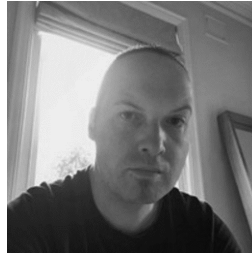


GENERATIVE SOCIAL DISTANCE DESIGN

THE SOCIAL DISTANCE LAB, LANCASTER, UK



DES FAGAN RIBA ARB BArch MArch SHFEA Architect
Head of Architecture at Lancaster
Advisor to the Architects Registration Board, UK

Des worked as lead architect for a number of international award-winning architectural practices prior to working in academia, most recently as the Project Architect for the Olympic Village Scheme for London 2012 at Glenn Howells Architects, and as Lead Architect at Zaha Hadid Architects for the Glasgow Transport Museum – winner of the 2013 European Museum of the Year.

THE SOCIAL DISTANCE LAB, LANCASTER

1

SOCIAL DISTANCING

Discussion on what constitutes social distancing, and what impact it has on infection rates.

2

SIGNAGE

A precedent study of global signage, considering different approaches to regulation.

3

LANCASTER SOCIAL DISTANCE LAB

Development and assembly of the Social Distance Lab to test generative distancing.

4

CONCLUSION

Evaluation of the work, reflection and speculation on future trends of social distancing.



QUOTE

“

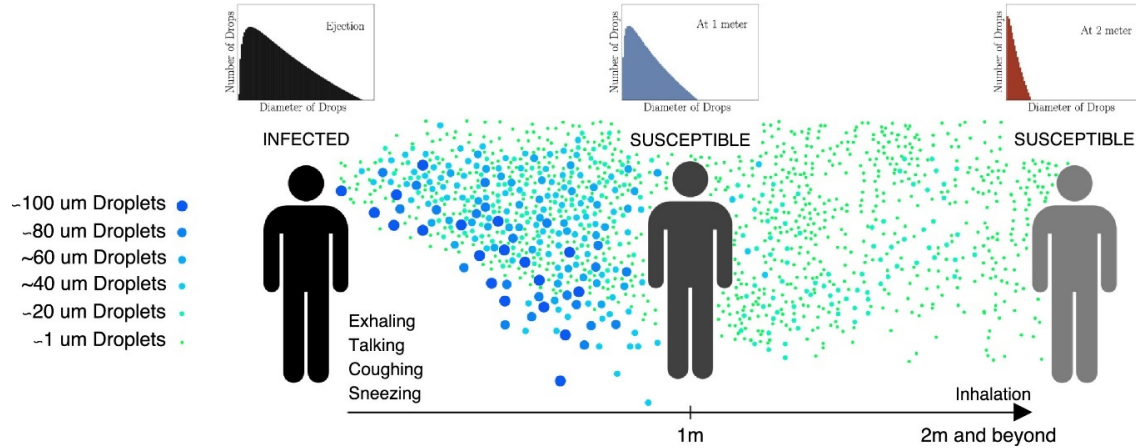
**WHAT DIVIDES US PALES IN COMPARISON TO
WHAT UNITES US.**

- TED KENNEDY

Edward Moore Kennedy (February 22, 1932 – August 25, 2009) was an American politician and lawyer who served as a U.S. Senator

SOCIAL DISTANCING

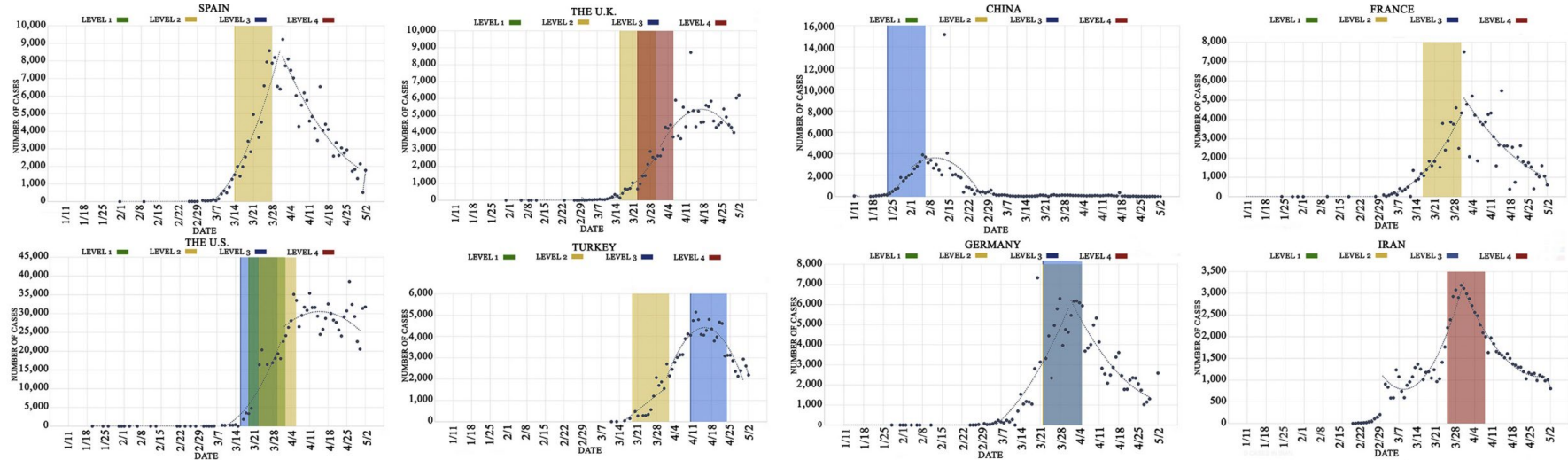
SCIENCE, HISTORY, CHANGE



*Host-to-Host Airborne Transmission as a Multiphase Flow
Problem For Science-Based Social Distance Guidelines*

Airborne particles, or aerosols, in the context of human to human transmission. It is also increasingly clear that airborne transmission is an important contributor to rapid spreading of the disease. The above diagram illustrates droplet generation by exhalation, their potential transformation into airborne particles by evaporation, transport over long distances by exhalation and by ambient air turbulence, and final inhalation by the receiving host as interconnected multiphase flow processes.

SOCIAL DISTANCE IMPACT ON CASES



Effect of the social distancing measures on the spread of COVID-19 in 10 highly infected countries

COVID-19 pandemic has demonstrated how important it is to develop fundamental knowledge related to generation, transport and inhalation of pathogen-laden droplets and their subsequent possible fate as airborne particles, or aerosols, in the context of human to human transmission

The total number of infections in the US is projected to reach 287 million without social distancing and 188 million with social distancing. When combined with the differential mortality rates when the health system capacity threshold is exceeded versus when not, the difference between the infection curves translates into about 1.24 million lives saved. Using a \$10 million value of reduced mortality risk (VSL) for the lives saved, the **benefits of social distancing are \$12.4 trillion**. The cost of social distancing is the difference in present value terms of the GDP losses without (\$6.49 trillion) and with (\$13.7 trillion) the policy, which is \$7.21 trillion.

Table 1 Benchmark outcomes for the uncontrolled scenario (without social distancing) and controlled scenario (with social distancing).

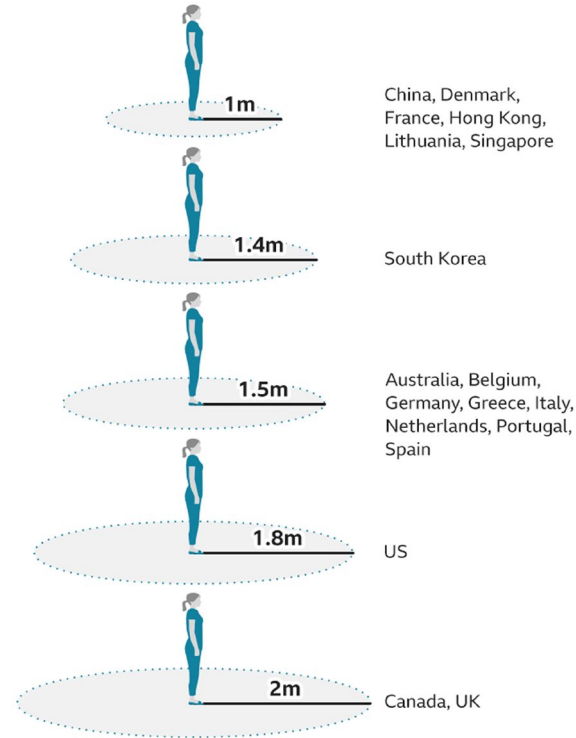
	Uncontrolled	Controlled
Infections (million)	287	188
Deaths (million)	2.18	0.941
Present value of GDP loss (trillion US\$)	6.49	13.7
Value of lives lost (trillion US\$)	21.8	9.41
Net benefits (trillion US\$)		5.16

Benchmark parameter values: $R_0 = 2.4$, infectious period = 6.5 days, low mortality rate = 0.5 %, high mortality rate = 1.5 %, reduction in contact rate = 38 %, VSL = \$10 million, uncontrolled initial GDP decline = 2.0 %, controlled initial GDP decline = 6.2 %, medical capacity threshold = 36 million infected, equal proportional rates of recovery in uncontrolled and controlled scenario, discount rate = 3.0 % year⁻¹, planning horizon = 30 years.

*The Benefits and Costs of Using Social
Distancing to Flatten the Curve for COVID-19*

- Initially, the scientific evidence for distancing varied across the world, from an initial 2m in the UK and Canada, to 1.8m in the US, 1.4m in South Korea and 1m in China, France and Hong Kong.
- Aggressive social distancing measures buy enough time to develop and distribute cost-effective COVID-19 treatments or vaccines.
- Distancing is, however, difficult to maintain for a long period of time and its' effectiveness decreases as time goes on. Long-term distancing breaches the limits of people's physical and mental endurance and the negative effects on socio-economics are enormous.

How social distancing rules differ



Note: Regional authorities can impose different guidelines in some countries

BBC NEWS – Covid19 Distancing Diagram

SIGNAGE

GLOBAL, TYPE, APPLICATION



GLOBAL SOCIAL DISTANCE SIGNAGE



GLOBAL SOCIAL DISTANCE SIGNAGE



GLOBAL SOCIAL DISTANCE SIGNAGE



GLOBAL SOCIAL DISTANCE SIGNAGE



Can social distancing guidance be effectively automated using generative software (Grasshopper w/python)

- Can automated software generate optimized building layouts successfully

- How does the design of signage impact the effectiveness of social distancing measures?

- How do the complex variables of signage design influence behavior?

- How does branding impact signage – should signage be designed case by case?

- Should signs be made to suit the building they are in, or be universal?

Can the outcomes be achieved cost-effectively?

- Can the project be scaled efficiently at economic cost for global use?

LANCASTER SOCIAL DISTANCE LAB

DESIGN TEAM, DEVELOPMENT, FABRICATION



FUNDING



CLIENT



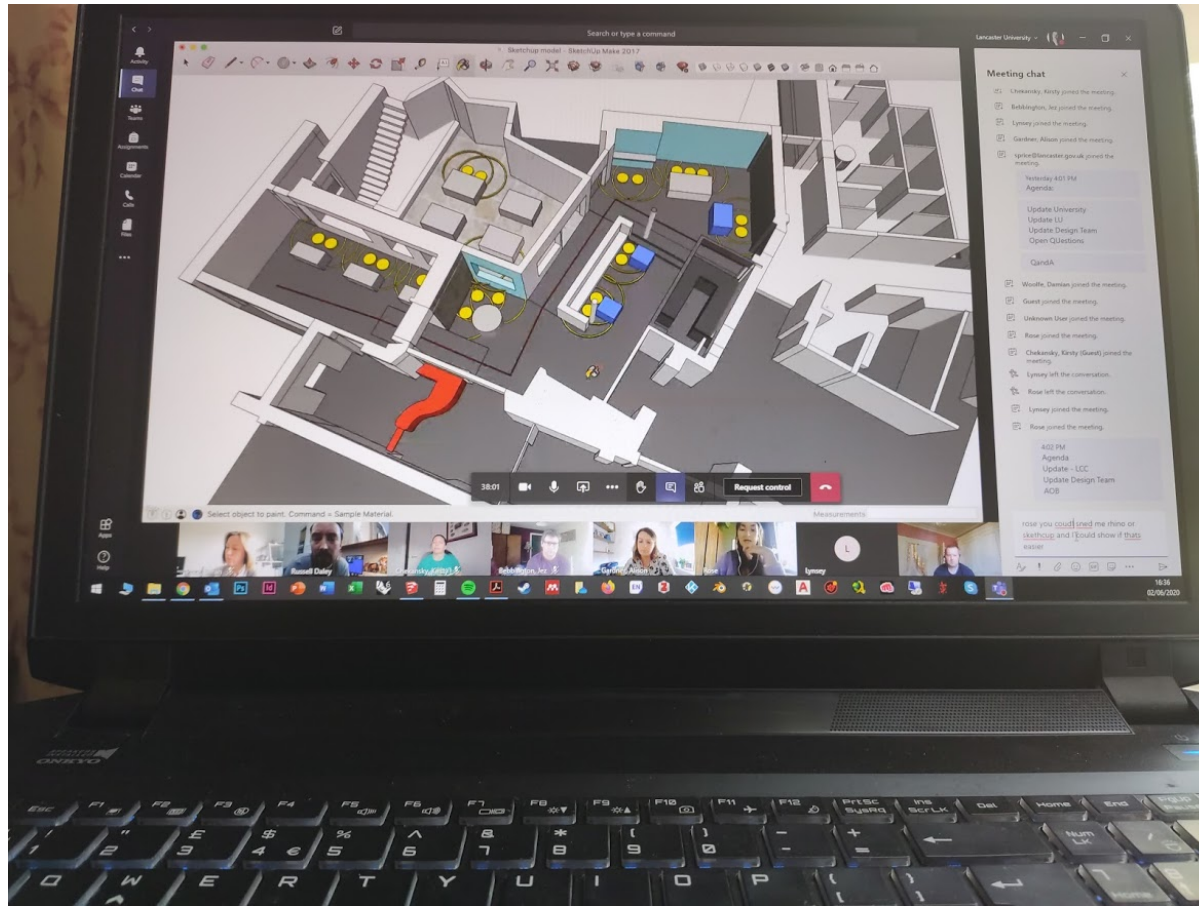
DESIGN TEAM



RESEARCH



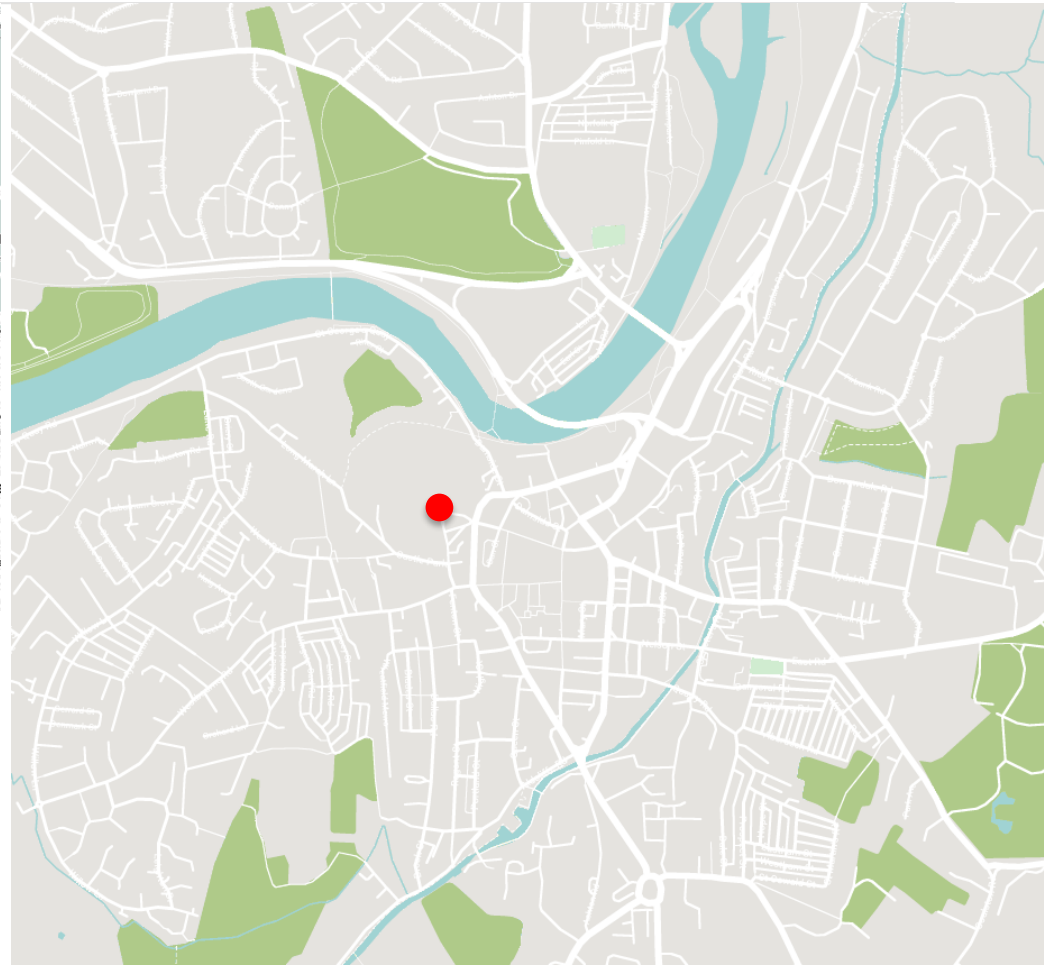
LOCAL BUSINESSES



SOCIAL DISTANCE LAB, THE STOREY BUILDING, LANCASTER



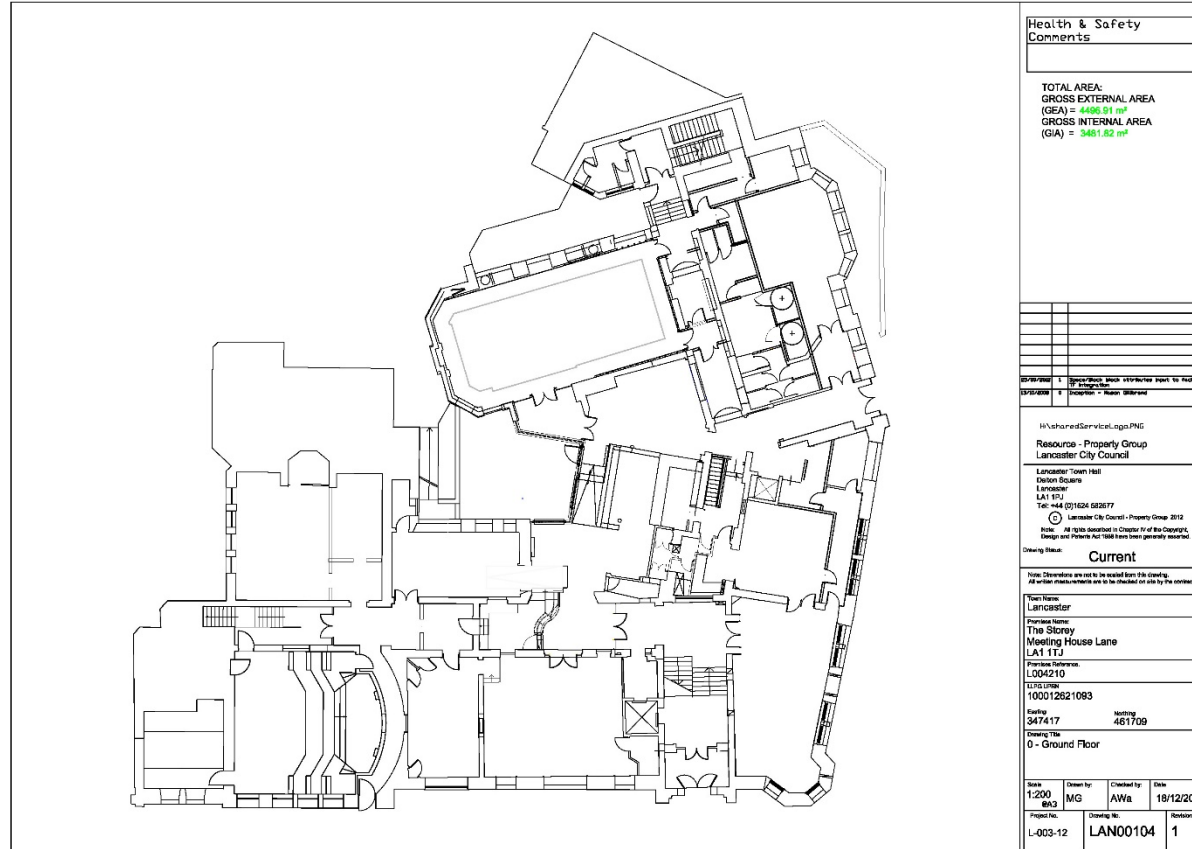
Map of the United kingdom



Plan of Lancaster City Centre



*An image of the Storey
Building, Lancaster, UK*



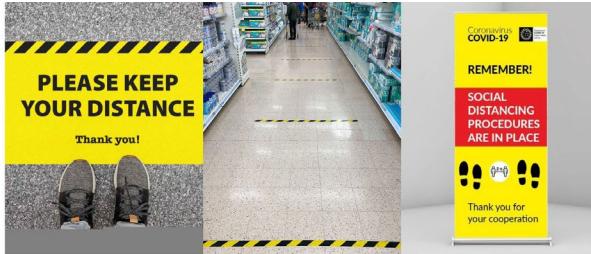
Plan of the Storey Building
Lancaster



*Interior View of the Storey
Building, Lancaster, UK*



*Interior View of the Storey
Building, Lancaster, UK*



Q.7A how EFFECTIVE IS
'UNIVERSAL' signage AS
SHOWN ?

63%

BELIEVE 'UNIVERSAL'
SIGNAGE IS EFFECTIVE





Q.7B how EFFECTIVE IS
'UK GOVERNMENT' signage
AS SHOWN ?

60%

BELIEVE 'UK GOVERNMENT'
SIGNAGE IS EFFECTIVE





Q.7C how EFFECTIVE IS
'LANCASTER CITY COUNCIL'
signage AS SHOWN ?

65%

BELIEVE 'LCC'
SIGNAGE IS EFFECTIVE





Q.7C how EFFECTIVE IS
'STORE SPECIFIC'
signage AS SHOWN ?

51%

BELIEVE 'STORE SPECIFIC'
SIGNAGE IS EFFECTIVE





Q.7E how EFFECTIVE IS
'DESIGNER BESPOKE'
signage AS SHOWN ?

72%

BELIEVE 'DESIGNER
ESPOKE' SIGNAGE IS EFFECTIVE



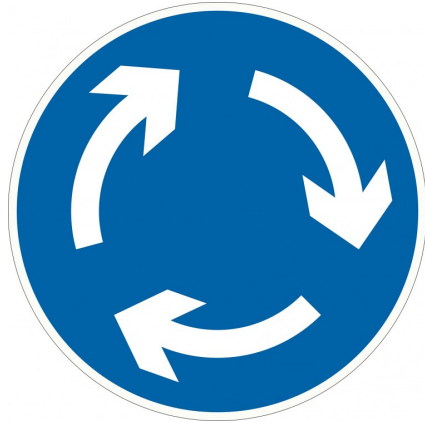
**Confidence &
Integrity**

**Warmth &
Friendliness**

**Safety &
Freshness**

**Peace &
Calmness**

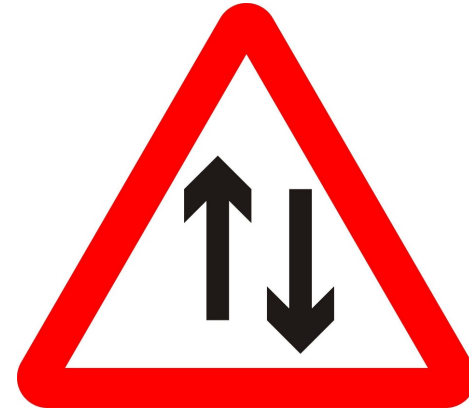
Ready Set Go



MESSAGE



INSTRUCTION



DIRECTION

The design is created out of three basic shapes. A circle, an octagon and a triangle - with each having its own purpose. Simplicity is key. Allowing these shapes to create a clear, precise and approachable design.

The rounded friendliness of a circle is used for general greeting messages. While the universal connotation of an octagon, flags more serious instructions; while the form of the triangle naturally lends itself to directional messaging.



ROUTE 2

As with route one - using colour to coordinate different instructions, this route uses basic shape to define different groups of information.

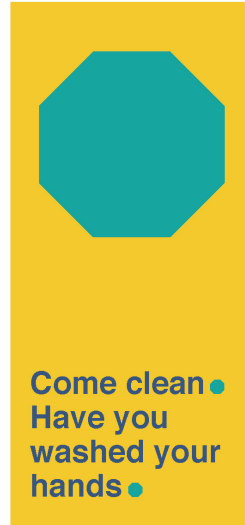
The friendly connotations associated with a circle reflects the approachability of general 'greeting' messages. While the universal connotation of a hexagon, flags more serious questions and statements. Finally, the form of a triangle naturally lends itself to directional signage.

Using a mix of blue, green and yellow of mid tones from the palette creates a fresh, friendly and confident tone, without being too 'flashy'.

Simplicity, is key in this route. Allowing basic shapes and language to create a clear, precise and approachable route.



'GREETING' HANGING BANNER

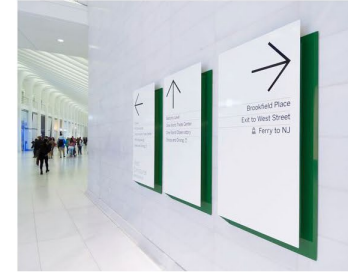


'QUESTION STATEMENT' HANGING BANNER



'DIRECTIONAL' HANGING BANNER

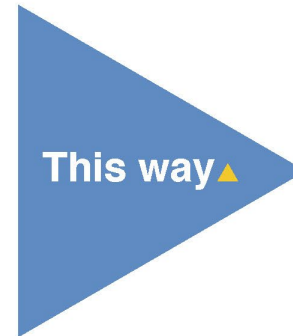
ROUTE 2



'GREETING' WALL PLAQUE

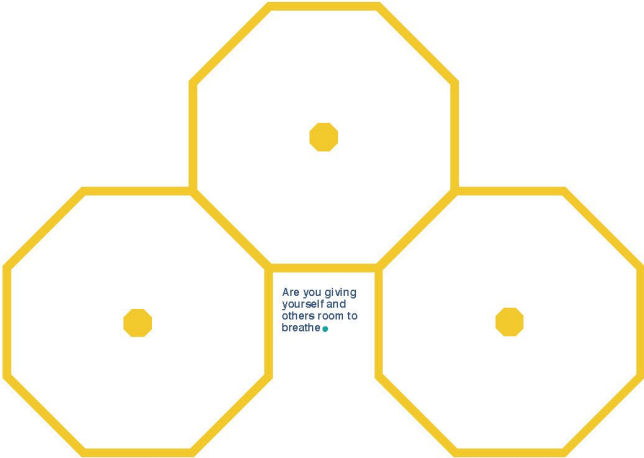


'QUESTION STATEMENT' WALL PLAQUE



'DIRECTIONAL' WALL PLAQUE

ROUTE 2



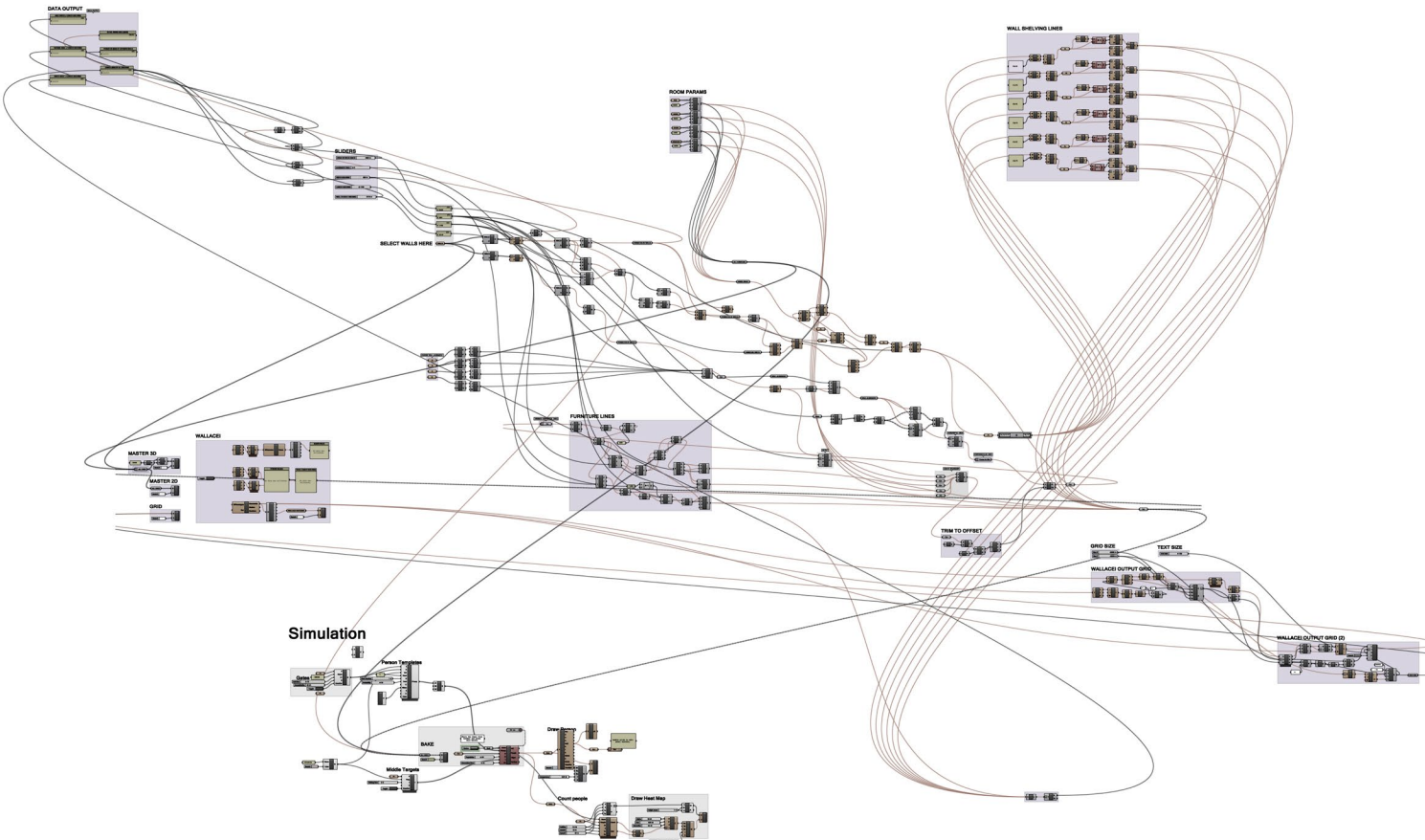
(AERIAL VIEW) SEAT DISTANCING FLOOR VINYL

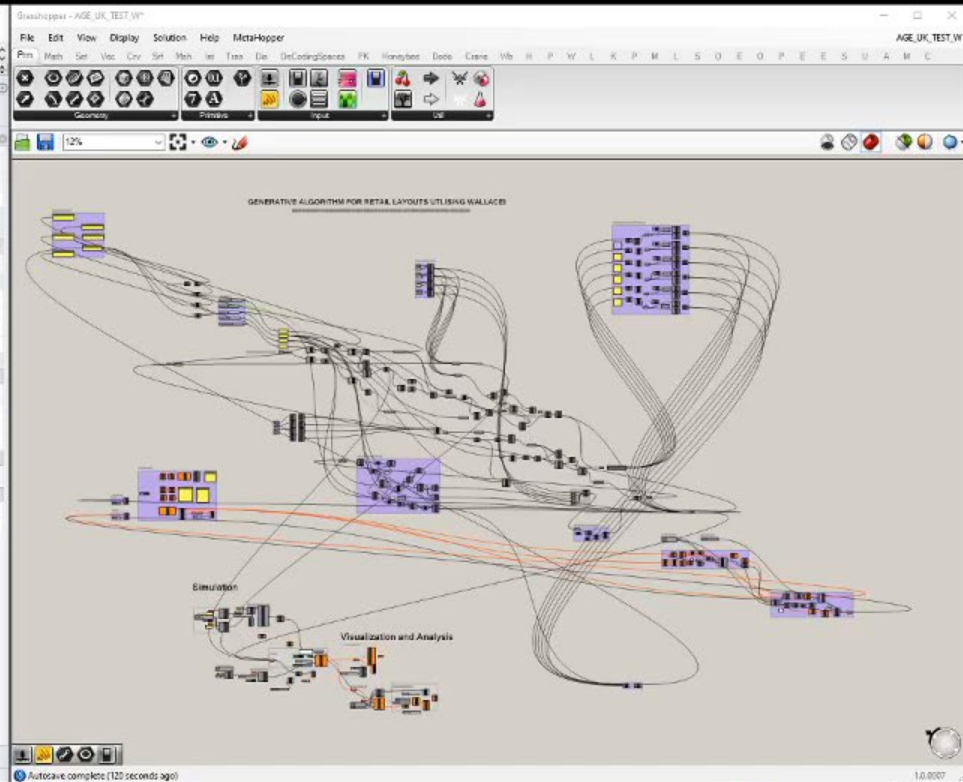
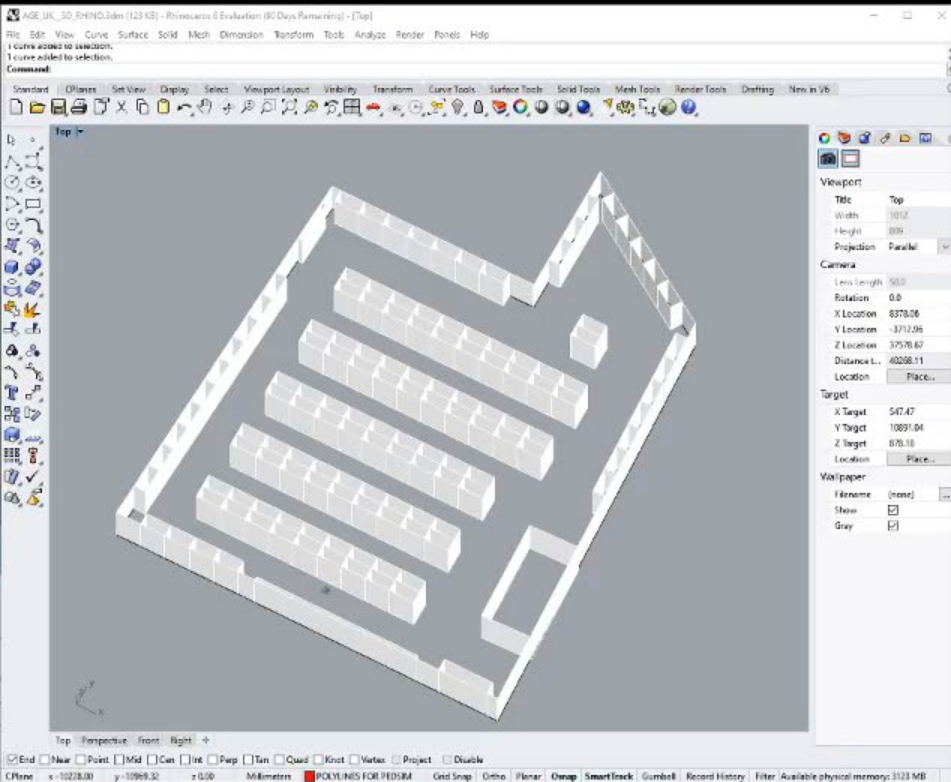


DIRECTIONAL FLOOR VINYL AND MEDIAN LINE



STANDING FLOOR CIRCLE VINYL





ALGORITHM PLAN OUTCOME





VINYL CUTTING AND ASSEMBLY



FLOOR VINYL STICKERS



COMPLETED SOCIAL DISTANCE LAB



OPENING WEEK SCHEDULE OF LOCAL BUSINESS APPOINTMENTS

SOCIAL DISTANCE LAB @ THE STOREY

Appointment Time 60mins

TIME	THU June 25, 2020		FRI June 26, 2020		MON June 29, 2020		TUE June 30, 2020		WED July 1, 2020		THU July 2, 2020	
10:00am	Name/s:	Kim Hodges & Julie Hodges	Name/s:	Joanne Roberts	Name/s:	Will Griffiths & Simon Kirby	Name/s:	Nicola Smith	Name/s:		Name/s:	2 x people (names TBC)
	Business Name:	Sage Café	Business Name:	Bells Cottage Tea Rooms	Business Name:	Lancaster City Council	Business Name:	Grandmas Puppets	Business Name:		Business Name:	Lancaster University
11:00am	Name/s:	Chris Eagle	Name/s:	Deborah Buckley	Name/s:		Name/s:	2 x names TBC	Name/s:	Lucie Carrington	Name/s:	11:30am Simon Auty
	Business Name:	Aquilla Pizza	Business Name:	Mighty Bites	Business Name:		Business Name:	Royal Kings Arms Hotel	Business Name:	Herbarium	Business Name:	Selectweb Computers
12:00pm	Name/s:	Robert Nixon	Name/s:	Lauren Akister	Name/s:	2 x people (names TBC)	Name/s:	2 x names TBC	Name/s:		Name/s:	
	Business Name:	Wiray Post Office & Village Store	Business Name:	Lancaster Search & Rescue	Business Name:	Lancaster University	Business Name:	Royal Kings Arms Hotel	Business Name:		Business Name:	
1:00pm	Name/s:	Mirian Calco & Louise Mullagh	Name/s:		Name/s:		Name/s:		Name/s:	2 x people (names TBC)	Name/s:	2 x people (names TBC)
	Business Name:	Lancaster University	Business Name:		Business Name:		Business Name:		Business Name:	Lancaster University	Business Name:	Lancaster City Council
2:00pm	Name/s:		Name/s:		Name/s:	Carolyn Dalton	Name/s:	Chloe	Name/s:		Name/s:	
	Business Name:		Business Name:		Business Name:	Lancaster City Council Museums	Business Name:	Holm Café	Business Name:		Business Name:	
3:00pm	Name/s:	2 x people (names TBC)	Name/s:	2 x people (names TBC)	Name/s:	Tom Robinson	Name/s:		Name/s:	2 x people (names TBC)	Name/s:	2 x people (names TBC)
	Business Name:	Lancaster Council	Business Name:	Hornby Tearooms	Business Name:	The Wobbly Cobbler	Business Name:		Business Name:	Lancaster University	Business Name:	Lancaster City Council
4:00pm	Name/s:	2 x people (names TBC)	Name/s:		Name/s:	Luiza Wood	Name/s:		Name/s:		Name/s:	
	Business Name:	Lancaster City	Business Name:		Business Name:	Brew	Business Name:		Business Name:		Business Name:	

BUSINESS CONSULTATIONS IN THE SOCIAL DISTANCING LAB

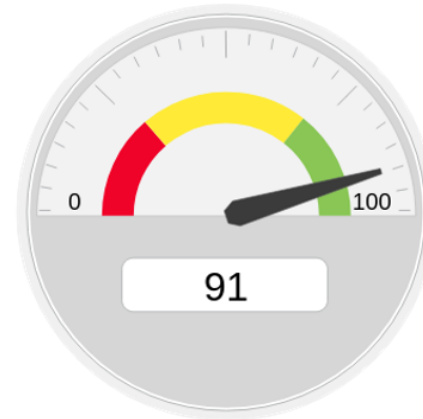


QUESTION 3

Q.3 How important is signage to maintain the government advised distance to reduce the risk of infection?

91%

BELIEVE SIGNAGE IS
IMPORTANT



QUESTION 4

Q.4 How EFFECTIVE is the signage at Storey?

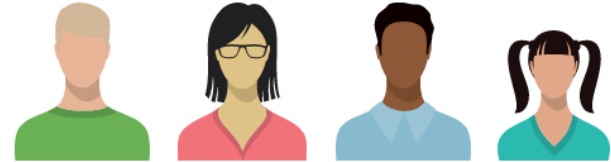
93%

BELIEVE THE DISTANCING
SIGNAGE @ STOREY IS
EFFECTIVE



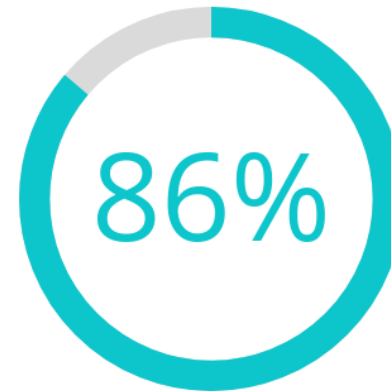
QUESTION 8A

Q.8A DO YOU BELIEVE THE CUSTOMER HAS
SOME RESPONSIBILITY FOR SOCIAL
DISTANCING?



86%

BELIEVE THE CUSTOMER
HAS SOME
RESPONSIBILITY



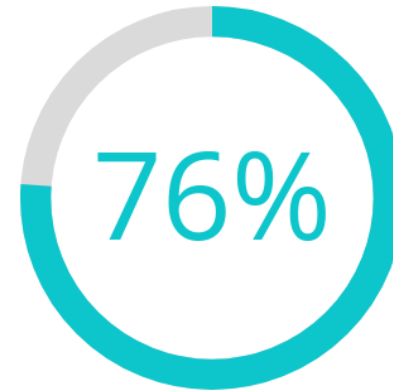
QUESTION 8B

Q.8B DO YOU BELIEVE THE CUSTODIAN HAS
SOME RESPONSIBILITY FOR SOCIAL
DISTANCING?



76%

BELIEVE THE CUSTODIAN
HAS SOME
RESPONSIBILITY

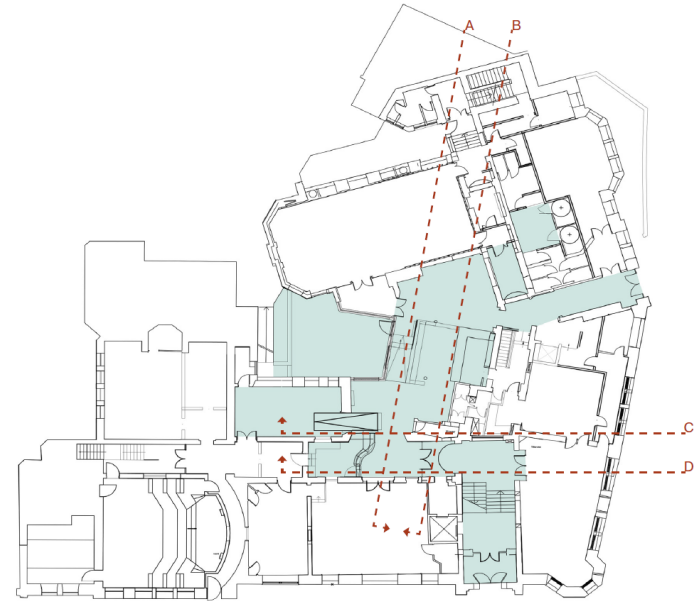


PROJECT COST – SIGNAGE COST /M2

STAGE	COST
STAGE 1 – DESIGN 3WKS	£4,800.00
STAGE 2 – BUILD 1 WK	£3,000.00
STAGE 3 – OBSERVATION 2 WKS	£3,000.00
STAGE 4 – SIGNAGE REPORT 2 WKS	£2,400.00
TOTAL STAFF COST	£13,200.00

EQUIPMENT	COST
ROLL UP BANNERS	£600.00
EXTENSION CABLE	£13.00
FLOOR VINYL	£100.00
FLOOR TAPE APPLICATOR	£130.50
FLOOR STANDING FRAME	£109.50
A2 PAVEMENT FRAME	£50.00
PRINTING AND MOUNTING	£500.00
TOTAL EQUIPMENT COST	£1,503.00

The Storey
Sections



$$£1503 / 245m^2 = \underline{\underline{£6.13 \text{ m}/2 = \$8.00 \text{ m}/2}}$$

Hello.

Social Distancing Signage Pack.

Open Source Designs for
Social Distancing.

Design

Pull up banners (PULL)

Off the shelf size for **PULL01** 800mmx2000mm **PAGE 27**.

Off the shelf size for **PULL02** 800mmx2000mm **PAGE 28**.

Off the shelf size for **PULL03** 800mmx2000mm **PAGE 29**.

Off the shelf size for **PULL04** 800mmx2000mm **PAGE 30**.

Off the shelf size for **PULL05** 800mmx2000mm **PAGE 31**.

For bespoke sizes please read the instructions section.



PULL01



PULL02



PULL03



PULL04

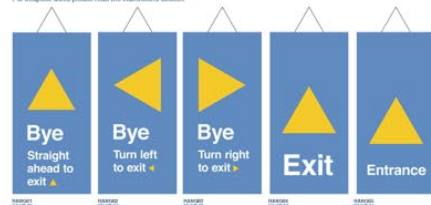


PULL05

Design

Hanging banners (HANG1)

Off the shelf size for HANG01 600mmx1200mm PAGE 32.
Off the shelf size for HANG05 600mmx1200mm PAGE 33.
Off the shelf size for HANG06 600mmx1200mm PAGE 34.
Off the shelf size for HANG08 600mmx1200mm PAGE 35.
Off the shelf size for HANG09 600mmx1200mm PAGE 36.
For bespoke sizes please read the instructions section.



HANG01
PAGE 32

HANG05
PAGE 33

HANG06
PAGE 34

HANG08
PAGE 35

HANG09
PAGE 36

Design

Hanging banners (HANG2)

Off the shelf size for HANG06 600mmx1200mm PAGE 32.
Off the shelf size for HANG07 600mmx1200mm PAGE 33.
Off the shelf size for HANG08 600mmx1200mm PAGE 34.
Off the shelf size for HANG09 600mmx1200mm PAGE 35.
Off the shelf size for HANG10 600mmx1200mm PAGE 36.
Off the shelf size for HANG11 600mmx1200mm PAGE 37.
For bespoke sizes please read the instructions section.



HANG06
PAGE 32

HANG07
PAGE 33

HANG08
PAGE 34

HANG09
PAGE 35

HANG10
PAGE 36

Design

Digital screen animation (DSAN)

Full frame animation of these designs, 16:9 ratio.
Off the shelf size DSAN01 PAGE 81-85.
For bespoke sizes please read the instructions section.



DSAN01
PAGE 81-85

Design

Cut-out Vinyl (VIN1)

Off the shelf size VIN01 1200mmx1200mm PAGE 44.
Off the shelf size VIN02 1200mmx1200mm PAGE 45.
Off the shelf size VIN03 1200mmx1200mm PAGE 46.
For bespoke sizes please read the instructions section.



VIN01-03
PAGE 44-46

Design

Cut-out Wall and Floor Vinyls (VIN2)

Off the shelf size VIN06 600mmx600mm PAGE 51.
Off the shelf size VIN09 600mmx600mm PAGE 52.
Off the shelf size VIN10 600mmx600mm PAGE 53.
Off the shelf size VIN11 600mmx600mm PAGE 54.
Off the shelf size VIN12 600mmx600mm PAGE 55.
Off the shelf size VIN13 600mmx600mm PAGE 56.
Off the shelf size VIN14 600mmx600mm PAGE 57.
Off the shelf size VIN15 600mmx600mm PAGE 58.
Off the shelf size VIN16 600mmx600mm PAGE 59.
Off the shelf size VIN17 600mmx600mm PAGE 60.
Off the shelf size VIN18 600mmx600mm PAGE 61.
Off the shelf size VIN19 600mmx600mm PAGE 62.
Off the shelf size VIN20 600mmx600mm PAGE 63.



VIN06
PAGE 51

VIN09
PAGE 52

VIN10
PAGE 53

VIN11
PAGE 54

VIN12
PAGE 55

Design

Wall boards (WB01)

Off the shelf size WB01 210mmx210mm PAGE 67.
Off the shelf size WB02 210mmx210mm PAGE 68.
Off the shelf size WB03 210mmx210mm PAGE 69.
Off the shelf size WB04 210mmx210mm PAGE 70.
Off the shelf size WB05 210mmx210mm PAGE 71.
Off the shelf size WB06 210mmx210mm PAGE 72.
For bespoke sizes please read the instructions section.



WB01
PAGE 67

WB02
PAGE 68

WB03
PAGE 69

WB04
PAGE 70

WB05
PAGE 71

WB06
PAGE 72

Design

Wall Boards (BRD1)

Of the shelf size BRD01 100mmx100mm PAGE 72.
Of the shelf size BRD01 100mmx100mm PAGE 74.
Of the shelf size BRD01 100mmx100mm PAGE 75.
Of the shelf size BRD01 100mmx100mm PAGE 76.
Of the shelf size BRD01 100mmx100mm PAGE 77.
For bespoke sizes please read the instructions section.



Design

Bespoke Board (DOOR)

Of the shelf size DOOR01 270mmx140mm PAGE 78.
Of the shelf size DOOR02 270mmx140mm PAGE 79.
For bespoke sizes please read the instructions section.



Design

Hanging banners (HANG)

Of the shelf size HANG01 110mmx100mm PAGE 42.
Of the shelf size HANG02 110mmx100mm PAGE 43.
For bespoke sizes please read the instructions section.



Design

Cut-out Wall and Floor Vinyls (VIN)

Of the shelf size VIN01 100mmx100mm PAGE 47.
Of the shelf size VIN03 100mmx100mm PAGE 48.
Of the shelf size VIN05 100mmx100mm PAGE 49.
Of the shelf size VIN07 100mmx100mm PAGE 50.
For bespoke sizes please read the instructions section.



Design

Hand Sanitiser Foot Pump Design (PUMP)

Of the shelf size PUMP01 PAGE 86.
Design the Pump Foot - <https://www.lancaster.ac.uk/signage/>
For bespoke sizes please read the instructions section.



Instructions [Octagons]

Floor distancing octagons are a template design, which require assembly.

1. 10m length of 3" (75.2mm) yellow vinyl tape [cutout referenced 7](https://www.lancaster.ac.uk/signage/).
 2. Hexagonal centre point. Of the shelf size OCT02 PAGE 87.
 - Where octagons overlap, the additional material is required.
 3. 10m length of 1" (25.4mm) blue tape [cutout referenced 8](https://www.lancaster.ac.uk/signage/).
 4. Overlap messaging sticker Of the shelf size OCT03 PAGE 88.
- The completed design can be seen on page 21 within the pdf.



IMPACT: SIGNS IN USE AROUND LANCASTER



IMPACT: SIGNS IN USE AROUND LANCASTER

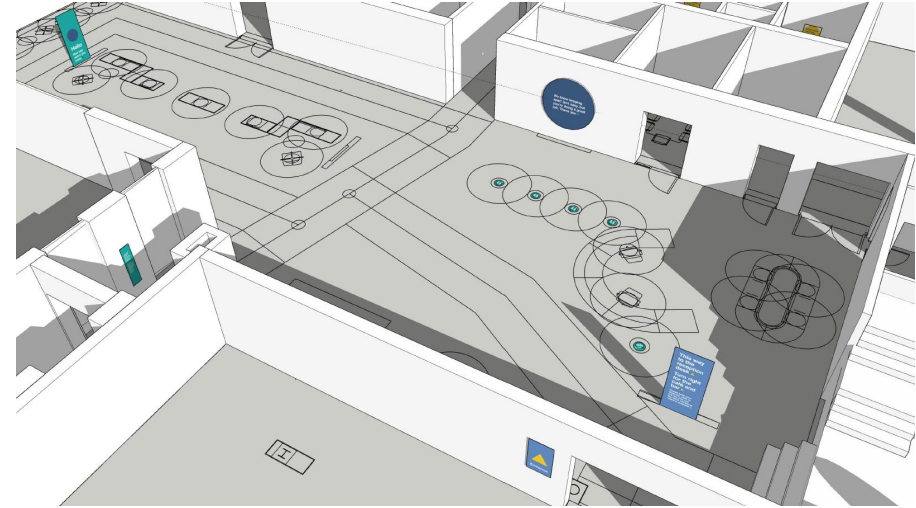


IMPACT: SIGNS IN USE AROUND LANCASTER

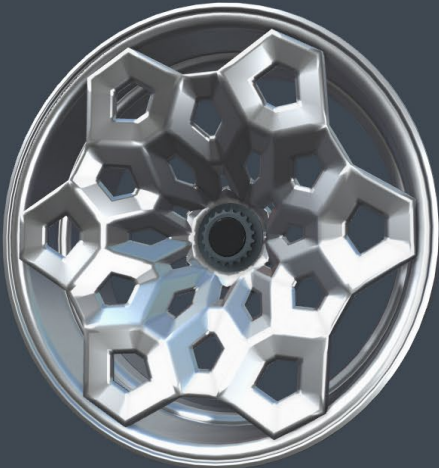




*An image of the Storey
Building, Lancaster, UK*



*An image of the Storey
Building, Lancaster, UK*



MODEL PARAMETERS

SPOKES: 6

SUBDIVISIONS: 5

HOLES SIZE %: 0.4

HOLES NORMAL OFFSET: -10

SUBDIVIDE GEOMETRY: ☐

EDGE SMOOTHNESS: 20.1

CONVEXITY/CONCAVITY: 0.45

NEXT STEPS: UKRI FUNDING BID FOR SCALING RESEARCH



CONCLUSION

EVALUATION, FUTURE, QUESTIONS





FUTURE OF SOCIAL DISTANCING?



“

**WHAT DIVIDES US PALES IN COMPARISON TO
WHAT UNITES US.**

- TED KENNEDY

THANK YOU