

Image optimization for the web

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WordPress Meetup
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Hi! I'm Jewel Clark.



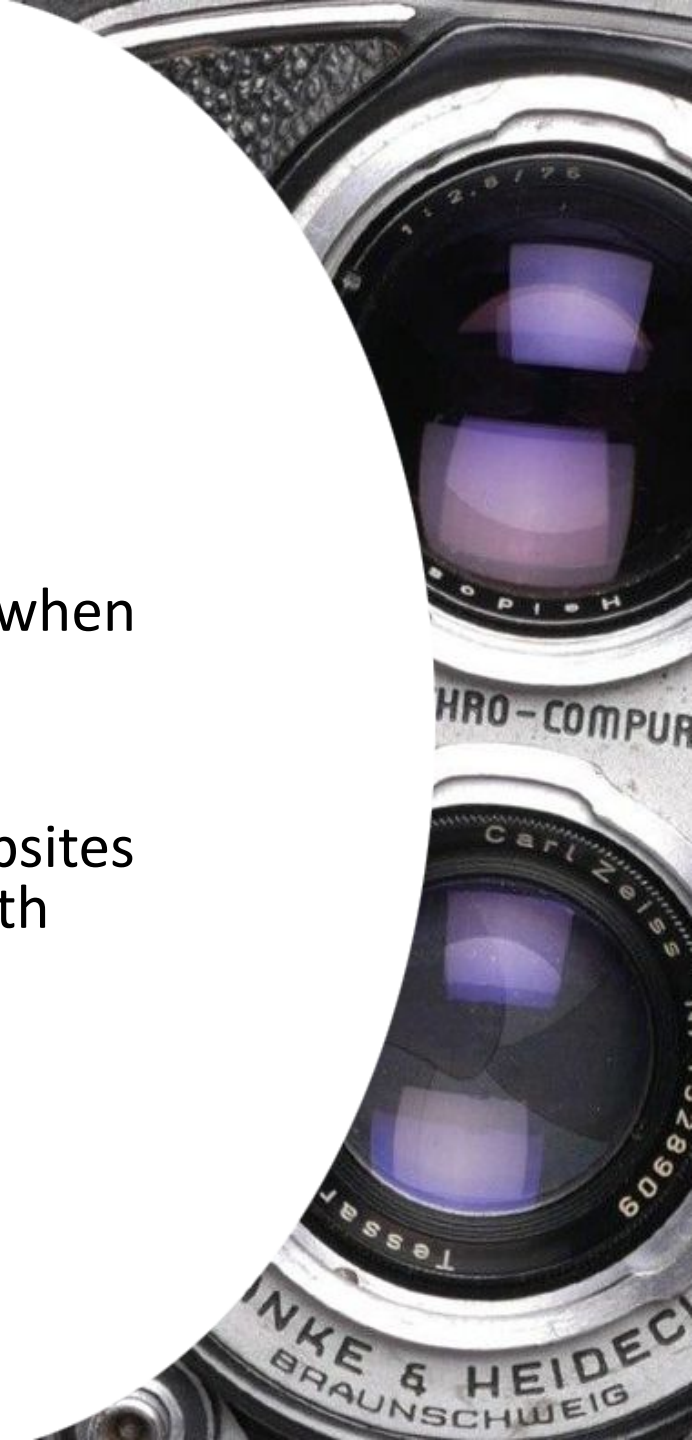
[Linkedin](#) | [Mastodon](#)
jewel@madmaud.com

Artist. Tech nerd. Polygeek.
Mostly harmless. 🤖

I started working with Photoshop in 1993 when it had 1, and only 1 “undo.”

I've been working in tech and building websites since the mid-2000s. I've been working with WordPress since 2010.

Current positions:
Web Administrator, ASU Library
Support Specialist, RadiateWP



What is image optimization?

Image optimization is the process of manipulating image files for proper sizing, compression, and format to best balance visual appeal with the smallest practical file size to improve site load speed.



Why do we need image optimization?



Performance

Values are estimated and may vary. The performance score is calculated directly from these metrics. [See calculator.](#)

▲ 0-49 ■ 50-89 ● 90-100



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Performance

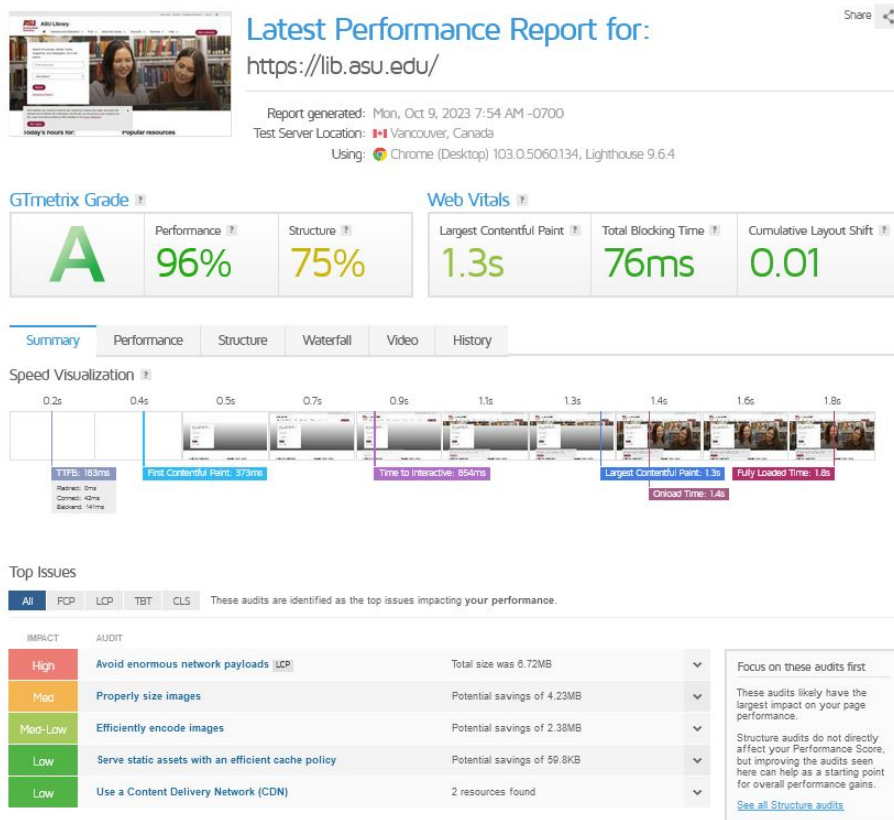
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▲ 0-49 ■ 50-89 ● 90-100

- Site speed is a key metric in ranking and user experience.
- It benefits the user and the site owner to ensure a site loads as quickly as possible.
- Fast site speed = good user experience + improved search rank
- Slow load times, esp. over mobile = higher bounce rate
- The golden rule of page load time? **< 3 seconds.**

Pictured: details of different site speed scores from Google's PageSpeed Insights.

How do you check your site speed?



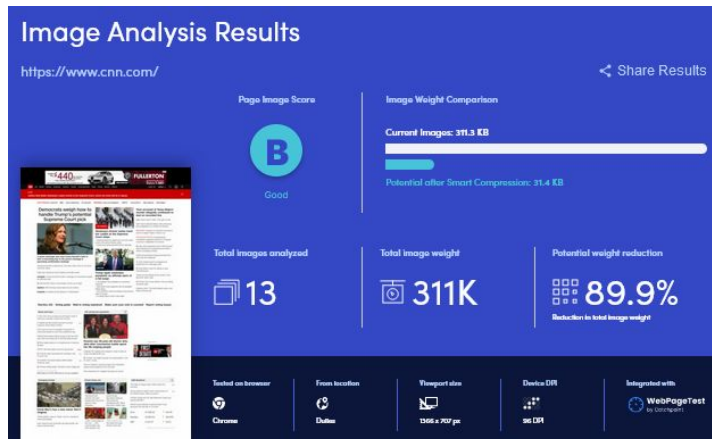
Pictured: GTmetrix site speed score

There are many online site speed tools.

Google's PageSpeed Insights is probably the most well-known

Pingdom and GTmetrix are also good checkers.

Check your images



Largest Contentful Paint (LCP)

This measures how long it takes for the initial largest piece of visual media or block of content to be visible.

<a href="https://www.cnn.com/middleeast/live-news/israel-hamas-gaza-attack-10..."

HTML/CSS 281.3 KB Current

Time to load (should be <2 sec)

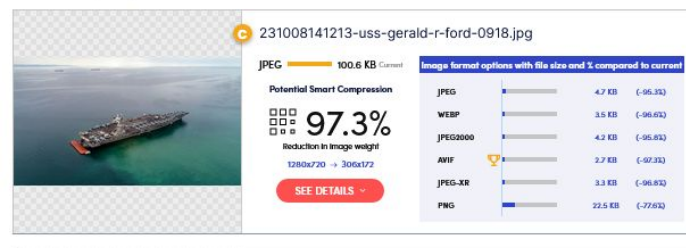
LCP Canvas



1.42s
Good

1239 X 232

Other page assets



Cloudinary offers a website image analysis tool that will perform a deep dive on the page you give it to return information on how your site is performing and where improvements can be made.

Smashing Magazine provides a great explanation of the report.

Pictured: Image analysis report from Cloudinary.

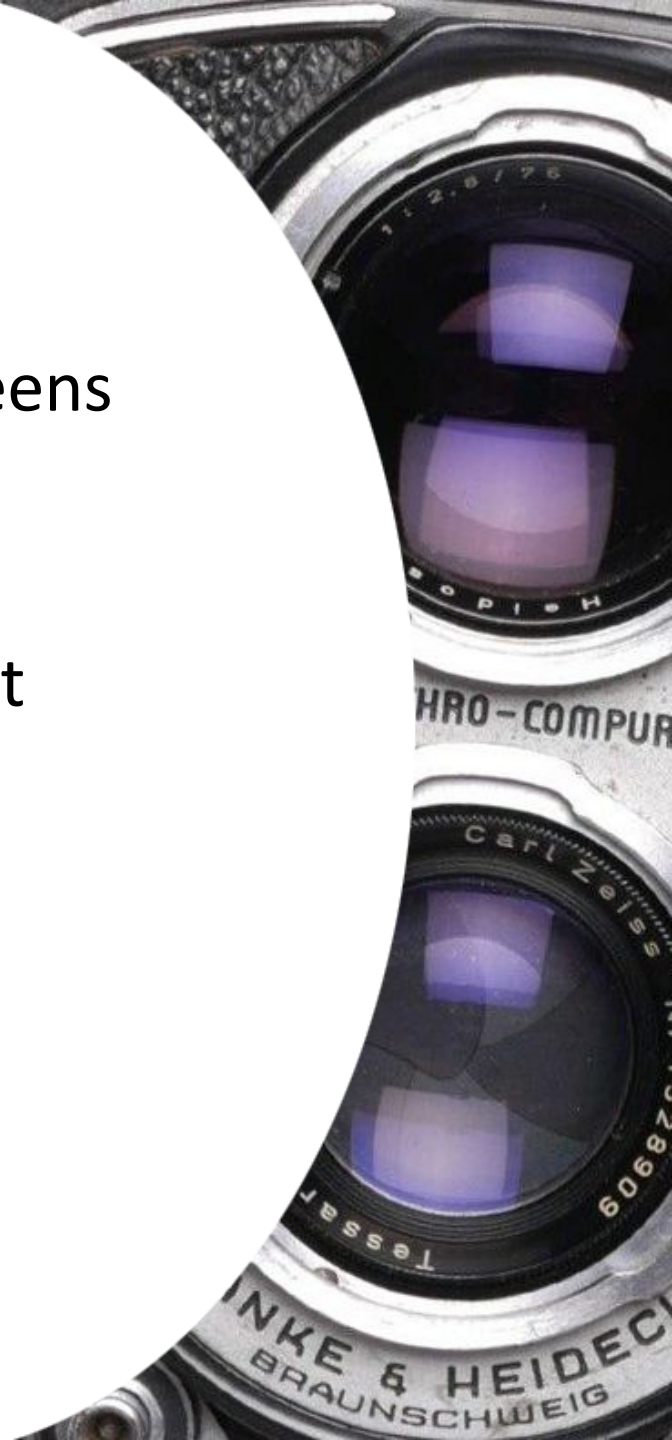
Before we can understand optimization...

We need to understand some basic principles of how screens work to present information.

Screens are all different sizes and there are many different screen resolutions as well. Resolution is described using:

PPI (pixels per inch)

PPI is a description of a monitor's **pixel density** (# of pixels packed into each inch).



Understanding screen vs image resolution

You will sometimes hear PPI referred to as resolution. There is *image* resolution and *screen* resolution.

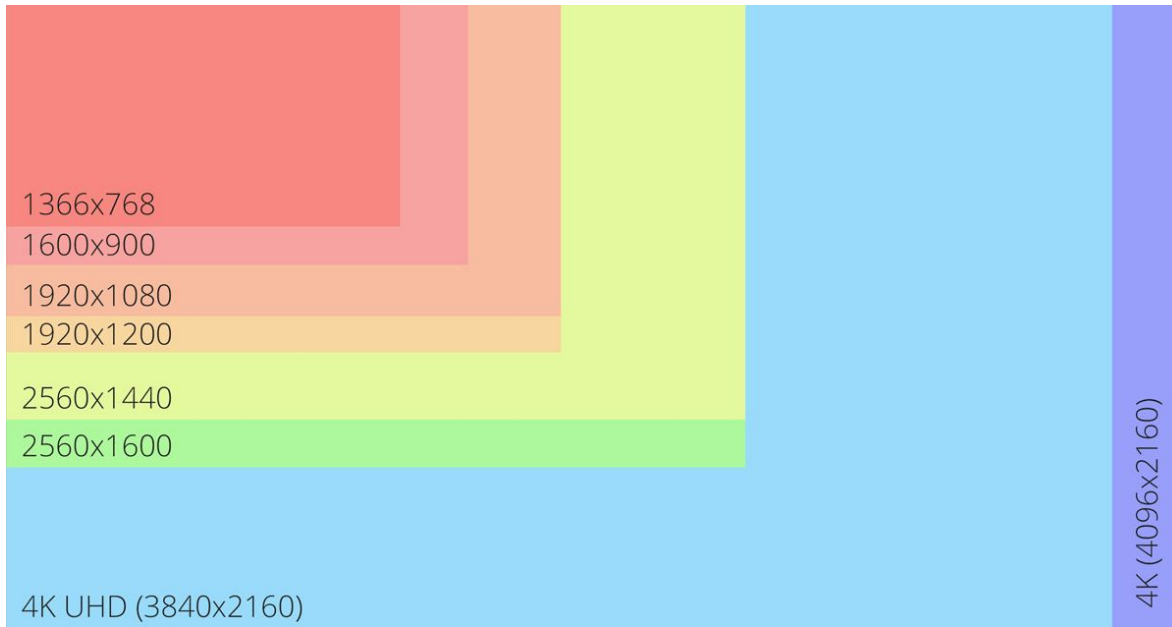
Screen resolution/PPI is affected by the size of the screen.

Rather than image resolution, think of images in terms of **pixel dimensions**.

“...a digital image, on its own, has no inherent resolution at all. It's just pixels...The width and height of an image, in pixels, is known as its **pixel dimensions**, and that's all a computer screen cares about.”

[-Photoshopessentials.com](http://Photoshopessentials.com)





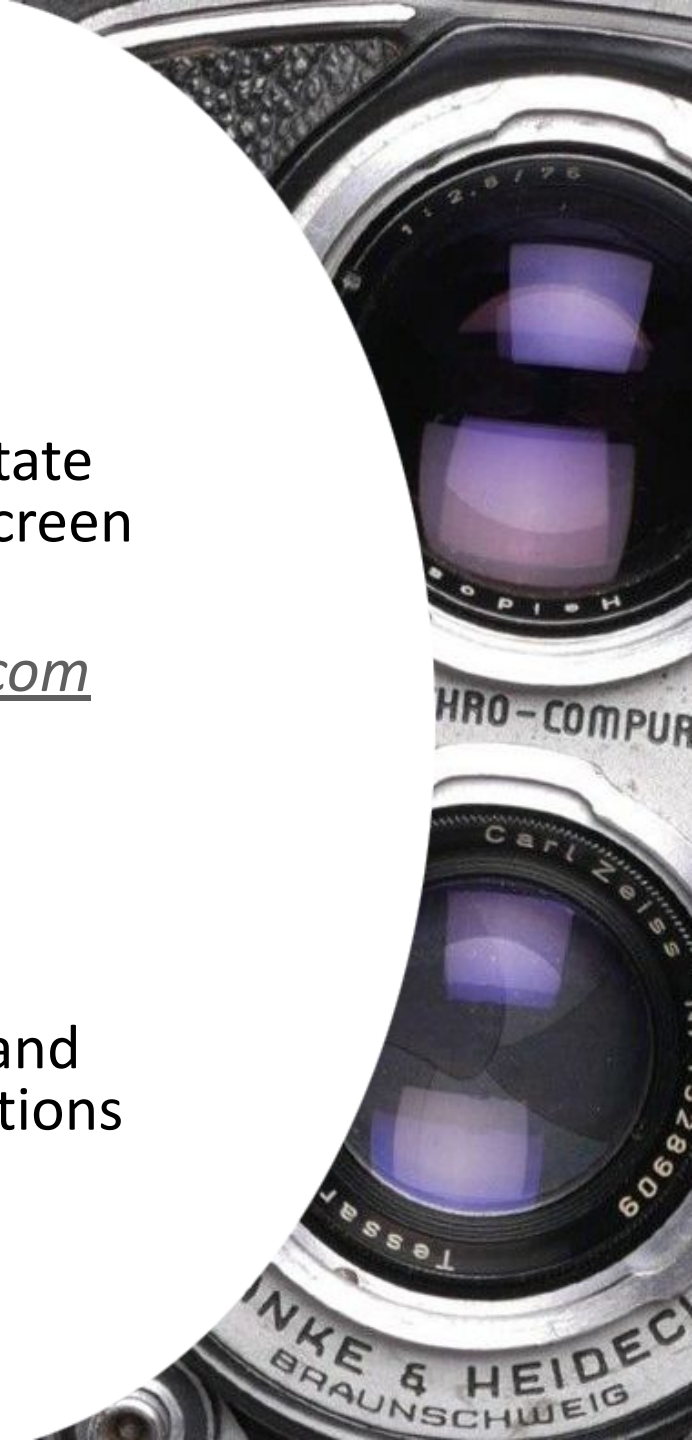
Difference in real estate between common screen resolutions

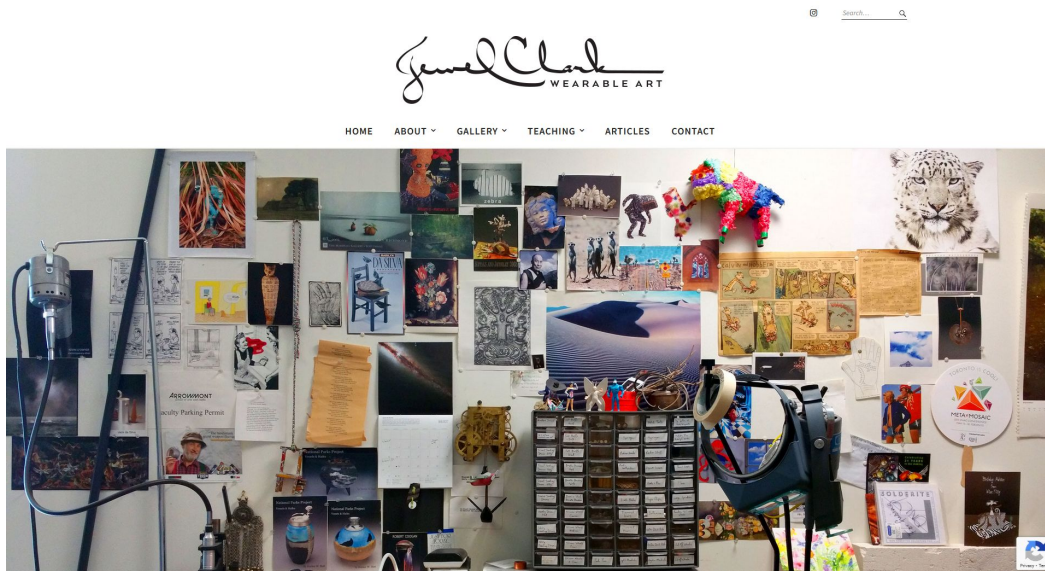
- logicalincrements.com

	1080p	1440p	4k
24"	92	123	184
27"	81	108	163
28"	79	105	157
32"	69	92	138

PPI by monitor size and native screen resolutions

- Medium.com

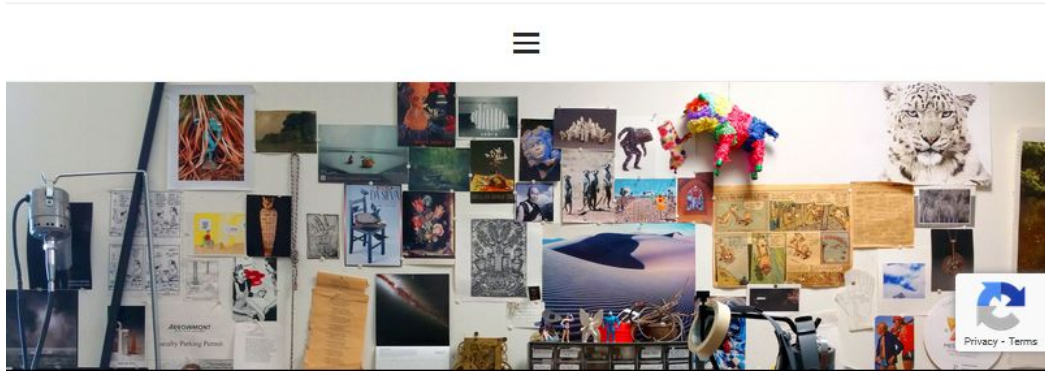




Website on 1920x1200 PPI screen, 24-inch monitor



Website on 800x600 PPI screen, 24-inch monitor



Look at the 70px wide reCAPTCHA graphic on each image. The image changes size depending on the pixel density of the screen.



Optimization guidelines, pre-upload

Start by creating properly sized and compressed images (whenever possible).

- Make your images the correct pixel width/height for what their largest use-case will be.
- Compress images when saving (for jpg/jpeg/png).
- Save images natively in next-gen formats.
- Save logos and graphics as SVG* (optional)

*SVGs have security risks and are not natively supported. See the Resources pages for information on how to use them safely.



Next-gen image formats

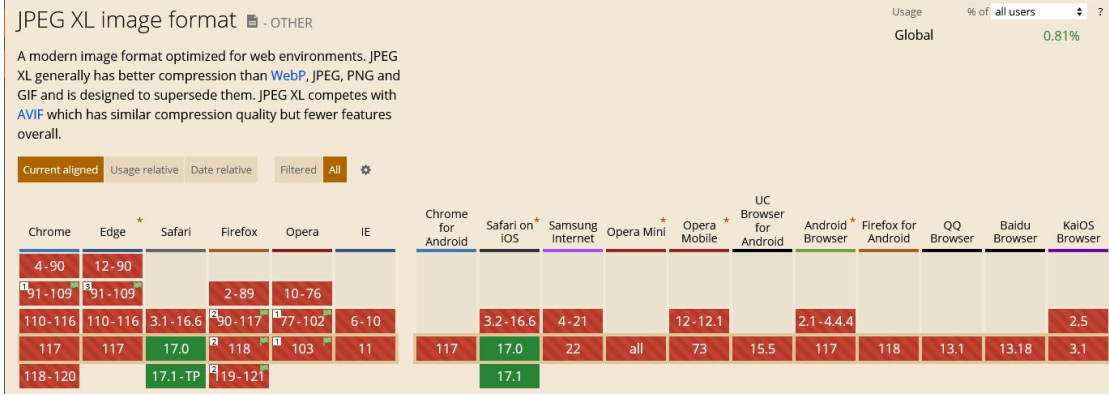
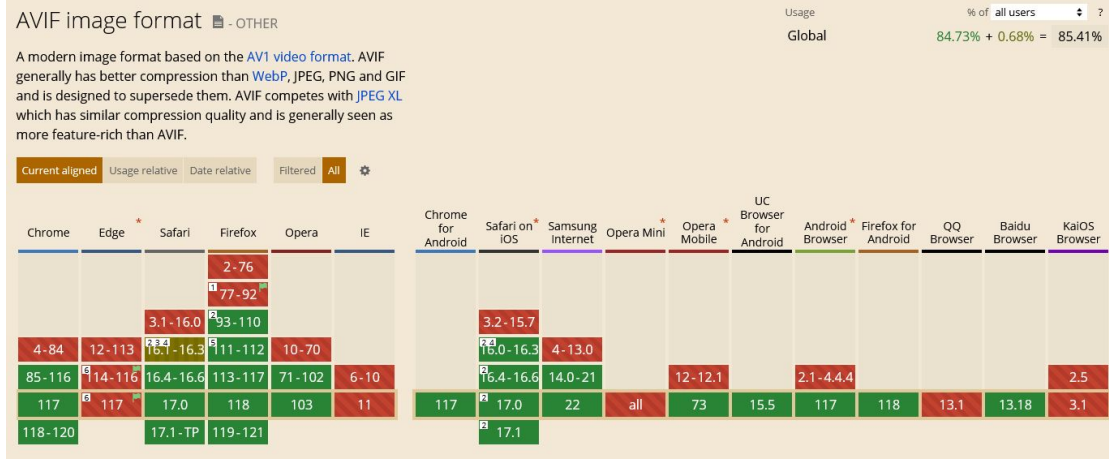
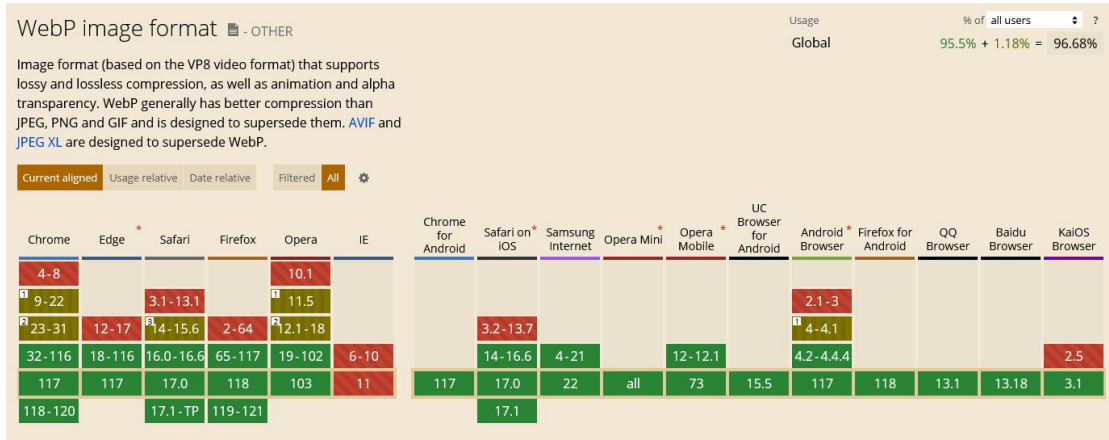
WebP- Image format developed by Google (2010) that supports lossy and lossless compression + animation + alpha transparency. WebP generally has better compression than JPEG, PNG and GIF and is designed to supersede them. AVIF and JPEG XL are designed to supersede WebP.

AVIF- Modern image format (2019) based on the AV1 video format. AVIF generally has better compression than WebP, JPEG, PNG and GIF and is designed to supersede them. AVIF competes with JPEG XL which has similar compression quality and is generally seen as more feature-rich than AVIF.

JPEG XL- Modern image format (2019) optimized for web environments. JPEG XL generally has better compression than WebP, JPEG, PNG and GIF and is designed to supersede them. JPEG XL competes with AVIF which has similar compression quality but fewer features overall.

Previous next-gen formats include JPEG XR and JPEG 2000 (legacy formats).





Internet adoption of next-gen formats:

WebP (top)

AVIF (middle)

JPEG XL (bottom)

- caniuse.com

JPEG XR is only supported on IE11.

JPEG 2000 is only supported on Safari.



Image optimization software

There are loads of options available now.

Pick software that lets you change the pixel dimensions and compress files when saving.

Options include:

My go-to is Photoshop (paid)

Irfanview (free)

Microsoft Photos (built into Windows and surprisingly useful)

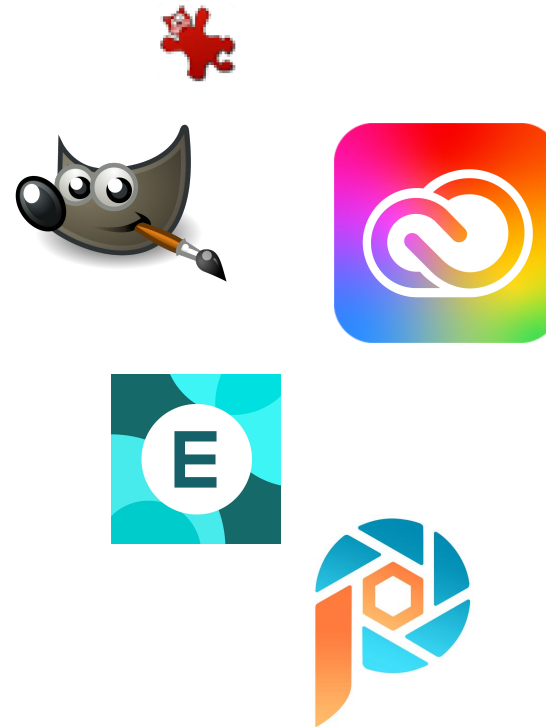
Gimp (free)

Other Adobe options like Lightroom, Elements (paid)

Pixlr (online only, requires account creation, free with ads)

Paintshop Pro (paid)

Online converters. There are a multitude, and your compression mileage will vary. Try a few.



Optimization guidelines post-upload

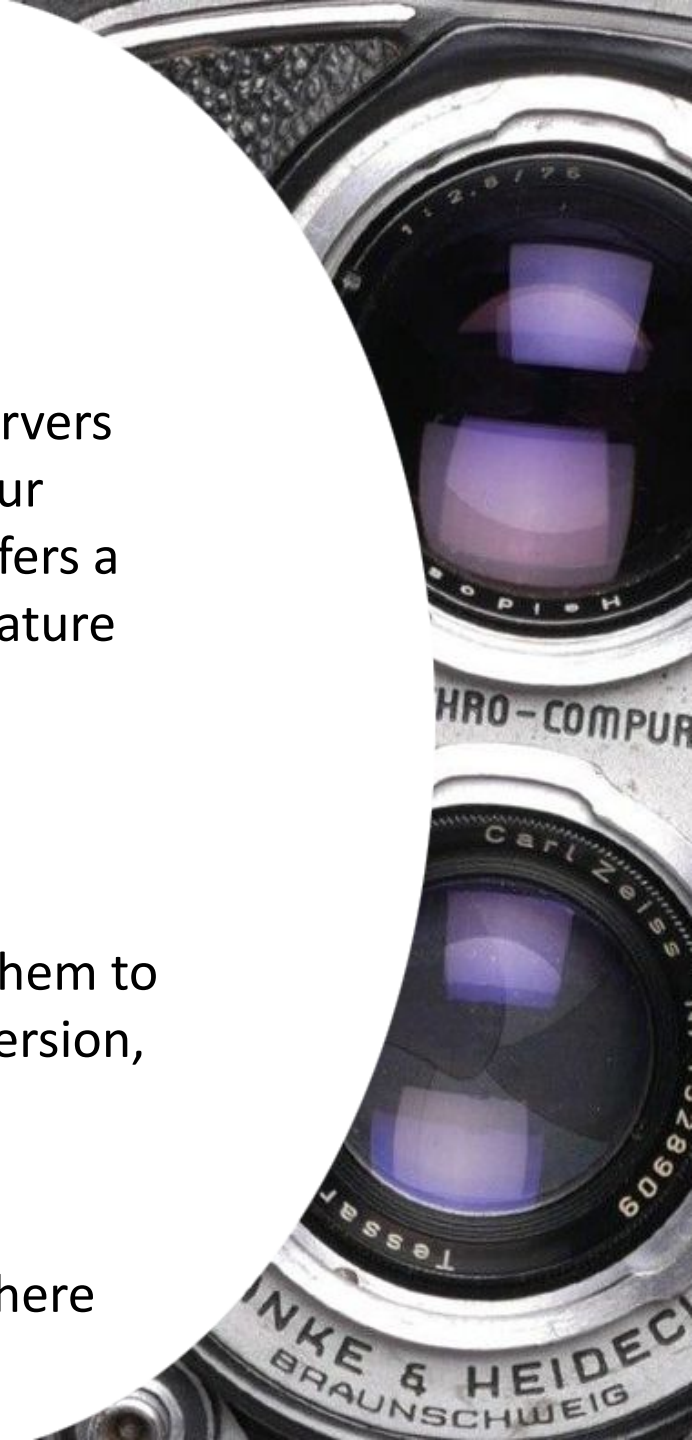
Use a CDN like [Cloudflare](#).

A content delivery network (CDN) is a globally distributed system of edge servers that provide fast delivery of website content. The edge servers closest to your visitors will deliver the images, thus improving site load times. Cloudflare offers a next-gen on-the-fly converter for paying users and an image optimization feature for all users (not beginner friendly).

Use a plugin like [EWWW Image Optimizer](#).

Image optimization plugins can further compress your images and convert them to next-gen formats. Your original image, unless you opt to delete it after conversion, can remain on the site as a fallback.

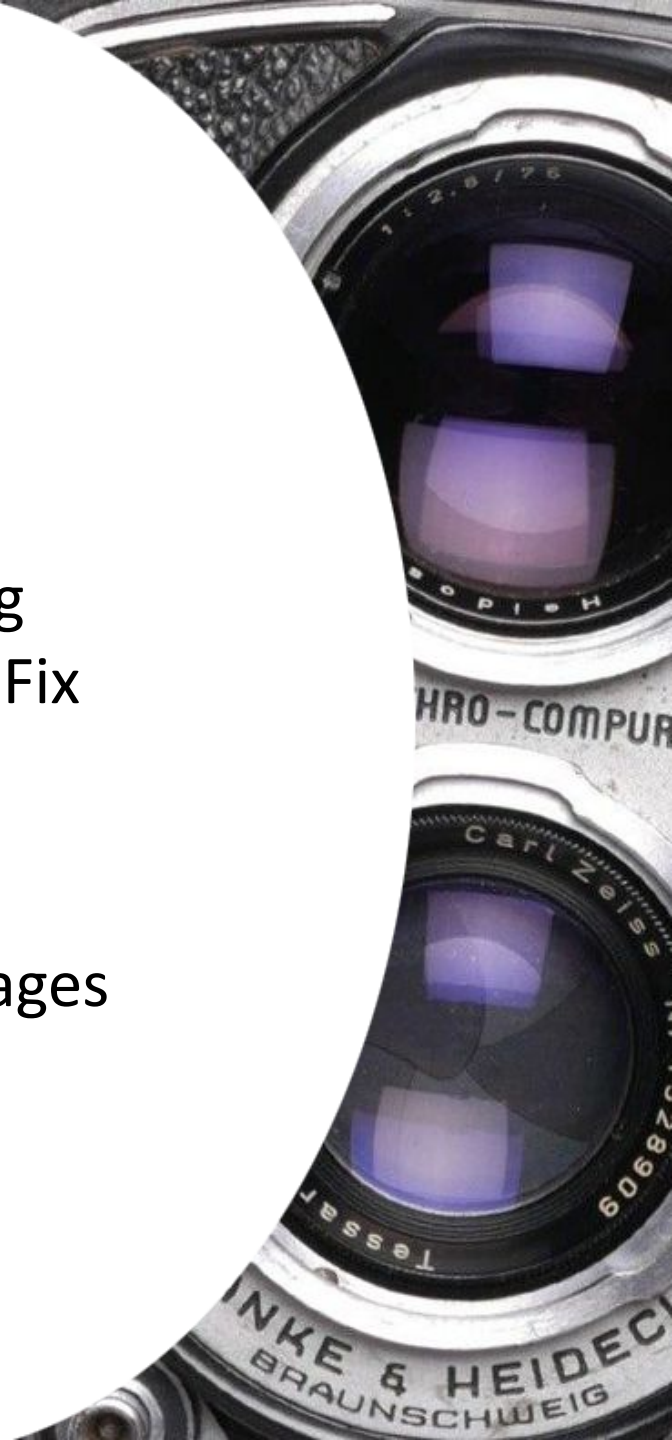
Other image optimization plugins include: [ShortPixel](#), [Smush](#), [Imagify](#), and there are many more.



How do I fix my already uploaded behemoths?

It is likely impractical to backtrack and try to fix a lot of existing images. Run speed and image tests. Find the worst offenders. Fix them, then optimize newer images moving forward.

Use optimization plugins to compress and convert existing images to next-gen formats and take advantage of CDN services.



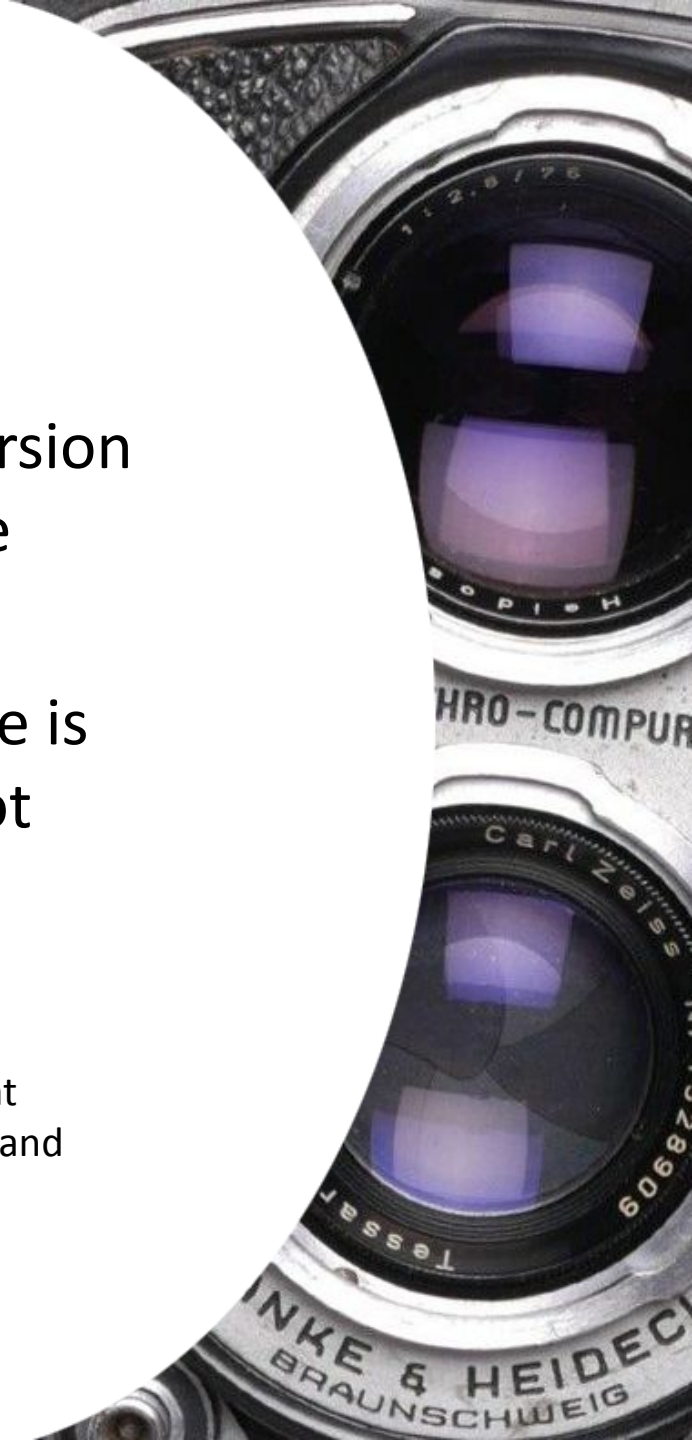
Other stuff

WordPress automatically includes *srcset** for images since version 4.4 and some themes automatically employ this based on the registered sizes.

Check your dev tools to see if it's working for you. If not, there is code you can add to your functions.php file to help. This is not necessarily beginner-friendly, but it's an option.

*What is srcset? Srcset is an HTML image attribute that specifies the list of images to use in different browser situations. The browser will pick the most optimal image version, based on the screen size and resolution.

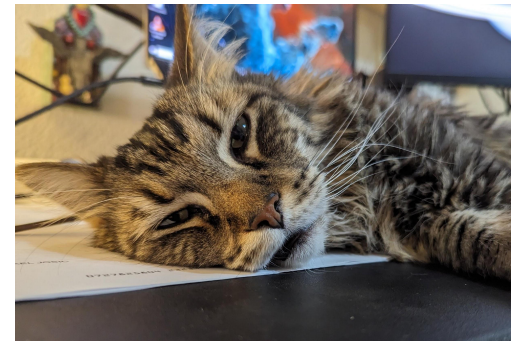
- ahrefs.com



How else can I improve my images?

Additional SEO & User Experience (UX) improvement:

- Give your files relevant, descriptive (but not long) names and use hyphens between words. Crawlers find images by extracting textual information relevant to the images (alt text, text surrounding the images, filename, caption, metadata, and more).
- Use relevant keywords in your file names when possible (don't stuff).
- ALT TAG text! Provide good, descriptive, concise alt text for your images. Google ranks accessibility and this is ground grazingingly low hanging fruit. It's also the right thing to do. Provide equitable access for all users.
- Lazy load images **below** the "fold" only.



Instead of
PXL_20230725_211441037.jpg
try *sleepy-cat-on-desk.jpg*

Questions?



References (not included in other slides)

Screen and image resolution/ image optimization

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<https://gtmetrix.com/blog/what-does-image-optimization-mean/>

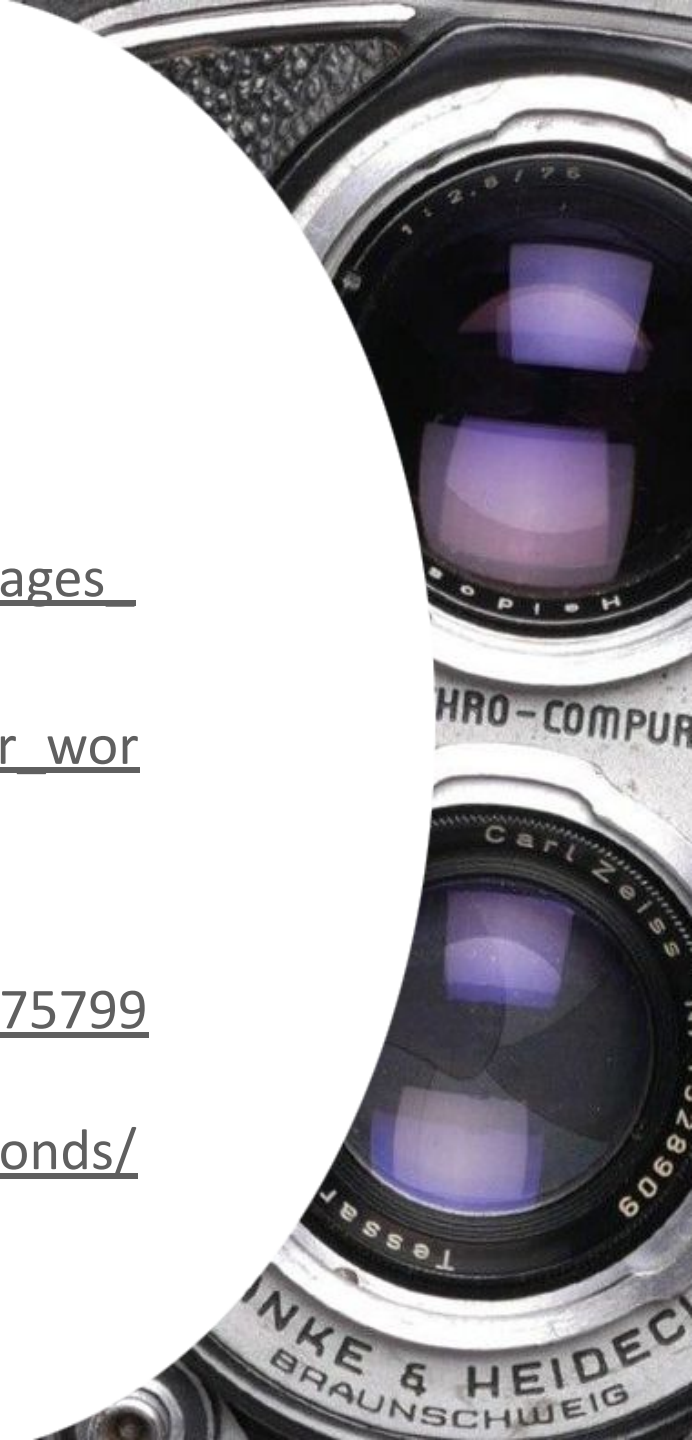
[https://cloudinary.com/blog/top 10 mistakes in handling website images and how to solve them](https://cloudinary.com/blog/top_10_mistakes_in_handling_website_images_and_how_to_solve_them)

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Site speed

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<https://www.hobo-web.co.uk/your-website-design-should-load-in-4-seconds/>



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<https://web.dev/articles/lazy-loading-best-practices>

<https://web.dev/articles/lcp-lazy-loading>

Srcset/retina/responsive images

https://developer.mozilla.org/en-US/docs/Learn/HTML/Multimedia_and_embedding/Responsive_images

<https://www.smashingmagazine.com/2016/09/responsive-images-in-wordpress-with-art-direction/>

<https://wpmudev.com/blog/make-images-retina-ready/>



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<https://www.searchenginejournal.com/google-on-image-filenames-a-surprising-seo-mistake/468366/>

<https://developers.google.com/search/docs/fundamentals/seo-starter-guide>

<https://rankmath.com/kb/how-to-name-images-for-seo/>

<https://www.jcchouinard.com/google-image-search-engine/>

