

Collaboration of BIM and Geomatics in Building Industry



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B = Building

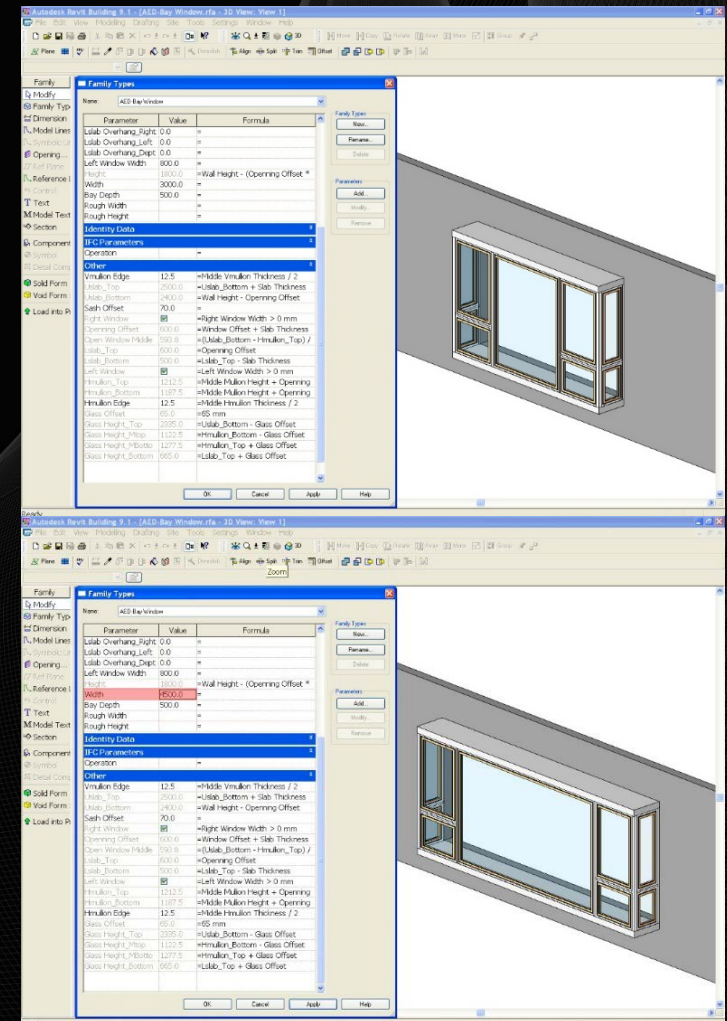
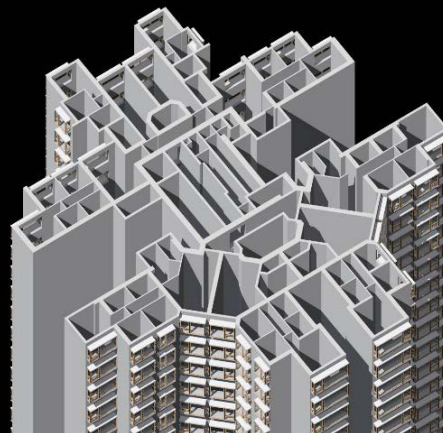
建築

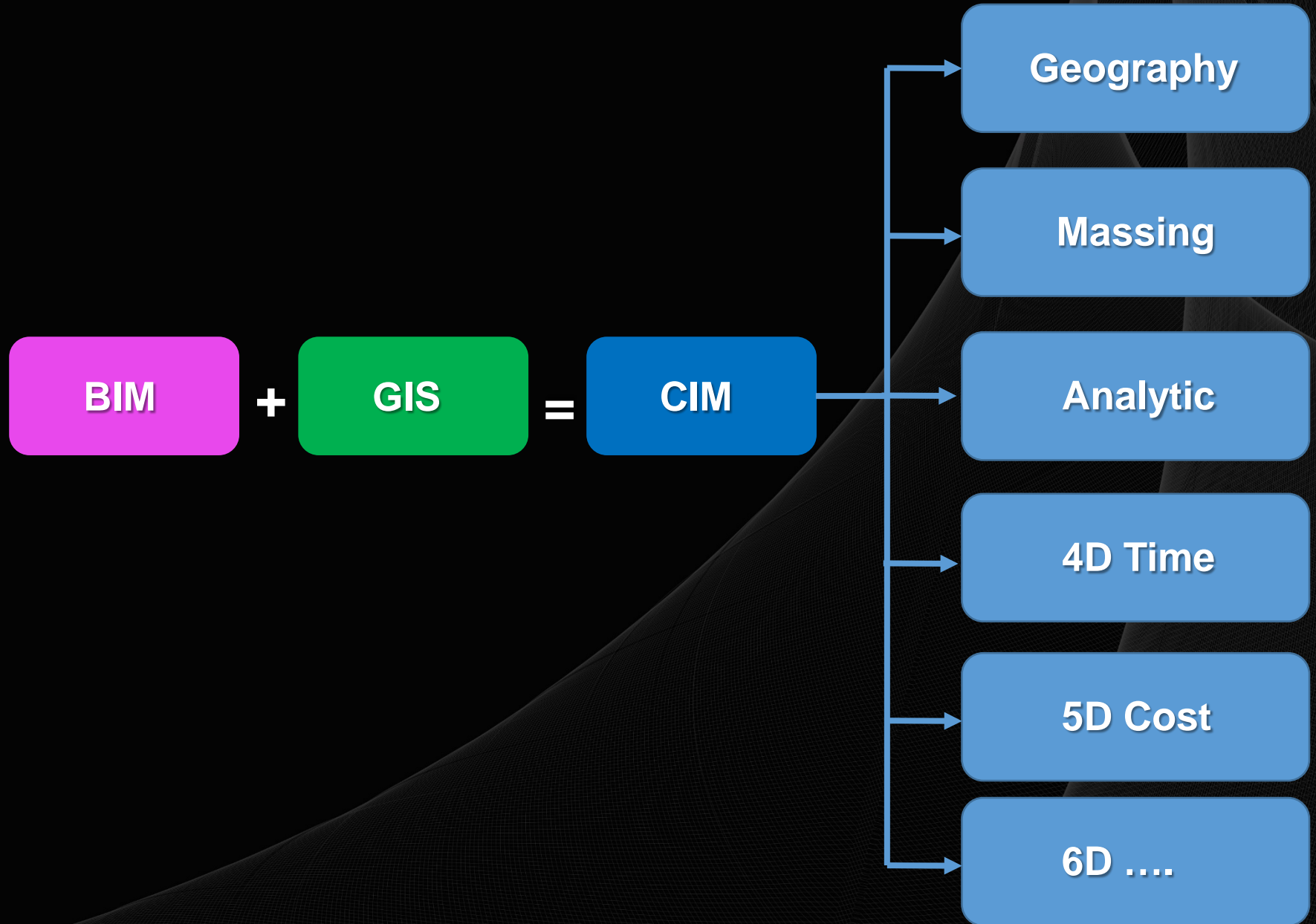
I = Information

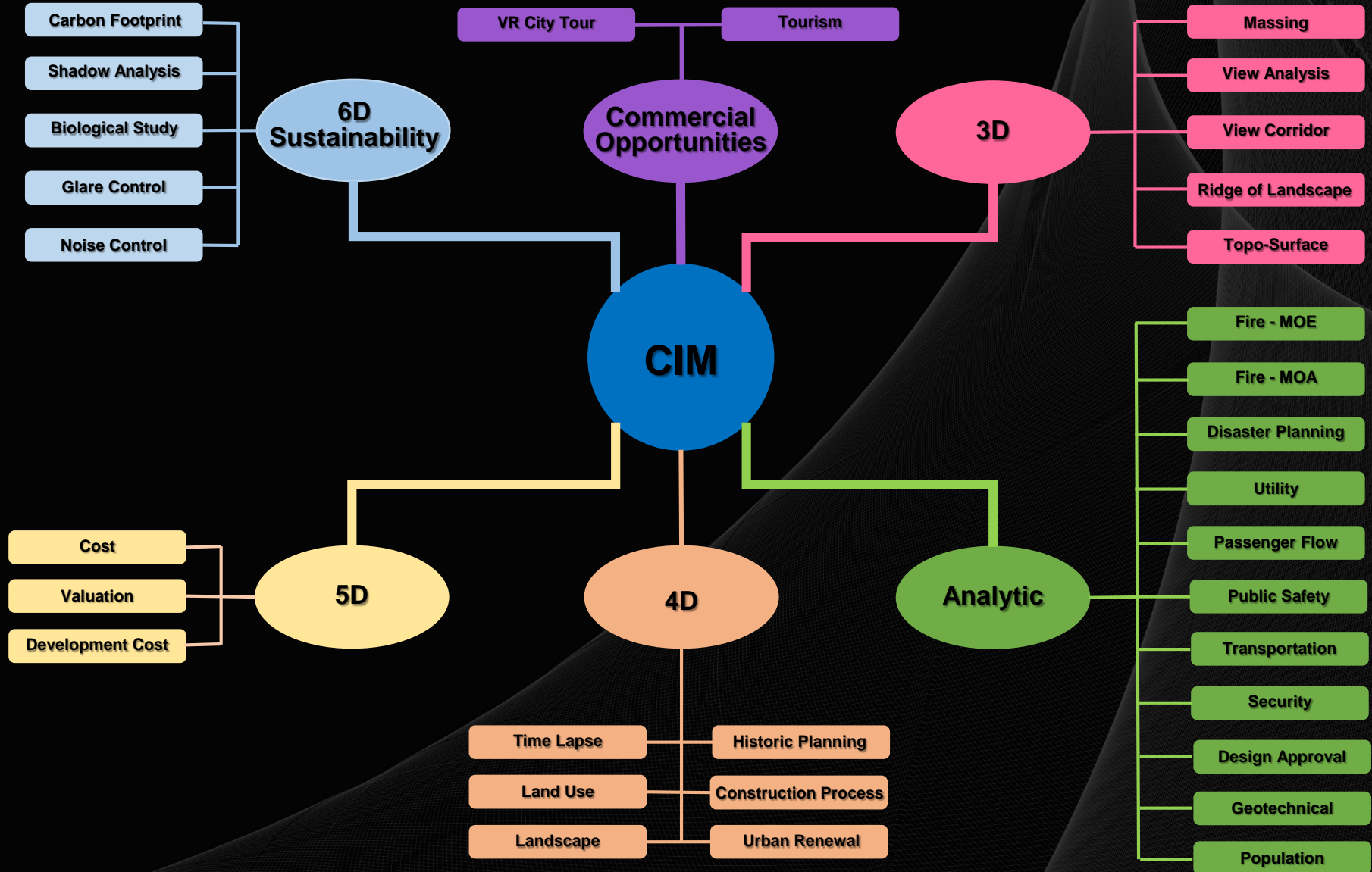
資訊

M = Modelling

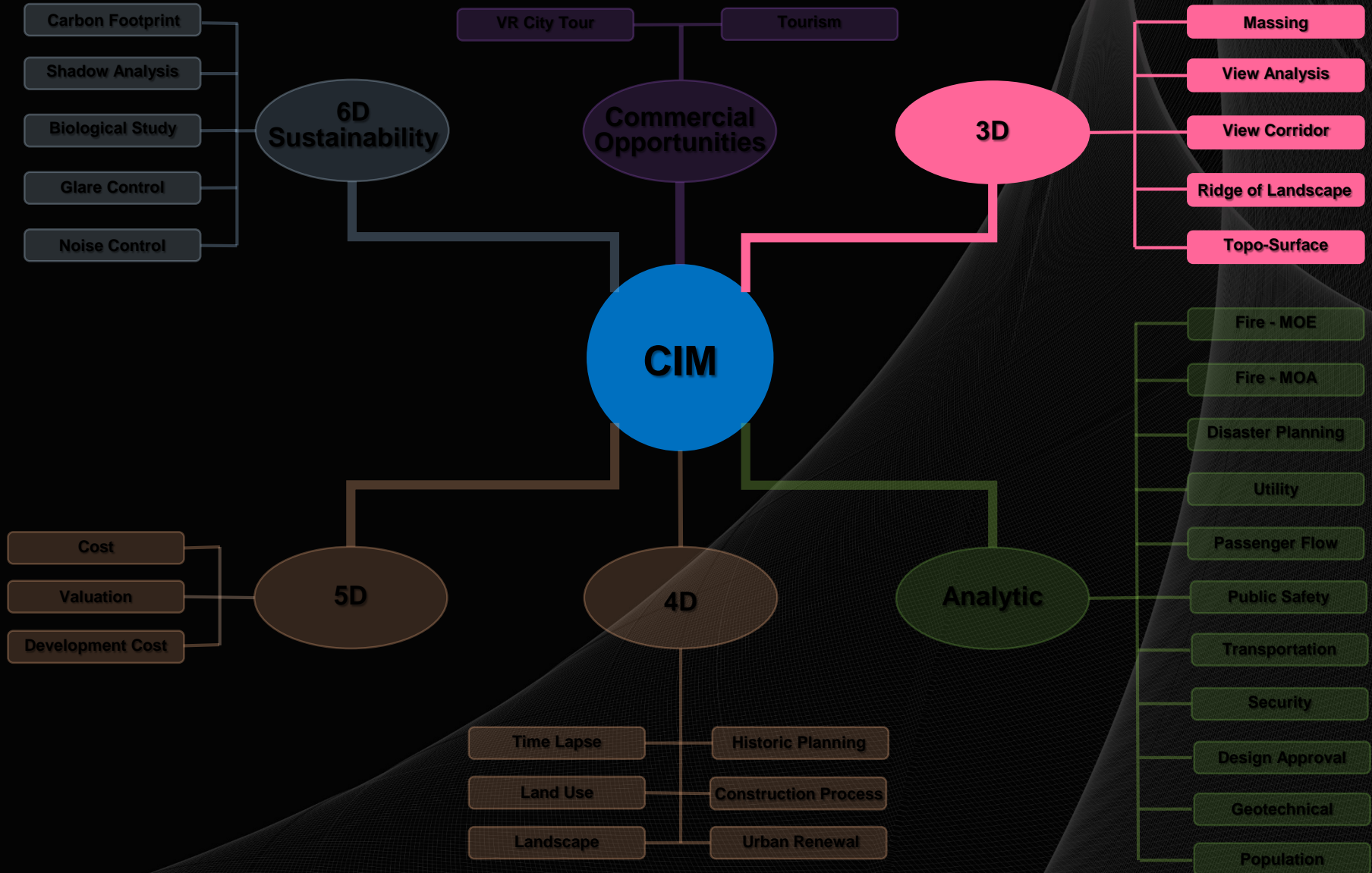
模型/ 模擬



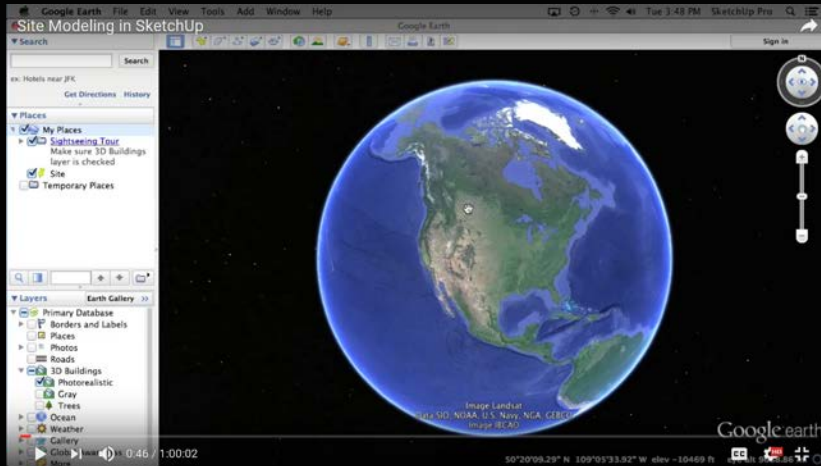




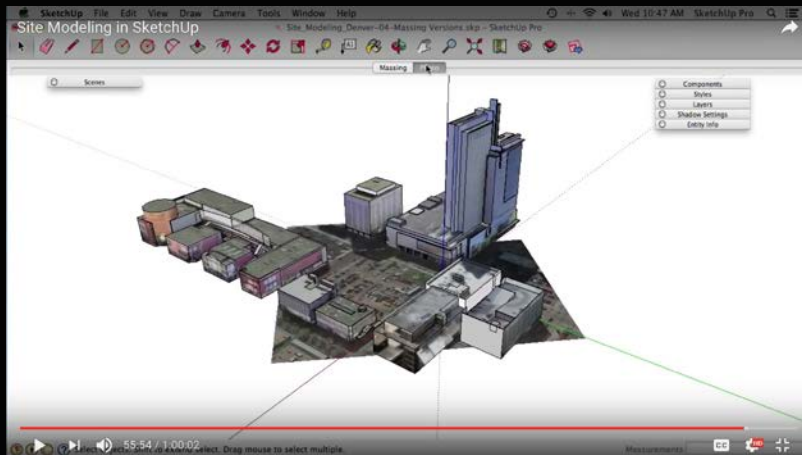




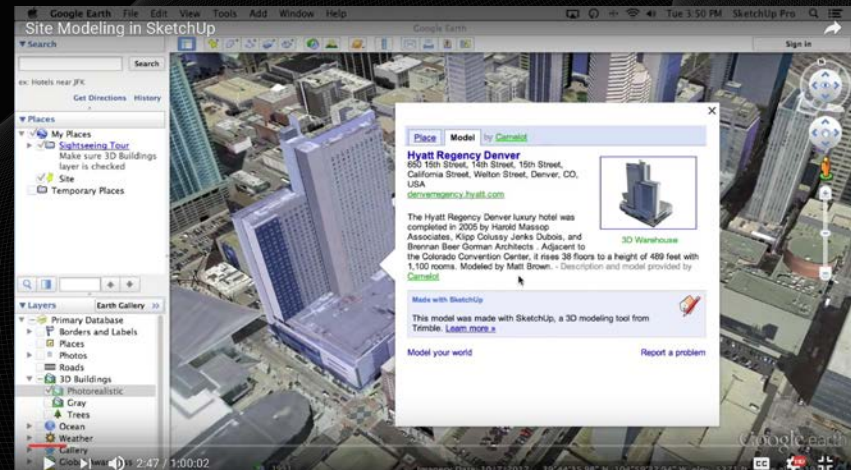
■ Massing Model



Site Location

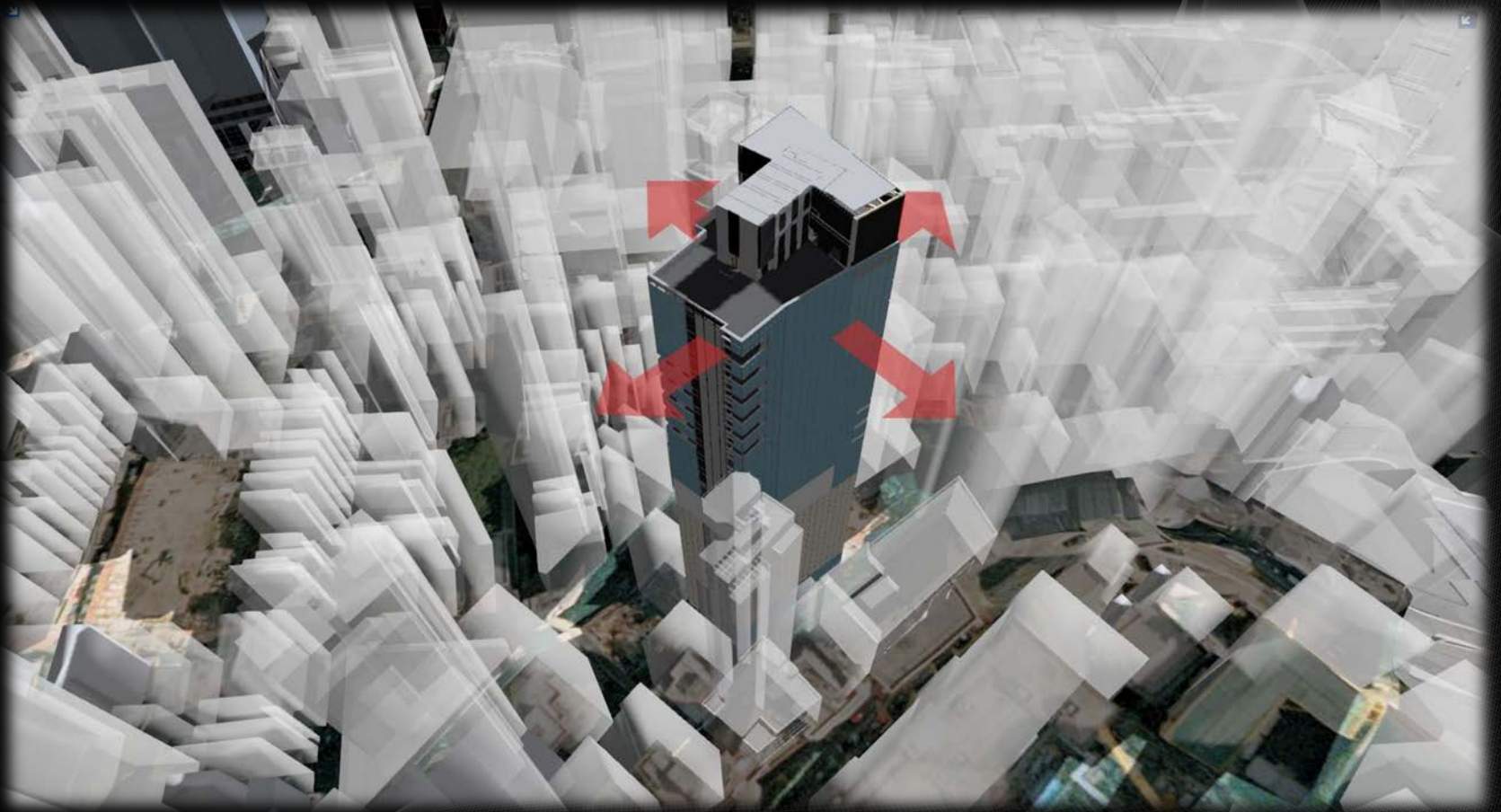


Site Model with Context

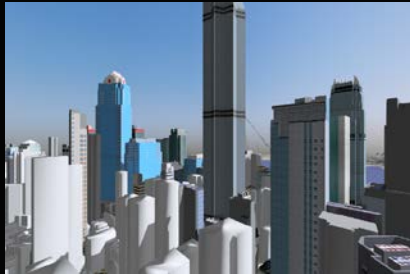


Context Information

■ View Analysis



▪ View Analysis



North Facade



East Facade



South Facade

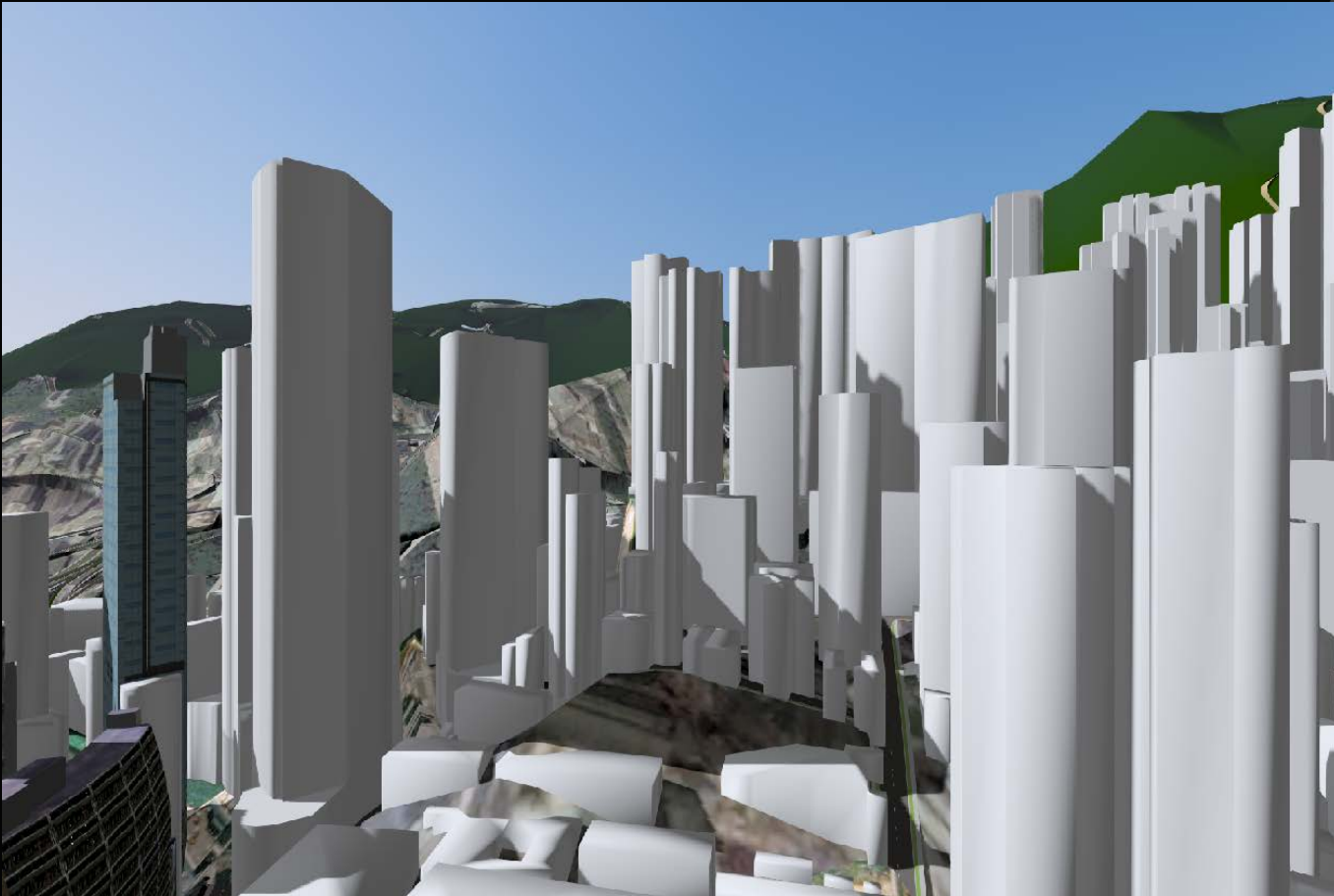


West Facade

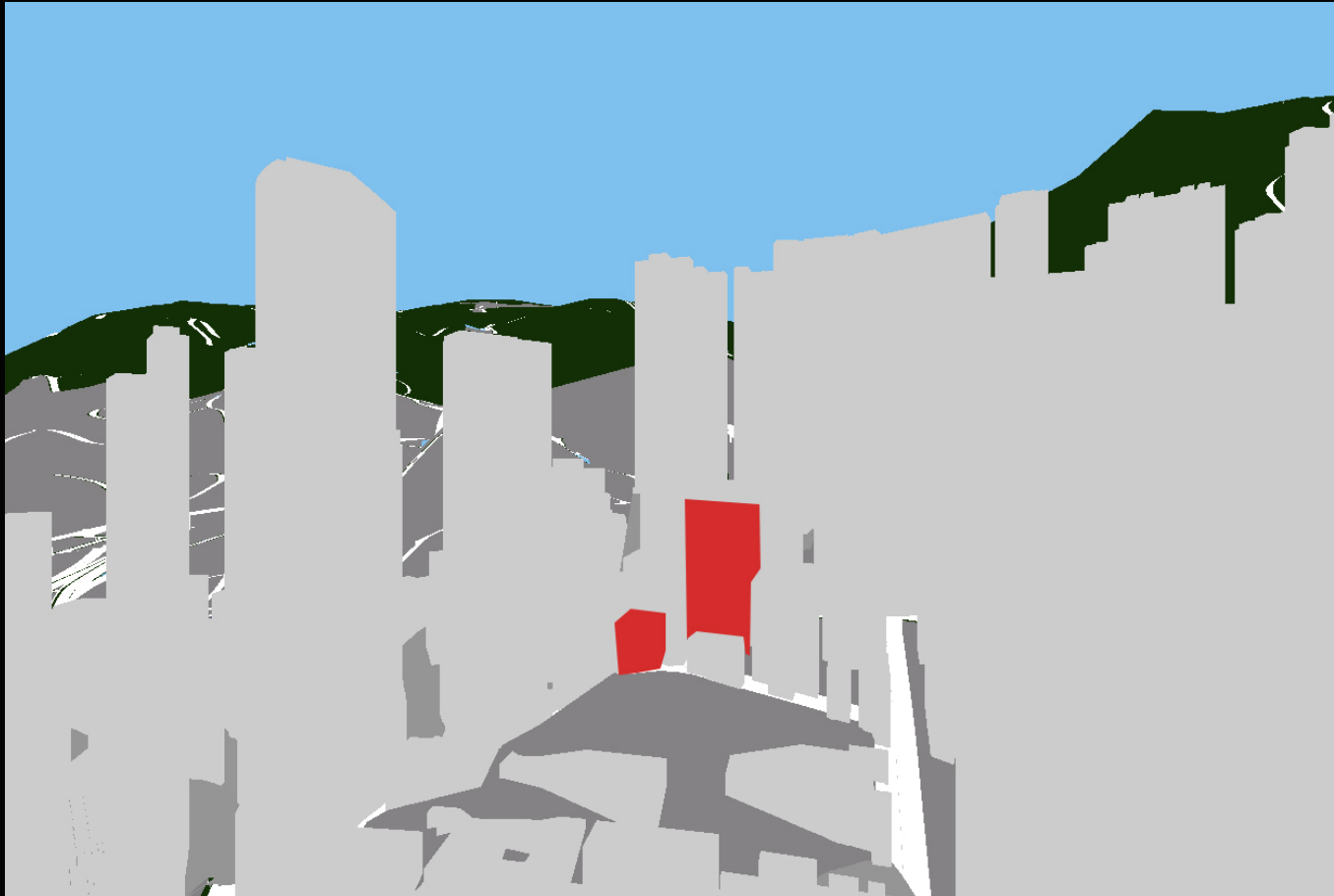
■ View Analysis



▪ View Analysis



■ View Analysis

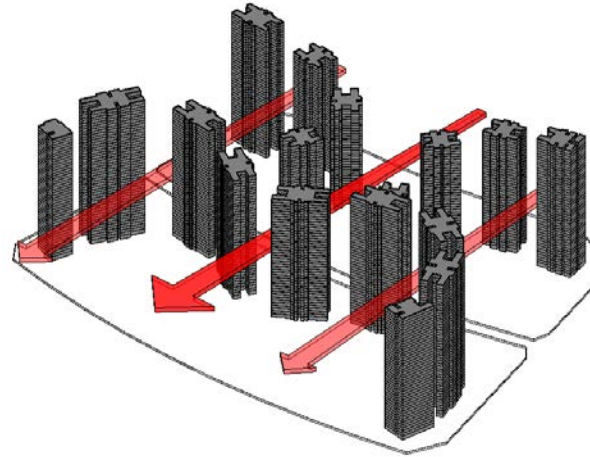


Rendered
Color
Percentage

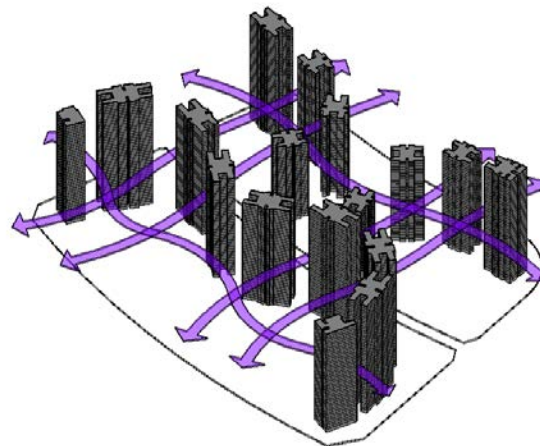
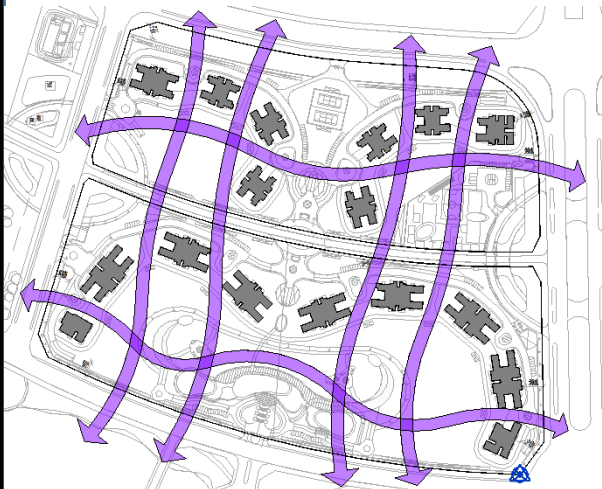
Buildings	69.2%
Sky	25.60%
Greeneries	4.2%
School	1.00%



■ View Corridor & Ventilation Diagram



View Corridor
Diagram

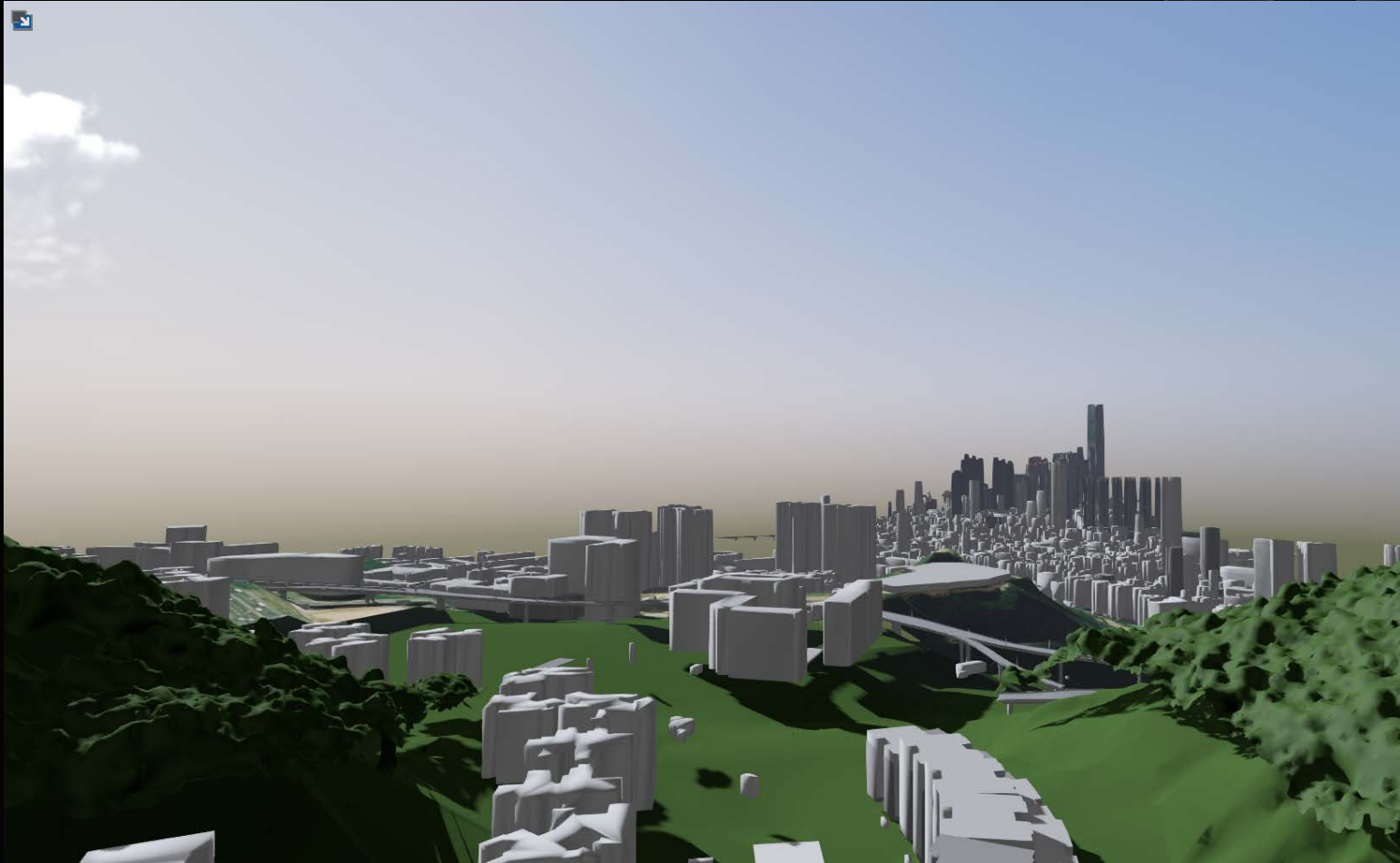


Cross Ventilation
Diagram

▪ Ridge of Landscape - Cityscape of Victoria Harbour

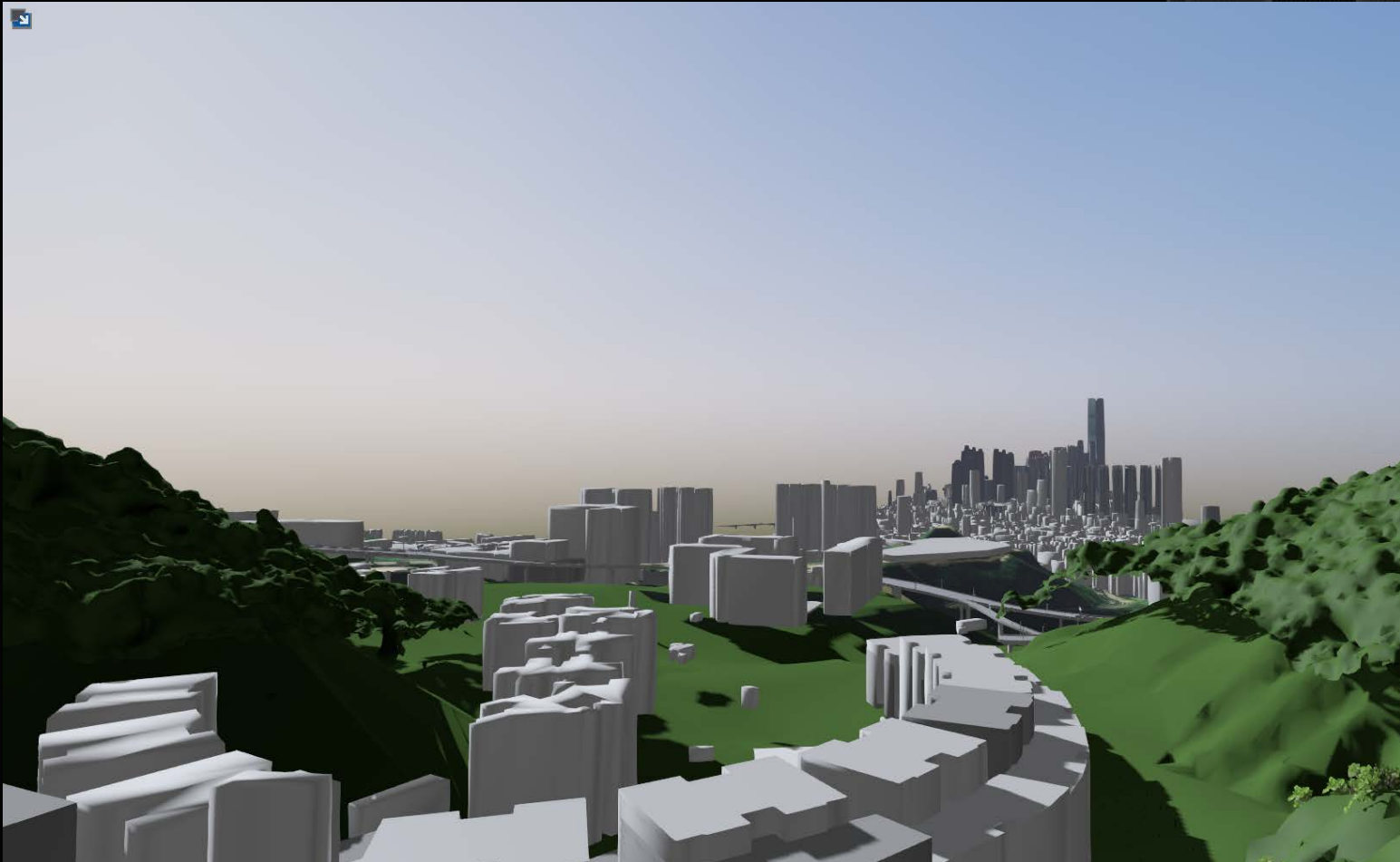


■ Topo-Surface



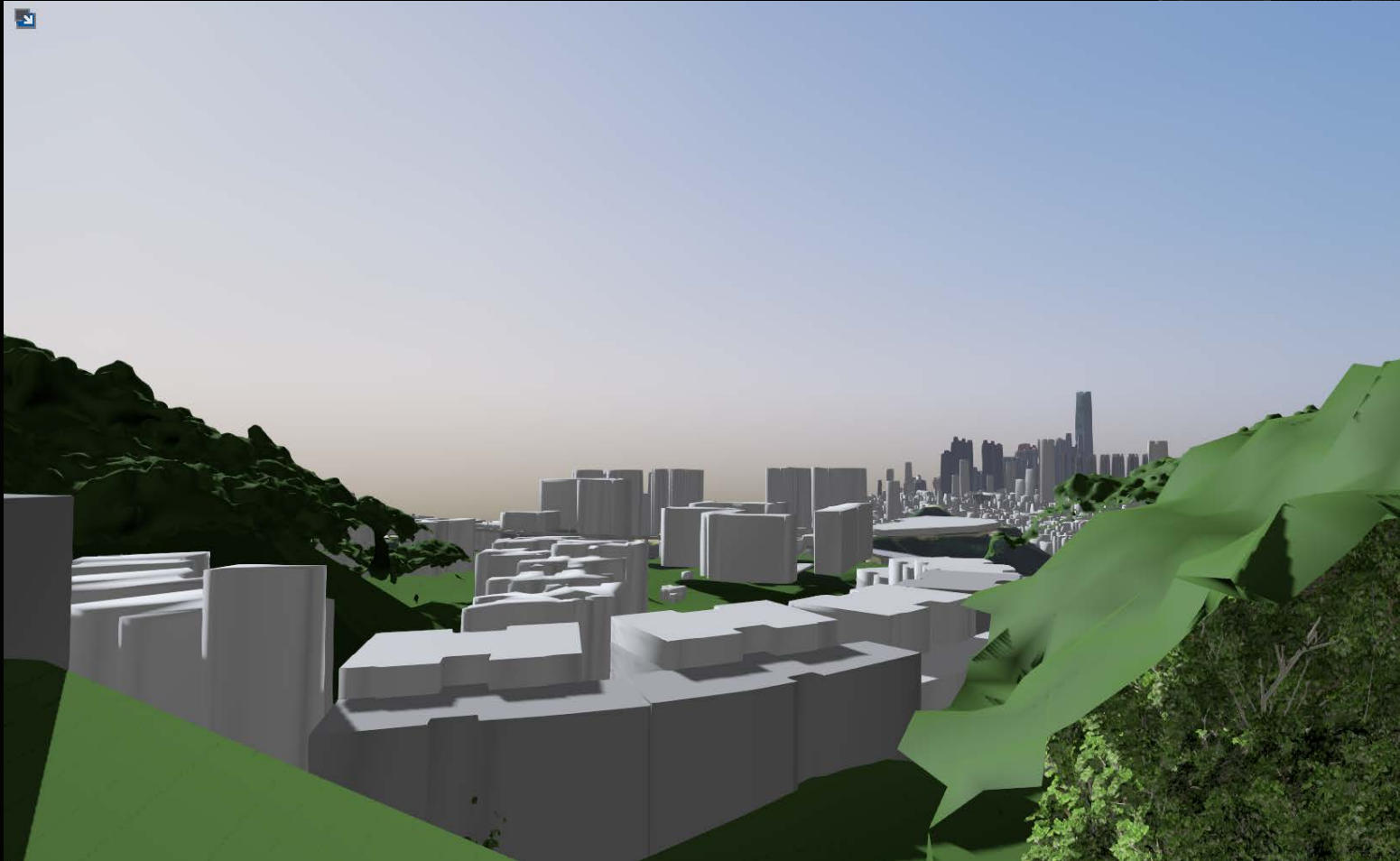
View from High Zone

■ Topo-Surface

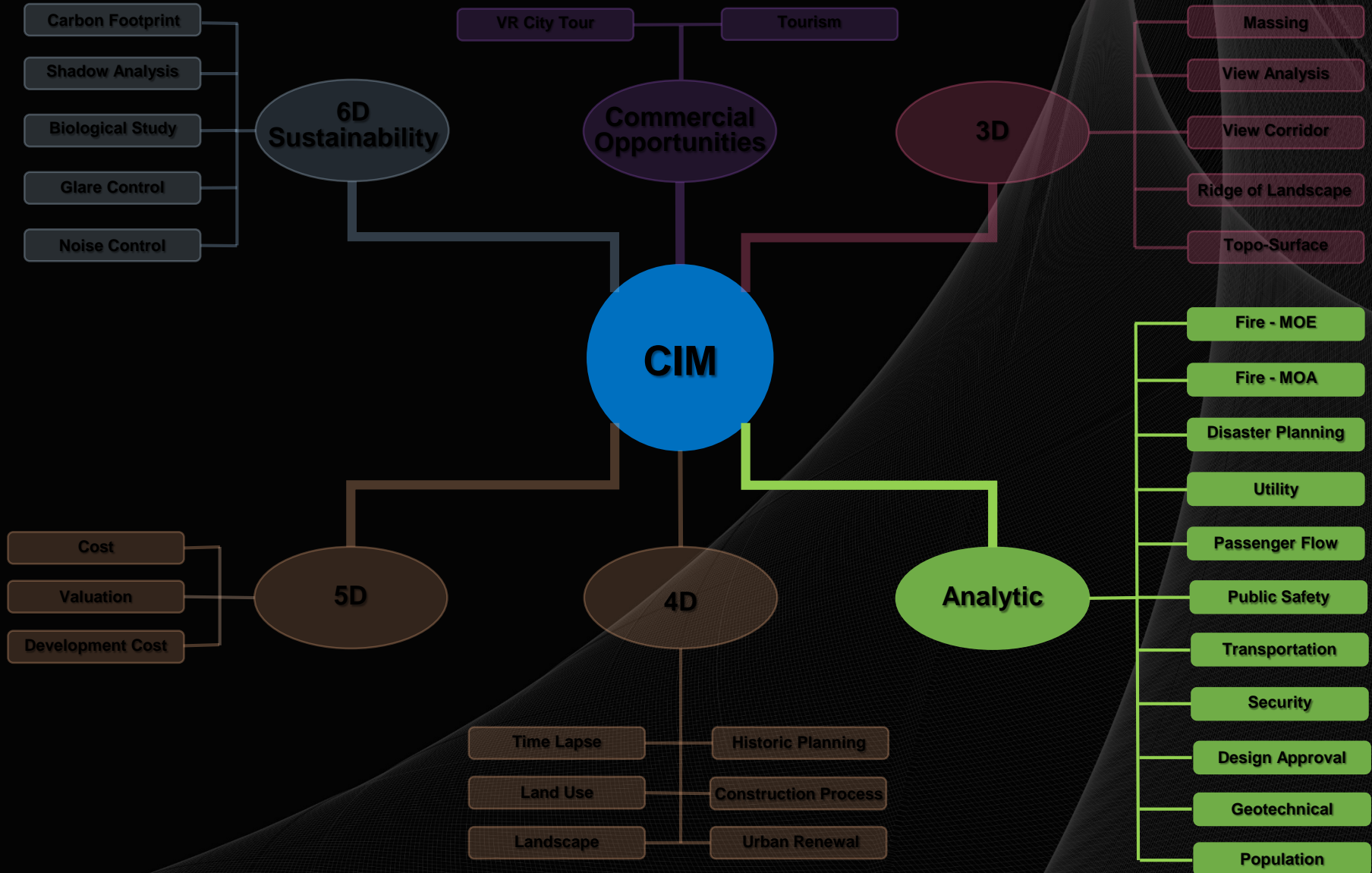


View from Middle Zone

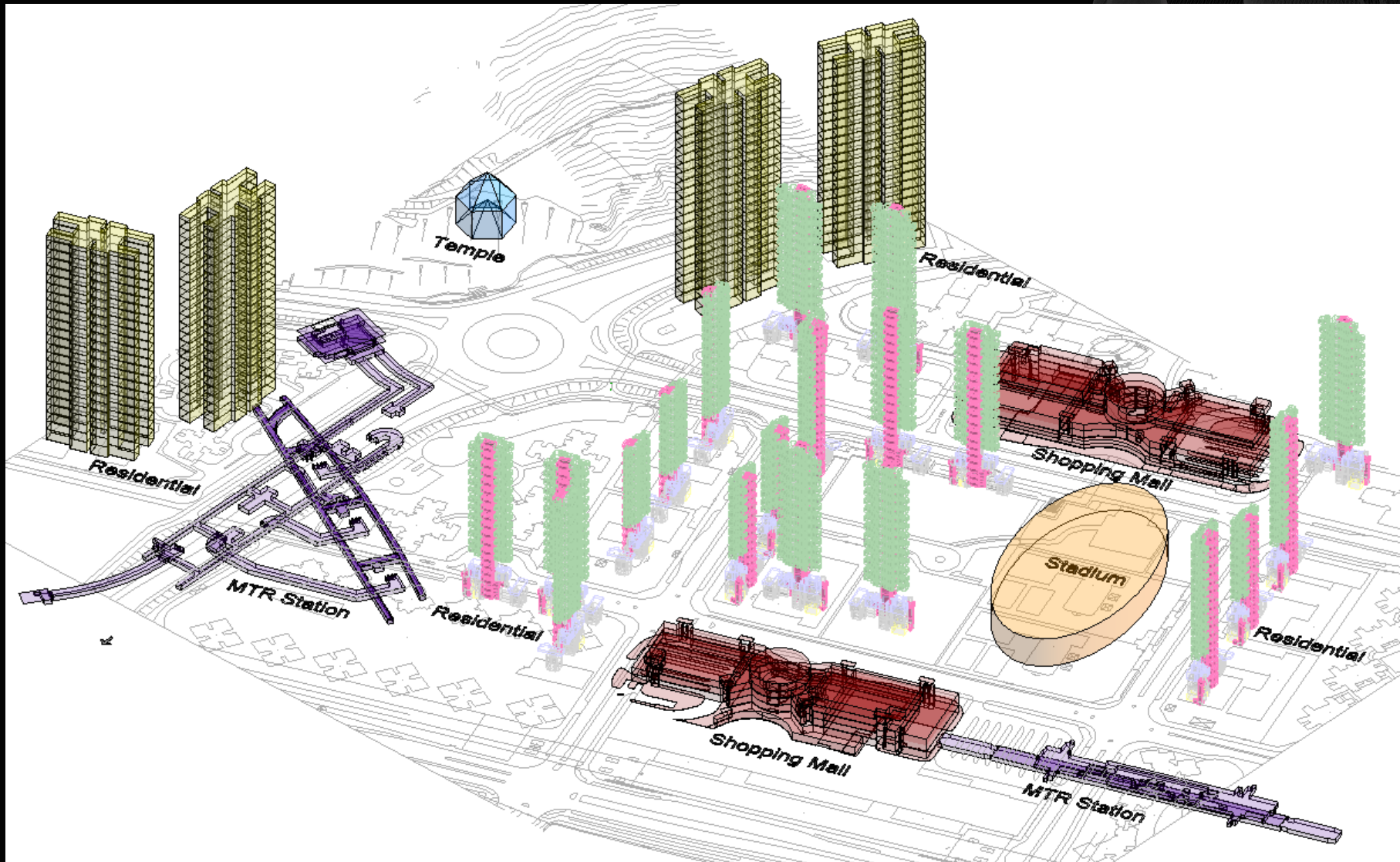
■ Topo-Surface



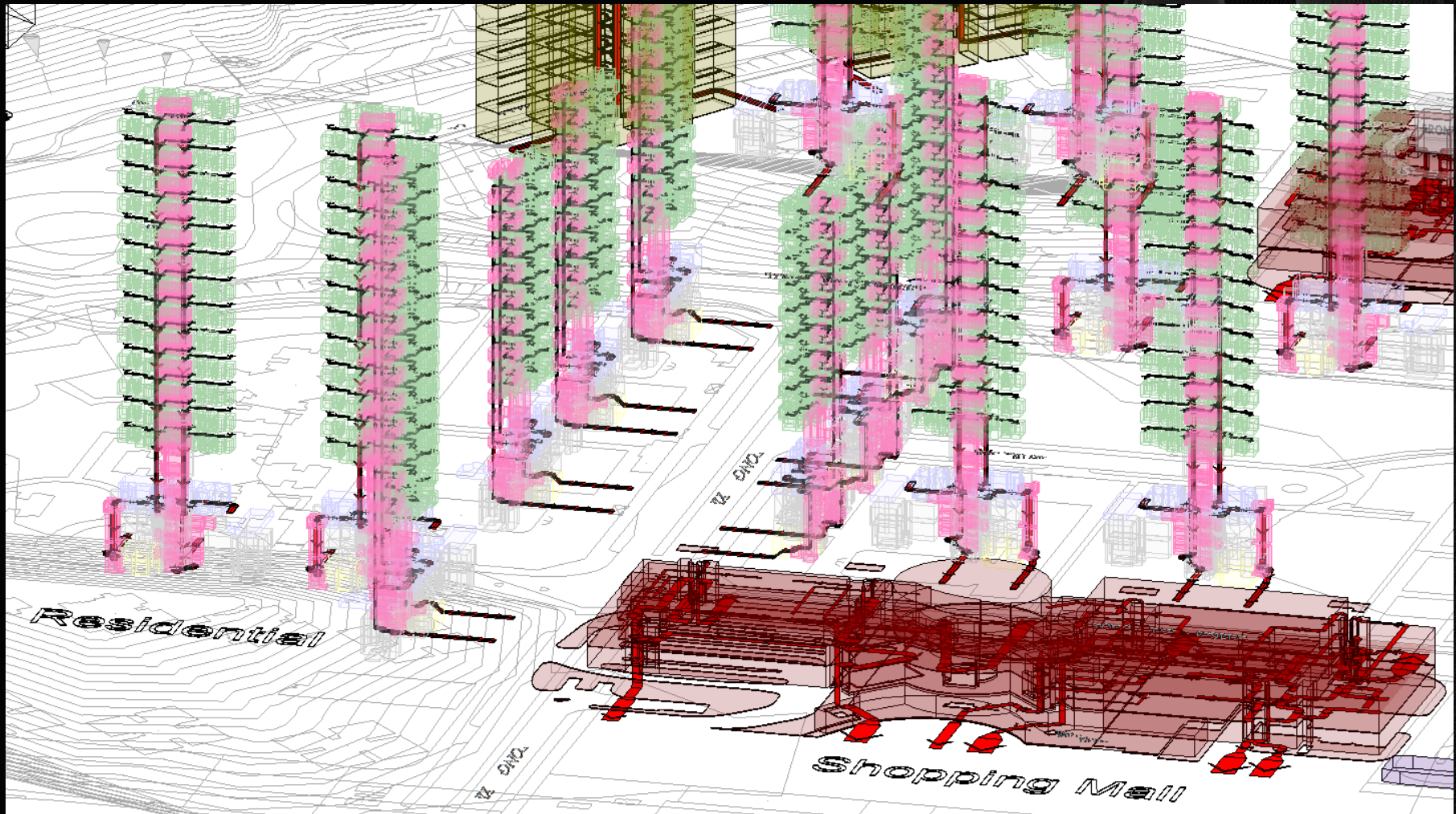
View from Low Zone



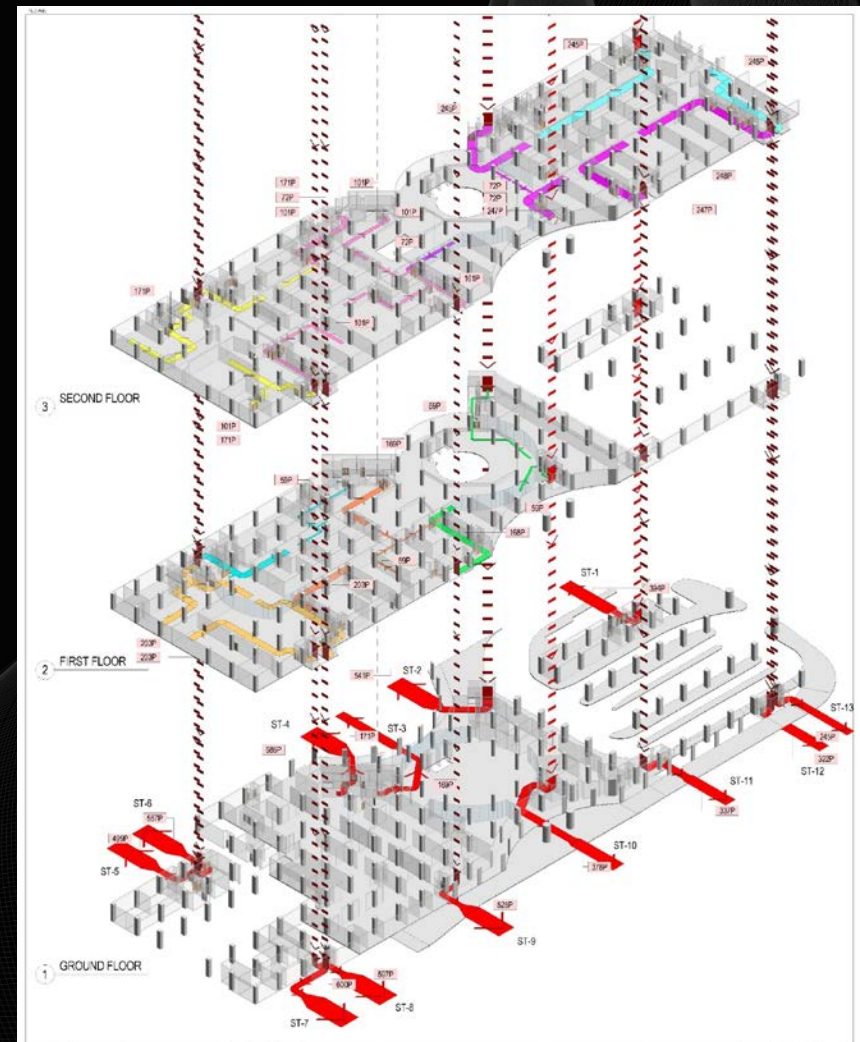
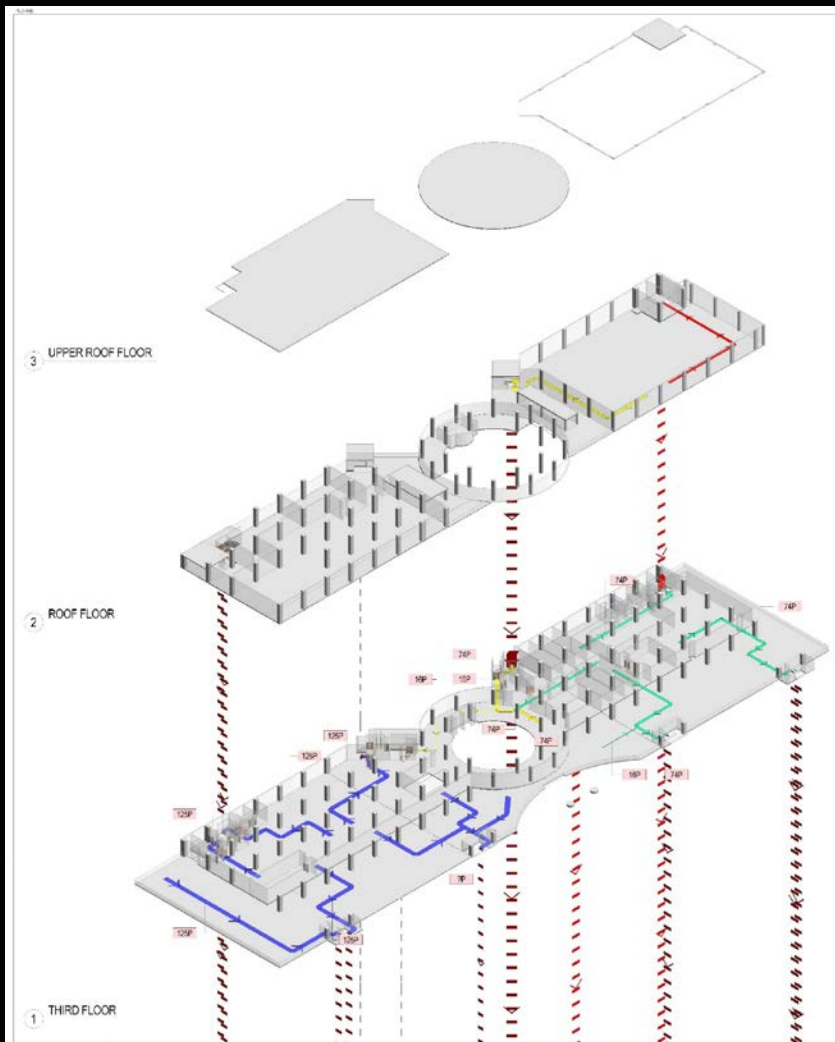
■ Analytical Model



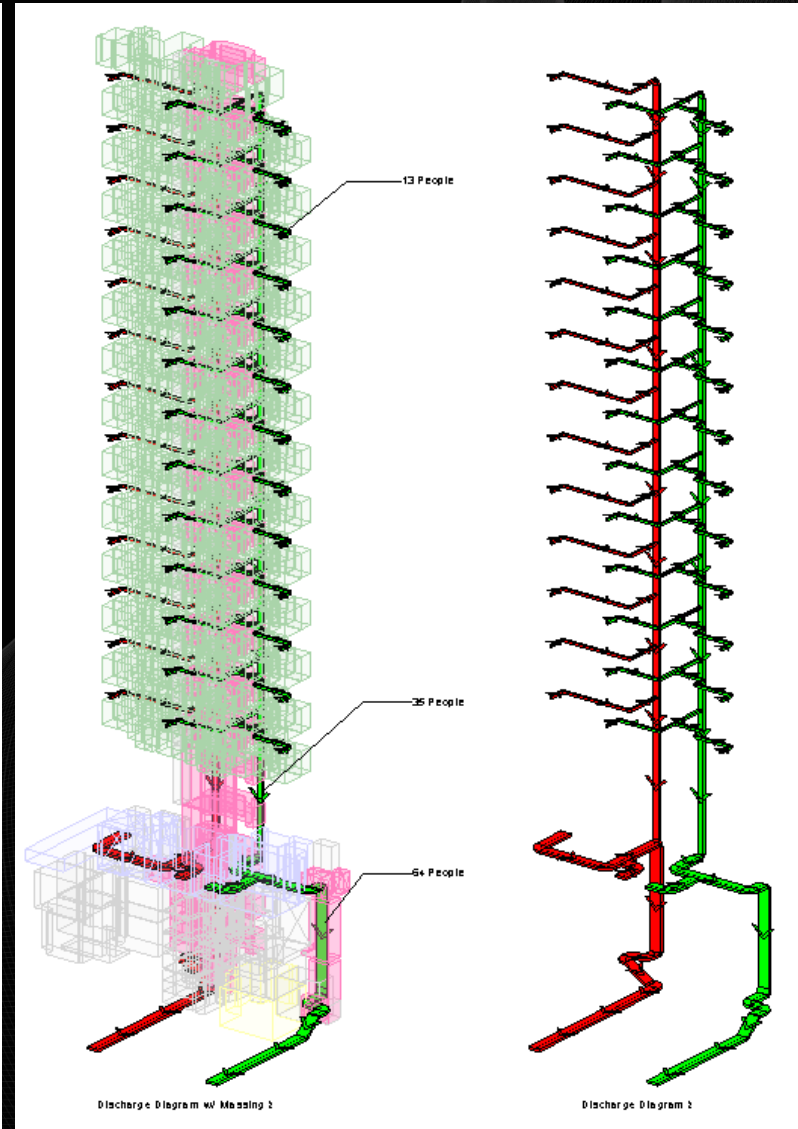
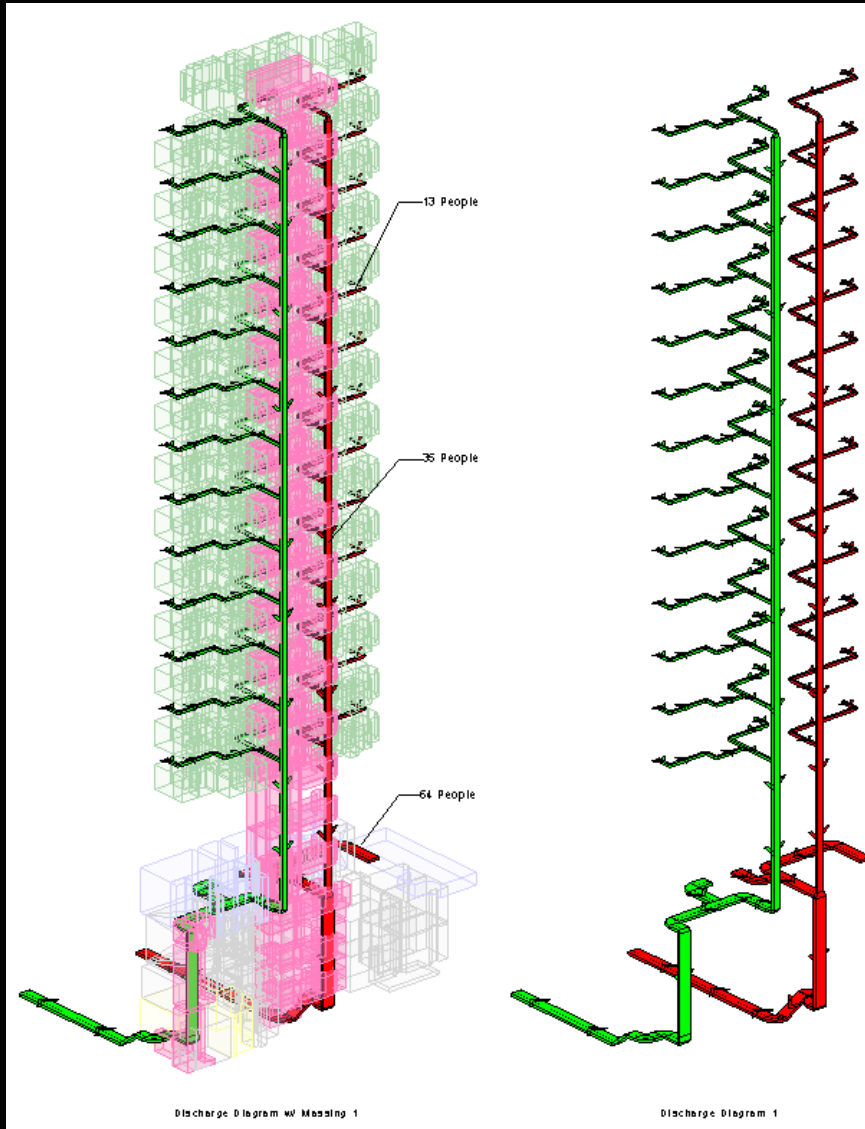
■ Means of Escape - Discharge Diagram in City Model



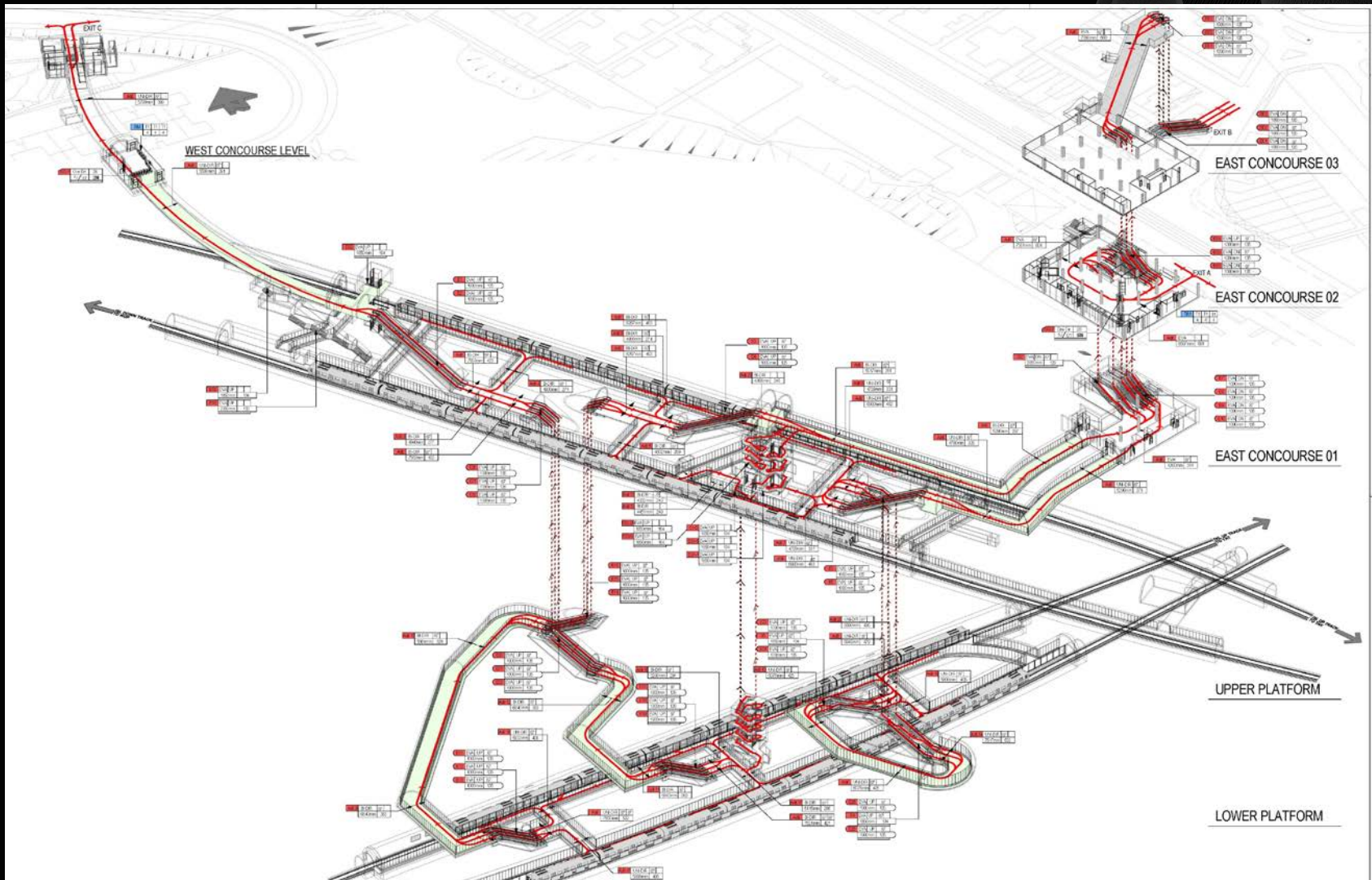
Means of Escape - Discharge Diagram with information



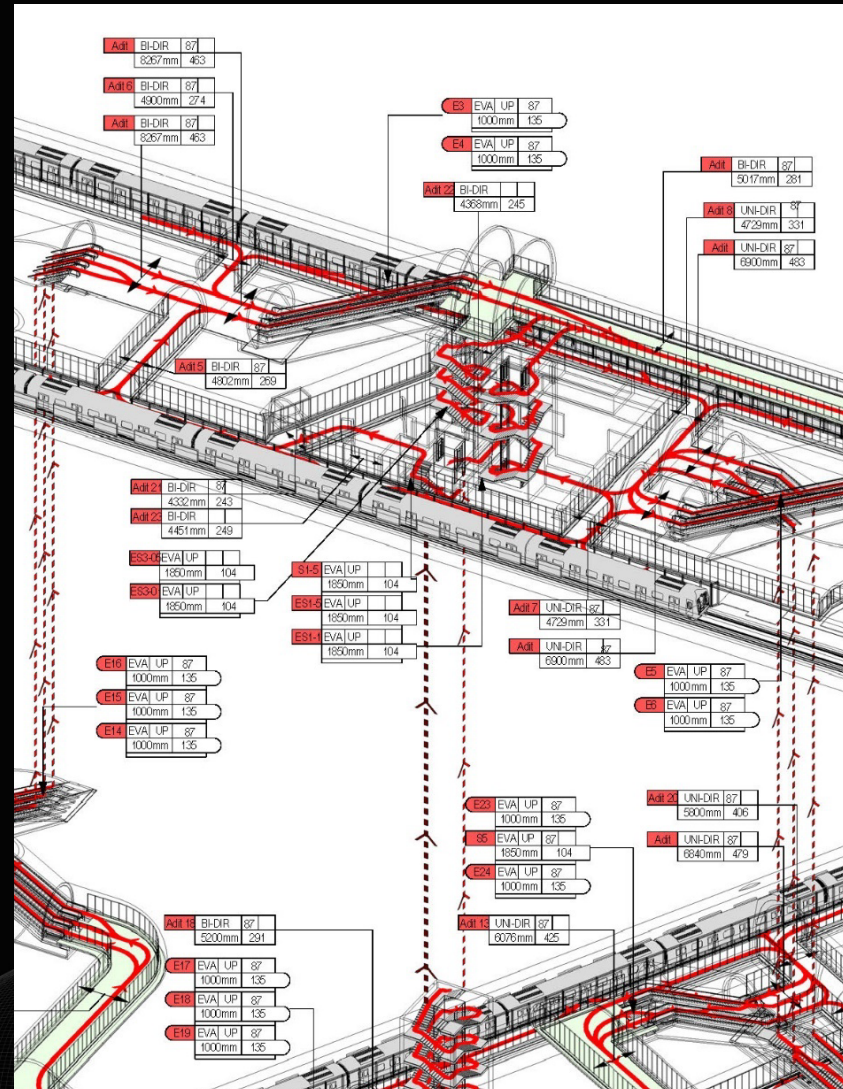
Means of Escape - Discharge Diagram with information

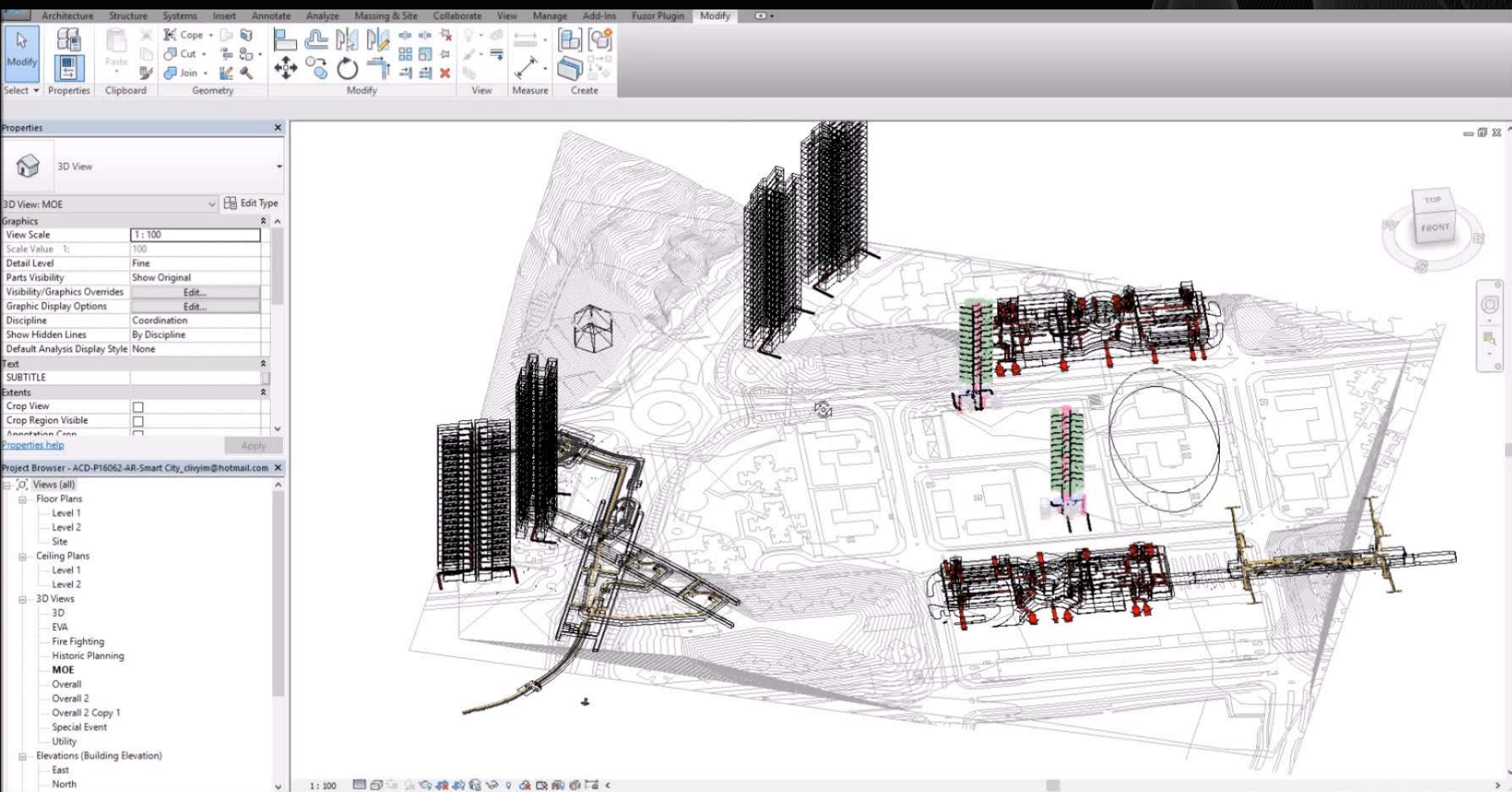


■ Means of Escape - Discharge Diagram with information



Means of Escape - Discharge Diagram with information

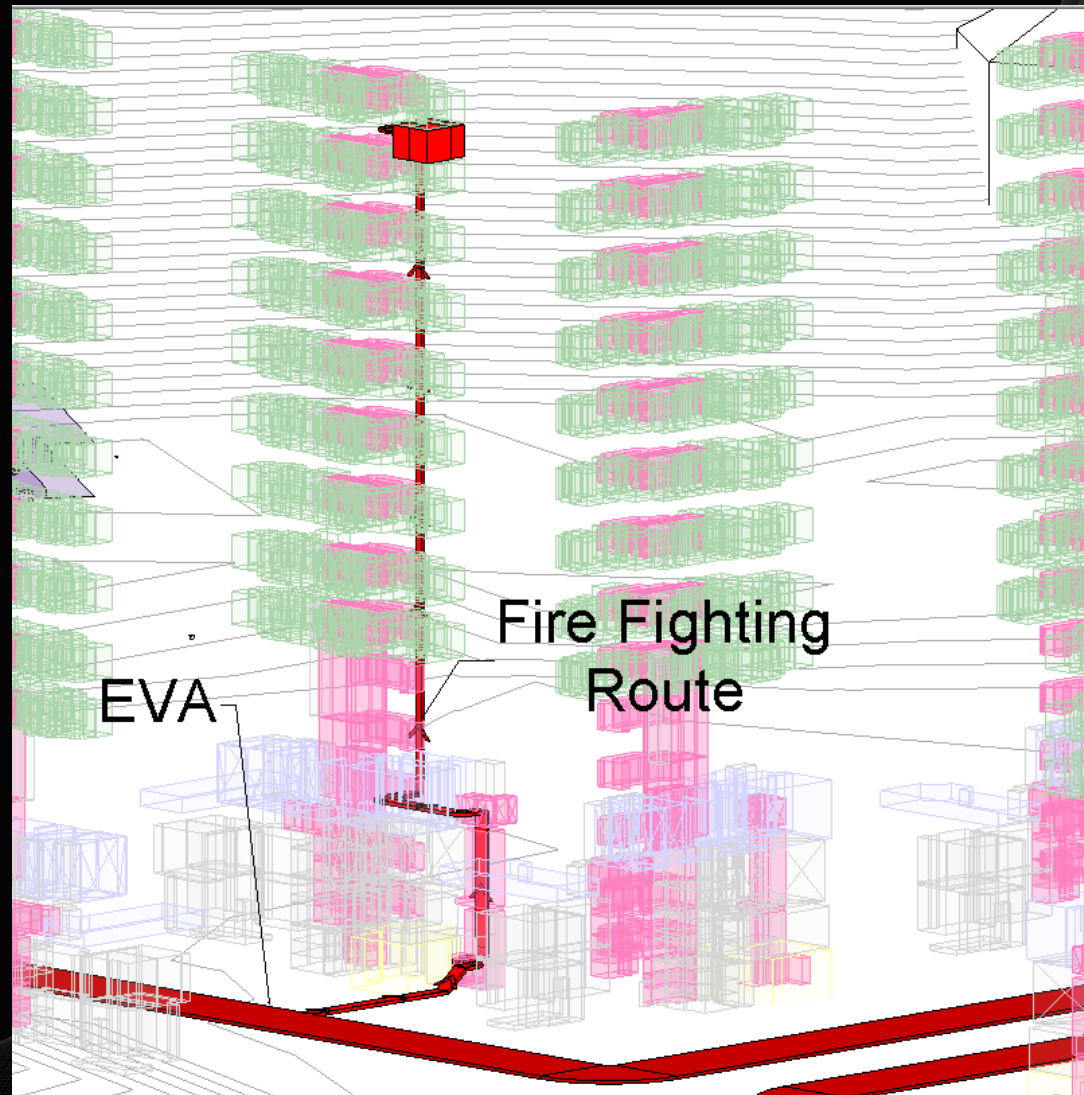




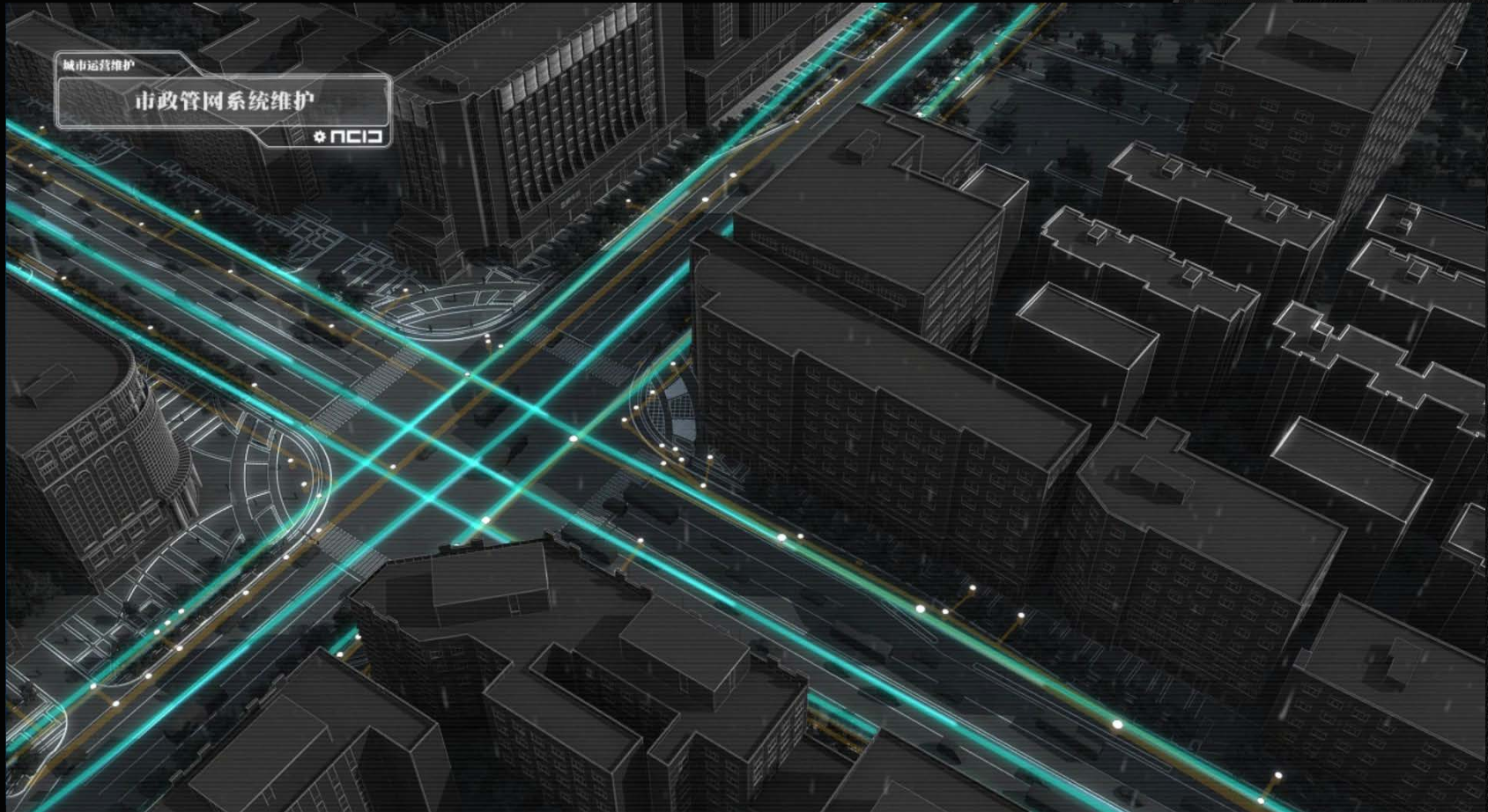
■ Means of Access - EVA



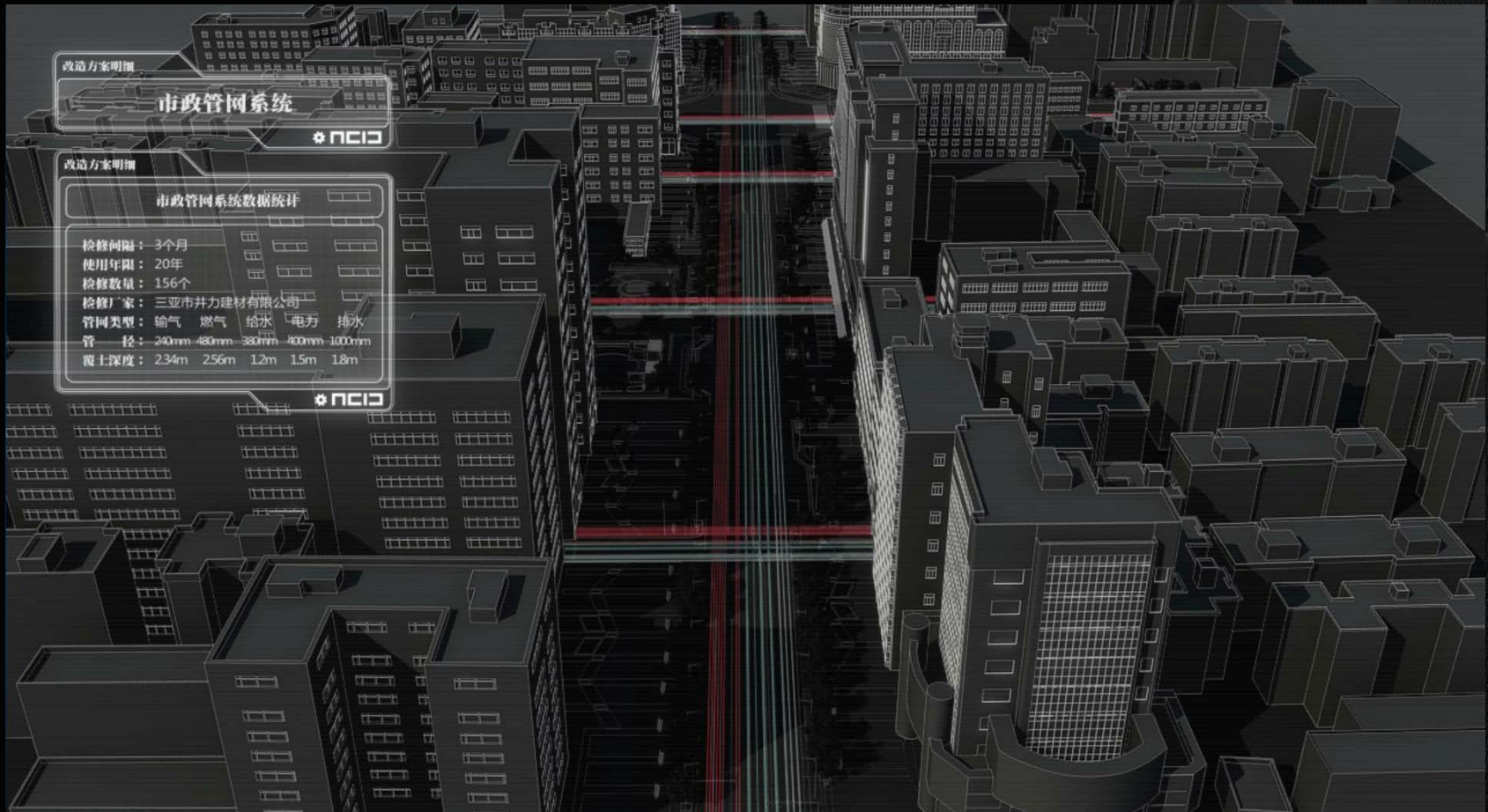
■ Means of Access – Fire Fighting Route



■ Utility Network in CIM



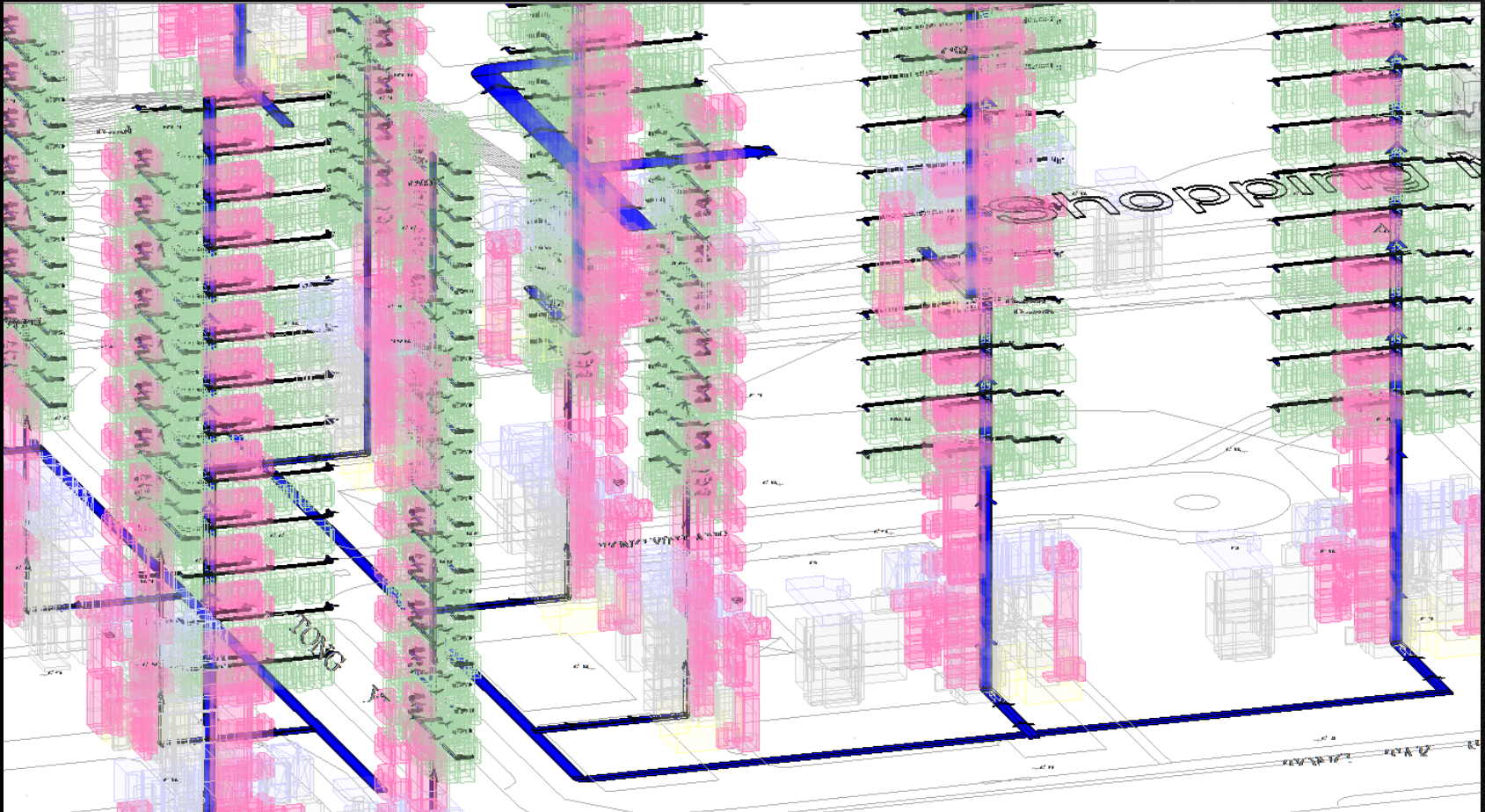
■ Utility Network in CIM



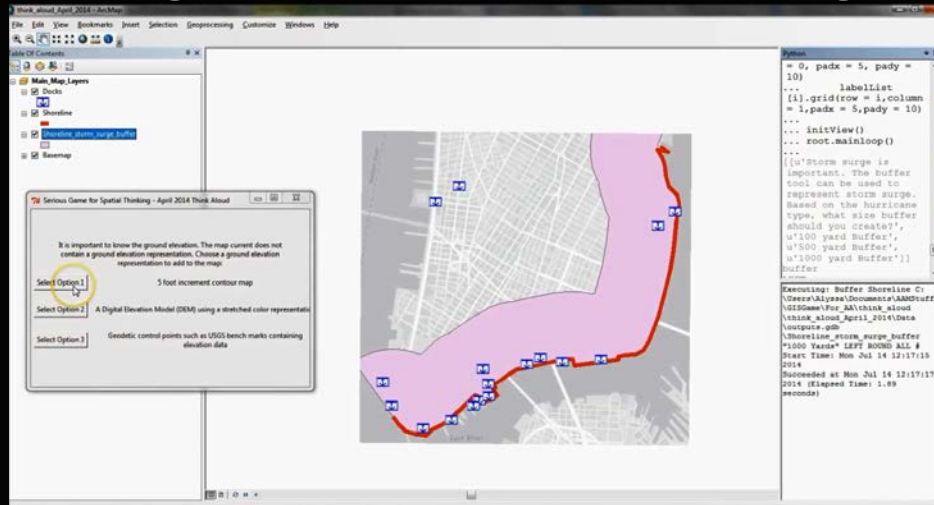
▪ Underground Utility System



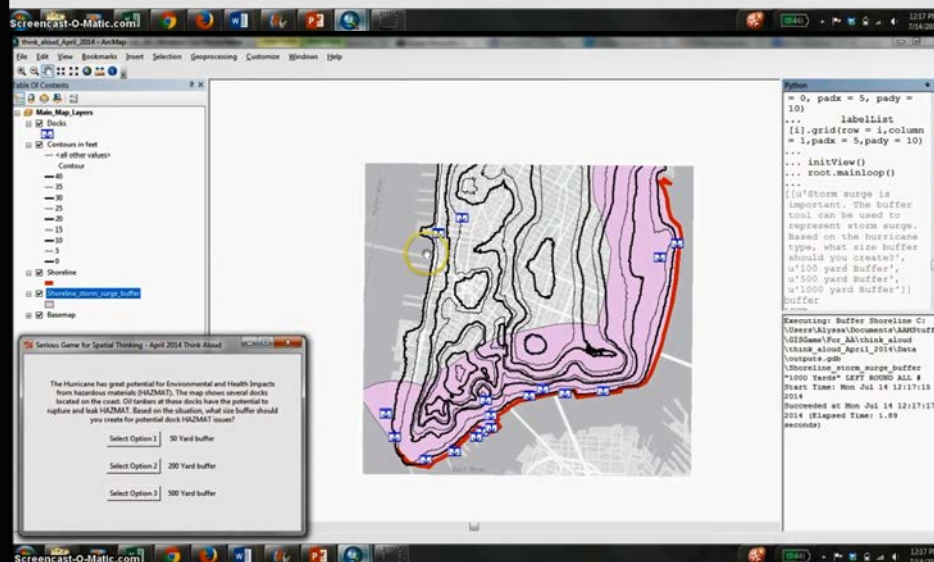
■ Utility System for Buildings



- Disaster Planning
- Using GIS to assist disaster management.

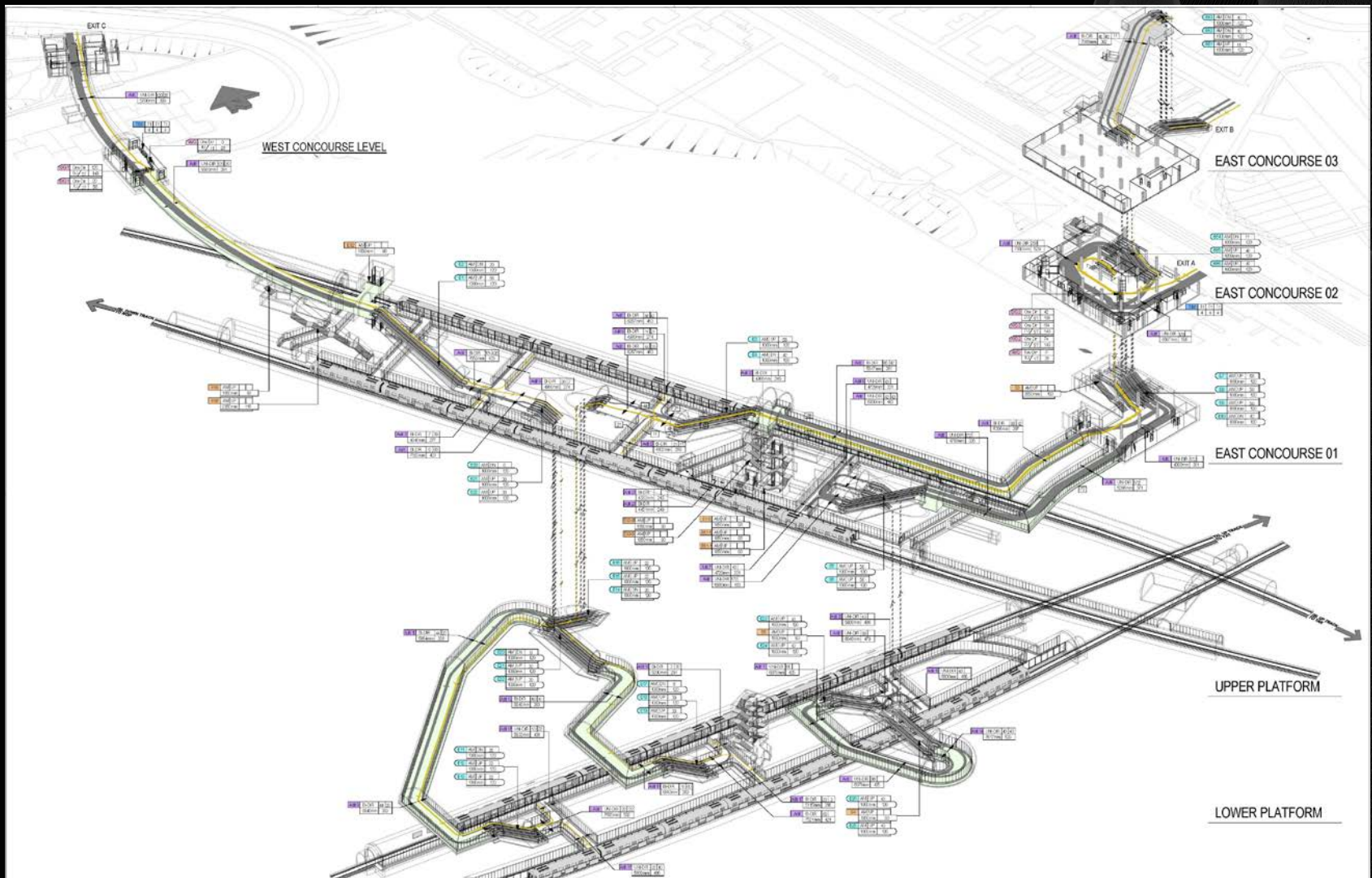


Shoreline – Surge Buffer

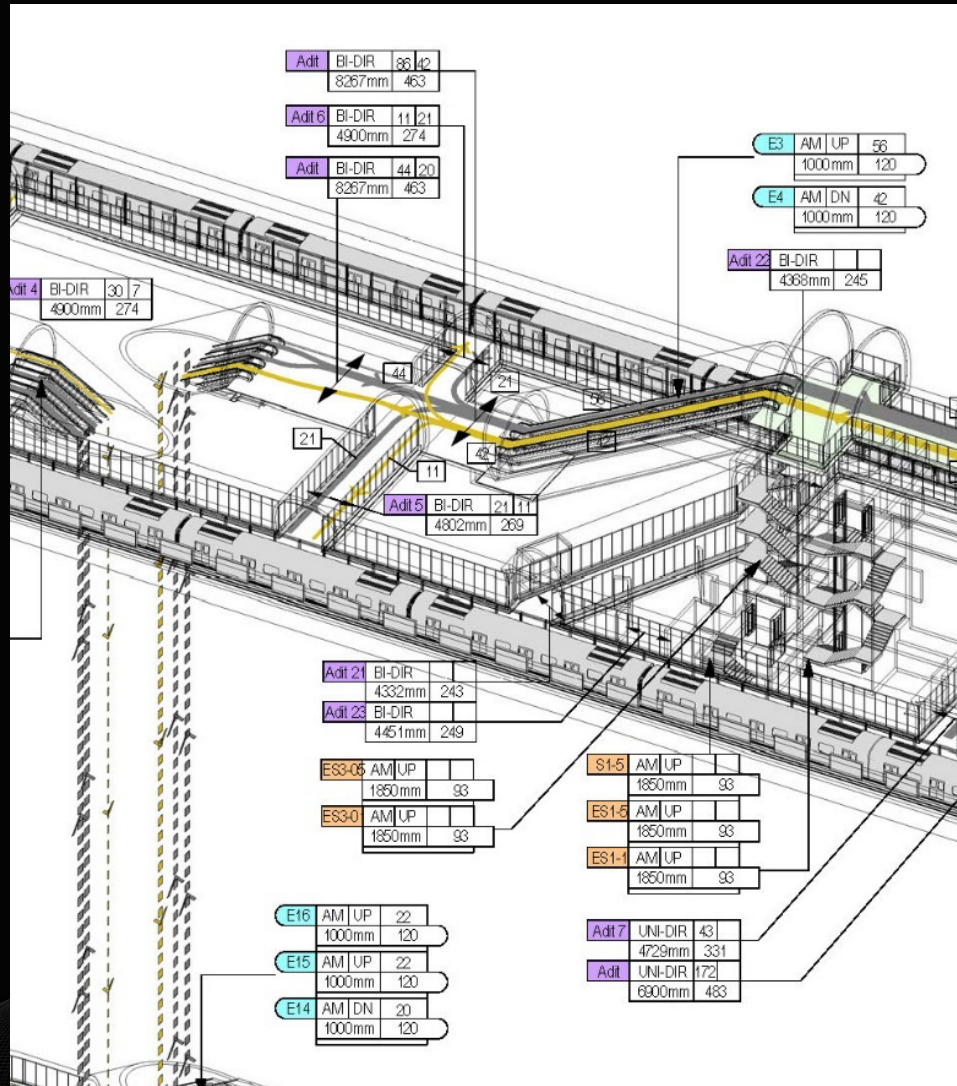


Surge Buffer with Contours

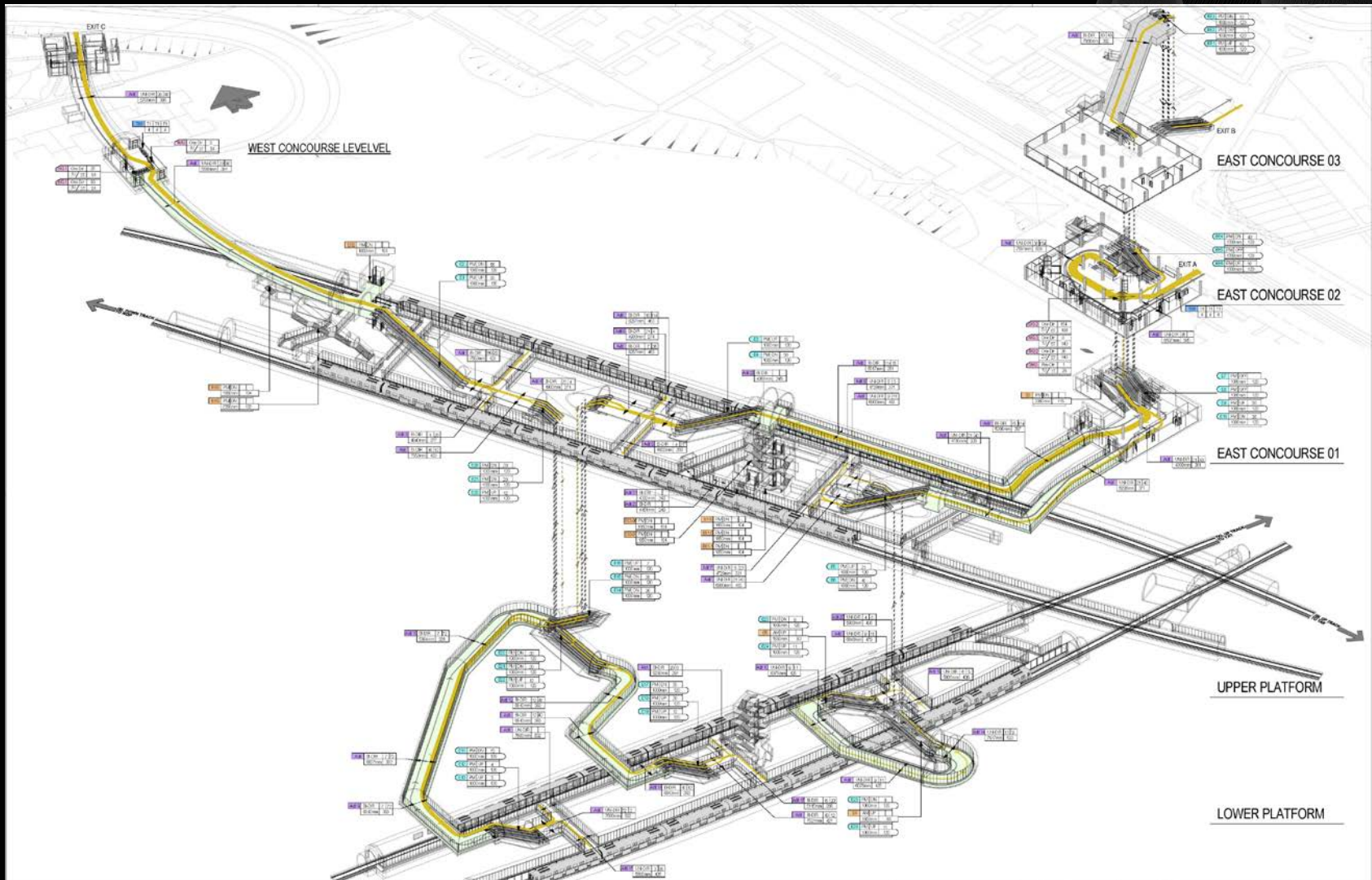
■ Passenger Flow Study - AM Peak



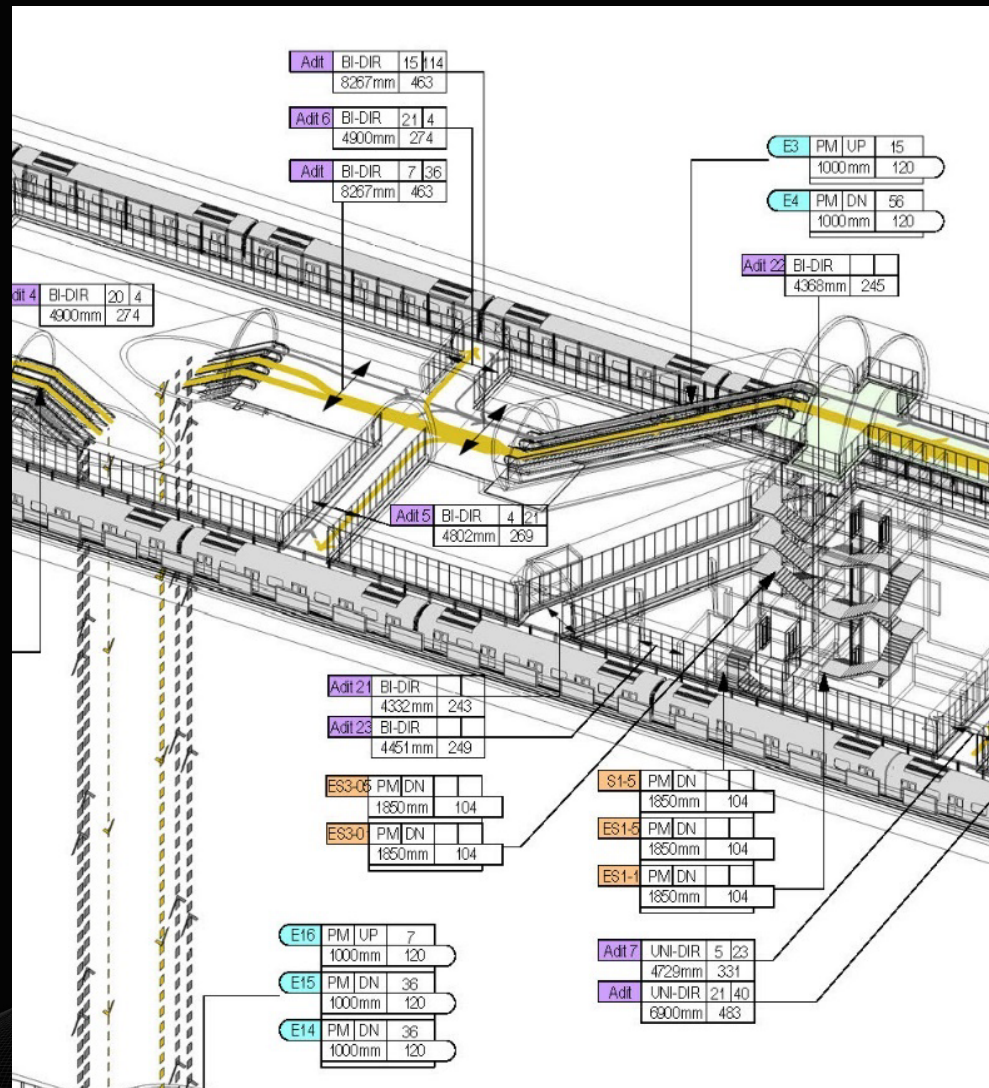
▪ Passenger Flow Study - AM Peak



■ Passenger Flow Study - PM Peak



■ Passenger Flow Study - PM Peak



Passenger Flow Study – Extract data from BIM model

DRAWING LIST				
DRAWING NUMBER	DRAWING TITLE	REVISION	SCALE	REMARK
ZSLQJ/SMTR/ A10001	FLOW STUDY SCHEDULES	A	NIL	
ZSLQJ/SMTR/ A10002	DOOR SCHEDULE	A	NIL	
ZSLQJ/SMTR/ A10003	Tactile Schedule Directional	A		
ZSLQJ/SMTR/ A10004	Tactile Schedule Postional & Hazard Warning	A		
ZSLQJ/SMTR/ A10005	DEPARTMENT ROOM SCHEDULE			
ZSLQJ/SMTR/ A10006	DEPARTMENT ROOM1 (OF 2)	A	1:400	
ZSLQJ/SMTR/ A10007	DEPARTMENT ROOM2 (OF 2)			
ZSLQJ/SMTR/ A10008	PASSENGER FLOW - AM PEAK	A	1:500	
ZSLQJ/SMTR/ A10009	PASSENGER FLOW - PM PEAK	A	1:500	
ZSLQJ/SMTR/ A10010	PASSENGER FLOW - EVACUATION	A	1:500	
ZSLQJ/SMTR/ A10011	ACCESSIBILITY - MOBILITY IMPAIRED	A	1:500	
ZSLQJ/SMTR/ A10012	PASSENGER FLOW - VISUALLY IMPAIRED	A	1:500	
ZSLQJ/SMTR/ A10013	PASSENGER FLOW PLAN - AM PEAK	A	1:400	
ZSLQJ/SMTR/ A10014	PASSENGER FLOW PLAN - PM PEAK	A	1:400	

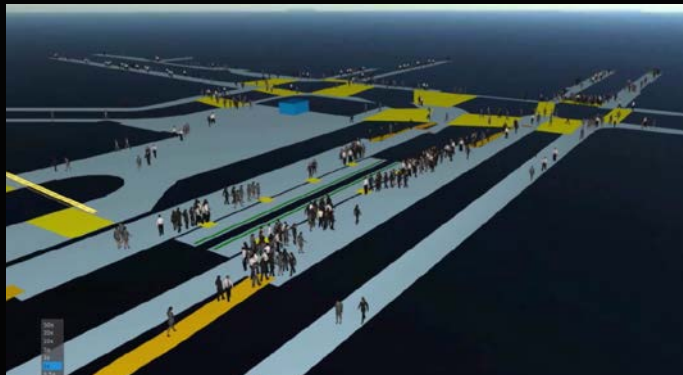
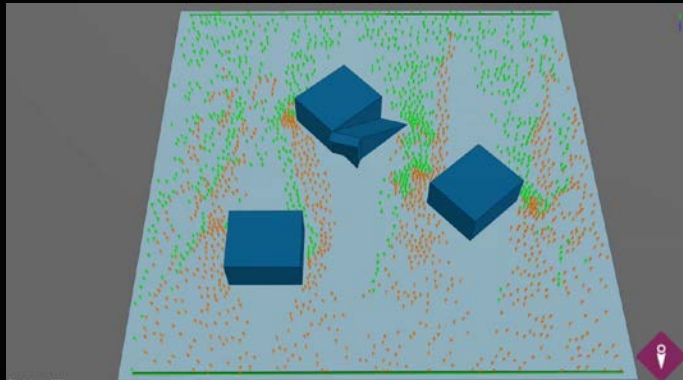
ESCALATOR SCHEDULE															
ESG. No	OEM	ESG PASSENGER CONVEYOR	MACHINE/CONTROLLER LOCATION (MT/ MOT/ MIT/ CO)	OUTDOOR	RATE SPEED (m/s)	OTHER SPEED SELECTION (m/s)	RISE (mm)	STEP WIDTH (mm)	AM PEAK		PM PEAK		REMARK	EVACUATION	
									DIR (UP/DN)	TOTAL CAPACITY	DIR (UP/DN)	TOTAL CAPACITY		DIR (UP/DN)	TOTAL CAPACITY
BE1	CNIM	Escalator	MOT	No	0.75	na	7403	1000	UP	120	UP	120		DN	130
BE2	CNIM	Escalator	MOT	No	0.75	na	7403	1000	DN	120	OFF	0		DN	130
BE3	CNIM	Escalator	MOT	No	0.75	na	7403	1000	DN	120	DN	120		DN	130
BE4	CNIM	Escalator	MOT	No	0.75	na	5000	1000	DN	120	DN	120		UP	130
BE5	CNIM	Escalator	MOT	No	0.75	na	5000	1000	UP	120	OFF	0		DN	130
BE6	CNIM	Escalator	MOT	No	0.75	na	5000	1000	UP	120	UP	120		UP	130
E1	CNIM	Escalator	MOT	No	0.75	na	15940	1000	UP	120	UP	120		UP	130
E2	CNIM	Escalator	MOT	No	0.75	na	15940	1000	DN	120	DN	120		UP	130
E3	CNIM	Escalator	MOT	No	0.75	na	13790	1000	UP	120	UP	120		UP	130
E4	CNIM	Escalator	MOT	No	0.75	na	13790	1000	DN	120	DN	120		UP	130
E5	CNIM	Escalator	MOT	No	0.75	na	13790	1000	UP	120	UP	120		UP	130
E6	CNIM	Escalator	MOT	No	0.75	na	13790	1000	UP	120	DN	120	Up running at 0815 - 0915 hours	UP	130
E7	CNIM	Escalator	MOT	No	0.75	na	5650	1000	UP	120	OFF	0	0815 - 0915 hours	DN	130
E8	CNIM	Escalator	MOT	No	0.75	na	5650	1000	UP	120	OFF	120	0730 - 0930 hours	DN	130
E9	CNIM	Escalator	MOT	No	0.75	na	5650	1000	UP	120	UP	120		DN	130
E10	CNIM	Escalator	MOT	No	0.75	na	5650	1000	DN	120	DN	120		DN	130
E11	CNIM	Escalator	MOT	No	0.75	na	7250	1000	DN	120	DN	120		UP	130
E12	CNIM	Escalator	MOT	No	0.75	na	7250	1000	UP	120	UP	120	0730 - 1000 & 1700 - 1930 hours	UP	130
E13	CNIM	Escalator	MOT	No	0.75	na	7250	1000	UP	120	UP	120		UP	130
E14	CNIM	Escalator	MOT	No	0.75	na	6790	1000	DN	120	DN	120		UP	130
E15	CNIM	Escalator	MOT	No	0.75	na	6790	1000	UP	120	DN	120	0730 - 1000 & 1700 - 1930 hours	UP	130
E16	CNIM	Escalator	MOT	No	0.75	na	6790	1000	UP	120	UP	120		UP	130
E17	CNIM	Escalator	MOT	No	0.75	na	7250	1000	DN	120	DN	120		UP	130
E18	CNIM	Escalator	MOT	No	0.75	na	7250	1000	UP	120	UP	120	0730 - 1000 & 1700 - 1930 hours	UP	130
E19	CNIM	Escalator	MOT	No	0.75	na	7250	1000	UP	120	UP	120		UP	130
E20	CNIM	Escalator	MOT	No	0.75	na	6790	1000	DN	120	DN	120		UP	130
E21	CNIM	Escalator	MOT	No	0.75	na	6790	1000	UP	120	UP	120		UP	130
E22	CNIM	Escalator	MOT	No	0.75	na	6790	1000	UP	120	UP	120	0730 - 1000 & 1700 - 1930 hours	UP	130
E23	CNIM	Escalator	MOT	No	0.75	na	7250	1000	UP	120	DN	120		UP	130
E24	CNIM	Escalator	MOT	No	0.75	na	7250	1000	UP	120	UP	120		UP	130
E25	CNIM	Escalator	MOT	No	0.75	na	6790	1000	UP	120	DN	120		UP	130
E26	CNIM	Escalator	MOT	No	0.75	na	6790	1000	UP	120	UP	120		UP	130

STAIR SCHEDULE																	
NAME	BASE LEVEL	TOP LEVEL	STEP WIDTH (mm)	AM PEAK				TOTAL CAPACITY	PM PEAK				EVACUATION				
				DIR (UP/DN)	UP	DN	BI		DIR (UP/DN)	UP	DN	BI	DIR (UP/DN)	UP	DN	BI	
E51-1	UPPER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E51-2	UPPER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E51-3	UPPER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E51-4	UPPER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E51-5	UPPER PLATFORM LEVEL	BASEMENT (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E52	CONCOURSE LEVEL (WESTERN CONCOURSE)	CONCOURSE LEVEL (WESTERN CONCOURSE)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E53-01	UPPER PLATFORM LEVEL	BASEMENT (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E53-02	BASEMENT (E)	BASEMENT (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E53-03	BASEMENT (E)	BASEMENT (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E53-04	BASEMENT (E)	BASEMENT (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E53-05	BASEMENT (E)	BASEMENT (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E55	CONCOURSE (E)	CONCOURSE (E)	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
E55	UPPER PLATFORM LEVEL	BASEMENT (E)	2200	UP	118	132	99	118	DN	118	132	99	132	UP	132	146	13
S1-1	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S1-2	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S1-3	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S1-4	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S1-5	LOWER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S2-1	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S2-2	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S2-3	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S2-4	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S2-5	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S2-6	LOWER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S3	BASEMENT (E)	CONCOURSE (E)	2050	UP	103	115	86	103	DN	103	115	86	115	UP	115	128	10
S4	LOWER PLATFORM LEVEL	UPPER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
S5	LOWER PLATFORM LEVEL	LOWER PLATFORM LEVEL	1850	UP	93	104	78	93	DN	93	104	78	104	UP	104	117	10
Star C	CONCOURSE LEVEL (WESTERN CONCOURSE)	1st (E)	1500	UP	75	84	63	75	DN	75	84	63	84	DN	84	96	9
xxx	BASEMENT (E)	BASEMENT (E)	2325	DN	116	130	98	130	DN	116	130	98	130	DN	130	146	14
xxx	BASEMENT (E)	BASEMENT (E)	2325	DN	116	130	98	130	DN	116	130	98	130	DN	130	146	14
xxx	BASEMENT (E)	BASEMENT (E)	2325	DN	116	130	98	130	DN	116	130	98	130	DN	130	146	14
xxx(lead)	GROUND FLOOR LEVEL (WESTERN CONCOURSE)	GROUND FLOOR LEVEL (WESTERN CONCOURSE)	2800	UP	143	160	120	143	DN	143	160	120	160	UP	160	180	16
xxx(lead)	GROUND FLOOR LEVEL (WESTERN CONCOURSE)	GROUND FLOOR LEVEL (WESTERN CONCOURSE)	2800	UP	143	160	120	143	DN	143	160	120	160	UP	160	180	16

■ Special Event – Crowd Control



Public Safety - Crowd Control



Properties: Journey

File Select Multi Help

Edit: Journey1

Timing

Start time: Simulation start + 00:00:00

Duration: 00:03:00

Uniformly distributed

Population

Agent count: 300

Profile: DefaultProfile

Origins

Ignore weights in list (and collections)

PortalActor3

Destinations

Agent goal: Assigned

Manual weights in list

Name	Weight
PortalActor	1
PortalActor1	0
PortalActor2	2

Position

X: -49.087

Y: 0.020

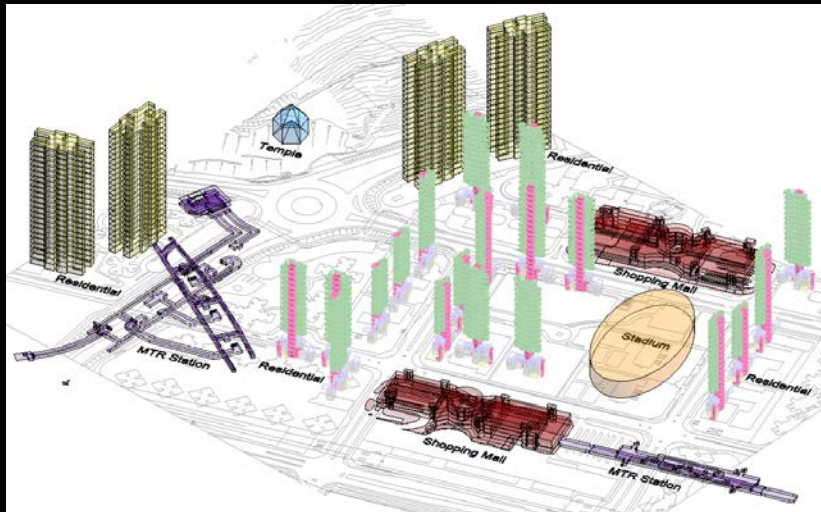
Z: 18.270

Transform

Operations

Tools

Security – Linking Live CCTV to City Model



City Model



CCTV

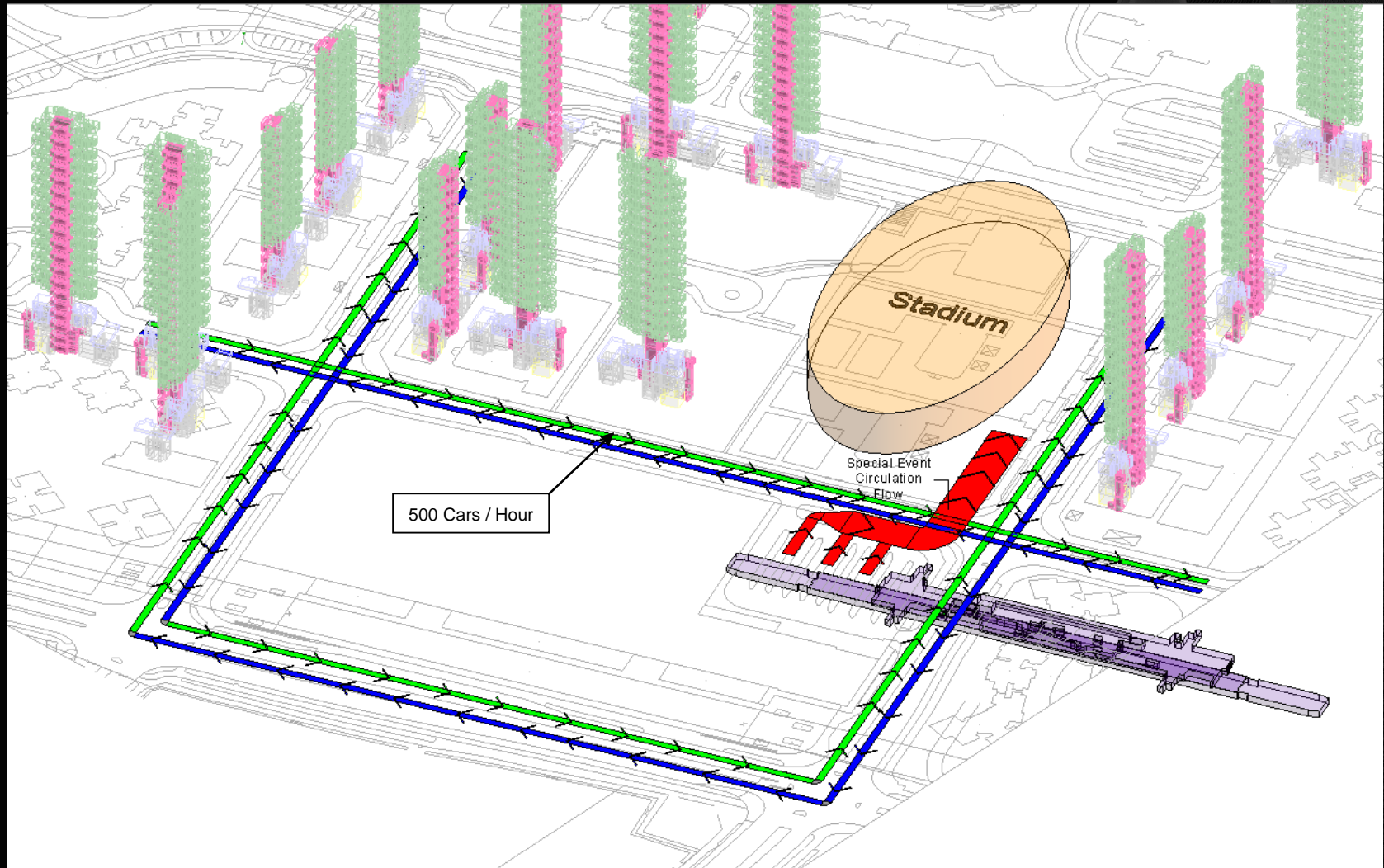


Live Information



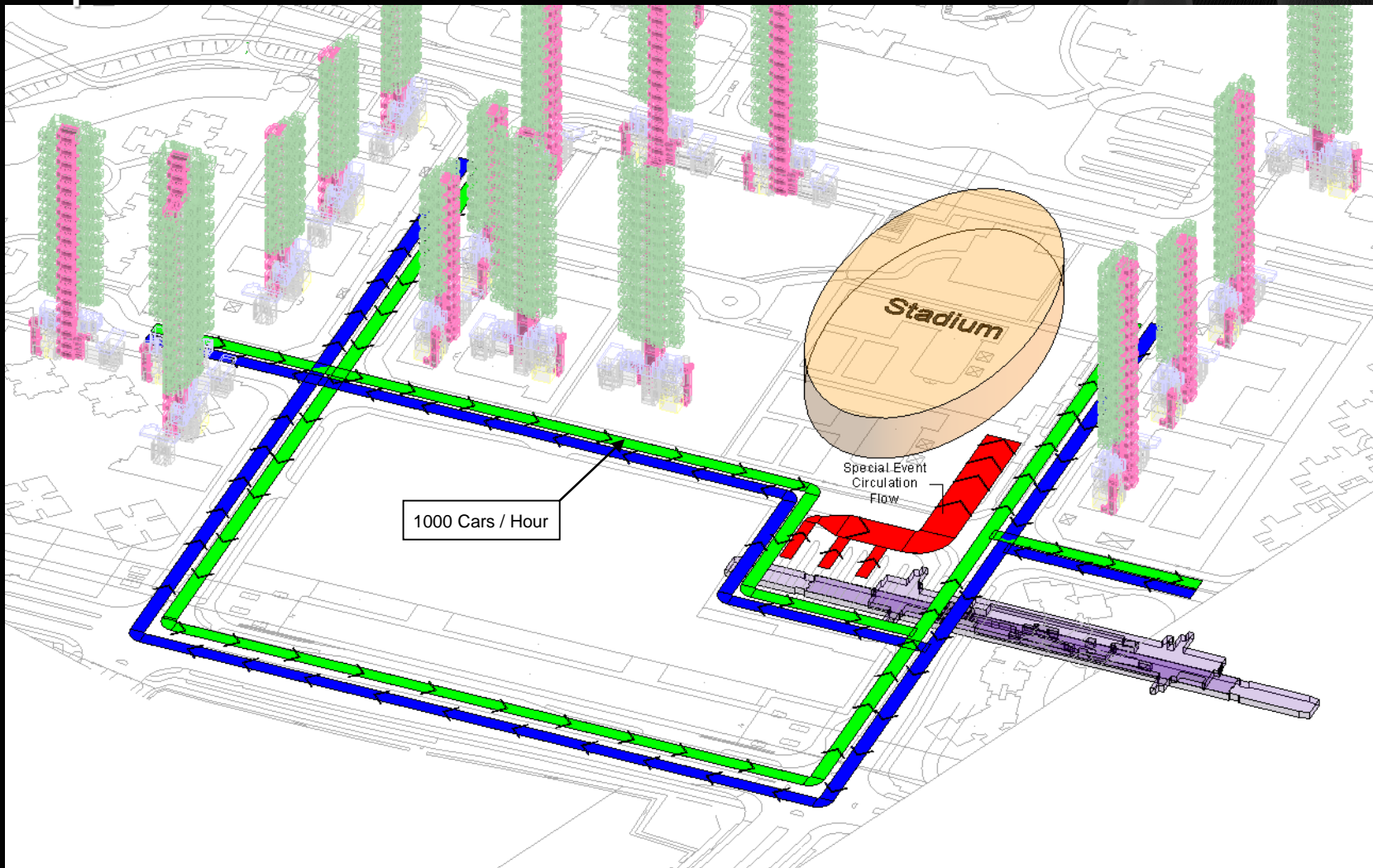
Mobile Device

■ Traffic Diversion



Daily Traffic Flow

▪ Special Event - Traffic Diversion

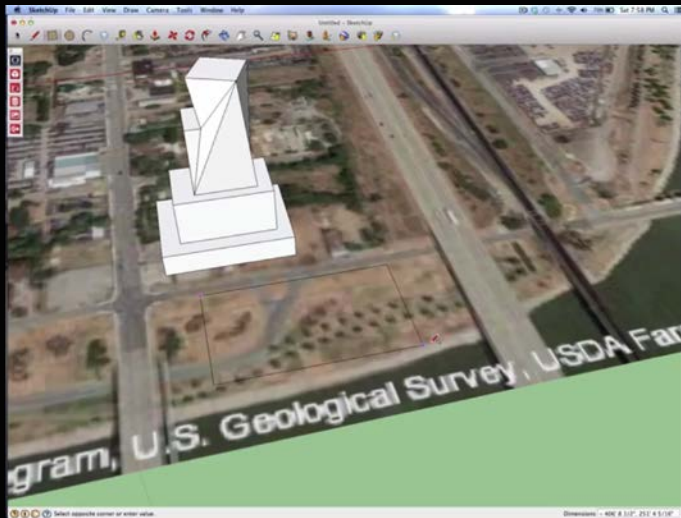


Special Event Traffic Flow

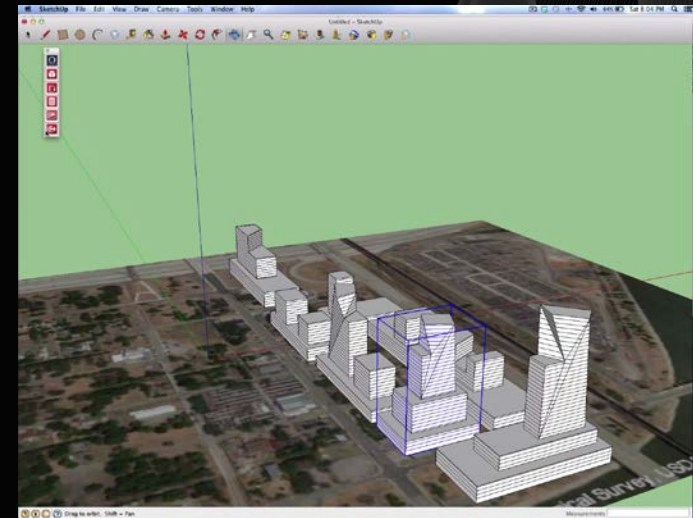
■ Carpark Control – Nos. of Lots Available



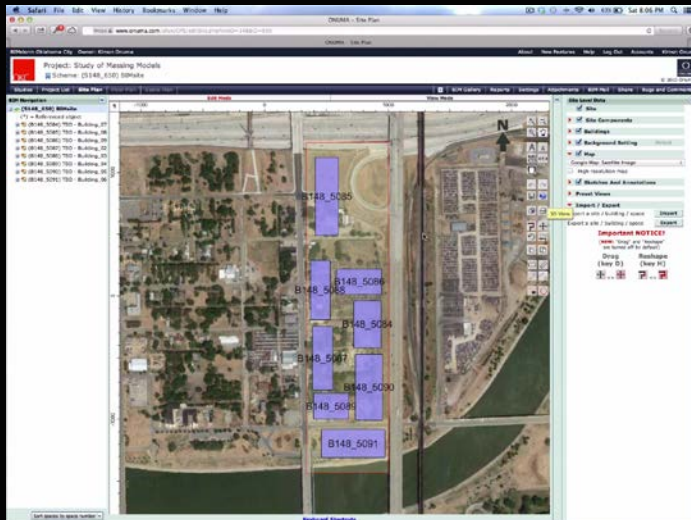
■ Design Approval – Volumetric



Single Massing Model



Multiple Massing Model in City Scale



Showing Rough Information – Lots Number

Building	Building Area	Building Volume	Building Height	Building Footprint	Building Envelope	Building Footprint Ratio	Building Envelope Ratio	Building Footprint Area	Building Envelope Area	Building Footprint Volume	Building Envelope Volume	Building Footprint Cost	Building Envelope Cost	Building Footprint O & M	Building Envelope O & M
Building_01	10,000.00	10,000.00	10.00	10,000.00	10,000.00	1.00	1.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Building_02	20,000.00	20,000.00	20.00	20,000.00	20,000.00	2.00	2.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Building_03	30,000.00	30,000.00	30.00	30,000.00	30,000.00	3.00	3.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
Building_04	40,000.00	40,000.00	40.00	40,000.00	40,000.00	4.00	4.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00	40,000.00
Building_05	50,000.00	50,000.00	50.00	50,000.00	50,000.00	5.00	5.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Building_06	60,000.00	60,000.00	60.00	60,000.00	60,000.00	6.00	6.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Building_07	70,000.00	70,000.00	70.00	70,000.00	70,000.00	7.00	7.00	70,000.00	70,000.00	70,000.00	70,000.00	70,000.00	70,000.00	70,000.00	70,000.00
Building_08	80,000.00	80,000.00	80.00	80,000.00	80,000.00	8.00	8.00	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
Building_09	90,000.00	90,000.00	90.00	90,000.00	90,000.00	9.00	9.00	90,000.00	90,000.00	90,000.00	90,000.00	90,000.00	90,000.00	90,000.00	90,000.00
Building_10	100,000.00	100,000.00	100.00	100,000.00	100,000.00	10.00	10.00	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00

Showing Detail Information – Building Areas, Utilities Summary, O & M Cost Summary

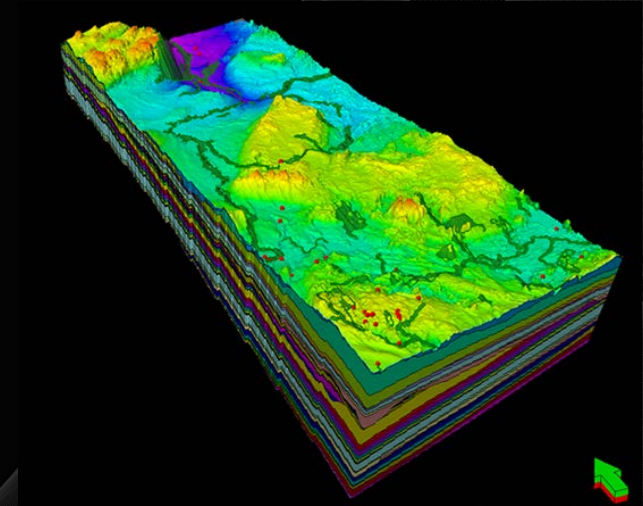
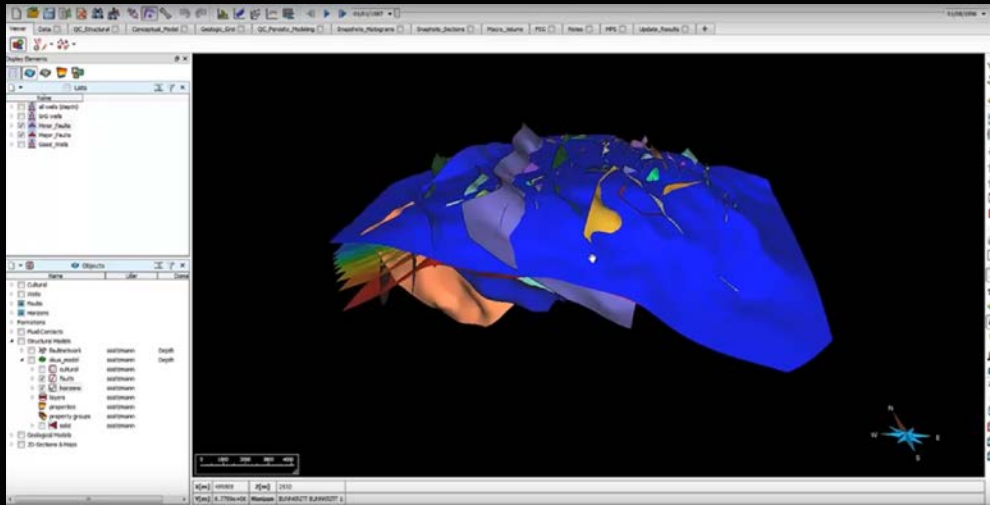
- **Design, Disposition and Height (DDH) Clause under Lease Conditions**



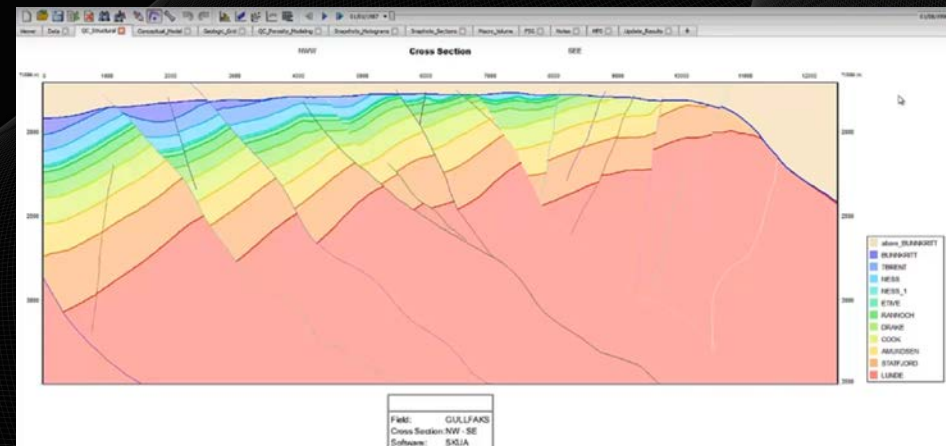
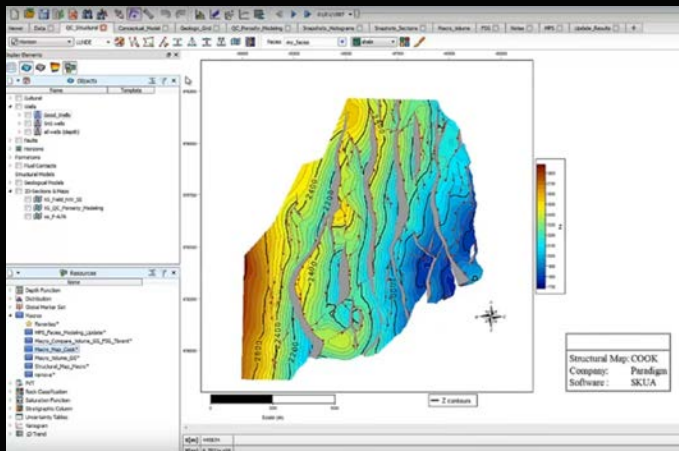
- **Design, Disposition and Height (DDH) Clause under Lease Conditions**



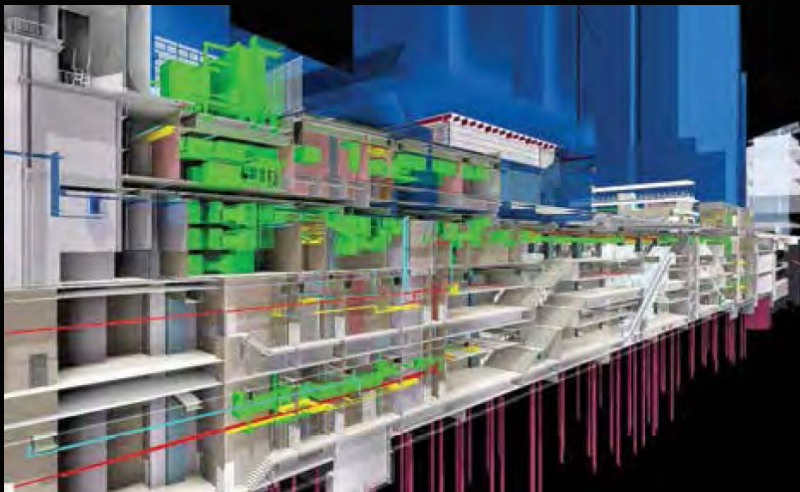
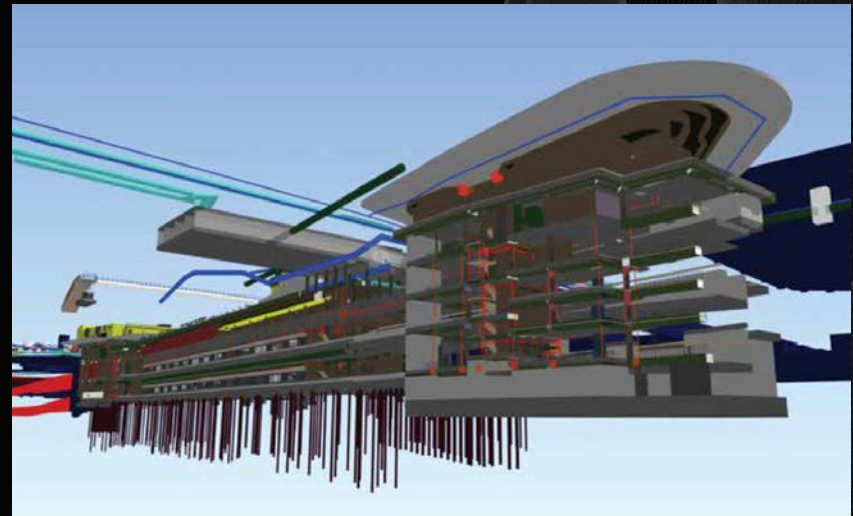
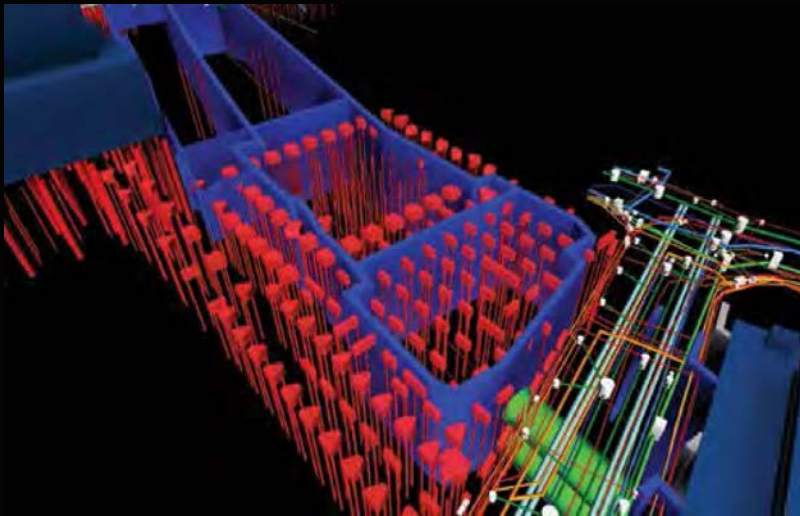
■ Geotechnical - Geological



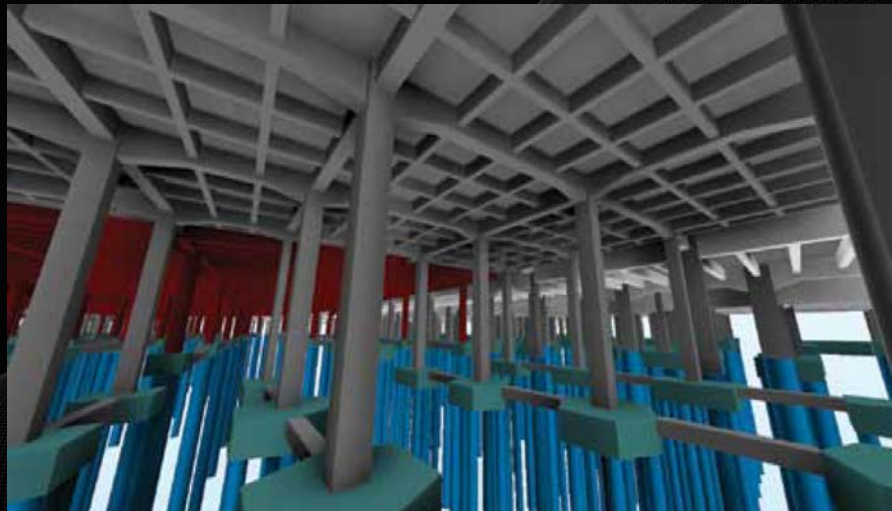
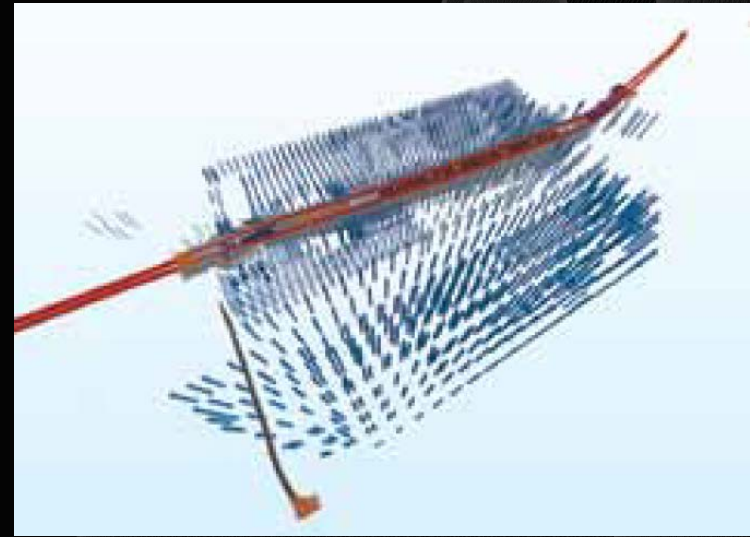
■ Technical Information from Geological Modelling



■ Geotechnical - Footing Information of MTR Station



■ Geotechnical - Footing Information of Railway Station

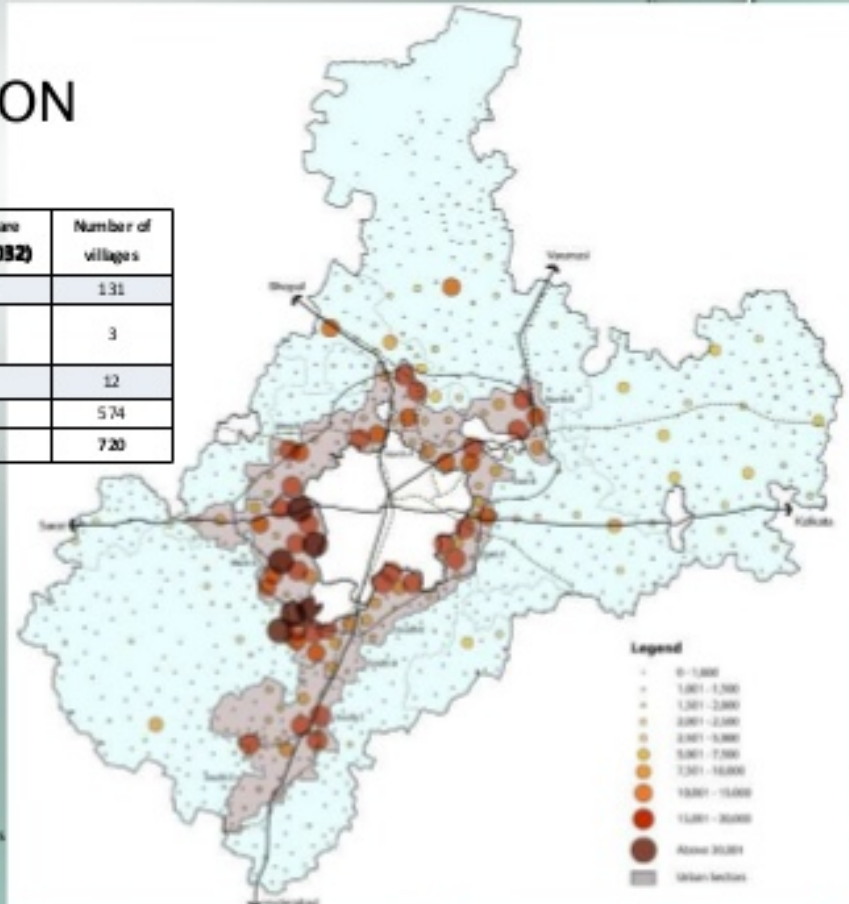
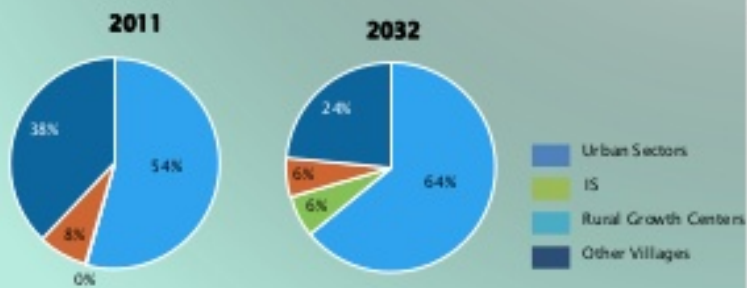


Population – Distribution Planning

POPULATION DISTRIBUTION

S.No	Description	Population 2011	Population 2027	Population 2032	Percent share of total (2032)	Number of villages
1	Urban Sectors*	5,63,287	9,55,000	10,87,000	64%	131
2	Kirmiti Improvement Scheme	670	1,10,000	1,10,000	6%	3
3	Rural Centers	78,540	90,500	1,02,500	6%	12
4	Other villages	3,91,080	3,44,500	4,00,500	24%	574
	Total	1,033,577	15,00,000	17,00,000	100%	720

Projected shift in percentage contribution of different areas



■ Population – Day & Night Information

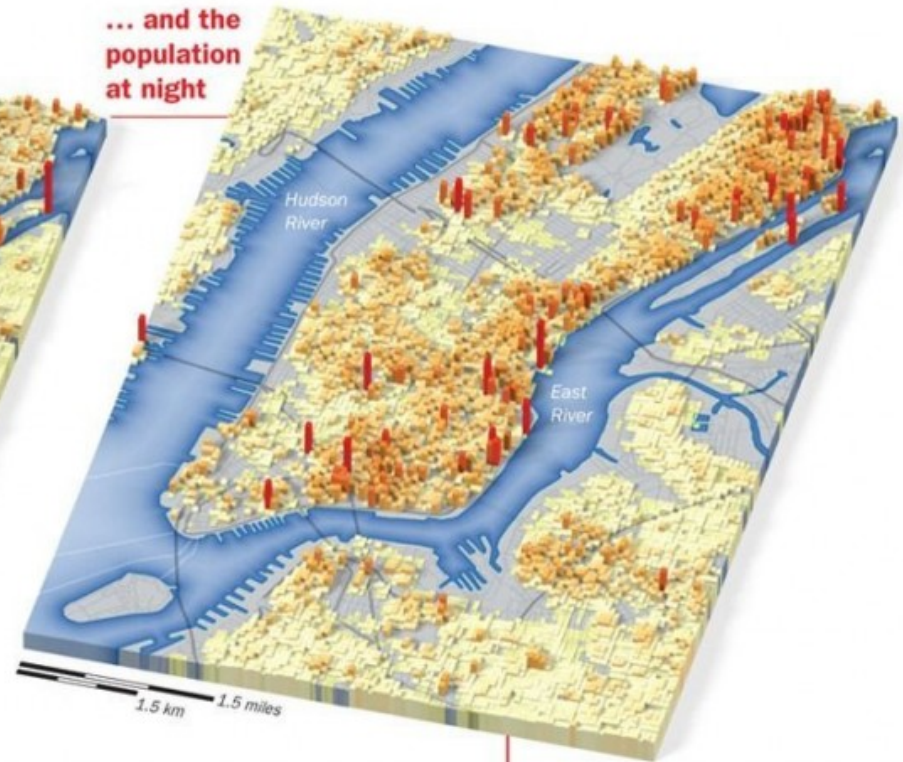
**This is
New York City's
population
by day ...**

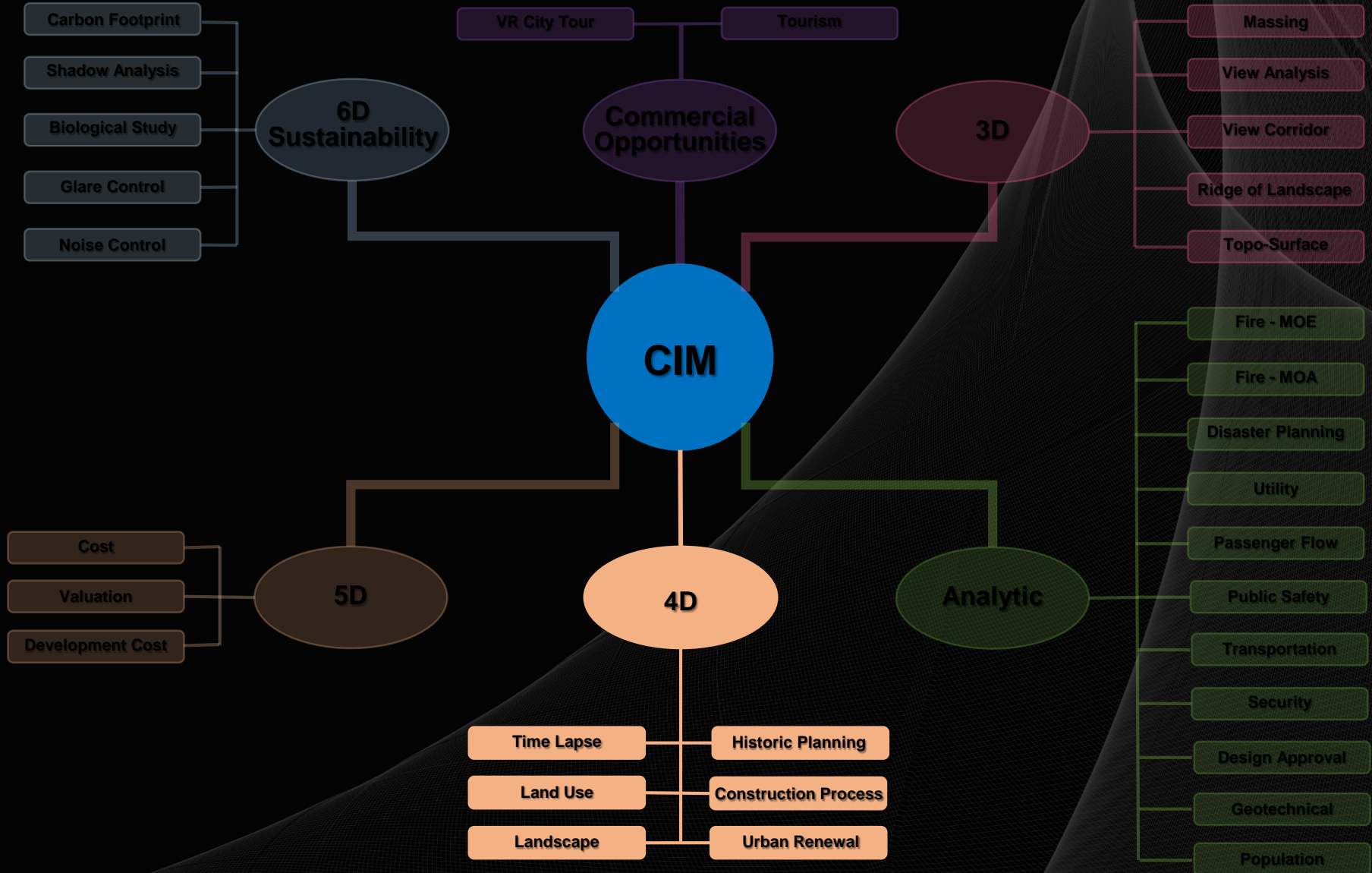
Traffic rank:
16th worst
(46 hr./yr.)

Average daily
commute:
34 min.

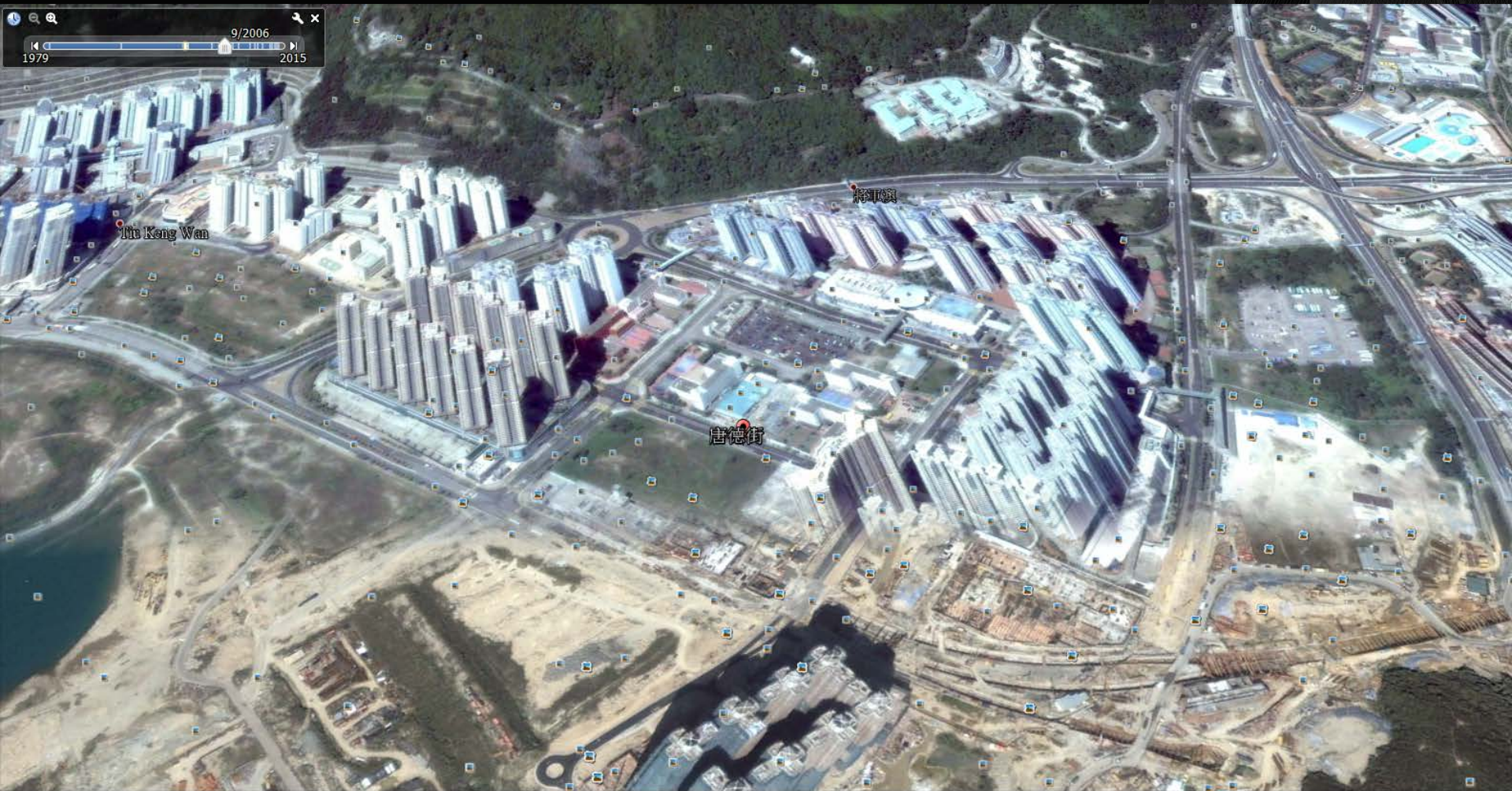
Key to city maps
Population
Low Medium High

**... and the
population
at night**





Time Lapse – Showing information in different era



Tseung Kwan O at 2006 September

Time Lapse – Showing information in different era



Tseung Kwan O at 2010 December

Time Lapse – Showing information in different era



Tseung Kwan O at 2012 January

Time Lapse – Showing information in different era



Tseung Kwan O at 2015 April

■ Land Use Planning in CIM



Existing Planning

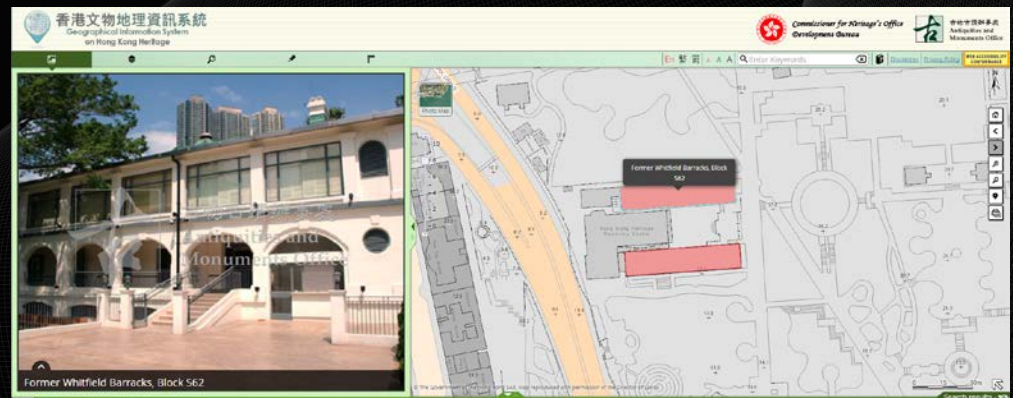
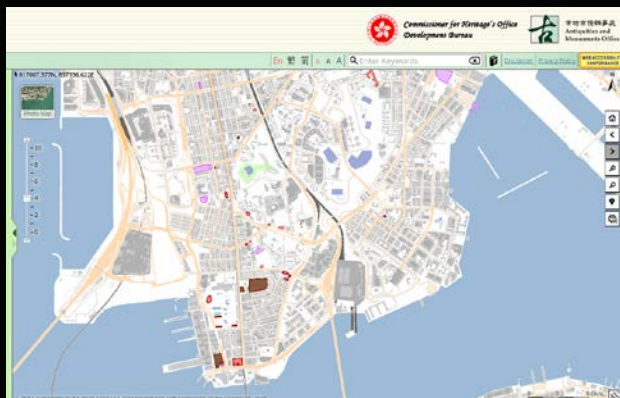
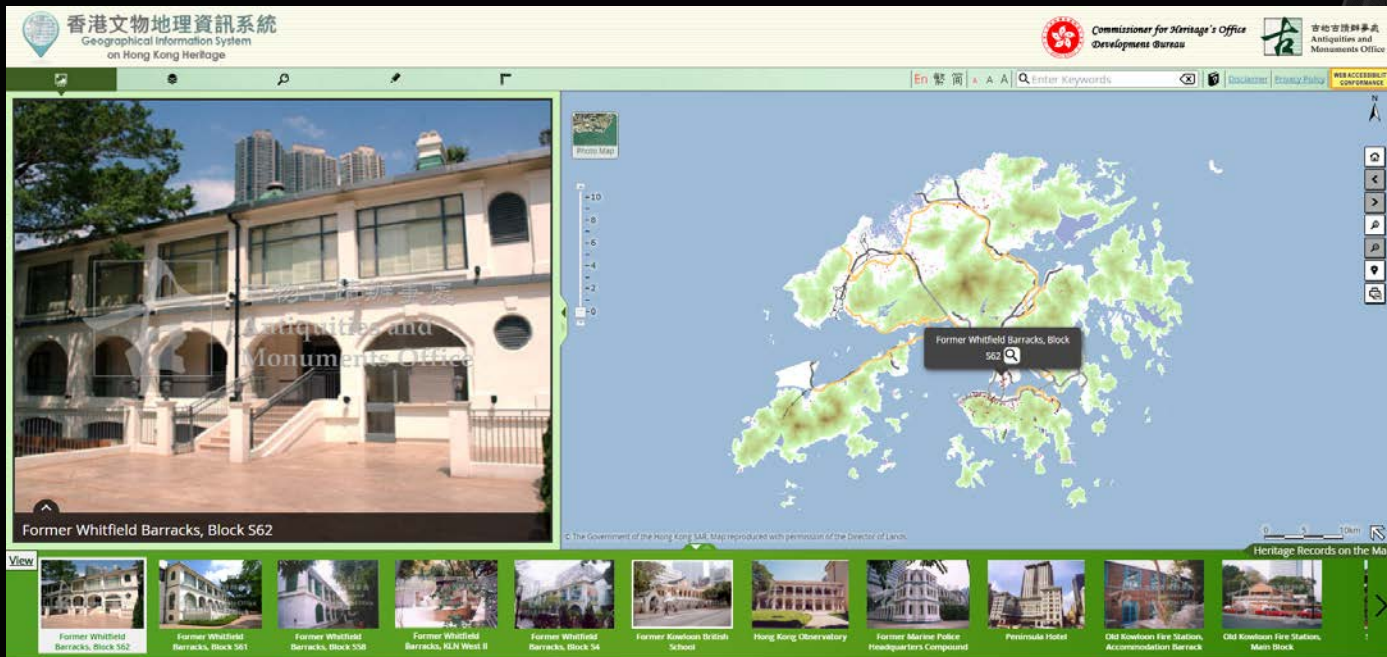


Proposed Zoning Scenario A



Proposed Zoning Scenario B

■ Historic Planning - GIS on Hong Kong Heritage

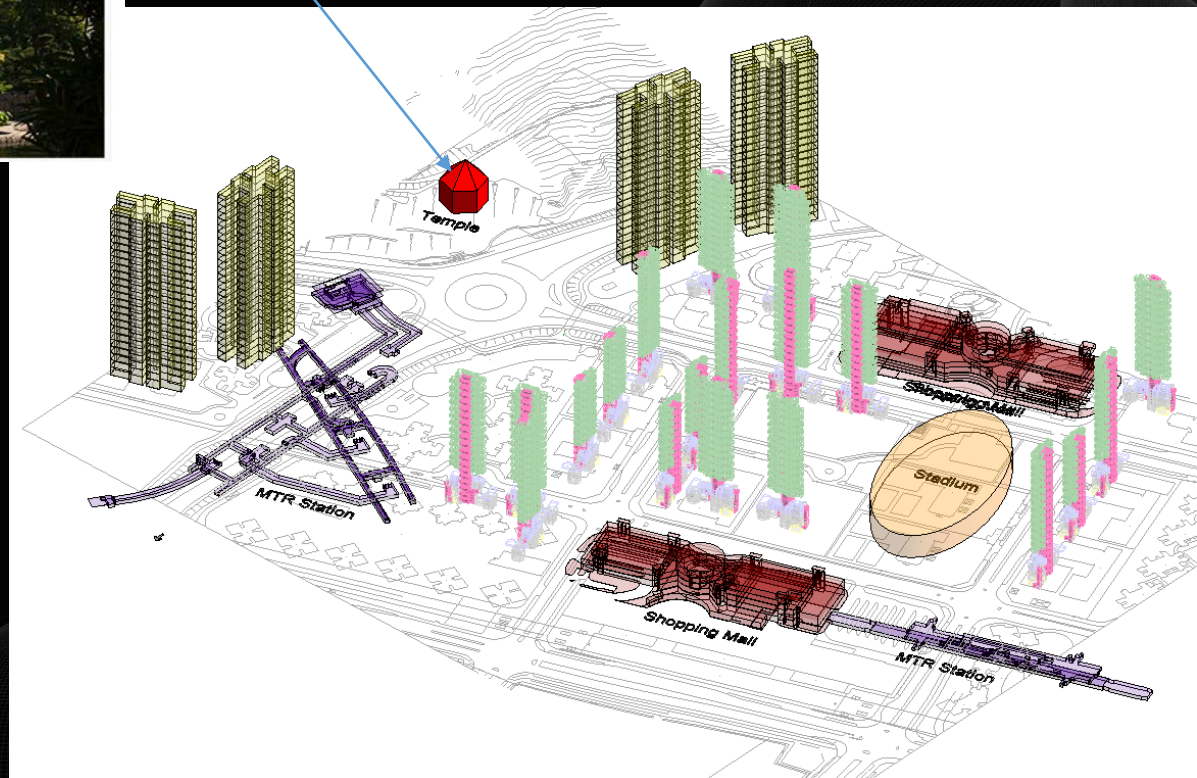


■ Historic Planning - Historic Building with Information in CIM

2. Chi Lin Nunnery and Nan Lian Garden

[Also see our travel article "The Four Best Chinese Restaurants in Hong Kong"]

At Diamond Hill, only one subway stop away from the Wong Tai Sin temple, you'll find the peaceful and serene Chi Lin Nunnery. In stark contrast to its colorful and brash Taoist neighbor, the Buddhist nunnery exudes calm and tranquility with smooth stone balustrades, lotus ponds and stunning wooden architecture. Inspired by Japanese and Tang Dynasty temples, the elegant series of halls and walkways were constructed without the use of nails, using a complex design of counterweights and dowels. Across the road, the Nan Lian Garden is a scenic oasis amid towering high-rise apartments looming up along the hillside. A relaxing stroll past ancient bonsai trees, koi ponds and meticulously landscaped gardens is the perfect antidote for those needing some time out from the hustle and bustle of the city.



■ Construction Process - Demolishing Old Building



Existing Building in Feb 2012



Erect Scaffolding in Mar 2012

Construction Process - Demolish Old Building



Demolishing Building in Apr 2012



Complete Demolish in May 2012

■ Construction Process - Excavation & Piling Foundation

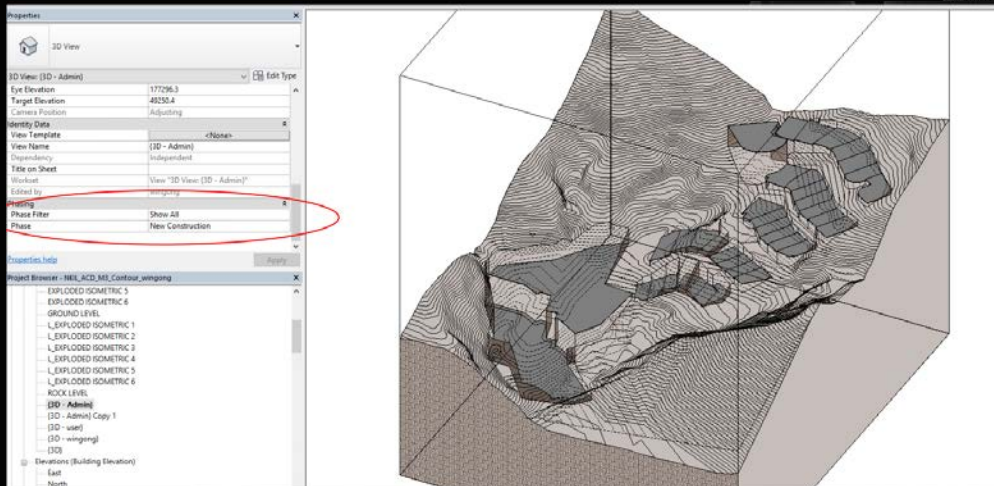
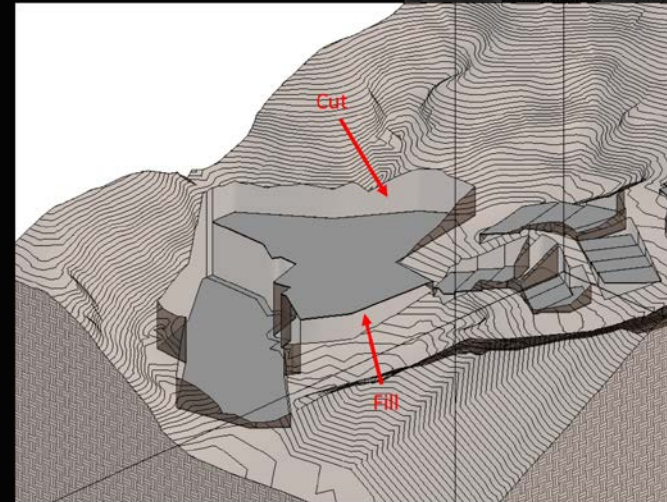
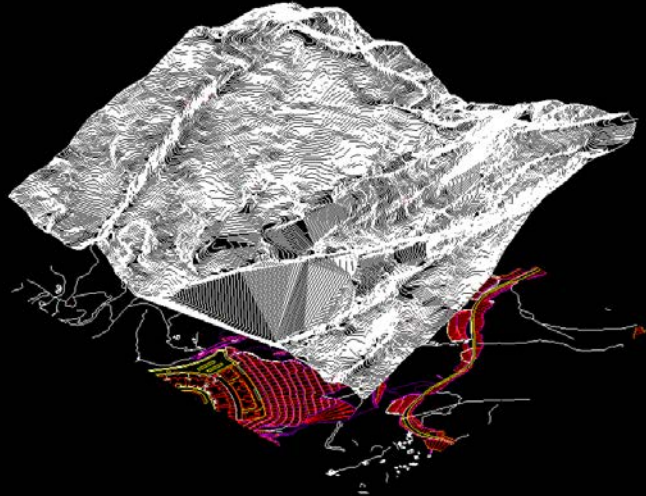


Excavation Work in Sept 2012



Piling Foundation in Oct 2012

Construction Process - Excavation – Cut & Fill Information



<CUT AND FILL SCHEDULE>				
	A	B	C	D
	Name	Cut	Fill	Net cut/fill
Building Pad 128.1		89798.28 m³	0.00 m³	-89798.28 m³
Building Pad 129.6		52360.25 m³	0.00 m³	-52360.25 m³
Building Pad (Step)		5383.86 m³	0.00 m³	-5383.86 m³
H1		0.00 m³	12829.57 m³	12829.57 m³
H2		0.99 m³	1540.89 m³	1539.89 m³
H3		322.57 m³	597.52 m³	274.95 m³
H4		555.67 m³	317.85 m³	-237.82 m³
H5		320.11 m³	396.49 m³	76.38 m³
H6		100.66 m³	804.80 m³	504.14 m³
H7		64.09 m³	519.90 m³	455.81 m³
H8		75.76 m³	341.93 m³	266.18 m³
H9		118.69 m³	500.14 m³	381.44 m³
H10		448.47 m³	77.97 m³	-368.50 m³
H11		588.78 m³	110.65 m³	-448.13 m³
H12		307.47 m³	185.24 m³	-144.23 m³
H13		237.63 m³	318.27 m³	80.64 m³
H14		248.40 m³	371.02 m³	128.64 m³
H15		276.46 m³	391.88 m³	115.42 m³
H16		885.19 m³	7.99 m³	-877.20 m³
H17		736.52 m³	40.41 m³	-696.11 m³
H18		423.65 m³	193.23 m³	-230.42 m³
H19		176.54 m³	382.37 m³	205.83 m³
H20		100.54 m³	520.46 m³	419.92 m³
H21		75.79 m³	508.42 m³	432.63 m³
H22		57.10 m³	251.52 m³	194.44 m³
H23		447.82 m³	14.84 m³	-432.98 m³
H24		1413.02 m³	0.00 m³	-1413.02 m³
H25		1070.35 m³	0.00 m³	-1070.35 m³
H26		617.03 m³	0.00 m³	-617.03 m³
H27		299.07 m³	30.22 m³	-268.84 m³
H28		122.06 m³	180.70 m³	68.64 m³
H29		25.92 m³	467.21 m³	381.59 m³
H30		262.03 m³	82.49 m³	-179.54 m³
H31		647.61 m³	7.26 m³	-640.34 m³
H32		538.61 m³	0.00 m³	-538.61 m³
H33		1107.99 m³	0.00 m³	-1107.99 m³
H34		798.08 m³	0.00 m³	-798.08 m³
H35		771.66 m³	0.00 m³	-771.66 m³
H36		625.46 m³	0.00 m³	-625.46 m³
Grand Total: 38		162088.24 m³	21608.91 m³	-140479.33 m³

■ Construction Process - Erection of Main Building



Erect 1st Floor in Mar 2013

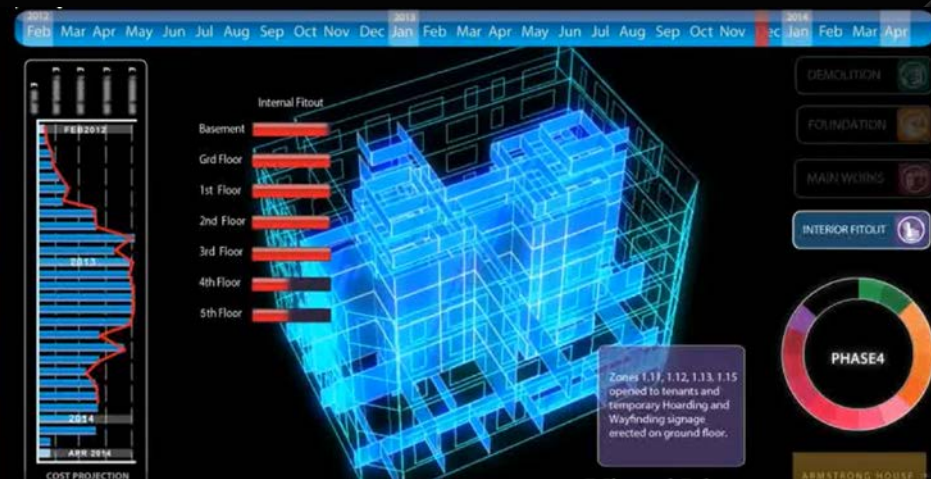


Erect 5th Floor in Jun 2013

Construction Process - Erection of Main Building



Construct Building Skin in Aug 2013



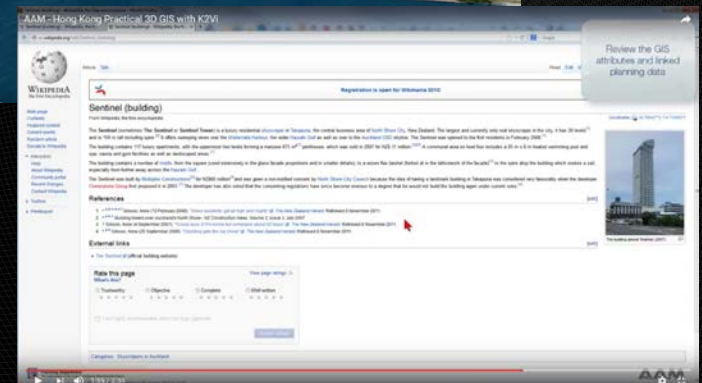
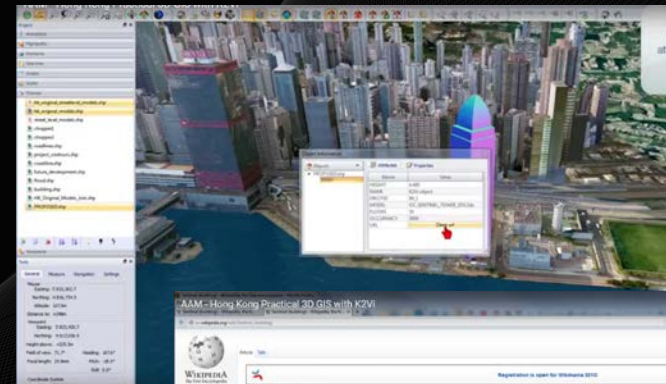
Interior Fitting Out in Dec 2013

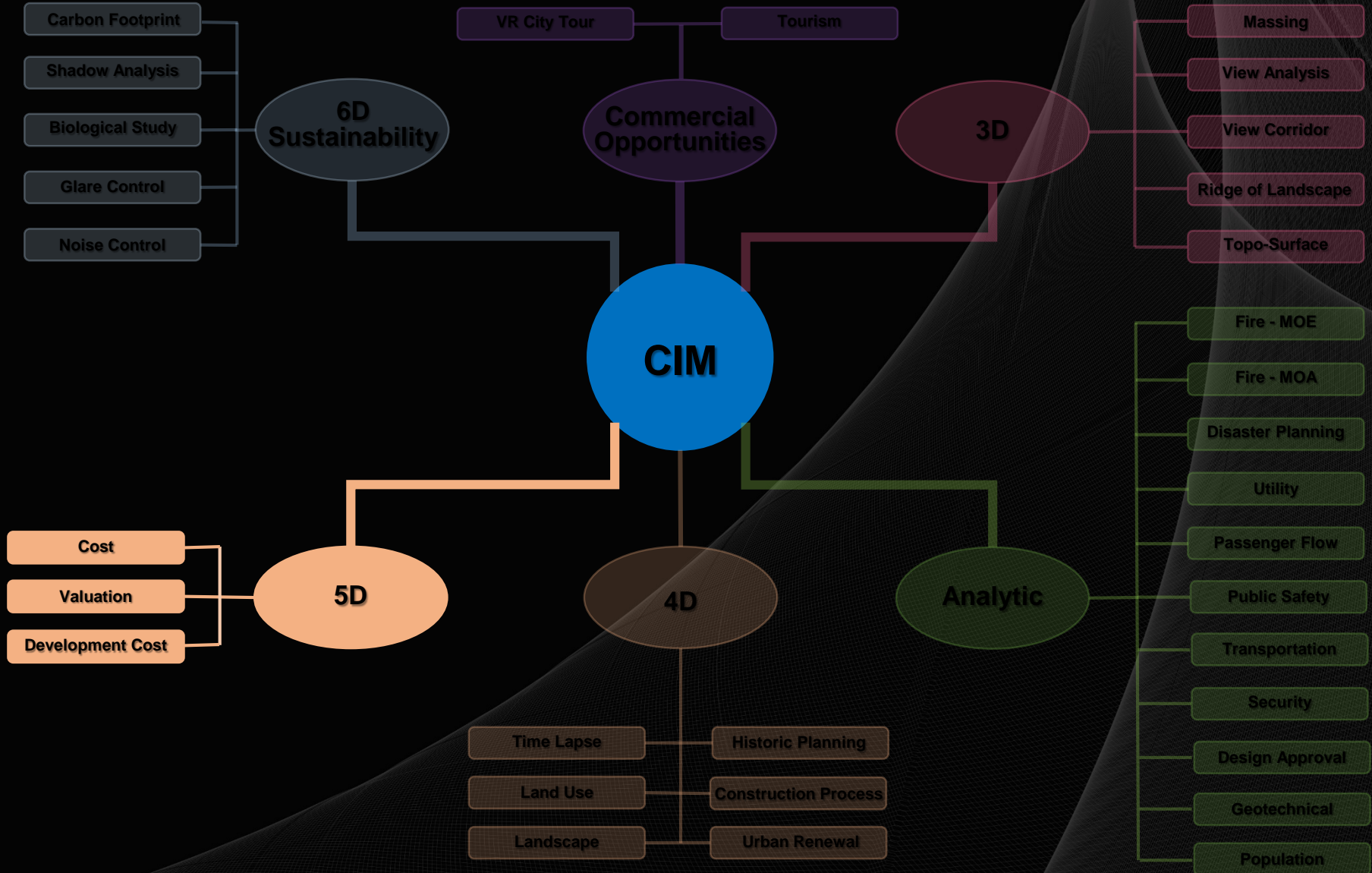
■ Construction Process - Complete Construction



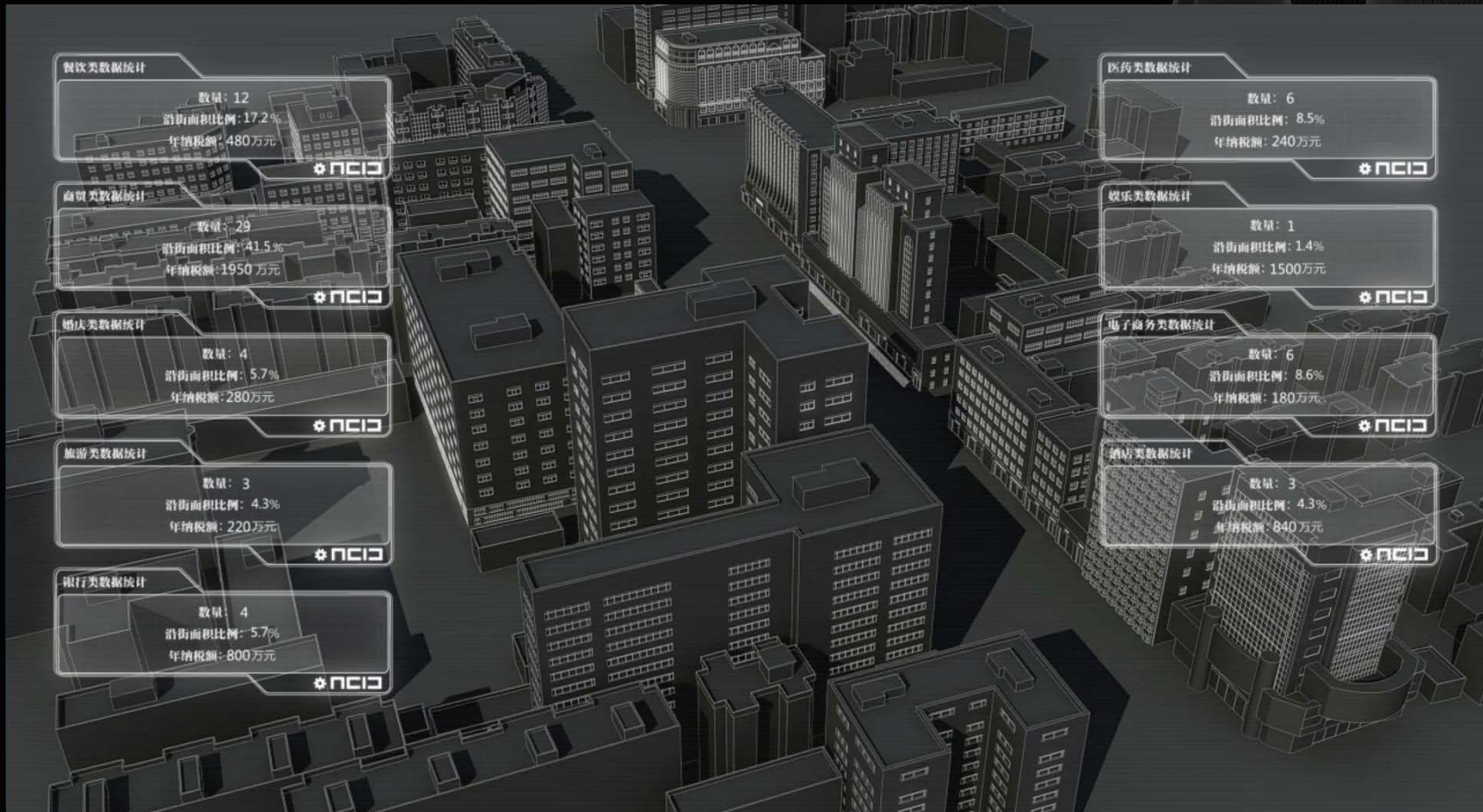
Complete Construction in Apr 2014

■ Urban Renewal



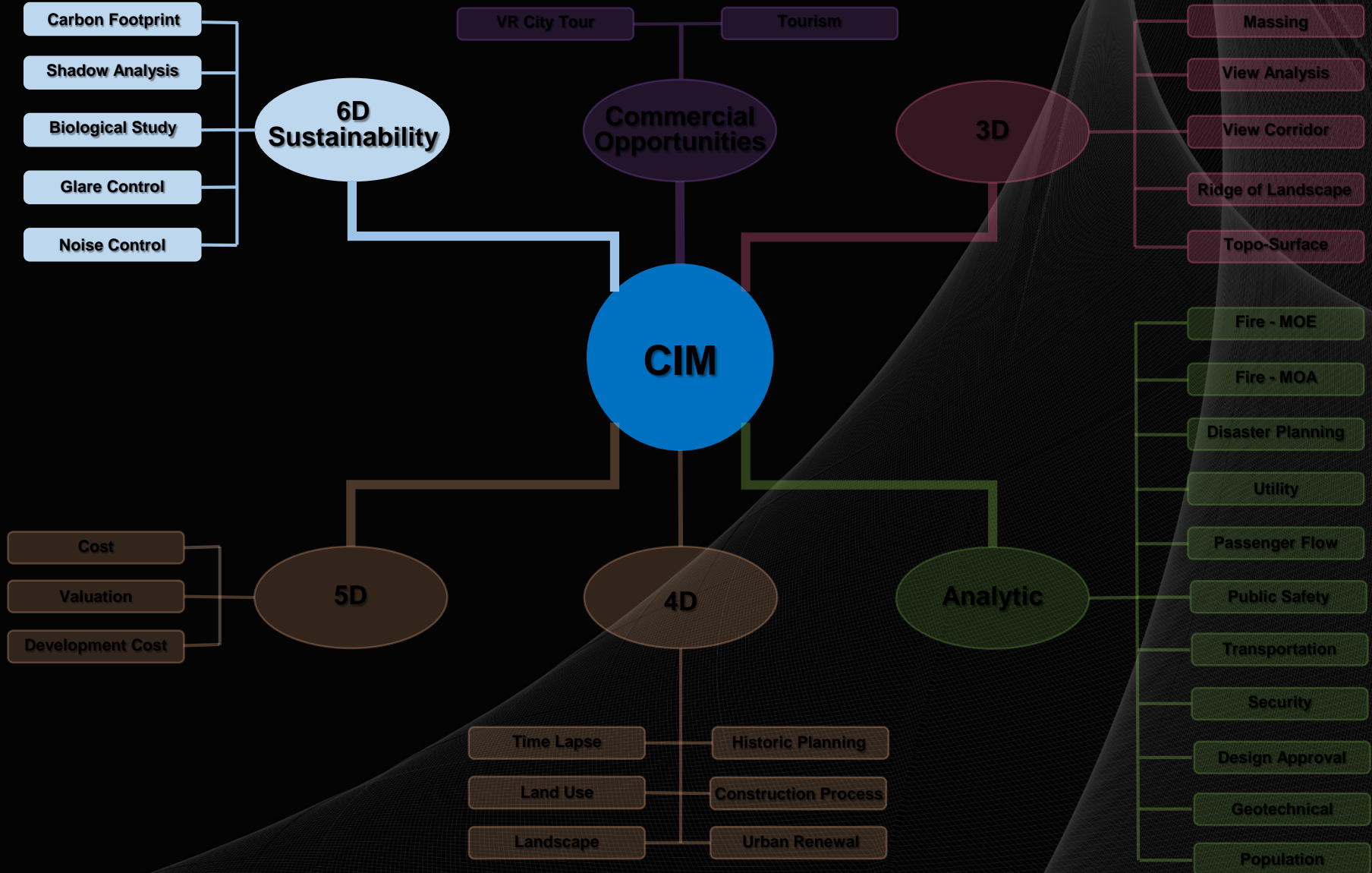


■ Cost & Valuation of different industry in CIM



Development Cost for Infrastructure



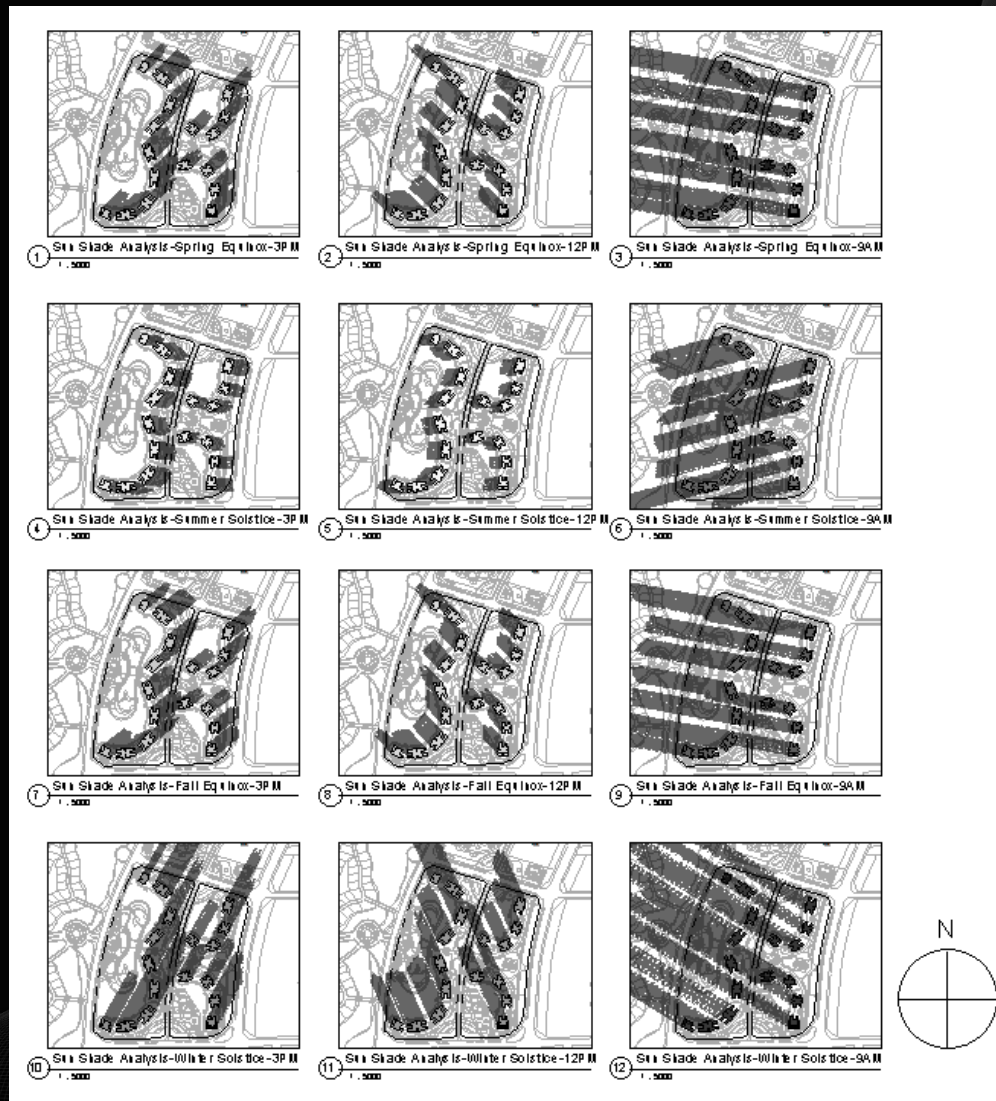


■ Sustainability

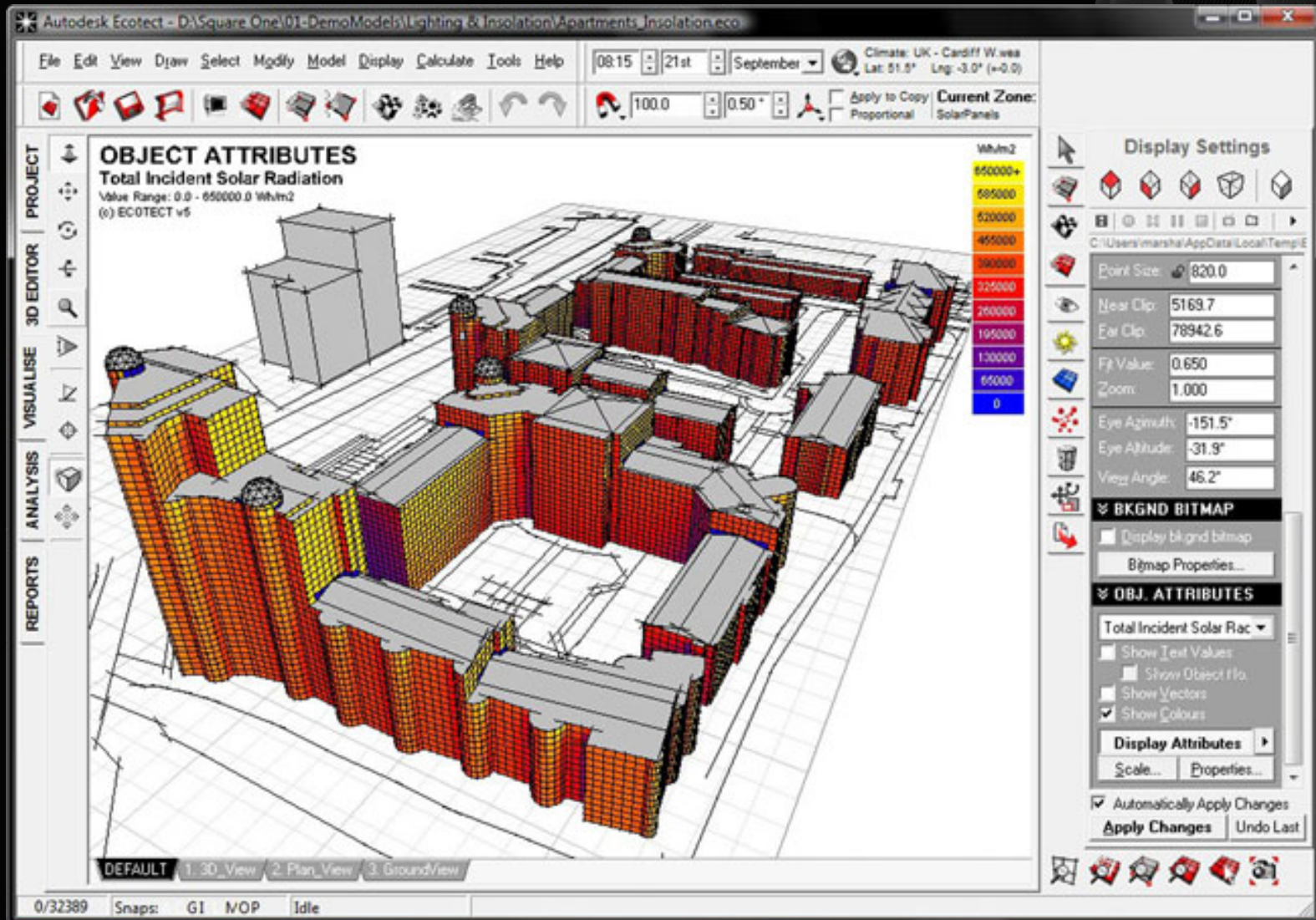
A New LEED® ND Neighborhood
in the Bronx, NY



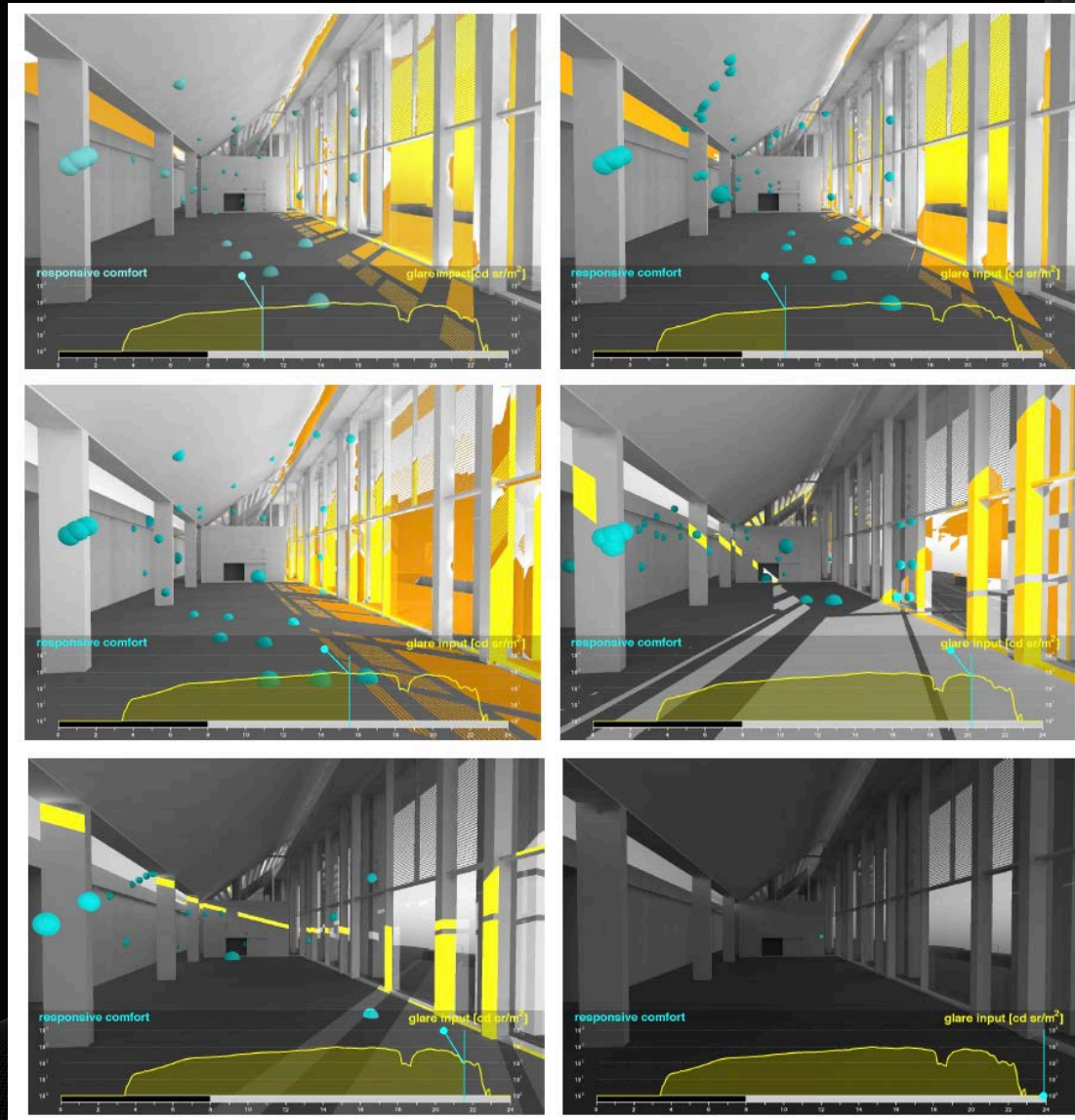
■ Showing shadow information in CIM

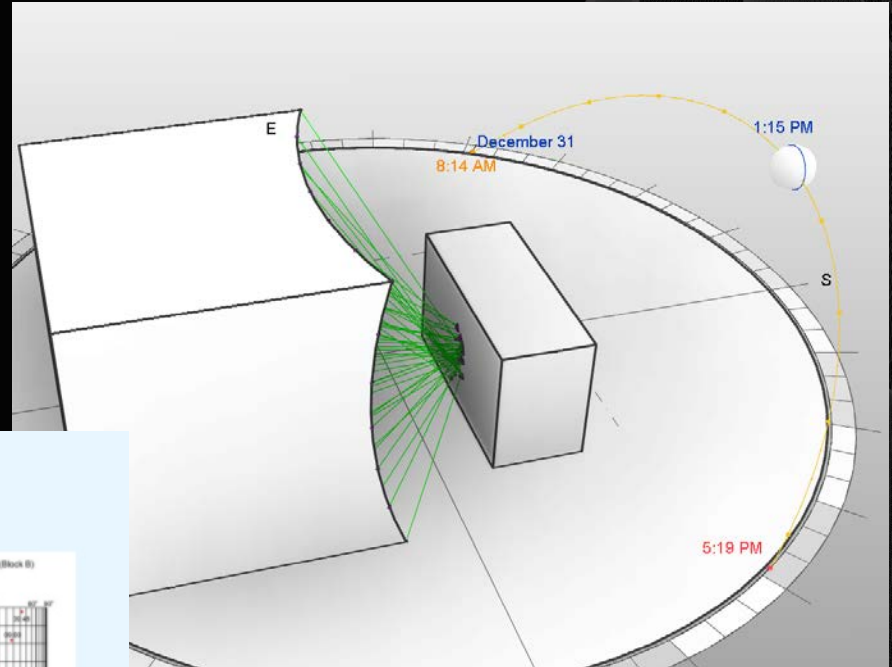


■ Sustainability

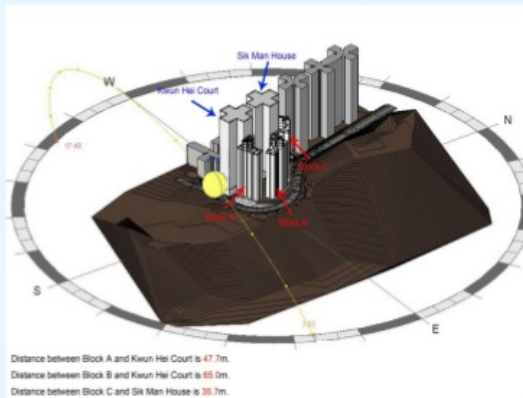


■ Showing shadow information in specific location

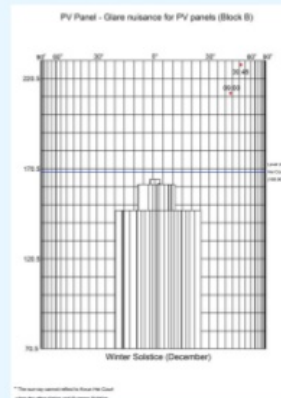




Glare Analysis of PV Panel



Glare Analysis of PV Panel



No Glare Nuisance to Nearby Buildings

Sheung Lok Street HOS

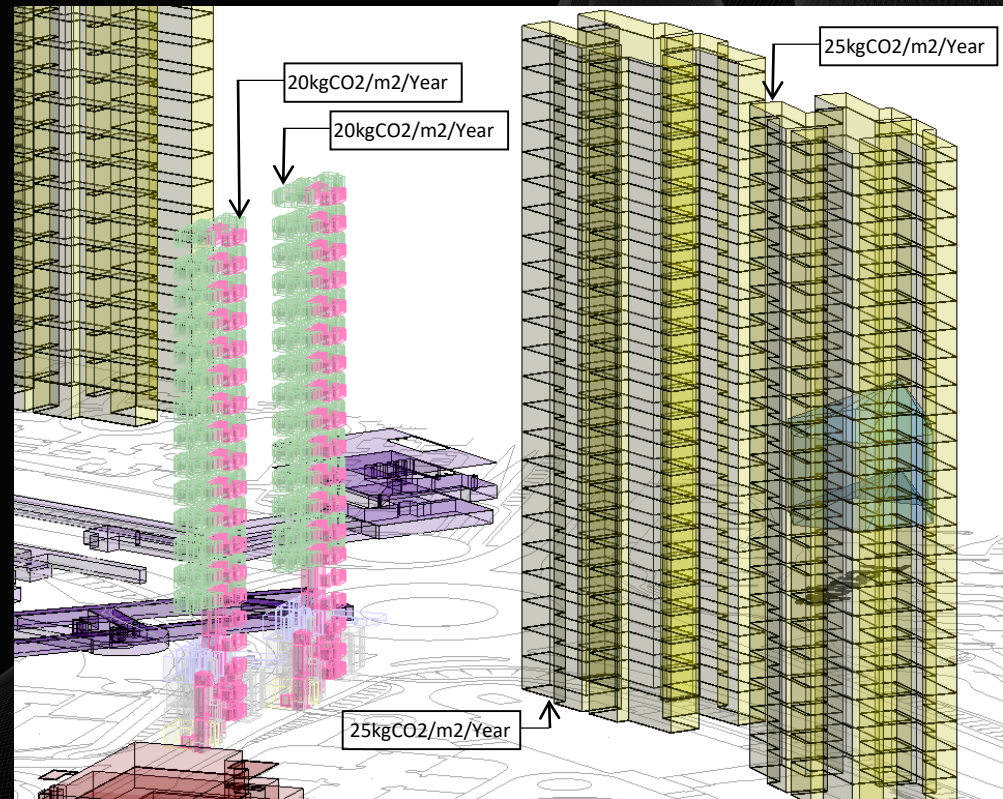
17

■ Glare Control in CIM

Carbon Footprint

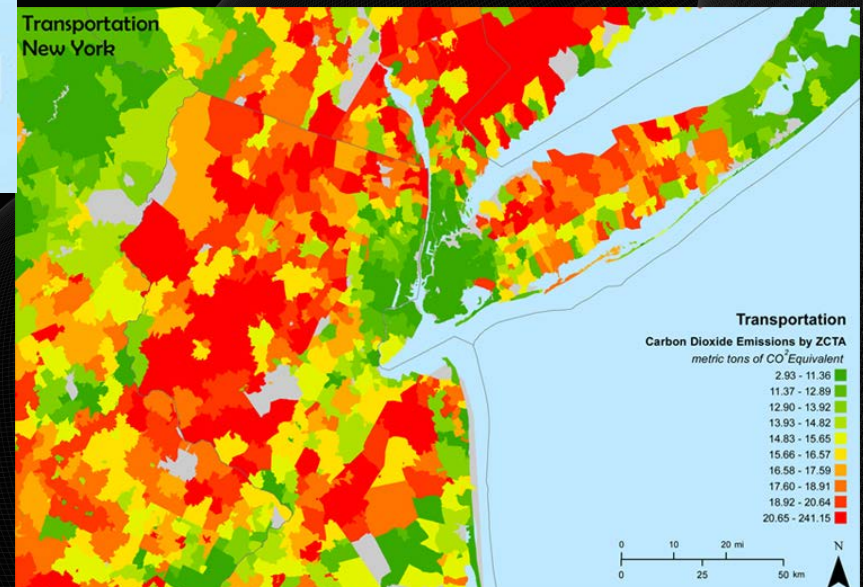
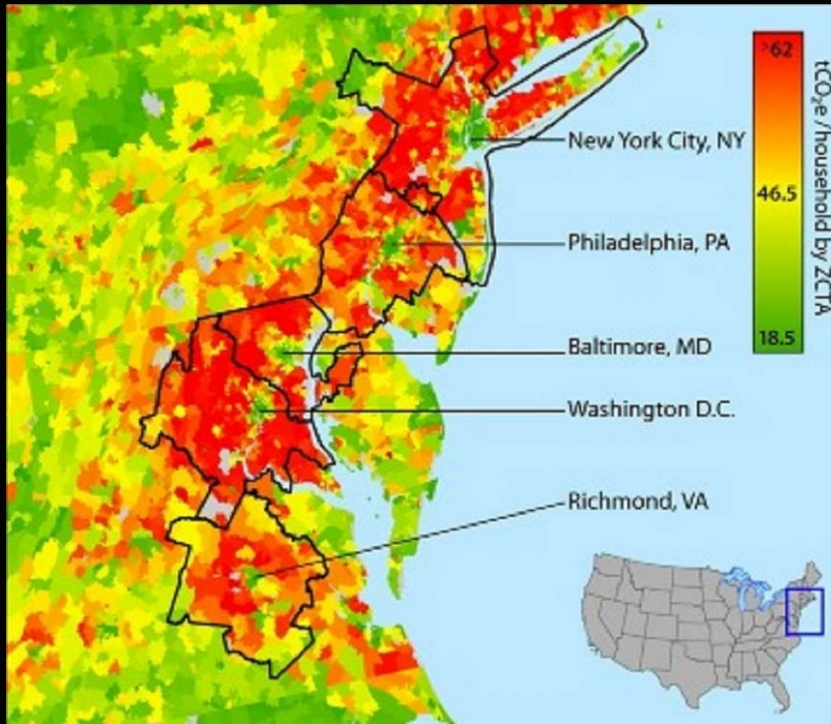


Choosing different building elements
to reduce Carbon Footprint

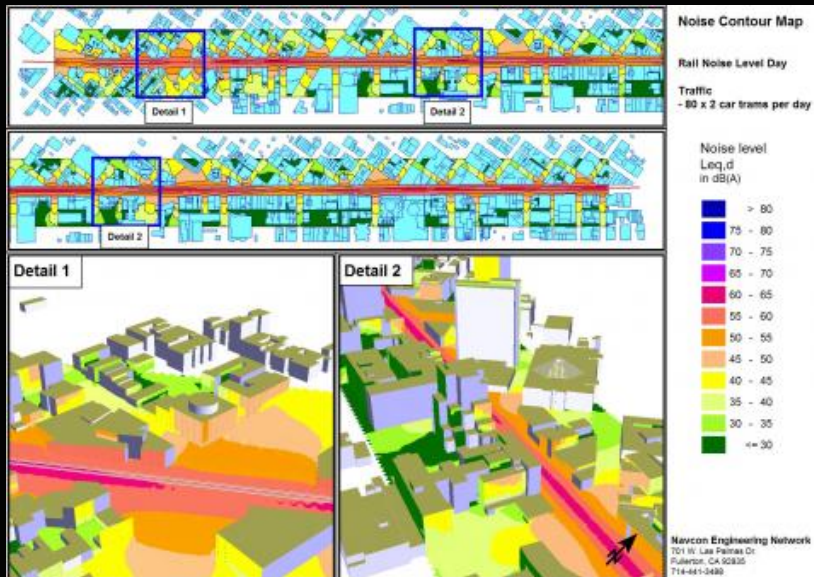
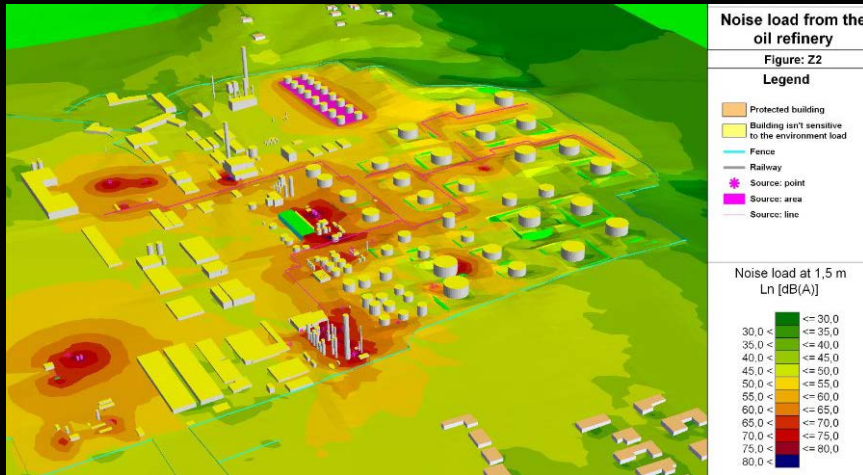


Carbon Footprint in City Model

■ Carbon Footprint

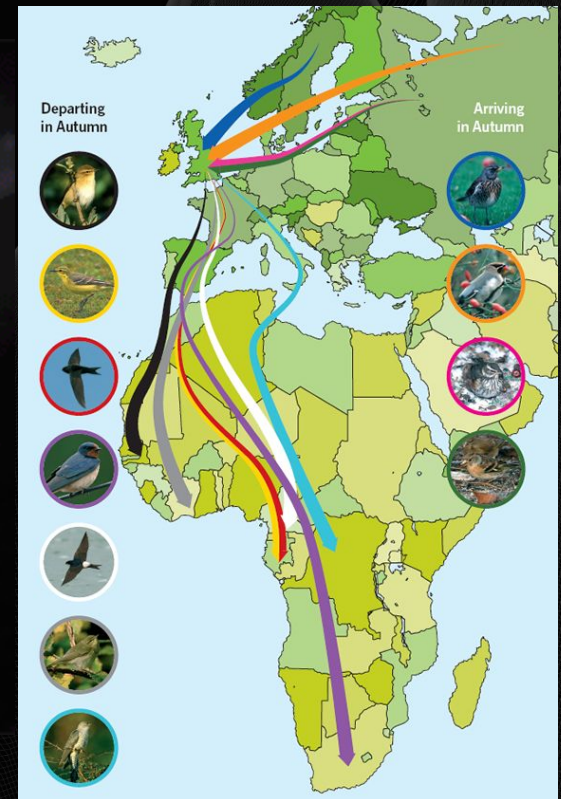
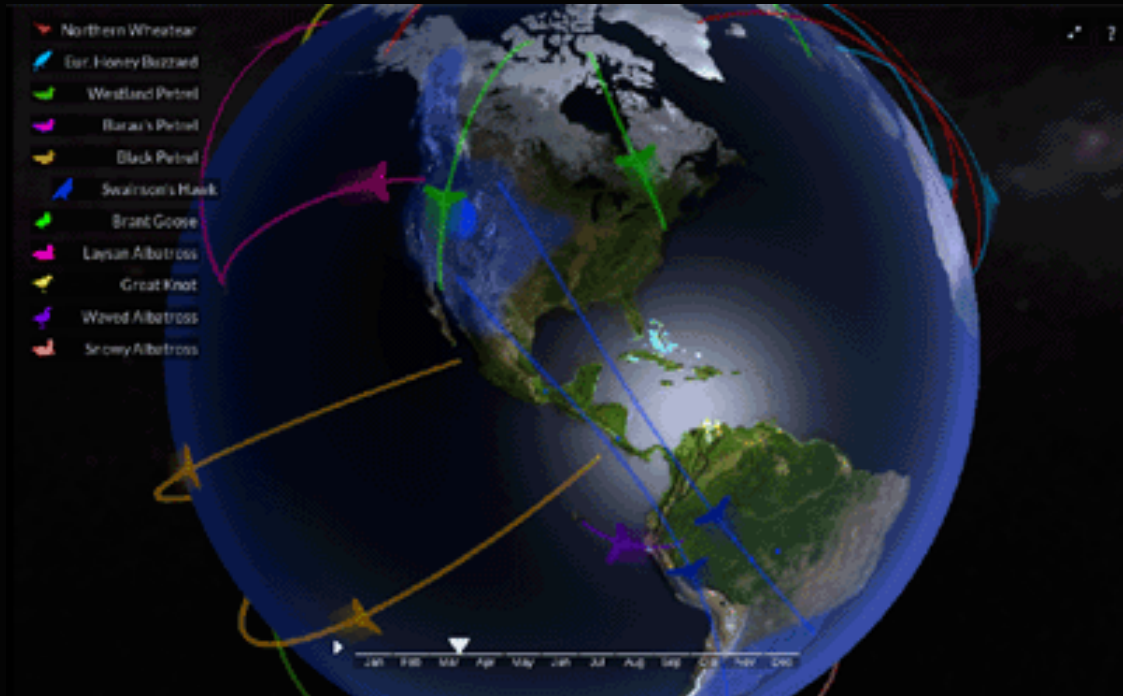


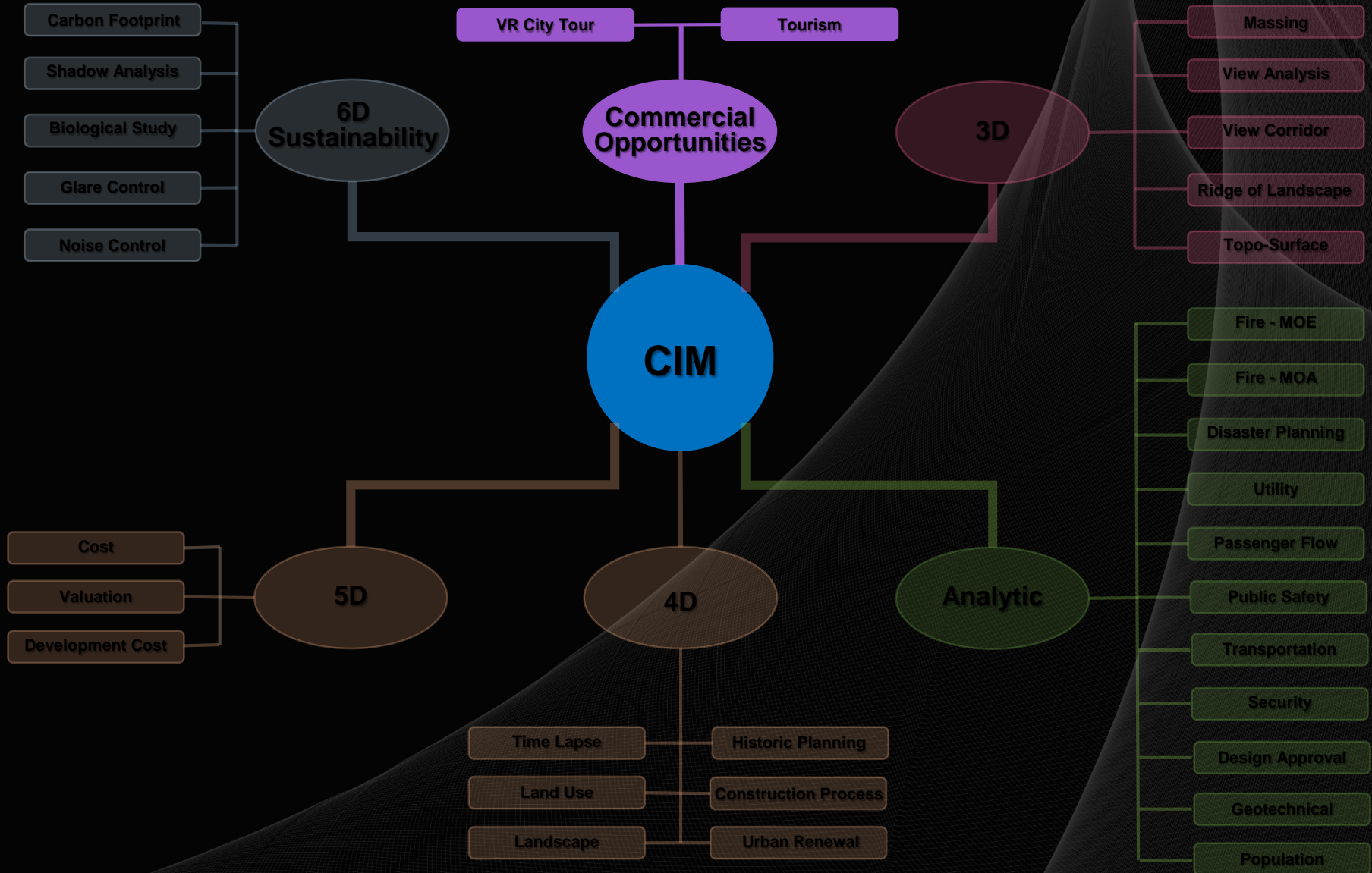
■ Noise Control - 3D Noise Load Information



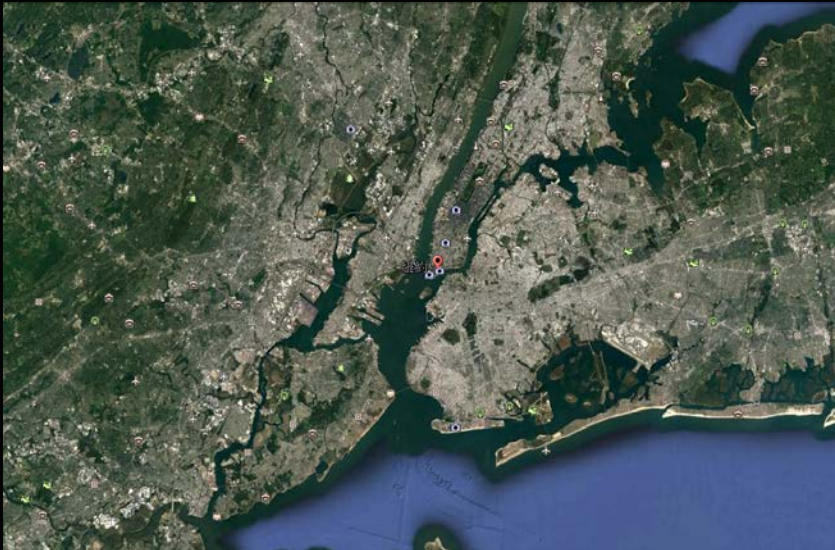


Biological Study - Bird Migration Map





■ Commercial Opportunities - Tourism & VR City Tour



New York City in 3D virtual reality.

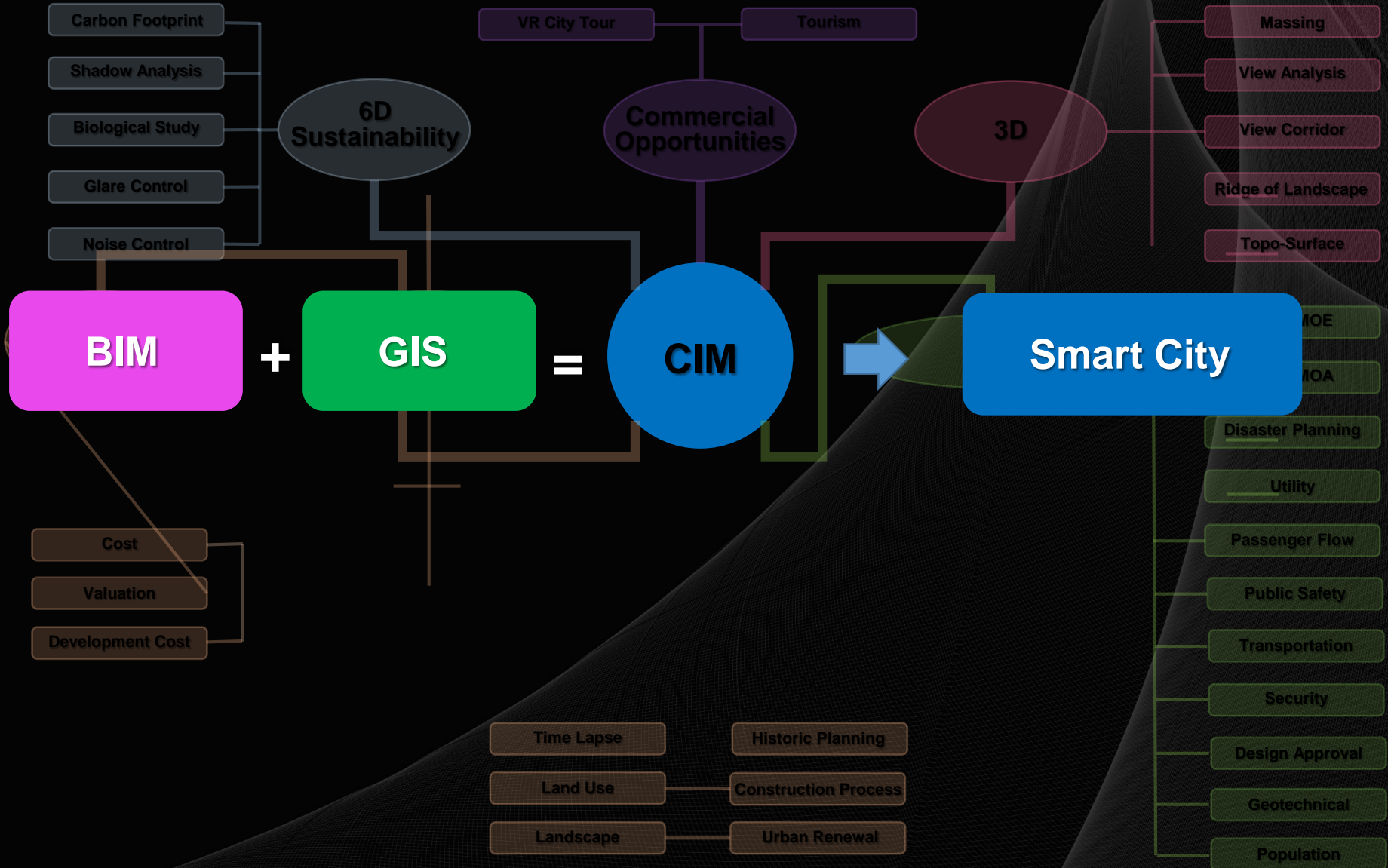


Land Mark Building

New York City in 3D virtual reality.



City Life



! Thank you !