



# PAGESPEED INSIGHTS BY GOOGLE: The 2020 Guide





Founded in 2014 in France, WP Media is a distributed company of more than 20 WordPress lovers living in the four corners of the world. We develop plugins that make the web a better place — faster, lighter, and easier to use.

**Check out our two main plugins:**

- **WP Rocket** integrates more than 80% of web performance best practices automatically to reduce your website's loading time.
- **Imagify** reduces image file sizes without losing quality. By compressing your images you speed up your website and boost your SEO..

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# Why a Book About PageSpeed Insights by Google?

When it comes to measuring your page speed, there are plenty of testing tools to choose from. Some of them are very intuitive, others go deeper and provide tons of metrics.

From PageSpeed Insights to GTMetrix, Pingdom, or WebPageTest, you're spoiled when it comes to the choices that are available.

Nonetheless, it's undeniable that most of the people approaching page speed monitoring for the first time will most likely turn to PageSpeed Insights by Google.

In this book, we're going to focus on this super popular tool.

We'll show you how to use it and understand its results, and how to fix its most common recommendations. We'll also suggest some alternative testing tools.



**At WP Rocket, we firmly believe that optimizing the web performance of your site is not something that should be left in the hands of a single tool. There are a number of excellent and free performance testing tools so take advantage of them.**



## CHAPTER 1

# PageSpeed Insights by Google: An Overview

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Google launched the first version of PageSpeed Insights around 2013. They wanted to provide a tool for performance analysis and make it usable for a broader audience.

For this purpose, they built a tool that returns a performance score and provides suggestions on how to improve it. Auditing is available for both desktop, and mobile devices.

## What is PageSpeed Insights?

Over the years, PageSpeed Insights (also referred to as PSI) evolved to become one of the most popular performance testing tools. Its scores are easy to read, and its suggestions are useful to understand what can be improved on your site.

This PageSpeed Insights 2020 Guide will take you through the secrets of this essential tool, and will show how to make the most of it.

## PageSpeed Insights Scores: How to Read and Understand Them Fully

The scoring system at the core of PageSpeed Insights is probably one of the reasons it became so popular.

Getting a grasp of the health state of your website is effortless with PSI:

- The green check means that everything is okay.
- The orange circle means that something requires some attention.
- The red triangle is the dreaded symbol that indicates something is not working as it should.

Since the end of 2018, PageSpeed Insights is powered by another tool from the Google family: Lighthouse.

While the scoring system didn't change its appearance, several under-the-hood mechanisms modified the way a PSI report should be read.

That's why we dedicated a chapter of this ebook to how to read the new PageSpeed audit powered by Lighthouse.

On the other hand, we can't stress this enough: it's imperative to use PageSpeed Insights as only one of the tools to assess the health of your website's performance. PSI scores shouldn't give you headaches. They're not a universal truth.

In our chapter about why you shouldn't care about PageSpeed scores, you'll understand why.

### **How to Fix the Most Common PageSpeed Recommendations**

A PageSpeed report usually contains several suggestions. But, if you don't feel comfortable with the technicalities of website development, they can cause confusion, and make you feel at a loss.

In the chapter dedicated to Google PageSpeed Insights recommendations explained in plain English, we provide the basis to understanding the most common PSI suggestions.

We'll see how to interpret their meaning, what the easiest fixes are, and when you shouldn't worry too much about them. Above all, you'll understand why getting a 100% PageSpeed Insights score may not be a realistic expectation.



## CHAPTER 2

# What is PageSpeed Insights and How Does It Work?

One of the most frequent questions our Customer Support team receives here at WP Rocket is *"How can I get a 100/100 score with PageSpeed Insights?"*.

How many times, while measuring your website speed, have you asked yourself a similar question?

There's no doubt that PageSpeed Insights by Google is one of the most internationally used page speed measurement tools, and for good reasons.

The Google team has always been on the front line of web performance optimization and tooling. Over the last ten years, they developed a series of performance tools dedicated to different types of users: from developers to marketers to amateur website owners, there's a Google tool suitable for every need!

**At the moment, we can count on the following performance tools developed by Google:**

- **PageSpeed Insights**, which analyzes your pages then generates suggestions to make them faster;
- **Lighthouse**, which collects modern performance metrics and insights on developer best practices;
- **WebPageTest**, a complete performance, and optimization tool diving into performance stats on real devices;
- **Chrome DevTools**, the set of developers tools built into the Google Chrome browser;
- **TestMySite**, the tool dedicated to performance testing on mobile devices;



Google's paternity allowed PageSpeed to rapidly gain a high reputation since its launch in 2013.

However, **the perfect speed test tool doesn't exist**: so PageSpeed Insights shouldn't be considered the only voice of truth, but a good ally for your web page performance assessments, along with other equally valid tools.

With this guide, you'll get to know PageSpeed Insights from its core; you'll understand how its famous score system works and what exactly does it measure.

### What is PageSpeed Insights by Google?

PageSpeed Insights (PSI) measures the performance of a page on both mobile and desktop devices, and then provides suggestions to improve that page.

PageSpeed Insights is powered by Lighthouse since the end of 2018. This means that the results in your PSI reports are based on the Lighthouse API. We'll analyse the meaning of it in Chapter 4.

When scanning a page, PageSpeed provides two types of data about it: **Lab** and **Field data**.

Lab data is collected in a controlled environment, that is with a set of predefined devices and network settings. It's effective for debugging performance issues, and its testing can be easily reproduced.

However, it might fail in catching real-world bottlenecks.

On the other hand, Field data (also called Real User Monitoring or RUM) includes performance data coming from real page loads. It's effective to capture true, real-world user experience, but the set of metrics is limited as well as its debugging potential.

### What Kind of Information Does PageSpeed Provide About Your Site?

When you ask PageSpeed Insights to analyze a page, it will return different sections and indicators about the performance of that page.



In order of appearance:

## Speed score



https://wp-rocket.me/

0-49 50-89 90-100 ⓘ

## Field data

**Field Data** — The Chrome User Experience Report **does not have sufficient real-world speed data** for this page.

☒ Show Origin Summary

**Origin Summary** — All pages served from this origin have a **Slow** speed compared to other pages in the [Chrome User Experience Report](#) over the last 30 days. To view suggestions tailored to each page, analyze individual page URLs.



Field data is based on [real-world Chrome users experience](#) over the last 30 days: it includes [First Contentful Paint \(FCP\)](#) and [First Input Delay \(FID\)](#).

## Lab data

### Lab Data



● First Contentful Paint	0.6 s	● First Meaningful Paint	0.9 s
● Speed Index	0.6 s	● First CPU Idle	1.7 s
● Time to Interactive	1.9 s	● Max Potential First Input Delay	110 ms



Lab data is based on a Lighthouse analysis on an emulated mobile device and mobile network. See the next chapter for the details of the metrics included in this section.

### Opportunities

**Opportunities** — These optimizations can speed up your page load.

Opportunity	Estimated Savings
■ Remove unused CSS	 0.45 s ▾
■ Eliminate render-blocking resources	 0.25 s ▾

The *Opportunities* section includes recommendations about performance metrics that could improve page loading time.

Each recommendation includes an estimation of the load time the page could save if the suggestions were implemented.

### Diagnostics

**Diagnostics** — More information about the performance of your application.

▲ Ensure text remains visible during webfont load	▾
■ Serve static assets with an efficient cache policy — 4 resources found	▾
● Minimize Critical Requests Depth — 4 chains found	▾
● Keep request counts low and transfer sizes small — 45 requests • 796 KB	▾

The *Diagnostics* section provides recommendations about which best practices for web development should be added to the page.

### Passed audits

<b>Passed audits (19)</b>	^
● Eliminate render-blocking resources	▾
● Properly size images	▾
● Defer offscreen images	▾
● Minify CSS	▾
● Minify JavaScript	▾
● Remove unused CSS — Potential savings of 27 KB	▾

The *Passed Audits* section includes all the performance checks the page already meets and that don't need any intervention.

In our opinion, three main reasons explain the popularity of PageSpeed Insights:

- Its **speed score** (from 0 to 100) gives an immediate indication of how well your website performs;
- The **color scheme** (green check, orange circle, red triangle) of its suggestions makes it easier to identify priority issues affecting your website performance;
- Its **recommendations** provide direct feedback about what you should fix on your site to improve its performance.

## How Is PageSpeed Insight Score Calculated?

As we said, PageSpeed results are now powered by Lighthouse API. The score makes no exception: the speed rating that you see on the top of your PageSpeed report is based on the lab data analyzed by Lighthouse.

The most important thing to notice in this context is that **Lighthouse simulates a page load in a particular environment: mobile networks and mid-tier device.**

Google's documentation about Lighthouse scoring is very precise and helps a lot to understand where PageSpeed Insights rating is coming from:

*"Lighthouse returns a Performance score between 0 and 100. 0 is the lowest possible score. A 0 score usually indicates an error in Lighthouse. [...] 100 is the best possible score which represents the 98th percentile, a top-performing site. A score of 50 represents the 75th percentile."*

Source: Google Tools for Web Developers

Google clarifies that only the items in the Metrics section of the Lighthouse's Performance category contribute to the score. The recommendations appearing under Diagnostic and Opportunities are not part of the score.

In Lighthouse 6 ([released in May 2020](#)), the score is measured with 6 metrics:

### Performance

- First Contentful Paint
- Time to Interactive
- Speed Index
- Largest Contentful Paint
- Total Blocking Time
- Cumulative Layout Shift

Compared to version 5, Lighthouse 6 has removed First Meaningful Paint and First CPU Idle; it replaced them with Largest Contentful Paint, Total Blocking Time and Cumulative Layout Shift.

Each of them has its own score. (For a detailed explanation of each metric, check Google's guide *"Tools for Web Developers" Lighthouse section*.)



### Performance

#### Metrics

■ First Contentful Paint	2.8 s	■ Time to Interactive	4.0 s
● Speed Index	2.8 s	● Total Blocking Time	30 ms
■ Largest Contentful Paint	3.0 s	● Cumulative Layout Shift	0

*Lighthouse new performance metrics (Source: [Web.Dev by Google](#))*

**Lighthouse weights those scores to generate the final Performance rating.**

The score follows a specific color-coding map:

- 0 to 49 (slow): Red
- 50 to 89 (average): Orange
- 90 to 100 (fast): Green

If you're curious to know how each metric contribute to the final score, see [Google's spreadsheet with the scoring details](#).

## What Is a Good PageSpeed Score?

It won't be difficult to find articles on the web promising to reveal the secret tip to score 100/100 on Google PageSpeed.

But now that you understand how the final score is calculated, it'll be easier to understand why scoring 100/100 is incredibly tricky nowadays.

Mobile-first indexing also adds to the challenge.

Obtaining a green PageSpeed Insights score can, of course, feel rewarding, but the real question to ask yourself should be different: does that single PageSpeed score really say something meaningful about my website?

In our opinion, it doesn't (and here's why you shouldn't care about your Google PageSpeed score).

There are a lot of tricks that can help to achieve a green score on PageSpeed.

For example, applying some code optimization techniques (like deferring non-critical JS files or unused CSS), could be an excellent way to improve the first paint of your pages, and obtain a green score.

But that won't be sufficient.

The real indicator of quality for your site is its loading time.

The lower loading time your site will obtain on the six Performance metrics indicated above, the better its overall score will be.

## So, PageSpeed Insights and SEO: are they related?

The mere PageSpeed score your site obtains won't influence Google's ranking: that number alone is not an indicator of an "SEO grade."

So there's not a direct correlation between how your site scores, and the position it will gain in the SERP.

But, there's a but.

Since, as we saw, the PageSpeed score is the result of overall performance analysis on a few specific metrics, the better your score, the more you can assume your site is in good shape.

A good score is a fair indicator of the well-being of your site in the eyes of Google. But it won't guarantee the victory in the race to the top of the SERP.

Given that Lighthouse scoring system rewards websites reaching satisfactory performance metrics, if you work on making your site fast and improving its user experience, you'll also get better PageSpeed scores.

A faster website has higher chances of being loved by Google.

Your efforts should then be focused on making sure your website loads as fast as it can: page speed is the real ranking factor, not the score.

To learn how you can achieve this goal, you can start from our blog post [about page speed optimization for WordPress and the errors to avoid.](#)

## CHAPTER 3

# Why You Shouldn't Care About Google PageSpeed Insights Scores

As a website owner, you know your site needs to be fast. You've read all the articles about how to make WordPress faster and which plugins to install to accomplish this.

You've probably added a caching plugin, hopefully WP Rocket (if not, [get it from here!](#)), and now you want to know how much benefit you're getting.

So you head over to Google PageSpeed Insights, because that's what all the articles tell you to do, and enter your URL.

**You'll be presented with a grade and a list of recommendations from Google and at that point, you might be dismayed:**



"What are all these red and orange warnings?"

"Why isn't my grade higher?"

"What do all these recommendations mean?"



After adding caching to your site, you might be expecting that your PageSpeed grade will be near-perfect. Or you'll look at the recommendations and wonder why your caching plugin hasn't fixed them all, automatically.

A lot of customers ask us why their PageSpeed grade isn't higher, or they assume that because it didn't increase a lot, it must mean WP Rocket isn't making their site faster.

The simple truth is this:

**Your Google PageSpeed score does not matter.**

**That's right, we said it doesn't matter.  
Here's why.**

## The Need for Speed

Speed, i.e the loading time of your site is the most important metric along with its perceived performance.

Perceived performance is a measure of how fast a user feels your website is. These two metrics are what counts for user experience and for SEO. When the Google bot crawls your site, it cannot see your "grade", only your speed.

**Did you know that Google PageSpeed doesn't even measure the loading time of your site?**

Read that again:

Google PageSpeed does not actually measure the speed of your site.

We'll see this in more detail in the chapter dedicated to the new PageSpeed API, which is now based on a different analysis engine, Lighthouse.

**We like to use Pingdom Tools to measure the load time.**

Think back to your school days.

Did perfect grades mean you were smart? Not necessarily.

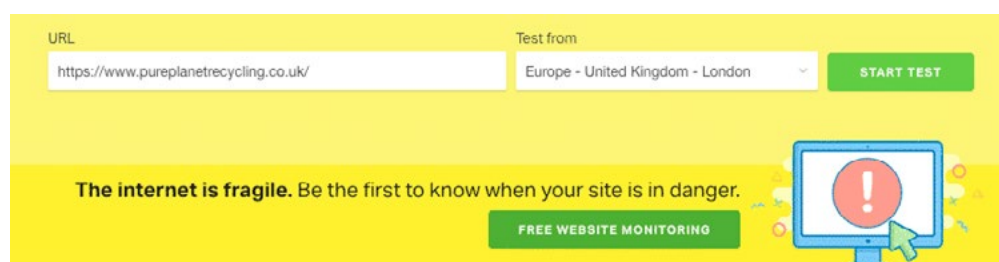
It just meant that you knew how to do well on tests. But many intelligent people simply not do well on tests.

So just like school grades are not an indicator of intelligence, Google's PageSpeed grade alone is not actually an indicator of speed.

**Here are 3 websites all with similar load times, but with vastly differing PageSpeed scores:**

### 1. PurePlanetRecycling

Pingdom Test



URL:



Test from:

**START TEST**

**The internet is fragile. Be the first to know when your site is in danger.**

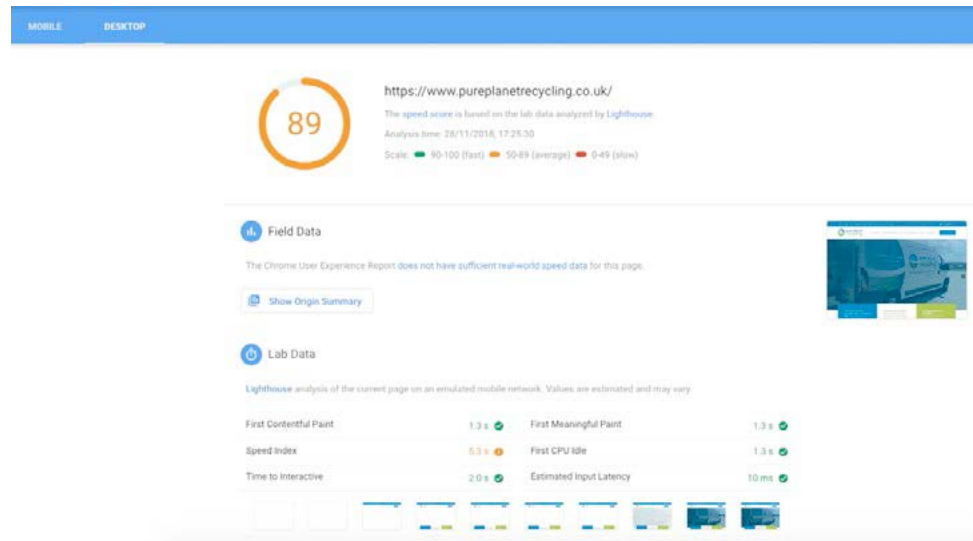
**FREE WEBSITE MONITORING**

Your Results:

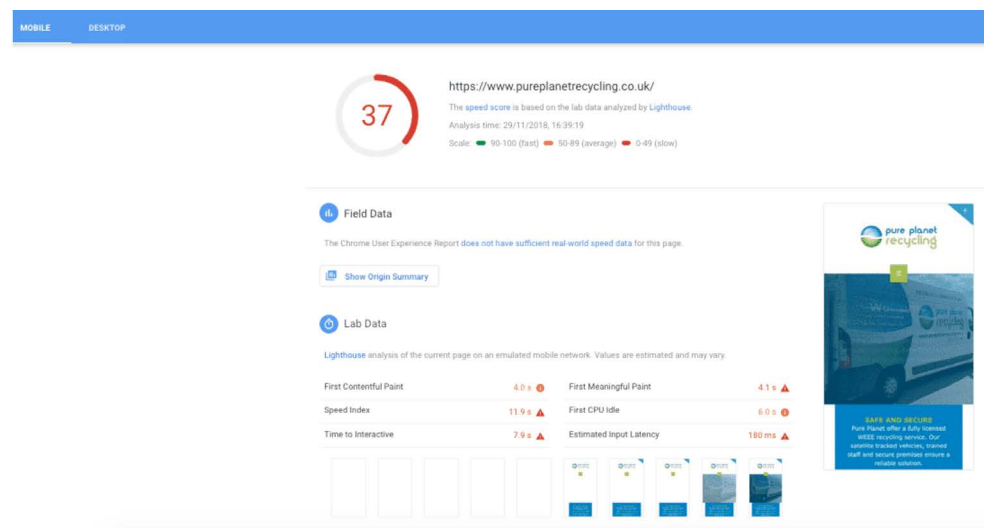
		<a href="#">DOWNLOAD HAR</a>	<a href="#">SHARE RESULT</a>
<b>Performance grade</b>  <b>80</b>		<b>Page size</b> <b>560.4 KB</b>	
<b>Load time</b> --		<b>Requests</b> --	



## PageSpeed for desktop



## PageSpeed pour mobile



- ▶ Loading time: **881 ms**
- ▶ Google PageSpeed: **89 on desktop / 37 on mobile**

## 2. AnticaTrattoriaPortico.it

### Pingdom Test

URL:  Test from:  [START TEST](#)

**The internet is fragile. Be the first to know when your site is in danger.**

[FREE WEBSITE MONITORING](#)

### Your Results:

[DOWNLOAD HAR](#) [SHARE RESULT](#)

Performance grade: **B 82**

Page size: **2.6 MB**

Load time: **649 ms**

Requests: **53**

### PageSpeed for desktop

MOBILE **DESKTOP**

**98**

http://www.anticatrattorialportico.it/  
The speed score is based on the lab data analyzed by Lighthouse.  
Analysis time: 28/11/2018, 17:30:35  
Scale: 90-100 (fast) 50-89 (average) 0-49 (slow)

**Field Data**  
The Chrome User Experience Report does not have sufficient real-world speed data for this page.

**Origin Summary**  
The Chrome User Experience Report does not have sufficient real-world speed data for this origin.

**Lab Data**  
Lighthouse analysis of the current page on an emulated mobile network. Values are estimated and may vary.

First Contentful Paint	1.1 s	First Meaningful Paint	1.3 s
Speed Index	3.0 s	First CPU Idle	1.3 s
Time to Interactive	1.6 s	Estimated Input Latency	10 ms

### PageSpeed for mobile

MOBILE **DESKTOP**

**41**

http://www.anticatrattorialportico.it/  
The speed score is based on the lab data analyzed by Lighthouse.  
Analysis time: 29/11/2018, 16:36:58  
Scale: 90-100 (fast) 50-89 (average) 0-49 (slow)

**Field Data**  
The Chrome User Experience Report does not have sufficient real-world speed data for this page.

**Origin Summary**  
The Chrome User Experience Report does not have sufficient real-world speed data for this origin.

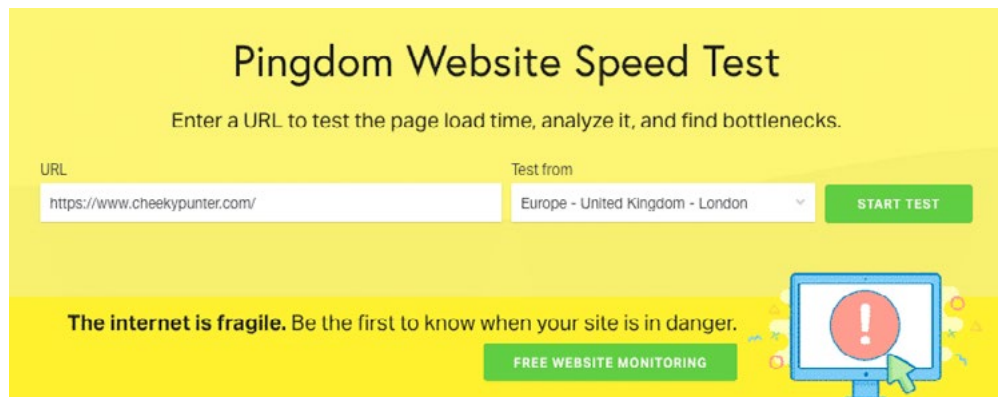
**Lab Data**  
Lighthouse analysis of the current page on an emulated mobile network. Values are estimated and may vary.

First Contentful Paint	3.2 s	First Meaningful Paint	4.3 s
Speed Index	8.0 s	First CPU Idle	4.2 s
Time to Interactive	11.1 s	Estimated Input Latency	20 ms

- ▶ Loading time: **649 ms**
- ▶ Google PageSpeed: **98 on desktop / 41 on mobile**

## 3. CheekyPunter.com

### Pingdom Test



**Pingdom Website Speed Test**

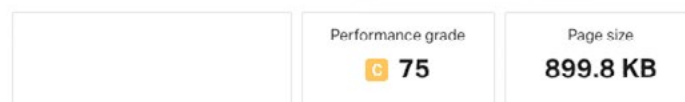
Enter a URL to test the page load time, analyze it, and find bottlenecks.

URL:  Test from:  **START TEST**

**The internet is fragile. Be the first to know when your site is in danger.**

**FREE WEBSITE MONITORING**

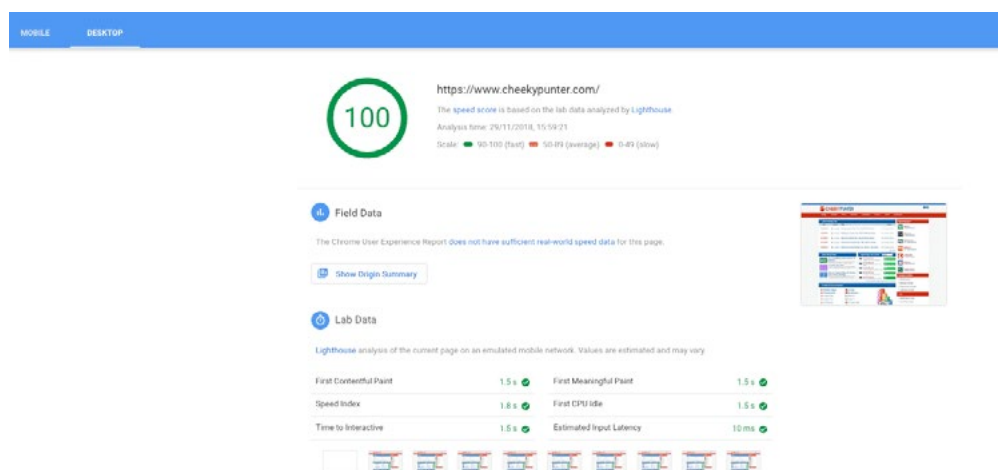
### Your Results:



**Performance grade**  
**C 75**

**Page size**  
**899.8 KB**

### PageSpeed for desktop



**100** <https://www.cheekypunter.com/>

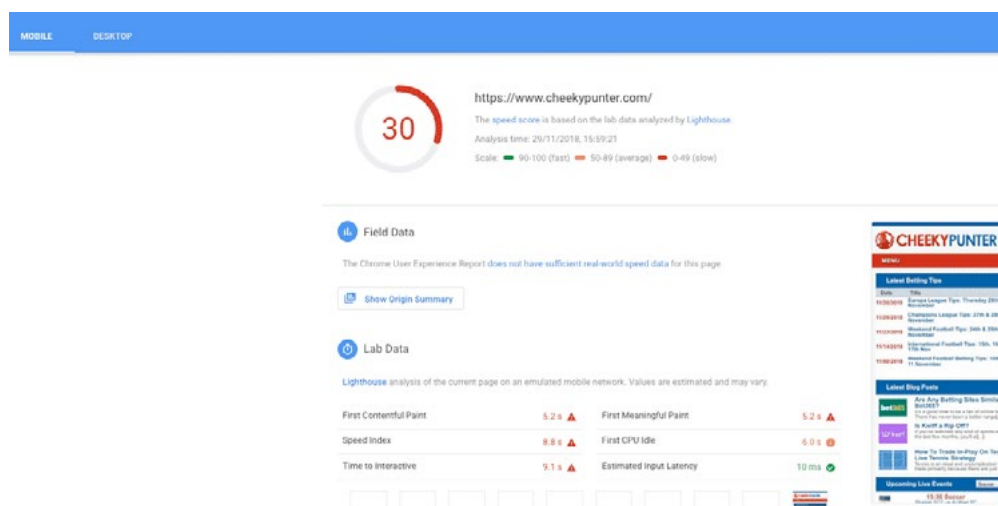
The speed score is based on the lab data analyzed by Lighthouse.  
Analysis time: 29/11/2018, 15:59:21  
Scale: 90-100 (fast) 50-89 (average) 0-49 (slow)

**Field Data**  
The Chrome User Experience Report does not have sufficient real-world speed data for this page.  
[Show Origin Summary](#)

**Lab Data**  
Lighthouse analysis of the current page on an emulated mobile network. Values are estimated and may vary.

First Contentful Paint	1.5 s	First Meaningful Paint	1.5 s
Speed Index	1.8 s	First CPU Idle	1.5 s
Time to Interactive	1.5 s	Estimated Input Latency	10 ms

### PageSpeed for mobile



**30** <https://www.cheekypunter.com/>

The speed score is based on the lab data analyzed by Lighthouse.  
Analysis time: 29/11/2018, 15:59:21  
Scale: 90-100 (fast) 50-89 (average) 0-49 (slow)

**Field Data**  
The Chrome User Experience Report does not have sufficient real-world speed data for this page.  
[Show Origin Summary](#)

**Lab Data**  
Lighthouse analysis of the current page on an emulated mobile network. Values are estimated and may vary.

First Contentful Paint	5.2 s	First Meaningful Paint	5.2 s
Speed Index	8.8 s	First CPU Idle	6.0 s
Time to Interactive	9.1 s	Estimated Input Latency	10 ms

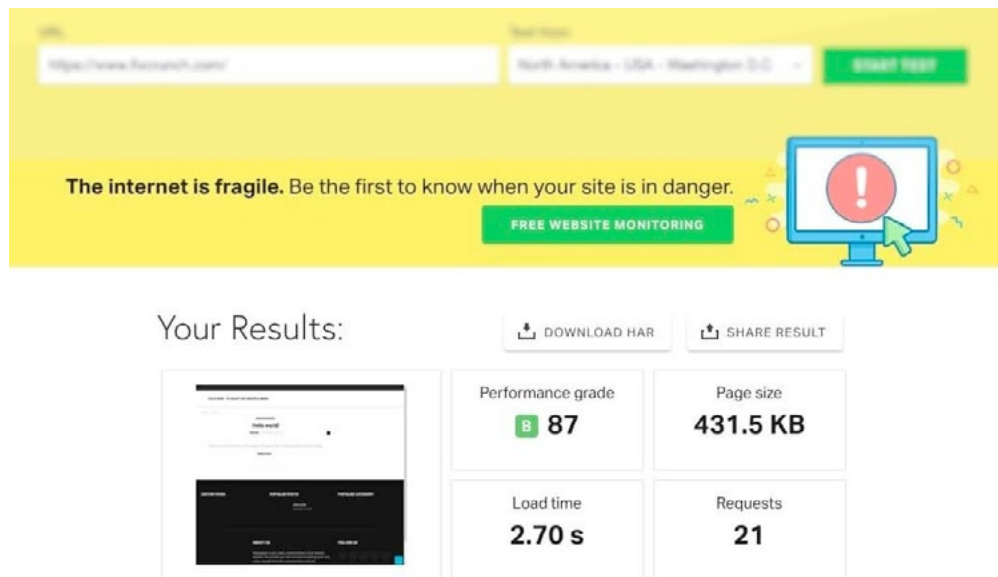
- ▶ Loading time: **649 ms**
- ▶ Google PageSpeed: **98 on desktop / 41 on mobile**

Between these 3 sites, the loading time ranges from 461 ms – 881 ms but the PageSpeed scores range from 30 to 41 on mobile!

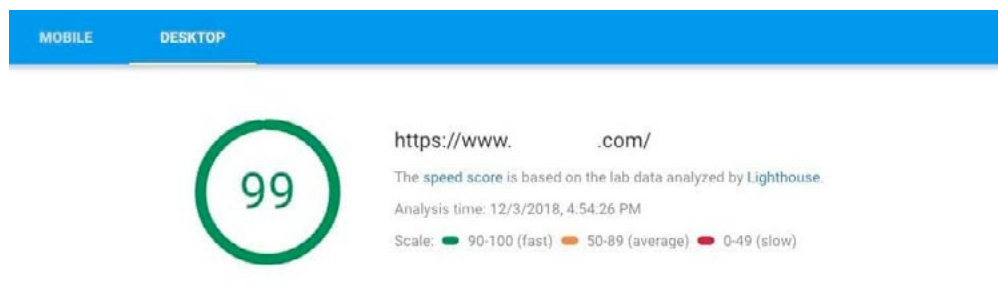
And the below site has a really good PageSpeed score but is slower than all 3 above (*note: the website owner asked to maintain URL anonymous*):

## 4. Anonymous URL

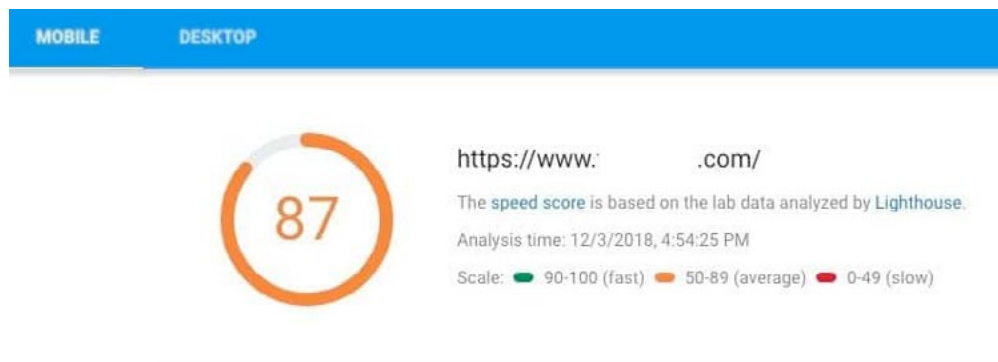
### Pingdom Test



### PageSpeed for desktop



### PageSpeed for mobile



► So you can see from these examples that the Google PageSpeed grade is not a real indicator of speed.

## Chasing A Grade Is A Waste of Time

No site gets a perfect grade, in fact it's pretty much impossible to achieve, and since it doesn't correlate to speed, why bother?

If you try to attain a perfect grade, by implementing all the suggestions Google PageSpeed makes, you will lose your sanity pretty quickly.

You cannot take too literally all of the suggestions from Google PageSpeed because sometimes they are unrealistic or impossible.

For example, it may tell you to minify or add expire headers to a file that is not hosted on your website. This is impossible.

A good example that illustrates the impossibility to control these resources can be the *"Serve static assets with an efficient cache policy"* recommendation showing up for WP Rocket's website:

1	User Timing marks and measures	▲	▼
2	Ensure text remains visible during webfont load	▲	▼
3	Serve static assets with an efficient cache policy	18 resources found	🔍 ▲
A long cache lifetime can speed up repeat visits to your page. <a href="#">Learn more.</a>			
URL	Cache TTL	Size (KB)	
/ga.js (ssl.google-analytics.com)	2 h	17 KB	
...fonts/PT_Sans-Web-Regular.woff (wprocket-eb2.kxcdn.com)	7 d	89 KB	
...fonts/PT_Sans-Web-Bold.woff (wprocket-eb2.kxcdn.com)	7 d	89 KB	
...fonts/Raleway-ExtraBold.woff (wprocket-eb2.kxcdn.com)	7 d	80 KB	
...1/6468921...js (wprocket-eb2.kxcdn.com)	7 d	67 KB	
...facebook-tracking/fbpix-config-349...-2.8.34.js (wprocket-eb2.kxcdn.com)	7 d	44 KB	
...1/ed27dd6...css (wprocket-eb2.kxcdn.com)	7 d	27 KB	
...fonts/wprocket.ttf?ts8n2p (wprocket-eb2.kxcdn.com)	7 d	15 KB	
...facebook-tracking/fbpix-eve...8.34.js (wprocket-eb2.kxcdn.com)	7 d	15 KB	
...js/wp-emoji-release.min.js?ver=4.9.8 (wprocket-eb2.kxcdn.com)	7 d	5 KB	
...images/logo-light.svg (wprocket-eb2.kxcdn.com)	7 d	5 KB	
...images/vortex-stars.svg (wprocket-eb2.kxcdn.com)	7 d	3 KB	
...js/lazyload-10.17.min.js (wprocket-eb2.kxcdn.com)	7 d	3 KB	
...images/header-background-home.svg (wprocket-eb2.kxcdn.com)	7 d	3 KB	
...images/background-cta.svg (wprocket-eb2.kxcdn.com)	7 d	2 KB	
...optim/obf-3.4.4.js (wprocket-eb2.kxcdn.com)	7 d	1 KB	
...js/api.min.js (a.optmnstr.com)	30 d	50 KB	
...js/legacy-api.min.js (a.optmnstr.com)	30 d	34 KB	

As you can see, Google PageSpeed Insight recommends to optimize external files coming from Google Analytics and OptinMonster.

## So What Is PageSpeed Good For?

Google PageSpeed can be helpful as long as you don't treat it as the be-all, end-all.

Sometimes it can alert you to problem areas on your site that you can address. For example, it might alert you to the fact that your content is not being GZIP-ed (Enable Text Compression).

WP Rocket adds the rules for GZIP by default so if PageSpeed gives you a warning, this might be a sign your server does not have it activated.

Or it might alert you that you have too many large images which could be compressed. This is a good recommendation which you can actually act on: Image Optimization – An Easy Win For A Faster Site

So it's best to look at PageSpeed as one of several tools in your arsenal that might provide some pointers, but your goal should always be to improve your actual speed, not your "PageSpeed" grade.

## Guidelines for Using PageSpeed

- **Don't rely on PageSpeed alone to assess the performance of your site. Use it as one of several indicators.**
- **Always read the recommendations carefully and assess if they are possible and worth your time. If it's asking you to do something impossible, you should ignore that!**
- **Don't forget to always focus on speed and don't worry about chasing a grade.**
- **Always use different speed testing tools like Pingdom or GTMetrix to see the impact of any changes you have made on your site.**

## CHAPTER 4

# PageSpeed Insights Is Now Powered by Lighthouse: How to Read the New Audit?

In November 2018, Google released v5 of its PageSpeed Insights API, which now implements Lighthouse technology and integrates field data provided by the Chrome User Experience Report (CrUX).

This new version got a mixed response from the public: while some people started to see PSI scores skyrocketing, others plunged in despair looking how their scores dropped.

In May 2020 came **Lighthouse v6** which introduced further changes in the metrics.

If you have followed WP Rocket since the beginning, you know that we believe that a reliable web performance optimization score shouldn't depend on PageSpeed Insights only.

But since Google's tools are among the most used when it comes to running a performance audit, let's see together what changed with the new PageSpeed Insights, and which key points you should always keep in mind when pondering its recommendations.

## Getting to Know Google Lighthouse

Until now, Google was relying on several performance tools to assess the performance of websites, such as [PageSpeed Insights](#), [WebPageTest](#), [Test My Site](#), [Chrome Developer Tools](#) and [Lighthouse](#).



Lighthouse

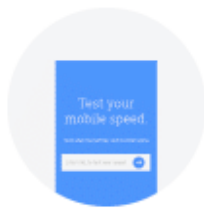
Gives you personalized advice on how to improve your website across performance, accessibility, PWA, SEO, and other best practices.



WebPageTest

Allows you to compare performance of one or more pages in controlled lab environment, and deep dive into performance stats and test performance on a real device. You can also run Lighthouse on WebPageTest.





### TestMySite

Allows you to diagnose webpage performance across devices and provides a list of fixes for improving the experience from Webpagetest and PageSpeed Insights.



### PageSpeed Insights

Shows speed field data for your site, alongside suggestions for common optimizations to improve it.

The main problem of employing different performance tools is that they produce various recommendations, piling up confusion to the Web Performance Optimization process which is not always straightforward to get to grips with.

That's why, according to Google, it was time to make things easier and allow developers to obtain the same performance recommendations everywhere, no matter which Google tool they decided to use.

Now that Lighthouse powers PageSpeed Insights, you should obtain the same result whether you choose to get your performance recommendations from the web, the command line, or Chrome DevTools.

Keeping in mind this context it's worth noting that, with this new tool, Google is targeting a very specific type of users: developers and tech-savvy people that already have a good knowledge of web performance best practices and solutions.

At the same time, if we focus on the WordPress ecosystem, we're observing a remarkable interest by Google in fine-tuning Lighthouse recommendations and making them more approachable for WordPress developers and site owners.

### **As Alberto Medina (Developer Advocate at Google) says:**

**"We are considering the development of a project called WordPress-localized Advice Packs for Lighthouse, with the goal of providing WordPress-specific guidance using Lighthouse.**

**With it, WordPress developers and site owners will get the results from Lighthouse audits tailored to the realities of the WordPress platform.»**

Now, before stepping into the details of the new PageSpeed Insight API, let's clarify what Google Lighthouse is.

## What Is Google Lighthouse?

Lighthouse is the technology at the core of this v5 PSI update. According to [Google's definition](#):

*"Lighthouse is an open-source, automated tool for improving the quality of web pages. You can run it against any web page, public or requiring authentication. It has audits for performance, accessibility, progressive web apps, and more. You can run Lighthouse in Chrome DevTools, from the command line, or as a Node module. You give Lighthouse a URL to audit, it runs a series of audits against the page, and then it generates a report on how well the page did. From there, use the failing audits as indicators on how to improve the page. Each audit has a reference doc explaining why the audit is important, as well as how to fix it. Lighthouse code is available on the public [Google Chrome GitHub repo](#)."*

(Source: Lighthouse section of Google's Tools for Web Developers)

## Why Is This PageSpeed Insights Update a Game-Changer?

From now on, the new PageSpeed Insights requires all of us to adjust the way we read performance scores and interpret Web Performance Optimization audits.

When you measure a page with PageSpeed Insights, the result includes both lab and field data about that page.

This is how Google explains the [difference between lab and field data](#):

*"Lab data is useful for debugging performance issues, as it is collected in a controlled environment. However, it may not capture real-world bottlenecks. Field data is useful for capturing true, real-world user experience – but has a more limited set of metrics."*

(Source: Official PageSpeed Insights documentation)

### Lab data on PSI is based on different metrics:

- [First Contentful Paint](#)
- [First Meaningful Paint](#)
- [Speed Index](#)
- [First CPU Idle](#)
- [Time to Interactive](#)
- [Estimated Input Latency](#)

Each of these metrics gets a score and the (in)famous PSI icon: green check when the grade is good (90+), orange circle for the average grade, and a red triangle for the lowest grade.

### Lab Data

Lighthouse analysis of the current page on an emulated mobile network. Values are estimated and may vary.

First Contentful Paint	2.3 s ✓	First Meaningful Paint	3.9 s ⓘ
Speed Index	3.0 s ✓	First CPU Idle	6.1 s ⓘ
Time to Interactive	6.9 s ⓘ	Estimated Input Latency	60 ms ✓

Field data, on the other hand, is based on a set of historical stats about how a specific page has performed "in the real world": it considers anonymized performance data from real users who visited the page from different devices and network conditions.

This data is stored on the [Chrome User Experience Report dataset](#) and is depicted in the user interface as a classification of speed: a green bar for fast pages, an orange bar for average pages, and a red bar for slow pages.

### Field Data

Over the last 30 days, the field data shows that this page has a **Slow** speed compared to other pages in the [Chrome User Experience Report](#). We are showing the 90th percentile of FCP and the 95th percentile of FID.

First Contentful Paint (FCP)	2.9 s ⚠	First Input Delay (FID)	65 ms ⓘ
<div> <div>40%</div> <div>45%</div> <div>15%</div> </div>		<div> <div>93%</div> <div>7%</div> <div>0%</div> </div>	

It's important to note that not all sites may have enough field data available for display.

## Why You Should Read PSI Scores in a Different Way

In simple terms, while lab data simulates the performance of a page on a fixed set of conditions (device and network), field data collects an average of the real-world performance.

Now that all PSI results are based on Lighthouse, we have to interpret results differently, and for a simple reason: Lighthouse simulates a page load on mobile networks and mid-tier devices.

This is the real revolution of the new PageSpeed Insight version. Every time you read a PSI report, you have to remember that the first screen presented is the mobile performance: it describes how your website performs under a mobile connection and, furthermore, on a mid-range device.

## 3 Key Points to Remember When You Run a PageSpeed Test

Now that you know that mobile is prioritized by Google and its Lighthouse tool, let's look at three key points to keep in mind when running a PageSpeed Insight test with the new API:

### 1. PSI Tests Are Conducted Using a Throttled 3G Connection

This will probably matter if your visitors are using low-speed 3G networks.

The average download speed on mobile is constantly increasing: our mobile networks are more and more powerful, and they can run four times faster than the speed of a 3G connection.

This parameter is not so relevant if your audience is based in countries where 3G mobile networks are getting surpassed by faster connections.

### 2. The Testing Server Location Used by PSI Reports Is Unknown This is a major point!

Suppose your server is in Atlanta, closest to your target audience, while the test server used by PageSpeed Insights is, let's say, in Los Angeles.

You'll get results that don't represent a real-world scenario in which a visitor located in Atlanta would experience lower loading time, being geographically closer to your server.

That's why we always suggest completing your performance audit using tools like Pingdom and GTMetrix, which allow you to choose different server locations (for GTMetrix, you need to create an account to access the server locations list).

### 3. The Mobile Device (Or the Emulator of Mobile Device) Used by PSI Is a Mid-Tier Moto G4

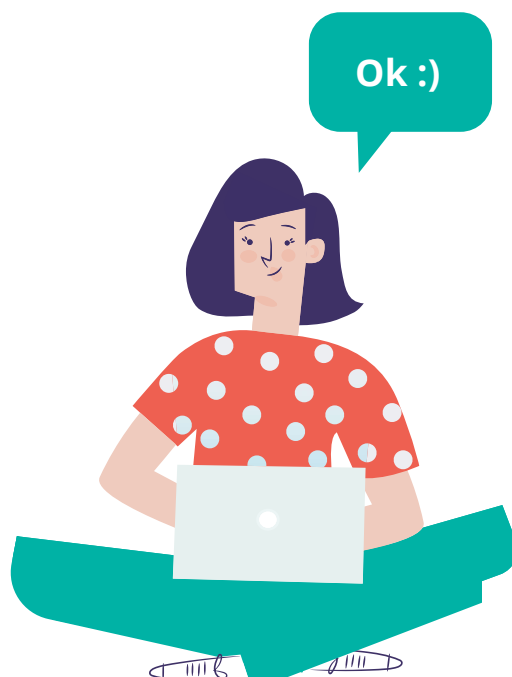
Mobile devices vary significantly in processing power/characteristics, and this can have a huge impact on page load time.

The latest technology smartphone would take significantly less time to load a page compared, under the same network conditions, to one that is even just a couple of years older.

“

With these three key points in mind, you're now ready to interpret PageSpeed results in the best way. Keep reading to discover how to address its recommendations.

”



# How to Address Google PageSpeed Insights Recommendations

PageSpeed Insights recommendations are a bittersweet aspect of web performance optimization.

They are indeed wonderful suggestions to help improve the performance of your website.

However, a PageSpeed report can contain a number of recommendations that can cause confusion and make you feel at a loss with questions like:

What do PageSpeed recommendations mean?

How can I fix PageSpeed warnings?

**Every PageSpeed Insights report includes a series of recommendations and warnings, divided into two main categories:**

**1. Opportunities**

**2. Diagnostics**

The *Opportunities* section focuses on performance metrics that could improve page loading time.

The Diagnostics section, on the other hand, focuses more on the best practices for web development that should be implemented into the analyzed page.

During this chapter, we're going to walk you through the most common PageSpeed Insights recommendations: we'll explain them in plain English and then we'll see how to fix them or, at least, how to put them into the right context.

## PageSpeed Insights Recommendations: Opportunities

With the Opportunities section, PageSpeed Insights wants to give you advice on the performance metrics that could help your page load faster.

Every recommendation is accompanied by the estimated time savings that you could gain by implementing the suggested fix.

## Opportunities

**Opportunities** — These optimizations can speed up your page load.

Opportunity	Estimated Savings
■ Remove unused CSS	0.45 s
■ Eliminate render-blocking resources	0.25 s

*Example of the Opportunity section: removing unused CSS could reduce this pages load time by 0.45 seconds.*

**Let's see which are the most common PSI recommendations in this section and how to approach them.**

- **Eliminate Render-Blocking Resources and Defer Unused CSS**
- **Reduce Server Response Time**
- **Minify CSS and Minify JavaScript**
- **Multiple Page Redirects**
- **Enable Text Compression**
- **Preconnect to Required Origins**
- **Preload Key Requests**
- **Defer Offscreen Images**
- **Properly Size Images**
- **Efficiently Encode Images and Optimize Images**
- **Serve Images in Next-Gen Format**

### Eliminate Render-Blocking Resources and Defer Unused CSS

With this recommendation, Google wants you to remove or defer JS and CSS files that interfere with loading the above the fold content of your webpages.

Above the fold content is the content your users see as soon as they open the page, before they start scrolling.

To understand what PageSpeed means when it asks you to eliminate render-blocking resources (be it a script or a stylesheet) or defer unused CSS, we have to understand what a render-blocking resource is.



### From WP Rocket's documentation:

*"Before the browser can display a web page, it has to render its HTML. During this process, whenever the browser encounters an element that references a script, or stylesheet, it has to stop, request the file, wait for it to download from the server, and execute it before it finally can continue parsing the HTML. With most WordPress themes and plugins loading not only one, but multiple CSS and/or JavaScript files, this process can delay the time to first render of the page quite significantly."*

While some CSS and JS resources have to be downloaded and processed before displaying anything on the page (they are the so called critical resources), some others can be postponed and loaded in a second time without any issue nor user experience loss.

This is also the case of the so called unused CSS, such as stylesheets that might be needed after the page is loaded, i.e. the CSS of a modal window appearing only after clicking a specific button.

Deferring the loading of non-critical resources or of unused CSS, and make them load after the browser has rendered the page, is a good practice to save a few (milli)seconds of loading time.

So, how to defer the loading of render-blocking JS/CSS and defer unused CSS?

Manually approaching this tweak might be a bit tricky, since it involves digging and editing your code.

If you prefer to proceed programmatically, here's an example of [how to remove render-blocking JavaScript](#) and one about [eliminating render-blocking CSS](#).

The easiest solution is to use a plugin like WP Rocket!  
Our plugin includes two options that will help to fix PSI recommendation:

- **Optimize CSS Delivery**
- **Load JavaScript deferred**

It's worth noticing that, sometimes, it can be very difficult (if not impossible) to completely eliminate all render-blocking CSS and JS. The possibility to achieve this result will highly depend on how the theme and plugins you're using on your WordPress site are coded.

If you didn't code your website from scratch yourself, and you're instead relying on a theme and plugins other developers wrote, you simply have to accept that you can't have 100% control over them.

It's ok to not defer ALL of your CSS and JS render-blocking resources, since sometimes this process can lead to a broken page (and that's way worse than a "red score" by Google PageSpeed Insight!).

## Reduce Server Response Time

If your server is responding slowly to users' requests, the overall user experience of your site will be affected.

The first thing to consider when approaching web performance optimization, is that a fast server is a fundamental element of it.

When Google PageSpeed asks you to reduce server response time, it's basically referring to the indicator known as *Time to First Byte*.

We already addressed this topic with our guide: [Time to first byte: how to test, interpret and reduce it!](#)

## Minify CSS and Minify JavaScript

These two recommendations are related to one of the most popular code optimization techniques: **minification**.

Minification is the technique that makes HTML pages, CSS and JS scripts less readable (for humans, of course) but faster to load!

This method removes all unnecessary characters, markups, spacing and comments that developers tend to add to web pages and script files.

Developers in fact may need comments, markup and spacing to make pages and scripts more readable during their development process.

But when their masterpiece is over and the website is online, all those additional elements become redundant: they increase network traffic, and burden the bandwidth of network requests.

That's when minification comes handy: it makes the code leaner, so the final user will receive it faster and the overall load time will improve.

So, how can you minify CSS and JS files?

There are two ways to minify your CSS and JavaScript:

- **Manually**
- **Automatically, with a plugin**

To know how you can manually minify your files, have a look at our guide: [Best CSS and JS Minification Tools](#).

To automatically take care of minification, and forget manual tweaks, you can use a WordPress plugin.

There are many efficient minification plugins on the market, but, again, WP Rocket could be the perfect solution for you!

Our plugin includes both CSS and JS minification, as well as CSS and JS combination:

### Minify and Combine CSS Files:

#### CSS Files

[NEED HELP?](#)

☒ **Minify CSS files**

Minify CSS removes whitespace and comments to reduce the file size.

☐ **Combine CSS files** *(Enable Minify CSS files to select)*

Combine CSS merges all your files into 1, reducing HTTP requests. Not recommended if your site uses HTTP/2. [More info](#)



**This could break things!**

If you notice any errors on your website after having activated this setting, just deactivate it again, and your site will be back to normal.

ACTIVATE COMBINE CSS ✓

### Minify and Combine CSS Files:

#### JavaScript Files

[NEED HELP?](#)

☒ **Minify JavaScript files**

Minify JavaScript removes whitespace and comments to reduce the file size.

☐ **Combine JavaScript files** *(Enable Minify JavaScript files to select)*

Combine JavaScript files combines your site's internal, 3rd party and inline JS reducing HTTP requests. Not recommended if your site uses HTTP/2. [More info](#)



**This could break things!**

If you notice any errors on your website after having activated this setting, just deactivate it again, and your site will be back to normal.

ACTIVATE COMBINE JAVASCRIPT ✓

As already mentioned for the note about eliminating render-blocking resources, minification and combination are advanced features that can *sometimes* break the layout of your pages.

It always depends on the code of the theme and other plugins you're using: some JS or CSS files might be incompatible with minification, so you should always keep your eyes open when you implement this technique.

Check out our documentation to understand [how to fix potential issues related to minification/combination](#).

## Multiple Page Redirects

301 redirects are indeed crucial to notify your browser that a HTTP request is coming from a different source location and [avoid 404 errors](#); but when redirects pile up, they tend to slow down your pages.

PageSpeed Insights considers redirects as a problem when a page contains more than two of them.

The ideal solution would be, of course, to update the original links to the redirected resources.

## Enable Text Compression

With this recommendation, PageSpeed Insights is asking you to enable GZIP compression.

[As Google's Tools for Web Developers guide explains](#):

*"Text compression minimizes the byte size of network responses that include text content. Less bytes downloaded means faster page loads."*

(Source: Lighthouse section of Google's Tools for Web Developers)

GZIP compression is a very popular and effective method to speed up your WordPress site, because it reduces the total size of the pages and [improves time to first paint](#).

## Preconnect to Required Origins

This PageSpeed warning appears every time you have third-party content on your website (e.g fonts loaded from Google, or a video from YouTube), and you're not prefetching their correspondent DNS resolutions.

### What Is DNS Prefetching?

Here's a definition from [our guide about the differences between preload, prefetch, and preconnect](#):

*"With prefetch, you can tell the browser to fetch resources you think the user might need later as part of a future navigation or interaction, if the user takes the action you're expecting. These resources will then be fetched at the lowest priority in the browser, when the current page is done loading and there's bandwidth available."*

(Source: Preload, Prefetch, Preconnect: How to Speed Up Your Site With Browser Resource Hints)

In particular, with DNS prefetching you can tell the browser to perform DNS lookups on a page while the users are browsing it: when the external resources get requested, the DNS resolution would have already been processed, reducing the latency.

Prefetching DNS requests can give your loading time a minor boost, and you can easily apply it (and make PageSpeed happy) with WP Rocket:

In particular, with DNS prefetching you can tell the browser to perform DNS lookups on a page while the users are browsing it: when the external resources get requested, the DNS resolution would have already been processed, reducing the latency.

Prefetching DNS requests can give your loading time a minor boost, and you can easily apply it (and make PageSpeed happy) with WP Rocket:

### Prefetching DNS requests

#### Prefetch DNS Requests



DNS prefetching can make external files load faster, especially on mobile networks

##### URLs to prefetch

*Specify external hosts to be prefetched*

//fonts.googleapis.com

### Preload Key Requests

This warning refers to the Critical Rendering Path (CRP) optimization strategy.

CRP is useful to prioritize some resources before others, and decide their loading order.

In this way, the browser can load a page faster.

To fix this PSI recommendation, you should declare preload links in your HTML, so the browser knows that it has to download critical resources as soon as possible.

WP Rocket allows you to take care of this warning for CSS files only: by enabling the Optimize CSS Delivery option, WP Rocket adds the rel="preload" attribute to CSS files.

☐ **Minify CSS files**  
*Minify CSS removes whitespace and comments to reduce the file size.*

---

☐ **Combine CSS files (Enable Minify CSS files to select)**  
*Combine CSS merges all your files into 1, reducing HTTP requests. Not recommended if your site uses HTTP/2. [More info](#)*

---

☒ **Optimize CSS delivery**  
*Optimize CSS delivery eliminates render-blocking CSS on your website for faster perceived load time. [More info](#)*

---

**Fallback critical CSS:**  

*Provides a fallback if auto-generated critical path CSS is incomplete. [More info](#)*

More info on [how WP Rocket manages critical CSS, here](#).

## Defer Offscreen Images

Offscreen images are those that don't appear when the user opens a page. They are the so-called below-the-fold images.

Since users can't see them when they load a page, there's no point in downloading them as part of the loading process.

With this recommendation, PageSpeed is asking you to defer the loading of offscreen images at a later stage, namely when the user scrolls the page and requests the below-the-fold content.

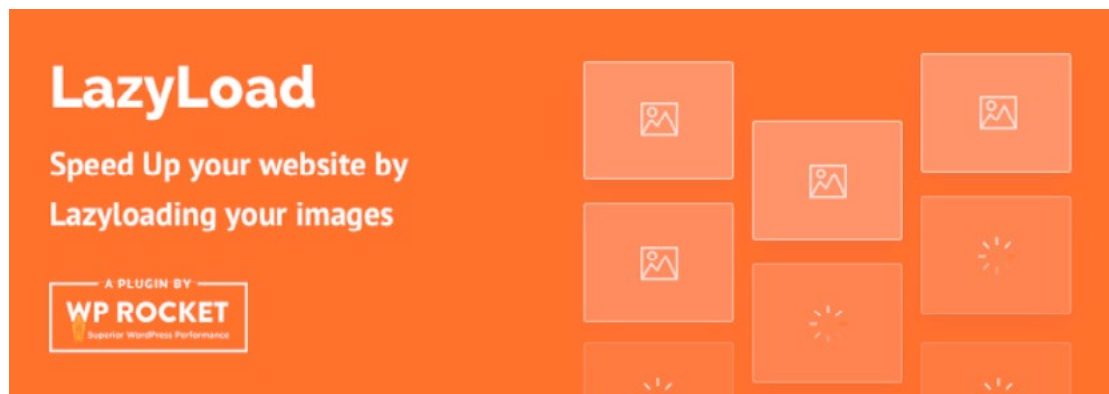
To defer offscreen images, you can LazyLoad them. LazyLoad is a technique that allows you to defer image loading.

LazyLoad is a technique that allows you to defer image loading ([to know more about LazyLoad and how to apply it to your images, read our guide](#)).

You can [manually lazyload your image files](#), or use a plugin instead.

If you opt for this second option, you have two great alternatives:

- Our standalone free LazyLoad plugin, which you can find on the WordPress.org repository:



- WP Rocket, which includes the option to lazyload your images:

### LazyLoad

 [NEED HELP?](#)

It can improve actual and perceived loading time as images, iframes, and videos will be loaded only as they enter (or about to enter) the viewport and reduces the number of HTTP requests.

☒ **Enable for images**

☐ **Enable for iframes and videos**

By choosing one of the two, PageSpeed Insights will be satisfied and it should fix the warning about offscreen images not deferred.

Just keep in mind that, as far as WP Rocket's LazyLoad is concerned, not all images can be lazy loaded at the moment, e.g. background images that are loaded from stylesheets.

To learn where this exceptions apply, [have a look at our documentation](#).

## Properly Size Images

Mastering the art of image optimization is something that you can easily learn. It will allow you to gain a huge improvement in page speed, and Google PageSpeed will definitely notice it rewarding you for this!

To properly size and optimize your images, you should follow a few steps that we extensively described in our guide on [how to compress your images and reduce their file size](#).

## Efficiently Encode Images and Optimize Images

Image encoding is the process of saving images in a more efficient and compressed format.

Optimizing images is the set of measures required to make your images load faster, such as:

- **Choose the right image format**
- **Reduce their file size**
- **Compress them carefully**



To take care of your image optimization strategy with a unique and efficient tool, [you can use our free tool Imagify](#). It will help you to work on your files and fix the majority of PageSpeed warnings concerning images.

## Serve Images in Next-Gen Format

With this recommendation, PageSpeed is asking you to use more modern image formats, like **JPEG 2000**, **JPEG XR** and **WebP**.

These image formats are superior to their "older" siblings, JPEG and PNG images, in terms of quality and compression features: they are able to load faster and consume less mobile data.

Our image optimization plugin [Imagify](#) is able to convert images to WebP formats, so don't hesitate to take advantage of it!

## PageSpeed Insights recommendations: Diagnostics

All the recommendations included in the Diagnostics section focus on performance and on the best practices that can help improve it.

**Diagnostics** — More information about the performance of your application.

▲	Ensure text remains visible during webfont load	▼
■	Serve static assets with an efficient cache policy — 4 resources found	▼
●	Minimize Critical Requests Depth — 4 chains found	▼
●	Keep request counts low and transfer sizes small — 45 requests • 796 KB	▼

**Let's see which are the most common PSI recommendations in this section and what you can do to fix them.**

- Ensure Text Remains Visible During Webfont Load
- Minimize Main-Thread Work and Reduce JavaScript Execution Time
- Serve Static Assets With an Efficient Cache Policy
- Avoid Enormous Network Payloads
- Avoid Excessive DOM Size
- Minimize Critical Requests Depth

## Ensure Text Remains Visible During Webfont Load

This PSI warning concerns the loading of web fonts, which are often large files that slow down pages a lot.

Some browsers, while waiting for fonts to load, hide text in the page, producing the effect known as the “flash of invisible text”.

But this solution doesn't facilitate user experience: the ideal solution, in this case, would be to let users immediately see the text using a system font.

This will produce the so-called “flash of unstyled text” effect: but defaulting to a system font will make the browser save important loading time, since it will be using a font it already has in its system.

Once the web font you originally chose is completely downloaded it will be visible to the user; nobody will have to wait staring at invisible text on the page, if you opt for a [“flash of unstyled text” solution](#).

WP Rocket 3.3.5 introduced support for Google Fonts using the “swap” font-display property:

This means that, if you're using Google fonts, WP Rocket will help to take care of the “flash of unstyled text” effect.

## Basic Settings

### Basic Settings

[NEED HELP?](#)

☐ **Minify HTML**

Minifying HTML removes whitespace and comments to reduce the size.

☒ **Combine Google Fonts files**

Combining Google Fonts will reduce the number of HTTP requests.

☐ **Remove query strings from static resources**

Removes the version query string from static files (e.g. style.css?ver=1.0) and encodes it into the filename instead (e.g. style-

Combine Google Fonts is enabled by default upon activation.

To learn more about [web fonts optimization](#), you can read our [guide](#).

## Minimize Main-Thread Work and Reduce JavaScript Execution Time

These recommendations have to do with the use of JS scripts, and its impact on the load performance of your pages.

JS comes at a high cost for your website: once downloaded, it has to be “read” and “understood” by the browser (parsed and compiled) and is then executed within the browser.

The more JS there is on your page, the more time the browser will need to parse, compile and execute it.

As per the note about "Minimize main-thread work", this is how PageSpeed defines it:

*"Consider reducing the time spent parsing, compiling and executing JS. You may find delivering smaller JS payloads helps with this."*

To reduce JS execution time and minimize main-thread work, you have to remove the JS that is not needed in the page by disabling plugin or theme JS files from loading on the page.

**You can use specific plugins that can help you remove unwanted JS from your pages, such as:**

- **Plugin Organizer**, by Jeff Sterup
- **Asset CleanUp**, by Gabriel Livan
- **Gonzales plugin**, by Tomasz Dobrzyński

**Use them carefully and consult with their developers and/or documentation before using them.**

## Serve Static Assets with an Efficient Cache Policy

A cache policy is the set of steps to put in place to make sure your pages are cached and load fast.

There are several layers of cache available that you should audit and apply, whenever possible, to your site: page caching, server-side caching, object caching and browser caching.

When Google PageSpeed asks to serve static assets with an efficient cache policy, it's referring to browser caching.

To learn how to tackle this warning, you can read our guide on [how to correct the static cache warning in PageSpeed](#).

If you're using WP Rocket, you don't have to worry about this: our plugin automatically applies the necessary Expire headers in the htaccess file.

If you're using an NGINX server, you won't have the htaccess file, so the above mentioned headers won't be applied.

However, WP Rocket works out of the box on NGINX servers: [here you can find more info about it](#).

### Avoid Enormous Network Payloads

Here PageSpeed is asking you to reduce the number of network requests. Network requests have a high impact on page load speeds but they also affect user experience, bounce rate and SEO.

To fix this warning and reduce the amount of HTTP requests on your site, you can follow our guide.

### Avoid Excessive DOM Size

DOM elements are all the tags on a page (like DIV, HTML, BODY, etc.).

According to Google's Web Developers Guide, an optimal DOM tree includes these characteristics:

- **Has less than 1500 nodes total.**
- **Has a maximum depth of 32 nodes.**
- **Has no parent node with more than 60 child nodes.**

Generally speaking, to reduce an excessive DOM size you should review themes and plugins you are using: you could do so by directly addressing the design of your site or asking for help from a developer.

### Minimize Critical Requests Depth

This note refers to the Critical Request Chains, that is the list of resources which are loaded with a high priority on a page. This is not an audit that you're meant to "pass" or "fail", but if you address it you'll be able to improve page load performance on your site.

PageSpeed Insights suggests to tackle this audit by "reducing the length of chains, reducing the download size of resources, or deferring the download of unnecessary resources to improve page load".

**With WP Rocket, you can improve the Minimize Critical Request Depth factor by removing render-blocking CSS/JS; this means enabling the options that we already presented above:**

- **Optimize CSS Delivery**
- **Load JavaScript deferred**
- **Combine JavaScript files**

## CHAPTER 6

# How to Use WP Rocket to Improve Your PageSpeed Insights Score

Learning how to use performance testing tools to assess the health of your site is a crucial asset. Once you understand how to read their reports, improving scores, and fixing their recommendations will become a lot easier.

WP Rocket is one of the tools that will help you achieve this goal efficiently and without stressing too much on configuration settings.

**Our plugin is all about caching and optimization. After installing it, your website will immediately, and automatically benefit from 80% of web performance best practices including:**

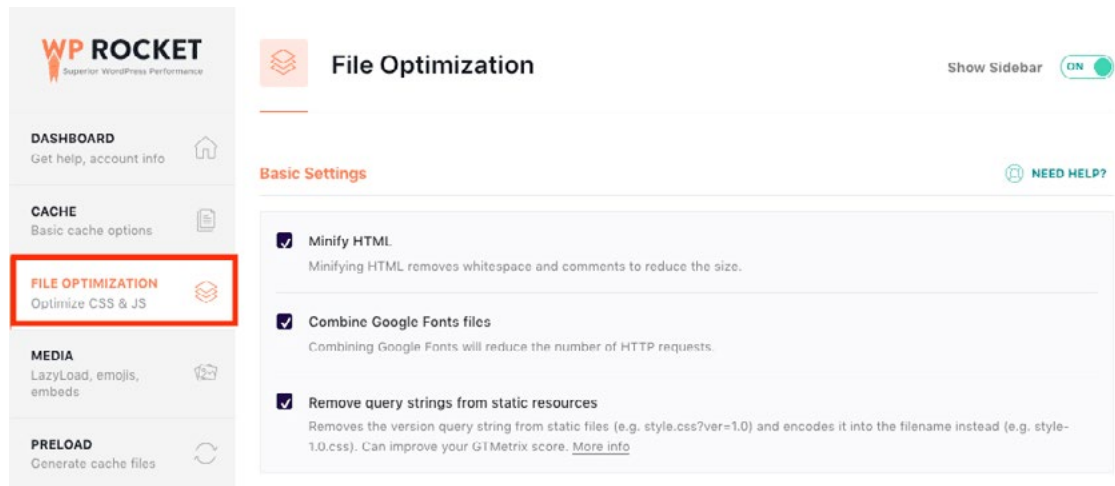
- **Page caching**
- **Browser caching**
- **GZIP compression**

PageSpeed Insights will love this and reward your site immediately, improving its performance score.

Then, you have WP Rocket's optional settings. They're not mandatory since your website will be faster already, even if you don't try them.

Proper use of these settings will not only make your site blazing fast, but will also boost its performance. You'll achieve faster page speeds, better SEO rankings, and the best scores in PageSpeed Insights (or other performance tools).

Most of the WP Rocket's options that will make PageSpeed Insights fall in love with your site are included in the File Optimization tab.

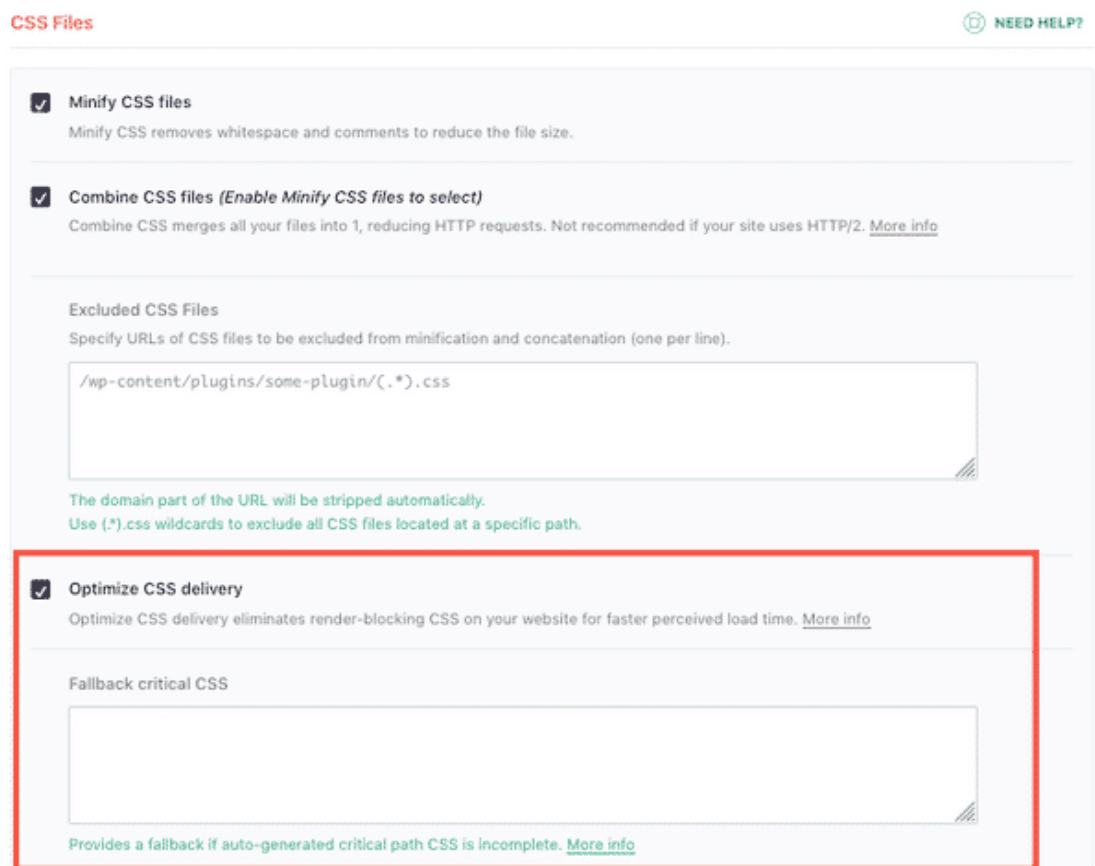


These options have to do with minification, combination, and deferred loading of CSS and JavaScript files.

PageSpeed Insights is particularly sensitive to the way files are loading on a page. A couple of its trickiest recommendations are called Eliminate Render-Blocking Resources, and Defer Unused CSS.

These refer to the fact that it's recommended to delay (defer) the loading of non-critical files until the browser is done rendering the page.

WP Rocket helps you to solve this puzzle thanks to the options labeled as Optimize CSS Delivery:



For JavaScript files, you can use the option *Load JavaScript deferred*:

JavaScript Files

NEED HELP?

☒ **Minify JavaScript files**  
 Minify JavaScript removes whitespace and comments to reduce the file size.

☒ **Combine JavaScript files (Enable Minify JavaScript files to select)**  
 Combine JavaScript files combines your site's internal, 3rd party and inline JS reducing HTTP requests. Not recommended if your site uses HTTP/2. [More info](#)

Excluded Inline JavaScript  
 Specify patterns of inline JavaScript to be excluded from concatenation (one per line). [More info](#)

Excluded JavaScript Files  
 Specify URLs of JavaScript files to be excluded from minification and concatenation (one per line).  

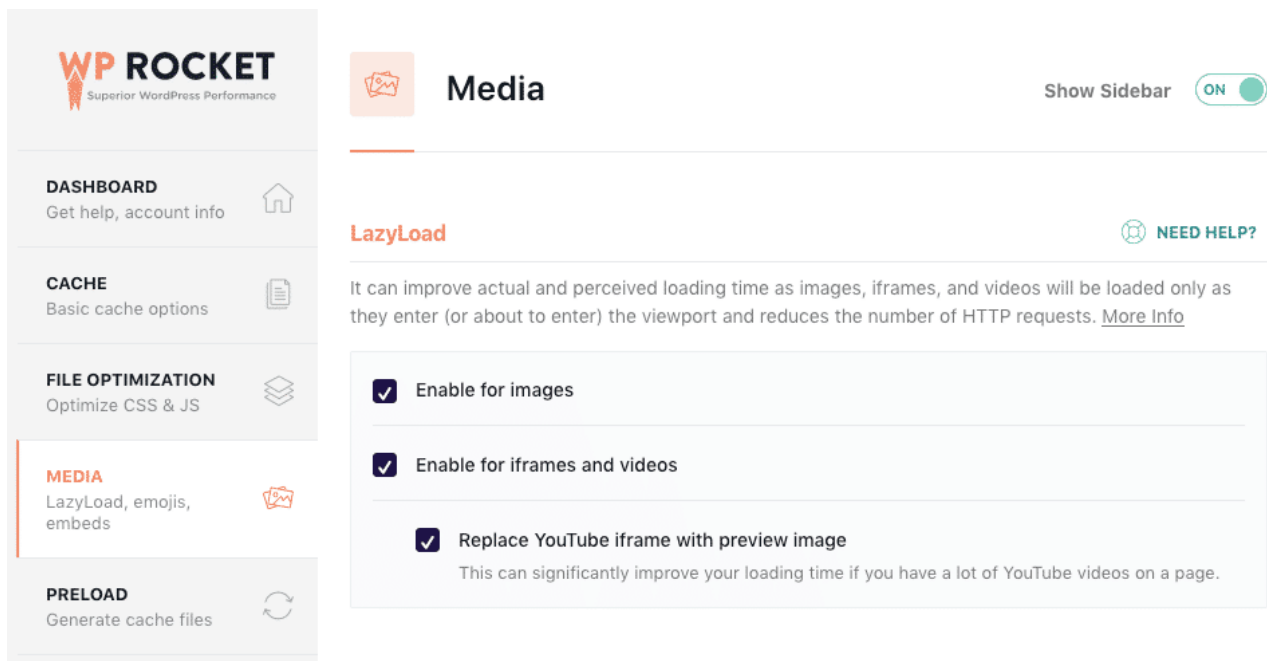
**Internal:** The domain part of the URL will be stripped automatically. Use `(.*)` wildcards to exclude all JS files located at a specific path.  
**3rd Party:** Use either the full URL path or only the domain name, to exclude external JS. [More info](#)

☒ **Load JavaScript deferred**  
 Load JavaScript deferred eliminates render-blocking JS on your site and can improve load time. [More info](#)

☒ **Safe Mode for jQuery (recommended)**  
 Safe mode for jQuery for deferred JS ensures support for inline jQuery references from themes and plugins by loading jQuery at the top of the document as a render-blocking script.  
 Deactivating may result in broken functionality, test thoroughly!

On the other hand, the *Media* tab contains the options that will fix PSI recommendations related to images like *Defer offscreen images*.





“

With WP Rocket, we're striving to make the web a more sustainable place with faster, and better performing web pages.

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We hope that this PageSpeed Insights guide was helpful and that you were able to take away interesting insights to know better how your site is performing.

Thank you for reading!

”





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