

Physical to Virtual:

How '3D' is transforming the work of local authorities

Thanks for joining,
We're almost ready to go!



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council



Comhairle Contae
Fhine Gall
Fingal County
Council



Comhairle Contae
Átha Cliath Theas
South Dublin County Council



Smart Dublin is an initiative of the four Dublin Local Authorities



To engage with Technology providers, Researchers and Citizens to address urban challenges and improve quality of life.



Smart Dublin Regional Webinar Series - Objectives

A combined invitation to all staff of the four DLAs:

1. To raise awareness of how emerging technology is being used in each of the DLAs.
 - To encourage further usage within a Council
 - To encourage adoption by another Council
2. To stimulate ideas on how emerging technology could be used for your own Service area.

Smart Dublin Regional Webinar Series – 2021 Schedule

April: Physical to Virtual

How 3D models, Digital Twins, AR/VR are transforming the work of local authorities.

July: Internet of Things (IoT)

How IoT technology is being used to deliver a variety of local authority services.

October: Future of Drones

How Unmanned Aerial Vehicles are being used to deliver a variety of local authority services.

December: Digital/Smart Citizenship

How technology can be used by local authorities to enhance and deepen citizen engagement.

www.smartsandyford.ie

@SmartSandyford

Physical to Virtual



**SMART
SANDYFORD**

A Smart Dublin District

Tuesday 13th April

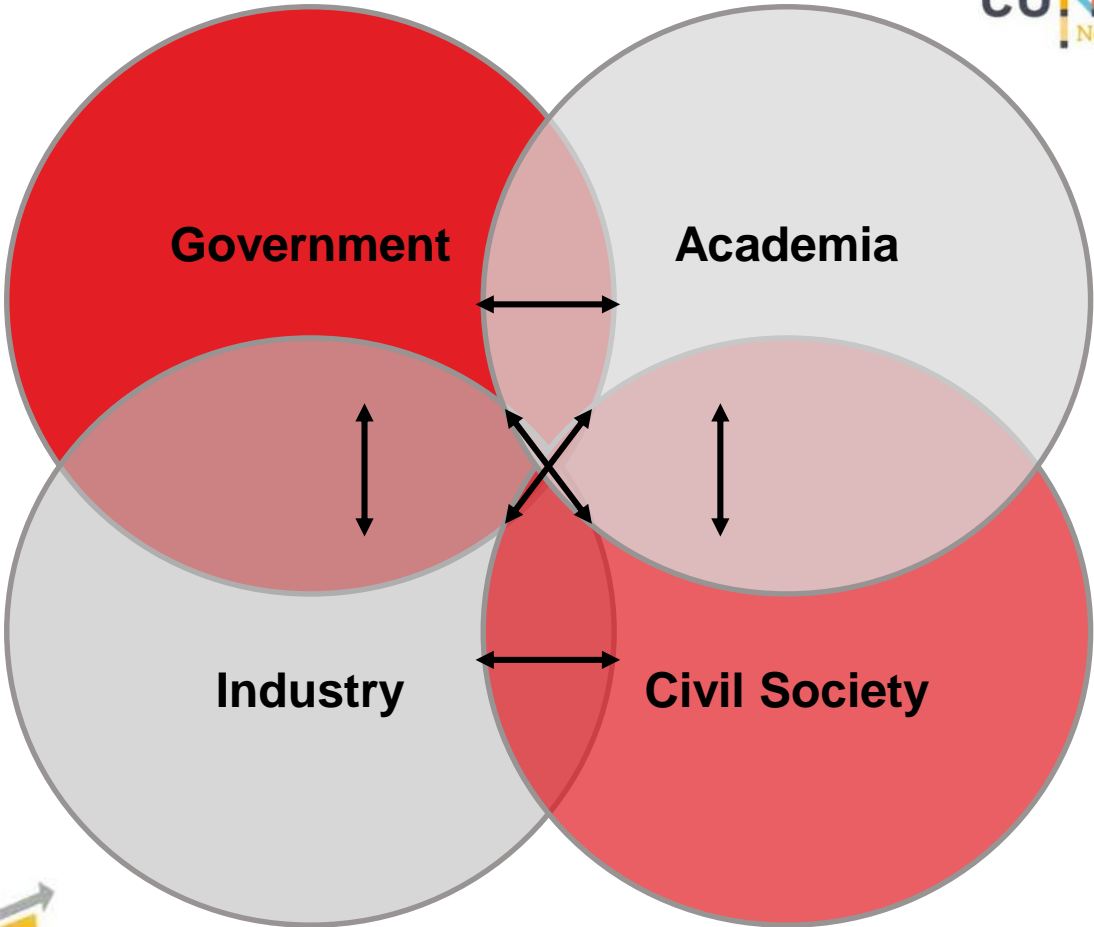


Physical to Virtual

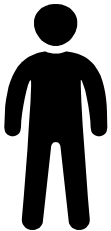


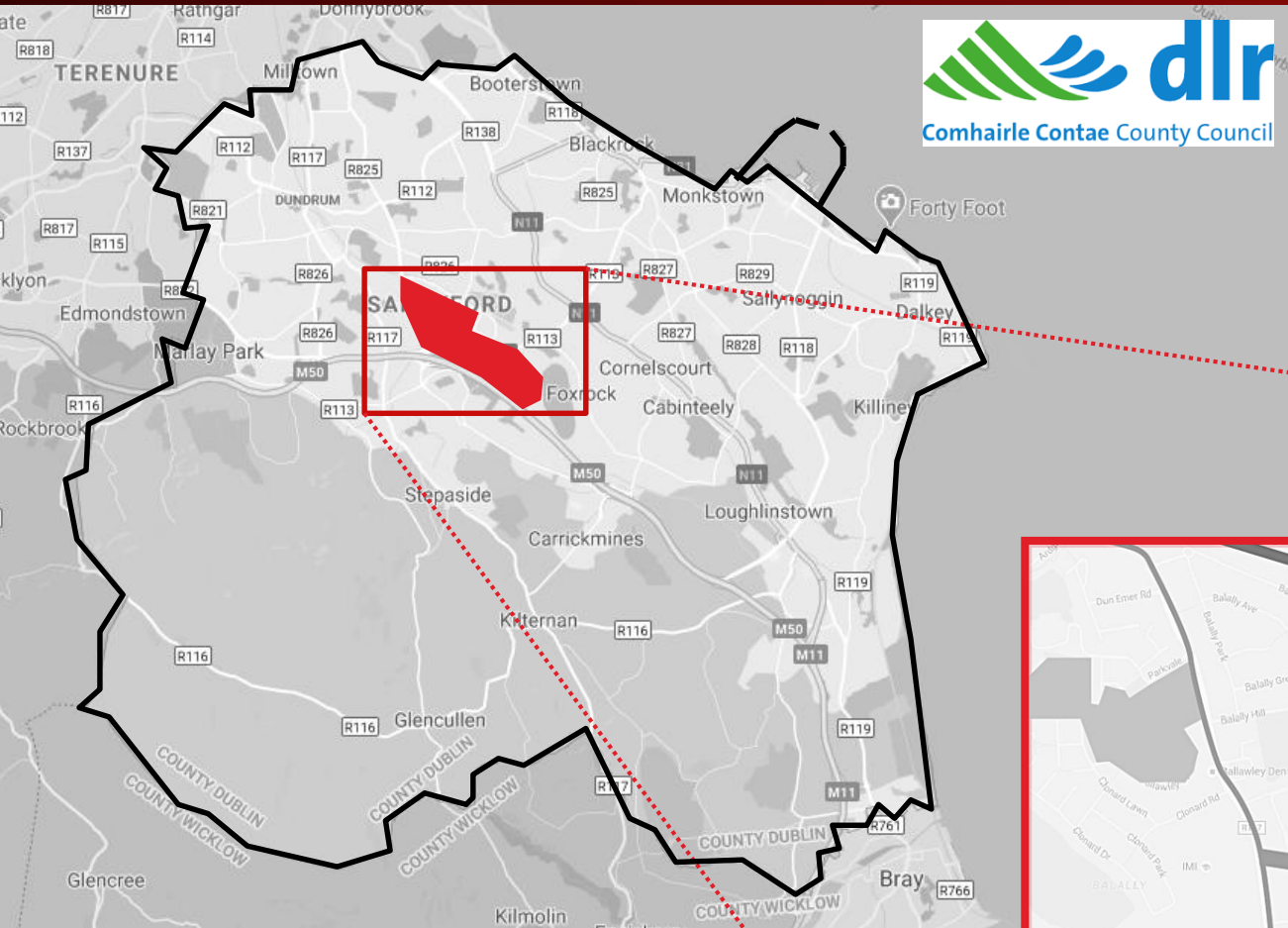
- District Programme
- PRECINCT
- SCORE

Engagement

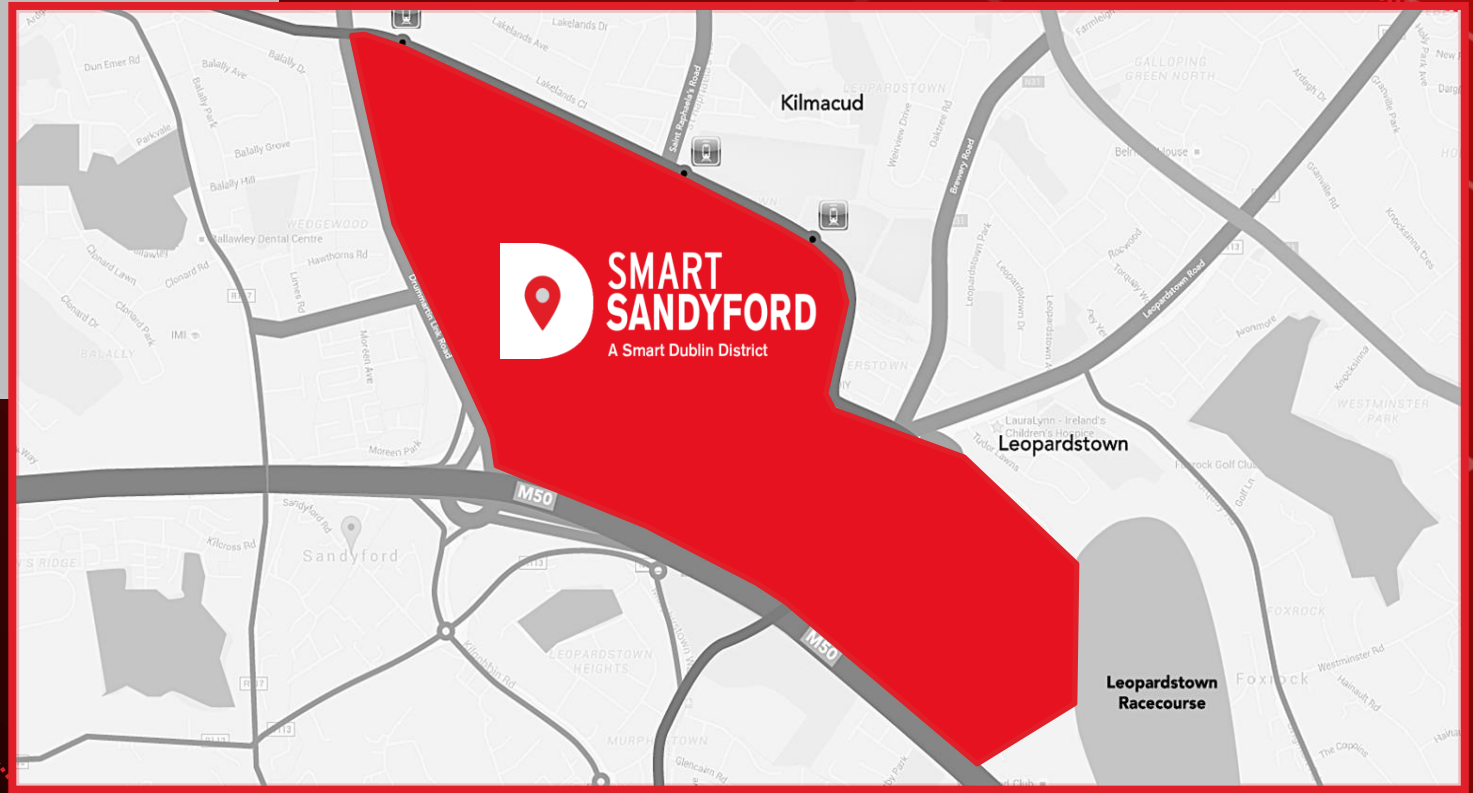


Quadruple Helix Engagement

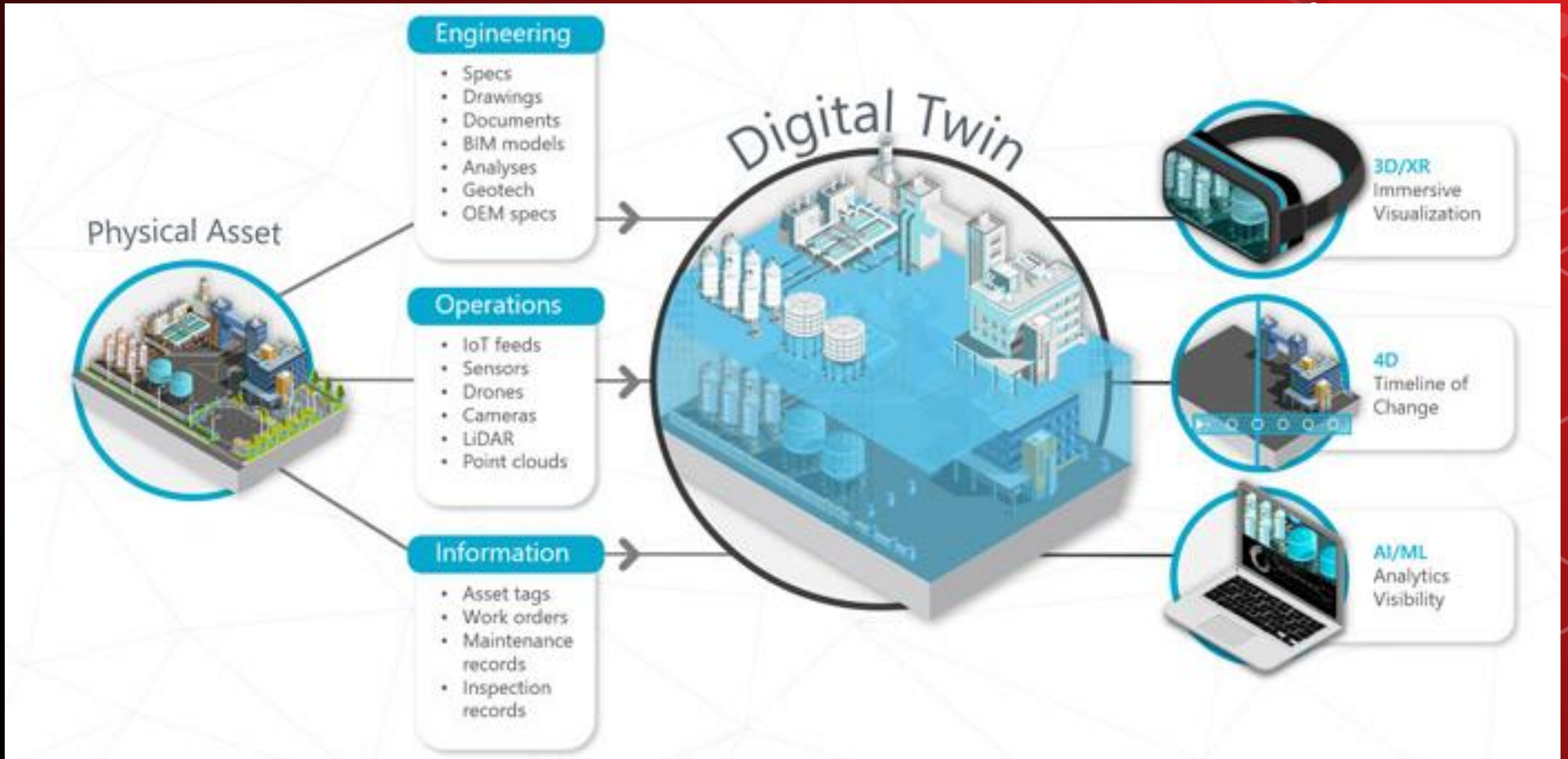




Dún Laoghaire Rathdown Innovation Testbed



What are digital twins?



Research Led Innovation

PRECINCT

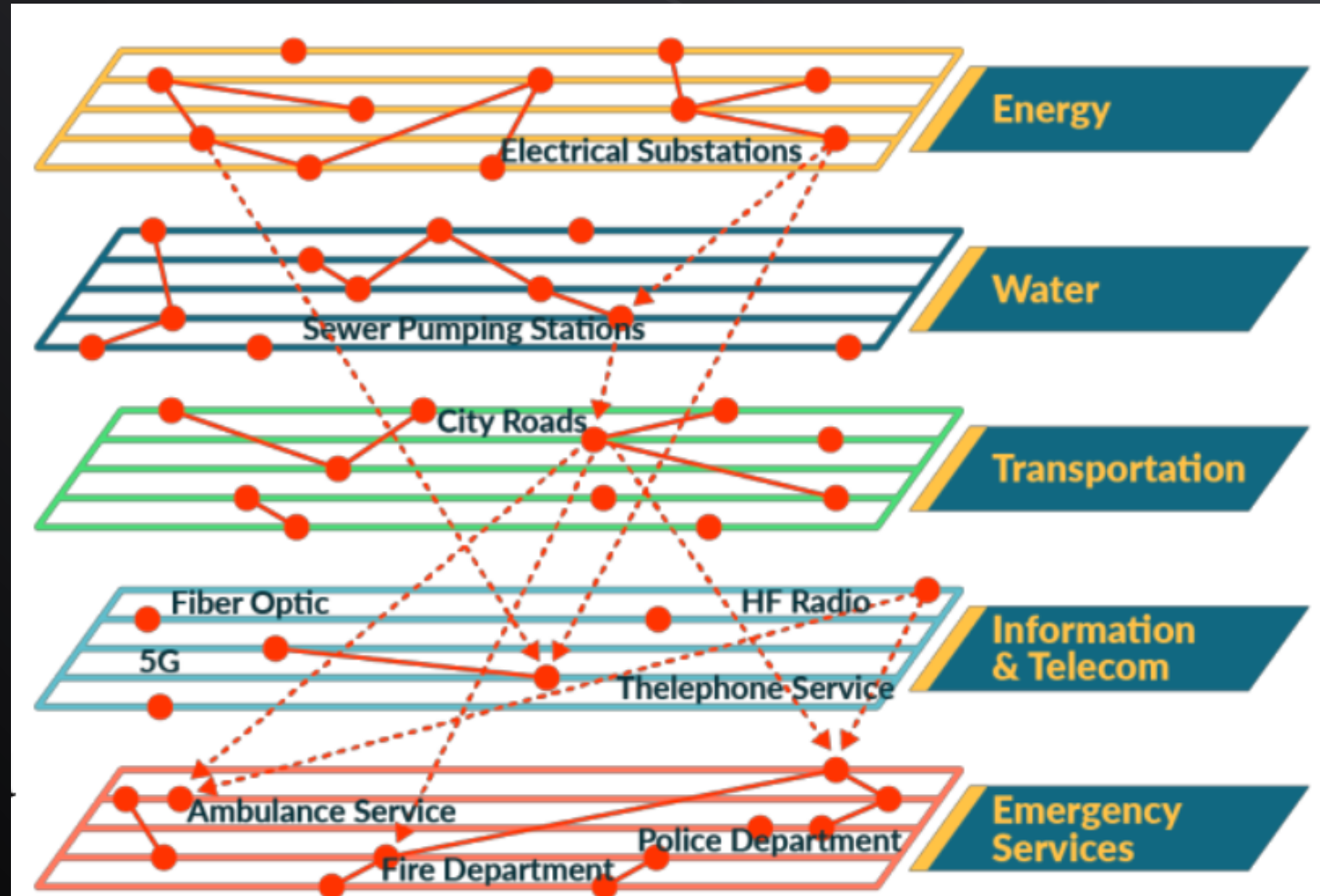


001

The project will evaluate and improve multiple critical infrastructure types

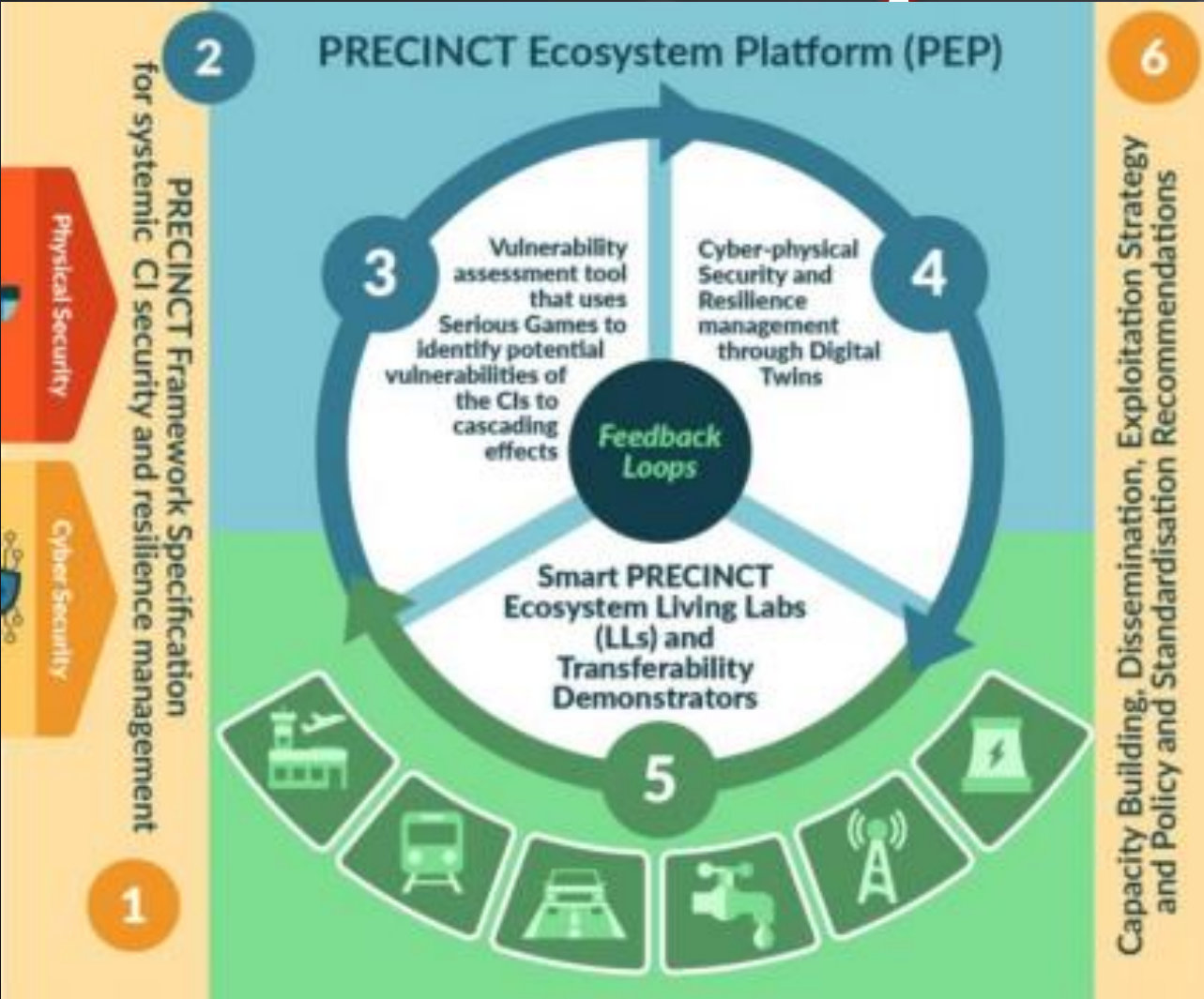
Living Labs provide both an experimentation environment and innovation testbed for PRECINCT

Working with UCD and our EU partners we will validate the findings and show their transferability across the three validation demonstrators



Research Led Innovation

PRECINCT



Research Led Innovation

SCORE

'Smart Control of the Climate Resilience in European Coastal Cities'

The research project offers new frameworks and approaches to managing the County and improving the resilience of the living lab

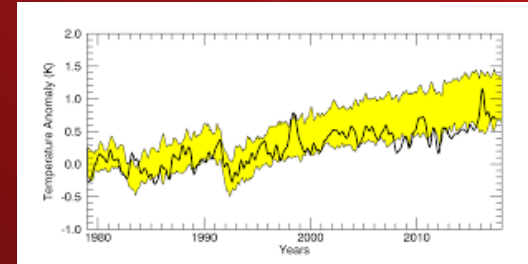
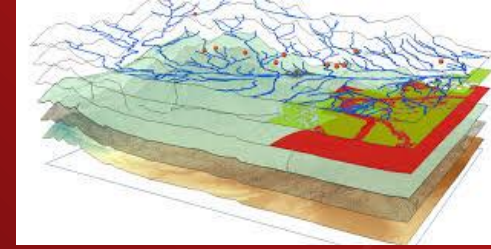
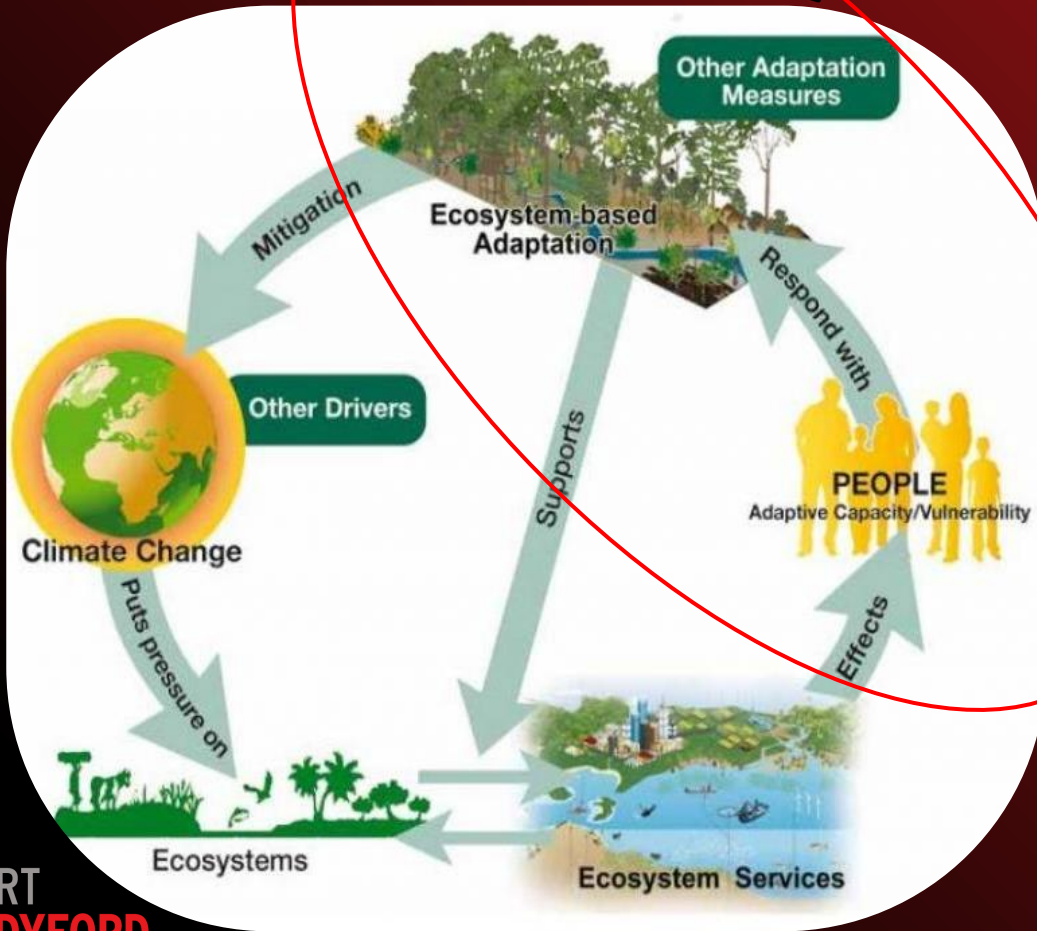
The ecosystem-based approach, adopted in SCORE will ensure sustainable management, conservation, and restoration of ecosystems that can generate social, economic and social benefits

The project will provide the Council access to cutting edge technologies, including digital twin and flood sensor technologies



SCORE

CCLs



- Smart technologies
- Digital Twin Solutions (virtual simulation of the physical environment)

For more information,
please get in touch:
conor.dowling@smartsandyford.ie



SMART SANDYFORD

A Smart Dublin District

Conor Dowling PhD
Programme Manager





Bringing Plans to Life:

How Fingal's 3D model is bringing the Balbriggan Rejuvenation Plan to life for local citizens.

13.04.21

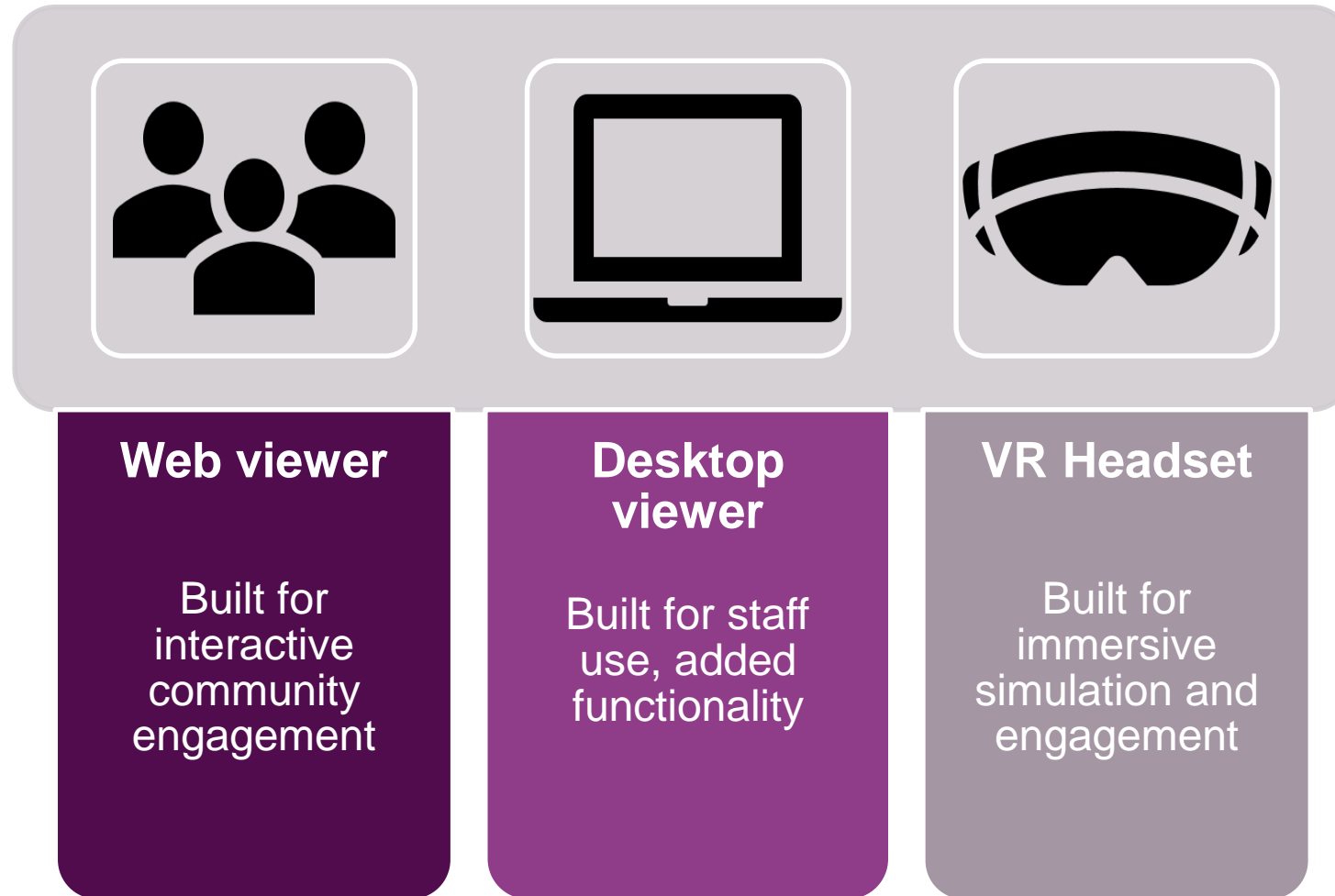
Balbriggan 3D Model



A Platform to Plan,
Communicate and Realise
the Our Balbriggan 2019 –
2025 Town Rejuvenation
plan. Funded by the Public
Service Innovation Fund



Balbriggan 3D Model



Mapping

Balbriggan 3D spatial fidelity comes
From underlying aerial mapping



Modelling

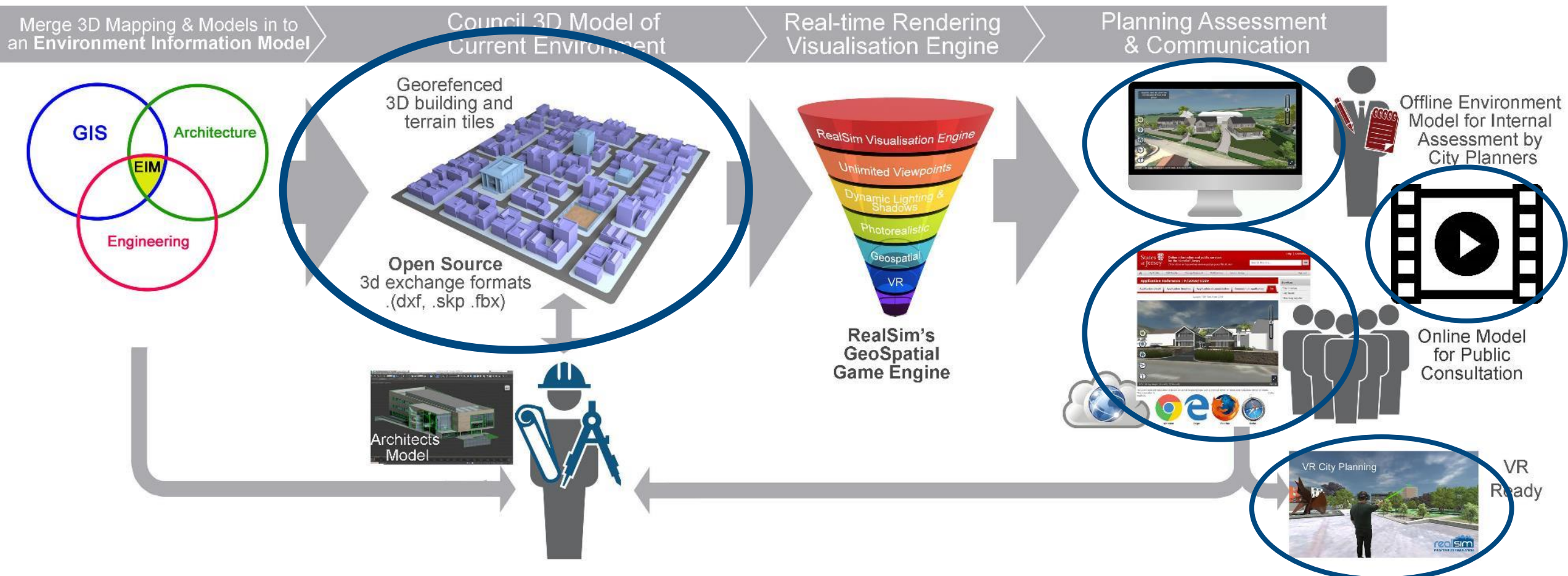


Outputs



The 3D Planning & Communication System

Data > Visualisation > Understanding



Balbriggan 3D Model Promo Video



3D Model

Supported by



An Roinn Caiteachais
Phoiblí agus Athchóirithe
Department of Public
Expenditure and Reform

Comhairle Contae
Fhine Gall
Fingal County
Council



Our Public
Service



SMART
BALBRIGGAN
A Smart Dublin District

Promo video: <https://youtu.be/mcbbz95N5gQ>

Engagement



- Online Community Events and Webinars
- Community Engagement Hackathon
- Staff seminars



THE CHANGING FACE OF BALBRIGGAN

CITIZEN ENGAGEMENT HACKATHON 12 - 13 June 2021

Powered by WHAT THE HACK



Check out the Balbriggan 3D Model web viewer here:
https://balbrigganwebscene20210205.s3-eu-west-1.amazonaws.com/Balbriggan_v1.3.7.1_210408_WebGL/index.html



Thank You



**Comhairle Contae
Fhine Gall**
Fingal County
Council



**Our Public
Service**



**An Roinn Caiteachais
Phoiblí agus Athchóirithe**
Department of Public
Expenditure and Reform





Stephen Willoughby

Senior Executive Planner

County Development Plan - Virtual Consultation Room



South Dublin 2022-2028
County Development Plan

Shape | Explore | Experience

set of la
legislation.
making or
rules ma



Legislative Requirements

Traditional Methods:

Coronavirus
COVID-19



Covid 19

**Adapting to Health &
Safety needs**



The Thought Process

What does the consumer want/how to engage?



Benefit of consumer research carried out as part of the development of the plan review website and booklet

Local Authority Planning Professional

Age 23-40

Occupation Local Authority Planners

Status Single/Partner/Married

Location Dublin City/ Dublin Suburbs

Practical

Focused

Motivated

BIO

Local Authority planning professionals working in a fast-paced environment. Working in Development Management and Enforcement, it is important that information is accurate and reliable as it is used to inform decisions and establish zoning of land as the CDP is used on a daily basis. Access to information, in a fast and efficient manner is also crucial. High importance

Motivations

Consistency

Accuracy

Strong

Implementable

Concise

Rational

Goals

(Objectives this person wants to achieve)

Prepare planning reports and base decisions on rational and implementable policies and objectives.

Provide planning advice for pre planning's.

Address all site-specific issues in planning application

Frustrations

(Pain points they want to avoid)

Lack of detail to make a decision

Introductions too long

Lack of GIS Mapping

Text heavy plan

A lot of repetition

Top Tasks

Interactive Mapping

Tightened Policies and Objectives

Influencers

Convenience

Trust

Reliable

Consistency

Quick, Accurate & Informative

Technology (Websites & Apps)

Devices

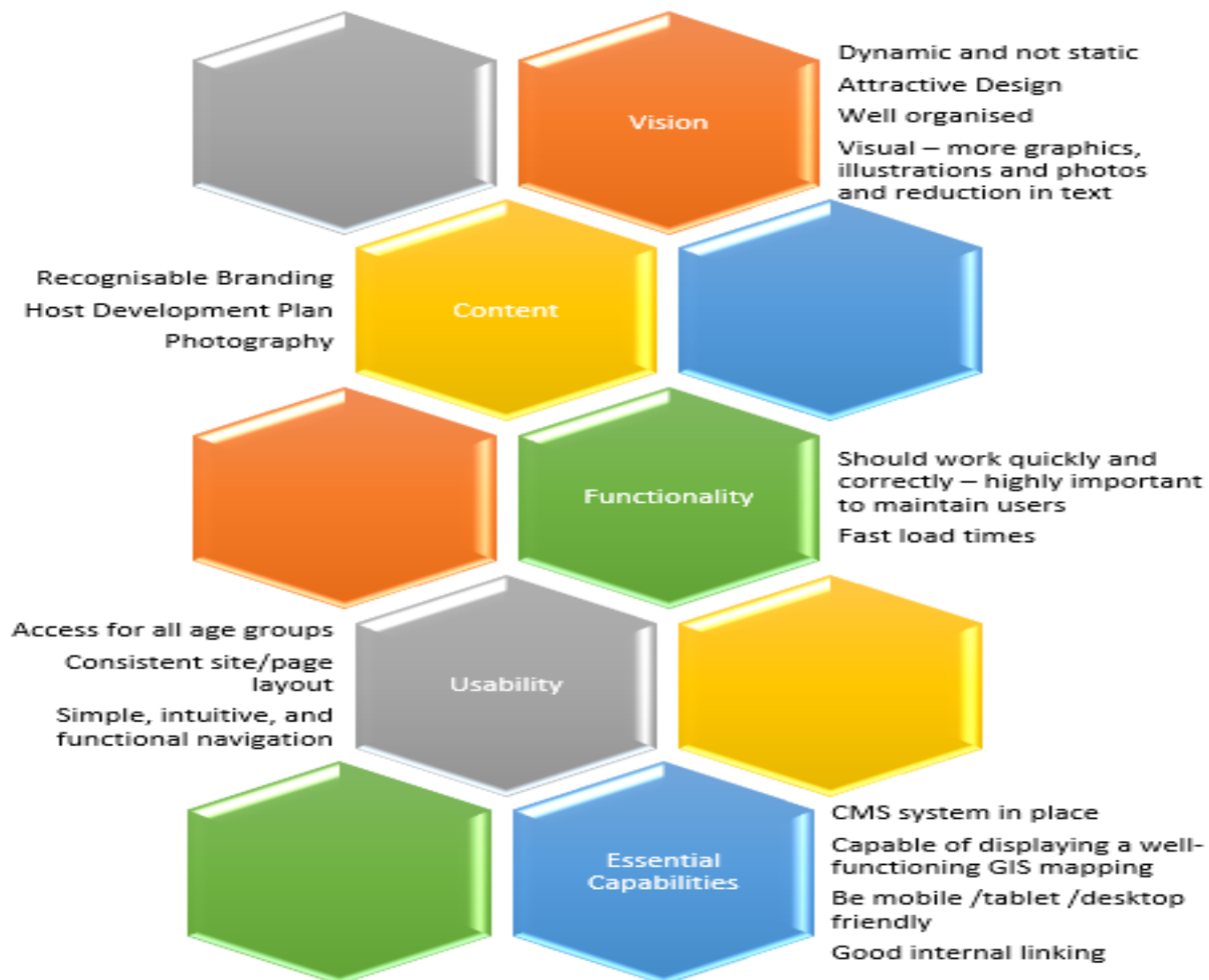


South Dublin

2022-2028

County Development Plan

Key Focus Areas



Options Considered

Distanced Library Events and Public Meetings



- Logistics
- Health and Safety for Public
- Health and Safety for Staff
- Confusion from the public
- Likely Attendance

Note 2 Events carried out within the Library on two afternoons 2 members of the public turned up.*

The Question:

How do we recreate the more traditional methods of consultation in a safe environment that is easily accessible to the public, interactive and provides access to the plan making team.

Initial Concept Development

3D Design and the creation of a Virtual Room



Initial Concept Development

First Sample Inhouse developed using Sketch Up prepared by Neil Kiernan Planning



Initial Concept Development

2ND Sample developed further using Sketch Up and Enscape 3D rendering prepared by Neil Kiernan Planning



Initial Concept Development

Collaboration with SDCC IT Section through Bernard Gaughan/Davy O'Connor

We have an Idea

This is what we're thinking

Do you think it could work?

How can we make it work?



Collaboration

- Initial room design, concept development and consideration
- Options considered/key functions/Cost/Timeframe (Very Tight)
- Engagement of designers to develop concept – **Keeper Solutions**

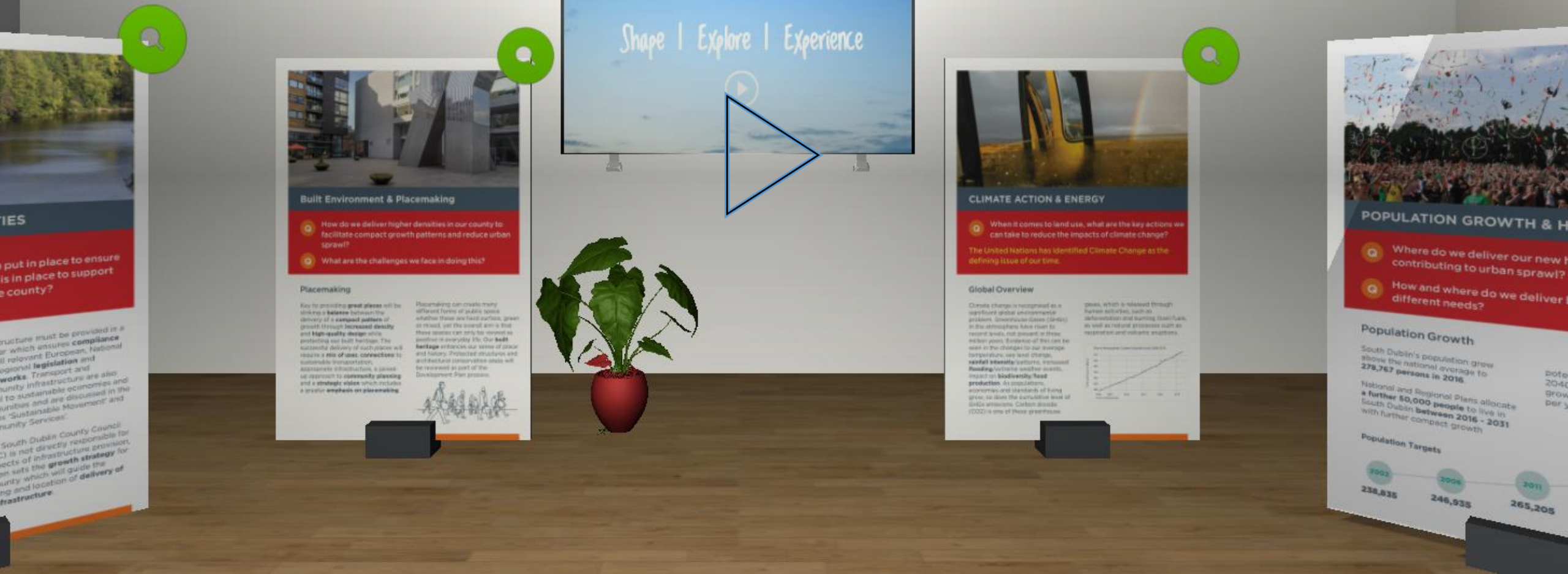


DESIGN OBJECTIVE OVERVIEW

*Provide the public with an opportunity to view the strategic issues facing the County as identified in the issues booklet **and** the ability to speak to a planner to discuss any questions or queries **'live'** at specified times in a similar manner to a real life consultation.*



The Virtual Consultation Room



Shape | Explore | Experience

Built Environment & Placemaking

- Q How do we deliver higher densities in our county to facilitate compact growth patterns and reduce urban sprawl?
- Q What are the challenges we face in doing this?

Placemaking

Key to providing **great places** will be striking a **balance** between the delivery of a **compact pattern** of growth through **increased density** and **high-quality design** which protects our built heritage. The successful delivery of such places will require a **mix of uses, connections** to sustainable transportation, sustainable distribution, a joined-up approach to **community planning** and a **strategic vision** which includes a **greater emphasis on placemaking**.

Placemaking can create many different forms of public space, whether these are hard surfaces, green or mixed, yet the overall aim is that these spaces can only be viewed as positive in everyday life. Our **built heritage** enhances our sense of place and history. Protected structures and architectural conservation areas will be reviewed as part of the Development Plan process.



CLIMATE ACTION & ENERGY

- Q When it comes to land use, what are the key actions we can take to reduce the impacts of climate change?
- The United Nations has identified Climate Change as the defining issue of our time.

Global Overview

Climate change is recognised as a significant global environmental problem. Greenhouse Gases (GHGs) in the atmosphere have risen to record levels, not present in these earlier years. Evidence of this can be seen in the changes to our average temperatures, sea level change, rainfall intensity patterns, increased flooding/invasive weather events, impact on biodiversity/food production. As populations, economies and standards of living grow, so does the cumulative level of GHG emissions. Carbon dioxide (CO2) is one of these greenhouse

gases, which is released through human activities, such as deforestation and burning fossil fuels, as well as natural processes such as respiration and volcanic eruptions.



POPULATION GROWTH & HOUSING

- Q Where do we deliver our new housing contributing to urban sprawl?
- Q How and where do we deliver different needs?

Population Growth

South Dublin's population grew above the national average to **278,767 persons in 2016**.

National and Regional Plans allocate a further **50,000 people** to live in South Dublin **between 2016 - 2031** with further compact growth.

Population Targets



Impact

Room was available for the general public to use. The first live consultation event was held on the Thursday the 27th of August with further live consultation on the 10th and 24th of September between the hours of 5 and 7pm. A voicemail service was also available during the entire 8-week consultation period up to the 28th of September.

Increased Awareness of the plan and the Consultation Process:



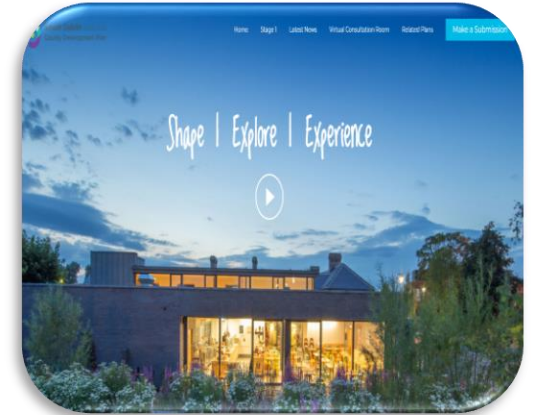
***Instagram Links
1,834 times***



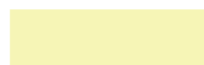
***Twitter Links
22,416 times***



***Facebook Links
16,932 times***



***Dev Plan Website
400 times***



Impact

The use of digital engagement tools enables stakeholders and communities to understand proposals, allowing them to provide an informed response and participate in the consultation process.

The VCR alongside other consultation methods allowed the consultation process to reach a wider audience increasing awareness and contributing towards an increase in the number of submissions received.

2015 – 114 SUBMISSIONS RECEIVED

2020 – 227 SUBMISSIONS RECEIVED



Impact

Team – *The plan team were able to engage with the public when they visited the Virtual Consultation Room in an interactive manner during live events via Microsoft teams either within the office environment or while remote working from home.*

Users Public and Stakeholder Engagement – *The UX provided the public with an opportunity to view relevant information in video or display board (pop up) PDF format with the ability to make direct contact with the plan team via a call button. The user is also provided with a direct link to the public consultation portal to make a submission at that particular moment in time which would not happen during a more traditional public consultation event.*

Sector –

The development of the Virtual Reality Consultation Room raised awareness of the plan review process and contributed towards an increase in the number of submissions received.

Increased potential for the capture of a wider cohort of the South Dublin population during the consultation process i.e people with accessibility issues or parents with young families who may not be able to normally attend such events due to childcare issues.



The Future



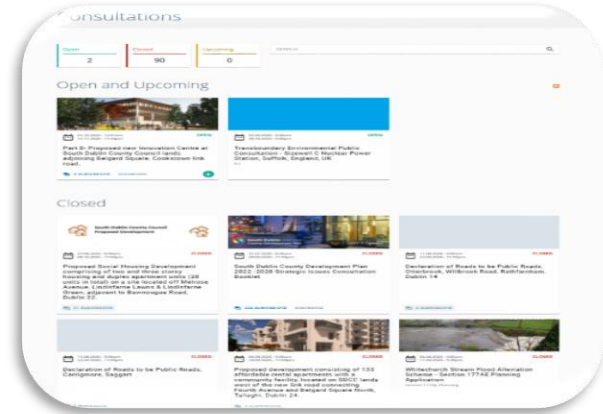
Response to Engagement



Innovative ways of engaging with the public



Potential to Increase Awareness of SDCC Projects



Facilitating the publics ability to discuss projects with staff



3D virtual walkthroughs and immersive VR experiences



3D City Models



The diagram illustrates a process flow for 3D City Models. It features a large dark grey shape on the left containing the text '3D City Models'. To its right is a solid black hexagon labeled 'DCC Journey'. Above this hexagon are two small, empty hexagons. A line connects the bottom of the 'DCC Journey' hexagon to a larger, empty hexagon on the right, indicating a continuation of the process.

DCC Journey



D3D

(Data Hackathon – explore use cases -> Planning case and DFB)

D3D

(use cases with city engineers and bridges team, promotion of VR in events, AR use cases and dataset made open in Dublinked)

White Water Rafting

VR Experience

Top 3 solutions from Hackathon

Dublin Fire Brigade Use Case



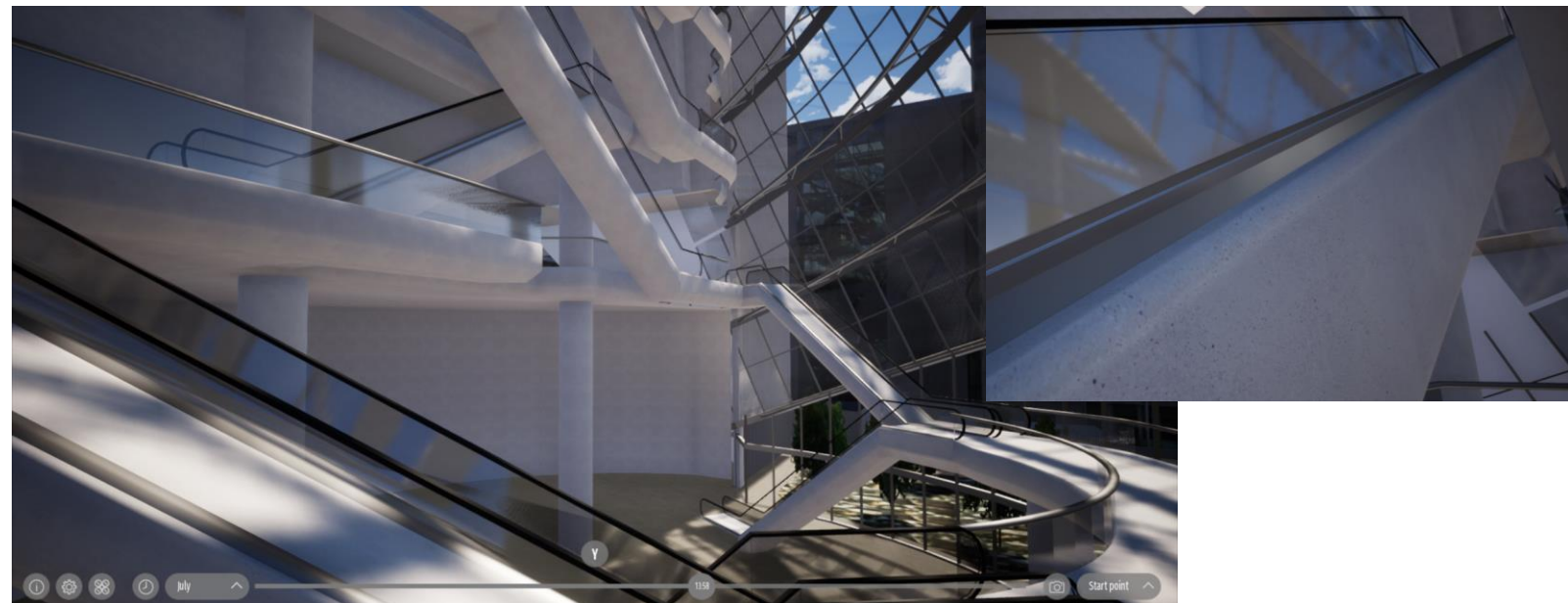
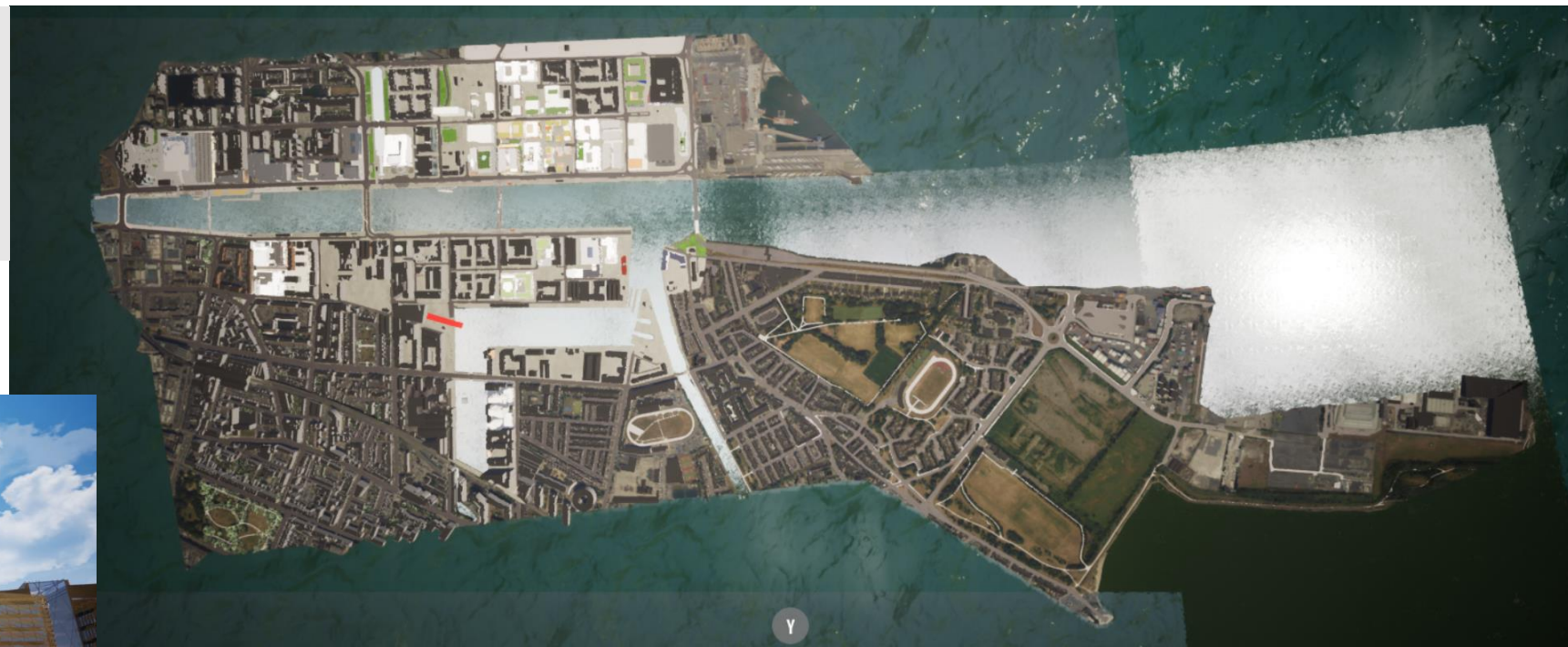
<https://www.youtube.com/watch?v=85GzydDn8Dg>

D3D

(Size of Model + LODs)

Video White Water Rafting:

<https://www.youtube.com/watch?v=BWblSoBeqJ0>



Bentley – Open Cities Planner (OCP) + 360 Panorama (mobile)

(Development Management, visualisation platform with build-in questionnaire, website/video/image embed, shadows and height analysis, 360 mobile version)

Article:

<https://cities-today.com/bentley-systems-and-microsoft-team-up-on-digital-twins/>

Video:

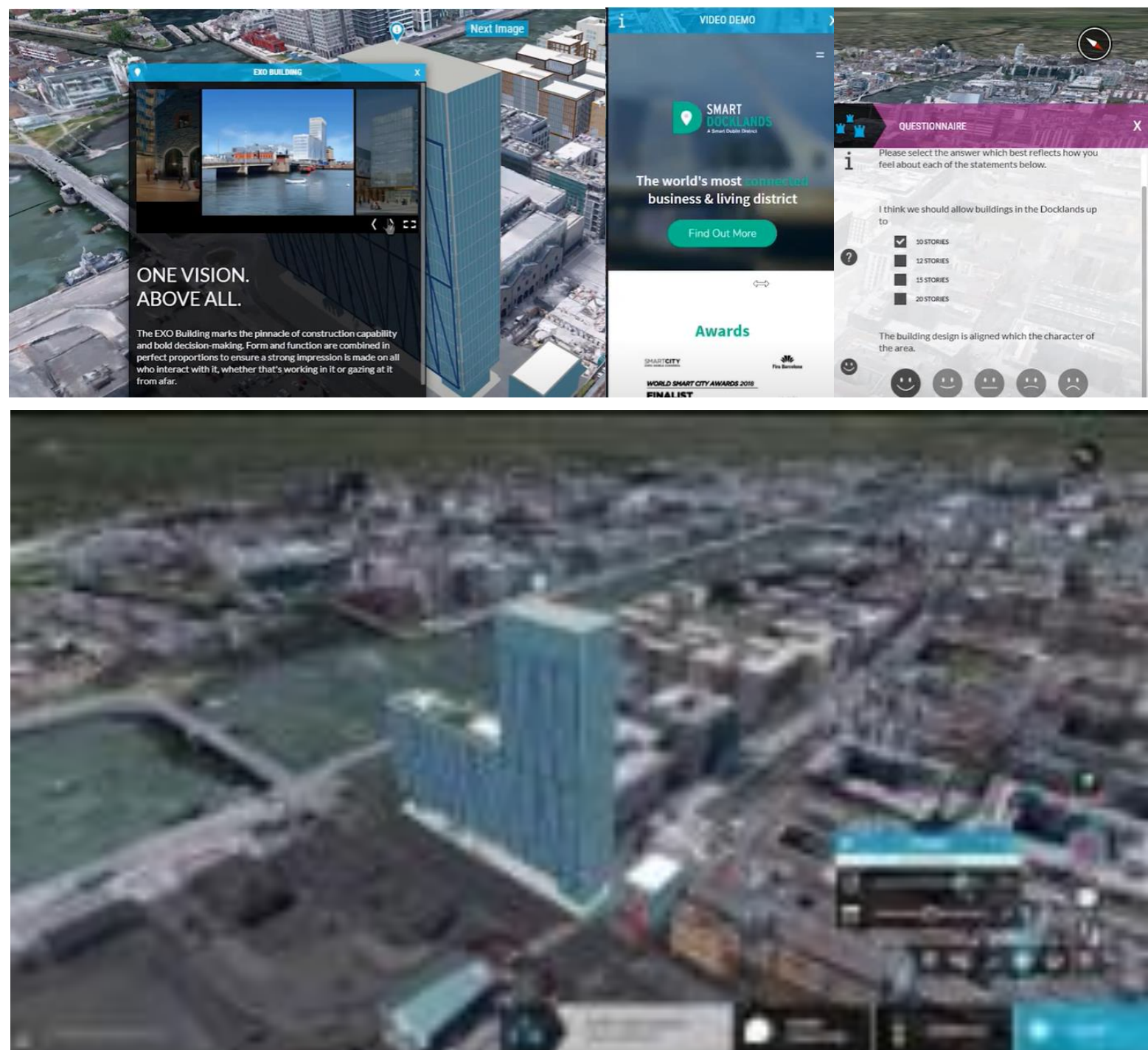
https://www.youtube.com/watch?v=eCdehJ2VT_Ao&feature=emb_logo

Gothenburg vision 2035

https://www.bentley.com/en/project-profiles/2018/gothenburg-city_3d-city-model

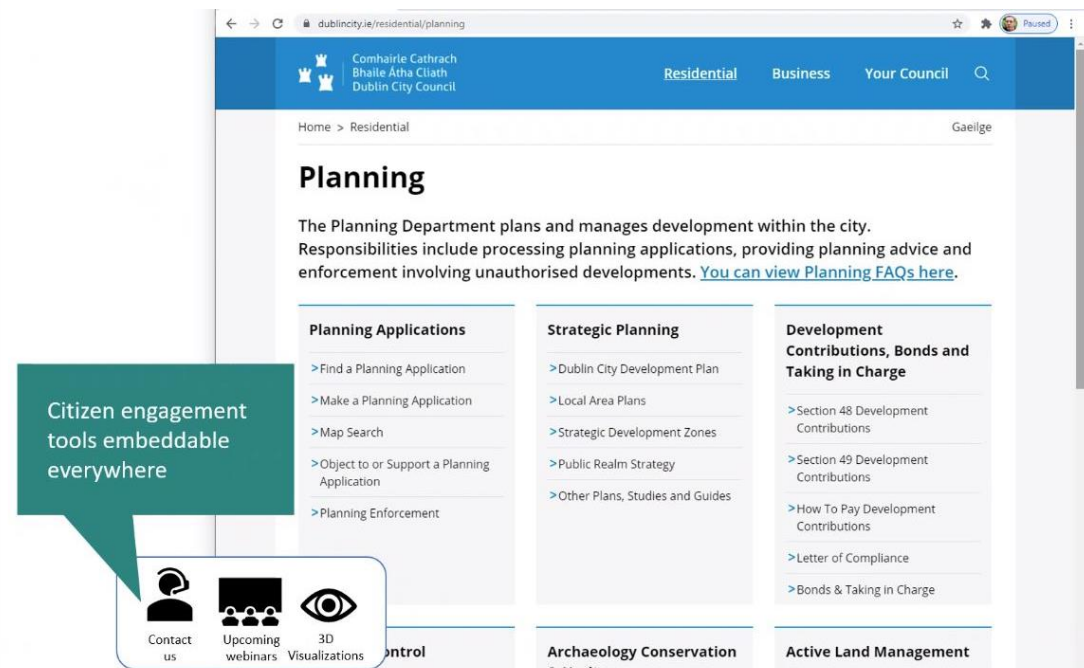
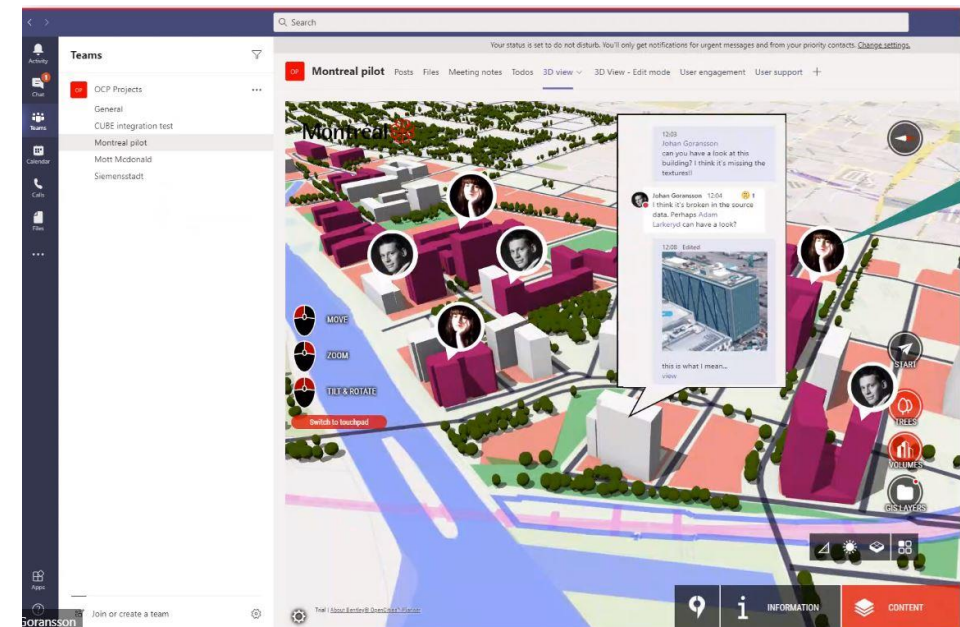
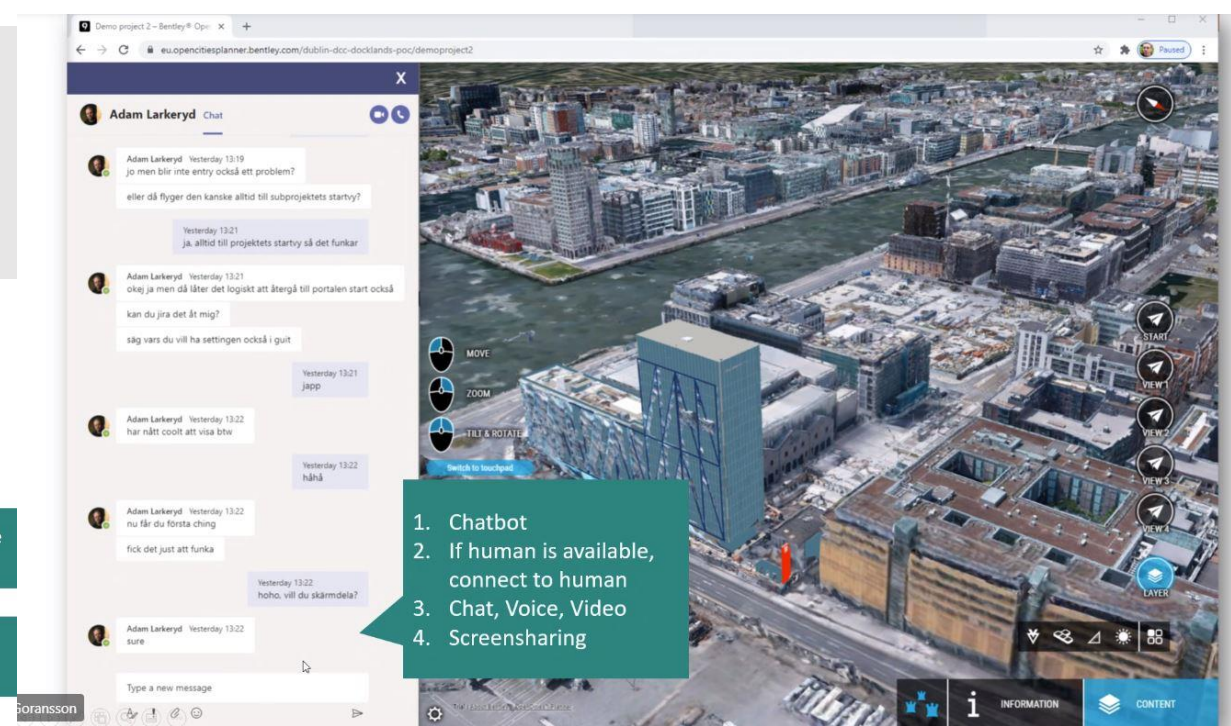
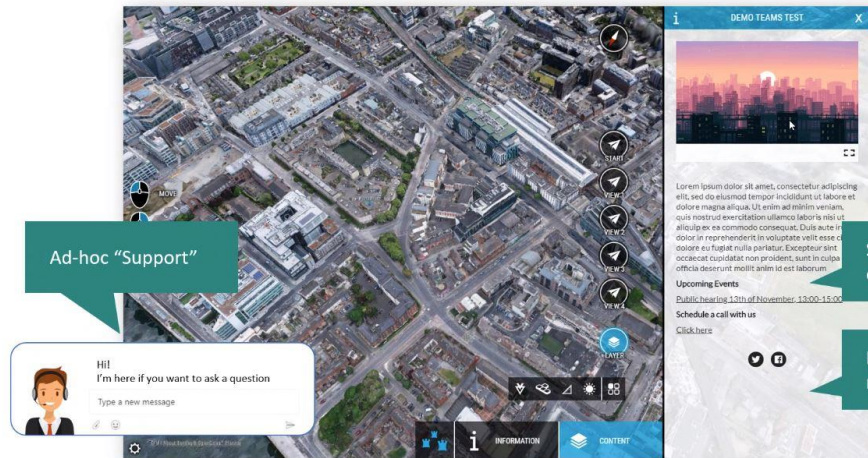
Open Cities Planner Brochure of use cases:

https://cdn2.webdamdb.com/md_6J1rc8w0F15.jpg.pdf



Bentley & Microsoft

(Integration OCP with MS Teams – embedded in many places, leave comments on model and gather statistics from surveys)



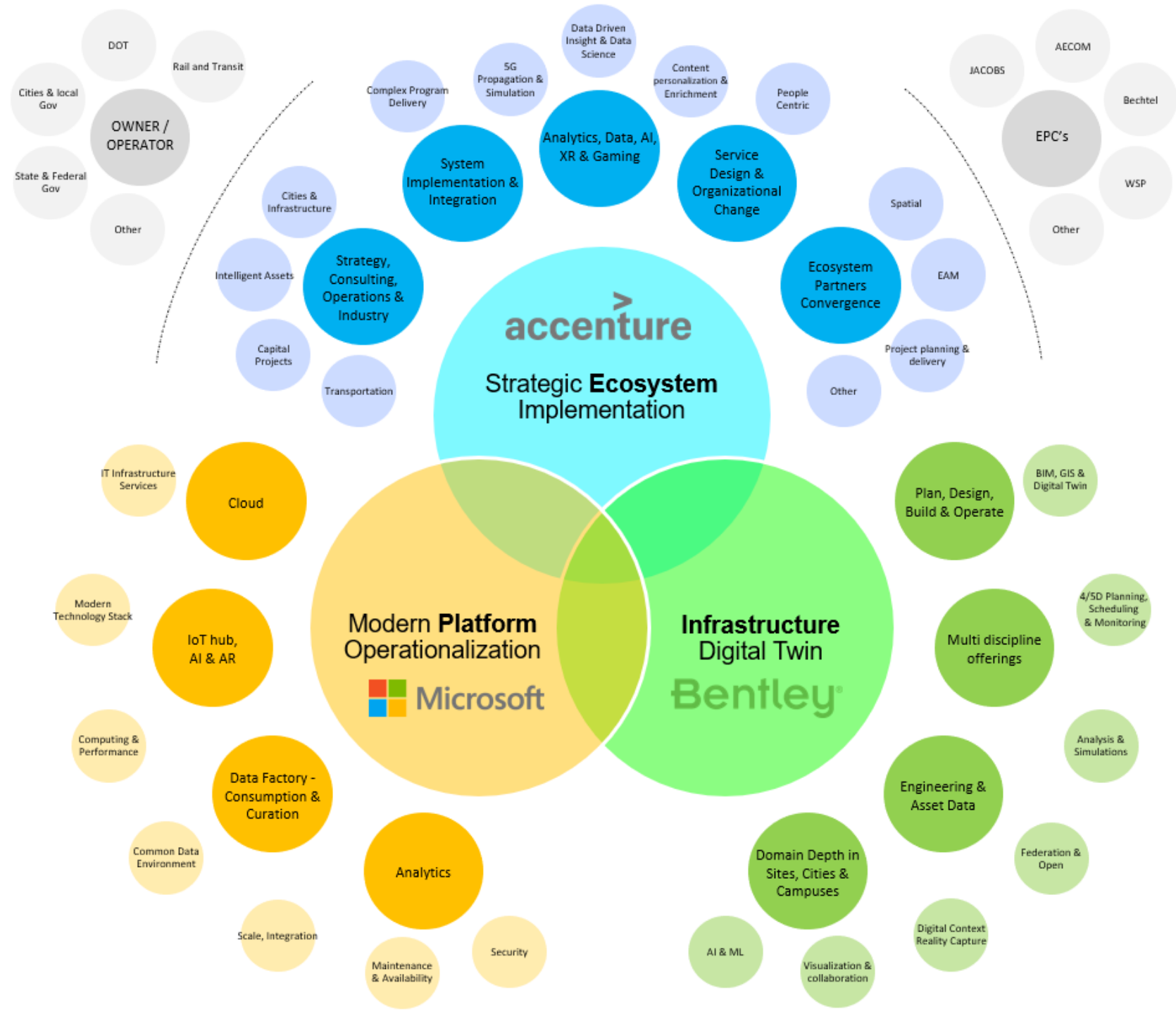
Bentley & Microsoft & Accenture

(IoT exploring phase – Air Quality and Noise)



City of Dublin: IoT Use Case Workshop

January 21, 2021
15:00-16:00 GMT



Graffiquo

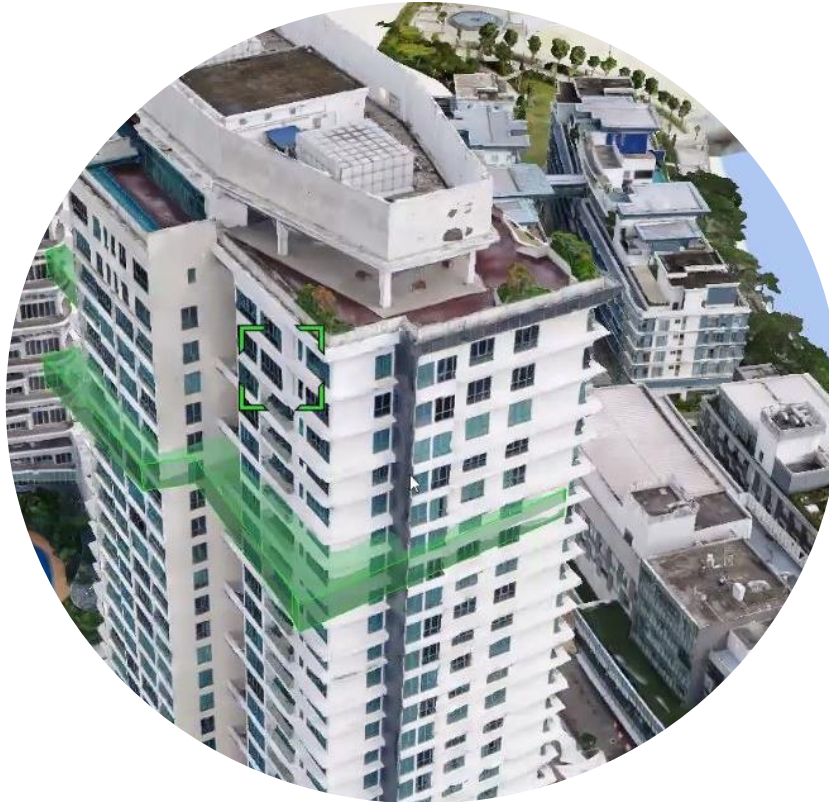
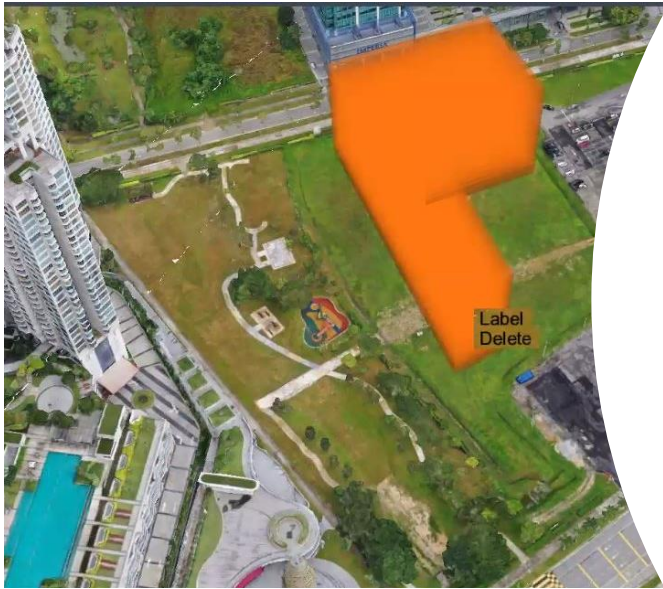
(IoT, Building single floors, High Details, CCTV, GIS data, quick mass buildings, web browser)

Website:

<https://graffiquo.com/>

Video:

https://youtu.be/h8_sLbr0mnA?list=TLGG0KbIBs-a9HgyMjAyMjAyMQ



Digital Urban Place

(SaaS Model, Mass Blocks – Aerial Photogrammetry with facades details from Lidar or terrestrial photogrammetry, BIM can be integrated, APIs, Integration with Traffic Data, Colour coded Air Quality and Energy, Flooding model, AR/VR, Satellite Data and AI powered solution)

OUR APPLICATIONS INCLUDE

- Realtime interactive software enabling user to walk or fly around the 3D urban models without the need for any specialist software or training
- Touch screen / interactive information displays to support marketing and promotional activities.

Simulations integrating data from:

- Traffic data, including microsimulation models
- Dynamic hydrograph data from flood models
- Spatial referenced mapping data including noise maps
- Emissions data
- Lighting studies, both calibrated simulations or luminescence false colour maps
- Web based 2D and 3D integrated with GIS systems
- Consultation and feedback applications
- Information Management systems utilising both 2d and 3D environments as an interface



Website:

<https://digitalurban.place/>

Platform:

<https://app.digitalurban.place/areas>

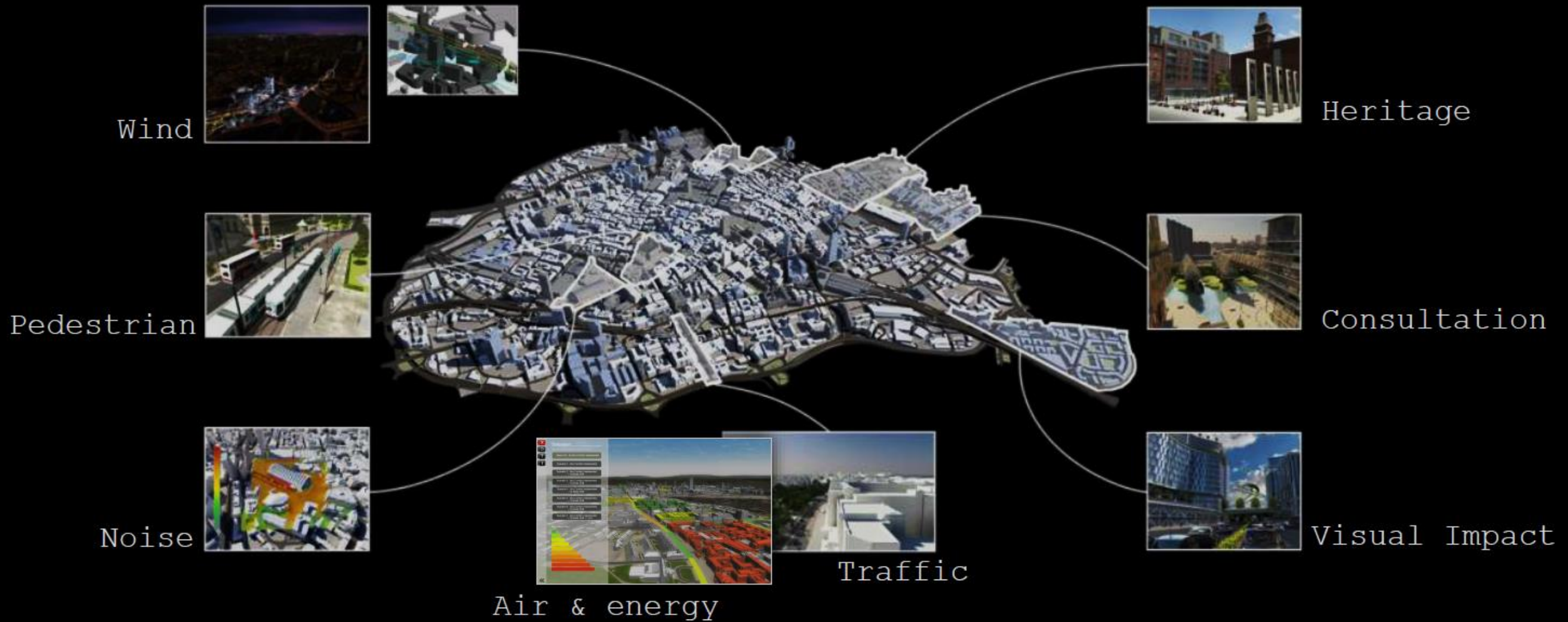
Slide Deck Presentation:

https://dublincitycouncil-my.sharepoint.com/:b:/g/personal/veronica_sesoko_dublincity_ie/EeLF6nhWTxBMhY5i8Eqm-4YB24fu6xZBCsnBY8dLpA7mWA?e=rZkUY5

Video Birkenhead:

<https://vimeo.com/508404606/fe5abbc61b>

Digital Urban Place



Vu.City

(DCC fully modelled including trees)

Working with Belfast on the Draft Local Development Plan

- Policy DES3 - Tall Buildings (AOD 35m)
- Policy HOU4 – Density of residential development

Website:

<https://vu.city/>

Video of tools:

<https://vimeo.com/322438996>

Dublin Modelling Info:

<https://vu.city/modelling/dublin-model>

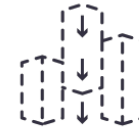
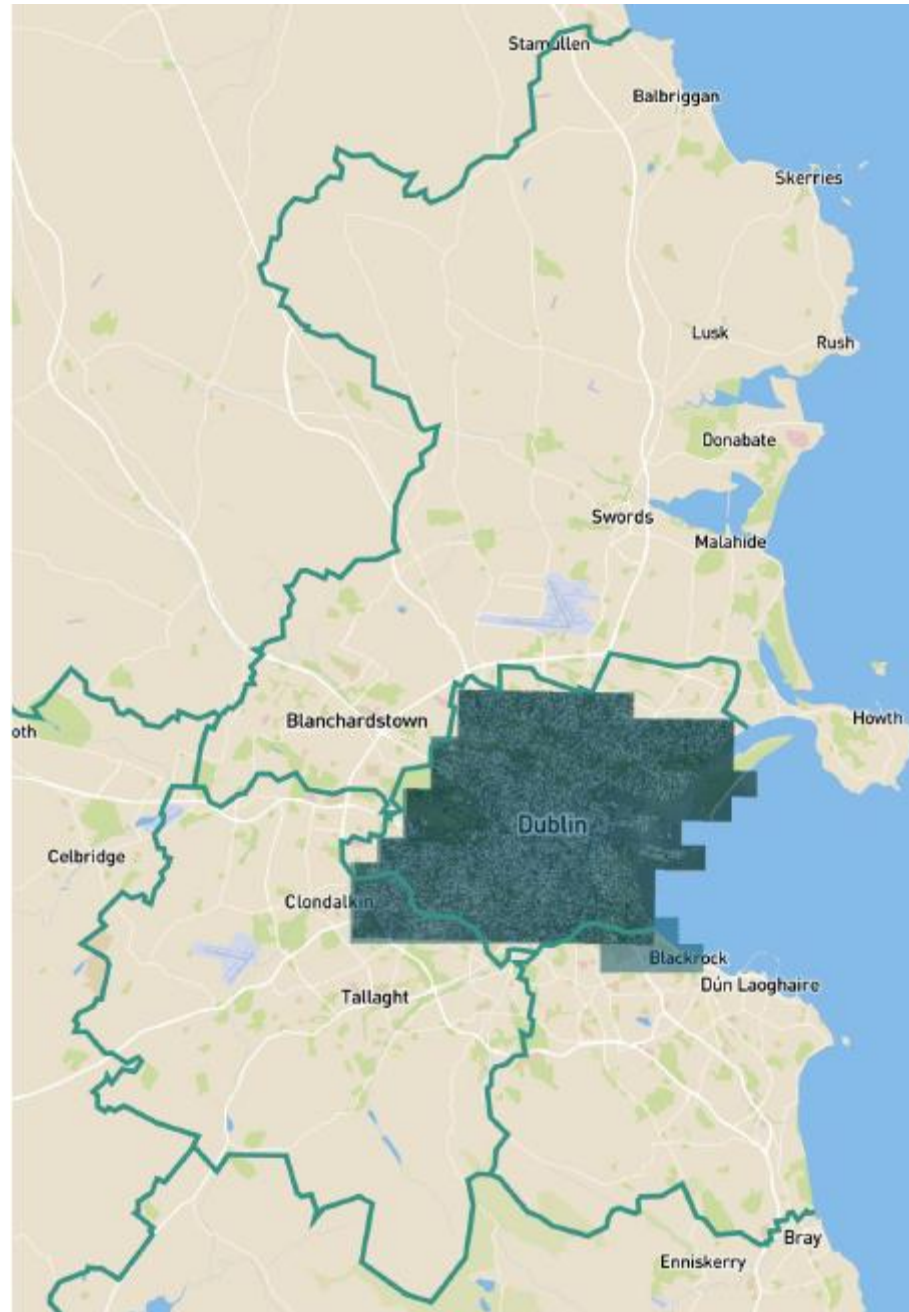
Some Use Cases:

<https://vu.city/portfolio-items/canada-water-interactive-3d-consultation-application>

<https://vu.city/portfolio-items/queen-elizabeth-olympic-park>

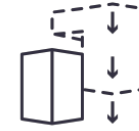
Belfast Overview tools:

<https://vu.city/vucity-belfast>



Planning Applications - Review Proposals

See concepts / schemes in context, immediately to assess viability



Planning Applications - Pre-app Meetings

Allow council planning teams to have early discussions with planning applicants around schemes, creating a collaborative narrative.



Planning Applications - Decision Making

Use VU.CITY to agree on ZTVs, Impact assessments, Verified Views and more. Justify conclusion visually.



Strategic Planning - Public Consultation

Communicating schemes clearly with the public, providing 100% transparency.



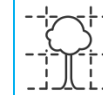
Strategic Planning / Local Plans – VU.CITY allows councils to test ideas and created the evidence based for planning policy. Imagery can be captured on VU.CITY to support this.

Available formats: DWG, 3DS, C4D, SKP, FBX (more options available upon request)

Source imagery: Flown Date 2018, 12.5cm GSD



116 sq km
65,119+ buildings
accurate to 15 cm



523,229 trees accurate
to height & canopy width



12 interactive design and
planning tools

(promotional video and examples)

[illegible]

1. Proposed Chancery House
 2. Proposed Carlton House
 3. Proposed Royal Exchange Development
 4. Embankment
 5. Victoria Square Residential Block
 6. Victoria Square Dome
 7. Museum Police Station

Key

- Proposed Chancery House Scheme
- Other approved/submit developments of significant height
- Built developments of significant height

ALL USES

- SHOPPING, SERVICES, FOOD & DRINK
- COMMUNITY & LEISURE
- BUSINESS / WORKSPACE
- LIVING

CANADA WATER

British Columbia

Vu.City

(Other use cases and datasets that can be added)

Options Assessments



- Flood Risk
- Air Pollution
- Air Quality Focus Areas
- Emission Zones
- Public Transport Accessibility Levels

Verified View / Visual Impacts



- Wind Analysis
- Daylight/Sunlight
- Overshadowing
- Conservation Areas
- Listed Buildings
- Building ages

- Protected Views
- Opportunity Areas
- Deprivation Areas

Summary

Platform or Model	Type of modes	Dublin Model	Supported on Web	GIS datasets / simulations	Other comments
Docklands D3D	Block Model – different LOD	Yes – bits and pieces DCC (e.g. Docklands, Poolbeg)	No	No	High visual quality, good for AR/VR, good public engagement, but heavy model not supported on web with no additional layers of information. Looking at inserting the existing model into other platforms.
Docklands OCP (Bentley)	Reality Mesh	Yes – only Docklands, maybe inner M50	Yes – Web and Mobile (360 pictures)	Yes – hard to customize GIS data	Visual quality still lower than Google street view and issues with glass surface, but doing good progress integrating with other software (Teams, Accenture IoT) and mobile friendly
Graffiquo	Reality Mesh	No – Singapore based company	Yes	Yes – GIS data well structured	Good GIS structure, fast web browser version, adding interesting real time IoT and CCTV data, can complement model with high detailed pictures. Not tested yet by us
Digital Urban Place	Block Model	No – projects in the UK (Liverpool, Watford – LOD3)	Yes, but not tools (TwinMotion is free)	Yes – GIS data well structured and APIs for simulations	Nice visuals, interesting APIs and AI tools, SaaS model, suitable to AR/VR, good GIS structure, trees and buildings modelled in separate. Not tested yet by us
CityZenith	Block Model	No	Yes	Yes – connect data	Supports BIM, CCTV, indoor navigation, dashboards. Not yet tested by us.
Vu.City	Block Model	Yes – DCC only (LOD3)	Yes – cloud version	Yes – GIS upload by VuCity and analysis tools	Planning focus with nice visuals, DCC data captured and ready to be used, can overlay GIS data, each building is single object, AR/VR. No clear Business Model. Being trailed by us.

Final Comments

Not one platform fits all

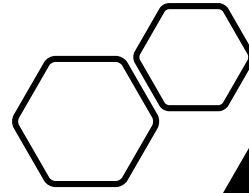
Technology is evolving and maturing

Different aspects: BIM, GIS, 3D Models and Digital Twins

Multiple potential benefits across many areas

Figure out how to procure this, what is the best way forward

Challenges: Integration, Interoperability, Data Management



Veronica Sesoko

veronica.sesoko@dublincity.ie

Thank You!



Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council



Comhairle Contae
Fhine Gall
Fingal County
Council



Comhairle Contae
Átha Cliath Theas
South Dublin County Council

Thank You!

info@smartdublin.ie / www.smartdublin.ie / [@smartdublin](https://twitter.com/smartdublin)

April: Physical to Virtual

How 3D models, Digital Twins, AR/VR are transforming the work of local authorities.

July: Internet of Things (IoT)

How IoT technology is being used to deliver a variety of local authority services.

October: Future of Drones

How Unmanned Aerial Vehicles are being used to deliver a variety of local authority services.

**December: Digital/Smart
Citizenship**

How technology can be used by local authorities to enhance and deepen citizen engagement.

