**Why is mobile speed often slower than desktop speed?**

Why are mobile PageSpeed scores different from desktop PageSpeed scores?

You may be slightly worried because you come to test your website on both mobile and desktop and you can't seem to figure out why mobile is always worse!

Right off the bat, I want to comfort you.

Usually mobile loads slower than desktop for 3 reasons:

1. Mobile devices generally have slower processors
2. PageSpeed Insights (a popular site to audit a page performance) stimulates the cell network at a slower speed
3. Mobile devices have device-specific CSS rules over and above desktop (re-sizing images, viewport size, etc).

Let me show you

One nice metric to look at is **Time to Interactive (TTI)**, which is one of six metrics tracked in the performance section of the Lighthouse report (also PageSpeed). Each metric captures some aspect of page load speed.

Measuring TTI is important because some sites optimize content visibility at the expense of interactivity. This can create a frustrating user experience: the site appears to be ready, but when the user tries to interact with it, nothing happens.

Lets keep our example simple and look at Google.com.

Here is the desktop score:

Graphical user interface, timeline

Description automatically generated

As you can see, the desktop scores 100 (surprise surprise Google!). The TTI is 0.8s.

And here is the mobile score:

Graphical user interface, application

Description automatically generated

As you can see, even Google's main landing page has a lower score (83 vs 100) for mobile than desktop, and a longer TTI.

Let’s break down why this is the case

Firstly, by default PageSpeed Insights always shows the mobile version of the site loading over a simulated throttled connection. Without “simulated throttling” checked (which is available on Google Lighthouse audits) the mobile and desktop scores shouldn’t be much different. I tested this myself and indeed it’s the case.

A screenshot of a computer

Description automatically generated with medium confidence

Another reason mobile speeds are different from desktop speed scores is mobile renders in different browsers with more to account for. Mobile devices also have more device-specific rules about re-sizing, etc. This is why it’s common for mobile devices to re-size images in the browser, and why it’s so important to avoid mobile optimization errors that may slow down your site. Additionally, more CSS rules are needed for mobile devices.

Conclusion

**If you have structured your code well and minimized render blocking resources (and have avoided mobile optimization errors), then most of the difference in page speeds for mobile vs desktop boils down to connection speed.**

In other words, scores shouldn’t be too different if they both are testing on the same connection speed. Remember that mobile and desktop also differ in processor power and CSS specific rules, which is a valid reason why they will slightly differ in score.

**Tip:**If you choose to run Google Lighthouse performance audits, use an incognito/private mode browser., because private browsers run without any extensions. If you use a normal browser, those extensions can negatively affect your speed scores. Extensions will not affect PageSpeed Insights scores, so you are free to run the tests in a normal browser.