

# Creating Vector Content Using Live Trace

## A Feature of Adobe Illustrator CS2

### TABLE OF CONTENTS

1	About vector tracing
2	How vector tracing works
3	Basic terminology
4	Choosing a source image
5	Bringing an image into Illustrator
5	Tracing an image
6	Artboard view options
6	Fine-tuning your results
8	Converting traced images to classic Illustrator paths
8	Converting traced images to Live Paint groups
10	Tracing options
12	Using Edit Original with Photoshop CS2
13	Batch processing
13	Live Trace in action
13	Live Trace for programmers
13	For more information

Adobe® Illustrator® CS2 puts industry-standard drawing tools at designers' fingertips so that they can create graphics for print, video, the web, and mobile devices with ease. And now, with the new Live Trace feature, Illustrator CS2 offers an entirely new way to create vector graphics. Live Trace, a breakthrough tracing tool, lets you convert scanned line art and bitmap images to scalable, editable vector paths and anchor points in just seconds.

How many times have you roughed out an idea on the back of a paper placemat, only to have to recreate your work from scratch on the computer? How often have you wished you could scan a photograph and convert it directly to a vector graphic as the starting point for an illustration? With Live Trace, you can do both—and more.

What makes Live Trace “live” is a link that is maintained between the original bitmap image and the traced vector result. You can experiment with tracing options ranging from aesthetic to technical, from color swatches to pixel value thresholds. The traced result updates automatically, even if the original linked bitmap file is modified. Not only is Live Trace live, it's also intelligent—its choice of the total number and placement of anchor points rivals that of the most skilled Illustrator artist.

This white paper is intended for graphic designers, art directors, freelancers, web designers, print and prepress professionals, and others who are involved in the day-to-day, hands-on creation of graphic materials for print, the web, and mobile devices. It explains how Live Trace works and how you can use it to achieve a high-quality vector foundation on which to build your creative artwork.

### About vector tracing

In the world of computer graphics, there are generally two types of image files: bitmap and vector. Vector tracing is the process of converting resolution-dependent bitmap content into resolution-independent vector content. There are many uses for bitmap to vector conversion and reasons why it's needed in a design workflow.

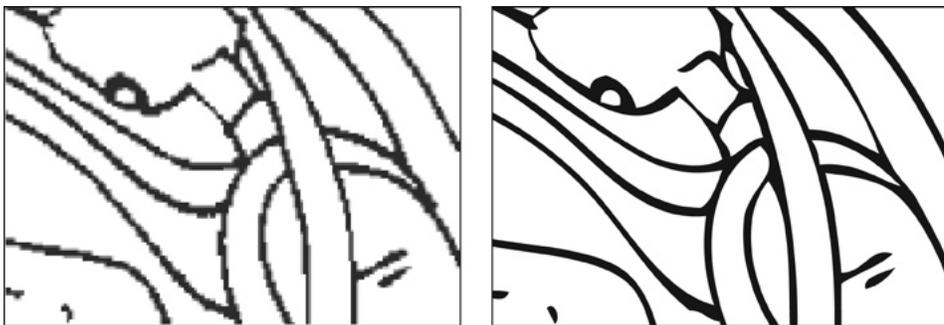
Bitmap images, also referred to as raster images, are made up of a collection of dots or pixels in a grid. Because bitmap images can produce painterly effects, they can be photographic in nature. Bitmap images are defined by the number of pixels in the image (called resolution) and the number of colors contained in the file (called bit depth). The ability to capture, manipulate, and display images in digital form has dramatically increased the amount of content that exists in bitmap form. Files that are saved as PSD, JPEG, GIF, TIFF, and BMP are all examples of bitmap file formats.

The resolution of a bitmap file is usually measured in pixels per inch (ppi) and is set when the image is created. For example, when you take a digital picture, scan a piece of art, or create a digital painting, you define what the resolution of that image will be. If an image has a high resolution, the individual pixels are smaller and, hence, give the image a greater level of detail. In extremely low-resolution images, the individual pixels might even be large enough to see, resulting in stair-step patterns, also known as jaggies. When bitmap images are enlarged, the pixels are just made larger. For example, if you take a 300 ppi image and enlarge it 200%, the effective resolution of the file is 150 ppi.

The color depth is also set at creation time and is usually measured in bits. For example, a 1-bit image can contain two colors: black and white. An 8-bit image can contain up to 256 colors, and a 24-bit image can hold 16 million colors. High-resolution images with a high bit depth can be extremely detailed.

Bitmap images look great at actual size, but begin to deteriorate in quality as they are scaled upward in size or manipulated. While bitmap images are perfect for photographs and digital paintings, they are less than ideal for logos and illustrations, which need to be rescaled for different uses. Additionally, bitmap images have softer edges on text and lack the crisp lines that are necessary for text and certain art styles and projects.

In contrast, vector images are made up of paths, called bezier paths, that are defined mathematically. These paths were originally developed for designing cars and airplanes. The paths use anchor points and control handles to define the position and behavior of paths on an  $x,y$  axis, which gives you the ability to create free-flowing shapes that are clean and sharp. Because the anchor points on these paths are defined as mathematical coordinates, they are resolution-independent and can be scaled to any size without losing quality or appearance. In addition, working with distinct objects and paths makes it easier to create and edit artwork. For these reasons, vector images are perfect for logos, maps, and other artwork that must remain in a scalable and nondestructive form



The image on the left is a 100 ppi bitmap scaled to 300% and has jaggies. The clean and smooth image on the right is vector art scaled to 300% of its original size.

If you want to take bitmap artwork and scale it up in size, enhance or sharpen the art's appearance, or perform other edits that require the art to be in vector rather than pixel form, you must perform vector tracing. Vector tracing is also necessary if you want to resize or edit scanned artwork, since scanners create bitmap image data. Low-resolution images, which can't be reproduced at large sizes, as well as photographs or images taken with a digital camera also need to be traced if you want them in vector form.

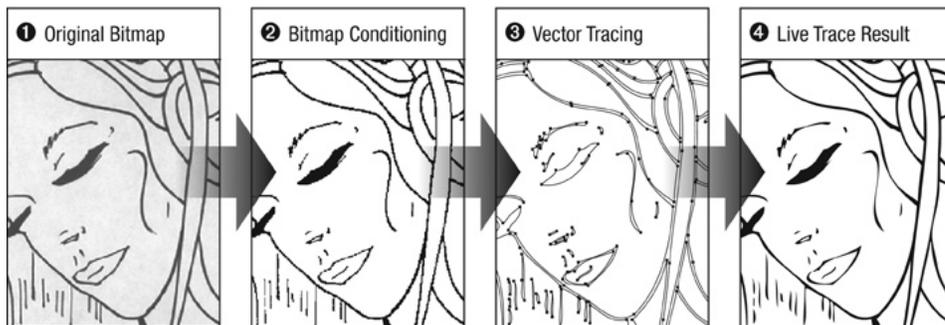
## How vector tracing works

Vector tracing takes a bitmap image and creates vector paths to closely match the lines and shapes in the bitmap image. The result is a version of the original artwork that is easier to edit—and more importantly—can be scaled to any size.

There are other products or plug-ins that perform this conversion, but they are expensive and don't give designers the results they need. For example, designers can spend a considerable amount of time editing a scanned image or photograph in an image-processing application, such as Adobe Photoshop®, to deliver optimal tracing results. This process requires an in-depth understanding of tracing technology and how to best prepare the image. In addition, extra work is often needed to add anchor points and fix imperfect paths and irregularities caused by the tracing process. Many experienced designers avoid automated tracing because they feel that they can produce better results and more efficient paths. Of course, this more manual process of tracing art by hand can be extremely time-consuming, usually entailing hours of detailed and complex work.

Live Trace in Illustrator CS2 takes all of these challenges into account and presents an elegant—and efficient—solution. Because Live Trace is completely integrated into Illustrator CS2, it requires no additional software, plug-ins, or investment. Live Trace takes a comprehensive two-step approach to converting bitmaps to vectors. In the first step, Live Trace “conditions” the bitmap image for optimal tracing, making adjustments to tone, resolution, and color. In the second step,

Live Trace draws vector paths, taking advantage of technology that creates highly accurate and professional vector art. But this two-step process is only half the story. By keeping the original bitmap image and the traced vector result linked together (hence the name, Live Trace), you can adjust the bitmap conditioning settings and the vector tracing settings individually, and preview the results immediately. So you can tweak the results of your designs easily and without disrupting your creative workflow.



Live Trace performs several steps to produce high-quality results. After the original bitmap is placed into Illustrator (1), Live Trace conditions the bitmap image (2), and then traces it with precision (3), resulting in a Live Trace object that can be tweaked to perfection (4).

## Basic terminology

Vector tracing has its own terms. You might want to familiarize yourself with the terminology, since it will be used throughout this document.

**Fill tracing** A style of vector tracing that uses filled objects to better simulate the natural thicks, thins, and curves of a drawing. Also referred to as outline tracing.

**Stroke tracing** A style of vector tracing that produces vector paths with stroke attributes rather than closed filled shapes. The paths produced throughout the entire trace have varying thicknesses to best match the original bitmap image, but each path itself has a single straight line of even and consistent thickness. This method is also referred to as centerline tracing.

**Black and white images** Also called 1-bit images, these bitmaps only contain pixels that are colored white or black. The Black and White setting in Live Trace produces vector art that is colored either black or white.

**Grayscale images** These 8-bit images support up to 256 levels of gray and represent photo-like quality. The Grayscale setting in Live Trace produces vector art that is colored with up to 256 different shades of gray.

**Color images** Images with color can contain up to 32 million colors, using a bit depth of up to 32 (sometimes called TrueColor). The Color setting in Live Trace produces vector art that is colored with up to 256 different shades of color.

**Posterization** When making contrast adjustments in an image, it's entirely possible to lose subtle gradations of color or detail where contrasting colors meet. Photographic images often have thousands, if not millions, of colors. To trace such an image, the photo must first be reduced to reference a smaller number of colors. This reduction causes a noticeably pronounced and abrupt shift in color, called posterization.

**Blur** A method of smoothing the pixels in a bitmap file. A blur removes detail from an image by reducing the number of high-contrast pixels in an image.

**Threshold** In multibit images, pixels might vary between black and white levels, or between colors used in a library. The Threshold setting determines whether intermediate pixels lean toward being traced as black art or white art. Threshold is only used when art is traced for black and white output.

**Resampling** Bitmap images are made up of a specific amount of pixels, which define the resolution of the image. Resampling changes the number of pixels in a bitmap image. Upsampling adds more pixels to an image. New pixels are added using a variety of interpolation methods. Downsampling removes pixels from an image.

**Minimum area** In the process of tracing, Live Trace looks for collections of pixels to convert into vector form. However, tiny areas of pixels might be the result of a noisy or dirty scanned image, resulting in a level of detail that is not desired. The Minimum Area setting determines how large a collection of pixels must be to be considered viable for conversion to vector. Any collection of pixels that falls beneath this setting is considered noise and is not traced.

**Preset** A stored or saved collection of option settings for a specific feature. The Live Trace feature in Illustrator has many different settings. Live Trace enables you to create and save your own tracing presets, or to quickly trace an image with one of the 13 image-specific presets that are built into the feature.

**Expand** Once a bitmap has been traced with Live Trace, Illustrator maintains a live link between the original bitmap image and the resulting vector paths, allowing for tweaking of the settings and minor adjustments. However, you do not have direct access to the actual anchor points and paths for editing. Once an image has been traced and you are happy with the results, you can *expand* the results, which permanently applies the trace. You can then edit the resulting vector paths. The original bitmap image is discarded, and tracing options are no longer available for the resulting vector paths. Expanding a Live Trace object is similar in concept to expanding a pattern, gradient, blend, or appearance.

## Choosing a source image

Live Trace is much more than a simple conversion tool. Rather, it can redefine how creative individuals use Illustrator and computers to create their work. Whether you like to start with a pencil and a sketch pad, a pressure-sensitive pen tablet, or a digital camera, we'll go through the steps of using Live Trace in Illustrator CS2 to turn those concepts into final art with professional results. You can take advantage of Live Trace to best match your needs. Experiment with results that look more hand-drawn or tweak for a more crisp and clean "computer-like" style.

Choosing the right source image can have a substantial impact on the quality of the resulting traced object. Likewise, when creating a sketch or drawing that will eventually be traced, there are general techniques and considerations you can apply to enhance the final result.

### Traditional drawing methods

In today's digital age, many traditional artists might feel at a disadvantage if they aren't familiar with drawing their designs directly on a computer, using either a mouse or a pressure-sensitive tablet. There is certainly no substitute for drawing with traditional tools such as ink on paper, and with Live Trace, there's no need to throw away those valuable tools. Artists are now free to create art as they wish and then scan and trace their work to complete it in digital form while still preserving their creativity in the process. While marker or ink pens on heavier paper might produce better tracing results, artists can use pencil and tracing paper, although such drawings might require more adjustments after being scanned and before tracing them in Illustrator. Live Trace works with bad source images. The main deterrent to getting a clean traced image is a scan that is very noisy. Images with noise contain artifacts that degrade image quality. The cleaner the image, the better the traced result.

### Scanning techniques

Scanners come in all shapes and sizes. Professional models support higher color bit depths and higher resolutions, however, those capabilities aren't needed for many tracing purposes. A simple flatbed scanner that can capture sketches cleanly with little noise works well. Another consideration is how large an original you can scan, since the maximum size the scanner can handle dictates the largest size paper you can sketch on. With Live Trace, a higher resolution scan doesn't necessarily translate to a better traced result. In many cases, a high-resolution file adds complexity to a traced file and significantly affects performance.

Some design workflows might require better scanners that can capture more detail in the bitmap image. Sometimes this additional detail can act as noise and get in the way of producing a good tracing result. Scanning at high resolutions might require that you reduce detail and lower the resolution of the source image after scanning. Live Trace has several tools to help adjust images in the bitmap conditioning stage.

## Digital painting

Some artists have found that using a pressure-sensitive pen tablet and Photoshop lets them express their creativity directly on their computer. Because the art is typically clean and free of noise, you can expect clean results from tracing these kinds of images.

## Digital photography

You can import digital photos onto your computer and place them directly into Illustrator for tracing. Because of the lossy JPEG compression used in most digital photographs, these images often have noticeable artifacts, which might contribute to additional noise. It might be helpful to use a photo editor like Photoshop CS2, which contains a noise reduction filter that can specifically clean up JPEG artifacts, to better prepare these images for tracing in Illustrator. See the section “[Edit Original and Adobe Photoshop CS2](#)” for more information.

## Bringing an image into Illustrator

In Illustrator, you can usually perform a particular task in several different ways, with each method having its own benefits or strengths. Working with bitmap images in an Illustrator document is no different. You can place an image into any open Illustrator document by choosing File > Place. Illustrator supports two kinds of placed images: linked and embedded. A linked image maintains an external connection to the original file. Linked files must be included when sending the Illustrator file to other users. Linked images don’t add any significant file size to the document. In contrast, embedded images lose their link with the original file when the image is placed. Embedded images become part of the Illustrator file, and the external file is not needed when transferring the Illustrator file to others.

	Place-Link	Place-Embed
Requires external link	Yes	No
Adds to file size	No	Yes
Can be updated easily with Edit Original feature	Yes	No
Live Trace can auto-detect resolution of file	Not always	Yes
Multiple placed images can be updated at once	Yes	No*

*\*Unless the embedded image is first defined as a symbol.*

The pros and cons of using placed-linked images and placed-embedded images in a workflow.

Once you’ve brought a bitmap image into Illustrator CS2, you can convert the image to vector paths using Live Trace, accessed through a new Illustrator CS2 feature called the Control palette. This context-sensitive palette stretches across the top of the screen and offers convenient access to nearly 80% of Illustrator’s feature set, alleviating the need to clutter your screen with multiple palettes.

## Tracing an image

To trace the selected image using the default preset, click the Live Trace button. Alternatively, click the tracing preset icon and choose from one of the following presets.

**Default** A simple black and white preset designed to get you started quickly.

**Color 6** For tracing color logos and simple illustrations.

**Color 16** For complex color logos and more advanced illustrations. Can also be used to achieve stylized posterized illustrations.



When you select any bitmap image, the Control palette changes to display several image-related functions.

**Photo Low Fidelity** For tracing photographic content where detail isn’t important.

**Photo High Fidelity** For tracing photographic content where detail is important.

**Grayscale** For tracing art or images where a monotone gray result is desired.

**Hand Drawn Sketch** For converting hand-drawn sketches into vectors.

**Detailed Illustration** For converting illustrations with fine lines and detail.

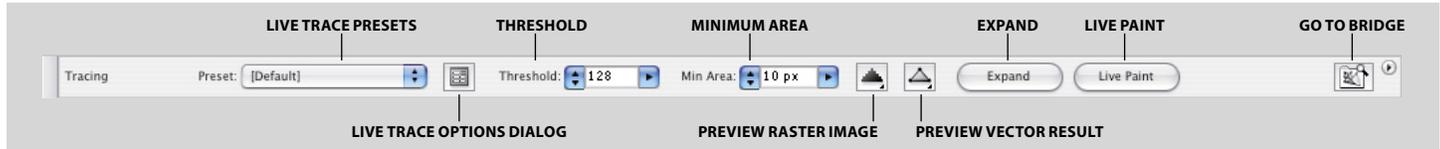
**Comic Art** For tracing art in a style often found in comic books and strips.

**Technical Drawing** For maps and highly technical drawings.

**Black and White Logo** For converting simple solid line art for logos.

**Inked Drawing** For tracing inked drawings.

**Type** For converting bitmap text objects into vectors.



Once you've traced an image, the Control palette changes to present different options.

**Note:** When tracing images using Grayscale or Color mode, the Max Colors setting replaces the Threshold setting in the Control palette.

In this live state, you can continuously make adjustments to the trace settings, and the results update automatically. You can't actually edit the vector paths just yet, since Live Trace maintains a live link between the bitmap image and the traced result. To access the paths, you have to either expand the trace or convert it to a Live Paint group, both of which we will discuss shortly. However, you don't have to expand the paths at all if you're happy with the trace results. Live Trace objects will RIP and print correctly as vector shapes.

## Artboard view options

Illustrator offers several different ways to preview a Live Trace object. Once a trace has been completed, two icons in the Control palette become active: one controls how the bitmap image is previewed, and the other controls how the resulting vector object is previewed. You can set these preview settings independently.

### Preview Raster Image

The No Image setting completely hides the bitmap image from the display (and is the default setting). The Original Image setting displays the original bitmap image in your document, which might be helpful to use when comparing the original image to the traced result. The Adjusted Image setting displays the bitmap image as it appears after Live Trace has applied the preprocessing conditioning adjustments. This preview mode is great for seeing how Live Trace works and makes it easier to preview adjustments you make to the bitmap image settings. The Transparent Image preview mode displays a dimmed preview of the bitmap image beneath the traced result, enabling you to better see the traced results when comparing them to the original bitmap.

### Preview Vector Result

The No Tracing Result setting hides the traced vector objects from the display. Additionally, this setting disables the actual vector tracing and is extremely useful when used in tandem with the Adjusted Image raster preview setting, allowing you to experiment with different bitmap conditioning settings and preview them without taking a performance hit each time while waiting for Live Trace to calculate the results. The Tracing Result setting displays the vector result of the tracing (and is the default vector setting). The Outlines setting displays the resulting bezier paths. The Outlines With Tracing setting displays those same paths as semi-transparent, enabling you to compare filled areas of the traced vector result with the original bitmap image. The color of the outlines displayed matches the color specified for guides in the document preferences.

## Fine-tuning your results

Once you have traced an image, you can tweak the Live Trace settings to perfect your results.

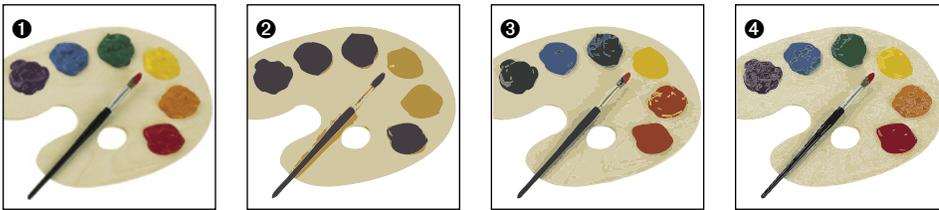
First, you can quickly choose between the different Live Trace presets to preview your art. (We will discuss how to create your own custom presets later in this document.) In the Control palette, you can use the Threshold, Max Colors, and Minimum Area settings to alter the results of your traced object.

The Threshold setting determines the boundaries between pixels when using the Black and White trace setting. For example, in a gray bitmap, a high threshold setting results in more gray pixels becoming black vector objects. In that same image, a low threshold setting results in more gray pixels ignored, making for more white-colored objects. When using the Black and White setting to trace color images, Threshold defines which colors appear as black or white in the final traced result.



1. The original bitmap image. 2. Threshold set to 80. 3. Threshold set to 128 (Live Trace default). 4. Threshold set to 200.

The Max Colors setting determines the maximum number of colors that can be used in the final traced result when the Grayscale or Color trace setting is used. Live Trace uses the Selective color reduction method to reduce the number of colors in the bitmap to match this setting during the bitmap conditioning process.



1. The original bitmap image. 2. Max Colors set to 4. 3. Max Colors set to 16. 4. Max Colors set to 48.

One of the most common issues with tracing images is dealing with noise in an image. Live Trace does a great job in turning each and every pixel into vector objects, but many times that's just too much granularity. The Minimum Area setting sets a threshold for how large a piece of artwork must be to be converted to a vector object. For example, you might not want to see a tiny 2-pixel by 2-pixel speck in your traced result. By setting a minimum area, you can instruct Live Trace to only trace collections of pixels that meet a minimum size. If the Minimum Area is set to 9 pixels, Live Trace ignores regions of pixels that are less than 3 by 3 pixels in size. In this way, you have a result that is much cleaner in appearance, isn't as complex, and is easier to work with.



1. Original bitmap image. 2. Minimum Area set to 10 pixels (Live Trace default). 3. Minimum Area set to 5 pixels. 4. Minimum Area set to 0 pixels.

## Converting traced images to classic Illustrator paths

Live Trace maintains a live link between the bitmap image and the traced vector result, which enables you to tweak and modify the images and have Illustrator automatically generate a new result. Once a trace is complete and you're satisfied with the result, you might want to edit the bezier paths, delete portions of the image, or apply your own custom coloring.

To convert a Live Trace object into classic Illustrator paths, you must use the Expand feature. With a Live Trace object selected, click Expand in the Control palette. You can then use the Direct Selection tool to edit anchor points and bezier paths. At this point, the traced object is no longer live or linked to the original bitmap image, which has been discarded from the file. The traced result is now permanent and can no longer be adjusted using any of the Live Trace options. Once a Live Trace object is expanded, you have complete freedom to use and apply any of the Illustrator editing tools and effects.



Once the Live Trace is expanded, you can edit each of the individual paths as you would any vector object.

*Tip: If you are tracing a bitmap and know that you are going to immediately expand it for further editing, you can press the Option key (Alt key on Windows) while clicking on the Live Trace button or choosing a Live Trace preset from the Control palette to both trace and expand in one step.*

## Converting traced images to Live Paint groups

The new Illustrator CS2 Live Paint feature lets you color artwork quickly and intuitively—almost as if you were coloring inside the lines of a coloring book. Once you've converted paths to a Live Paint group, you can use the Live Paint Bucket tool to apply color anywhere you want. The art that is created in a Live Paint group is represented in a flat world in which intersecting paths define paintable areas: what *looks* like a paintable area *is* a paintable area. No need to painstakingly plan and create objects just to carry color—instead, you can dive right into coloring.

With a Live Trace object selected, click the Live Paint button in the Control palette, which expands the trace and converts all of the resulting vector objects into a Live Paint group in a single step. You can then select the Live Paint Bucket tool to fill your art with color without any additional steps.



All objects within a Live Paint group exist on a single flat layer.

Moving the Live Paint Bucket tool over a Live Paint group highlights paintable regions.

One of the more powerful features of Live Paint is Gap Detection, which lets you fill areas that are not completely closed, either as a result of the style of the illustration or the tracing process. Gap Detection is available by selecting a Live Paint group and clicking on the Gap Options icon in the Control palette. Alternatively, you can choose Object > Live Paint > Gap Options.

When you use the Live Paint button to convert a Live Trace object directly to a Live Paint group, Gap Detection is deselected by default. Selecting Gap Detection can significantly impact painting performance if you are working with a complex tracing result. The number of objects in a Live Paint group can also slow down performance, so in large complex groups with many objects, you might get better performance by first expanding the trace and then creating several smaller Live Paint groups rather than one large group.

If you prefer to do inking by hand and then scan and trace the results, the Live Trace to Live Paint workflow makes it easy to apply color as a last step rather than try to scan and trace colored drawings.

For more information on the Live Paint feature in Illustrator CS2, go to the Illustrator CS2 product page at [www.adobe.com/products/illustrator](http://www.adobe.com/products/illustrator).

## Tracing options

The Tracing Options dialog box offers a wealth of settings to perfect a trace. You can access the Tracing Options dialog box via the  icon in the Control palette (when a tracing object is targeted) or by choosing Object > Live Trace > Tracing Options.



The Tracing Options dialog box in Illustrator CS2 enables you to tweak Live Trace objects to perfection.

**Note:** All settings in the Tracing Options dialog box (including vector settings) use pixels for measurement, since the only reference is the original source bitmap image.

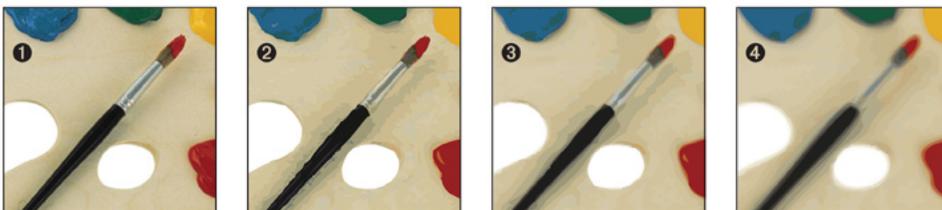
The Tracing Options dialog box gives you full access to the two-step process that Live Trace uses. The Adjustments settings on the left side of the dialog box apply to the conditioning of the bitmap image before the image is traced. The Trace Settings determine how the vector tracing is performed on the image.

### Adjustments

Live Trace converts a bitmap image to either 1-bit black and white, 8-bit grayscale, or 8-bit color, which you can choose from the menu. If you choose Black and White, you can specify a threshold value. If you choose Grayscale or Color, you can specify the maximum number of colors for Illustrator to use for tracing. If you select Output to Swatches, Live Trace creates global process color swatches for all of the colors used in the traced result, which makes it easy to use those colors for other vector objects in the file.

By default, Illustrator uses the selective color reduction method to choose the best colors to fit the image (based on the Max Colors value). Alternatively, you can choose specific colors to use when tracing an image, enabling you to change or edit colors without expanding the Live Paint object. First, you must load a custom swatch library by choosing Open Swatch Library from the Swatches palette menu. Then, in the Tracing Options dialog box, choose the custom library from the Palette menu. You can also sample colors directly from the bitmap to build your own custom library of colors. Choose the Eyedropper tool and press the Shift key while clicking on regions of the bitmap to sample colors. Use the Swatches palette to save the colors as swatches, and then save a custom swatch library by choosing Save Swatch Library from the Swatches palette menu. Experimenting with different custom swatch libraries can yield stylized and creative results.

The Blur setting applies a Gaussian Blur to the image, which helps remove noise from a bitmap and might ultimately reduce the number of anchor points in the tracing result, especially when tracing photographic content. Blur also helps smooth out rough edges.



1. The original bitmap image. 2. Blur set to 0 pixels. 3. Blur set to 1 pixel. 4. Blur set to 2 pixels.

The Resample setting lets you change the resolution of the bitmap image to help obtain a better traced result. Resampling a bitmap image at a lower resolution greatly enhances the speed performance of Live Trace. Alternatively, you can resample images to achieve a variety of creative effects. If the Resample option is not available, Illustrator is able to detect the native resolution of the bitmap image. There are cases for which it might not be possible for Live Trace to determine the native resolution of the linked file (for example, if a placed-linked PDF file contains multiple images within it). If Live Trace can't detect native resolution, resampling is selected and set to 72 ppi by default. Additionally, placed-linked EPS files are sampled at 72 ppi when the Use Low Resolution Proxy for Linked EPS setting is selected in the File Handling & Clipboard panel of the Preferences dialog box.

### Trace Settings

Live Trace can perform two types of vector tracing: fill and stroke. If Fills is selected, Live Trace creates closed and filled vector paths for all resulting vector objects. Fill tracing produces results that more closely match the original bitmap, including variable-width lines that are common in marker or ink sketches and photographic content. Fill tracing also results in more complex vectors because it needs more anchor points.

If Strokes is selected, Live Trace creates stroked open paths for all areas that fall within the Max Stroke Weight setting. Areas that exceed this setting result in unfilled areas outlined with a 1-pt stroke. While Live Trace can apply different stroke widths to each path drawn, each path on its own can only contain one stroke width, making it difficult to trace lines of varying thicknesses. Stroke tracing results in less complex vectors with fewer anchor points.

The Strokes option activates two additional settings: Max Stroke Weight determines the heaviest stroke weight Live Trace can use in the traced vector result, and Min Stroke Length determines the shortest path Live Trace can use in the traced vector result.

Live Trace is also able to perform vector tracing using a combination of the Fills and Strokes tracing methods. If you select both Fills and Strokes, Live Trace converts the bitmap to a vector result using both stroked and filled paths.



1. The original bitmap image. 2. Fill tracing. 3. Stroke tracing. 4. Fill and Stroke tracing.

Path Fitting determines how closely the Live Trace vector result resembles the original bitmap image. A lower Path Fitting setting results in paths that follow closely with the edges and boundaries within the bitmap image, yet might also reveal imperfections in the original or produce paths that aren't perfectly clean or smooth. A higher setting produces smoother paths with fewer anchor points, but might not match up exactly with the bitmap image. Setting the view options to compare both the original bitmap and traced result can help you determine the best Path Fitting setting for each file.



1. The original image. 2. Path Fitting set to 1 pixel. 3. Path Fitting set to 3 pixels. 4. Path Fitting set to 10 pixels.

Minimum Area defines the smallest areas that are traced. Corner Angle defines the sharpness of the angles used in the resulting vector objects. This setting is measured in degrees, not pixels. If you think of 0 degrees as perfectly flat and 180 degrees as perfectly sharp, anything sharper than the Corner Angle setting (the default is 20) is converted to a corner anchor point rather than a smooth anchor point.

### Saving your own presets

Live Trace provides the option to define and save presets of settings that you use often. To create your own custom preset, click Save Preset in the Trace Options dialog box, name your preset, and click OK. Alternatively, you can choose Edit > Tracing Presets to create, edit, delete, and import or export Live Trace presets.

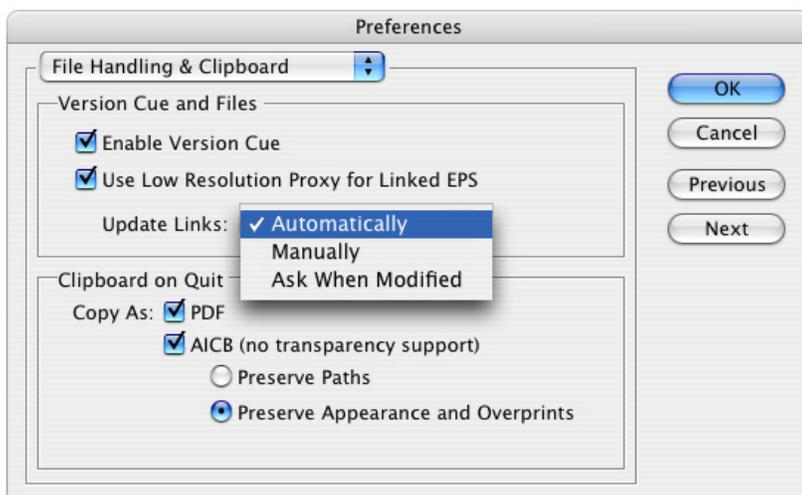
Live Trace presets are stored in a file named Tracing Presets in the Presets folder, located in the Illustrator application folder. You can distribute this file cross-platform among co-workers and colleagues. The following settings are not stored in a Live Trace preset: resample, the raster and vector view settings, and custom color libraries.

## Using Edit Original with Photoshop CS2

One of the benefits of using placed-linked images with Live Trace is the ability to use the Edit Original feature, which enables you to easily edit the placed-linked image in a professional image editor, such as Photoshop CS2.

Even though Live Trace can perform bitmap conditioning, at times it might be beneficial to perform more advanced edits on the bitmap image to achieve better tracing results. For example, Photoshop has the ability to apply different settings or filters to portions of an image (Illustrator features apply to an entire image as a whole). In Photoshop, you can use the Paintbrush tool to edit local parts of the file and make minute changes in image makeup or structure. The Photoshop Crop tool can also remove parts of an image that aren't needed.

With a Live Trace object selected, click Edit Original in the Control palette. The image opens in Photoshop. When you are done editing it, save the image and close the file. When you return to your Illustrator document, a message alerts you that the image has been modified and offers to update the file, at which time the Live Trace object updates with the new tracing result. In the File Handling & Clipboard panel of Preferences, you can have Illustrator update modified images automatically.



Setting Illustrator to automatically update modified links.

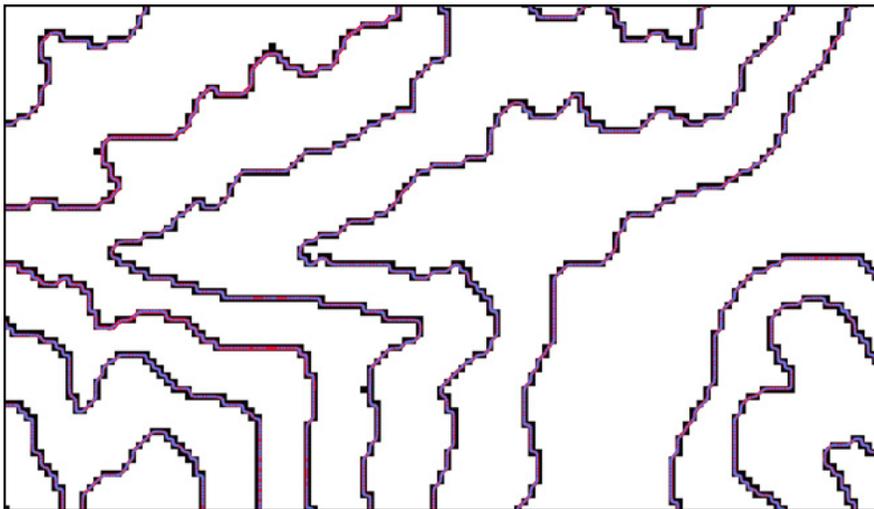
Photoshop also has several filters that can help reduce noise or enhance an image for better tracing results. For example, you can use the Median, Smart Blur, and Reduce Noise filters to remove artifacts from images. Running these filters repeatedly with minimal settings usually produces good results. Adjusting the contrast of a bitmap using Levels or Curves, and using the Histogram palette to preview contrast and tone, can help define color boundaries and thicken thin lines that might not appear in the traced result. Additionally, a variety of tools, such as Dodge, Burn, Brush, and Eraser, can enhance parts of a bitmap image.

## Batch processing

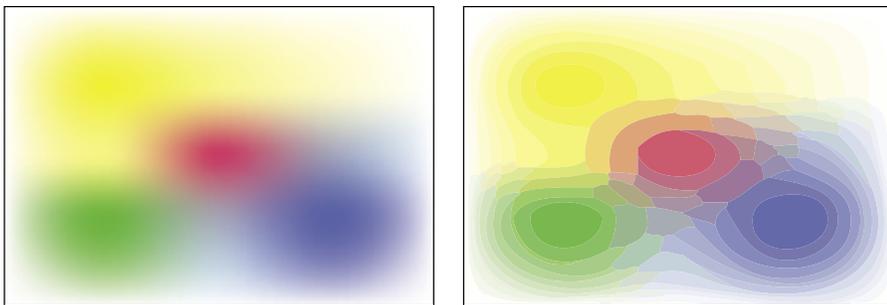
In workflows where multiple images require vector tracing, you can use a workflow script found in Adobe Bridge to automate the process. In Illustrator CS2, select Go to Bridge in the Control palette. After you have selected the images to trace in Adobe Bridge, choose Tools > Illustrator > Live Trace. You can then choose a Live Trace preset and a destination folder. The script can process up to 10 files at once. If you don't have Illustrator running when you first run the script, you'll have to run the script a second time.

## Live Trace in action

Sometimes, a picture speaks louder than words. This section demonstrates how the different Live Trace settings can affect the final result.



Centerline tracing—A high-quality map can be created easily using the Stroke tracing option.



This abstract design was created by rasterizing a gradient mesh (right) and then applying the Photo High Fidelity Live Trace preset.

## Live Trace for programmers

Illustrator features extended support for automation via scripting. With support for AppleScript on Mac OS and VB Scripting on Microsoft Windows, developers can take advantage of creating time-saving scripts for repetitive tasks. Additionally, Illustrator has robust support for ExtendScript, an Adobe language based on the JavaScript standard. Adobe Creative Suite 2 ships with the ExtendScript Toolkit, which enables developers to write scripts, check syntax, and perform testing in an innovative and pleasing environment.

The Live Trace feature is scriptable, and you can create your own scripts to perform customized tasks. You can use the Live Trace batch script included in Adobe Bridge as an example of how you might enhance workflows using scripts with Live Trace.

## For more information

For additional information about the features in Adobe Illustrator CS2, go to [www.adobe.com/products/illustrator](http://www.adobe.com/products/illustrator).



## ADOBE ILLUSTRATOR CS2 SYSTEM REQUIREMENTS

### Macintosh

- PowerPC® G4 or G5 processor
- Mac OS X version 10.2.8 through version 10.3.8 (10.3.4 through 10.3.8 recommended)
- 256 MB of RAM (512 MB recommended)
- 960 MB of available hard-disk space
- 1024x768 monitor resolution with 16-bit or greater video card (24-bit screen display recommended)
- CD-ROM drive
- For Adobe PostScript® printers: PostScript Level 2 or PostScript 3™
- Internet or phone connection required for product activation

### Windows

- Intel® Pentium® III or 4 processor
- Microsoft Windows 2000 with Service Pack 3 or Windows XP with Service Pack 1 or 2
- 256 MB of RAM (512 MB recommended)
- 820 MB of available hard-disk space
- 1024x768 monitor resolution with 16-bit or greater video card (24-bit screen display recommended)
- CD-ROM drive
- For Adobe PostScript printers: PostScript Level 2 or PostScript 3
- Internet or phone connection required for product activation

Adobe Systems Incorporated  
345 Park Avenue, San Jose, CA 95110-2704 USA  
[www.adobe.com](http://www.adobe.com)

Adobe, Illustrator, InDesign, Photoshop, PostScript, and PostScript 3, are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. Mac, Mac OS, and Macintosh are trademarks of Apple Computer, Inc., registered in the United States and other countries. Windows is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries. Intel and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries.

© 2005 Adobe Systems Incorporated.  
All rights reserved. 4/05