

Metrics to Measure Website Performance

What are website performance metrics?

Website performance metrics are measurable indicators that help you understand how well your site functions in terms of speed, user experience, and overall efficiency. These metrics tell you how quickly your website loads, how smoothly it operates, and how responsive it is to users.

Just four years ago, measuring **perceived performance** was nearly impossible, and online businesses had to resolve to use custom tracking (if at all). Today, web performance metrics help us paint a clear picture of what's *actually* going on when users land on our websites and, most importantly—where we are losing their attention.

What is perceived performance?

Perceived performance refers to how fast and responsive a website *feels* to users, regardless of the actual technical speed. It's all about the user's experience—how quickly they see content appear, how smoothly they can interact with the page, and whether they encounter any delays or disruptions. For example, even if a website takes several seconds to fully load in the background, if the main content appears quickly and users can start interacting with it right away, the site *feels* fast.

Why does monitoring website performance metrics matter?

Monitoring website performance metrics is the best way to identify and troubleshoot hidden performance bottlenecks regarding how real users behave on your website.

Imagine you have to drive 100 free trial sign-ups for a new product launch. The deadline is fast approaching, but you've only reached 40% of your goal. Everything looks fine on the surface—page elements load and events fire correctly. But to identify hidden obstacles, it's time to dive into performance metrics like scroll depth, bounce rate, [TTFB](#), and session duration on the registration page.

These metrics reveal whether there are underlying issues, such as slow-loading or unstable elements, that might be driving potential sign-ups away.

But how do you determine the thresholds of performance metrics?

While industry benchmarks and CRM tools offer some guidance, the most reliable way to gauge performance is by consistently monitoring and analyzing your website's metrics over time. And improving them introduces lots of business benefits.

For example, [research](#) shows that a 0.1-second boost in page load speed affects KPIs across the entire buyer journey:

- **Enhanced user experience:** 8.6% more pages viewed in a session and 5.2% improvement in customer engagement
- **Higher conversions:** 8.4% more conversions and a 9.2% average order value (AOV) increase
- **Increased user retention:** 8.3% less likely to go to your competitors

So, which metrics should you track to achieve these results? Read on to start making a list of performance indicators that match your business case.

Website performance metrics that influence conversion rate

Pro tip: Network strength, latency, and device hardware capabilities make a great difference to website performance on mobile and desktop. Thus, it's important to measure both and prioritize optimizing for mobile.

Core Web Vitals

Core Web Vitals are a **set of standardized performance metrics defined by Google** that measure key aspects of user experience on a website. These **metrics focus on loading performance, responsiveness, and visual stability**—factors that significantly impact how users perceive and interact with a website. The three main Core Web Vitals are LCP, INP, and CLS.



Core Web Vitals use **"Real User Monitoring" (RUM)**—data collected from real users as they interact with your website. Unlike lab data, which is gathered in controlled environments, field data reflects *actual* user experiences across different devices, network conditions, and **locations**. Field data is what Google uses to assess Core Web Vitals for ranking purposes, making it essential for optimizing both user experience and SEO performance.

LCP (Largest Contentful Paint)

LCP measures the time it takes for the biggest element on a web page to load. This can be an image, video, heading, and more. **If your website visitors wait over 2.5 seconds to access this element above the fold, they will bounce.**

Beginner tips on how to improve LCP:

- **Cache all your website's resources**
- **Optimize media and text with Lossy and Lossless compression, GZIP compression, font loading strategies, and early hints.**
- Use a Content Delivery Network (CDN) to speed up content delivery.
- Implement lazy loading for all content below the fold to speed up the initial load of the page

INP (Interaction to Next Paint)

INP measures the responsiveness of a website by tracking the time it takes for the website to respond to user interactions like clicks, taps, or keyboard inputs. Specifically, INP assesses the time between the user's action and the next visual update or "paint" on the screen that reflects the response to that action. It assesses all user interactions during a session, and the final score is the longest interaction observed.

A good INP score should be under 200 milliseconds. This means that when a user interacts with your site, they should see a visual response within 200 milliseconds for an optimal experience. If INP exceeds 500 milliseconds, it's considered poor and may result in a frustrating user experience.

Beginner tips on how to improve INP:

- Prioritize critical rendering tasks over less essential background tasks.
- Break down long tasks into smaller chunks with tools like the Long Tasks API.
- Use async or defer attributes for script tags to prevent blocking the main thread.

CLS (Cumulative Layout Shift)

CLS measures the visual stability of a webpage by tracking how often and how much the layout shifts unexpectedly while the page is loading. These shifts can be caused by images, ads, or other content loading asynchronously or resizing dynamically, causing the page's elements to move around and potentially disrupt the user experience.

An ideal CLS benchmark is between 0 and 0.1. Anything that is more requires improvement.

Beginner tips on how to improve CLS:

- Always include width and height size attributes on media elements so that browsers allocate the correct amount of space during the load.
- Reserve space for ads and embeds.
- Redesign your banners and pop-ups not to take up the majority of the mobile screen

Page load metrics

Page load metrics are lab metrics measured in a synthetic (lab) environment. They do not represent real-world user interactions but are invaluable for debugging and testing. For instance, developers track page load metrics to make improvements before deploying to production.

1. Performance score

Performance Score is a composite metric that represents the usability and speed of your website, including page render time. It varies from 0 to 100, but only a 90 or above score is considered good.

The best way to improve your performance score is to visit [Google's PageSpeed Insights](#) for free performance analysis. The tool offers a handy Diagnostics section listing warnings and helpful tips for fixing them.

DIAGNOSTICS		
▲	Reduce JavaScript execution time — 24.5 s	▼
▲	Minimize main-thread work — 36.8 s	▼
▲	Largest Contentful Paint element — 18,470 ms	▼
▲	Reduce the impact of third-party code — Third-party code blocked the main thread for 5,920 ms	▼
▲	Largest Contentful Paint image was lazily loaded	▼
▲	Reduce unused JavaScript — Potential savings of 2,367 KiB	▼
▲	Avoid an excessive DOM size — 5,714 elements	▼
▲	Eliminate render-blocking resources — Potential savings of 1,220 ms	▼
▲	Reduce unused CSS — Potential savings of 121 KiB	▼

2. FCP (First Contentful Paint)

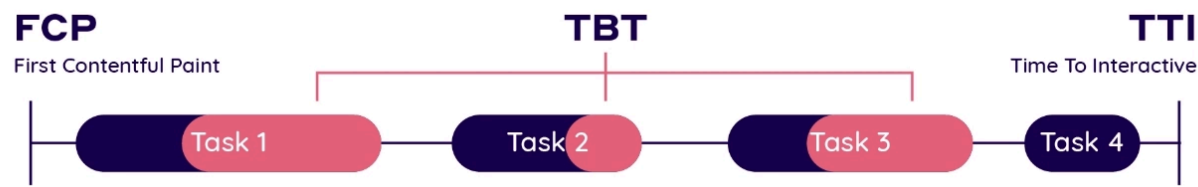
FCP is a performance metric that measures the time it takes for a web page to display the first piece of content to the user after they initiate a page load. Specifically, FCP tracks how long it takes from when a user begins loading a page until the first bit of content—such as text, an image, or a background element—appears on the screen.

To optimize FCP, consider:

- Using a CDN to help distribute the load and reduce server response times.
- Loading JavaScript and CSS files asynchronously to unblock page content rendering
- Deleting unused CSS and JavaScript code
- Optimize loading sequence with preconnect, dns-prefetch, and prefetch resource hints.

3. TBT (Total Blocking Time)

TBT is a performance metric that measures the time a webpage is unresponsive to user input while it is loading. Specifically, TBT tracks the time between First Contentful Paint (FCP) and Time to Interactive (TTI), during which the main thread of the browser is busy executing tasks that prevent the page from responding to user interactions, like clicks or key presses.



Some ideas on improving TBT include:

- Split your code into smaller parts to load them as needed and reduce the amount of JavaScript during the initial load.
- Delegate heavy computations to web workers run in the background.
- Set a priority to the loading of essential resources required for initial rendering.

4. Speed Index

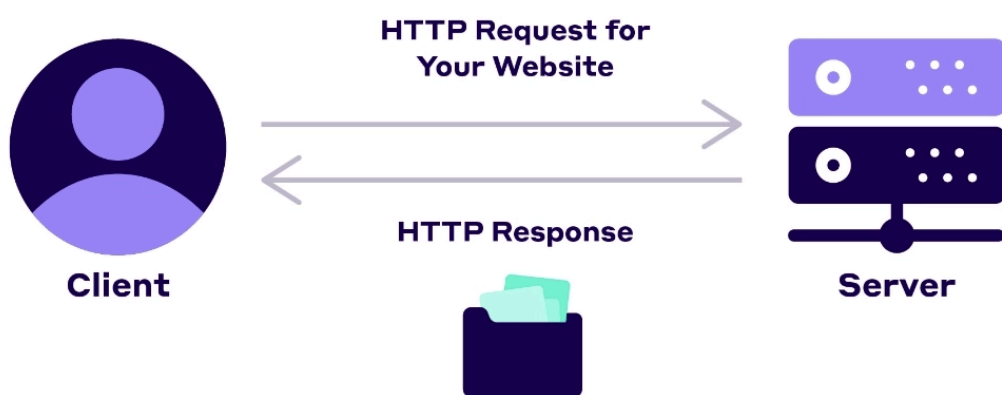
The Lighthouse Speed Index measures how quickly a website’s content is visually displayed during load. SI is different from other performance metrics in the sense that it doesn’t mark a specific time in the page loading process. Instead, SI provides a quick assessment of where your webpage stands in terms of visible load time. Striking below the 3.4 s mark is often the goal, ensuring users perceive your page as quick and efficient.

Network performance metrics

Network performance metrics refer to the key measurements that **assess how efficiently data is transferred between a user's device and a website's server**. They play a crucial role in determining how fast and reliable data transfer is on your website.

1. TTFB (Time to First Byte)

Time to First Byte (TTFB) **measures how long it takes for a client's browser to receive the first byte of the response from the server**. When a user tries to visit a page, their browser sends an HTTP request. The server that hosts the page has to process that request and return a response.



Most companies **aim for a TTFB of 0.8 seconds or less**. If it is higher, you probably have issues with **network latency**, server-side processing delays, or configuration. Each of these guys makes your website feel unresponsive and sluggish to users.

Consider the following to speed up TTFB:

- Check if your server is configured correctly, HTTP/2 settings, and active keep-alive connections.
- **Optimize database queries on the server side**. Use efficient algorithms and minimize scripting overhead.
- [Clean and maintain your database](#) to get rid of performance bottlenecks.
- Ensure you use a fast and reliable web hosting provider with low latency.

2. Number of HTTP Requests

HTTP requests are the calls that a web browser makes to a server to retrieve all kinds of elements needed to **display** a webpage, like HTML files, images, stylesheets (CSS), scripts (JavaScript), and other resources. Every time a visitor loads your website the browser needs to load a new element on a webpage and sends an HTTP request to the server, which then responds by sending back the requested data.

Each additional HTTP request requires time to be processed, meaning **that more requests can slow down the loading process**, especially if they are large or involve external resources (like third-party scripts or images hosted on different servers). While we can't recommend a specific "good" number of HTTP requests, **loading fewer resources on a web page is always a good rule of thumb**.

3. DNS Lookups

DNS lookups are the process by which web browsers find the corresponding IP address to a URL user has typed in before it can send an HTTP request to retrieve the web page. If DNS lookup times are slow, they can delay the entire loading process, leading to longer wait times for users.

Consider the ideas below for [improving DNS lookup](#) time:

- Ensure you use a high-performance DNS provider with global coverage and fast response time.

- Limit the number of unique domains your webpage needs to contact.
- Set an appropriate Time-to-Live value for DNS records. It determines how long users and DNS resolvers cache a DNS record.
- Simplify your DNS records to avoid long chains of CNAMEs.

Total Page Size

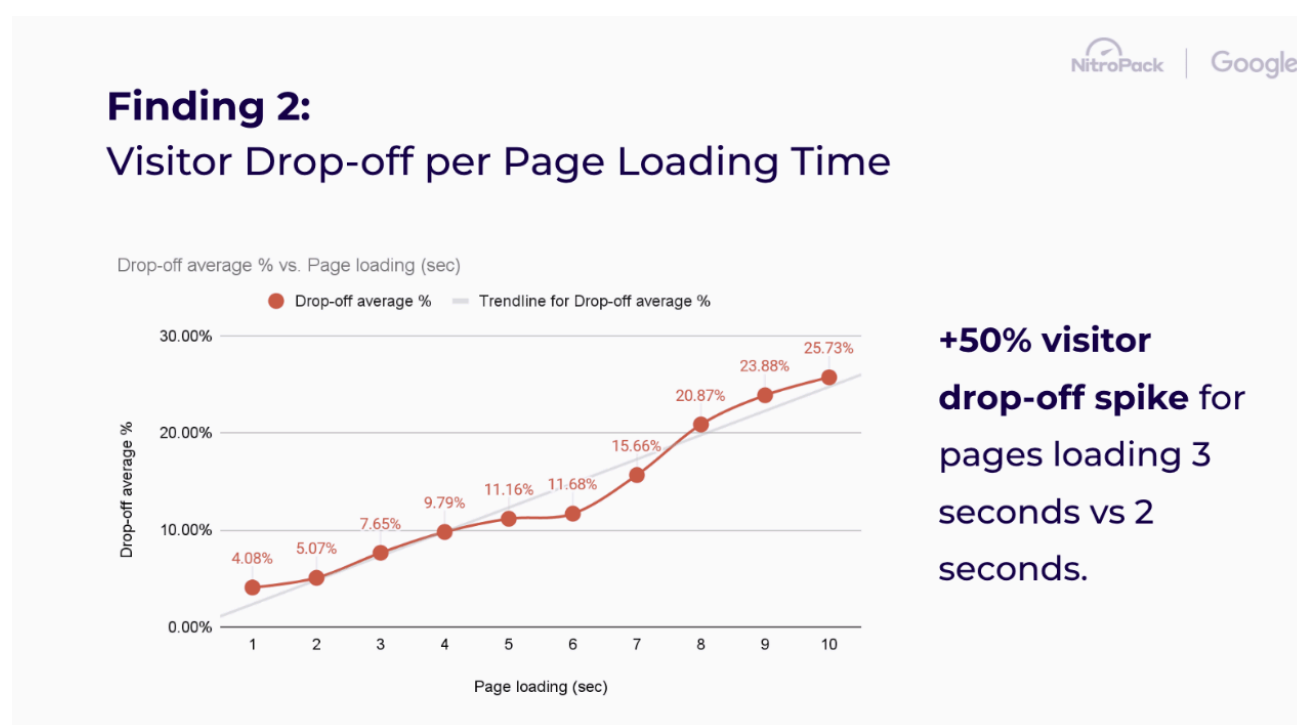
Total page size (or page weight) is a **metric that measures the overall amount of data that needs to be downloaded by a user's browser to fully load a webpage.** This includes all the elements that make up the page, such as HTML files, images, videos, CSS, JavaScript, fonts, and any other resources. The total size of these files is measured in kilobytes (KB) or megabytes (MB).

Larger page sizes (anything over 2MB of data on a page) require more time to download, especially on slower mobile internet connections, which can lead to longer load times and a poorer user experience. Compressing images, minifying CSS and JavaScript, and eliminating unnecessary resources can drastically reduce page weight to provide a smoother, quicker user experience.

User Patience Index

The patience index is a concept used to describe **how long users are willing to wait for a website to load before they abandon it.** It essentially measures user tolerance for slow-loading pages. The higher the patience index, the longer users are willing to wait.

Earlier this year, we monitored over 245,000 unique site visits across three ecommerce websites to measure the user patience threshold. Our research showed that **visitors lose patience and disproportionately abandon a web page at 2.75s of the page load.**



By improving load times and reducing delays, websites can lower their reliance on user patience and ensure visitors have a positive experience from the moment they land on the page.

Cache Hit Ratio

The cache hit ratio evaluates the efficiency of a caching system. It represents the **percentage of requests for content that are successfully served from the cache (a "cache hit") rather than requiring the content to be fetched from the original server (a "cache miss").** The higher the cache hit ratio, the more effective the cache delivers content quickly.

$$\text{Cache hit ratio (\%)} = [\text{Cache Hits} / (\text{Cache Hits} + \text{Cache Misses})] \times 100$$

As a benchmark, an 80% and higher cache hit ratio indicates an effective caching policy. Improve your cache hit ratio by implementing caching strategies—such as setting appropriate cache headers, using Content Delivery Networks (CDNs), and ensuring frequently accessed content is cached.

5 bonus website metrics to measure user engagement

Tracking engagement is vital for understanding user interaction with your website. It reveals user preferences and improves content strategy and growth conversions. Flip through five user engagement metrics that can benefit your business.

Bounce rate

Bounce rate measures the percentage of visitors who land on a webpage and leave without interacting further—such as clicking on a link, filling out a form, or navigating to another page. Essentially, it indicates the number of single-page sessions where users "bounce" off the site without taking any action.

The difference between Bounce rate and Exit rate

Exit rate refers to the percentage of users who leave your website from a specific page, but unlike bounce rate, these users may have visited other pages on the site before exiting. It measures the number of times a page is the last page viewed in a session. Both metrics are helpful in pinpointing pages with high bounce rates and pages with high exit rates (*"Thank you" pages have a higher exit rate that matches the intended behavior*).

A high bounce rate signals to Google that the content is irrelevant, resulting in lower SERP positions. Optimizing your website for better speed and performance should minimize bounce rates and increase dwell time—a crucial metric for Google's page quality rating system. Ensure the page's content is aligned with the user intent, and consider leveraging behavioral analysis tools like HotJar for even more insights.

Average session duration

Average session duration measures users' average time on your website during a single session. A session includes all user interactions on your site, from when they land on the first page until they leave or become inactive for a specified period (typically 30 minutes).

$$\text{Average Session Duration} = \frac{\text{Overall duration of session (in seconds)}}{\text{Total number of sessions}}$$

A shorter session duration might indicate that users are not finding what they're looking for or losing interest quickly, which can point to content relevance, usability, or page performance issues. To identify potential on-page problems, consider launching usability research and A/B testing on your website.

Pages per session

Paired with average session duration, the pages per session metric gives insight into how deeply users engage with your content and how effectively your site encourages exploration. A low pages-per-session number might indicate that users aren't finding what they're looking for or that your site's navigation and internal linking aren't optimized.

Consider adding relevant links and related content banners to help visitors discover more content; ensure your site menu, categories, and breadcrumbs are clear; and use compelling elements like "Read more" or "Sign-up for early access" to move users deeper into your journey.

Error rate

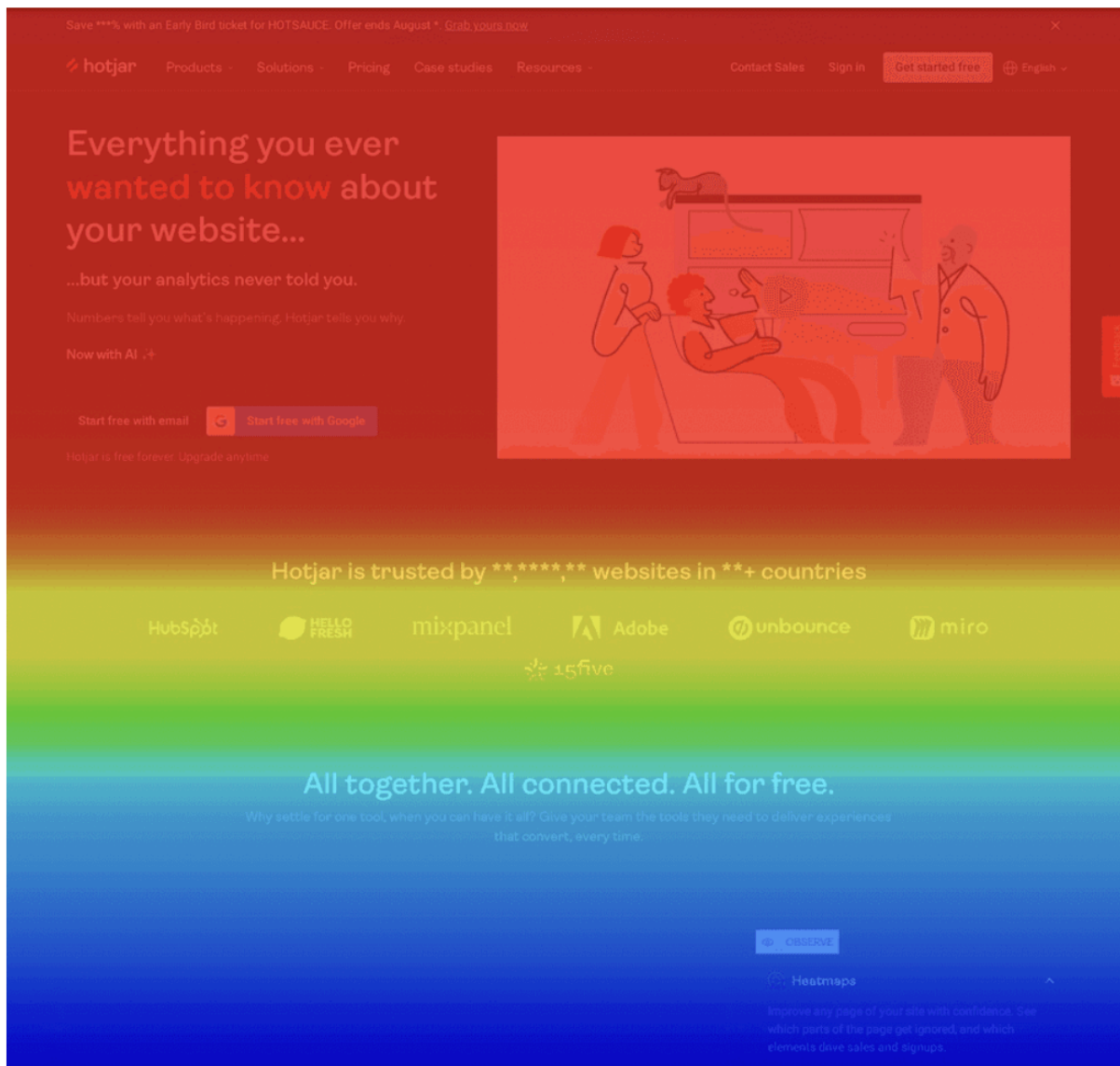
Error rate measures the percentage of user interactions with your website that result in errors. These errors can include failed page loads, broken links, server errors (like 404 or 500 errors), and issues with forms or scripts that prevent users from completing actions. The error rate is calculated by dividing the number of errors by the total number of interactions or sessions and then multiplying by 100 to get a percentage.

To decrease error rates, consider these strategies:

- Introduce a retry logic for transient errors
- Test your website for errors, especially after updates or changes
- Implement database replication and failover mechanisms to ensure high availability and reliability
- Ensure your hosting environment is robust and capable of handling traffic without frequent downtimes or server errors.
- Fix broken links and malfunctioning forms, and write clear, helpful messages for when users encounter an error

Scroll depth

Scroll depth evaluates how far down a webpage users scroll during their visit. It provides insight into how much of your content visitors see and engage with. Scroll depth can be tracked as a percentage (e.g., 25%, 50%, 75%, 100%) or by specific content milestones (e.g., reaching a particular page section).



Some tips on how to improve scroll depth include:

- Place key information and CTAs higher on the page
- Structure your content in a way that naturally leads users down the page with a logical progression of information
- Use design elements like arrows, images, or buttons that subtly encourage users to scroll down for more content.
- Analyze drop-off points on key pages and think of ways to improve or reposition your content
- Add sticky navigation sidebars. They help readers navigate to other sections of the page.

How to measure website performance metrics

Here are the top best practices from my team’s experience to get you started:

- **Set web performance budgets:** The performance budget is a kind of calorie limit for your website. Like in real life, you need to set clear goals here, like keeping a page load time under 3 seconds or ensuring your Largest Contentful Paint (LCP) stays below 2.5 seconds. Collect a list of benchmarks on the chosen metrics to help all your teams track (and avoid) regressions after updates.
- **Implement the 28-day rule for Core Web Vitals:** Monitoring LCP, INP, and CLS metrics over 28 days will give you a realistic picture of your website performance. This period is how frequently new data is aggregated for Core Web Vitals.
- **Leverage both lab data and Real User Monitoring (RUM):** The first is a test drive where you simulate user interactions to see how your website performs. You can conduct it with Google PageSpeed Insights. Pair it with field data to discover real-life performance bottlenecks.
- **Don’t skip mobile:** Because of device limitations and slower network connection, your mobile users are at high risk of page loading issues. Prioritize optimizing for mobile and simplify mobile experiences for a higher chance of conversion.

FAQ

What are the top 3 website performance metrics to monitor?

The most important web performance metrics to track are Largest Contentful Paint, Interaction to Next Paint, and Cumulative Layout Shift. We recommend, however, also monitoring a combination of metrics we mentioned earlier that best fit your case.