# Build Right: Maker Series - Tim Kadlec

**Performance Budgets**

April 23, 2015


Hello, Maker Series Attendees!

First, BE NICE! Let's use this document for collaborative notes, announcements, comments—whatever!

*On Twitter: @brworkshop, #brworkshop, @tkadlec, @hearsparkbox*

Giveaways & Discounts for all attendees:
- **Frontend Masters**: You will be given a unique code for a free 1-year membership to Frontend Masters ($390 value). Once you have that code, activate your membership here: https://frontendmasters.com/enroll/prepaid/. ***Tweet to Marc (@1Marc) to thank him for this generous gift!***
- **After lunch, make sure to tweet @harvest and thank them!**


Lack of performance means lack of planning

Pre-optimization is the root of all evil
- but post-optimization is too, because it NEVER happens…

Performance is so VERY critical to user experience.

**Performance Stats:**
- Walmart:
  - down 100ms = 1% up in revenue
- Yahoo
  - down 400ms = 9% up in traffic
- Firefox
  - down 2.2s = 15.4% up in conversions
- Etsy (mobile)
  - up 160kb = 12% increase in bounce rate
  - experimentation with adding extra images
- Google
  - up 500ms = down 25% searches
  - experimentation with bumping up with artificial weight

- Netflix
  - Enabling Gzip saw 43% bandwidth bill decrease

Backing up with data and sprinkling in *what people care about* speaks to people to get them on board.

Just about anything that matters from a business perspective, there is data to back up that performance has a benefit for that.

Search Twitter for "slow site" and see what people are saying about those experiences.

http://perf-tooling.today/
Neat resources ^

## Performance Budgets
Performance budget = get concrete about something. A tangible point of reference.

http://webpagetest.org
AWESOME tool. Test URLs and get a detailed report.

Four types of metrics:
1. **Quantity Based**
   a. Easy to understand
   b. Clear tie to design/dev decisions
   c. Not very indicative of the UX at all
      i. http://www.filamentgroup.com/lab/weight-wait.html
2. **Rule Based Metrics**
   a. Metrics based on adherence to a set of rules or guidelines
   b. yslow.org
   c. Google Page Speed
   d. A little closer to the user experience, but not very much
   e. Biggest risk is stopping with just these metrics.  They are a good start.
3. **Milestone Timings**
   a. Timing of a very specific milestone in the course of loading a page
   b. Start render
   c. DOMContentLoaded
   d. When document fires onLoad event
   e. Fully loaded (everything done)
   f. (see other potential milestones from the W3C Timing API)
   g. Easy to track, easy to communicate, user timing allow for specific metrics
      i. Limited representation of user experience
4. **Speed Index**

      a. A representation of the perceived load of a page from start to finish
      b. Closely tied to user experience
      c. Difficult to communicate
      d. Limited Tracking

A strong performance budget strategy involves all of those things, taking advantage of the good parts of all of them.


Speed Index <= 1000 (Paul Irish gold standard)
Potentially overkill if you're just getting rolling (think of Tim's example of trying to run and then hating it)

**Tools**

Audit 10-12 competitors
- [webpagetest.org/getkey.php](webpagetest.org/getkey.php)
  API key for a variety of tools

- [webpagetest-mapper](webpagetest-mapper)
  Command line tool to get Web Page Test data from multiple competitors

- [WPT-bulk-tester](WPT-bulk-tester)
  Google spreadsheet tool to get Web Page Test data from multiple competitors

- Using with Pattern Lab to weigh elements as we build them (GENIUS!)
  https://gist.github.com/tkadlec/7e352b74b1961a3e36d7

- http://lafikl.github.io/perfBar/
  Perf Bar

- https://github.com/tkadlec/grunt-perfbudget/
  grunt perf budget. run the task whenever you want, sits on top of WPT. Tim has it run on a formal build of pass or fail. Will not let it go live if it doesn't perform to our budget.
  - You can spit the output out and graph it
  - Do user timing and define a budget on that
  - Task will fail if it is not met. Can't go anywhere until it's fixed.

- http://www.sitespeed.io/
- https://speedcurve.com/
  - Track WPT results.
- http://www.html5rocks.com/en/tutorials/webperformance/usertiming/
- http://perfaudit.com/

- http://aerotwist.com/blog/my-performance-audit-workflow/

**Tips**
- Get your current baseline metrics to start while you develop tooling and process to evaluate your budget.  Then, start shaving down after you understand the details.
- 20% faster is a good place to start
- Have tools constantly there in development that is impossible to ignore

**Articles/Books:**
- **More Weight Doesn't Mean More Wait** - Filament Group
  http://www.filamentgroup.com/lab/weight-wait.html
- **How to use WPT-bulk-tester** - Andy Davies
  http://calendar.perfplanet.com/2014/driving-webpagetest-from-a-google-docs-spreadsheet/
- **How to make a performance budget** - Dan Mall
  http://danielmall.com/articles/how-to-make-a-performance-budget/
- **Designing for Performance** (book) - Lara Hogan
  http://www.amazon.com/Designing-Performance-Weighing-Aesthetics-Speed/dp/1491902515

- **Designing and Engineering Time** (book)

- **Flow** (book)

- **Responsible Responsive Design** (book) - Scott Jehl

- http://jankfree.org/ - collection of articles, etc on browser rendering performance

**Questions:**
1. When the developer tells the designer "You have 100KB for images", where does that 100KB come from? Why not 50KB, 84KB?f
2. How do you scale? What to consider when scaling?
3. How do you create cultural change?
4. How do you handle third-party tracking and analytics tools required by business and marketing?
5. Can deferring elements above the fold be problematic for user experience since content can move down page while reading? Happens a lot on news sites.

6. Can you explain Speed Index again please? :]
   WebPageTest.org definiton: "*The Speed Index is the average time at which visible parts of the page are displayed.  It is expressed in milliseconds and dependent on size of the view port.*" - https://sites.google.com/a/webpagetest.org/docs/using-webpagetest/metrics/speed-index
7. WebPageTest - If 676 is a pretty good Speed Index, how much is a bad Speed Index?'
   a. What is the threshold between good and not-good?
8. Are there good resources to understand waterfall and milestones? Sounds like certain metrics are impacted by server speed vs HTML/CSS/JS.