

# The Shape of Uncertainty

A blurred background image of the Seattle skyline, featuring the Space Needle on the right and snow-capped mountains in the distance across a body of water.

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The New Yorker

July 20, 2015

The next full-margin  
rupture of the Cascadia  
subduction zone will  
spell the worst natural  
disaster in the history of  
the continent.



Our house

Year built:  
1962

Foundation:  
Cinder  
blocks with  
no rebar



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# Types of Metrics

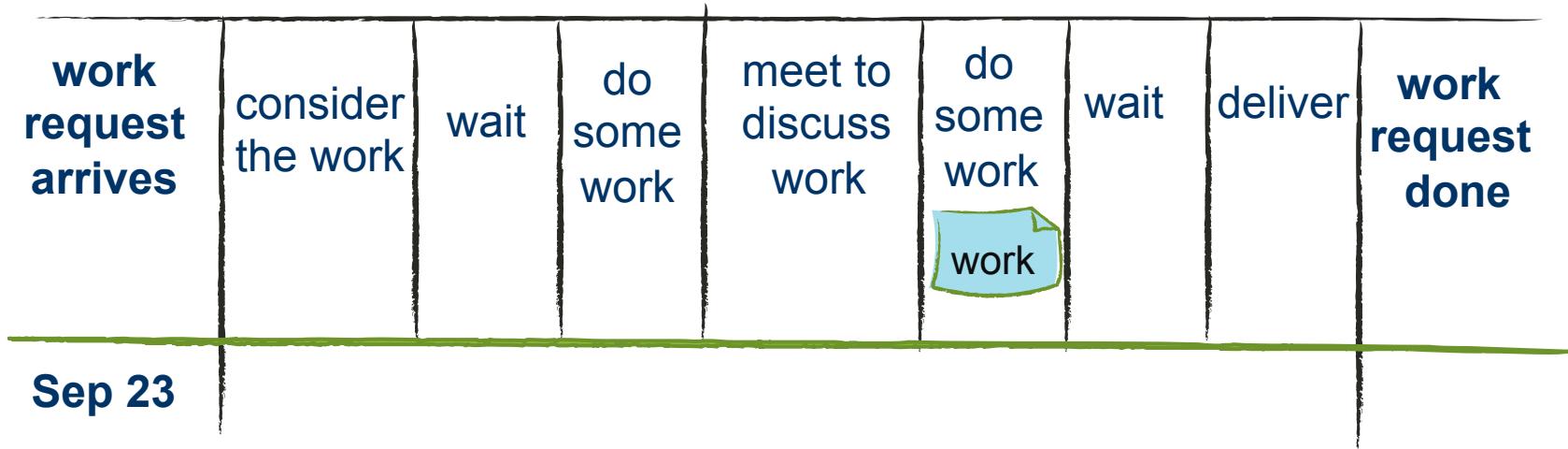
Descriptive

Predictive

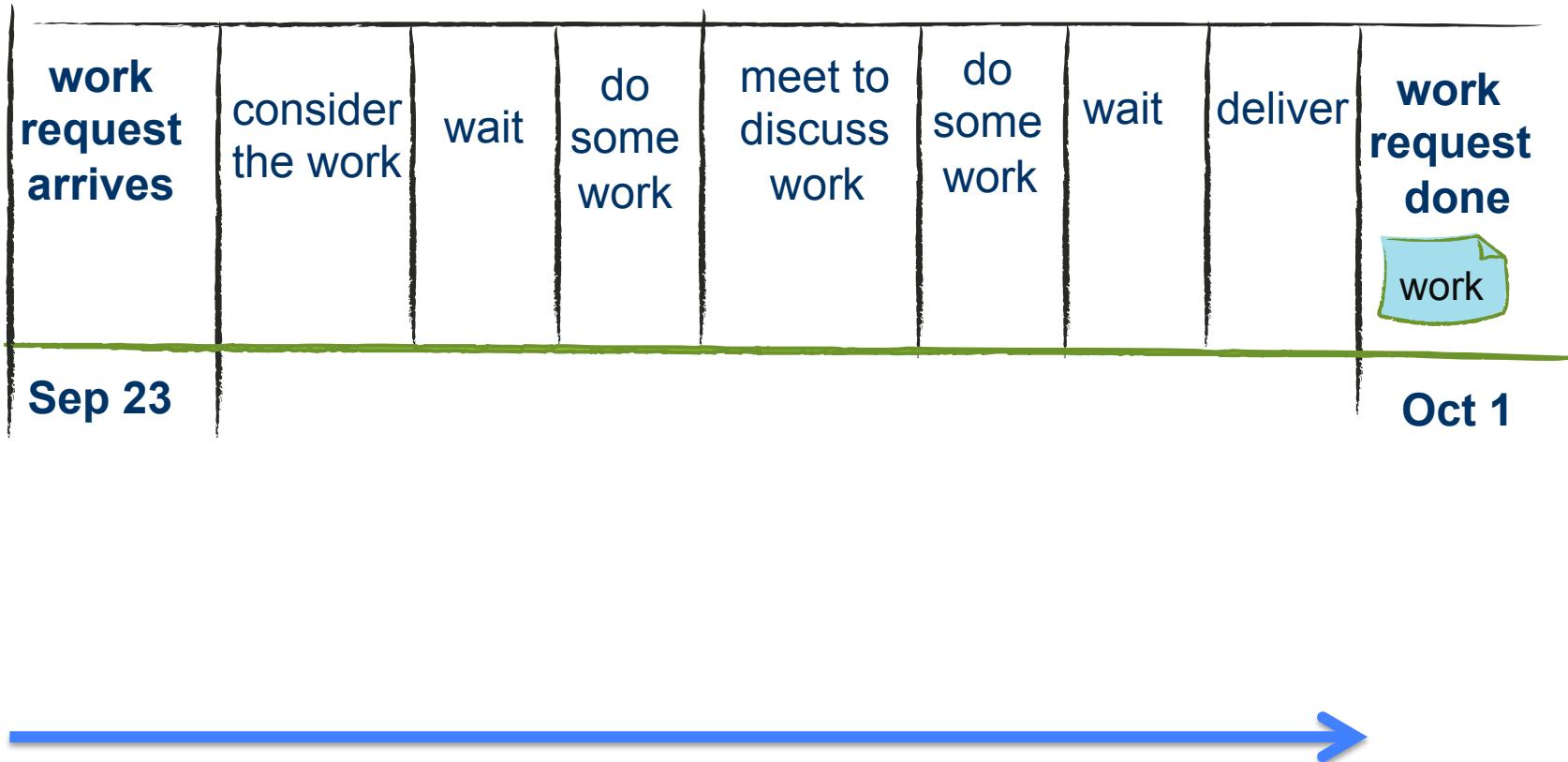
Prescriptive

We are trying to be approximately right instead of exactly wrong.

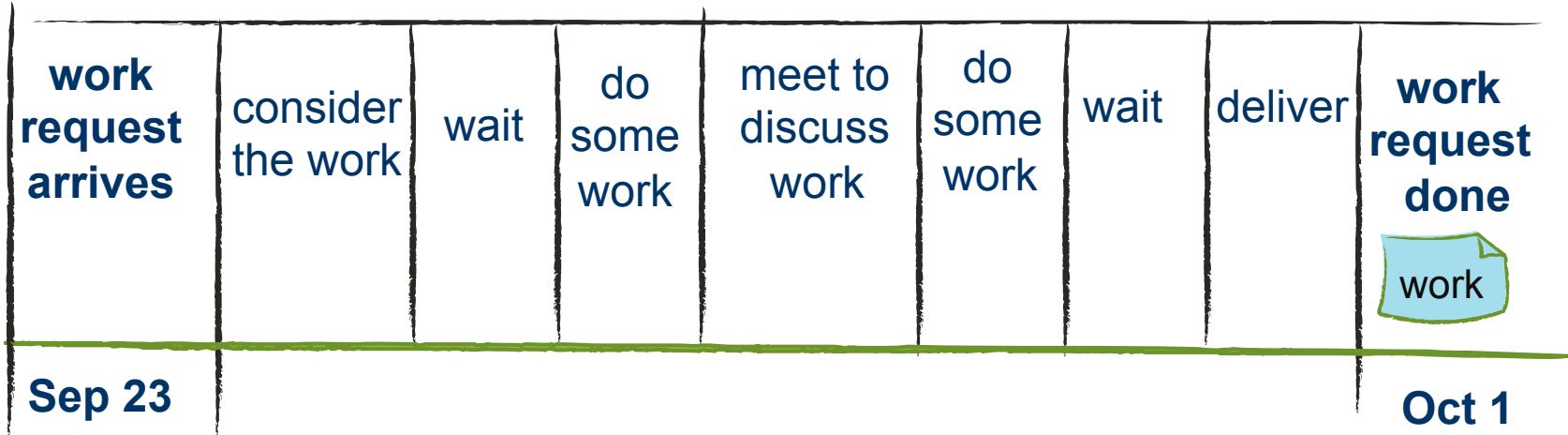
# When will work be done?



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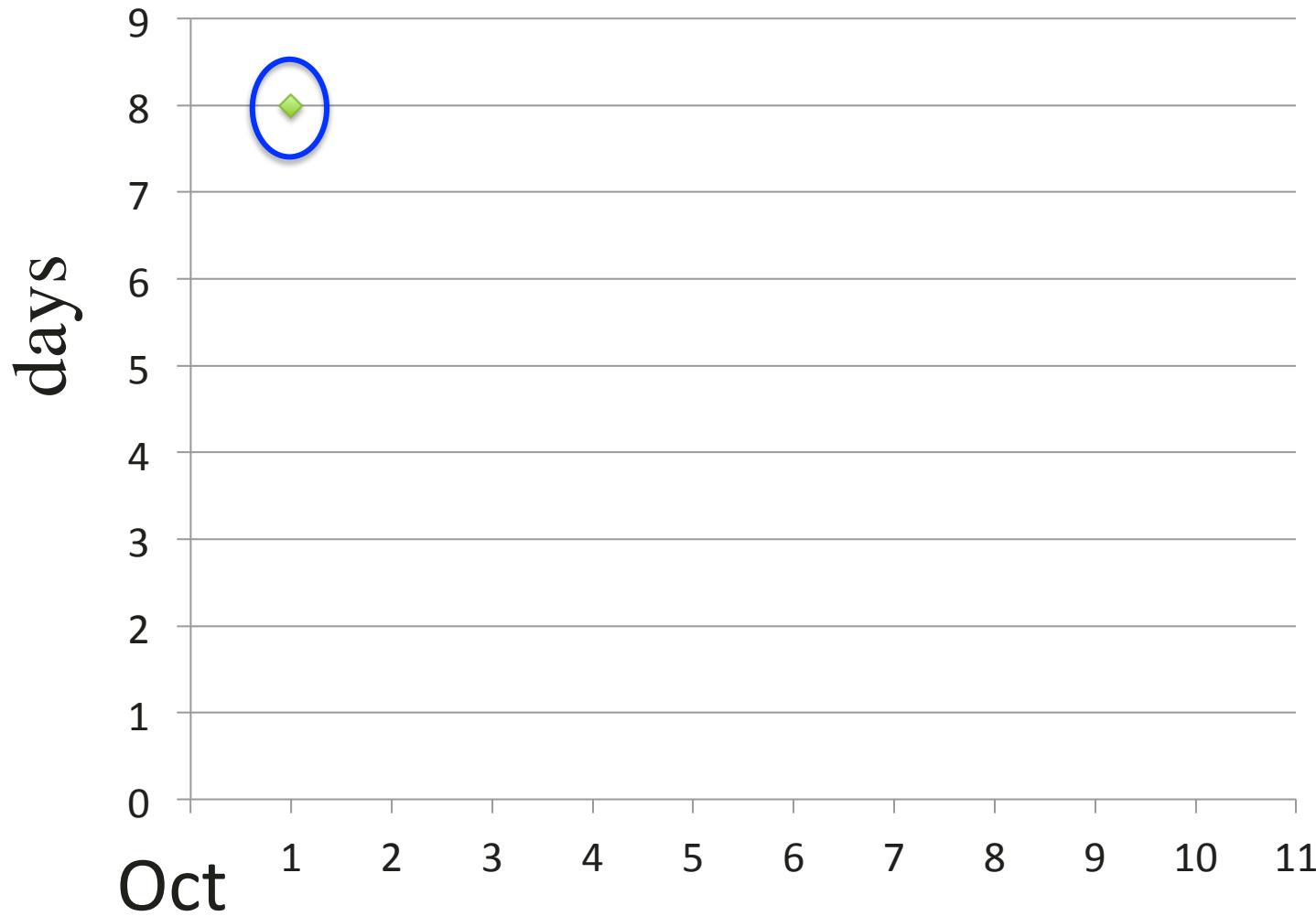
# When will work be done?



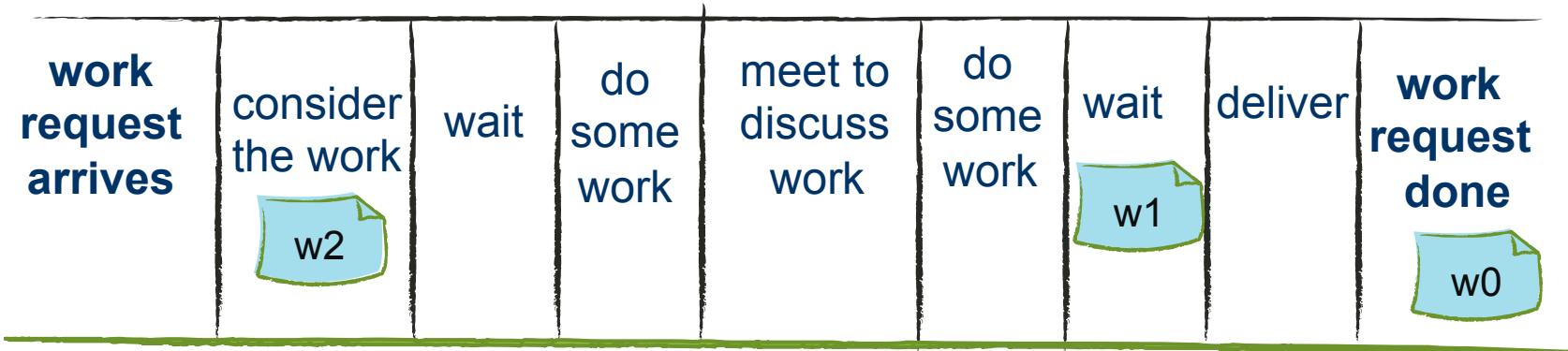
The elapsed time for the work to get done is 8 days

Flow time (Process time + wait time) = 8 days

# Plotting elapsed work Flow time



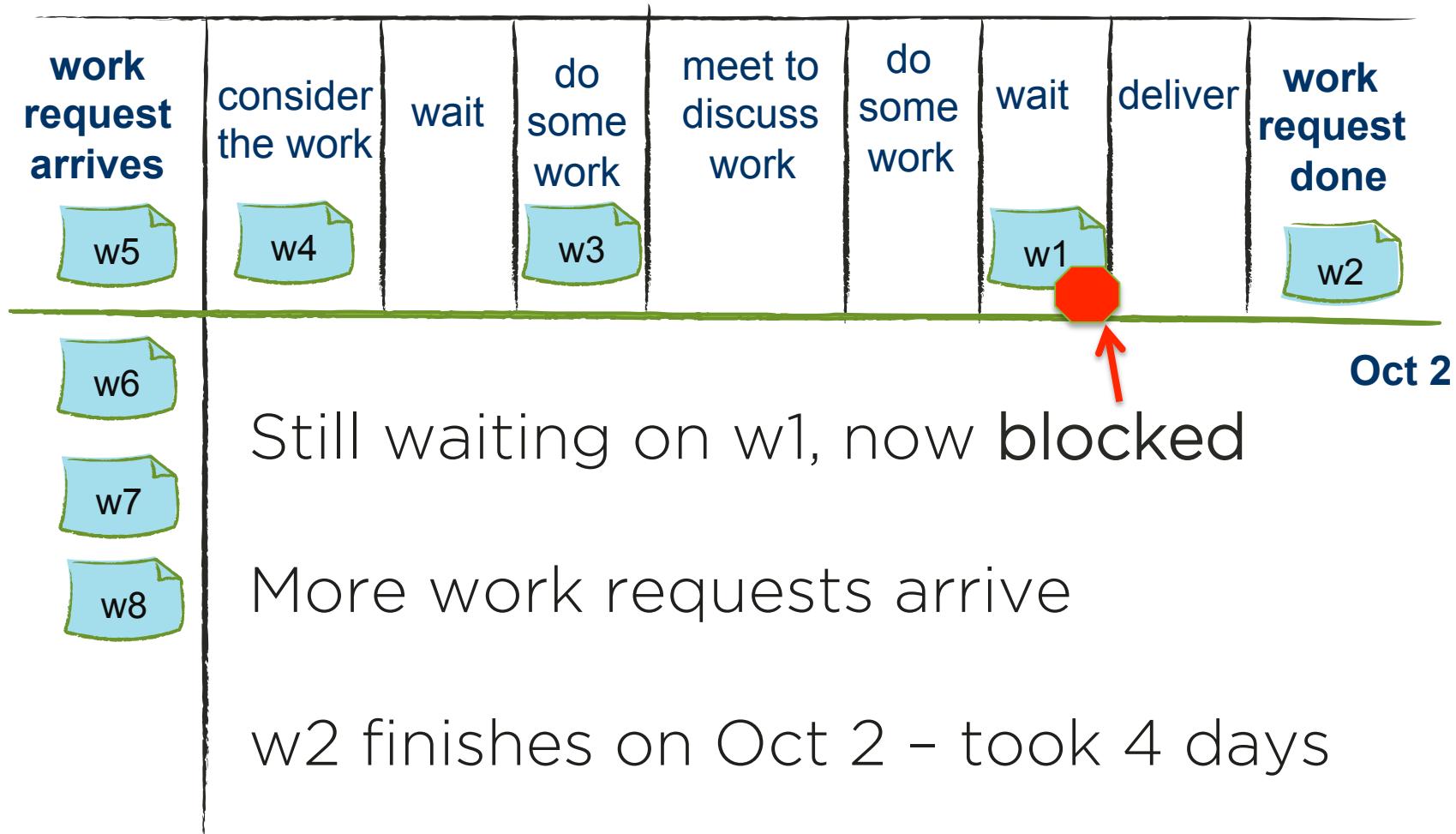
# More work gets started



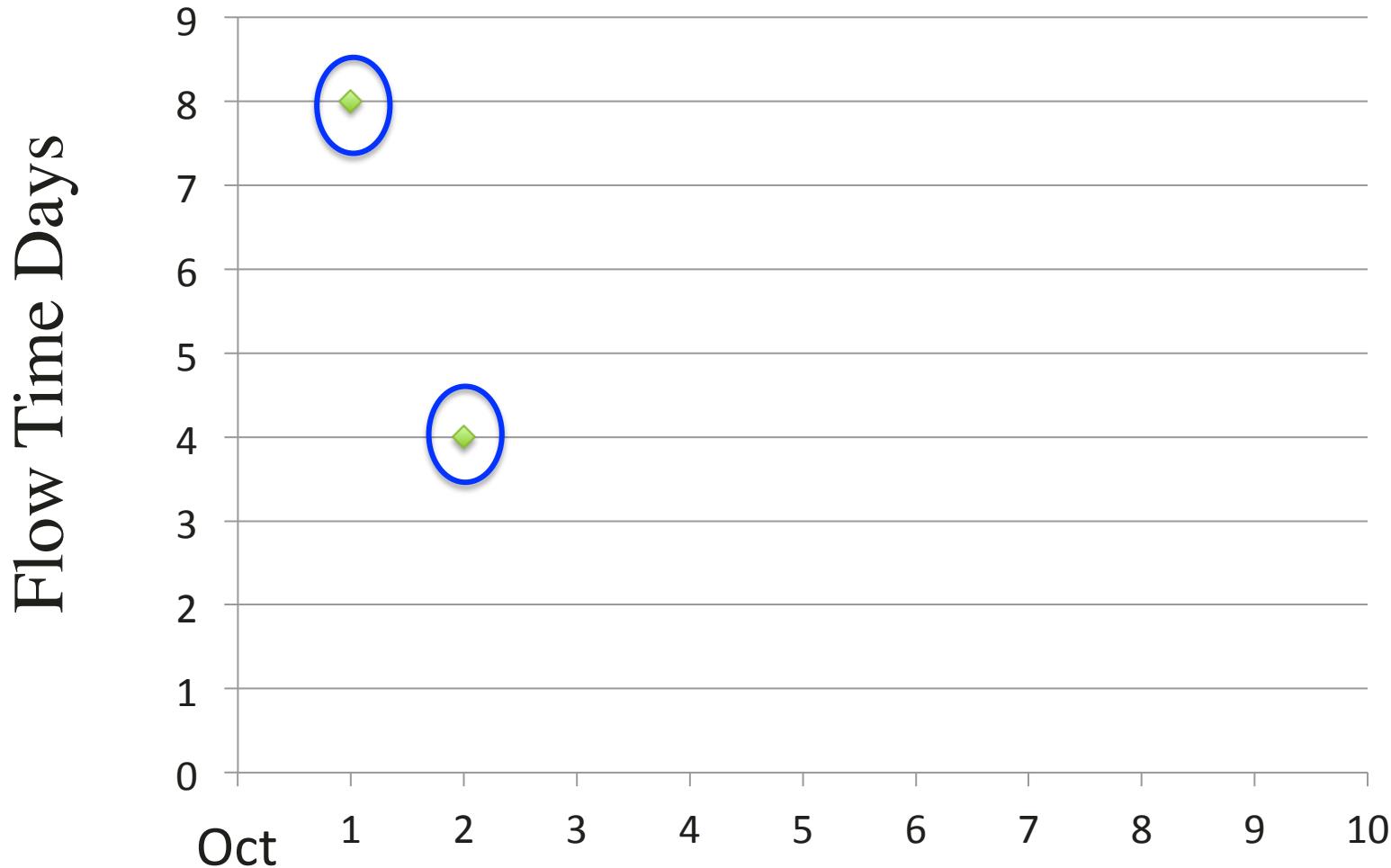
w1 comes in and makes it almost all the way to done, but gets hung up waiting on vendor.

While we're waiting, we pull in work item w2.

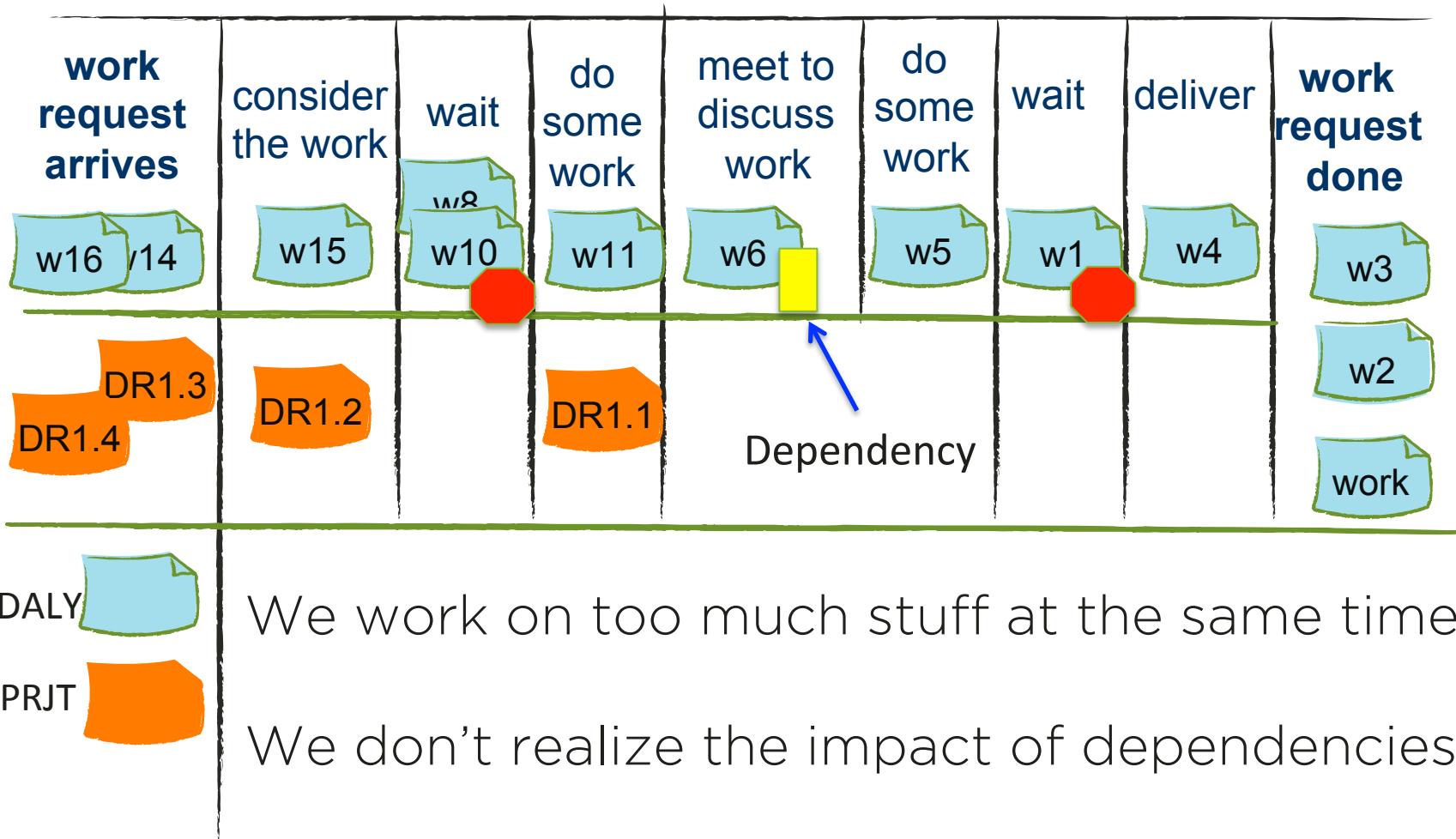
# The problem in knowledge work is delayed feedback



# Plotting elapsed work Flow time



# Starting new work faster than finishing prior work = No flow



# Dependency $\times$ 2

you	friend
X	
	X
X	X

What's the likelihood of  
Arriving on time?

# Dependency $\times$ 2

you	friend
X	
	X
X	X

What's the likelihood of Arriving on time?

1 chance in 4 = 25%  
of arriving on time

# Dependency × 3

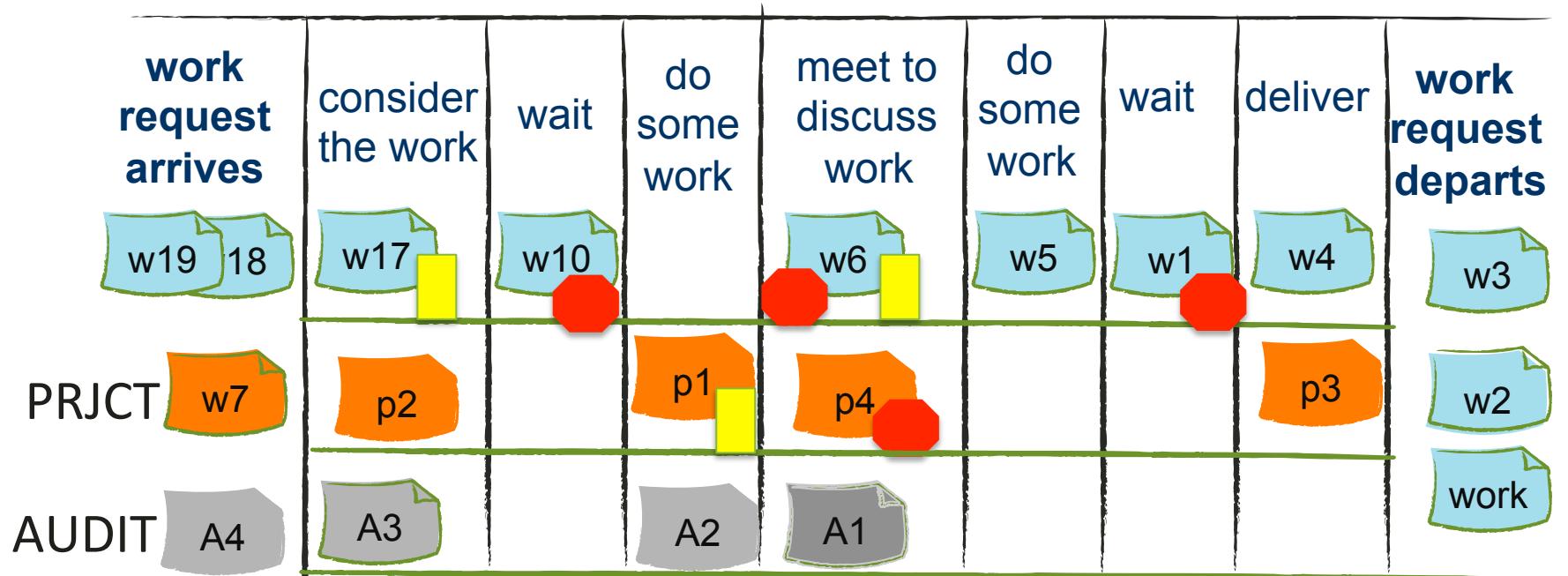
you	friend	brother
X		
	X	
X	X	
		X
X		X
	X	X
X	X	X

# Dependency $\times$ 3

you	friend	brother
X		
	X	
X	X	
		X
X		X
	X	X
X	X	X

1 chance in 8  
= 12.5% of  
arriving on time

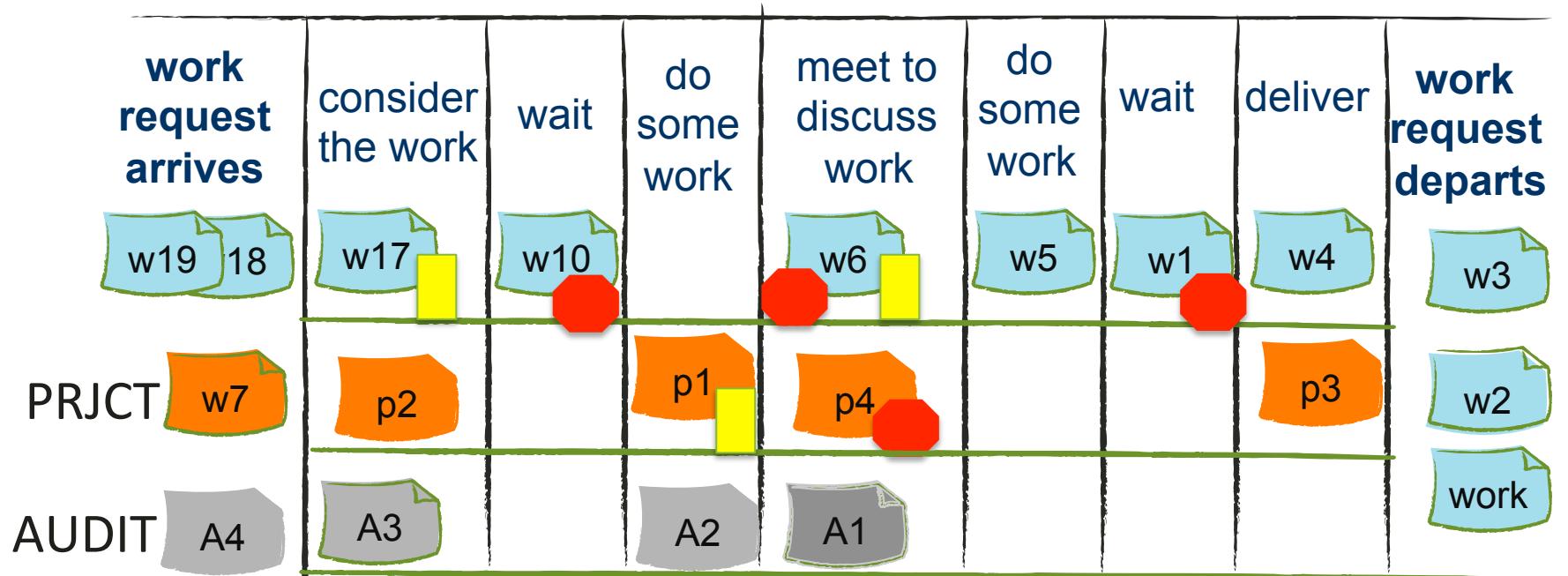
# Flow - the movement & delivery of value through the pipeline



That point when we said it would only take 2 days, but it actually took 2 weeks.

We have become unpredictable.  
And our fellow workers don't trust us anymore.

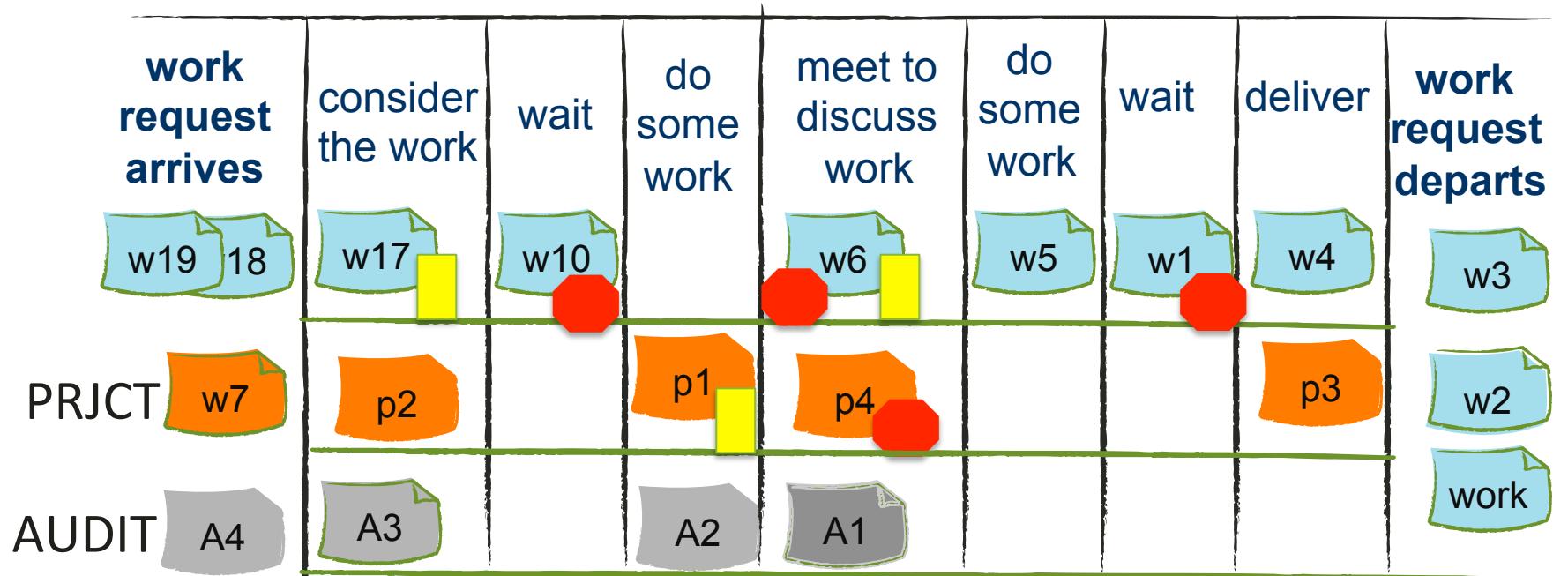
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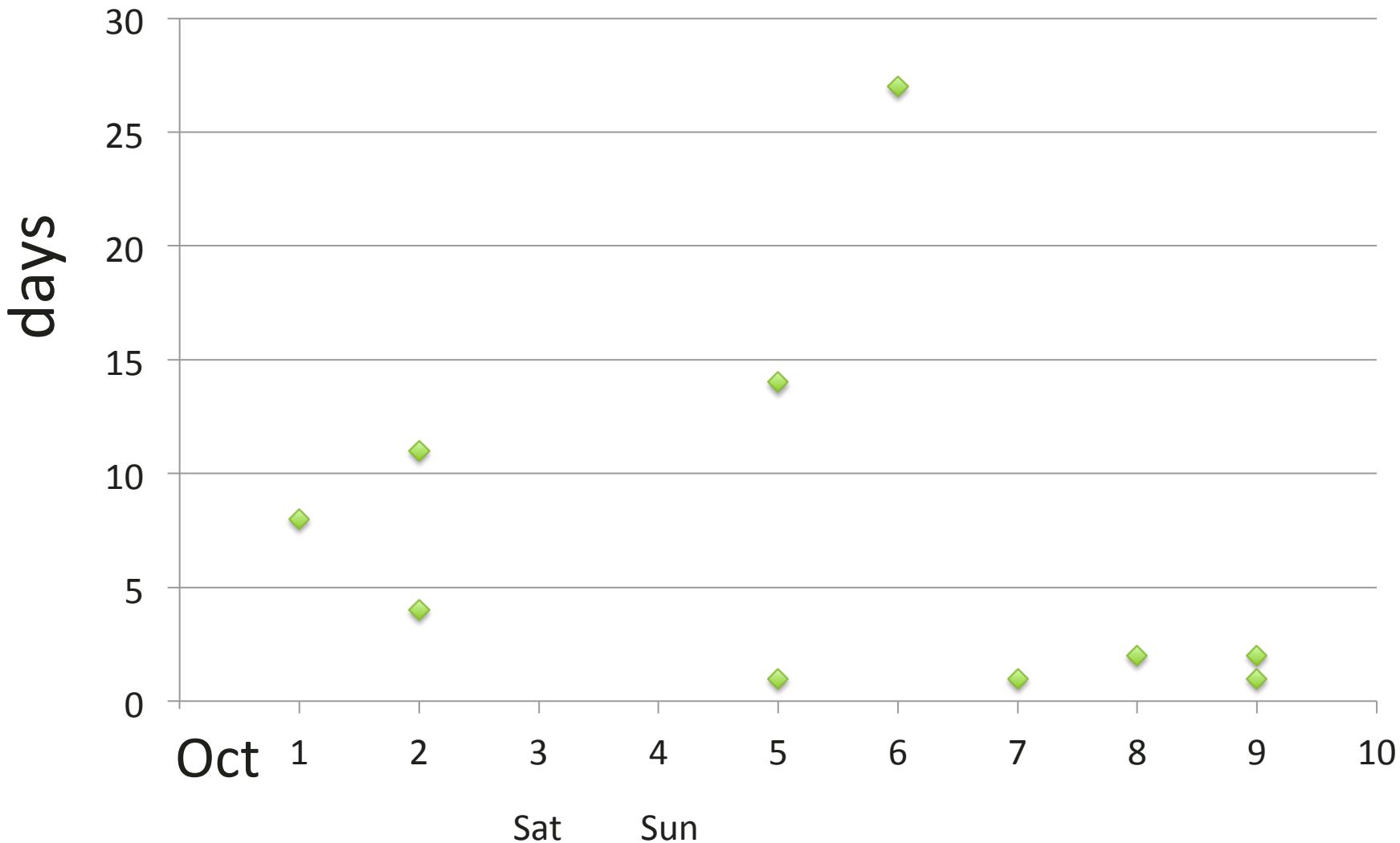
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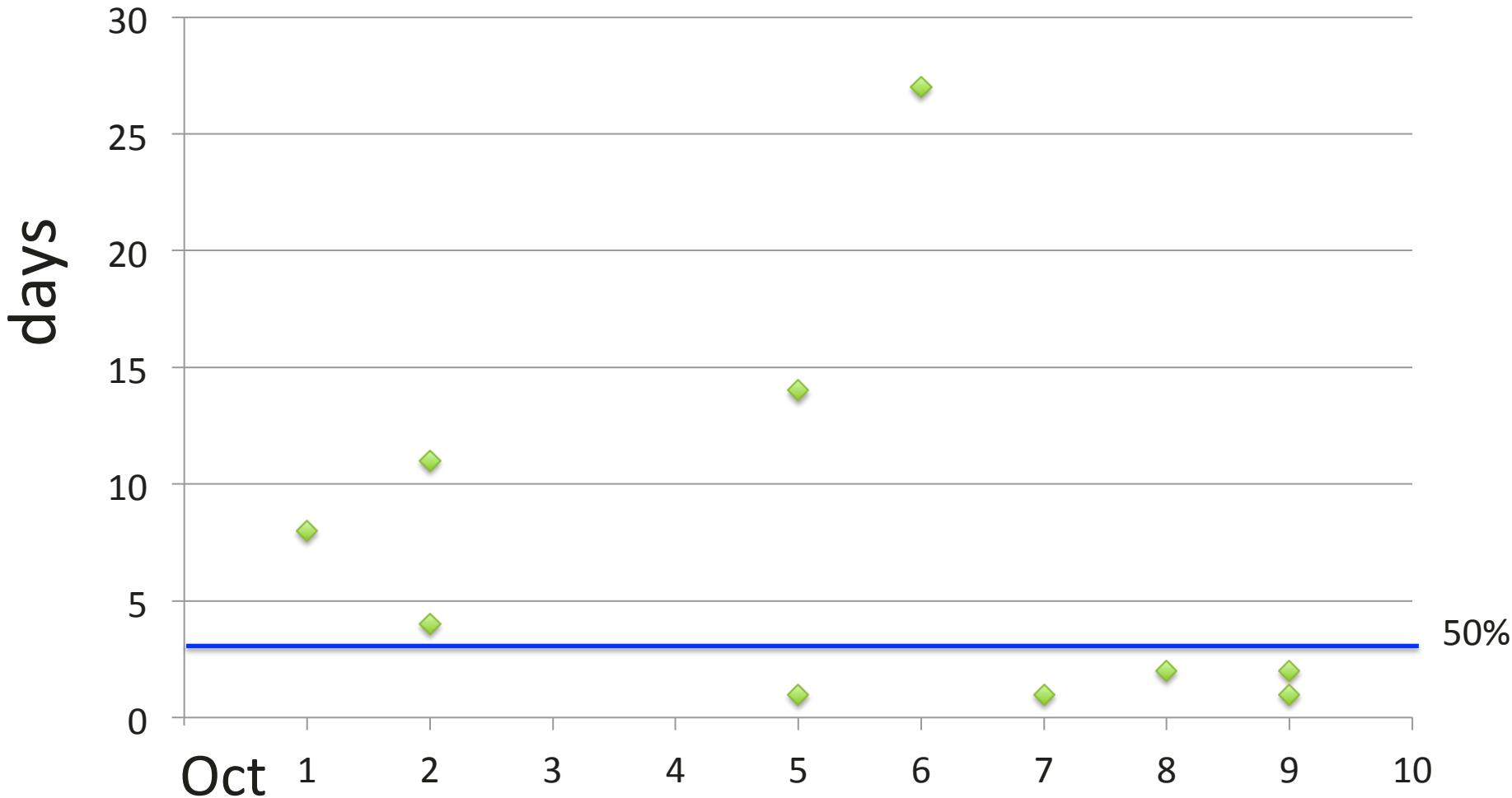
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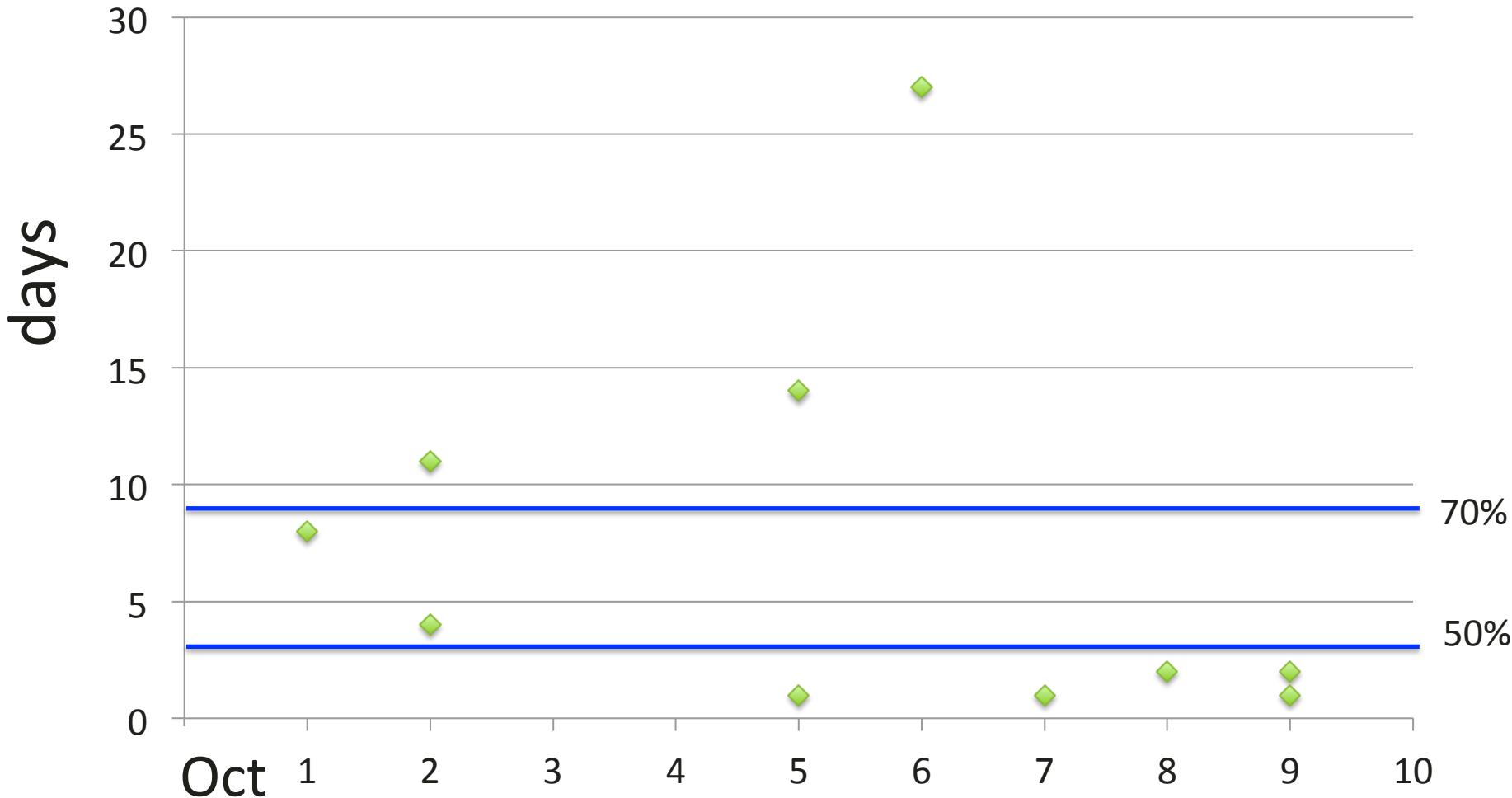
# Time series plot for completed work



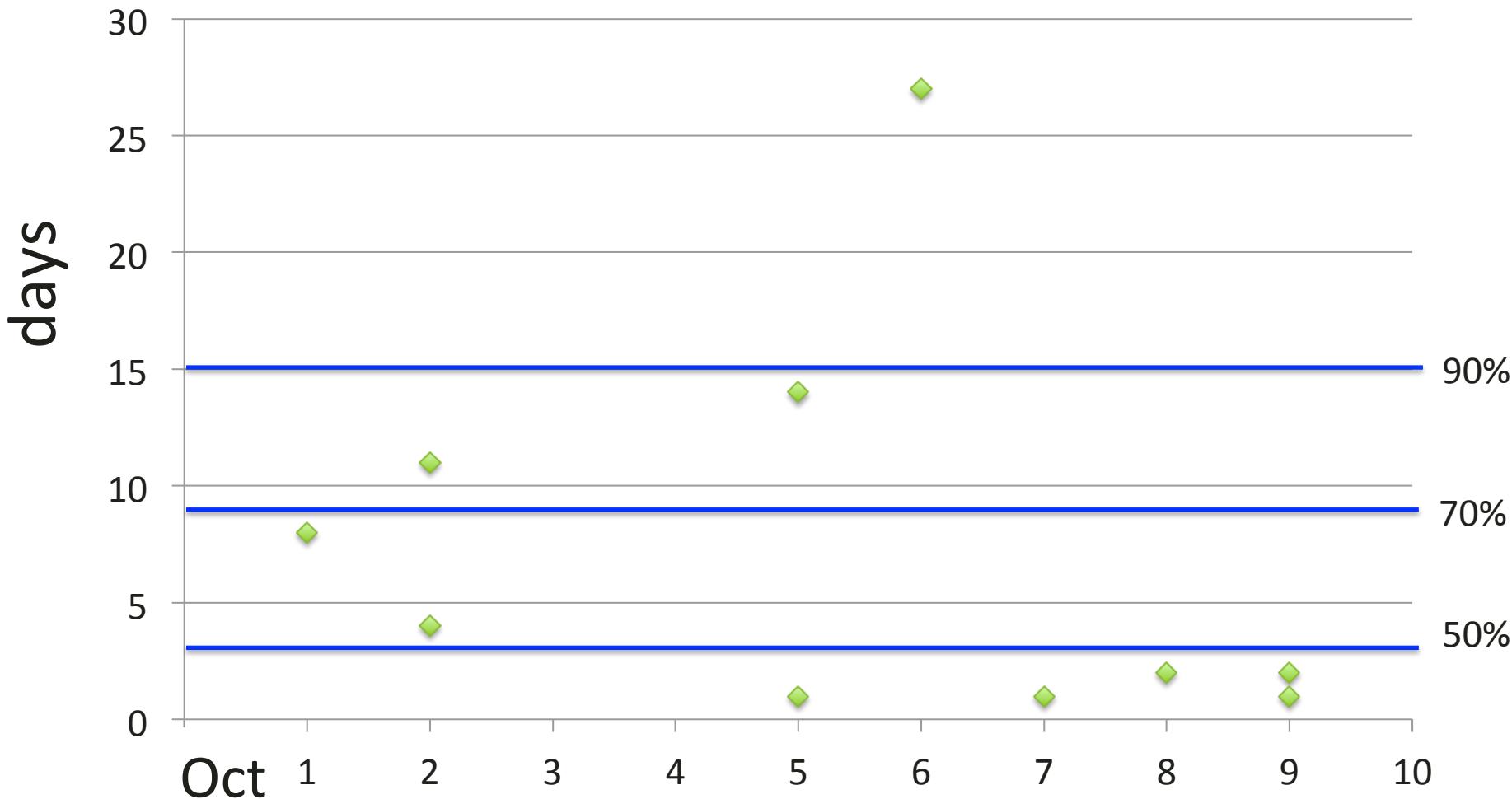
# Percentile line – 50%



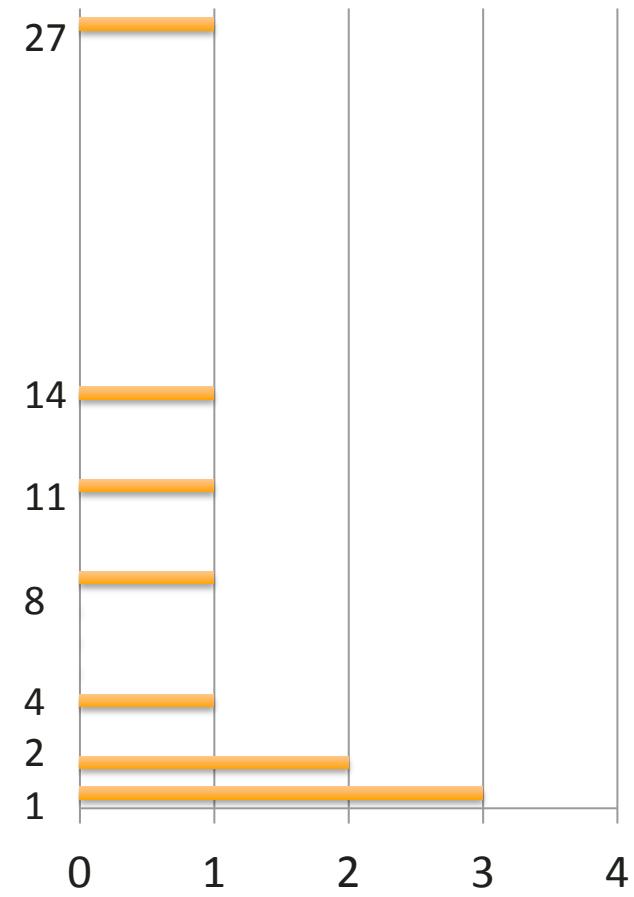
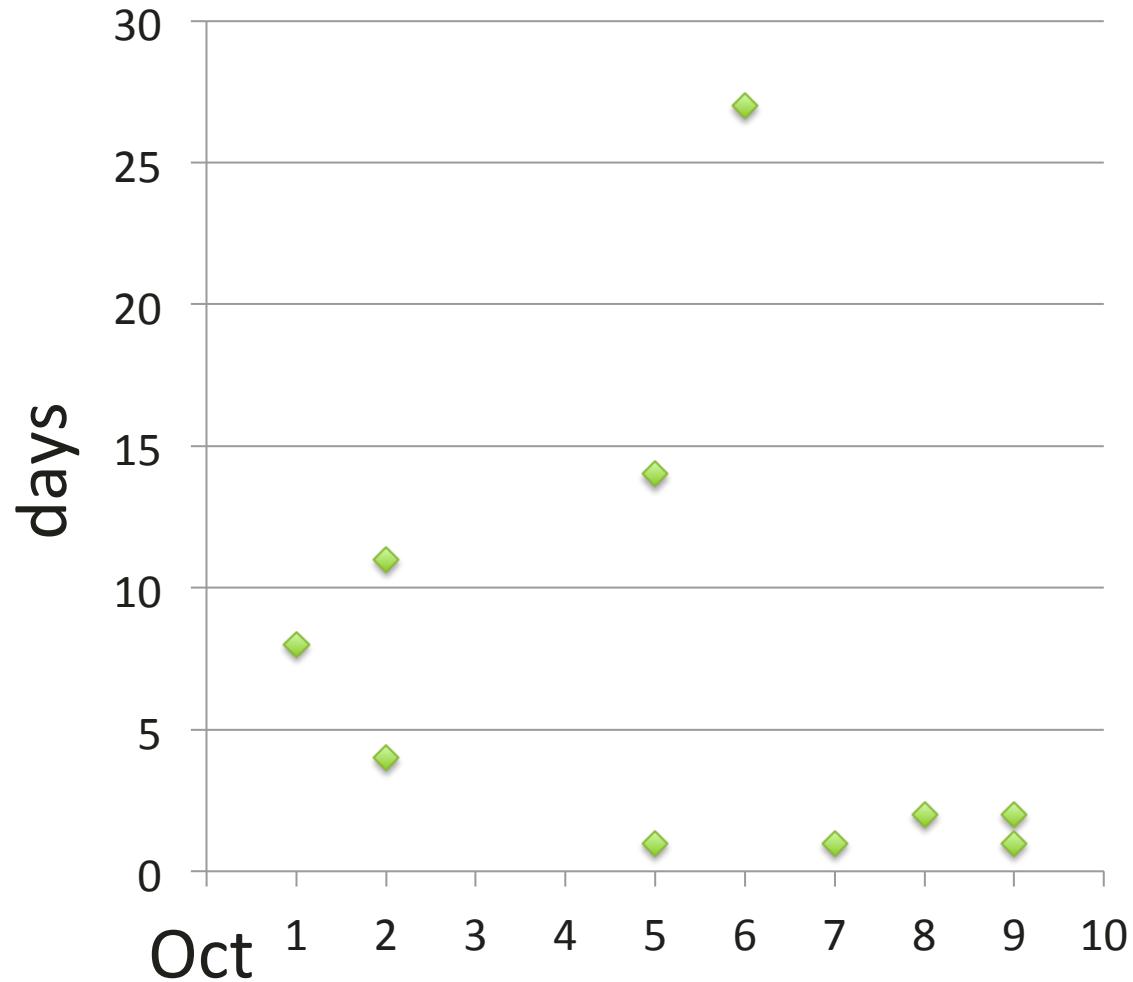
# Percentile lines – 50% and 70%



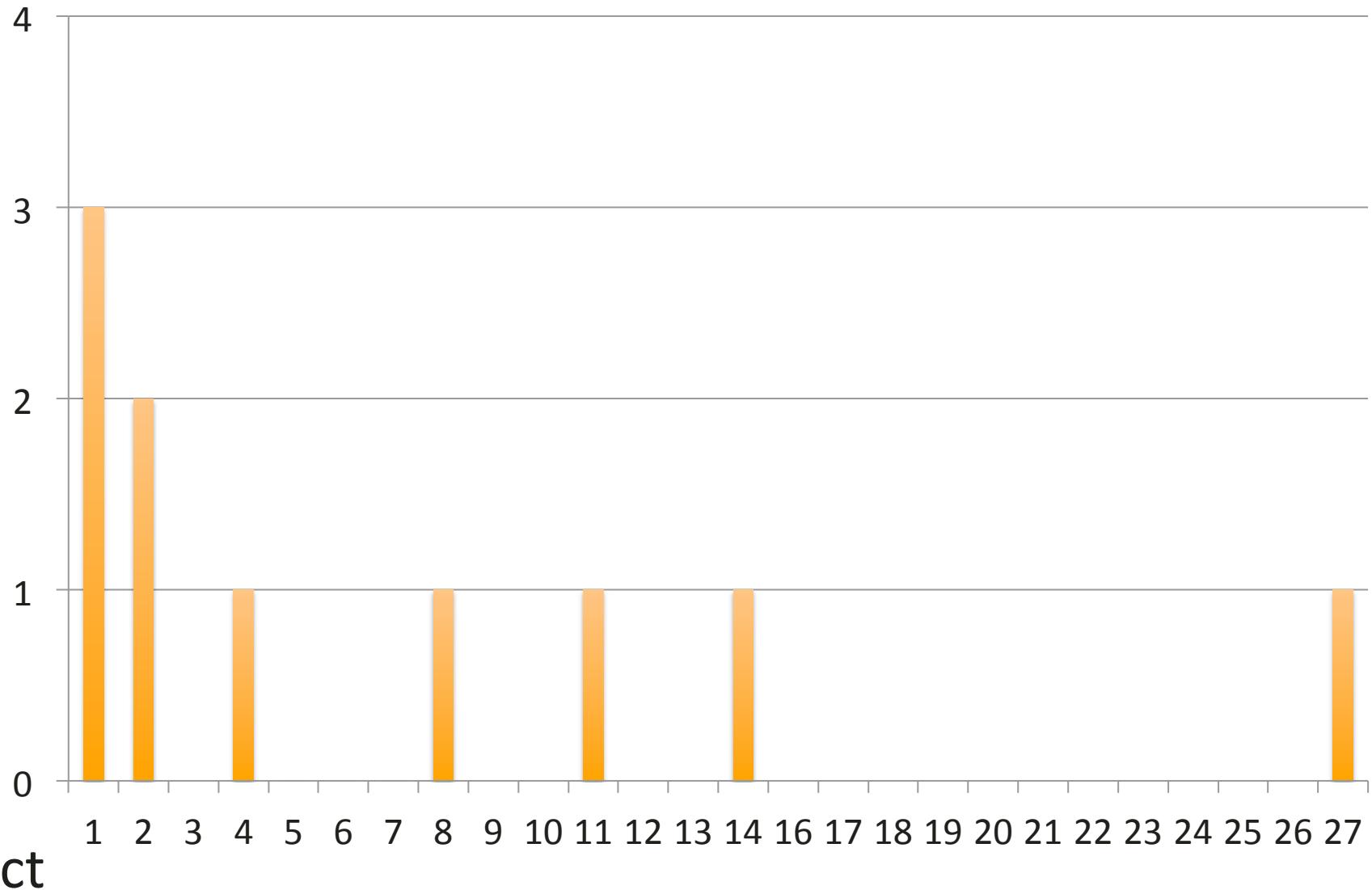
# Percentile lines – 50%, 70%, 90%



# Map time series plot to histogram



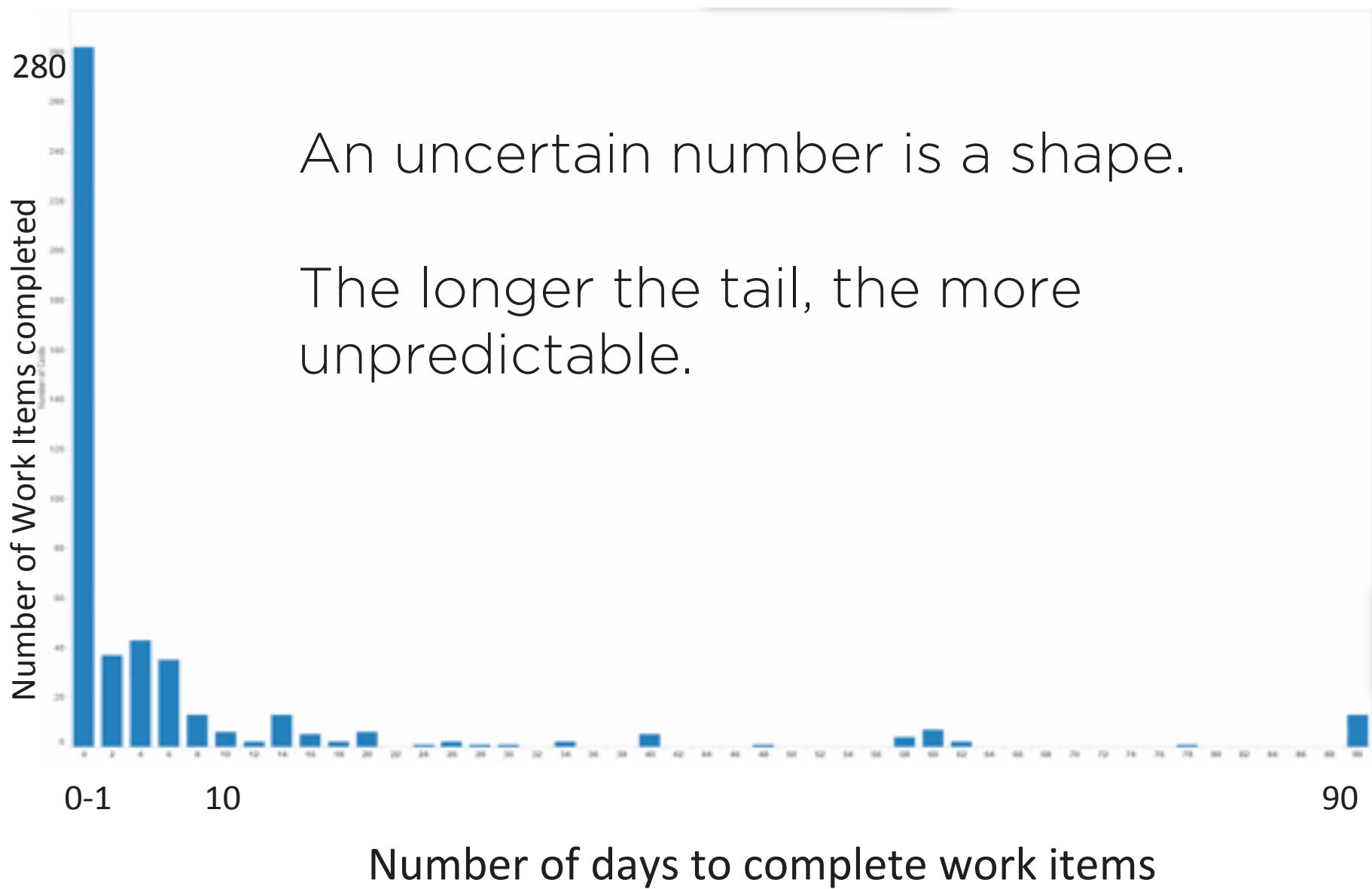
# Histogram – the shape of uncertainty



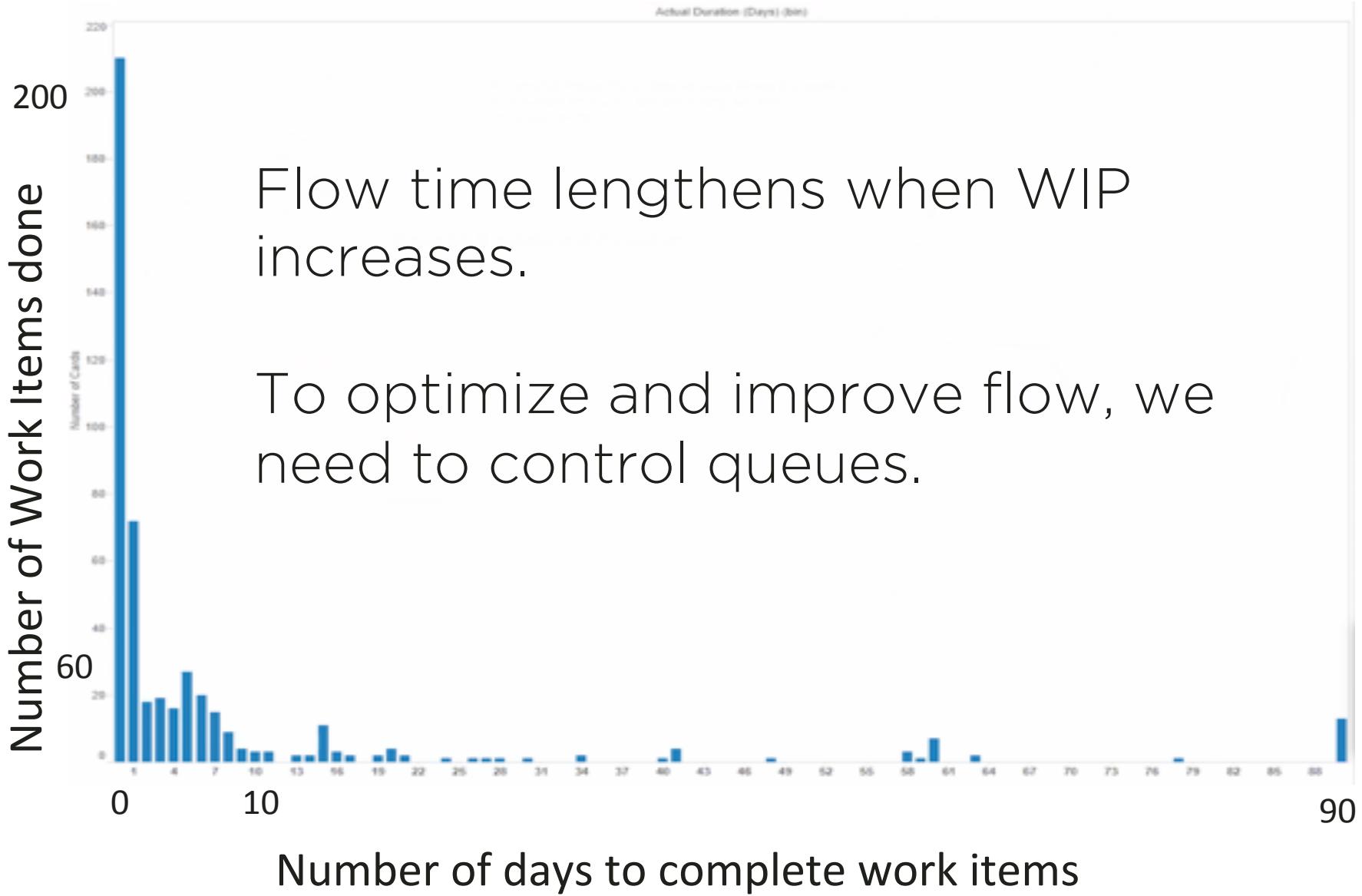
# Visualizing Uncertainty

An uncertain number is a shape.

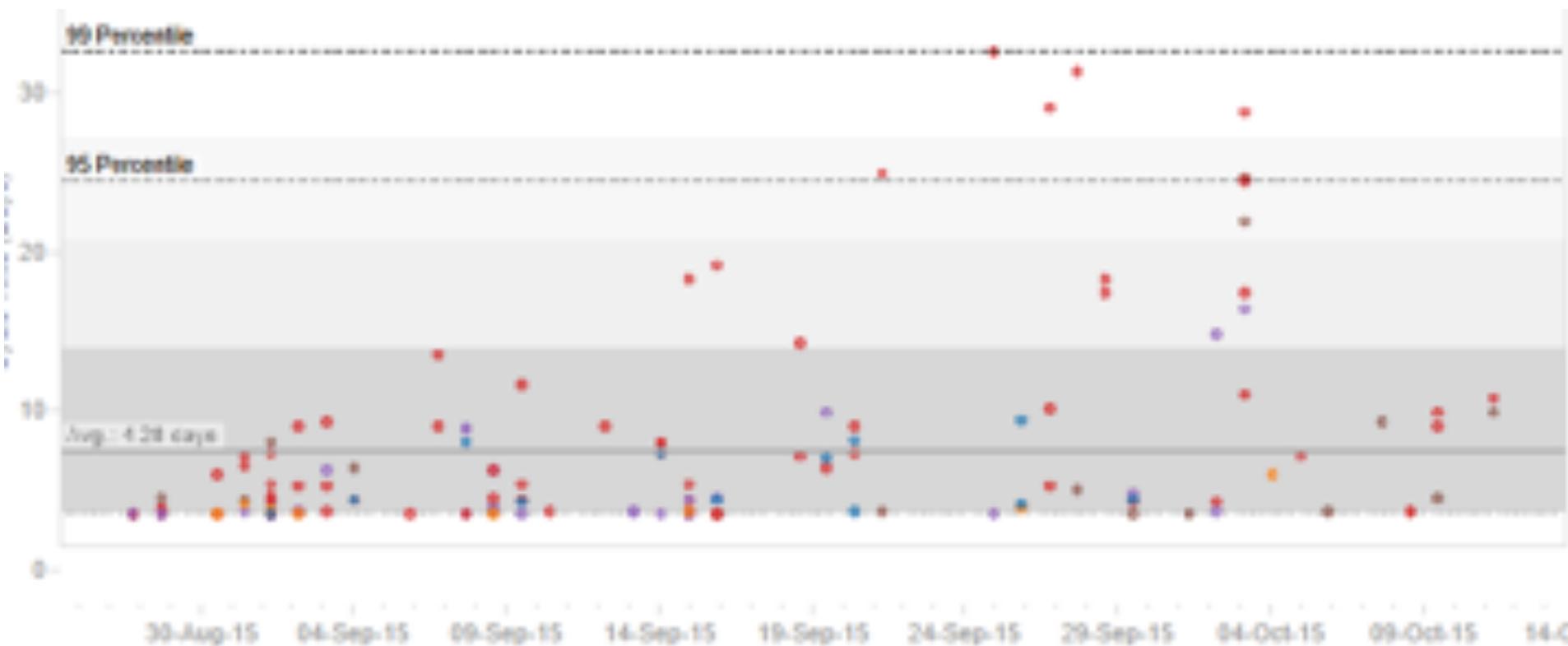
The longer the tail, the more unpredictable.



# Control Queues Instead of Timelines



# All Ops Work completed Aug 28 -Oct 12

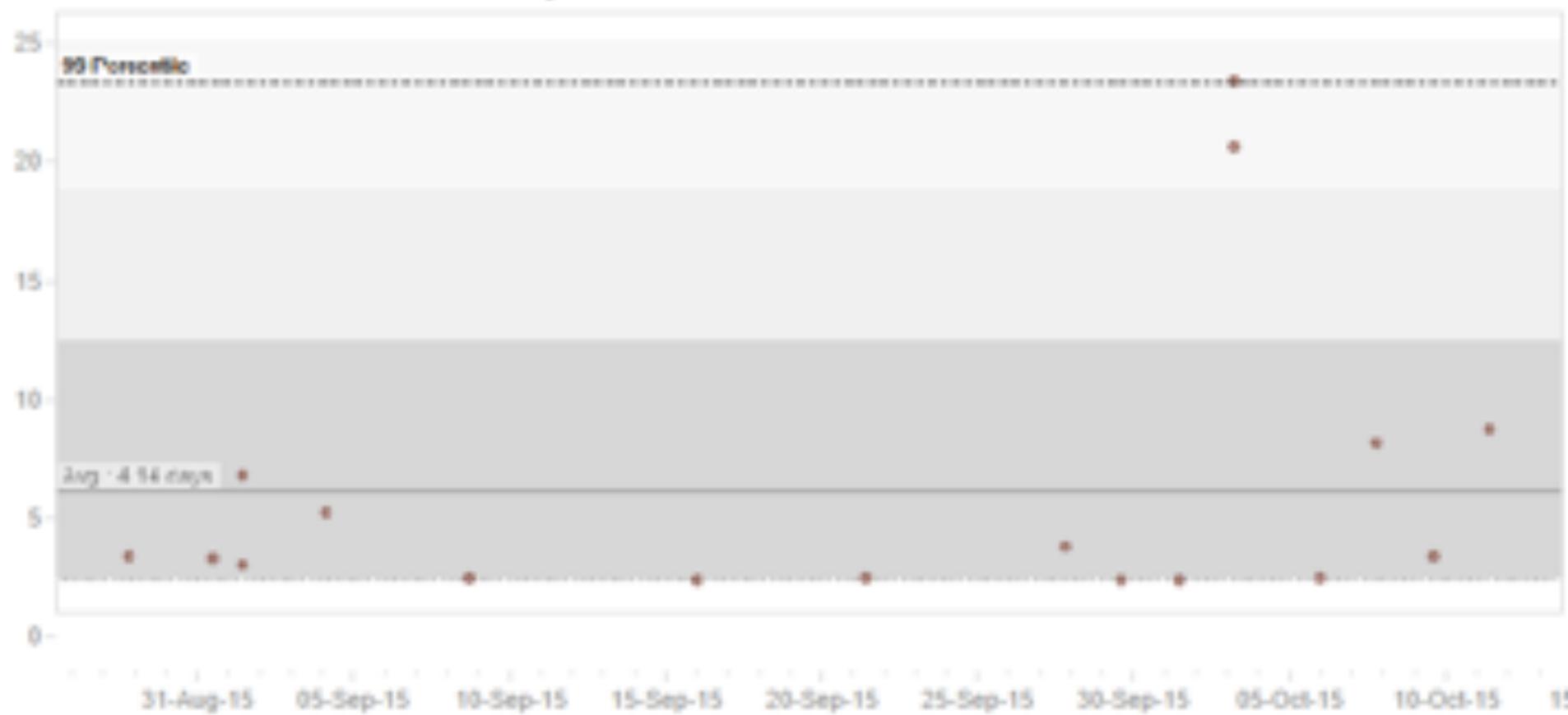


Average FT 4.3 days.  
95% work done < 23 days.

Use this graph to quantify the probability of completing X% of the work within Y days.

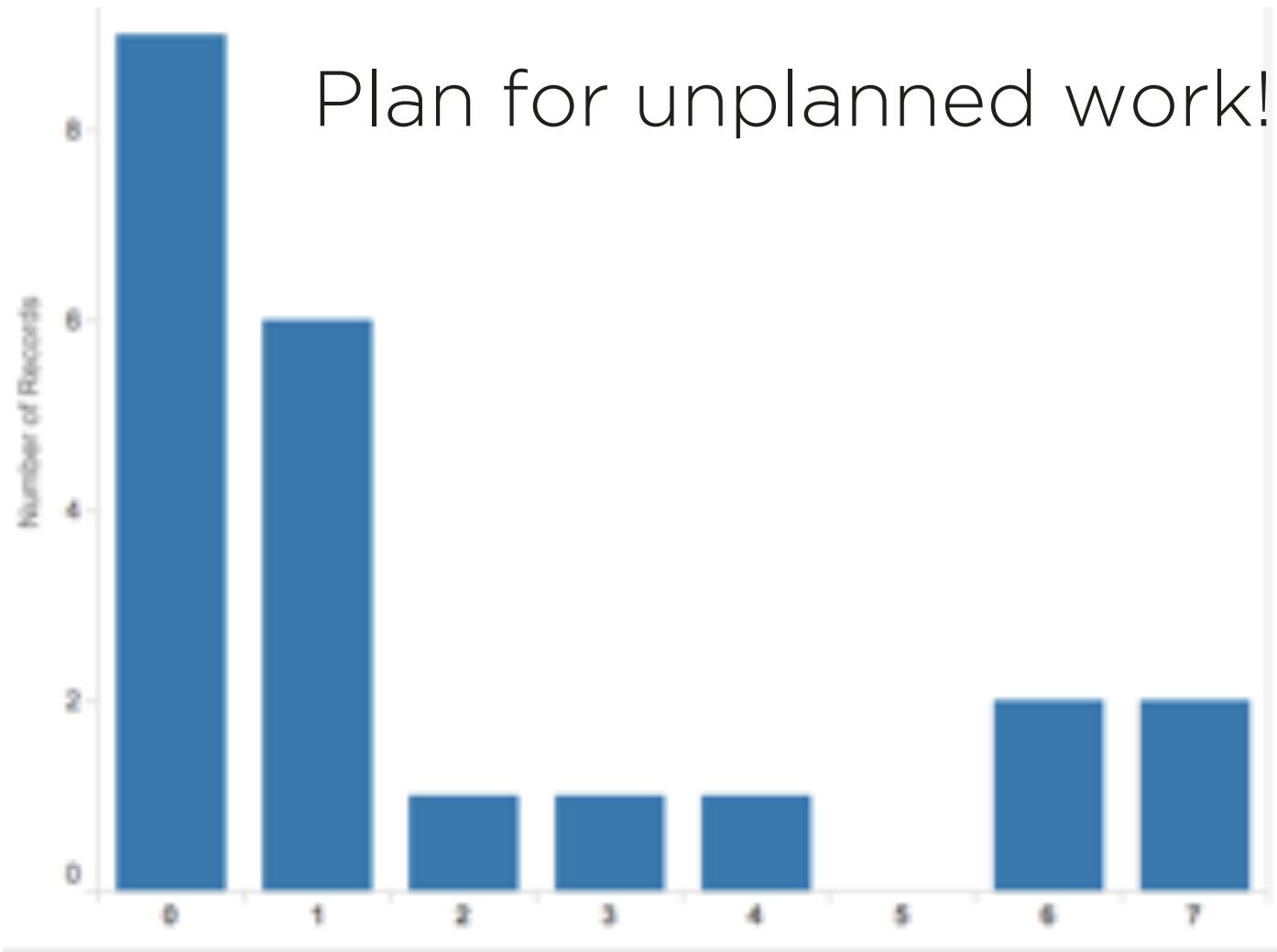
# Unplanned Work

Aug 28 - Oct 12



# Unplanned Work

Aug 28 -Oct 12



*“If we have data, let’s look at  
data. If all we have are  
opinions, let’s go with mine.”*

*Jim Barksdale  
former Netscape CEO*

## 5 Take Aways:

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1. Consider being approx. right vs. precisely wrong.
2. Adding work to your plate faster than completing prior work increases WIP.
3. The odds of being predictable decrease when WIP increases & FlowTimes elongate
4. Control queues, not timelines to improve flow.



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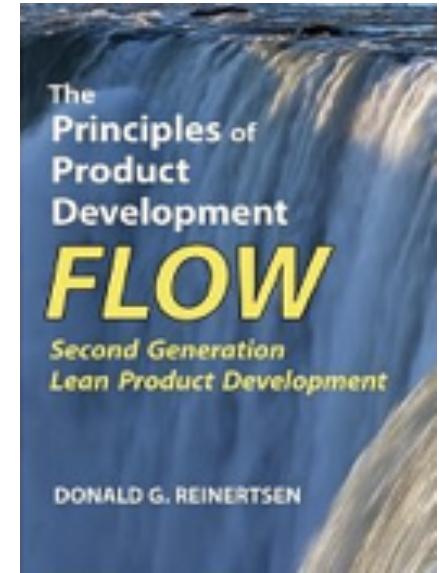
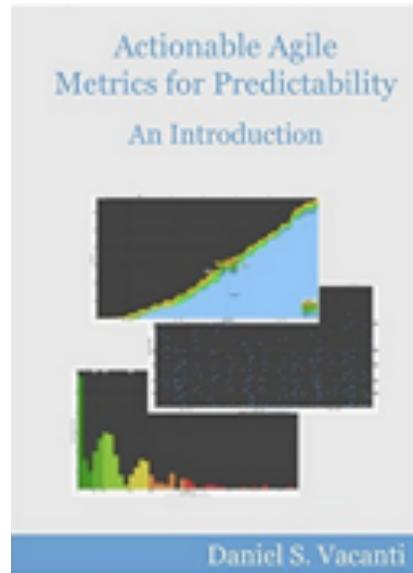
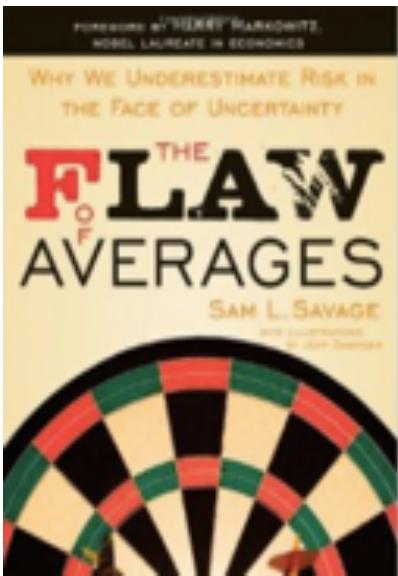


*“If predictability is your goal,  
the best thing you can do  
as a leader is reserve capacity”*

Troy Magennis  
Founder, Focused Objective

Where is the costliest  
uncertainty in your  
organization?

# References



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