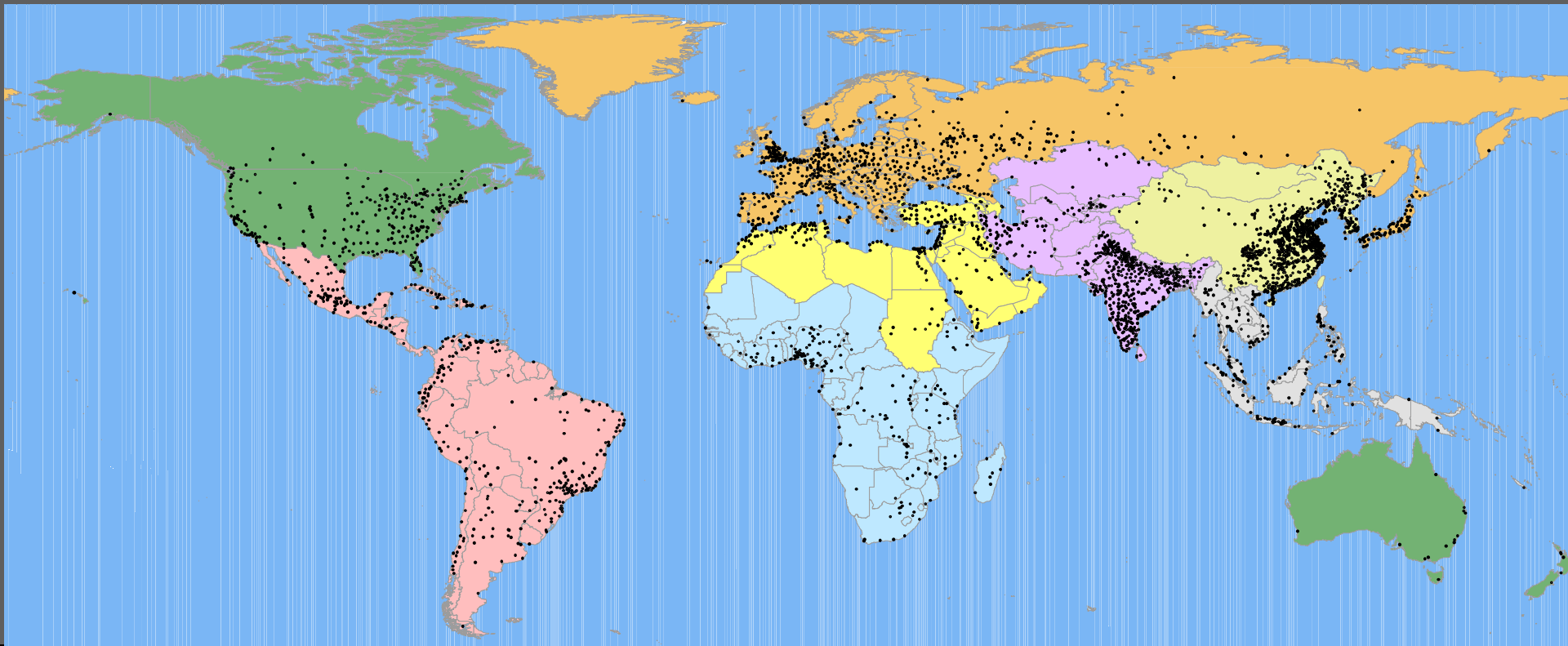


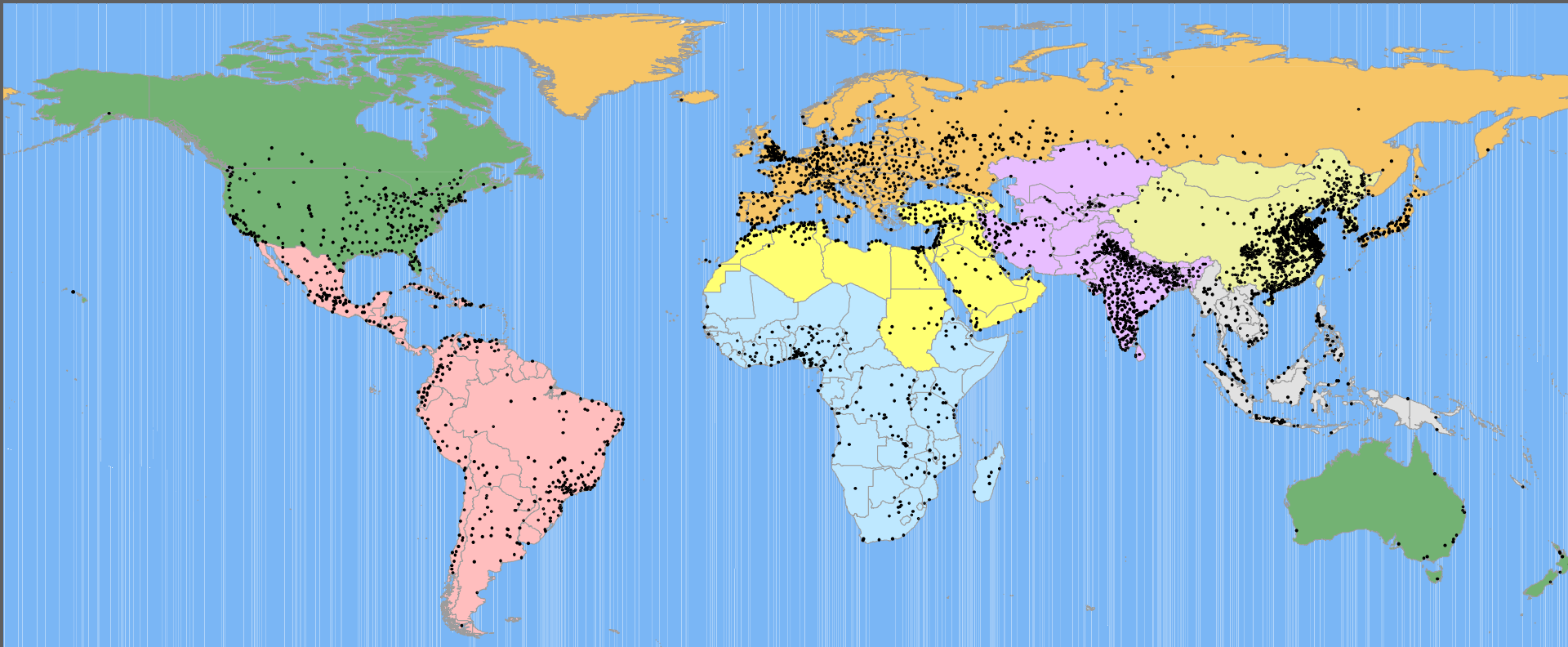
MANAGING URBAN EXPANSION: FROM GLOBAL MONITORING TO STAKES IN THE GROUND



Dr. Shlomo Angel, NYU, 18 January 2016

I: MONITORING GLOBAL URBAN EXPANSION

THE UNIVERSE OF CITIES



The universe of all 4,245 cities that had 100,000 people or more in 2010

MONITORING GLOBAL URBAN EXPANSION

Phase I—The Mapping & Measurement of Urban Expansion

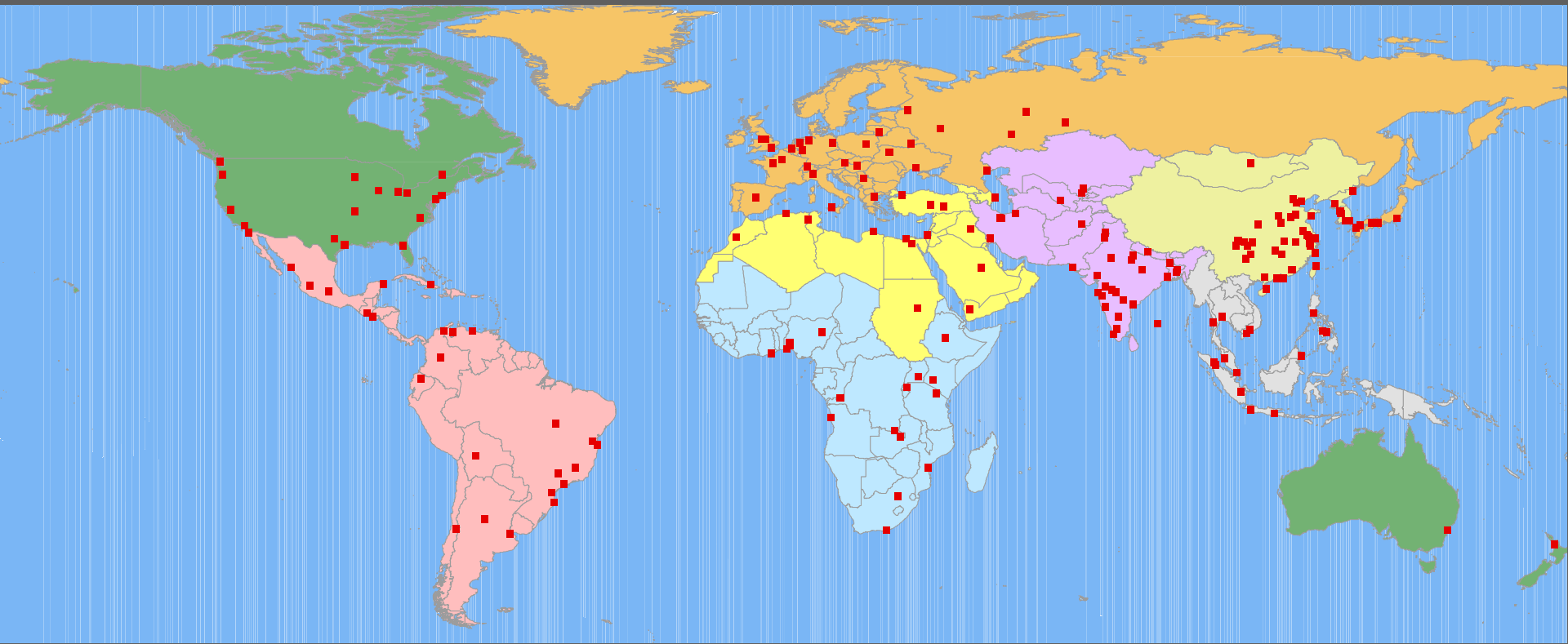
Phase II—The Mapping and Measurement of Urban Layouts

Phase III—The Land and Housing Survey

Partners: U.N. Human Settlements Programme (UN Habitat), Lincoln Institute of Land Policy, and U.N. Population Division

MONITORING GLOBAL URBAN EXPANSION

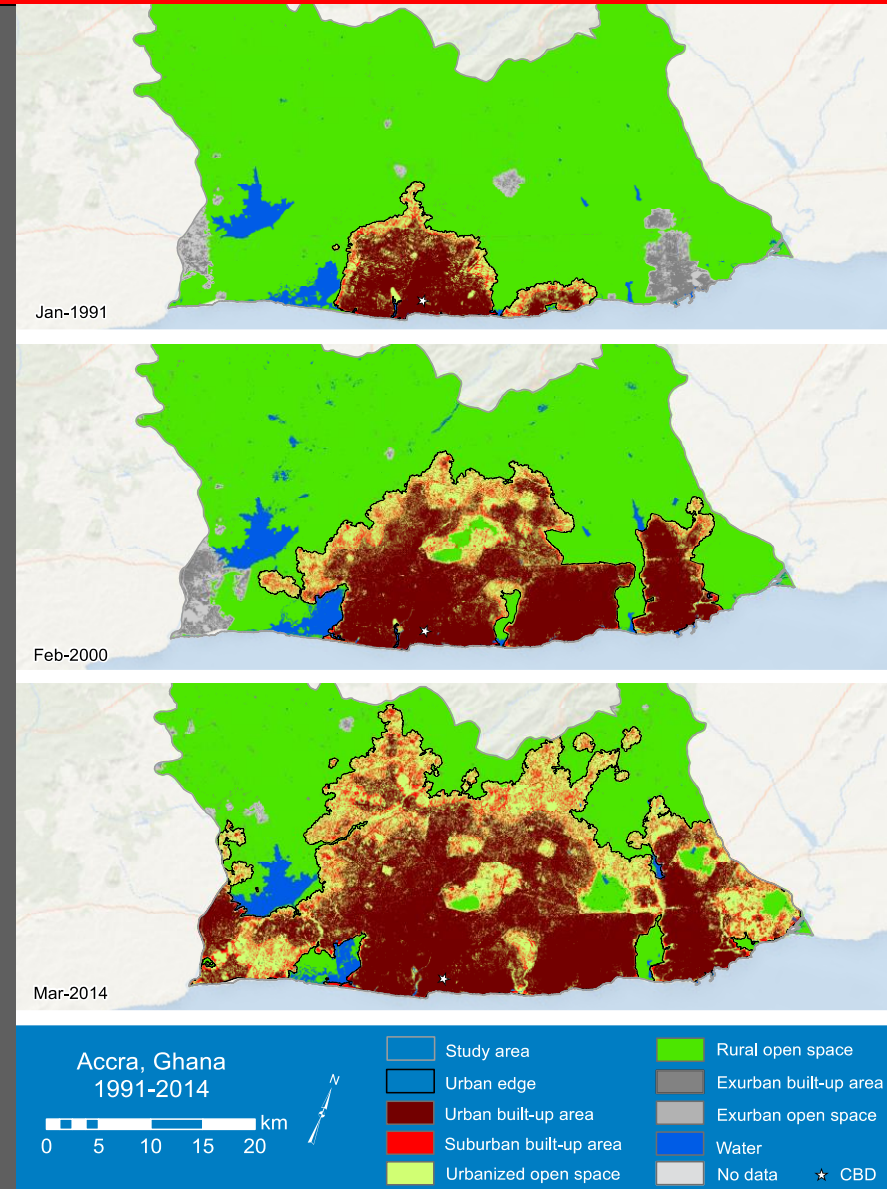
THE NEW SAMPLE OF 200 OF CITIES



Sampling from 8 world regions, 4 city population size classes, and 3 categories of countries with 0-9, 10-19 and 20+ cities.

PHASE I: URBAN EXPANSION

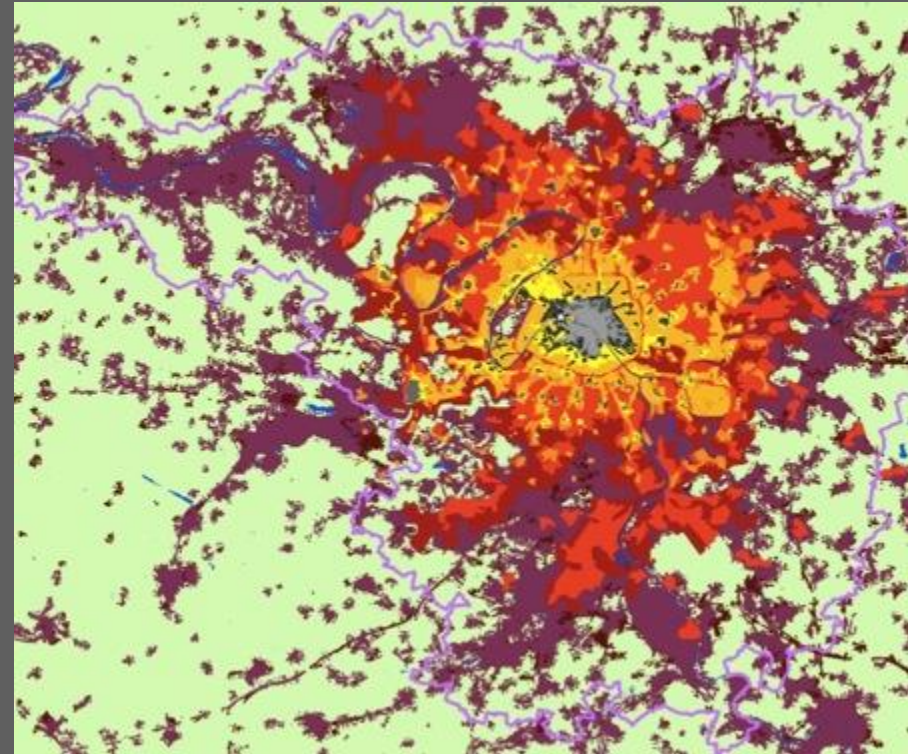
Phase I—The Mapping & Measurement of Urban Expansion in a global sample of **200 cities**:
1990 – 2000- 2014.



Landsat-based maps of the expansion of Accra, Ghana: 1985-2014

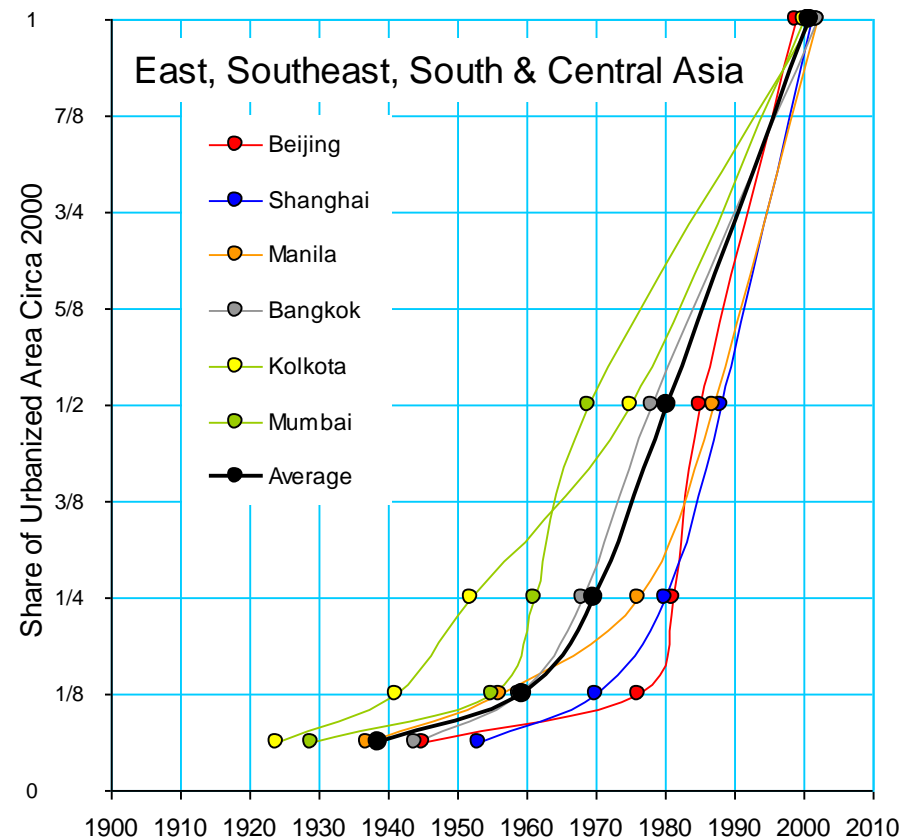
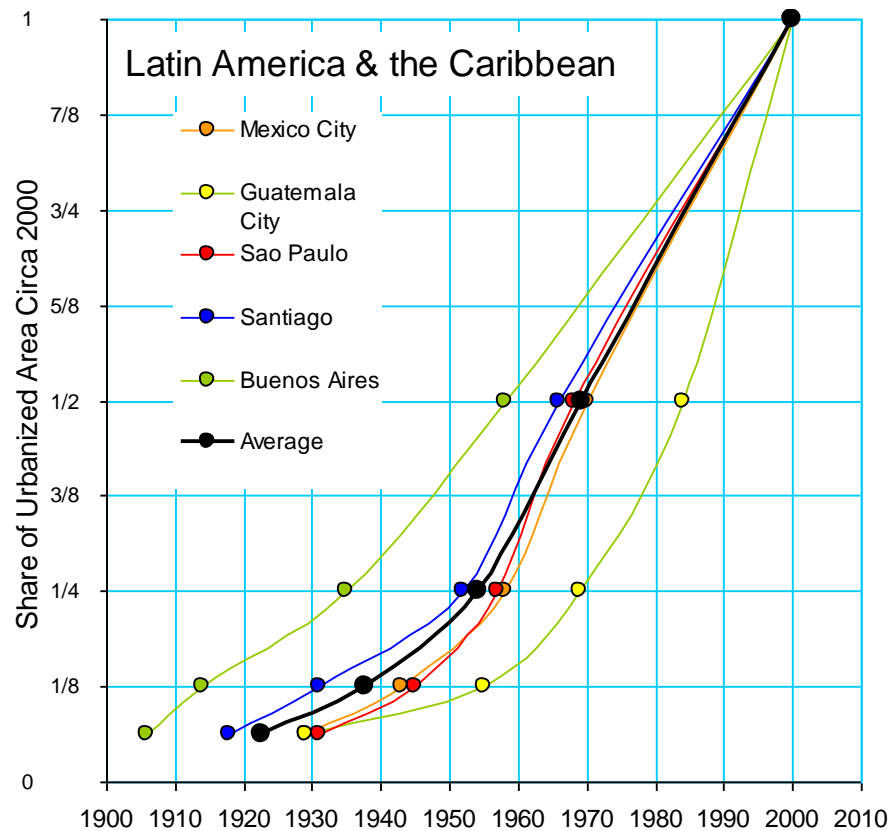
PHASE I: URBAN EXPANSION

Phase I—The Mapping & Measurement of
Urban Expansion in a Representative
Sample of 30 Cities, 1800-2000



Paris, France: 1834 and 1800-2000

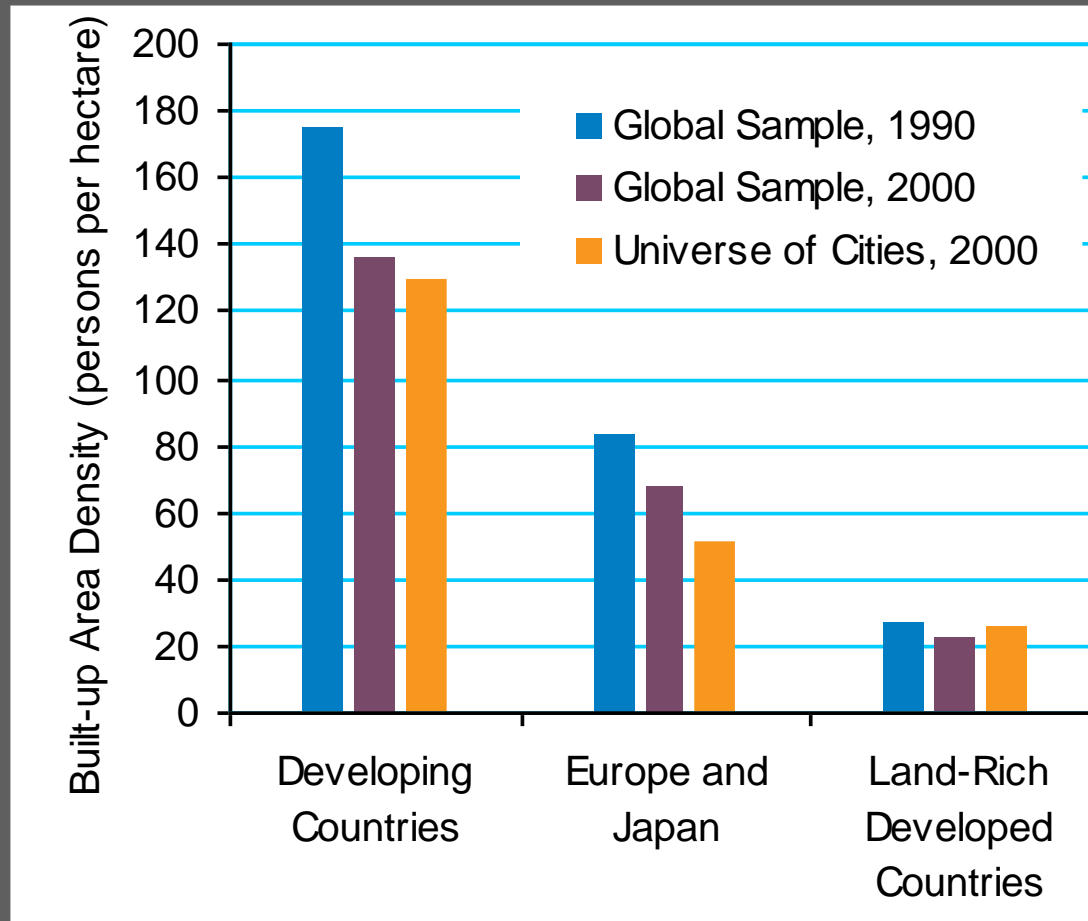
PHASE I: URBAN EXPANSION



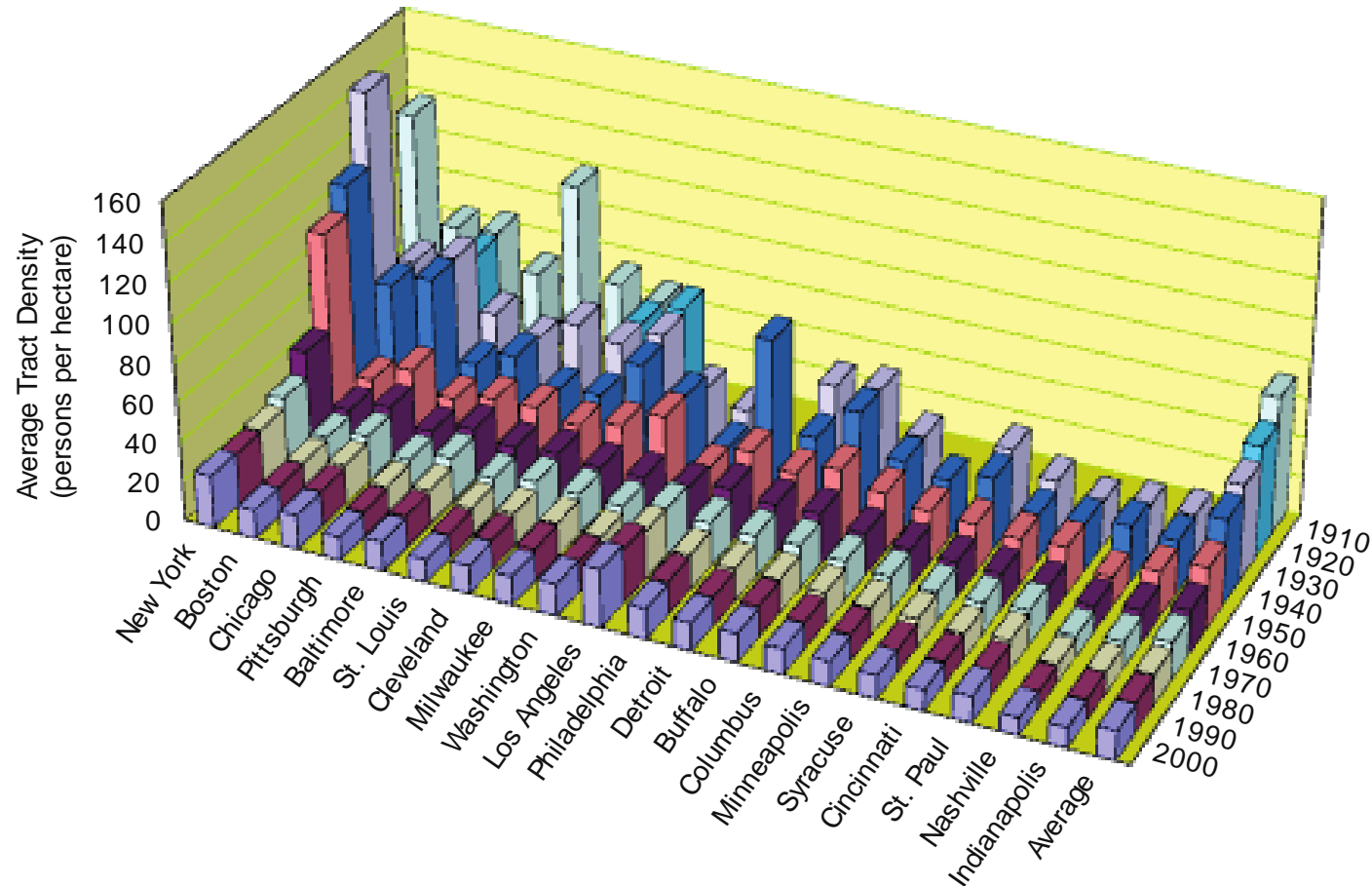
Selected Findings: 28 of the 30 historical cities studied increased their urban extent **16-fold** during the 20th Century,

PHASE I: URBAN EXPANSION

Selected Findings: Between 1990 and 2000, average urban densities declined at the rate of **2% per annum**.

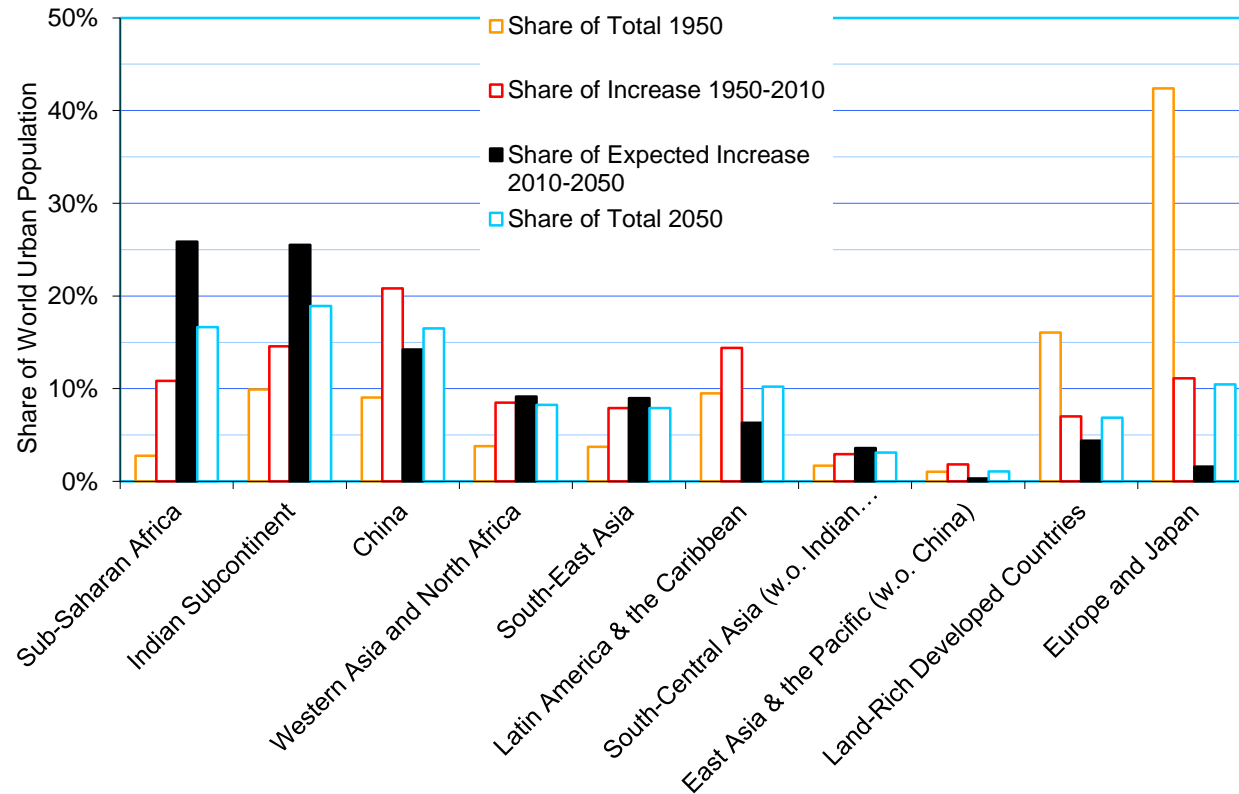


PHASE I: URBAN EXPANSION



The General Decline in Average Tract Densities in 20 U.S. Cities, 1910-2000

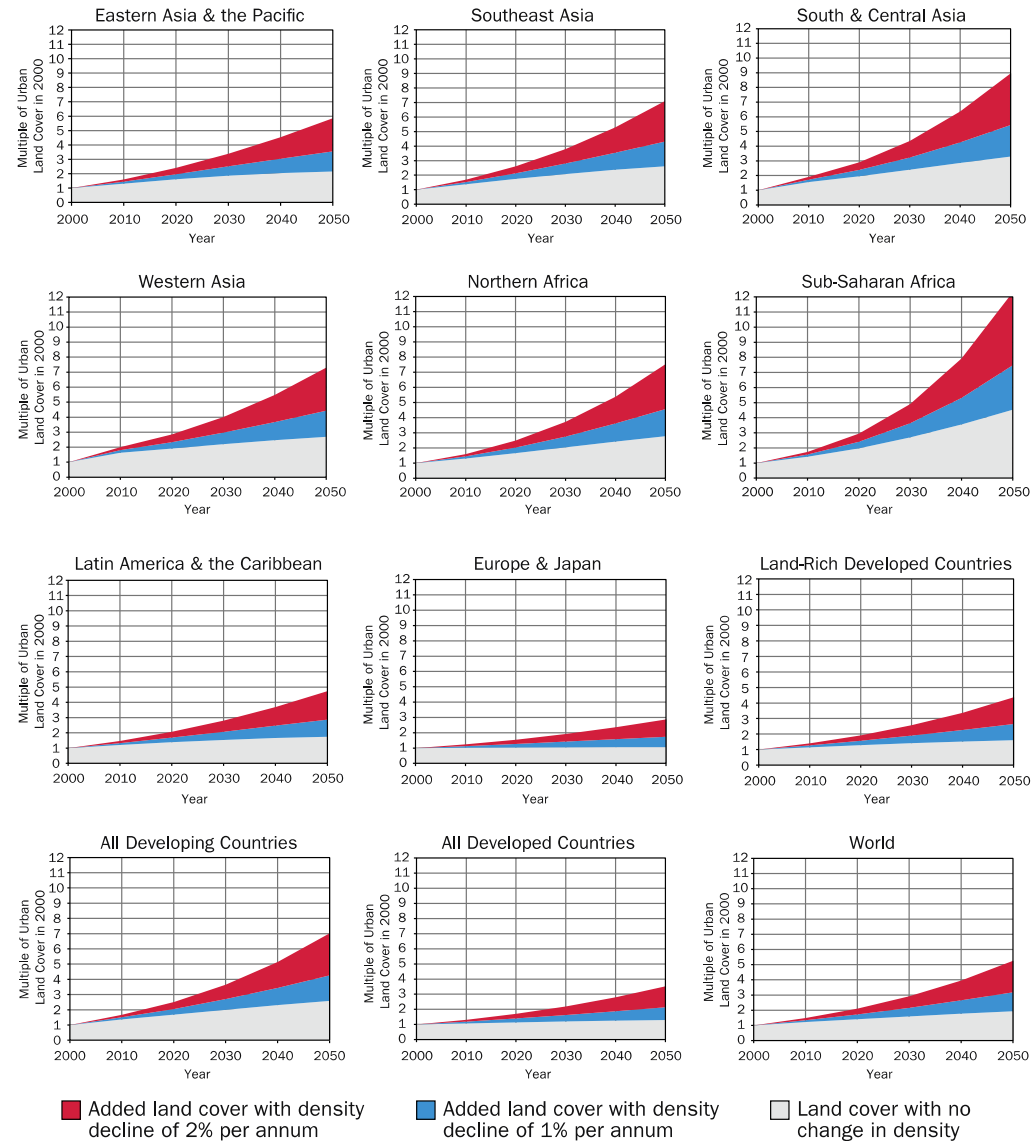
PHASE I: URBAN EXPANSION



Selected Findings: The fastest growth in the population of cities in coming decades will occur in **Sub-Saharan Africa and in the Indian Subcontinent.**

PHASE I: URBAN EXPANSION

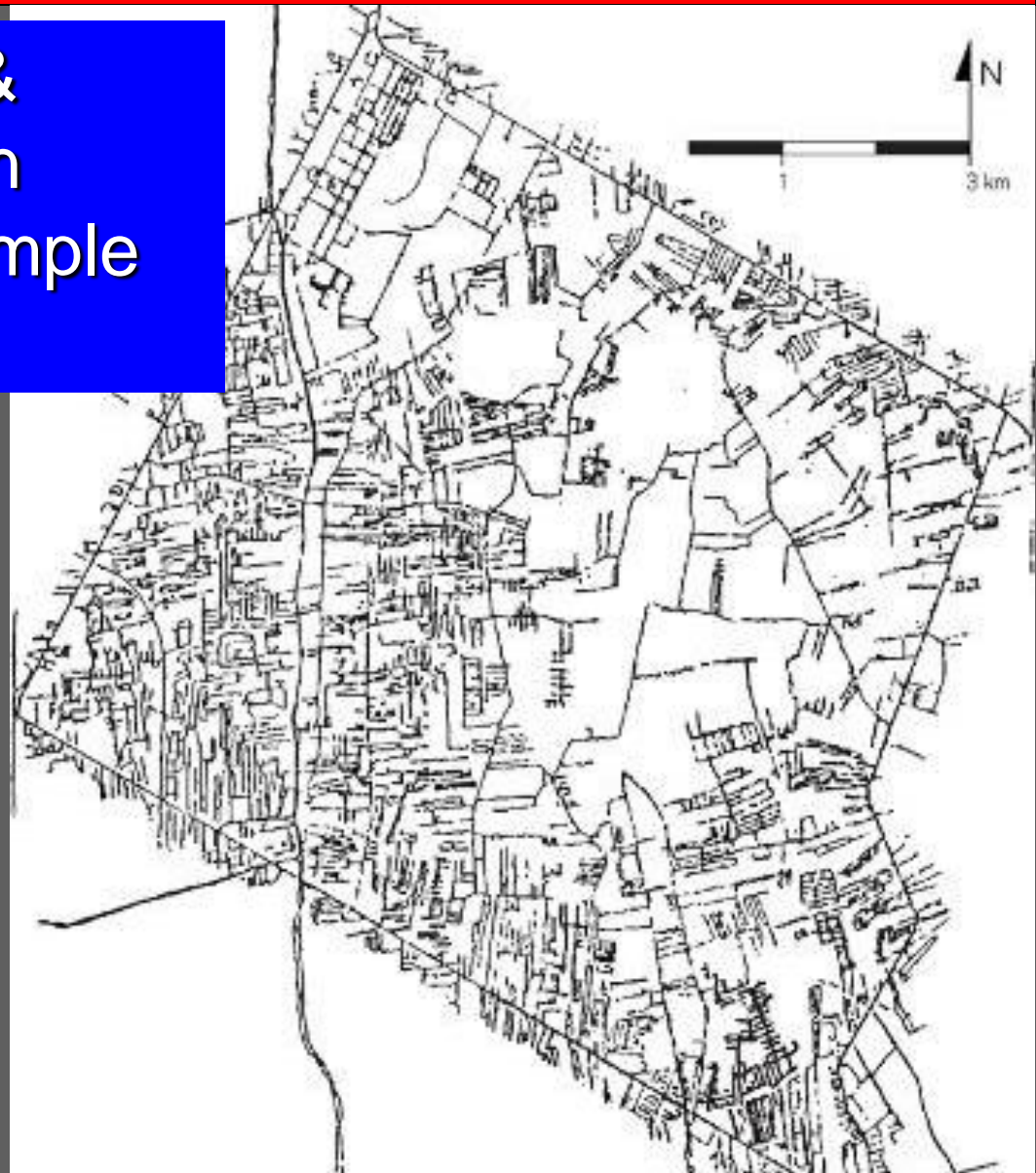
Selected Findings:
Between 2000 and 2050, urban land cover in developing countries may increase, on average, **4-fold to 6-fold**.



Projections of Urban Land Cover for World Regions Under Three Density Change Scenarios, 2000–2050

PHASE II: URBAN LAYOUTS

Phase II—The Mapping & Measurement of Urban Layouts in a global sample of **200 cities, 2015.**



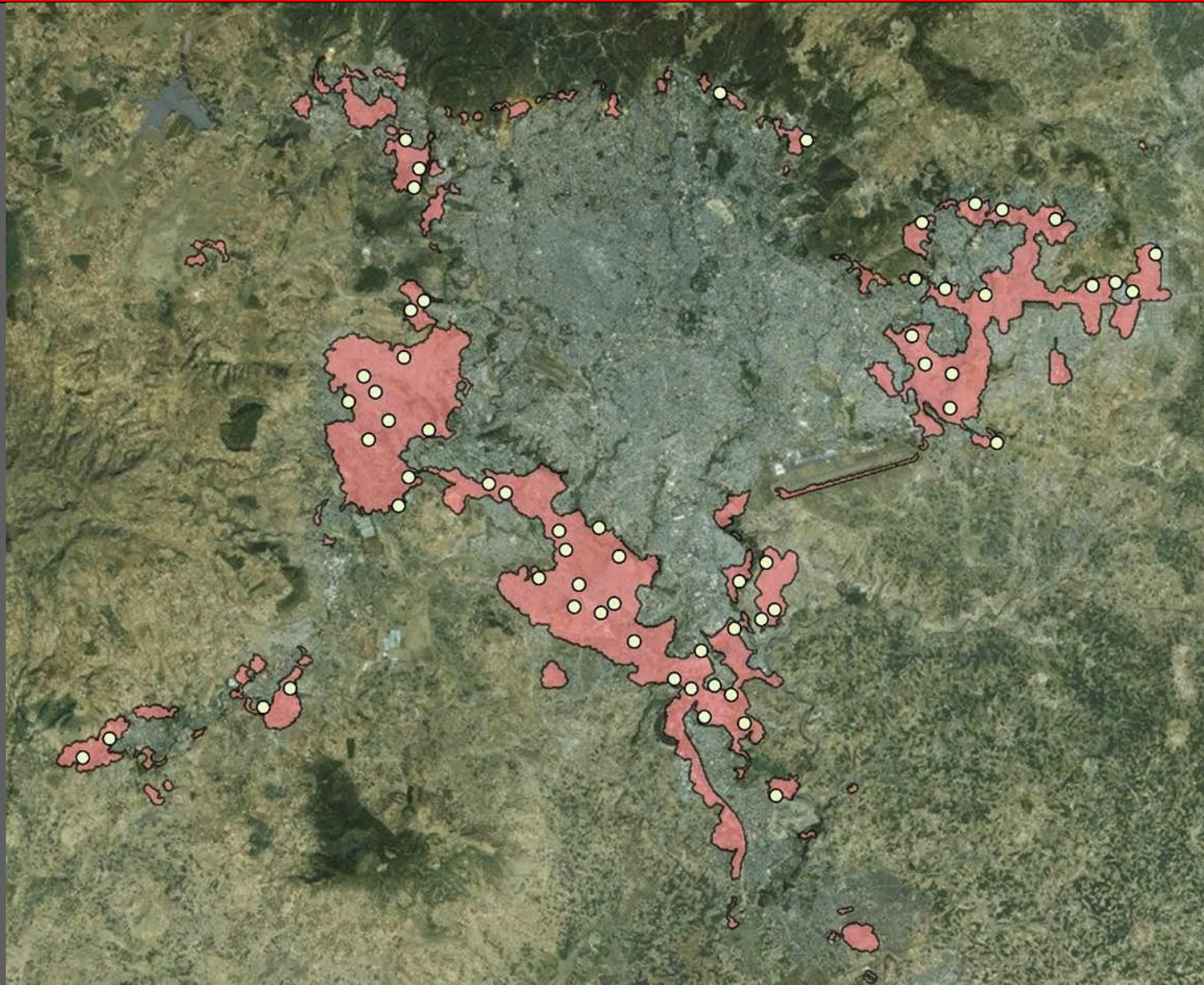
The absence of arterial roads and through streets in a 60 km² area in Northeast Bangkok, Thailand, 1987

PHASE II: URBAN LAYOUTS



The El Carmen squatter settlement, Comas district, Lima, Peru in 2009

PHASE II: URBAN LAYOUTS



The expansion area of Addis Ababa, Ethiopia, 1990-2014, and the set of quasi-random 10-hectare locales used to analyze the quality of urban layouts there

PHASE II: URBAN LAYOUTS



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

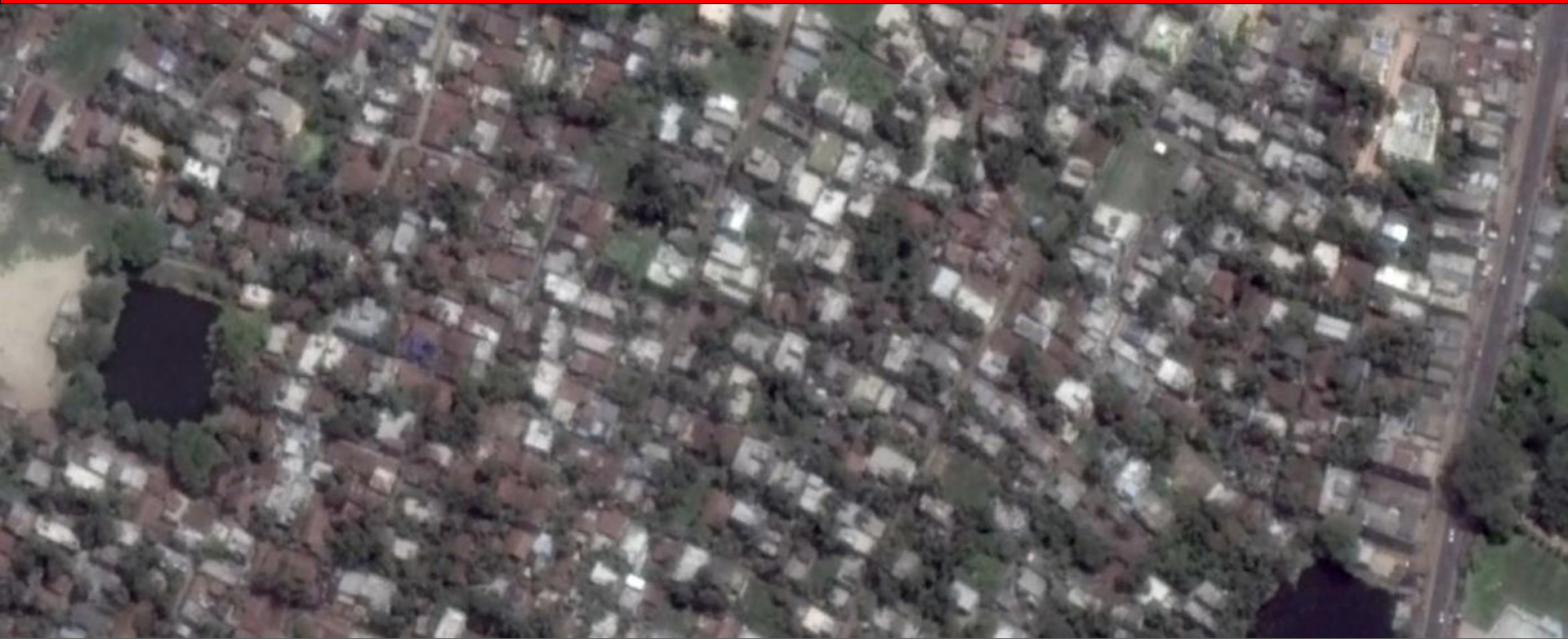
Typical 10-hectare locale in the expansion area of Addis Ababa, Ethiopia

PHASE II: URBAN LAYOUTS



Analysts digitizing 10-hectare locales at the Urban Expansion Observatory, a joint initiative of NYU and the Mahatma Education Society, Navi Mumbai, India

PHASE II: URBAN LAYOUTS



Selected findings, Kolkata urban fringe, 1990-2014:

- Share of residential area in atomistic housing: $92.1 \pm 7.4\%$;
- Share of the built-up area in roads and boulevards: $8.4 \pm 2.2\%$; and
- Share of roads less than 4m. wide: $66.7 \pm 13.3\%$

Residential development on the urban fringe of Kolkata, India, 1990-2014

PHASE III: THE LAND AND HOUSING SURVEY

NYU  STERN



URBANIZATION
PROJECT

The Land and Housing Survey in the Global Sample of Cities *The Affordability Survey*

Initiated and Conducted by The NYU Urban Expansion Program
In Partnership with:

The United Nations

NYU  STERN



URBANIZATION
PROJECT

The Land and Housing Survey in the Global Sample of Cities *The Regulatory Survey*

Initiated and Conducted by The NYU Urban Expansion Program
In Partnership with:

The United Nations Human Settlements Programme (UN-Habitat), and
The Lincoln Institute of Land Policy

(1) The Affordability Survey; and (2) The Regulatory Survey

PHASE III: THE LAND AND HOUSING SURVEY

| Section 3: Apartments in private multi-family buildings offered for sale or rent | | | | | | |
|--|--|-------|--------|-----------------|-------------|-----------|
| Estimated Shares | | 0-20% | 20-40% | 40-60% | 60-80% | 80-100% |
| 3.1 | Of units with bathroom and toilet inside unit | | | | | |
| 3.2 | Of units with municipal water Supply | | | | | |
| 3.3 | Of units with water Supply from wells | | | | | |
| 3.4 | Of units with paved Road in front of Building | | | | | |
| 3.5 | Of units that Satisfy Municipal Building Regulations | | | | | |
| 3.6 | Of units with legal ownership documents | | | | | |
| Features and Attributes | | | | Typical/Average | Range: From | Range: To |
| 3.10 | Living Area of Dwelling Unit? (square meters) | | | | | |
| 3.11 | Sale Price of Dwelling Unit? | | | | | |
| 3.12 | Monthly Household Income of Buyers? | | | | | |
| 3.13 | Age of Buyers? | | | | | |
| 3.14 | Is financing available? | | | | | |
| 3.15 | Down Payment (percent) | | | | | |
| 3.16 | Monthly Payment | | | | | |
| 3.17 | Number of years to repay loan | | | | | |
| 3.18 | Interest Rate fixed or variable? (Fixed) | | | | | |
| 3.19 | Interest rate (percent) | | | | | |
| 3.20 | Are units available for rent? (Yes/No) | | | | | |
| 3.21 | If yes, monthly Household Income of | | | | | |
| 3.22 | Age of renters | | | | | |
| 3.23 | Monthly rent | | | | | |

The Affordability Survey

Identifying the main housing and residential plots types and measuring (1) their share the housing market, (2) their prices and rents, and (3) their key attributes.

PHASE III: THE LAND AND HOUSING SURVEY

PART I: LAND OWNERSHIP, LAND TRANSACTIONS, AND PROPERTY RIGHTS IN THE EXPANSION AREA

1.0 Land Ownership

Ownership of land in the expansion area is (check one):

Mostly private=1

Mostly tribal/customary=2

Mostly by rural communes=3

Mostly public (government ministries, agencies and institutions)=4

Mostly public (municipal) = 5

Nationalized=6

الجزء الأول:
ملكية الأراضي، والمعاملات العقارية، وحقوق الملكية في مساحة التوسع

1.0 ملكية الأراضي

إن ملكية الأراضي الواقعة في مساحة التوسع هي (اختر واحدة مما يلي):

1 = خاصة في الغالب

2 = قبلية/عرفية في الغالب

3 = جماعات قروية في الغالب

4 = عامة في الغالب (تابعة لوزارات حكومية وهيئات ومؤسسات)

5 = عامة في الغالب (تابعة للبلدية)

6 = مؤزمة

7 = ليست هناك إجابة تنطبق على كل أو معظم مساحة التوسع

ملاحظات:

The Regulatory Survey

Measuring (1) land ownership, land transactions, and property rights; (2) land use regulations; and (3) regulations governing the subdivision of land.

II: STAKES IN THE GROUND

The 4-Step Program for implementing Urban Expansion Initiatives:

I **MAKE REALISTIC PROJECTIONS**: Make realistic 30-year projections of 30-year land needs for urban expansion;

II **EXPAND CITY LIMITS**: Extend official city limits to encompass the projected expansion;

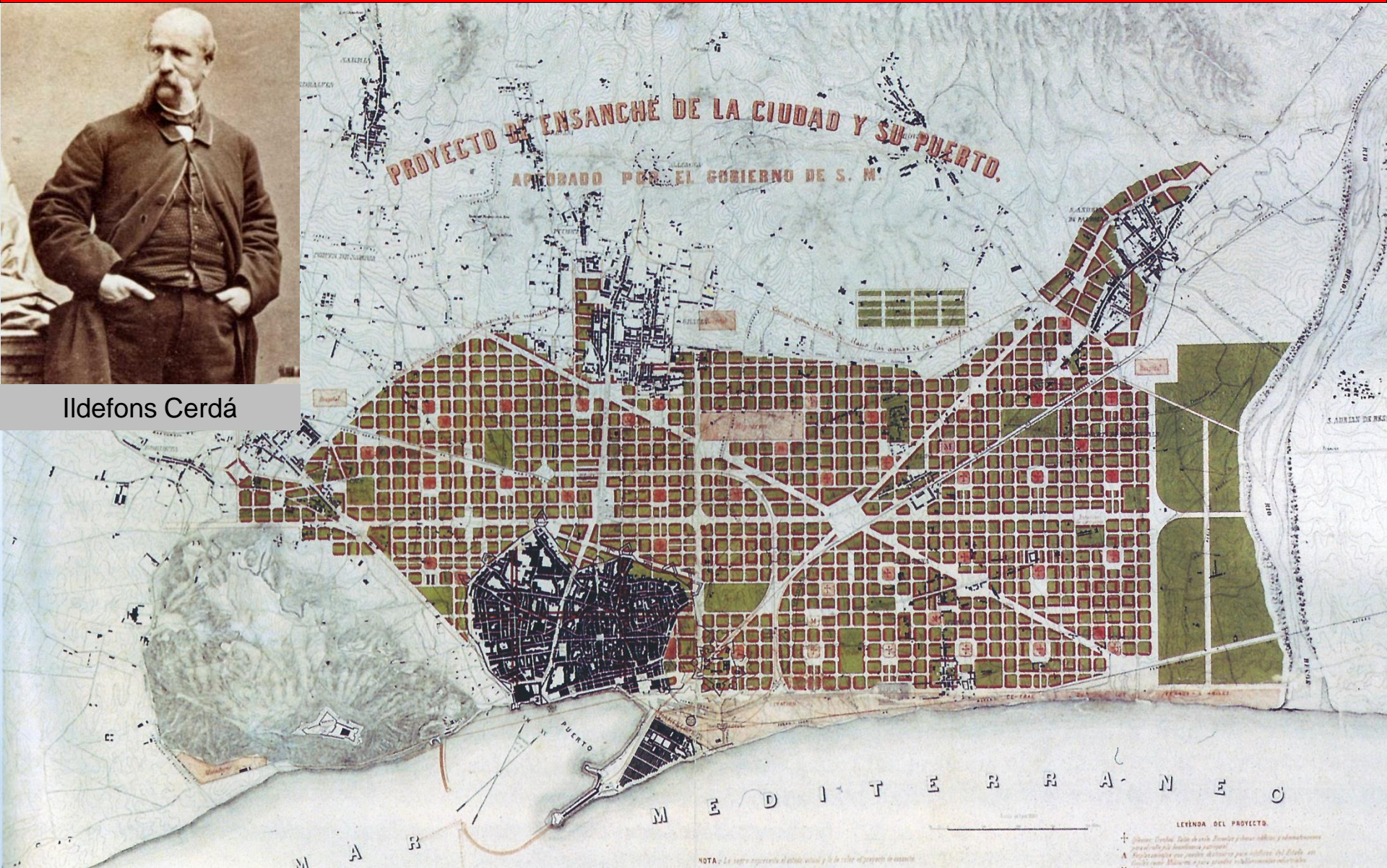
III **PREPARE THE ARTERIAL GRID**: Secure the rights-of-way for an arterial infrastructure grid in expansion areas; and

IV **PROTECT PUBLIC OPEN SPACES**: Create the institutional framework for protecting a hierarchy of open spaces there.

THE 19TH CENTURY VISION: MAKING ROOM

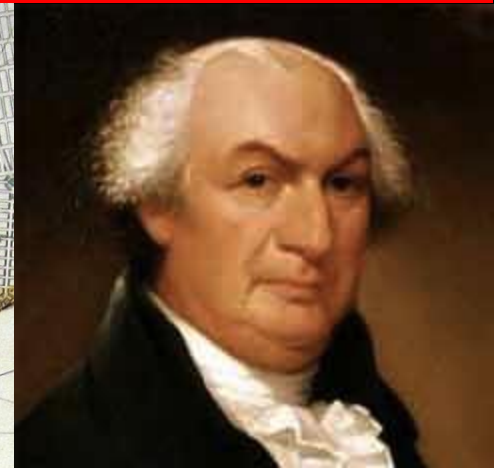


Ildefons Cerdà

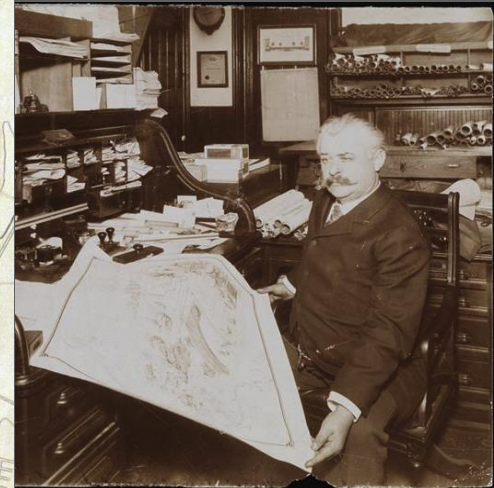


Ildefons Cerdà's *Ensanche* Plan for Barcelona, Spain, 1859, expanded its built-up area 9-fold.

THE 19TH CENTURY VISION: MAKING ROOM



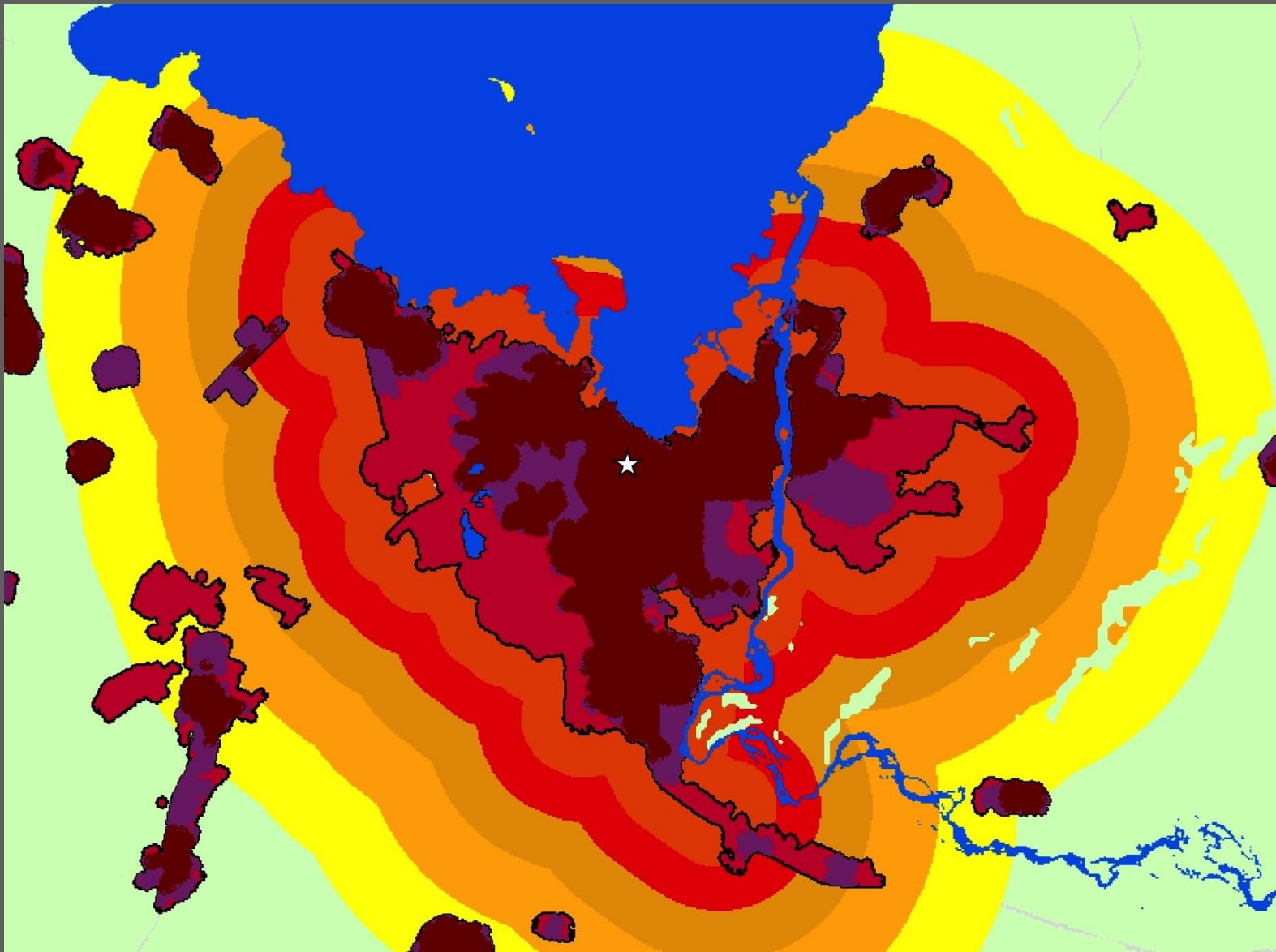
Gouverneur Morris, 1811
Commission Chairman



Louis Risse, Chief Engineer,
Topographical Department.

Ambitious expansion plans: The 1811 New York City Commissioners' Plan and the 1900 Board of Public Improvement Plan for New York City

ORDERLY URBAN EXPANSION IN PRACTICE



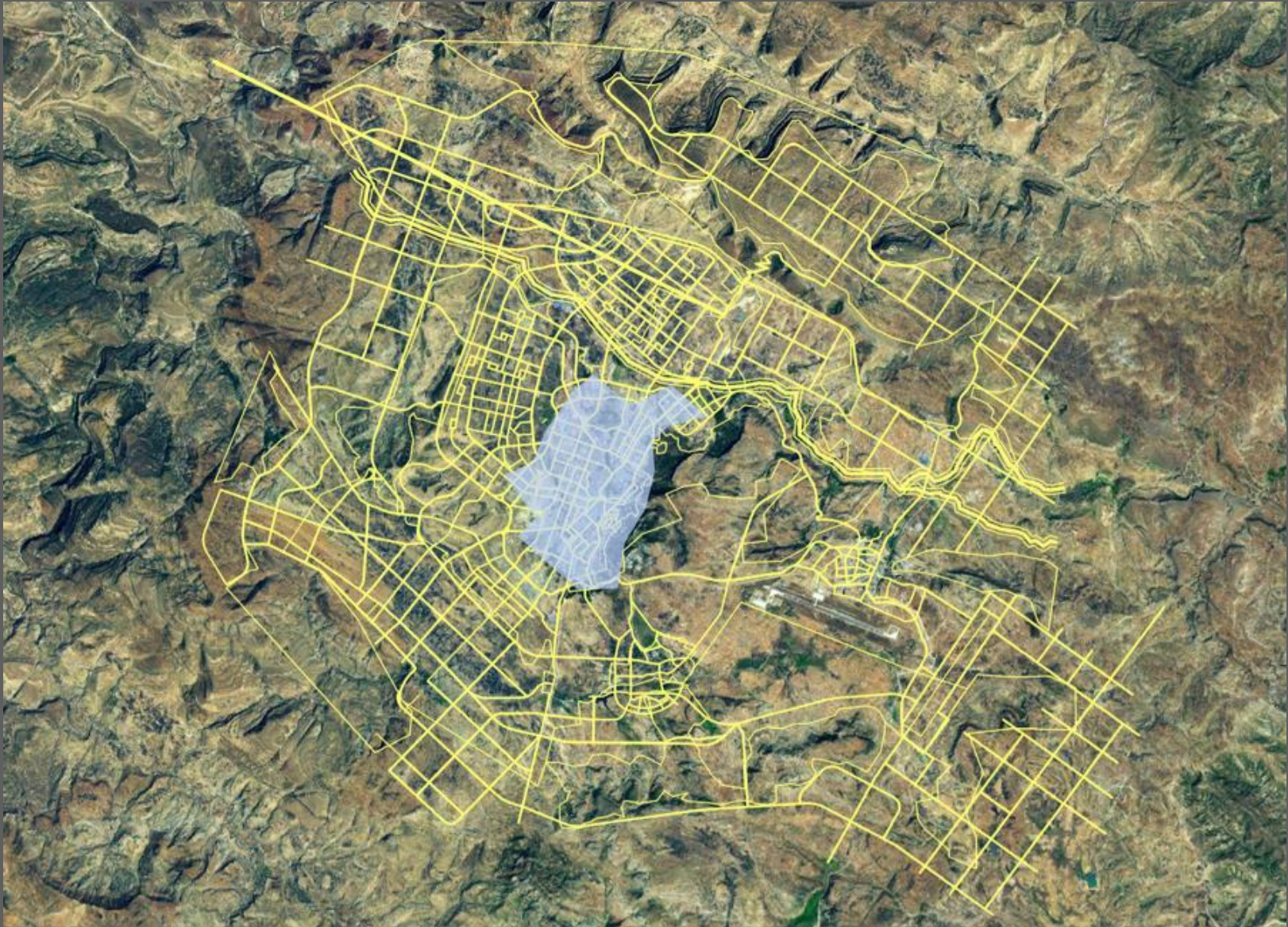
The estimated area of expansion of Bahir Dar, Ethiopia, prepared by NYU

ORDERLY URBAN EXPANSION IN PRACTICE



Municipal officials from Bahir Dar, Ethiopia, preparing draft plans of the expansion area of their city in an NYU workshop in Addis Ababa, 2013

ORDERLY URBAN EXPANSION IN PRACTICE



The arterial grid in the expansion area of Mekelle, Ethiopia, 2010-2040, prepared by municipal officials, 2014

ORDERLY URBAN EXPANSION IN PRACTICE



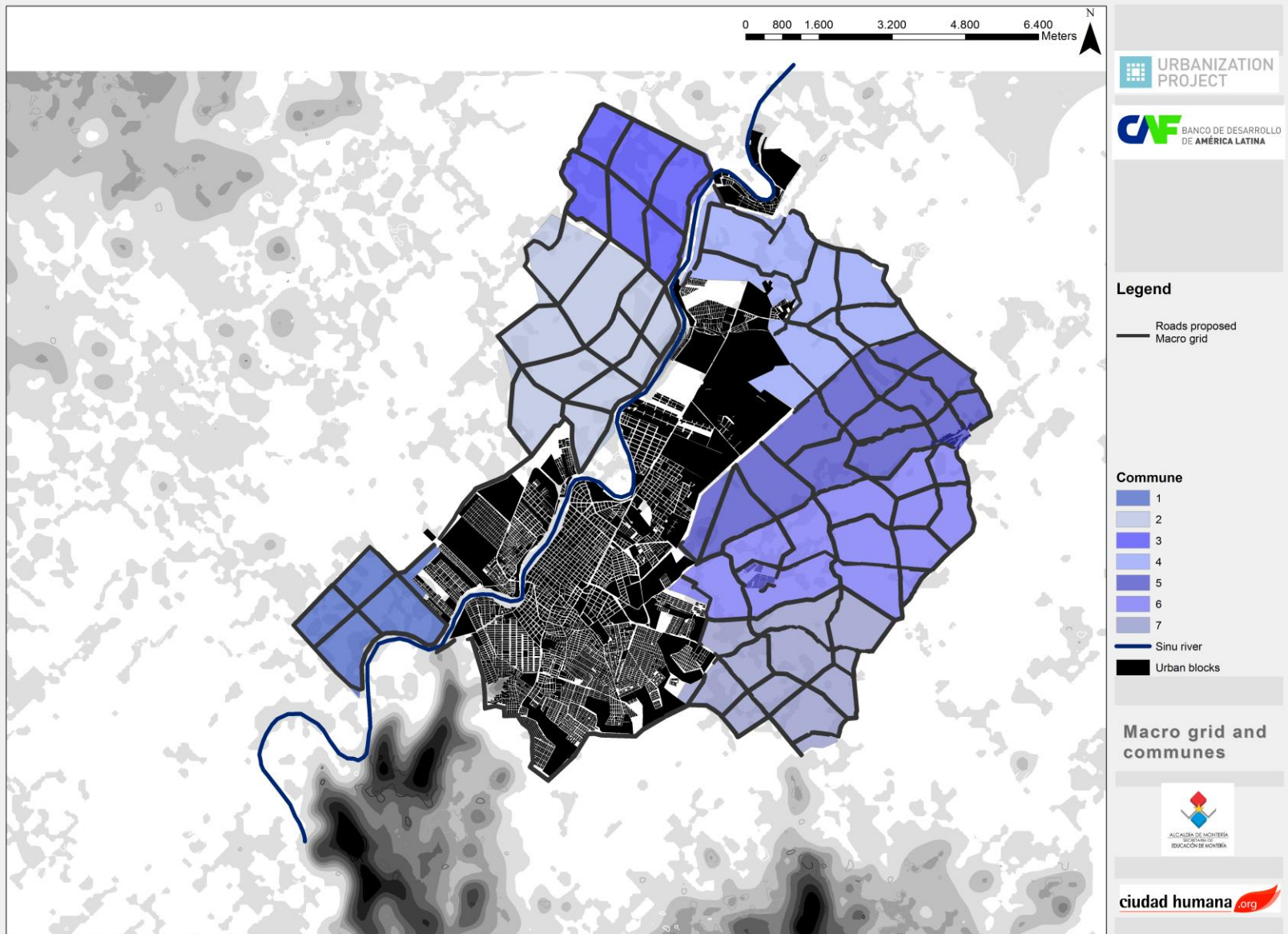
A survey team laying out a road in the expansion area of Hawassa, Ethiopia, where 66kms. of arterial roads have been surveyed and secured (road boundaries are marked on houses).

ORDERLY URBAN EXPANSION IN PRACTICE



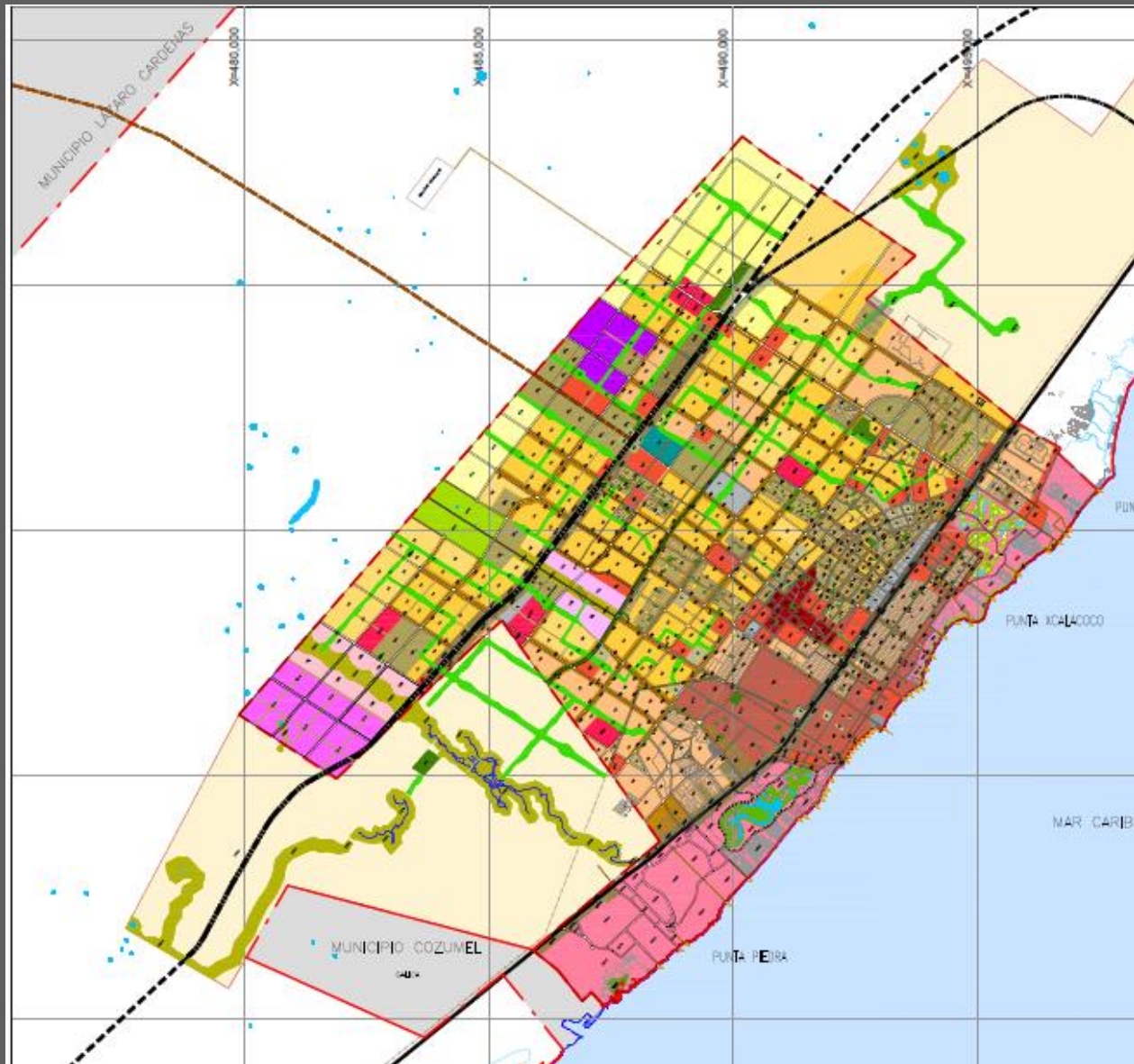
An arterial road in the expansion area of Mekelle, Ethiopia being graded, 2015

ORDERLY URBAN EXPANSION IN PRACTICE



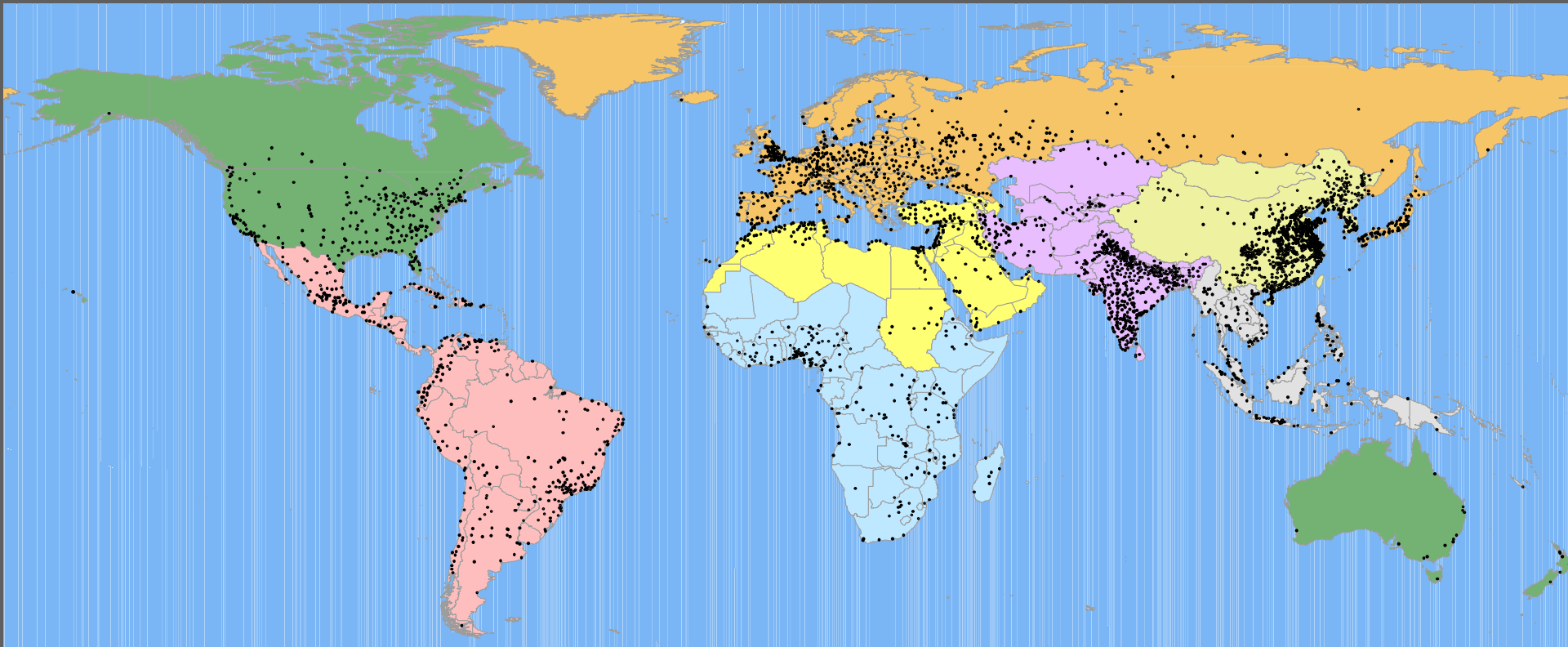
The proposed arterial grid for Montería

ORDERLY URBAN EXPANSION IN PRACTICE



The proposed arterial grid for Playa del Carmen, Mexico

MANAGING URBAN EXPANSION: FROM GLOBAL MONITORING TO STAKES IN THE GROUND



Thank you!