Common & Not So Common Core Web Vitals Issues (and how to fix them)

Tom Pool

www.bluearray.co.uk | @bluearrayseo
I’m Tom - Technical & Training Director at Blue Array
And I love a good adventure
Like all good adventures
We’re going to start with a question
What are the things that really annoy you about using the internet?
No,
Twitter/Reddit/LinkedIn doesn’t count
What are the things that really annoy you about using the internet?
If you had to make a list of 5 things that annoy you
Pages ‘not working’ fast enough
Links taking you to irrelevant locations
Pages moving around while interacting (Local News Publishers)
Pages taking ages to load
3 of these areas, coincidentally
Are all things that ‘CWV’ aims to track & monitor
Pages ‘not working’ fast enough

(Interactivity)

FID
First Input Delay

GOOD
NEEDS
IMPROVEMENT
POOR

100 ms 300 ms
Pages ‘taking ages’ to load

(Load)

LCP
Largest Contentful Paint

GOOD | NEEDS IMPROVEMENT | POOR

2.5 sec | 4.0 sec

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Things on pages moving around

(Visual Stability)

**CLS**

Cumulative Layout Shift

- **GOOD**
- **NEEDS IMPROVEMENT**
- **POOR**

0.1

0.25

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Core Web Vitals are a set of metrics, intended to
‘Help site owners measure User Experience on the web’
CWV were announced nearly 3 years ago
And lots of sites are still shit
Especially pages that are not the main, ‘money’ pages
Evaluating page experience for a better web
Thursday, May 28, 2020

Through both internal studies and industry research, users show they prefer sites with a great page experience. In recent years, Search has added a variety of user experience criteria, such as how quickly pages load and mobile-friendliness, as factors for ranking results. Earlier this month, the Chrome team announced Core Web Vitals, a set of metrics related to speed, responsiveness and visual stability, to help site owners measure user experience on the web.
This past May, we announced that page experience signals would be included in Google Search ranking. These signals measure how users perceive the experience of interacting with a web page and contribute to our ongoing work to ensure people get the most helpful and enjoyable experiences from the web. In the past several months, we've seen a median 70% increase in the number of users engaging with Lighthouse and PageSpeed Insights, and many site owners using Search Console’s Core Web Vitals report to identify opportunities for improvement.

Today we’re announcing that the page experience signals in ranking will roll out in May 2021. The new page experience signals combine Core Web Vitals with our existing search signals including mobile-friendliness, safe-browsing, HTTPS-security, and intrusive interstitial guidelines.
Core Web Vitals

- **Loading**
  - Largest Contentful Paint (LCP)
- **Interactivity**
  - First Input Delay (FID)
- **Visual Stability**
  - Cumulative Layout Shift (CLS)

Search signals for page experience

- Mobile Friendly
- Safe Browsing
- HTTPS
- No Intrusive Interstitials

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Timeline for bringing page experience ranking to desktop

Thursday, November 4, 2021

**Update on February 22, 2022:** The page experience update is now slowly rolling out for desktop. It will be completed by the end of March 2022.

**Update on January 17, 2022:** Search Console now has a dedicated ‘Desktop’ section in the Page Experience report.

An RFP 2021, we announced our plans to bring page experience ranking to desktop. Today we’re announcing more details, including the timeline for these changes. This work builds on top of the page experience update we rolled out on mobile between June and August 2021.

Rollout will begin in February 2022

We’ll begin using page experience as part of our desktop ranking systems beginning in February 2022. The rollout will be complete by the end of March 2022. This ranking change will be based on the same page experience signals that we rolled out on mobile earlier this year. We are also planning to help site owners understand how their desktop pages are performing with regards to page experience using a Search Console report which will launch before desktop becomes a ranking signal.

This means the same three Core Web Vitals metrics (CL, FID, and LCP) and their associated thresholds will apply for desktop ranking. Other aspects of page experience signals, such as HTTPS security and the advance of intrusive interstitials, will remain the same as well. While the mobile-friendliness signal continues to be a part of mobile ranking, it won’t be a factor for desktop. When a site has separate desktop and mobile URLs with an appropriate configuration, the desktop signal is based on the URLs that desktop users see.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mobile</th>
<th>Desktop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largest Contentful Paint (LCP)</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Cumulative Layout Shift (CLS)</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>First Input Delay (FID)</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>HTTPS Security</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Above-the-fold interstitials</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Mobile Friendly</td>
<td>☑️</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

We hope this blog post provides you with details for you to understand and optimize your page experience in preparation for the upcoming changes, and in turn help you build better websites.

If you have questions or feedback, please visit our help forums or let us know through Twitter.

Posted by: Jeffrey, Senior Product Manager on Search

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</tr>
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<td>Largest Contentful Paint (LCP)</td>
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<td>✓</td>
</tr>
<tr>
<td>First Input Delay (FID)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HTTPS Security</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Absence of intrusive interstitials</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mobile friendliness</td>
<td>✓</td>
<td>☠️ (Not applicable)</td>
</tr>
</tbody>
</table>
What about now?
A lot of sites still struggle with Core Web Vitals
Catholic War Veterans

What does CWV stand for? All Acronyms has a list of 27 CWV definitions. Updated April 2020. Top CWV acronym meaning: Catholic War Veterans

CWV Meanings | What Does CWV Stand For?

www.allacronyms.com/CVV

What is their history?  How can I join them?  What do they do?  How many?

Type a message...
A quick look through Search Console
Core Web Vitals

Student Discounts

Source: Chrome UX report  
Last updated: 3/13/23

Mobile

- 3,436 poor URLs
- 1,644 URLs need improvement
- 387 good URLs

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Core web vitals

Large national food producer

Source: Chrome UX report  📌  Last updated: 13/03/2023

Mobile

- 0 poor URLs
- 328 URLs need improvement
- 130 good URLs

@cptntommy  |  www.bluearray.co.uk  |  @bluearrayseo
Multinational retailer

Core web vitals

Source: Chrome UX report  
Last updated: 15/03/2023
Coffee company
There’s also the more general ‘Page Experience’ report.
Local Ebay competitor

**Mobile**

<table>
<thead>
<tr>
<th>Good URLs</th>
<th>Total impressions of good URLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.8%</td>
<td>5.22M</td>
</tr>
</tbody>
</table>

**Page experience signals for mobile**

- **Core web vitals**
  - Failing URLs: 19,500

- **Mobile Usability**
  - Failing URLs: 5

- **HTTPS**
  - Non-HTTPS URLs: 3
No site is safe from the judgement of CWV
The report shown in Search Console is built from the CrUX
This is also what the first view in Page Speed Insights is built from
Discover what your real users are experiencing
Learn how your site has performed, based on data from your actual users around the world.

Core Web Vitals assessment: Failed
Computed from the Core Web Vitals metrics over the latest 28-day collection period.
Learn more

- First Contentful Paint (FCP) - 2.4s
- First Input Delay (FID) - 59ms
- Largest Contentful Paint (LCP) - 4.5s
- Cumulative Layout Shift (CLS) - 0.03

Latest 28-day collection period
Various mobile devices
Many samples (Chrome UX Report)
Full visit durations
Various network connections
All Chrome versions
The Chrome User Experience Report is powered by real user measurement of key user experience metrics across the public web
You have to be using Chrome (not Chromium), (not on iOS), and be opted in to syncing browser history
The CrUX report collects a lot of different data
First Paint
First Contentful Paint
First Input Delay
Largest Contentful Paint
Cumulative Layout Shift
Time to First Byte
Connection Type
Device Type
Country

https://developers.google.com/web/tools/chrome-user-experience-report
You can explore this data in more depth within the CrUX dashboard in Looker Studio.
Core Web Vitals

Largest Contentful Paint (LCP)
LCP reports the render time of the largest content element that is visible within the viewport.
LCP (> 2.5s)
LCP (0-2.5s)
LCP (2.5-4.0s)
LCP (> 4.0s)

First Input Delay (FID)
FID measures the time from when a user first interacts with a page (i.e., when they click a link, tap on a button, or use a custom, and/or (prevented) control) to the time when the browser is actually able to respond to that interaction.
FID (> 3.0s)
FID (0-3.0s)
FID (> 4.0s)

Cumulative Layout Shift (CLS)
CLS measures the sum-total of all individual layout shift scores for every unexpected layout shift that occurs during the entire lifespan of the page.
CLS (> 0.2s)
CLS (0-0.2s)

Questions or concerns? Visit the GMB forum.
www.bluearray.co.uk
@bluearrayseo
Largest Contentful Paint (LCP)

- Good LCP: 90.15% (Good)
- P75 LCP (All Devices): 1.500 (Needs Improvement)
- Poor LCP: 3.67% (Poor)

New datasets are released on the second Tuesday of each month.
Questions or concerns? Visit the GSC forums and the GSC documentation.
Create your own dashboard at g.co/chrome-dev-tools.
See the GSC Dashboard Guide for more information.
There’s a lot of useful insight
You can use it with any domain - ideal for competitor analysis
SELECT CONNECTOR

Chrome UX Report
By The Chrome UX Report Team

Explore user experience stats about an origin in the Chrome UX Report. Terms of Service: https://policies.google.com/terms
Privacy Policy: https://policies.google.com/privacy

It is your responsibility to review and comply with all applicable third party TOS.

LEARN MORE  REPORT AN ISSUE

Parameters

Enter origin URL:
e.g. https://developer.chrome.com

Allow "Enter origin URL" to be modified in reports.

https:// is added by default. If needed, add http:// at the URL beginning (e.g. http://example.com)

Click "CONNECT" to continue.

Use report template for new reports
This is provided by the connector's creator.

Learn more about how your data is being shared when allowing report editors to modify parameter values.
A few moments ago we mentioned the 3 main CWVs.
Largest Contentful Paint
First Input Delay
Cumulative Layout Shift
The most common issue that we see is usually with LCP
What is LCP?
The Largest Contentful Paint (LCP) metric reports the render time of the largest image or text block visible within the viewport, relative to when the page first started loading.

https://web.dev/lcp/#what-is-lcp
The LCP can change as a page loads
As soon as a user interacts with a page, no new LCP classifications can occur.
What can impact LCP?
Slow server response times
Render blocking resources
Resource load times
Large files
Client side rendering
One of the most common issue that we see with LCP
(And we do a lot of CWV investigations)
Is large imagery
It’s also one of the easier areas to fix, too
For example, take this URL on the BlueArray Website
Tom Pool was Blue Array’s first hire and has excelled on the technical side of SEO. Tom's engineering BTEC level has proven to be a solid foundation and he's excited about pursuing his career with Blue Array.

We asked Tom “If you could visit any place in the world, where would you choose to go and why?”;

If I could visit anywhere, it would have to be Switzerland for the mountains, or somewhere north, where you can see the Northern Lights. I’m slowly ticking off each European country, and absolutely loving the different cultures!
Page Speed Insights shows
Diagnose performance issues

Performance
Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.

- 0–49
- 50–89
- 90–100

65

Largest Contentful Paint
3.1 s

METRICS
- First Contentful Paint
  2.4 s
- Total Blocking Time
  360 ms
- Speed Index
  2.8 s
- Cumulative Layout Shift
  0.342

Largest Contentful Paint

Serve images that are appropriately-sized to save cellular data and improve load time. Learn how to size images.

Upload images directly through the media library to ensure that the required image sizes are available, and then insert them from the media library or use the image widget to ensure the optimal image sizes are used (including those for the responsive breakpoints). Avoid using full size images unless the dimensions are adequate for their usage. Learn More.

Serve images in next-gen formats
Reduce unused JavaScript
Eliminate render-blocking resources
Reduce unused CSS
The Blue Array website is hosted on WP
(So it’s easy to fix this one!)
2560 x 1920 pixels
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It’s surprising to see how many sites just upload images & roll with them
Simple scaling can really help
SCALE IMAGE

Original dimensions 2560 × 1920

New dimensions:

500 × 375

Scale
You can also do this easily on Mac
Preview > View > Show Markup
Toolbar > Resize
Image Dimensions

- Fit into: Custom
- Width: 500 pixels
- Height: 375 pixels
- Resolution: 72 pixels/inch

Scale proportionally
Resample image

Resulting Size
17.64 x 13.23 cm
106 KB (was 1.4 MB)
You can also resize multiple images

When you’ve resized, don’t forget to upload
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Performance

Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.

METRICS

- First Contentful Paint: 2.3 s
- Largest Contentful Paint: 2.8 s
- Total Blocking Time: 410 ms
- Cumulative Layout Shift: 0.315

View Treemap

Opportunities

- Reduce unused JavaScript: 1.47 s
- Eliminate render-blocking resources: 0.94 s
- Minify JavaScript: 0.15 s

These suggestions can help your page load faster. They don’t directly affect the Performance score.
Improvement!
But there’s still more actions to take
Moving on to another example, where the issue is not as commonly seen
Relating to Lazy Loading
The developers were very ‘keen’ with the lazy-loading implementation
And all images had

`loading="lazy"`
Even the images that appear above the fold
Sample site - The Verge doesn’t have lazy loading issues (they have other ones...)

When astronomer Tyler Nordgren first got involved in astrophotography in the ‘90s, he noticed something very off about the postcards, posters, and other photos he’d see when living and traveling in the American Southwest.

“One of the big things that struck me at that time was the number of pictures I’d see that show the buttes in Monument Valley with a full moon rising behind them,” Nordgren recalls. Nordgren had been to that exact location in Monument Valley, and he knew the Moon didn’t rise in the position shown in the photos. “And even if it did, the shadows on the Moon are utterly different from the shadows on the buttes.” Even in a photo he had taken a few weeks ago, Nordgren’s photo shows the correct shadows.
So instead of seeing rich, valuable content
Using lazy loading meant that the resource would not load until after the layout was confirmed.
In practice, it would look something like:
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Again, it’s a pretty straightforward fix
Make sure that all in-viewport images are not using lazy loading
Or if they are, that the site is using an Intersection Observer
This watches for changes to the visibility of each image.
When an image enters the user's view, the Intersection Observer detects this and triggers a JavaScript function that loads the image.
We can also take this further, and help the LCP element (if it’s an image) load faster.
With something called ‘Priority Hints’
Priority Hints indicate the relative priority of resources to the browser. They can enable optimal loading and improve Core Web Vitals.

https://web.dev/priority-hints/
You can hint to the browser as to which resources are most important via the `fetchpriority` attribute for resources that could benefit from a higher priority.
For example, if you specify `fetchpriority=“high”` on a main image, LCP can happen sooner.
There’s a wide range of other issues that can affect LCP
Clear & optimised caching is useful; more so for returning users
Be aware of preloading, too
Preloaded resources are fetched at a high priority, delaying the arrival of other resources in the page
In the case where a preloaded resource is never actually used by the page, that means potentially critical requests will be delayed, slowing down the initial loading of your site.
In addition to this, there’s a couple of other things to be aware of
Slow Server Response Time - Make sure you’re using a good, trustworthy host
Slow Server Response Time - Using a CDN is also valuable (Cloudflare)
Caching
- Make sure you’re using smart caching rules
Look at the resources that make up your site, and work out best possible cache times
Beyond LCP, CLS is the thing that can really affect User Experience
What is CLS?
CLS is a measure of the largest burst of layout shift scores for every unexpected layout shift that occurs during the entire lifespan of a page.

https://web.dev/cls/#what-is-cls
A layout shift occurs any time a visible element changes its position from one rendered frame to the next.

https://web.dev/cls/#what-is-cls
The Layout Shift Score is based on the size of a shifting element in comparison to the viewport — Impact Fraction
The distance the element moves in comparison to the viewport
- Distance Fraction
Layout Shift Score = Impact Fraction * Distance Fraction
The way that CLS was calculated was updated mid 2021
To account for pages with lots of small changes over a longer period of time (a sports scoring page)

@cptntommy | www.bluearray.co.uk | @bluearrayseo
Google takes readings every second for 5 seconds
And assigns each bracket its own CLS
The bracket with the highest CLS is what represents the page in PSI
The most common issue for CLS
Not including size attributes on images & videos
I’m sure we’ve all seen the local ‘news’ publisher sites
MANY ISSUES;
Banners, ads, ads, ads, images not having dimensions
Good documentation on GTMetrix shows
Let’s look at a specific example
https://theoxfordmagentine.com/events/
If we have a look at the page loading
Mar
20
Marina Abramović: Gates and Portals
£7.50 - £10.00

Mar
20
Dia al-Azzawi – Painting Poetry
Using Page Speed Insights highlights the issue
Performance
Values are estimated and may vary. The performance score is calculated directly from these metrics. See calculator.

- First Contentful Paint
  2.3 s

- Total Blocking Time
  1,130 ms

- Speed Index
  13.2 s

Accessibility
Best Practices
SEO
Looking at the timeline view shows the visual progress
There’s some quite obvious immediate wins
Now, I don’t have access to this website
But I do have access to WebPageTest
Welcome to WebPageTest Pro

You're ready to go! Enjoy premium locations, bulk runs, test priority, our API, & No-Code Experiments!

Start a Site Performance Test!

https://theoxfordmagazine.com/events/

Simple Configuration: 3 test runs from recommended location and browser presets

- MOBILE 4G Virginia, US
- DESKTOP Cable Virginia, US
- MOBILE 3G Mumbai, IN
- DESKTOP Cable Toronto, CA
- DESKTOP Cable Frankfurt, DE

- Include Repeat View
  (Loads the page, closes the browser and then loads the page again)

- Run Lighthouse Audit
  (Runs on Chrome, emulated Moto G4 device, over simulated 3G Fast connection)

- Make Test Private
  Private tests are only visible to your account

967 Runs Left | Upgrade

Start Test →
Needs Improvement. This site had major layout shifts. It took a long time to become interactive. It had 1 accessibility issue, none serious. Some HTML was generated after delivery, potentially delaying usability.

WebPageTest ran 5 diagnostic checks related to this category and found 4 opportunities.

Layout shifts exist and may be caused by images missing aspect ratio.

1 experiment selected. Experiment Runs: 3 (6 total runs)
Each experiment run uses 2 test runs (1 experiment, 1 control) for each first & repeat view

Add Aspect Ratio to Images
This experiment adds width="..." and height="..." attributes to specified images, matching their natural width and height, to provide an aspect ratio.

Assets included in experiment:
Running the experiment takes a minute
## Experiment Results

### Experiment Impact

<table>
<thead>
<tr>
<th>Metric</th>
<th>Experiment</th>
<th>Control</th>
<th>Change</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Render</td>
<td>0.1s</td>
<td>2.9s</td>
<td>SLOWER</td>
<td>0.2s</td>
</tr>
<tr>
<td>First Contentful Paint</td>
<td>0.11s</td>
<td>2.92s</td>
<td>SLOWER</td>
<td>2.81s</td>
</tr>
<tr>
<td>Speed Index</td>
<td>0.3s</td>
<td>3.74s</td>
<td>FASTER</td>
<td>4.04s</td>
</tr>
<tr>
<td>Largest Contentful Paint</td>
<td>0.07s</td>
<td>3.62s</td>
<td>SLOWER</td>
<td>3.55s</td>
</tr>
<tr>
<td>Cumulative Layout Shift</td>
<td><strong>0.334</strong></td>
<td>0.334</td>
<td>BETTER</td>
<td>0.001</td>
</tr>
<tr>
<td>Total Blocking Time</td>
<td>0.03s</td>
<td>5.27s</td>
<td>SLOWER</td>
<td>5.23s</td>
</tr>
<tr>
<td>Visual Complete</td>
<td>0.9s</td>
<td>13.3s</td>
<td>SLOWER</td>
<td>12.4s</td>
</tr>
<tr>
<td>Fully Loaded</td>
<td>0.24s</td>
<td>17.89s</td>
<td>SLOWER</td>
<td>17.65s</td>
</tr>
<tr>
<td>Page Weight</td>
<td>18 KB</td>
<td>3996KB</td>
<td>LIGHTER</td>
<td>4014KB</td>
</tr>
</tbody>
</table>

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**Notes:**
- The experiment resulted in a significantly improved Cumulative Layout Shift (CLF) value, reducing from 0.334 to 0.001.
- Other metrics also showed improvement, particularly in Speed Index and Page Weight.

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**Sources:**
- BlueArray
- Friends of Search

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**Social:**
- @cptntommy
- www.bluearray.co.uk
- @bluearrayseo
We can then compare the visual loading
Mar 20  Marina Abramović: Gates and Portals
£7.50 – £10.00

Mar 20  Dia al-Azzawi – Painting Poetry
Free
WebPageTest can also highlight other issues & allow for immediate testing
If you can, I’d recommend playing around with this
It can be really useful if you’d like to prove the potential impact of changes
It can also be useful for pitches, too
Cookie Banners can cause CLS issues, too
As well as other CWV problems
If not properly implemented
Consent Management Platforms often rely on a fair number of 3rd party scripts & resources
“If a CMP is configured to load before other critical resources on a webpage, it can delay the loading of those resources and negatively impact CWV metrics.”
It’s worth checking implementation to ensure best possible performance
We’ve got one more CWV to look at
First Input Delay
What is FID?
“FID measures the time from when a user first interacts with a page (i.e. when they click a link, tap on a button, or use a custom, JavaScript-powered control) to the time when the browser is actually able to begin processing event handlers in response to that interaction.”

https://web.dev/fid/#what-is-fid
What can impact FID?
Lots of third party code (JS etc)
Long JS execution times
High levels of main thread work
High numbers of requests
Unused code
Optimising & Minifying code
“Minify JS/CSS”
If using WordPress
Divi (theme) can do this for you
Cloudflare can also do this, as well as other hosts (Siteground, in particular)
There’s plugins available for most platforms
(or you could do it yourself)
“Reduce the impact of 3rd party code”
This is around reduction of render blocking resources, to ensure users get the main content faster
Deferring 3rd party scripts can benefit. Some plugins can aid with this, or some themes have functionality built in to defer.
Tying it all together
Testing sites - particularly large ones
Especially pages that are not the usual ‘money’ pages
Can reveal a number of different issues
It’s important to understand what causes these issues
As well as how to fix (or at least understand some of the detail behind) these issues
There may be many, many, many things that annoy us about using the internet
Don’t let Core Web Vitals be one of them.
Thanks!
Appendix:

https://web.dev/optimize-long-tasks/
https://support.google.com/webmasters/thread/86521401?hl=en&msgid=86521401
https://developers.google.com/search/docs/appearance/page-experience
https://web.dev/fast/