SOLENT
UNIVERSITY

CPB
Projects

# ‘We shape our buildings and our buildings shape us’

## What space planning reveals about institutional sustainability

AUA Conference, 16 April 2019

# Welcome to the session

Part 1 – curriculum planning, timetabling and estates planning – how does it fit together?

Part 2 – case study – investigating the issues and making wise decisions

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Ground rules: Chatham house - Issues should not be attributed to an institution

# Too much and too little space...

## Do you recognise the following?

- You want to book a room but there's nothing available on the system

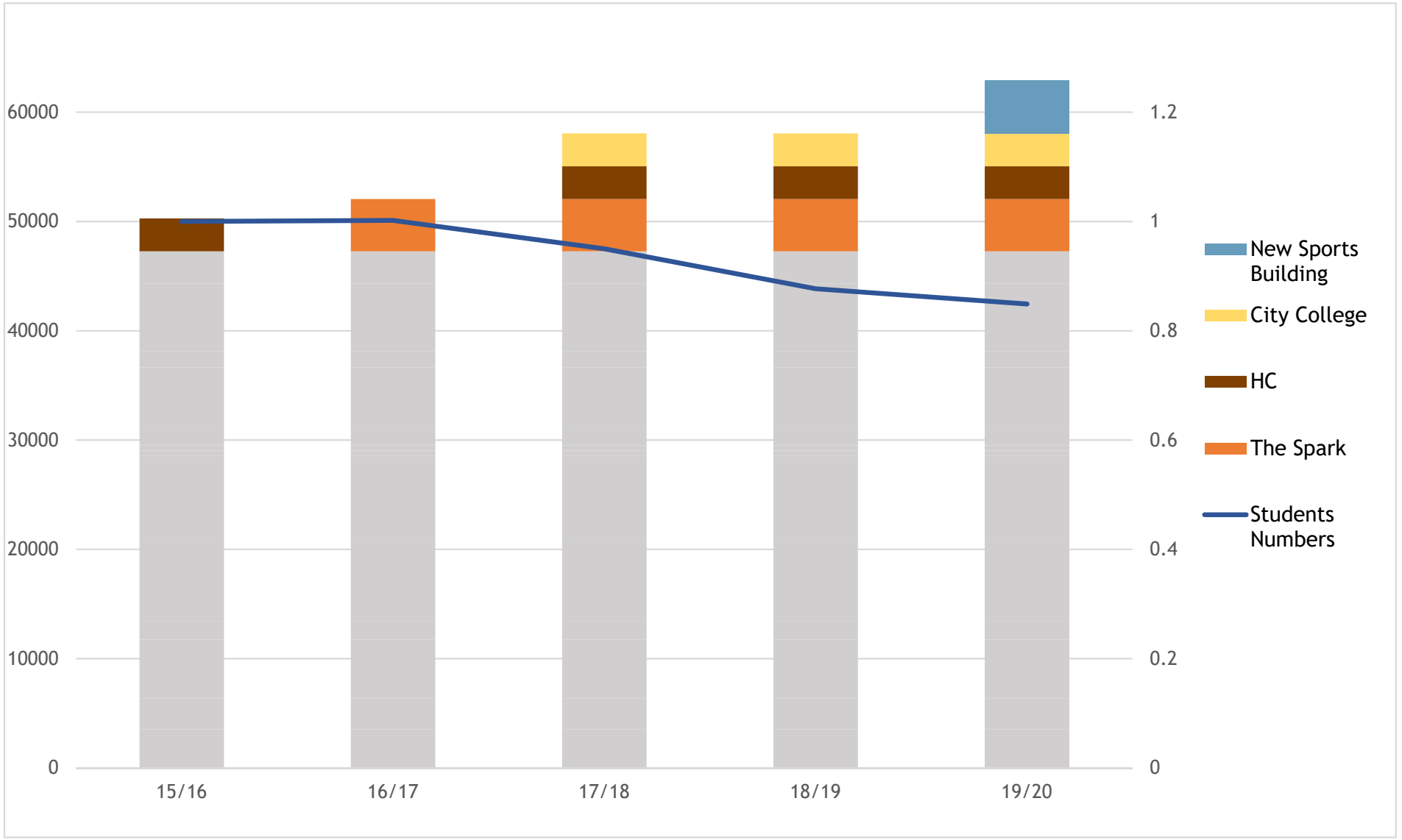
- "Our school needs more teaching and office space: our courses are growing exponentially!"

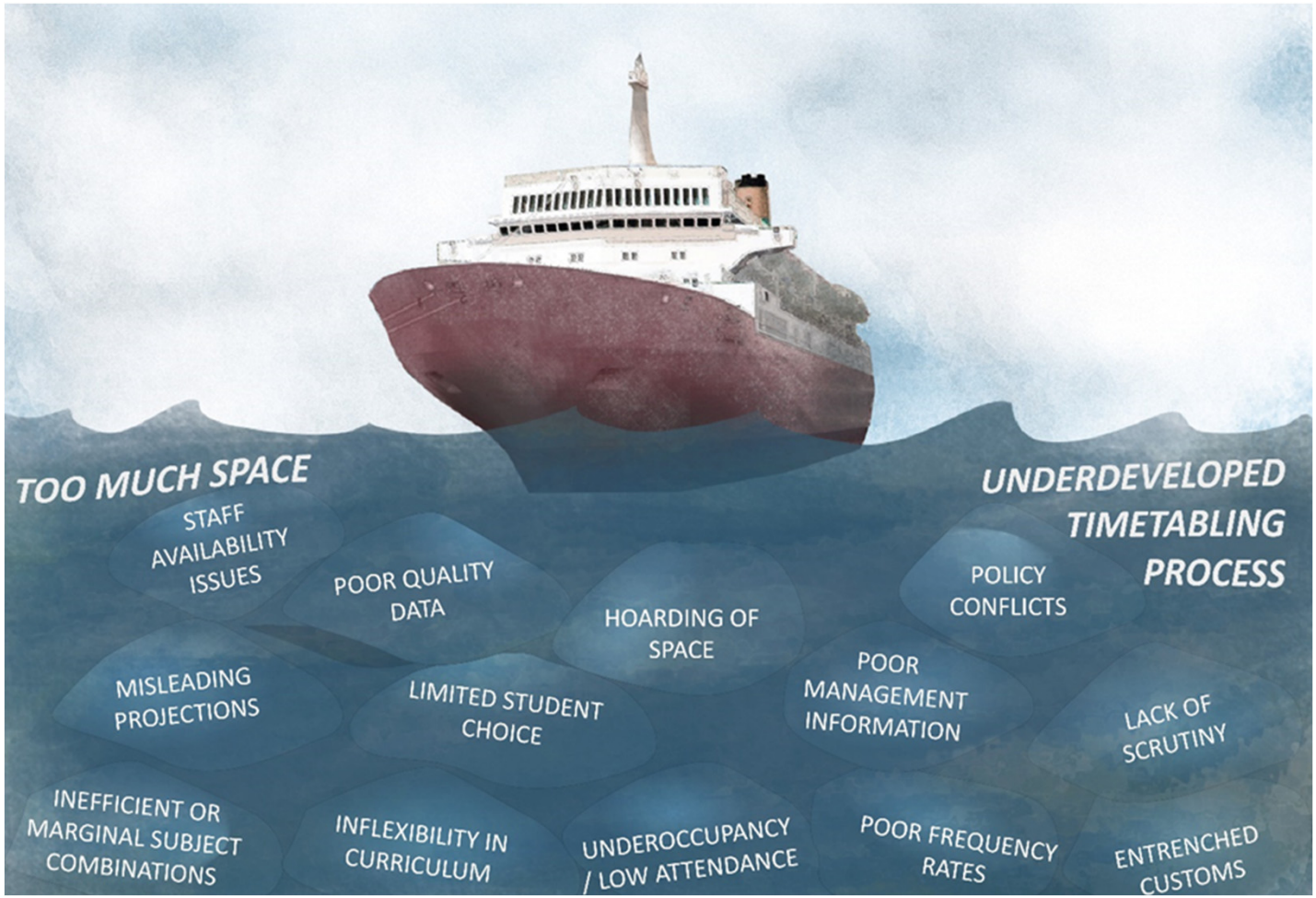
- "Performance would improve if only we had more space / space in a different location / better space"

# Paradoxical Symptoms

- Too much space exemplified by low utilisation rates
- Demands for more space
- Increasingly problematic to timetable efficiently
- Tension between timetablers and space managers
- Tensions between academic departments and timetabling and/or estates team
- “You can’t get a room when you need one”
- “There’s no one here on Friday afternoon or Monday morning”

# Too much and too little space...





# CONSTRAINTS

## DEMAND- SIDE

Students' Choices, Needs & Preferences

## SUPPLY- SIDE

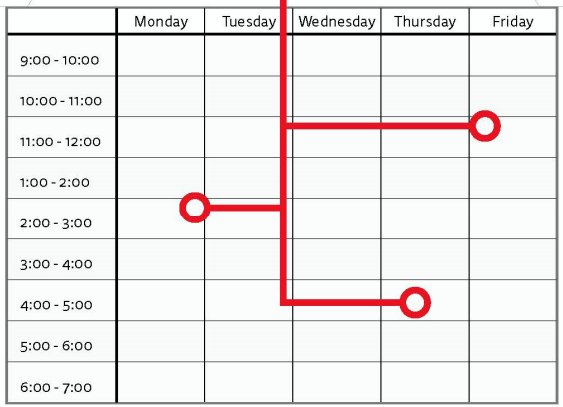
Design of Programmes

Contact Time

Staff Availability

Space

**Scheduling Solutions**

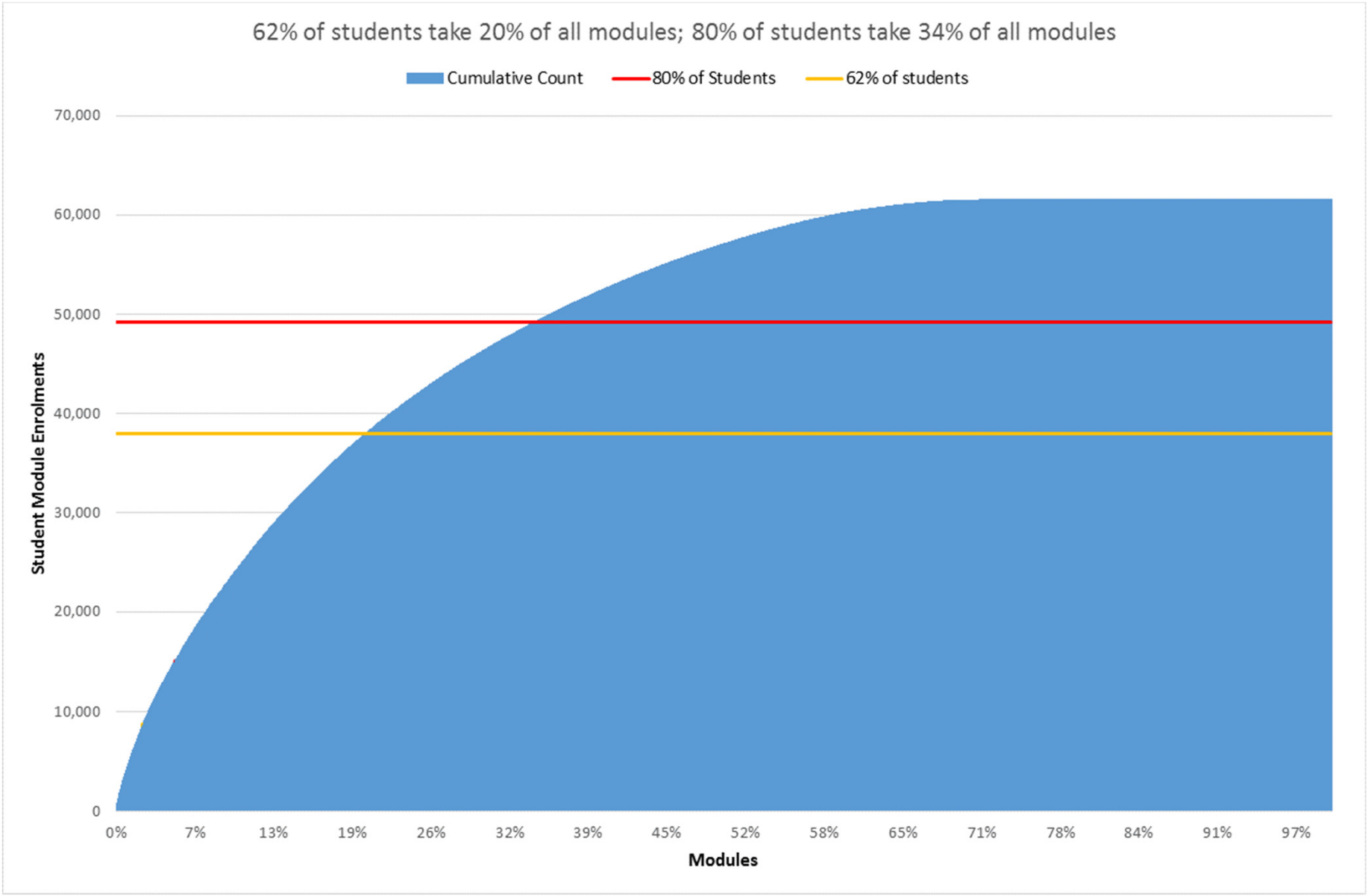


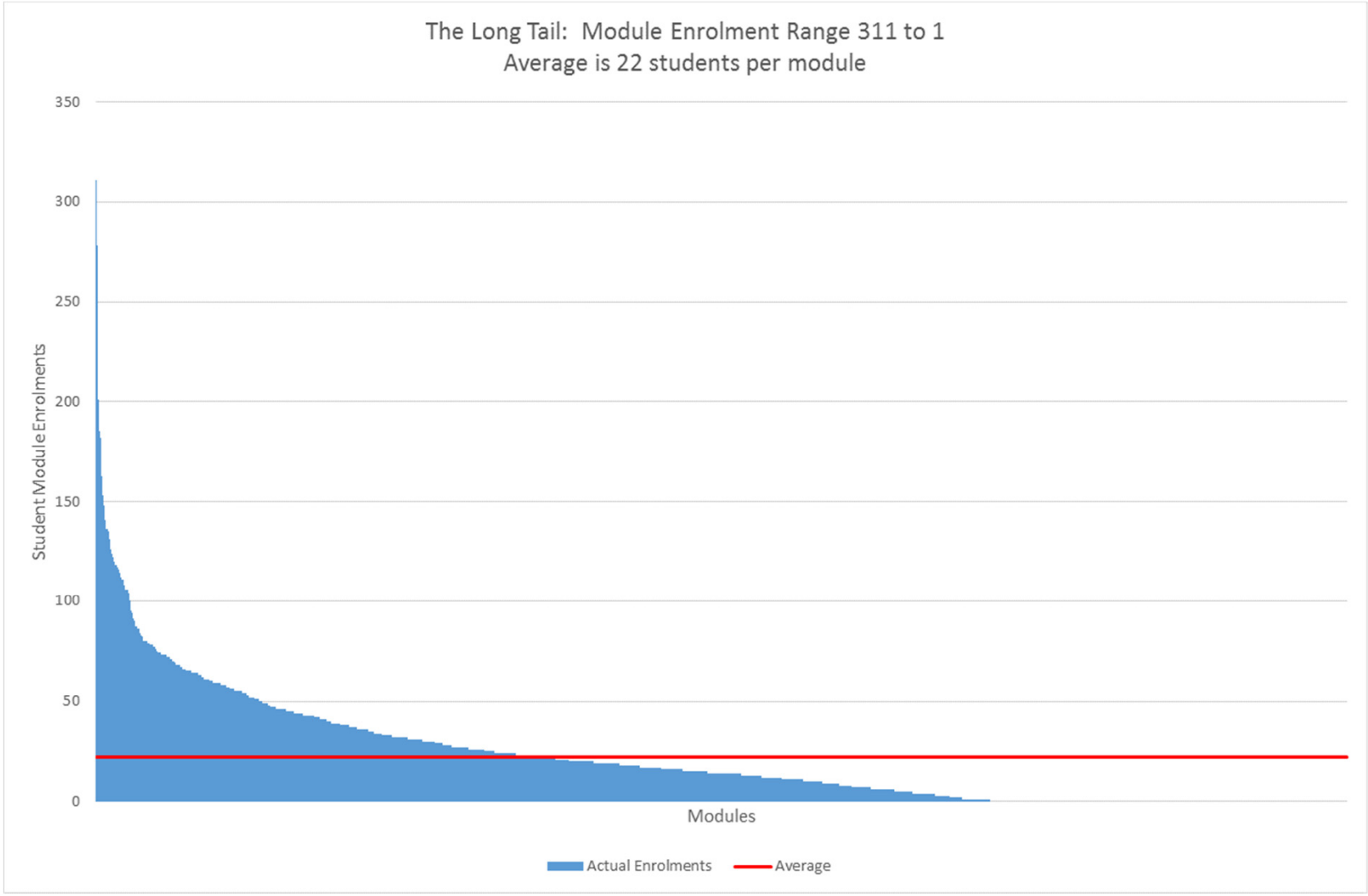
| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 9:00 - 10:00 | | | | | |
| 10:00 - 11:00 | | | | | |
| 11:00 - 12:00 | | | | | |
| 1:00 - 2:00 | | | | | |
| 2:00 - 3:00 | | | | | |
| 3:00 - 4:00 | | | | | |
| 4:00 - 5:00 | | | | | |
| 5:00 - 6:00 | | | | | |
| 6:00 - 7:00 | | | | | |

# Problem 1: Design of the curriculum

- A large number of courses/modules with small numbers of students
- Proliferation of closely connected/interrelated courses to provide a more attractive offer

  Traditional crafts course group
  - Basket weaving - 20 students
  - Basket weaving and knitting – 15 students
  - Basket weaving and crochet – 8 students
  - Knitting and crochet – 13 students
  - Crochet – 17 students
  - Knitting – 5 students
- Complex sharing of modules across a Faculty / University
- High degree of optionality to enhance the student experience


62% of students take 20% of all modules; 80% of students take 34% of all modules
Cumulative Count
80% of Students
62% of students
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Student Module Enrolments
0%
7%
13%
19%
26%
32%
39%
45%
52%
58%
65%
71%
78%
84%
91%
97%
Modules


The Long Tail: Module Enrolment Range 311 to 1
Average is 22 students per module
350
300
250
200
150
100
50
0
Student Module Enrolments
Modules
Actual Enrolments
Average

# INITIAL CURRICULUM DESIGN

| | BW | BW&K | BW&C | K&C | C | K |
|---|---|---|---|---|---|---|
| Module 1 | | | | | | |
| Module 2 | | | | | | |
| Module 3 | | | | | | |
| Module 4 | | | | | | |
| Module 5 | | | | | | |
| Module 6 | | | | | | |
| Module 7 | | | | | | |
| Module 8 | | | | | | |
| Module 9 | | | | | | |
| Module 10 | | | | | | |
| Module 11 | | | | | | |
| Module 12 | | | | | | |

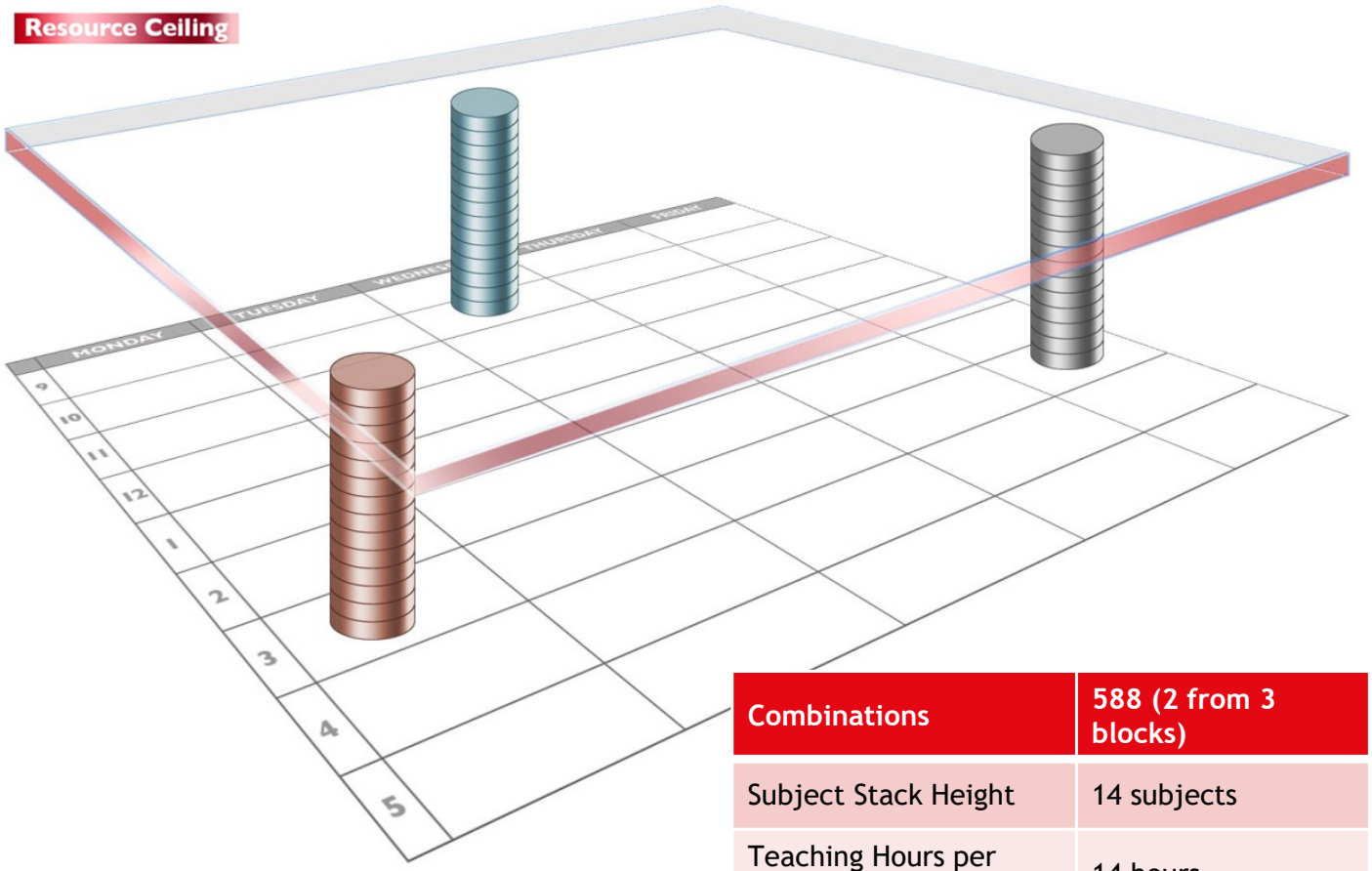
# CURRICULUM WITH STACKING

| | BW | BW&K | BW&C | K&C | C | K |
|---|---|---|---|---|---|---|
| Module 1 | | | | | | |
| Module 2 | | | | | | |
| Module 3 | | | | | | |
| Module 4 | | | | | | |
| Module 5 | | | | | | |
| Module 6 | | | | | | |
| Modules 7/8/9 | 7 | 8 | 9 | 7 | 8 | 9 |
| Module 10 | | | | | | |
| Modules 11/12 | 11 | 12 | 11 | | 11 | 12 |

# Curriculum Stacking Summary

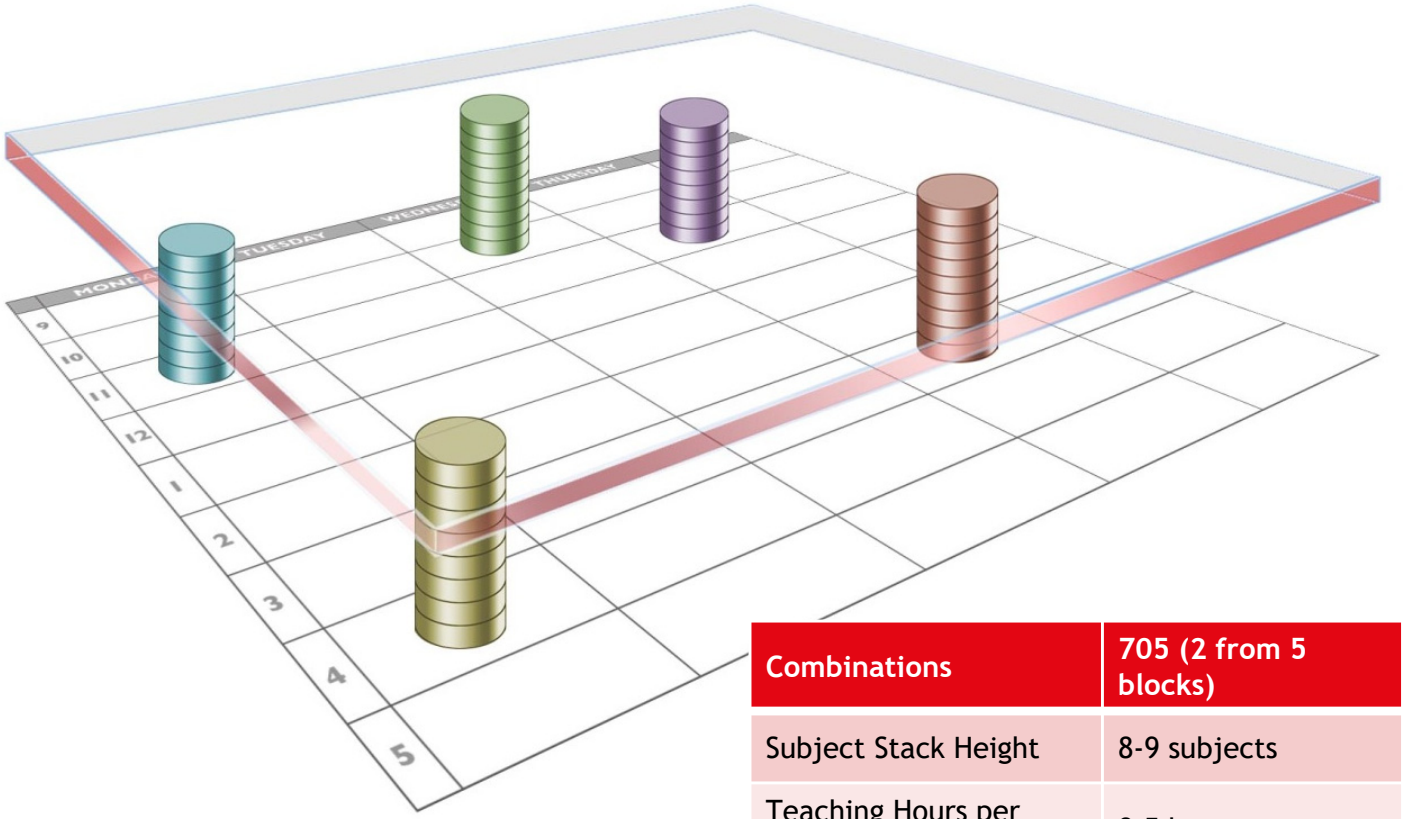
- Our Curriculum only allows for partial stacking of modules
- 9 Time Slots are required to deliver only 12 modules
- Modules remain cross-threaded
- The Curriculum creates timetable complexity even before any other constraints (e.g. staff, rooms) are introduced

# Example 1 - 3 Block



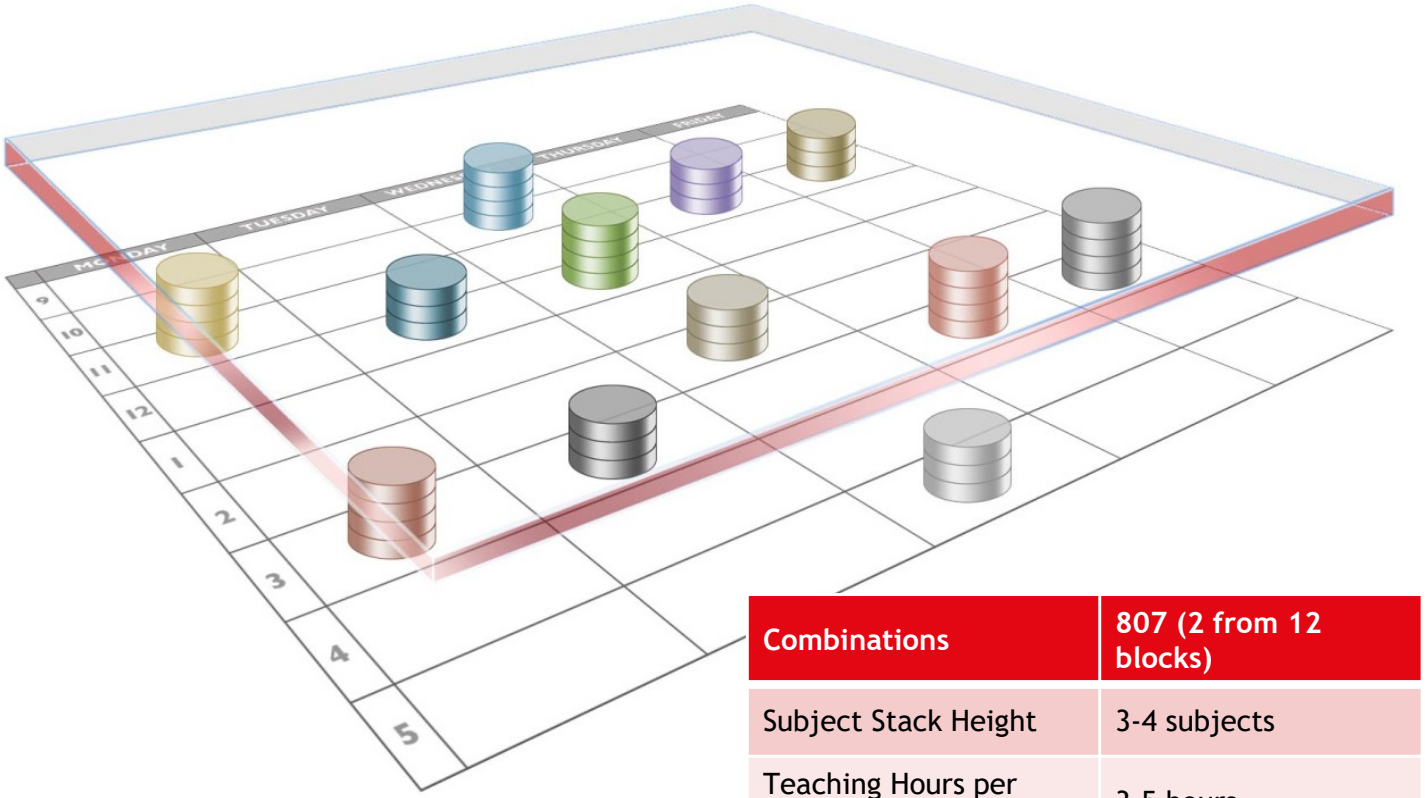

| Combinations | 588 (2 from 3 blocks) |
|---|---|
| Subject Stack Height | 14 subjects |
| Teaching Hours per block | 14 hours |

# Example 2 - 5 Block



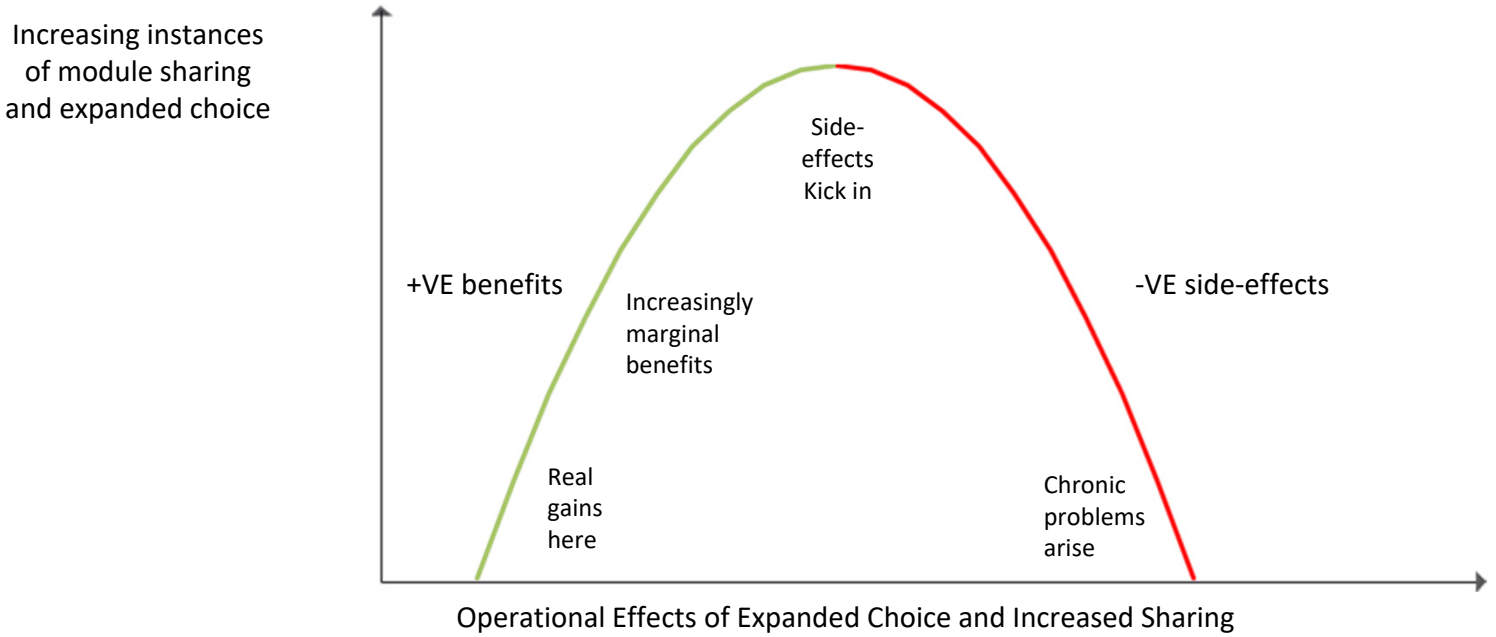

| Combinations | 705 (2 from 5 blocks) |
|---|---|
| Subject Stack Height | 8-9 subjects |
| Teaching Hours per block | 8.5 hours |

# Example 3 - 12 Block




| Combinations | 807 (2 from 12 blocks) |
|---|---|
| Subject Stack Height | 3-4 subjects |
| Teaching Hours per block | 3.5 hours |

# Good ideas gone bad: when a positive policy has side effects




| Positive Benefits | Negative Side Effects |
|---|---|
| Attractive Curriculum Offer | Combinations Increase Constraints |
| Scale economies | Diseconomies arise |
| - Programme inefficiencies off-set by module efficiencies (viable numbers) | - Repeat teaching required to break constraints |

# Problem 2: Staff / student constraints

## Does this resonate ?

- Perceived view that students won't want to come to classes before 10am and after 4pm
- Friday teaching leads to poor NSS scores
- Students want a day without teaching to help them get a job
- Staff commuting from afar
- Staff must have a research day
- Modules need a lecture at the start of the week and seminars at the end of the week
- Highly specialised academics dictate their availability

# The effect of staff & student constraints

1. Results of our 2018 space survey
2. Percentages – frequency x occupancy.

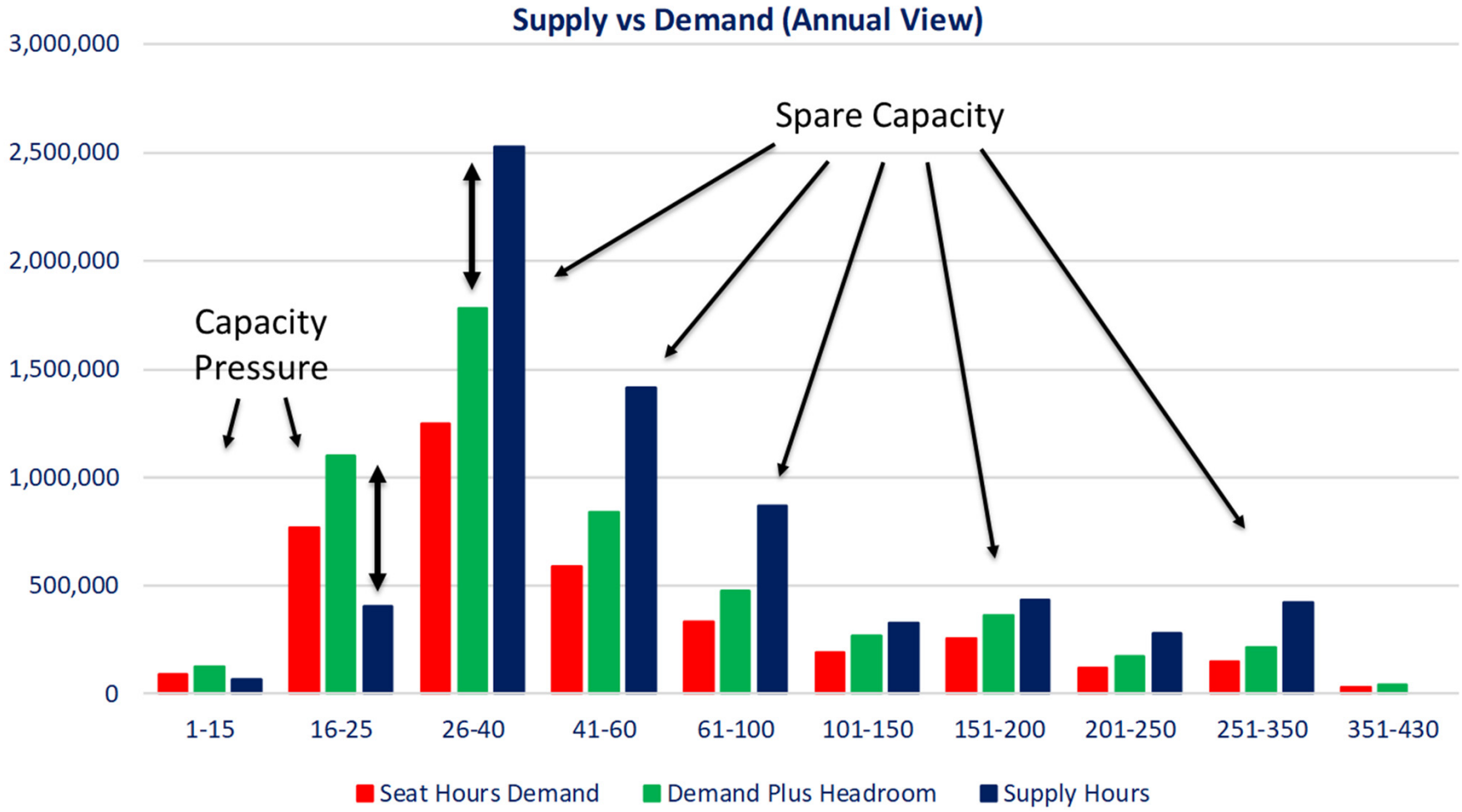
| Utilisation by day & time | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 09:00 | 16% | 17% | 16% | 18% | 12% |
| 10:00 | 30% | 22% | 24% | 21% | 16% |
| 11:00 | 26% | 25% | 25% | 24% | 18% |
| 12:00 | 24% | 24% | 23% | 20% | 16% |
| 13:00 | 30% | 25% | 17% | 19% | 14% |
| 14:00 | 31% | 24% | 22% | 21% | 12% |
| 15:00 | 30% | 24% | 22% | 22% | 9% |
| 16:00 | 20% | 12% | 13% | 10% | 3% |

# Problem 3: Poor timetabling processes

## Effects of poor Timetabling processes

- Timetable instability
- Zero attended events
- Poor use of space
- Mis-fit between group sizes and classroom sizes
- Over inflated idea of the number of classrooms needed. Money spent on facilities that are not required
- Struggling to free up space for new project / new courses

# Room/Group (mis-)Fit



# Solution : good Timetabling by design

- Early, honest information about student numbers
- Well designed option choosing process – done before timetabling starts
- Upfront information from academics about teaching requirements
- Class duration always a multiple of one hour
- Minimal constraints
- No late change process
- No scope for special pleading with the timetabling team

# What we've learned

- 'Bee stings' – the small stuff is worth investigating and tackling.  Multiple small issues soon become big problems

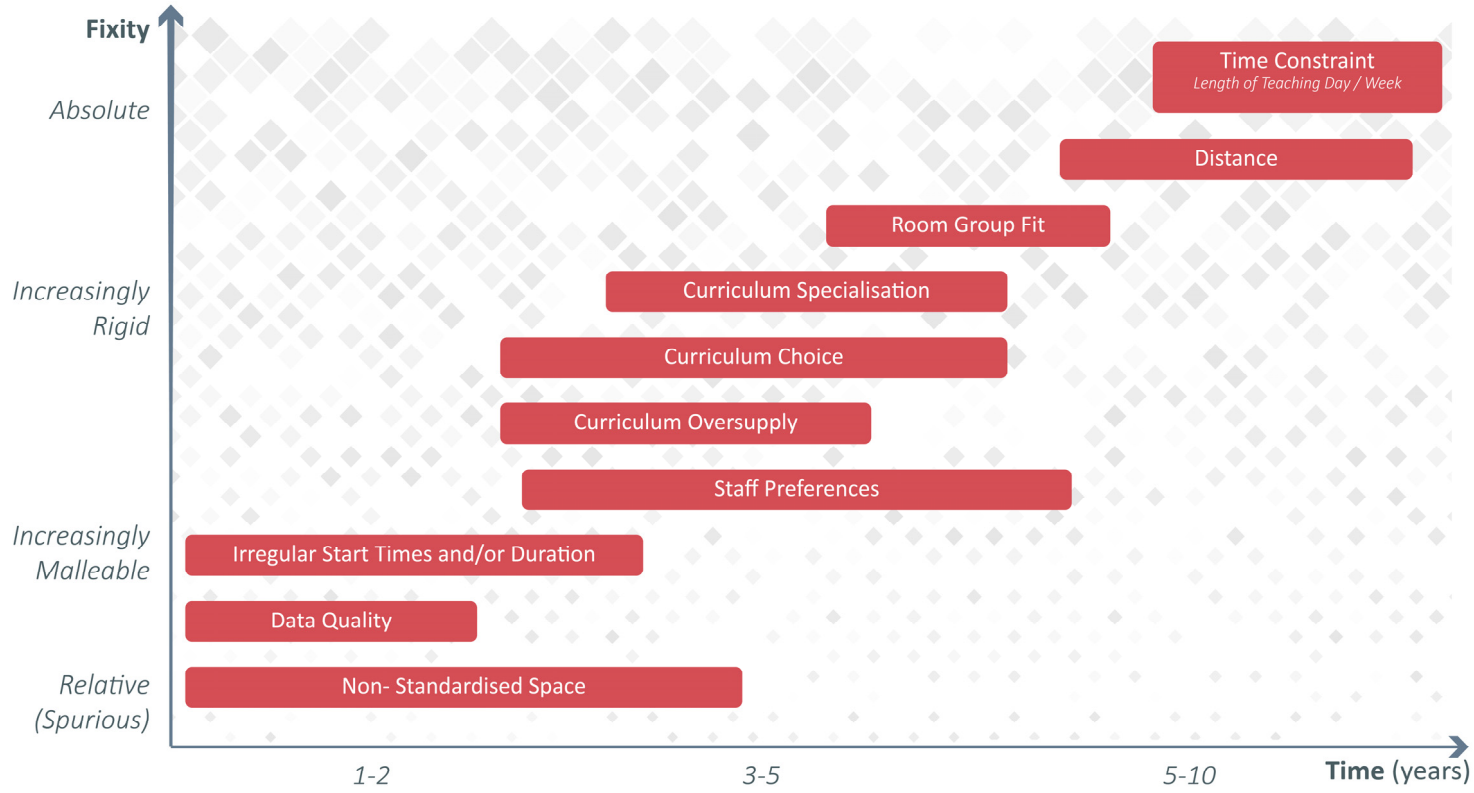
- Dig into the detail to understand what's going on under the surface – you should then be able to prioritise effectively

- Space costs money : If currently maintaining 10% of the Estate that is surplus to requirements, the University is spending approximately £370,000 unnecessarily

# Questions to ask yourself

- Are your courses running with low numbers?
- Do you offer a high level of optionality?
- Are your processes for making option choices and timetabling underdeveloped / inconsistent / non existent?
- Are your student attendance figures low?
- Is your course costing model underdeveloped / non existent?

# Alleviating Constraints



# Case Study: Background

Briefing Pack and Guidance Issued

Key Decision/Choice:

Progress 10,000 $m^2$ Science Building (Phase 1 of the Estates Strategy -

Or

Replace the Science Scheme with a new Teaching Building

Any Questions/Clarifications?

# Case Study: Timing

Work in small teams up to 4 people

15 minutes to reach decisions

20 minutes for each group to report back

15 minutes for discussion and key lessons

# Case Study: Challenge

Identify any options other than to choose between the two projects

You are free to identify any alternative options to address the problem and to reject the binary choice between the two projects

Make a clear recommendation to back one or other of the projects
That may include the recommendation to support your other option instead

Identify any interim measures which need to be taken for September 2019

Identify the key reasons for the decision.

# Case Study: Key Lessons

1. Paradoxes imply deeper problems
2. Some solutions are unthinkable without an understanding of Constraints
3. If space is a lever, more space and fewer students should lead to easier timetabling
4. Everything is connected
5. Every decision has consequences
6. Capital is very scarce
7. Understand scale economies when growth is under discussion
8. Surpluses and Returns are not optional
9. Manage up
10. Finance is not just for the FD where space and staff time are concerned
11. Differentiate Maths Problems from Human/Cultural/Political Problems
12. Adding space alone will not solve anything but may increase staff costs too