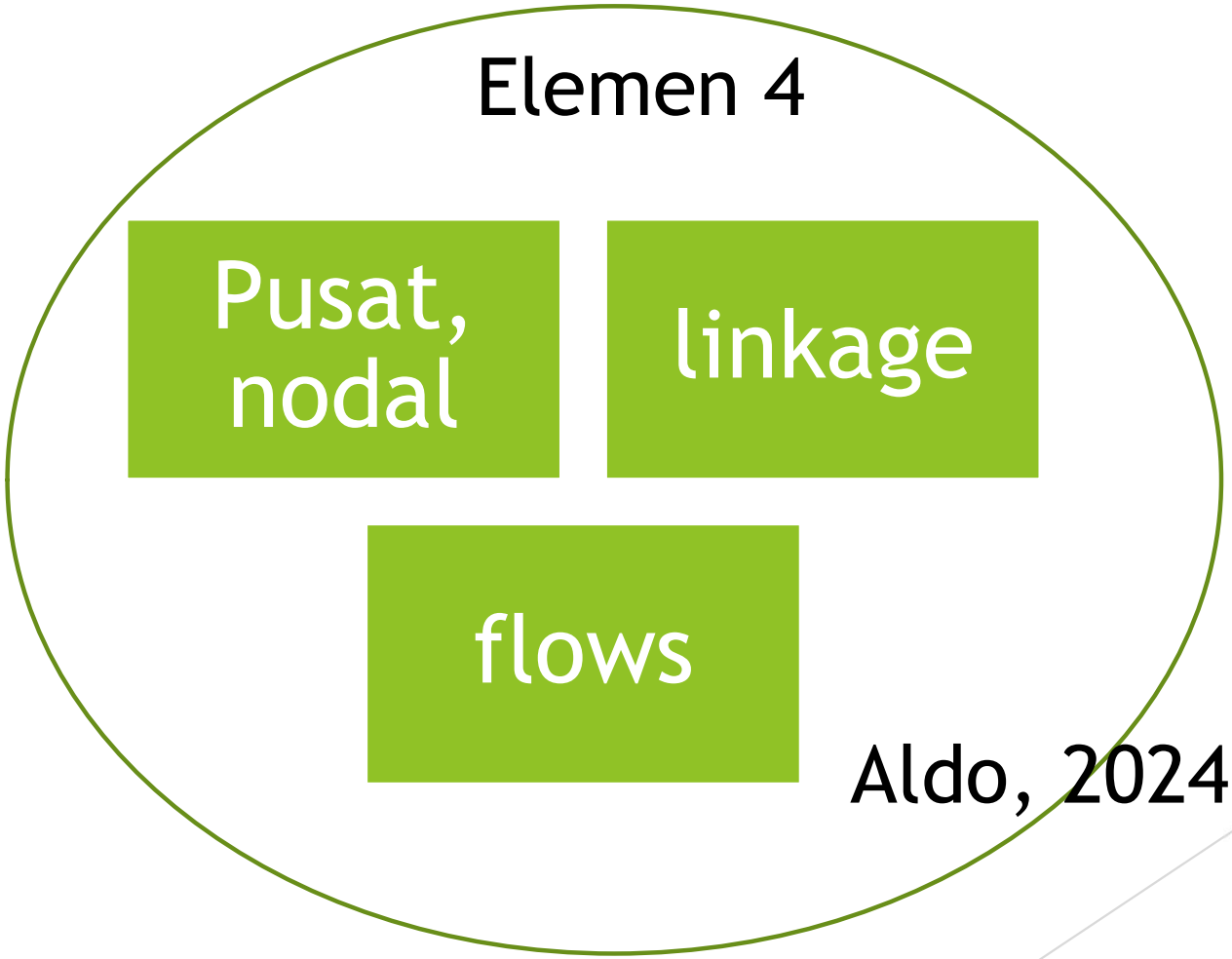
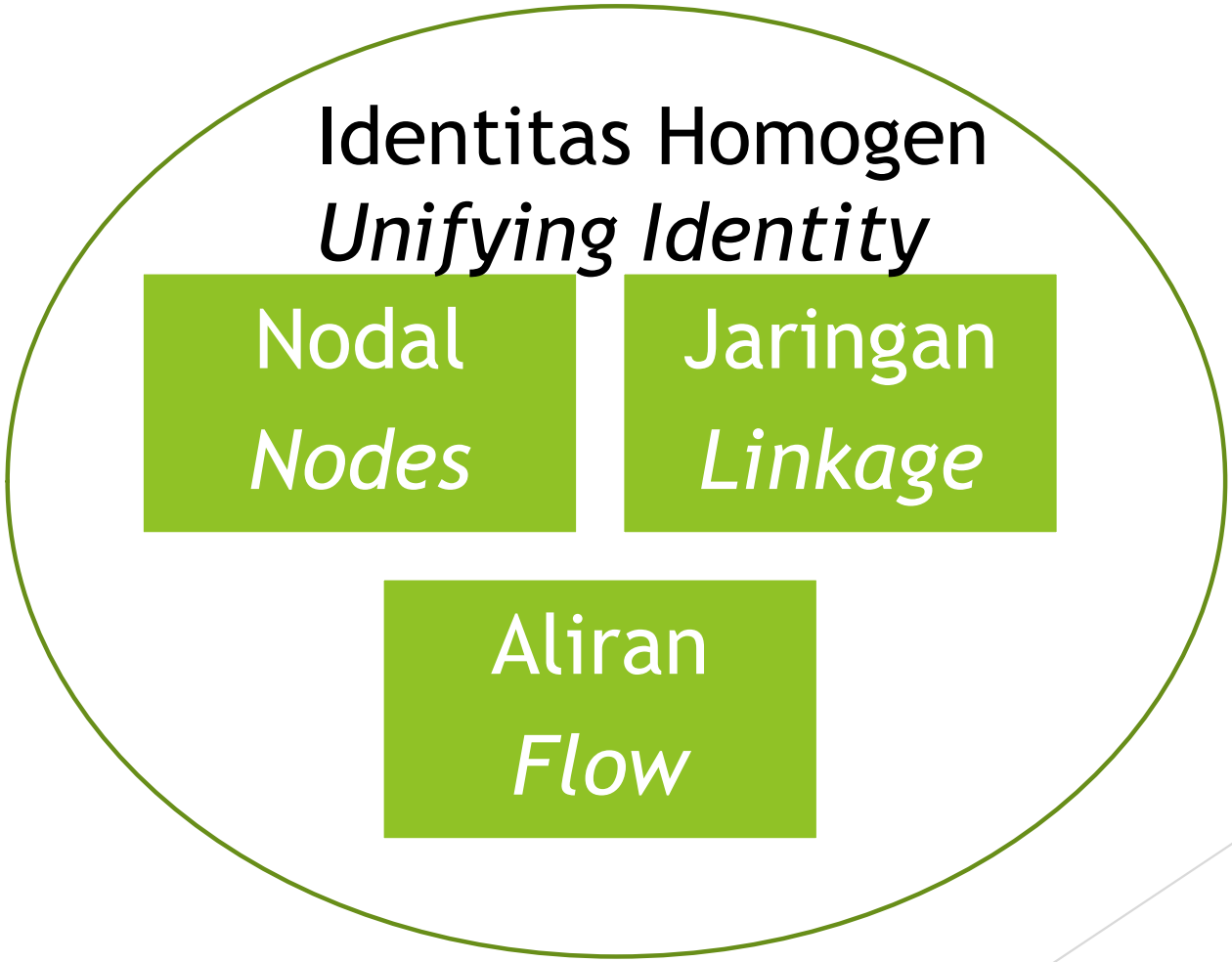
Struktur regional 1:
Sistem Perkotaan dengan Populasi

Perencanaan Wilayah
PWK FT UNS
2024

Apa elemen wilayah?



Apa elemen wilayah?

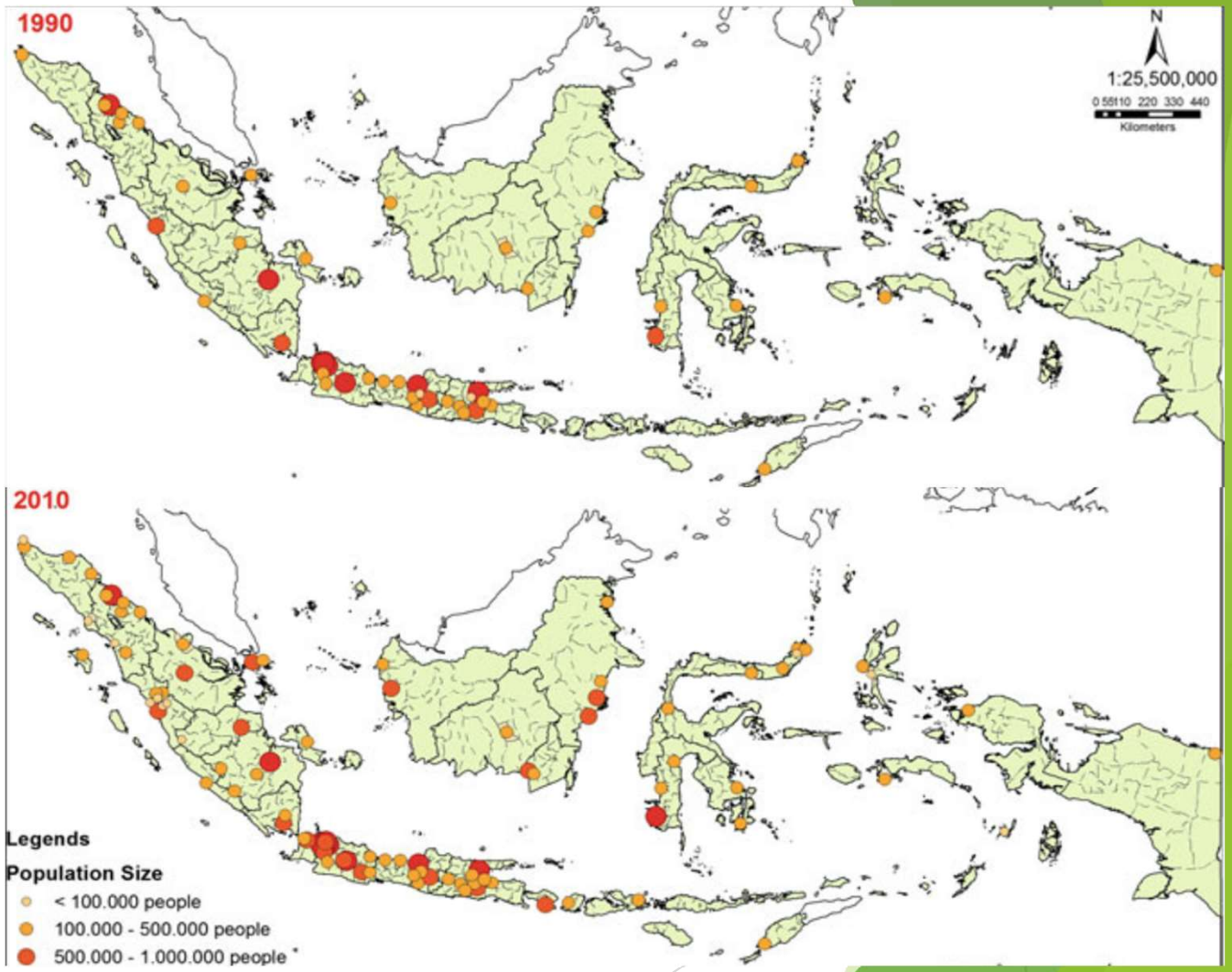


Apa tandanya wilayah berkembang?

nodal	• Produktivitas nodal naik • Perubahan sektor unggulan
jaringan	• Lebih banyak jaringan transportasi • Menghubungkan lebih banyak nodal • Perubahan 2
interaksi	• Lebih banyak kerjasama antar nodal • Perubahan 2

What a difference a century made!

20 years made this.



Population lights on.

data apa yang menunjukkan

perkembangan wilayah?

1. Aldo: data jumlah penduduk, data pdrb total dan sektoral
2. Untsa:
3. Rafli: penggunaan lahan
4. Siska: jumlah persebaran infrastruktur

masih

ingat?

- **Growth** can be internally and externally **induced**
- Growth **spread through a spatial structure** formed by the network of hard (road, rails, power networks) and soft (tax, incentives, authorities) infrastructure
- Growing **nodals, linkages, and flows** of resources are requirements to ensure regional development

Topik hari ini.

1. Measuring **growing nodals.**
2. Identifying the **regional structure based on nodal population.**

measuring

the growing nodals

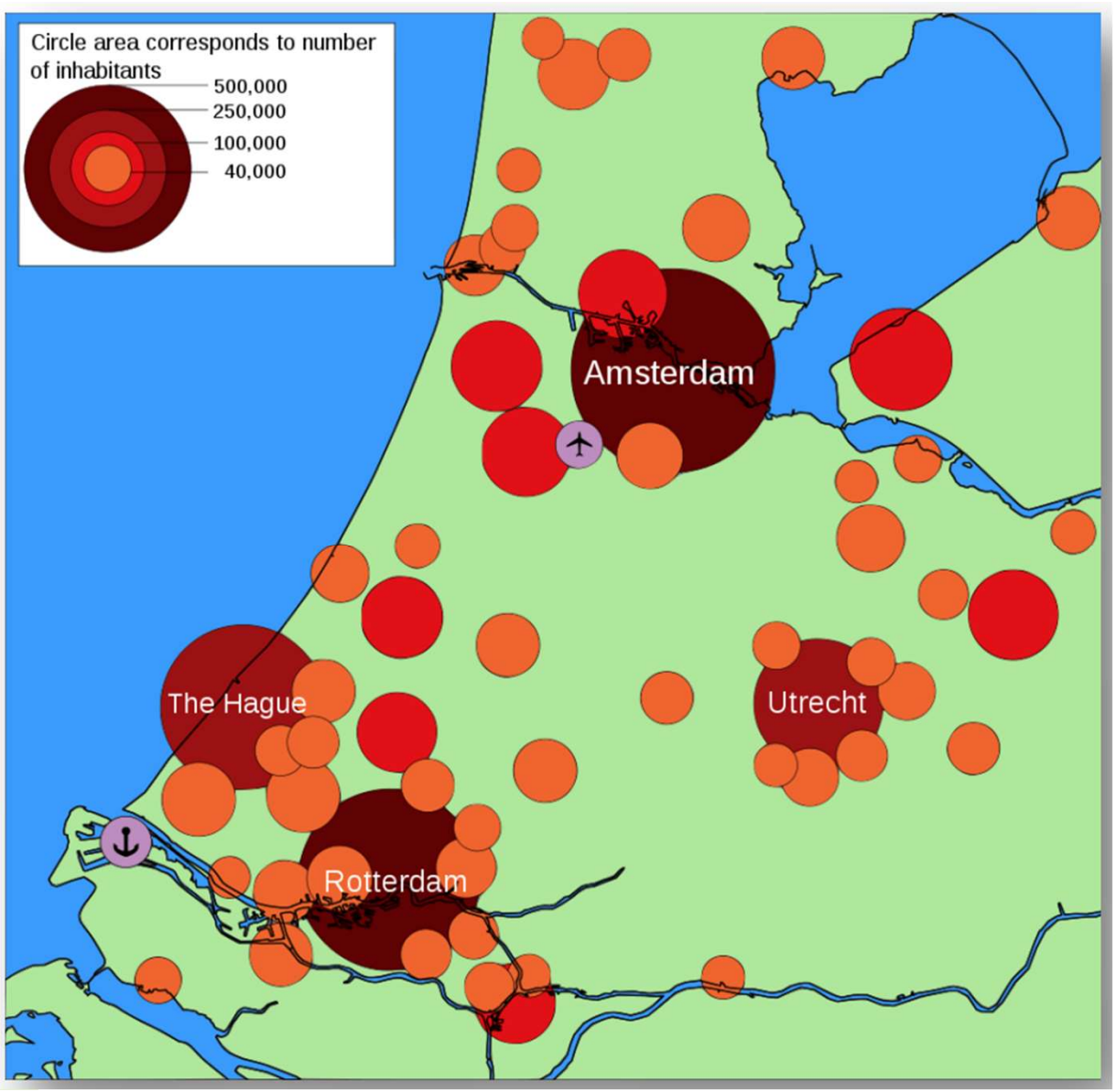
mengapa
kota tumbuh?

Location advantages, making investment favors the site

More opportunities in higher-paid jobs, provided by the secondary and tertiary economic activities

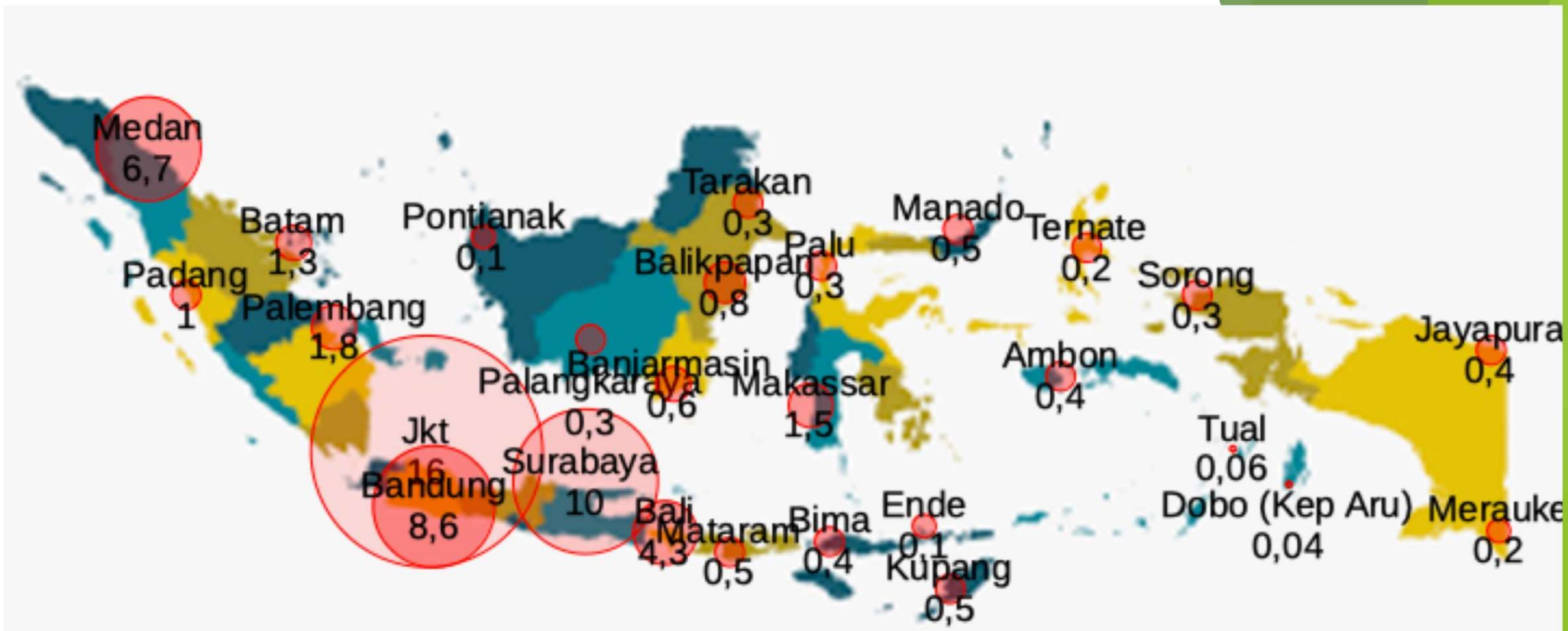
Better quality of life (better amenities), provided by the urban bias in infrastructure provision

Duranton, 2013



Urban hierarchy by

population

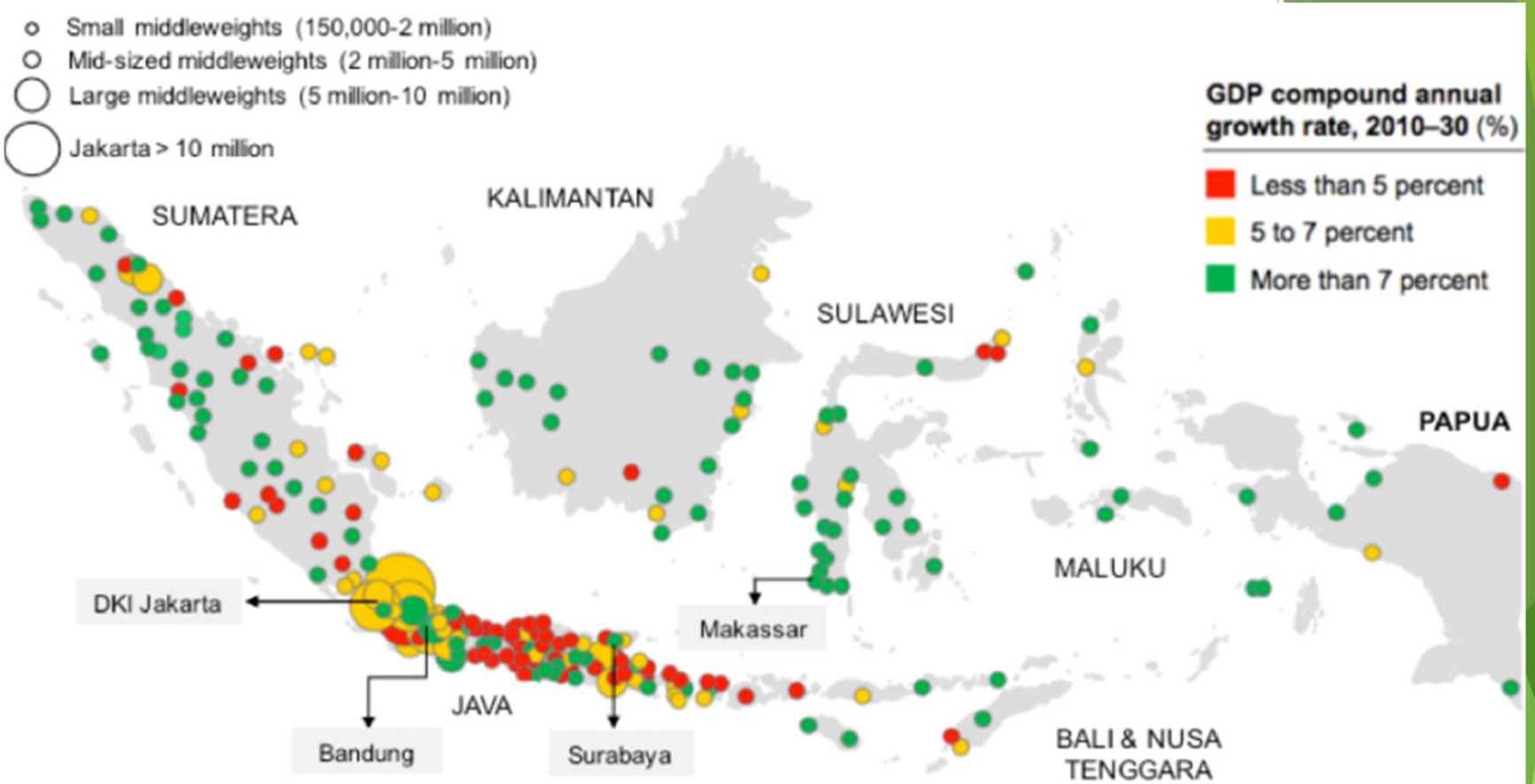


Klasifikasi BPS

1. Kota kecil: 20.000 - 50.000 jiwa.
2. Kota sedang: 50.000 - 100.000 jiwa.
3. Kota besar: 100.000 - 1 juta jiwa.
4. Kota metropolitan: 1 - 5 juta jiwa.
5. Kota megapolitan: > 5 juta jiwa

Urban hierarchy by

population

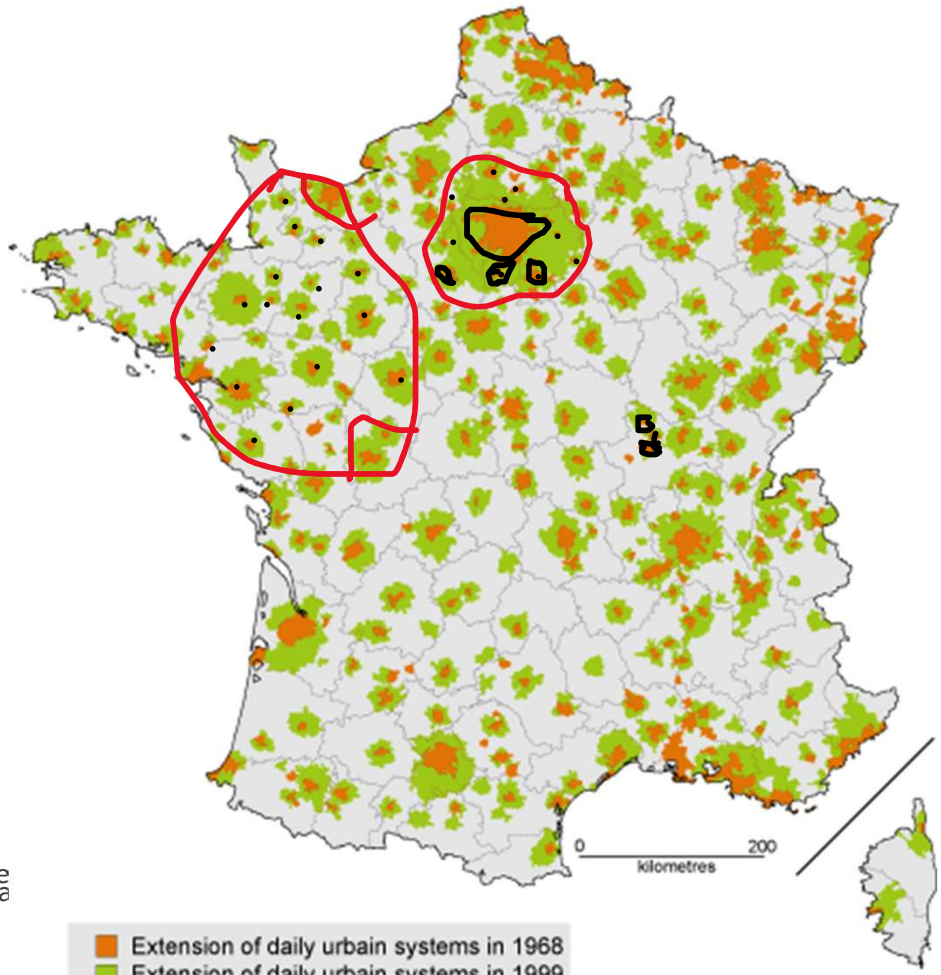


Asiagreen, nd

Urban hierarchy by

Economic growth

Figure 7 : Evolution of surface in daily urban systems
(1968-1999 ; time-space)



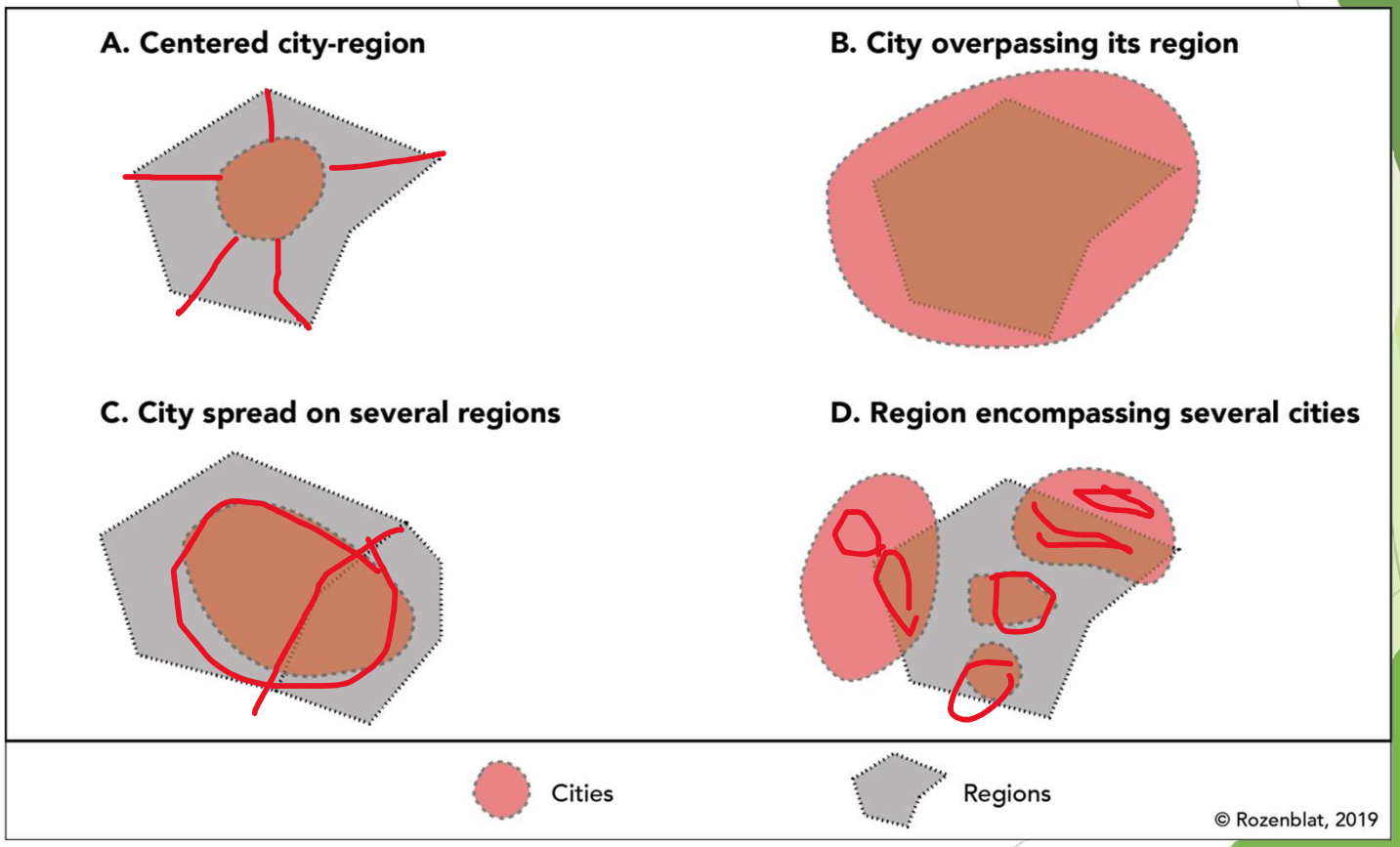
Urban hierarchy by

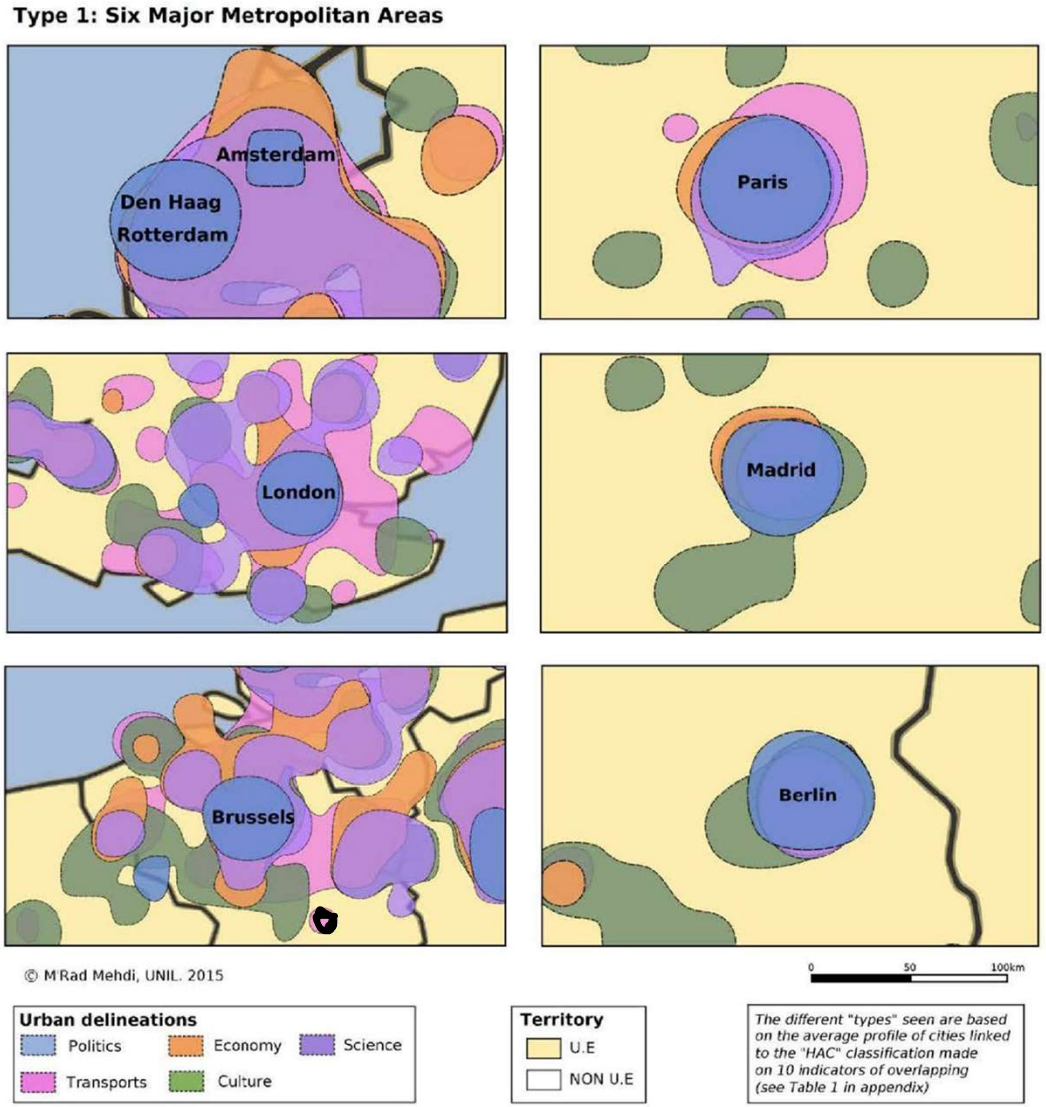
service coverage area

Brate
Duma

Growth pattern

Rozenblat, 2020





Urban hierarchy by

functions

Rozenblat, 2020

Growth indicator of a nodal.

01	**Physical**	• Population • Area • Networks
02	**Functions (or services)**	• Variety of services • Variety of functions
03	**Output**	• Productivity • Consumption • Quality of Life

Figure 9. Projects implemented under the Multi-Year Plan for Infrastructure, Spatial Planning and Transport (MIRT)

Urban hierarchy by

network

identifying

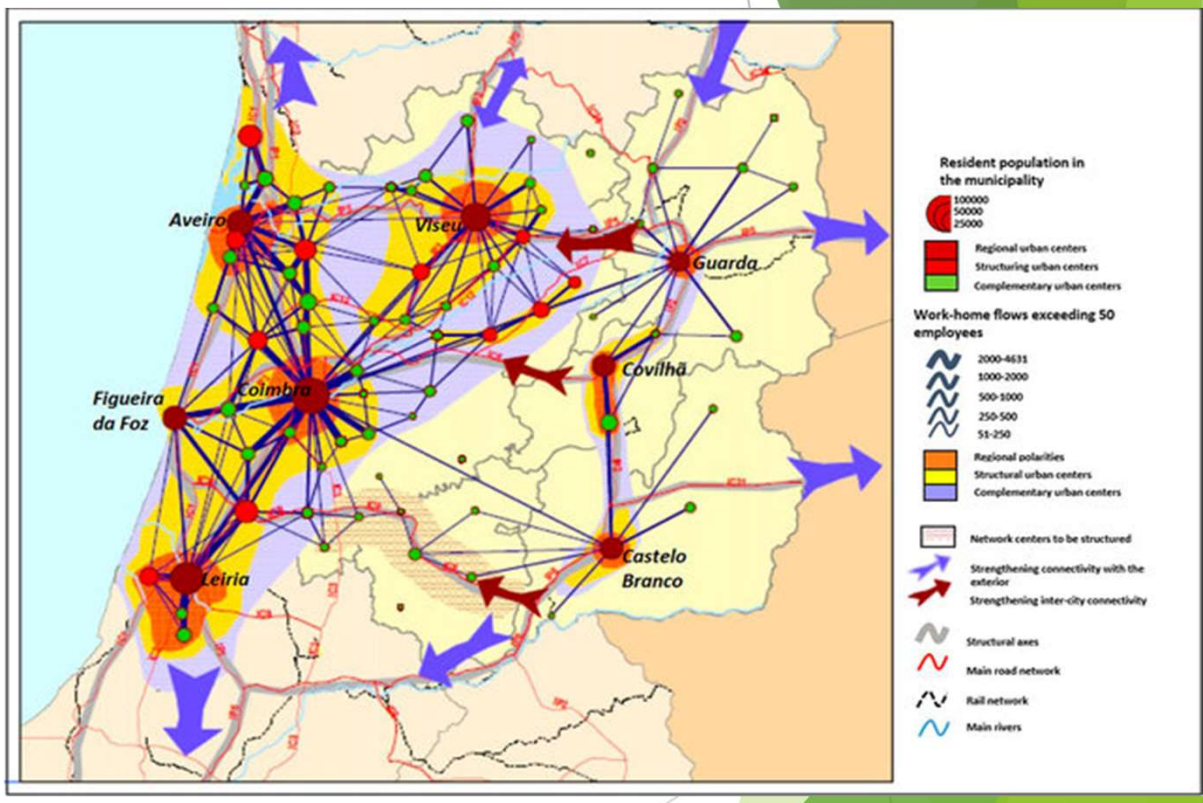
The system of cities: regional structure

from

backyard surplus

to

collaborative advantage



Tavares, et al, 2019

systems of cities

a set, national or regional, of interdependent cities in such a way that any significant change in the economic activities, occupational structure, income or population of one of the cities directly or indirectly brings about any change in the economic activities, occupational structure, income or population of one or more other elements of the whole

Berry, 1964; Pred, 1977

Ingat.

Not only interconnected

(linkage, mainly physical)

Ingat.

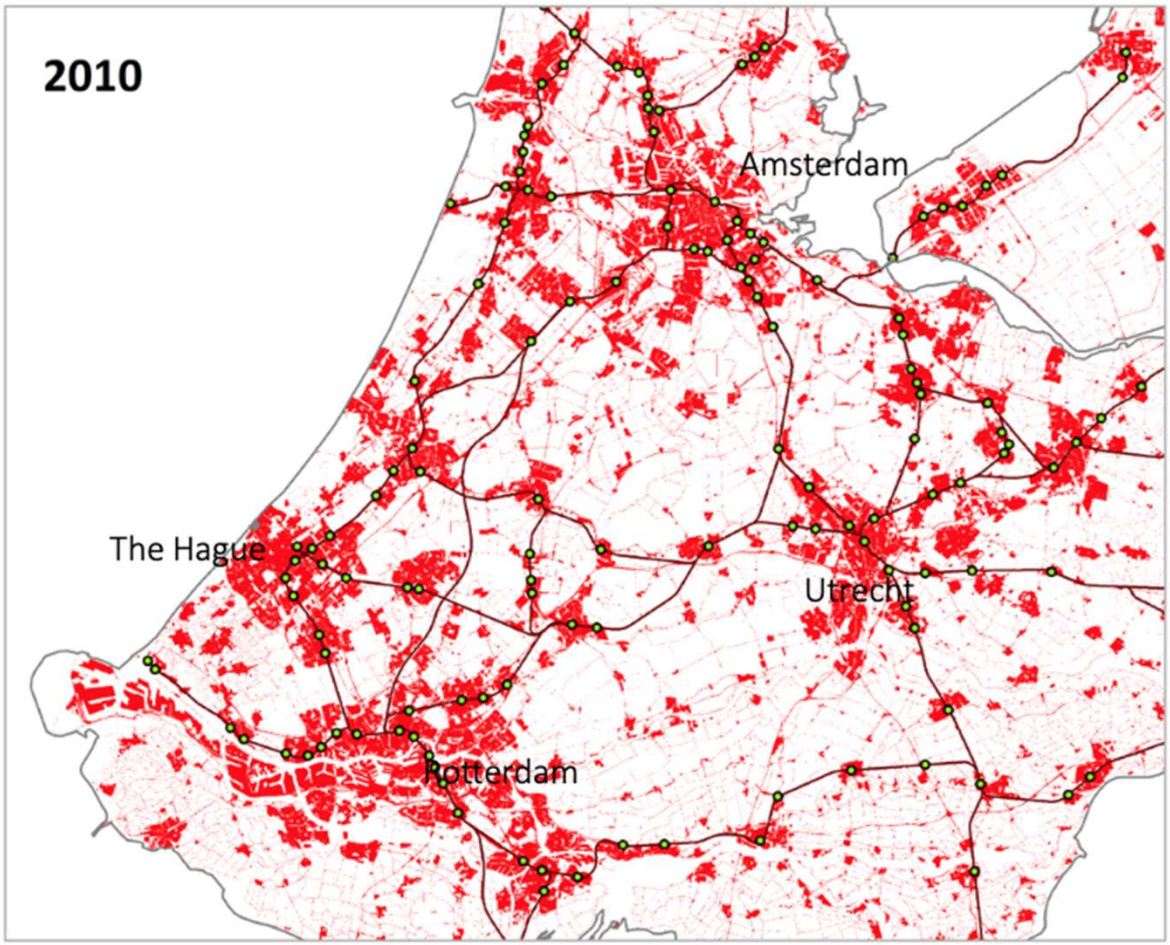
Not only interconnected
(linkage, mainly physical)

it is interdependent
(significant flows)

Rail network

interconnected

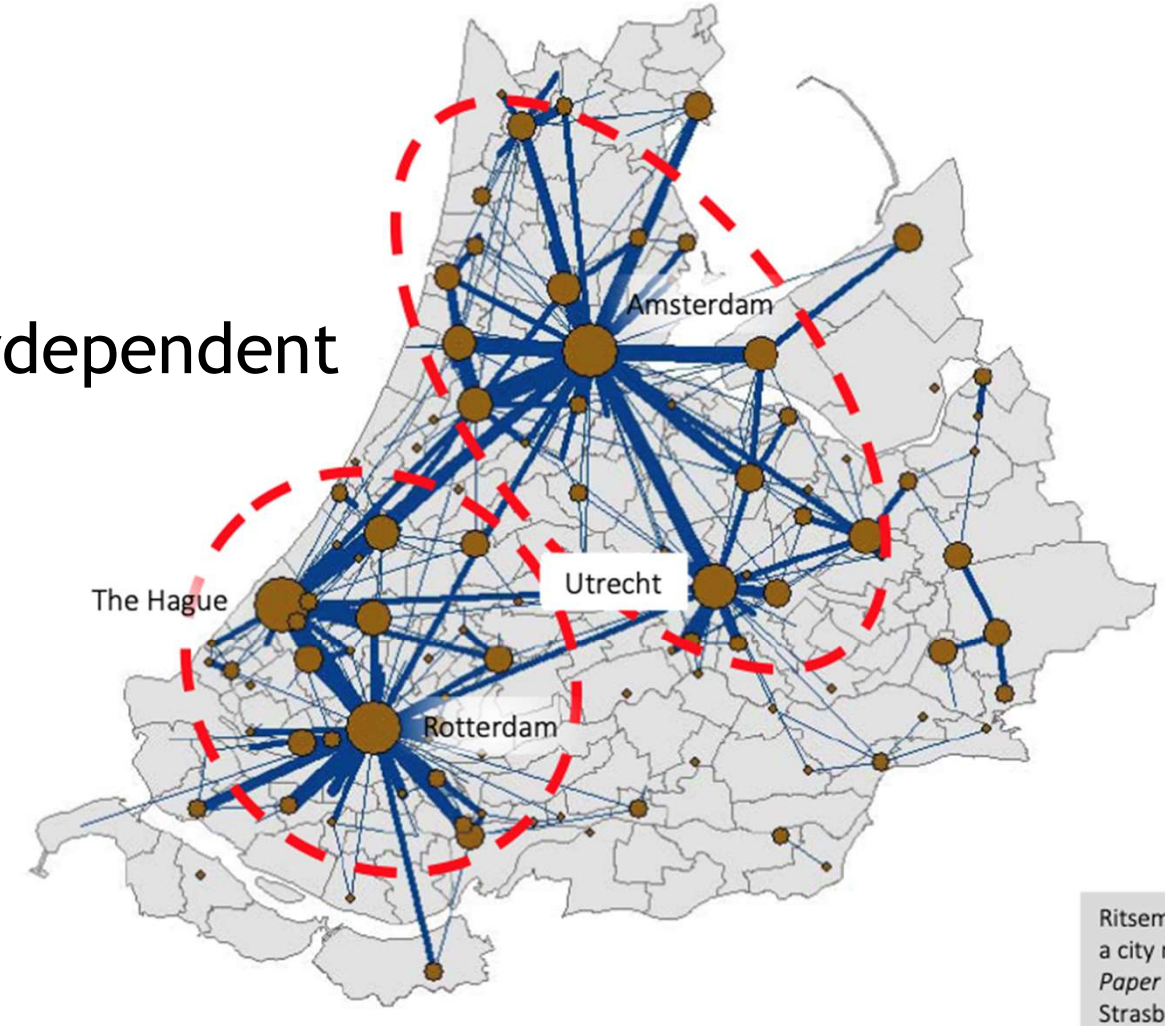
Rozenblat, 2020



Stead and Meijers, 2015

Commuting patterns – flows

interdependent



Legend

local home-to-work trips

- < 5,000
- 5,000 - 10,000
- 10,000 - 25,000
- 25,000 - 50,000
- 50,000 - 100,000
- > 100,000

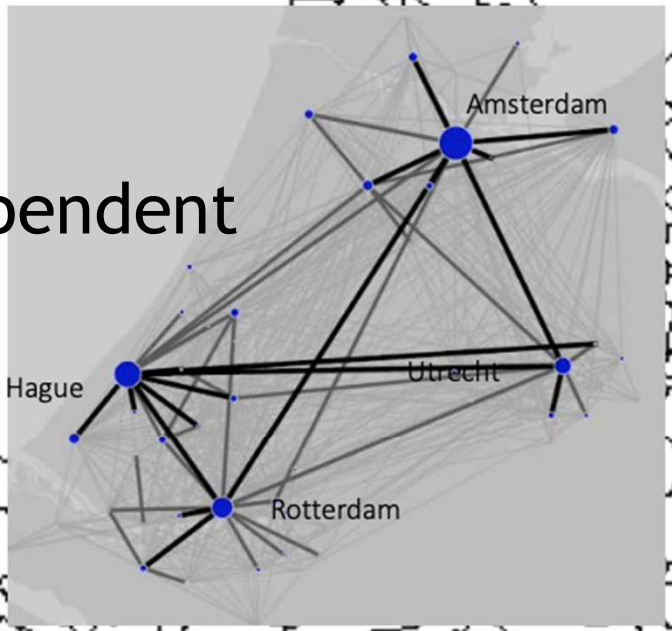
commuters

- < 2,500
- 2,500 - 5,000
- 5,000 - 10,000
- 10,000 - 25,000
- > 25,000

Ritsema van Eck, J. & Snellen, D. (2006). Is the Randstad a city network? Evidence from commuting patterns. *Paper presented at the European Transport Conference*, Strasbourg, 18-20 September 2006.

Business travel

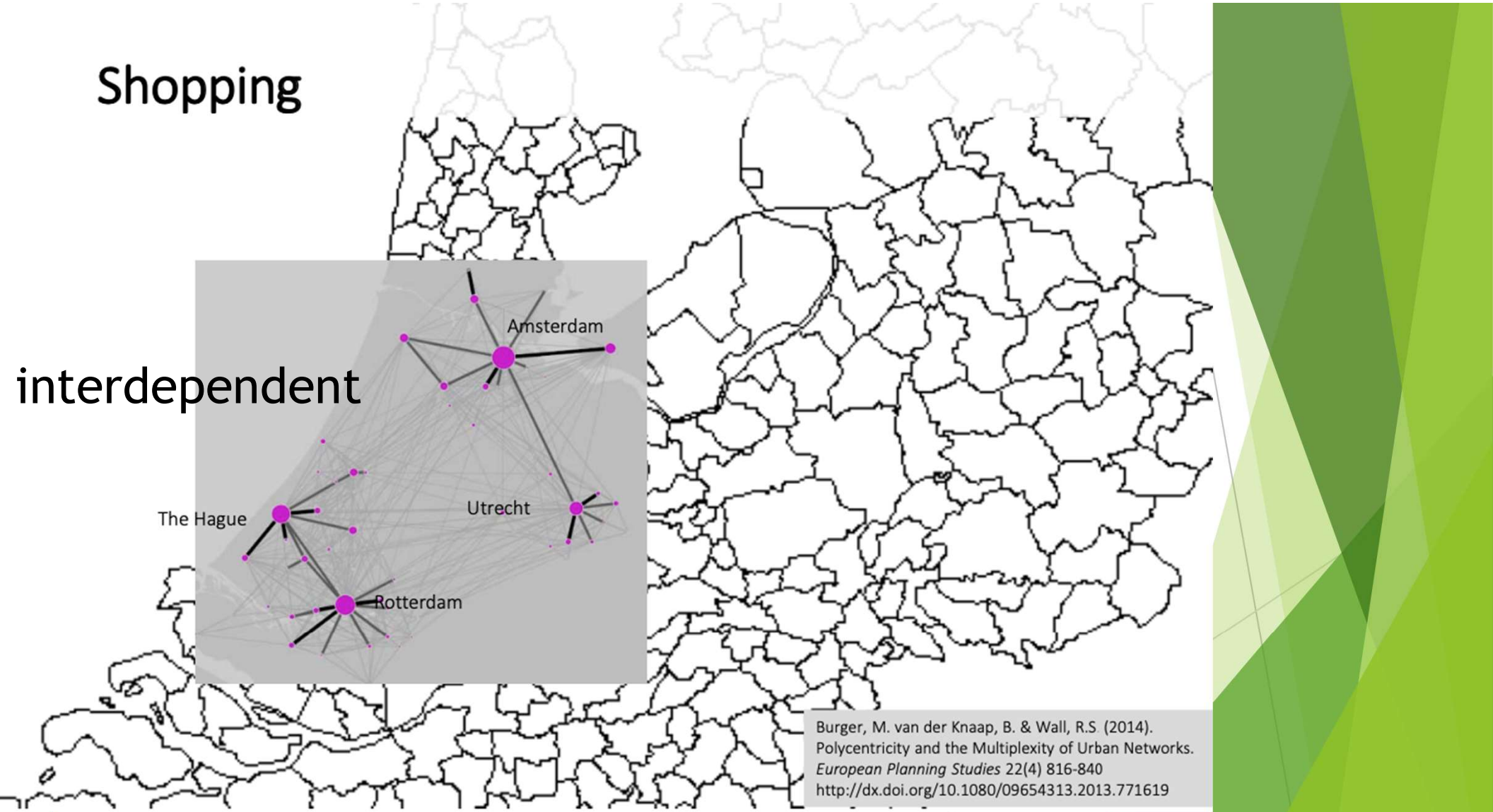
interdependent



Burger, M. van der Knaap, B. & Wall, R.S (2014). Polycentricity and the Multiplexity of Urban Networks. *European Planning Studies* 22(4) 816-840 http://dx.doi.org/10.1080/09654313.2013.771619

Shopping

interdependent



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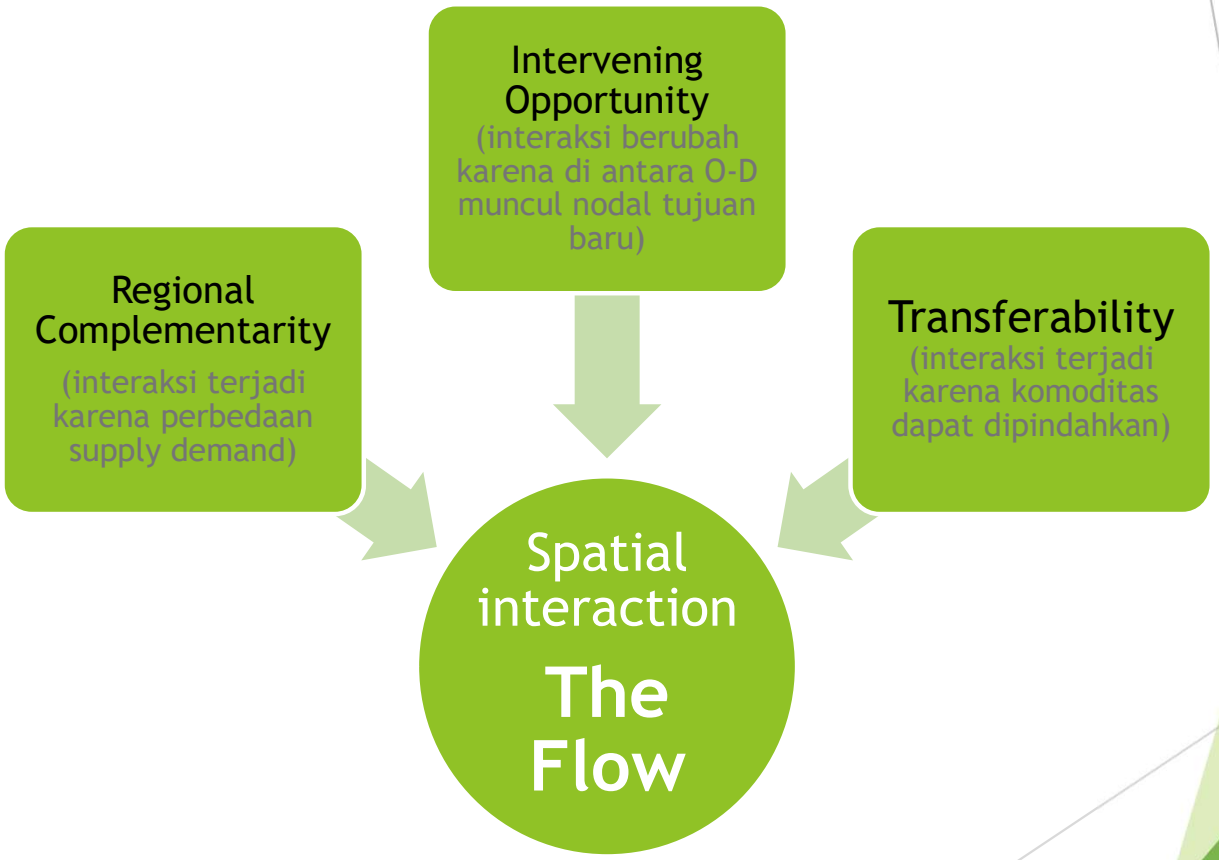
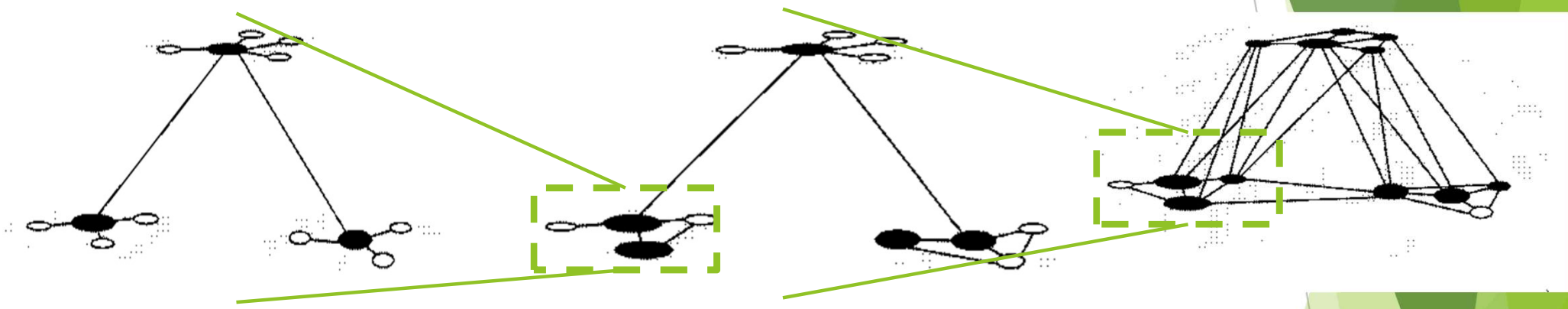
Inter-nodal flow in system of cities



Rodrigue et al, 2006

The development of regional structure



Daily labor commute

“**Nodal region**”; “functional urban region” “greater metro”

Traditional hierarchical order, centralized flow to nodal

Business interaction, more knowledge base economy

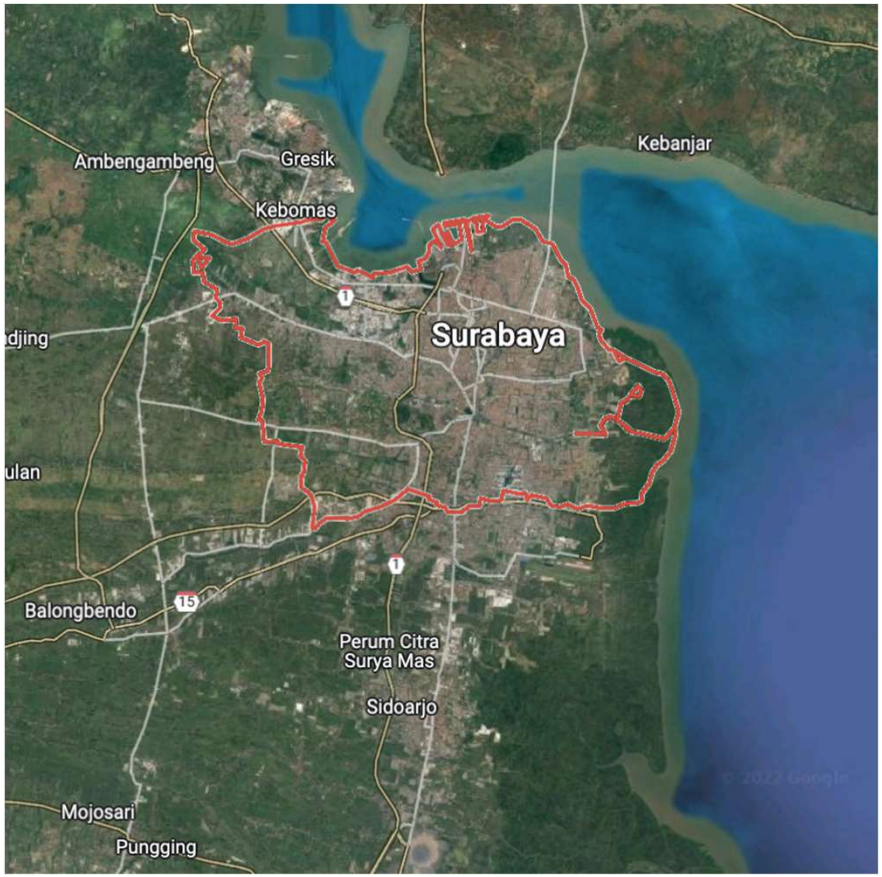
”**local multinodal system**”

Less centralized, specialized top nodal functions

Resources and growth transfer

“Polycentric urban region”
“**regional multinodal network**”

More symmetrical flow in horizontal level, decentralized



Surabaya Greater Urban

1. Surabaya
2. Gresik
3. Sidoarjo

Surabaya Metropolitan

Gerbangkertosusilo

1. Gresik
2. Bangkalan
3. Mojokerto
4. Surabaya
5. Sidoarjo
6. Lamongan

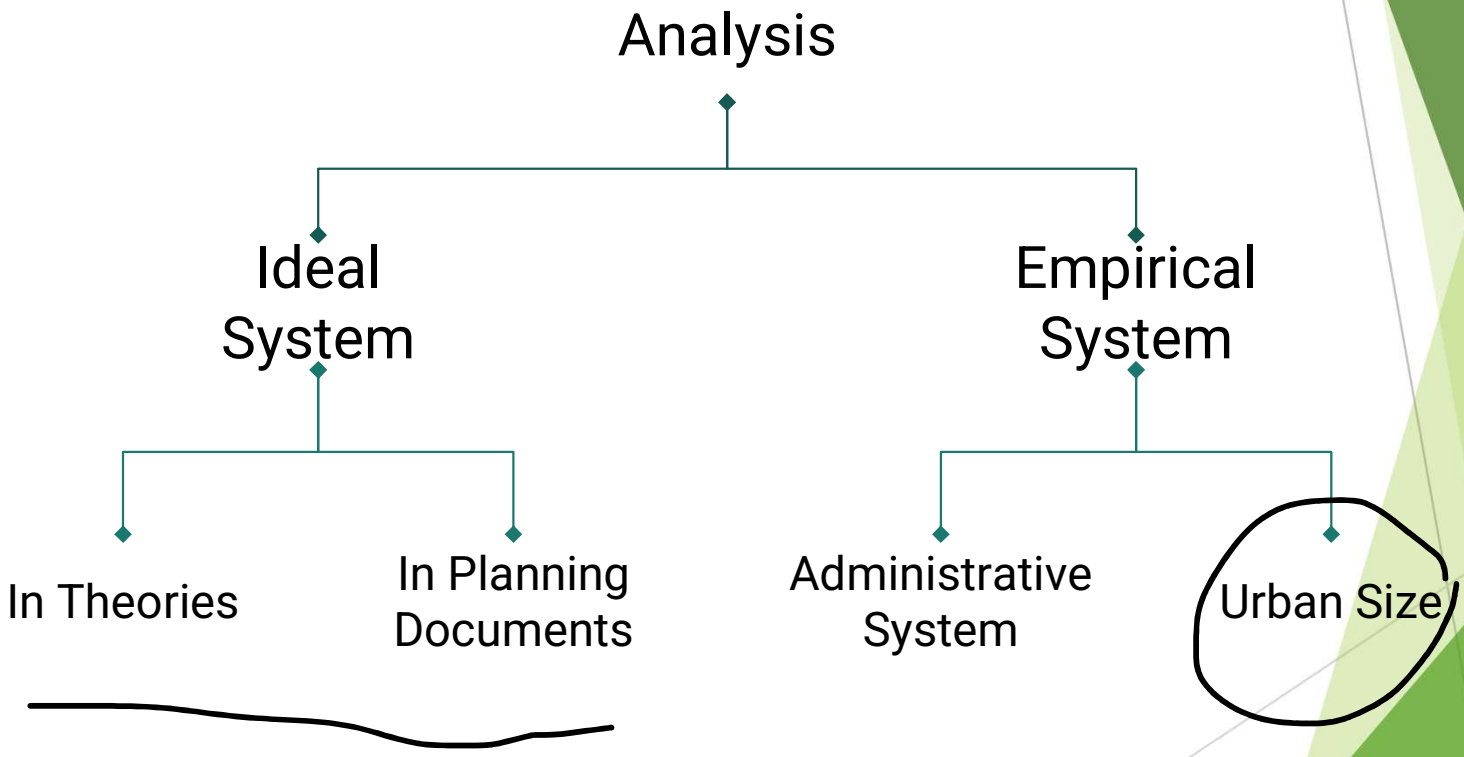
Growing Region

Nodal	• More nodals • More population in aggregate
Linkage and Flows	• More physical-non physiscal linkage • More interdependence
Structure	• More complex structure

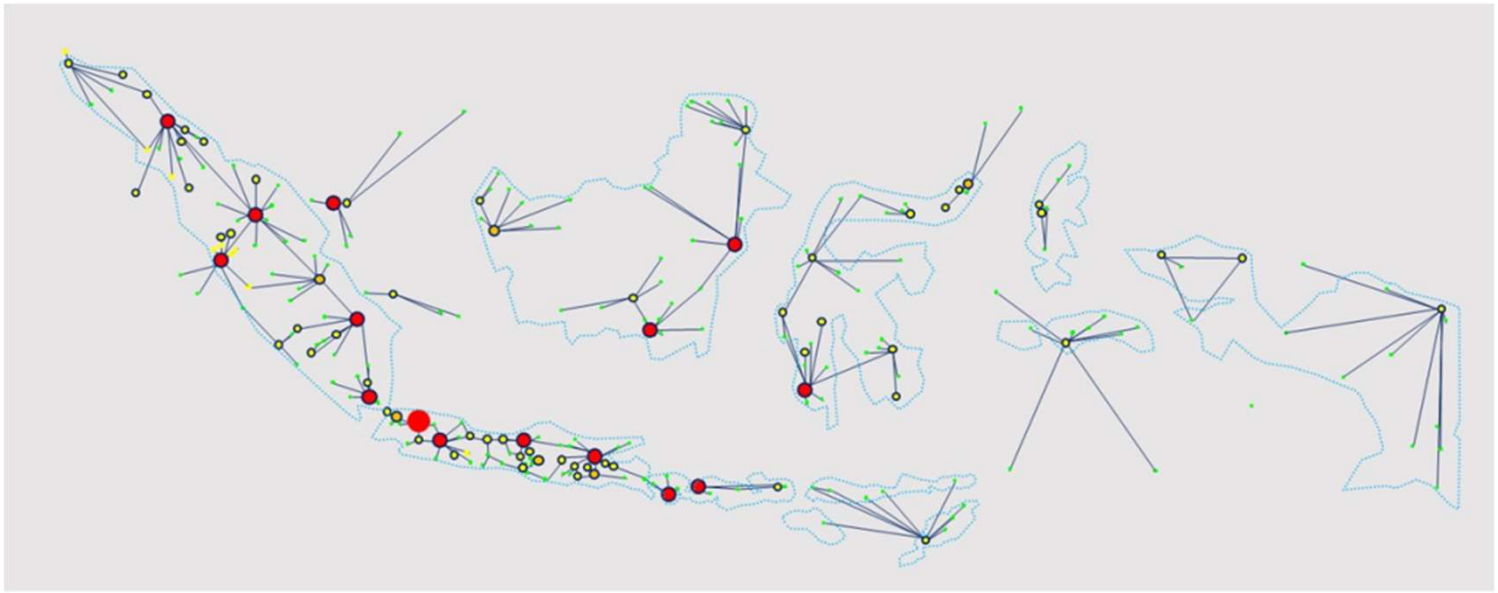
mengidentifikasi

struktur ruang wilayah

Dua sudut pandang: Ideal vs. Empirik



Ideal 1: Dokumen Perencanaan



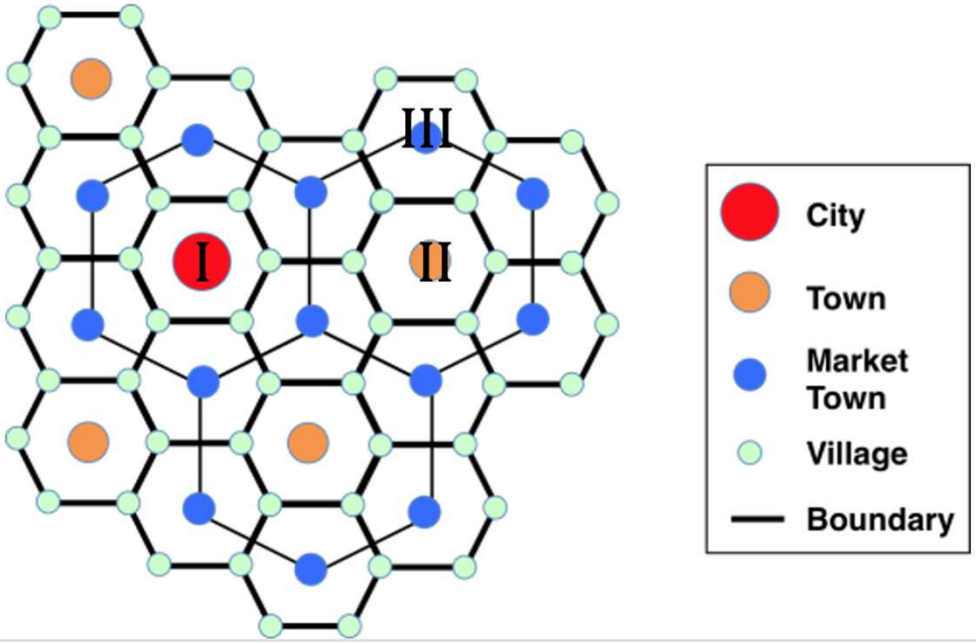
Tipologi Kota	PKN	PKSN	PKW	PKL***	Jumlah
Megapolitan	1	--	--	--	1
Metropolitan	13 + 1*	1# + 1*	--	--	16
Kota Besar	6	--	--	--	6
Kota Sedang	16 + 4*	4* + 2**	26 + 2**	5	59
Kota Kecil	--	1**	4 + 1# + 1**	4	11
Kaw. Perkot	2 + 1*	20 + 1* + 8**	138 + 8**	--	178
Jumlah	44	38	180	9	

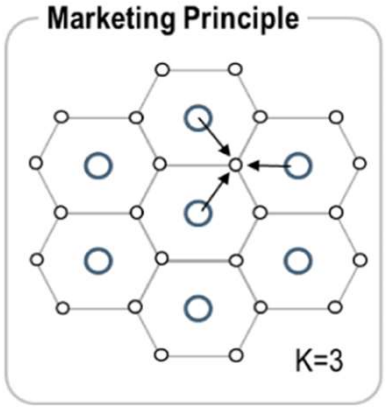
Keterangan: *PKN & PKSN **PKSN & PKW ***Kota Otonom tidak masuk dalam Sistem Kota RTRWN

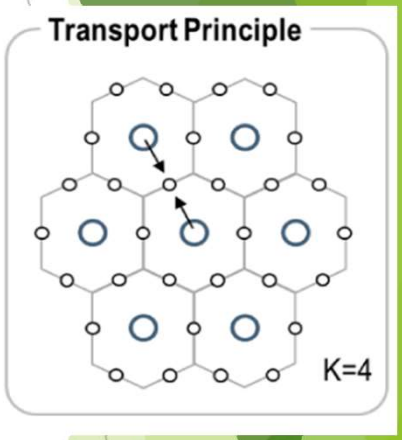
#Hanya disebut nama otonom, juga masuk masuk sebagai bagian Kawasan Perkotaan Metropolitan

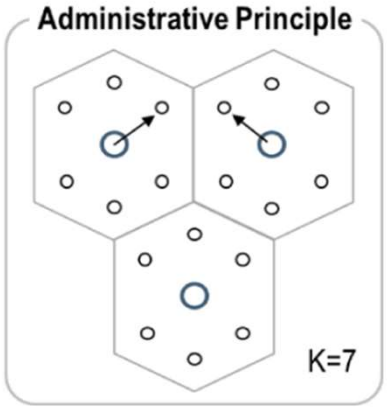
Ideal 2: Central Place Theory

The size and the spatial distribution of cities









Population threshold for **different goods** and services leads to **different** range and **distributions** of cities

Ideal 2: Central Place Theory

The Number of Cities

Tipologi Kota	PKN	PKSN	PKW	PKL***	Jumlah
Megapolitan	1	--	--	--	1
Metropolitan	13 + 1*	1# + 1*	--	--	16
Kota Besar	6	--	--	--	6
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Keterangan: *PKN & PKSN **PKSN & PKW ***Kota Otonom tidak masuk dalam Sistem Kota RTRWN

#Hanya disebut nama otonom, juga masuk masuk sebagai bagian Kawasan Perkotaan Metropolitan

number of cities

K=3 to K = 7

size of cities

⅓ of the size of higher hierarchy

K = 3	K = 4	K = 7
• medium sized cities (orde 4) = 59 • orde 3 = 18 max • orde 2 = 3 max • orde 1 = 1 max	• medium sized cities (orde 4) = 59 • orde 3 = 14 max • orde 2 = 3 max • orde 1 = 1 max	• medium sized cities (orde 4) = 59 • orde 3 = 10 max • orde 2 = 2 max • orde 1 = 1 max

Ideal 2: Central Place Theory

The size of cities

Tipologi Kota	PKN	PKSN	PKW	PKL***	Jumlah
Megapolitan	1	--	--	--	1
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Keterangan: *PKN & PKSN **PKSN & PKW ***Kota Otonom tidak masuk dalam Sistem Kota RTRWN

#Hanya disebut nama otonom, juga masuk masuk sebagai bagian Kawasan Perkotaan Metropolitan

From the smallest

- Orde 5 = 100k Kota kecil
- Orde 4 = 300k
- Orde 3 = 900k
- Orde 2 = 2.7 mil
- Orde 1 = 8.1 mil

From the biggest

- Orde 1 = 16 mil Jakarta
- Orde 2 = 5.3 mil
- Orde 3 = 1.7 mil
- Orde 4 = 600k
- Orde 5 = 200k

number of cities

K=3 to K = 7

size of cities

⅓ of the size of higher hierarchy

Ideal 3 dan 4: Rank-size rule dan Zipf Law

Only the size of cities

Rank size

$$P_x = \frac{P_1}{x}$$

Zipf

$$P_n = \frac{P_1}{n^q}$$

Ranksize
(based on the largest size)

- Orde 1 = 16 mil
- Orde 2 = 8 mil
- Orde 3 = 5,3 mil
- Orde 4 = 4 mil
- Orde 5 = 3 mil
- Orde 6 = 2,6 mil
- Orde 7 = 2,2 mil
- Orde 8 = 2 mil
- Orde 9 = 1 mil

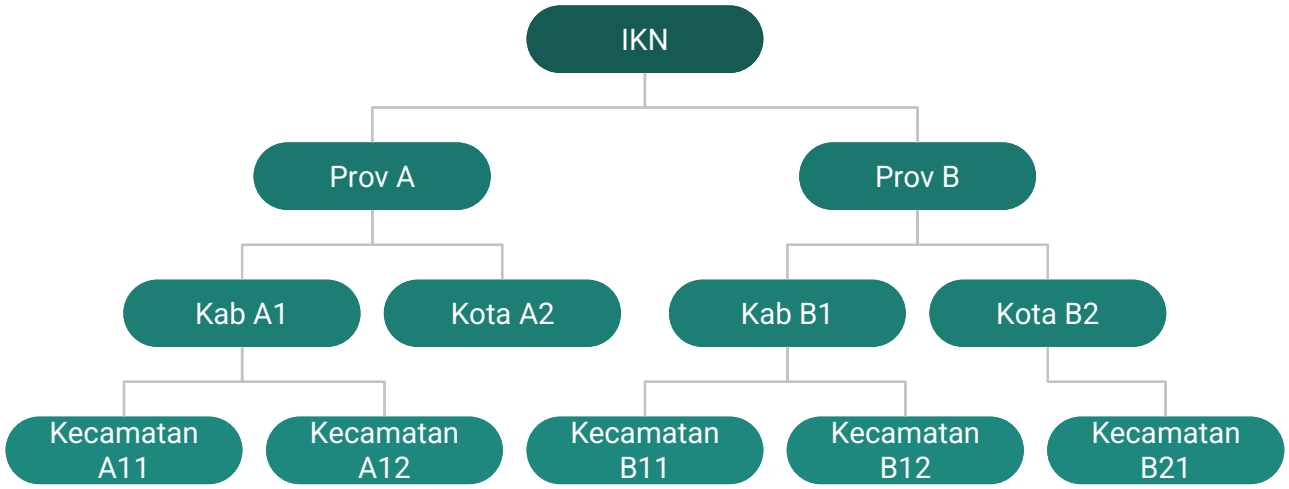
Zipf Law
Based on the largest and the smallest

- Orde 1 = 9,46 mil
- Orde 2 = (1,32 mil)
- Orde 3 = (420k)
- Orde 4 = (185k)
- Orde 5 = 100k

P = 9,46 mil
Orde 5 = 100k

100k = (9,46mil) / 5^q)
5^q = 94,6
q log 5 = log 96,4
q (0.699) = 1.984
q = 2.84

Empirik 1: Administratif



K = 7

- medium sized cities (orde 4) = 59
- orde 3 = 10 max
- orde 2 = 2 max
- orde 1 = 1 max

Orde 1: Capital City, 1 (2)

Orde 2: Capital of Provinces, 34 (280an)

Orde 3: Capital of District dan City, 514 (1400an)

Orde 4: SubDistrict, 7230

Empirik 2: Urban Size

Order	Size	Number of cities
Orde 1 (megapolitan)	> 5 mil	5
Orde 2 (metropolitan)	1 mil - 5 mil	4
Orde 3 (kota besar)	100k - 1 mil	xx
Orde 4 (kota sedang)	50k - 100k	2xx?
Orde 5 (kota kecil)	20k - 50k	3xx?

No	Urban Centers	2019 pop
1	MUR Jakarta	16 juta
2	MUR Surabaya	10 juta
3	MUR Medan	6.7 juta
4	Bandung Urban Area	8.6 juta
5	Semarang Urban Area	6 juta
6	Yogyakarta Urban Area	3.7 juta
7	Denpasar Urban Area	4.3 juta
8	Palembang	1.8 juta
9	Makassar	1.5 juta
10	Balikpapan	0.8 juta
11	Kupang	0.5 juta
12	Manado	0.6 juta
13	Jayapura	0.4 juta
14	Surakarta Urban Area	0.8 juta

Coba kita bandingkan.

	Data	Christaller from smallest	Christaller from largest	Rank-size rule	Zipf Law
Orde I	16 juta	8,1 juta	16 juta	16 juta	16 juta
Orde II	(5 juta)	2,7 juta	5,3 juta	8 juta	1,8 juta
Orde III	(1 juta)	900 ribu	1,7 juta	5,3 juta	500 ribu
Orde IV	(500ribu)	300 ribu	600 ribu	4 juta	200 ribu
Orde V	100ribu	100 ribu	200 ribu	3,2 juta	100 ribu

Bagaimana jika
penduduknya banyak tapi tidak memerankan banyak fungsi?

Pertemuan 7.
Indeks Sentralitas dan Primasi

“Mari mencoba. Bandingkan empirik dengan hirarki ideal.”

File dikirim ke WAG.

Kerjakan dalam kelompok tugas.