Integrated Resource Management (IRM)





SPeAR[®] Integrated Thinking

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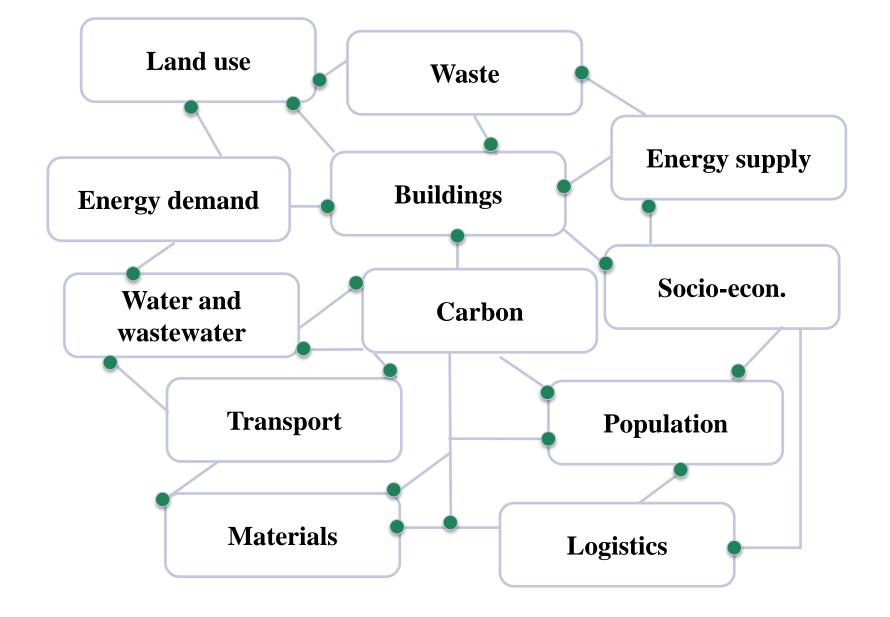
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SPeAR is Arup's sustainability appraisal tool. It provides a holistic project sustainability decision-making framework and access to the knowledge and skills of Arup's global experts.

Wate Water

Sustainable Project Appraisal Routine







³ Integrated Resource Management

Integrated Resource Management

A holistic quantitative model for improved understanding of urban systems and the impact of decisions



⁴ Why develop a model?

Integrated Resource Management



5 IRM

Waterfront Toronto Carbon Tool

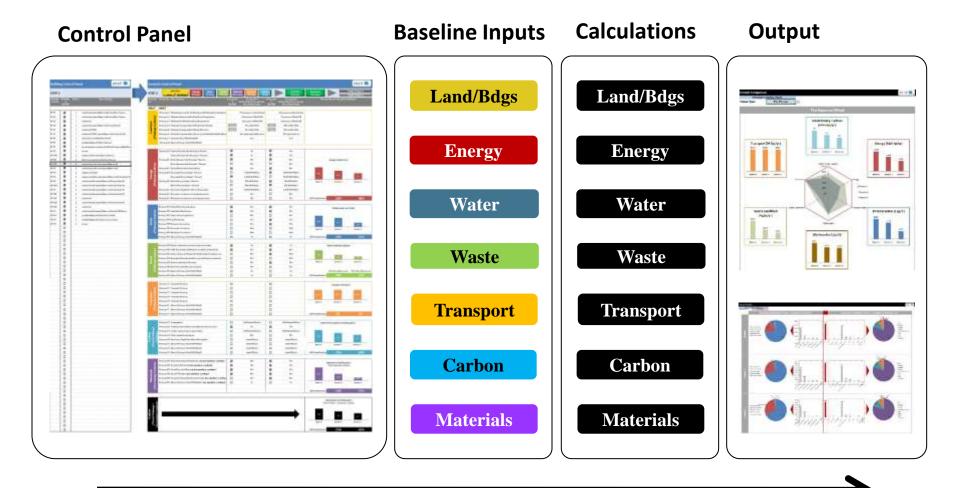


- 32 hectares
- 6,000 new
 residential units
- 9.3 hectares of parks and public space
- Home of Toronto 2015 Pan/Parapan American Games Athletes' Village

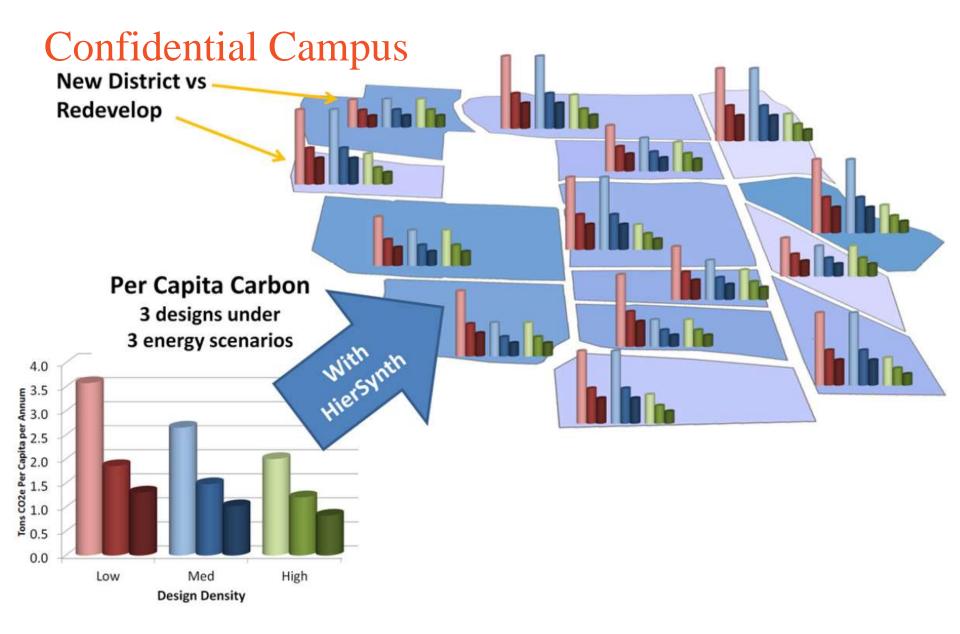
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Waterfront Toronto Tool

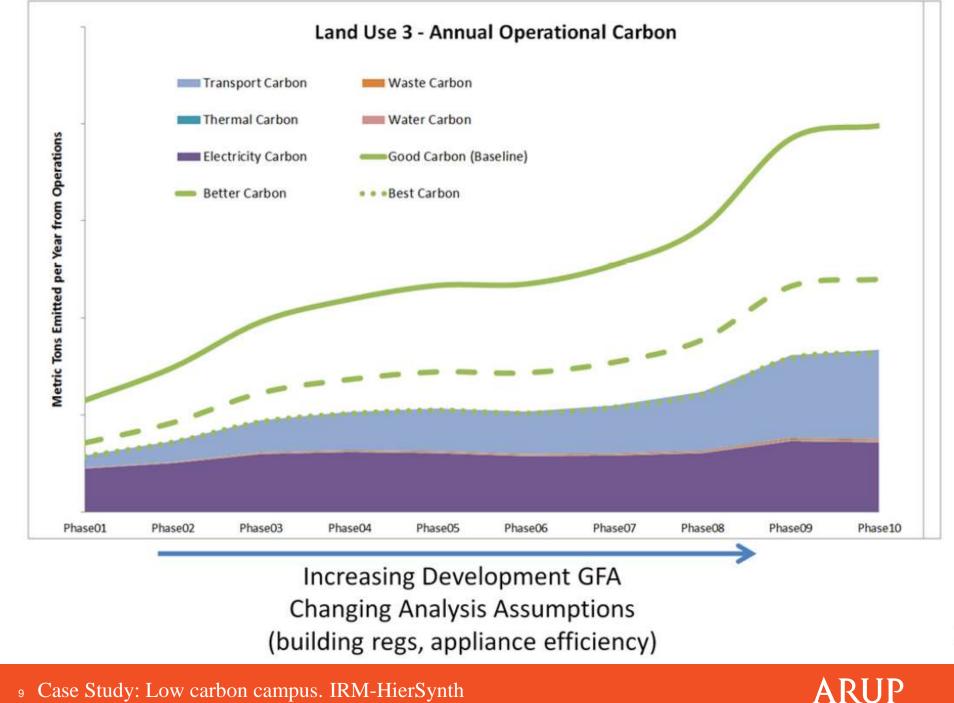






8 Case Study: Low carbon campus. IRM-HierSynth





⁹ Case Study: Low carbon campus. IRM-HierSynth

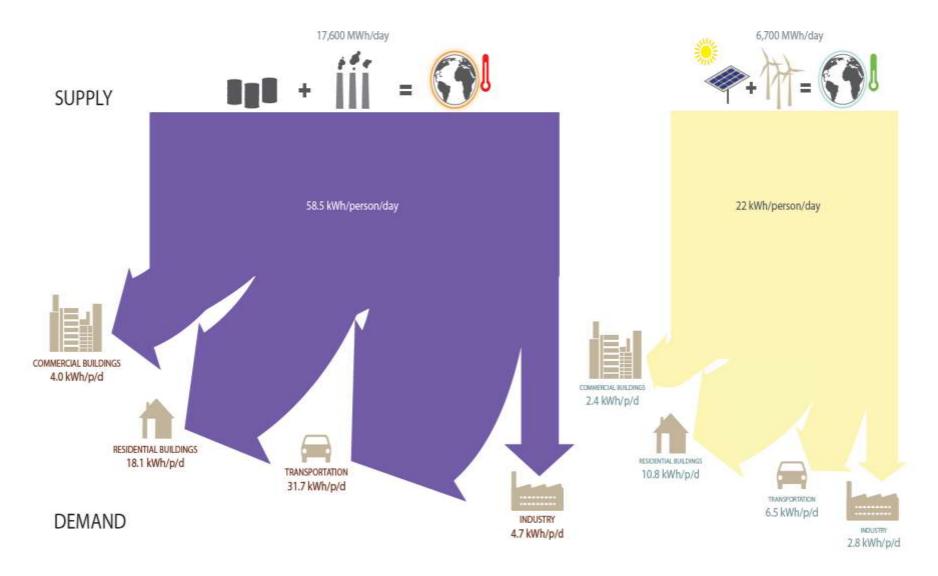
KA-Care City for Atomic and Renewable Energy





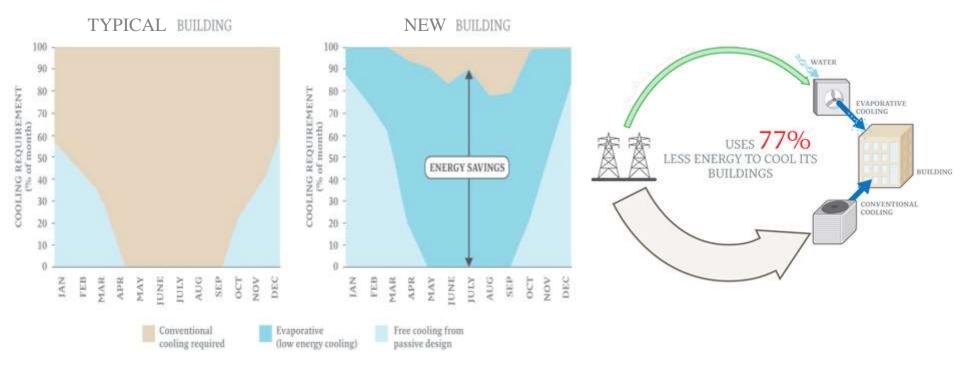


Energy reduction





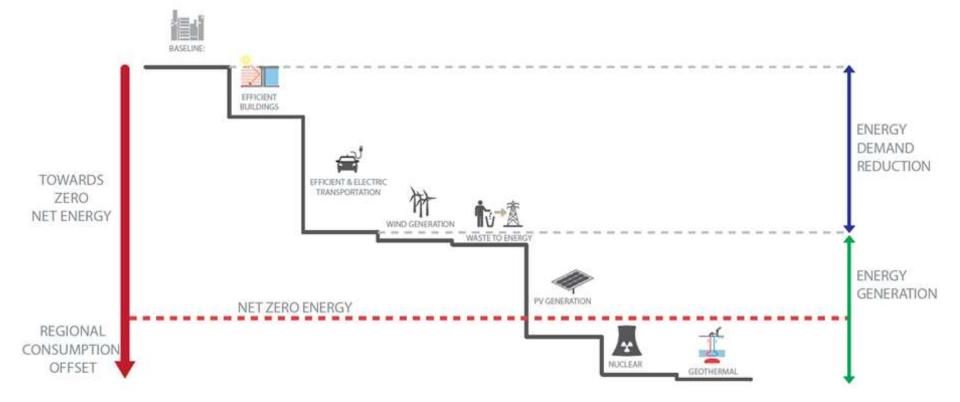
Energy reduction – cooling strategy



Low energy cooling strategies achieves a 77% energy saving Chillers only needed for 10% of year

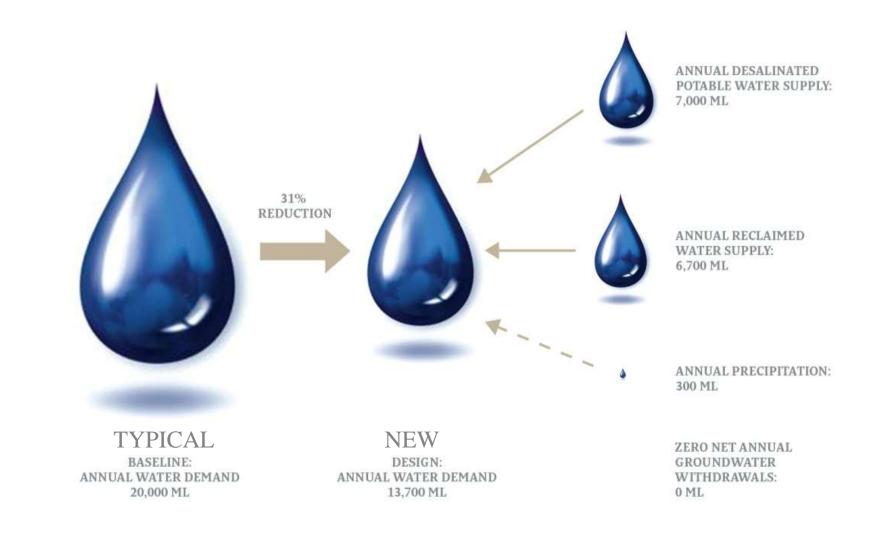






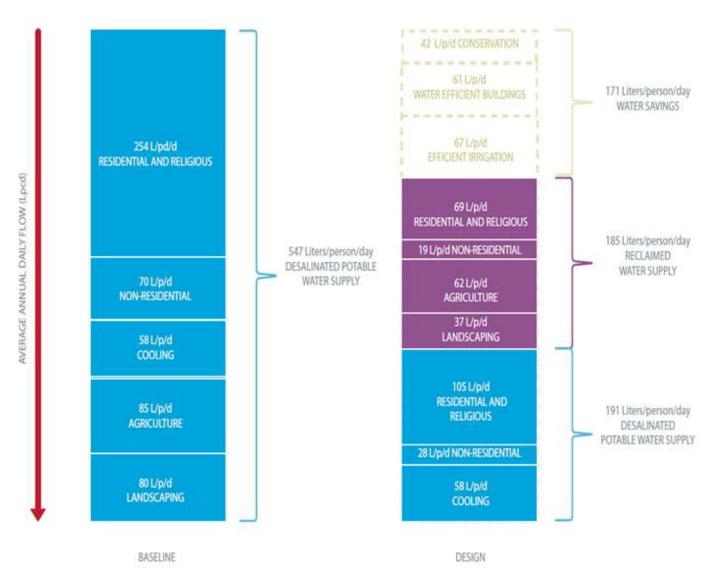


Water reduction



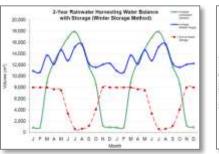


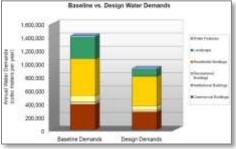
Minimizing imported potable water

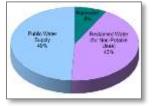


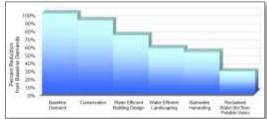
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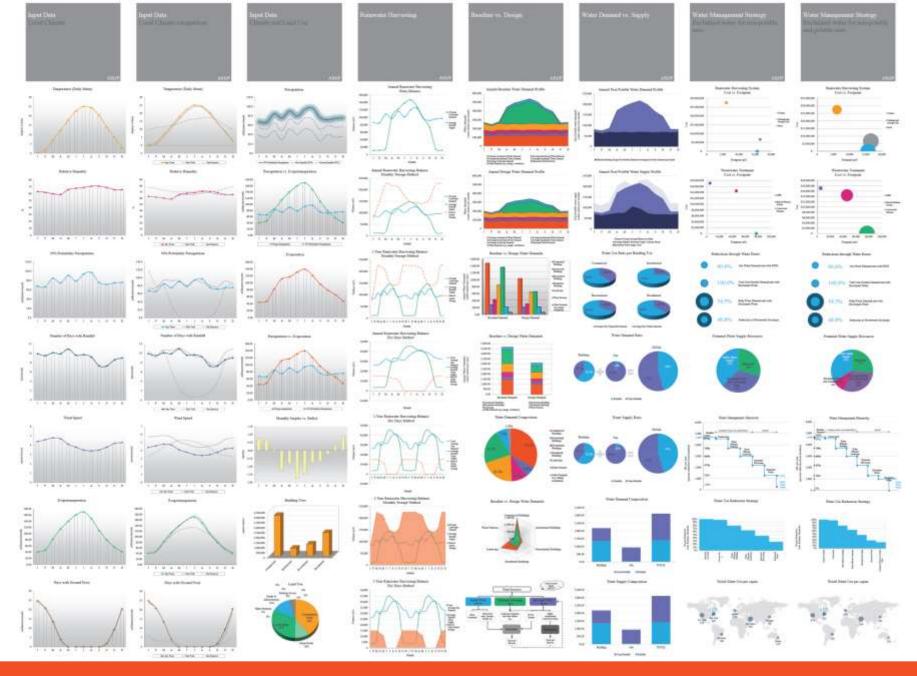








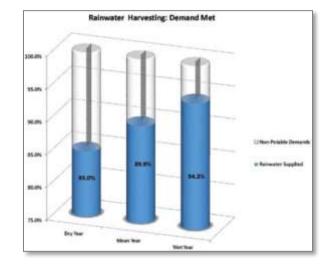
Design Tools | Water Neutral Design



Design Tools | Water Neutral Design

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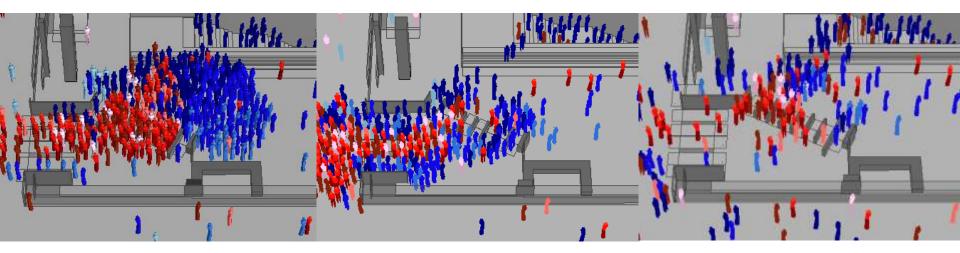
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1.8	tal D				1004	- 88.7	2804	91.6		Notes:					
25	A AL					28.0	2605	41							
100	Distante	2			1995							10. see 25ef			
	Finds feels				1990	177.8	2000	47.5		2) Use data					
	and the second second	0.1			1007	11.1	3807	54.8		3) Select a c					
	E Nati Nation				1999	44.5	2000	46.2		4) Use Auto					il meet a
1.	[Internations	- Line			1999	45.2	2009	415		given perce	ntage of a	demand in th	w mean w	or.	
		in the second			11	1.1.1.1.1.1.1	1025	WET		Contraction Contractor	= yalues	s to be enter	*0		
		Day year				-	- bernte	The		in the second second		Mult Year			1
Peop	Renoff inte	Volume Colected	Demand	Storage	medp	Ranoff (IR)	Volume Collected	Demand	Blockpri	Prestp	Bason	Convoted	Demand	Stonage	
0.00	0.00	- 44		1494.3	100	. 5.80	- 44		1500.0	6.00	1.10	0.0	- 40	16765	1.340
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0.01	0.08	43.5	389	1005	0.05	.0.01	390.6	389	3485.9	6.01	0.05	300.6	389	0012	3-541
0.1	0.01	140.1	329	1855.3	0.17	0.02	1077.3	389	3608.0	637	0.29	14430.4	.589	3600.0	#-A##
024	.a.es	7010.7		10000	5.00.	0.001	0.8	380	12417	8.80	8.50	44	100	10:07	5.Art
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0.01			41	3650.0	0.04	0.00	82	48	3141	0.62	0.00	28.1	48	2011	0.440
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0.0F 0.27 0.00	0.00					0.00	8.0	48	1772.7	0.00	0.09		- 49	2054.5	22-346
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0.07 0.00 0.00	0.00	1.0					0.0	389	2724 1 2324 8 9345 8	120	0.70	10100-8 HUM25.6	48 260 260	3600.8 3600.0 3210.7	25-Jan 24-Jan 25-Jan

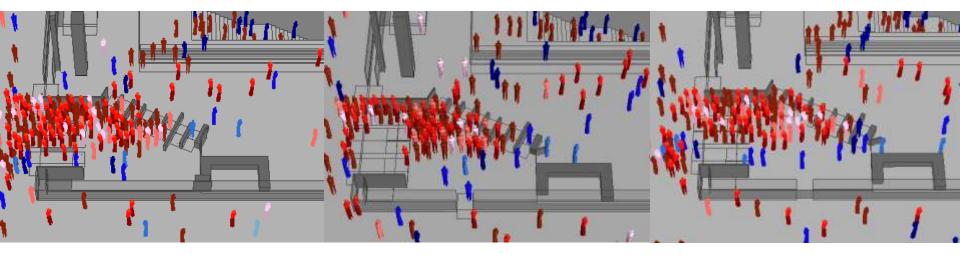


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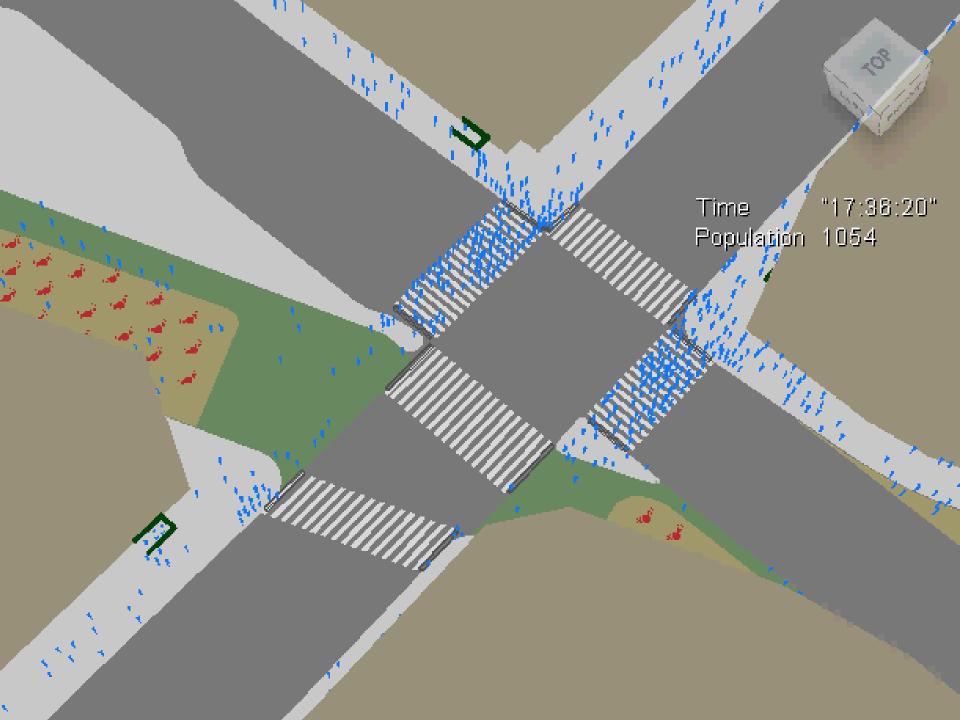


¹⁹ The New School University Center, New York, New York

Pedestrian Planning in the Urban Realm

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the et Herald Square, New York City



Pedestrian Planning in the Urban Realm

²² Fulton Center, New York, New York



Pedestrian Planning in the Urban Realm Population 44

×______ Result

23 Building Evacuation, New York, New York



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