

An aerial view of a city with a river, showing a mix of urban development and green spaces. A semi-transparent dark grey box is overlaid on the center of the image, containing the main title and subtitle.

Digital Twins for Towns, Villages and neighbourhoods

Creating a more enjoyable planning process



DIGITALURBAN.PLACE

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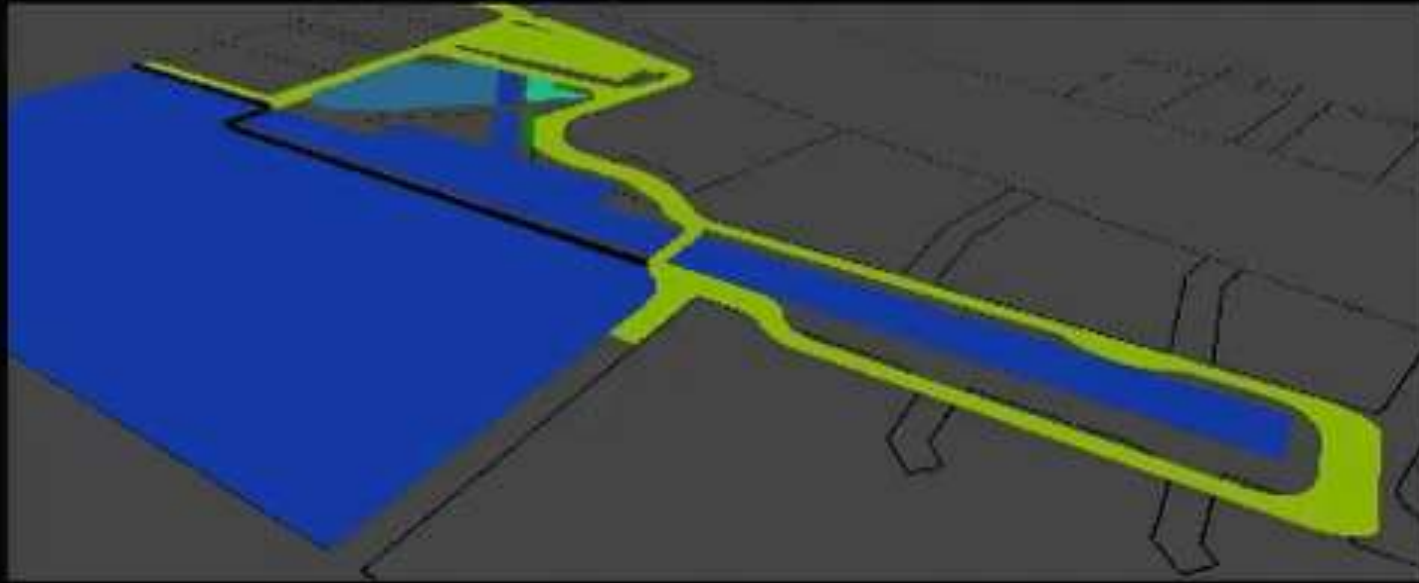
*Is planning consultation process
the “Human in the loop”
for a Digital Urban Twin*



1988

'VERIFIED VIEWS' STUCK ONTO LARGE PHOTOGRAPHS





Day: 1

SITE ZONES

- - Construction /storage
- - Facility operation
DO NOT OBSTRUCT

KEY

- - Item under construction



- Restricted stand



- Unrestricted stand



1995

HEATHROW AIRPORT -PROJECT INFORMATION MODELING

Urban/City Modelling

1996

MANCHESTER – CITY MODELLING



ENGINEERING GAMES



Wind



Heritage



Pedestrian



Consultation



Noise



Traffic



Visual Impact



Air & energy

2007

MANCHESTER – CITY MODELLING

Micro simulation data -Traffic (4D objects)

t;	Type;	VehNr;	WorldX;	WorldY;	WorldZ;	RWorldX;	RWorldY;	RWorldZ;
2699.5;	3;	6760;	721.8050;	-2243.7270;	0.0000;	717.1224;	-2233.1782;	0.0000;
2699.5;	1;	7641;	327.9378;	-1087.3917;	0.0000;	322.8766;	-1088.9980;	0.0000;
2699.5;	1;	7573;	337.3933;	-1092.7671;	0.0000;	332.8999;	-1089.9376;	0.0000;
2699.5;	1;	7083;	175.7609;	-1174.5245;	0.0000;	179.8899;	-1172.2376;	0.0000;
2699.5;	7;	7269;	669.8751;	-2068.5727;	0.0000;	668.6245;	-2064.1356;	0.0000;
2699.5;	1;	7619;	708.0374;	-2223.7503;	0.0000;	709.3115;	-2228.1704;	0.0000;
2699.5;	1;	7753;	167.1153;	-1169.4368;	0.0000;	163.1466;	-1171.7824;	0.0000;
2699.5;	1;	7772;	183.3724;	-1165.4228;	0.0000;	178.6046;	-1167.7603;	0.0000;
2699.5;	7;	7208;	706.5091;	-2196.7967;	0.0000;	704.3353;	-2192.7314;	0.0000;
2699.5;	1;	7556;	712.2901;	-1510.7294;	0.0000;	715.6881;	-1514.8098;	0.0000;
2699.5;	1;	7508;	718.5828;	-1513.5503;	0.0000;	721.3821;	-1517.2005;	0.0000;
2699.5;	1;	7441;	397.2019;	-1063.9032;	0.0000;	401.2464;	-1067.3438;	0.0000;

Time (keyframe)

Vehicle Type
(object)

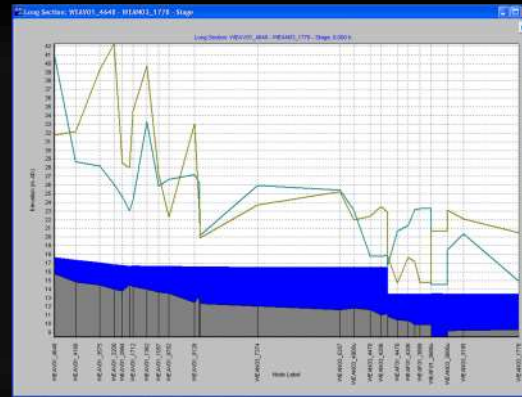
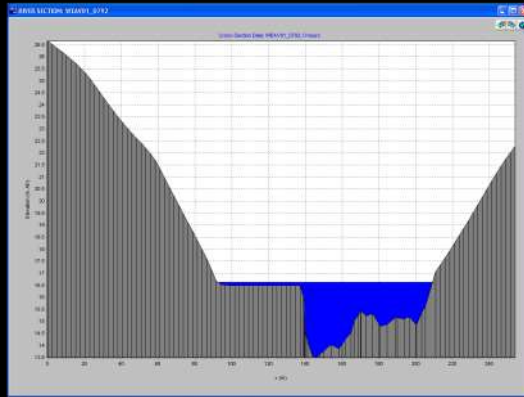
Front Position
(x,y,z)

Rear Position
(x,y,z)

Centre + Rotation



Integrating data - Flood models (4D surface)



North East Region
Project appraisal
Flood modelling

Model node	Description		base water level 1:2	subtract 500mm	Max Stage 50year	Max Stage 100year	Max Stage 200yr +CC
River Aire; Newlay to Fleet (Leeds PAR study reach)							
76 02671603990A	Market garden	cs_0	31.609	31.109	33.26	33.514	34.54
77 02671603990B	Market garden	cs_1	31.809	31.109	33.26	33.514	34.54
78 02671603792	Just d/s of The Goit	cs_2	31.352	30.852	32.893	33.142	34.194
79 02671603586C	U/s Goits bridge	cs_3	30.155	30.655	32.655	32.911	34.09
80 02671603586D	D/s Goits bridge	cs_4	31.093	30.655	32.593	32.834	34.01
81 02671603582	D/s refuse destructor	cs_5	31.037	30.593	32.557	32.797	34.001
82 02671603327	U/s of Evanston Avenue	cs_6	30.395	30.537	31.895	32.245	33.664
83 02671603202	Kirkstall Power Station outfalls	cs_7	30.493	29.895	31.993	32.359	33.791
84 02671603195	U/s of Armley Weir	cs_8	30.5	29.993	32	32.367	33.798
85 02671603193E	U/s Armley Weir	cs_9	30.5	30	32	32.367	33.798
86 02671603193F	D/s Armley Weir	cs_10	30.446	30	31.946	32.32	33.766
87 02671603185	Armley Mills (u/s footbridge)	cs_11	30.446	29.946	31.946	32.319	33.765
88 02671603061A	Armley Mills (d/s footbridge)	cs_12	30.271	29.946	31.771	32.156	33.643
89 02671603061B	Armley Mills (d/s footbridge)	cs_13	30.271	29.771	31.771	32.156	33.643
90 02671602871	Armley Mills (d/s of buildings)	cs_14	29.925	29.771	31.425	31.834	33.407
91 02671602780C	U/s Armley Mills disused rail bridge	cs_15	29.925	29.425	31.425	31.838	33.42
92 02671602780D	D/s Armley Mills disused rail bridge	cs_16	29.775	29.425	31.275	31.599	32.849

Sheet1 / Sheet2 / Sheet3

Ready

Sum=267170183

MJM

Location Reference

Position Text Reference

Time (keyframe)

Water Height (Z value)

Bone Position (x,y,z)

Existing



Without defences



With defences



Air quality, energy (painting by numbers)



Transport

Click the buttons to switch between scenarios

Base CO₂ - No Bus Corridor Implemented

Scenario 1 - Bus Corridor Implemented

Scenario 2 - Bus Corridor Implemented
+ % Modal Shift

Scenario 3 - Bus Corridor Implemented
+ % Modal Shift

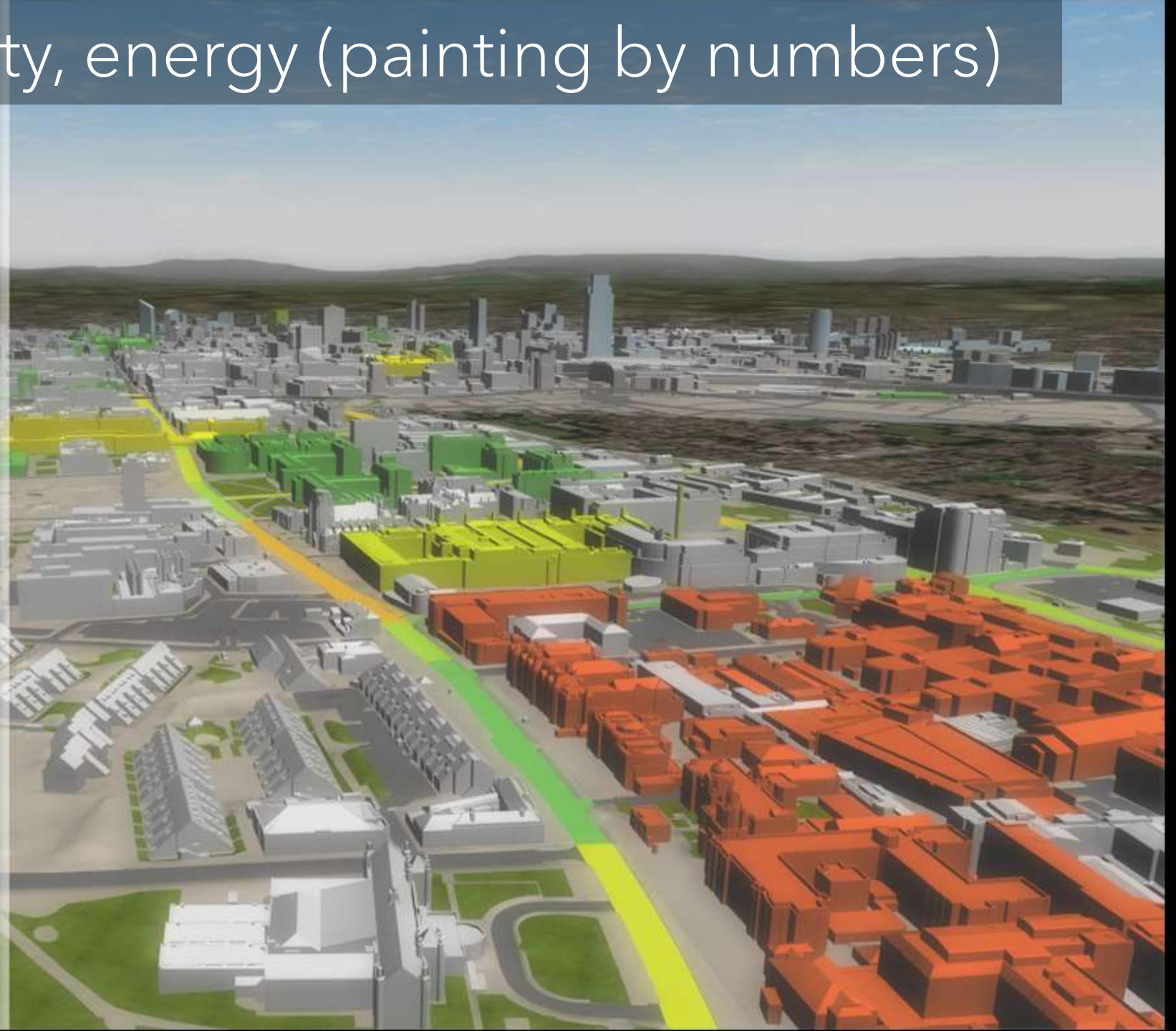
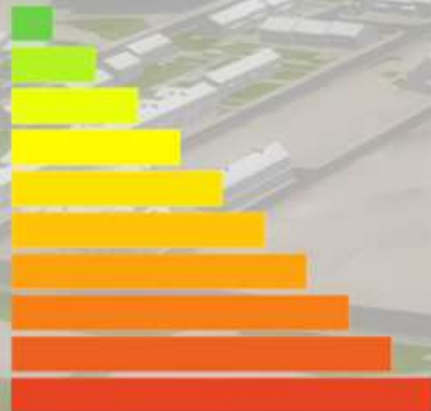
Scenario 4 - Bus Corridor Implemented
+ % Modal Shift

Scenario 5 - Bus Corridor Implemented
+ % Modal Shift

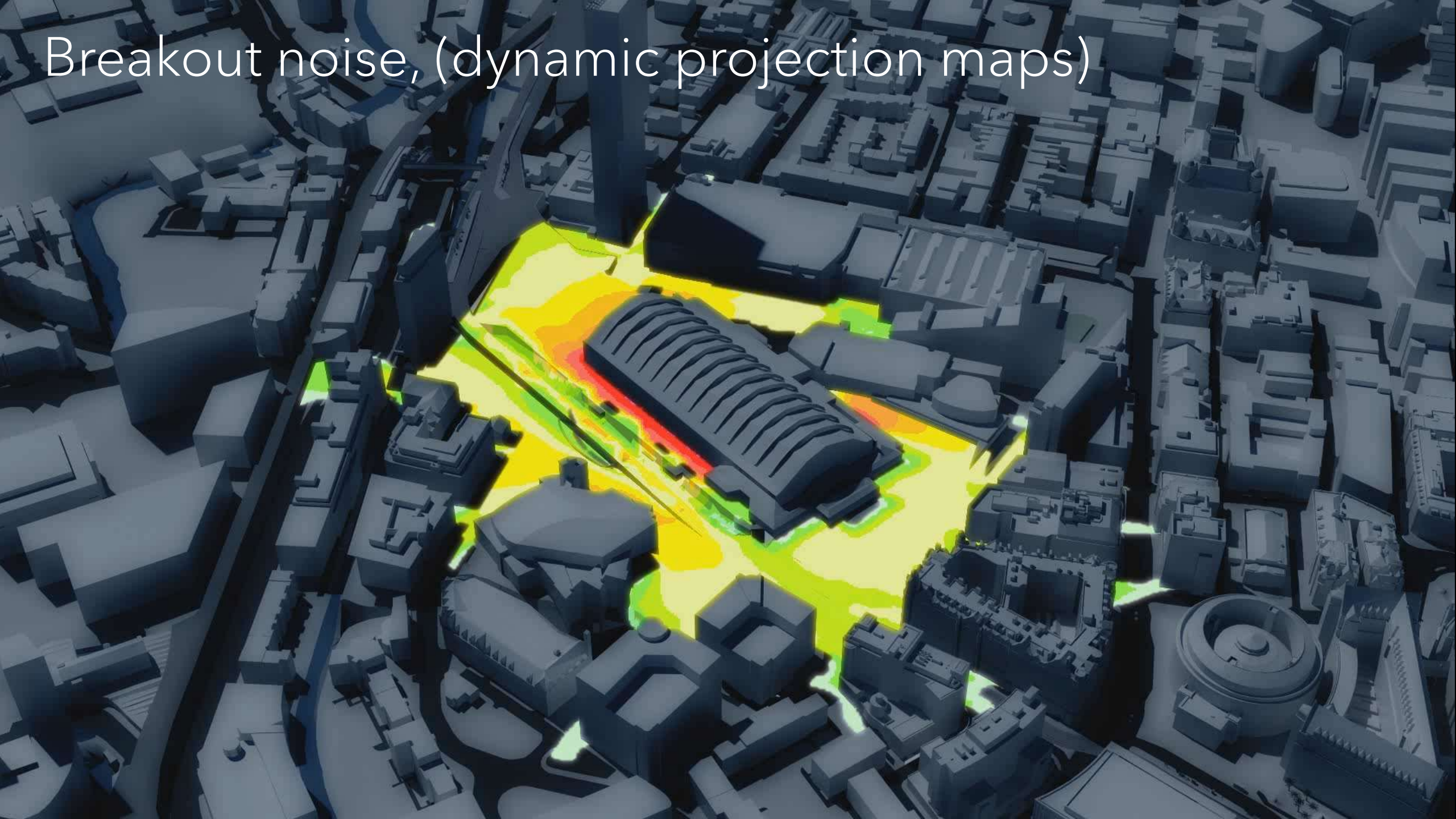
Scenario 6 - Bus Corridor Implemented
+ % Modal Shift

Scenario 7 - Bus Corridor Implemented
+ % Modal Shift + LGVs

Key: (Kg of CO₂)



Breakout noise, (dynamic projection maps)



Below ground services (3D Data integration)

Utilities

- ☒  Electric
- ☒  Street Lighting Cables
- ☒  TM
- ☒  Water
- ☒  Gas
- ☒  BT
- ☒  Comms
- ☒  Low Pressure Gas
- ☒  Medium Pressure Gas
- ☒  Intermediate Pressure Gas
- ☒  Utility Electric
- ☒  Unknown Utility

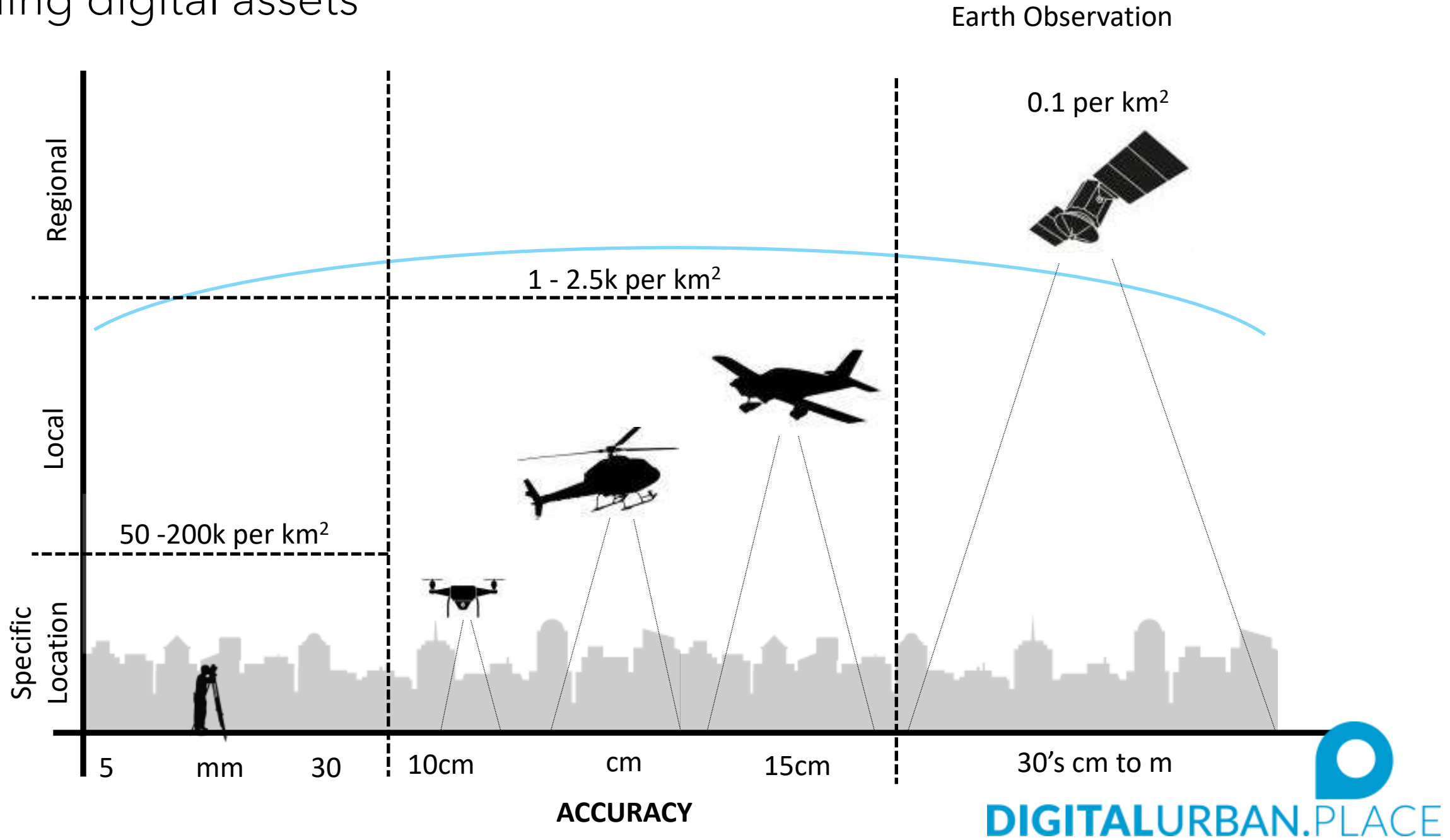
Alignment Options

- ☐ Existing
- ☒ Proposed Option A
- ☐ Proposed Option B
- ☐ Adoption Boundary

Ground Opacity



Building digital assets





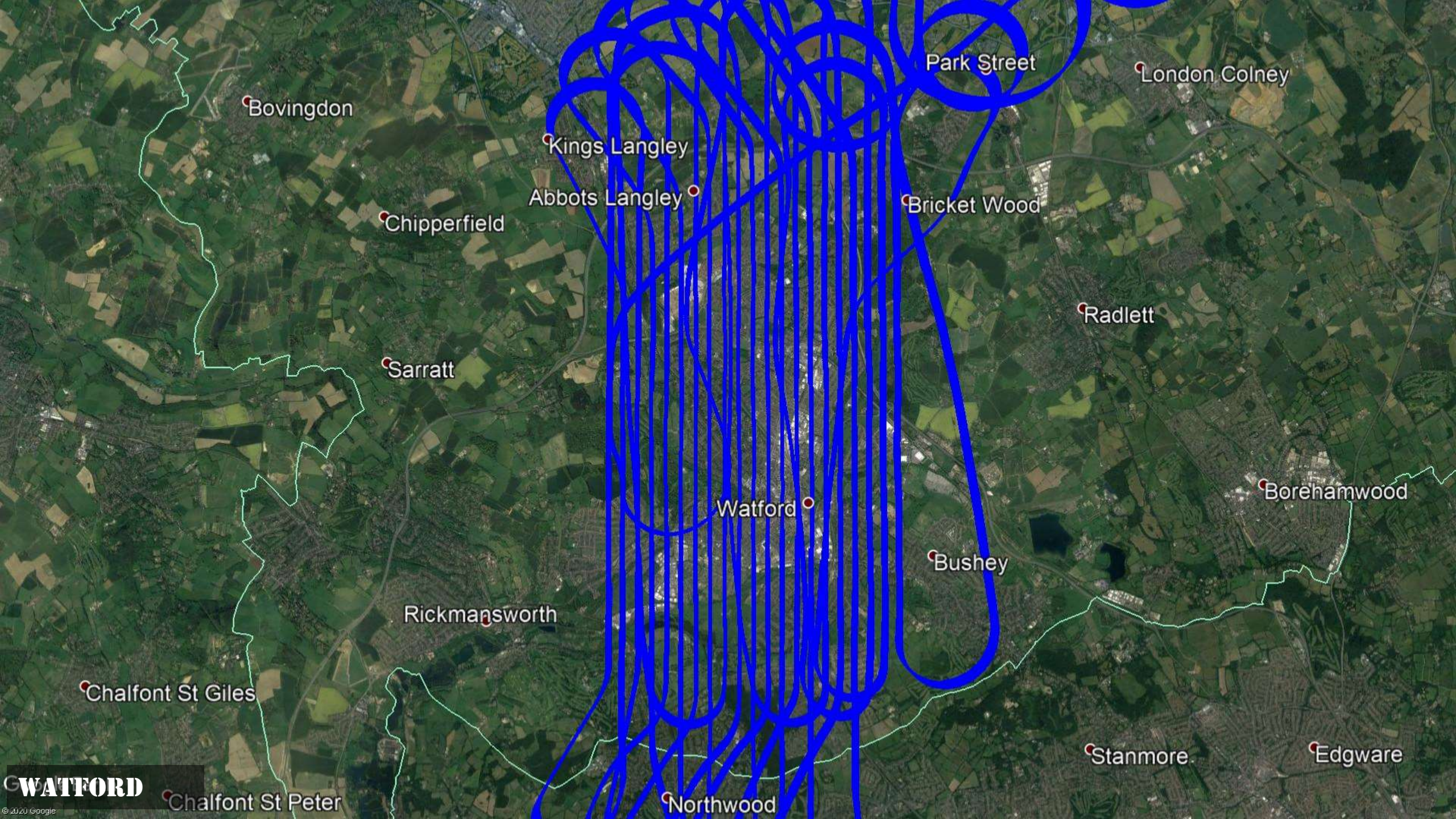
BERWICK UPON TWEED



BERWICK UPON TWEED



BERWICK UPON TWEED



Bovingdon

Kings Langley

Abbots Langley

Chipperfield

Sarratt

Watford

Rickmansworth

Chalfont St Giles

Chalfont St Peter

Northwood

Park Street

London Colney

Bricket Wood

Radlett

Borehamwood

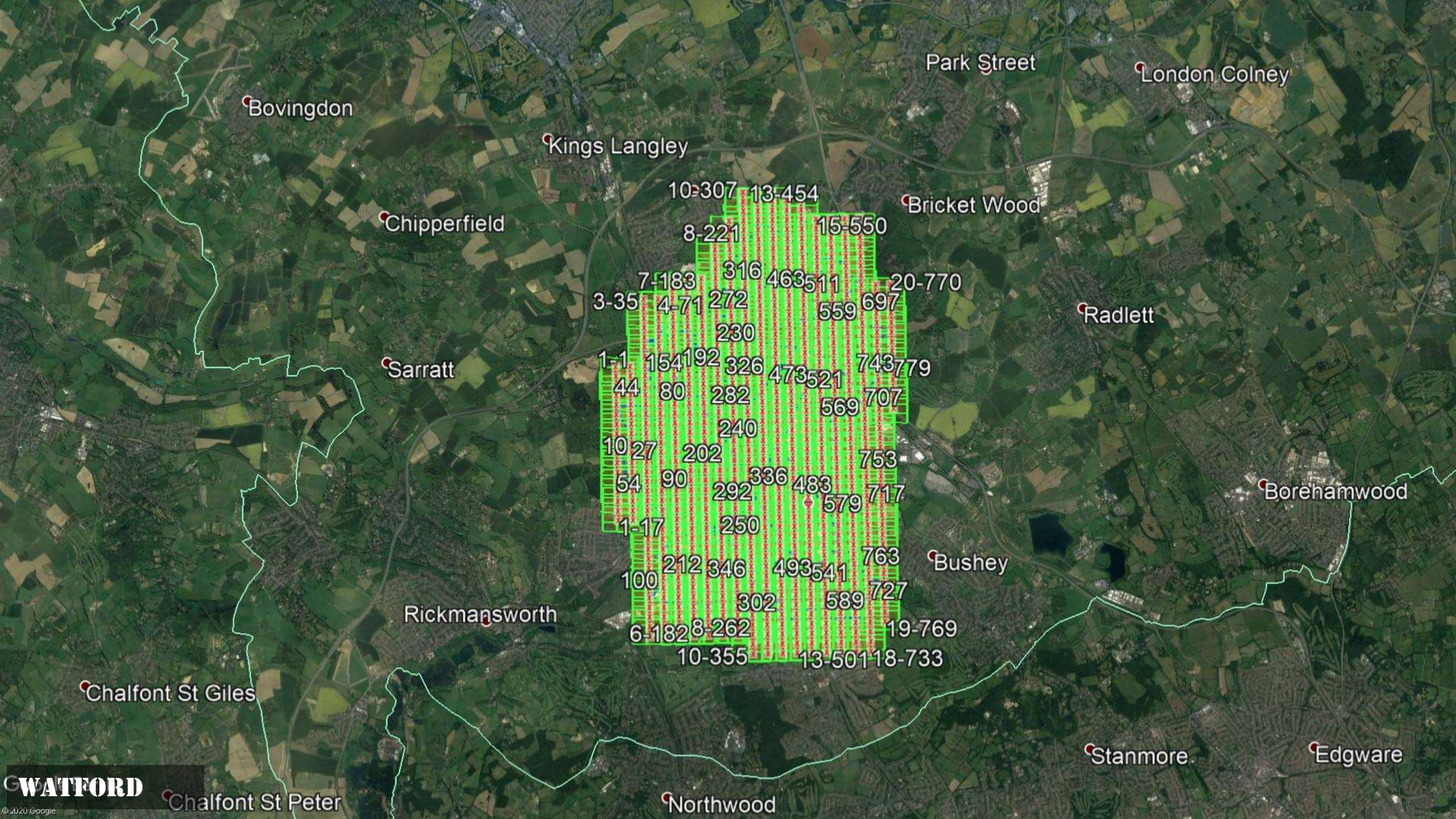
Bushey

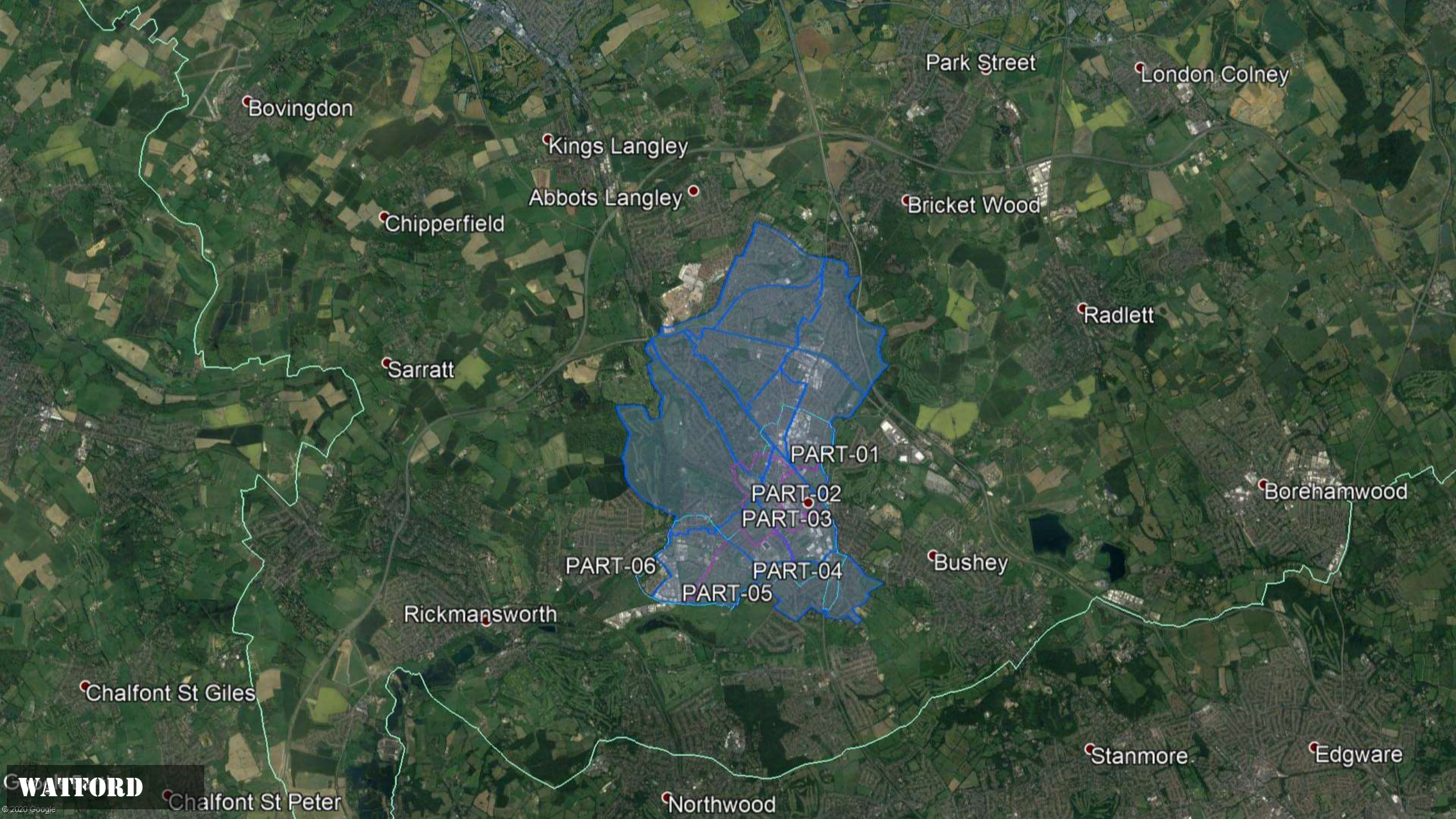
Stanmore

Edgware

WATFORD

© 2020 Google





Bovingdon

Park Street

London Colney

Kings Langley

Abbots Langley

Chipperfield

Bricket Wood

Radlett

Sarratt

PART-01

PART-02

PART-03

Borehamwood

PART-06

PART-04

PART-05

Bushey

Rickmansworth

Chalfont St Giles

WATFORD

Chalfont St Peter

Northwood

Stanmore

Edgware



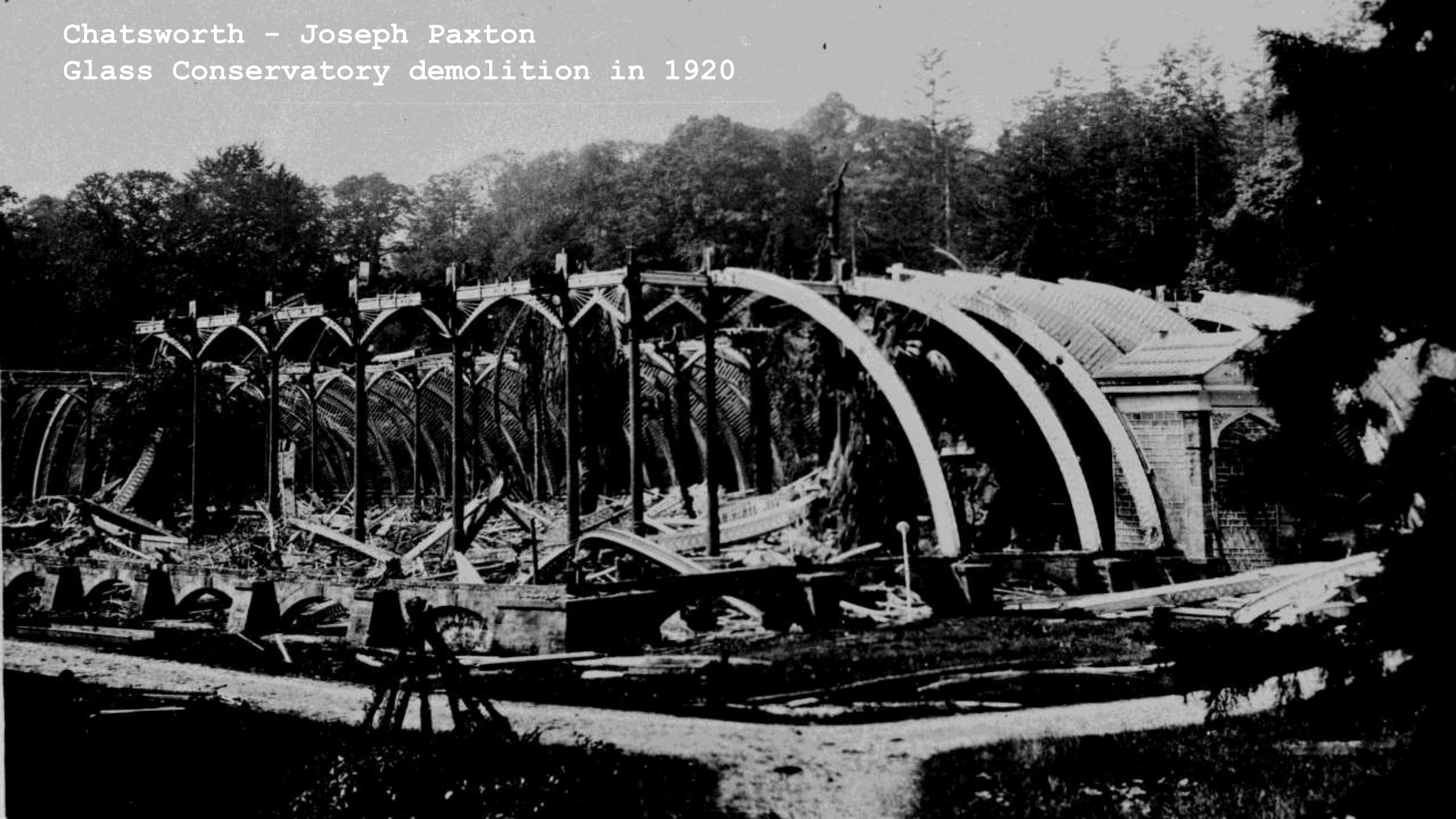




Immersive 360 technology



Chatsworth - Joseph Paxton
Glass Conservatory demolition in 1920



Immersive 360 technology





Open for adventure Virtual Reality Experience

WHERE TO?



Flower School



Family groups get to share the experience
This helps to create conversations
And triggers longer-term responses

An amazing
experience, very
real.

Thank you

Metrolink

What a
wonderful
attraction.

Good luck taking
it onto Carehomes.
Inspired idea

Metrolink

This is the first
time I've experienced
virtual reality -
fantastic - I'm
hooked!

Metrolink

Absolutely
Brilliant
Very clever
Superb ✓✓

Metrolink

100% I loved
it. It felt real
life. ♥

Thank
you

Metrolink

Very
relaxing
brilliant!
Thank
you

Metrolink

Fabulous
A wonderful
experience

Metrolink

Brilliant
Really
exciting!

Metrolink

Fabulous!
Really enjoyed it
and very clever. ♥

x

Metrolink

Super!
AMAZING

Metrolink

Abs. amazing
A great
stress-buster
(workplace)
(Autism)
(behaviour
hubs!)

Amazing
Fantastic
experience
BH & W

Metrolink

Fantastic best
part of Totton
so far

Metrolink

Fantastic
Green ponds
will never be the
same
Thank you

Metrolink

What a
brilliant
journey
Liz

Metrolink

It's the
best thing EVER!!
Metrolink

Metrolink

A
must for
every adult
with an
inner child.
Fabulous!

Metrolink

超赞!

一定要试试!

✍

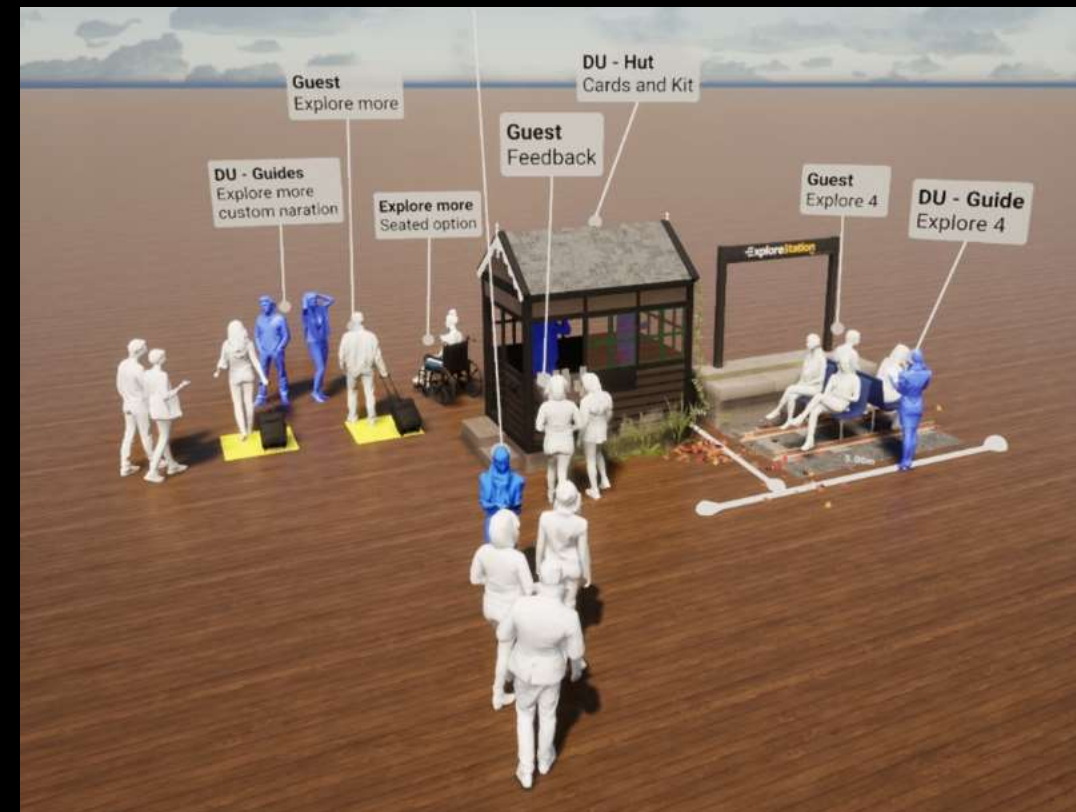
2019-7-20
Metrolink

≡ exploreStation



Virtual Reality Pop-up Touring in May 2022

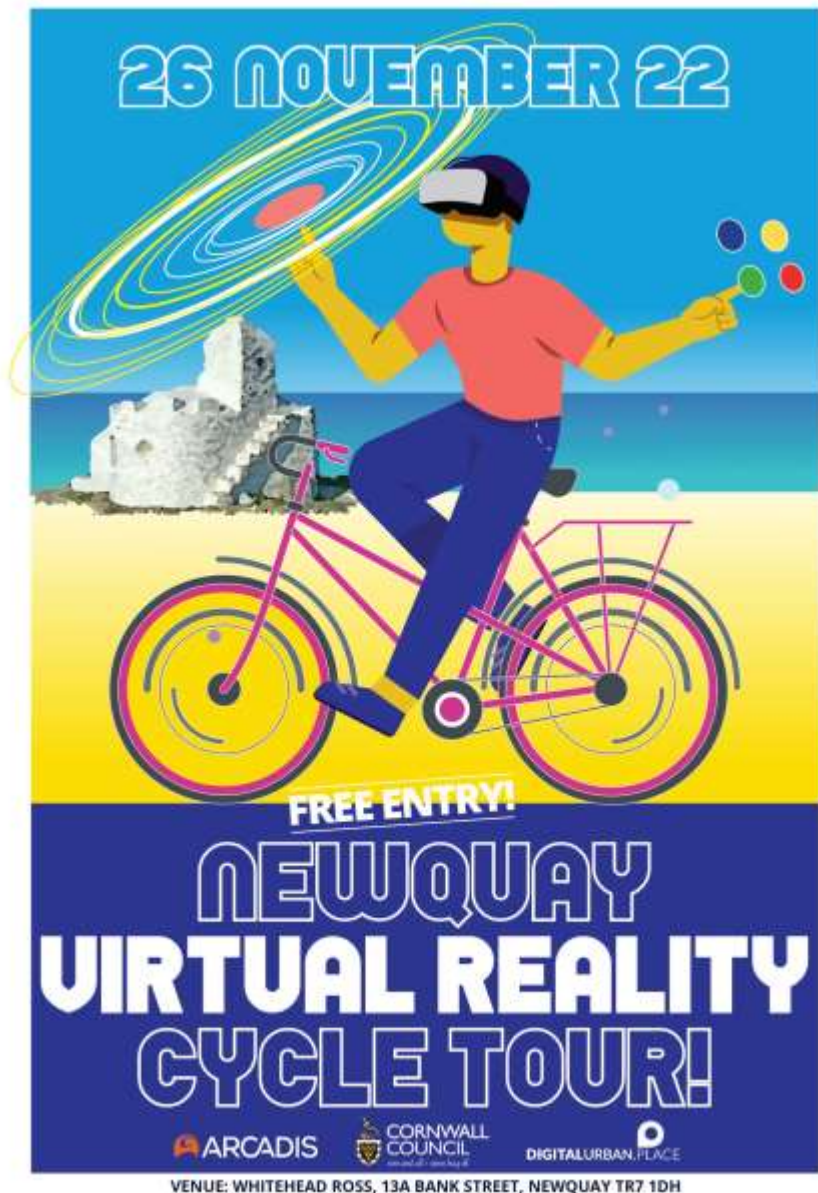
- National Railway Museum 4,5 May
- Locomotion Museum 7,8 May
- Science and Industry Museum 11,12,13 May
- Hereford (shell Store) 16,17 May
- Paisley (Scotland) 19,20 May







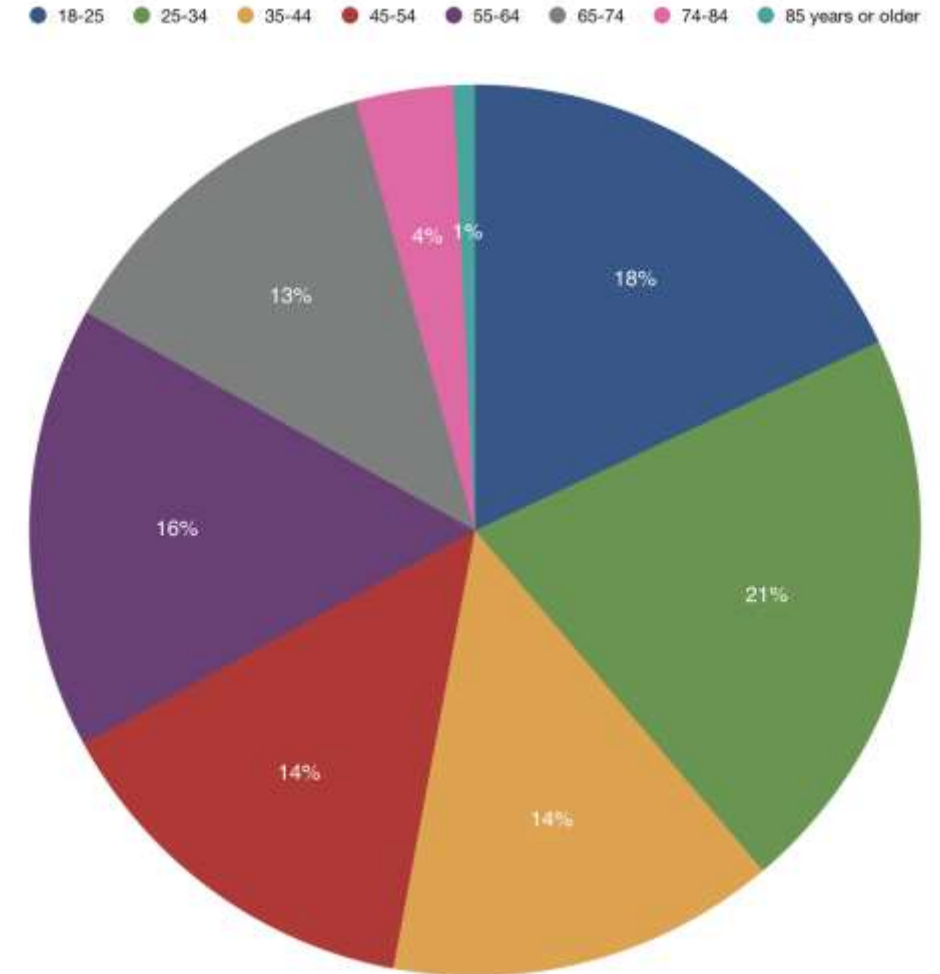
DLUHC - Immersive consultation





Age Ranges

- There is a near equal dispersal of age groups interacting with our projects.
- There is no over-representation of a group in particular, with all age groups between 18-74 holding a close stake in engagement.
- Those aged 18-34 hold a significant proportion, which demonstrates a keener interest in a younger audience when Virtual Reality is involved.



*Using immersive technology as part of
the planning consultation process
is the “Human in the loop”
for a Digital Urban Twin
That encourages behavioural change.*



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