Autodesk Inventor Suite, Autodesk Inventor Routed Systems Suite, Autodesk Inventor Simulation Suite, or Autodesk Inventor Professional); 32-bit versions only.

*Note: iMap is not currently supported for 64-bit operating systems.*

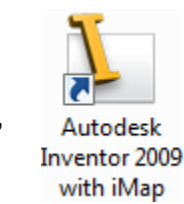
*Note: iMap will not work with Autodesk Inventor LT™ software since Inventor LT does not have assembly capabilities.*

### Installation Instructions

1. Download the [iMapforInventor2009.zip](#) file from Autodesk Labs. Use of the iMap for Inventor Technology Preview is subject to the end user license agreement accompanying the software.
2. Save the zip file to a file path location that only contains English characters
3. Double-click on [iMap for Inventor 2009.exe](#) to begin your installation. Follow the installation prompts.
4. You should see a confirmation dialog indicating that iMap has successfully installed. If you do not install successfully, please contact [labs.iv.imap@autodesk.com](mailto:labs.iv.imap@autodesk.com).

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5. Browse to your Windows desktop. You should see a new Inventor shortcut called **Autodesk Inventor 2009 with iMap**. This shortcut allows you to launch Autodesk Inventor with iMap view capabilities. Your original shortcuts remain unchanged.
6. **iMap only loads when launched from the new desktop shortcut.** If you start Inventor by double clicking an Autodesk Inventor file type (.iam, ipt, etc.), iMap capabilities will not be present.



## User Interface

Once you have launched Autodesk Inventor 2009 with iMap using the new desktop shortcut, open an assembly document normally, then right mouse click to get the context menu. There are two menu items to open an iMap view:

- **Constraint iMap** – A view designed to help view, create and manage assembly constraints and structures
- **Skeletal iMap** – A view designed to create, and managed derived part relationships frequently used to do “Skeletal modeling” in Inventor

Once the iMap view opens, familiarize yourself with a few key concepts. **Components** are arranged in the iMap view and are connected by **relationships**. Components are drawn as boxes and relationships as lines connecting the boxes.

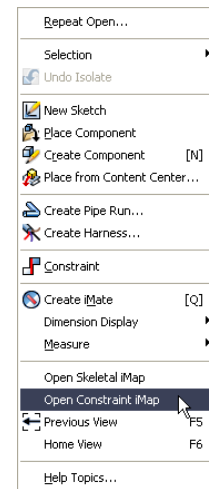
Components in the iMap view may represent sub-assemblies and can have their own sub-views. Sub-views can be collapsed (i.e. closed) or expanded (i.e. open). Initially, all sub-views are closed. The approach closely matches that of Inventor’s Browser; iMap lets you ‘expand’ areas of interest and generally avoid information overload by not displaying everything at once.

iMap also supports **interfaces**. An interface is attached to a component and can be used to create new relationships. For example, in the Constraint iMap, interfaces are iMates; the user can create a constraint by dragging a source iMate to a target iMate.

iMap uses several new methods to convey information:

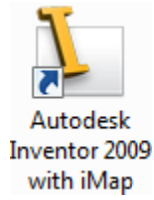
- Line color and line font for relationship lines can help you understand the type and health of a relationship.
- Component size in the iMap view can help understand the most important components in the iMap view.
- The color and icons associated with a component also can convey information about the component.

The image on the next page shows the Constraint iMap of a simple assembly. The boxes represent occurrences and the lines constraints. Note that highlighting (shown in red) and selection (shown in green except in the browser, where it is solid blue) is shown in all views (browser, graphical and iMap).



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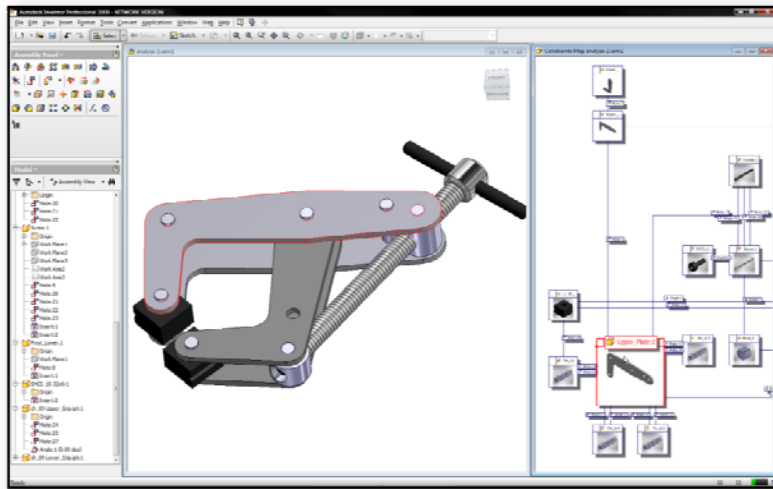
## Using iMap



Launch Inventor by double-clicking on the new Inventor 2009 with iMap desktop icon.

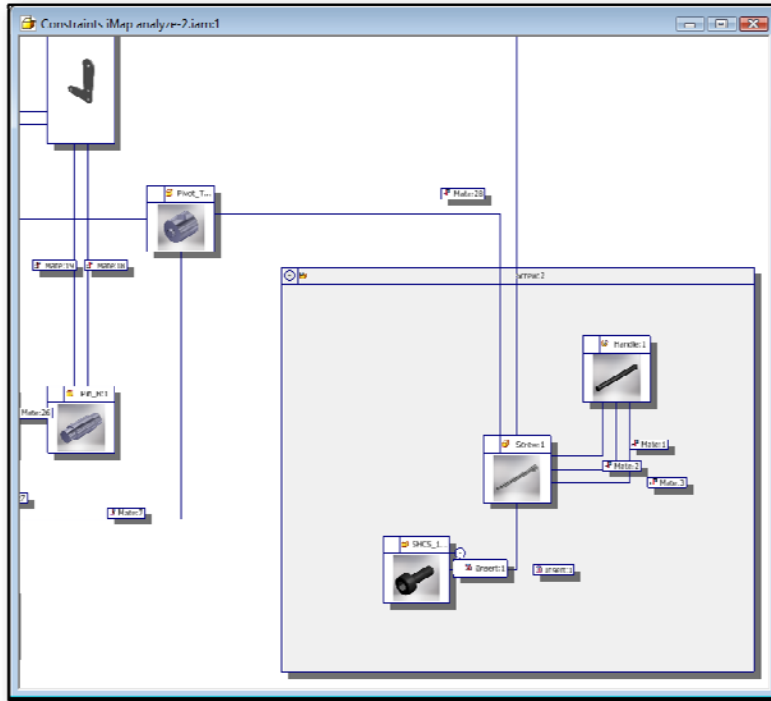
**IMPORTANT:** iMap only loads when launched from the new desktop shortcut. If you start Inventor by double clicking an Autodesk Inventor file type (.iam, ipt, etc.), iMap capabilities will not be present.

From within an assembly document, right mouse click to get the context menu and select either Open Constraint iMap or Open Skeletal iMap.



The + signs at the top left of some nodes represent sub-assembly occurrences that can be expanded by the user to reveal sub-iMaps. The + signs at the right of some nodes show that the nodes contain iMates; the plus signs can be clicked to reveal the interfaces. The image below shows an example of a sub-assembly that has been expanded and some interfaces that have been expanded.

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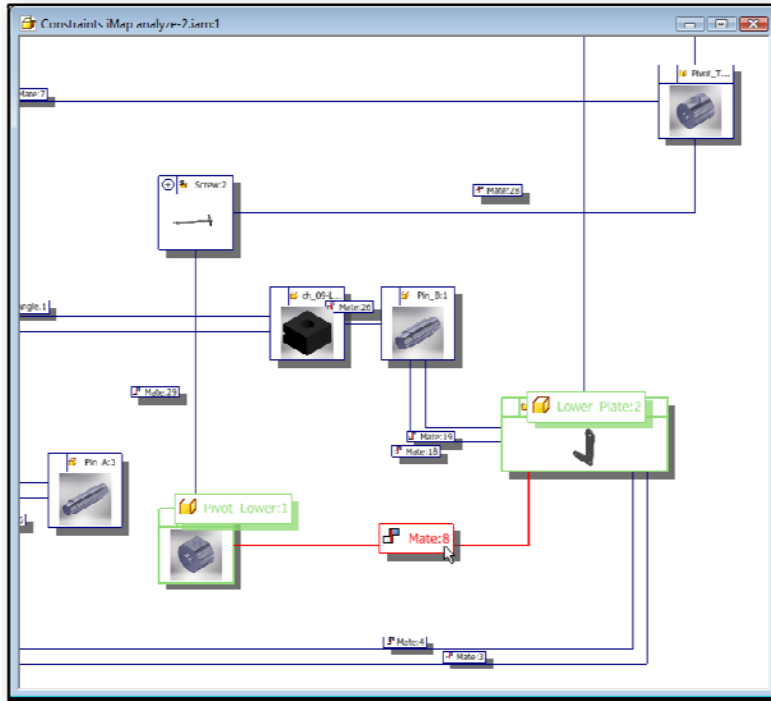
Often, the objects shown in an iMap view are existing Inventor objects and can be selected normally, either in the iMap view or another view. For example, the Constraint iMap view shows occurrences, constraints and iMates. You can select the object in the view, right click on it and you get a normal context menu that operates on the selection. So, for example, constraints can be deleted or suppressed.

There are some subtleties about displaying selection and especially highlighting in the iMap view:

1. When zoomed out an iMap view can have each node displayed as a really small box, if the selection or highlight is too small we also display some readable text associated with the selection (or highlight).
2. When highlighting a relationship (but not when showing a selected relationship), iMap will also highlight (using the secondary select color) the connected components or interfaces.
3. When highlighting an interface, all the relationships that use the interface are highlighted using the secondary select color.
4. When a component box is too small, iMap show the thumbnail of the node when it is highlighted.

The first two techniques are shown for a highlighted relationship – Mate:8 – in the image below.

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### Commands in iMap Views versus Other Views

iMap views are equal to existing Inventor views. All standard Inventor commands like selection (including window selection), zoom, pan, select other, etc work, as you would expect.

There are a number of commands unique to the iMap view; they are all found in the context menu. The commands allow the user to

- Expand all nodes (when no node is selected)
- Collapse all nodes (when no node is selected)
- Collapse the selected node (when it is expanded)
- Expand the selected node (when it is collapsed)
- Extend the selection; this works by 'following the references'.
- Isolate the iMap view to only show the current selection. This is very like the command of the same name in the normal graphics view.
- Undo isolate.
- Relayout the iMap. Generally, layout is done incrementally (e.g. as the user expands a node). This reduces change in an iMap view and prevents the user 'getting lost' but it can result in a less than optimal layout. Relayout redoes the entire layout from scratch.
- Open a sub-iMap view for a selected node in its own window. This is discussed in the following section.

Because users can have multiple views open of the same document, there are advantages in how all these views relate to each other that help you accomplish otherwise complicated tasks.

In normal Inventor (i.e. when iMap is not in use), a 3D graphics view is tied to a browser view and vice versa. If you open a document and go to the **Window** pull down menu and select **New Window** you get two graphics views, each of which is tied to a different browser view. When you switch between the two graphics view, the different browser views are activated in

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the browser pane (and you can see this clearly if you expand different folders in the 2 browser views). Commands like 'Find in Browser' and 'Find in Window' work from one view type to another (e.g. 'Find in Browser' is invoked from a graphics view, and allows the corresponding object to be seen in the tied browser view).

When iMap is in use, you create an iMap view from a specific graphics + browser view pair. If you right click in the graphics of an assembly view and select **Open Constraint iMap**, the iMap view created is considered tied to the graphics + browser view pair. Commands like 'Find in Browser' and 'Find in Window', when used from the iMap view, will find the corresponding object in these tied views.

Closing the graphics view also closes the browser view. It will not close any associated iMap View. The iMap view remains open and is then not tied to any browser or graphics view. Commands like Find In Browser are not available. You can then close the iMap view when done.

You can also open a iMap view without having a browser or graphics view open by using the **Open [ iMap Type ] Sub-graph** command. This command is located in the iMap view from the context menu of any selected component.

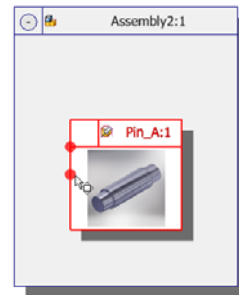
The main restrictions with iMap views are:

- Layout is automatic (so the user cannot change the position of nodes)
- Nodes are currently always rectangular in shape.
- Views cannot be combined with a user-edited object, like a sketch.
- You can only have one iMap view open for each 3D + browser view.

### Component Controls

Clicking the + or – on a component box will expand or collapse a component or its interfaces. Drag Manipulation is used to Move and/or Copy nodes and also to create relationships by dragging from a source component or interface to a target component or interface. This is will be covered in more detail in the explanation of the two iMap types.

You use these controls by dragging a Manipulator; a manipulator is shown as a solid circle. Manipulators are only shown when the operation is appropriate; the following Figure shows the Copy and Move manipulator for a node; when the cursor is above the circle, the user sees a tooltip and cursor that explain what the manipulator does.



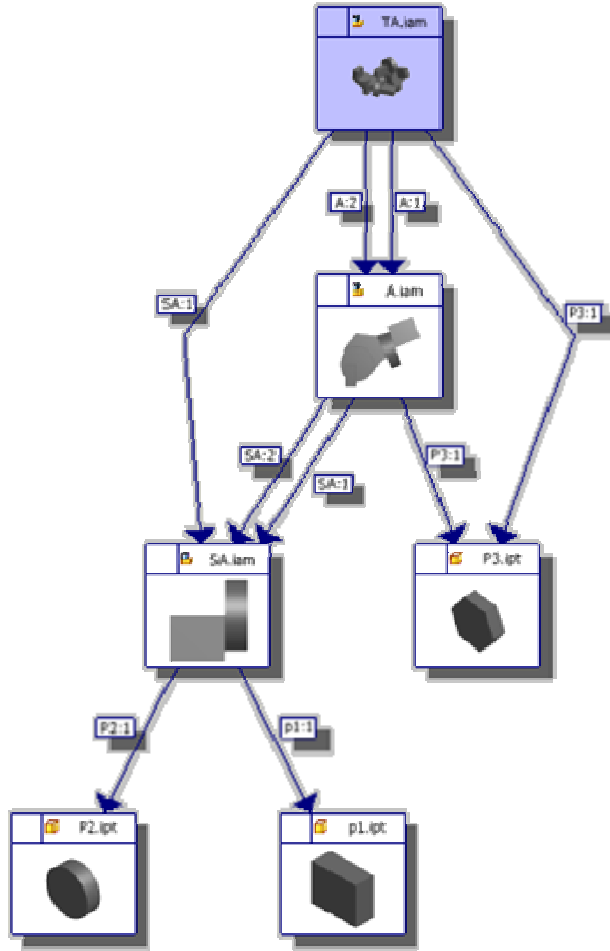
### Working with the Skeletal iMap

The Skeletal iMap view shows referencing relationships in an assembly and it shows how relationships from exported object are used to in skeletal modeling to produce derived components.

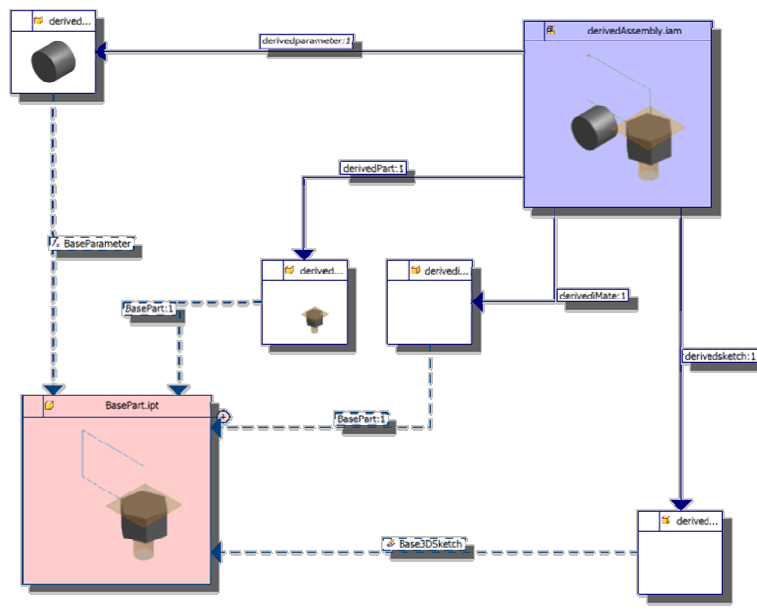
The components shown in the Skeletal iMap view represent Files, not Occurrences (the difference is that if a bolt is placed many times in an assembly, there is one File but many Occurrences). The lines shown in the Skeletal iMap view represent instances inside an assembly (shown solid) and derivation links (show dotted).

The following example shows an assembly that does not use skeletal modeling techniques; the assembly is represented as a tree, and the root is colored blue.

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When skeletal modeling techniques are used, the iMap view contains more information, as shown in the following figure.

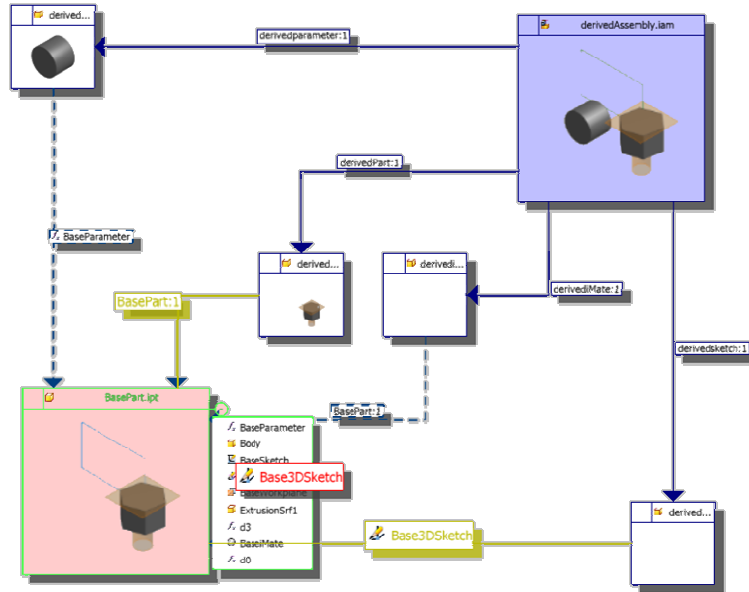


Here the root of the assembly is again shown in blue. Components used as 'base components' (i.e. the source for derivation) are shown in red. By popping open the interfaces

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in a base component, the user is shown everything that is being exported. Highlighting relationships and interfaces shows how they are being used together. When highlighting a derivation (dotted) reference, the interfaces it uses are also highlighted. When highlighting an export interface, all the relationships that use it are also emphasized.

Highlighting the interface for the exported Base3DSketch; the relationships that use it are also emphasized, allowing you to see the components that use that exported information. This information is difficult to obtain without using the iMap view.



The Skeletal iMap is very different from the Constraint iMap, because it shows objects that do not have existing, standard selections. Component, Instances and Exports are not directly selectable inside Inventor. As a result, these objects are selected directly in the iMap view.

Some commands in the Skeletal iMap view allow the user to edit exports and change derivation. For example, you want to export some information from a component; you can select it in the iMap view. From the right click menu select **Edit Exported Objects** command. This allows you to change the exports for that component without explicitly opening a view allowing you to do all the work to set up exported object without leaving the Skeletal iMap view.

Unfortunately, Inventor currently can't run the export object command on a document that isn't the active document. To work round this, Inventor opens a minimized view of the selected component and immediately starts the appropriate command. When you have finished with the command Edit Parameters or Edit Exported Objects simply re-activates the iMap view by clicking in the iMap view.

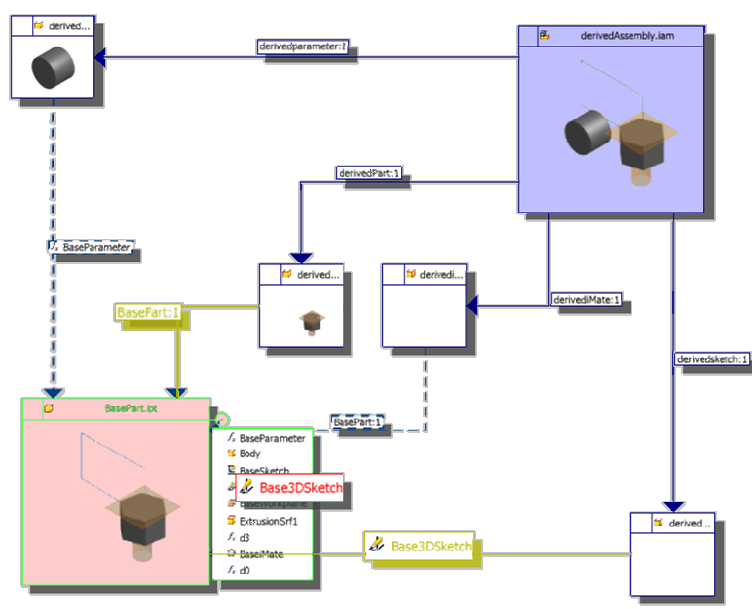
The user can derive information directly using drag and drop; he can select an exported interface and drag it to a component and that information will then be derived into the target. Currently, this is only supported for parameters.

You can also create instances via drag and drop (dragging from an assembly to a sub-component creates an instance) or via the Add Instance... command. The user can also select an instance and delete it. This allows you to create a new, empty assembly, populate it with components, and accomplish significant amount of design work without leaving the Skeletal iMap view!

## Working with Constraint iMap

Constraint iMaps show the occurrences and constraints in an assembly; the overall structure is very similar to that displayed in the browser (where a node in the iMap view is roughly the equivalent of an entry in the browser). Since every object in the iMap view has a corresponding Inventor selection (an occurrence, a constraint or an iMate for every node, edge or interface), cross-highlighting makes it easy to select something in the iMap, right click on it and change or delete it via a menu-item.

Because the iMap is structured, you can look at a constraint and see how many levels 'deep' it goes. The selected constraint (shown in green) lives at the top level of the assembly (TA.iam); on one side, it attaches directly to P3 and on the other it goes down into the sub-assembly SA:1 and attaches to P2:1. The highlighted constraint (shown in red) is owned by SA:1.



Adaptive and sick relationships are stressed in the Constraint iMap and are shown in bold and in an alternate color. In addition they will show an exclamation icon similar to the one seen in Inventor's browser. Suppressed constraints are shown differently as well. You can copy occurrences and move occurrences to do restructuring. Expanding components interfaces shows available iMates for that component. You can create constraints by dragging between compatible iMates.

Using these tools you will find that the Constraint iMap view can be an excellent place to manage your assembly constraints!

## April 1, 2009 Expiration Date

iMap is a Technology Preview and is programmed to expire on April 1, 2009. Since you will no longer be able to use iMap after this date, consider uninstalling iMap after this date.

## Uninstall

From Add or Remove Programs in your Windows Control Panel, simply locate the iMap for Autodesk Inventor entry and select **Uninstall**.

## Contacting Autodesk

Thank you for your interest in iMap for Inventor. Please direct any support issues, questions or feedback to [labs.iv.imap@autodesk.com](mailto:labs.iv.imap@autodesk.com).

Your feedback helps us make better products and technology, and it plays an important role in determining the future of iMap. All feedback is subject to the Autodesk agreement(s) applicable to your use of Autodesk Labs.



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