

SAS-149 Research Technical Course on Basics of complex modern urban functions and characteristics

Functions of a Large and Complex City

Allan W. Shearer, The University of Texas at Austin, USA

 **TEXAS** Architecture

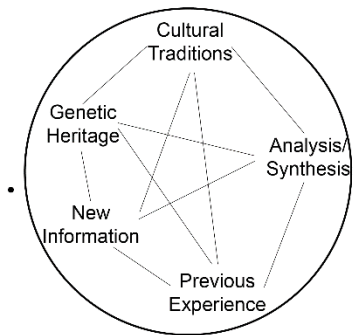
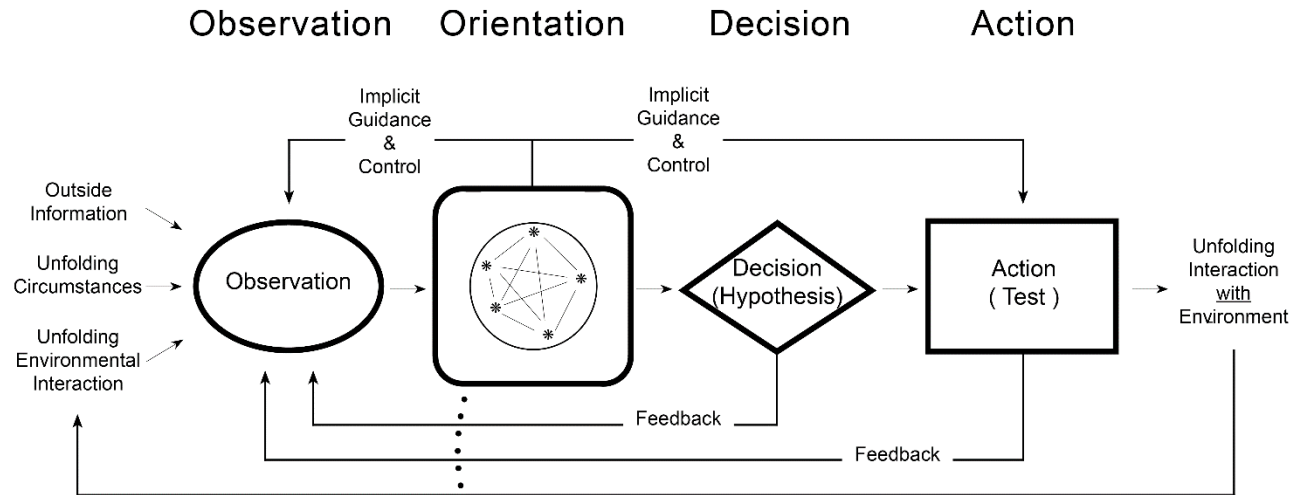
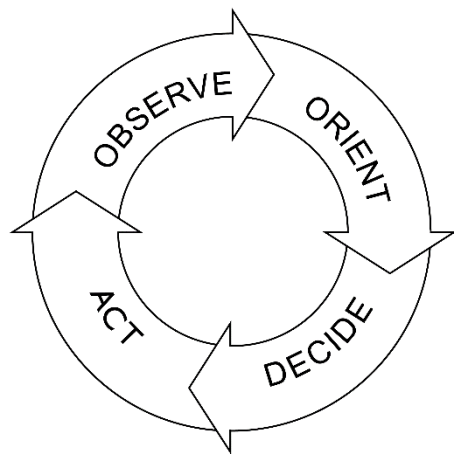
15 – 17 December 2020

The Changing Image of the City



Archaria 2035

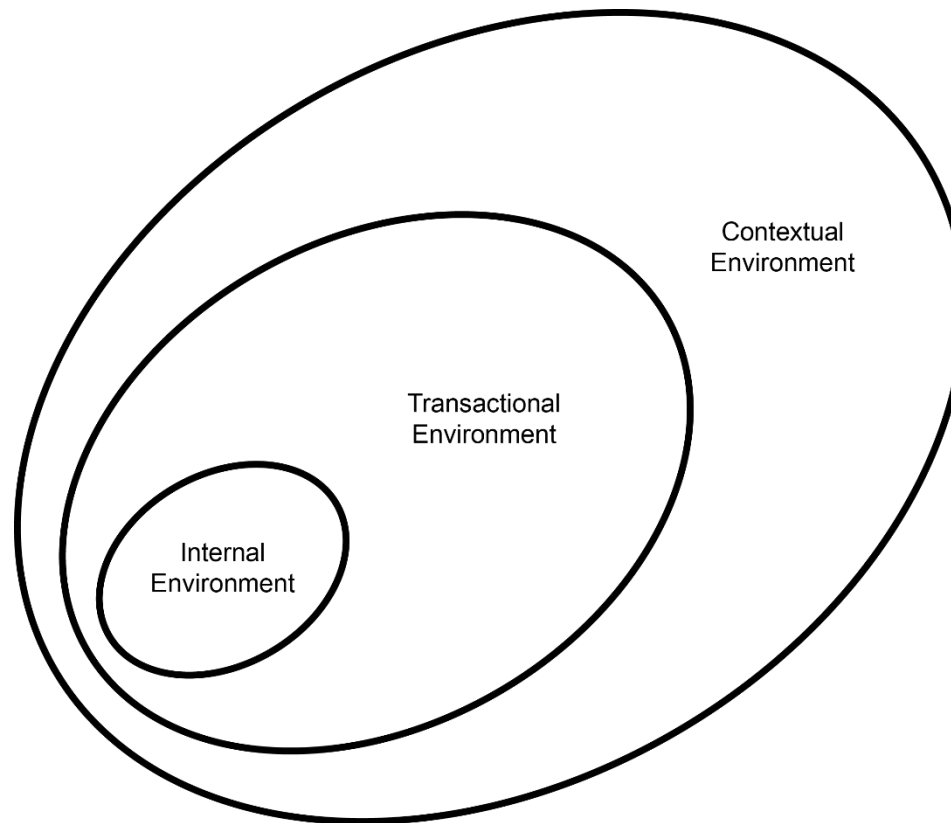
OODA Loop



*Redrawn after
MCDP 6: Command and Control*

*Redrawn after
Col. John R. Boyd, "The Essence of Winning and Loosing" (1995/1996)*

Decision Environments



Drawn after F.E. Emery and E.L. Trist, The Causal Texture of Organizational Environments

City as a System

- Purposeful
- Emergent
- Complex
- Open
- Self-Organizing

Early Modern Cities



Image: Nuremberg, 1493

City Connectivity

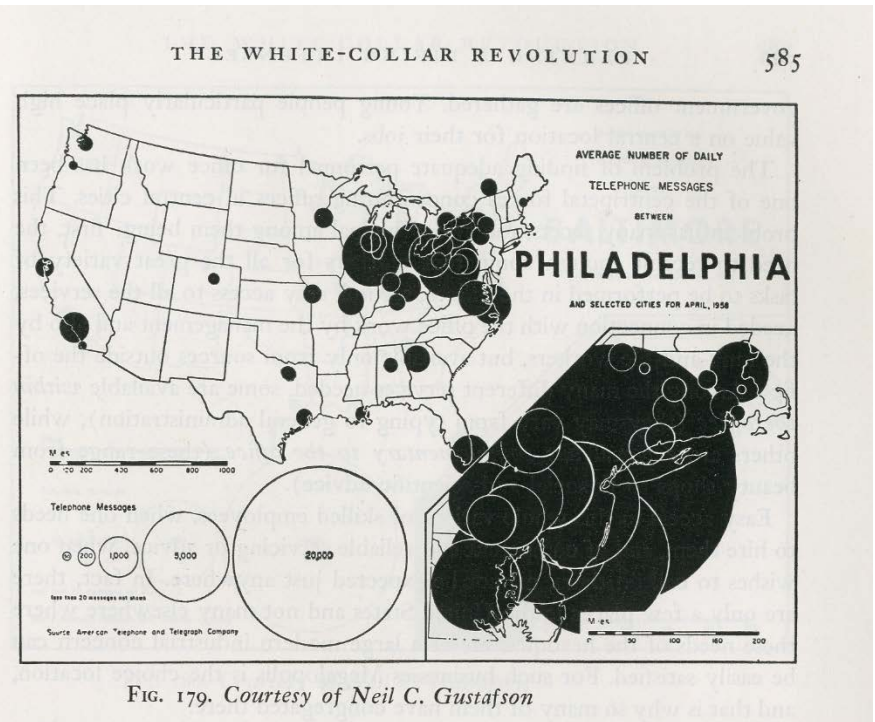
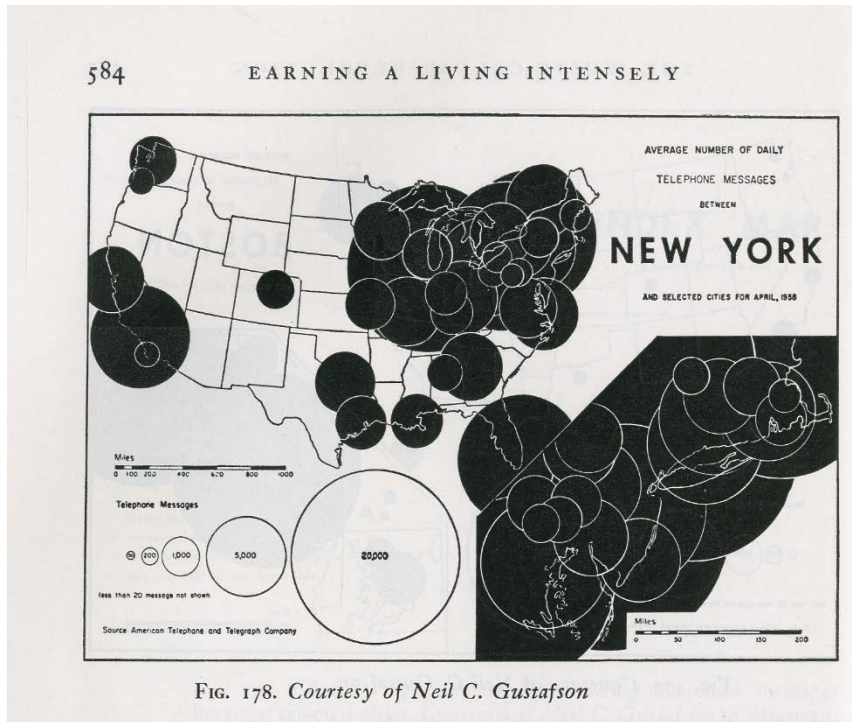


Image credit: Jean Gottmann, *Megalopolis*, 1961

City Connectivity

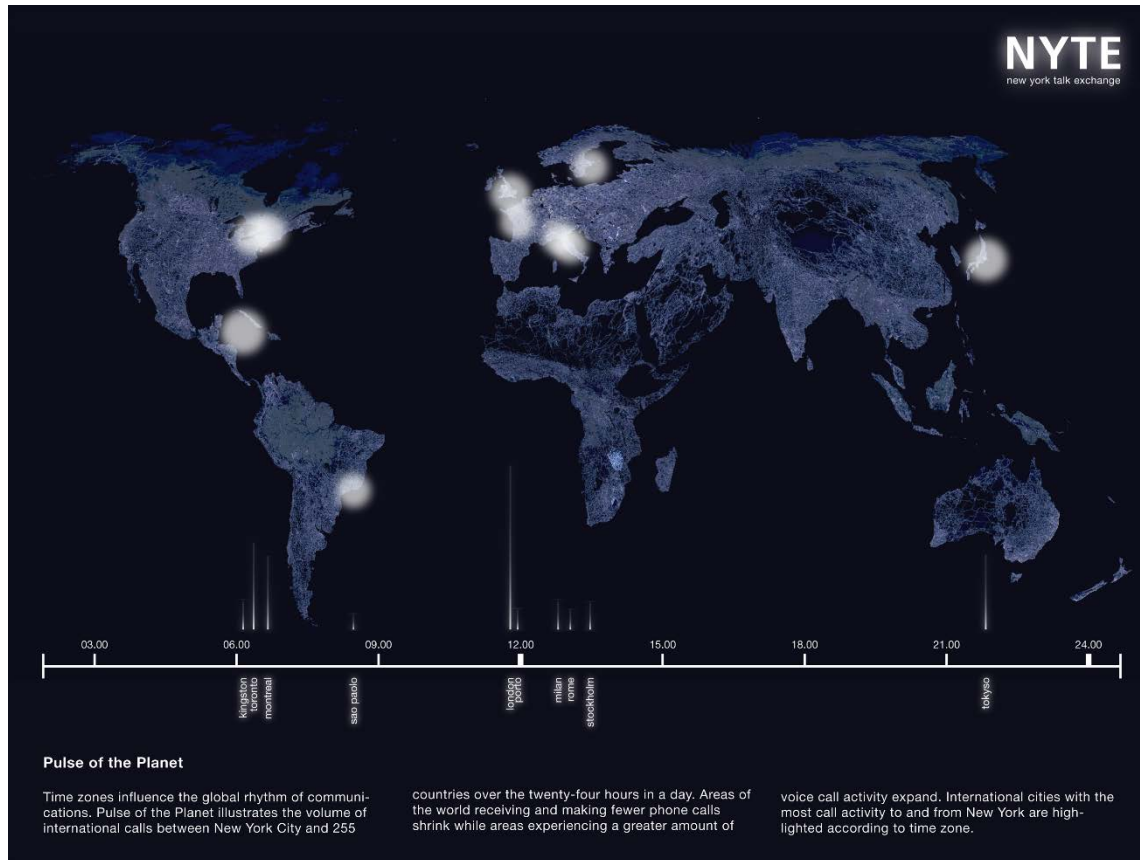


Image credit: International calls over a 24-hour period, New York Talk Exchange

City Connectivity

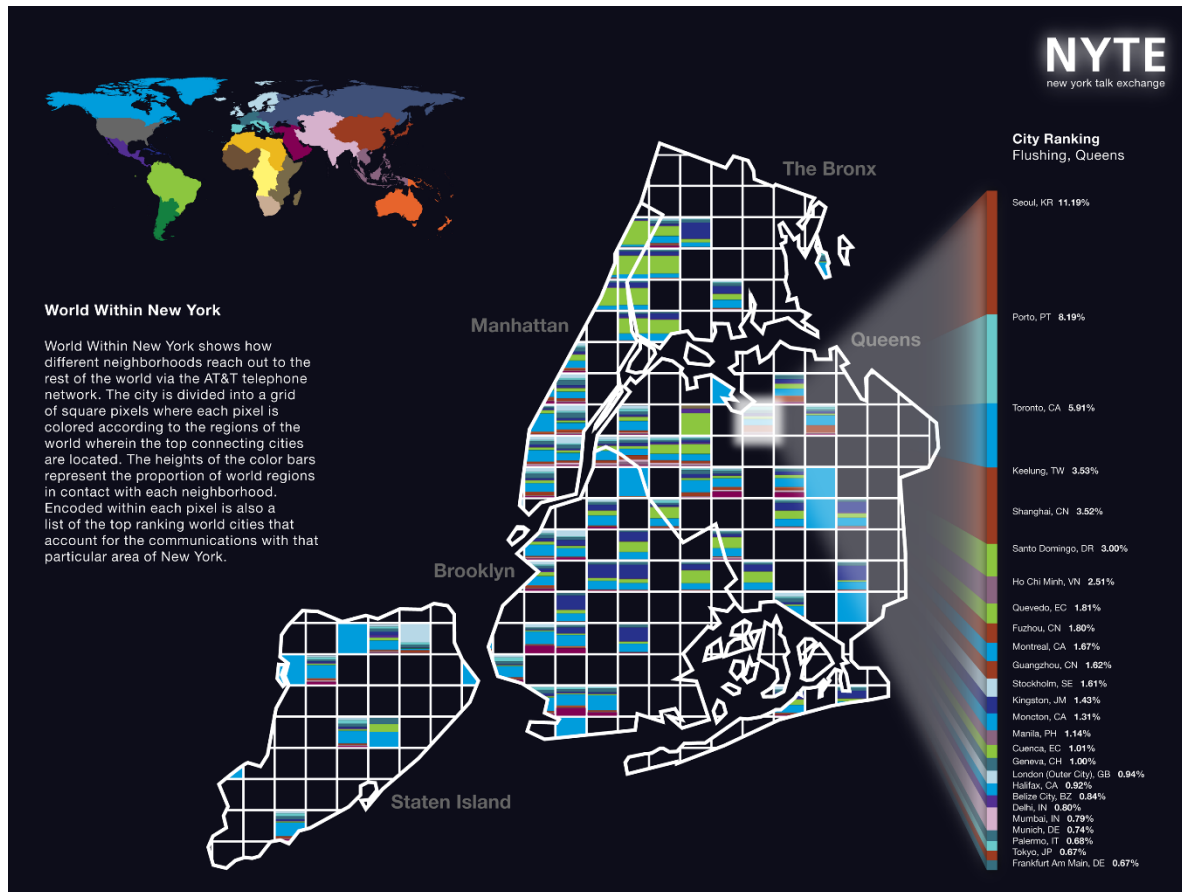


Image credit: International with New York by neighborhood over a 24-hour period, New York Talk Exchange

City Connectivity

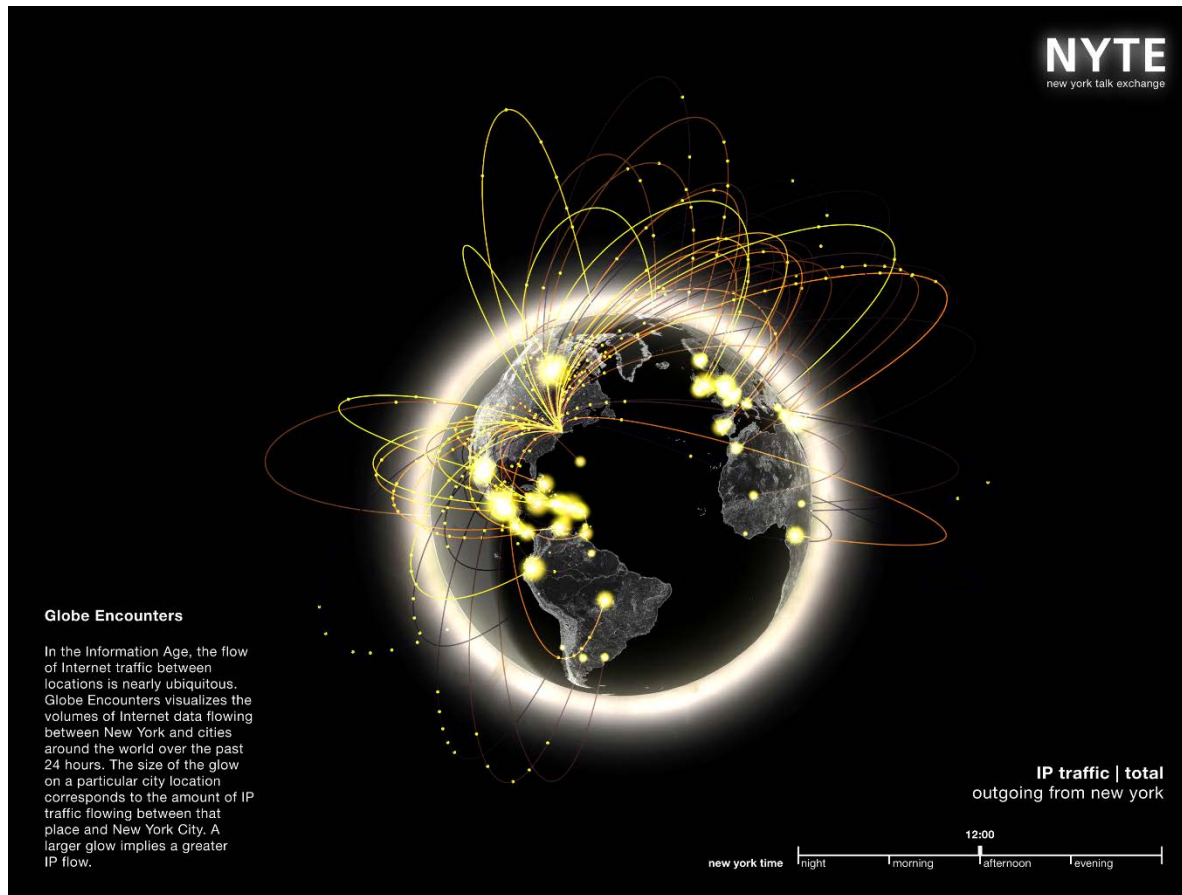


Image credit: International internet traffic from New York over a 24-hour period, New York Talk Exchange

Special Economic Zones

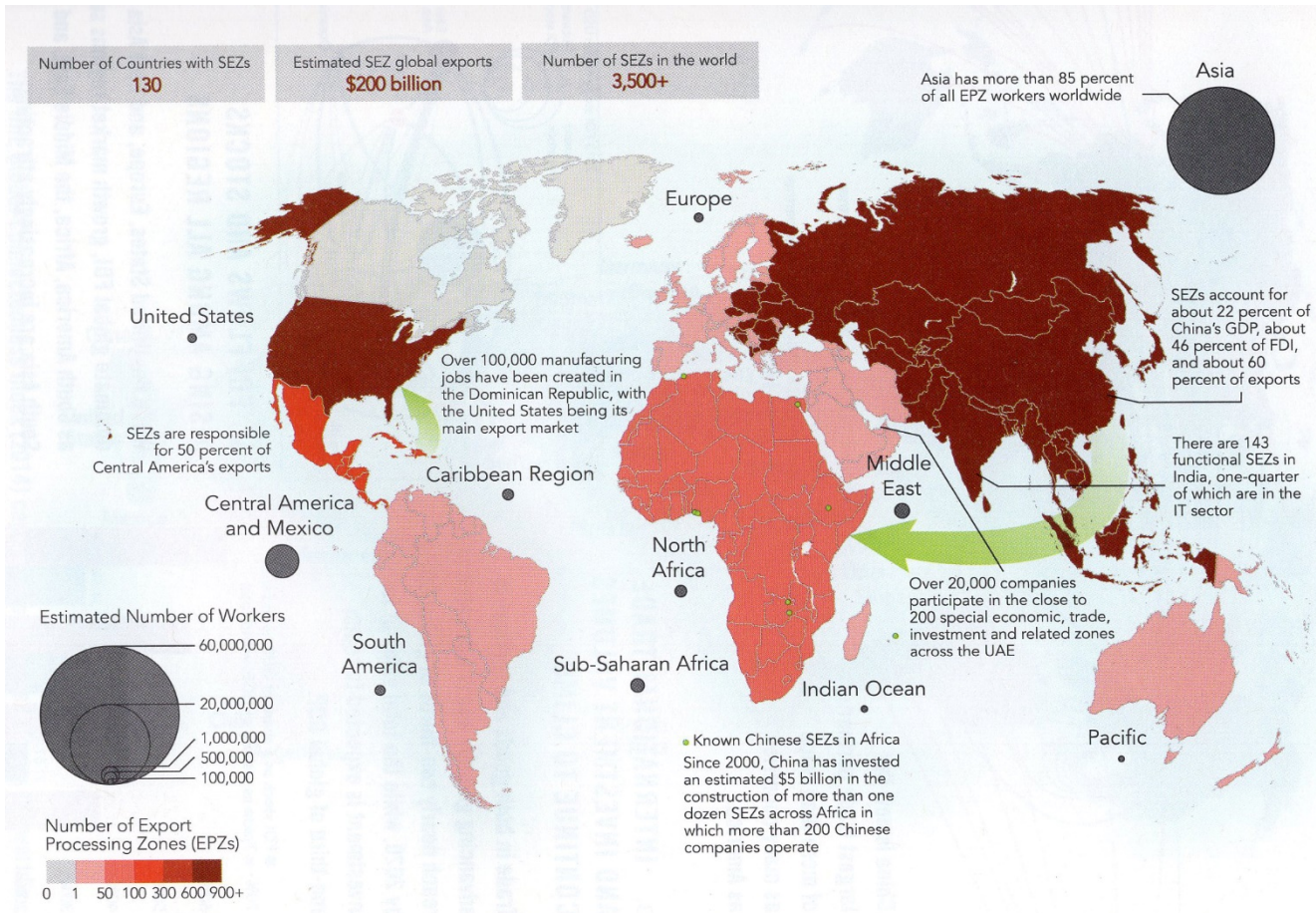


Image credit: Parag Khanna, Connectography

Special Economic Zones

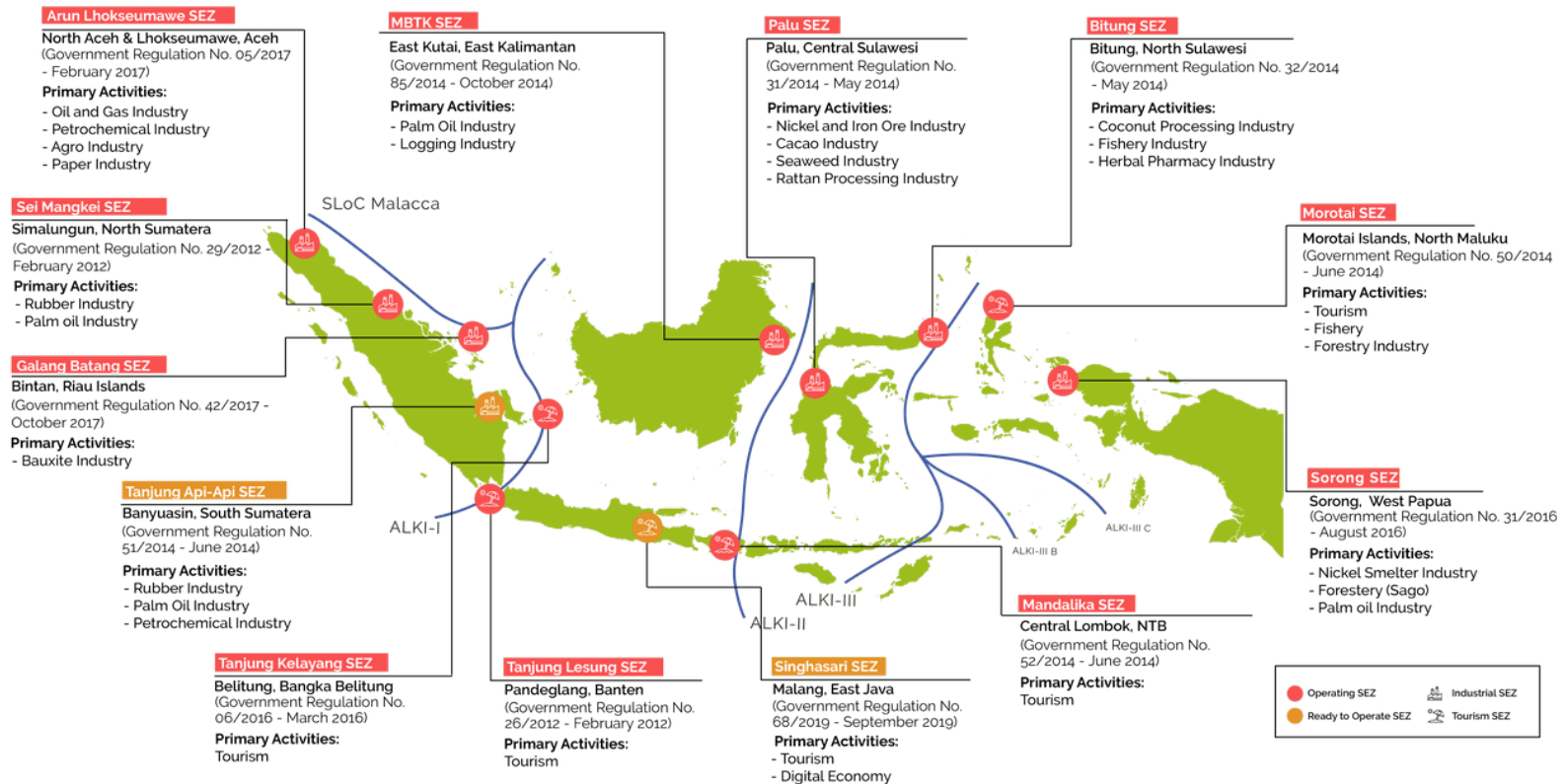


Image credit: Republic of Indonesia National Council for Special Economic Zones

Special Economic Zones

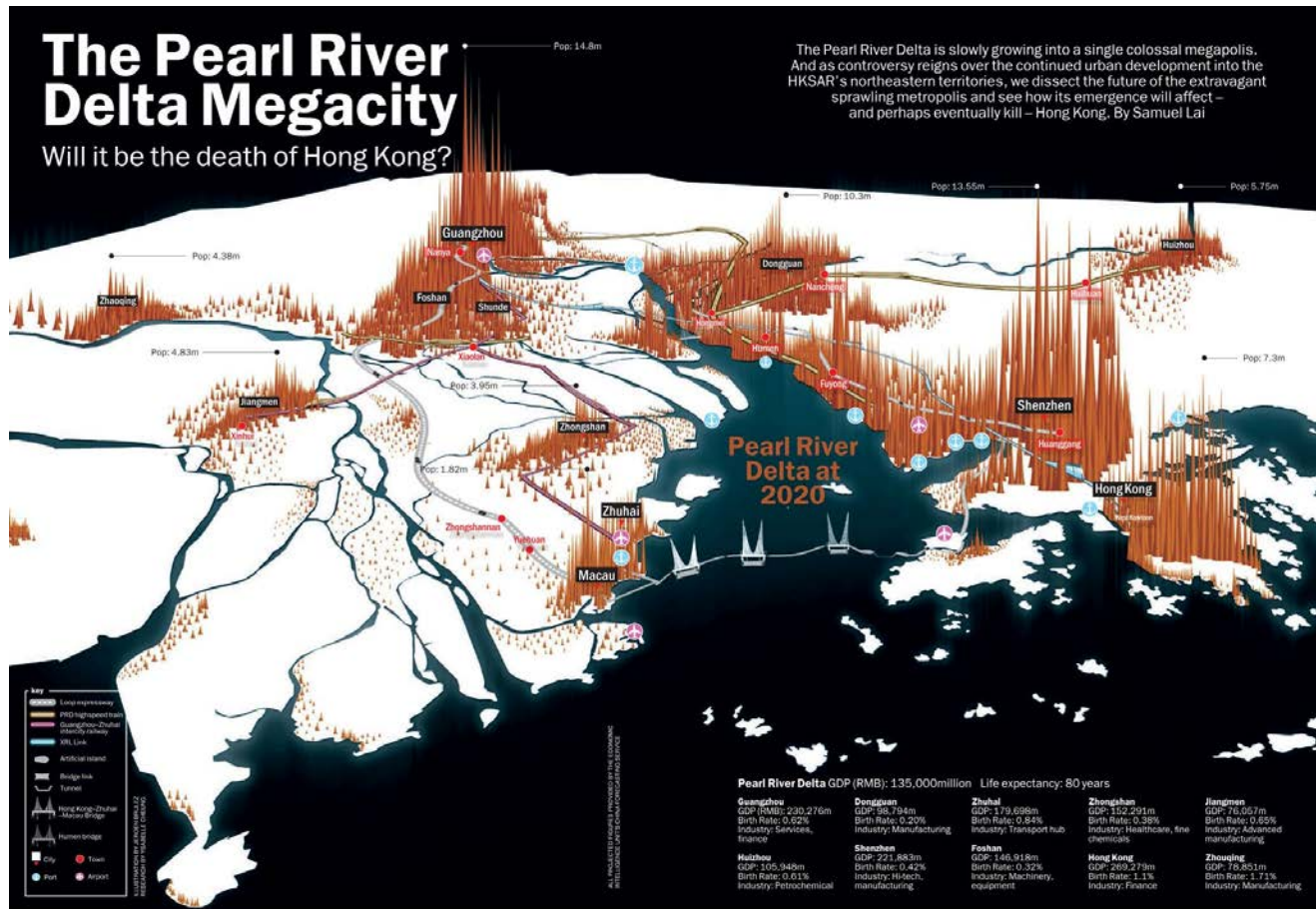


Image credit: Brulez & Chung, Growth of the Delta

Reshaping Regions

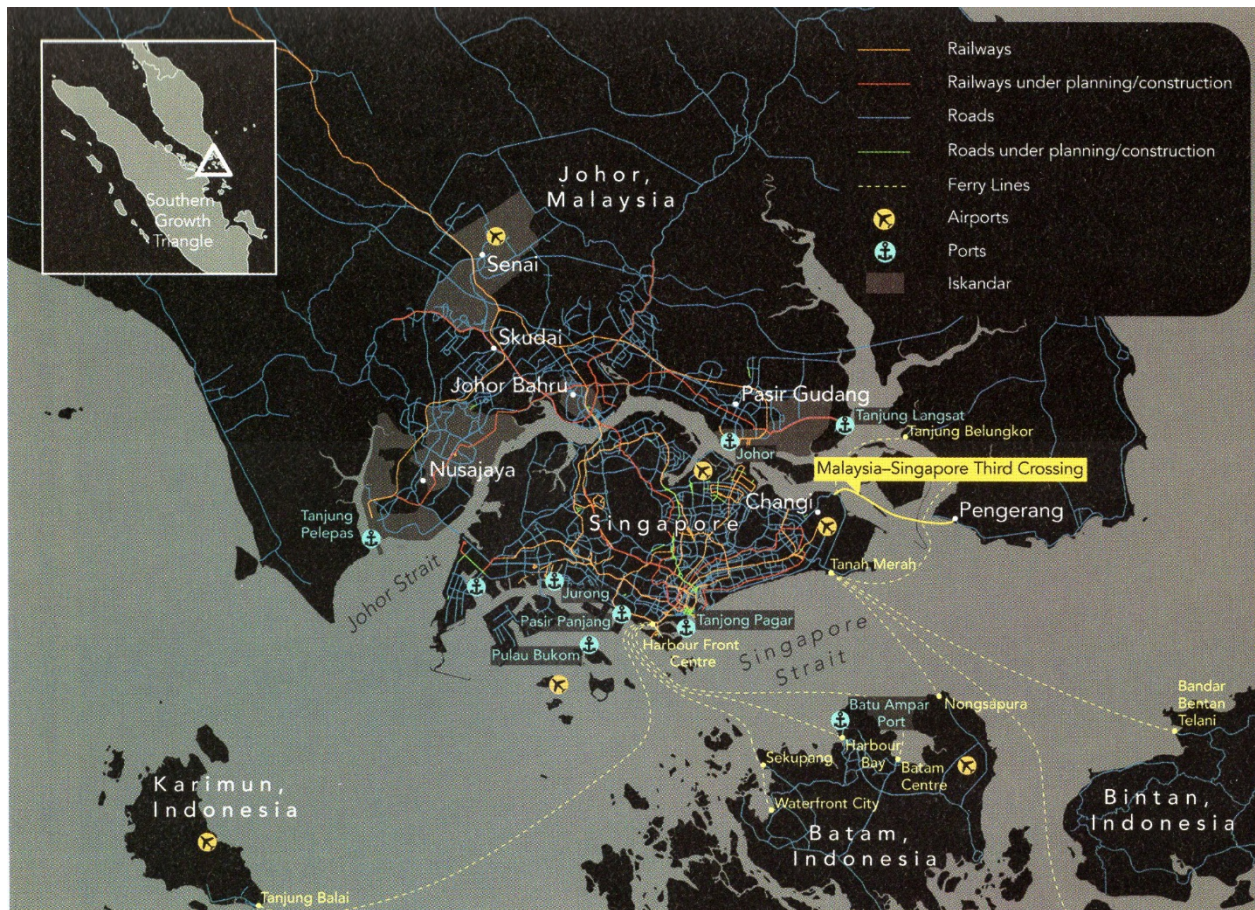


Image credit: Parag Khanna, Connectography

Megaregions of Megacities

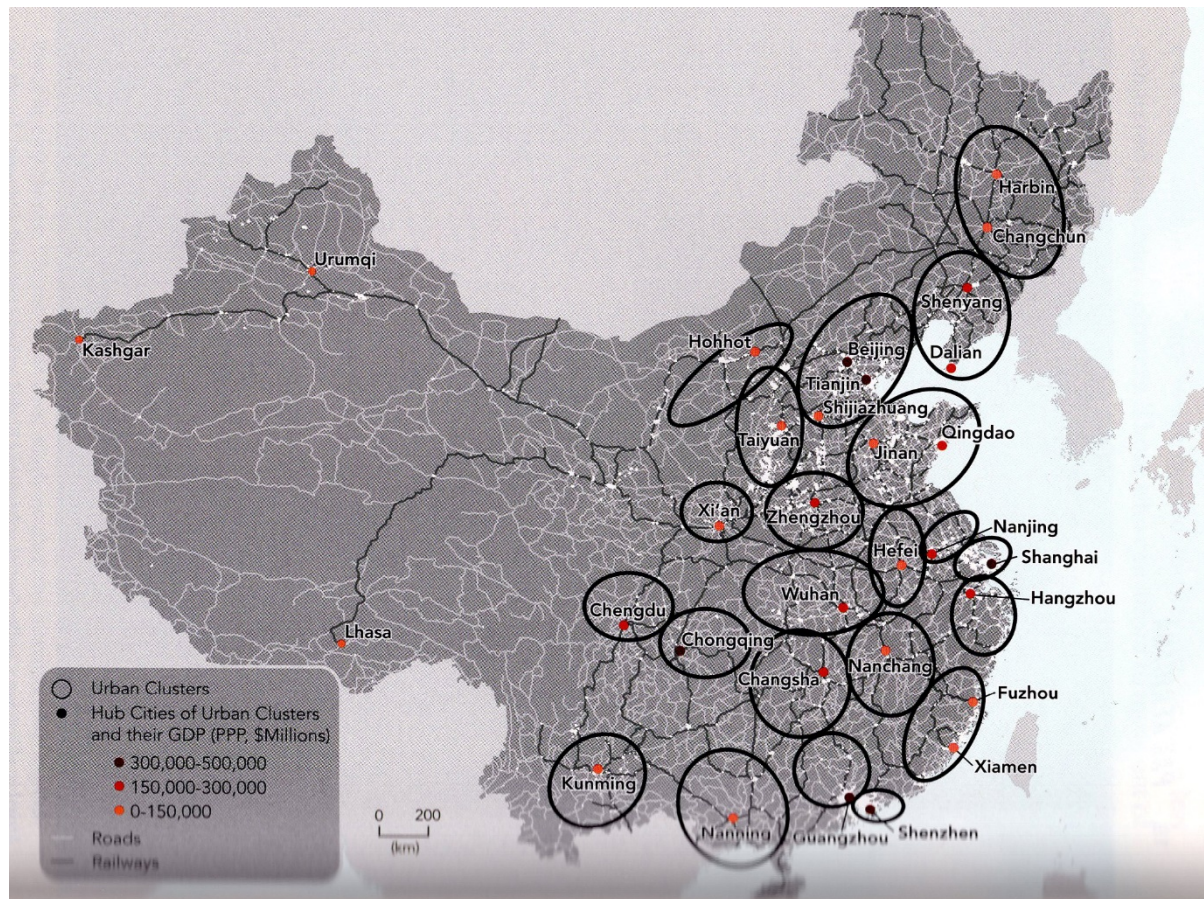


Image credit: Parag Khanna, Connectography

Internationalization

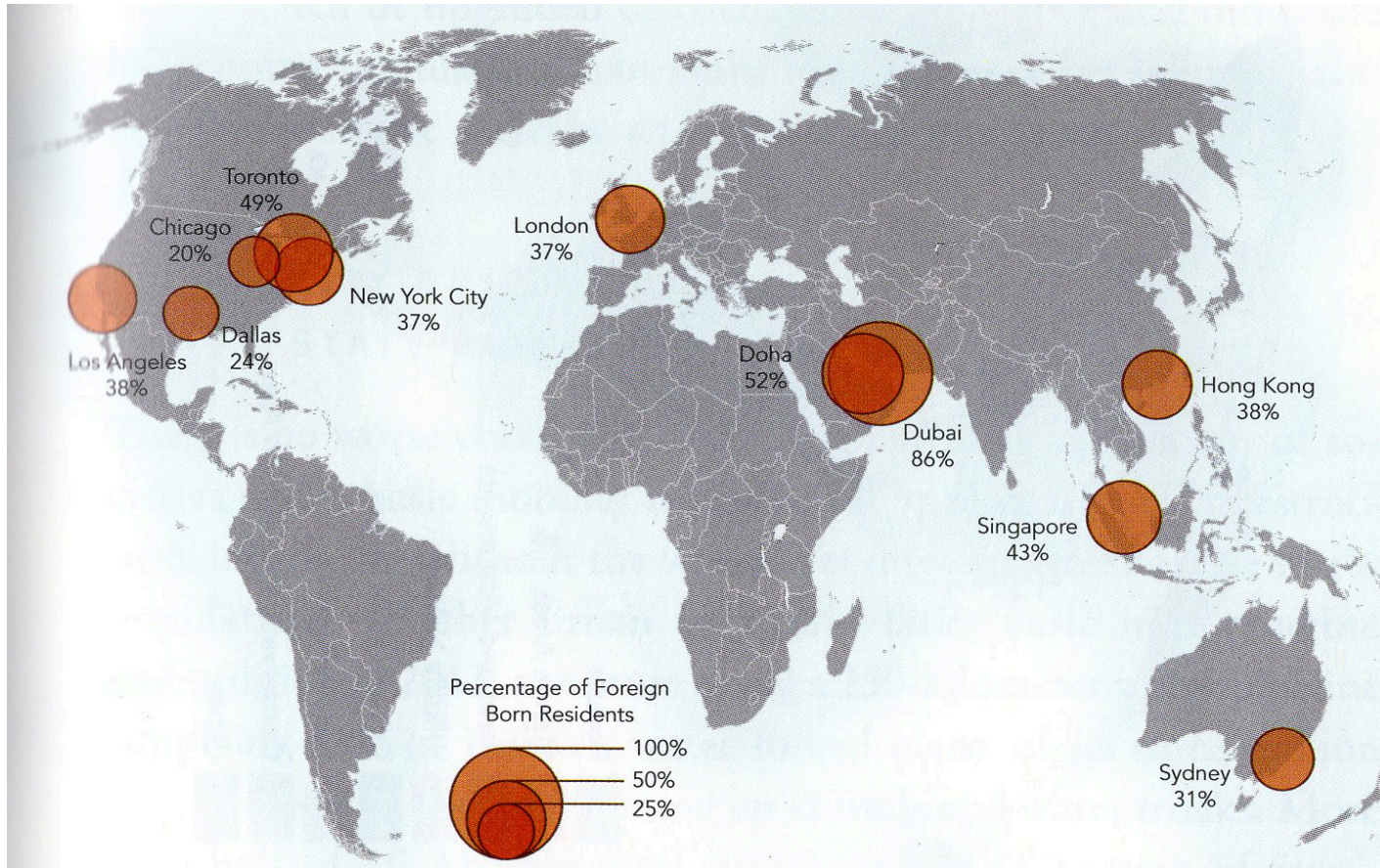


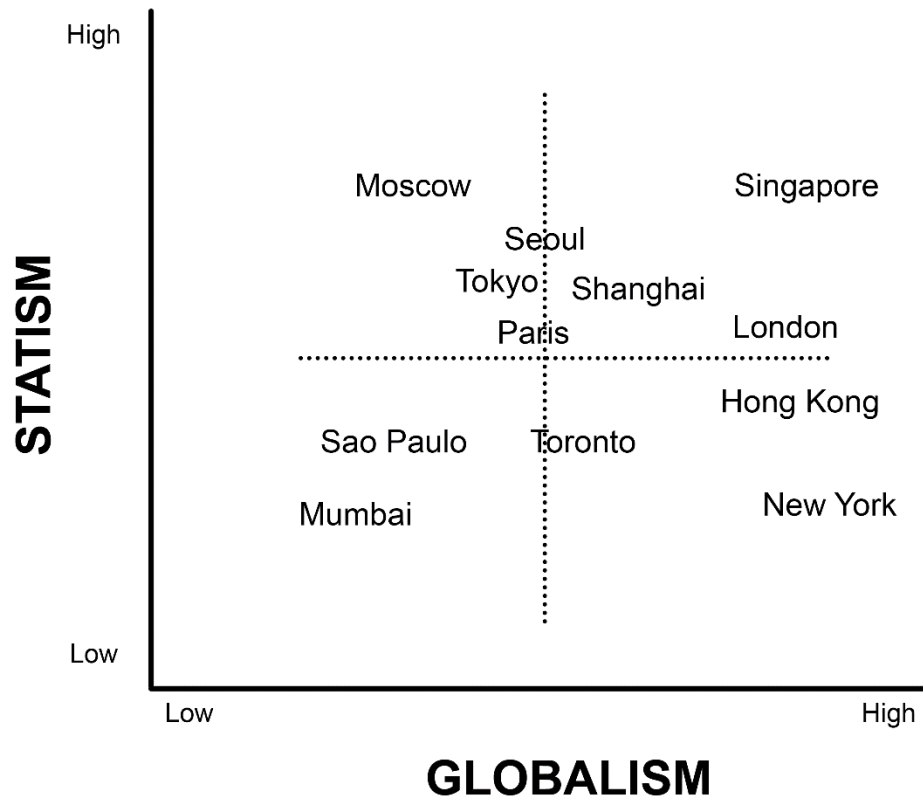
Image credit: Parag Khanna, Connectography

Semi-State Capabilities



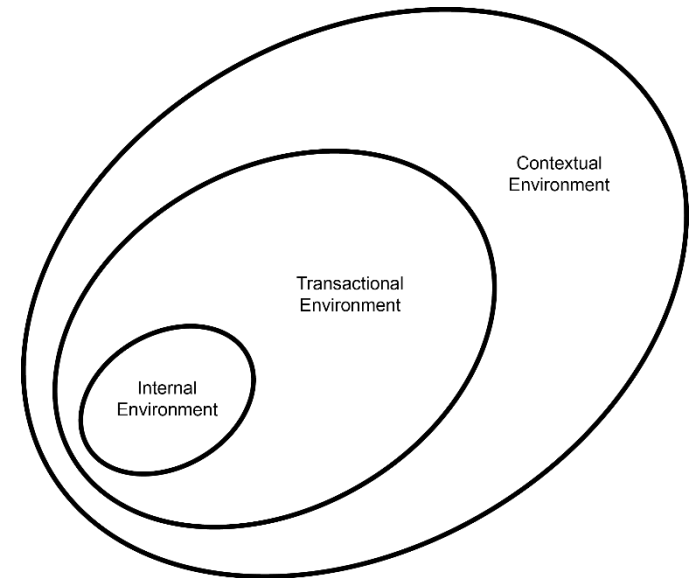
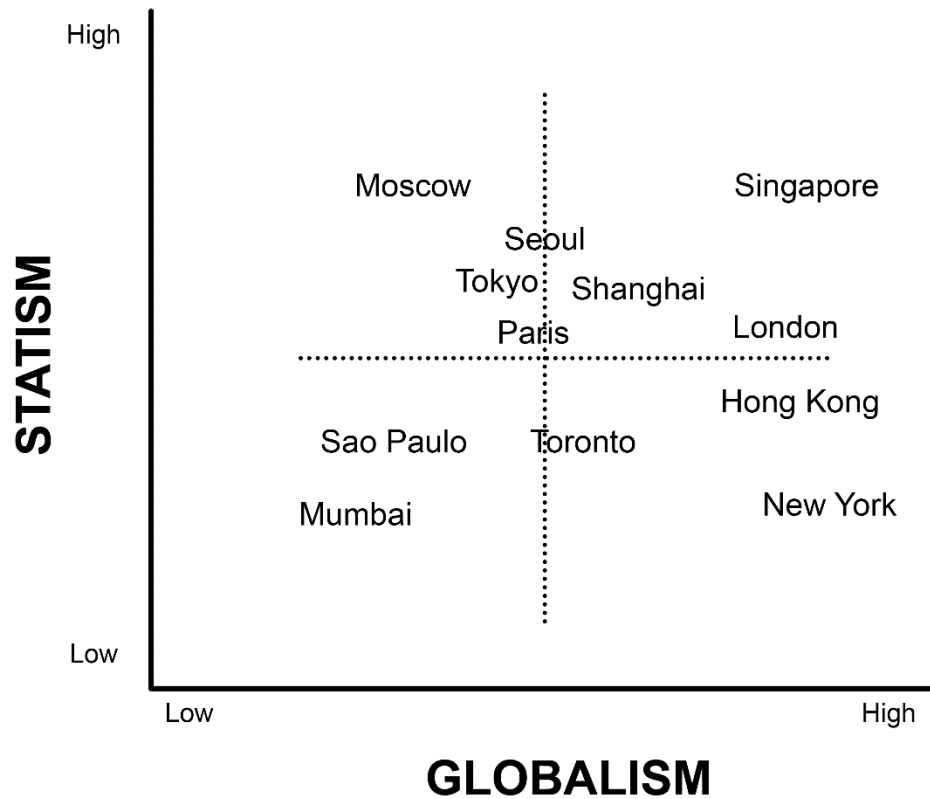
Image credit: New York Times

Cities vs. States



Drawn after G. Clark and T. Moonen, Global Cities and Nation States

Cities vs. States



PMESII

credit



Structural

**Describe the distribution
of responsibility and
power at all levels**

Functional

**How is a member
(typically a citizen)
identified, what rights
pertain to a member, and
how do these rights differ
from a non-member?**

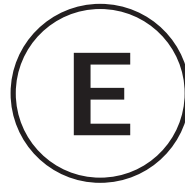


Structural

**The military and/or
paramilitary capabilities of
all relevant actors (enemy,
friendly, and neutral) in a
selected operational
environment**

Functional

**How are security issues
defined, declared,
engaged, and resolved?**



Structural

Encompasses individual and group behaviors related to producing, distributing, and consuming resources

Functional

How do people exchanged goods and services?



Structural

Functional

**Describes the cultural,
religious, and ethnic
compositions**

**How do individuals and
groups behave and why
do they do what they do?**

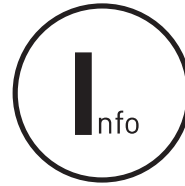


Structural

Portrays the basic facilities, services, and installations needed for the functioning of a community or society

Functional

How are flows—flows of people, food, water, goods, power, etc.—coordinated throughout the city?



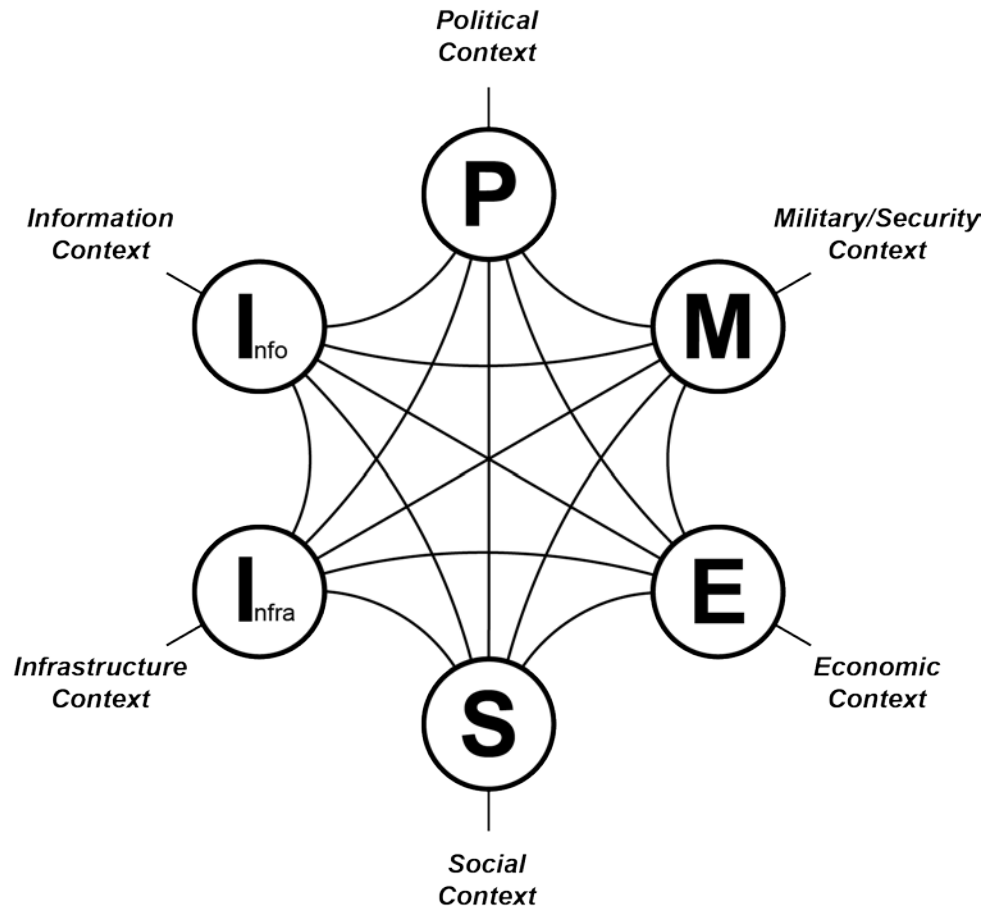
Structural

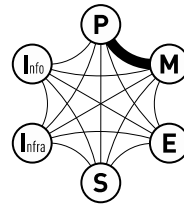
Functional

Depicts the nature, scope, and effects of individuals, organizations, and systems that collect, process, disseminate, or act on information

How is truth recognized?

PMESII Interactions





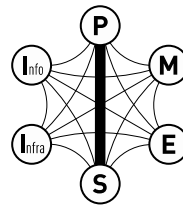
How is control over a population administered enforced?



Credit: ThoughtCo



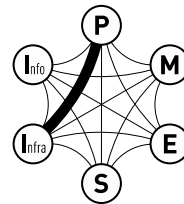
Credit: ThoughtCo



How is order legitimized?

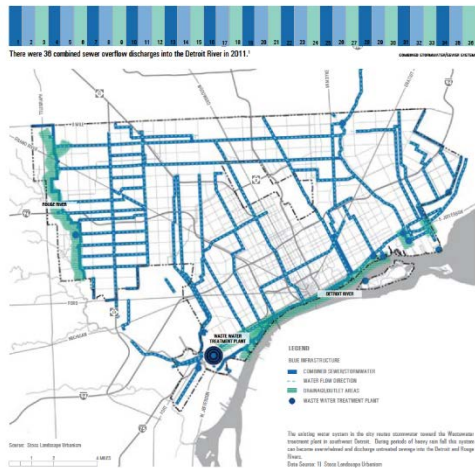


Credit: FEMA

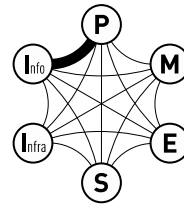


How does the city (or state) establish conduits and protocols to direct flows of people, materials, energy, and ideas?

EXISTING: CURRENT WATER SYSTEM CONFIGURATION



Credit: City of Detroit

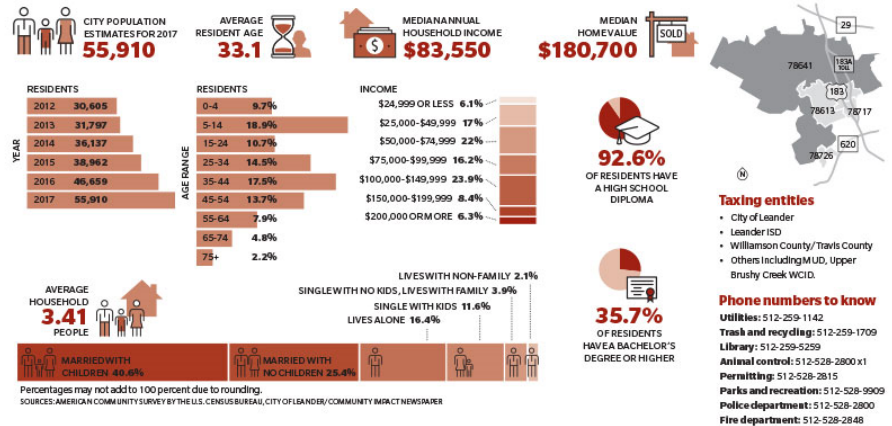


What is counted and how are counting (measuring, inventorying) systems constructed and used?

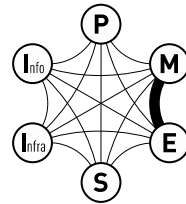


Credit: Transport for London

LEANDER



Credit: Leander, Texas



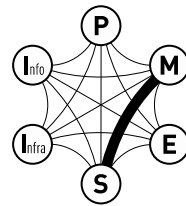
How are technologies for war and peace prioritized and changed from one to the other?



Credit: Irish News

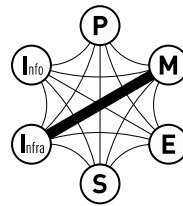


Credit: Connecticut Mirror



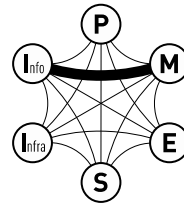
How do the institutions associated with the ‘two hands on the sword’ influence one another?



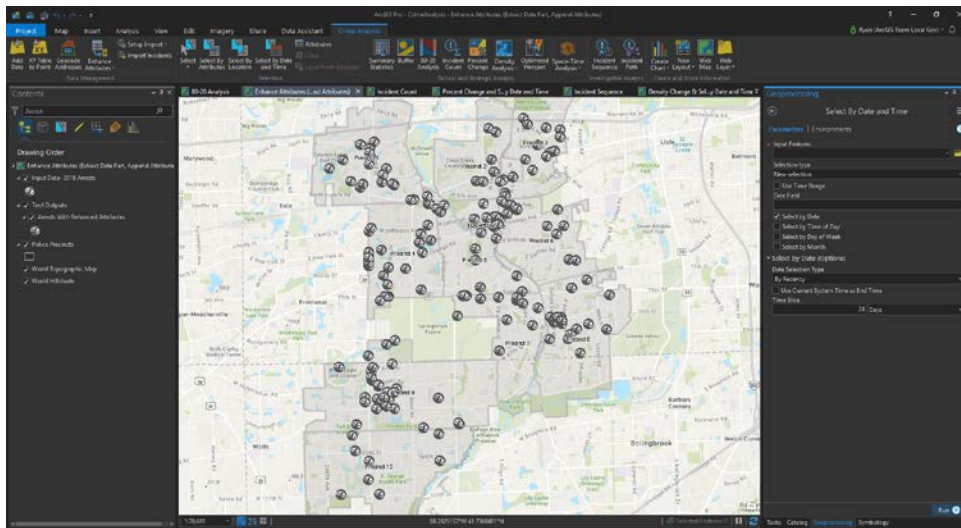


How is force expanded, extended, and delivered?

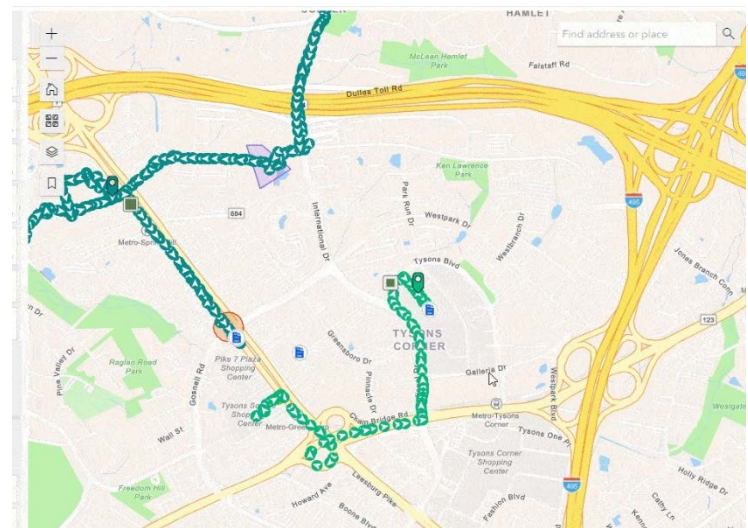




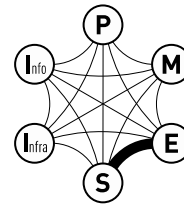
How is situational awareness sensed and made sense of?



Credit: Esri



Credit: Esri



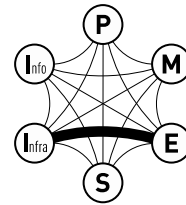
How do social interests get costed and priced?



Credit: Getty Images



Credit: Uber



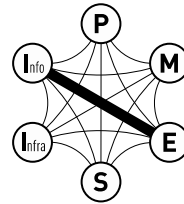
How are general, basic services made sharable for specialized production, trade, and individual use?



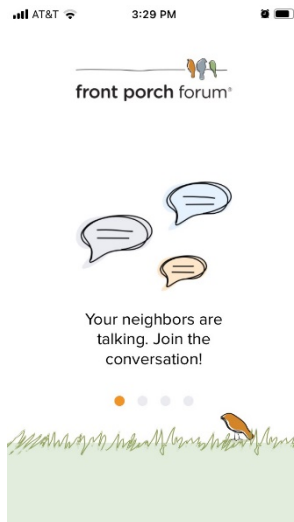
Credit: Getty Images



Credit: Manatu Routes, MIT Civic Design Lab



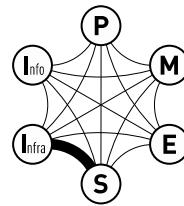
How are opportunities for exchange revealed?



Credit: Front Porch Forum



Credit: Hokou, Japan, TripAdvisor



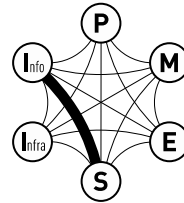
How do people extend their reach and expand their effect?



Credit: Getty Images



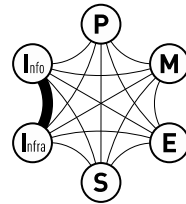
Credit: Informed Infrastructure



How do people share individual perceptions (facts and opinions, aspirations and fears) with one another and how do they make collectively shared perceptions?



Credit: Review of African Political Economy

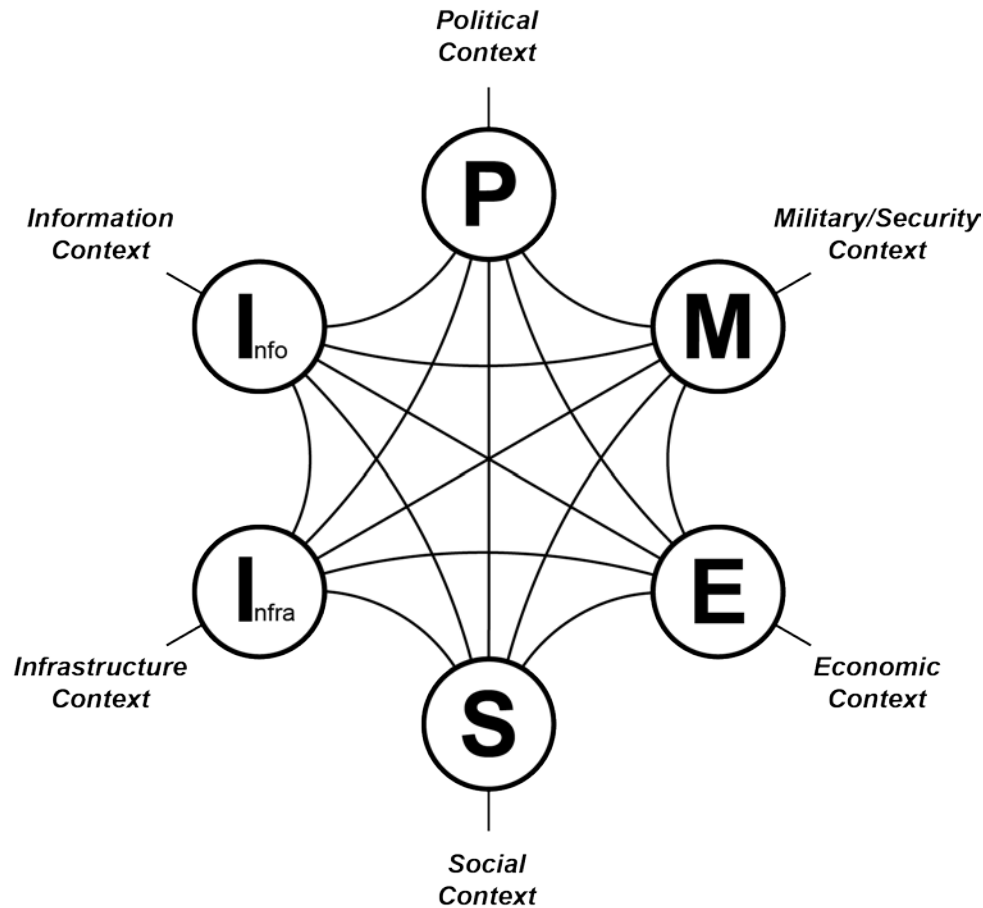


How are flows measured, managed, integrated, and synchronized (or separated)?



Credit: MDS

PMESII Interactions



Questions?