Vertex Tools for Google SketchUp

Vertex Tools • version 1.0

1st edition – 7 July 2010

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http://www.thomthom.net/software/vertex_tools/

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Getting Started

INSTALLING

The zip file with Vertex Tools contains a file, `tt_vertex.rb` and a folder `TT_Vertex`. These should be extracted to SketchUp's plugin folder. The location of this folder differs from platform to platform. On Windows it is in whatever folder SketchUp was installed to. On OSX it is at a fixed location.

Windows 32-bit: *(Default location for SketchUp 7)*

```
C:\Program Files\Google\Google SketchUp 7\Plugins\
```

Windows 64-bit: *(Default location for SketchUp 7)*

```
C:\Program Files (x86)\Google\Google SketchUp 7\Plugins\
```

OSX: *(SketchUp 7)*

```
/Library/Application Support/Google/Google SketchUp 7/SketchUp/plugins/
```

For other SketchUp version replace the version number in the path.

Note OSX users: The path is under the root Library folder, not under your user folder!

The footprint of Vertex Tools in the Plugins folder is:

- `[..]/Google SketchUp 7/SketchUp/plugins/TT_Vertex/`
- `[..]/Google SketchUp 7/SketchUp/plugins/tt_vertex.rb`

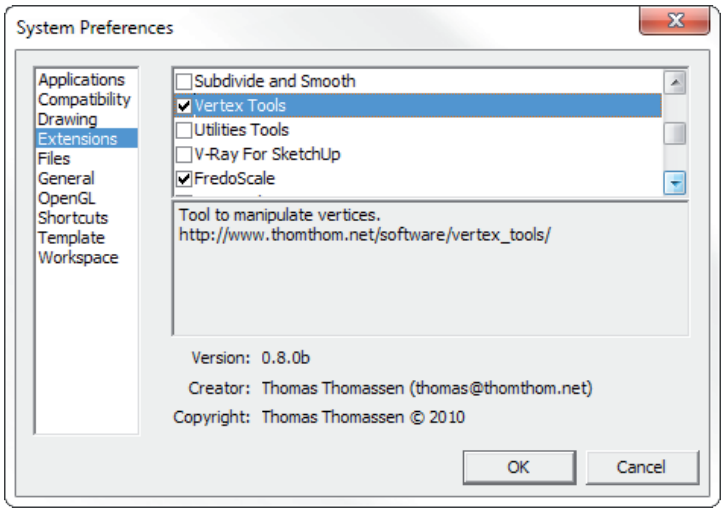
If you run into problems installing ensure that the files are located in the correct location.

UNINSTALLING

Remove the file `tt_vertex.rb` and the folder `TT_Vertex` folder from where Vertex Tools was installed.

ACTIVATING / DEACTIVATING

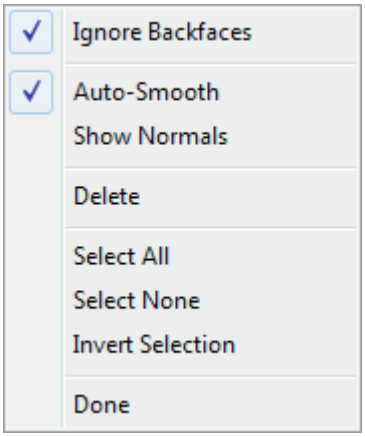
Vertex Tools can be activated and deactivated via SketchUp's extension manager. If you don't see Vertex Tools in your Tools menu, ensure that the plugin is enabled under Window » Preferences » Extensions.



User Interface

MENUS

Vertex Tools' menus are located under SketchUp's Tool menu. Vertex editing mode can be activated from its submenus. Edit Vertices and Preferences are the main items in the sub-menu. The other menus, such as Move, Rotate, Scale, etc. are there primarily to act as shortcut hooks so that SketchUp's Shortcut manager can be used to assign shortcuts to the various functions. This is described in detail in the Shortcuts section.

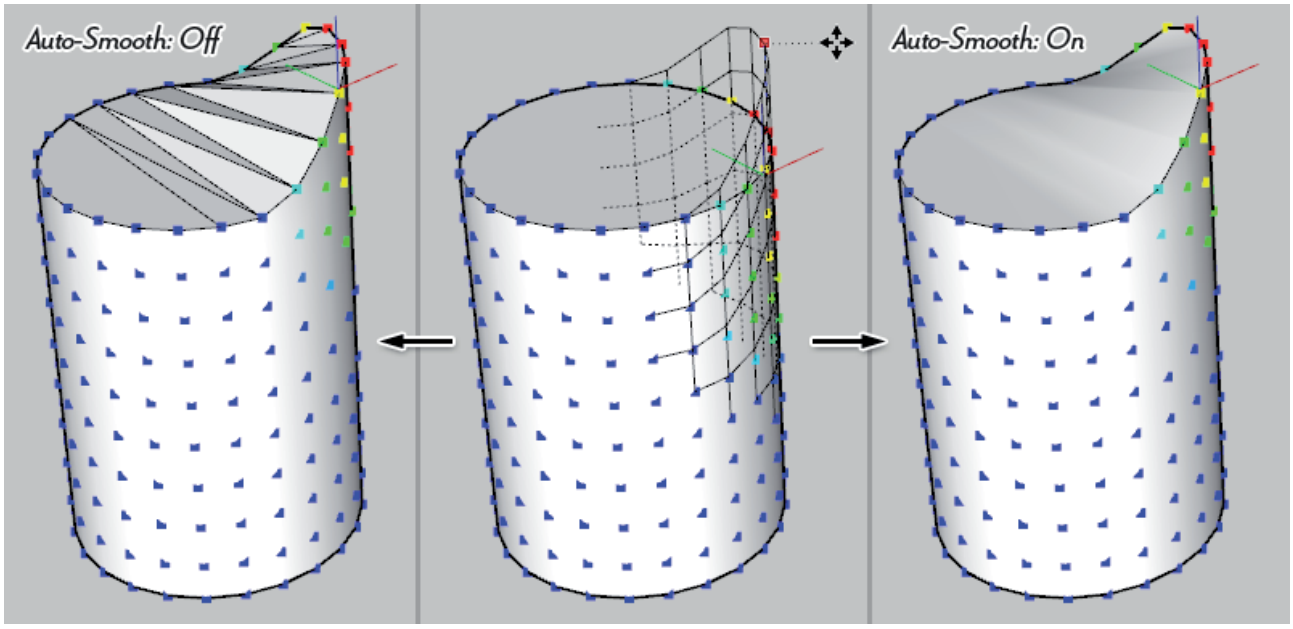


CONTEXT MENUS

While vertex editing a different context menu is available. It gives access to functions and preferences dependent on the active vertex editing tool. The context menu contains some items that are only accessible from the context menu:

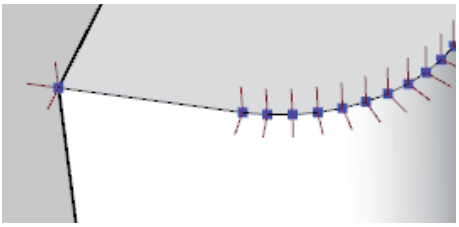
Auto-Smooth

When a face is deformed in such a way that its vertices are no longer coplanar, Sketchup Autofolds the face by adding new edges. These edges are normally not soft or smooth which as a result produce a faceted surface.



When Auto-Smooth is enabled these new edges will be softened and smoothed ensuring a continuous surface.

Show Normals



Turn this on for visual clue representing the normals for the surfaces connected to the vertex. The normals point in the same direction as the front side of the connected faces.

TOOLBARS

Vertex Mode Toolbar

Vertex Tools' main toolbar appears only when vertex editing mode is activated. It is drawn directly onto SketchUp's viewport and because of that it does not behave exactly like the normal toolbars in SketchUp.

- It cannot float over other windows.
- It cannot move outside SketchUp's viewport.

SketchUp Toolbar

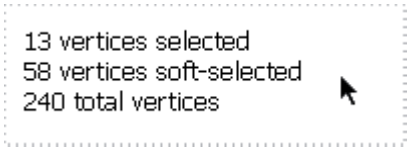
A normal SketchUp toolbar is available that provides a single button to activate vertex mode. This toolbar is by default not visible. Due to SketchUp's tendencies under Windows to shuffle toolbars around the procedure to enable it is different than the OSX version.

OSX: View » Toolbars » Vertex Tools

Windows: Tools » Vertex Tools » Preferences – Toolbar

INFORMATION PANEL

The information panel floats on the screen while editing vertices displaying vertex statistics of the current selection. It can be moved around by clicking and dragging within the dotted frame that appear when the mouse is over it.



Tools

The tools available to modify vertices tries to mirror SketchUp's native tools as closely as possible. Where new tools are introduced without a native counterpart their behaviour tries to keep with normal SketchUp conventions.

Known Issue: Due to limitation of SketchUp 6, inferences cannot correctly lock to user defined axis when the user presses the arrow keys.

SELECT

 Also accessible via Tools » Vertex Tools » Select

Activates the last used selection shape tool. Normal selection modifies applies to all selection shapes:

- Adding to selection: Press and hold `Ctrl` (Microsoft Windows) or `Options` (OS X).
- Toggle selection status: Press and hold `Shift`.
- Remove from selection: Press and hold `Ctrl` and `Shift` (Microsoft Windows) or `Option` (OS X).

When a selection tool is active a second row of buttons becomes available.

Selection Shapes

 Rectangular Select – Press and hold down the left mouse button to create a rectangular selection area or click a vertex to add individual vertices.

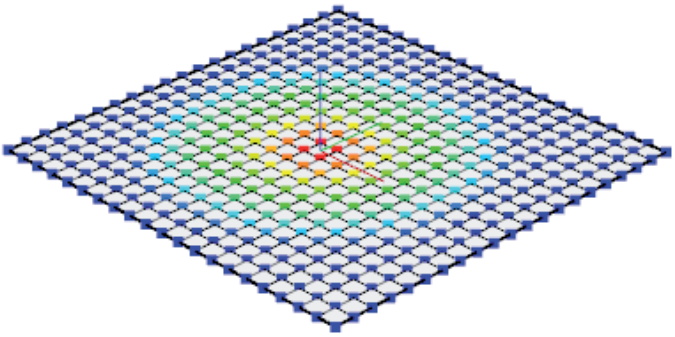
 Circular Select – Press and hold down the left mouse button to create a circular selection area or click a vertex to add individual vertices.

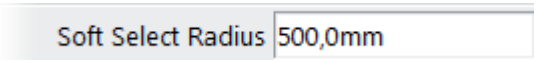
 Polygon Select – Click to add points to polygon selection. Double click to finish polygon.

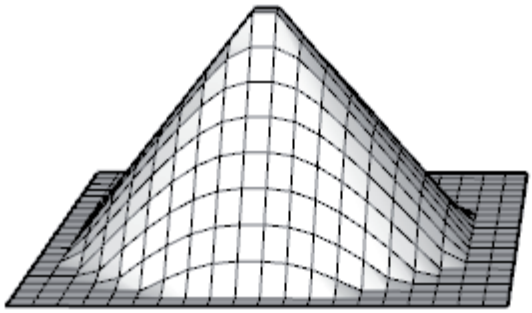
 Freehand Select – Press and hold down the left mouse button while moving the cursor to create a freehand selection shape.

Soft Selection

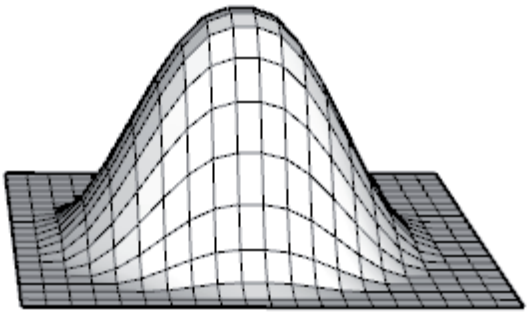
Soft Selection is set by typing in a Length in the VCB while a selection tool is active. Vertices within this distance from the selected vertices are also affected by tools that modify the geometry. The further away from the selection, the less they are affected. This is illustrated by colour-coding the vertices from Red, Orange, Yellow, Green and Blue – where Red is 100% and Blue is 0%. There are two types of fall-off for the soft-selction radius:







Linear fall-off



Cosine fall-off

Linear falloff affects the vertices directly proportional to their distance from the selected. Cosine falloff affects the vertices using a cosine curve.

Ignore Backfaces

Turn this on to prevent selecting vertices attached to faces pointing away from the camera.

Note that this is not the same as selecting only visible vertices. Vertices connected to faces pointing towards the camera but obscured by other objects will still be selected.

MOVE

Also accessible via Tools » Vertex Tools » Move

1. Pick a point for the origin of the move.
2. Move the cursor to move the selected vertices. The distance is displayed in the VCB.
3. To complete the move, either click a second time or enter a distance in the VCB for an accurate displacement.

Inference and axis lock is available for the Move tool. After completing a Move operation the distance can be corrected by typing a length in the VCB immediately afterwards.

ROTATE

Also accessible via Tools » Vertex Tools » Rotate

1. Pick a point for the origin of the rotation. Like the native rotate tool you can infer and lock the plane of rotation by pressing and holding Shift before placing the first point. The same goes for the click-drag method of defining the rotation plane.
2. Pick a second point to define a reference axis.
3. Move the cursor to rotate. The angle is displayed in the VCB.
4. To complete the rotation, either click a third time or enter an angle in the VCB for accurate rotation.

After completing a rotation the angle can be adjusted by typing a new angle in the VCB.

If 'Enable angle snapping' is checked in the Units Panel of the Model Info dialogue window, the protractor will snap to the specified angle — just like the native Rotate tool.

SCALE

Also accessible via Tools » Vertex Tools » Scale

1. Pick the centre point to scale about or type a scale ratio into the VCB. If the VCB is used the centre point of the selection is used as the point to scale about.
2. Pick a second point to define a reference length.
3. Move the cursor to scale. The scale is displayed in the VCB.
4. To complete the scaling, click a third time or enter a scale ratio.

After completing a scale operation the ratio can be adjusted by typing a new value into the VCB.

INSERT

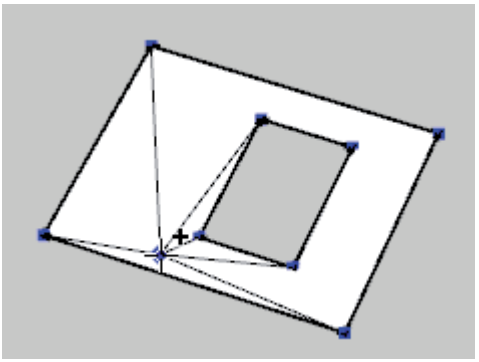
Also accessible via Tools » Vertex Tools » Insert Vertex

1. Pick a point on an Edge or a Face.

Edges are split at the point picked.

When the point picked is on a Face, new edges are created from each vertex of the Face towards the point provided they do not cross any existing edges. Press `Ctrl` to toggle between soft & smooth versus hard edges.

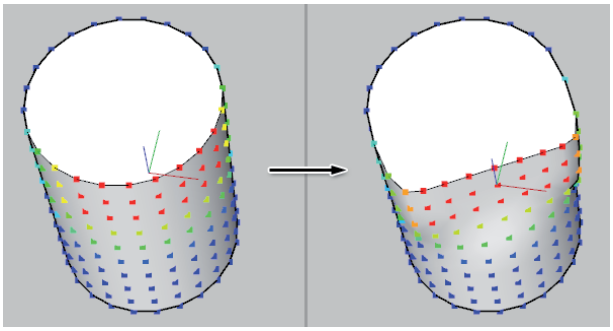
The tool makes use of snapping inference, but no inference locking.



MAKE PLANAR

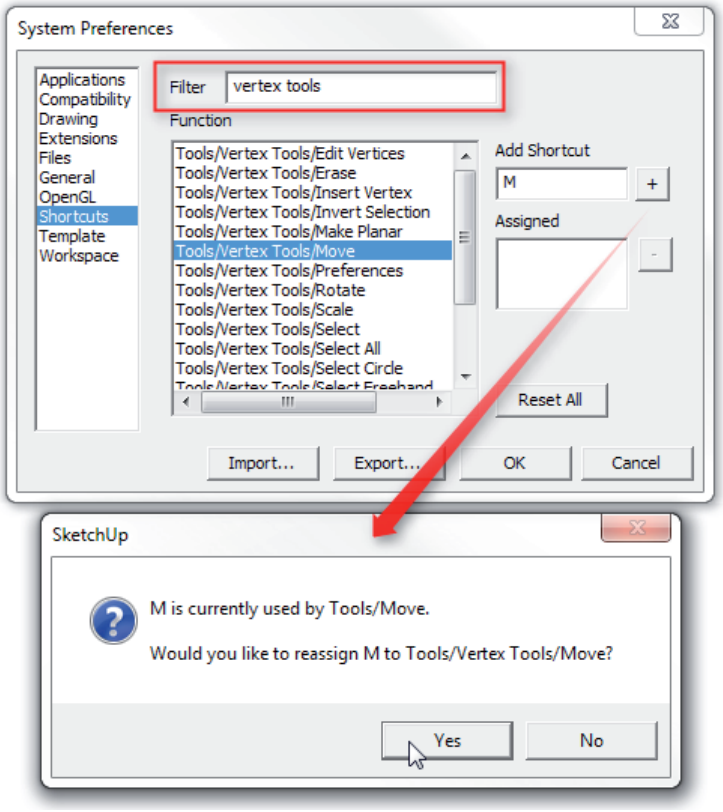
Also accessible via Tools » Vertex Tools » Make Planar

Selected vertices will be projected to a best fitting plane. Soft selected vertices are affected but do not contribute to the computation of the plane.



Shortcuts

Shortcuts to Vertex Tools' functions are assigned using SketchUp shortcut manager – Window » Preferences » Shortcuts.



To quickly locate Vertex Tool's functions use the Filter box above the function list.

PROXY FUNCTIONS

Some of Vertex Tools' menus have double functions. Using Tools » Vertex Tools » Move as an example:

- When vertex mode is active this trigger Vertex Tools' Move tool.
- When not editing vertices this trigger SketchUp's native Move tool.

This allows user to have their shortcuts functioning inside and outside vertex mode because the menus act as proxies that knows which tool to activate.

Available Proxy Functions

- Select *(All select variant will trigger the native select tool when outside vertex mode)*
- Move
- Rotate
- Scale
- Select All
- Select None
- Invert Selection

Example

If any of Vertex Tools' menus for Select is activated while a vertex select tools is already active it will exit vertex mode:

1. Space has been assigned to Vertex Tools » Select:
2. Vertex mode is active; the Move tool is the active tool.
3. The user presses Space, the Vertex Select tool is activated.
4. The user presses Space a second time, vertex mode is ended and SketchUp's native Select tools become active.

Limitations: The Delete key can't be remapped in SketchUp. This is a SketchUp limitation.

Note: When changing the language of Vertex Tools any shortcuts must be reassigned. This is because SketchUp use the menu text to identify the correct function to trigger.

Note: If shortcuts are assigned to Vertex Tools' functions and Vertex Tools is uninstalled, the shortcuts must be manually mapped back to their original functions. SketchUp will not do this automatically.

Preferences

Accessible via Tools » Vertex Tools » Preferences

Language

List of available languages for Vertex Tools. SketchUp must be restarted for the new language to take effect.

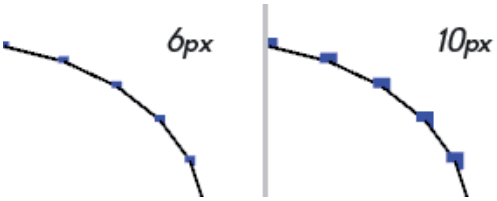
Note: If shortcuts has been assigned to Vertex Tools' functions they must be remapped after changing language.

Initial Tool

By default Vertex Tools will start with the last used vertex tool when entering vertex mode. This can be overridden here to always select a specific tool.

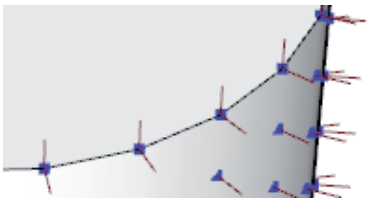
Vertex Size

This value affects the visual size and clickable area of a vertex. The value must be between 4 and 10.



Normal Size

Vertex normals indicate the direction of the faces connected to each vertex. Faces connected by a soft edge will share a normal indicator averaging the normals of the faces.



TOOLBAR

The purpose for this setting is mainly for PC users. It is a work around for the Windows version of SketchUp which has an unfortunate tendency to shuffle about the user's toolbars whenever a plugin with a toolbar is added. Because of this the Vertex Tools' toolbar is not available from View » Toolbars by default under Windows. The toolbar must be enabled through this setting before it becomes available.

Note that it will still cause SketchUp to shuffle about the toolbars, but it gives users that do not wish to use the toolbar an option to avoid being affected.

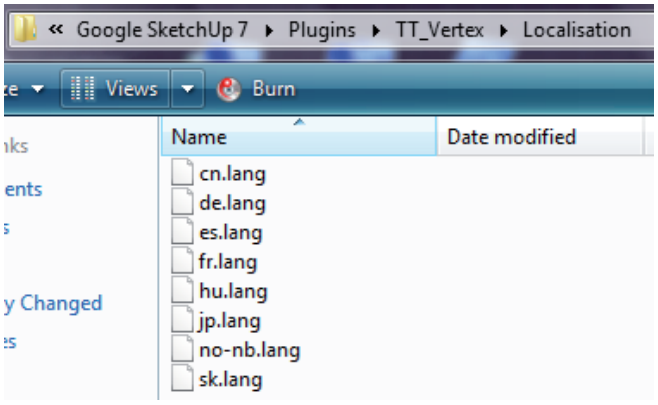
OSX users do not have to use this preference as the toolbar will be available from View » Toolbars by default.

CONTEXT MENU

Enable this to add a "Edit Vertices"menu item in SketchUp's context menu to activate vertex mode.

TRANSLATIONS

Vertex Tools can be translated into different languages by creating simple `.lang` files located in the `Localisation` folder.



Use the Norwegian language file (`no-nb.lang`) as a template when translating as it will always be updated and contain all the strings available. Additionally it includes comments with hints and a description of the file format.

.LANG FILE FORMAT SPECIFICATION

I. File MUST be plain text UTF-8 encoded. BOM is supported. If any `.lang` file is not UTF-8 encoded strange characters will appear and it can affect all other translations. Refer to your chosen text editor for how to encode files in UTF-8.

II. The filename MUST be saved with ASCII range characters. SketchUp's Ruby version (1.8) does not handle files with non-ASCII characters.

III. Please name your `.lang` file using the language code SketchUp reports for that language. This will ensure that Vertex Tools tries to load the language which matches the current SketchUp language. A list of language codes can be found here:
http://download.sketchup.com/OnlineDoc/gsu6_ruby/Docs/ruby-sketchup.html#get_locale
Example for French language file: "`fr.lang`"
If you can't find the language listed, just use any name as long as it does not conflict with any of the language codes on the list.

IV. `@title` MUST be the first line in the file. This is a special tag that contains the name of the language which appears in the list of available Languages under Preferences. The title should be the name of the language in its native language – not English.

V. `@author` and `@contact` are two optional tags that MUST appear right after the `@title` tag in any order. This is the credit and contact information that appear under the chosen language under Preferences.

VI. `@contact` tag MUST start with "`http://`", "`https://`" or "`mailto:`".

VII. Except the header tags the content of the file can be in any order.

VIII. After the header tags comments can be added by prefixing the line with `#`.

IX. The `%` symbol is a special character. It represents a variable and MUST be included. If you need to add a percent symbol to the strings you can do so by using a double percent sign: `%%`
Example: "`Hello %% World`" becomes "`Hello % World`"
All the strings are `sprintf` formatted.
For more info: http://ruby-doc.org/core/classes/Kernel.html#M005962

X. Another set of variables are `@@n` - where `n` represent a number. These are used by webdialogs. When present in the original string they MUST appear in the translated string. Example: "`Hello @@1 World`" becomes "`Hello 123 World`"

XI. Do not insert line breaks. The strings must appear on a single line.

TIPS AND RECOMMENDATIONS

Please include your name, contact info and the date the file was last revised.

To check for missing string you can open the Ruby Console and type `TT_Vertex::S.check` This will compare all the language files against the Norwegian file and list any missing strings for all the languages.

Do not literally translate the words, translate the meaning.

If possible, use the same terms used in SketchUp if SketchUp exist in the target language. Look at other 3d modelling and graphic software products to figure out what the norm is.

Great repository of translations terms in Microsoft's products: http://msdn.microsoft.com/en-gb/goglobal/bb688105.aspx

Look for guidance for translating to your own language. Often you can find guides provided by Open Source projects.

Known Issues / Limitations

- No way to hook into the use of the Delete key. SketchUp limitation.
- SketchUp 6 does not recognize user defined model axis.
- Rotation tool might rotate the rotation plane if the user moves the cursor too quickly after placing the initial reference point. Deviation from the native Rotate tool. Investigating.
- VCB is always enabled, even for tools that do not accept input. Technical limitation.

Known Bugs

- Insert Vertex occasionally creates new faces when there are holes in the face. Investigating.
- Rotation Gizmo's guide line does not always appear as an infinite line. Investigating.

Credits

Thanks to all the beta testers that provided invaluable feedback and support.

Thanks to the translators who contributed translations and interesting semantic discussions.

Thanks to Sketchucation for the support during the development.

Thanks to Google for letting me use some of SketchUp's cursors and toolbar icons.

Big thanks to TBD and AdamB for helping me get started with Ruby C Extensions when I needed to crunch numbers in a speedy manner.

Contact

Use the contact form at Vertex Tools' website for any questions or feedback.

http://www.thomthom.net/software/vertex_tools/contact

I can also be found lingering around the forums at Sketchucation.