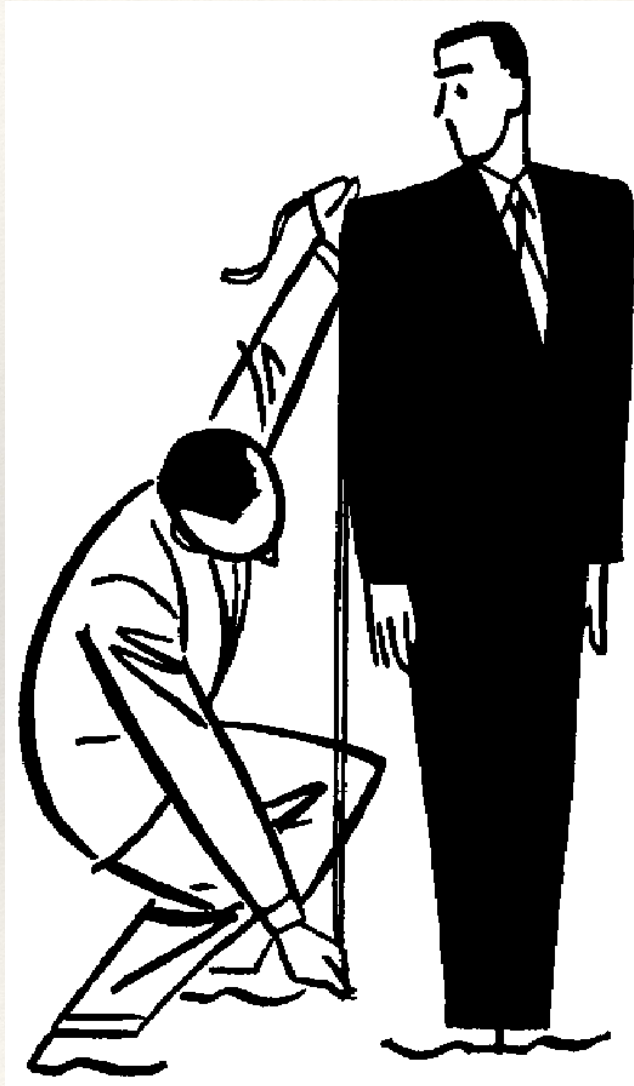


Tailoring Science Teaching Buildings

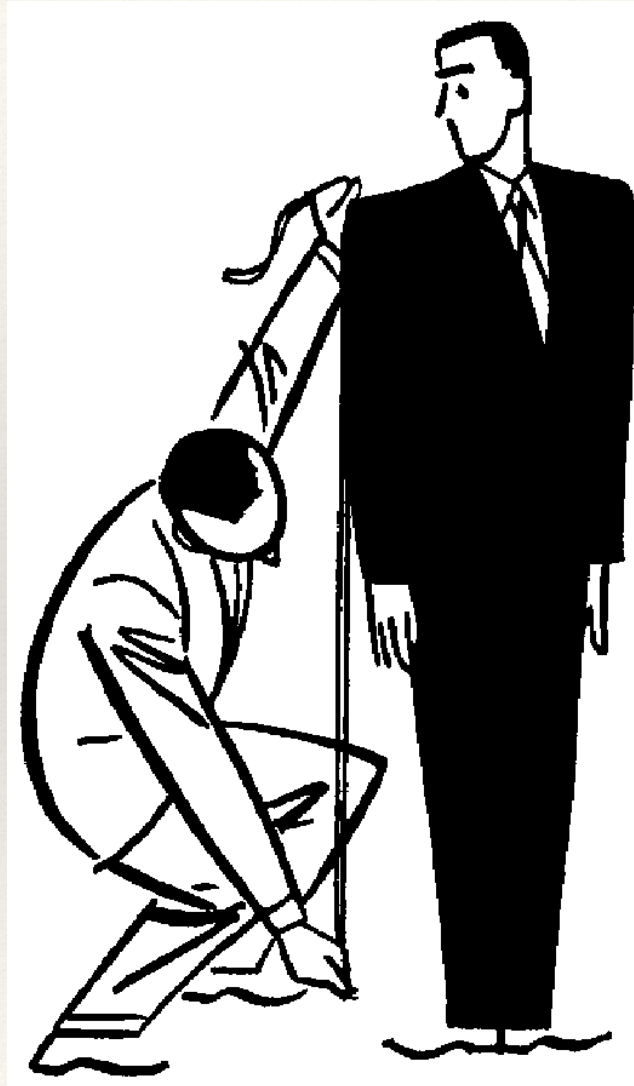
PPAA Winter Conference

January 24th, 2017

Why Tailoring?



Post Occupancy Analysis



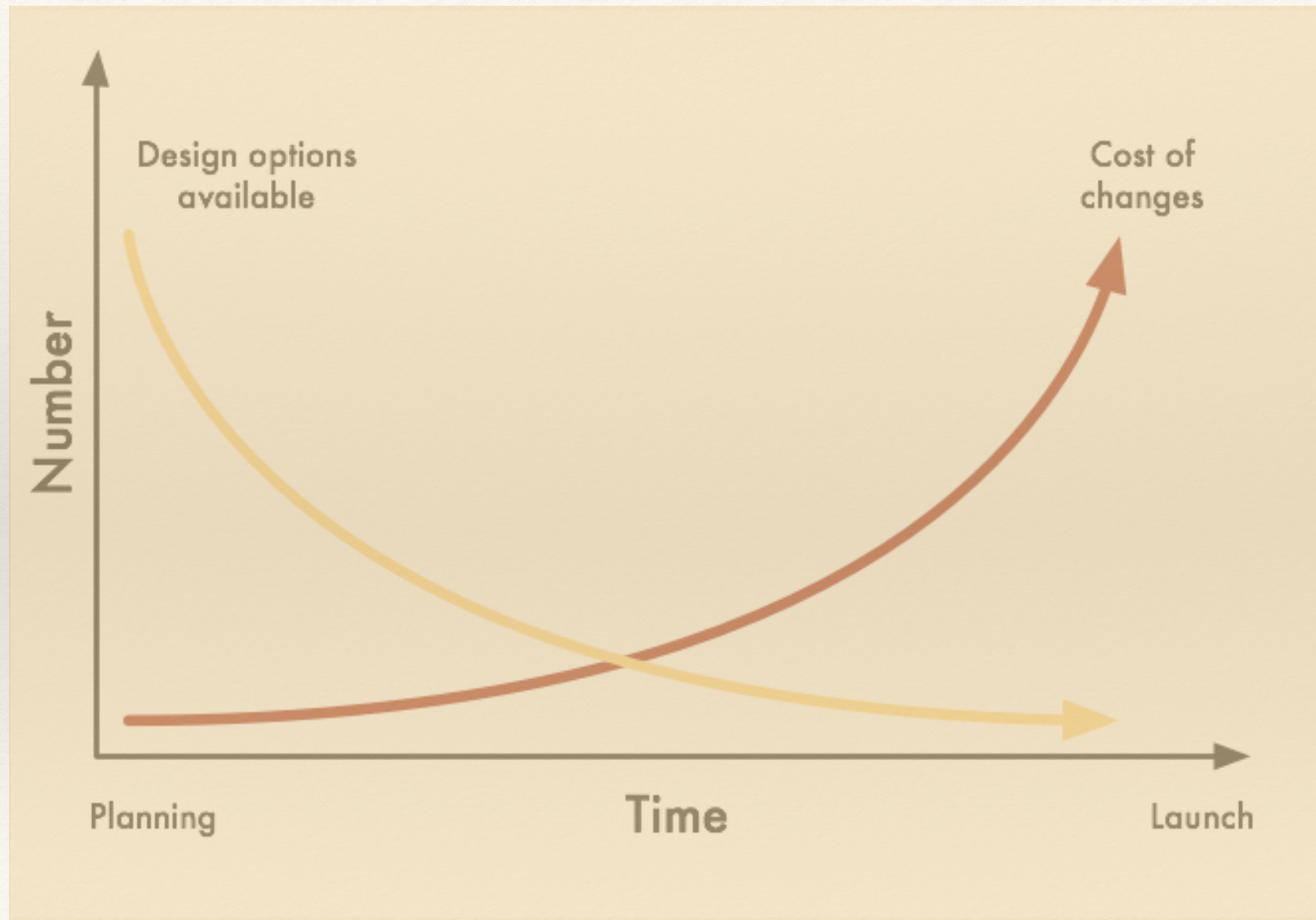
Post Occupancy Analysis

Three Undergraduate Science Buildings

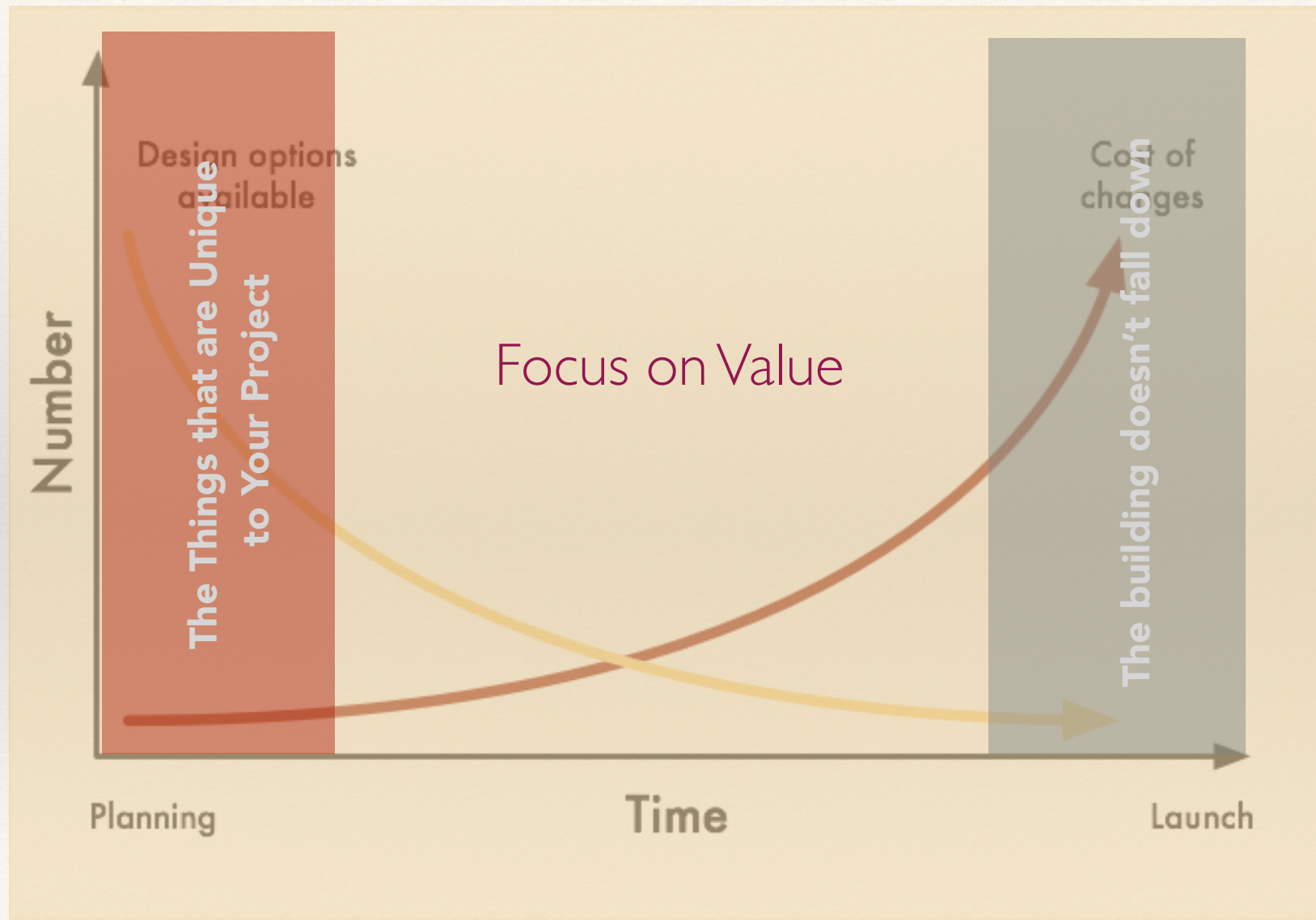
All Under 10 Ten Years Old

All Roughly 120,000 GSF

Minimizing Cost



Maximizing Value



Dramatization

Jimmy



Mikey

Dramatization

Jimmy the Architect asks Mikey the Biologist,
“How many teaching labs do you need?”

Dramatization

“22”

Case Study #1



Public Institution
Comprehensive College
Science Facility
120,000 GSF

Case Study #1

Biology

Chemistry

Environmental Science

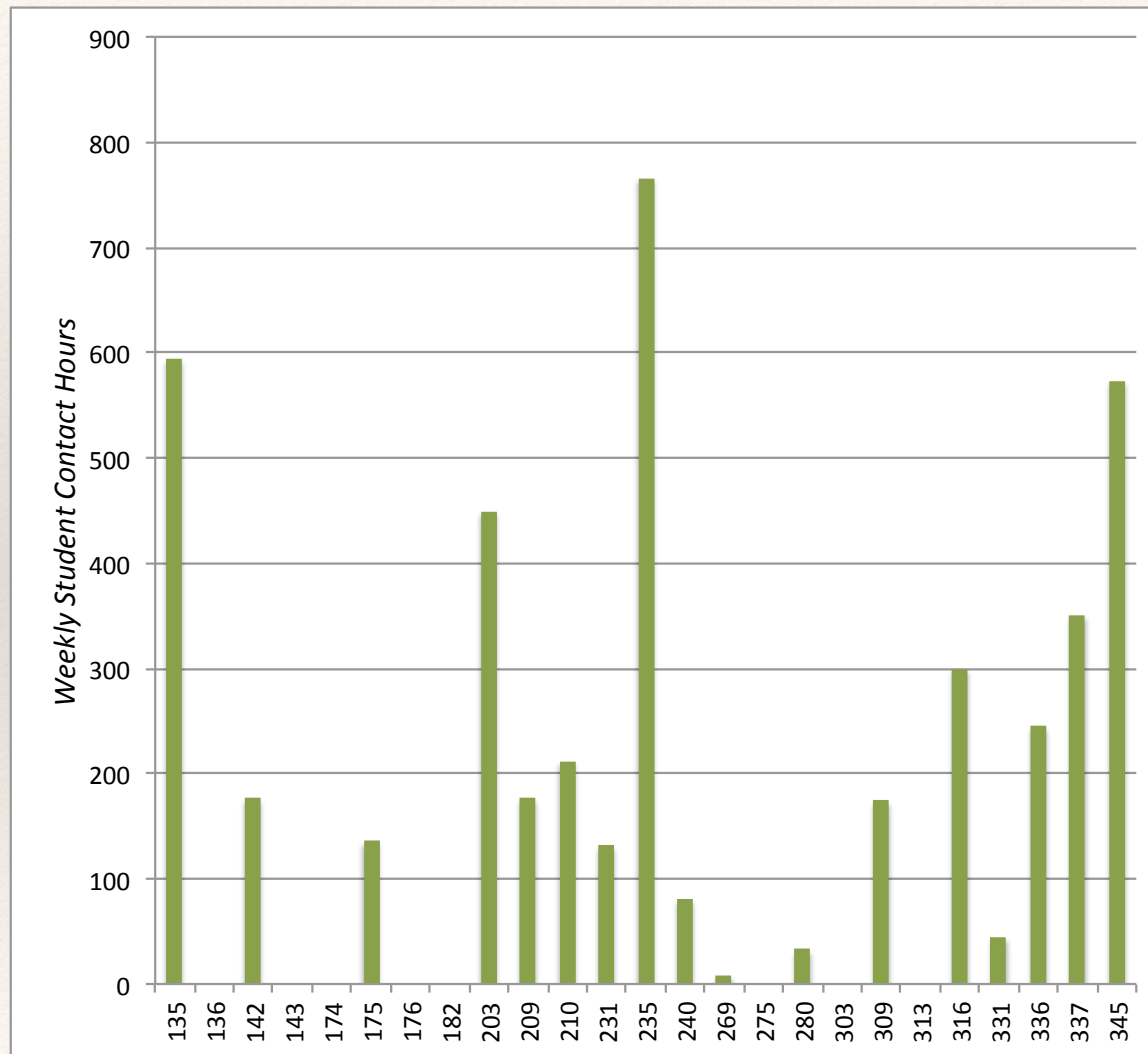
Physics, Astronomy, and Meteorology

Case Study #1

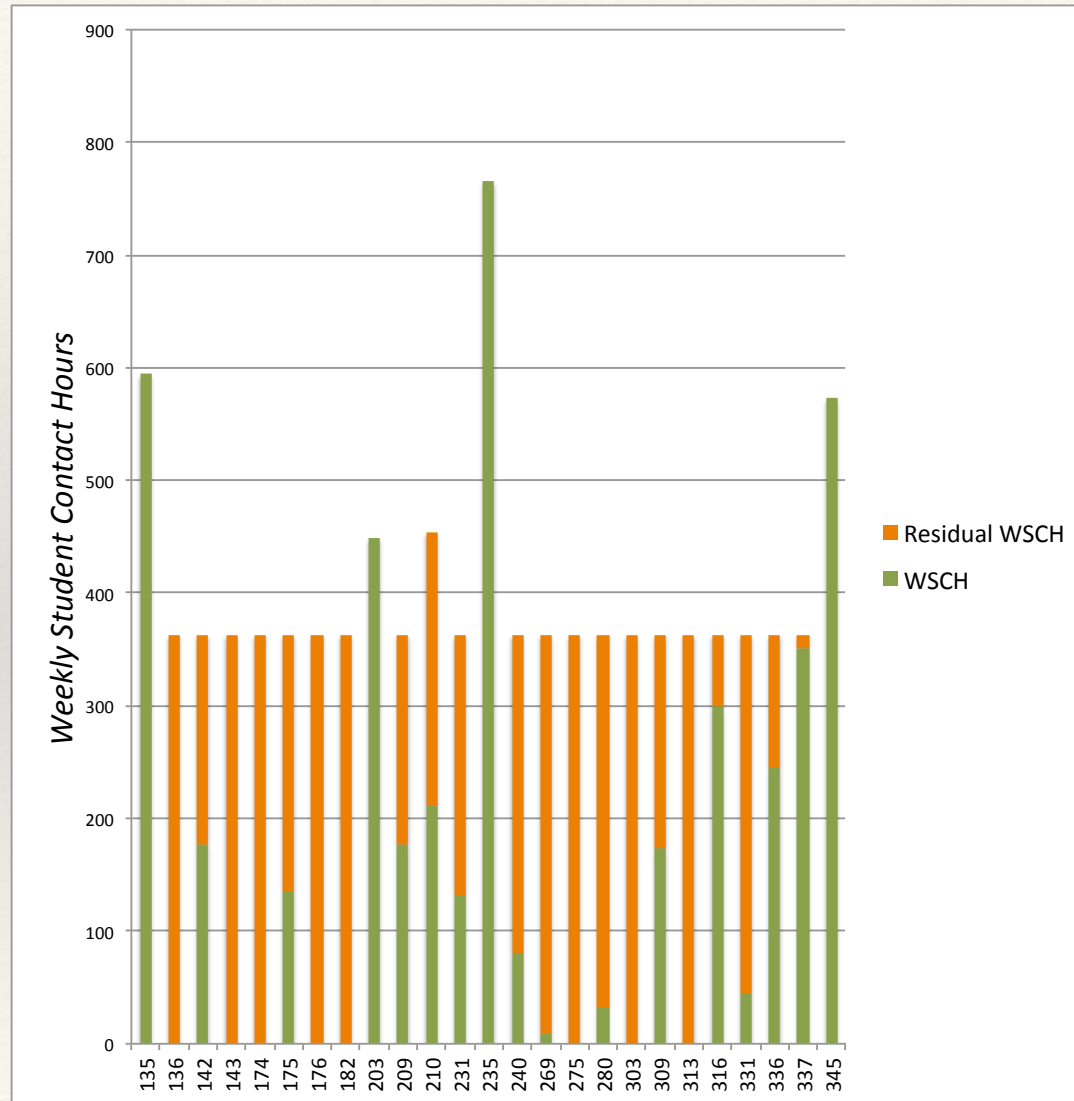
Amphibian & Fish Lab
Analytic Chemistry Lab
Anatomy & Physiology Lab
Animal Physiology Lab
Astronomy Lab
Bio-Chemistry Lab
Botany/Ecology Lab
Cellular Biology Lab
Computer Aided Physics Lab
Biology Concepts Lab
Electronics Lab
EveryDay Chemistry Lab

General Chemistry Lab
Genetics Lab
Geology Lab
Instrumental Lab
Meteorological Lab
Meteorology Lab
Microbiology Lab
Organic Chemistry Lab
Physical Chemistry Lab
Physics Lab
Plant Physiology Lab
Survey of Chemistry Lab
Zoology Lab

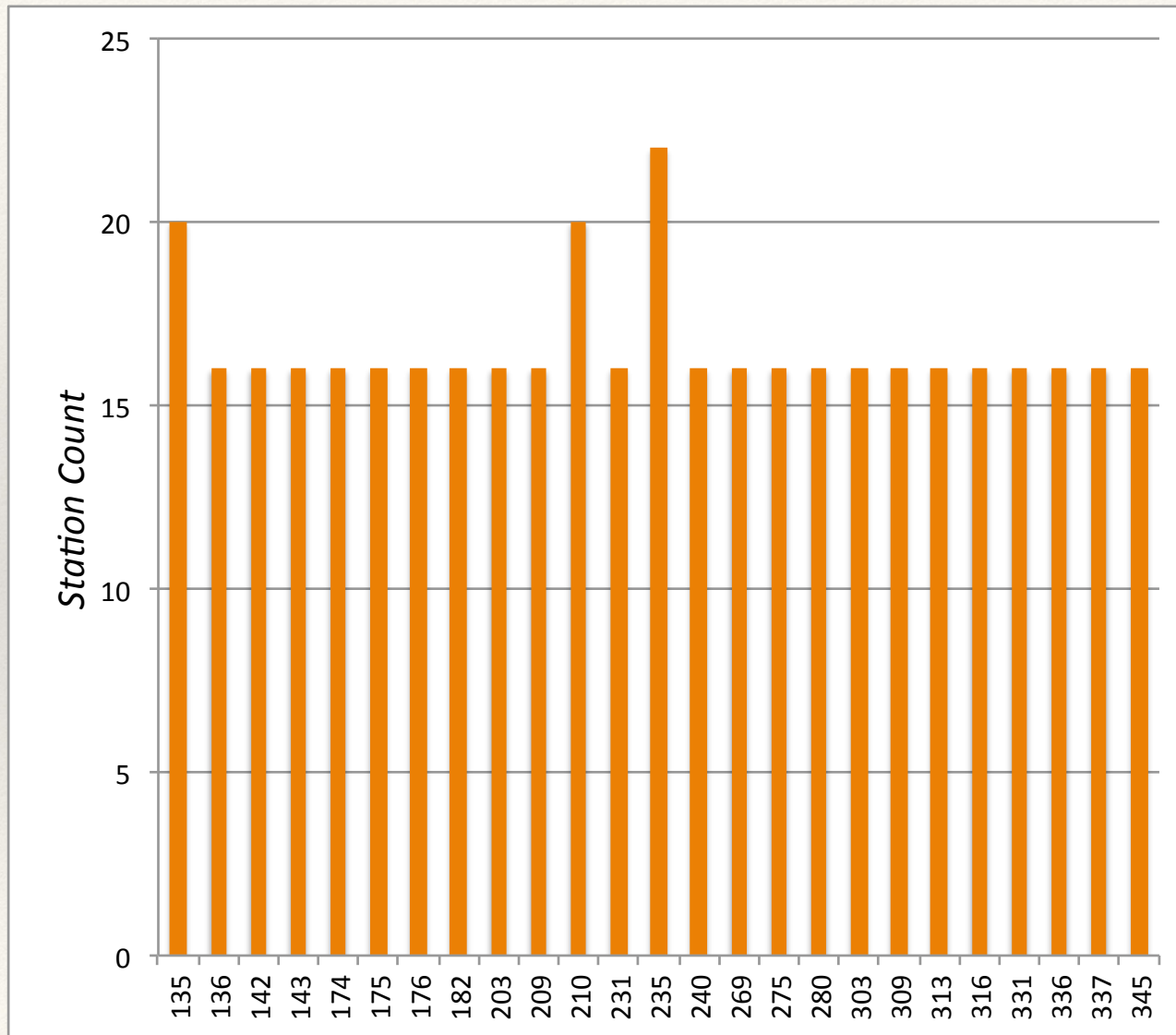
Case Study #1



Case Study #1



Case Study #1

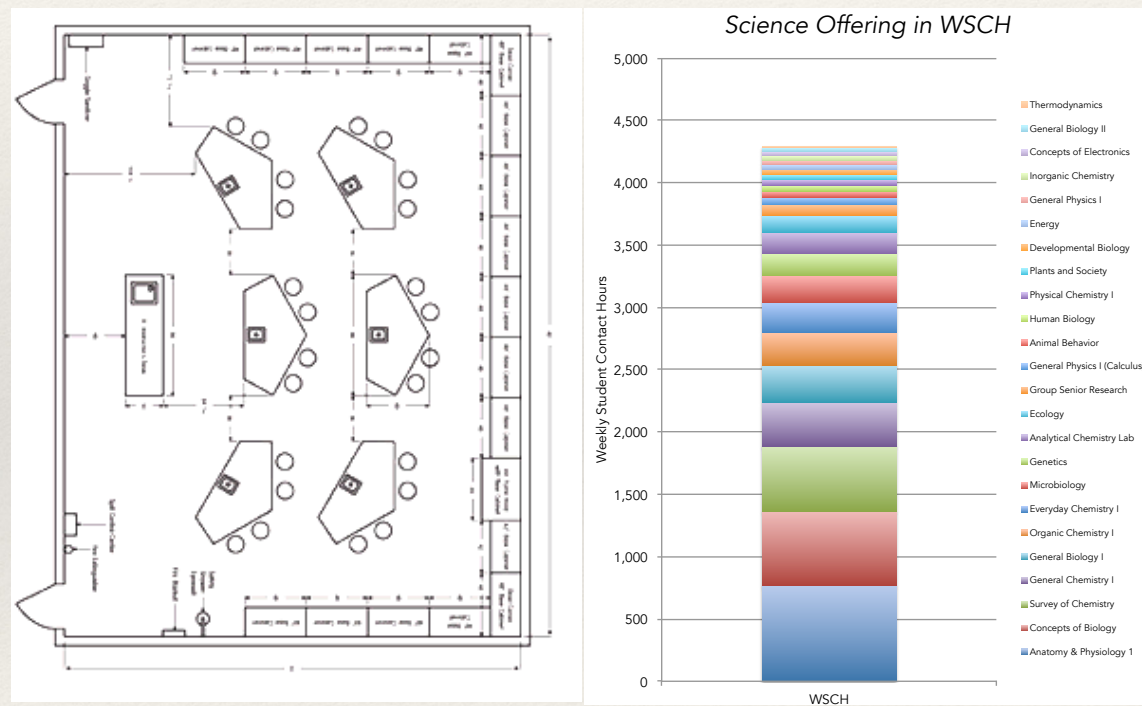


The Noise & The Signal

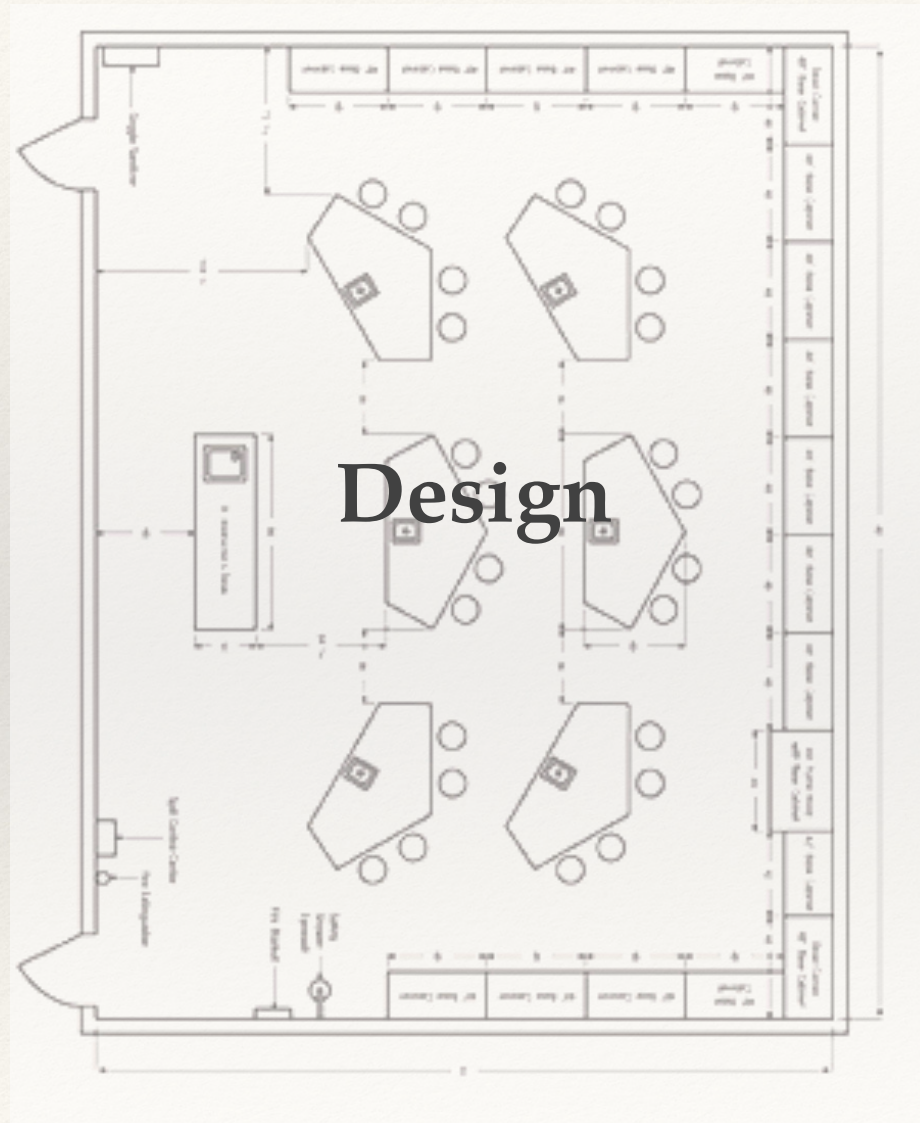


Roberta Wohlstetter

The Noise & The Signal



The Noise



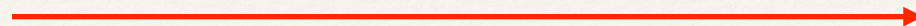
Overhead



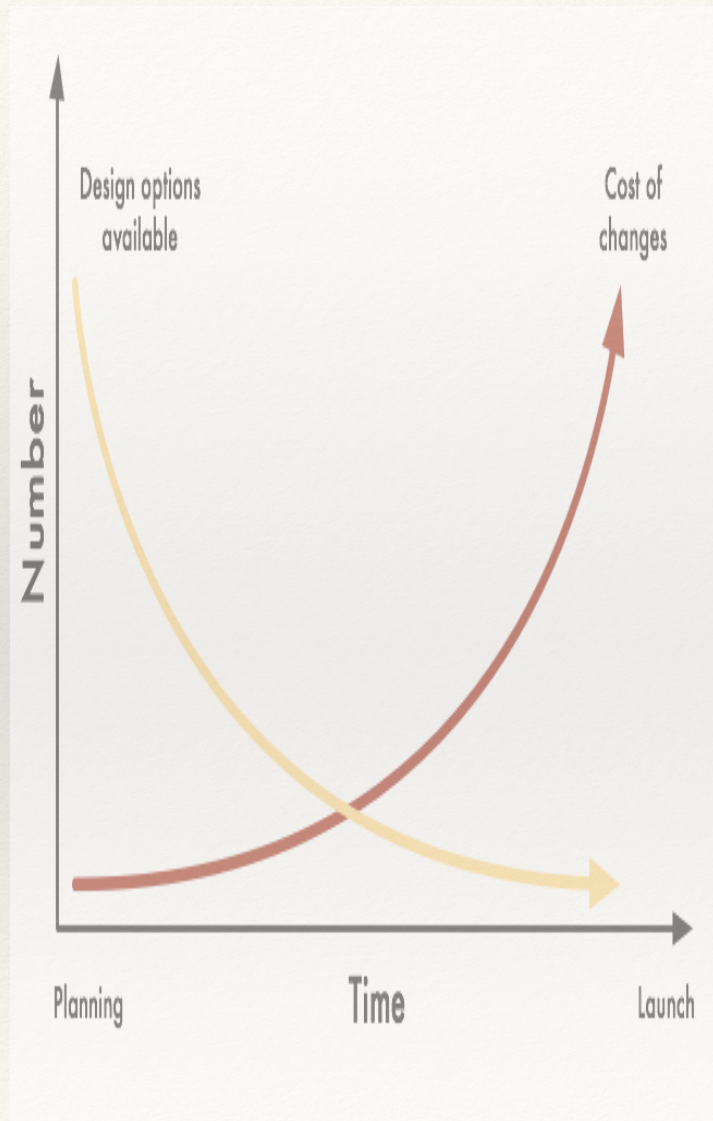
25 “Person Months”



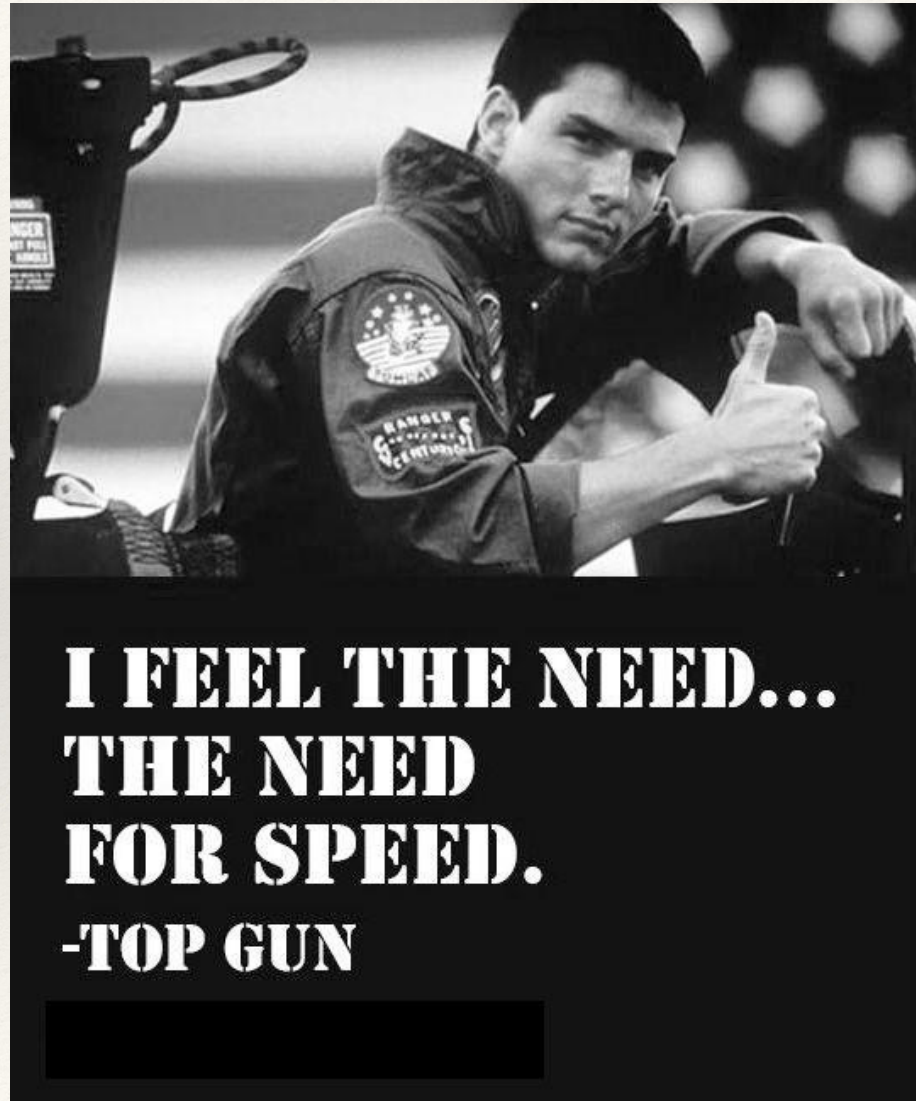
25 “Person Months”



Maximizing Value

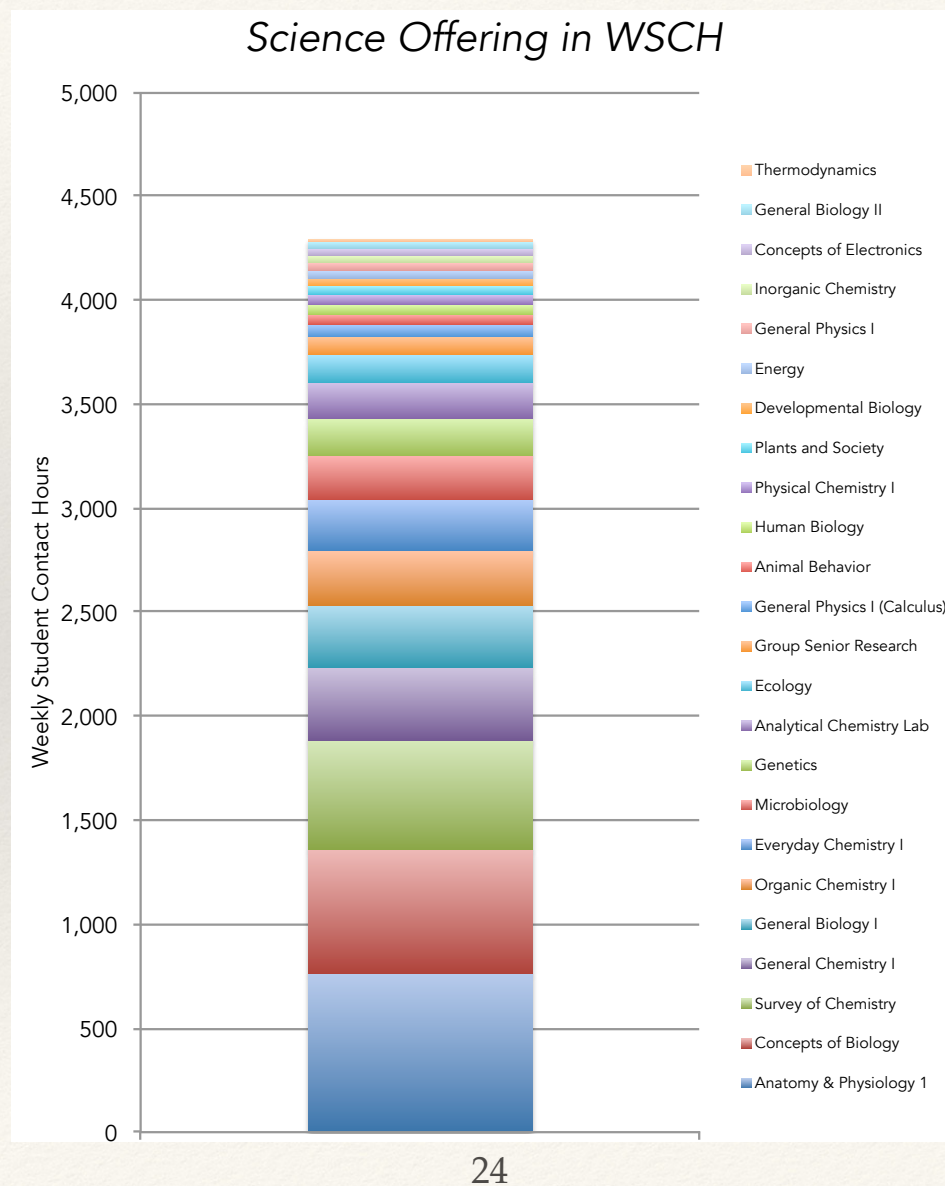


Maximizing Speed

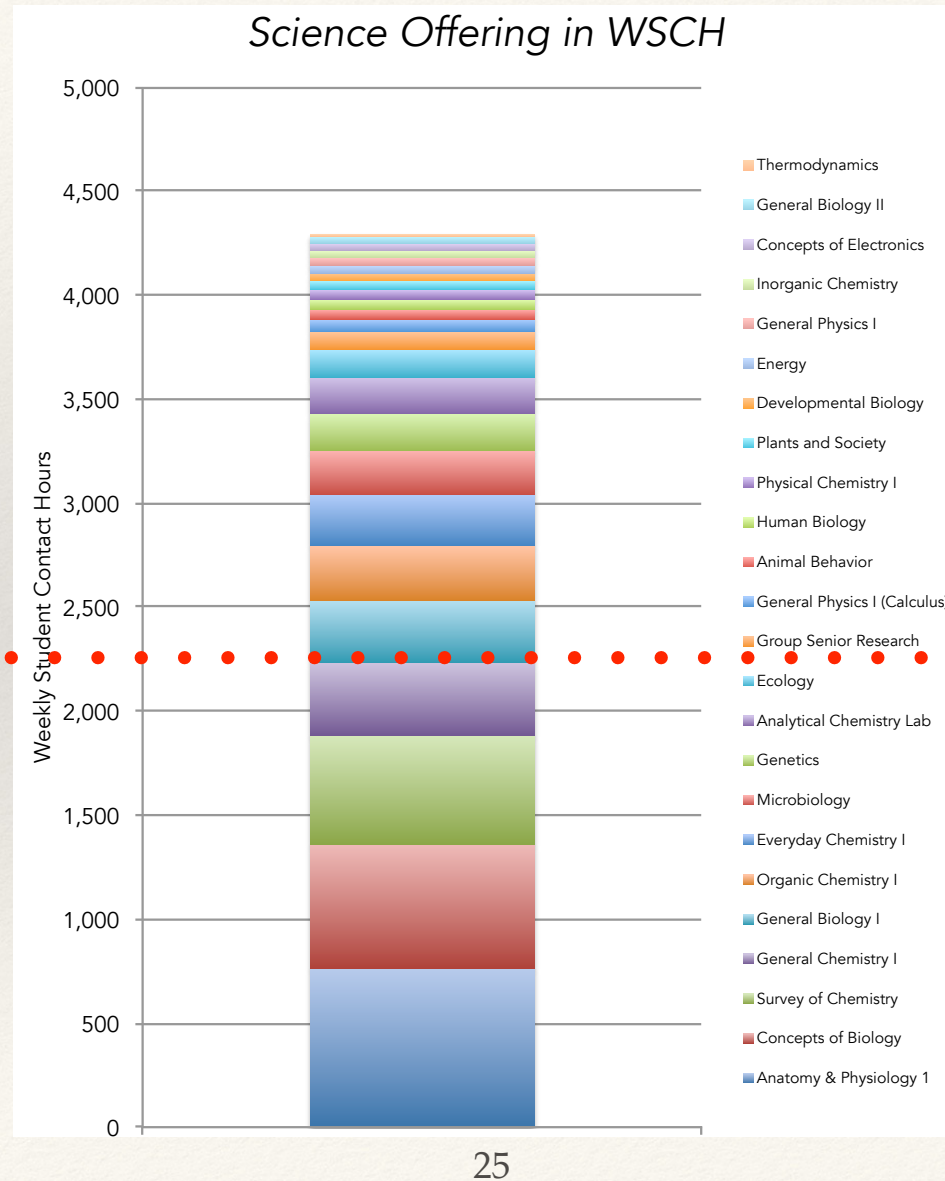


**I FEEL THE NEED...
THE NEED
FOR SPEED.
-TOP GUN**

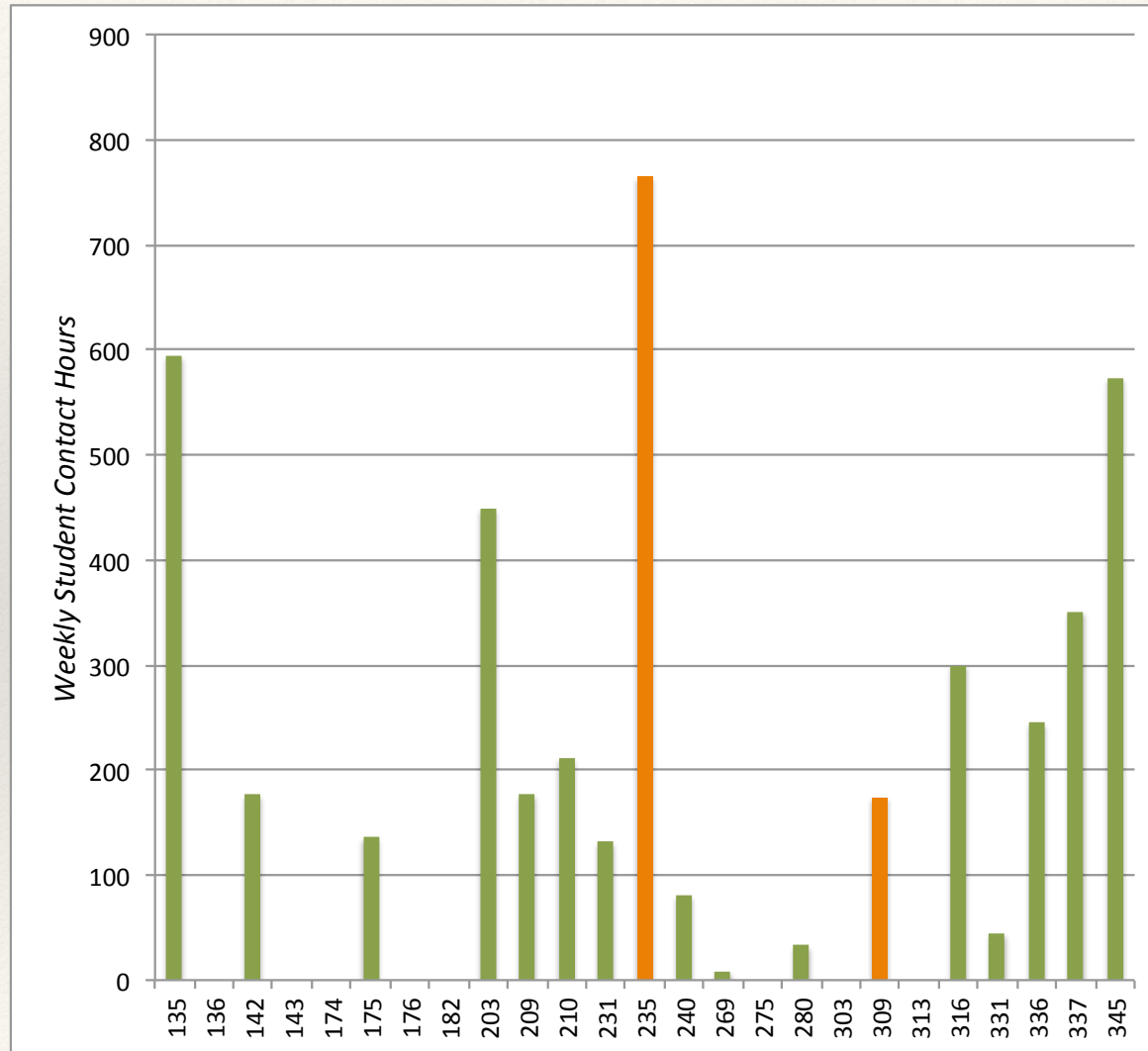
The Signal



The Signal



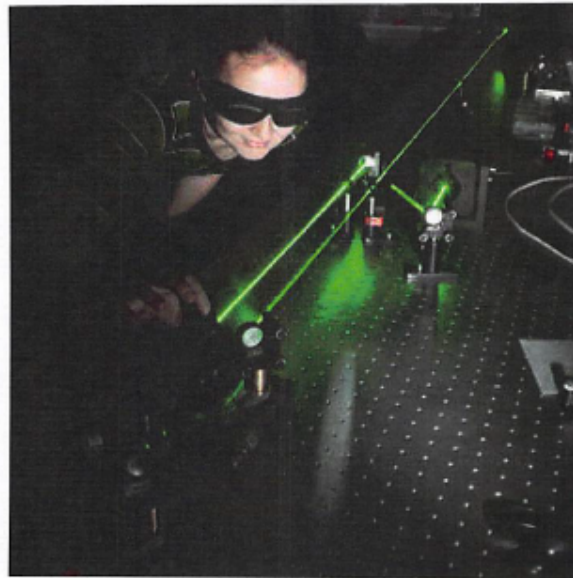
Case Study #1



Casting A Wider Net

More Signal But Also More Noise

Casting A Wider Net



**Preliminary Report by the STEM Division
on the
Construction of a New STEM Building**

&

**STEM Middle College
at
Naugatuck Valley Community College
Waterbury, Connecticut**

December 12, 2015

Casting A Wider Net

Omission Bias

Case Study #2



Northeast Public Institution
Liberal Arts College
Science Facility
120,000 GSF

Case Study #2

Biology

Chemistry

Geological Sciences

Physics & Astronomy

Case Study #2

Classrooms

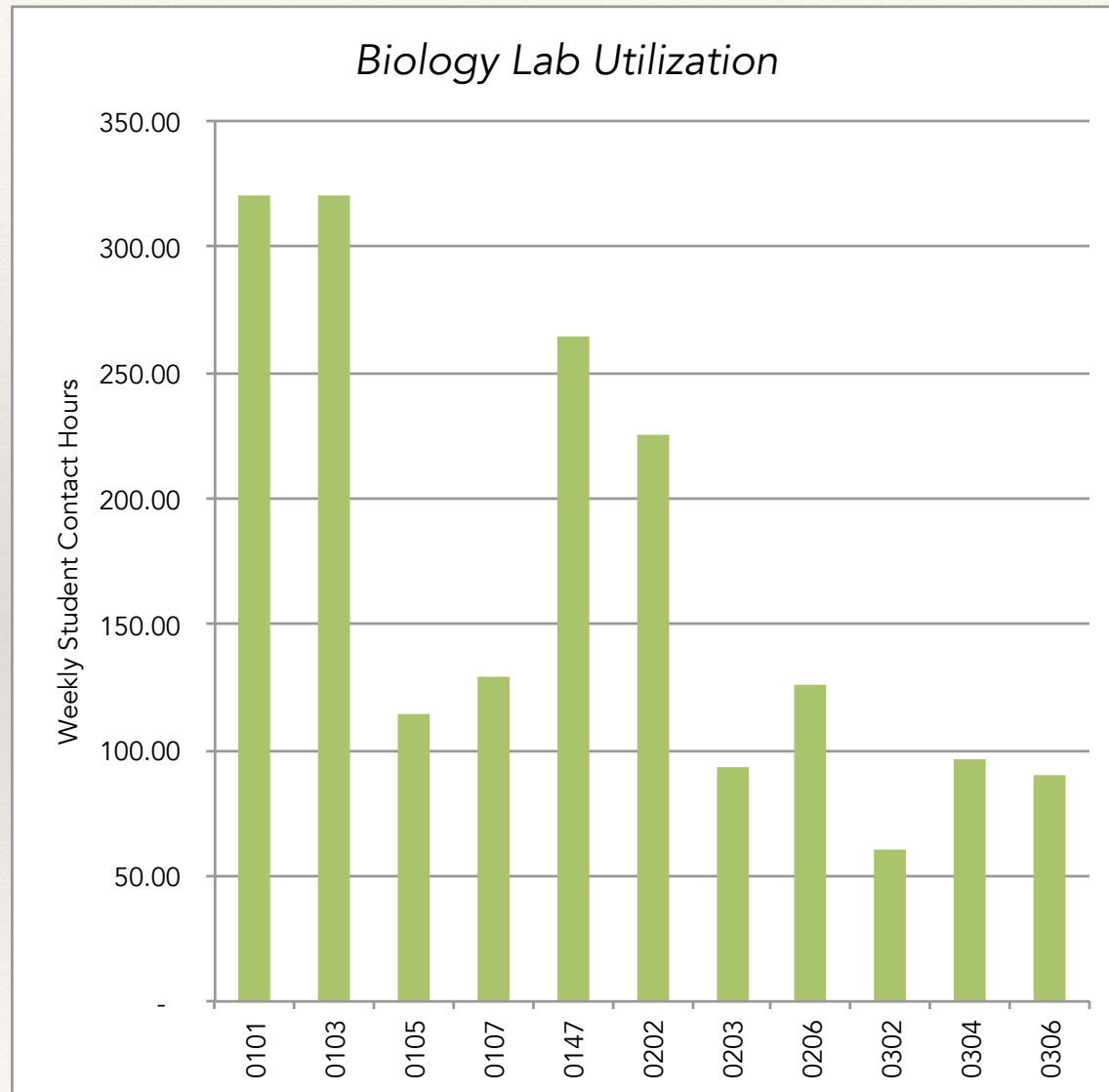
Biology

Chemistry

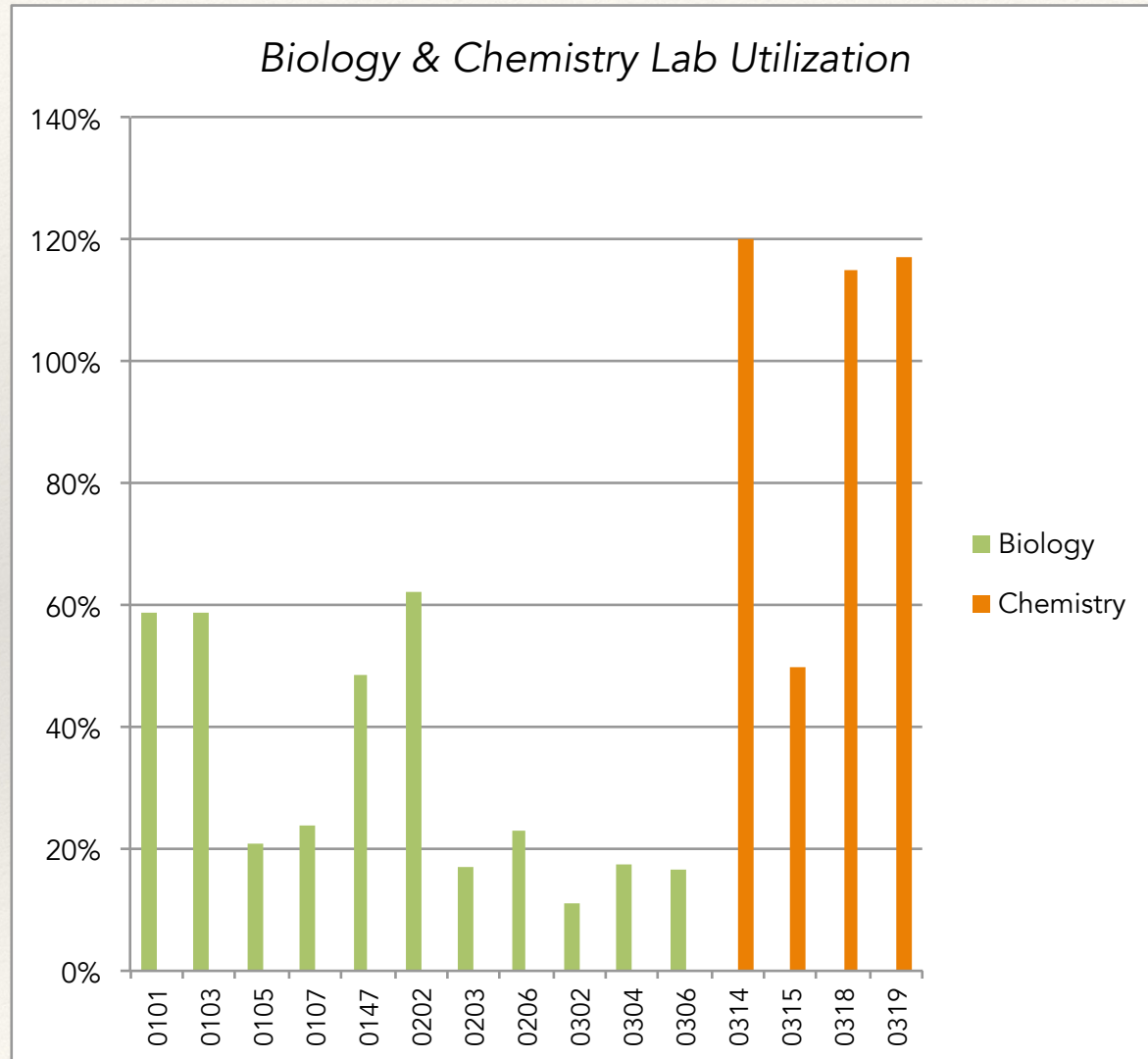
Geological Sciences

Physics & Astronomy

Case Study #2



Case Study #2

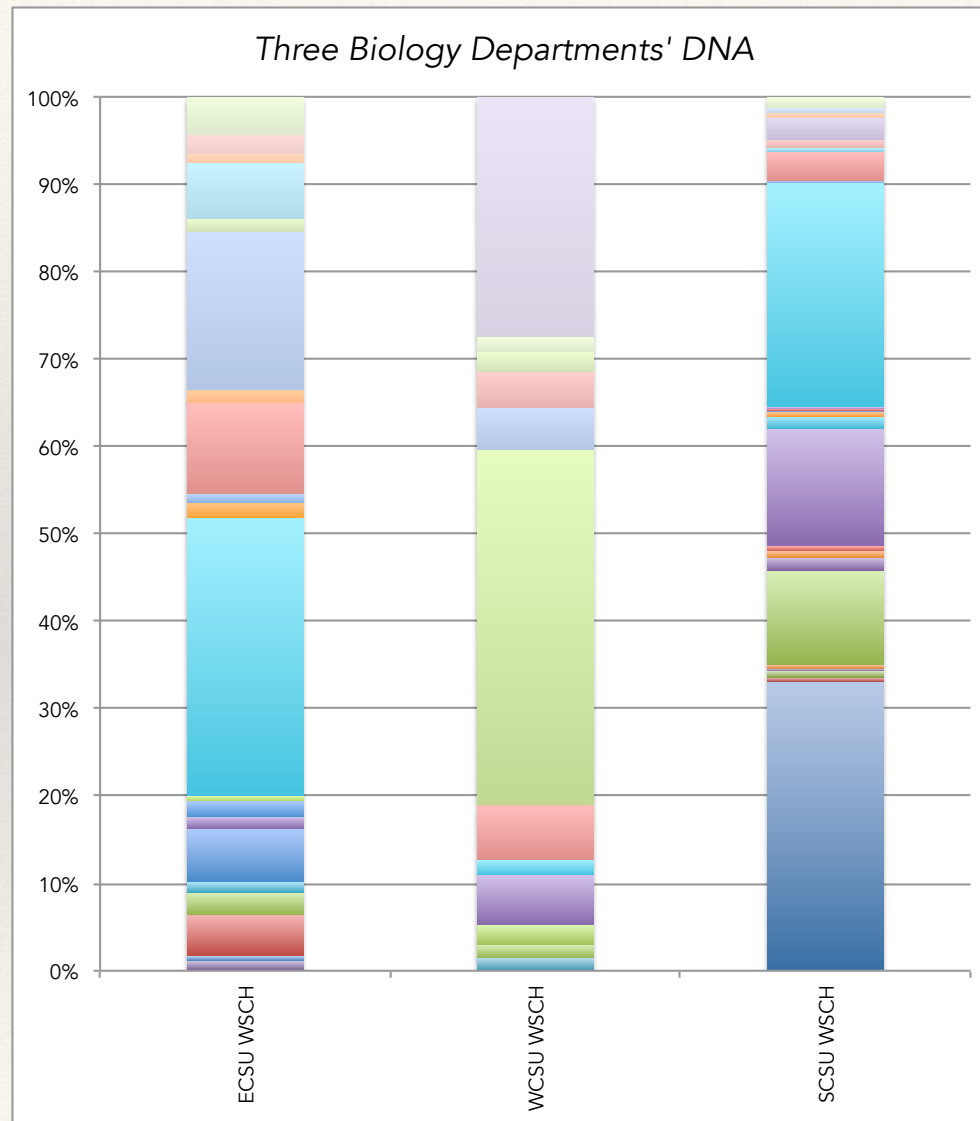


State Guidelines

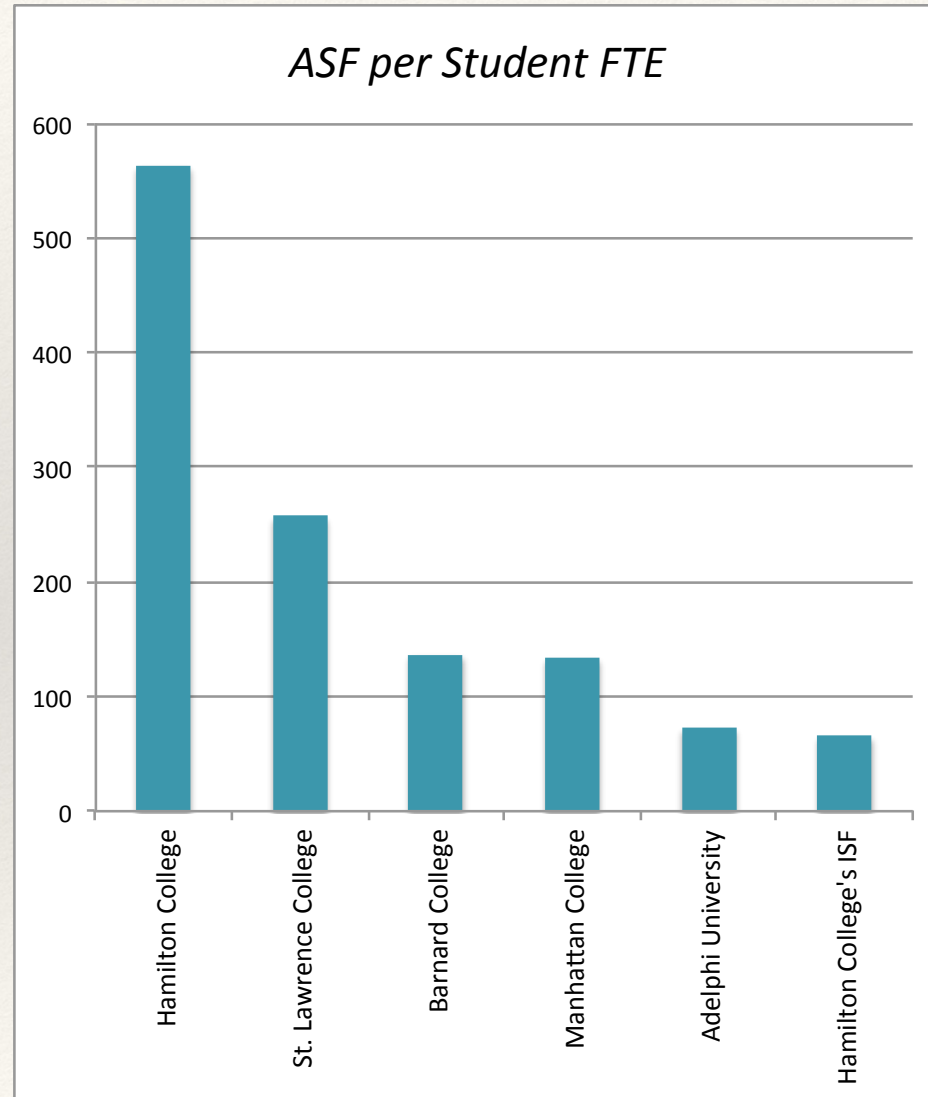
Example: Biology Department	Classrooms/Lecture Halls				Class Labs & Services				Individual Study Labs & Services				Research & Support			Faculty Office	General Use
	LD	UD	G1	G2	LD	UD	G1	G2	LD	UD	G1	G2	G1	G2	Faculty		
(2) Average Weekly Contact Hours per FTE	14	10.1	2.7	2.7	13.46	11.84	12.8	6.4					16.73	30.9	20		
(3) Average Square Foot per Station	16	16	16	16	60	60	60	60					360	360	360		
(4) Weekly Contact Hours per Station	28	28.3	28.32	28.32	22.66	22.66	22.66	22.66	59	59	59	59	47.2	47.2	47.2		
(1) Space Factor	7.8	5.7	1.5	1.5	35.6	31.4	33.9	16.9					127.6	235.7	152.5	196.0	10%

Example: Math Department	Classrooms/Lecture Halls				Class Labs & Services				Individual Study Labs & Services				Research & Support			Faculty Office	General Use
	LD	UD	G1	G2	LD	UD	G1	G2	LD	UD	G1	G2	G1	G2	Faculty		
(2) Average Weekly Contact Hours per FTE	14	14.3	12						3.75	2.5			6.6		10		
(3) Average Square Foot per Station	16	16	16						40	40			60		60		
(4) Weekly Contact Hours per Station	28	28.3	28.32		22.66	22.66	22.66		59	59	59		47.2		47.2		
(1) Space Factor	8.1	8.1	6.8						2.5	1.7			8.4		12.7	160.0	1%

State Guidelines



Benchmarking



Case Study #3



Northeast Private Institution
Liberal Arts College
Science Facility
120,000 GSF

Case Study #3

Biology

Chemistry

Environmental Studies

Geology

Mathematics

Physics

Psychology

Case Study #3

Classrooms

Biology

Chemistry

Environmental Studies

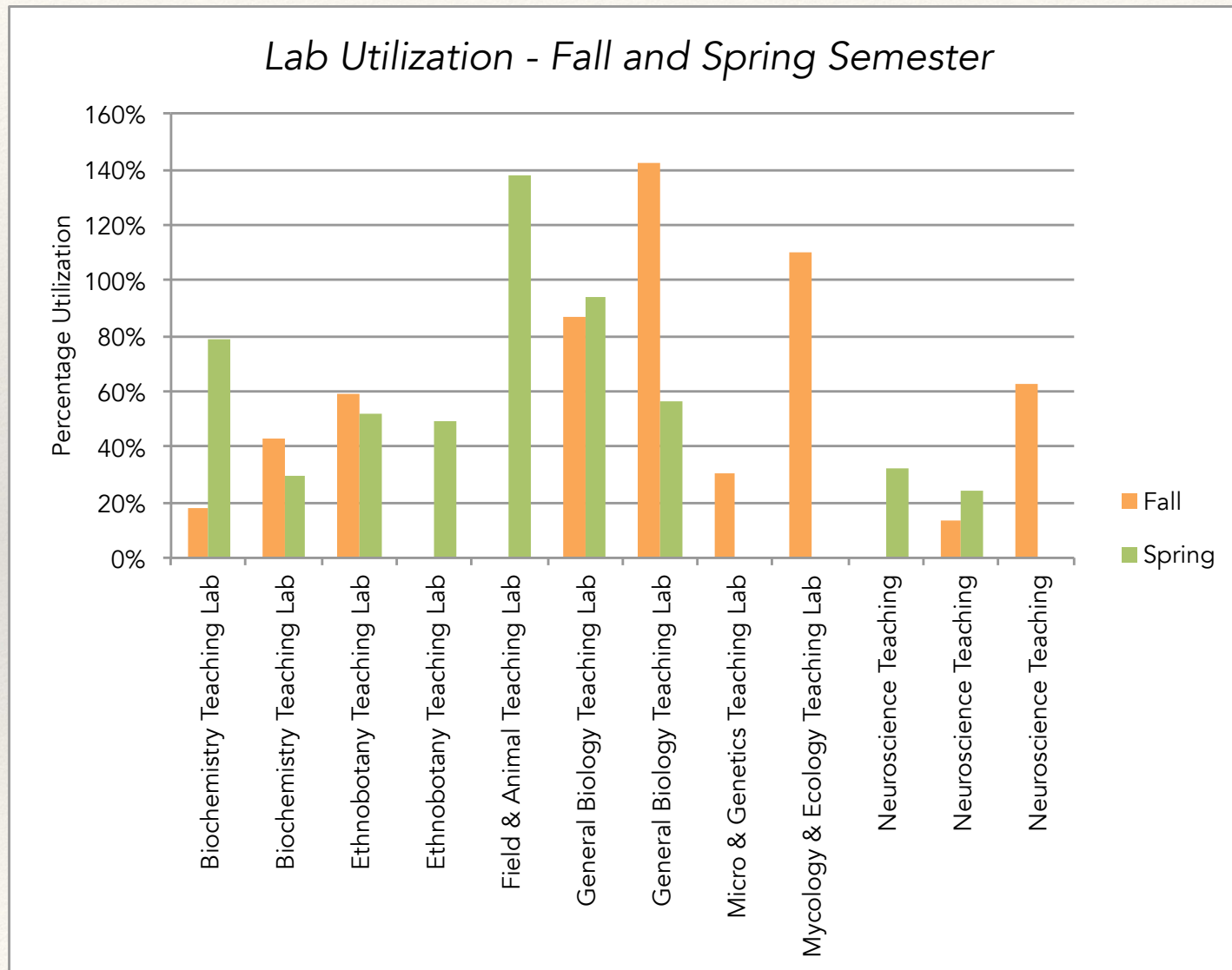
Geology

Mathematics

Physics

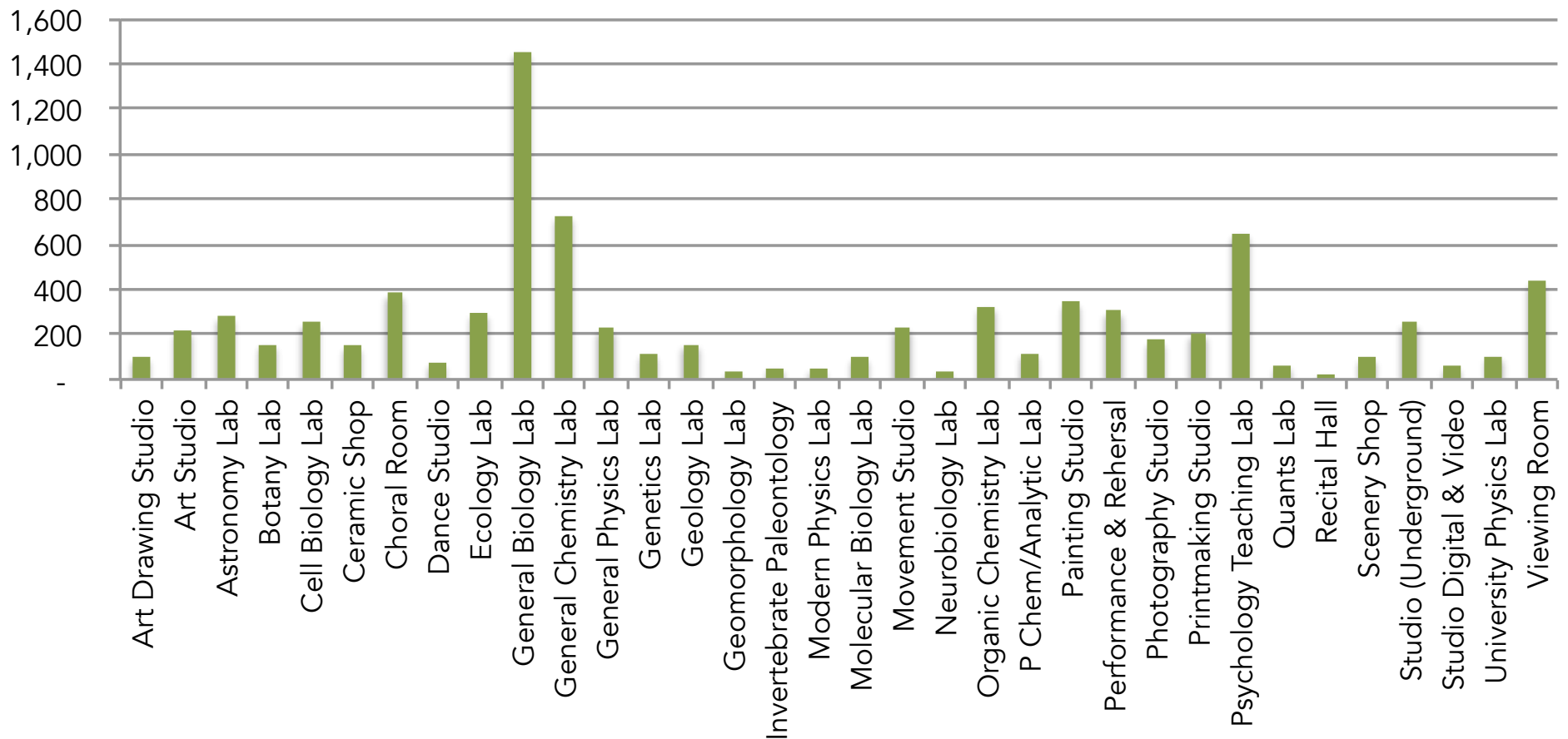
Psychology

Case Study #3

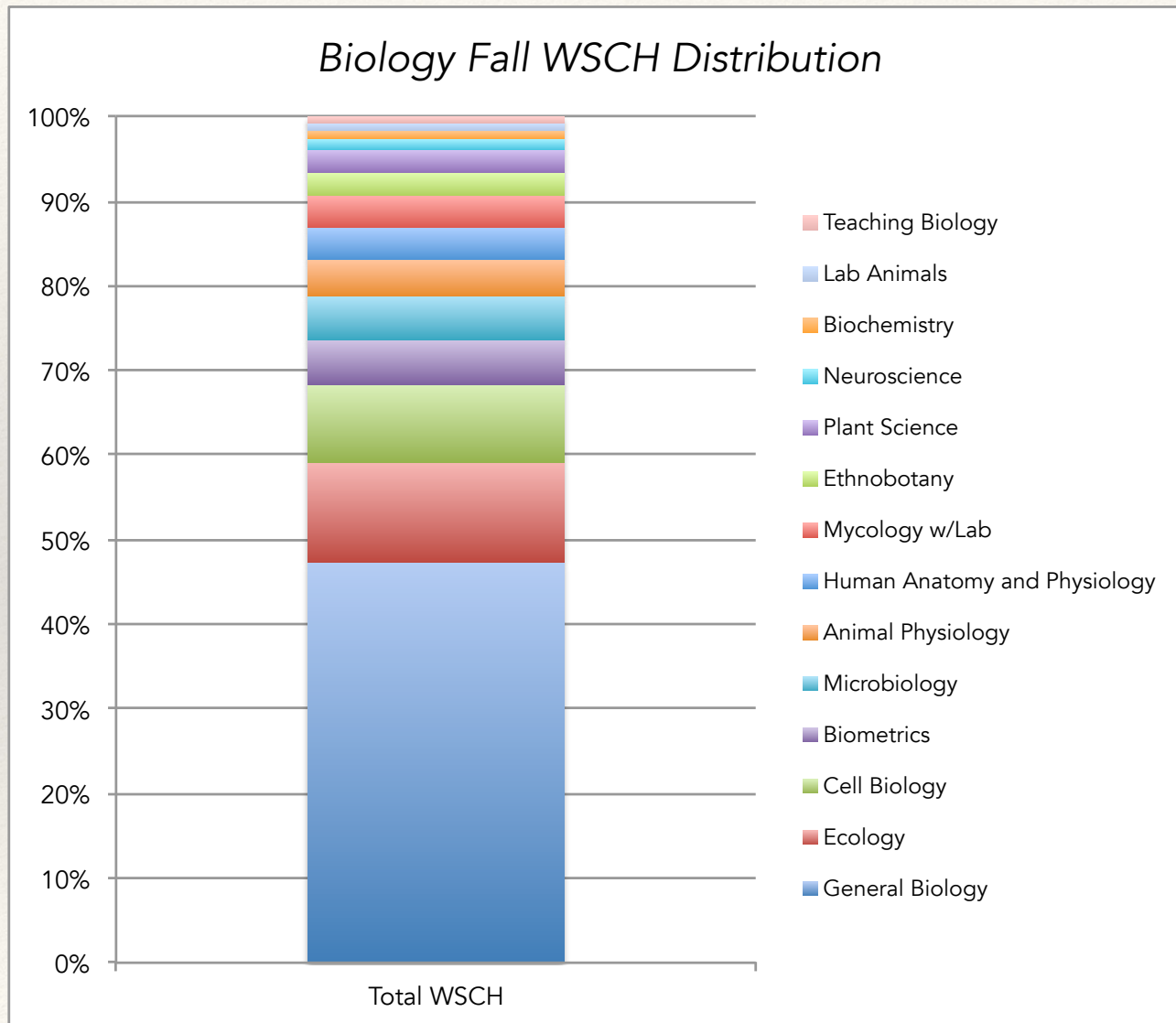


Case Study #3

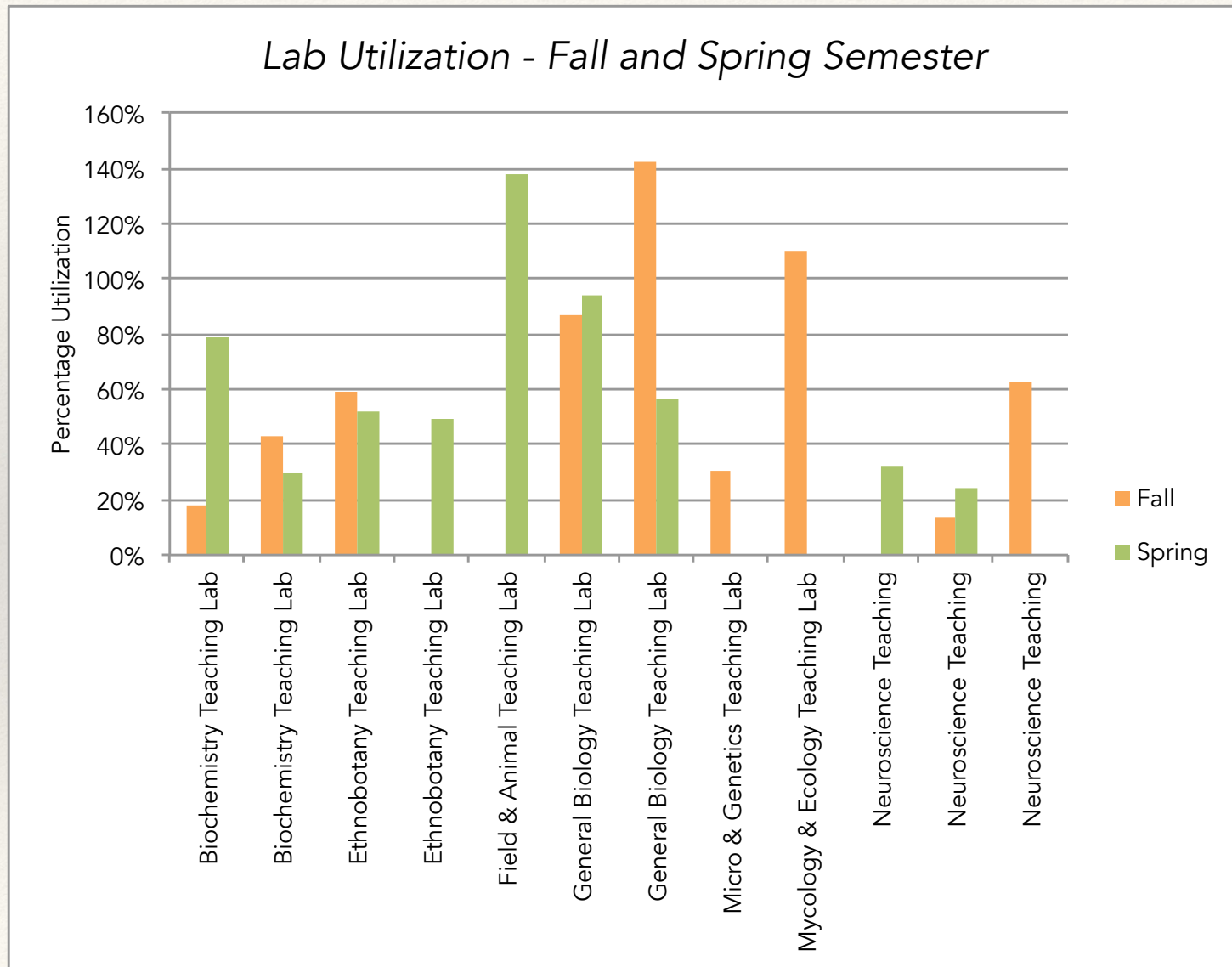
Weekly Student Contact Hours - Fall 2011



Case Study #3



Case Study #3



Bill James



Metrics

OBP

Metrics

WSCH

Metrics

PA	PLATE APPEARANCES
BB%	WALK RATE
K%	STRIKE OUT PERCENTAGE
BABIP	BATTING AVERAGE ON BALLS IN PLAY
AVG	BATTING AVERAGE
OBP	ON BASE PERCENTAGE
SLG	SLUGGING PERCENTAGE
wOBA	WEIGHTED ON-BASE AVERAGE
wRC+	WEIGHTED RUNS CREATED

Dramatization

“22”

Dramatization



Dramatization

Jimmy



Mikey

Scotty

Dramatization

Scotty to Mikey the Biologist,
“You have eight teaching labs”
“Your utilization of those lab are...”

Closing

ANCHORING BIAS

Planning fallacy

Overconfidence effect

Omission Aversion

Choice Paralysis

Herding

Preference for Stories versus Analysis

Recency Bias

The Bias Blind-Spot

Selection Bias

Selection Bias

Muddled But Not
A Good Story

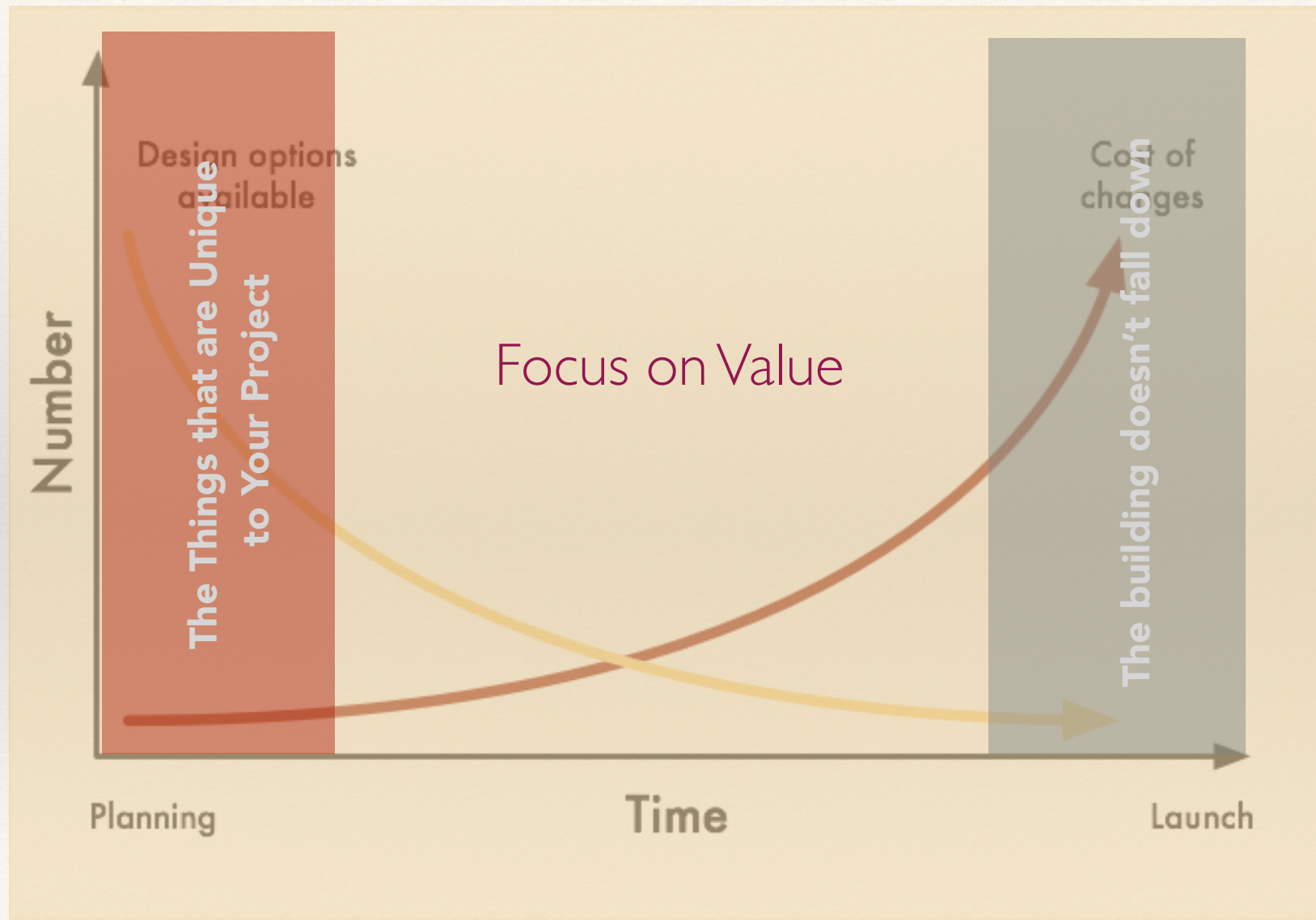
Good Story That
Cannot Be Told In
45 Minutes

Perfect
Projects

Good Story That
Can Be Told In
Under 45 Minutes

Cannot Be
Easily Explained
Given Almost Any
Amount Of Time

Maximizing Value



Tailoring Science Teaching Buildings

PPAA Winter Conference

January 24th, 2017