



Design + Performance



Bringing designers & developers
closer together







Yesenia Perez-Cruz
Philadelphia, PA



I used to be a
reckless designer.



HI DAVE HOLMES! YOU HAVE **1,234,567** POINTS.

MY INFO ▾

THE ROAD TRIP IS LIVE!

Follow along as the Flaming Lips attempt to break a world record.

21:10:17

HOURS TO GO

653

MILES TO GO

04

SHOWS LEFT

MEMPHIS

CLARKSDALE

OXFORD

JACKSON

HATTIESBURG

BILOXI

BATON ROUGE

NEW ORLEANS

VOTING IS STILL OPEN IN SOME CATEGORIES! ENTER YOUR CODE TO UNLOCK VOTING:

Enter Code Here

UNLOCK

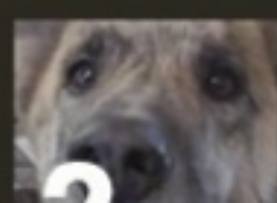
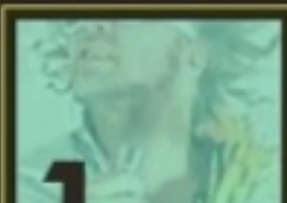


NOW PLAYING:

Channel 1: The Bus Route

We're at the fourth stop on our route. Watch

THE LIVE FEEDS:



WINNERS & NEWS

FAN FEED

All Updates

Winners



@OMusicAwards

Lady Gaga has won the title of Best Artist With A Cameraphone!
#winners

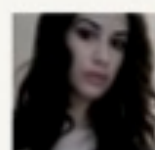
Just now!



ThatGuyDave

Lovin' Yeah Dog on Camera 3.
#omashow

5 minutes ago



TeamTokioHotel

Tokio Hotel better win Fan Army FTW or else I'll cry!!!!!!!!!!!! #omashow

5 minutes ago



King Slayer



WHERE GAGA'S MEAT DRESS
AND PETA'S LETTUCE BRAS COLLIDE.

WE'VE GOT ISSUES. YOU BRING THE ACTION.



MUSIC AWARDS

REQUESTS: 136

PAGE WEIGHT: 5.9MB

LOAD TIME: 2M 46S

WATCH WINNERS BLOG UNBOXED ABOUT SEARCH

LOG IN WITH f

OFFBEAT OUTRAGEOUS ONGOING - FOLLOW US ALL

Clear Persist All HTML CSS JS XMLHttpRequest Images Flash Media

▶ GET_hp;sec0=_hp;	200 OK	ad.doubleclick.net	317 B	209.85.148.149:80	144ms
▶ GET act-banner_30	200 OK	s0.2mdn.net	79.7 KB	209.85.148.149:80	2.15s
▶ GET_hp;sec0=_hp;	200 OK	ad.doubleclick.net	317 B	209.85.148.149:80	157ms
▶ GET act-banner_72	200 OK	s0.2mdn.net	64 KB	209.85.148.149:80	290ms
▶ GET_hp;sec0=_hp;	200 OK	ad.doubleclick.net	320 B	209.85.148.149:80	168ms
▶ GET 1-act-banner_	200 OK	s0.2mdn.net	77.1 KB	209.85.148.149:80	372ms
▶ GET_hp;sec0=_hp;	200 OK	ad.doubleclick.net	317 B	209.85.148.149:80	137ms
▶ GET act-banner_72	200 OK	s0.2mdn.net	63.8 KB	209.85.148.149:80	312ms
▶ GET_hp;sec0=_hp;	200 OK	ad.doubleclick.net	317 B	209.85.148.149:80	139ms
▶ GET act-banner_30	200 OK	s0.2mdn.net	79.7 KB	209.85.148.149:80	590ms
136 requests			5.9 MB	2m 46s (onload: 1m 15s)	

Server Delays Experiment: Results

	Distinct Queries/User	Query Refinement	Revenue/User	Any Clicks	Satisfaction	Time to Click (increase in ms)
50ms	-	-	-	-	-	-
200ms	-	-	-	-0.3%	-0.4%	500
500ms	-	-0.6%	-1.2%	-1.0%	-0.9%	1200
1000ms	-0.7%	-0.9%	-2.8%	-1.9%	-1.6%	1900
2000ms	-1.8%	-2.1%	-4.3%	-4.4%	-3.8%	3100

- Means no statistically significant change

- Strong negative impacts
- Roughly linear changes with increasing delay
- Time to Click changed by roughly double the delay

Search Traffic Impact

Type of Delay	Delay (ms)	Experiment Duration (weeks)	Impact on Average Daily Searches Per User
Pre-header	50	4	Not measurable
Pre-header	100	4	-0.20%
Post-header	200	6	-0.29%
Post-header	400	6	-0.59%
Post-ads	200	4	-0.30%

- Increase in abandonment heuristic = less satisfaction
 - Abandonment heuristic measures if a user stops interacting with search engine before they find what they are looking for
- Active users (users that search more often a priori) are more sensitive

Browsing all articles in **website optimization**

Recent Posts

[Menu Item Usage Study: The 80-20 Rule?](#)

[Why People Don't Upgrade Their Browser – Part IV](#)

[Menu Item Usage Study: An Update to the Initial Analysis](#)

[Web Analytics and Mozilla Websites](#)

[Menu Item Usage Study: Elements in Firefox](#)

[Menu Item Usage Study: An Update to the Data](#)

[Firefox & Page Load Speed – Part II](#)

[Firefox & Page Load Speed – Part I](#)

[Mozilla's Q1 2010 Analyst Report – State of the Internet](#)

[Firefox's Adoption Funnel](#)

Archives

[April 2010](#)

[March 2010](#)

[February 2010](#)

[January 2010](#)

[December 2009](#)

[November 2009](#)

[October 2009](#)

[September 2009](#)

APR

5

19

FIREFOX & PAGE LOAD SPEED – PART II

Blake Cutler [speed, website optimization](#)

Let's start with the punchline. By making a few minor tweaks to our top landing pages we can drive an additional 15.4% more conversions.

60 million is a big number, so let's add a little context. Looking back at our record [breaking download day](#) campaign, we know that 60 million people downloaded Firefox. Adding 60 million downloads is akin to running 10 Download Day campaigns.

What are the tweaks?

It comes down just one factor — speed. As it stands, our landing pages can be painfully slow. Take a look:

...shaved 2.2 seconds off the average page load time and increased download conversions by 15.4%!

Mozilla.com IE Landing Page



4.0

KYLE RUSH

HOME

ABOUT

CONTACT

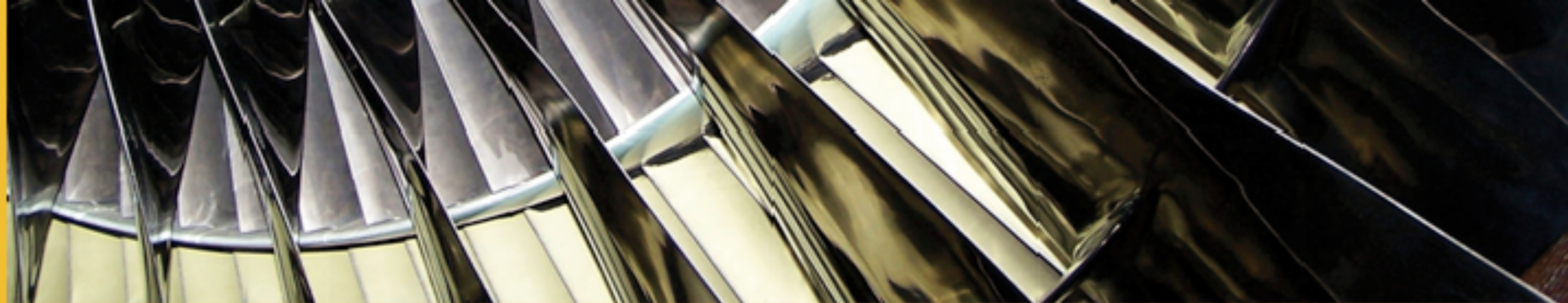
Meet the Obama campaign's \$250 million fundraising platform

We made the new platform 60% faster and this resulted in a 14% increase in donation conversions.

- 6 month life span
- \$250 million dollars, 4,276,463 donations
- 81,548,259 pageviews, 17,807,917 unique visitors
- 60% faster time to paint than previous platform
- 240 a/b tests, 49% increase in donation conversion rate

Performance Summary

- Conversion Rate **+7% - 12%**
 - Page View's **+25%**
 - US SEM Sessions **+8%**
 - Bizrate.co.uk SEM Sessions **+120%**
 - Infrastructure Required (US) **-50%** (200 vs 402 nodes)
 - Availability **99.71% → 99.94%**
 - Product Velocity **+225%**
 - Release Cost **\$1,000's → \$80**
-

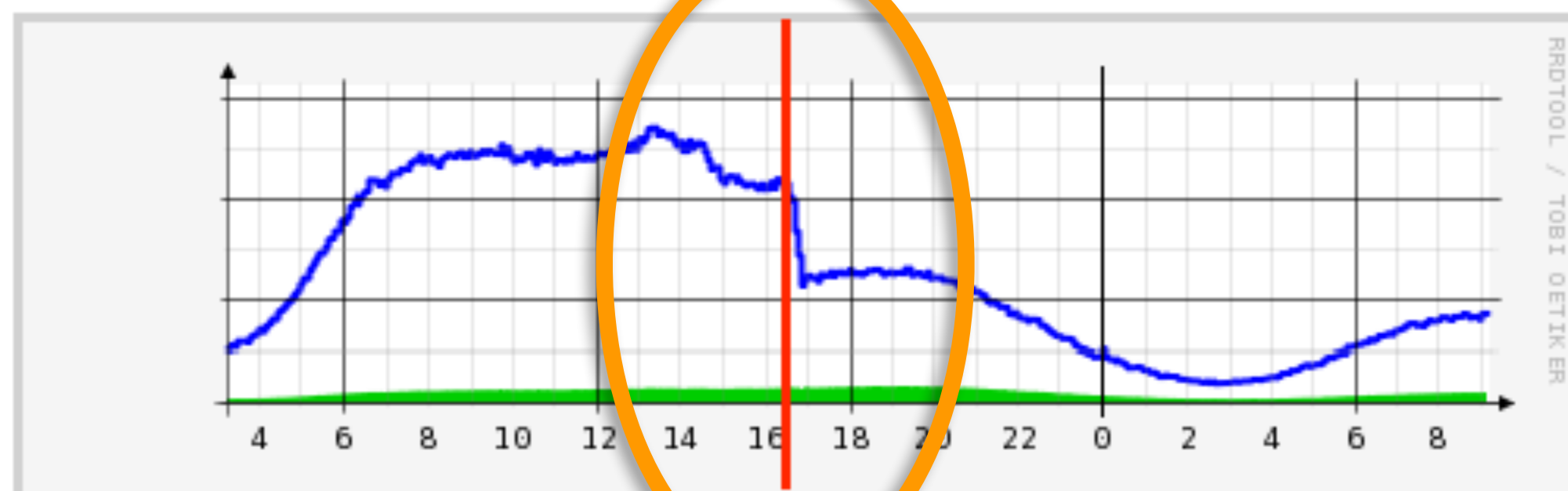


Improving Performance: Gzip

- Payload reduced in some cases 15x (typically in half)

Empty Cache	Primed Cache	Empty Cache	Primed Cache
804.8K 1HTML/Text	804.8K 1HTML/Text	51.6K 1HTML/Text	51.6K 1HTML/Text
284.5K 3JavaScript Files	284.5K 3JavaScript Files	0.0K 1XMLHttpRequest	0.0K 1XMLHttpRequest
73.4K 2Stylesheet Files	73.4K 2Stylesheet Files	63.9K 3JavaScript Files	0.0K 23CSS Images
8.0K 20CSS Images	0.0K 20CSS Images	15.4K 2Stylesheet Files	0.0K 61 Images
55.0K 60 Images	0.0K 60 Images	21.9K 23CSS Images	0.0K 61 Images
1225.8K Total size	1162.8K Total size	56.3K 61 Images	51.6K Total size
86 HTTP requests	86 HTTP requests	209.3K Total size	86 HTTP requests
		91 HTTP requests	

- User experience performance improvement 13% - 25%
- Network outbound traffic cut in half



Quick Wins: CACHING!

- Solution

Added Expires Header + Removed Etags

- Result:

34% reduction in bandwidth

= 34TB annual savings

= FREE video streaming for 2 years

= Faster pages when cache is primed



How GQ cut its webpage load time by 80 percent

Lucia Moses | @lmoses | August 12, 2015

7216

“traffic jumped from 6M to 11M uniques...
time spent on site rose from 5.9 to 7.8 minutes...
interaction rate on ads rose 108%”

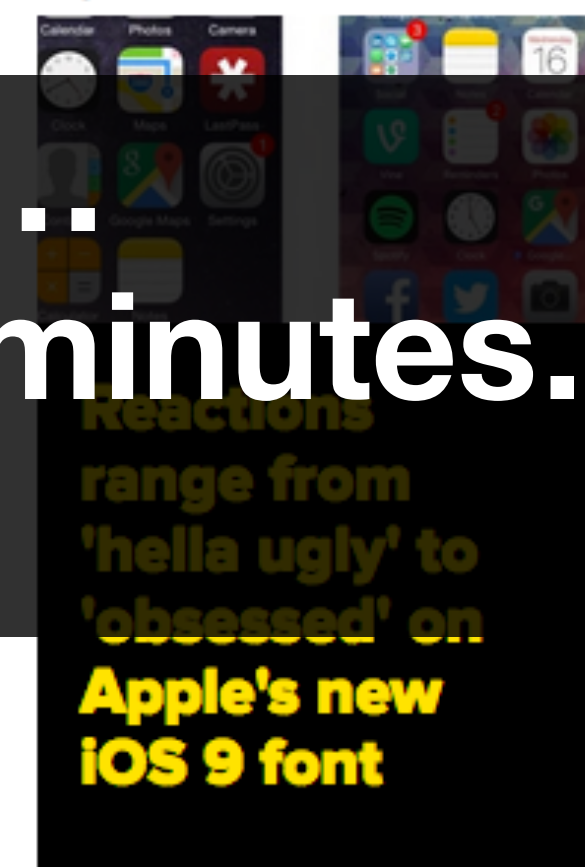
It used to be that publishers measured their success in audience size. Now, with the rise of reading on mobile devices, it's page load time that they're crowing about.

Before GQ relaunched its website July 1, pages took a painfully long seven seconds to load. If GQ's website was slow, it was an unacceptable lag.

“As users migrate to mobile, page load time is perhaps the most important metric we have,” said Howard Mittman, vp and publisher of the Condé Nast men's monthly. “If you can't load pages fast enough, you can't compete. Consumer expectations in a mobile-led world are extreme.”

GQ set out to tackle that with its reboot. Over the years, the site had gotten weighed down with ad tags and features that direct the server to load certain elements, like autoplay, but had become obsolete or redundant. The site also was publishing on multiple content-management systems, which added to the slowdown.

Popular





...we've decided to take site speed into account in our search rankings.

Using site speed in web search ranking

Friday, April 09, 2010 at 11:00 AM
Webmaster Level: All

You may have heard that here at Google we've been working on [the web](#). As part of that effort, today we're introducing new algorithms: site speed. Site speed reflects how quickly a website responds to web requests.

Speeding up websites is important — not just to site owners, but to all Internet users. Faster sites create happy users and we've seen in our [internal studies](#) that when a site responds slowly, visitors spend less time there. But faster sites don't just improve user experience; recent data shows that improving site speed also [reduces operating costs](#). Like us, our users place a lot of value in speed — that's why we've decided to take site speed into account in our search rankings. We use a variety of sources to determine the speed of a site relative to other sites.

If you are a site owner, webmaster or a web author, here are some free tools that you can use to evaluate the speed of your site:

- [Page Speed](#), an open source Firefox/Firebug add-on that evaluates the performance of web pages and gives suggestions for improvement.
- [YSlow](#), a free tool from Yahoo! that suggests ways to improve website speed.
- [WebPagetest](#) shows a waterfall view of your pages' load performance plus an optimization checklist.
- In [Webmaster Tools](#), Labs > Site Performance shows the speed of your website as experienced by users around the world as in the chart below. We've also blogged about [site performance](#).

Site performance

This page shows you performance statistics of your site. You can use this information to improve the speed of your site and create a faster experience for your users. [Learn more](#)

Performance overview

On average, pages in your site take 1.4 seconds to load (updated on Apr 7, 2010). This is faster than 87% of sites. These estimates are of high accuracy (more than 1000 data points). The chart below shows how your site's response time has changed over the last few months. For

Archive

Site Feed

Google

85081 readers

BY FEEDBURNER

Google Translate

Select Language

Gadgets powered by Google

Useful links

[Google Webmaster Central](#)

[Webmaster Help Center](#)

[Google Webmaster Tools](#)

[Webmaster Central on](#)

[YouTube](#)

[Webmaster Central China Blog](#)

Tech • Women in Tech • Girls In STEM • Screen Sense • Tech The Halls • Tech Innovations

Google To Favor 'Mobile-Friendly' Sites In Search

AP | By MICHAEL LIEDTKE

Posted: 04/17/2015 8:22 am EDT | Updated: 4 hours ago



“To stay in Google's good graces, websites must be designed so they load quickly on mobile devices.”

SAN FRANCISCO (AP) — Google is about to change the way its influential search engine recommends websites on smartphones in a shift that's expected to sway where millions of people shop, eat and find information.

The revised formula, scheduled to be released Tuesday, will favor websites that Google defines as "mobile-friendly." Websites that don't fit the description will be demoted in Google's search results on smartphones while those meeting the criteria will be more likely to appear at the top of the rankings — a prized position that can translate into more visitors and money.

Although Google's new formula won't affect searches on desktop and laptop computers, it will have a huge influence on how and where people spend their money, given that more people are relying on their smartphones to compare products in stores and look for restaurants. That's why Google's new rating system is being billed by some search experts as "Mobile-geddon."

"Some sites are going to be in for a big surprise when they find a drastic change in the amount of people visiting them from mobile devices," said Itai Sadan, CEO of website-building service Duda.



Fast is Good

D

28

29

RSV

F



ATM

T



15



A hand is pointing at a colorful map with various icons. The map features buildings, trees, and several icons including 'ATM', 'T', 'F', 'i', '15', and accessibility symbols like a wheelchair and a stroller. The text 'Designers & developers often work in silos' is overlaid in white on a dark background.

Designers & developers
often work in silos



Designers & developers
often work in silos

Some designs are hard
to make fast



Designers & developers
often work in silos

Some designs are hard
to make fast

Being fast is important



Small Interdisciplinary Teams





Call Lake
Denton

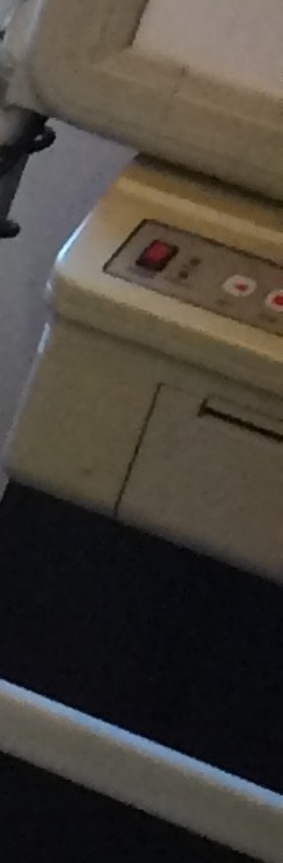
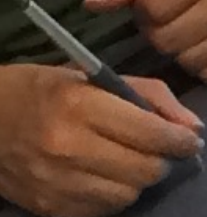
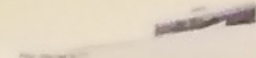
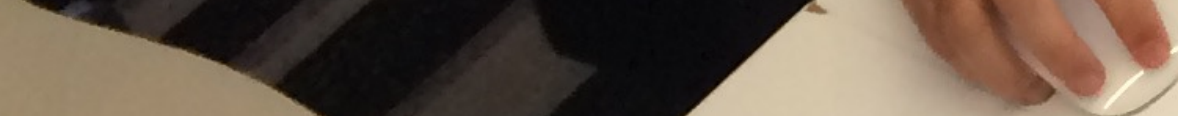
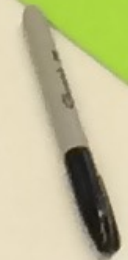
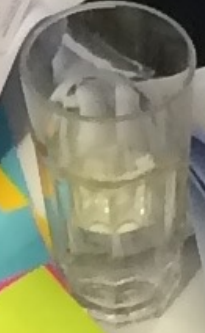
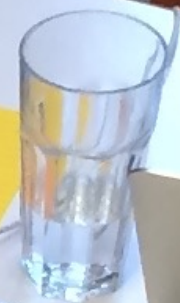
UNLIMITED...
08
MCC...

RELATED A...
LIFE BACK TO...
TUBA

Apple logo



Tablet screen displaying a web interface





Guiding Principles





TVNZ News

Speed is more important than design embellishment.

People are filling small gaps in their day with news. It must load fast on all touchpoints.

The design should feel light and nibble, always fresh and up to date. Never heavy, slow to load or clogged up with content.

Users expect sites to load in under 2 seconds.



Tourism New Zealand

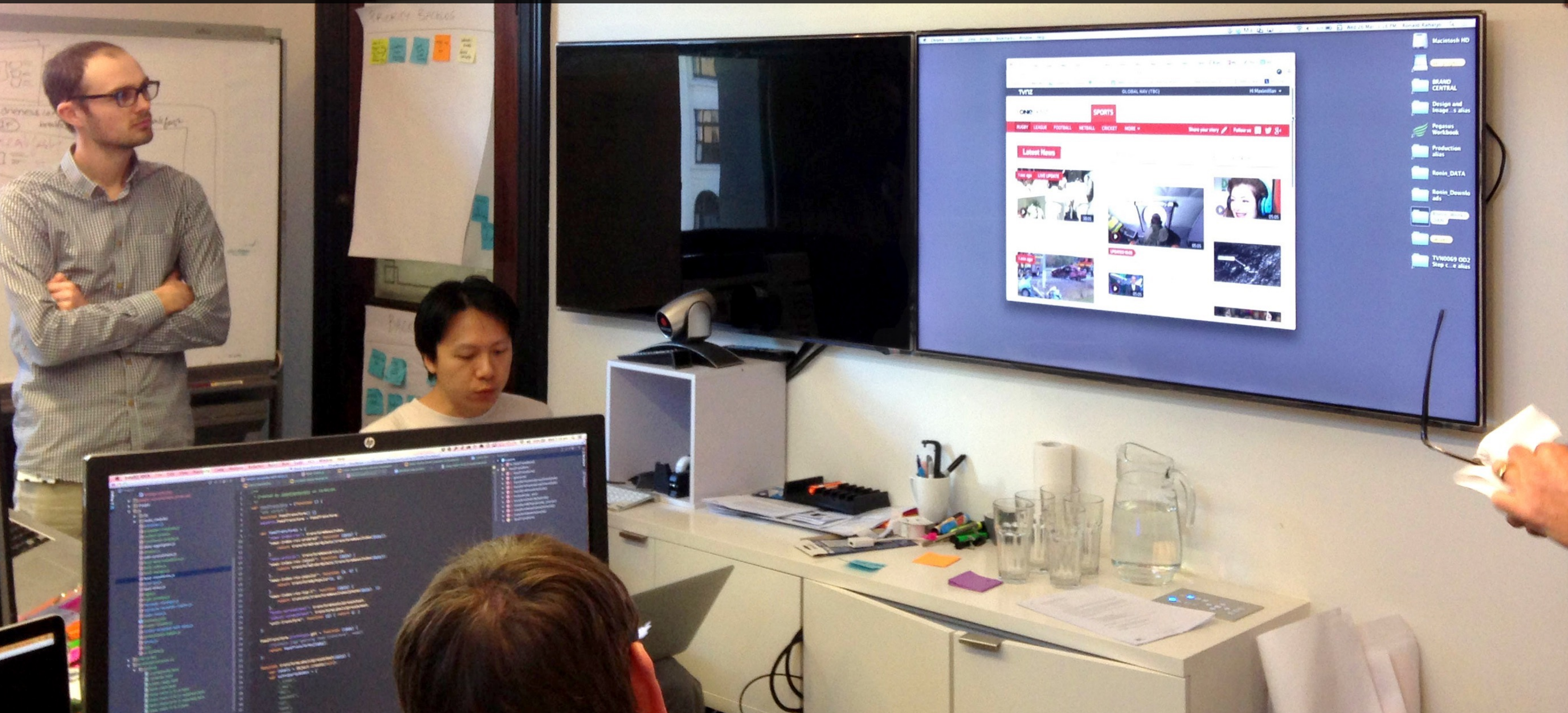
Engage quickly and then make it feel like you're there.

Tourists are making a big important decision so they want to know that it's worth it.

People need to know they are in the right place - hook them immediately with engaging imagery.

Unobtrusively stream in lots of rich content.

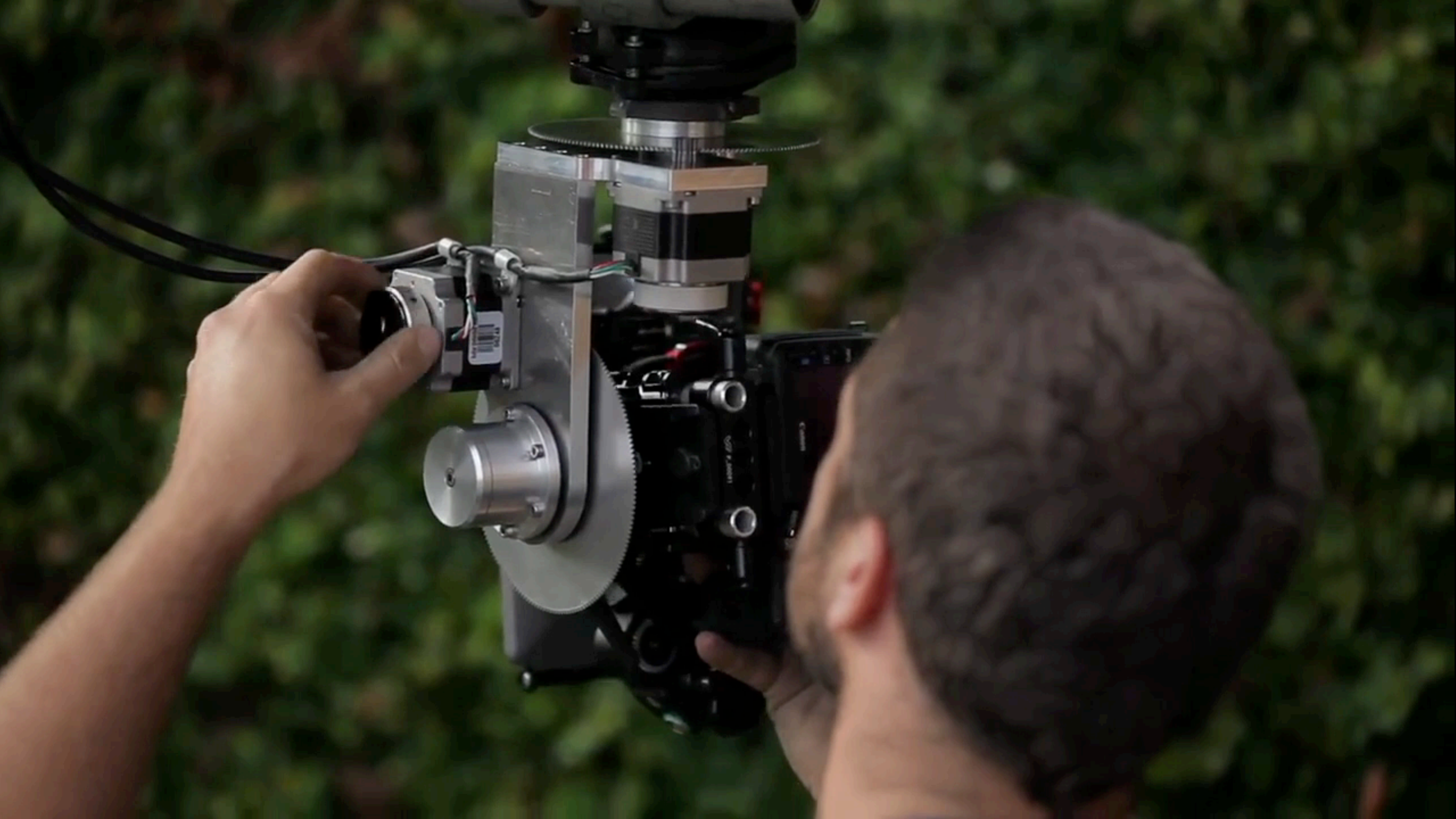
Prototype Early

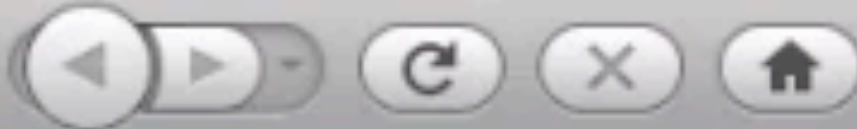






Tourism New Zealand

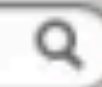




http://www.newzealand.com/int/



Google



**NEW ZEALAND
100% PURE**

Search the site

[Login](#)

[Register](#)

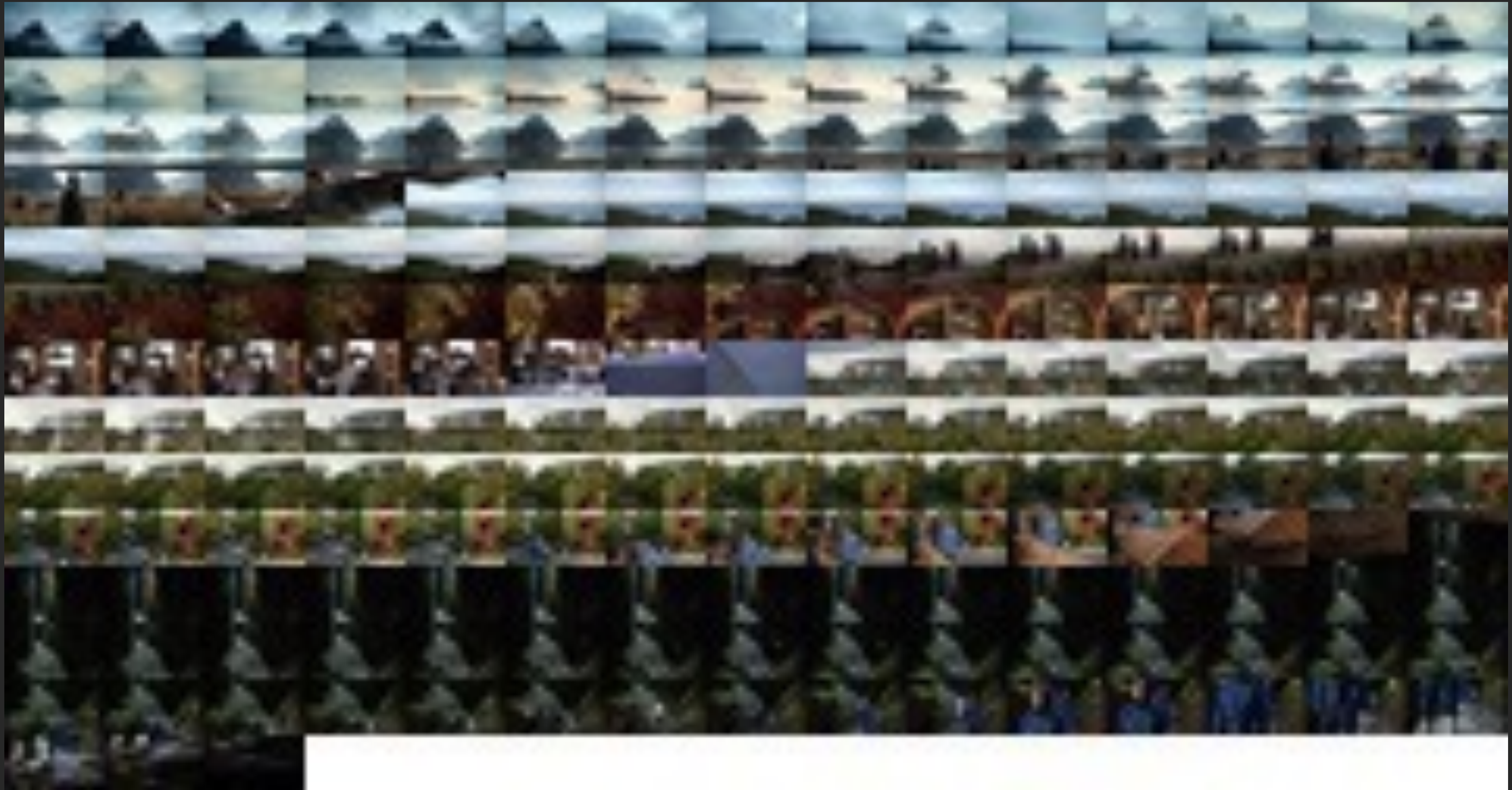
[United States](#)

Kia Ora
Welcome to New Zealand

Landscapes

Milford Sound





First layer with 1 sprite sheet (34k)



Third layer of 8 sprite sheets (829k)



201 high quality frames (22.6MB)



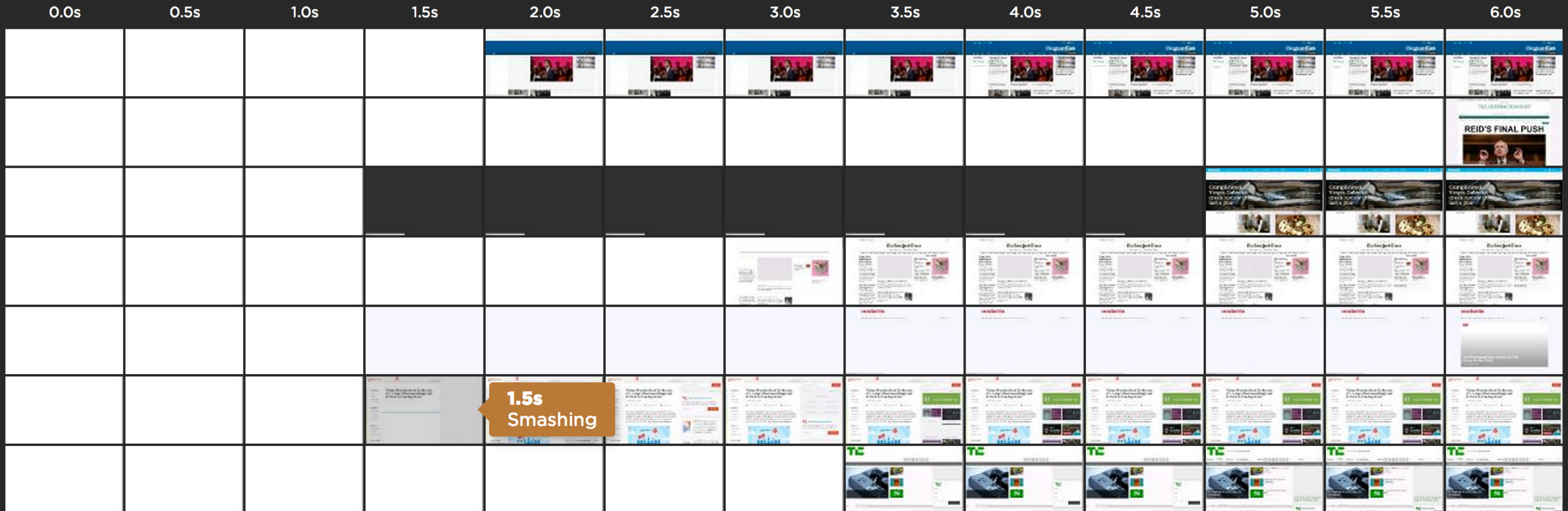
We're designing timelines
not static pages

UX Content flow

The background of the image is a blurred, close-up view of a red speedometer. The needle is pointing towards the right. The numbers on the speedometer are white and include 100, 120, 140, and 160. The overall color scheme is dark red and black.

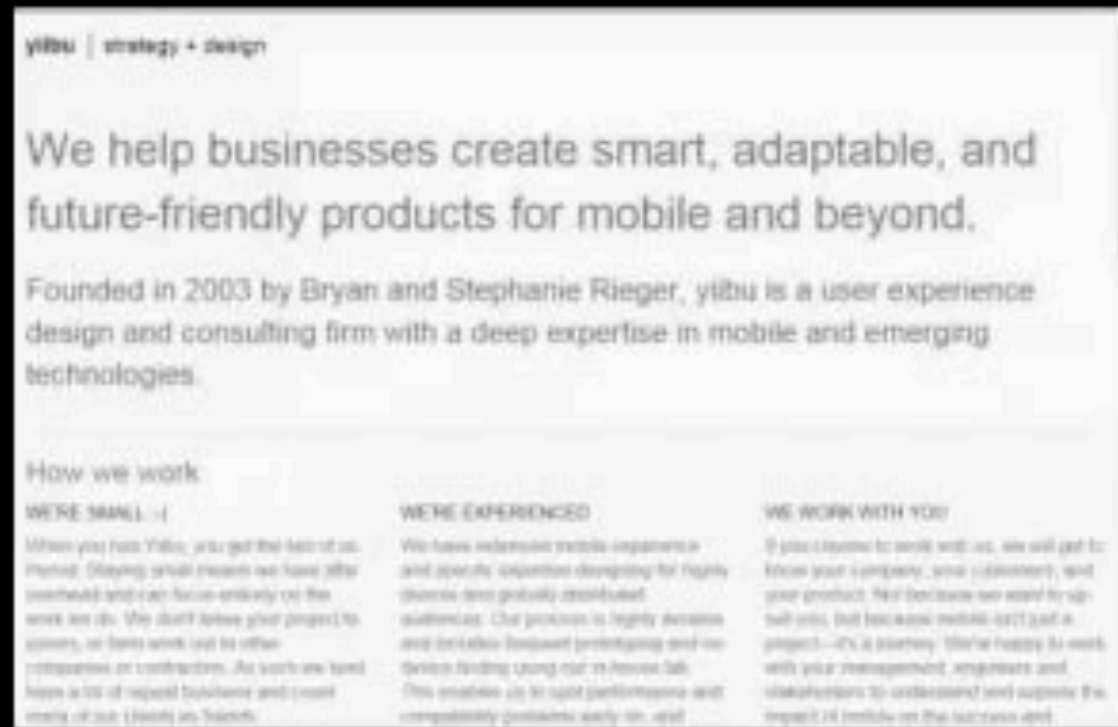
Measuring Performance

Filmstrips



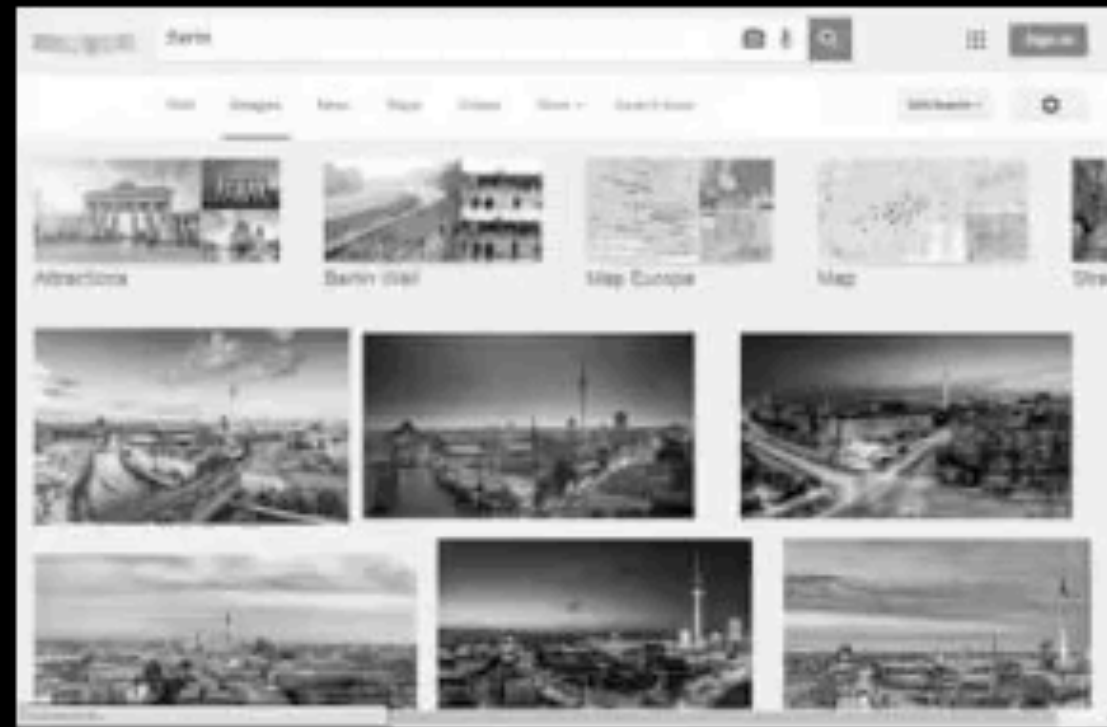
Videos

<https://yibu.com/>



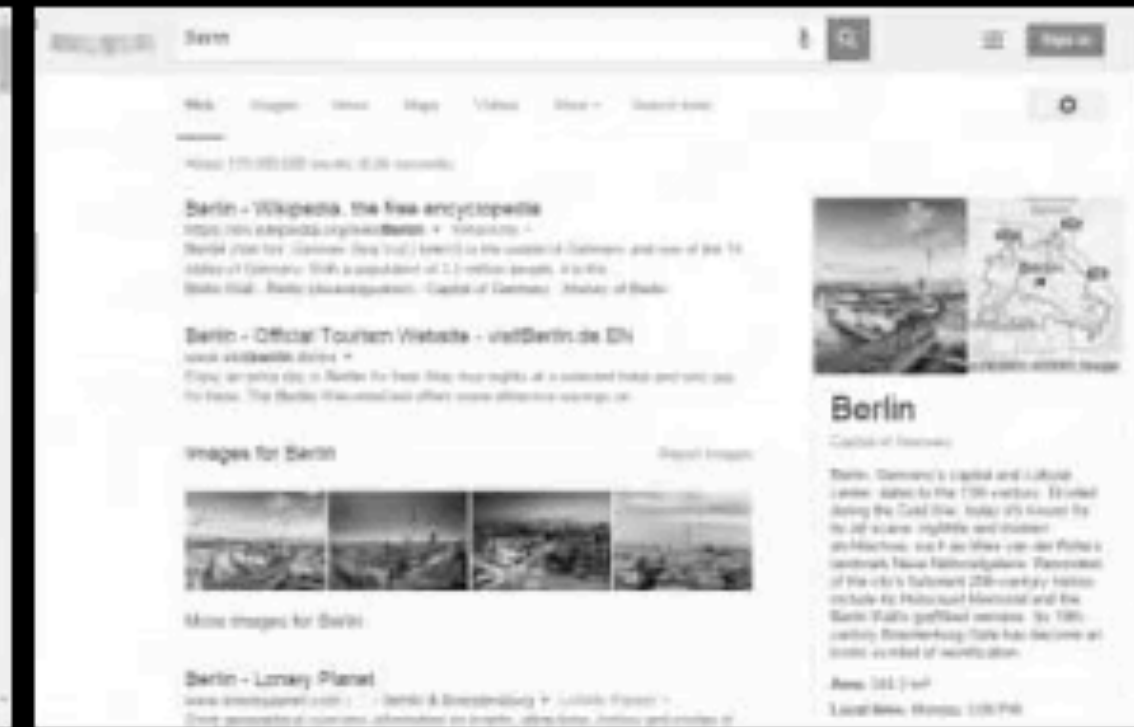
0.5

<https://www.google.com/search?q=Berlin&biw=1436&bih=805&source=images&btn=isch&sa=X>



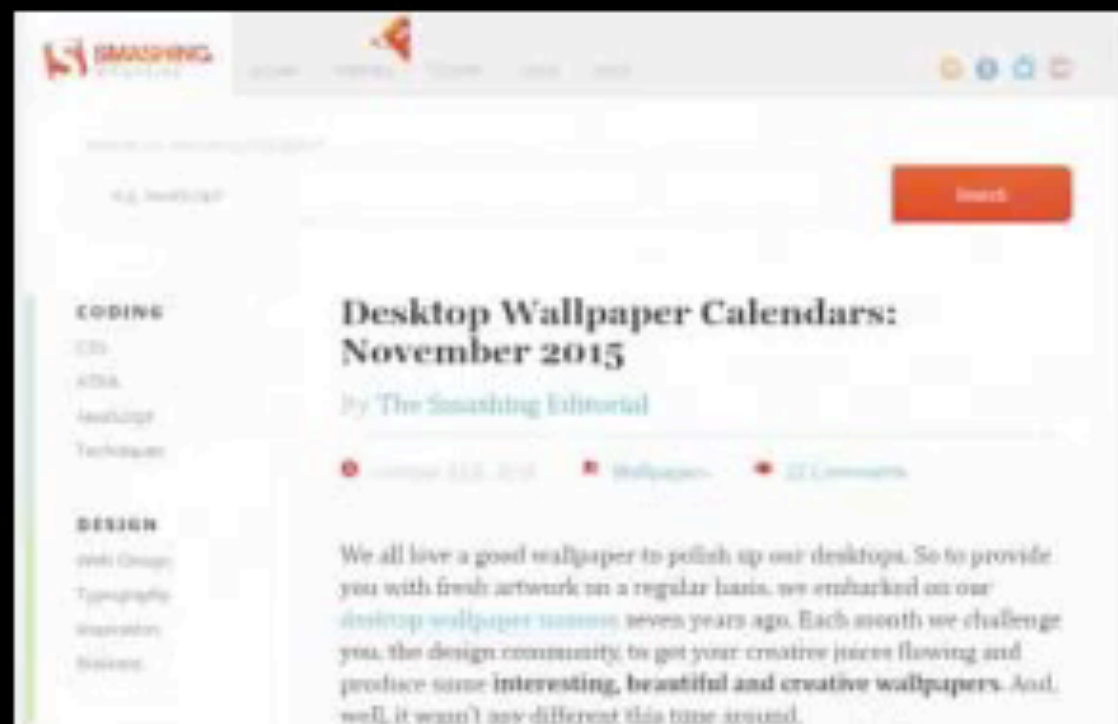
3.5

https://www.google.com/?gl=cr_sl&q=Berlin



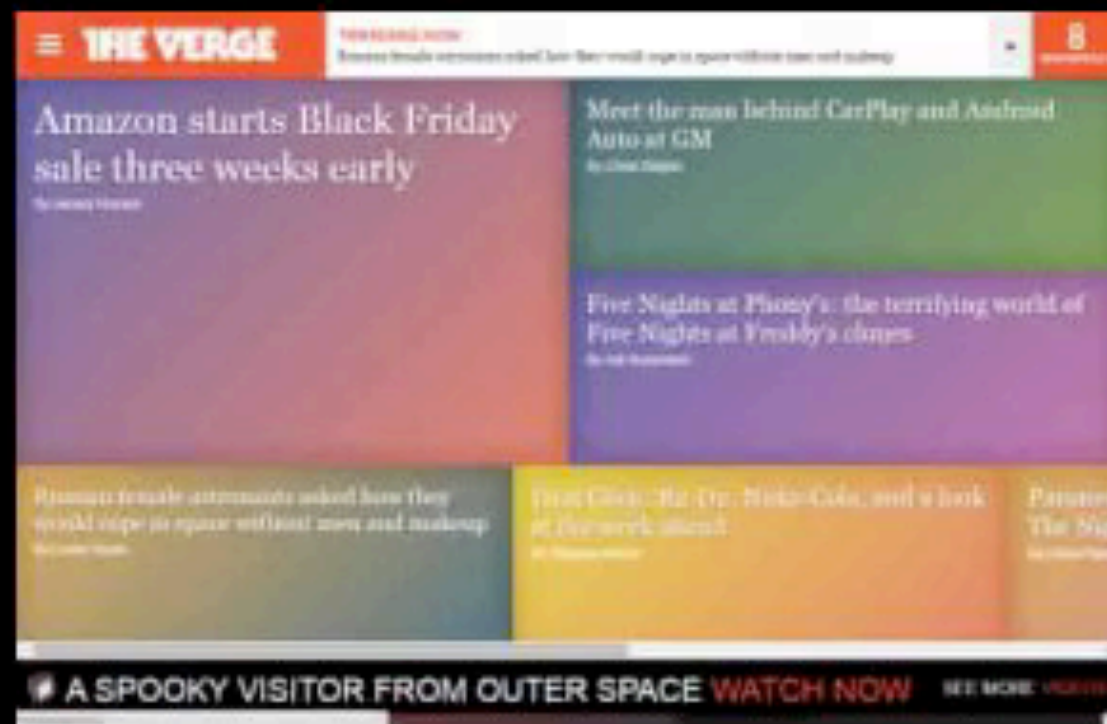
2.9

<https://www.smashingmagazine.com/>



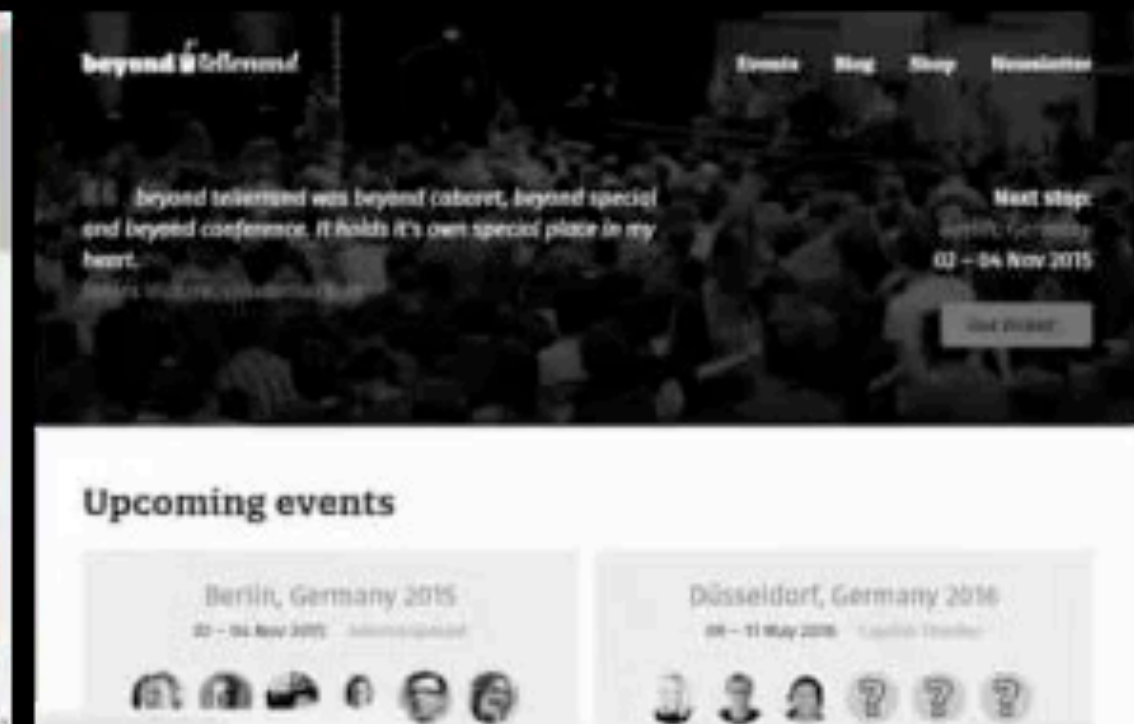
4.3

<https://www.theverge.com/>



4.3

<https://beyondtheborder.com/>



4.1

START RENDER TIME BUDGET

Current Start Render

2s

Start Render Budget

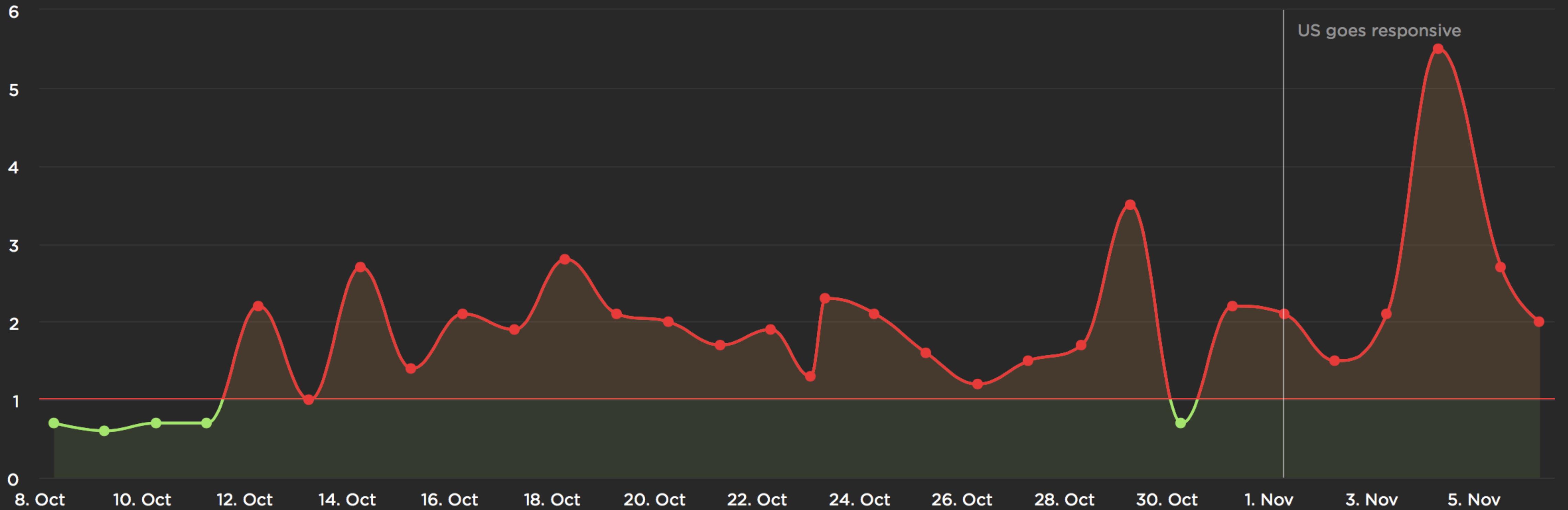
1s

Increase over 30 days (186%)

1.3s

Over budget (-100%)

-1s



W3C Web Timing Specs

Navigation Timing

overall page metrics

`performance.timing, .now()`

Resource Timing

individual HTTP requests

`performance.getEntries()`

User Timing

custom metrics

`performance.mark(), .measure()`

Search for:

MOST RECENT POSTS

[Joining SpeedCurve](#)[SERIOUS CONFUSION with Resource Timing](#)[Request Timeout](#)[do u webview?](#)[Onload in Onload](#)[View Archive](#)

FEEDS

[Posts](#)[Comments](#)

Moving beyond window.onload()

May 13, 2013 9:13 am | [11 Comments](#)

[Originally posted in the [2012 Performance Calendar](#). Reposting here for folks who missed it.]

There's an elephant in the room that we've been ignoring for years:

window.onload is not the best metric for measuring website speed

We haven't actually been "ignoring" this issue. We've acknowledged it, but we haven't coordinated our efforts to come up with a better replacement. Let's do that now.

window.onload

What we're after is a metric that reflects user perception, readability, and performance.

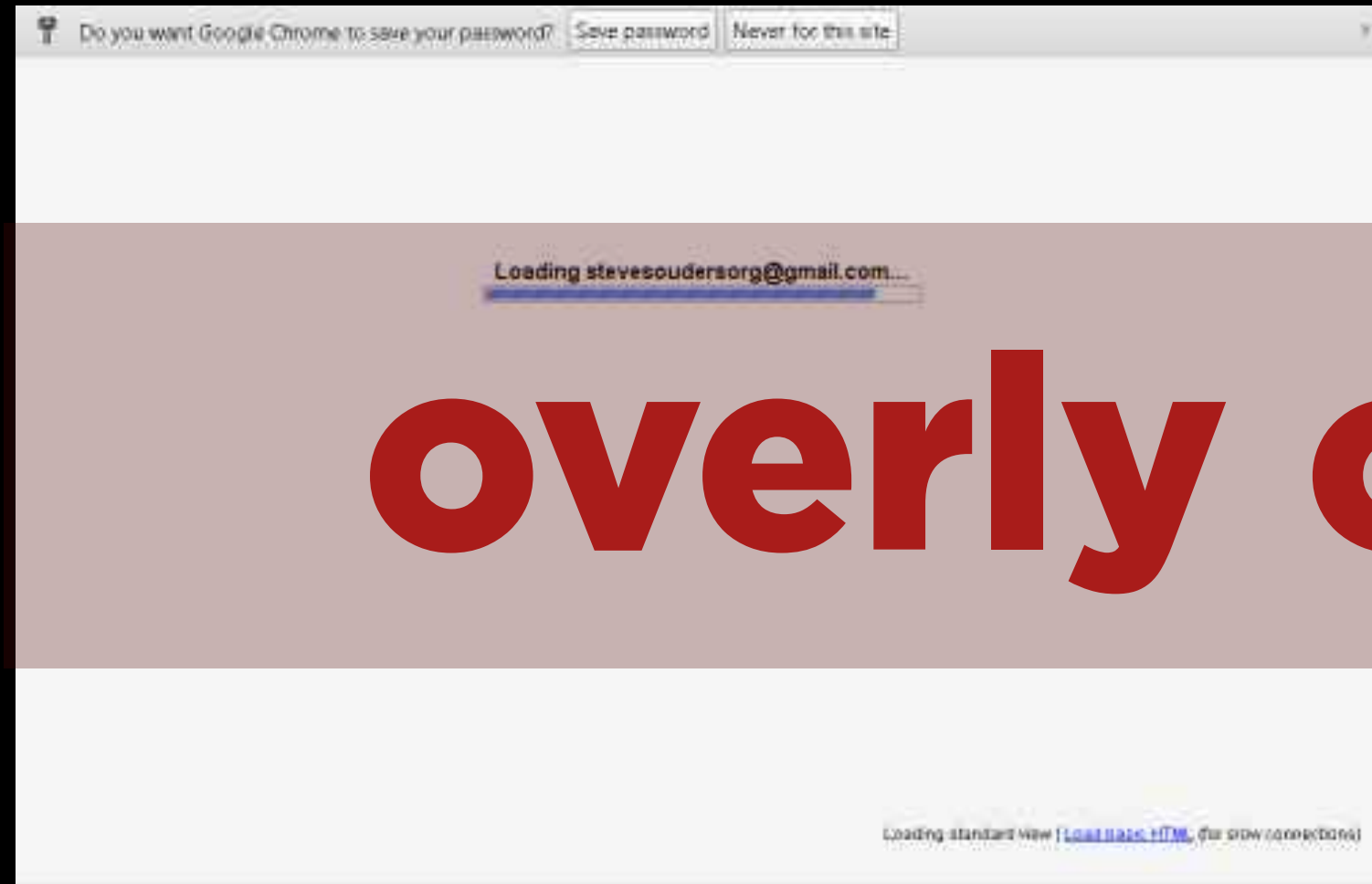
Ten years ago, when the web was static and pages were small, window.onload was a good proxy for when the page was ready. Back then, pages were small and loading delays and blocked resources were less common, as were the complex scripts that are now so common. Plus it had other desirable attributes.

- **standard across browsers** - window.onload means the same thing across all browsers. (The only exception I'm aware of is that [IE 6-9 don't wait for async scripts before firing window.onload](#), while most other browsers do.)
- **measurable by 3rd parties** - window.onload is a page milestone that can be measured by someone other than the website owner, e.g., metrics services like [Keynote Systems](#) and tools like [Boomerang](#). It doesn't require website owners to add custom code to their pages.
- **measurable for real users** - Measuring window.onload is a lightweight operation, so it can be performed on real user traffic without harming the user experience.

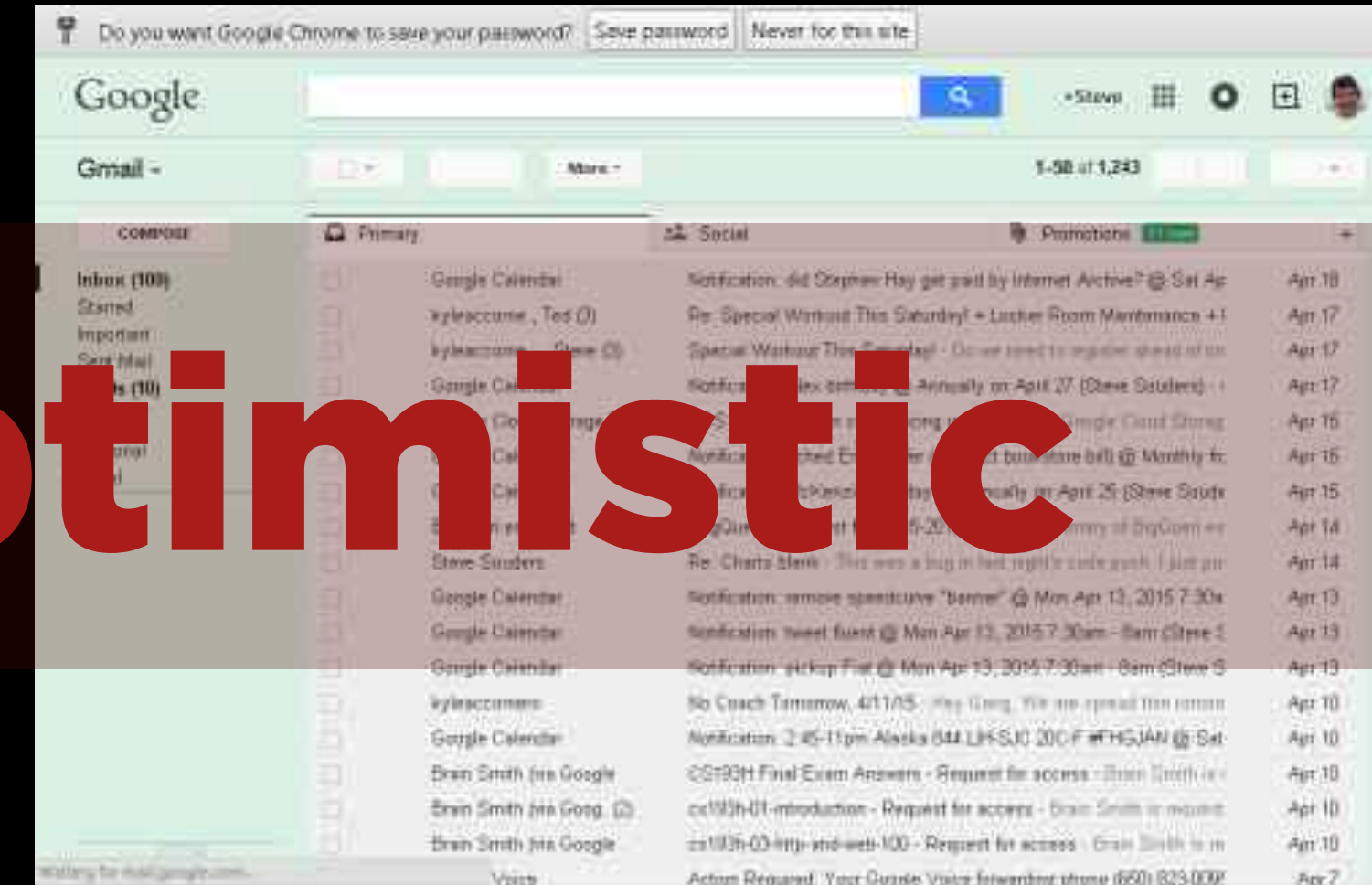
Web 2.0 is more dynamic

Fast forward to today and we see that window.onload doesn't reflect the user perception as well as it once did.

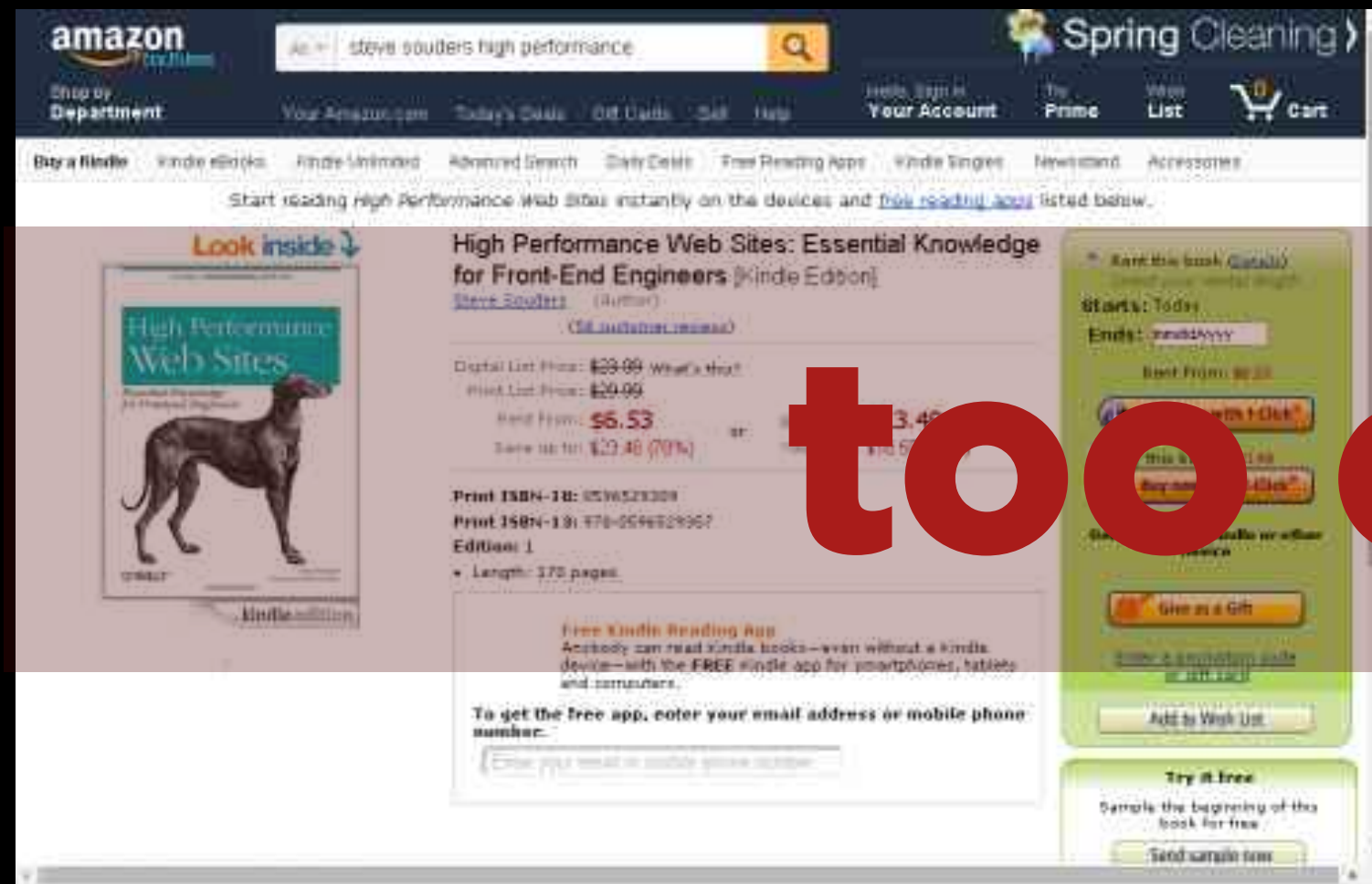
“window.onload is *not* the best metric for measuring website speed”



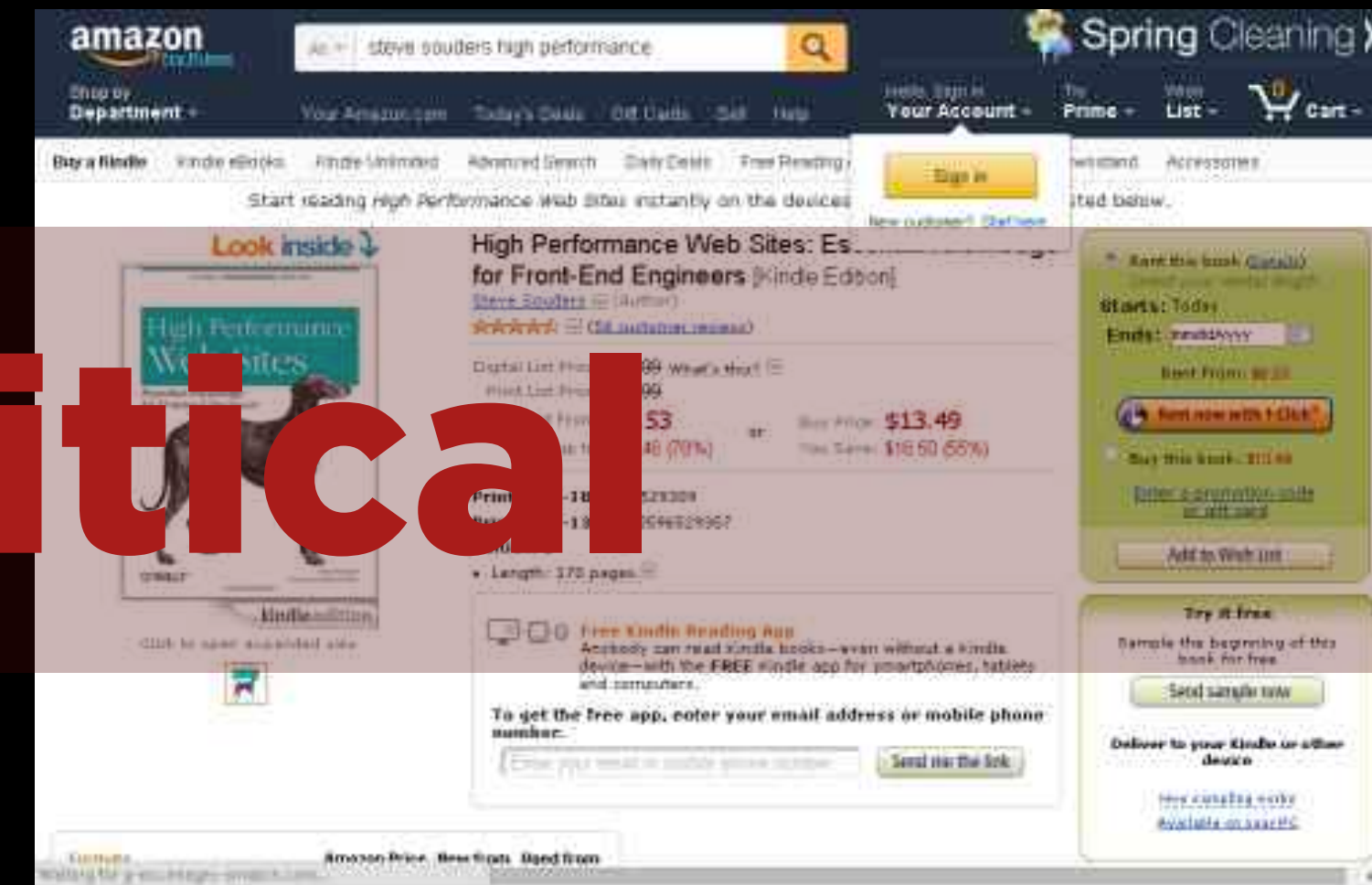
onload: 3.9s



98% ATF rendered: 4.7s



99% ATF rendered: 2.0s



onload: 9.7s

User Interface Design patterns

User Interface Design patterns are recurring solutions that solve common design problems. Design patterns are standard reference points for the experienced user interface designer.

Newest blog post: Review: Heatmap vs. Clickmap

Advertisement



Host Unlimited Domains
Unlimited disk space and
transfer for one low price.

Not all pixels are the same.

User Interface Design Patterns

Persuasive Design Patterns

Getting input

Getting the user to input data is a task that should be tailored to the context of use.

Visual navigation

The user needs to locate specific features and content and needs navigation to accomplish this.

Confirmation

Patterns of psychological tendencies that cause the human brain to draw incorrect conclusions.

Game mechanics

Games engage, involve, and influence us through its playful nature.

Dealing with data

Data can be searched, formatted, overviewed, and browsed in a variety of ways.

How to stay associated

How to stay associated, communicate, and interact with other people online.

The memory

Patterns in how we visually perceive, interpret, and remember meanings as we interact with systems.

Feedback

As the users interacts with your system feedback motivate them to take the next step.

Miscellaneous

Patterns that haven't found their main category yet.

Social

Allow the user to associate, communicate, and interact with





Site Speed

Jan 4, 2012 - Feb 3, 2012

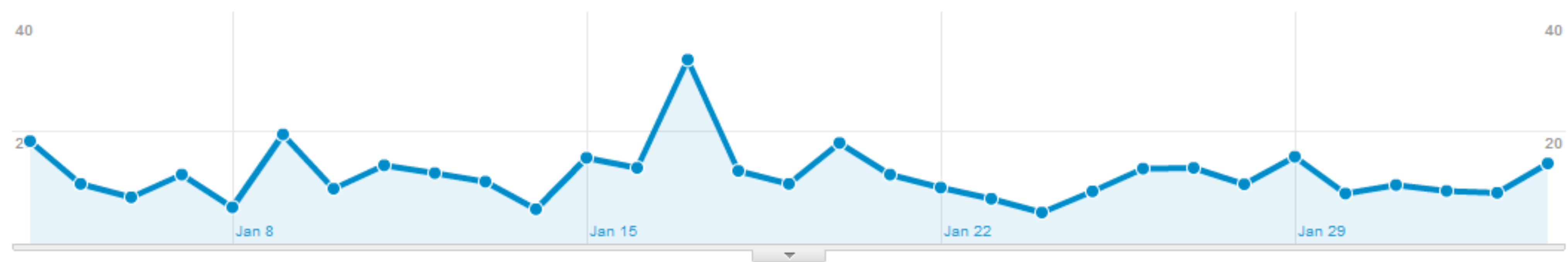
100.00% of total pageviews

Explorer Performance Map Overlay

Site Usage Technical

Avg. Page Load Time (sec) 12.86 Site Avg: 12.24 (5.05%)	Pageviews 6,197 % of Total: 73.06% (8,482)	Page Load Sample 453 % of Total: 77.84% (582)	Bounce Rate 82.27% Site Avg: 82.56% (-0.35%)	% Exit 76.78% Site Avg: 73.87% (3.93%)
---	--	---	--	--

Graph Mode: Line Chart Compare Metric Graph By:



Viewing: Page Page Title Other

Secondary dimension: Select... Sort Type: Default Advanced Filter ON edit View: 1 - 10 of 14

	Page		Avg. Page Load Time (sec) ↑	Pageviews	Page Load Sample	Bounce Rate	% Exit
1.	/google-analytics/		3.18	313	26	63.78%	49.84%
2.	/		3.54	396	22	53.62%	44.95%
3.	/wordpress-plugins/		7.98	139	12	86.60%	81.29%
4.	/how-to-choose-a-great-domain-name/		9.39	179	13	86.52%	79.33%
5.	/advanced-web-ranking-review/		9.41	143	27	81.73%	71.33%
6.	/google-analytics-event-tracking-measure-call-to-actions/		11.36	365	30	82.62%	78.63%



Custom Metrics

C₃

U₁

S₁

T₁

O₁

M₃

Custom Metrics

Define most important elements on the page

Custom Metrics

Define most important elements on the page

Measure using User Timing

Custom Metrics

Define most important elements on the page

Measure using User Timing

Track with RUM *and* synthetic



Improving performance on twitter.com

Tuesday, May 29, 2012 | By Twitter (@twitter) 05/29/2012 - 21:23

Tweet

To connect you to information in real time, it's important for Twitter to be fast. That's why we've been reviewing our entire technology stack to optimize for speed.

When we shipped [#NewTwitter](#) in September 2010, we built it around a web application architecture that pushed all of the UI rendering and logic to JavaScript running on our users' browsers and consumed the Twitter REST API directly, in a similar way to our mobile clients. That architecture broke new ground by offering a number of advantages over a more traditional approach, but it lacked support for various optimizations available only on the server.

...

Reducing time to first tweet

Before starting any of this work we added instrumentation to find the performance pain points and identify which categories of users we could serve better. The most important metric we used was "time to first Tweet". This is a measurement we took from a sample of users, (using the [Navigation Timing API](#)) of the amount of time it takes from navigation (clicking the link) to viewing the first Tweet on each page's timeline. The metric gives us a good idea of how snappy the site feels



Under the hood

Tools, projects & community

engineering.twitter.com

Tweets

Follow



Twitter
Engineering
@TwitterEng

16 Apr

We're sharing updates on how we use MySQL & our plans to open source Mysos, a new MySQL on Apache Mesos framework.

blog.twitter.com/2015/another-l..

Show Summary



Twitter
Engineering

15 Apr



Steve Souders
@Souders

TWEETS **5,584** FOLLOWING **43** FOLLOWERS **26.1K**


Gain more followers
Promote your account and get discovered by more people on Twitter. Preview it first below

Trends · Change

- Full House
- #Mobilegeddon
- #RSAC
- #internetbestfriendday
- #RuinThePartyIn5Words
- #TNWEurope
- star wars
- Android Wear
- Apple Watch
- Steve Byrnes


Who to follow · Refresh · View all

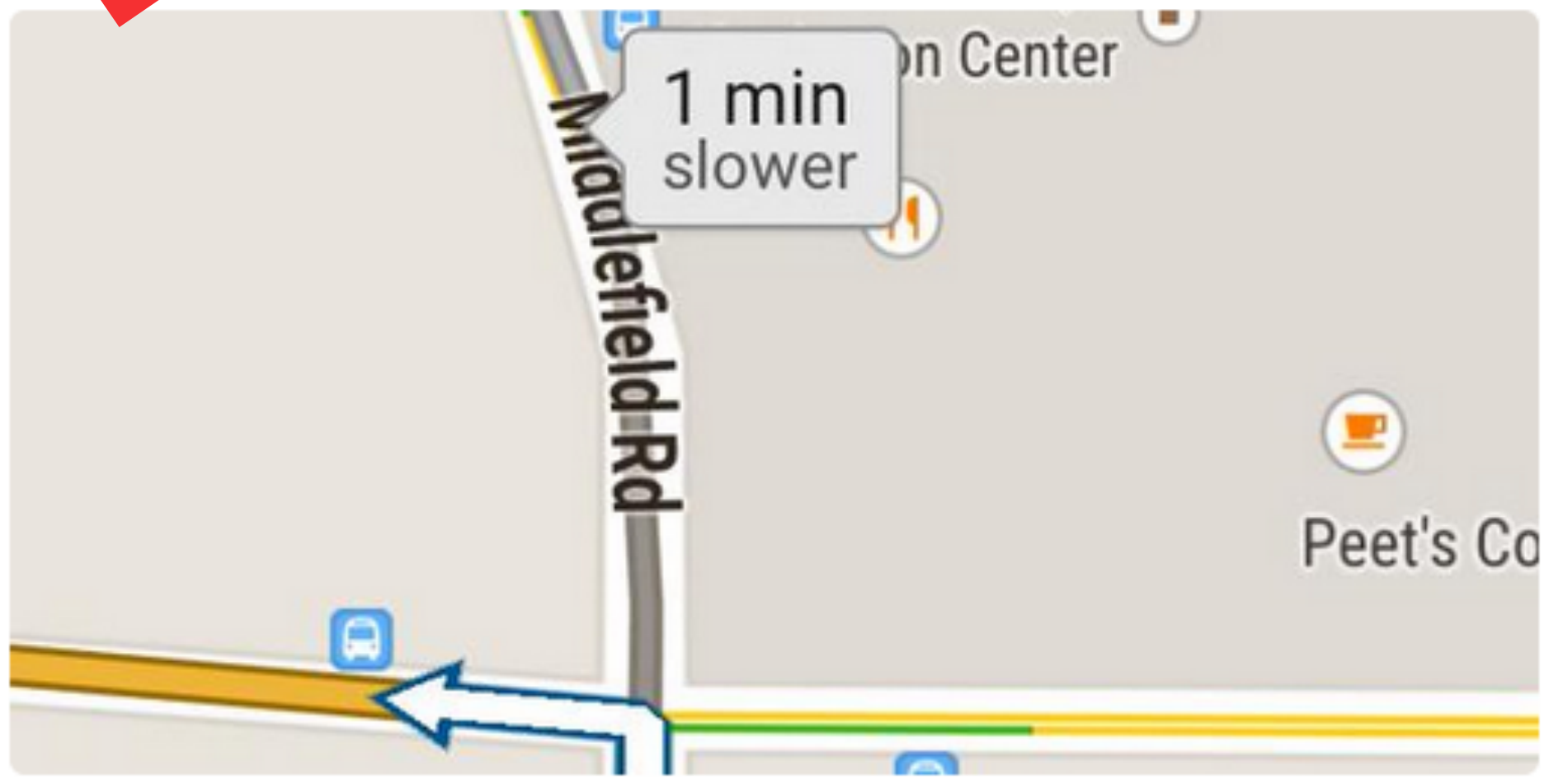
-  **Pretty State Machine** @kerr...
[Follow](#)
-  **Chad Fowler** @chadfowler
[Follow](#)
-  **Jonah Kowall** @jkowall

What's happening? 


 **Eric Lawrence** @ericlaw · 45m
If you're going to mangle your JPEG into a 256 color PNG, at least have the decency to use Zopfli to deflate it.


   





 **Almaer** @dalmaer · 1h
What is my "if only a minute don't keep bugging me" setting @GoogleMaps?
#Mobilegeddon #OfError #ux



  1  2  [View photo](#)

 Yehuda Katz retweeted

 **James Kyle** @thejameskyle · 3h
Breaking News: #ThoughtLeaders still unsure about this new JavaScript thing. @wycats reporting live at the scene.

  10  18  [View conversation](#)


 **Fastly** @fastly · 2h
Good morning #rsac! We'll be here all week, so come visit us at booth #2736 and hear about how we can help your site.

image load time custom metric

```
<div class="stream-item-header">  
  <a class="account-group js-account-group js-action-profile js-  
user-profile-link js-nav" href="/ericlaw" data-user-id="5725652">  
      
    <strong class="fullname js-action-profile-name show-popup-with-  
id" data-aria-label-part> Eric Lawrence </strong>
```


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```

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performance.measure('imgDisplayed');
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```
<script>
performance.clearMeasures('imgDisplayed');
performance.measure('imgDisplayed');
</script>
```




Steve Souders
@Souders

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[View photo](#)


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10 18

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Custom Metrics

HERO PRODUCT IMAGE

Current

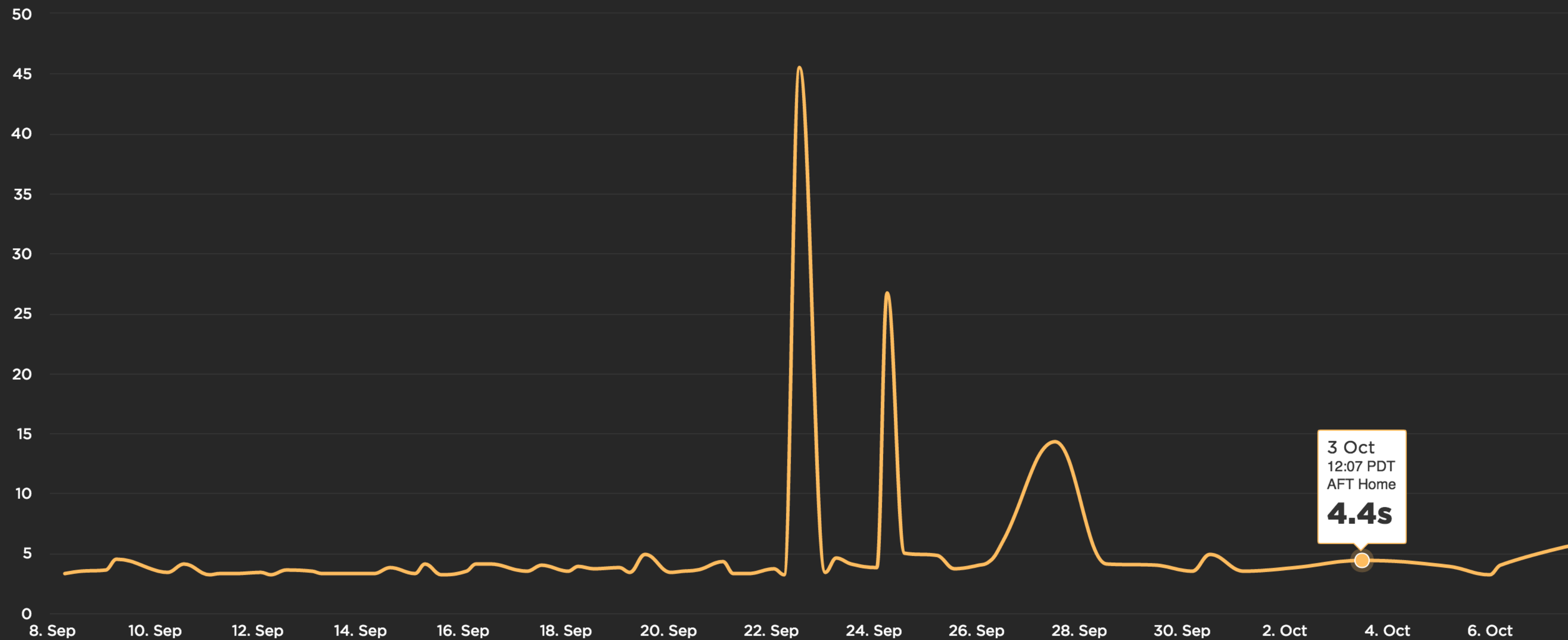
5.6s

Change over 30 days

2.3s

Change over 30 days

70%

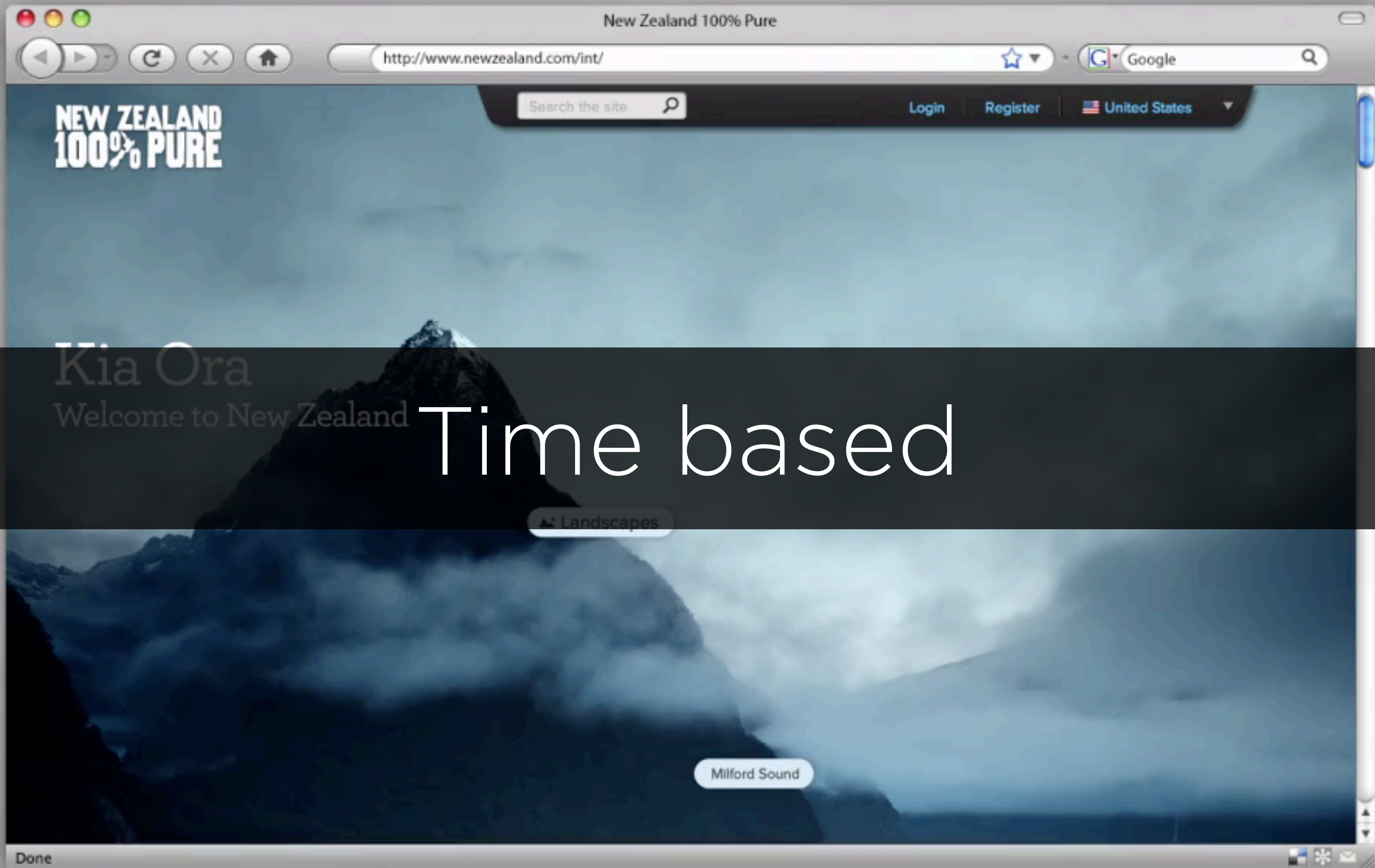


A large crowd of people is seated in a stadium, many holding up their smartphones to take photos or videos. The scene is brightly lit, and the crowd is dense, filling the bleachers. The text "Measure content for users" is overlaid in white on a dark horizontal band across the middle of the image.

Measure content for users

A photograph of a collaborative workspace. In the foreground, several computer monitors are visible on desks. In the background, three people are working. One person is standing and looking at a whiteboard covered in sticky notes. Another person is sitting at a desk with a computer. A third person is also visible. The walls are covered with whiteboards and red bulletin boards, all filled with papers, diagrams, and sticky notes. The room is brightly lit by overhead lights.

Small Interdisciplinary Teams



NEW ZEALAND
100% PURE

Search the site

Login

Register

United States

Kia Ora
Welcome to New Zealand

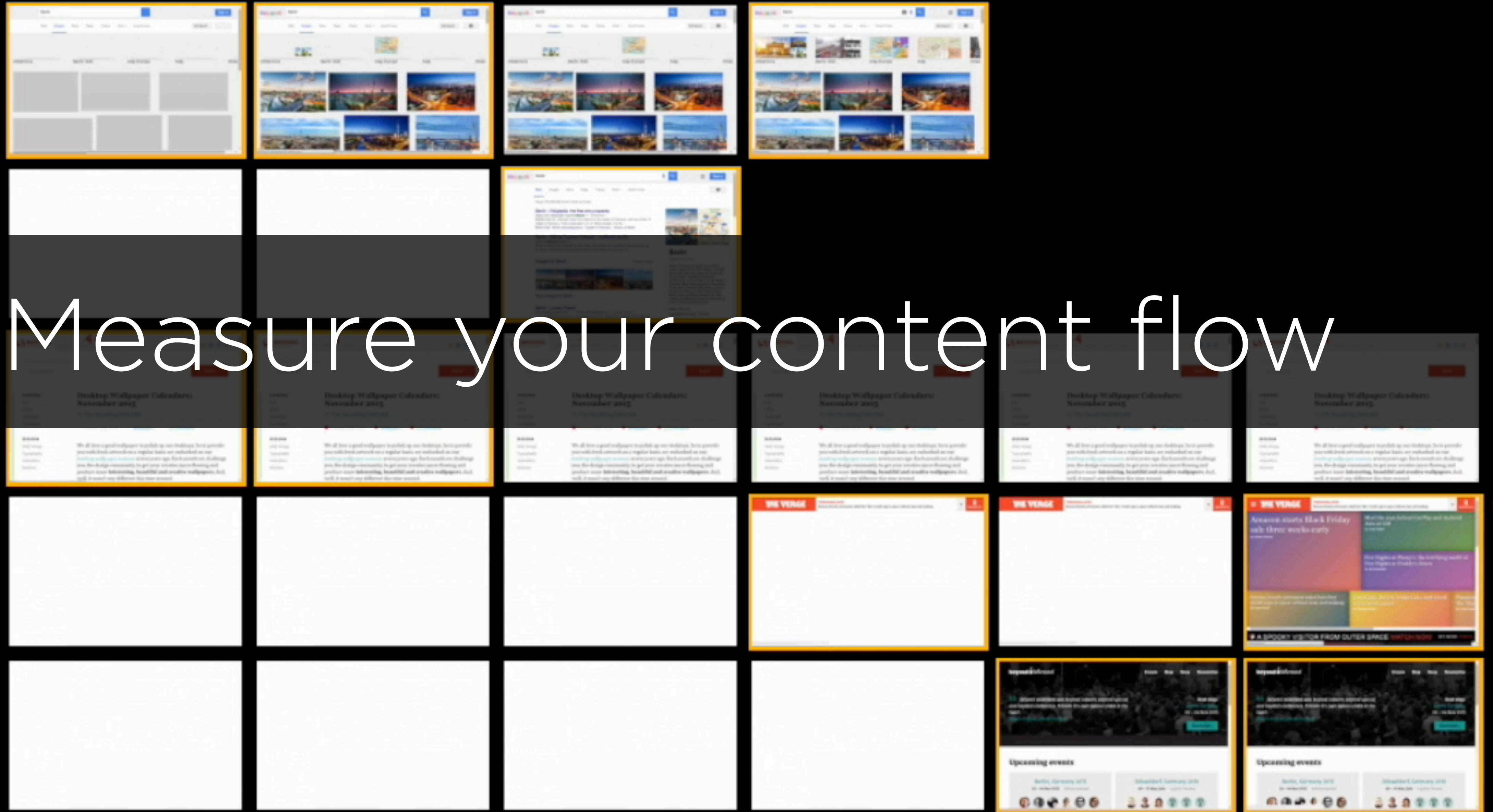
Time based

Landscapes

Milford Sound

Done

Measure your content flow



Have an awesome BT!



 **SpeedCurve**