



The Fire Resistance Rating of the wall in Car park shall not be less than 60 mins

if building has car park
and car park boundary has wall
then Fire Resistance Rat o
w



3-CERTAINTY



**DESIGN
CERTAINTY**



**CONSTRUCTION
CERTAINTY**



**LIFECYCLE
CERTAINTY**



Design Certainty – The BIM Fire Safety Tool



Means of Escape

- Nos. and width of exits and discharge value
- Travel and dead-end distance
- Distance between required staircase
- more...



Fire Resisting Construction

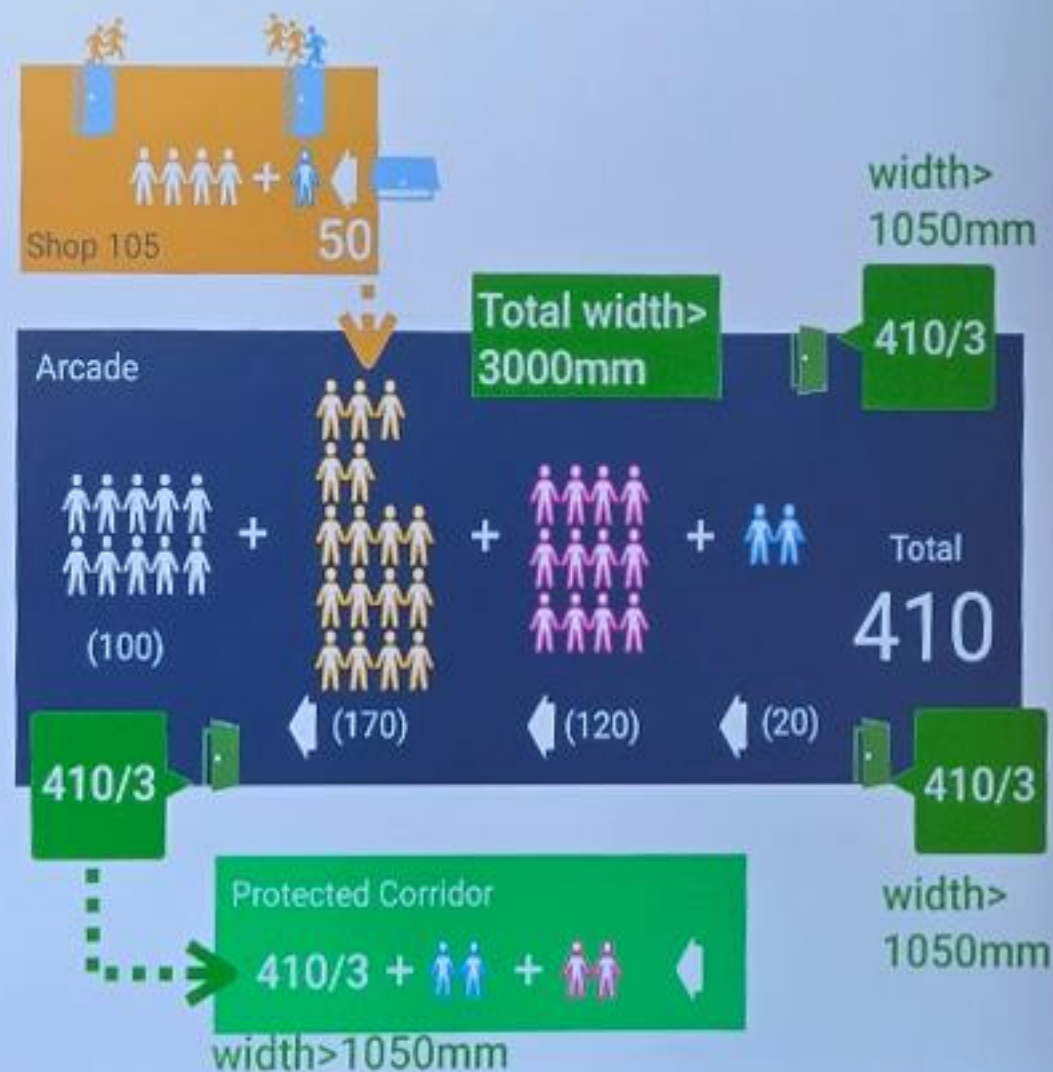
- Compartment table
- Separation between occupancy and use
- Fire protection for required staircase
- more...



Means of Access

- Provision of fireman's lift/ firefight
- Provision of rescue stairway
- Distance from fireman's lift/ firefight
- Distance from rescue stairway
- Major facade served by emergency vehicle
- more...

Space-to-Space Approach



BIM Fire Safety Tool Algorithm



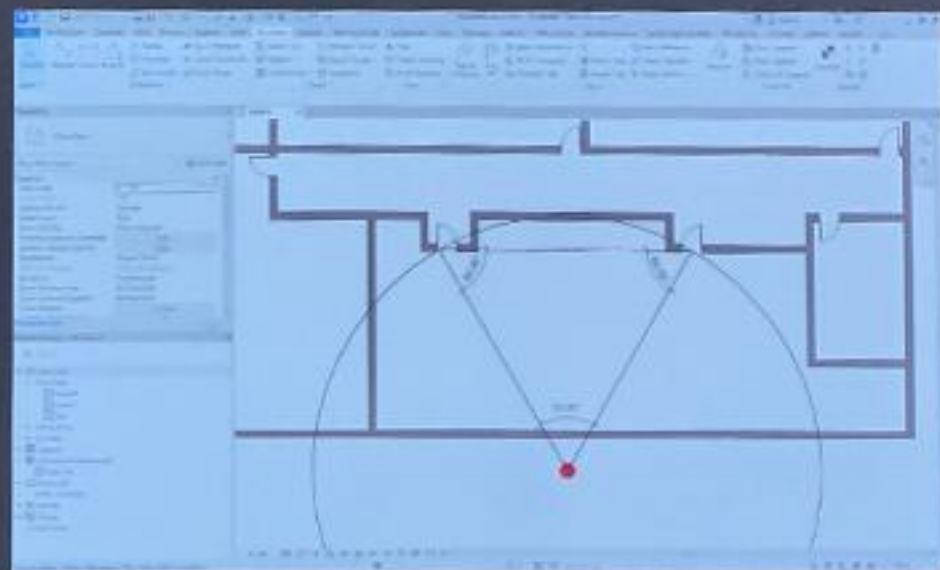
Breadth-first search Algorithm



A-star Algorithm



Circle Theorems



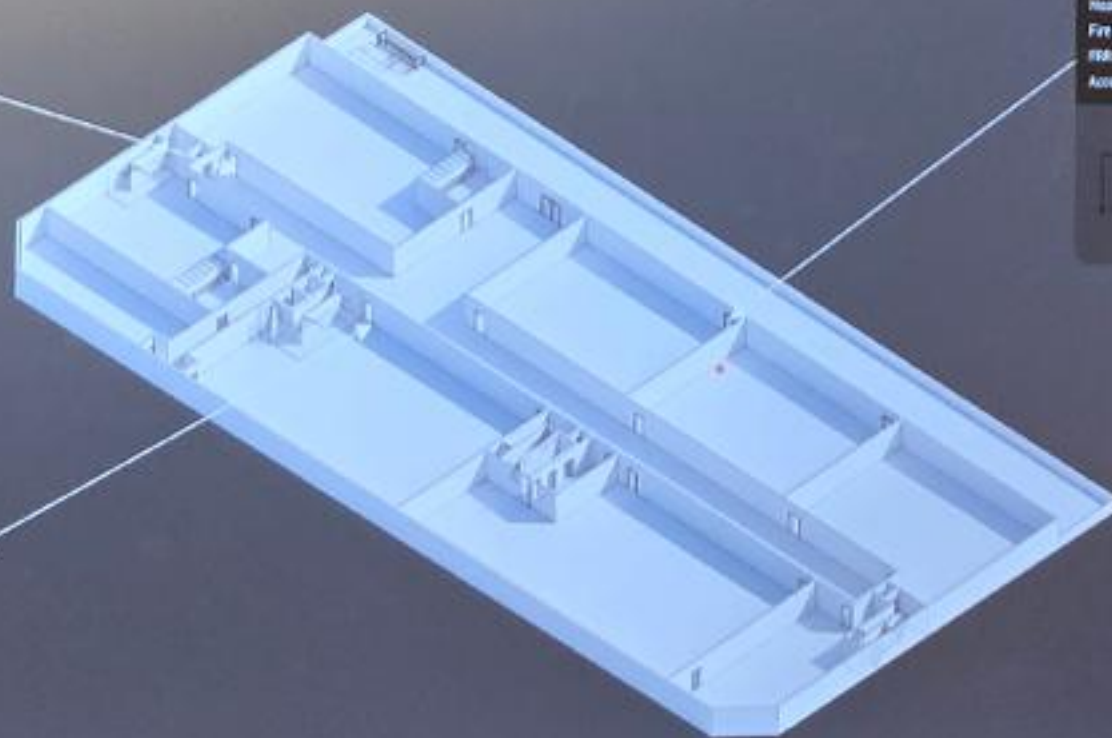
Construction Certainty – Traceability of Fire Rated Material



Mark	000-002
Name	DoubleDoorB
Quantity	1
WebSize	1,500x2,400
Orientation	R
Headheight	2400
Fire Exit	✓
IRB	60/60/60
Accessible	✓



Mark	000-004
Name	DoubleDoorB
Quantity	1
WebSize	1,500x2,400
Orientation	L
Headheight	2400
Fire Exit	✓
IRB	60/60/60
Accessible	✓



Mark	000-003
Name	DoubleDoorA
Quantity	1
WebSize	1,500x2,400
Orientation	R
Headheight	2400
Fire Exit	✓
IRB	60/60/60
Accessible	✓



Lifecycle Certainty – Simulation of Impact of Proposed Changes



Change in Use

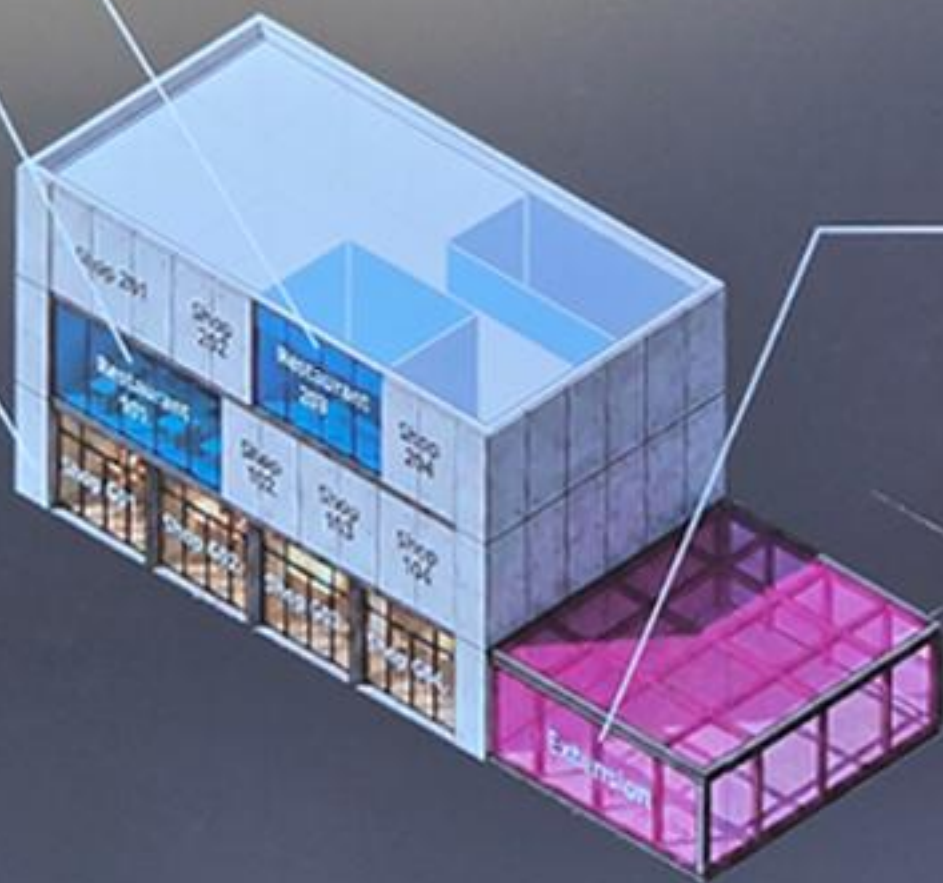
Shop 203 $\rightarrow$ Restaurant 203
3m²/person $\rightarrow$ 1m²/person
50 person $\rightarrow$ 150 person

Shop 101 $\rightarrow$ Restaurant 101
3m²/person $\rightarrow$ 1m²/person
60 person $\rightarrow$ 180 person



Staircase Capacity

LEVEL	OCCUPANCY	STAIR 1	STAIR 2
2/F	99 person + 175 person	137	137
1/F	120 person + 210 person	165	165
Actual Total	604 person	302	302
Permitted Total	< 680 person	< 340	< 340



Extension

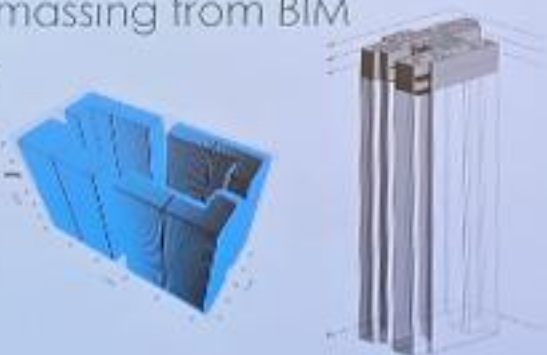
Compartment Area
2000m² $\rightarrow$ 2800m²

Compartment Area
60mins $\rightarrow$ 120mins

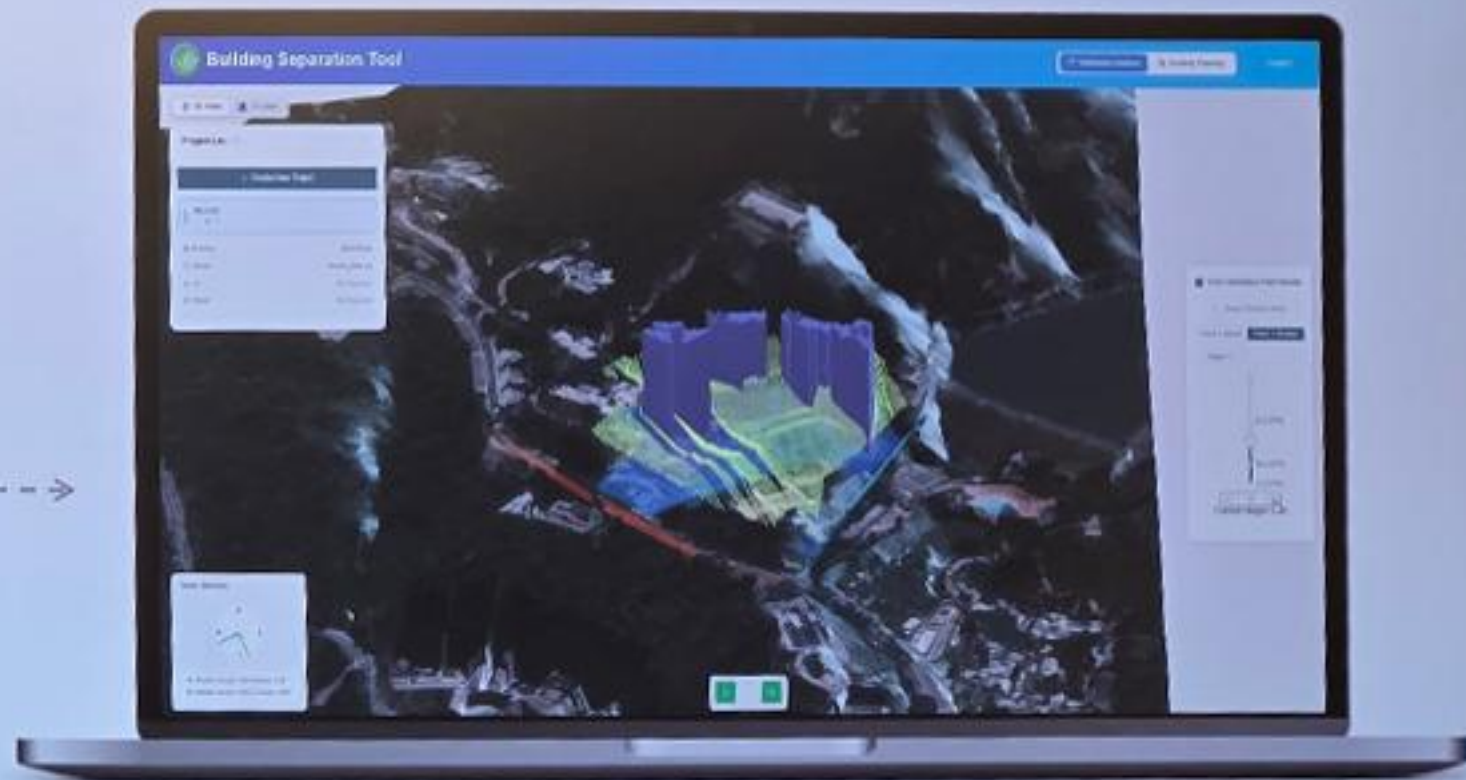
Sustainability – The BIM Building Separation Tool



Automated creation of building massing from BIM software



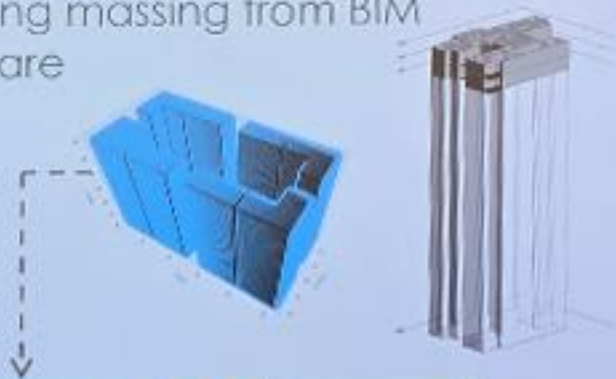
Import spatial data from CSDI
(Lot boundary, area, street(s), use zoning...)



Sustainability – The BIM Building Separation Tool



Automated creation of
building massing from BIM
software



Import spatial data from CSDI
(Lot boundary, area, street(s), use
zoning...)



Windbreak-derived Method for Assessment of Permeability



Turning **-91%**
reducing wind velocity

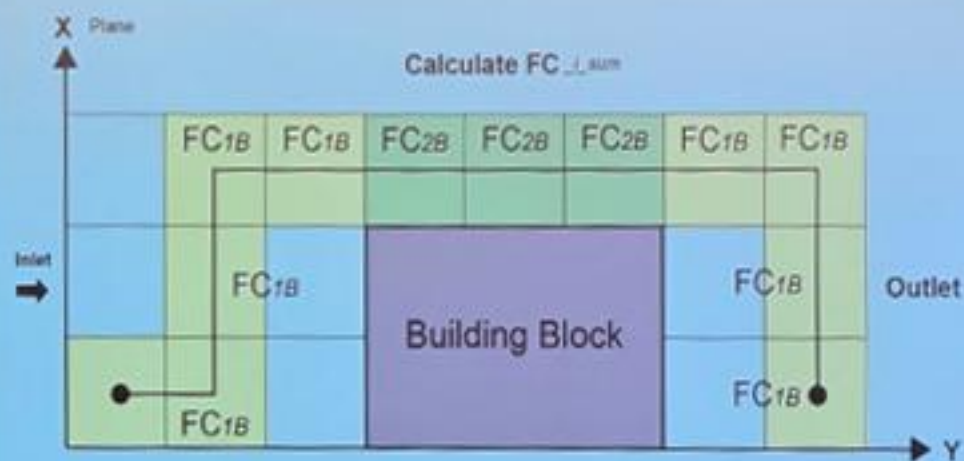
Windbreak-derived Method for Assessment of Permeability



$$\rho \frac{D\varepsilon}{Dt} = \frac{\partial}{\partial x_i} \left(\alpha_\varepsilon \mu_{\text{eff}} \frac{\partial \varepsilon}{\partial x_i} \right) + C_{1\varepsilon} \frac{\varepsilon}{k} (G_k + C_{3\varepsilon}) - C_{2\varepsilon} \rho \frac{\varepsilon^2}{k} - R$$

A New Method – The Least Cost Path (LCP)

Friction Cost (FC) : representing Airflow Resistance



$FC_{1B} = 0.5$



$FC_{2B} = 1$



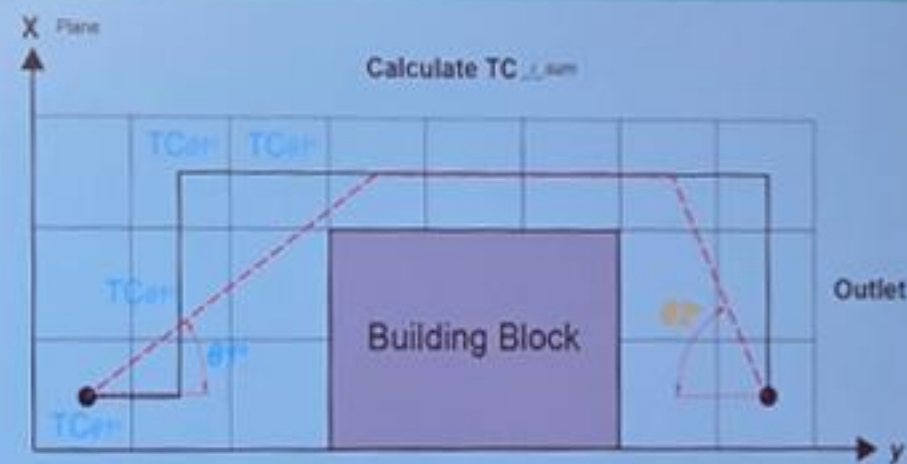
$FC_{3B} = 1.5$



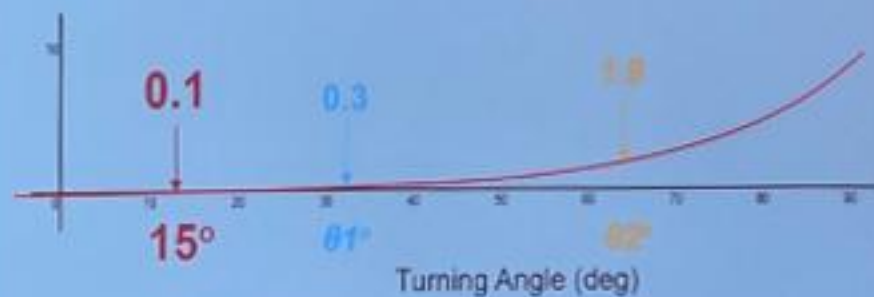
$FC_{4B} = 2$



Turning Cost : representing Airpath Complexity



Turning Cost



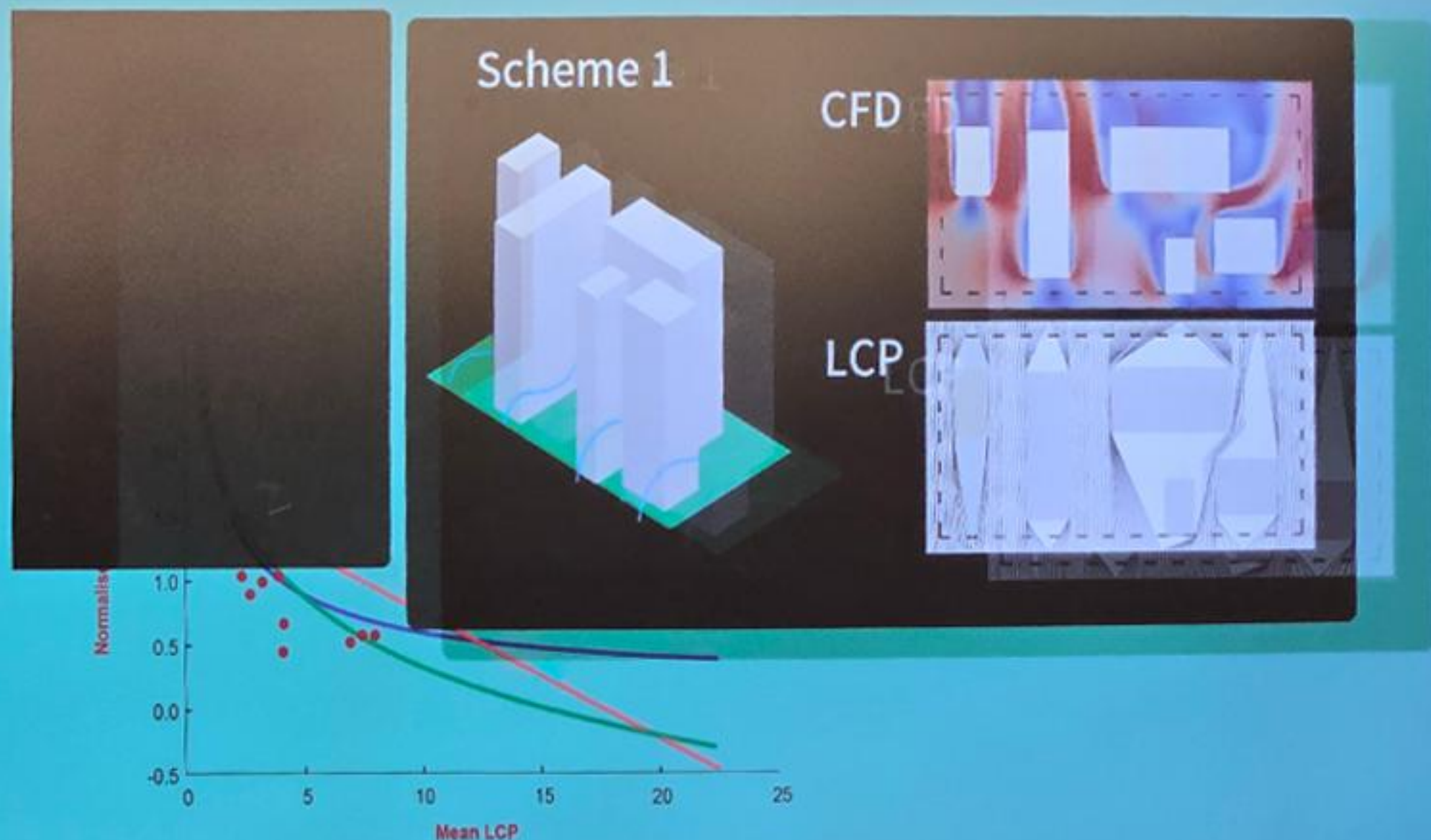
A New Method – The Least Cost Path (LCP)



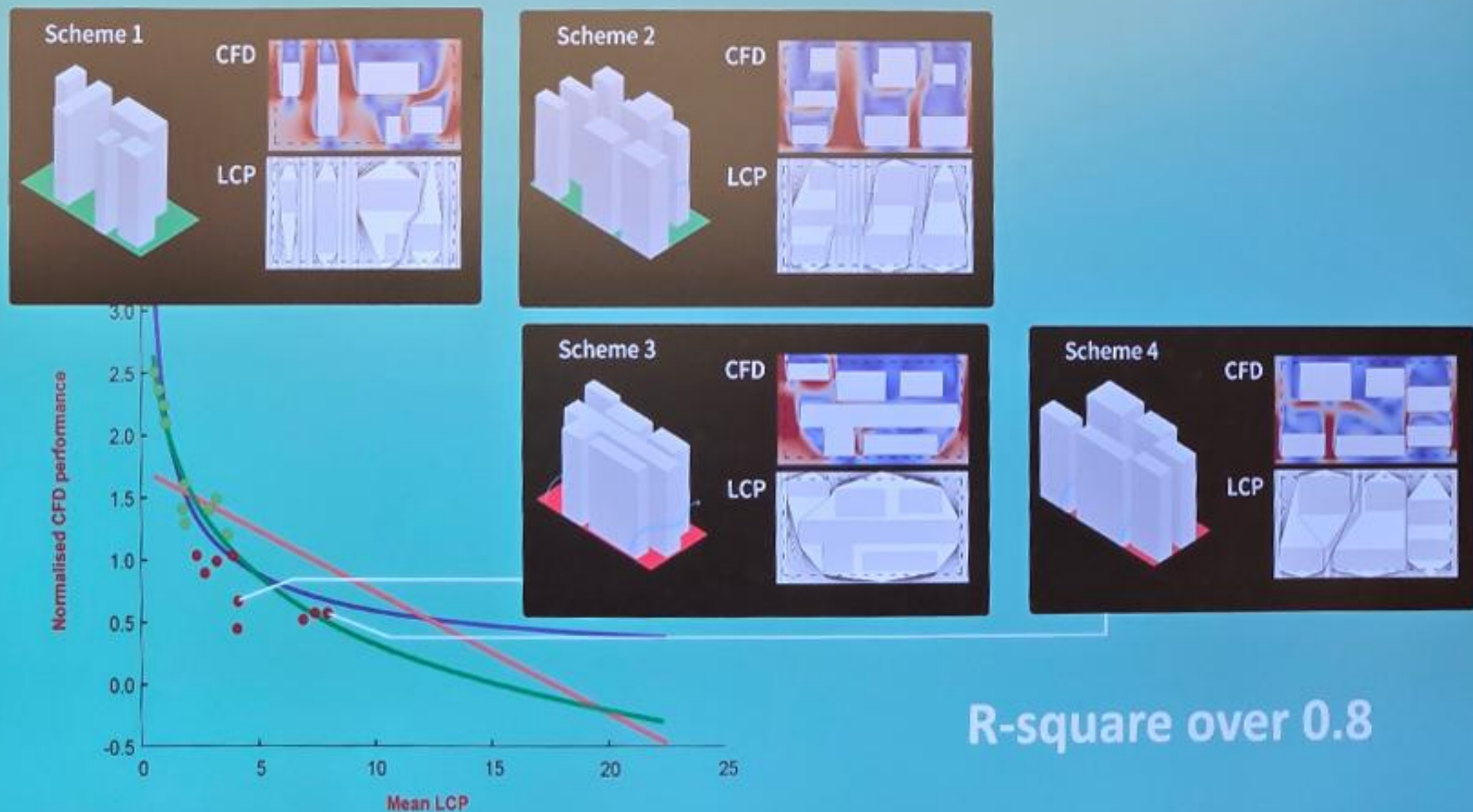
A New Method – The Least Cost Path (LCP)



Correlation between LCP and CFD Results



Correlation between LCP and CFD Results



Smart Functions



INPUT

POPULATE ESSENTIAL
PARAMETERS



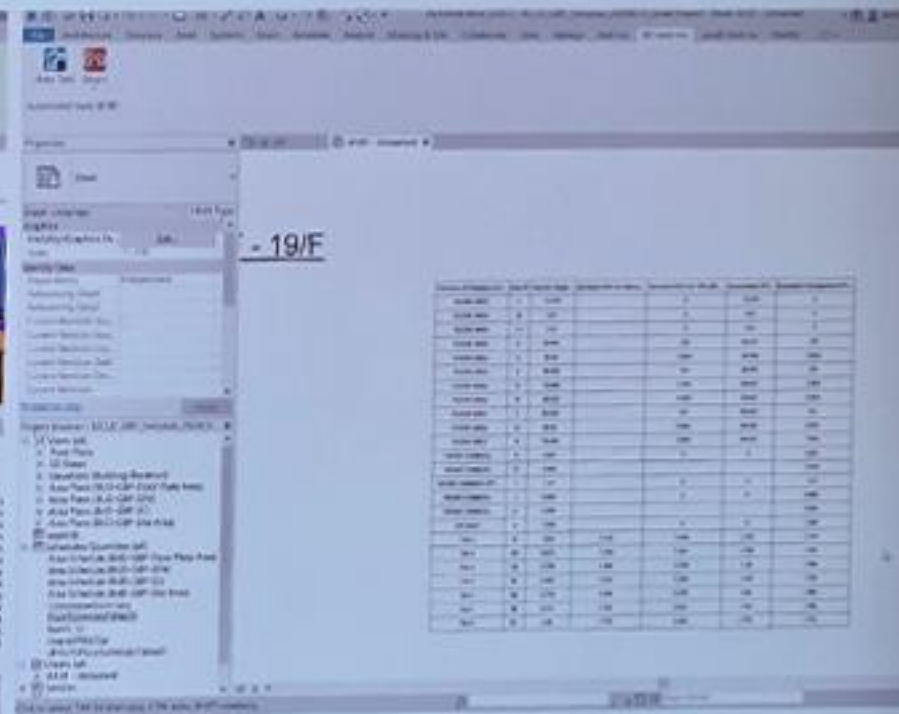
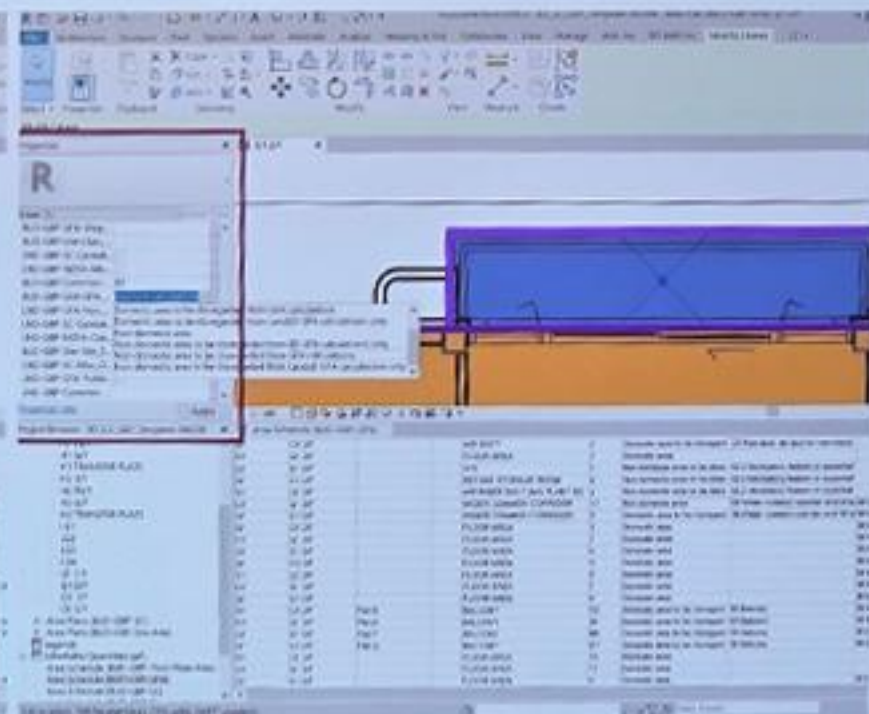
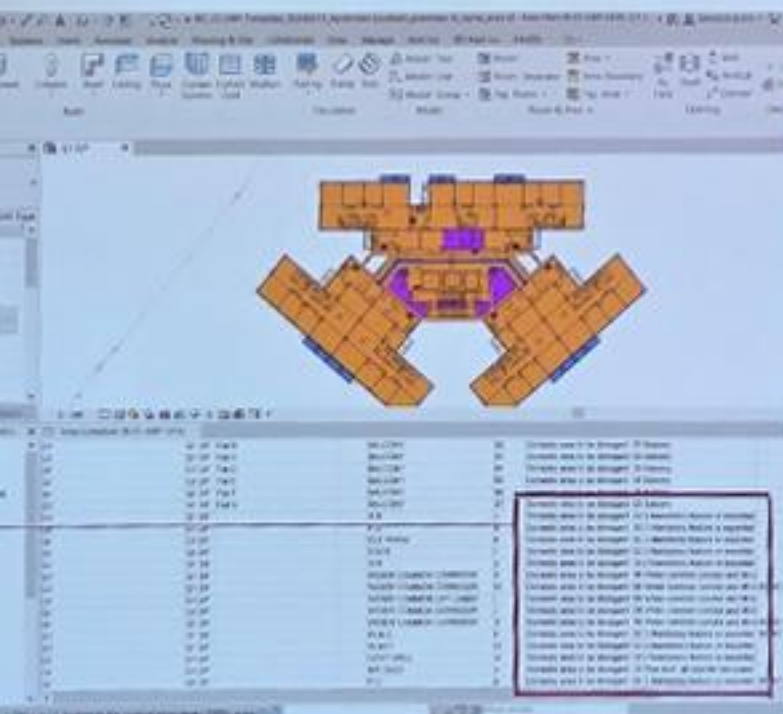
CHECK

IDENTIFY MISSING DATA AND
IRREGULARITIES



IMPORT

BATCH IMPORT OF CHECKING RESULT
FOR PLAN PREPARATION





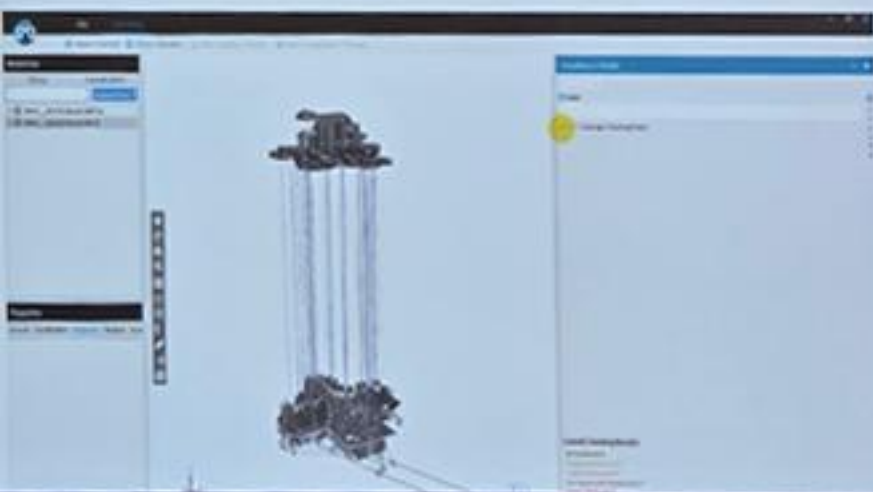
Generate design scheme meeting key development and spatial requirements



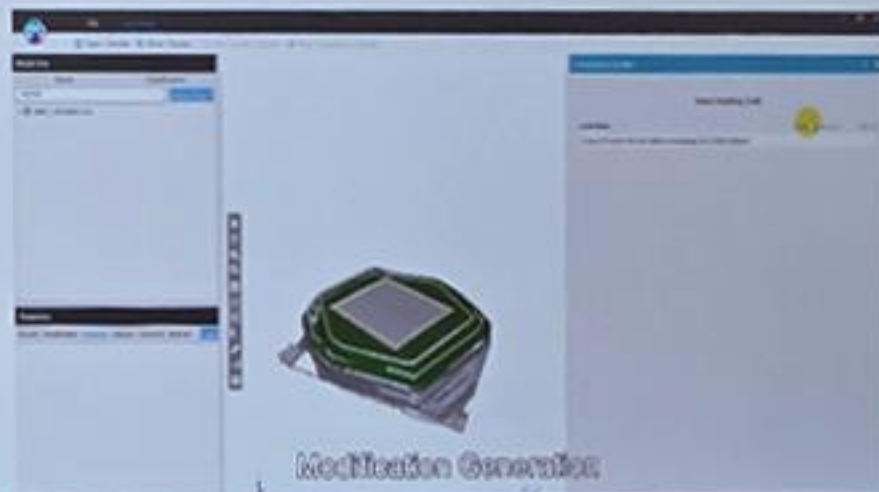
The Fire Resistance Rating of the wall in Car park shall not be less than 60mins

if building has Car park
and Car park boundary has wall
then Fire Resistance Rating of wall >= 60mins

Create both human and machine readable checking logic



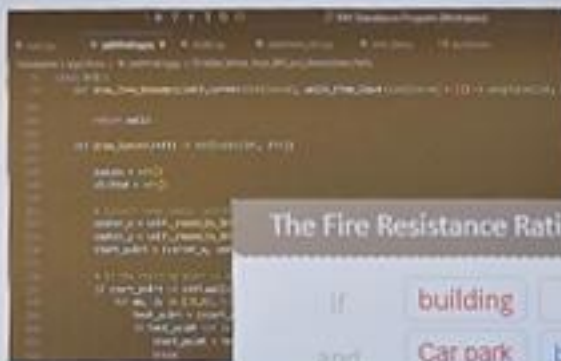
Generate schematic diagram from BIM 3D model



Customise checking rules for modification



Generate design scheme meeting key development and spatial requirements



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BIM Automation Arena 2025 (The GBA Station)
The Hong Kong Institute of Building Information Modelling

Gold Award (API/Plugin)
Best Innovation Award

Building Surveyor Awards 2025
The Hong Kong Institute of Surveyors

Winner Award
Value Enhancement Award



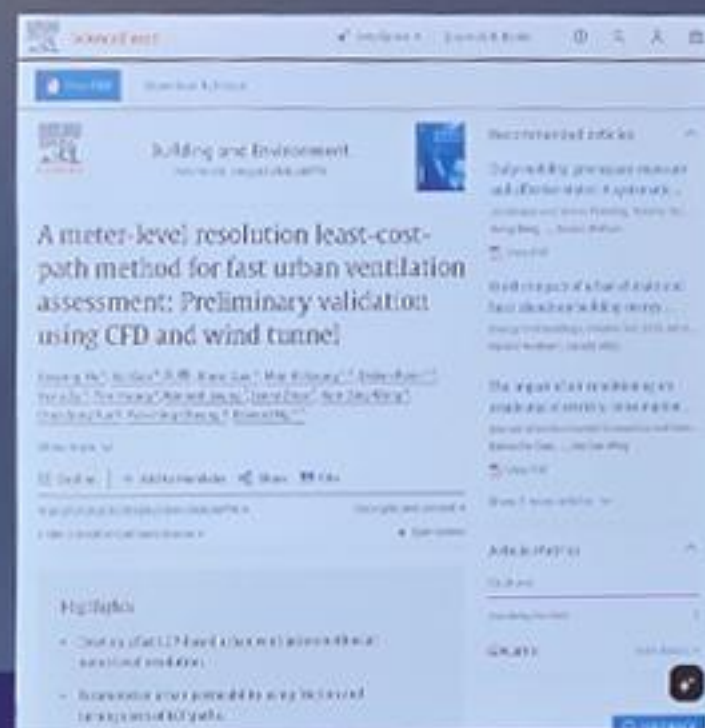


World Building Congress 2025
International Council
for Research and Innovation in Building and Construction

Best Paper Award

Building and Environment Journal

Volume 301, 1 August 2026



You might ask

What is the background of this initiation "Adopting BIM for Statutory Submission"?

The Government will promulgate this year (2023) a roadmap for **full adoption of BIM** in the preparation and approval of building plans for private projects.

The Hong Kong Special Administrative Region
of the People's Republic of China
The Chief Executive's 2023 Policy Address

Expedite the approval of building plans – ...The Government will promulgate this year a roadmap for **full adoption of BIM** in the preparation and approval of building plans for private development projects.

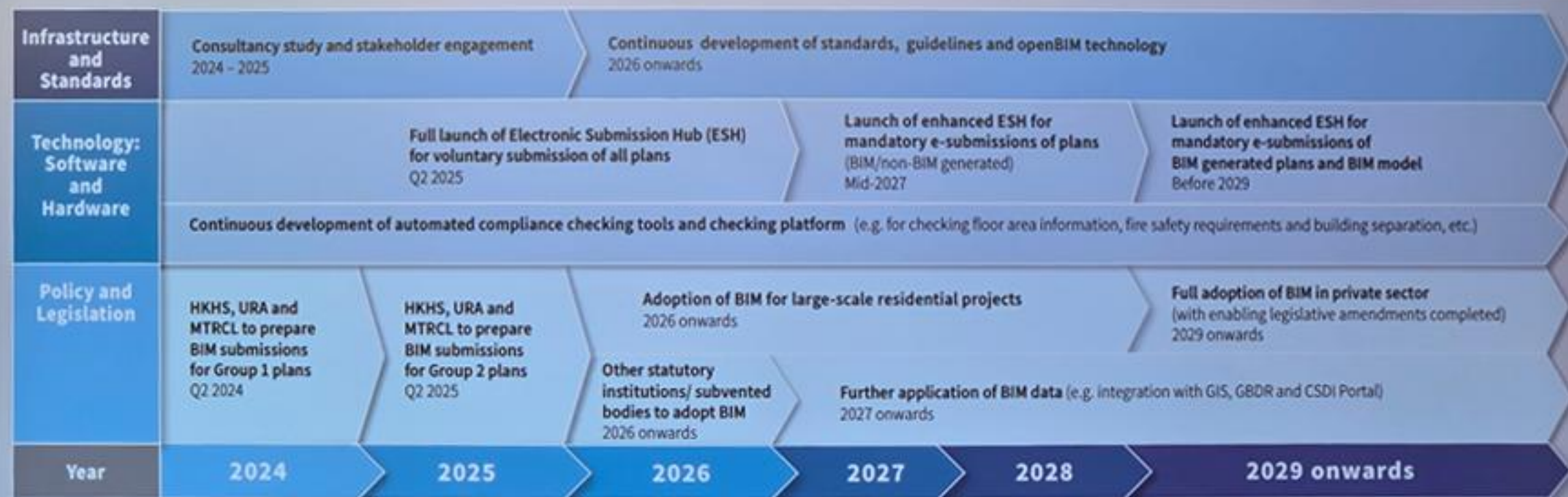
The Hong Kong Special Administrative Region
of the People's Republic of China
The Chief Executive's 2024 Policy Address

Actively promote the application of artificial intelligence in the Government and the public sector to speed up the **digital transformation of public services**

Roadmap on Adoption of
Building Information Modelling (BIM)
for Building Plan Preparation and Submission



Roadmap on Adoption of Building Information Modelling (BIM) for Building Plan Preparation and Submission.



Consultancy Study

Findings in Stakeholder Engagement

Government should **provide openBIM platform, checking tools, and plugins**

Need **one standard** that clearly defines **what should be in BIM vs 2D**; **no duplication** of efforts.

SME consultants **needs funding support to upgrade and uplift** openBIM readiness

Hope this can increase **certainty of approval** and be **faster**.

Not everyone is **ready** for BIM and openBIM adoption.

Findings in Overseas/Mainland Study

Finland



Singapore



UK



China – 3 cities



- openBIM Platform (e.g. IFC-SG)

- Automated Model Checker

- Code of Practice (e.g. CoP of CORENET X)

- Hybrid submissions (3D BIM + 2D drawings)

- Incentive to support SME

- Applicable & Relevant BIM Training

- Reduction in approval time

- Incremental implementation

You might ask

How to ensure openBIM submission is smooth?

3 Key Components



Code of Practice



openBIM Platform



Machine-readable Data Standards



Are we doing BIM only for the sake of doing it, or it can really help us?

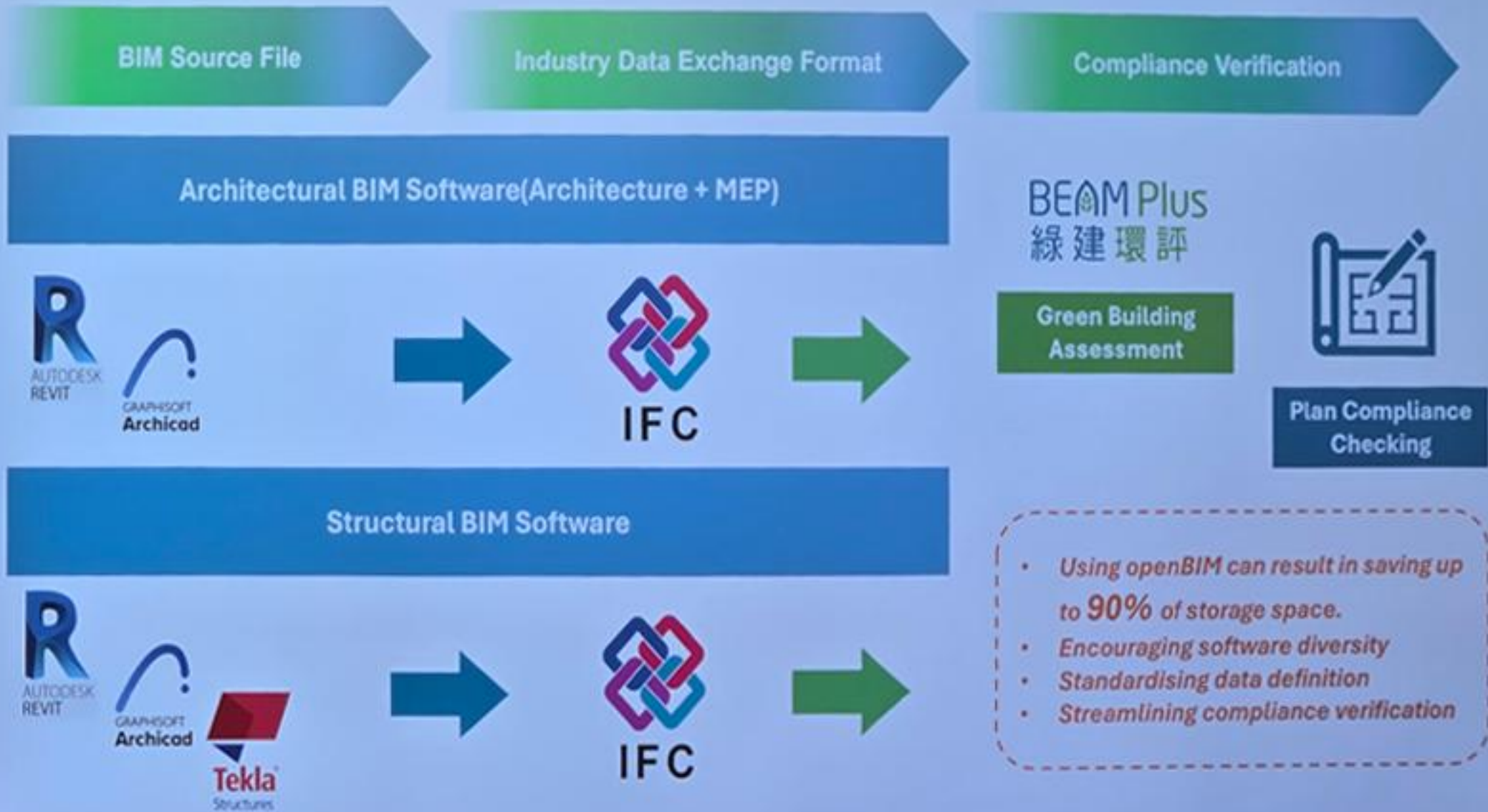
First Submission

52

	First Submission	Amendment submission
GBP Submission processing Time	60 → 52 calendar days (13% reduction)	30 → 24 calendar days (20% reduction)

20% Reduction in GBP Preparation time for APs

Why OpenBIM?

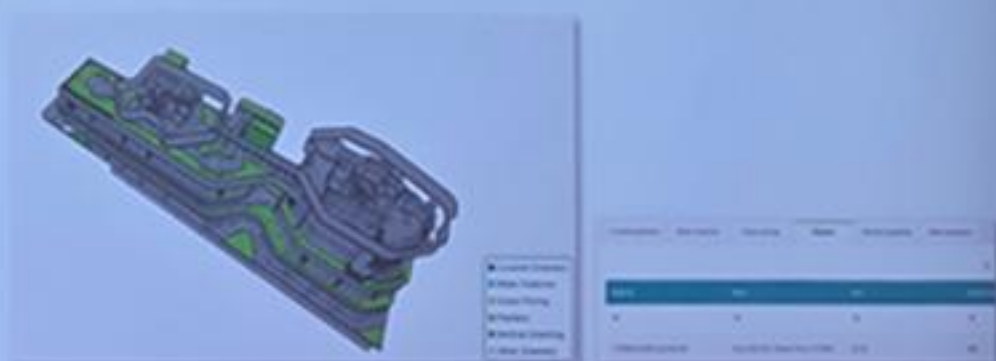


Previous Researches

Applying OpenBIM in "BEAM Plus" Green Building Assessment



Embodied Carbon Calculation



Landscape Area Calculation



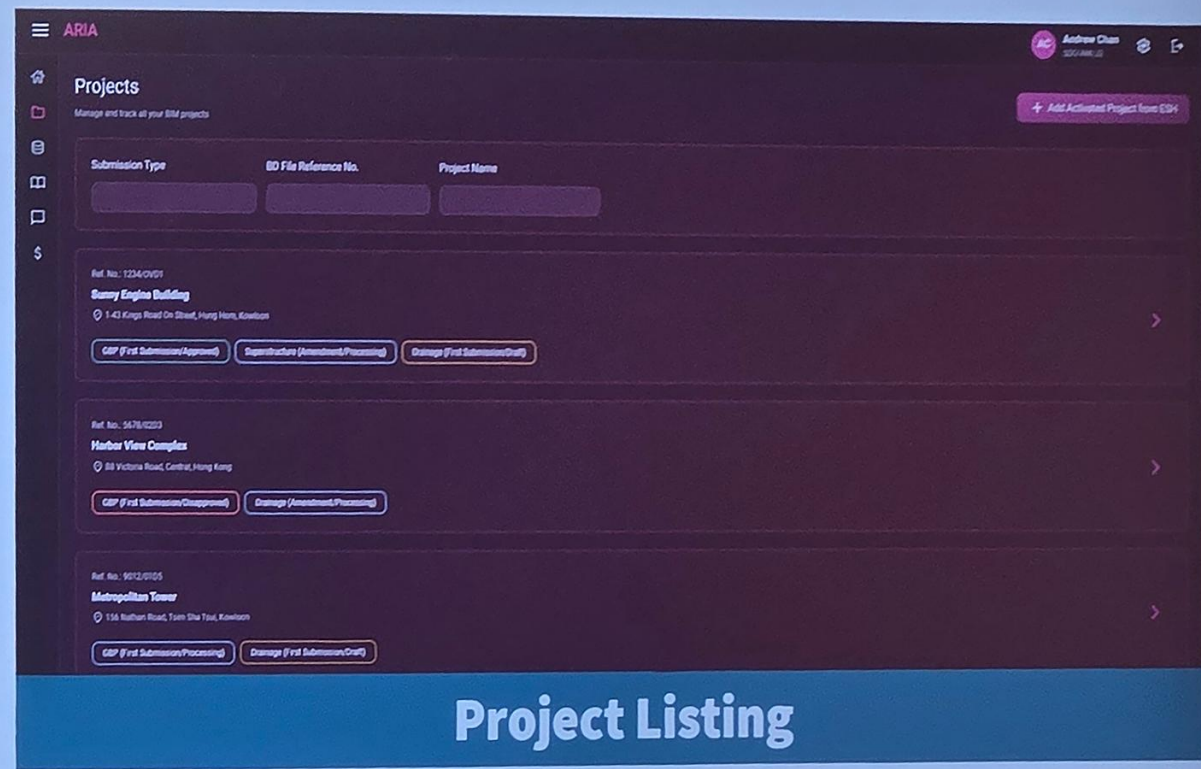
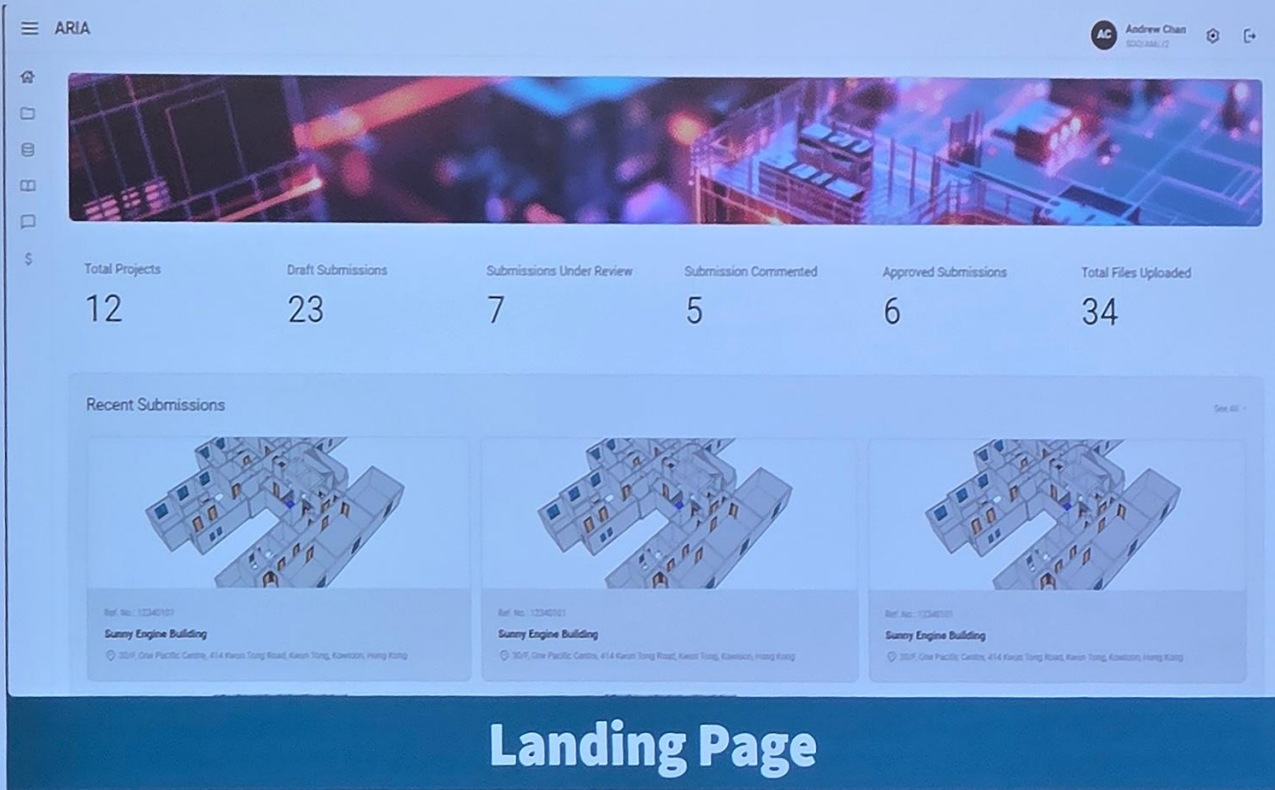
Space Locator

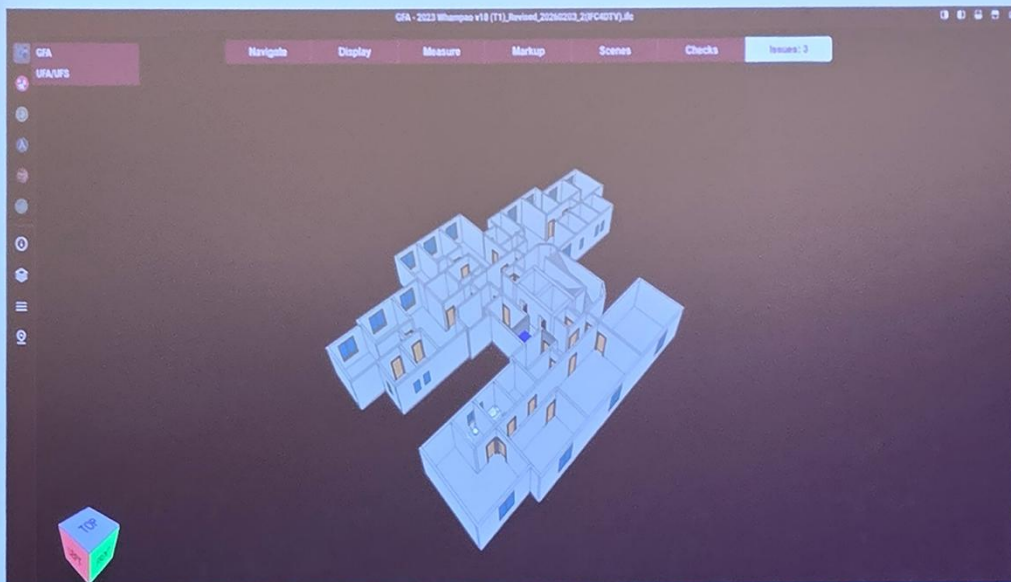


Solar Irradiation Calculation

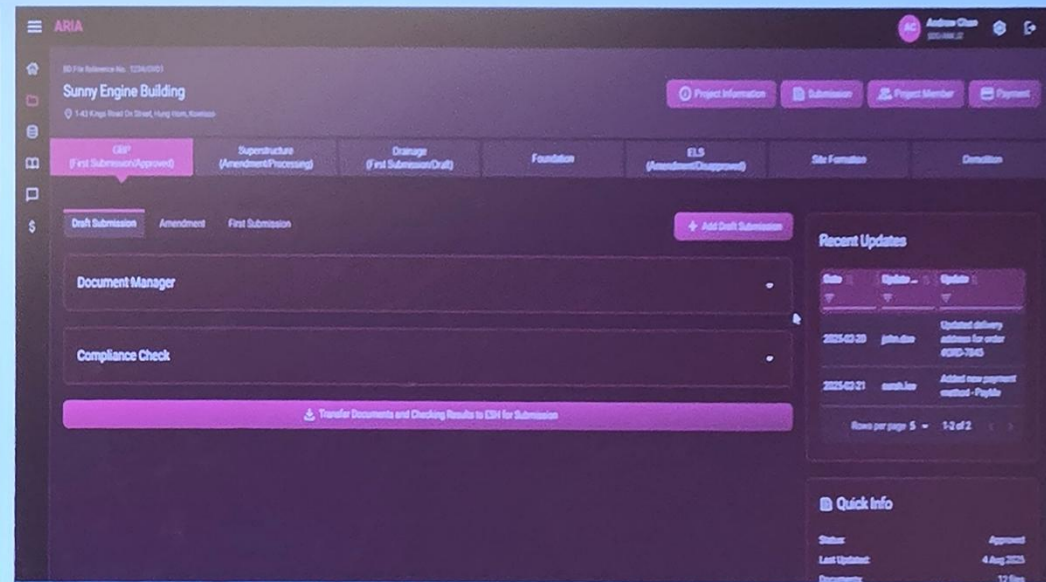
Ongoing Researches

Provisional Functions of The Planned OpenBIM Platform

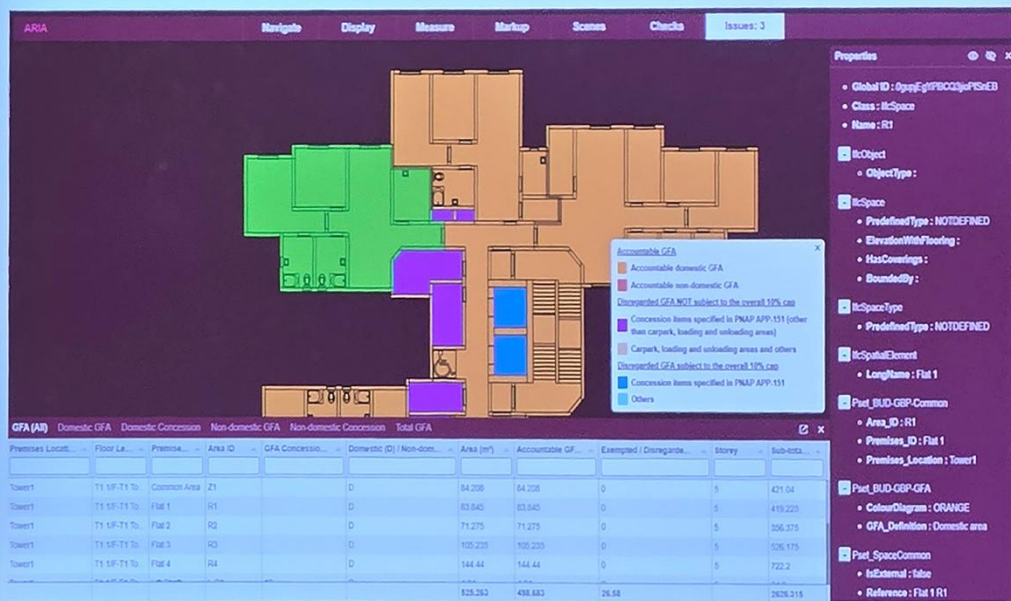




Model Viewer



Model Manager



GFA Diagram

GFA/SC/UFA/UFS Calculations [View Model](#)

Non-Conformity Checklist | Concession Summary | **GFA Floor Summary** | Storey and Flat Schedule | UFA UFS Floor Summary | Item 1 | Item 2.3 | Item 4 | Item 5&12 | Item 5&12 (Covered area) | Item 7

Summary of Domestic GFA for T1 1/F-T1 Top constraint

Premises ID / Multiplex ID / Name	Area ID	Area for Single Storey (sqm)	Exempted GFA for Balcony (sqm)	Exempted GFA for Utility Platform (sqm)	Exempted GFA for 10% MFC Floor Area (sqm)	Accountable GFA (sqm)	Exempted / Dispersed GFA (sqm)	GFA Concession Definition	GFA Concession 2 Definition
Flat 1	R1	83,845	0	0	0	83,845	0		
Flat 2	R2	71,275	0	0	0	71,275	0		
Flat 3	R3	105,235	0	0	0	105,235	0		
Flat 4	R4	144.44	0	0	0	144.44	0		
Common Area	Z1	84,208	0	0	0	84,208	0		
R.D.	X1-1	0.84	0	0	0	0	0.84		Z1 Pipe duct, air duct for mandatory feature or essential plant room
R.D.	X1-2	0.72	0	0	0	0	0.72		Z1 Pipe duct, air duct for mandatory feature or essential plant room
									02.2 Mandatory feature or essential plant room, area of which is NOT limited

Floor Summary