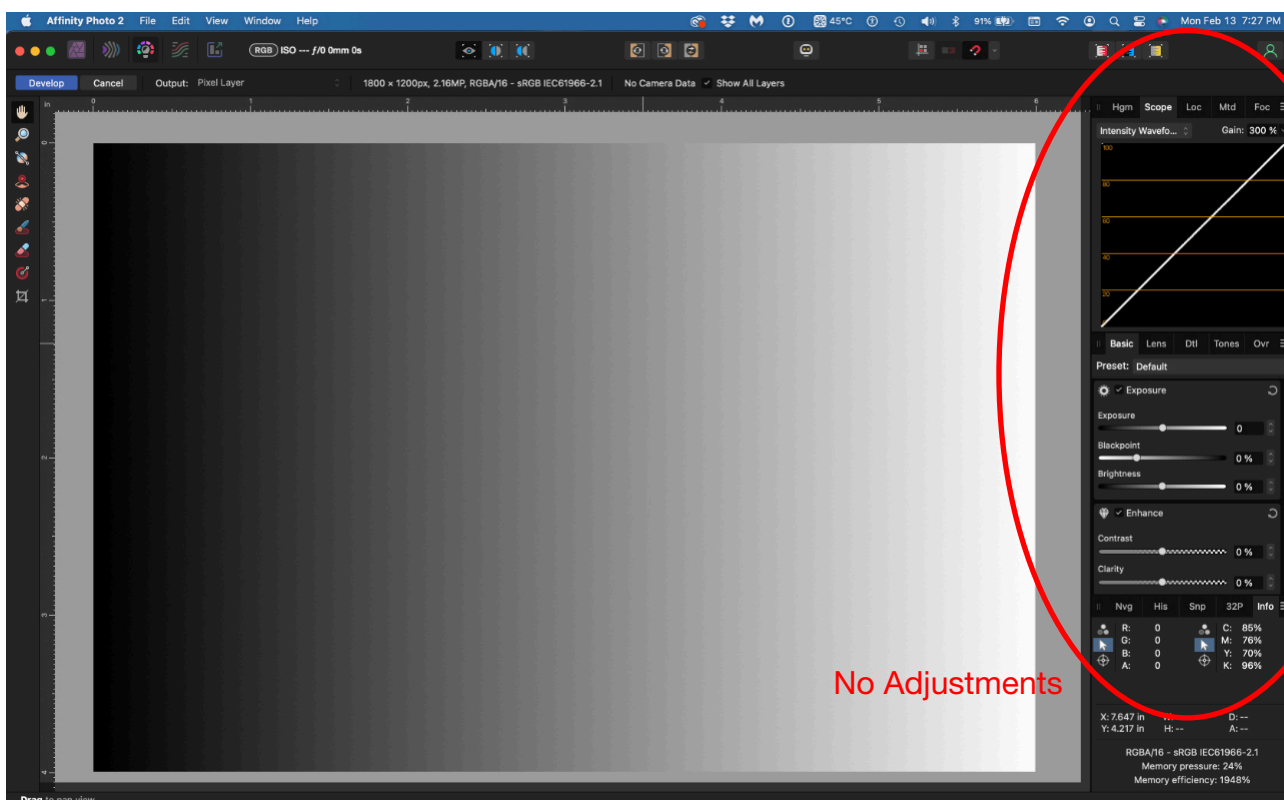


Tonal Adjustments in Affinity Photo and the Develop Persona

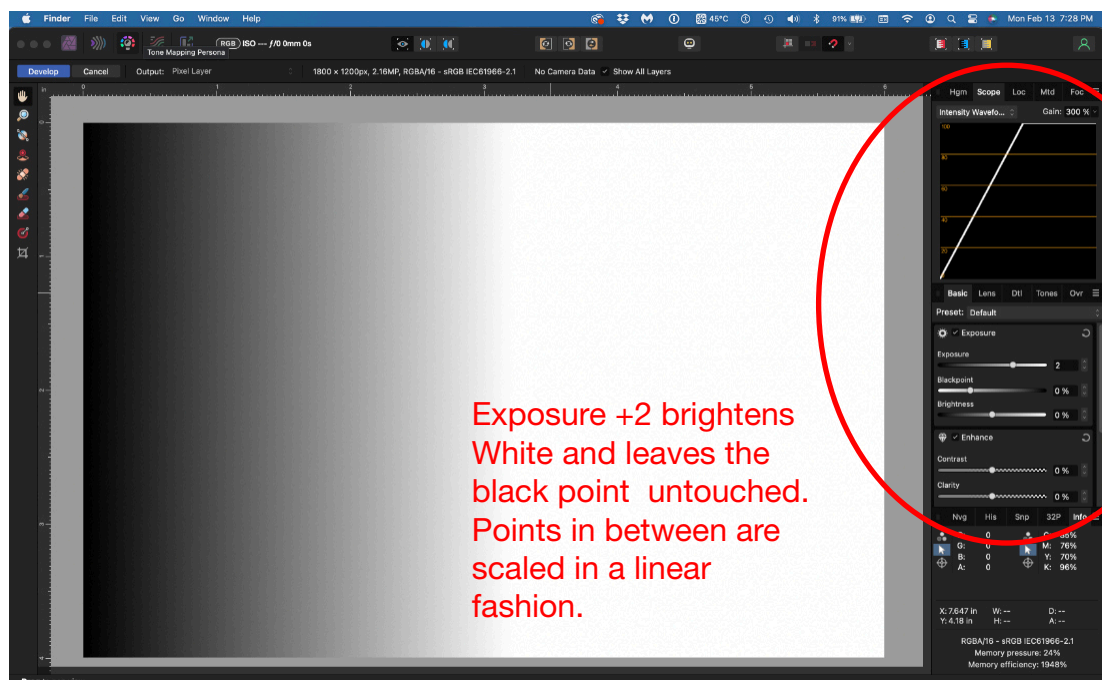
I think some people, especially newcomers to Affinity, have some confusion about the different tonal adjustment controls in Affinity Photo and the Develop Persona as well. For example, what is the difference between the Exposure and Brightness sliders in the Develop Persona? What exactly does each adjustment do and what portions of the tone curve are affected? To clear up the confusion for myself, I ran a series of tests, using a simple Black to White Gradient created in the Photo Persona, then rasterized it so I could experiment with different adjustments in both Personas. It is now clear to me what the various tonal adjustment tools can and cannot do, and which ones will be my “Go To” tools in each Persona. Since I went through this exercise in some depth, I thought it might be helpful to share what I have learned with others. This document covers Affinity Photo v2.0.4.

I will start with the Develop Persona, since many users will develop their RAW digital camera files there before bringing the images into the Photo Persona for further processing. (This article deals with tonal range only – , i.e., brightness levels, not color.) My goal in the Develop Persona is to deliver a clean, highly editable file to the Photo Persona, one that avoids clipping, blocked shadows, blown highlights, heavy color casts, excessive color or luminance noise, etc. So, my approach in the Develop Persona tends to be rather conservative and allows plenty of “headroom” for further, non-destructive editing in the Photo Persona. Let’s get to it.

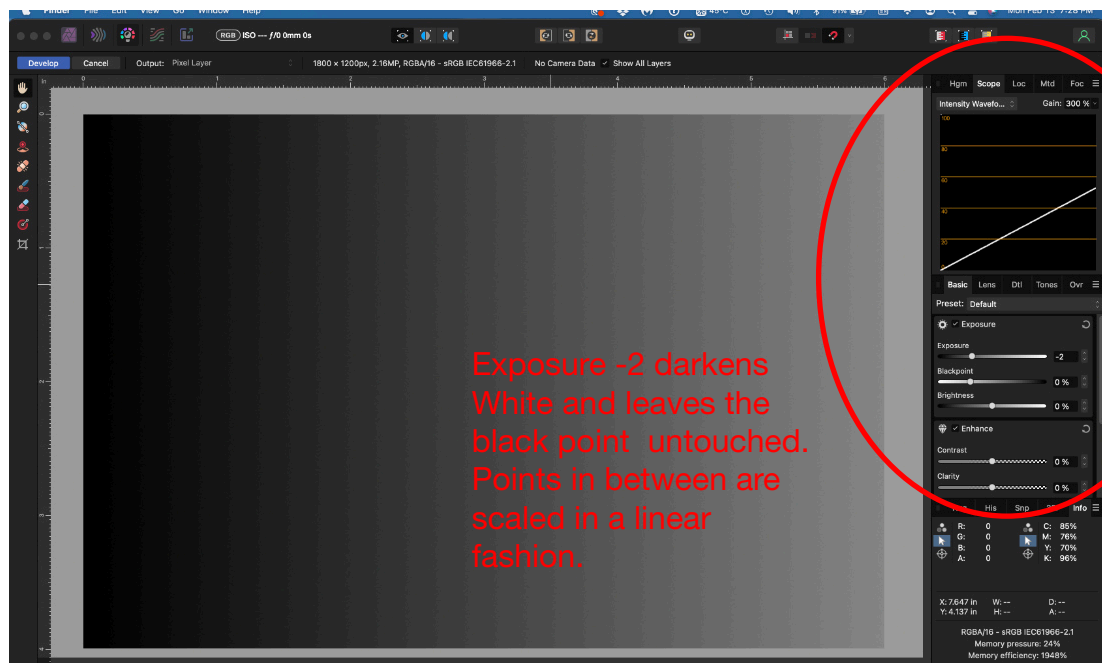
I started with a new RGB/16 document and created a simple Rectangle in the Photo Persona. I applied a black to white gradient, and then rasterized it so I could make adjustments in both the Photo and Develop Personas. Below, we are in the Develop Personal with all settings at their defaults. The Scope Panel shows the Intensity Waveform, which is a straight line from bottom left to upper right, which describes the intensity (i.e., brightness range) of the Black to White gradient.



Now, let's make a first adjustment in the Develop Personal and see what happens. Only one adjustment was made below...I moved the **Exposure** slider in the Basic Panel to +2 from the default setting of "0". As you can see, the black to white gradient was brightened, but not exactly as I anticipated. I expected ALL tonal ranges would be brightened, including black, but this is not so, as the Intensity Waveform confirms. The Black Point remains stationary, i.e., the same exact black level, but all other tones have been brightened in a linear, straight-line fashion. Moving the slider to +3 or higher just makes the straight line steeper. This clips highlights if taken too far, and of course, varies with the image and the exposure.



The next graphic, shown below, moves the Exposure Slider to -2 instead of +2. Again, we have a straight line shown in the Scope Panel's Intensity Waveform. As before, the White Point has moved. But this time down instead of to the left, and the result is a lower contrast gradient. All points between black and the "new white point" have been scaled in a linear fashion. No curve, just a straight line graph. So, the Exposure slider only adjusts the White Point and scales all other tones in a linear fashion, leaving the Black Point unchanged.

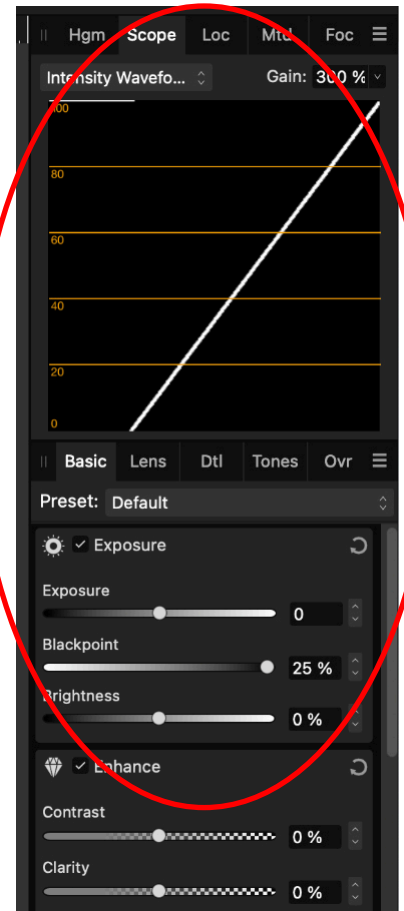


OK...you get the general idea of the black to white gradient and how the tonal values in the gradient are mirrored in the graph displayed in Scope Panel's Intensity Waveform. So, I won't eat up additional real estate with more snapshots of the gradient itself. I will just show the adjustment sliders, their settings and how those settings are reflected in the Scope Panel.

To the right, I have adjusted the "**Blackpoint**" slider to +25% and have reset the Exposure slider to its default position of "0". So, this shows the impact of only the Blackpoint Slider adjustment.

Moving the BlackPoint Slider to the right (or left) moves the black point and leaves the white point untouched, exactly the opposite of the Exposure slider. Again, it connects the brightest and darkest tonal values using a straight line, so all values between dark and light are evenly distributed in a linear fashion.

Blackpoint +25% darkens blacks and leaves the white point untouched. Points in between are scaled in a linear fashion.

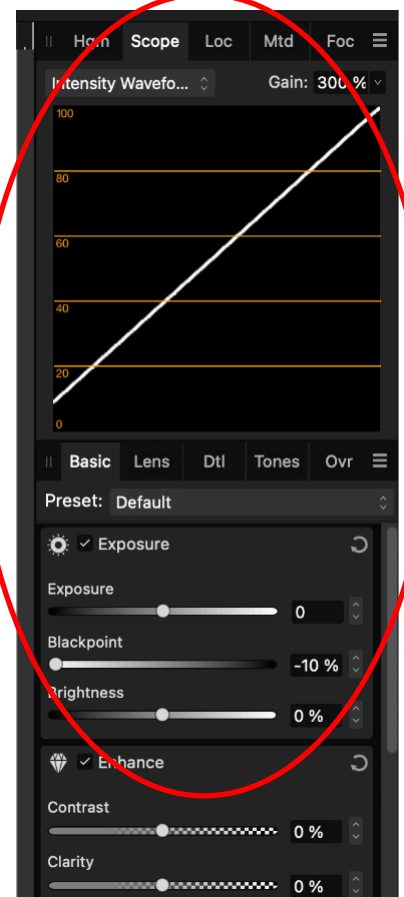


To the right, I have moved the **Blackpoint** Slider to the -10% position. The white point has been left unaltered and only the level of black has lightened. The values between the new black point and the old white point have been scaled in a straight-line fashion.

So hopefully, it is becoming clear that the Exposure slider will set the white level in the image, and the BlackPoint slider sets the darkest black in the image. All points in between will be scaled in a straight line (linear) fashion if those are the only two sliders you use.

So, what does the Brightness Slider do? It is IDENTICAL to the Exposure Slider, (only impacting the white point), however it is much less aggressive than Exposure. Affinity has changed the scale so that it is a finer adjustment. Again, it's a straight-line function, just like Exposure or Blackpoint.

Blackpoint -10% lightens blacks and leaves the white point untouched. Points in between are scaled in a linear fashion.



Okay...now onto the **Contrast** Sliders in the Develop Persona.

I reset all sliders to their defaults and adjusted only the Contrast slider to see what it would do. Increasing Contrast to +50% adjusted BOTH the black and white points equally, resulting in a steep, high contrast slope. As with the previous adjustments, all points in between are scaled in a linear fashion. This works fine for a very flat original image, but lacks independent control of the white and black points.

Contrast set to -50% lightens blacks and darkens whites equally, lowering contrast, again in a linear fashion. I see no compelling reason to use the Contrast Slider in the Develop Persona. I'd rather use the Exposure and Blackpoint sliders to set them separately.



The **Shadows/Highlights** Sliders are the first adjustments I've discussed that do not affect tonal range in a linear fashion. **They target specific tonal ranges and leave the rest of the tonal range alone**, which is great when you need to zero in on plugged shadows or subtle highlights that are losing detail.

Usually, we adjust the Shadows slider to recover shadow detail that is too dark, though it can be used to darken shadows too. As can be seen on the graph at right, it affects ONLY the 1/4 tones between black and middle gray. The blackpoint is NOT changed, nor are the tones above 50% gray.

The Highlights Slider does the same thing, but ONLY in the highlights (3/4 tones). The whitest white is not altered, nor are any tones darker than 50% gray.

Shadow/Highlight sliders can be helpful in preventing plugged shadows or blown highlights lacking sufficient detail. My goal, again, is to deliver an image to the Photo Persona that is conservative, clean, and has plenty of headroom, where I can perform non-destructive edits. Conservative is good here.



Shadows and Highlight Sliders do NOT alter white or black levels, but act in a non-linear fashion on their respective tonal target ranges.

Develop Persona Summary and Usage

When using Affinity, I mainly use the Develop Persona to develop RAW camera images. The major editing is done in the Photo Persona. As such, I want to deliver a conservative, highly editable image to the Photo Persona.

For my workflow, this means no clipped white or black tones, adequate highlight and shadow detail, medium to low contrast, a reasonably accurate white balance, and reduced noise, chromatic aberration and fringing (if required).

So these are the steps and the tools I use to achieve this:

1. Set the White Point. I use the Exposure Slider to adjust the white clipping point, while looking the image, Scope and/or Histogram panel. The Exposure slider is pretty aggressive, so if smaller adjustments are needed, I use the Brightness Slider. These two sliders work exactly the same, but the Brightness slider is less aggressive and offers finer control. I rarely clip the white levels while in the Develop Persona (perhaps pure specular highlights in some images). I want to leave “headroom” in the Whites and Highlights, so I have room to work with non-destructive tools in Photo.

2. Set the Black Point. I use the Blackpoint Slider to set the black clipping value independently. As with the white point, I want to leave some headroom on the black end, so I have room to work in Photo. Exposure, Brightness and Blackpoint Sliders all work in a linear fashion and result in straight line, so all tones between your chosen black and white points are scaled linearly.

3. I see NO REASON to ever use the Contrast Slider in the Develop Persona, because it adjusts both the white and black points simultaneously in equal amounts. I’d rather do that individually with the sliders in steps 1 and 2 above. By the way, The Contrast Slider in the Photo Persona is totally different from the Contrast Slider in the Develop Persona, which I will discuss later.

4. Adjust White Balance. I try to get my white balance fairly close at this point (or as step 1), using the White Balance Picker tool or manually, using the WB sliders.

5. Adjust Highlights and Shadows, if required. The Highlight and Shadow Sliders in the Develop Persona limit their influence to their respective tonal ranges and leave the White and Black points unaltered. If you need to tweak the highlights and shadows, this is a good place to do it. *Most of the time*, I find it’s not necessary if I don’t get too aggressive when setting the White and Black points in steps 1 and 2. BTW, the Highlight Slider in the Photo Persona is completely different that the one offered in the Develop Persona, so if Highlights need adjusting, do it in the Develop Persona.

6. Reduce Noise, Chromatic Aberration and Color Fringing, if required. I have generally found it best to perform these operations in the Develop Persona.

7. Develop the Image. In Photo v2, I usually set the *Output to RAW Layer (linked)* before developing. This maintains a link to the original RAW file, so if I want to make additional edits to the raw file, I can go back and forth between Personas as needed, and previous raw settings are remembered. There is no real impact on file size so I think it’s a no-brainer. Setting Output to RAW Layer (embedded) however, places a copy of the raw file in the exported document, which greatly increases file size, so I’d only use this if sharing with others, who might need access to the original raw file.

8. The Result. If I have done things well, I will deliver a clean, conservative, highly editable image to the Photo Persona, without losing any important whites, blacks, highlights or shadows, with low noise, a good white balance, no color fringing, etc. This is an image that is easy to edit and sculpt using non-destructive tools in the Photo Persona, and takes advantage of the Develop Persona’s many strengths.

Photo Persona Tonal Adjustment Tools

We are now in the Photo Persona, where we can perform non-destructive edits and bring our somewhat conservative image to life. BTW, this workflow discusses only “normal” 16-bit RAW images and does not address HDR, 32-bit, combining multiple images, stacking, etc.

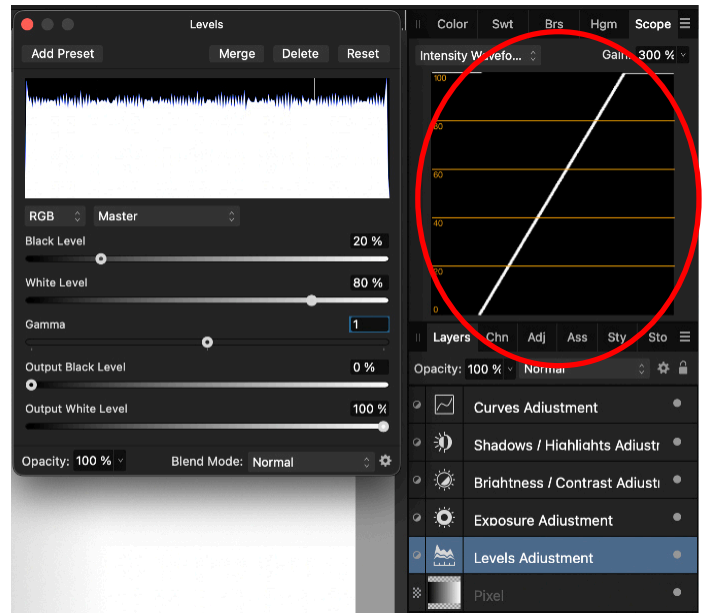
Levels is our first stop. The **White Level** and **Black Level** Sliders are linear, resulting in a straight line. To the right I have moved the Black Level to 20% and the White Level to 80%. As long as the Gamma slider stays at its default setting of 1, you get a steep, high contrast, straight-line slope. (Holding down Opt/Alt will show black or white clipping when adjusting these two sliders, which can be very helpful.)

The **black and white output** sliders result in a lower contrast slope and a flatter image. This can be helpful for tailoring brightness ranges for print output. (can also be done with Curves.)

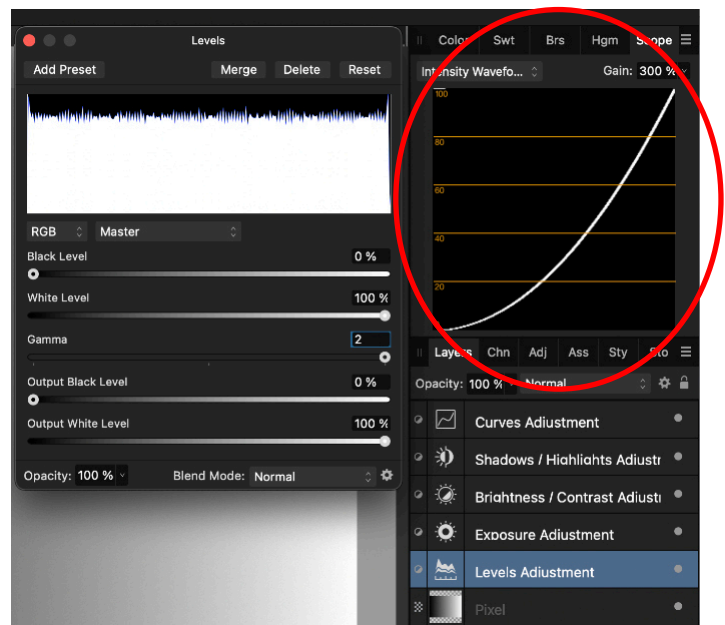
The **Gamma** slider left at its default value of 1.0 results in linear slopes, regardless of what we do to the four white and black sliders. But once we change the gamma, we convert that linear result into a smooth curve. To the right, I have increased the Gamma value to 2.0, with white and black sliders all set to their defaults. This darkens the midtones and applies a smooth curve to redistribute all the other tones, between black and white.

Gamma values greater than 1.0 darken the midtones. Values less than 1.0 brighten the midtones. If you move the Gamma all the way to the left, you get a pure white image.

As mentioned above, Levels can show black or white clipping, which Curves does not offer. So, Levels can be very useful, but limits you to a 3-point curve, which is often all you need. My “go to” tool for most tonal adjustments, however, is “**Curves**”, which I will discuss later.

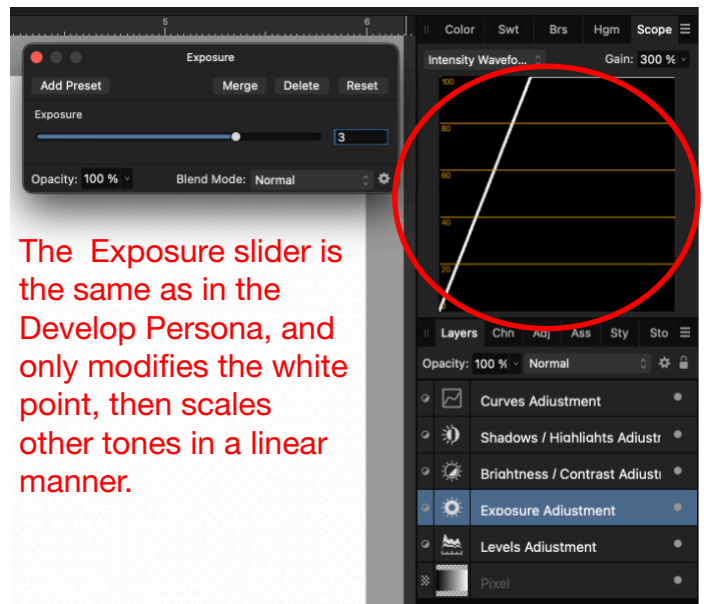


The **White Level**, **Black Level** and **Output** sliders generate linear adjustments as long as the **Gamma** slider remains at its default setting of 1.



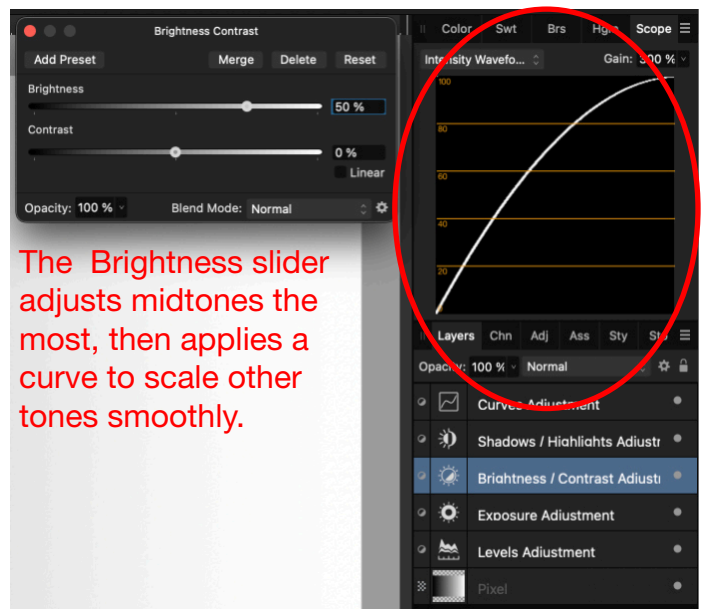
The **Gamma** slider has the most impact on the midtones, then introduces a curve to scale all other tones between black and white.

The **Exposure** slider in the Photo Persona acts exactly the same as it does in the Develop Persona. It moves the white point, leaves the black point alone, and scales all values in between in a linear manner. A value of 3 in the Exposure slider results in a very steep, high contrast image, which is shown in the Scope by the steep slope. I don't use it, as I consider it too blunt a tool. It might come in handy for a pixel-based image that is extremely dark overall, but I'd rather use Curves.

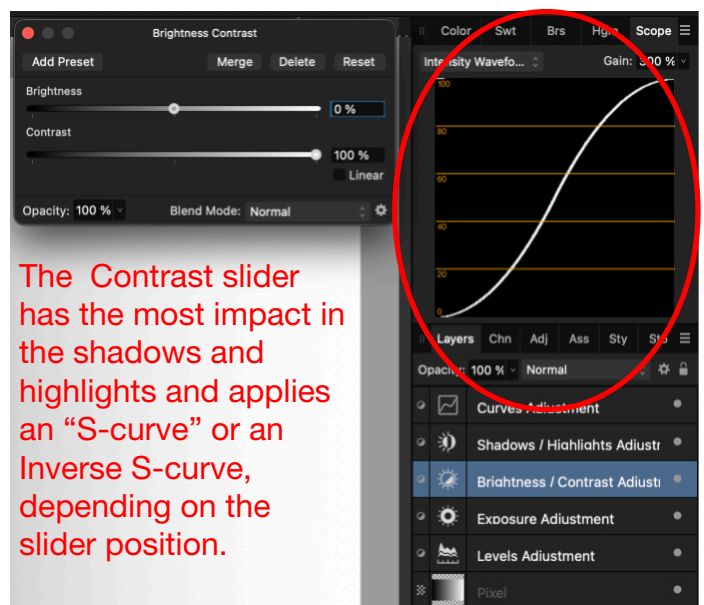


Brightness/Contrast

The **Brightness** slider, used alone, acts similarly to the Gamma Slider in Levels. It leaves the white and black endpoints untouched, affects mostly the midtones, and applies a smooth curve to redistribute all other tones. As shown on the right, Contrast set to +50% results in a significant midtone adjustment. It's worth noting that the curve is steeper at the shadow end than at the highlight end, resulting in greater tonal separation in the shadows, and less tonal separation in the highlights.

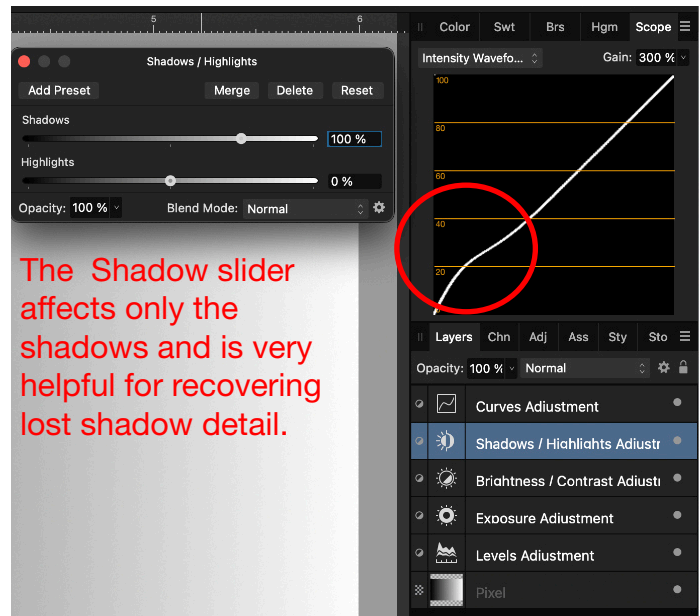


The **Contrast** slider, when set to its default, results in a straight line. When moved from its default setting, it applies an "S-curve". Move it to the right and you get the classic "S-curve", which darkens the shadows and brightens highlights for more contrast and snap in the image. Move it to the left, and you get an "Inverse S-curve", which brightens the shadows and darkens the highlights. In both cases, the max white and black points are left unchanged.

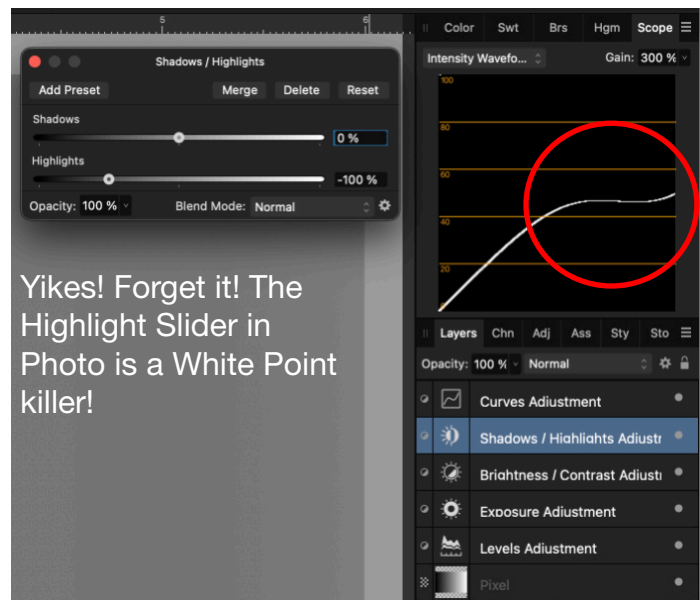


Shadows/Highlights Sliders

To the right, I have adjusted the **Shadows** slider to a value of 100%. As you can see, it only acts on the quarter tones, those shadow areas between pure black and about 30-35%. This is a great tool for recovering plugged up shadows that are lacking in detail. The black point is unaltered, and the midtones and highlights are also unchanged. You can also darken shadows by moving the slider to the left, but it is usually used to recover shadow detail. (See *addendum at the end of this paper about the excellent Shadow/Highlight Live Filter.*)



To me, the **Highlights** slider (Adjustment Layer version) is like using a sledgehammer or a crowbar to repair a Swiss watch! I don't recommend using it in the Photo Persona because it clobbers the highlights AND the White Point. To tweak highlights, use the Highlights slider in Develop Persona or the Shadow/Highlight **"Live Filter"** in the Photo Persona. To the right you can see that the Highlights Adjustment Layer version has reduced highlights in the 3/4 tones, but it has also hammered the white point. (See *addendum at the end of this paper about the excellent Shadow/Highlight Live Filter.*)



Curves are the best tool, in my opinion, for sculpting the tonal range. I can set the white point, black point, midtones, shadows and highlights, all in a single curve, with excellent control over each individual point. To the right, I darkened the blacks, brightened the white, then applied an Inverse S-curve to recover some shadow and highlight detail in the 1/4 and 3/4 tones. I also raised the midtone brightness slightly. You can also access the individual RGB channels to adjust color (or use Lab, CMYK and Grayscale modes). It also does Alpha channels.

For more focused adjustments to the shadows and highlights, I recommend the Shadow/Highlight **"Live Filter"**, or use S/H sliders in the Develop Persona.

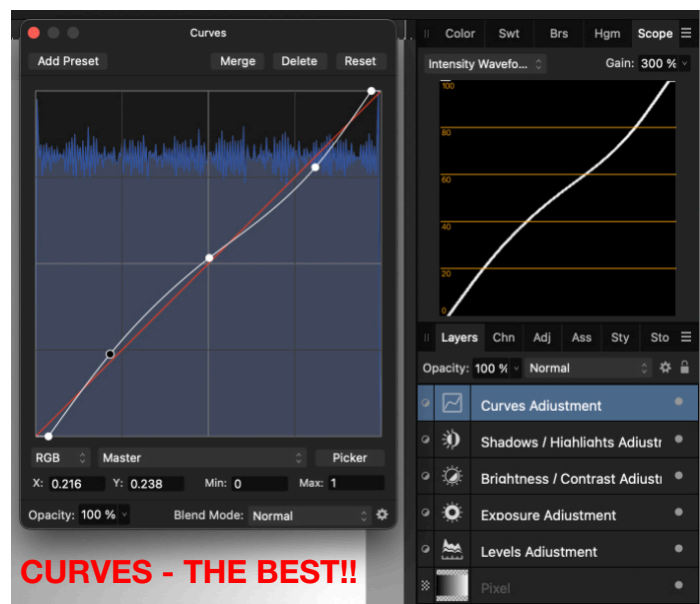


Photo Persona Summary and Usage

Adjusting tonal range in the Photo Persona is generally an easy choice for me. For *global* tonal correction, **Curves** is the clear standout. The **Shadow/Highlight “Live Filter”** is a great addition for more subtle corrections to the shadows and highlights. These two tools provide great control and flexibility.

Brightness/Contrast are excellent tools, but I can do everything they do using **Curves**.

One attraction **Levels** offers is the ability to view black or white clipping when adjusting the White Level and Black Level sliders (while holding down the Opt/Alt Key). Curves do not display clipping, but are more flexible overall. The Curves adjustment window does display a Histogram, so I find I don't usually need to use Levels. Still, Levels is a very useful tool, especially for those who are less comfortable working with Curves, or when you want a visual when setting black and white clipping.

I find **Exposure** in the Photo Persona a blunt tool not worth using. I feel even more strongly about the **Highlight** slider (only the Adjustment version) in the Photo Persona...it's a sledgehammer that clobbers whites. *(The Highlight slider in the Develop Persona is a different story...it's a great tool and leaves the white point alone. See the following pages that covers the Shadow/Highlight Live Filter.)*

Below are the basic steps and the tools I use to achieve a balanced tonal scale in Photo:

1. Use Curves. With Curves, I make global adjustments to the tonal range of the image. I can individually set my white and black clipping points, midtone brightness, then add additional points to the curve for finer adjustments to highlights, shadows, etc. If I wish, I can make curve adjustments to individual RGB channels for color correction, or even LAB, CMYK or Grayscale channels. Powerful and flexible. You can use Levels to set white/black clipping.

2. Adjust White Balance. If required, I can

adjust my White Balance using a variety of tools, including White balance, HSL, Curves, Levels, etc. White balance can be adjusted before or after tonal adjustments.

3. Shadow/Highlight Detail. If my global Curves adjustment wasn't adequate, I will often use the **Shadow/Highlight Live Filter** for fine tuning of shadow and highlight detail. I don't use the Highlight Slider (Adjustment Layer version), only the Live Filter version.

4. Local Tonal Adjustments. Local adjustments can be done after global tonal correction, using a wide variety of tools, masks, blending options, blend modes, etc. This is an entire topic unto itself and far beyond the scope of this paper, which is already way too long!

5. Color Correction. Adjusting hue and saturation is often best left until after tonal correction is close to where you want it. This is also beyond the scope of this article.

6. Final Touches. Sharpening, vignettes, etc., typically come last, or at least later in the process.

7. Summary. This started, for me, in trying to understand precisely what each of the tonal correction tools actually do, both in the Affinity Develop and Photo Personas. Hopefully, I've cleared up some confusion and presented it so it is reasonably understandable.

There are many workflows, but this is mine for routine RAW digital camera images in the Affinity applications, or editing pre-existing bitmap images. I don't cover 32-bit, HDR, stacking, compositing, or other viable workflows. My main goal was to understand the tonal correction tools and exactly what they do, so I could use them more effectively. It's been helpful and productive for me, and I hope it is for others as well.

Happy editing!

Lou Dina

Addendum 1 - Shadows/Highlights “Live Filter Version”

This Addendum discusses the “**Live Filter**” version of **Shadow/Highlights** in The Photo Persona (which I omitted previously). It’s a great tool. It not only allows you to control the strength of the adjustment, it also allows you to adjust the range, or portion of the tone curve, to which it applies. Very nice!

To the right are three graphs showing **Live Filter Shadows** adjustments. Default settings result in a straight line (i.e., no adjustments to the tone curve).

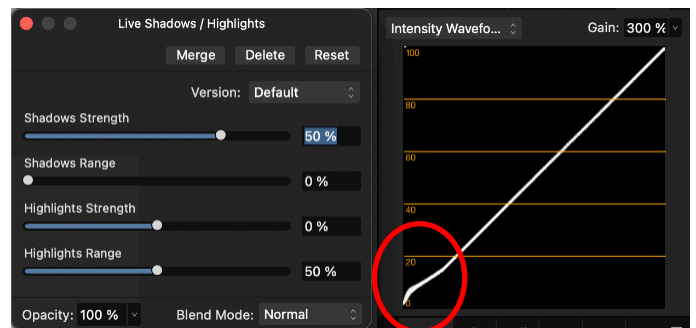
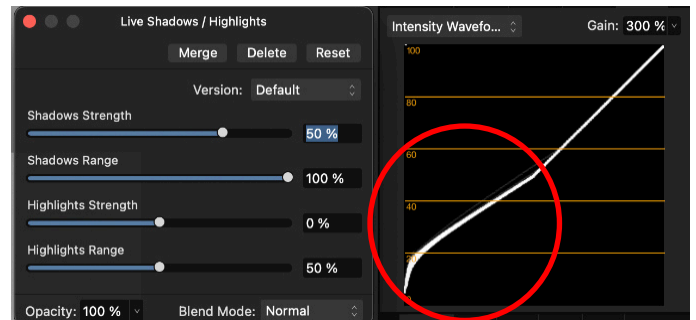
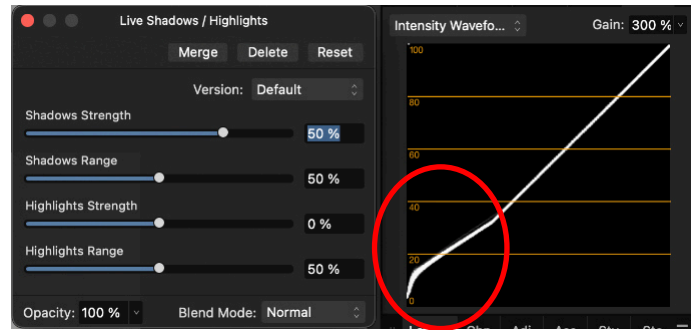
I arbitrarily set the **Shadow Strength** to 50% (from it’s default setting of 0%), to lighten the shadows. A Shadows Strength of 100% will result in the maximum effect and much lighter shadows. As you move the strength slider to the left (ie, negative numbers), you will gradually darken the shadow tones.

In the top graph, I left the **Shadows Range** set to its *default* of 50%, which affects the shadows from black to about 30% or so.

In the center graph I set the **Shadows Range** to 100%, so the shadows adjustment covers the widest range, from Black to 50% gray.

The bottom graph has a **Shadows Range** of 0% and looks like it affects shadows from black to about 10-15% or so.

In each case, the absolute **Black Point is unchanged**. You can also see that the steepest portion of the curve in all three graphs occurs nearest the black end. The steeper the curve, the more differentiation there is between tones, so this helps separate tones and make the darkest shadow detail more visible (if you are lightening the shadows). As you approach the midtones, the curve flattens out, is less steep, and gradually blends into the main curve. The flatter areas of the curve will have *less* tonal separation, so some detail there will be suppressed. There’s only so much tonal range in an image, so it’s a matter of “horse-trading” and making the best overall compromises.



The Strength Sliders control the extent of the effect, whether lightening or darkening that portion of the curve. The farther your are from zero, the stronger the effect.

The Range Sliders determine the portions of the tone curve that will be affected. A Range of 0% affects about 10-15% the curve, where 100% affects the maximum range. The default range is 50%.

Let's move on to the **Highlights** portion of the **Live Shadows/Highlights** Filter.

To the right are graphs showing **Live Filter Highlights** adjustments. As with Shadows, the default settings result in a straight line (i.e., no adjustments to the tone curve).

I arbitrarily set the **Highlights Strength** to -50% (from it's default setting of 0%), to reduce highlight brightness and recover detail. A Highlights Strength of -100% will result in the maximum effect and darker highlights. As you move the strength slider to the right (ie, positive numbers), you will gradually brighten highlights.

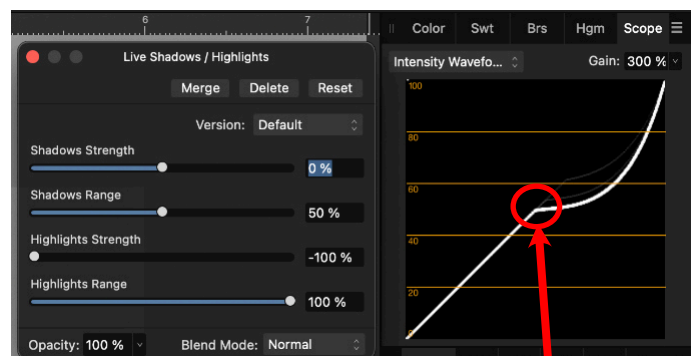
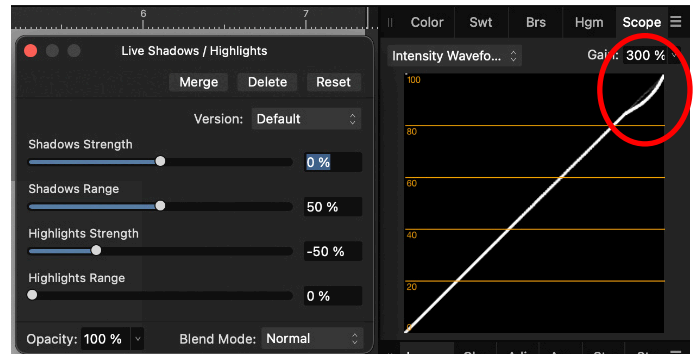
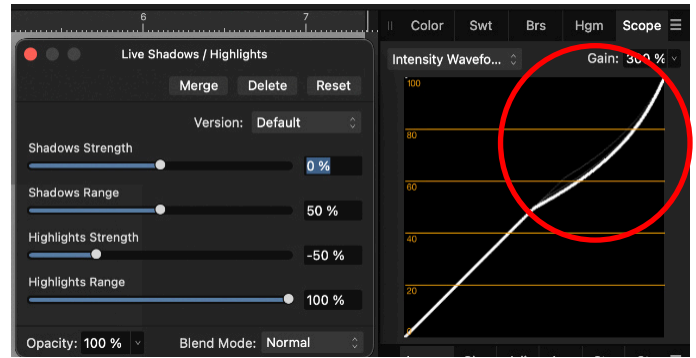
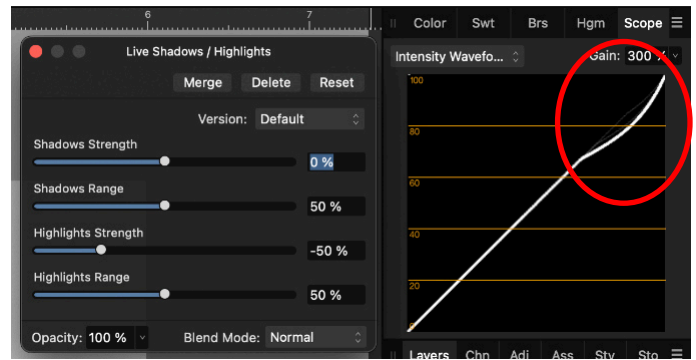
In the top graph, I left the **Highlights Range** set to its *default* of 50%, which affects the highlights from white to about 70% or so.

In the 2nd graph I set the **Highlights Range** to 100%, so the highlights adjustment covers the widest range, from White to 50% gray.

The 3rd graph has a **Highlights Range** of 0% and looks like it affects highlights from white to about 85-90% or so.

The 4th graph is included as a "**caution.**" Here, I set the Highlights Strength Slider to 100%. Notice the abrupt transition between Highlights and Midtones. That abrupt change in slope will be noticeable in many images, so be cautious as you approach 100% strength.

In each case, the absolute **White Point is unchanged**. You can also see that the steepest portion of the curve in all the graphs occurs nearest the white end. The steeper the curve, the more differentiation there is between tones, so this helps separate tones and make the brightest highlight detail more visible (if you are darkening the highlights). As you approach the midtones, the curve flattens out, is less steep, and gradually joins the main curve. The flatter areas of the curve will have *less* tonal separation, so some detail there will be suppressed. There's only so much tonal range in an image, so it's a matter of "horse-trading" and making the best overall compromises.



Abrupt transition as you near 100% Strength!

The Strength Sliders control the extent of the effect, whether lightening or darkening that portion of the curve. The farther you are from zero, the stronger the effect.

The Range Sliders determine the portions of the tone curve that will be affected. A Range of 0% affects about 10-15% the curve, where 100% affects the maximum range. The default range is 50%.

Some Final Thoughts

NotMyFault offered an important comment on the Affinity Forums regarding the impact on color when adjusting tonal ranges. I will address that here in a very cursory manner. Maybe I will write a tutorial on that some day.

Tonal Corrections - Impact on Color

As mentioned in the last few pages, the steeper the curve, the greater the tonal separation in that portion of the tone curve. That applies not only to tones, but to color as well! Where the curve is steeper, we have greater tonal separation, but we also increase color separation, driving hue and saturation further apart. This is why adding lots of contrast can result in garish, over saturated colors.

Flatter portions of the curve, conversely, will have less tonal separation and less contrast, but they will also reduce the separation between hue and saturation.

This is the case in most modes and is worth keeping in mind. If your girlfriend's skin complexion has gone nuclear, it might be because you cranked up the contrast, which also cranked up the Hue and Saturation.

There are ways around this if you handle color and tonal range separately. For example, if you adjust the tone curve using Curves or Levels, then set the **Layer Blend Mode to Luminosity**, you will **ONLY** affect the tonal range and not the color. Or, you can adjust the **Lightness Channel in LAB** color mode, which affects only luminosity. In CMYK, you can **adjust the K-channel** and leave CMY alone, which again leaves color alone. There will be some perceptual changes in color because lightness does affect our perception of saturation.

Then, you can **adjust color separately** on another adjustment layer, setting the Layer Blend Mode to Color, which affects color, but not luminosity. You can also readjust hue and saturation with HSL, Color Balance or other tools, but they all act somewhat differently and

yield different results. Just be aware that major shifts to tonal range will result in major shifts in Hue and Saturation, unless you address them individually. This is not always a problem, especially if you want to increase tonal separation as well as hue and saturation.

Curves in the Develop Persona

I never mentioned the use of **Curves** when developing RAW images in the Develop Persona. That was not an oversight, but I didn't explain why. Curves are just as good a tool in the Develop Persona as they are in the Photo Persona, so feel free to use them.

In my workflow, my whole goal in the Develop Persona is to deliver a conservative, highly editable image to the Photo Persona, where I can work non-destructively and make my image shine. Highly editable means no clipped whites or blacks, decent shadow and highlight detail, decent white balance, limited noise, chromatic aberration or color fringing. So, most of the time, I really don't **need** Curves in the Develop Persona, because I'm not trying to "complete" the image there.

Programs like Adobe LightRoom are different. Many photographers use LightRoom as a "*one-stop-shop*" for ALL their editing and never intend to send their images to Photoshop, Affinity Photo, or other image editing programs. Their goal is often to finish the image there and be done with it, or to generate client proofs that are "in the ballpark" quickly and efficiently. When using LightRoom, I often spent more time tweaking images to get them just right, including the use of Curves. LR is a good program for its intended purpose, but when it comes to local editing and greater control, it is fairly limited. I can almost always do a better job in a program like Affinity Photo.

If you want to "*finish*" your images in the Develop Persona, by all means, spend more time with all the tools provided, including Curves. Happy editing!