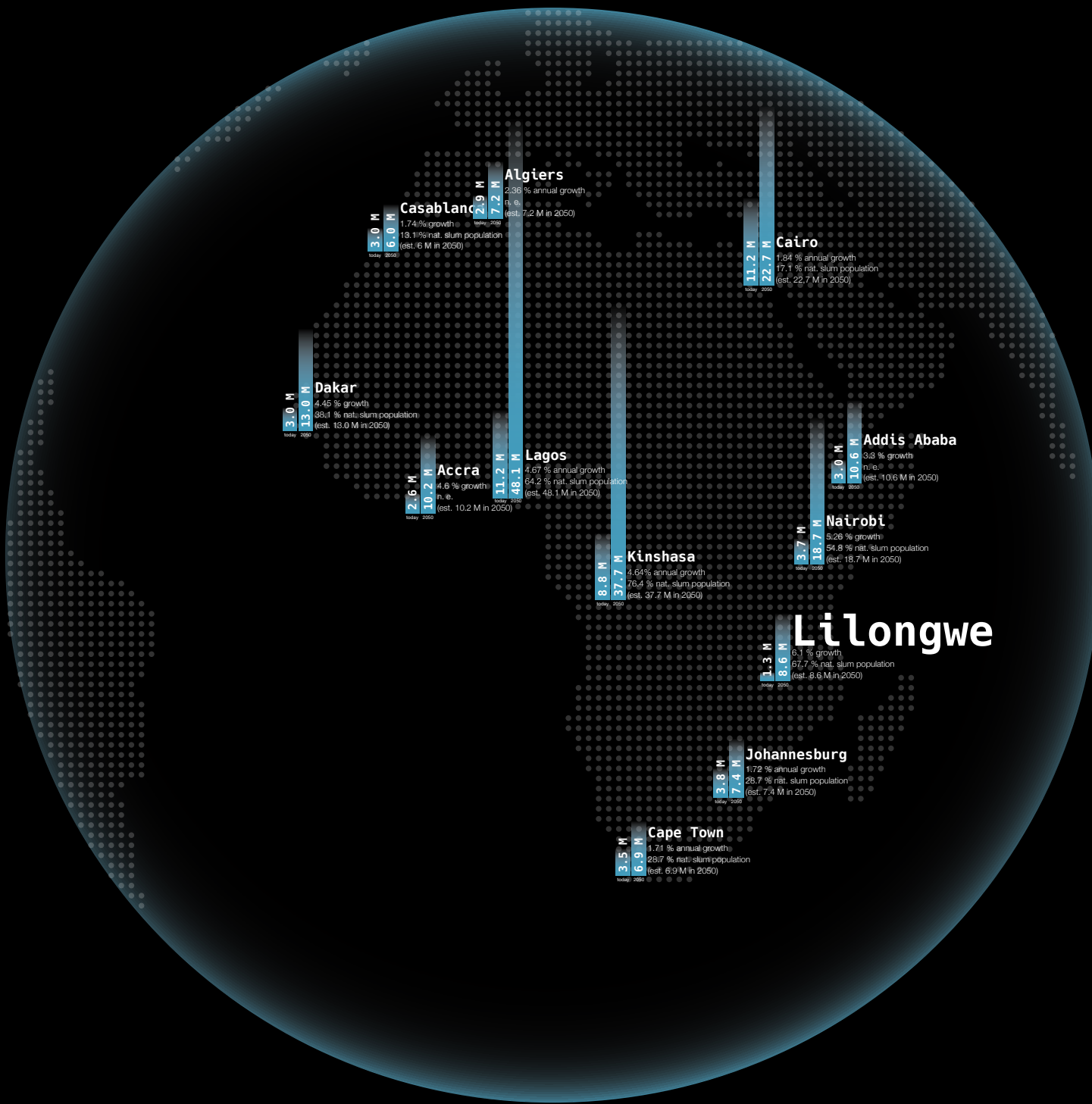
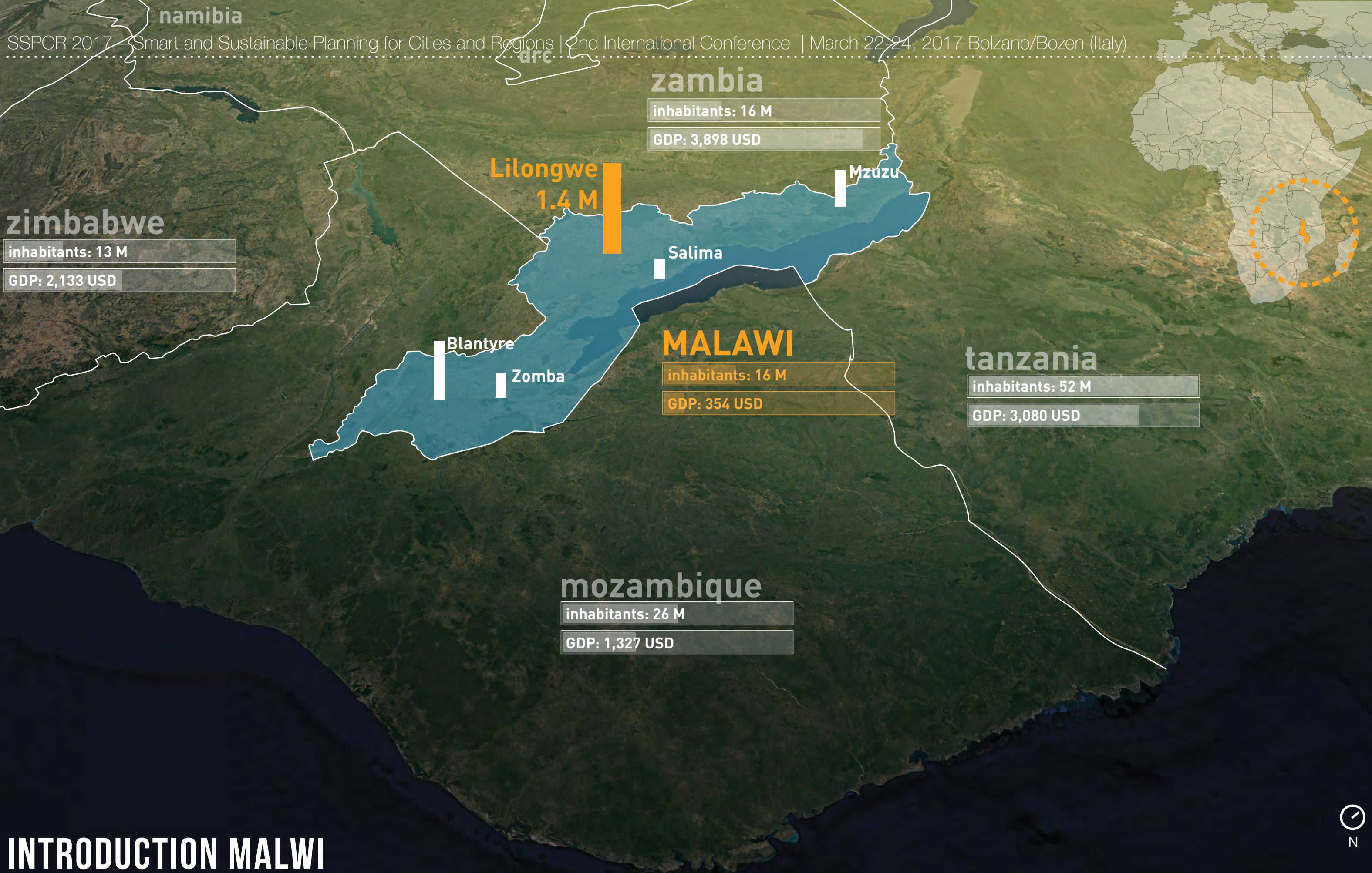


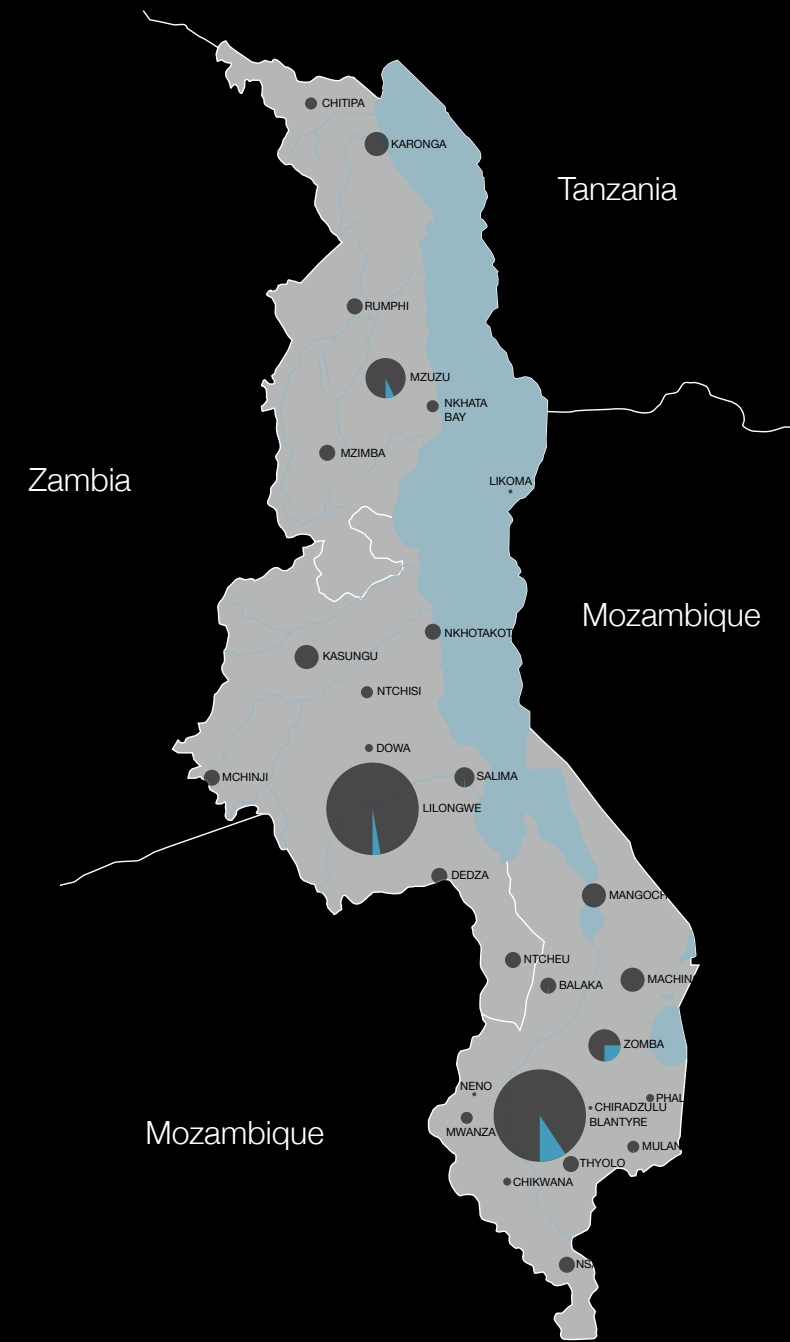
AN URBAN FRAMEWORK AS AN ADAPTIVE SPATIAL PLANNING TOOL FOR SUB-SAHARAN CITIES



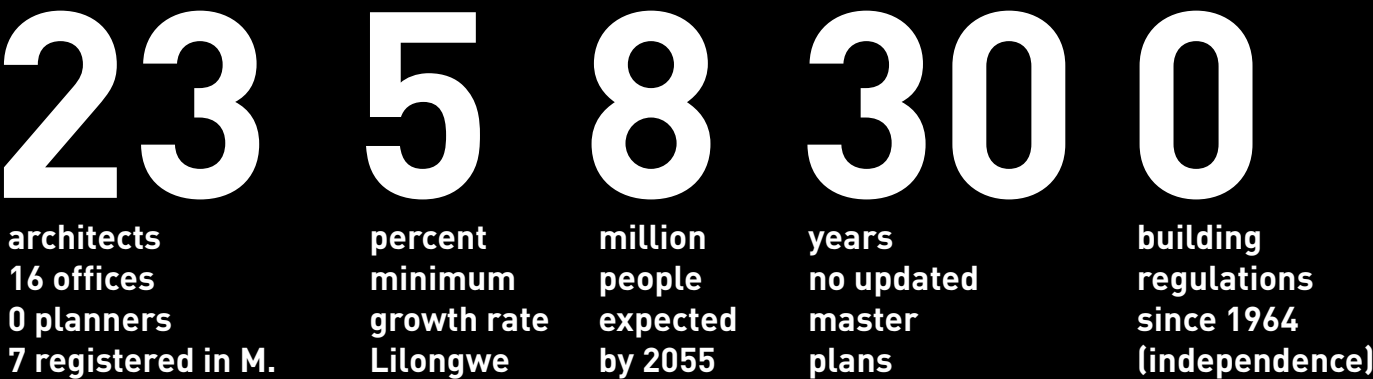
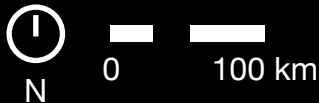
AN EXAMPLE OF LILONGWE, MALWI



INTRODUCTION MALWI

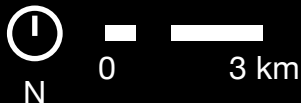
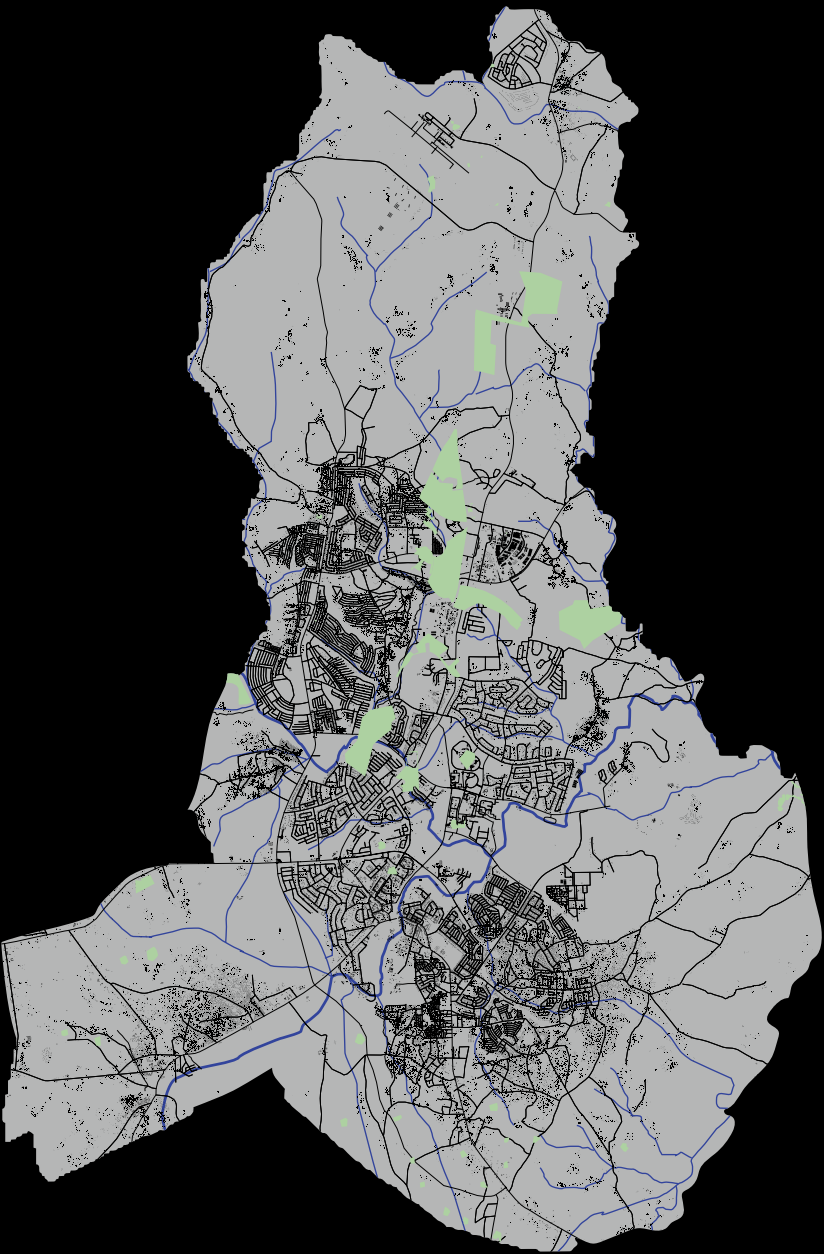


■ Population 1968
■ Population 2011

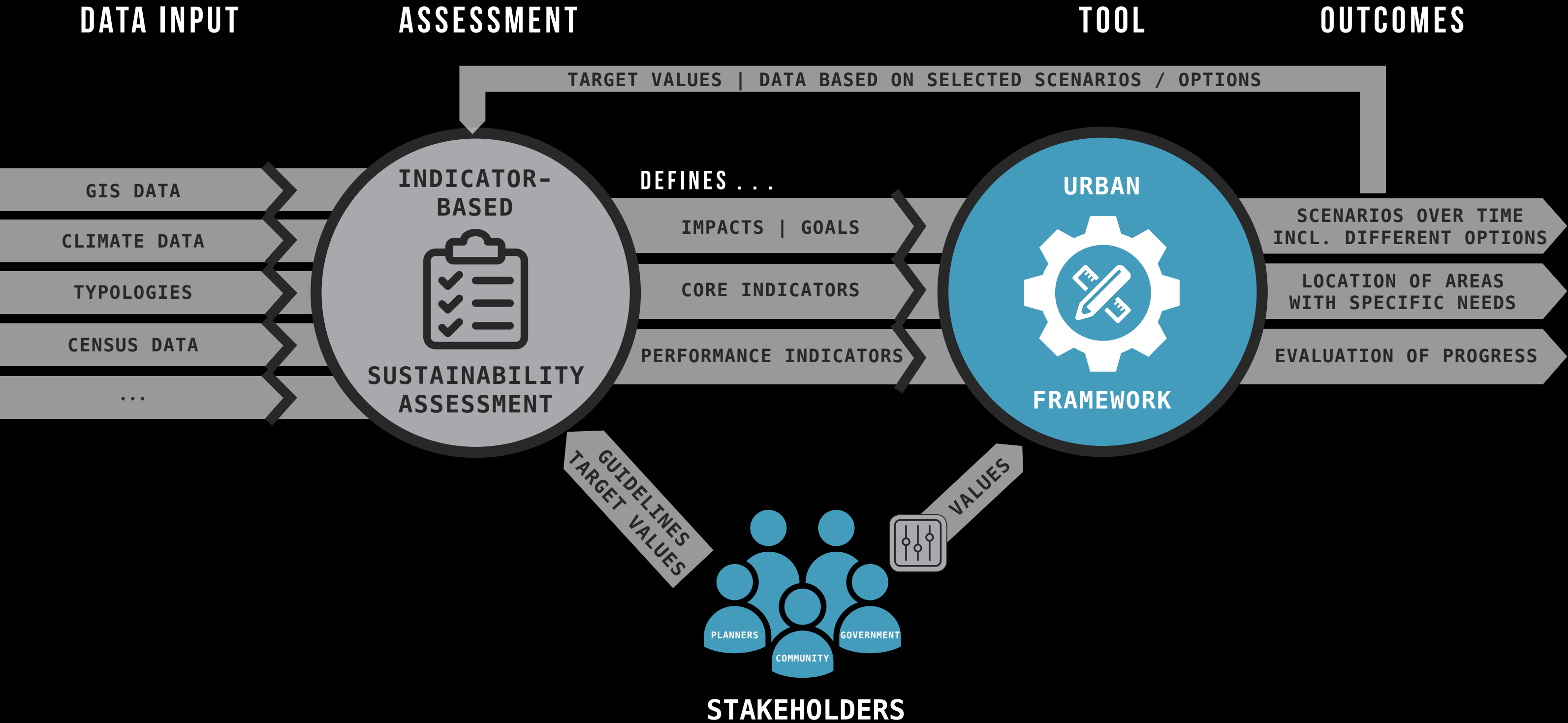


Malawi
Independent since 1964
3.9 M inhabitants in 1964
16 M inhabitants in 2016
#167 of 175 on HDI
Lowest GDP in 2016 (266 \$)

Lilongwe
Capital of Malawi since 1975
20,000 in 1968
70,000 in 1975
~1.4 M in 2015
est. 8 M in 2050



CHALLENGE



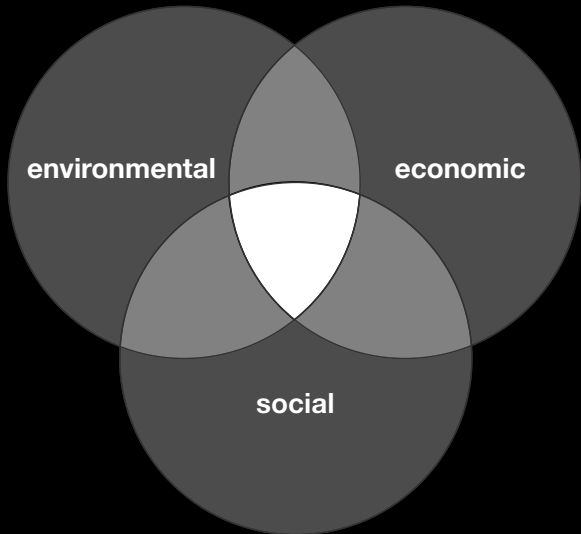
URBAN FRAMEWORK AS AN ADAPTIVE SPATIAL PLANNING TOOL

1024

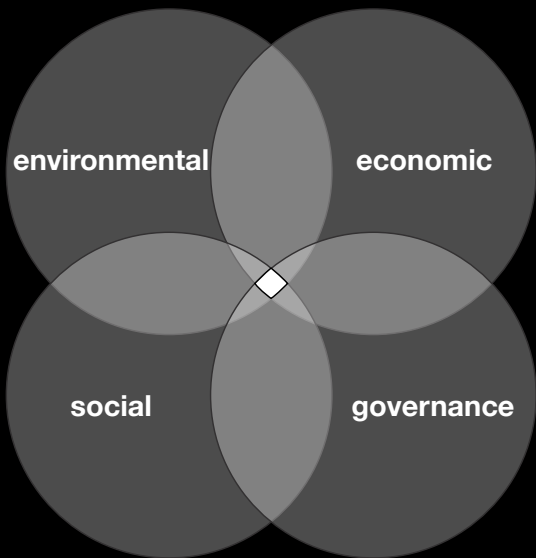
INDICATORS

(> 500 applicable)

TRIPLE BOTTOM LINE
Elkington 1998



QUADRUPLE BOTTOM LINE
Teriman 2009



Schematic themes
Economy
Education
Energy
Environment
Recreation
Safety
Shelter
Solid waste
Telecommunications and innovation
Finance
Fire and emergency response
Governance
Health
Transportation
Urban planning
Wastewater
Water and sanitation

ISO 37120
Global City Indicators Facility

Goal 3 Ensure healthy lives and promote well-being for all at all ages
Goal 6 Ensure availability and sustainable management of water and sanitation for all
Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable

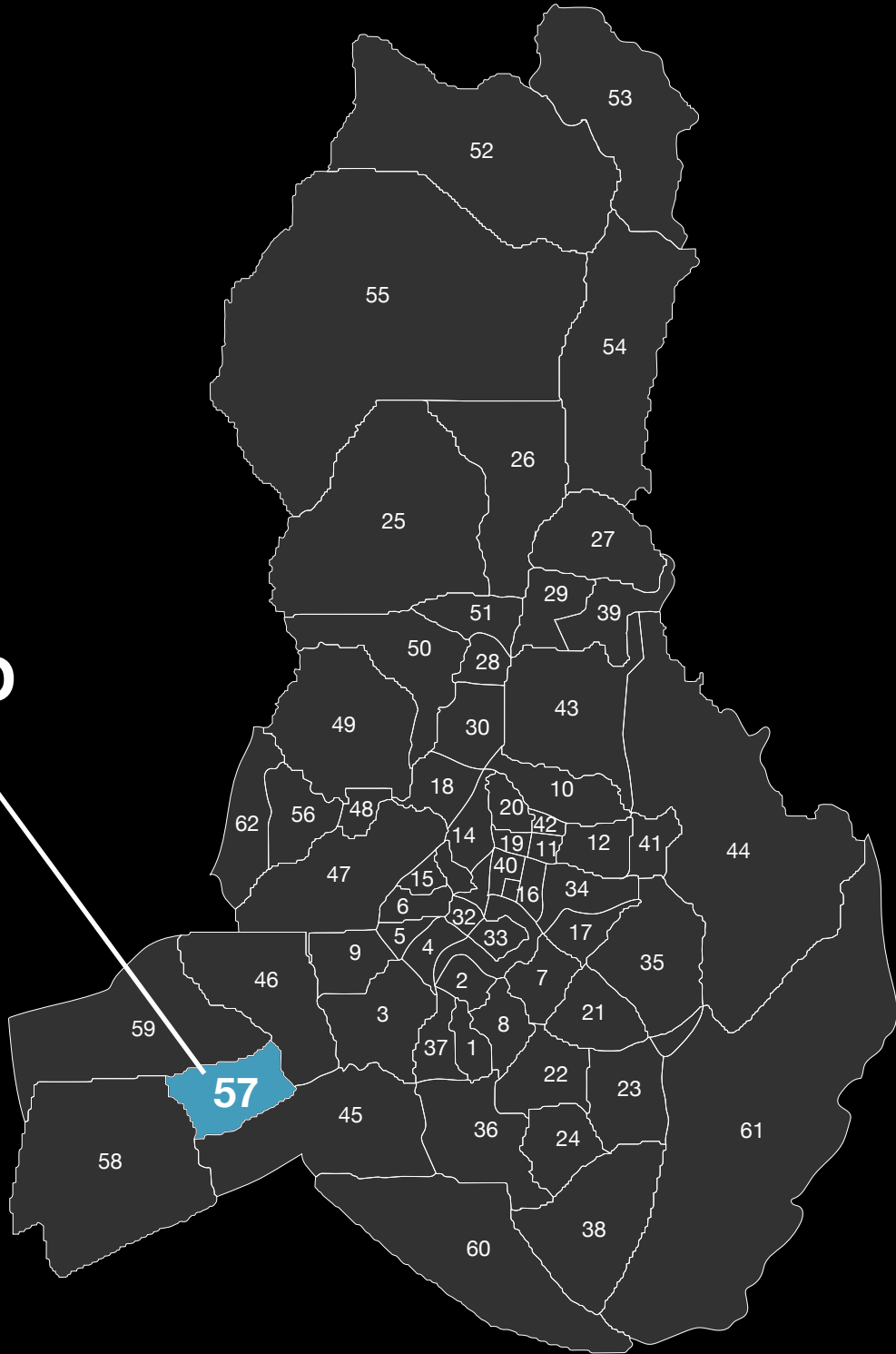
UNITED NATIONS 2015
Sustainable Development Goals

Dimension	Sub-theme	Approach / Method	Impacts / Goals	Spatial Level	Time Scale	Indicator	Data-Source	Data-Type
Environmental	Local Economy	Urban Planning	Healthy lives and well-being	City	long-term > 20 years	Core Profile	Objective	Quantitative
	Education		availability and sustainable management of water and sanitation					
	Energy	Urban Design	access to affordable, reliable, sustainable and modern energy					
	Environment		sustained, inclusive economic growth, productive employment and decent work					
Economic	Recreation	Urban Finance	resilient infrastructure, inclusive, sustainable industrialization, and innovation	District	medium-term 5-20 years	Core Performance	Semi-Quantitative	
	Shelter		inclusive, safe, resilient and sustainable cities and human settlements					
	Solid waste	Urban Legislation	Gender / Youth / Human Rights					
	Telecommunications and innovation		Climate Change					
Social	Finance	Education / Training	Housing & Slum Upgrading	Area	short-term < 5 years	Secondary Profile	Subjective	Qualitative
	Fire and emergency response	Land Tenure	Urban Basic Services					
	Local Governance		...					
	Health	Property Development						
Institutional / Governmental	Transportation	Construction		Neighbourhood		Secondary Performance		
	(Infrastructural) Urban planning							
	Wastewater	Operation						
	Water and sanitation							
	...							
multiple assignments possible						absolute assignments		

INDICATOR-BASED SUSTAINABILITY ASSESSMENT

EXEMPLARY ASSESSMENT | INDICATOR ‘REACHABILITY’

EXAMINED
AREA






Functions	
Section 1	Public space
	Public green (min. 0.25 ha)
	Public transport
	Retail
	Nursery / elementary school
	Secondary school
Section 2	Civic services
	Religious institution
	Public green (min. 1 ha)
	Shopping area / market
	Offices / workplace
	Cultural institution
Section 3	Regional transport hub
	Hospital / medical care
	College / University
	Library

Section	Modes of transport
1 daily activities	foot
2 average activities	bike
3 infrequent activities	public transport

INDICATOR-BASED SUSTAINABILITY ASSESSMENT

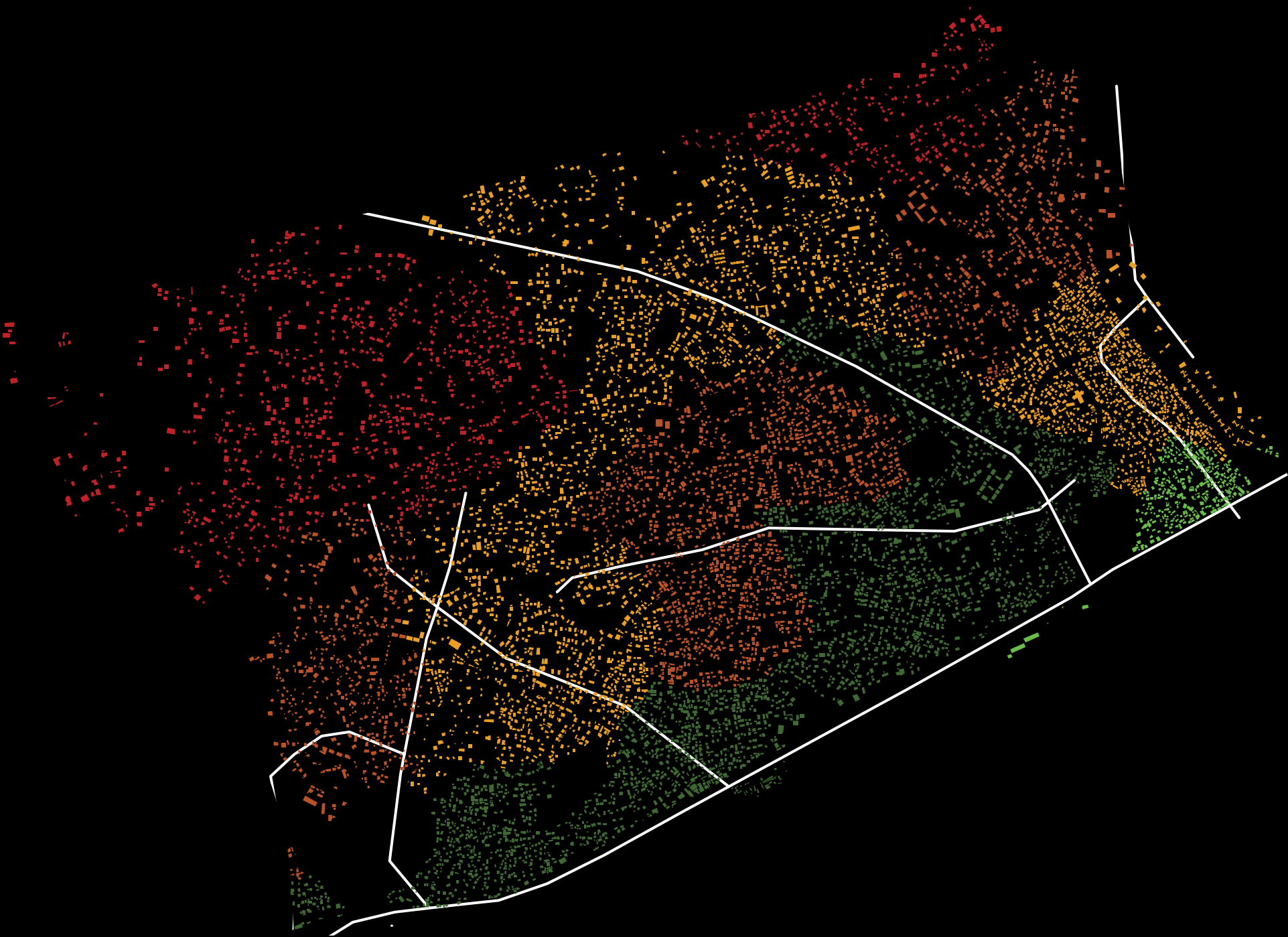
GRADING METHOD 01



Section 1	Functions				m				G	G
	Public space				6500	78	26	–	6	F
	Public green (min. 0.25 ha)				–	–	–	–	6	F
	Public transport				2050	25	8	–	2.3	B
	Retail				6850	83	27	–	6	F
	Nursery / elementary school				1450	17	6	–	2	B
	Secondary school				1480	18	6	–	2	B
Section 2	Civic services				6500	78	26	20	3.7	C
	Religious institution				1060	13	4	10	1.3	A
	Public green (min. 1 ha)				6400	77	26	20	3.7	C
	Shopping area / market				1900	23	8	12	1.7	A
	Offices / workplace				7100	86	28	21	4	D
	Cultural institution				5800	70	23	19	3.3	C
Section 3	Regional transport hub				7750	93	31	23	4	D
	Hospital / medical care				1400	17	6	11	2	B
	College / University				9000	108	63	25	4	D
	Library				11500	139	46	30	6	F
Section		1-6	A-F	%	Total Grade					
1		4.1	D	50	3.7			C-		
2		3	C	30						
3		4	D	20						

INDICATOR-BASED SUSTAINABILITY ASSESSMENT

GRADING METHOD 01



Functions		A	B	C	D	F
Section 1	Public space	D	F	F	F	F
	Public green (min. 0.25 ha)	D	F	F	F	F
	Public transport	A	A	B	B	C
	Retail	C	D	F	F	F
	Nursery / elementary school	A	A	B	B	C
	Secondary school	A	A	B	B	C
Section 2	Civic services	B	B	C	C	D
	Religious institution	A	A	A	A	B
	Public green (min. 1 ha)	C	C	C	D	D
	Shopping area / market	A	A	A	A	B
	Office / workplaces	C	C	D	D	F
	Cultural institution	C	C	C	D	D
Section 3	Regional transport hub	C	D	D	F	F
	Hospital / medical care	A	A	B	B	B
	College / University	C	C	D	D	D
	Library	D	F	F	F	F
Section		Modes of transport				
1 daily activities		foot				
2 average activities		bike				
3 rare activities		public transport				

INDICATOR-BASED SUSTAINABILITY ASSESSMENT

RULEBOOK

Public Space

– at least 15% public space

Diversity

At least:

– 30% public/commercial use in ground-floor in each district

– 5 different typologies/functions in each neighborhood

Maximum:

– 5% single-use blocks in each district

– less than 15% plots should be over 1600 sqm

Green space

– at least 5% public green/10% total

Shading

– each residential/office unit must have at least 2 hours sunlight per day

Density

– the density should reach 10,000 – 20,000 people per square kilometer

– at least 30% of the buildings must be min. 4 floors

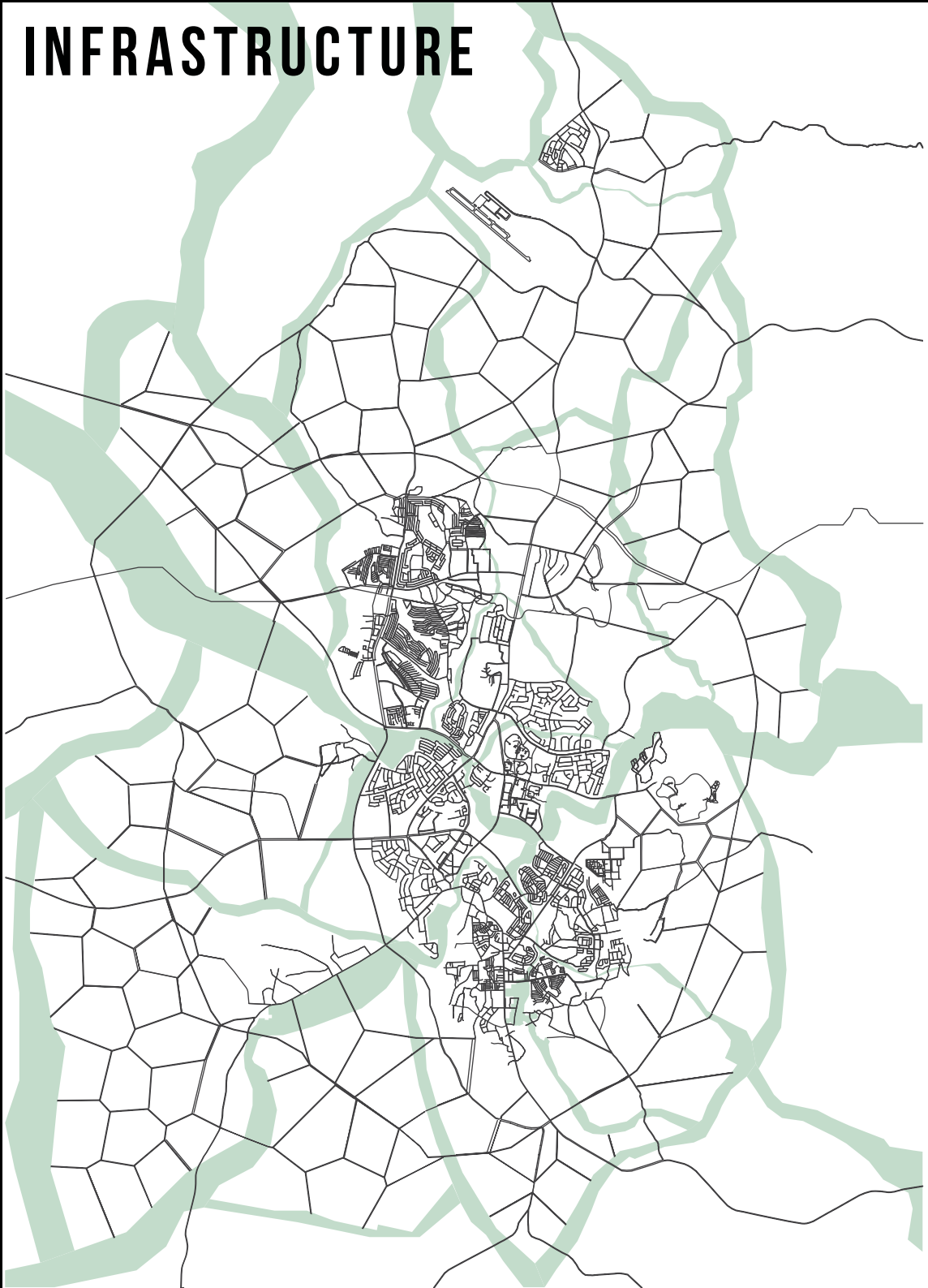
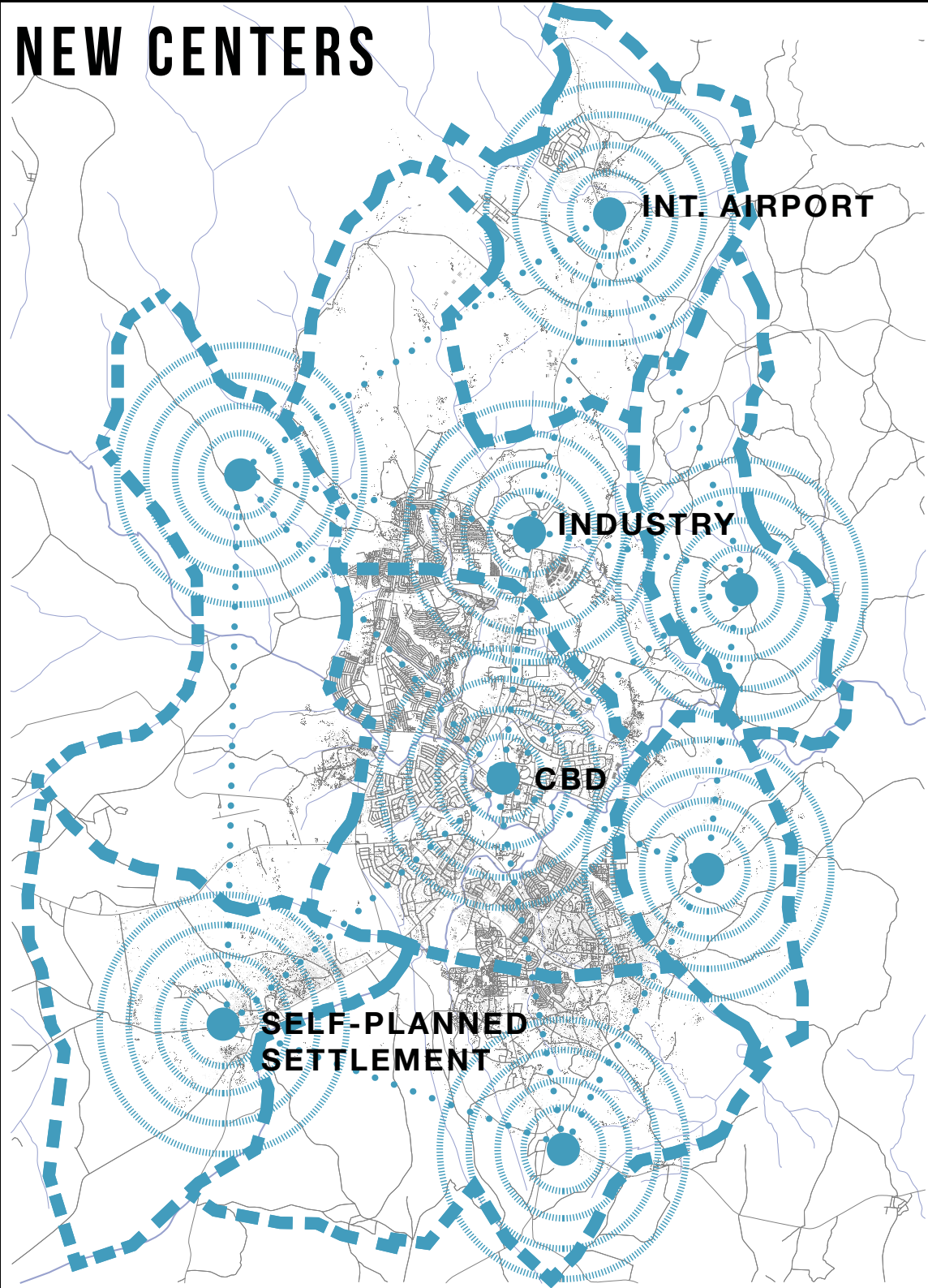
– block courtyards must be reachable by car

Social Mix

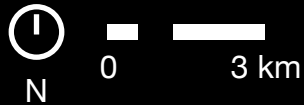
– 20 – 50% should be low-cost-housing

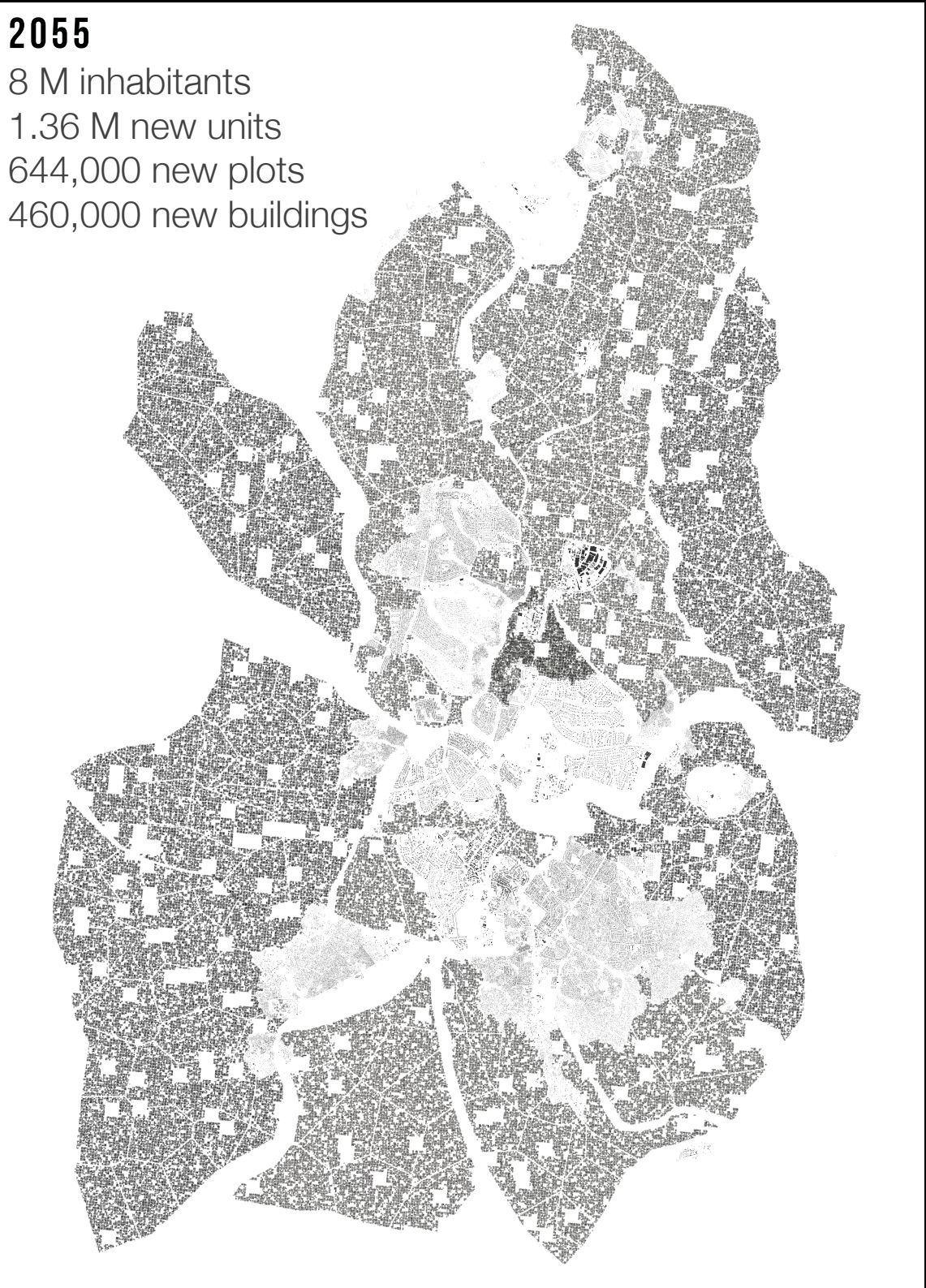
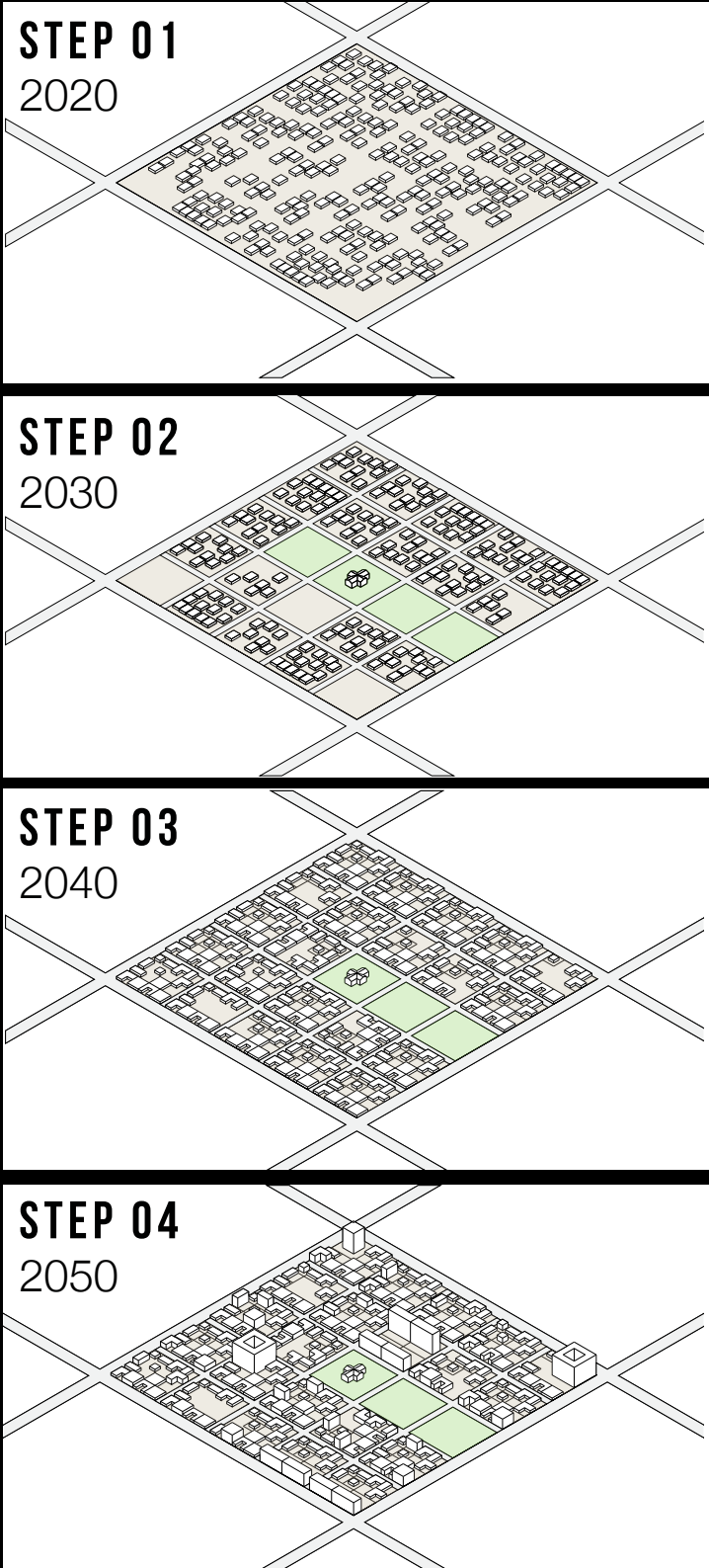
Public Transport

– in max. 15-minutes walking distance should be a public transport connection

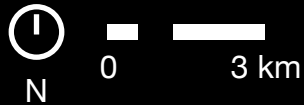


CITY-WIDE URBAN FRAMEWORK





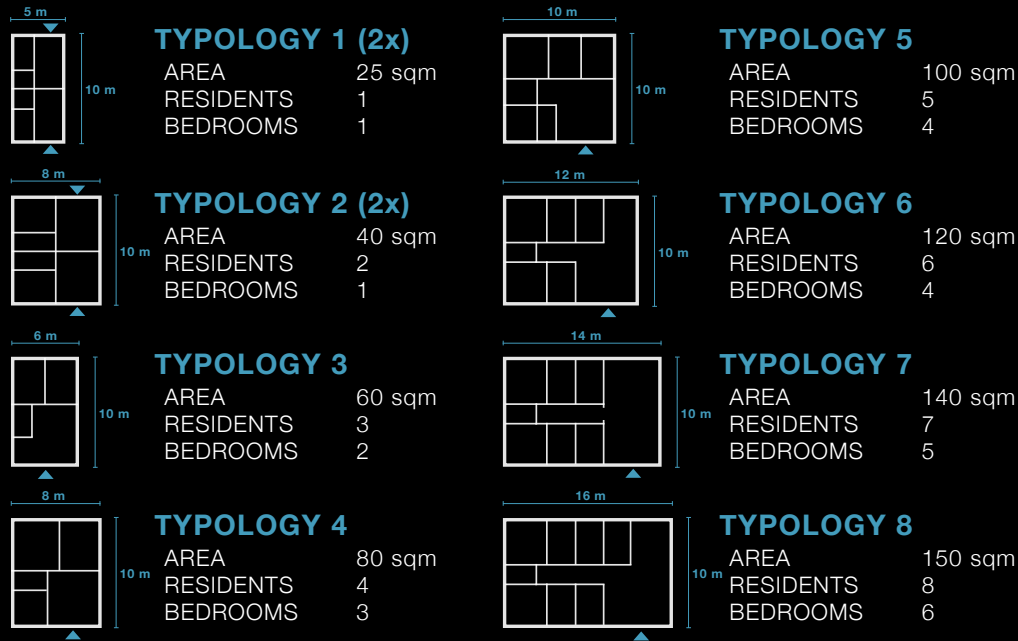
CITY-WIDE URBAN FRAMEWORK



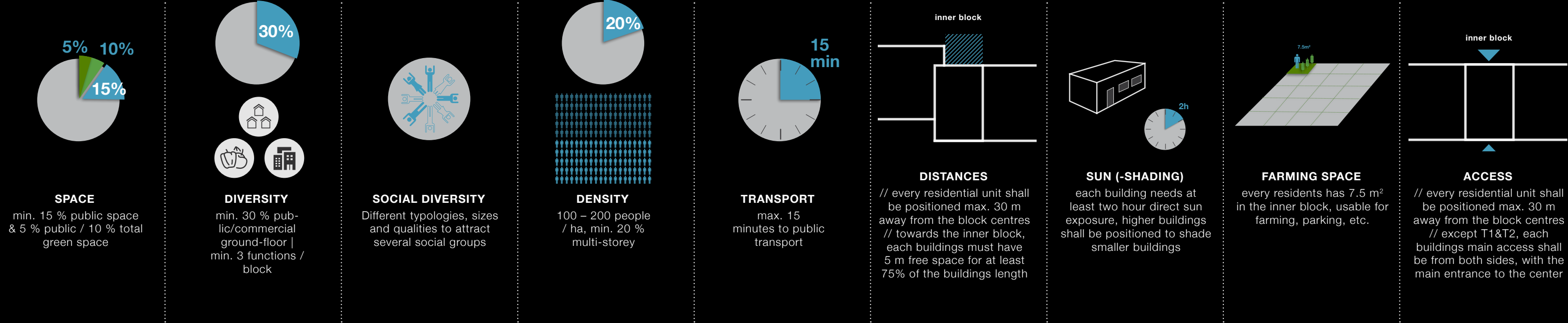
DATA INPUT



EXAMPLARY TYPOLOGIES



RULEBOOK



ORGANIC URBAN SIMULATION | NEIGHBORHOOD-SCALE

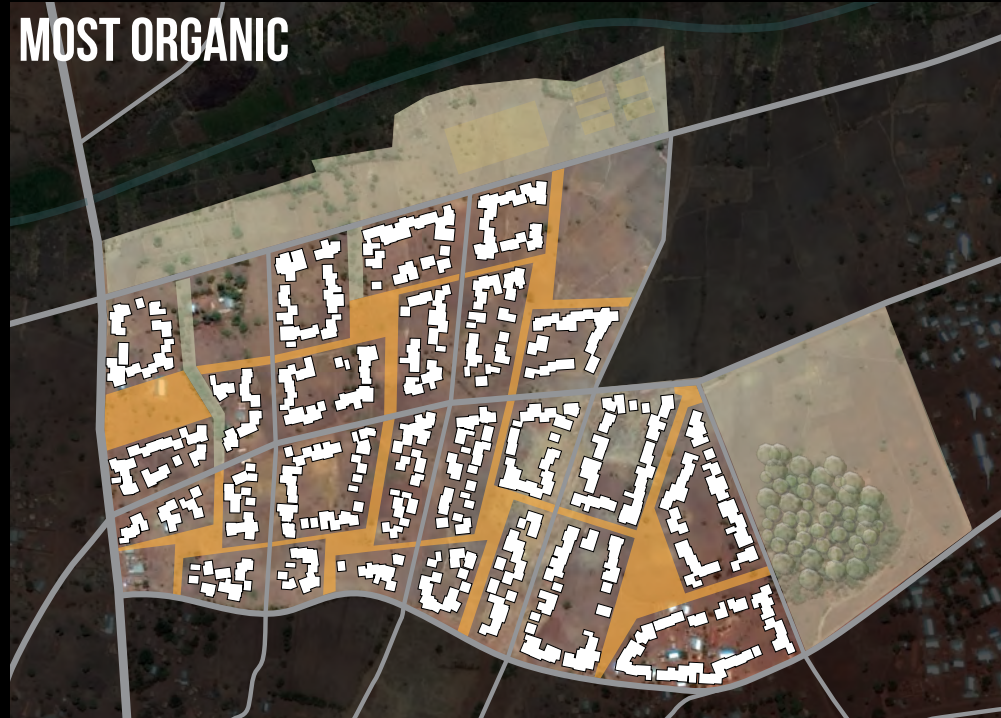
MOST STRICT



MEDIUM ORGANICITY



MOST ORGANIC



ORGANIC URBAN SIMULATION | NEIGHBORHOOD-SCALE

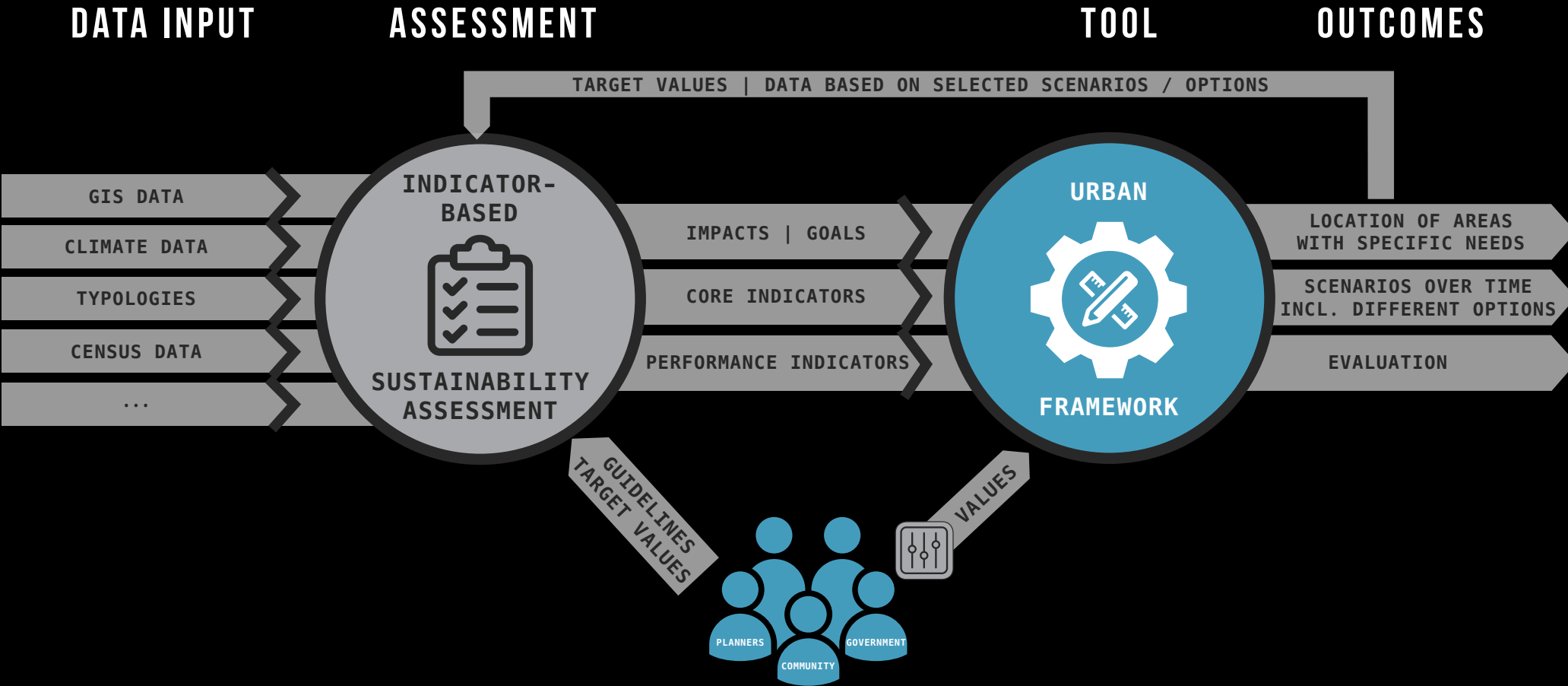


Esri City Engine | Case Study 'YouCity Real Estate' (Source: <http://www.esri.com/software/cityengine/industries/youcity> | 15.03.2017)



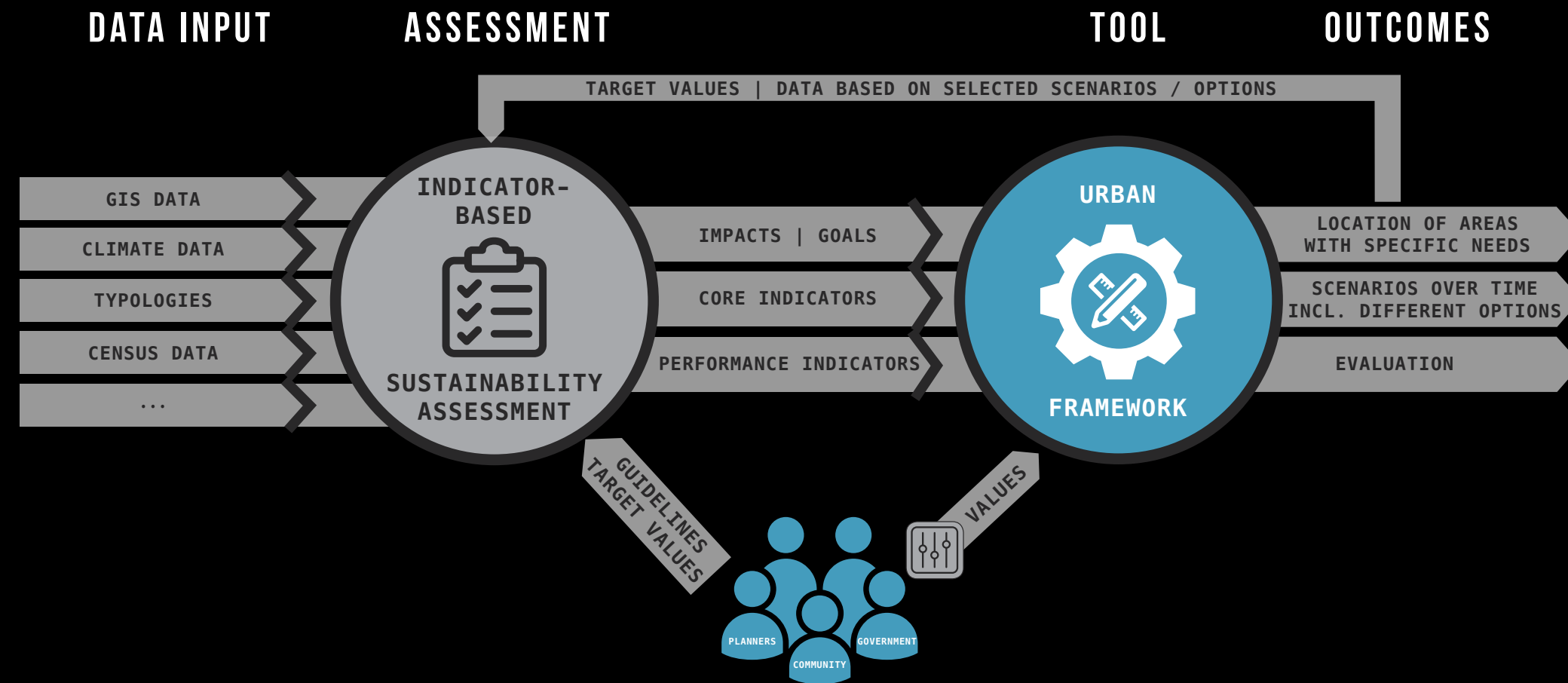
UrbanSim Cloud Platform (Source: <http://www.urbansim.com> | 15.03.2017)

EXISTING APPROACHES | SOFTWARE



QUESTIONS ...

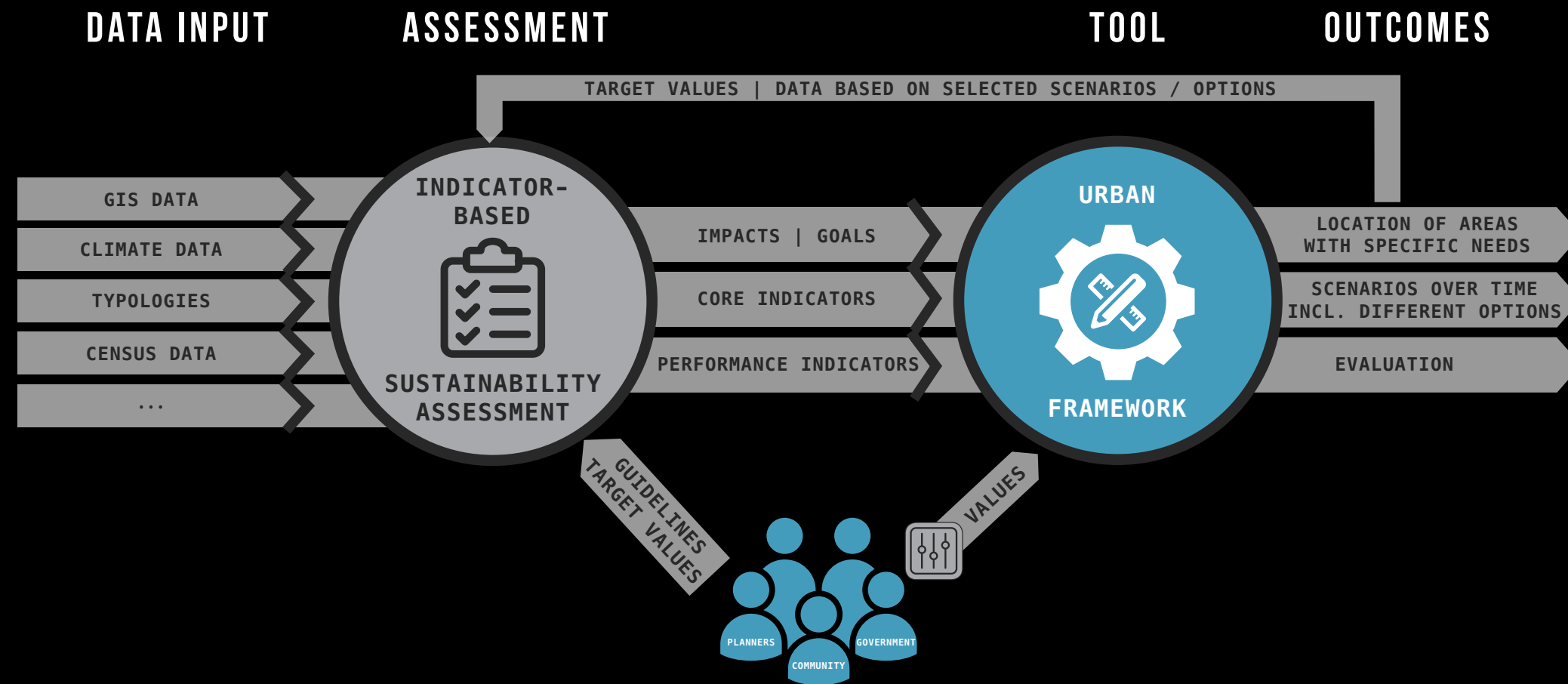
VISION | TOWARDS WHAT ARE WE WORKING?



QUESTIONS ...

Is technology able to effectively simplify planning practice?

VISION | TOWARDS WHAT ARE WE WORKING?

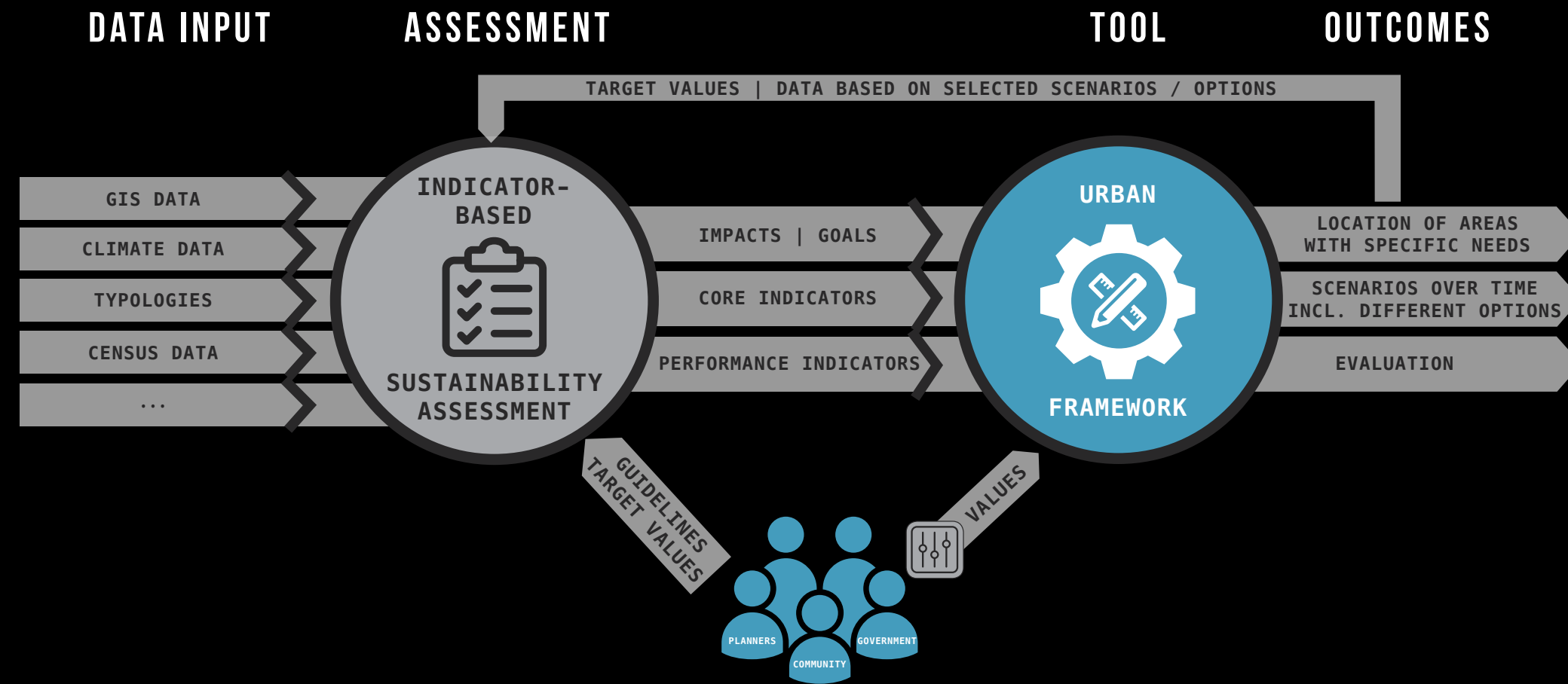


QUESTIONS ...

Is technology able to effectively simplify planning practice?

Does the human scale come back into focus or get lost due to complexity/size of our future cities?

VISION | TOWARDS WHAT ARE WE WORKING?



QUESTIONS ...

Is technology able to effectively simplify planning practice?

Does the human scale come back into focus or get lost due to complexity/size of our future cities?

Are advanced technical spatial assessment and planning tools allowing planners to concentrate on fundamental aspects or competes and disables our freedom in planning sustainable & resilient cities?

VISION | TOWARDS WHAT ARE WE WORKING?