UN HABITAT
FOR A BETTER URBAN FUTURE

claudio.acioly@unhabitat.org

Orientation Workshop

indicators for strategic city planning and decision making.

International Experiences

The City Prosperity Index

1.

Indicators: what it is, what it serves for:

A key measure to describe what is happening in the real world?

What are indicators?

Source: Based on 'The Good Indicators Guide'. http://www.apho.org.uk/resource/item.aspx?RID=44584

- An **indicator** is "a summary measure that aims to describe in a few numbers as much detail as possible about a system, a phenomenon, to help understand it, compare, predict, improve, and innovate."

Why are indicators so important?

- Indicators are extremely important forms of measurement, but they can also be controversial.
- Like all powerful tools, they can easily do as much harm as good.
- The world is becoming a more transparent and competitive place, where people want instant summary information. Indicators appear to fit this need and are therefore becoming an increasingly important part of how everybody works.

Source: The Good Indicators Guide. http://www.apho.org.uk/resource/item.aspx?RID=44584

ANALOGY:
What are CITY indicators?

A **CITY INDICATOR** reflects "a characteristic of an urban area, a population residing within its boundaries, or the environment which is subject to measurement and can be used to describe one or more aspects of the state of an individual urban area or the people who reside within its boundary."

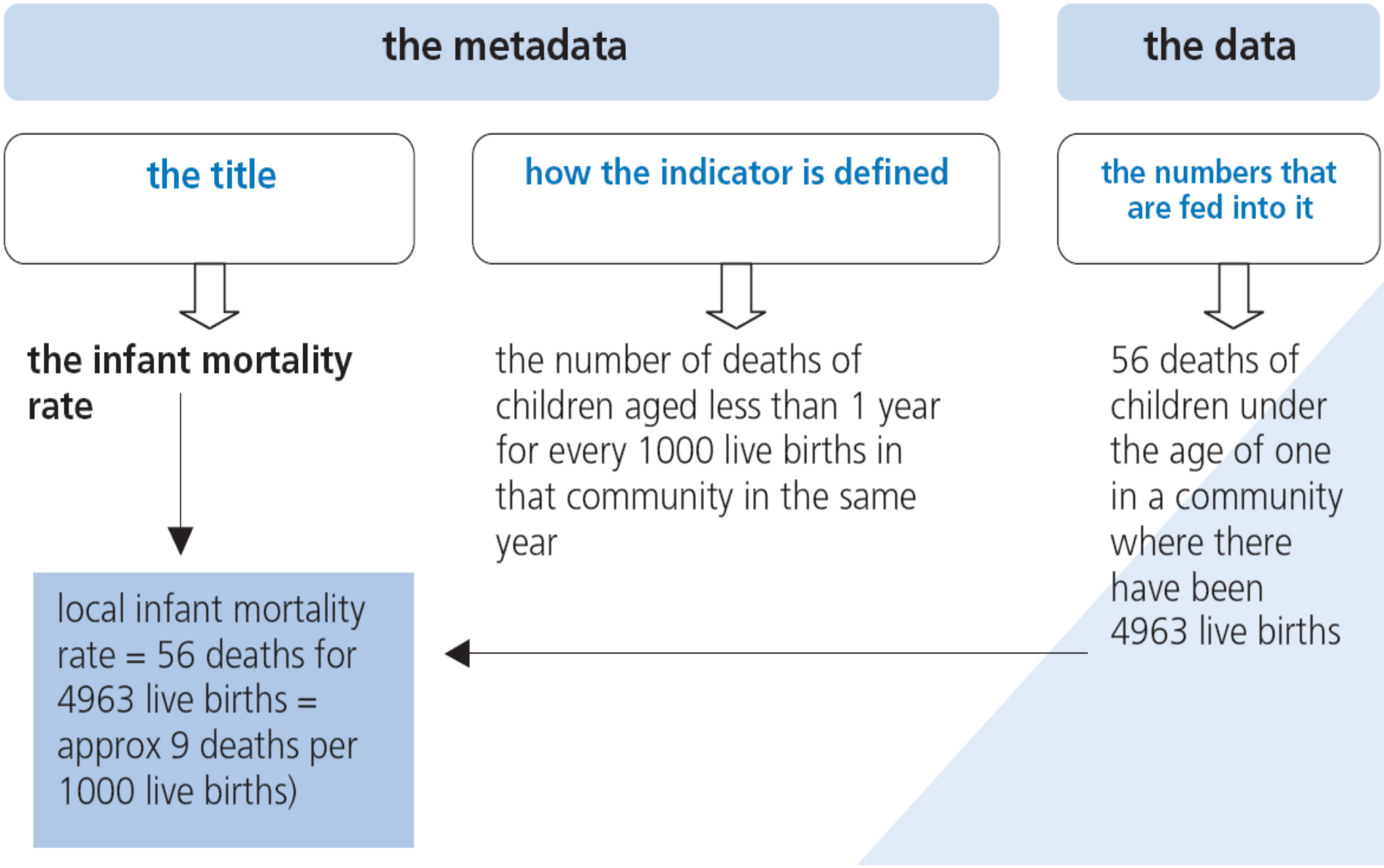
Source: Based on Nancy Allee, University of Michigan. Webinar, January 27, 2010. Community Health Status Indicators (CHSI)

3 key roles of measurement

1. For **understanding**: to know how a system works, how a particular development area performs and how it might be improved (research role)

2. For **performance**: monitoring if and how a system, an urban development sector is performing to an agreed standard (performance/managerial/improvement role) and whether policies are resulting in improvements

3. For **accountability**: allowing systems, organizations and policies to hold themselves up to society, the government and taxpayers and be openly scrutinised by the public (accountability/democratic role).


the metadata
the data
the title
how the indicator is defined
the numbers that are fed into it
the infant mortality rate
the number of deaths of children aged less than 1 year for every 1000 live births in that community in the same year
56 deaths of children under the age of one in a community where there have been 4963 live births
local infant mortality rate = 56 deaths for 4963 live births = approx 9 deaths per 1000 live births)

City Product per Capita - Metadata

Source: City Prosperity Index Toolkit, UN-Habitat, 2014.

TITLE	DEFINITION	UNIT
City product per capita	The City Product per capita is the sum of the gross value added by all producers within a city, relative to its total population	US$ per capita

METHODOLOGY

The City Product per capita is calculated as the sum of the product between the National Gross Domestic Product (GDP) in each economic sector (primary, industrial and service sectors) and the employment sector's share of the national's sector employment, divided by total city population:

$$City\ Product\ per\ capita = \frac{\sum_{j=1}^{J} National\ Product_j * \left(\frac{city\ employment_j}{national\ employment_j}\right)}{Total\ City\ Population}$$

Accessibility to Open Public Area - Metadata

Source: City Prosperity Index Toolkit, UN-Habitat, 2014.

TITLE	DEFINITION	UNIT
Accessibility to Open Public Area	Percentage of urban area that is located less than 300 meters away from an open public space	%

METHODOLOGY (A & B)

A) This indicator provides information about the open public area that a city has and whether it is enough for its population. Additionally, this indicator takes into account the accessibility of people to open public areas, and the way in which total public area is distributed across the city. A prosper city has enough open public area for its population, it is properly distributed and people have easy access to it.

$$Accessibility\ to\ open\ public\ area = 100\frac{population\ less\ than\ 300m\ away\ open\ public\ area}{city\ population}$$

4 THINGS we should know and accept about INDICATORS

Source: Based on 'The Good Indicators Guide'. http://www.apho.org.uk/resource/item.aspx?RID=44584

1. **Indicators only indicate**: it will never completely capture the richness and complexity of a system. It give 'slices' of reality. It will usually not improve things much. They are designed to give 'slices' of reality. It might provide the truth, but rarely give the whole truth. Like any reductionist approach, an indicator must be understood in context.

2. **Indicators encourage explicitness**: it force us to be clear and explicit about what we are trying to do. We must face important differences in understanding which makes difficult attaining a true agreement and understanding of the work. It can help in achieving this by asking questions such as "What would success look like if we could only measure three things?"

4 THINGS we should know and accept about INDICATORS

Source: Based on 'The Good Indicators Guide'. http://www.apho.org.uk/resource/item.aspx?RID=44584

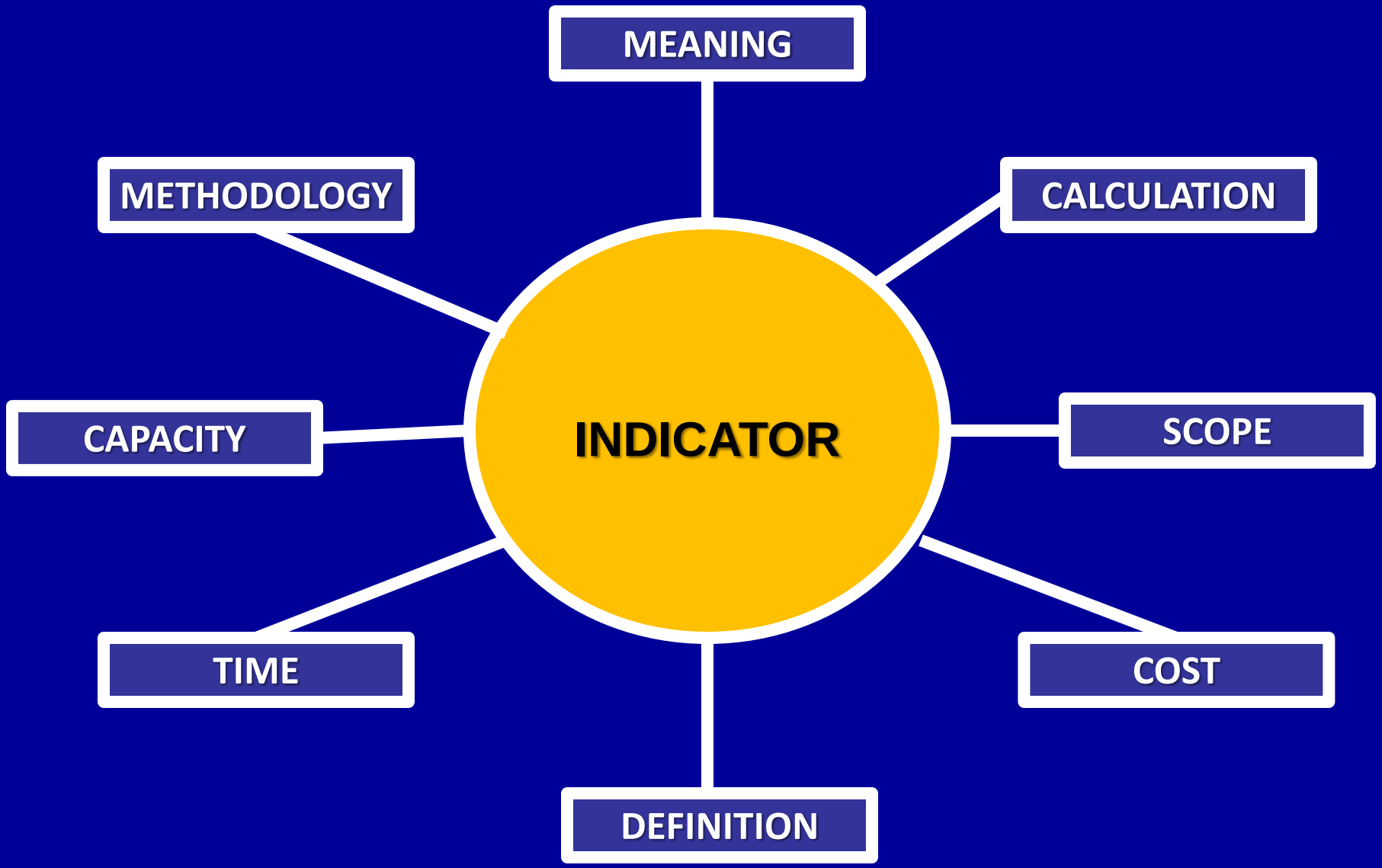
3. **Indicators usually rely on numbers and numerical technicques**: people fear numbers. In order to be able to use indicators properly or challenge them, we need a basic understanding of elementary statistics (rates, ratios, comparisons,standardisation etc). But indicators don't always use complex methods.

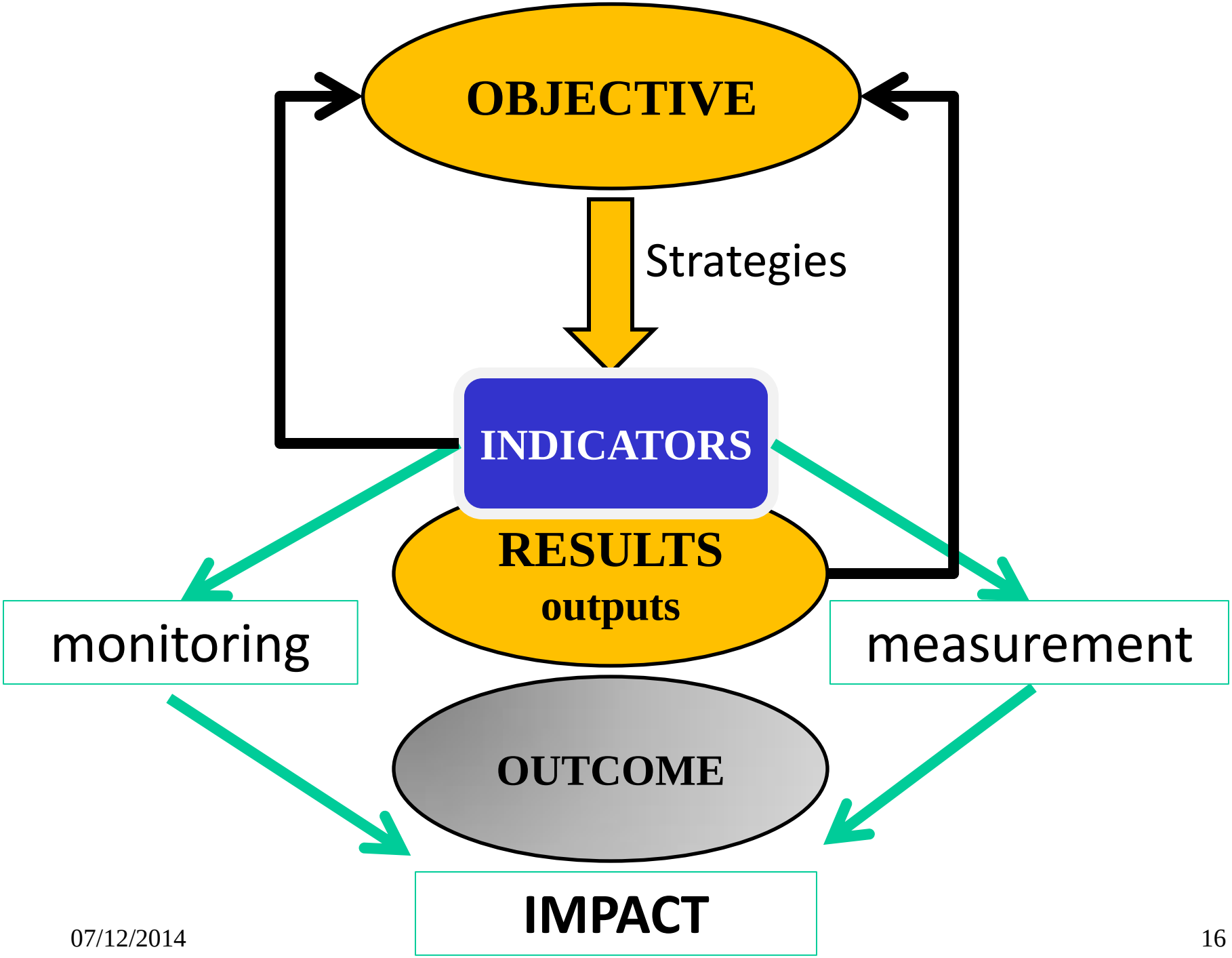
4. **Indicators should not be associated with fault finding**: it can help us understand our performance be it good or bad. Well-designed measurement systems identify high performers (from whom we can learn), as well as systems (or parts of systems), that may warrant further investigation and intervention.

The DNA of an Indicator

1. NAME
2. DEFINITION
3. METHODOLOGY
4. GEOGRAPHY (area /scope of concern)
5. Timeliness (data collection)
6. What it purports to measure?
7. RATIONALE (Why is it important ?
8. Reason to include this indicator (valid, meaningful, possible to communicate)
9. Policy relevance (relates and responds to particular policy framework)
10. INTEPRETATION (what a high and low measure means)

Capacity to collect, retrieve, analyse and keep regularity is critical


MEANING
METHODOLOGY
CALCULATION
INDICATOR
CAPACITY
SCOPE
TIME
COST
DEFINITION


OBJECTIVE
Strategies
INDICATORS
RESULTS
outputs
monitoring
measurement
OUTCOME
IMPACT

Public Policies on Cities

1. Different policies
2. Different approaches
3. Different strategies
4. Diverse results and outcomes
5. **A wide range of impacts on:**
   a. People
   b. city form,
   c. environment,
   d. housing prices,
   e. accessibility to jobs,
   f. land markets,
   g. Businesses
   h. Mobility
   i. Transportation
   j. Quality of life

7.

International Experience with Urban Indicators and City Performance Monitoring:

Collecting data and designing and maitaining indicators requires methodology, agreement, commitment, consistency and organisation, and resources to finance it amongst other things.

Data, Metrics and Policies

Source: UN-Habitat (2014) . City Prosperity Index: methodological guide.

- Cities from developed & developing countries require monitoring systems with clear indicators, baseline data, targets and goals to support a city vision and a long-term plan for sustainable development.

Cities require a monitoring system that can:

- Track progress and identify setbacks;
- Use new approaches and techniques in order to support the formulation of well-informed policies.
- Enable periodic assessments on their state of development
- Employ accurate tools to evaluate policy outcomes and the impact of specific plans and actions.

THE GLOBAL CITY INDICATORS FACILITY – 250 MEMBER CITIES

Source: GCIF-Global City Indicators Facility (2013). Data, Boundaries, Competitiveness. The Toronto Urban Region in Global Context. Dec 2013.

The Global Cities Indicators Facility

Source: GCIF-Global City Indicators Facility (2013). Data, Boundaries, Competitiveness. The Toronto Urban Region in Global Context. Dec 2013.

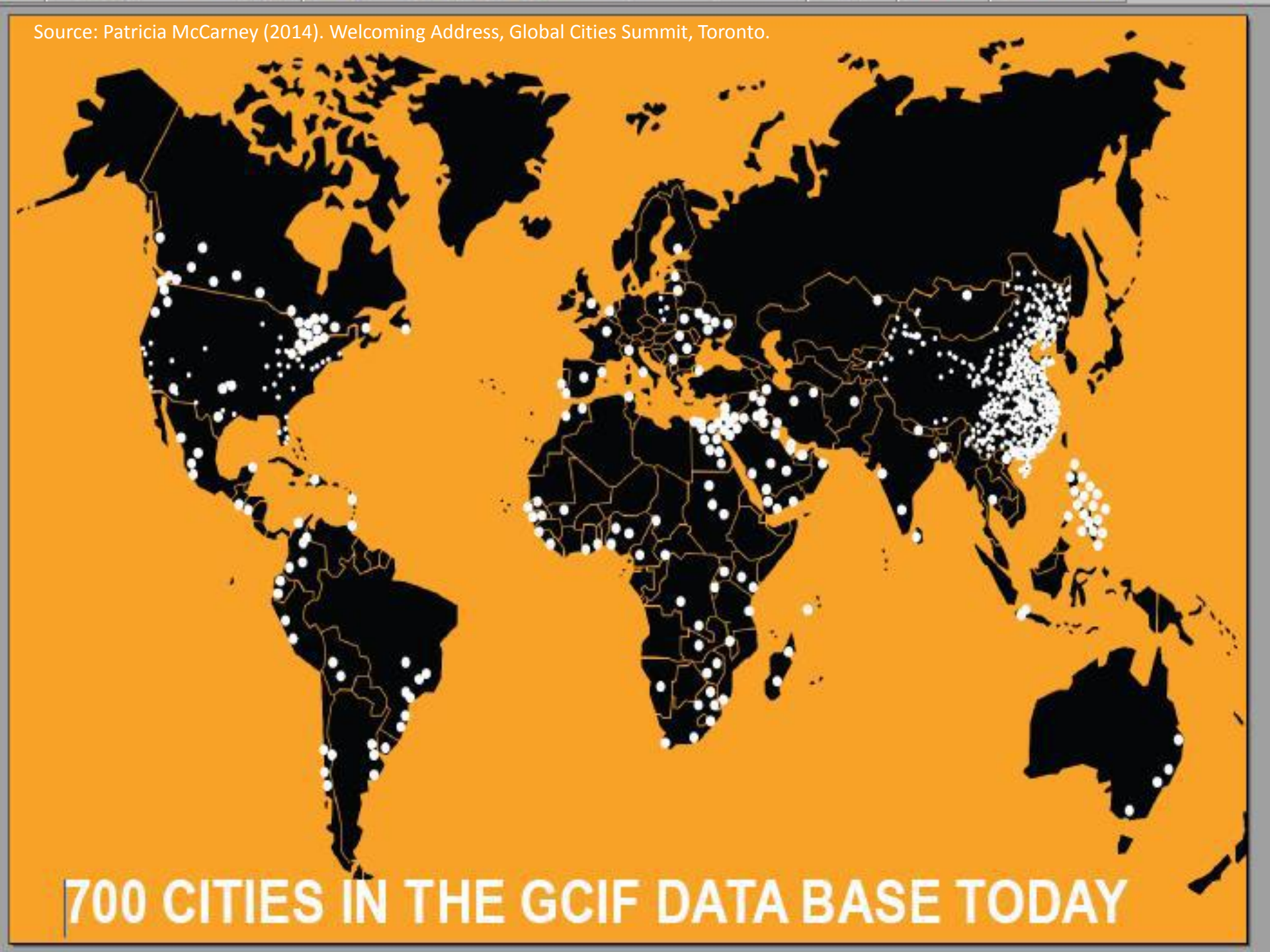
1. The project began in 2008.
2. World Bank and UN-Habitat approached the University of Toronto to start working on a uniform set of indicators for cities.
3. Nine pilot cities, including Bogotá, Toronto, São Paulo and Belo Horizonte helped to devise a list of some 115 initial indicators.
4. Over time the number of participating cities would rise to 258 across 82 countries.

INDICATORS: selection criteria

Source: GCIF-Global City Indicators Facility (2013). Data, Boundaries, Competitiveness. The Toronto Urban Region in Global Context. Dec 2013.

- This set of global city indicators was selected based on significant input from the partner cities, ensuring that these indicators reflect city information needs and interests, and a rigorous screening process. The indicators must be:
- Available, up to date, and able to be reported annually;
- Readily comparable among cities globally;
- Relevant for public policy decision making and/or linked to established goals (e.g. MDG);
- Cost effective to collect;
- Meaningful to cities across the globe regardless of geography, culture, affluence, size, or political structure;
- Understandable and not overly complex;
- Clear as to whether changes in the indicators are good or bad.

Source: Patricia McCarney (2014). Welcoming Address, Global Cities Summit, Toronto.



People	Total city population
	Population density (per square kilometer)
	Percentage of country's population
	Percentage of population that are children (0-14)
	Percentage of population that are youth (15-24)
	Percentage of population that are adult (25-64)
	Percentage of population that are senior citizens (65+)
	Male to female ratio (# of males per 100 females)
	Annual population change
	Population Dependency Ratio
	Percentage of population that are new immigrants
	Percentage of population that are migrating from elsewhere in the country
Housing	Total number of households
	Total number of occupied dwelling units (owned & rented)
	Persons per unit
	Dwelling density (per Square Kilometer)
Economy	Average household income (US$)
	Annual inflation rate based on average of last 5 years
	Cost of living
	Income distribution (Gini Coefficient)
	Country's GDP (US$)
	Country's GDP per capita (US$)
	City Product per Capita (US$)
	City Product as a percentage of Country's GDP
	Total employment
	Employment percentage change based on the last 5 years
	Number of Businesses per 1000 Population
	Annual average unemployment rate
	Commercial/industrial assessment as a percentage of total assessment
Government	Type of government (e.g. Local, Regional, County)
	Gross operating budget (US$)
	Gross operating budget per capita (US$)
	Gross capital budget (US$)
	Gross capital budget per capita (US$)

	Percentage of population that are youth (15-24)
	Percentage of population that are adult (25-64)
	Percentage of population that are senior citizens (65+)
	Male to female ratio (# of males per 100 females)
	Annual population change
	Population Dependency Ratio
	Percentage of population that are new immigrants
	Percentage of population that are migrating from elsewhere in the country
Housing	Total number of households
	Total number of occupied dwelling units (owned & rented)
	Persons per unit
	Dwelling density (per Square Kilometer)
Economy	Average household income (US$)
	Annual inflation rate based on average of last 5 years
	Cost of living
	Income distribution (Gini Coefficient)
	Country's GDP (US$)
	Country’s GDP per capita (US$)
	City Product per Capita (US$)
	City Product as a percentage of Country's GDP
	Total employment
	Employment percentage change based on the last 5 years
	Number of Businesses per 1000 Population
	Annual average unemployment rate
	Commercial/industrial assessment as a percentage of total assessment
Government	Type of government (e.g. Local, Regional, County)
	Gross operating budget (US$)
	Gross operating budget per capita (US$)
	Gross capital budget (US$)
	Gross capital budget per capita (US$)
Geography and Climate	Region
	Climate Type
	Land Area (Square Kilometers)
	Percentage of non-residential area (square kilometers)
	Annual average temperature (Celsius)
	Average annual rain (mm)
	Average annual snowfall (cm)

	Core Indicator	Supporting Indicator
Solid waste	Percentage of city population with regular solid waste collection	Percentage of the city's solid waste that is disposed of in an incinerator
	Percentage of city's solid waste that is recycled	Percentage of the city's solid waste that is burned openly
		Percentage of the city's solid waste that is disposed of in an open dump
		Percentage of the city's solid waste that is disposed of in a sanitary landfill
		Percentage of the city's solid waste that is disposed of by other means
	Future Indicators – Under discussion • *Indicator to capture informal waste (waste-pickers, sorters, etc.)*	
Transportation	Km of high capacity public transit system per 100,000 population	Number of two-wheel motorized vehicles per capita
	Km of light passenger transit system per 100,000 population	Commercial Air Connectivity (number of nonstop commercial air destinations)
	Number of personal automobiles per capita	Transportation fatalities per 100,000 population
	Annual number of public transit trips per capita	
	Future Indicators – Under discussion • *Total municipal road and transit expenditure per capita* • *Indicator regarding shape/condition of infrastructure* • *Urban accessibility index*	

	Core Indicator	Supporting Indicator
Governance		Percentage of women employed in the city government workforce
	Future Indicators - Under discussion • *Average number of days to get a business license* • *Requests for service response time* • *Under discussion to incorporate civic engagement in governance indicator* • *City governance Index*	
Urban Planning	Jobs/Housing ratio	Areal size of informal settlements as a percent of city area
		Green area (hectares) per 100,000 population
	Future Indicators – Under discussion • *Frequency of official reviews of master plan/ official plan* • *Percentage of land parcels with a registered title* • *Mechanisms for enforcement; regulation, planning standards (building codes, zoning by-laws, informal)*	

Source: Patricia McCarney (2014). Welcoming Address, Global Cities Summit, Toronto.

Indica
Facilit

Challenges in this Field of City Data

- Unrecorded informal service provision
- Unregistered land titles (no addresses)
- Undocumented citizens, incomes, employment
- Boundaries – No Conformity
- City data often collected nationally – Not locally
- No Standardized definitions on what to measure
- No Standardized methodologies on how to measure
- Weak or nonexistent baseline data in cities
- No mechanism for data and knowledge sharing across cities

The **ISO 37120** Initiative

STANDARDIZED CITIES INDICATORS FOR GLOBAL MEASUREMENT OF URBANIZATION

What are standardized indicators?

Quantitative, qualitative or descriptive sets of measurements and metrics that provide a globally standardized set of definitions and methodologies.

Who are the users of ISO 37120?

This International Standard is applicable to any city, municipality or local government that undertakes to measure its performance in a comparable and verifiable manner, irrespective of size and location or level of development.

How can ISO 37120 help cities?

Standardized indicators enable cities to assess their performance and measure progress over time and also to draw comparative lessons from other cities locally and globally. They also help to guide policy, planning and management across multiple sectors and stakeholders.

ISO 37120 – Benefits of standardized indicators:

- More effective governance and delivery of services
- International benchmarks and targets
- Local benchmarking and planning
- Informed decision making for policy makers and city managers
- Learning across cities
- Leverage for funding and recognition in international entities
- Leverage for funding by cities with senior levels of government
- Framework for sustainability planning
- Transparency and open data for investment attractiveness
- Data is moving fast – big data and the information explosion – ISO can help to give cities a reliable foundation of globally standardized data that will assist cities in building core knowledge for city decision-making, and enable comparative insight and global benchmarking

Why do we need city indicators?

1. Currently, 53 % of the world's population resides in cities, a figure that is expected to rise to 70 % by 2050. Cities are cultural and economic centres which today generate 70 % of the global GDP. Investing in them may be a priority for many governments, but doing so sustainably and effectively can be a challenge – this where ISO 37120:2014 can help.

2. The indicators included in ISO 37120:2014 will help cities to assess their performance and measure progress overtime, with the ultimate goal of improving quality of life and sustainability. The standard's uniform approach will enable cities to seamlessly compare where they stand in relation to other cities. This information can in turn be used to identify best practice and learn from one another.

http://www.iso.org

46 performance measures The world's cities will be judged by

http://citiscope.org/story/2014/here-are-46-performance-measures-worlds-cities-will-be-judged

Economy
City's unemployment rate
Assessed value of commercial and industrial properties as a percentage of total assessed value of all properties
Percentage of city population living in poverty

Education
Percentage of female school-aged population enrolled in school
Percentage of students completing primary education
Percentage of students completing secondary education
Primary education student/teacher ratio

Energy
Total residential electrical use per capita (kWh/year)
Percentage of city population with authorized electrical service
Energy consumption of public buildings per year (kWh/m2)
Percentage of total energy derived from renewable sources, as a share of the city's total energy consumption

Environment
Fine particulate matter (PM2.5) concentration
Particulate matter (PM10) concentration
Greenhouse gas emissions measured in tonnes per capita

Finance
Debt service ratio (debt service expenditure as a percent of a municipality's own-source revenue)

Fire and emergency response
Number of firefighters per 100 000 population
Number of fire related deaths per 100 000 population
Number of natural disaster-related deaths per 100 000 population

Governance
Voter participation in last municipal election (as a percentage of eligible voters)
Women as a percentage of total elected to city-level office

Health
Average life expectancy
Number of in-patient hospital beds per 100 000 population
Number of physicians per 100 000 population
Under age five mortality per 1 000 live births

Safety
Number of police officers per 100 000 population
Number of homicides per 100 000 population

Shelter
Percentage of city population living in slums

Solid waste
Percentage of city population with regular solid waste collection (residential)
Total collected municipal solid waste per capita
Percentage of city's solid waste that is recycled

Telecommunication and Innovation
Number of internet connections per 100 000 population
Number of cell phone connections per 100 000 population

Transportation
Km of high capacity public transport system per 100 000 population
Km of light passenger transport system per 100 000 population
Annual number of public transport trips per capita
Number of personal automobiles per capita

Urban Planning
Green area (hectares) per 100 000 population

Wastewater

Percentage of city population served by wastewater collection
Percentage of the city's wastewater that has received no treatment
Percentage of the city's wastewater receiving primary treatment
Percentage of the city's wastewater receiving secondary treatment
Percentage of the city's wastewater receiving tertiary treatment

Water and Sanitation

Percentage of city population with potable water supply service
Percentage of city population with sustainable access to an improved water source
Percentage of population with access to improved sanitation
Total domestic water consumption per capita (litres/day)

- See more at: http://citiscope.org/story/2014/here-are-46-performance-measures-worlds-cities-will-be-judged#sthash.q9UV7iT3.dpuf

The UKID Index

The UKID Index Urban Child Development

a. 1st global metric using detailed standardized data on children in cities
b. Starting point for measuring tangible progress on child development in cities
c. Important tool for advocacy, programming and evidence-based policy development.
d. Metric for evaluating cities' progress in creating a child-friendly environment
e. Developed under the guidance of UNICEF's Child Friendly Cities Initiative and embodies the Convention on the Rights of the Child at the local level.

The Global City Indicators Facility (GCIF) has a membership of 252 cities from which 7 cities are now participating in this pilot.

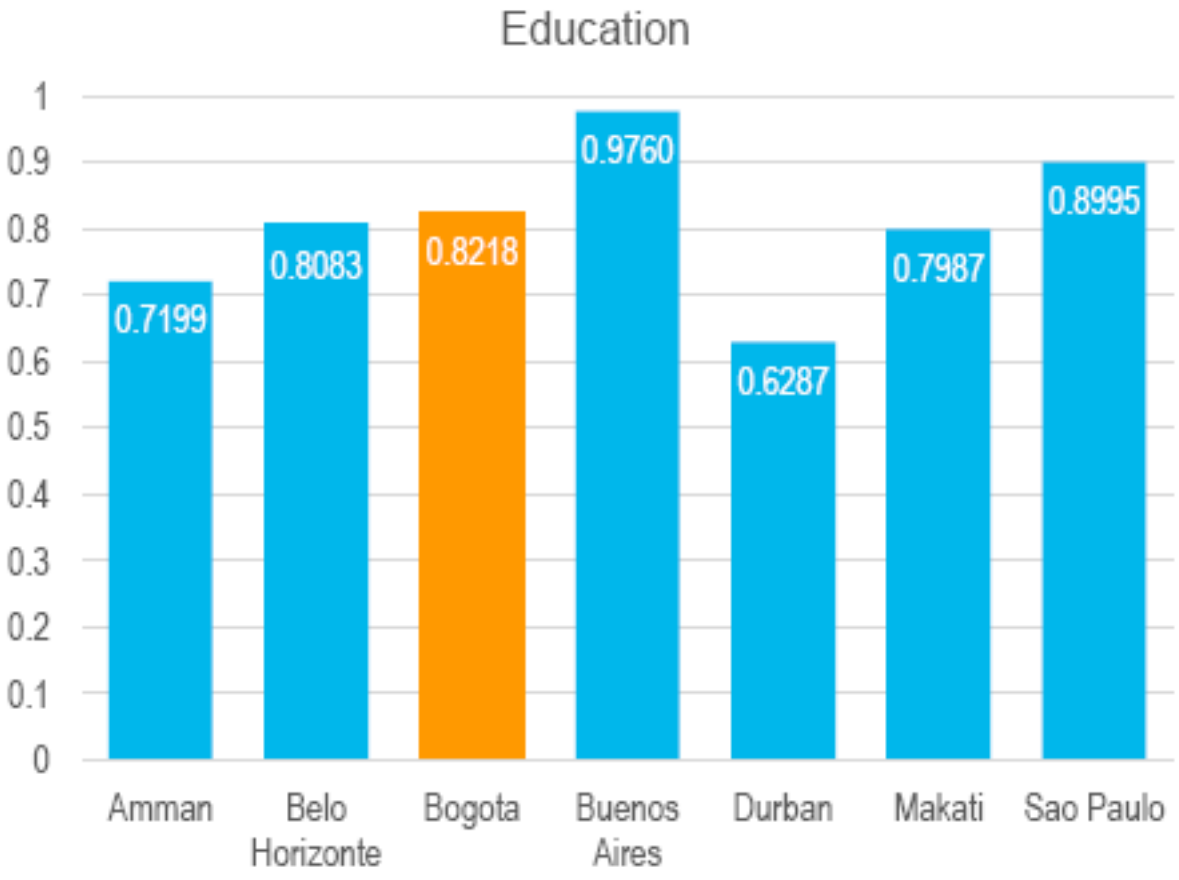
UKID INDEX

dimension	sub-index	indicator
Good Start to Life	Healthy Start	Number of physicians per 100,000 population Number of nursing and midwifery per 100,000 population Under-5 mortality rate per 1,000 live births Children aged under-5 that are underweight (%) Children aged under-5 that are overweight (%)
	Water & Sanitation	Population with access to an improved water source (%) Population served by wastewater collection (%) Wastewater receiving no treatment (%) Population with access to improved sanitation (%)
Protection from Harm	Safety & Emergency Preparedness	Number of homicides per 100,000 population Number of hospital beds per 100,000 population Number of firefighters per 100,000 population Disaster preparedness rating
Education & Knowledge	Education	Students completing primary education (%) Students completing secondary education (%) Male population enrolled in school (%) Female population enrolled in school (%)
Standard of Living	Social Equity	Population living in poverty (%) Population living in slums (%) GINI coefficient (Income distribution) Children aged under-5 that are registered (%) Children aged 5-17 involved in child labour (%)
	Connectivity	Total residential electrical use per capita (kWh/y) Number of internet connections per 100,000 population Number of cell phone connections per 100,000 population Annual number of public transit trips per capita
	Quality of Life	PM-10 concentration Green area per 100,000 population (ha) Life expectancy at birth

Preliminary **RESULTS** | Bogotá

Source: Patricia McCarney (2014). Welcoming Address, Global Cities Summit, Toronto.

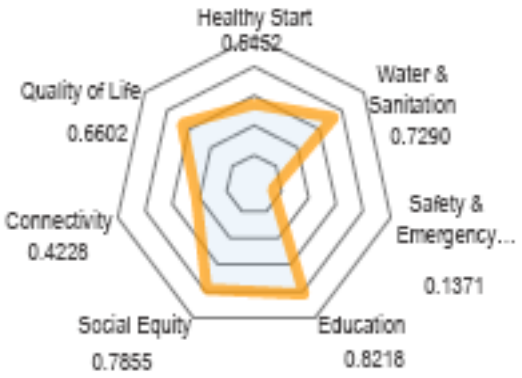
Bogotá's highest sub-index score is in Education. It also scores well in Social Equity and Water & Sanitation.



Overall:

0.5166

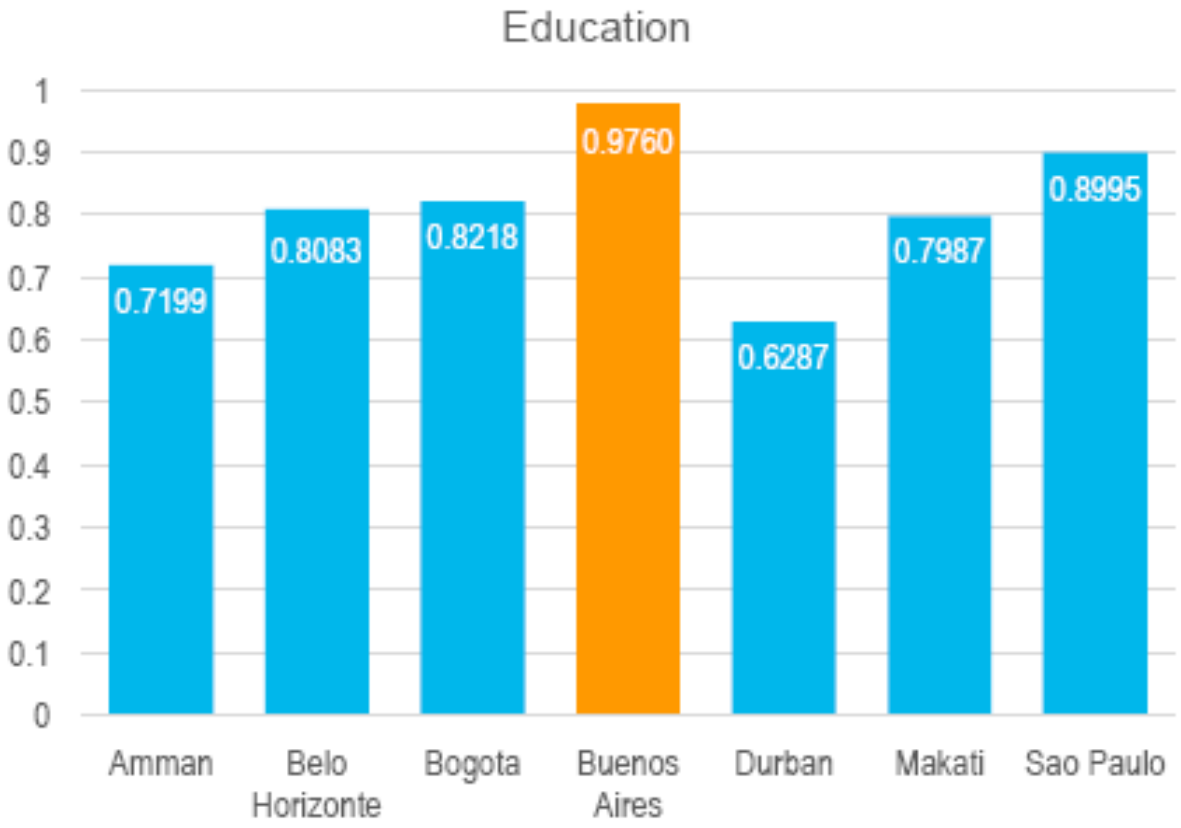
Sub-Indices:



Preliminary **RESULTS** | Buenos Aires

Source: Patricia McCarney (2014). Welcoming Address, Global Cities Summit, Toronto.

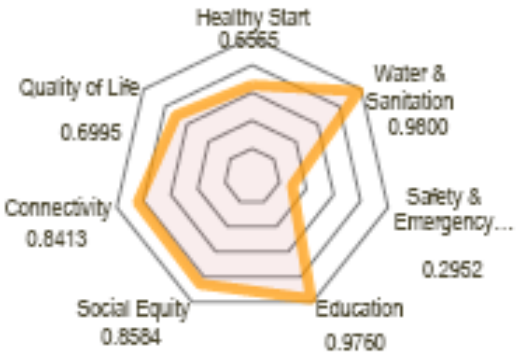
Buenos Aires is the strongest performer in the Education sub-index. It also scores extremely well in Water & Sanitation, Social Equity and Connectivity.



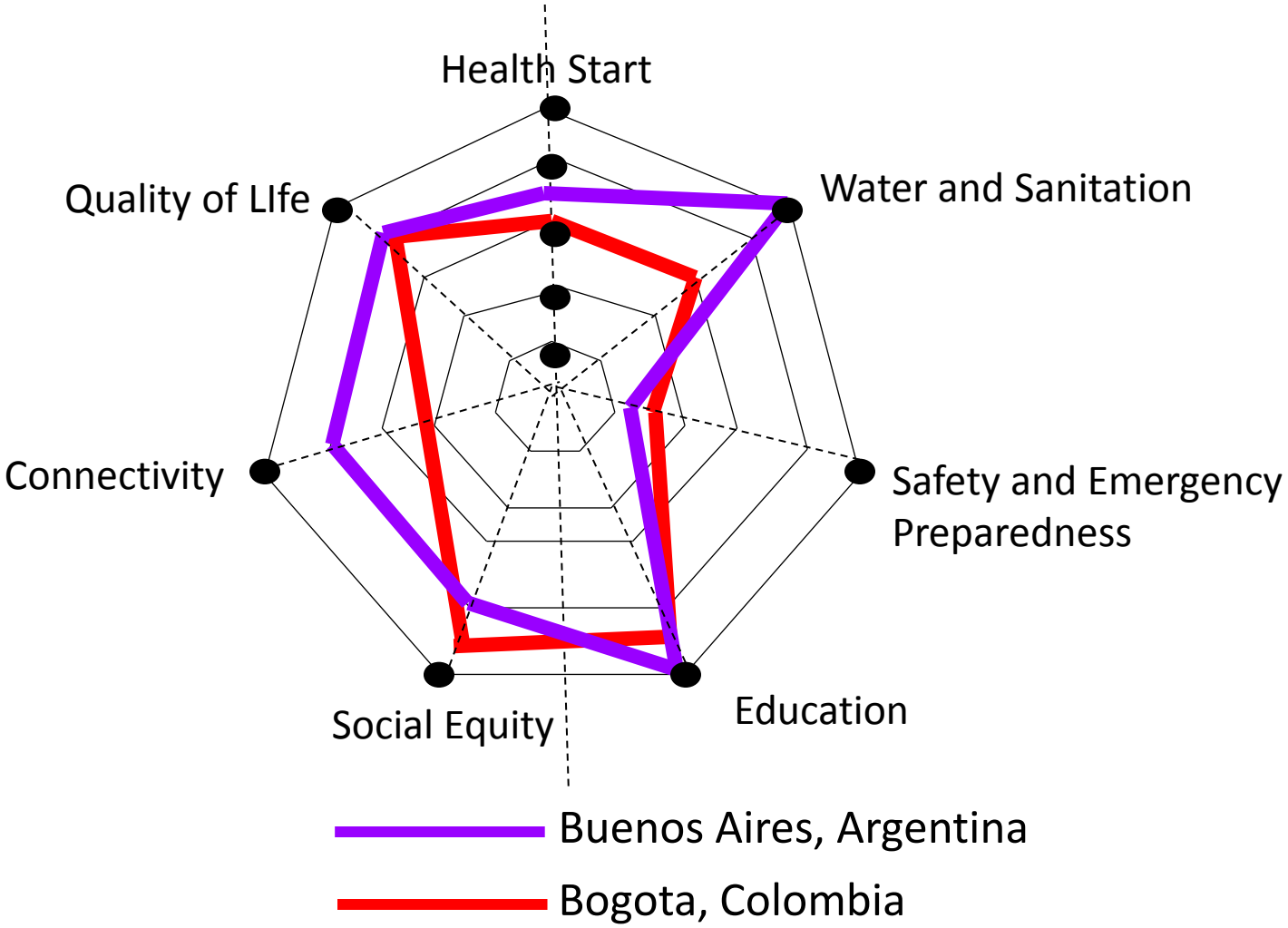
Overall:

0.7128

Sub-Indices:



The UKID Index Urban Child Development

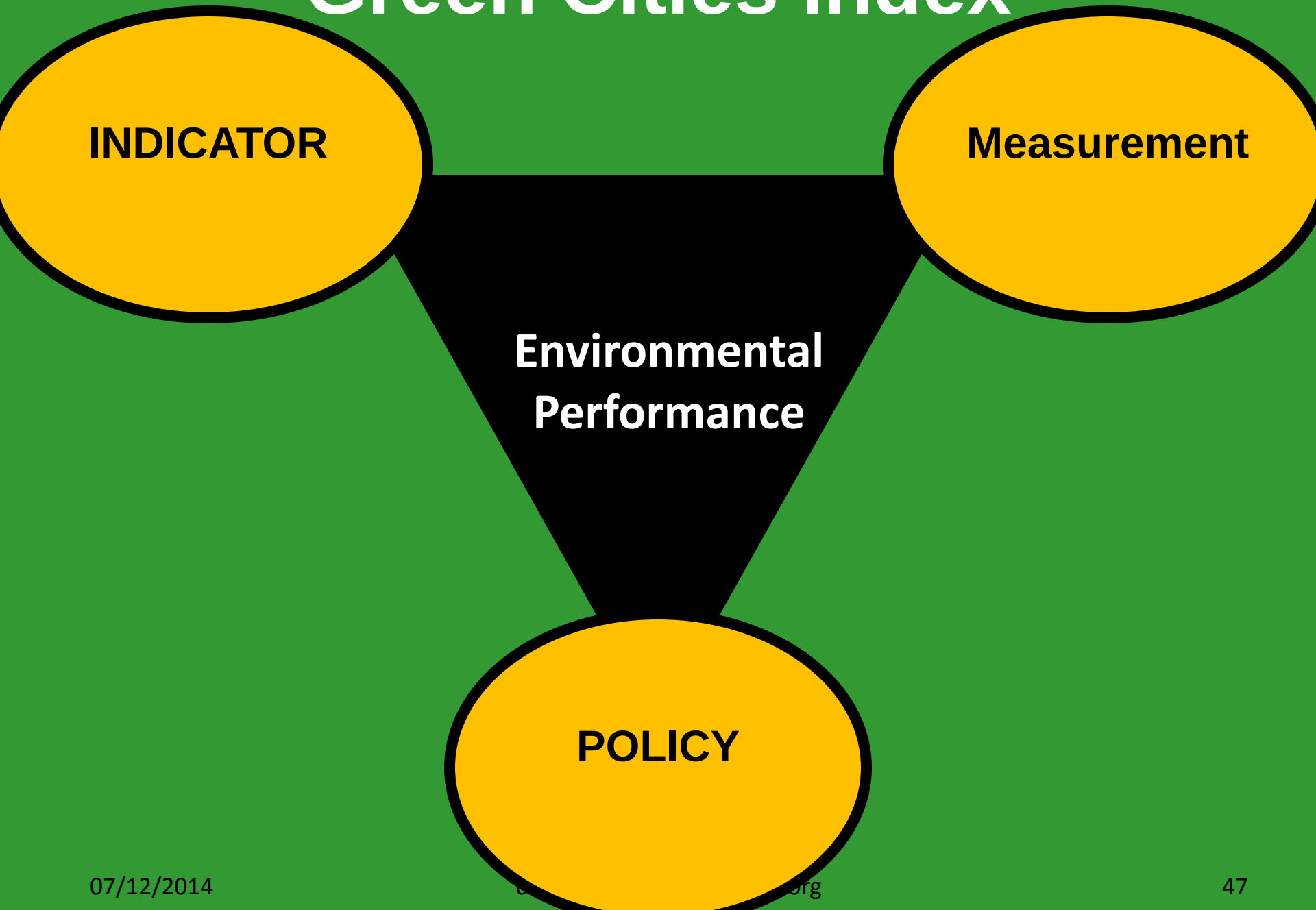


Green City Index

The Green City Indices are unique research projects assessing and comparing cities in terms of their environmental performance.

- Summary (new)
- Africa
- Asia
- Europe
- Germany
- Latin America
- US and Canada

Green Cities Index



Green City Index

- 30 individual indicators based on multiple data points
- Each city is assessed by 8 categories and placed within a performance bank to indicate its relative results

Measures environmental performance across 8 categories

(1) Energy and CO_2,

(2) Land Use & Buildings,

(3) Transport,

(4) Waste,

(5) Water,

(6) Sanitation,

(7) Air Quality

(8) Environmental Governance

Source: European Green City Index. Assessing the environmental performance of Europe's major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

Green City Index

- It started as European Green City Index
- Goal is to measure environmental performance and the city's commitment to reduce its future environment impact

- 16 out of the 30 indicators are derived from quantitative data

Example: level of CO_2 emissions, amount of energy it consumes

- 14 indicators are qualitative assessments of cities' aspirations and ambitions

Example: commitment to consuming more renewable energy, to improve energy efficiency of buildings

Source: European Green City Index. Assessing the environmental performance of Europe's major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

Overall

	City	Score
1	Copenhagen	87,31
2	Stockholm	86,65
3	Oslo	83,98
4	Vienna	83,34
5	Amsterdam	83,03
6	Zurich	82,31
7	Helsinki	79,29
8	Berlin	79,01
9	Brussels	78,01
10	Paris	73,21
11	London	71,56
12	Madrid	67,08
13	Vilnius	62,77
14	Rome	62,58
15	Riga	59,57
16	Warsaw	59,04
17	Budapest	57,55

CO_2

	City	Score
1	Oslo	9,58
2	Stockholm	8,99
3	Zurich	8,48
4	Copenhagen	8,35
5	Brussels	8,32
6	Paris	7,81
7	Rome	7,57
8	Vienna	7,53
9	Madrid	7,51
10	London	7,34
11	Helsinki	7,30
12	Amsterdam	7,10
13	Berlin	6,75
14	Ljubljana	6,67
15	Riga	5,55
16	Istanbul	4,86
=17	Athens	4,85

Energy

	City	Score
1	Oslo	8,71
2	Copenhagen	8,69
3	Vienna	7,76
4	Stockholm	7,61
5	Amsterdam	7,08
6	Zurich	6,92
7	Rome	6,40
8	Brussels	6,19
9	Lisbon	5,77
10	London	5,64
11	Istanbul	5,55
12	Madrid	5,52
13	Berlin	5,48
14	Warsaw	5,29
15	Athens	4,94
16	Paris	4,66
17	Belgrade	4,65

Buildings

	City	Score
=1	Berlin	9,44
=1	Stockholm	9,44
3	Oslo	9,22
4	Copenhagen	9,17
5	Helsinki	9,11
6	Amsterdam	9,01
7	Paris	8,96
8	Vienna	8,62
9	Zurich	8,43
10	London	7,96
11	Lisbon	7,34
12	Brussels	7,14
13	Vilnius	6,91
14	Sofia	6,25
15	Rome	6,16
16	Warsaw	5,99
17	Madrid	5,68

Source: European Green City Index. Assessing the environmental performance of Europe's major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

30 CITIES

Transport

	City	Score
1	Stockholm	8,81
2	Amsterdam	8,44
3	Copenhagen	8,29
4	Vienna	8,00
5	Oslo	7,92
6	Zurich	7,83
7	Brussels	7,49
8	Bratislava	7,16
9	Helsinki	7,08
=10	Budapest	6,64
=10	Tallinn	6,64
12	Berlin	6,60
13	Ljubljana	6,17
14	Riga	6,16
15	Madrid	6,01
16	London	5,55
17	Athens	5,48

Water

	City	Score
1	Amsterdam	9,21
2	Vienna	9,13
3	Berlin	9,12
4	Brussels	9,05
=5	Copenhagen	8,88
=5	Zurich	8,88
7	Madrid	8,59
8	London	8,58
9	Paris	8,55
10	Prague	8,39
11	Helsinki	7,92
12	Tallinn	7,90
13	Vilnius	7,71
14	Bratislava	7,65
15	Athens	7,26
=16	Dublin	7,14
=16	Stockholm	7,14

Waste and land use

	City	Score
1	Amsterdam	8,98
2	Zurich	8,82
3	Helsinki	8,69
4	Berlin	8,63
5	Vienna	8,60
6	Oslo	8,23
7	Copenhagen	8,05
8	Stockholm	7,99
9	Vilnius	7,31
10	Brussels	7,26
11	London	7,16
12	Paris	6,72
13	Dublin	6,38
14	Prague	6,30
15	Budapest	6,27
16	Tallinn	6,15
17	Rome	5,96

Air quality

	City	Score
1	Vilnius	9,37
2	Stockholm	9,35
3	Helsinki	8,84
4	Dublin	8,62
5	Copenhagen	8,43
6	Tallinn	8,30
7	Riga	8,28
8	Berlin	7,86
9	Zurich	7,70
10	Vienna	7,59
11	Amsterdam	7,48
12	London	7,34
13	Paris	7,14
14	Ljubljana	7,03
15	Oslo	7,00
16	Brussels	6,95
17	Rome	6,56

Environmental governance

	City	Score
=1	Brussels	10,00
=1	Copenhagen	10,00
=1	Helsinki	10,00
=1	Stockholm	10,00
=5	Oslo	9,67
=5	Warsaw	9,67
=7	Paris	9,44
=7	Vienna	9,44
9	Berlin	9,33
10	Amsterdam	9,11
11	Zurich	8,78
12	Lisbon	8,22
=13	Budapest	8,00
=13	Madrid	8,00
=15	Ljubljana	7,67
=15	London	7,67
17	Vilnius	7,33

Source: European Green City Index. Assessing the environmental performance of Europe's major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

Green Cities INDICATORS

1. In order to be able to compare data points across countries, as well as to construct aggregate scores for each city, the project team had first to make the gathered data comparable.
2. To do so, the quantitative indicators were “normalised” on a scale of 0 to 10, where 10 points were assigned to cities that met or exceeded certain criteria on environmental performance.
3. Cities were scored either against an upper benchmark or lower benchmark. Benchmark targets were chosen from international or European directives.

Source: European Green City Index. Assessing the environmental performance of Europe’s major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

Green Cities INDICATORS

4. For example, an upper benchmark of 50% was set for the amount of waste cities should aim to recycle, which is in line with the EU's 2020 target for recycling waste. Cities that met or exceeded this benchmark scored 10 points, and the rest received a score between 0 and 10, based on their distance away from the target.
5. For other indicators, lower benchmarks were set, such as for the maximum amount of pollutants cities should emit on an average daily basis (for example, 40 ug/m2 in the case of nitrogen dioxide). In such cases, any city scoring the same or higher than the benchmark received a score of 0, while the city furthest below the benchmark scored 10. Remaining cities received a score according to their distance away from the best-performing city.

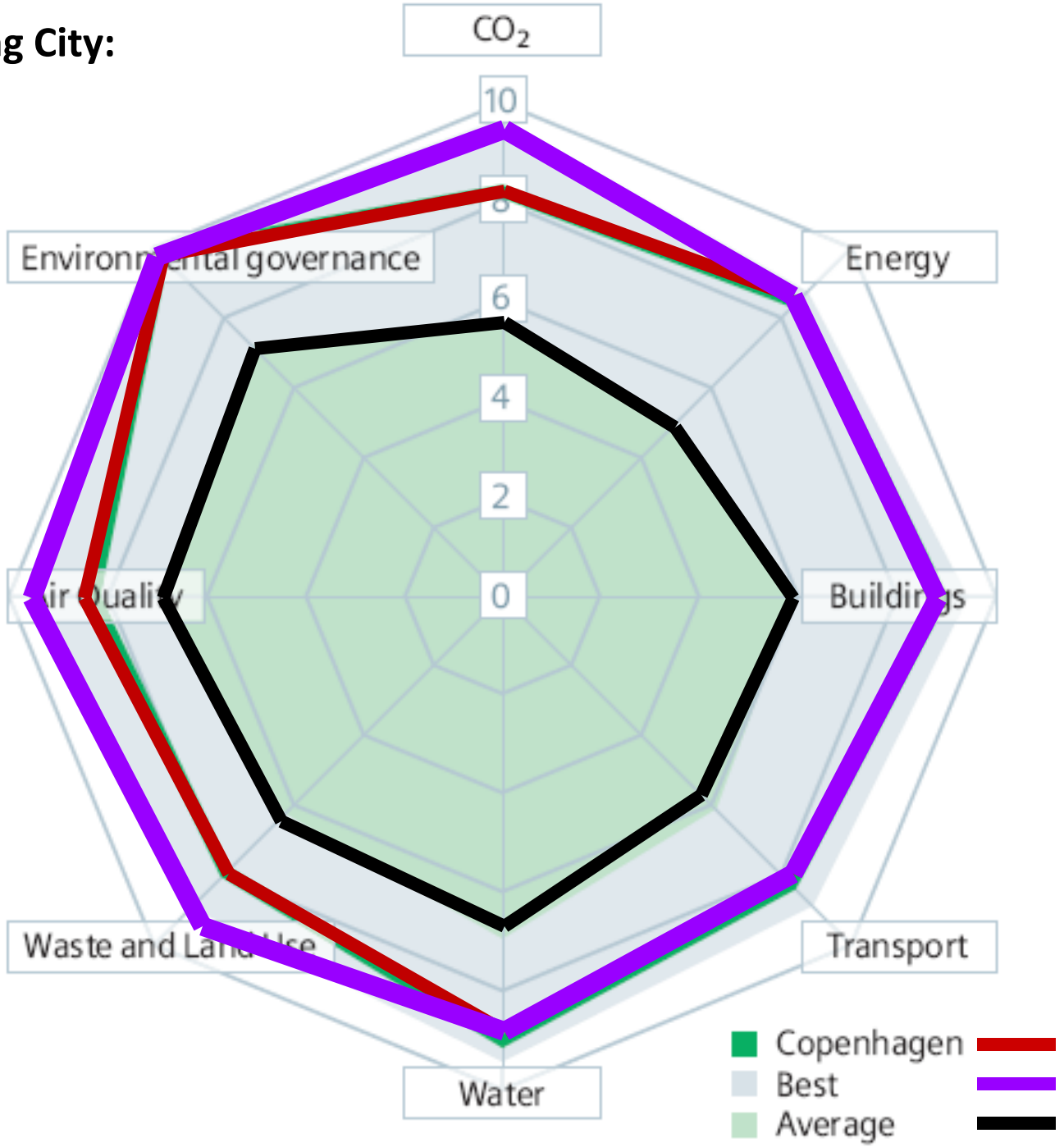
Source: European Green City Index. Assessing the environmental performance of Europe's major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

Green Cities INDICATORS

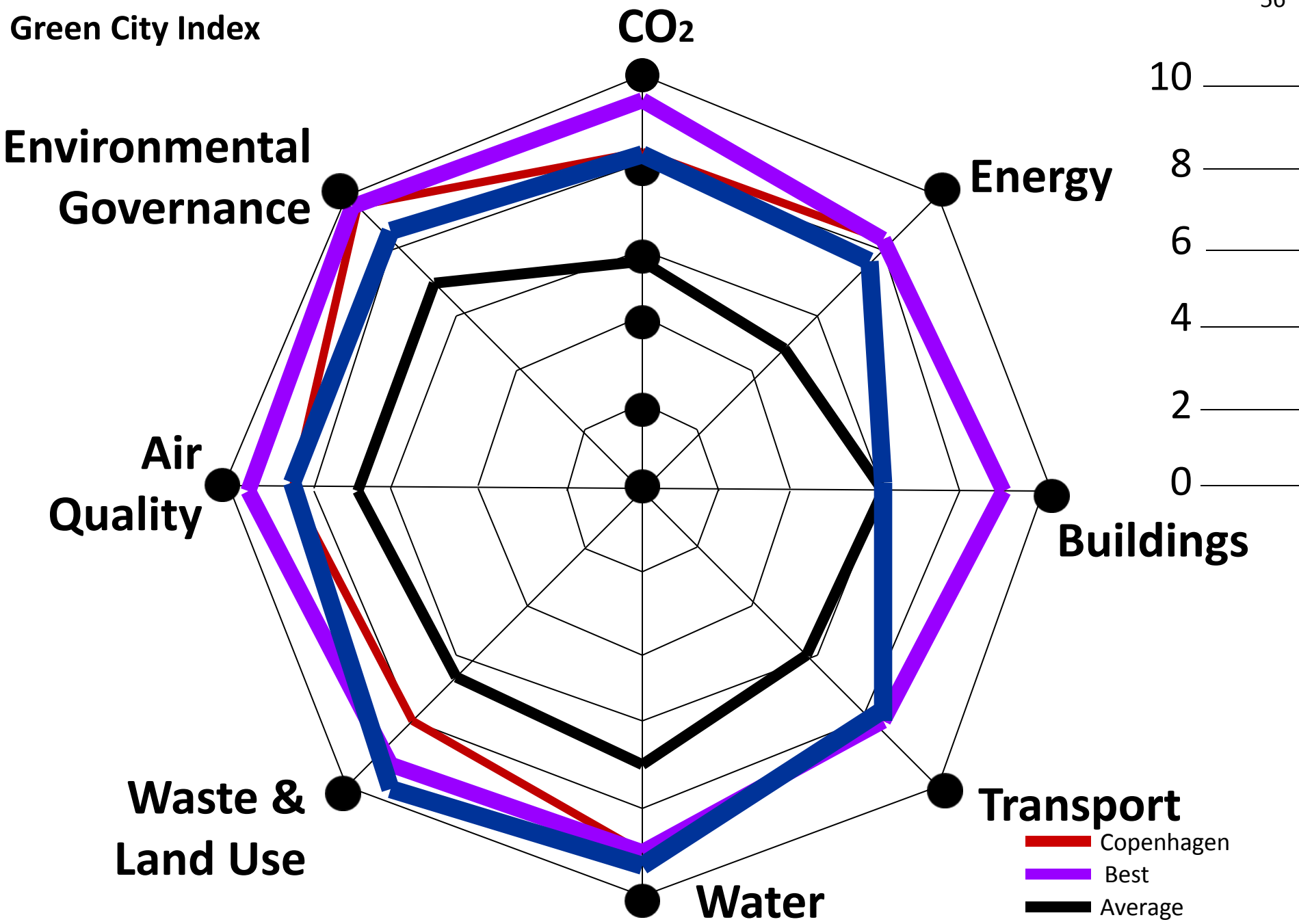
- The goal of the index is to allow key stakeholder groups — such as city administrators, policymakers, infrastructure providers, environmental non-governmental organisations (NGOs), urban sustainability experts, and citizens — to compare their city's performance against others overall, and within each category.
- The index also allows for comparisons across cities clustered by a certain criteria, such as geographic region or income group.
- In short, this tool is provided in the hope that it will help European cities move towards being a bigger part of the solution to climate change and other environmental challenges.

Source: European Green City Index. Assessing the environmental performance of Europe's major cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens. 2009

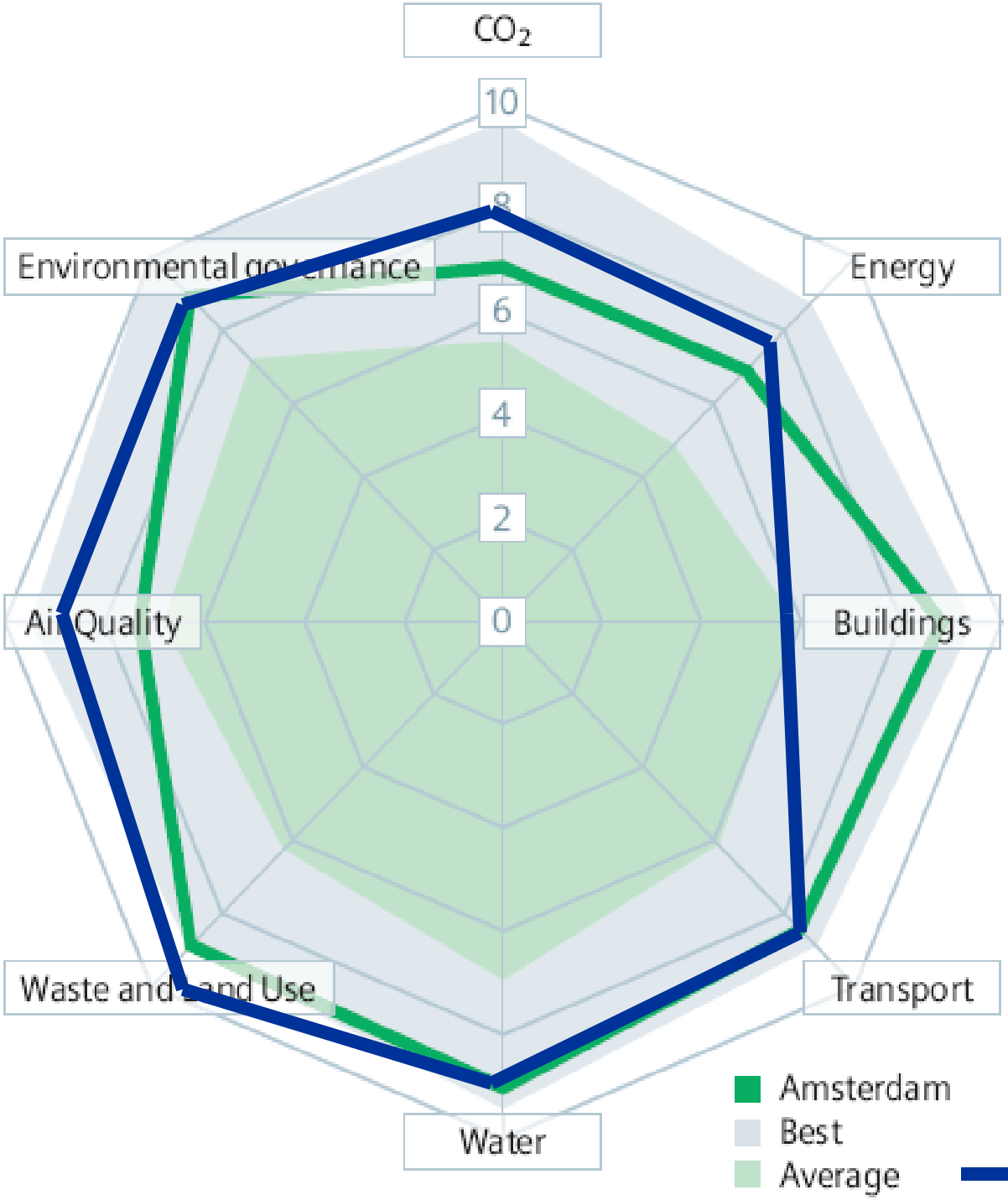
Top Performing City:
Copenhagen



Green City Index



claudio.acioly@unhabitat.org


CO_2
10
8
6
4
2
0
Energy
Buildings
Transport
Water
Waste and Land Use
Air Quality
Environmental governance
Amsterdam
Best
Average
Curitiba - estimate

Lowest Performing City:
Kiev

Latin American Green City Index

How are Latin American cities performing with respect to urban environmental sustainability? A study conducted by Siemens in cooperation with the Economist Intelligence Unit provides the answer. 17 leading Latin American cities are compared in terms of their environmental sustainability. The cities are assessed in eight categories, such as energy and CO, transport and waste.

› Objectives › Methodology

Contact

✉ Send Message

Related Information

- PDF Overall report: Latin American Green City Index
- PDF Overall report (Spanish): Índice de Ciudades Verdes de América Latina
- PDF Overall report (Portuguese): Índice de Cidades Verdes da América Latina
- ↗ Press special

Results

Overall

Well Below Average	Below Average	Average	Above Average	Well Above Average
Guadalajara	Buenos Aires	Medellín	Belo Horizonte	Curitiba
Lima	Montevideo	Mexico City	Bogotá	
		Monterrey	Brasília	
		Porto Alegre	Rio de Janeiro	
		Puebla	São Paulo	
		Quito		
		Santiago		

Select a city from the grid

Deutsch

Well Below Average	Below Average	Average	Above Average	Well Above Average
Guadalajara	Buenos Aires	Medellín	Belo Horizonte	Curitiba
Lima	Montevideo	Mexico City	Bogotá	
		Monterrey	Brasília	
		Porto Alegre	Rio de Janeiro	
		Puebla	São Paulo	
		Quito		
		Santiago		

17 CITIES

“I will argue that good urban planning can be of great value for places and their branding efforts. Cities with good urban planning get noticed. This is important, especially for relatively unknown non-capital cities in Latin America, Africa or Asia. Such cities often have millions of inhabitants and have much to offer to people and investors, but are barely known outside their region. One such a city is Curitiba, located in the south of Brazil”.
Hans Pul, 14/03/2012.

http://blog.inpolis.com/2012/03/14/curiciba-latin-americas-green-city/

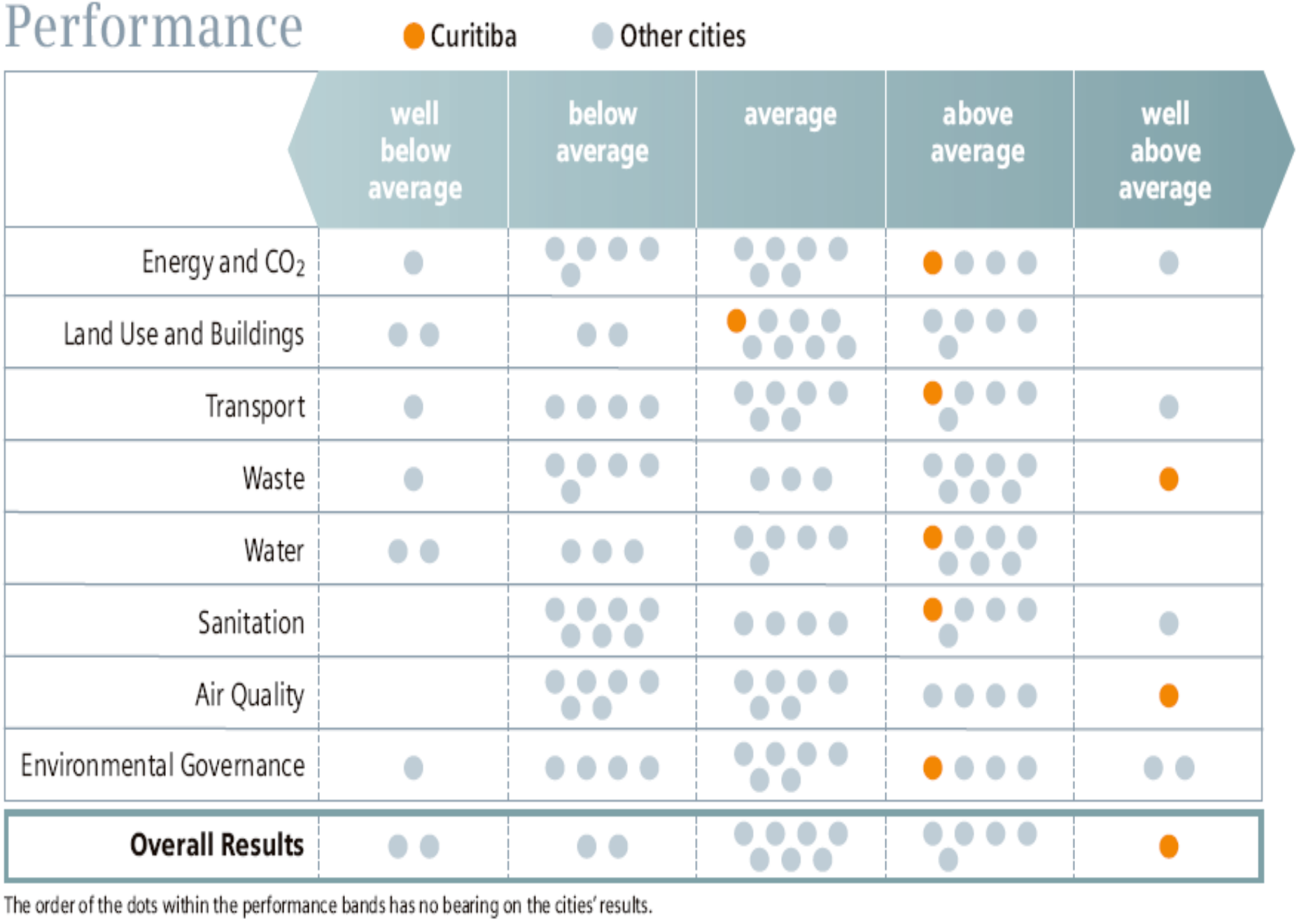
Source: Latin American Green City Index. Assessing the environmental performance of Latin American Cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens.

Quantitative Indicators: Curitiba

		Average	Curitiba	Year*	Source
Energy and CO_2	CO_2 emissions from electricity consumption per person (kg/person)	202.2	70.4 [1, e]	2007	EIU estimate; Agência Curitiba; Curitiba, Prefeitura da Energy Agency; Intergovernmental Panel on Climate C
	Electricity consumption per US$ GDP (megajoules per thousand US$ GDP)	760.7	743.5 [2]	2007	Agência Curitiba; Curitiba, Prefeitura da Cidade; Economist Intelligence Unit
Land use and Buildings	Population density (persons/km²)	4,503.0	4,296.2 [2]	2009	Agência Curitiba; Curitiba, Prefeitura da Cidade
	Green spaces per person (m²/person)	254.6	51.5 [2]	2009	Agência Curitiba; Curitiba, Prefeitura da Cidade
Transport	Length of mass transport network (km/km²)	5.0	8.5 [2, e]	2009	Agência Curitiba; Curitiba, Prefeitura da Cidade
	Superior public transport networks (km/km²)	0.13	0.19 [2]	2010	URBS Curitiba
	Stock of cars and motorcycles (vehicles/person)	0.30	0.50 [2]	2010	Denatran
Waste	Share of waste collected and adequately disposed (%	96.2	100.0 [2]	2007	Agência Curitiba; Curitiba, Prefeitura da Cidade
	Waste generated per person (kg/person/year)	465.0	473.2 [2]	2009	Agência Curitiba; Curitiba, Prefeitura da Cidade
Water	Water consumption per person (litres per person per ay)	264.3	150.0 [2]	2010	SANEPAR - Companhia de Saneamento do Paraná
	Water system leakages (%)	34.6	39.2 [2]	2009	Agência Curitiba; Curitiba, Prefeitura da Cidade
	Share of population with access to potable water (%)	97.5	100.0 [2]	2009	Agência Curitiba; Curitiba, Prefeitura da Cidade
Sanitation	Population with access to sanitation (%)	93.7	92.5 [3]	2010	SANEPAR - Companhia de Saneamento do Paraná
	Share of wastewater treated (%)	51.5	98.3 [2]	2010	SANEPAR - Companhia de Saneamento do Paraná
Air Quality	Daily nitrogen dioxide levels (ug/m³)	37.8	22.5 [2]	2007	Secretaria de Estado do Meio Ambiente - Relatório de Qualidade do Ar Curitiba e RMC
	Daily sulphur dioxide levels (ug/m³)	11.4	6.6 [2]	2007	Secretaria de Estado do Meio Ambiente - Relatório de Qualidade do Ar Curitiba e RMC
	Daily suspended particulate matter levels (ug/m³)	48.0	25.9 [2]	2007	Secretaria de Estado do Meio Ambiente - Relatório de Qualidade do Ar Curitiba e RMC

* Where data from different years were used only the year of the main indicator is listed, e) EIU Estimate, energy sources used in electricity production in Brazil, 2) Based on City of Curitiba, 3) Ba

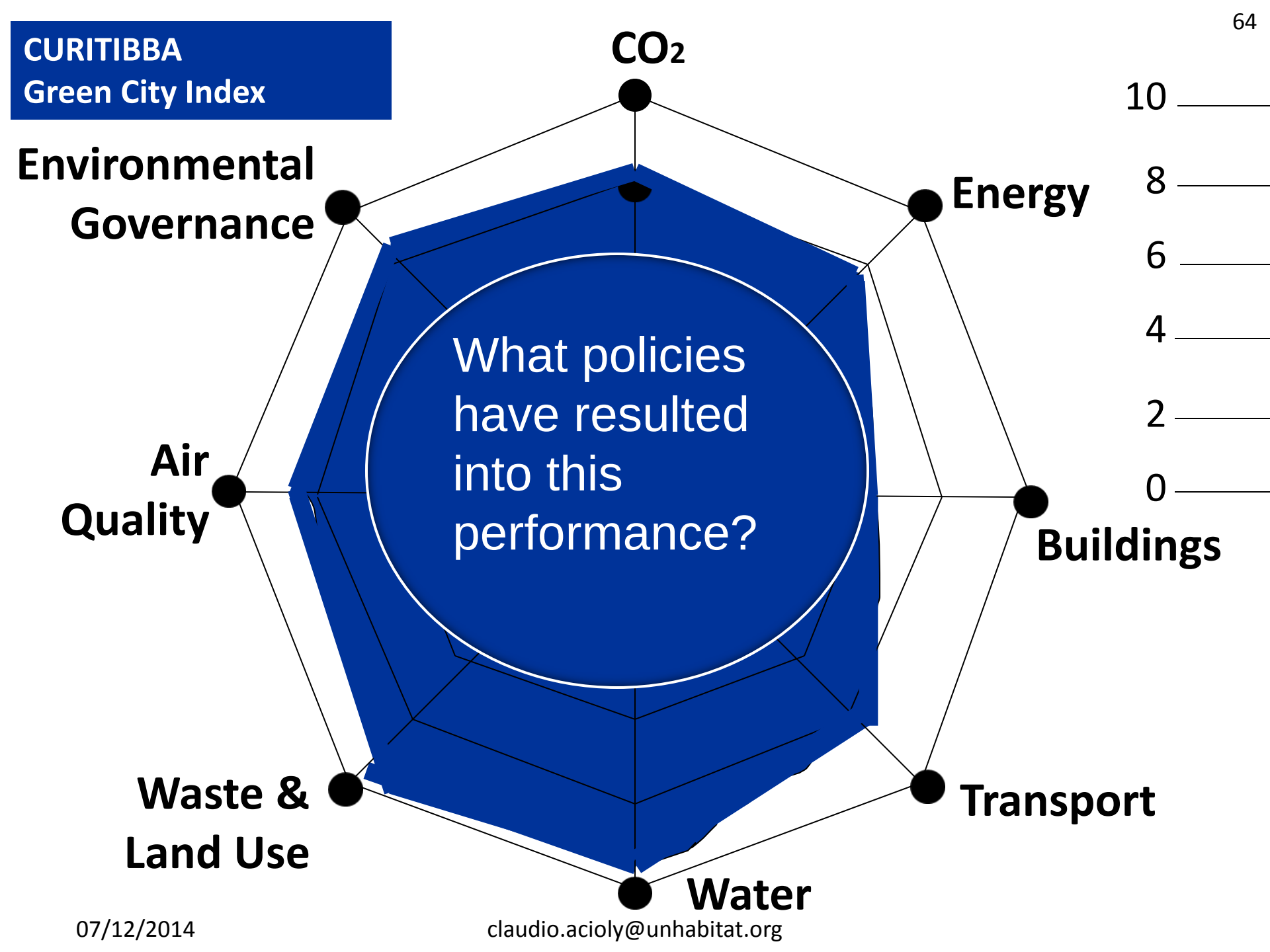
Performance



The order of the dots within the performance bands has no bearing on the cities' results.

Source: Latin American Green City Index. Assessing the environmental performance of Latin American Cities. A research conducted by the Economist Intelligence Unit, sponsored by Siemens.

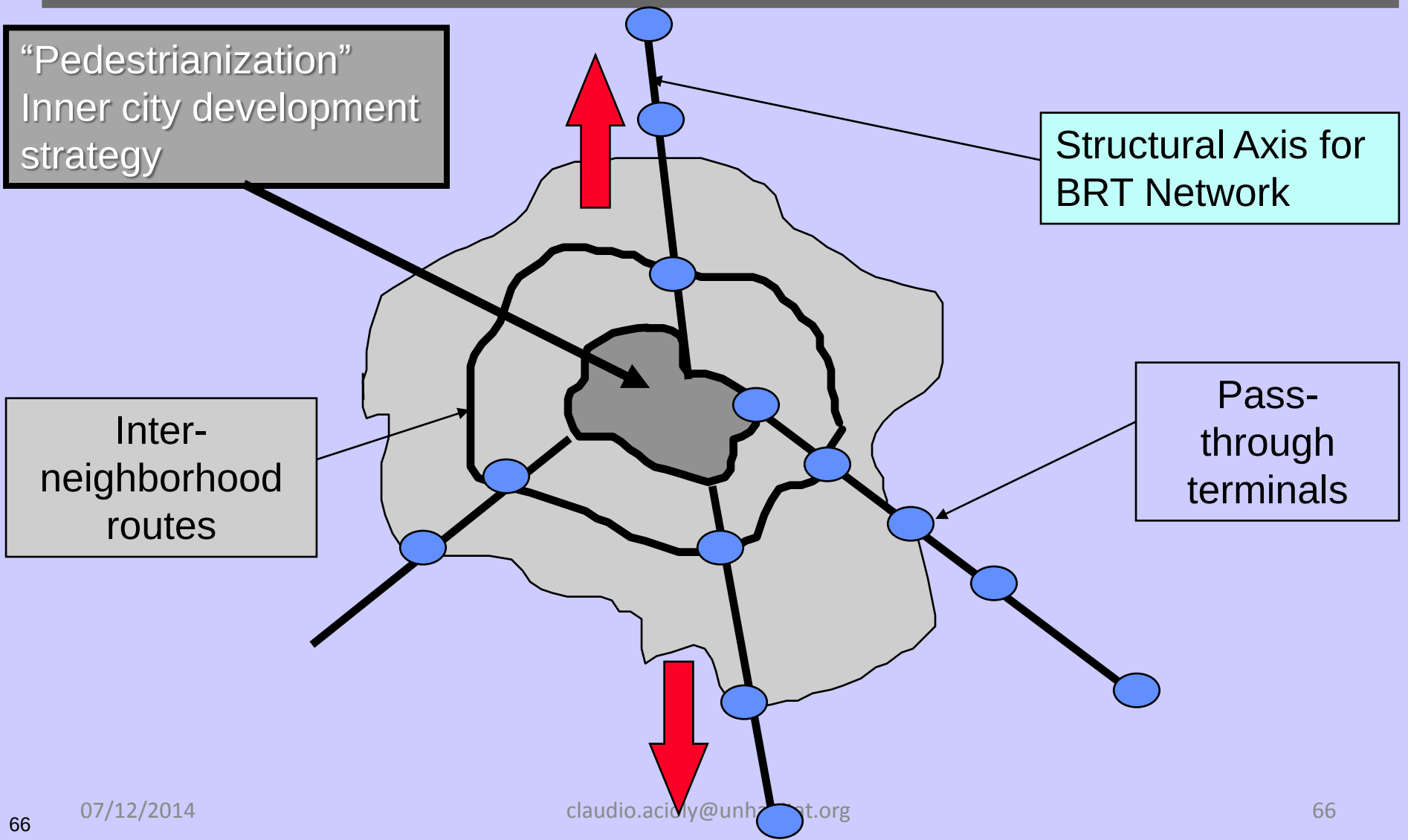
CURITIBBA
Green City Index



claudio.acioly@unhabitat.org

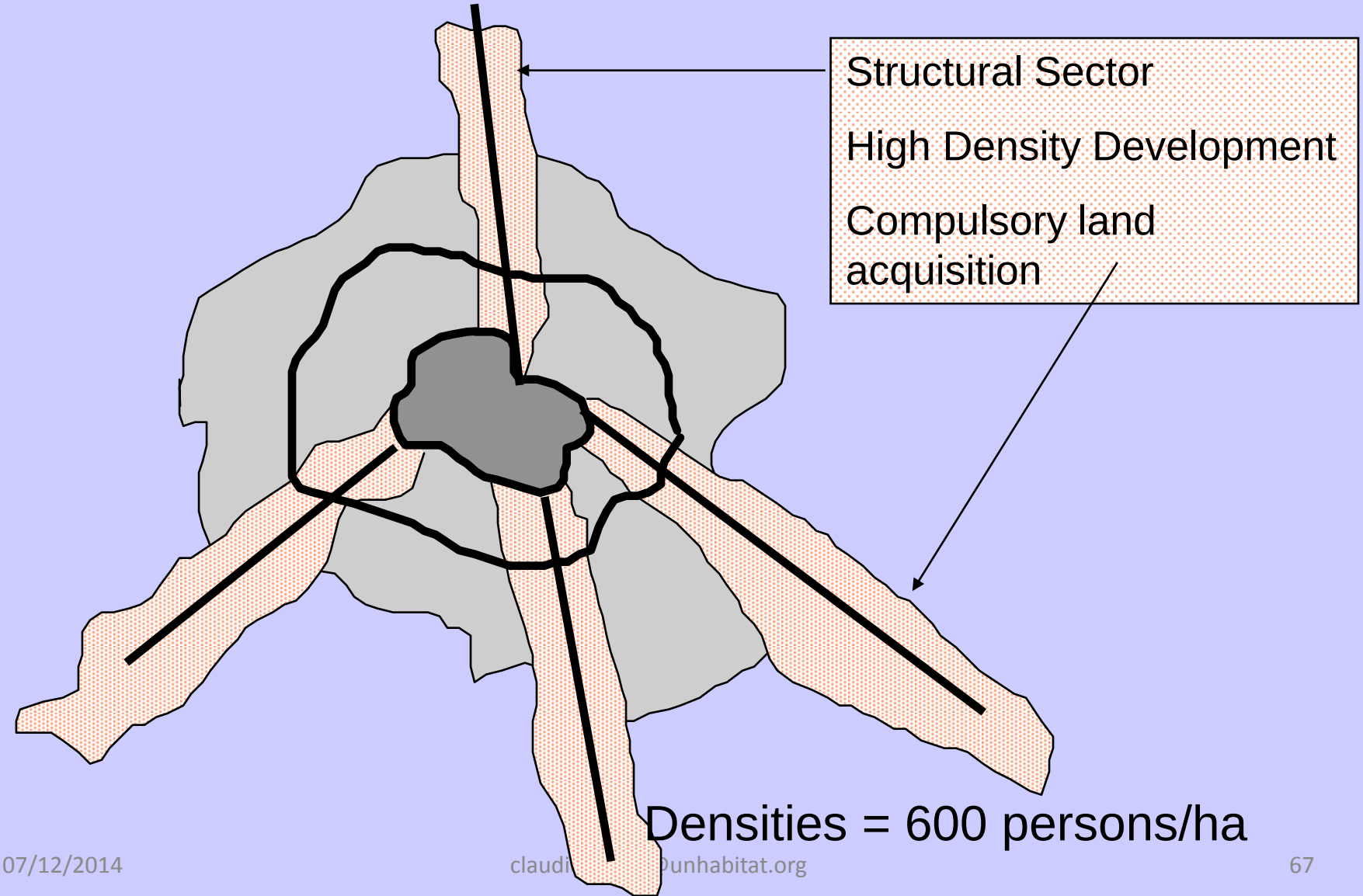
Changing the Urban Form of Curitiba, Brazil

From Radial to Linear Growth Pattern
Urban Development Strategy - SCHEMATIC VIEW



Changing the Urban Form of Curitiba, Brazil

From Radial to Linear Growth Pattern
Urban Development Strategy - SCHEMATIC VIEW



Curitiba Integrated Transport Network

Trinary System and the Structural Axis of Curitiba

1. One way traffic towards the inner city.

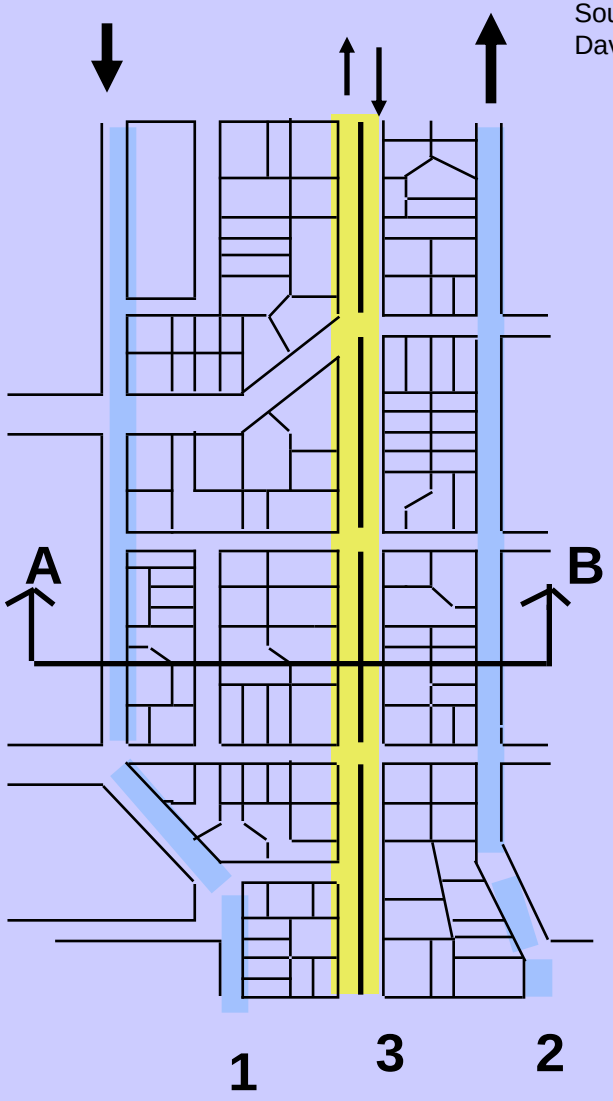
2. One way traffic outwards the inner city.

3. Structural axis with exclusive bus lane and parallel local traffic roads.

A-B. Structural sector

Density = 600 inhab/ha

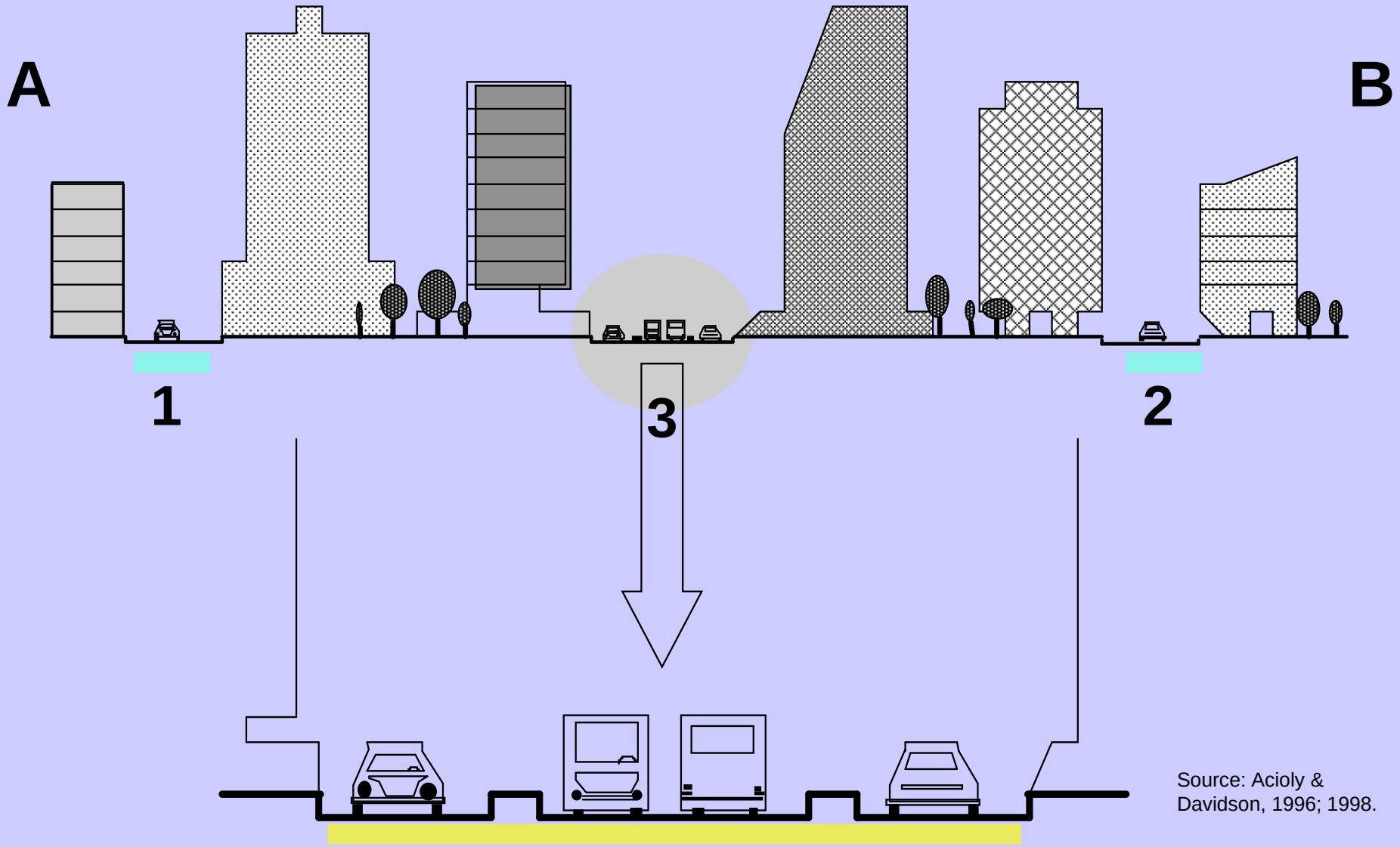
FAR = 6



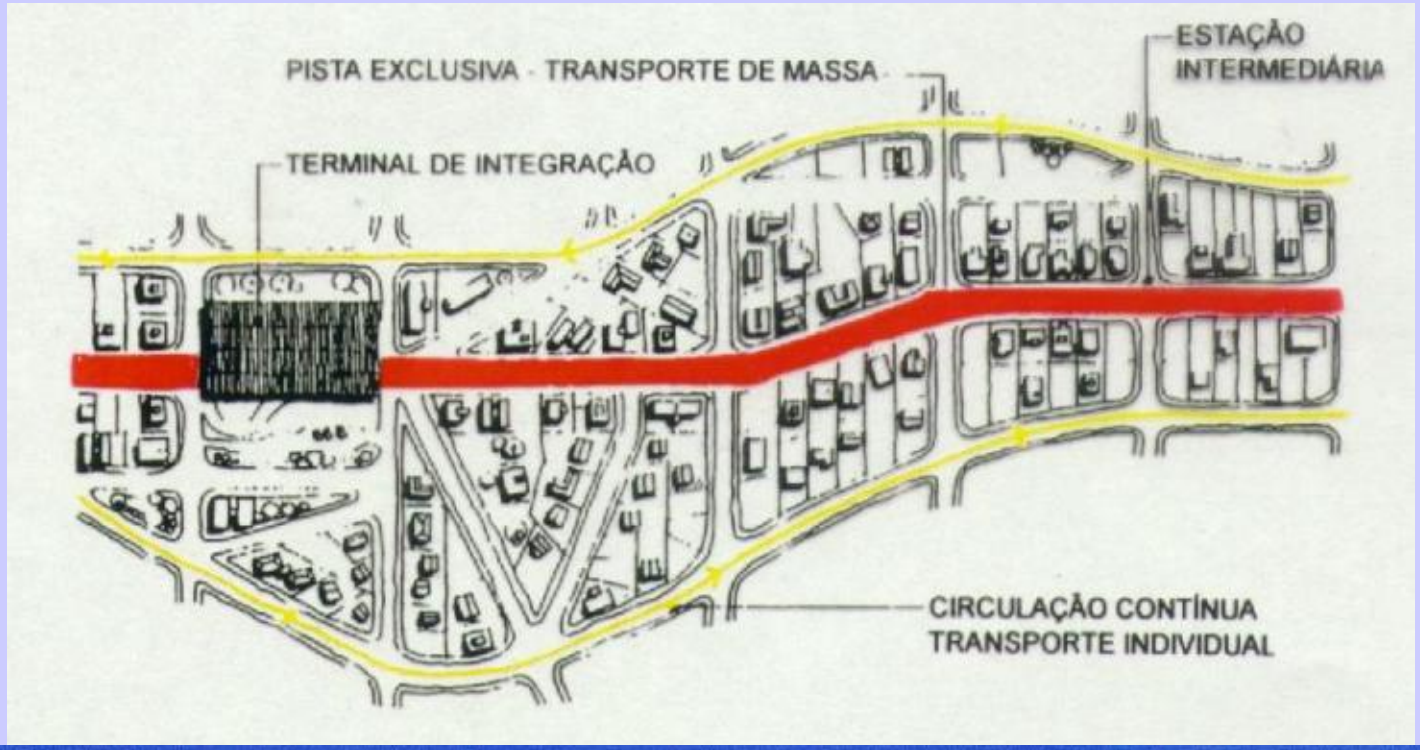
Source: Acioly & Davidson, 1996; 1998.

Curitiba Integrated Transport Network

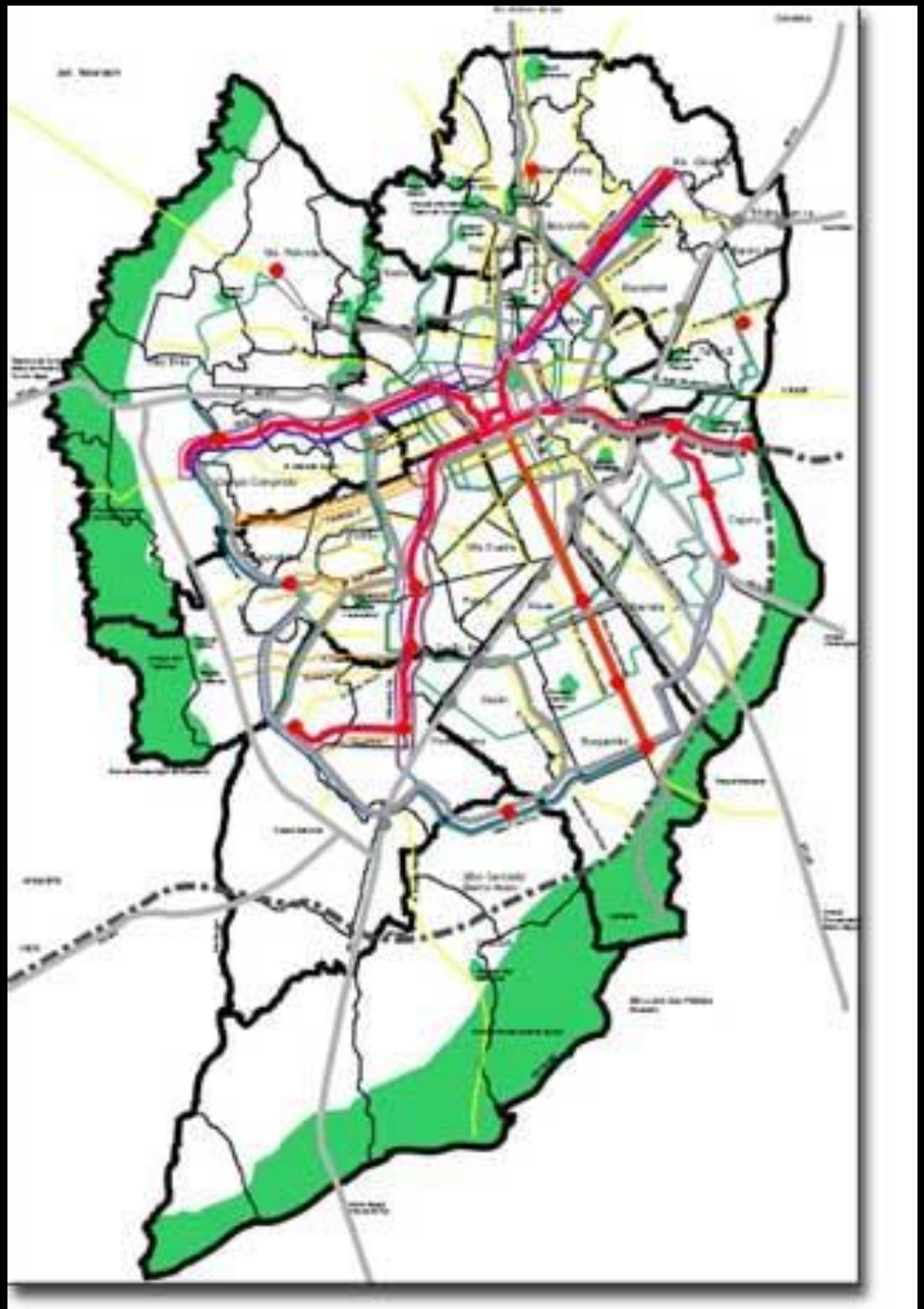
Trinary System and the Structural Axis of Curitiba

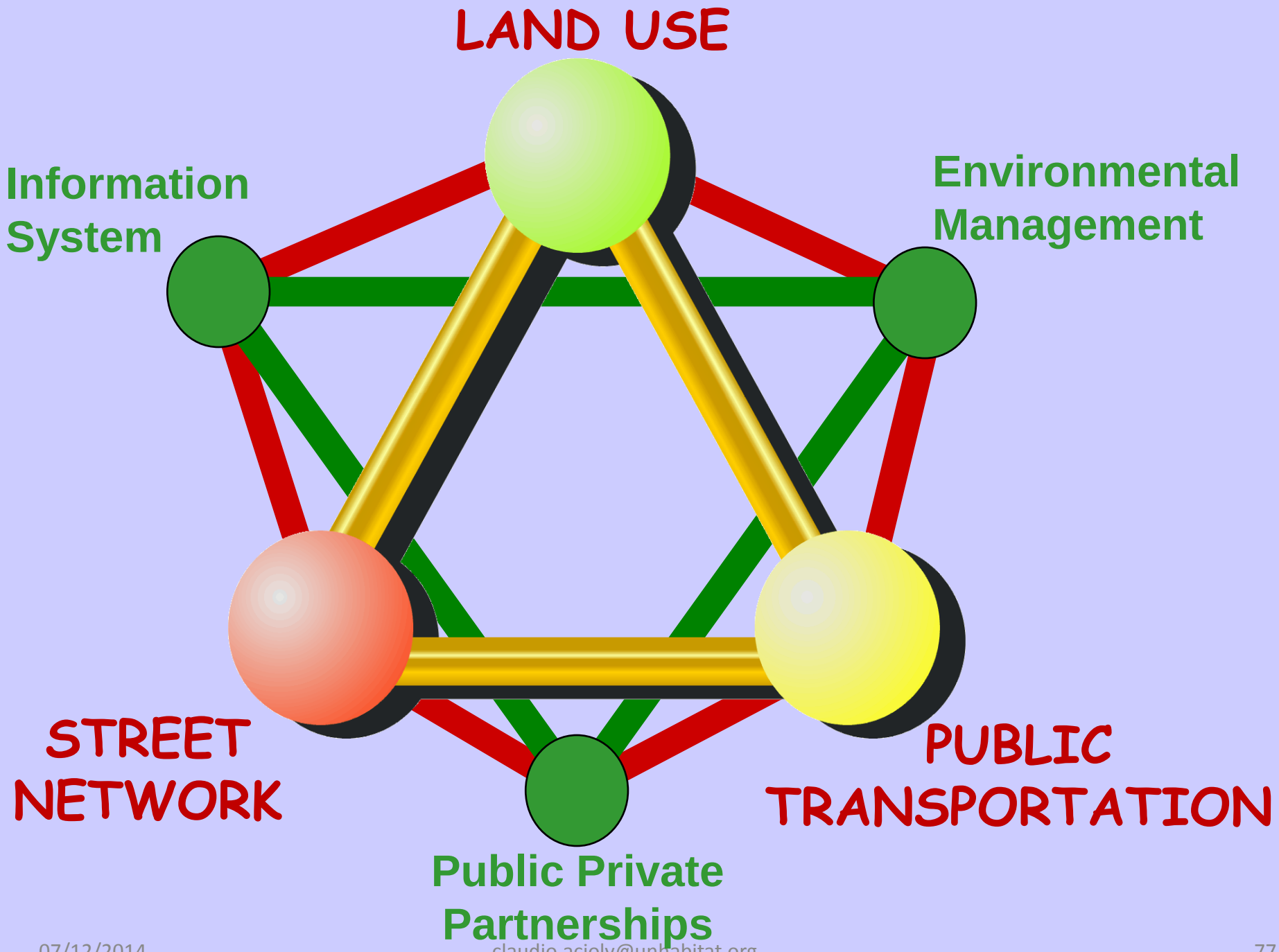


Source: Acioly & Davidson, 1996; 1998.

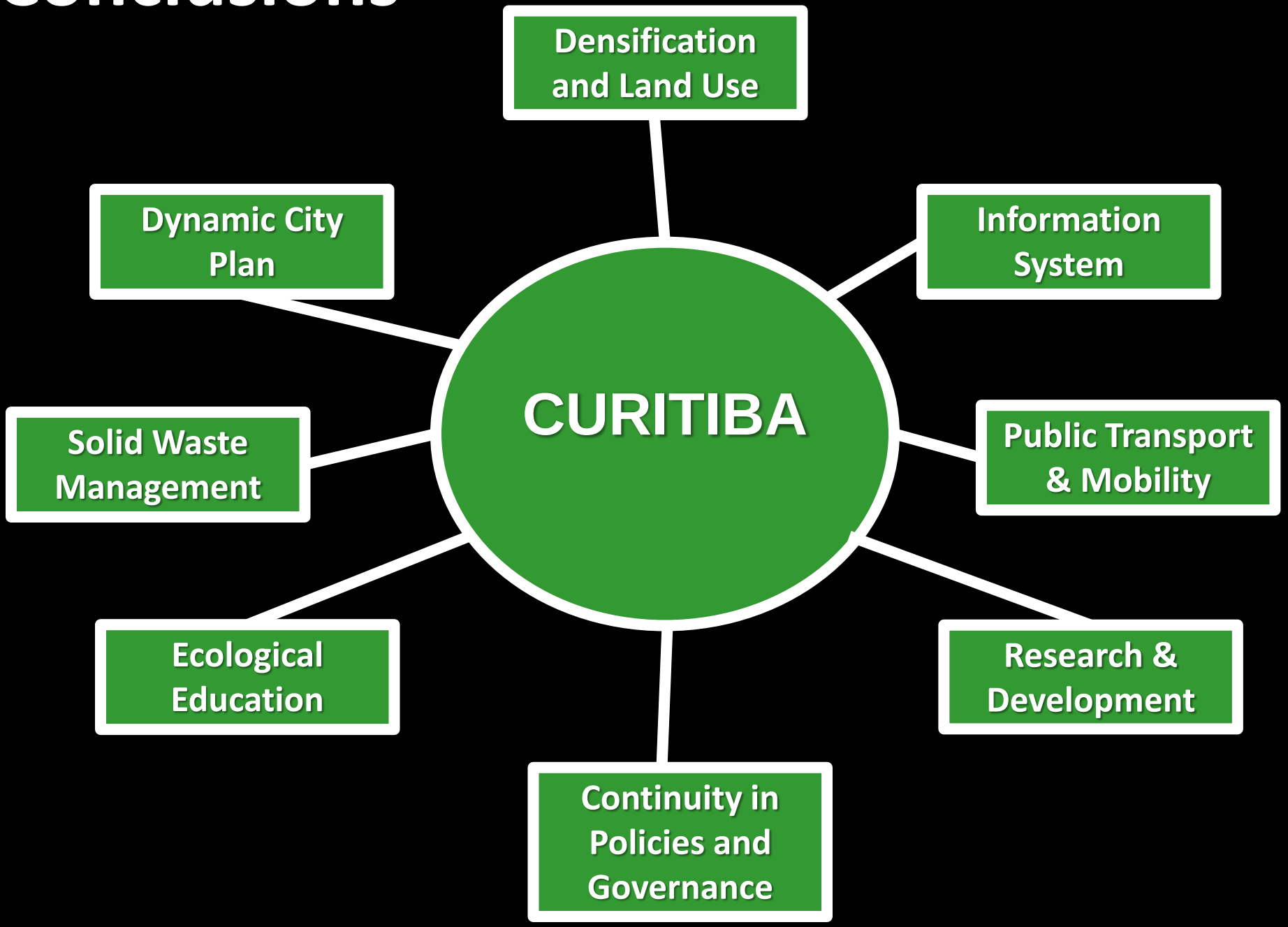


STRUCTURAL CORRIDORS




LAND USE
Information System
Environmental Management
STREET NETWORK
PUBLIC TRANSPORTATION
Public Private Partnerships

Conclusions



The World Cup City That Every Other City on the Planet Could Learn

From Matthew Niederhauser's World Cup Photo Diary: Day Seven
By Matthew Niederhauser

- *Matthew Niederhauser is reporting from Brazil with support from the Pulitzer Center.*

  I arrived early in Curitiba after a late night in Porto Alegre. It was definitely a wild card for me. I had never even heard of the place before its announcement as a host city for the World Cup. My curiosity was piqued, though. What were three million people doing on this plateau in Southern Brazil? Right off the bat I was extremely impressed with the atypically comfortable and spacious FIFA Fan Zone in the airport, replete with a "chill out" section for taking naps. I was more than tempted to test out the crate-and-mattress setup, but instead headed into the city center to explore what I found out is one of the most sustainably developed cities in Brazil, if not the world.
- What Curitiba did have was efficient public transportation, pedestrian and bike friendly streets, widespread urban green spaces, and an overall high quality of life. UNESCO even suggested Curitiba as a model for rebuilding cities in Afghanistan. It is not known whether they included the 40,000-seat Arena da Baixada in that recommendation.
- http://www.newrepublic.com/article/118312/world-cup-2014-photos-curitiba-brazils-most-sustainable-city

Some observations on the GCI

- Changes in the composition of the Green City Index makes comparison amongst cities and their policy outcomes very difficult
- The framework set up for the EU cities were not uphold for Latin America and subsequent regions, partly because of lack of reliable data and information
- The availability of information and data makes difficult to maintain and sustain the collection and retrieval of data that comprises the GCI

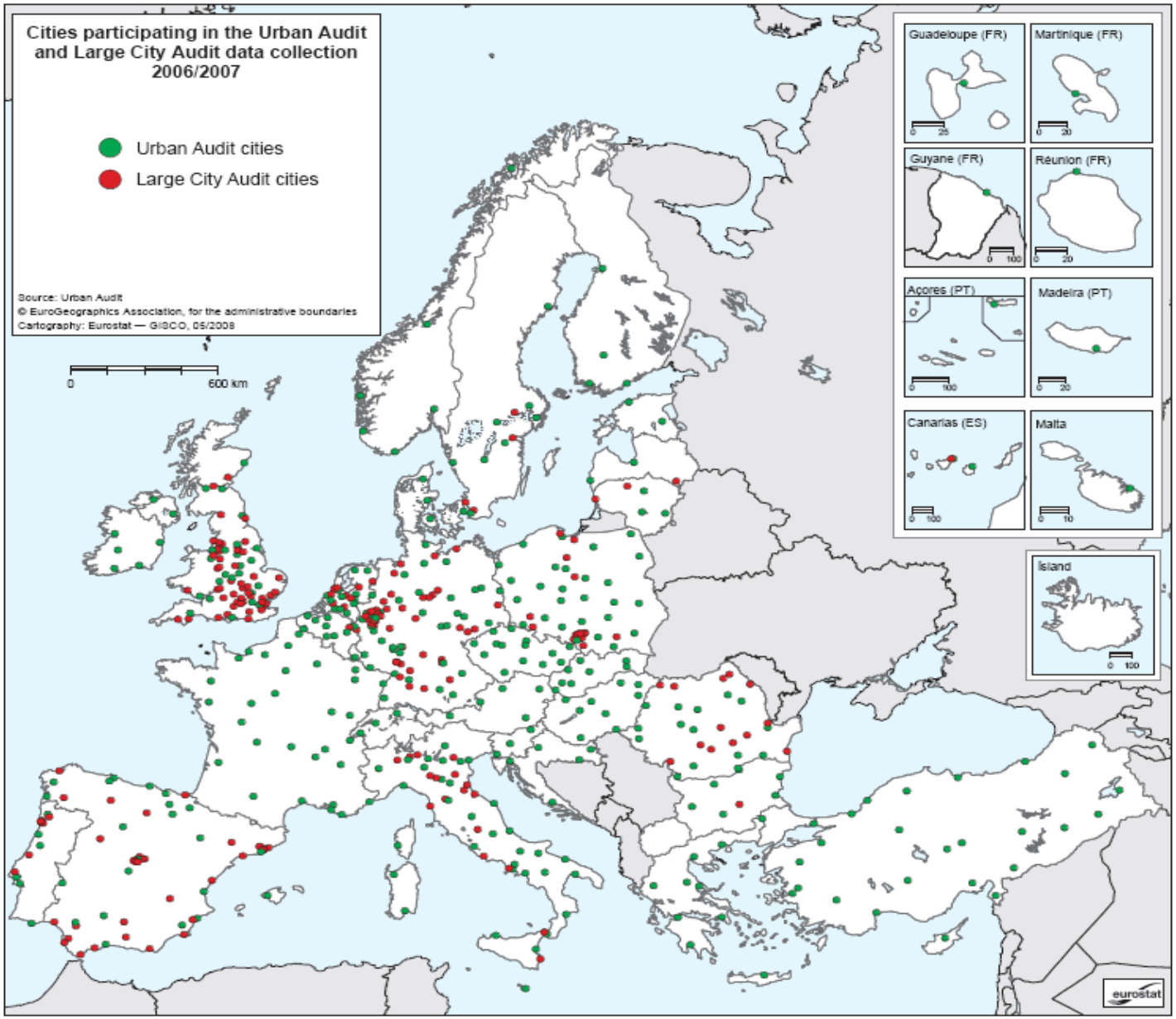
The EU Urban Audit

eurostat

EUROPEAN COMMISSION
REGIONAL POLICY

URBAN AUDIT

http://ec.europa.eu



Urban Audit 2006 involving

'Urban Audit cities':
362 cities

EU27 321 cities
Croatia 5 cities
Turkey 26 cities
Switzerl. 4 cities
Norway 6 cities

Plus **222 cities** (>100,000 pop.) of "Large City Audit"

Source: Eurostat

Urban Audit D

What is the Urban Audit?

The Urban Audit is a joint effort by DG Regio and Eurostat to provide reliable and comparative statistical information on selected urban areas

Dimensions of the dataset:

- More than 300 variables collected and 260 indicators (derived series) calculated
- **Reference periods:**
  1989-1993; 1994-1998 (reduced data set); 1999-2002, 2003-2005 (complete data set)
- **Four spatial units:**
  core city (complete data set)
  larger urban zone, kernel, sub-city information (reduced data set)

Source: Berthold Feldmann, Eurostat, 2011

Dimensions of the Urban Audit

- More than **300 variables** collected from Member States
  - Cover many demographic, economic and social aspects in European cities
- Data collections
  - Exhaustive collection every three years – 2004, 2007, 2010, 2013
  - Annual data collection of 38 variables since 2010
- Three spatial units
  - 369 **core cities**
  - **larger urban zones** (=including the city hinterland)
  - **sub-city** information (reduced dataset)

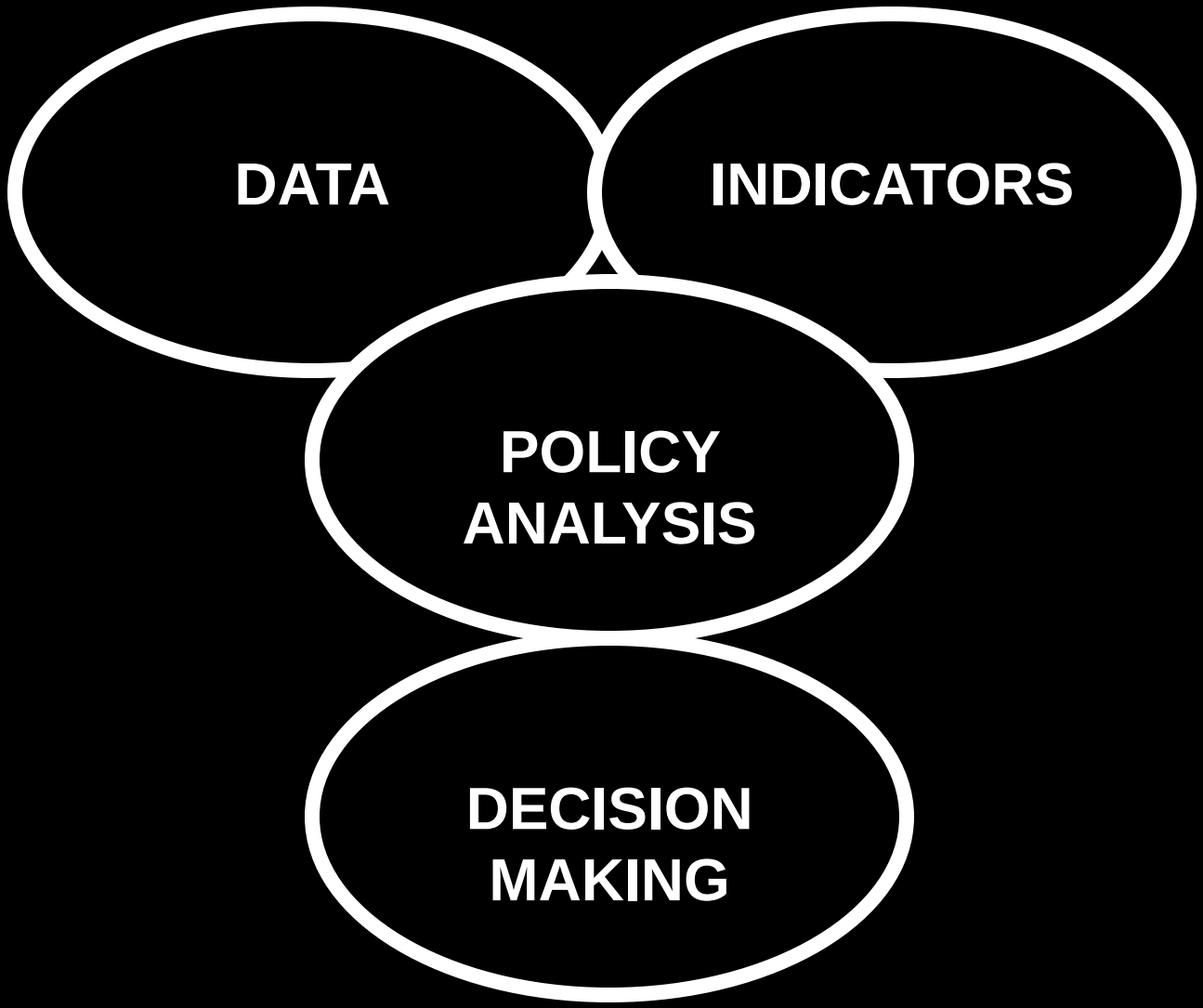
Source: Berthold Feldmann, Eurostat, 2011

Situation of Urban Audit (2011)

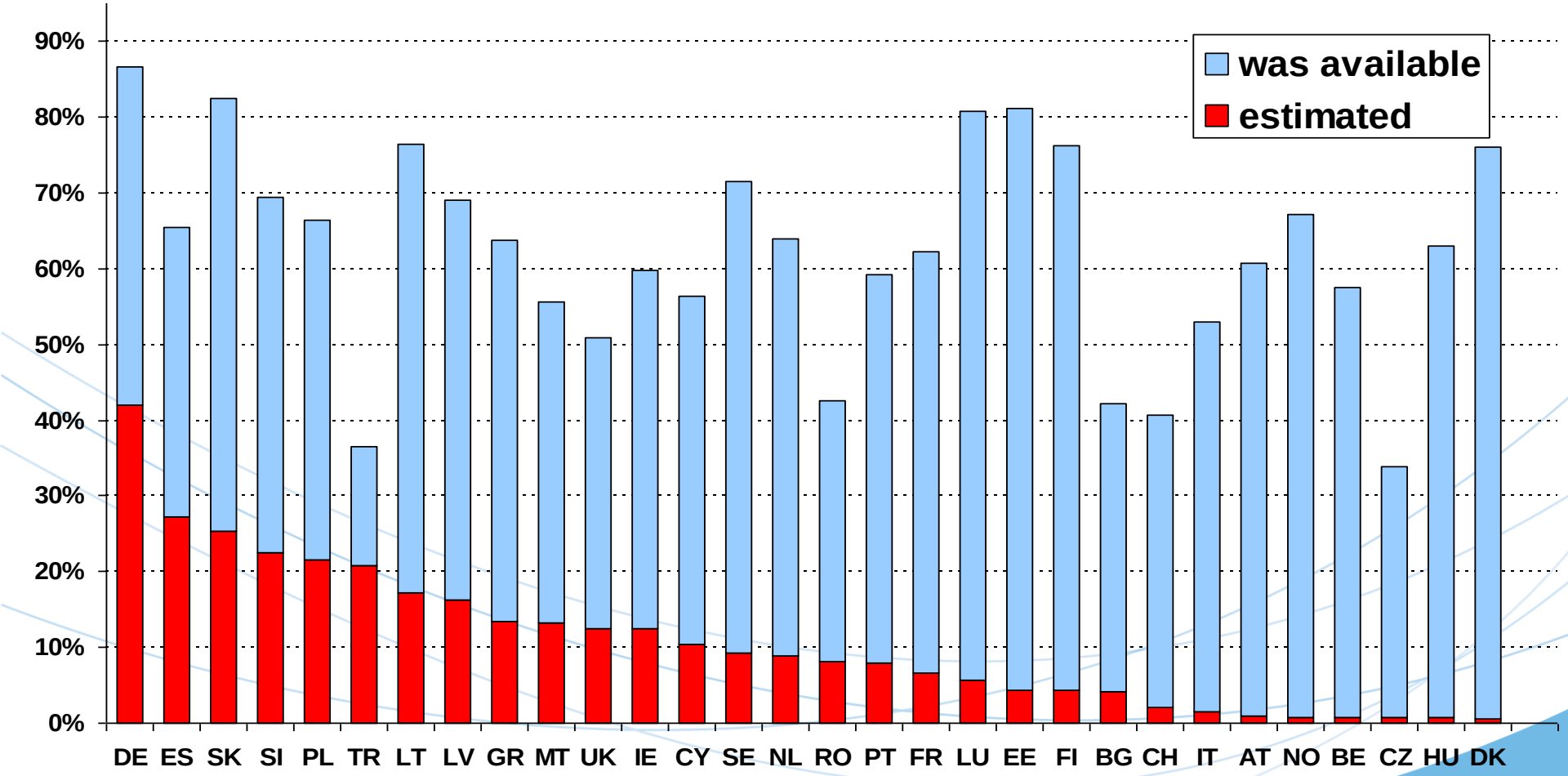
- The Urban Audit project was started more than 10 years ago as a pilot project (58 cities)
- It has grown to an **ambitious voluntary** data collection in order to give a comprehensive statistical picture of urban life in more than 350 cities with over 300 indicators
- The Urban Audit data has been **intensively used in EU Policy** context and analyses
- Urban Audit has been very useful in defining **harmonised concepts** for core cities, larger urban zones and sub-city districts
- Overall response rate: only 60%

Source: Berthold Feldmann, Eurostat, 2011

The EU Urban Audit



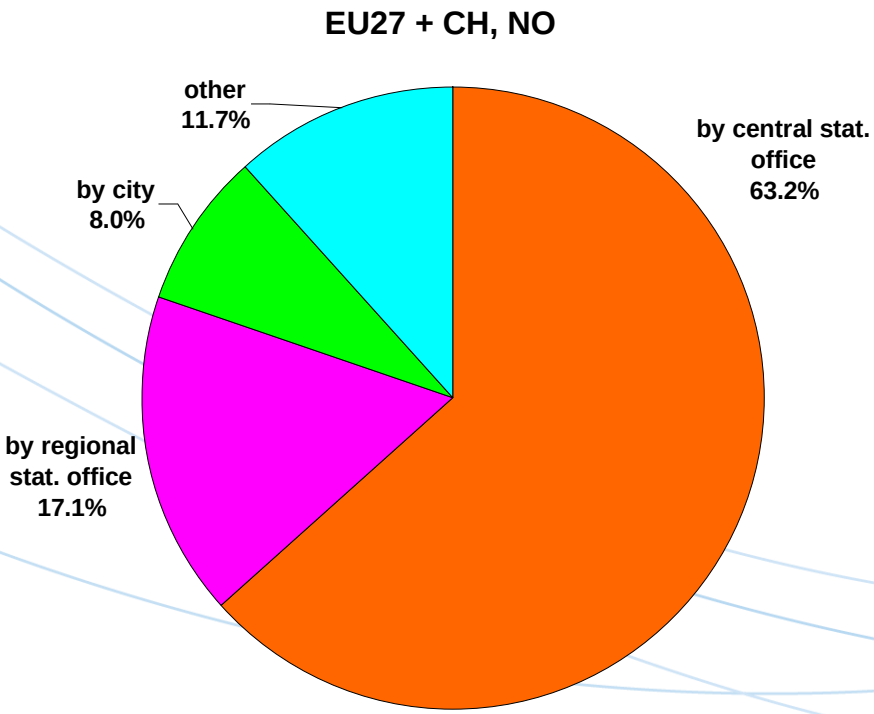
Part of estimation in data delivery

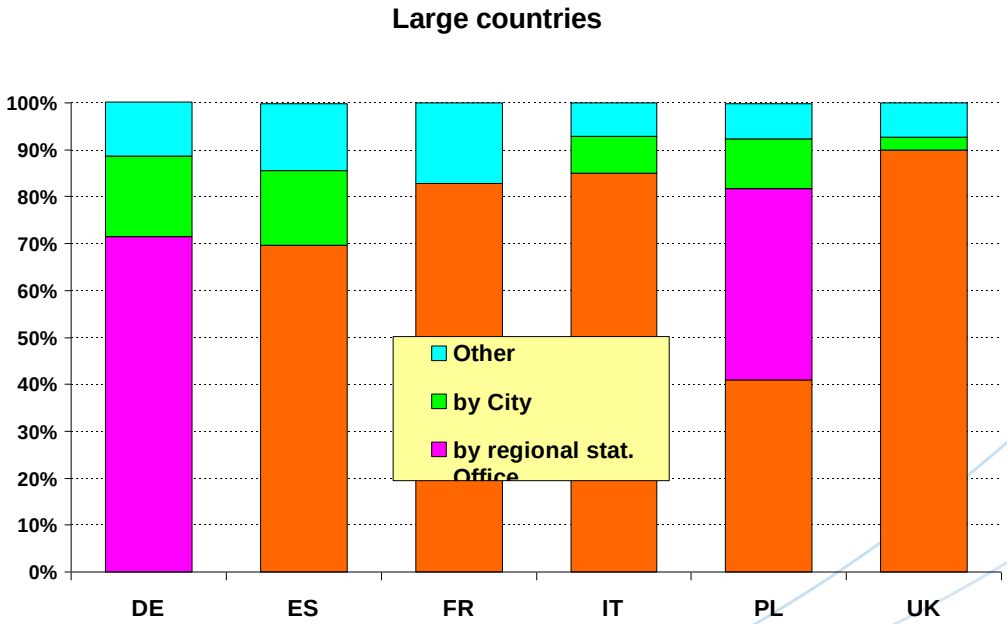


Source: Berthold Feldmann, Eurostat, 2011

eurostat

Where the Urban Audit data comes from





- Inevitably a complex data collection system

Source: Berthold Feldmann, Eurostat, 2011

Content Structure of the Urban Audit

1. DEMOGRAPHY
   - Population
   - Nationality
   - Migration
   - Household Structure
2. SOCIAL ASPECTS
   - Housing
   - Health and Health Care
   - Crime
3. ECONOMIC ASPECTS
   - Labour Market
   - Economic Activity
   - Income, Income Disparities
4. CIVIC INVOLVEMENT
   - Participation in Elections
   - Local Administration

5. TRAINING AND EDUCATION
   - Education & Training: Provision
   - Educational attainment
6. ENVIRONMENT
   - Climate
   - Air Quality and Noise
   - Water
   - Waste Management
   - Land Use
7. TRAVEL AND TRANSPORT
   - Modes of Transport
   - Public Transport
   - Accessibility
8. INFORMATION SOCIETY
9. CULTURE AND RECREATION
   - Culture and Recreation
   - Tourism

Key indicators

Population

- Total resident population
- Total population of working age
- Total population change over 1 year
- Total annual population change over 5 years
- Nationals as a proportion of total population
- Other EU nationals as a proportion of total population
- Non-EU nationals as a proportion of total pop.
- Nationals born abroad as a prop. of total pop.
- Average size of households
- Proportion of households that are 1-person househ.
- Proportion of households with children aged 0-17

Source: Teodora Brandmuller (2007). Aiming at high-quality statistical information on Urban Europe – Achievements and challenges.

Social aspects

- Average living area in m2 per person
- Proportion of households living in owned dwellings
- Number of hospital beds per 1000 residents
- Number of car thefts per 1000 population
- Number of domestic burglary per 1000 population

Civic Involvement

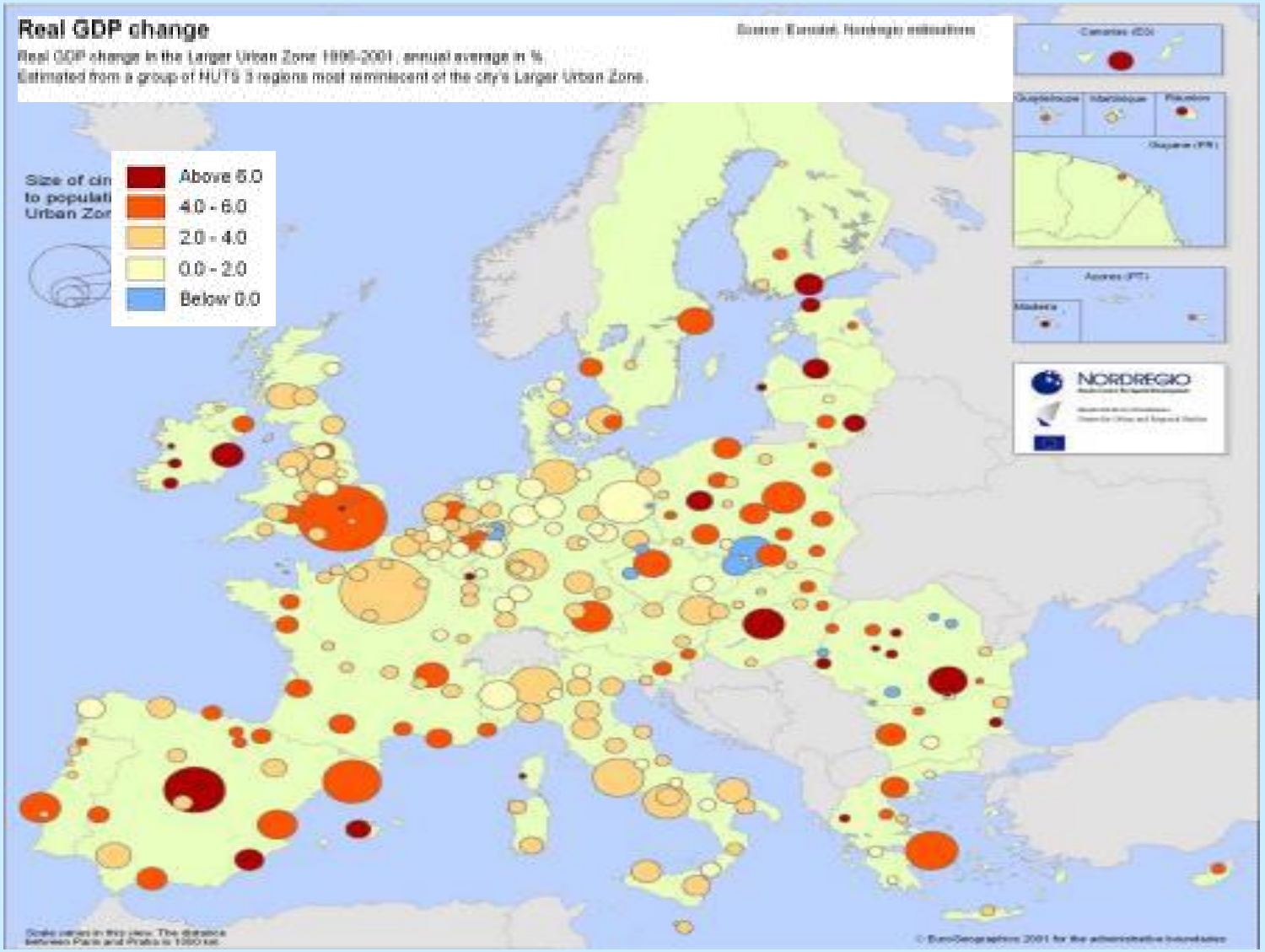
- Percentage of elected city representat. who are men
- Annual expenditure of the munic. authority per resident
- Prop. of munic. authority income from local taxation

Economy

- Unemployment rate
- Ratio of employed persons to population of working age
- Self-employment rate
- Proportion in part-time employment
- GDP per head
- GDP per employed person
- Percent. households with less than half nat.aver.income

Urban Audit analysis – examples of results -

Disparities among Cities: Real GDP Growth 1996-2001



Source: DG Regio (ed.), State of the European Cities Report, May 2007

Perceptions of quality of life in 75 European Cities: a European survey

Corinne Hermant-de Callataÿ

DG REGIO OPEN DAYS – 11 October 2007

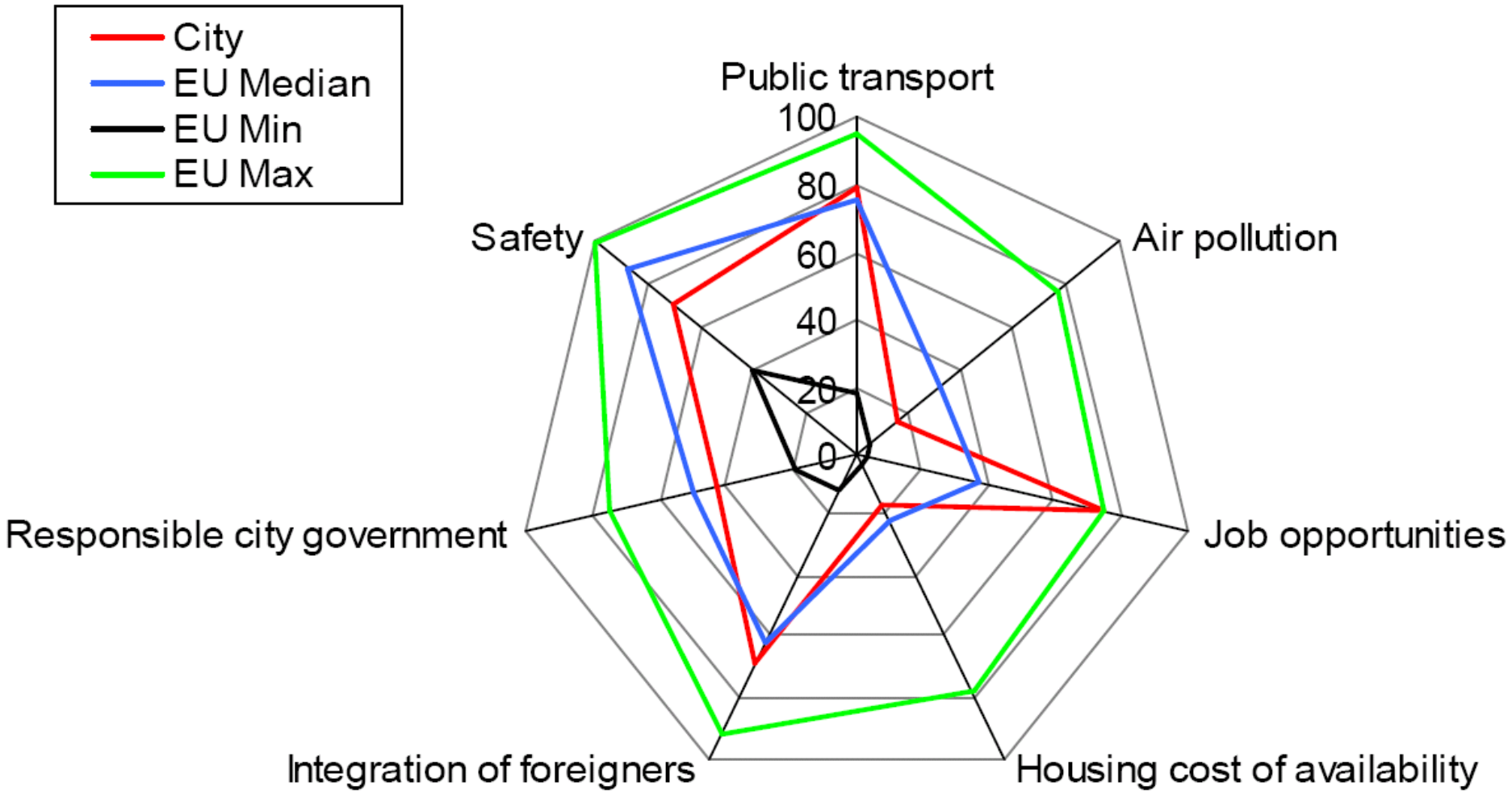
EUROPEAN
REGIONAL POL

Snapshot of Public Opinion in 75 cities

Surveyed cities

Praha

Czech Republic

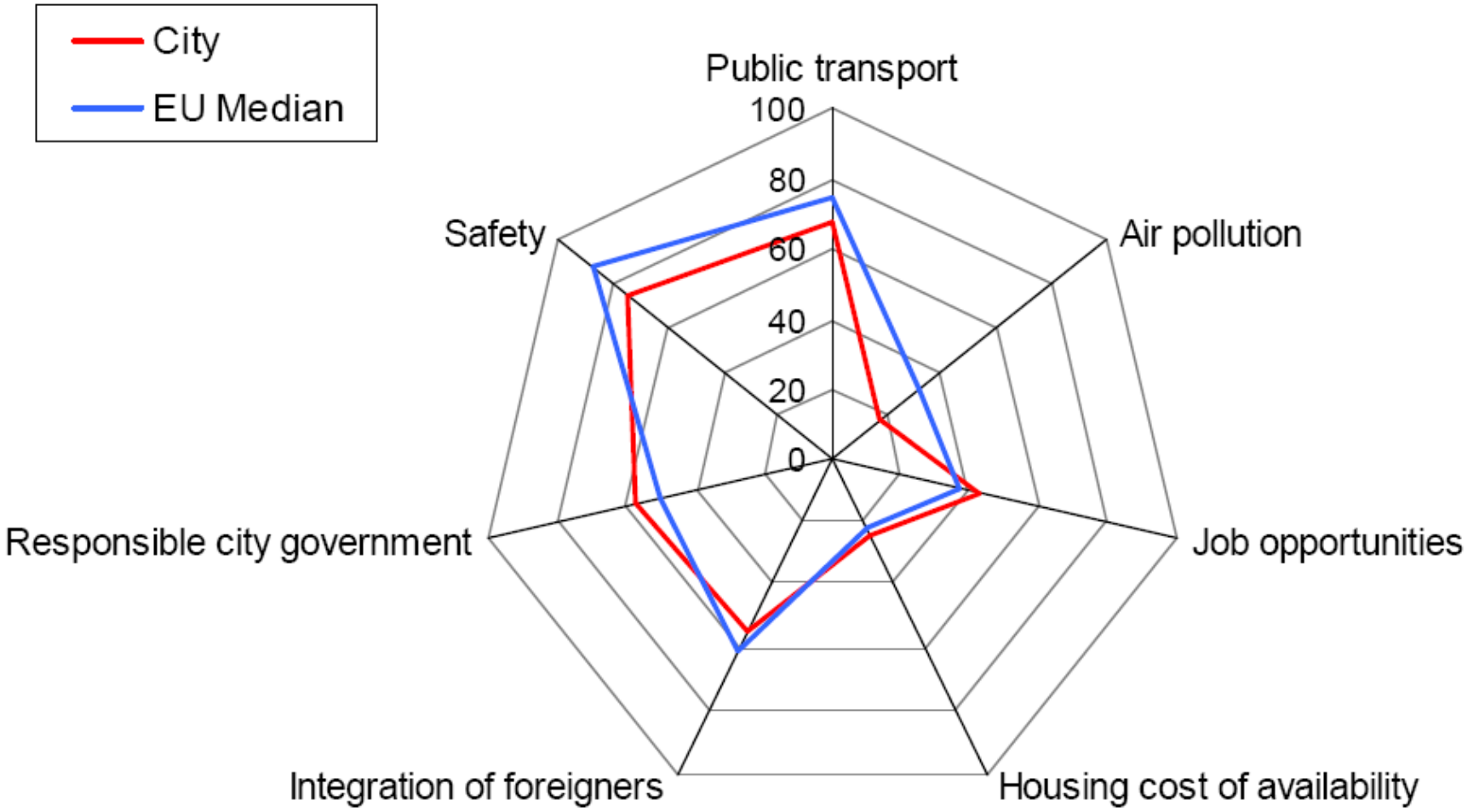


Each axis shows the share of respondents who are satisfied with this issue

Source: Corinne Hermant-de Callataÿ (2007). Perceptions of quality of life in 75 European Cities: a European survey

Bruxelles / Brussel

Belgium

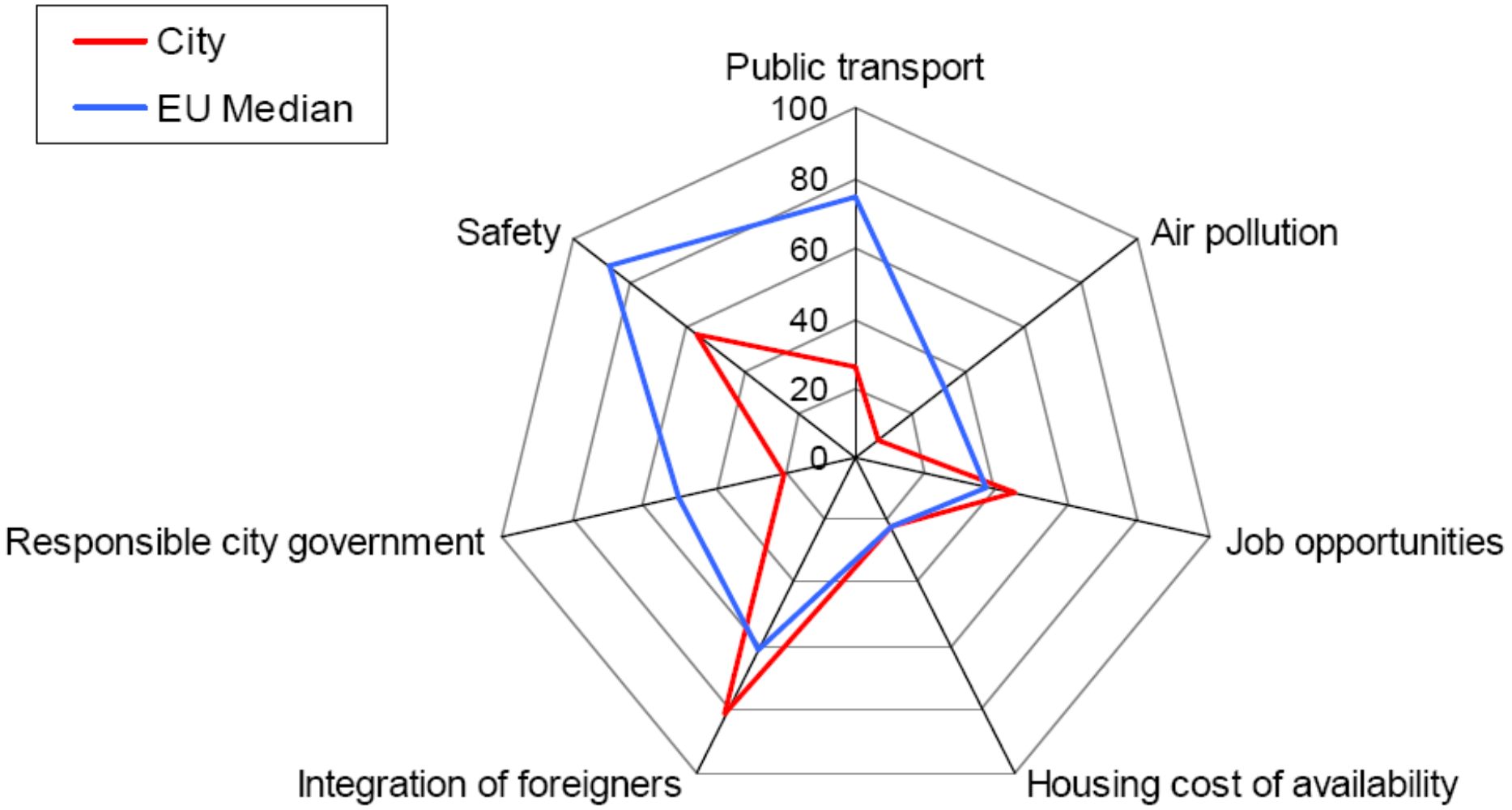


Each axis shows the share of respondents who are satisfied with this issue

Source: Corinne Hermant-de Callataÿ (2007). Perceptions of quality of life in 75 European Cities: a European survey

Sofia

Bulgaria

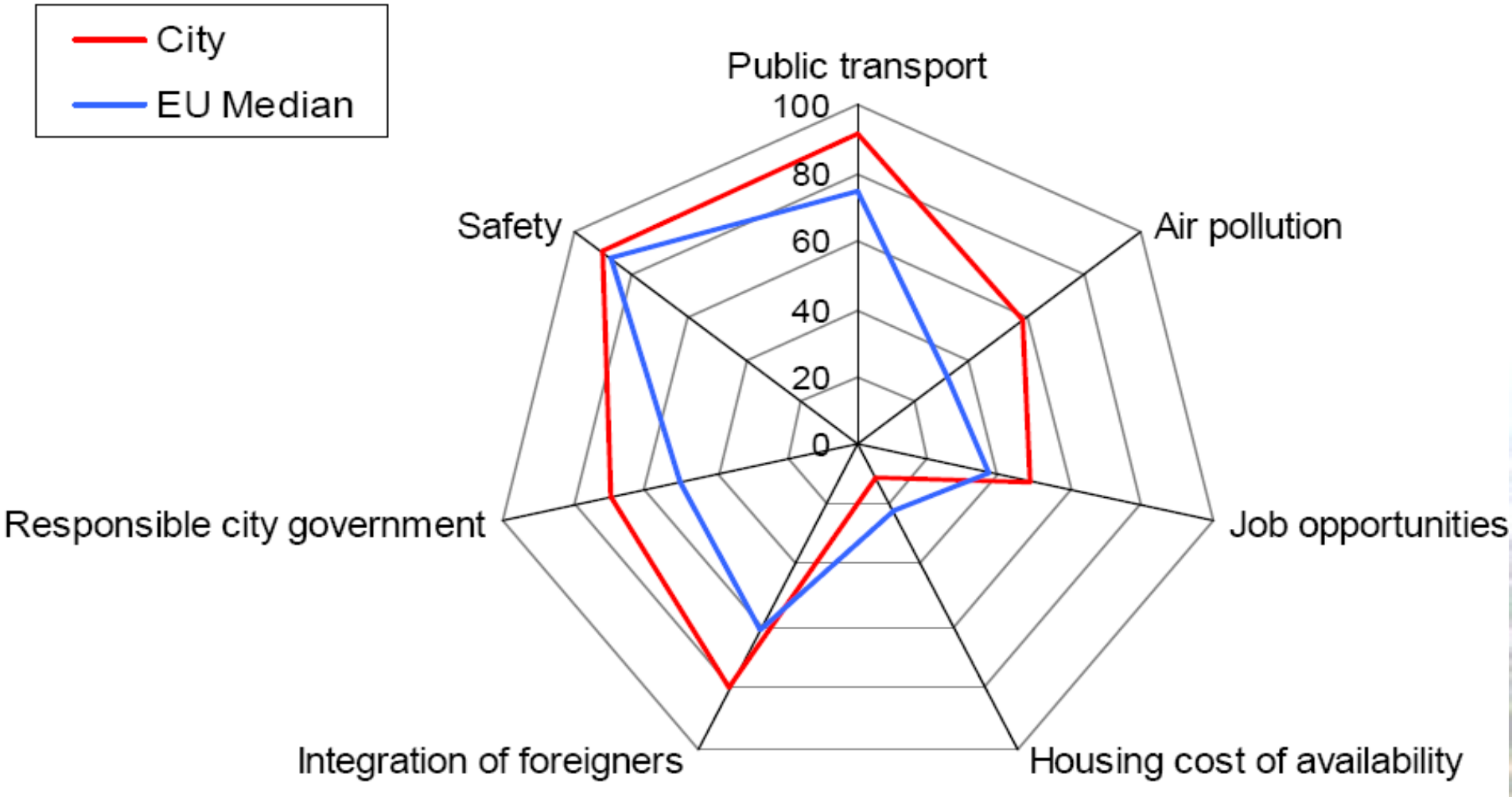


Each axis shows the share of respondents who are satisfied with this issue

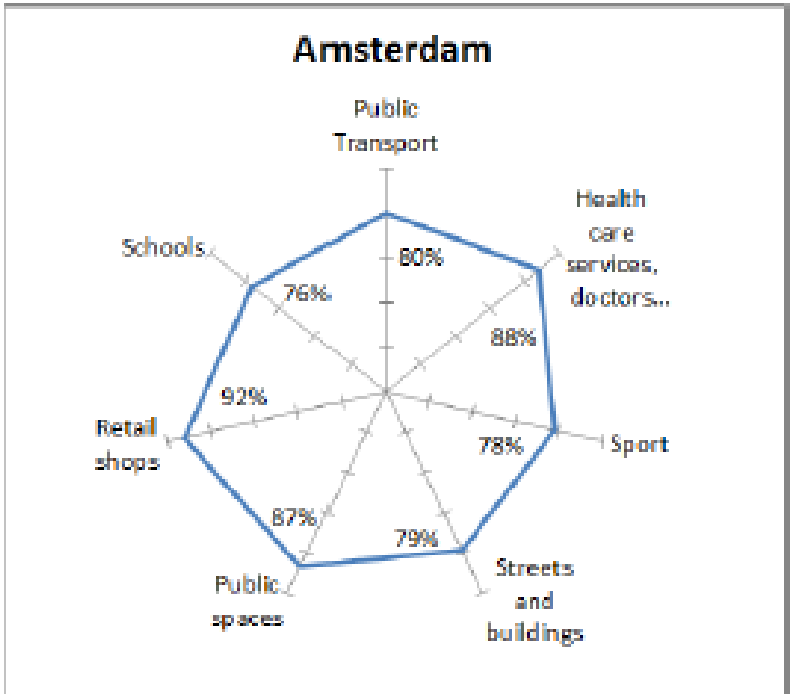
Source: Corinne Hermant-de Callataÿ (2007). Perceptions of quality of life in 75 European Cities: a European survey

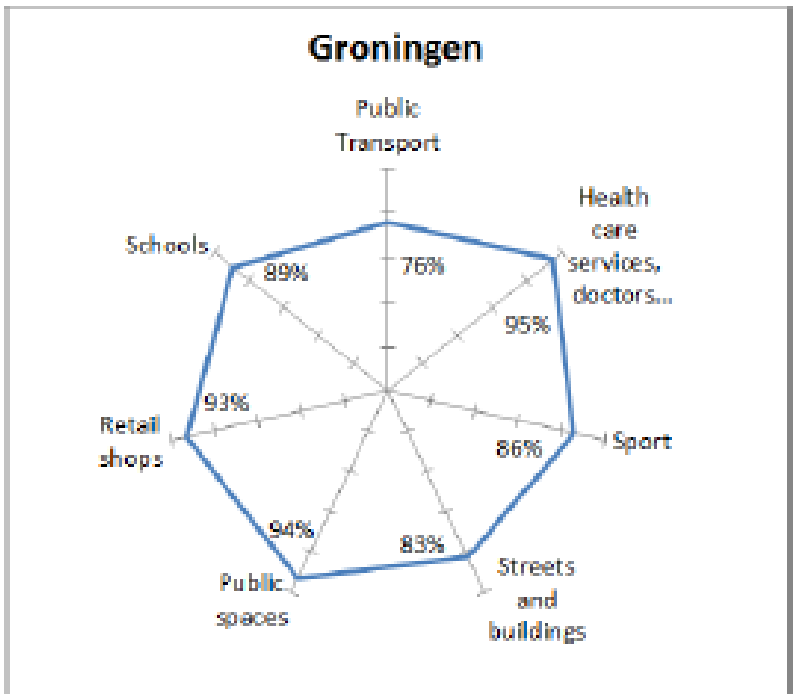
Rennes

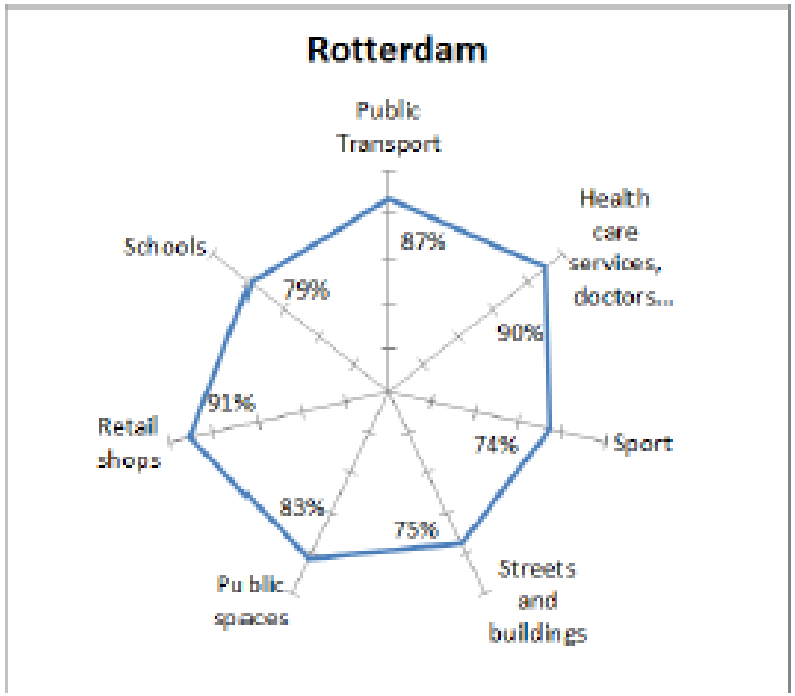
France



Each axis shows the share of respondents who are satisfied with this issue


Amsterdam
Public Transport
Health care services, doctors...
Sport
Streets and buildings
Public spaces
Retail shops
Schools
80%
88%
78%
79%
87%
92%
76%


Groningen
Public Transport
Health care services, doctors...
Sport
Streets and buildings
Public spaces
Retail shops
Schools
76%
95%
86%
83%
94%
93%
89%


Rotterdam
Public Transport
Health care services, doctors...
Sport
Streets and buildings
Pu blic spaces
Retail shops
Schools
87%
90%
74%
75%
83%
91%
79%

SOME CONCLUSIONS:

Housing Indicators, Slum Indicators, Global Cities Indicators, ISO 37120 Indicators, Green City Index, UKID Index, Urban Audit Indicators

Define WHY we need indicators for?

Define WHAT we want to measure?

- Methodology
- Comparability
- Rigorous Collection
- Standardization
- Normalization

DECISION MAKING

Units of Measurement

%
X per km2
X per ha
X per 1000 population
time
X per capita
X per m3

POLICY

UN HABITAT
FOR A BETTER URBAN FUTURE

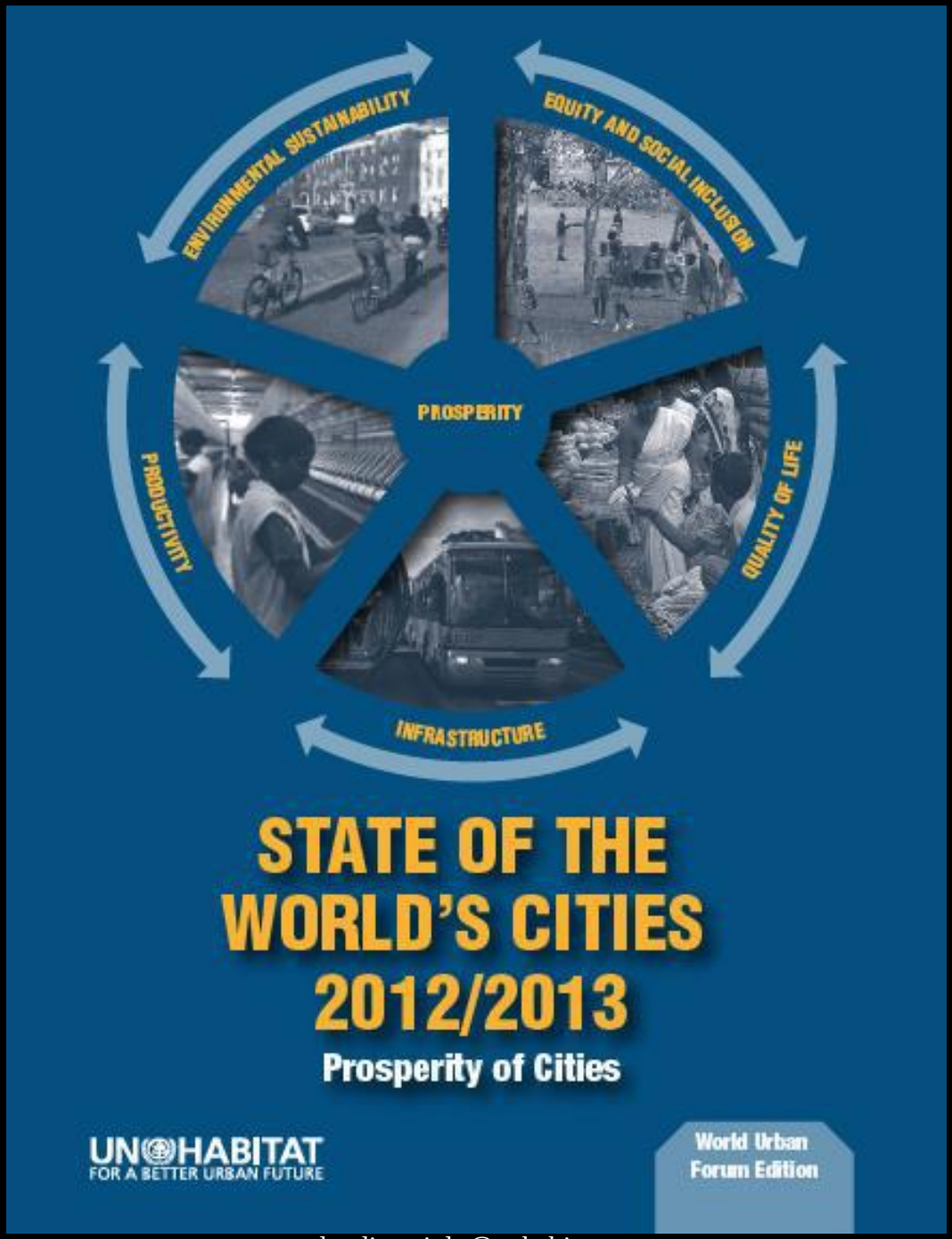
Measuring the Livability of Cities

Approaches, Experiences and Lessons

The City Prosperity Index

CPI

Claudio Acioly Jr.
Head Capacity Development Unit
claudio.acioly@unhabitat.org


ENVIRONMENTAL SUSTAINABILITY
EQUITY AND SOCIAL INCLUSION
PROSPERITY
PRODUCTIVITY
QUALITY OF LIFE
INFRASTRUCTURE
STATE OF THE WORLD'S CITIES 2012/2013
Prosperity of Cities
UN HABITAT
FOR A BETTER URBAN FUTURE
World Urban Forum Edition

7.

Understanding the Notion of Prosperity:

the economy of scale and the comparative advantages of urban agglomeration generate wealth and if managed adequately also prosperity and broader accessibility to public services.

claudio.acioly@unhabitat.org

Measuring Prosperity

- What gets measured, gets done!
- Measuring a society's overall well being cannot be limited to GDP-gross domestic product (a country's total production of goods and services)
- **Intangible dimensions (something relevant to our life in the city needs to get measured as well):** quality of life, happiness, feeling safe and secure, sense of belonging, identify with place, freedom of choice, having a say in the future of my city and neighborhood, feeling respected and empowered

Source: SWCR 2012.

PROSPERITY: Seeking a common understanding

1. Enhance the public realm, expand public goods and consolidate rights to the 'commons'.
2. Safeguard public goods and collective interests to ensure development of today does not jeopardize the opportunities of future generations.
3. Prosperity if about things going well for all of us, going well being a common human concern
4. It is about our well being
5. Not only measuring the GDP growth, the GDP per capita growth
6. It is more than only economics

Source: SWCR 2012.

PROSPERITY: Seeking a common understanding

A prosperous life includes non-material and non-tangible dimensions:

1. Having a say in the future of one's city and neighborhood;
2. Belonging to a thriving community
3. Having access to resources and opportunities to realize one's dream
4. Having one's right recognized, protected and fulfilled
5. Living in an environmentally sound and sustainable living conditions
6. Living in dignity in a city that respects diversity and does not discriminate or segregate.

Source: SWCR 2012.

SEEKING THE MEANING OF PROSPERITY:

1. Life satisfaction remaining unchanged in spite of economic growth
2. Declining percentage of people ‘feeling happy’ in spite of increasing real incomes
3. Happiness Paradox or Easterlin Paradox (Richard Easterlin) empirically demonstrated leading countries to seek for alternative indicators to measure societal progress
4. Contrasting to cities seeking cardinal indicators and hard metrics including inflation rates, GDP, FDI
5. More attention to residents’ perceptions, customers’ satisfaction

Source: SWCR 2012.

The UN-Habitat City Prosperity Index

- Cities can take different paths to prosperity.
- UN-Habitat views development as a non-linear, non-sequential and complex process and recognizes that development paths are differentiated and unique.
- Sill, actions and policies implemented by governments to increase prosperity and the outcomes of these policies can be measured to provide an indication of how solid or weak are the factors of prosperity available to any individual urban area.

Source: SWCR 2012.

Expanding Prosperity for All Citizens

- **City is a Human Construct**
- Human interventions enable cities to enhance their potential as engines of today's and tomorrow's **prosperity**.
- Well-managed urbanization stands out as the new comparative advantage in the 21st century
- Thus a city well managed and well planned with thrive.
- Government policies, corporate strategies, human capital, capital investments, strategic decisions, all impact on cities and therefore on its ability to generate prosperity and wealth for its inhabitants.

Source: SWCR 2012.

claudio.acioly@unhabitat.org

One fundamental question: how do we measure the performance of cities and the outcome of public policies?

São Paulo

Seeking Attributes of Prosperity in Cities

UN-Habitat undertook a perception survey amongst local experts in 50 cities in the world (2011)

In comparison to productivity, quality of life and infrastructure, municipal authorities perceive equity and environmental sustainability as least important.

Survey:
Governments should adopt policies in areas like affordable public transport, well-planned public spaces, sports, recreational facilities, security, safety and LED

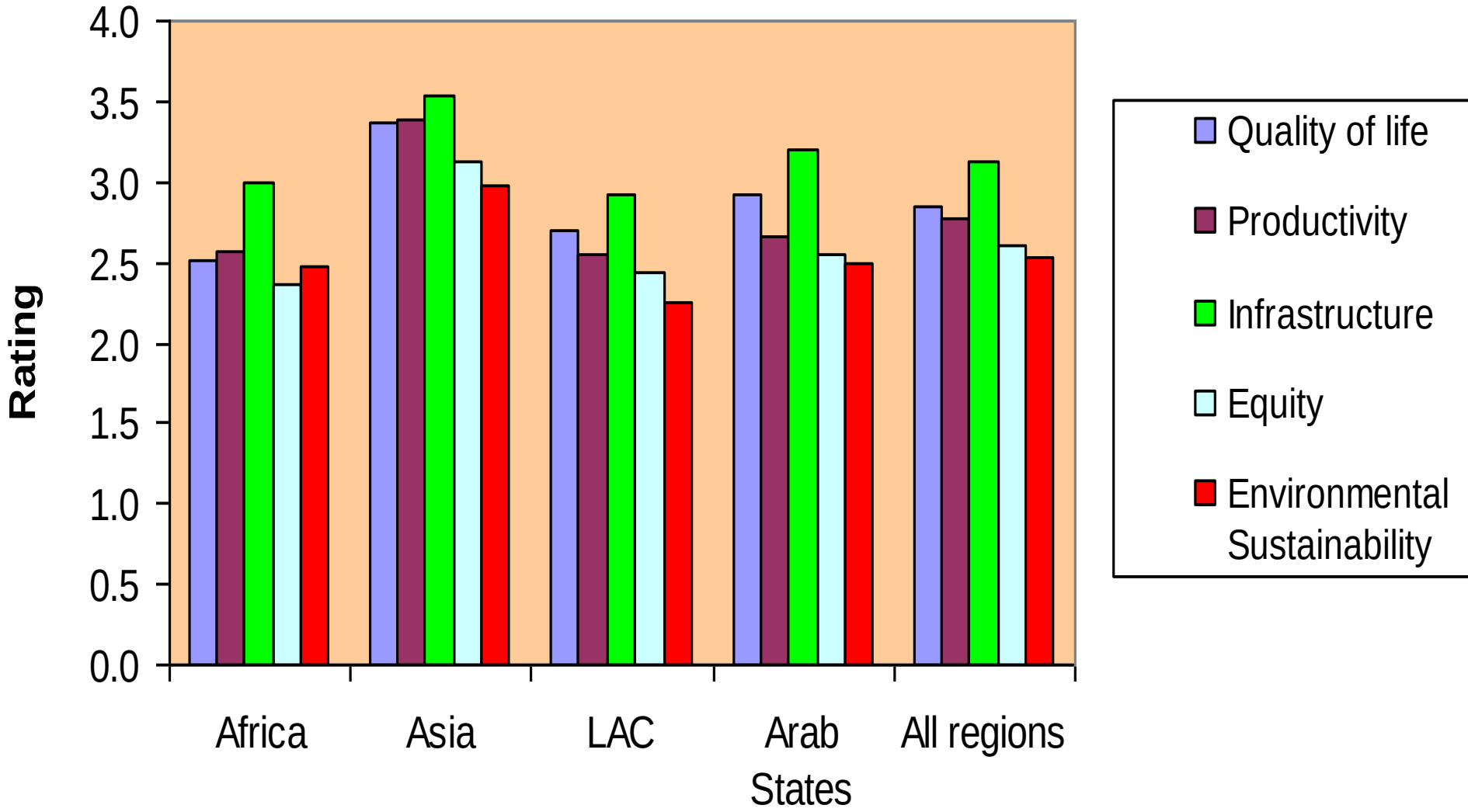
This suggests that city authorities must pay more attention to the equity dimension of prosperity in response to residents' concerns.

Source: SWCR 2012.

What attribute makes a difference in achieving prosperity?

Survey Outcome

Source: SWCR 2012.

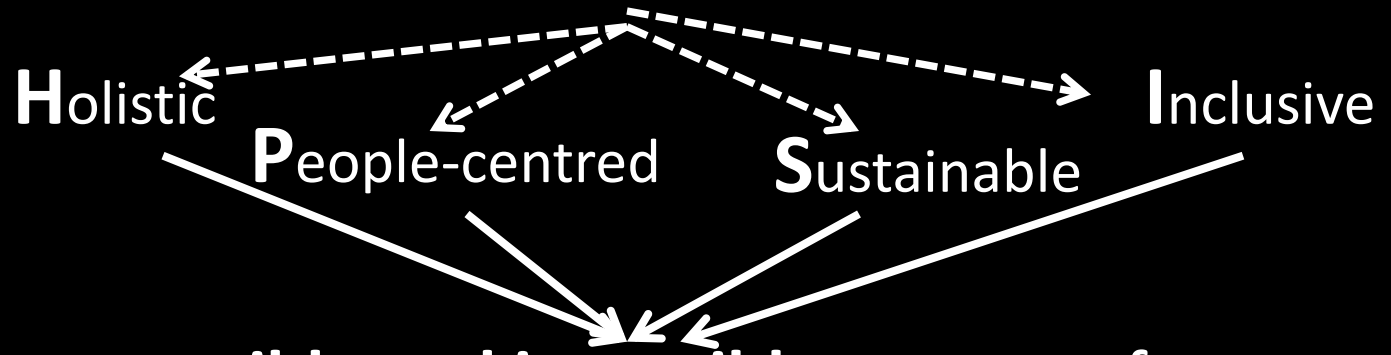


Defining a Prosperous City

Source: SWCR 2012.

1. **Productivity:**	Contributes to economic growth, generates income, provide decent jobs and equal opportunities…
2. **Infrastructure development**	Provides adequate infrastructure in order to enhance mobility, productivity, mobility and connectivity…
3. **Quality of Life**	Enhances of the use of public space in order to increase community cohesion, civic identity…
4. **Equity and Social inclusion**	Ensures the equitable distribution and redistribution of the benefits of a prosperous city, reduces incidence of poverty and slums…
5. **Environmental sustainability**	Values the protection of the urban environment while ensuring growth…

TRANSFORMATIVE CHANGE



1. Integrates **tangible and intangible** aspects of prosperity
2. Responds to the inefficient, unsustainable forms and functionalities of the city of the previous century.

1. Resilient to cope with adverse forces and externalities
2. Public spaces, social diversity and environmental sustainability
3. Harmony and well-being
4. Controlling its ecological footprint
5. Greater heterogeneity and functionality: mix land use, social mix, mixed economic basis
6. Creative spaces

The City of the 21st Century

- More Compact Form
- Balance lower Energy Costs
- Greater Heterogeneity and Functionality
- Safeguards against New Risks
- Higher Provision of Public Goods
- More 'Human Scale'

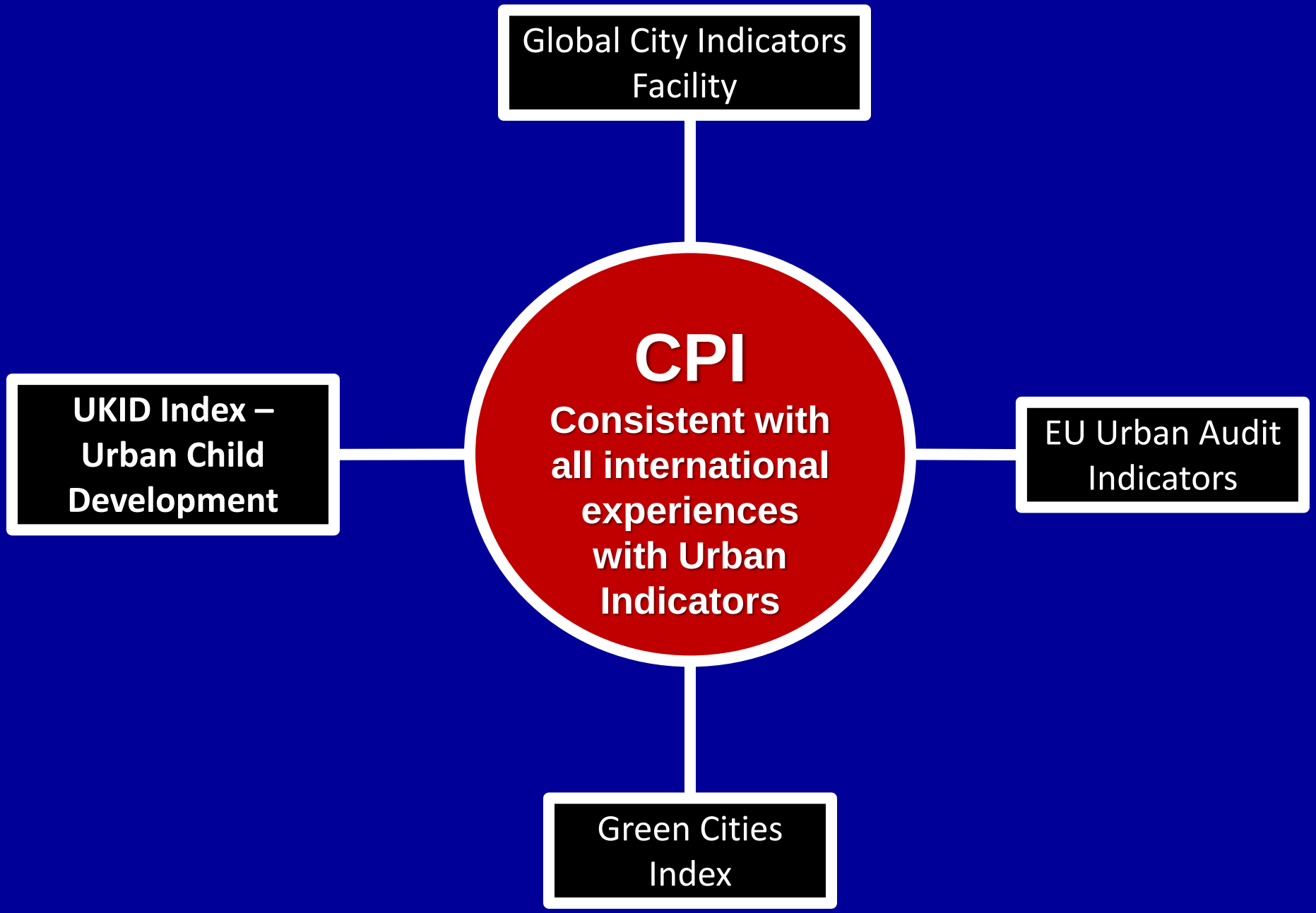
- ✓ Stimulates local job creation
- ✓ Reduces disaster risks and vulnerabilities
- ✓ Build resilience to adverse forces of nature
- ✓ Creates harmony between the different dimensions of prosperity
- ✓ Recognizes the importance of public spaces.

8.

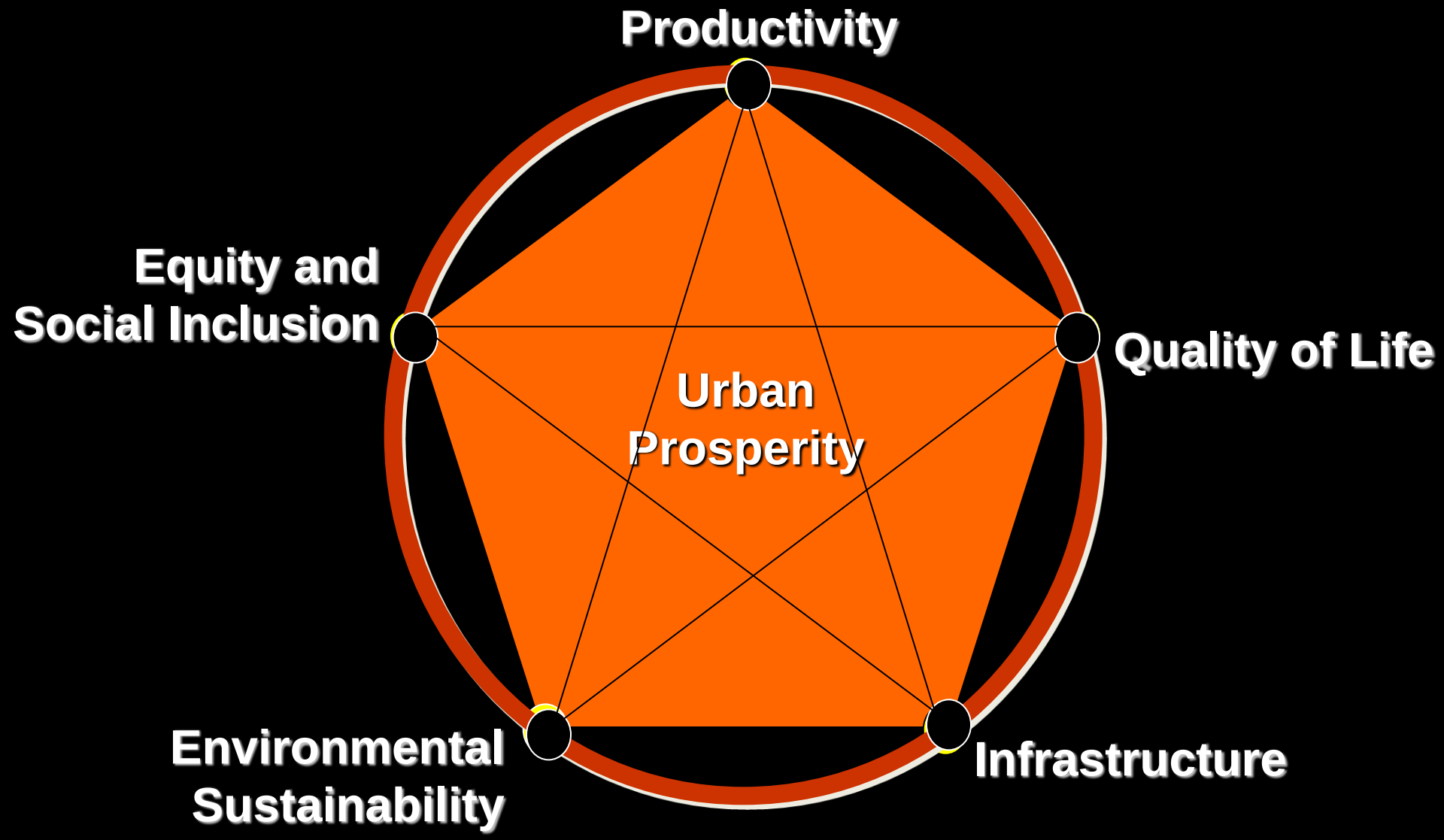
Measuring Prosperity (the first generation):

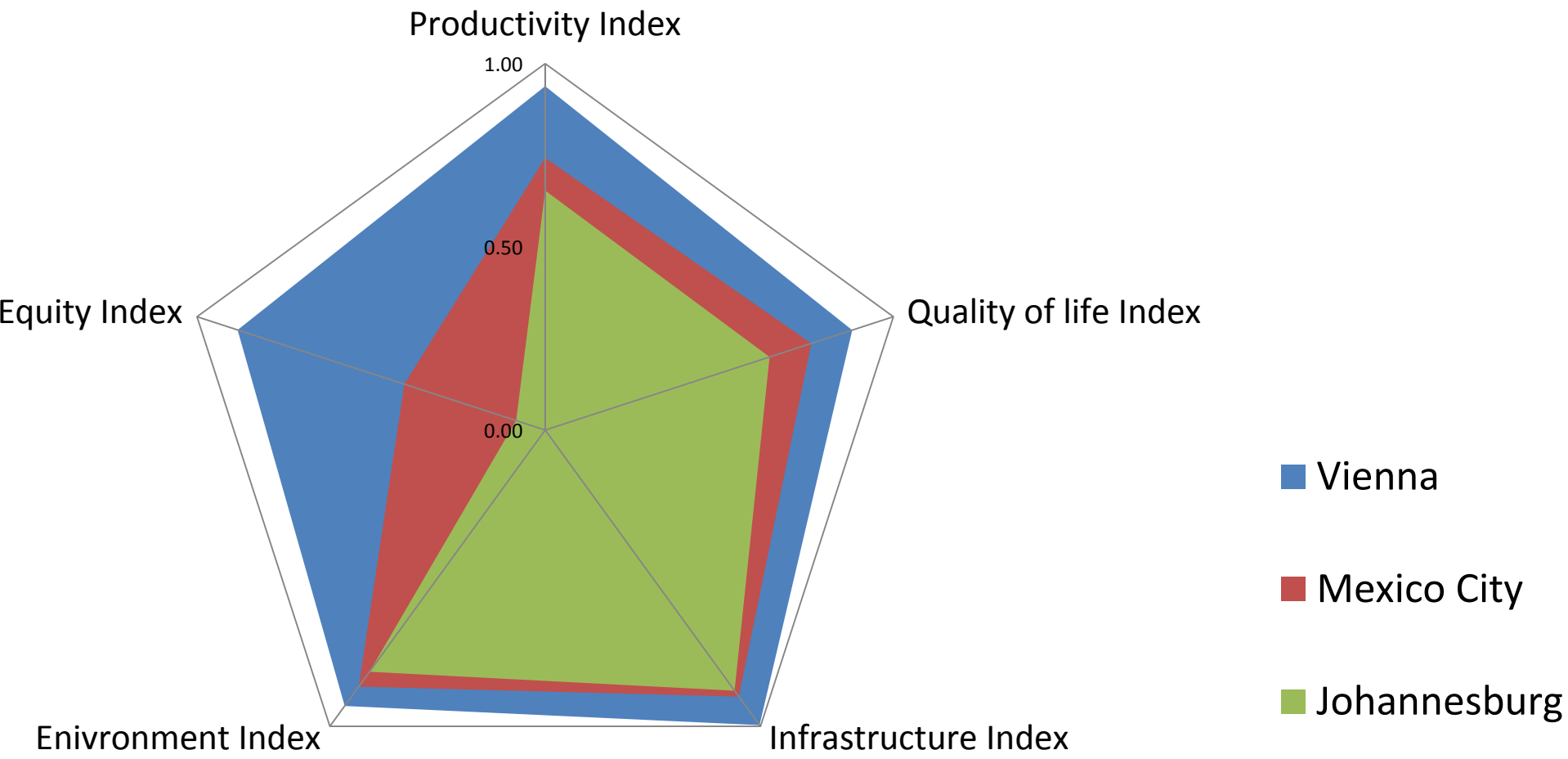
Defining the fundamental elements that help cities to become more prosperous and generate the benefits of urbanisation.

claudio.acioly@unhabitat.org

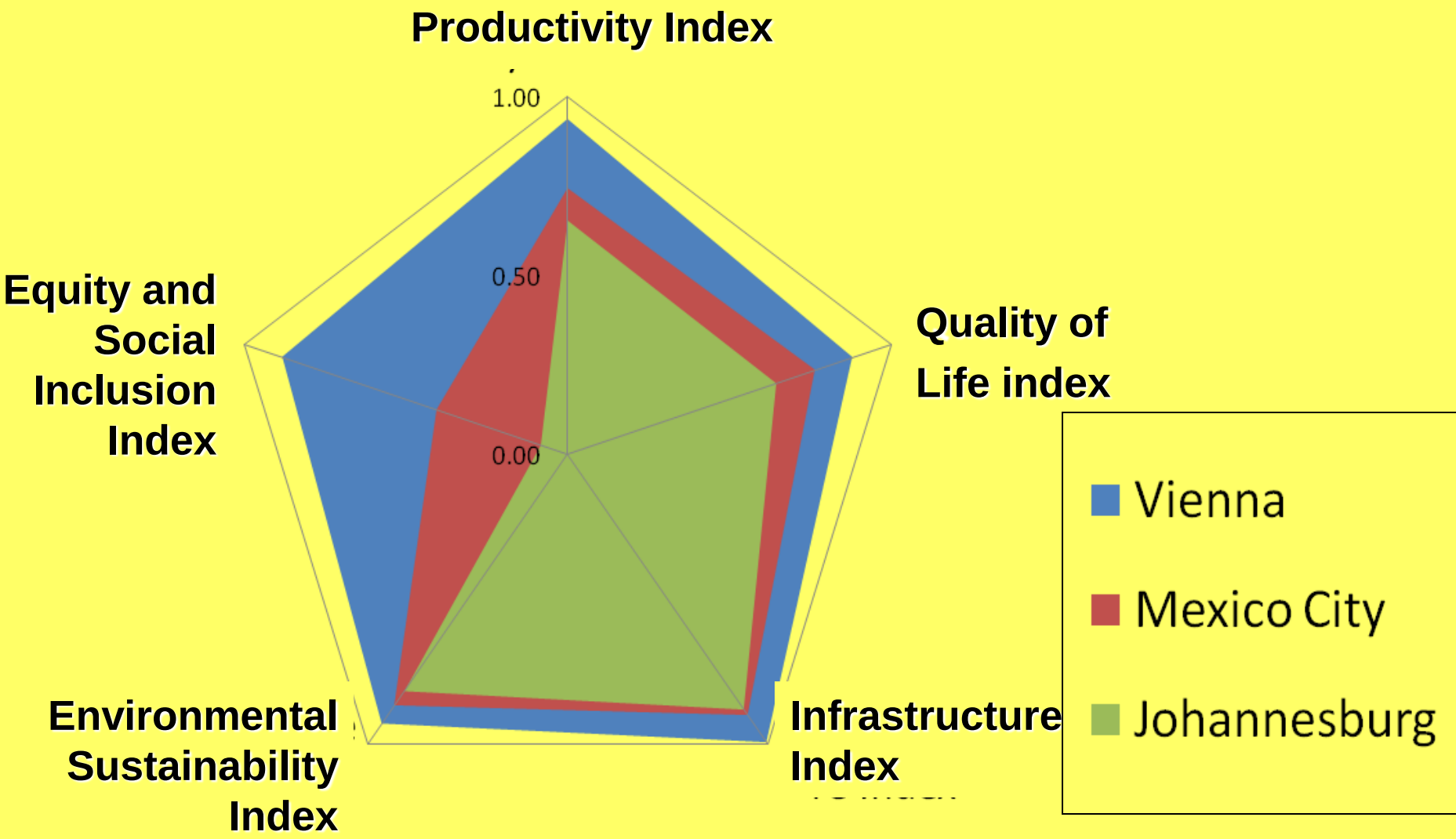

Global City Indicators Facility
CPI
Consistent with all international experiences with Urban Indicators
UKID Index – Urban Child Development
EU Urban Audit Indicators
Green Cities Index

The Five 'Spokes' of Urban Prosperity

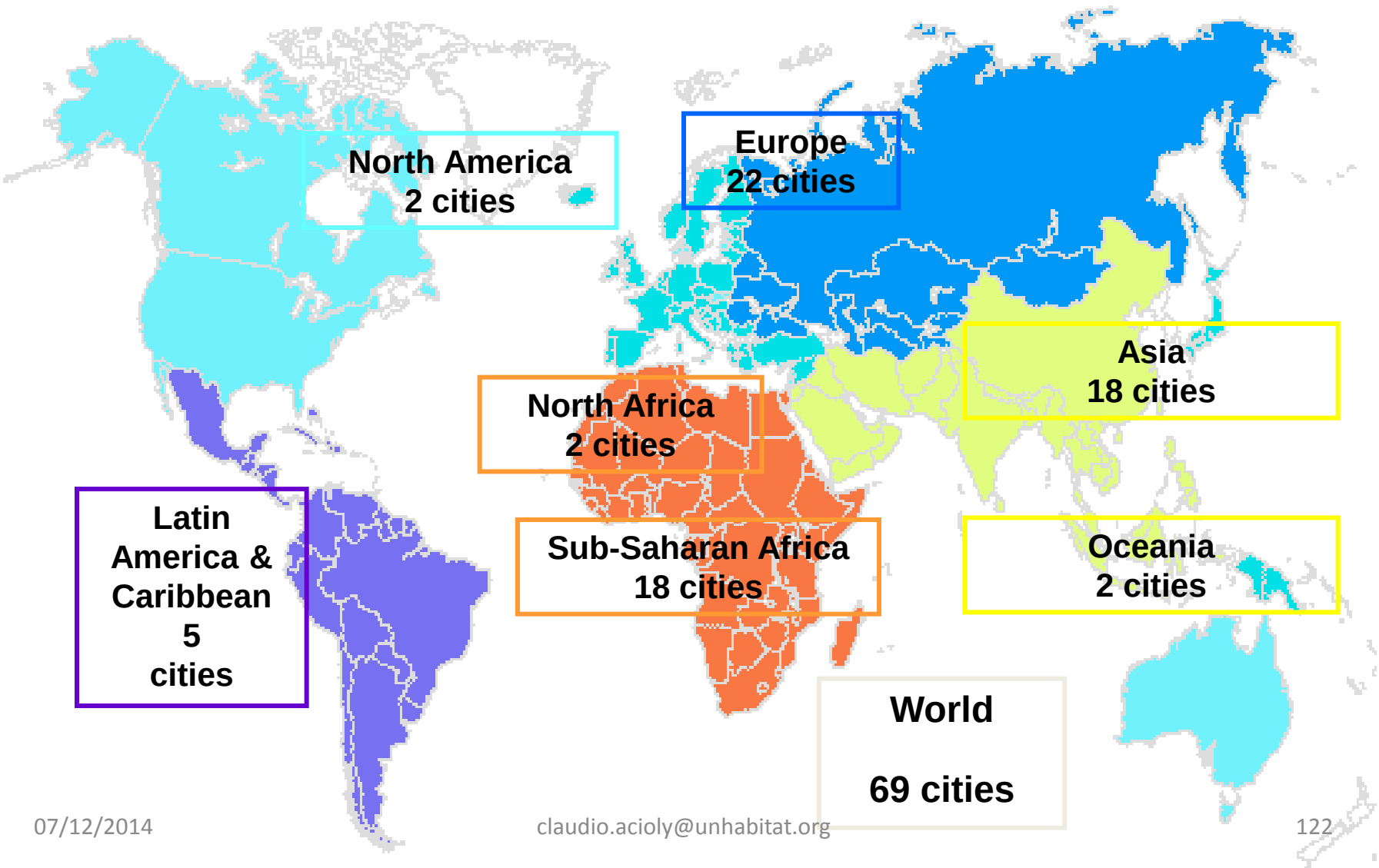


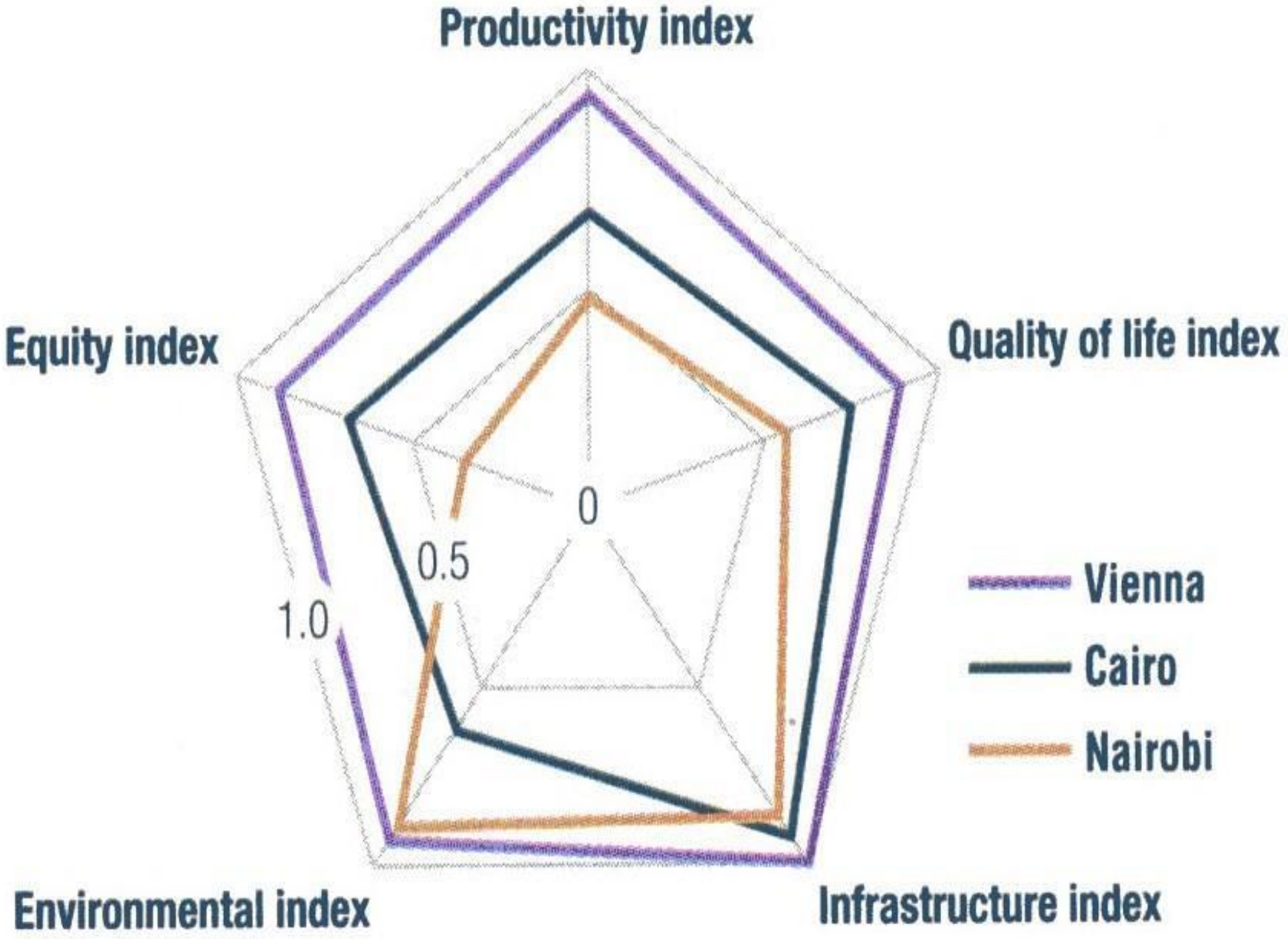

Productivity Index
1.00
0.50
0.00
Quality of life Index
Infrastructure Index
Enivronment Index
Equity Index
Vienna
Mexico City
Johannesburg

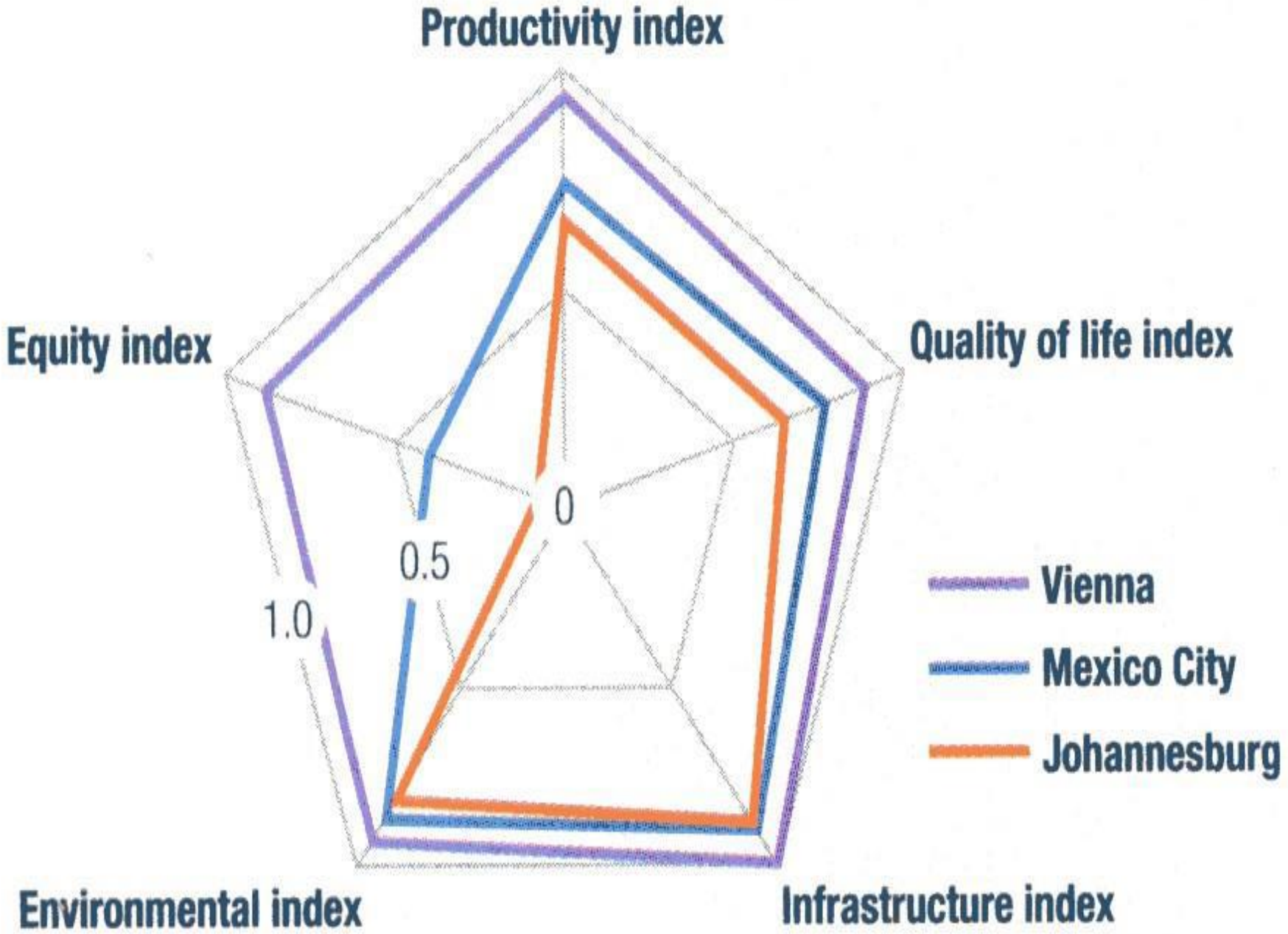
Visualizing Prosperity:



Global estimation of CPI of 69 cities published to date

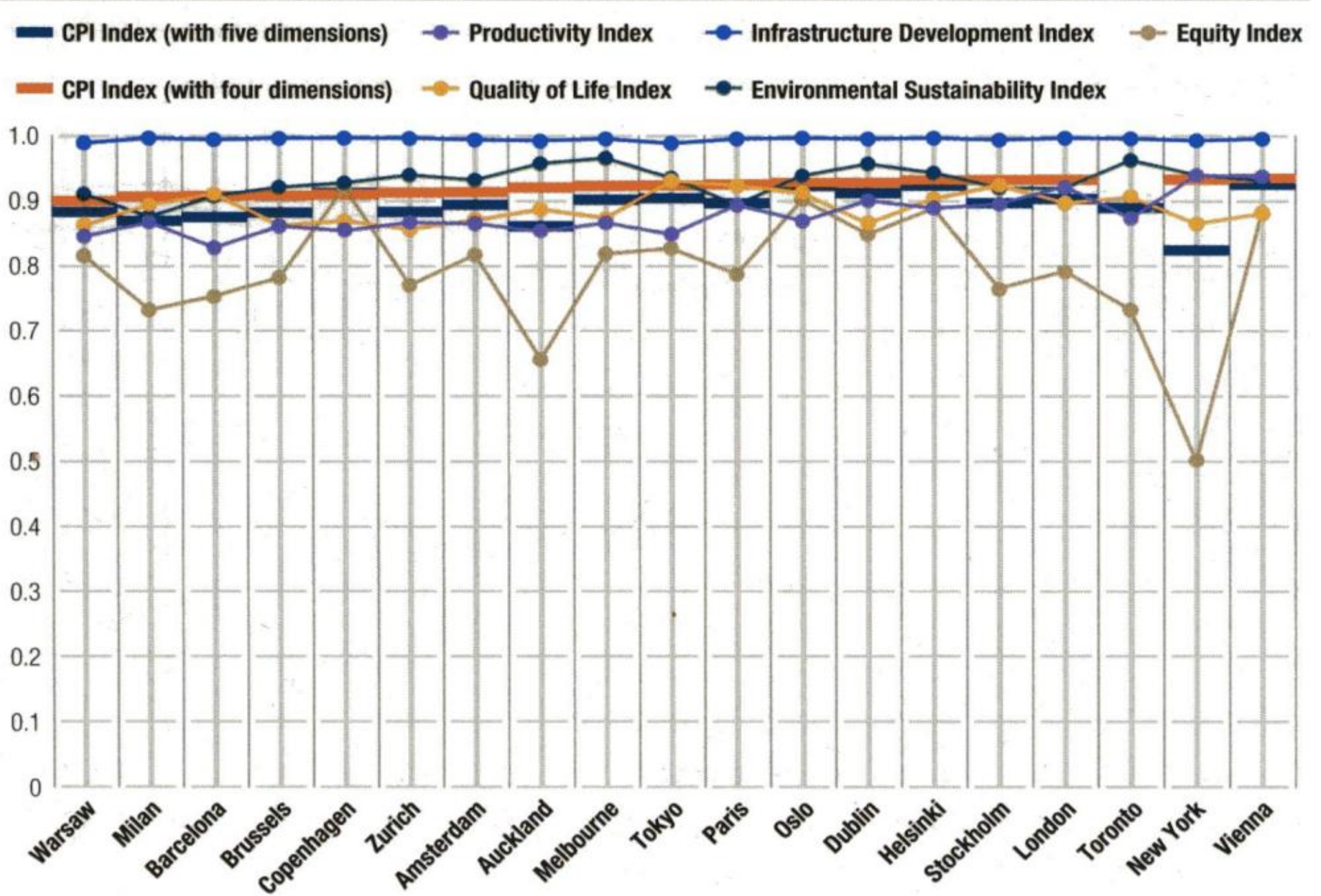



Productivity index
Equity index
Quality of life index
0
0.5
1.0
Vienna
Cairo
Nairobi
Environmental index
Infrastructure index


Productivity index
Quality of life index
Infrastructure index
Environmental index
Equity index
0
0.5
1.0
Vienna
Mexico City
Johannesburg

Cities with very solid prosperity factors

Source: SWCR 2012.



Urban Prosperity

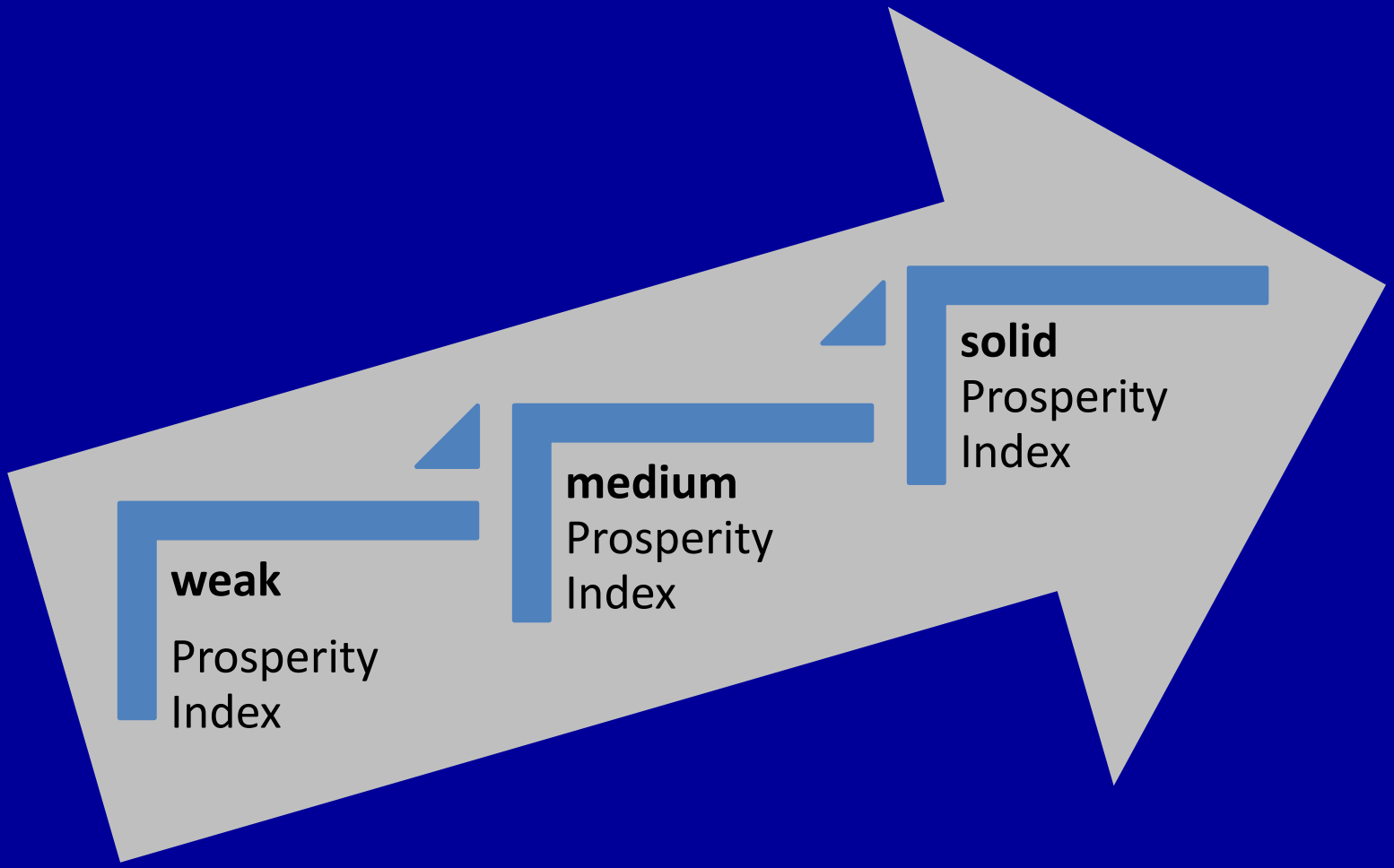
Source: SWCR 2012.

Cities with a very solid prosperity factors (0.9 and above) are well developed overall.

FEATURES:

1. **Good governance, urban planning, laws, regulations and institutional frameworks ensure that no particular dimension of prosperity gains prevalence to the detriment of the others.**
2. **High volumes of goods and services**
3. **Strong economic fundamentals and high productivity.**
4. **Their population live longer and are well educated.**
5. **Infrastructure available without spatial distortions**
6. **The urban environment is well managed.**

From Metrics to Policies:
The policies implications and outcomes of CPI



claudio.acioly@unhabitat.org

Table 1

City Prosperity Index and components

Source: SWCR 2012.

Country	City	City Prosperity Index (CPI) with 5 Dimensions	City Prosperity Index (CPI) with 4 Dimensions*	Productivity Index	Quality of life Index	Infrastructure Index	Enivronment Index	Equity Index
Austria	Vienna	0.925	0.936	0.939	0.882	0.996	0.932	0.883
United States	New York	0.825	0.934	0.940	0.866	0.994	0.941	0.502
Canada	Toronto	0.890	0.934	0.874	0.907	0.997	0.963	0.733
United Kingdom	London	0.904	0.934	0.923	0.898	0.997	0.920	0.793
Sweden	Stockholm	0.898	0.934	0.896	0.925	0.995	0.921	0.767
Finland	Helsinki	0.924	0.933	0.890	0.905	0.997	0.944	0.890
Ireland	Dublin	0.913	0.929	0.901	0.867	0.996	0.958	0.850
Norway	Oslo	0.924	0.929	0.870	0.914	0.997	0.939	0.903
France	Paris	0.897	0.927	0.895	0.925	0.996	0.895	0.788
Japan	Tokyo	0.905	0.925	0.850	0.931	0.989	0.936	0.828
Australia	Melbourne	0.903	0.925	0.867	0.875	0.996	0.967	0.820
New Zealand	Auckland	0.862	0.922	0.854	0.889	0.994	0.958	0.657
Netherlands	Amsterdam	0.895	0.915	0.866	0.872	0.995	0.933	0.818
Switzerland	Zurich	0.884	0.914	0.868	0.858	0.997	0.941	0.772
Denmark	Copenhagen	0.913	0.911	0.855	0.871	0.997	0.928	0.922
Belgium	Brussels	0.883	0.910	0.862	0.864	0.997	0.922	0.783
Spain	Barcelona	0.876	0.909	0.829	0.912	0.995	0.908	0.755
Italy	Milan	0.870	0.908	0.868	0.895	0.997	0.876	0.733
Poland	Warsaw	0.883	0.901	0.846	0.864	0.990	0.911	0.817
Portugal	Lisbon	0.853	0.899	0.827	0.867	0.995	0.916	0.692
Hungary	Budapest	0.881	0.894	0.808	0.867	0.990	0.921	0.833
Greece	Athens	0.862	0.889	0.800	0.885	0.996	0.884	0.762

Figure 1.1.3

Source: SWCR 2012.

Cities with solid prosperity factors – first category

Figure 1.1.4

Source: SWCR 2012.

Cities with solid prosperity factors – second category

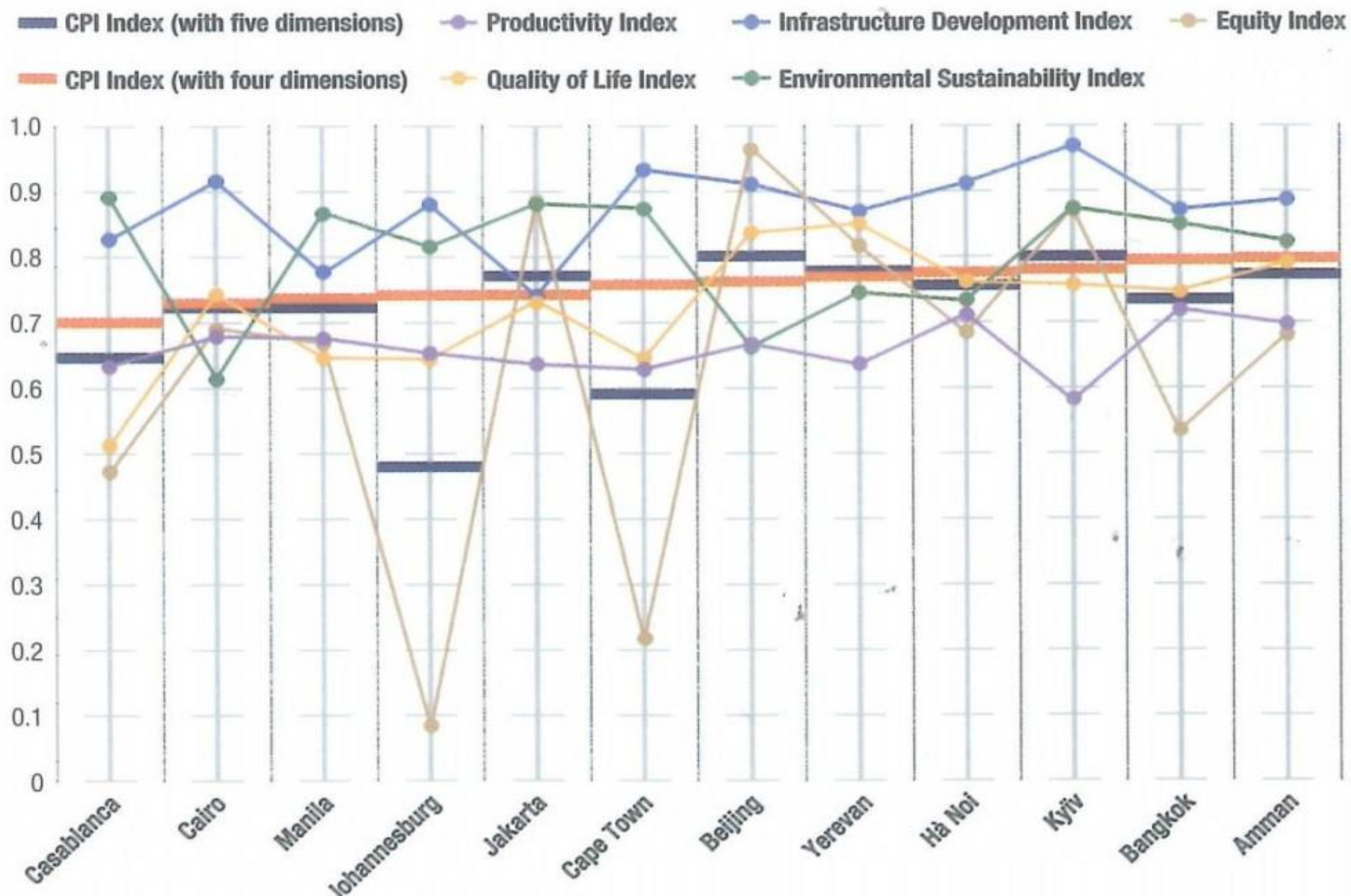


Figure 1.1.5

Cities with moderate prosperity factors

Source: SWCR 2012.

Urban Prosperity

Source: SWCR 2012.

Cities with moderate prosperity factors (CPI: 0.60-0.699).

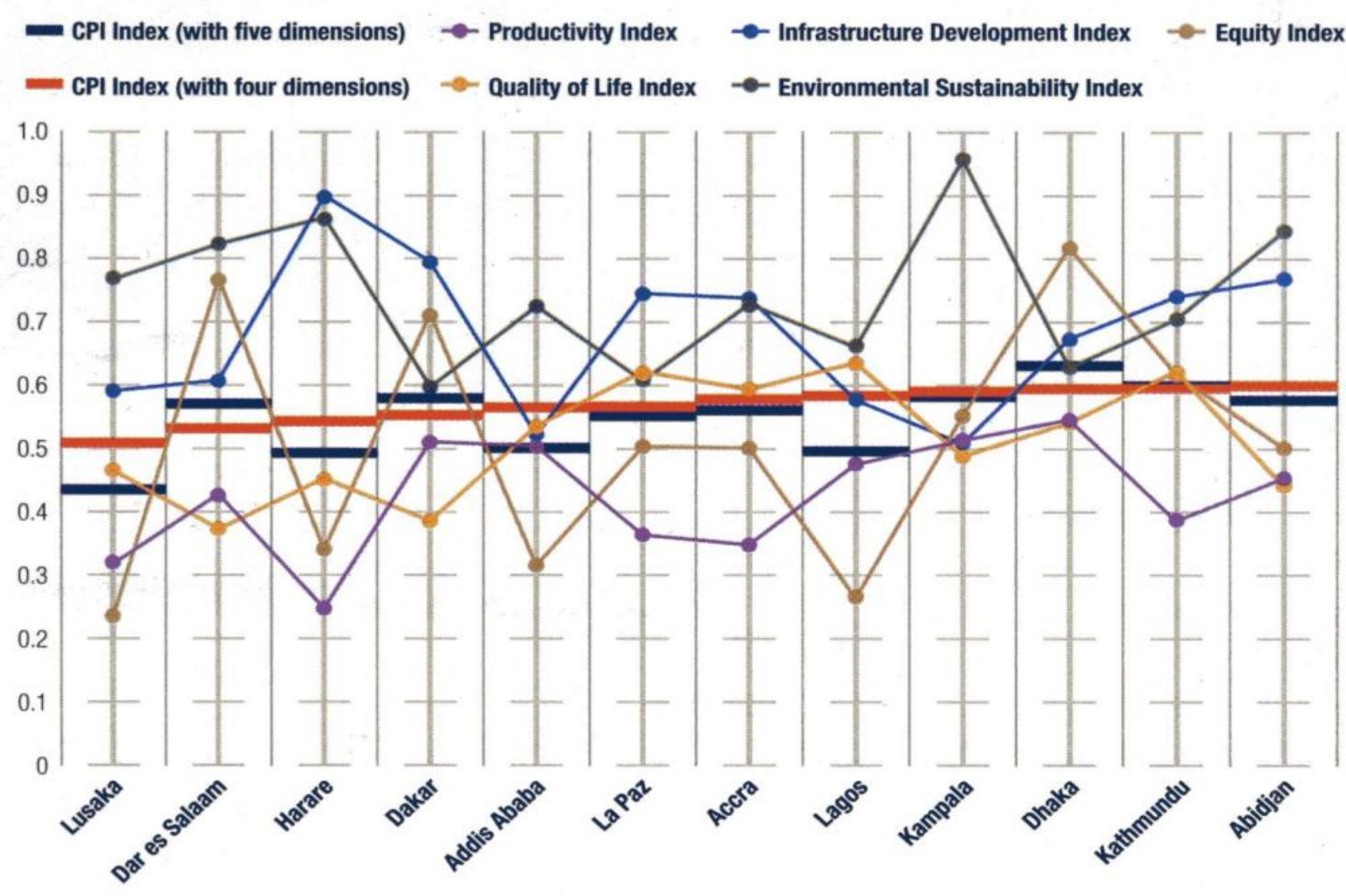
FEATURES:

1. **Presents institutional and structural failures**
2. **Cities with less balanced development feature contrasted patterns**
3. **Socially and economically divided cities (rich x poor)**
4. **Low city product**
5. **Serious environmental problems**

Figure 1.1.6

Cities with weak prosperity factors

Source: SWCR 2012.



Urban Prosperity

Source: SWCR 2012.

Cities with weak prosperity factors (CPI: 0.50-0.59).

FEATURES:

1. **Much remains to be done in terms of quality of life, infrastructure and environment in most of the cities within this bracket.**
2. **Historical structural problems**
3. **chronic inequality of opportunities**
4. **Widespread poverty**
5. **Inadequate capital investment in public goods**
6. **Absence of pro-poor social programmes are critical factors behind such low degrees of prosperity.**

Table 1

City Prosperity Index and components

Source: SWCR 2012.

Country	City	City Prosperity Index (CPI) with 5 Dimensions	City Prosperity Index (CPI) with 4 Dimensions*	Productivity Index	Quality of life Index	Infrastructure Index	Enivronment Index	Equity Index
Kazakhstan	Almaty	0.830	0.833	0.751	0.822	0.872	0.897	0.818
China	Shanghai	0.826	0.832	0.671	0.836	0.900	0.950	0.800
Romania	Bucharest	0.836	0.821	0.707	0.767	0.968	0.867	0.900
Mexico	Mexico City	0.709	0.816	0.743	0.764	0.900	0.866	0.405
Turkey	Ankara	0.780	0.806	0.699	0.802	0.842	0.891	0.683
Jordan	Amman	0.771	0.796	0.697	0.790	0.887	0.824	0.680
Thailand	Bangkok	0.733	0.794	0.719	0.747	0.871	0.850	0.533
Ukraine	Kyïv	0.798	0.781	0.579	0.757	0.968	0.874	0.873
Viet Nam	Hà Noi	0.756	0.776	0.712	0.761	0.912	0.733	0.683
Armenia	Yerevan	0.779	0.769	0.635	0.850	0.870	0.745	0.817
China	Beijing	0.799	0.762	0.667	0.836	0.911	0.663	0.967
South Africa	Cape Town	0.590	0.758	0.628	0.645	0.933	0.875	0.217
Indonesia	Jakarta	0.769	0.743	0.636	0.733	0.741	0.881	0.885
South Africa	Johannesburg	0.479	0.742	0.654	0.645	0.880	0.816	0.083
Philippines	Manila	0.723	0.737	0.676	0.647	0.775	0.868	0.669
Egypt	Cairo	0.722	0.730	0.679	0.743	0.916	0.616	0.692
Morocco	Casablanca	0.647	0.700	0.634	0.513	0.827	0.891	0.472
Honduras	Tegucigalapa	0.652	0.694	0.541	0.729	0.709	0.829	0.510
Moldova	Chisinau	0.698	0.693	0.340	0.850	0.895	0.894	0.717
India	Mumbai	0.694	0.688	0.645	0.739	0.745	0.632	0.715
Kenya	Nairobi	0.593	0.673	0.481	0.559	0.860	0.889	0.357
Cambodia	Phnom Penh	0.677	0.666	0.544	0.613	0.728	0.809	0.722
Mongolia	Ulaanbaatar	0.675	0.664	[illegible]	0.777	[illegible]	[illegible]	[illegible]

Egypt	Cairo	0.722	0.730	0.679	0.743	0.916	0.616	0.692
Morocco	Casablanca	0.647	0.700	0.634	0.513	0.827	0.891	0.472
Honduras	Tegucigalapa	0.652	0.694	0.541	0.729	0.709	0.829	0.510
Moldova	Chisinau	0.698	0.693	0.340	0.850	0.895	0.894	0.717
India	Mumbai	0.694	0.688	0.645	0.739	0.745	0.632	0.715
Kenya	Nairobi	0.593	0.673	0.481	0.559	0.860	0.889	0.357
Cambodia	Phnom Penh	0.677	0.666	0.544	0.613	0.728	0.809	0.722
Mongolia	Ulaanbaatar	0.675	0.664	0.493	0.777	0.632	0.804	0.722
Guatemala	Guatemala City	0.614	0.646	0.440	0.556	0.823	0.866	0.502
Cameroon	Yaoundé	0.618	0.623	0.492	0.555	0.666	0.827	0.600
India	New Delhi	0.635	0.617	0.596	0.690	0.786	0.448	0.712
Côte d'Ivoire	Abidjan	0.578	0.599	0.452	0.440	0.767	0.842	0.500
Nepal	Kathmundu	0.598	0.594	0.385	0.621	0.740	0.704	0.617
Bangladesh	Dhaka	0.633	0.593	0.545	0.539	0.673	0.627	0.817
Uganda	Kampala	0.581	0.590	0.512	0.486	0.507	0.956	0.550
Nigeria	Lagos	0.496	0.582	0.475	0.634	0.576	0.659	0.262
Ghana	Accra	0.560	0.576	0.347	0.592	0.737	0.728	0.500
Bolivia	La Paz	0.551	0.565	0.363	0.621	0.745	0.606	0.502
Ethiopia	Addis Ababa	0.501	0.564	0.503	0.534	0.521	0.724	0.313
Senegal	Dakar	0.581	0.552	0.510	0.384	0.794	0.596	0.712
Zimbabwe	Harare	0.493	0.542	0.246	0.451	0.899	0.864	0.338
United Republic of Tanzania	Dar es Salaam	0.571	0.530	0.427	0.371	0.607	0.822	0.767
Zambia	Lusaka	0.434	0.507	0.316	0.463	0.590	0.766	0.233
Niger	Niamey	0.482	0.456	0.402	0.426	0.485	0.521	0.602
Mali	Bamako	0.491	0.452	0.401	0.416	0.544	0.460	0.683
Madagascar	Antananarivo	0.465	0.446	0.171	0.558	0.511	0.812	0.552
Guinea	Conakry	0.449	0.416	0.133	0.461	0.607	0.809	0.612
Liberia	Monrovia	0.313	0.285	0.048	0.381	0.411	0.886	0.457

*The CPI with 4 dimensions does not include the equity index

Source: United Nations Human Settlements Programme (UN-Habitat), Global Urban Indicators Database 2012.

Source: SWCR 2012.

10.

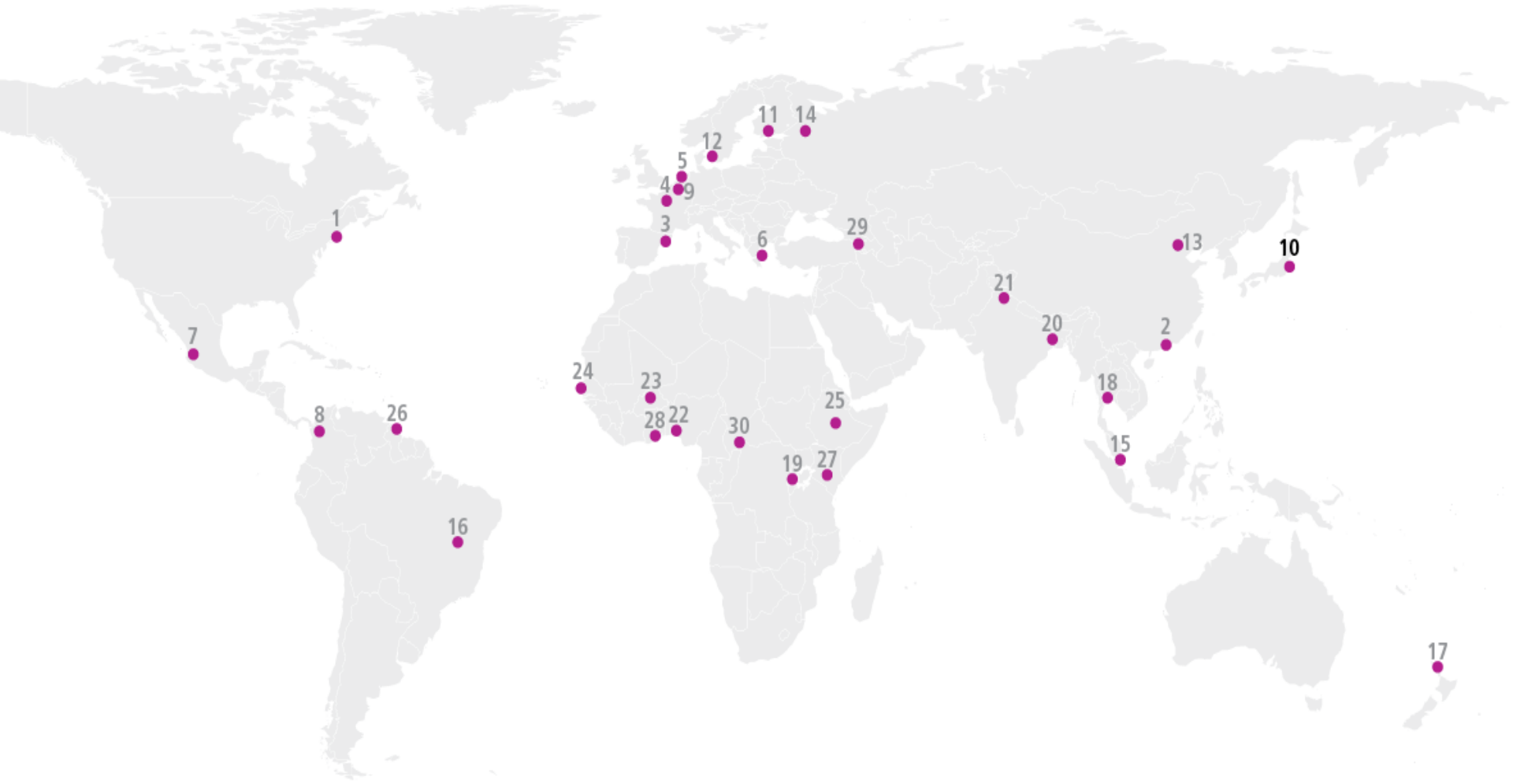
Refining and further Developing the City Prosperity Index:

Seeking ways to capture spatial dimensions and indicators reflecting spatial structures

claudio.acioly@unhabitat.org

Reconceptualizing the CPI

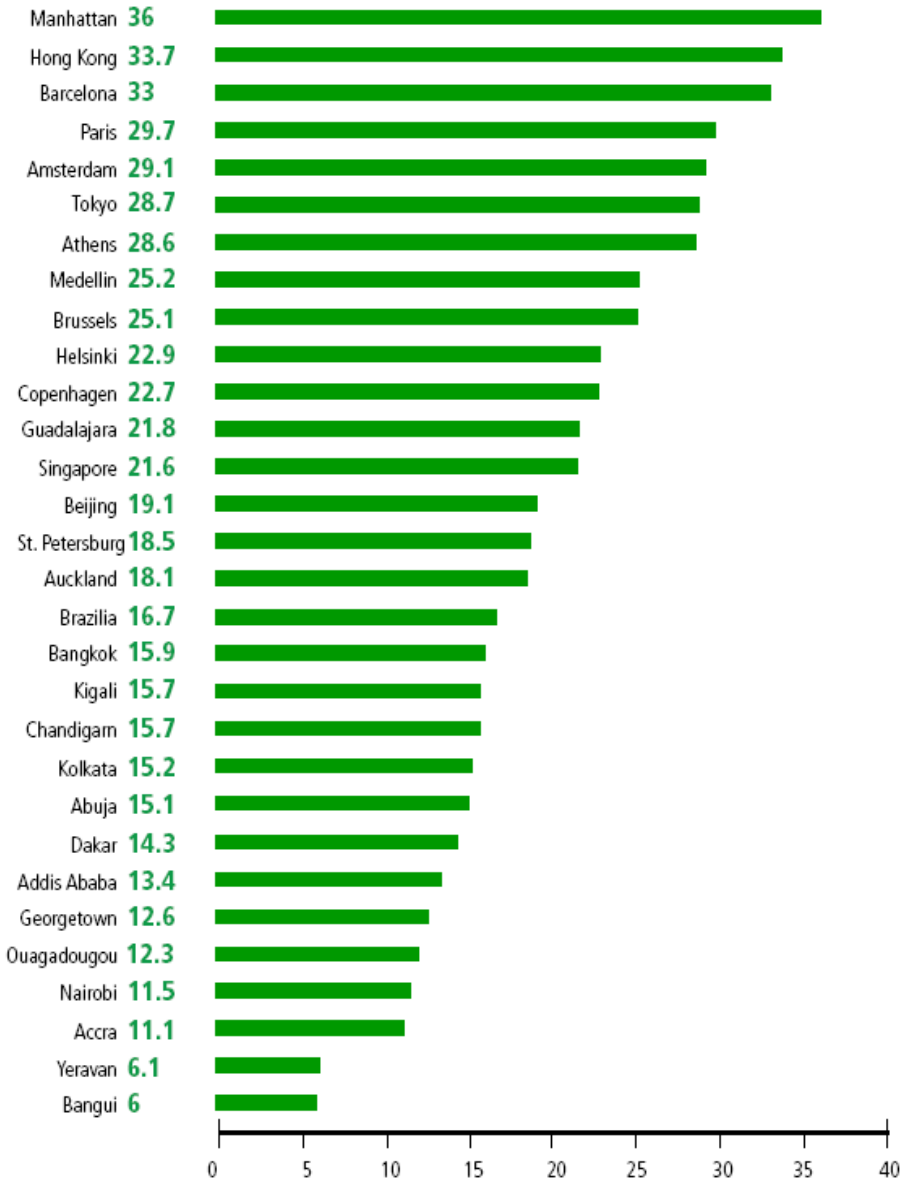
- Urban form carries the spatial dimention
- Streets and public spaces are linked to efficiency and productivity of urban structures
- Streets contribute to prosperity: infrastructure, quality of life, spatial inclusion, accessibility and productivity
- Land allocation to streets safeguard. public goods



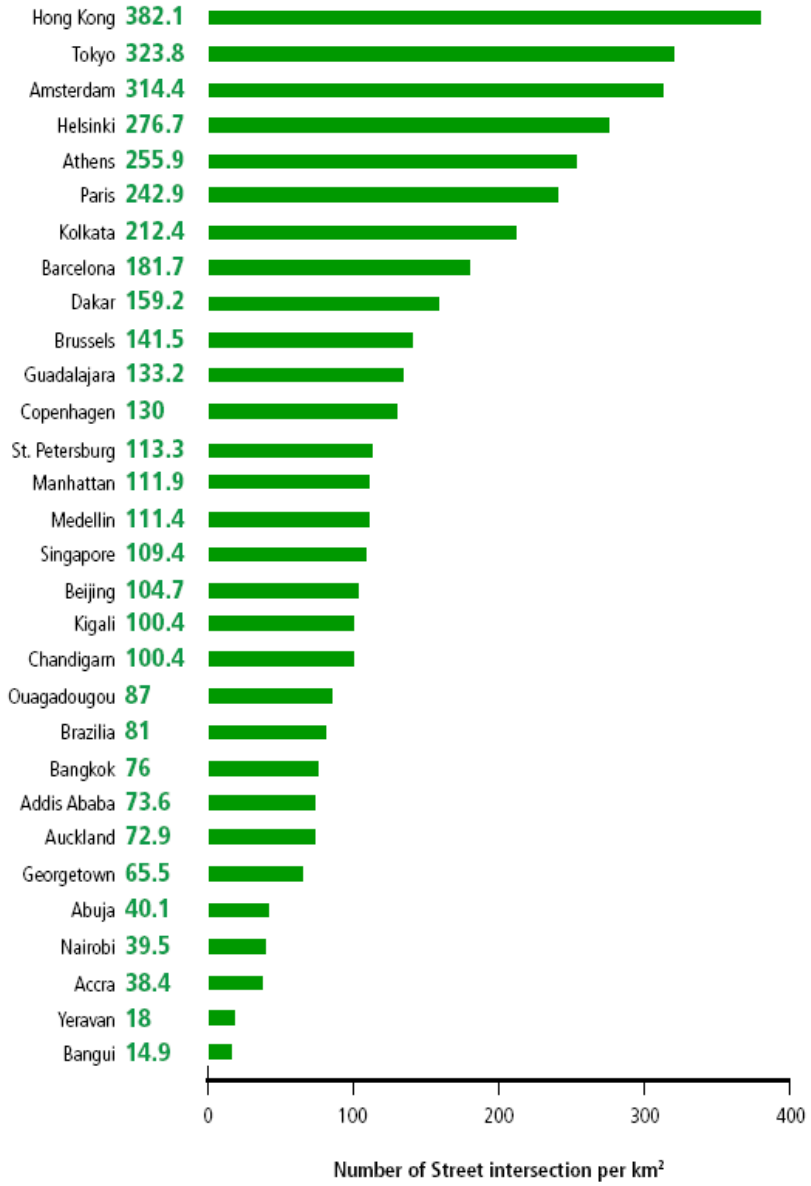
Thirty cities have been selected as a pilot project:

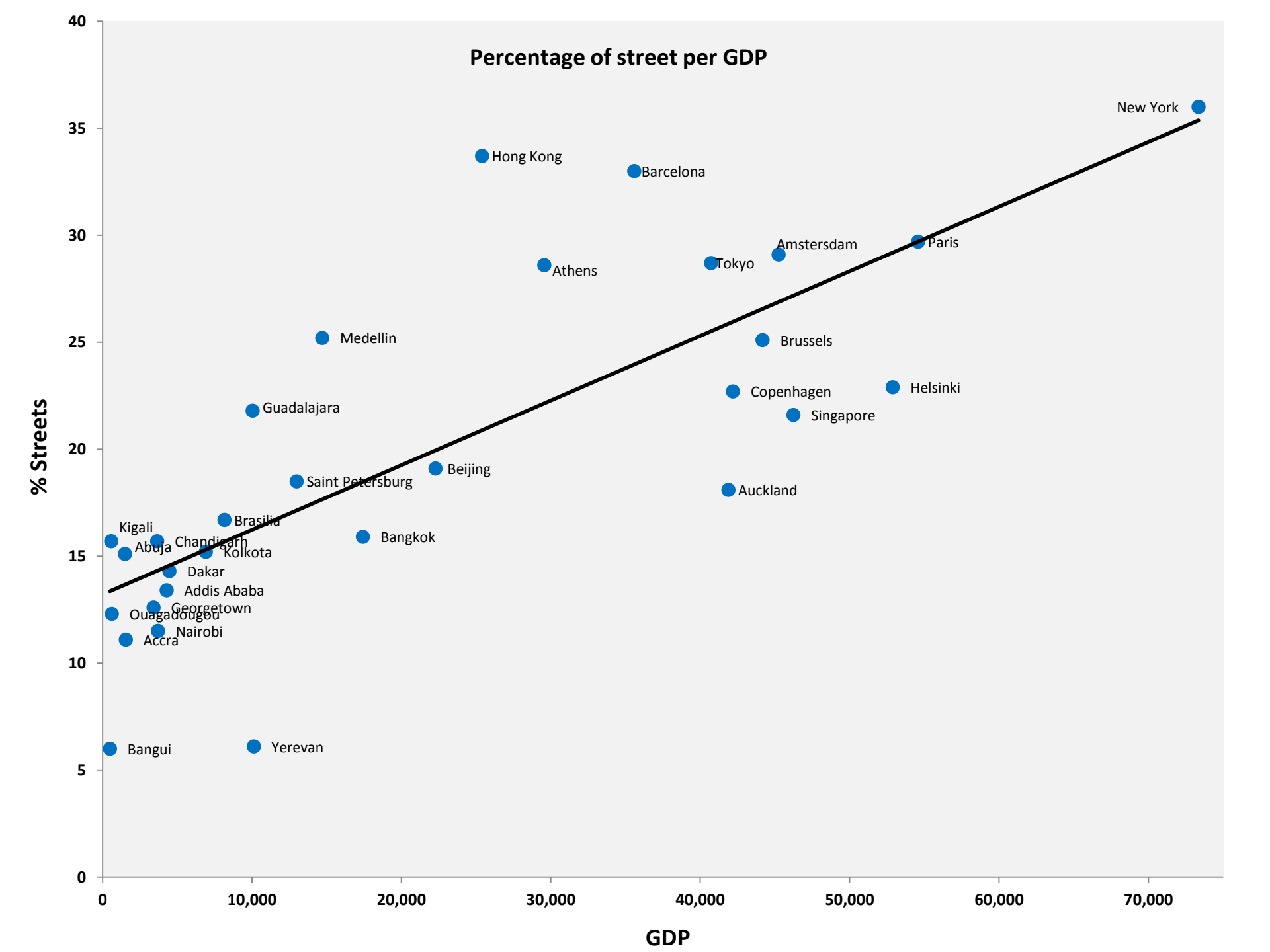
1. Manhattan
2. Hong Kong
3. Barcelona
4. Paris
5. Amsterdam
6. Athens
7. Guadalajara
8. Medellin
9. Brussels
10. Tokyo
11. Helsinki
12. Copenhagen
13. Beijing
14. St. Petersburg
15. Singapore
16. Brasilia
17. Auckland
18. Bangkok
19. Kigali
20. Chandigarh
21. Kolkata
22. Abuja
23. Ouagadougou
24. Dakar
25. Addis Ababa
26. Georgetown
27. Nairobi
28. Accra
29. Yeravan
30. Bangui

Ranking of selected cities in relation to its land allocated to streets



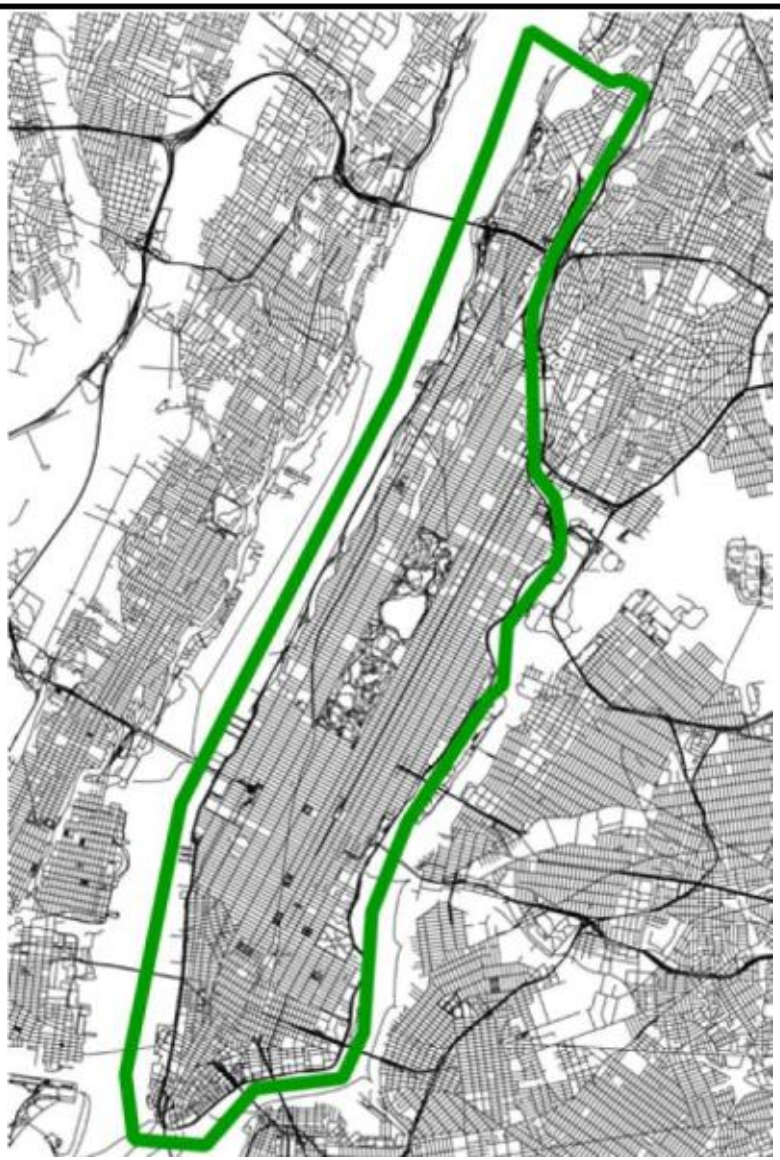
Ranking of cities in relation to number of street intersection per SQ/Km




Percentage of street per GDP
% Streets
GDP
0
5
10
15
20
25
30
35
40
0
10,000
20,000
30,000
40,000
50,000
60,000
70,000
New York
Hong Kong
Barcelona
Amstersdam
Paris
Athens
Tokyo
Medellin
Brussels
Copenhagen
Helsinki
Guadalajara
Singapore
Beijing
Saint Petersburg
Auckland
Brasilia
Kigali
Bangkok
Abuja
Chandigarh
Kolkota
Dakar
Addis Ababa
Georgetown
Ouagadougou
Nairobi
Accra
Bangui
Yerevan

NEW YORK (MANHATTAN)

	Total land area (km²)	Total streets area (km²)	Proportion of streets area (%)	Total streets length (km)	Street density (km/km²)	Average street width (m)	Total intersections (Int)	Intersections density (Int/ Km²)
Centre area	52	19	36	1,188	22.7	15.9	5,863	111.9



The higher the street connectivity, the higher the city prosperity index

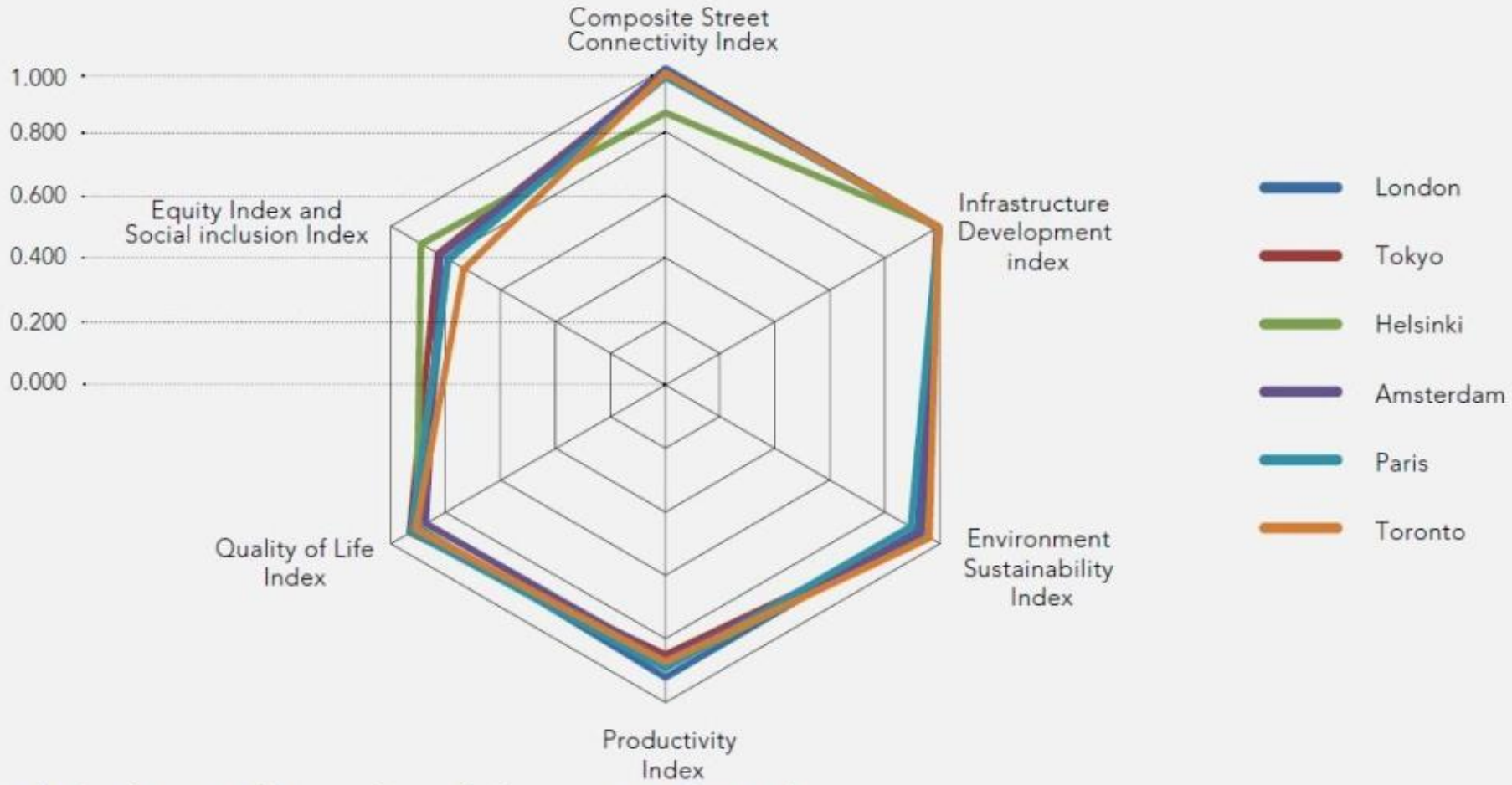
Street Connectivity : parameters of urban form

Infrastructure Development Index (ID)	1. Housing Infrastructure Sub Index (HI)	1. Improved Shelter
		2. Access to Improved Water
		3. Access to Improved Sanitation
		4. Access to Electricity
		5. Sufficient Living Area
		6. Residential Density
	2. Social Infrastructure (SI)	1. Physicians Density
		2. Number of Public Libraries
	3. ICT Sub Index (ICT)	1. Internet Access
		2. Home Computer Access
		3. Average broadband speed
	4. Urban Mobility Sub Index (UM)	1. Use of Public Transport
		2. Average Daily Travel Time (reversed)
		3. Length of Mass Transport Network
		4. Traffic Fatalities (reversed)
		5. Affordability of Transport (reversed)
	5. Street Connectivity (SC)	1. Street Intersection Density
		2. Street Density
		3. Land allocated to streets

Measuring and Testing Co-relations of Street Connectivity in the CPI

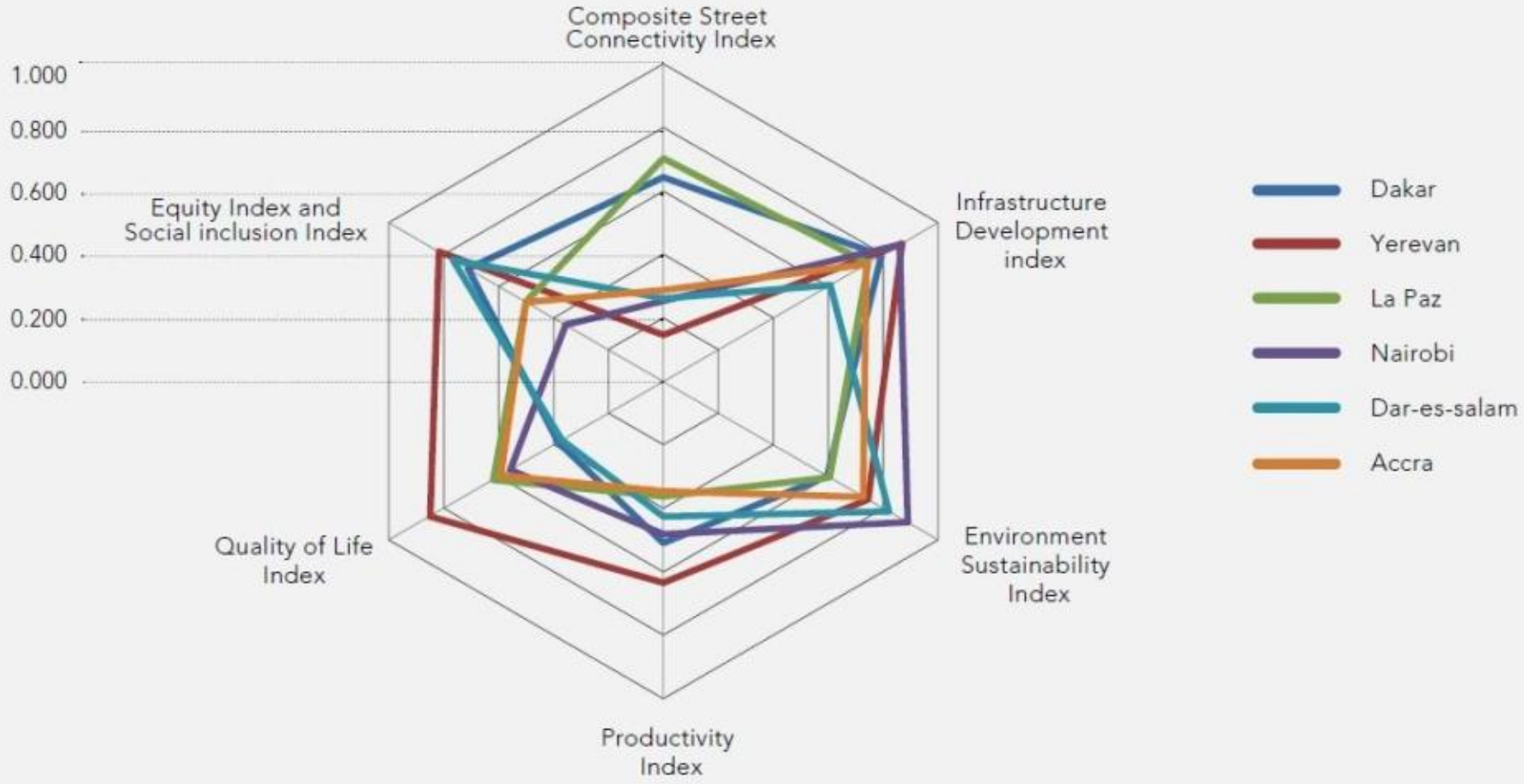
- Transforming Street Connectivity into a spoke of the CPI: the composite street connectivity index
- Corelation between higher CPI and high street connectivity: urban form matters, urban structure influences city prosperity

The higher the street connectivity, the higher the city prosperity index



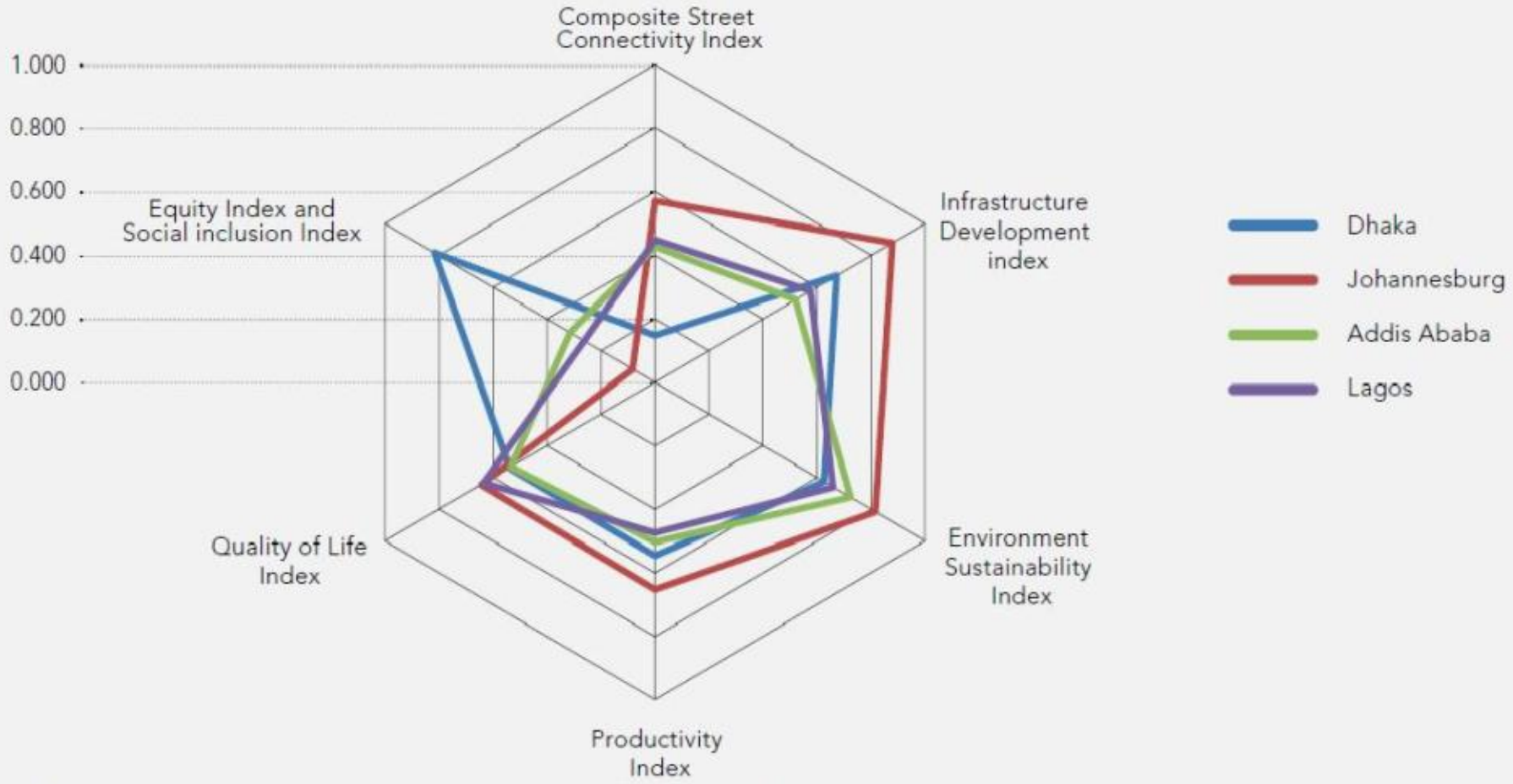
UN-Habitat (2013) *Streets as Public Spaces and Drivers of Urban Prosperity*, UN-Habitat, Nairobi.

FIGURE 5.5 **CITIES WITH A CPI OF BETWEEN 0.500 AND 0.599**



UN-Habitat (2013) *Streets as Public Spaces and Drivers of Urban Prosperity*, UN-Habitat, Nairobi.

FIGURE 5.6 **CITIES WITH A CPI OF BELOW 0.500**



UN-Habitat (2013) *Streets as Public Spaces and Drivers of Urban Prosperity*, UN-Habitat, Nairobi.

5. Street Connectivity (SC)	1. Street Intersection Density
	2. Street Density
	3. Land allocated to streets

a. Since ancient times, streets have played a critical role in cities, connecting spaces and people and allowing goods to reach them, and thereby facilitating commerce, social interaction and mobility.
b. Successful urban development is a function of an organized physical layout, a fluid urban structure and a system of street that enables interconnectivity within cities.
c. Cities that have failed to integrate the multi-functionality of streets tend to have lesser infrastructure development, lower productivity and a poorer quality of life.

11.

Methodological aspects:

Data collection, coherence and further understanding of indicators that help define prosperity and the basis for policy analysis.

City Development Index - CPI

Dimension	Definitions/Variables
1. Productivity	Productivity index is measured through the city product (outputs & goods produced by a city's population). Variables: capital investment, formal/informal employment, inflation, trade, savings, export-import and household income/consumption.
2. Infrastructure development	The index combines two sub-indices: one for infrastructure proper, and another for **housing.**
3. Quality of Life	This index is a combination of 3 indices: education, health sub-index and public space.
4. Equity and Social inclusion	This index combines statistical measures of inequality of income/consumption, (Gini coefficient) and inequality of access to services and infrastructure.
5. Environmental sustainability	Values the protection of the urban environment while ensuring growth…

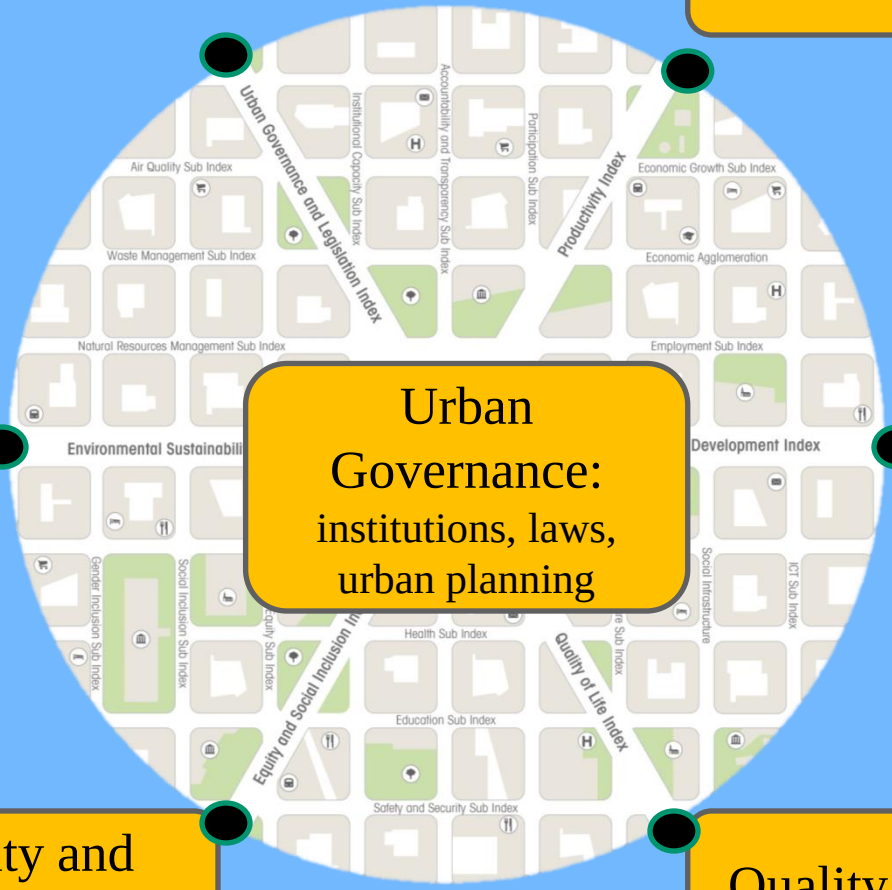
City Development Index - CPI

From 5 to 6 spokes

Refining the CPI

Productivity

Environmental Sustainability

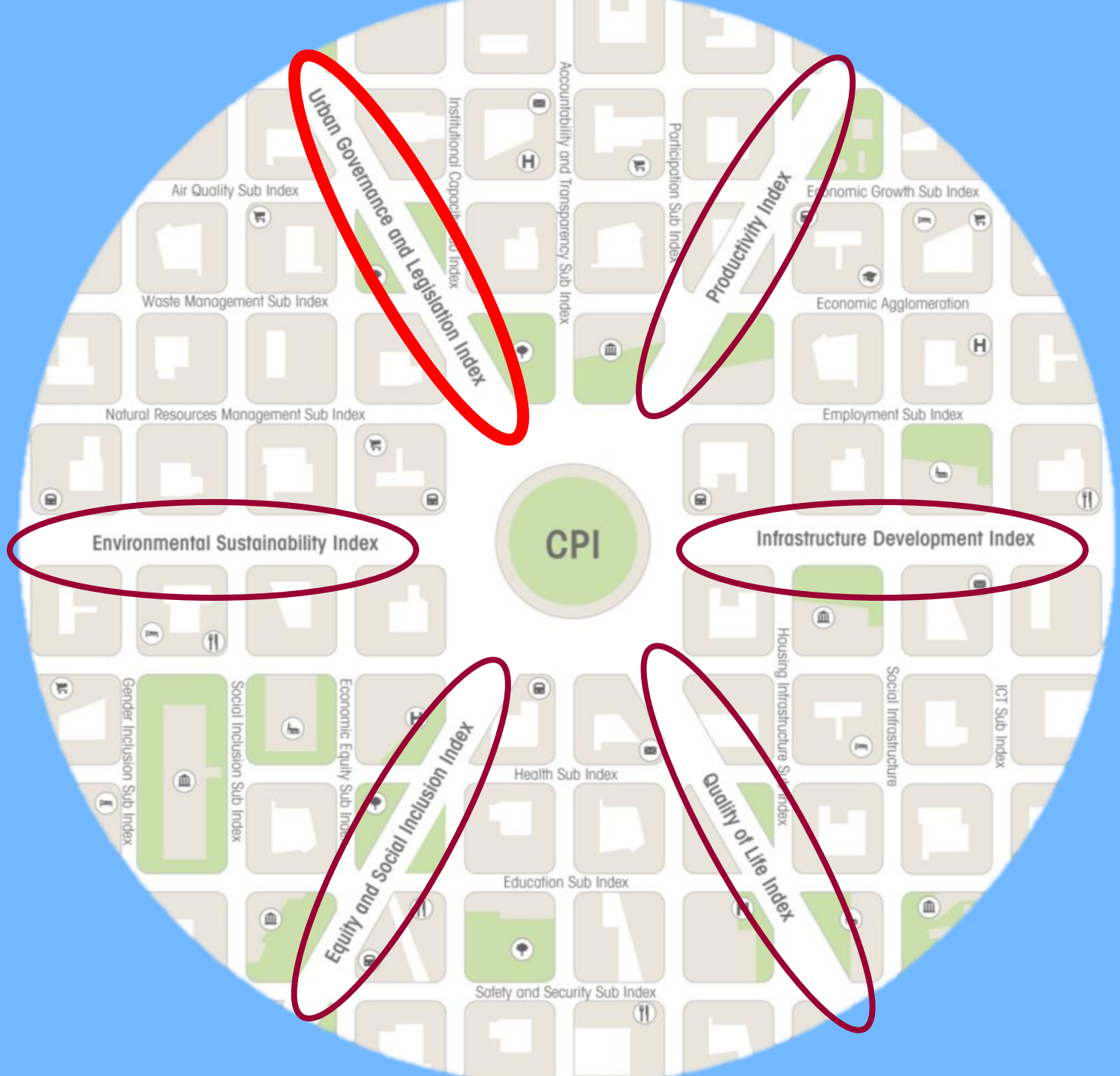


Urban Governance: institutions, laws, urban planning

Infrastructure Development

Equity and Social Inclusion

Quality of Life


Urban Governance and Legislation Index
Productivity Index
Environmental Sustainability Index
CPI
Infrastructure Development Index
Equity and Social Inclusion Index
Quality of Life Index
Air Quality Sub Index
Waste Management Sub Index
Natural Resources Management Sub Index
Institutional Capacity Sub Index
Accountability and Transparency Sub Index
Participation Sub Index
Economic Growth Sub Index
Economic Agglomeration
Employment Sub Index
Housing Infrastructure Sub Index
Social Infrastructure
ICT Sub Index
Gender Inclusion Sub Index
Social Inclusion Sub Index
Economic Equity Sub Index
Health Sub Index
Education Sub Index
Safety and Security Sub Index

Incremental approach to Prosperity

Contextual CPI		
Policy performance monitoring	Comparable across time	70 Indicators

Extended CPI		
In-depth Diagnosis	Comparable region / country	55 Indicators

Basic CPI		
Initial Diagnosis	Globally comparable	30 Indicators

Productivity Index (P)	1. Economic Growth Sub Index (EG)
	2. Economic Agglomeration (EA)
	3. Employment Sub Index (E)
Infrastructure Development Index (ID)	1. Housing Infrastructure Sub Index (HI)
	2. Social Infrastructure (SI)
	3. ICT Sub Index (ICT)
	4. Urban Mobility Sub Index (UM)
	5. Street Connectivity (SC)
Quality of Life Index (QOL)	1. Health Sub Index (H)
	2. Education Sub Index (E)
	3. Safety and Security Sub Index (SS)
	4. Public Space (PS)
Equity and Social Inclusion Index (ESI)	1. Economic Equity Sub Index (EE)
	2. Social Inclusion Sub Index (SI)
	3. Gender Inclusion Sub Index (GI)
	4. Urban Diversity (UD)
Environmental Sustainability Index (ES)	1. Air Quality Sub Index (AQ)
	2. Waste Management Sub Index (WM)
	3. Water and Energy Sub Index (WE)
Urban Governance and Legislation (UGL)	1. Participation Sub Index (P)
	2. Accountability and Transparency (AT)
	3. Institutional Capacity (IC)
	4.Governance of Urbanization (GU)

23 Sub Indexes

Indicators will reveal the sub-dimensions and the dimension of the CPI

DIMENSION	SUB-DIMENSION	INDICATOR
Productivity Index (P)	Employment (E)	P_E_1_UnemploymentRate (Reversed)
		P_E_2_EmploymentToPopulationRatio
		P_E_3_InformalEmployment (Reversed)
	Economic Growth (EG)	P_EG_1_CityProductPerCapita
		P_EG_2_OldAgeDependencyRatio (Reversed)
		P_EG_3_MeanHouseholdIncome
	Economic Agglomeration (EA)	P_EA_1_EconomicDensity
		P_EA_2_EconomicSpecialization

Indicator:	City Product per capita
Scope	Basic CPI
Rationale:	Cities have traditionally served as economic centers and have become primary providers of services. They are engines of economic growth and development. Also, cities currently generate more than half of national economic activities worldwide (UN-Habitat, 2003). Urban production, measured through the City Product, is an important indicator to measure the level of economic development of a city *vis-à-vis* the national level that provides information about the level of income and the capacity to generate employment opportunities (United Nations, 2001). A prosper city seeks to increase its level of product per capita in order to achieve higher levels of economic well-being.
Definition:	The City Product per capita is the sum of the gross value added by all producers within a city, relative to its total population.
Unit [ ]	US$ per capita (2011 PPP)
Methodology:	The City Product per capita is calculated as the sum of the product between the National Gross Domestic Product (GDP) in each economic sector (primary, industrial and service sectors) and the employment sector's share of the national's sector employment, divided by total city population:

$$City\ Product\ per\ capita = \frac{\sum_{j=1}^{J} National\ Product_j * \left(\frac{city\ employment_j}{national\ employment_j}\right)}{Total\ City\ Population}$$

Where j stands for the industry sector. In case that city employment information by sector does not available, it is possible to use census information about the employment structure.

The following table should be filled out for each economic sector (using sectorial

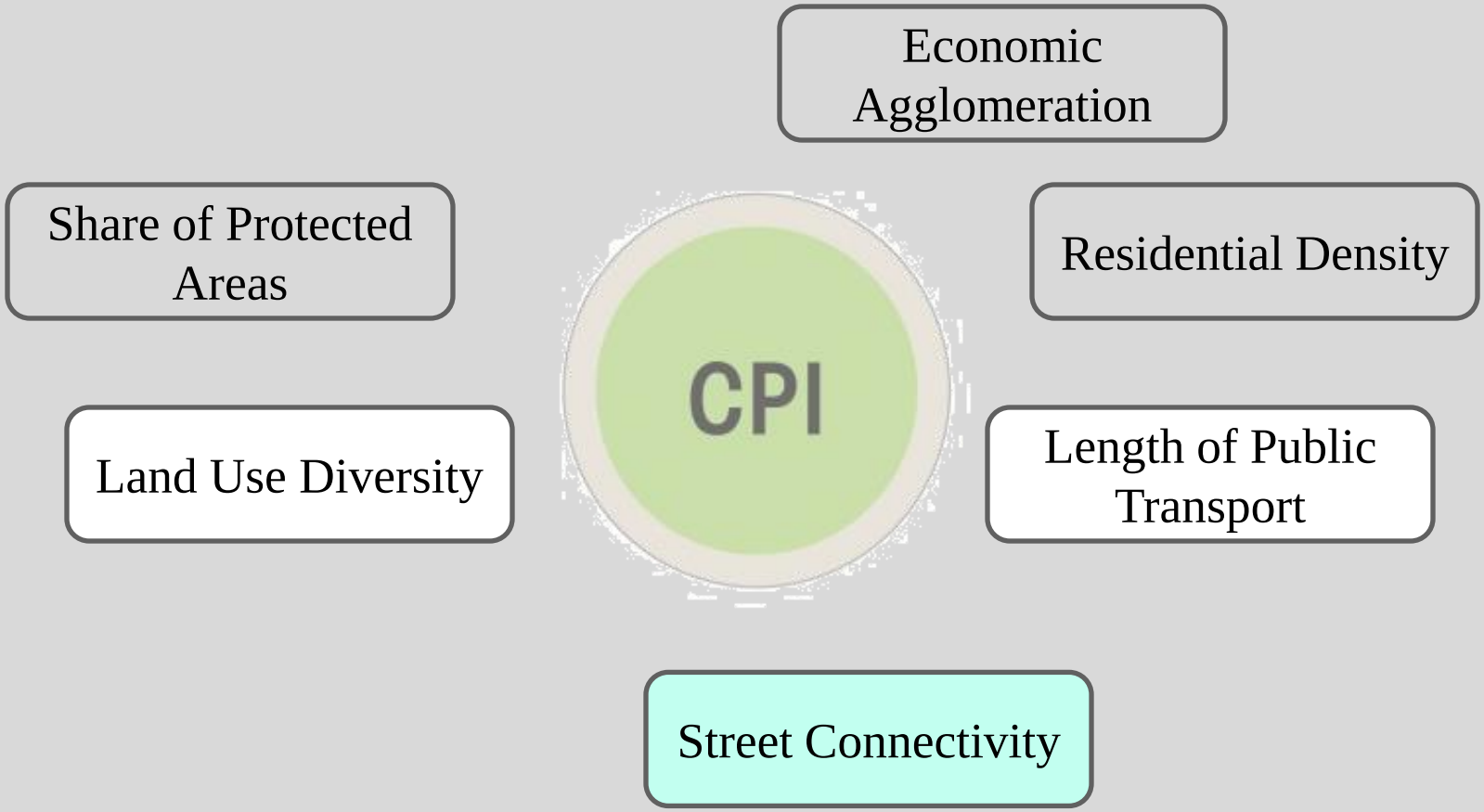
12.

SPATIAL INDICATORS:

Using the composite street connectivity index to bring urban form, urban patterns and spatial dimensions into the CPI

claudio.acioly@unhabitat.org

Use of spatial indicators



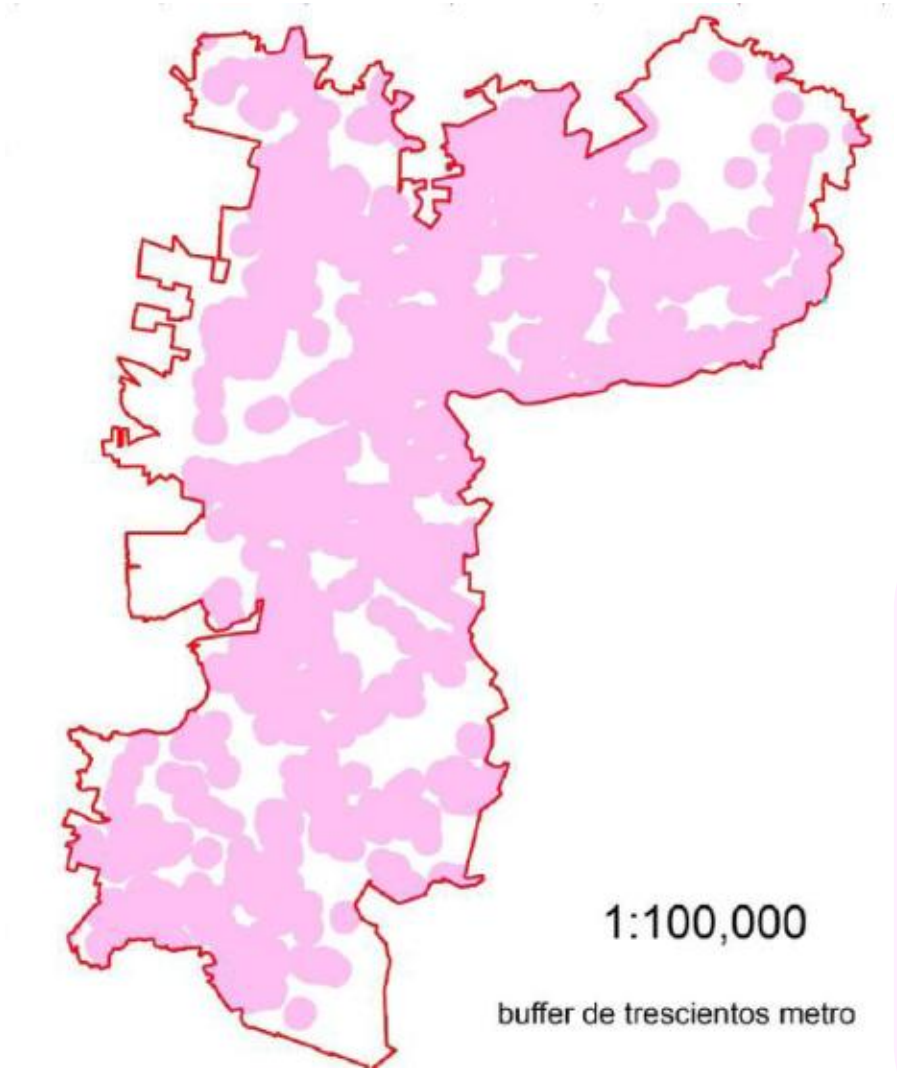
Spatial indicators in the dimensions

Productivity Index (P)	Economic growth	• City Product per capita • Old age dependency ratio • Mean household income
	Economic agglomeration	• Economic density • Economic Specialization
	Employment	

Spatial indicators in the dimensions

Infrastructure Index (P)	Housing	
	Social infrastructure	
	ICT	
	Urban mobility	
	Street connectivity	• Land allocated to streets • Street density • Street intersection density

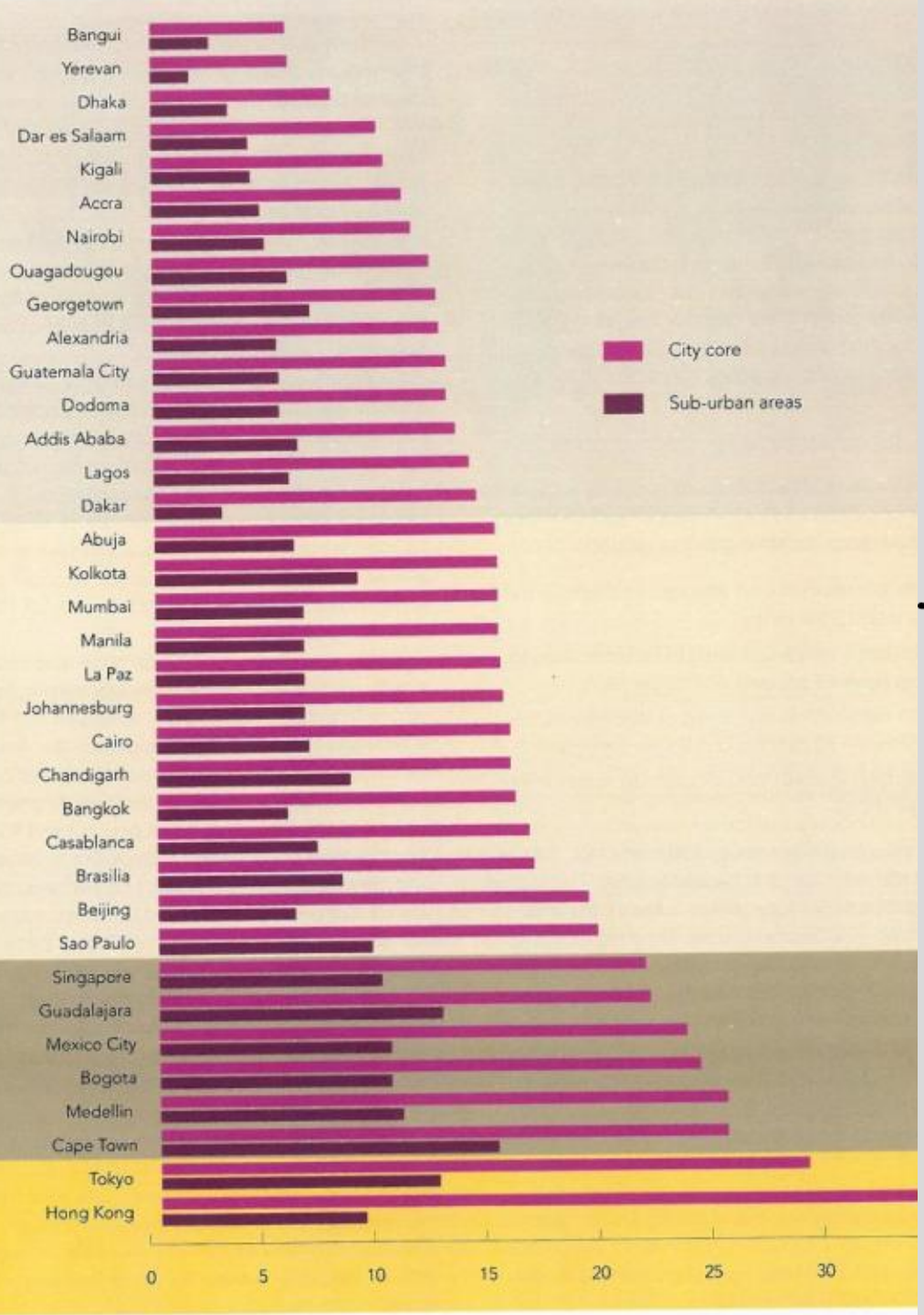
Public Space Indicators



1. Green Area per Capita

2. Accessibility to Open Public Space

- % urban AREA within 300m from open public space
- % urban AREA within 1000m from **major** open public space



Absence of footpaths

Slums very poor street networks

Many streets are links.. only.

New urban extensions undeserved by streets

The form of the city and prosperity
(street connectivity index)

City	Land allocated to streets	Street density	Intersection densities
Neiva	22.5	24.8	**243.8**
Bogotá	**18.3**	**15.9**	153.2
Santa Marta	20.0	18.6	160.9
Medellín	22.1	18.1	105.0
	20.5	**18.3**	**150.8**
Recommended range	**30**	**20**	**100**

Form of the City – Example: Medellin
(connectivity at intra-city level)

Consolidated areas	
Land to streets	25.99
Land density	19.79
Density intersections	130

Residential areas	
Land to streets	30.74
Land density	22.69
Density intersections	140

Informal areas	
Land to streets	12.04
Land density	16.17
Density intersections	130

Form of the City – Example: Medellin
(connectivity at intra-city level)

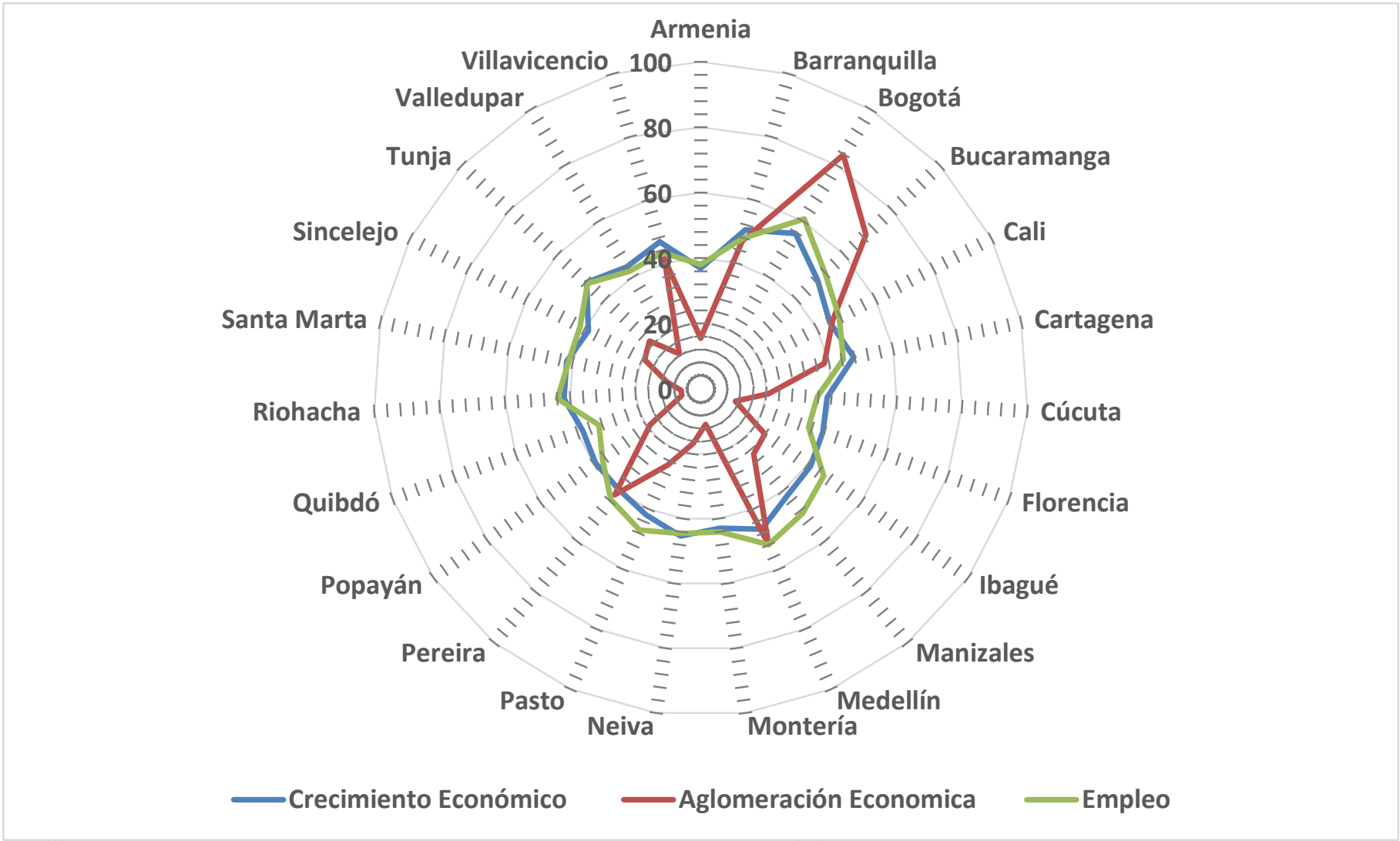
The shape and structure of the city are crucial in achieving prosperity

Street in informal areas are half of the consolidated areas

EXTENDED PROPERTY INDEX
Aggregated Values

	Productivity Index	Infrastructure Development Index	Quality of Life Index	Equity and Social Inclusion Index	Environmental Sustainability Index	**IPU Extended**
Armenia	30,138	55,793	54,797	58,373	60,223	**50,360**
Barranquilla	48,467	52,022	52,758	60,145	43,678	**51,130**
Bogotá	66,729	52,664	60,379	70,058	52,898	**60,134**
Bucaramanga	56,574	57,346	57,204	72,207	47,926	**57,748**
Cali	45,763	54,659	49,567	64,907	45,593	**51,631**
Cartagena	43,595	54,378	60,345	60,059	43,434	**51,806**
Cúcuta	31,699	53,990	50,669	57,649	42,123	**46,204**
Florencia	28,566	48,352	47,153	60,026	43,612	**44,294**
Ibagué	36,990	59,953	48,945	66,649	52,564	**52,002**
Manizales	38,874	61,260	53,433	64,989	58,314	**54,532**
Medellín	50,161	65,510	63,797	62,659	50,517	**58,127**
Montería	32,680	46,122	49,586	59,617	59,979	**48,460**
Neiva	35,597	49,594	51,218	62,624	56,963	**50,317**
Pasto	38,101	51,676	53,030	61,211	58,819	**51,882**
Pereira	41,638	62,000	49,003	63,394	55,775	**53,718**
Popayán	31,727	47,750	52,058	57,146	54,804	**47,702**
Quibdó	25,806	33,979	48,153	37,734	41,512	**36,651**
Riohacha	30,634	44,456	45,356	52,551	39,559	**41,852**
Santa Marta	31,212	50,871	49,968	59,807	55,571	**48,330**
Sincelejo	33,232	50,696	49,458	58,855	43,545	**46,334**
Tunja	38,840	55,036	52,472	67,224	45,713	**50,990**
Valledupar	32,767	54,888	52,038	63,260	56,291	**50,648**
Villavicencio	43,752	49,720	46,716	65,447	39,768	**48,360**

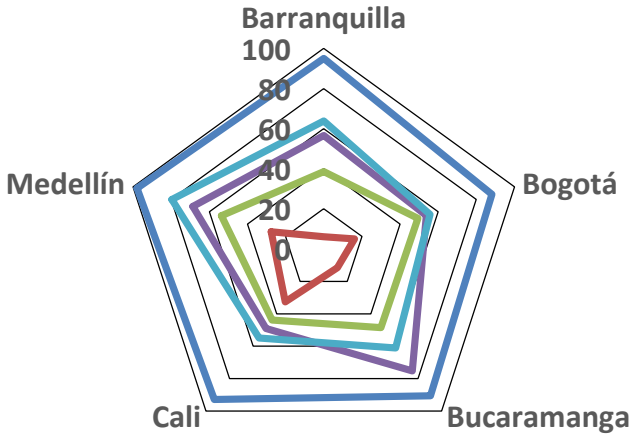
EXTENDED CPI
Productivity Dimension



ONU HABITAT
POR UN MEJOR FUTURO URBANO

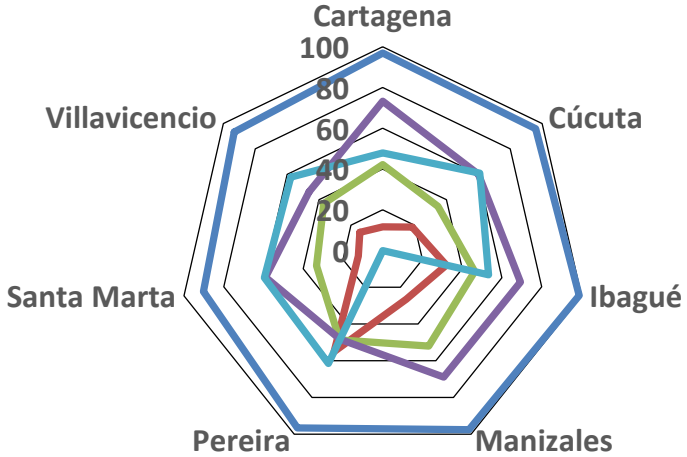
EXTENDED CPI
Infrastructure Development Dimension

Cities with more than 1 million inhabitants

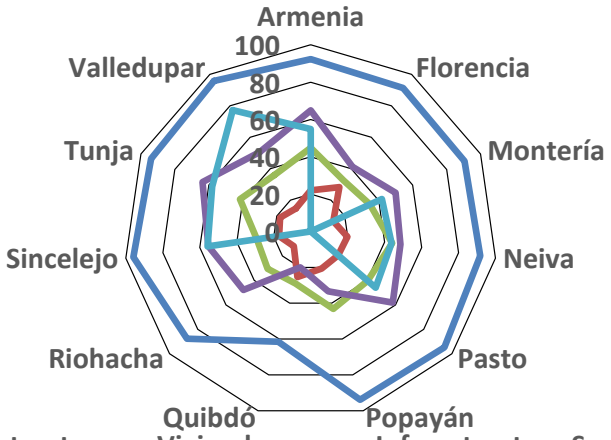


Infraestructura en Vivienda
Infraestructura Social
ICT
Movilidad Urbana
Conectividad de las vías

Cities between 1 M & 400.000 inhabitants



Infraestructura en Vivienda
Infraestructura Social
ICT
Movilidad Urbana
Conectividad de las vías

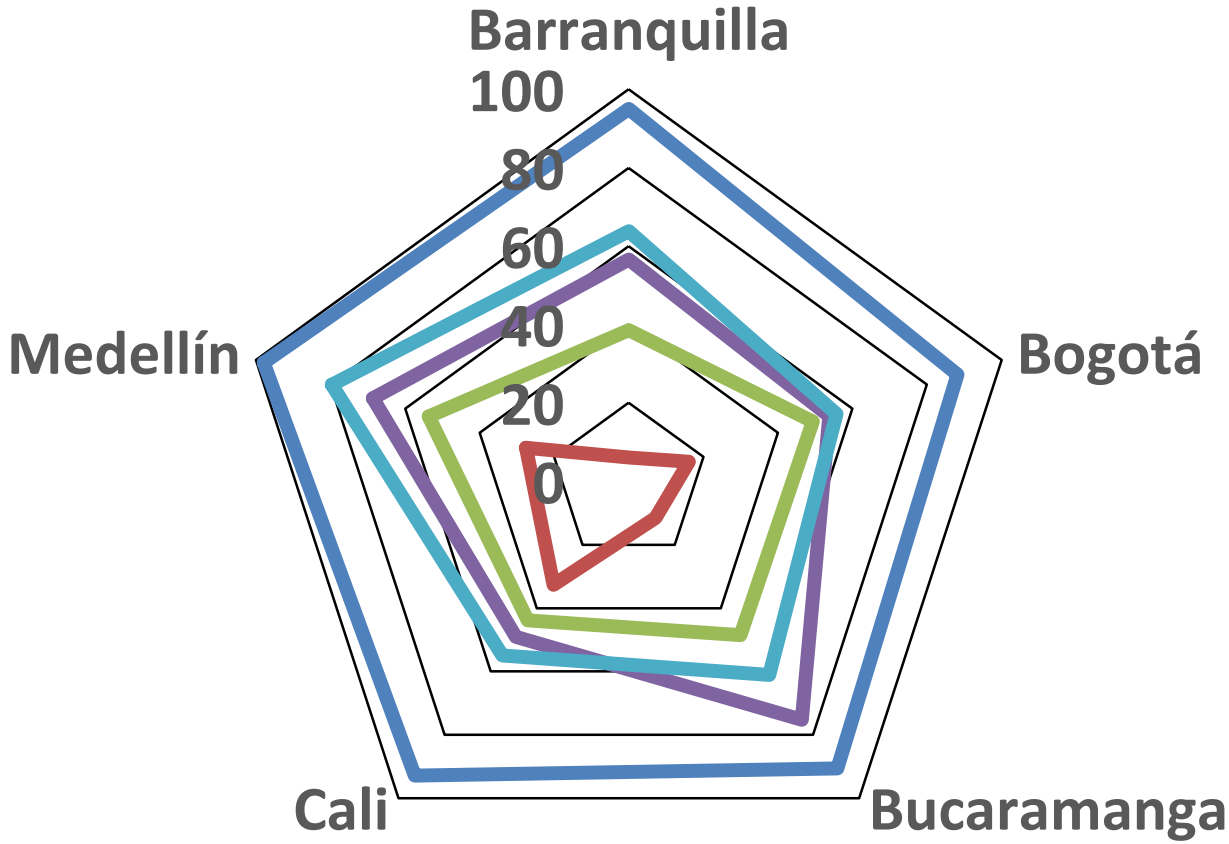


Infraestructura en Vivienda
Infraestructura Social
ICT
Movilidad Urbana
Conectividad de las vías

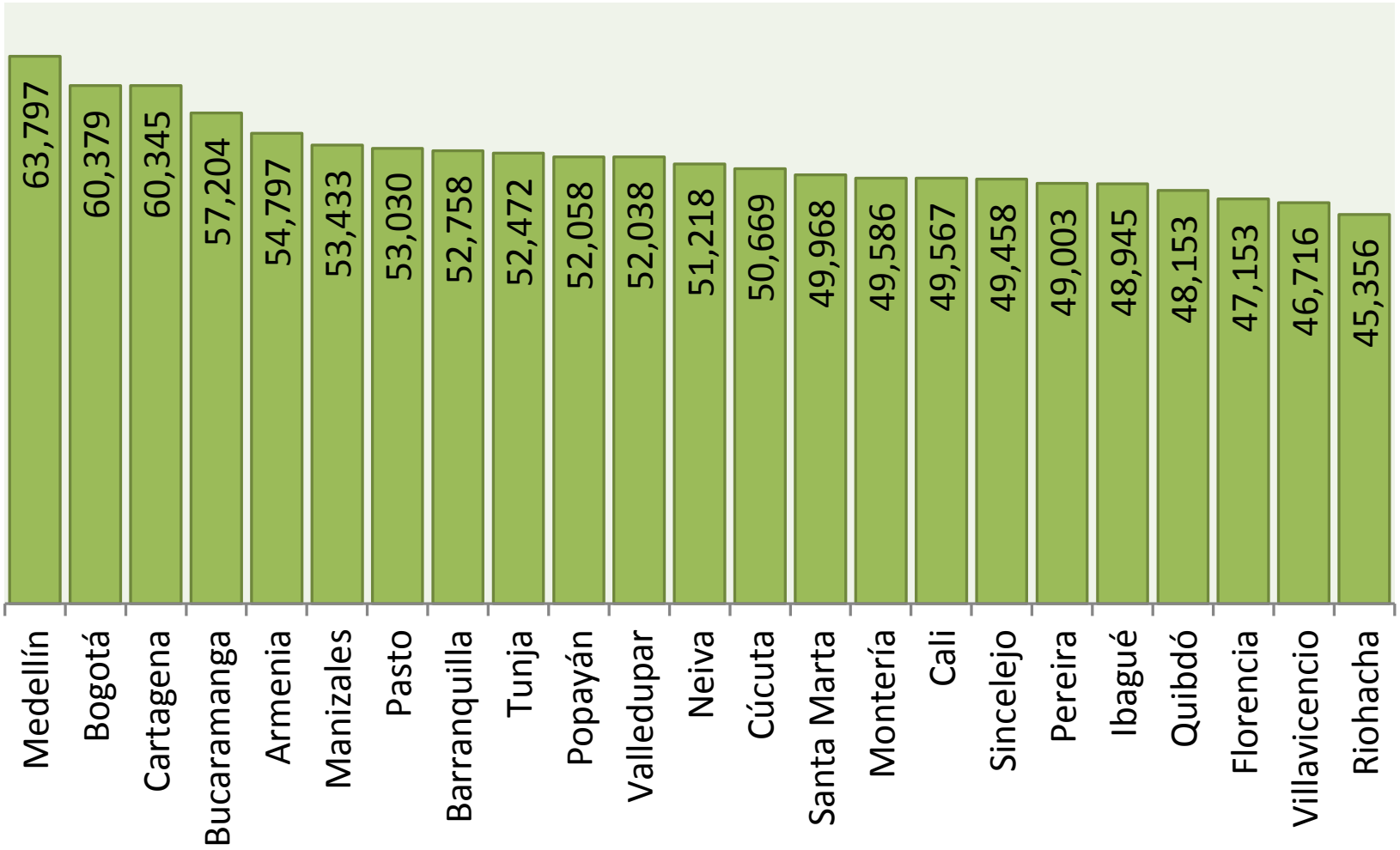
Cities with less than 400,000 inhabitants

EXTENDED CPI
Infrastructure Development Dimension

Cities with more than 1 million inhabitants más de un millón de habitantes



EXTENDED CPI
Dimension Quality of Life

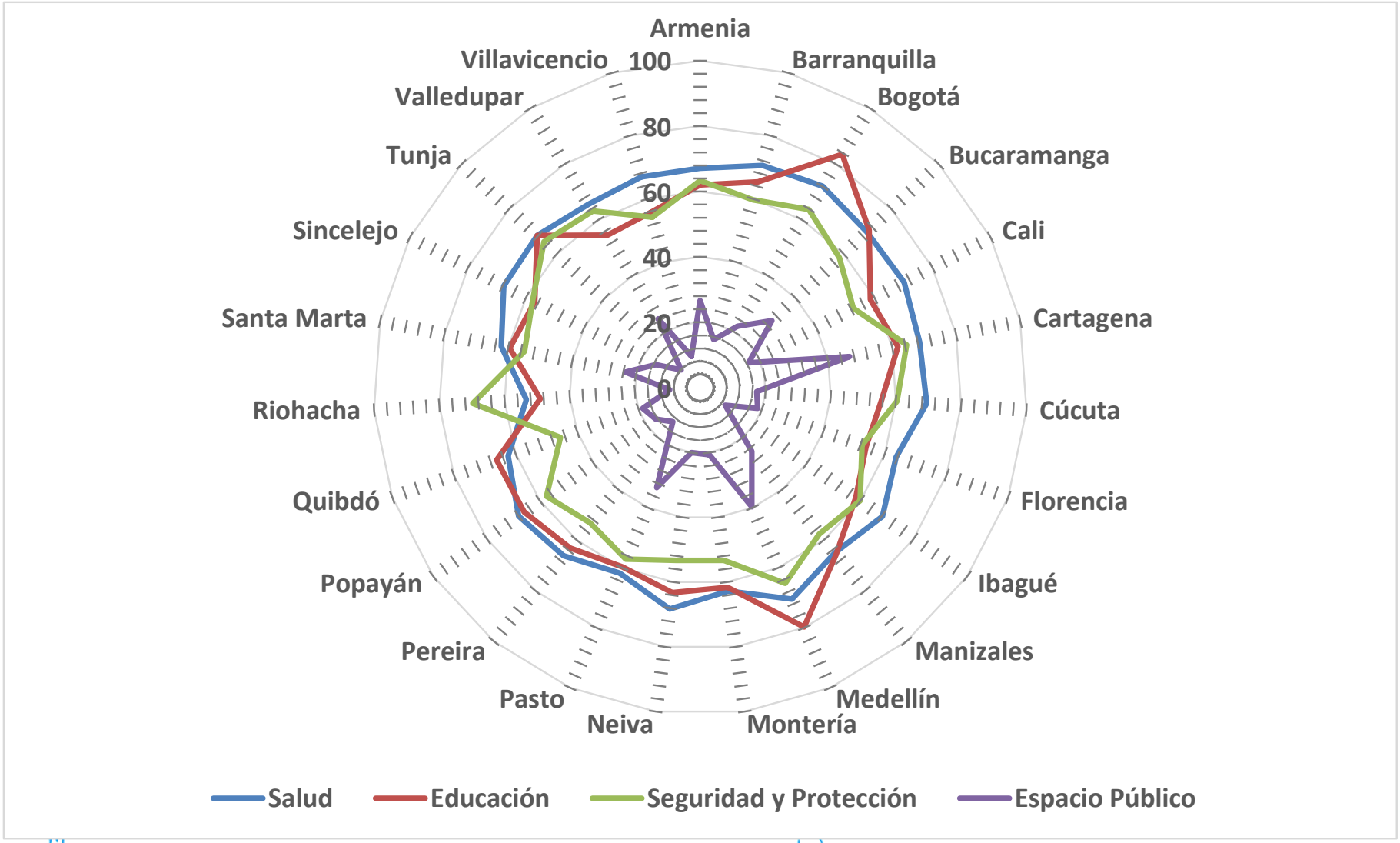


ONU HABITAT
POR UN MEJOR FUTURO URBANO

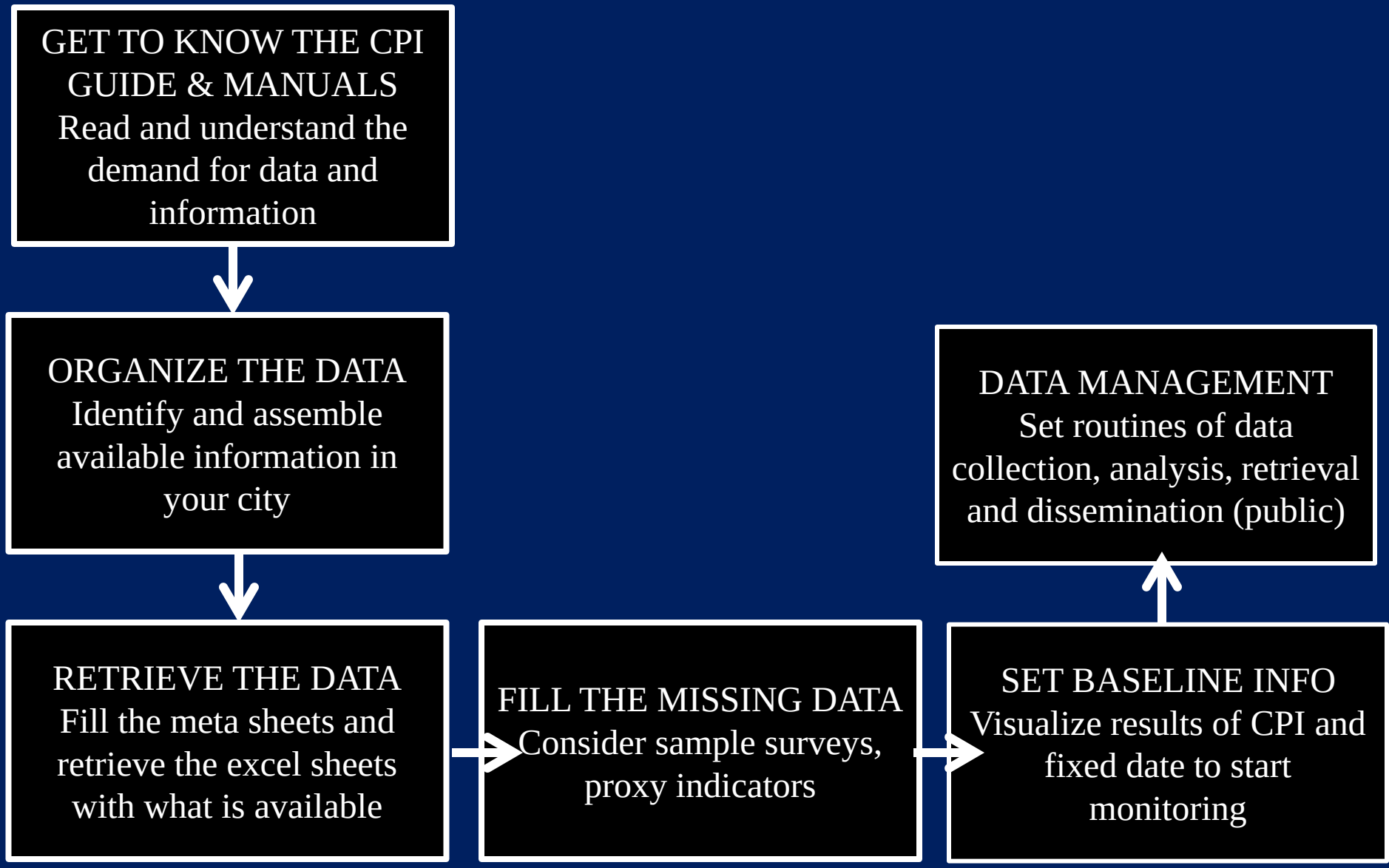
EXTENDED CPI
Dimension Quality of Life

Ciudad	Salud	Educación	Seguridad y Protección	Espacio Público	Calidad de Vida
Armenia	67,097	62,055	63,372	26,667	**54,797**
Barranquilla	70,583	65,418	59,698	15,333	**52,758**
Bogotá	72,074	83,596	63,846	22,000	**60,379**
Bucaramanga	69,823	70,732	58,261	30,000	**57,204**
Cali	70,210	58,619	52,773	16,667	**49,567**
Cartagena	68,517	61,758	64,437	46,667	**60,345**
Cúcuta	69,472	55,574	60,296	17,333	**50,669**
Florencia	63,560	53,885	52,502	18,667	**47,153**
Ibagué	68,276	58,283	59,886	9,333	**48,945**
Manizales	65,152	65,855	57,659	25,067	**53,433**
Medellín	70,468	79,764	65,255	39,700	**63,797**
Montería	62,744	61,631	53,303	20,667	**49,586**
Neiva	68,336	63,233	53,303	20,000	**51,218**
Pasto	61,828	59,769	57,189	33,333	**53,030**
Pereira	66,249	63,142	53,288	13,333	**49,003**
Popayán	68,062	65,954	57,551	16,667	**52,058**
Quibdó	62,400	66,123	45,422	18,667	**48,153**
Riohacha	53,303	49,051	69,738	9,333	**45,356**
Santa Marta	62,138	59,531	54,871	23,333	**49,968**
Sincelejo	67,685	57,060	57,755	15,333	**49,458**
Tunja	68,198	68,282	65,408	8,000	**52,472**
Valledupar	65,687	54,565	63,235	24,667	**52,038**
Villavicencio	66,963	55,744	54,156	10,000	**46,716**

EXTENDED CPI
Dimension Quality of Life



OPERATIONAL & METHODOLOGICAL STEPS



THE END
thank you.

UN HABITAT
FOR A BETTER URBAN FUTURE

claudio.acioly@unhabitat.org