



# Future Directions in Buildings Strategic Asset Management Plan and Master Planning at ECU

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Presentation by:

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jcy

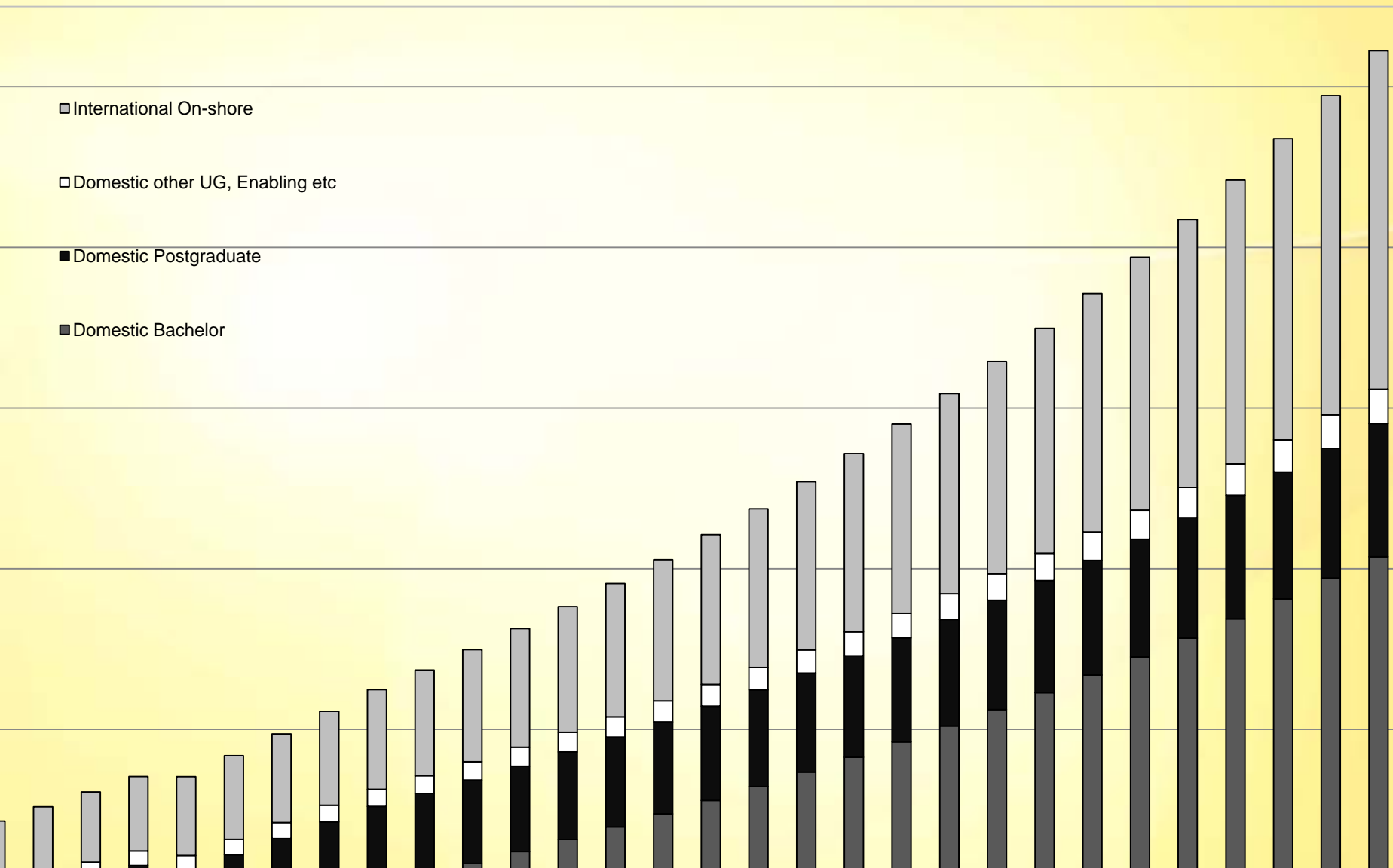


University has concluded campus consolidation and plan for appropriate space to meet the growth teaching and research on its three Campuses.

Strategic Asset Management Framework (SAMF) has developed and the Facilities and Services Centre is working to improve space planning tools and processes.

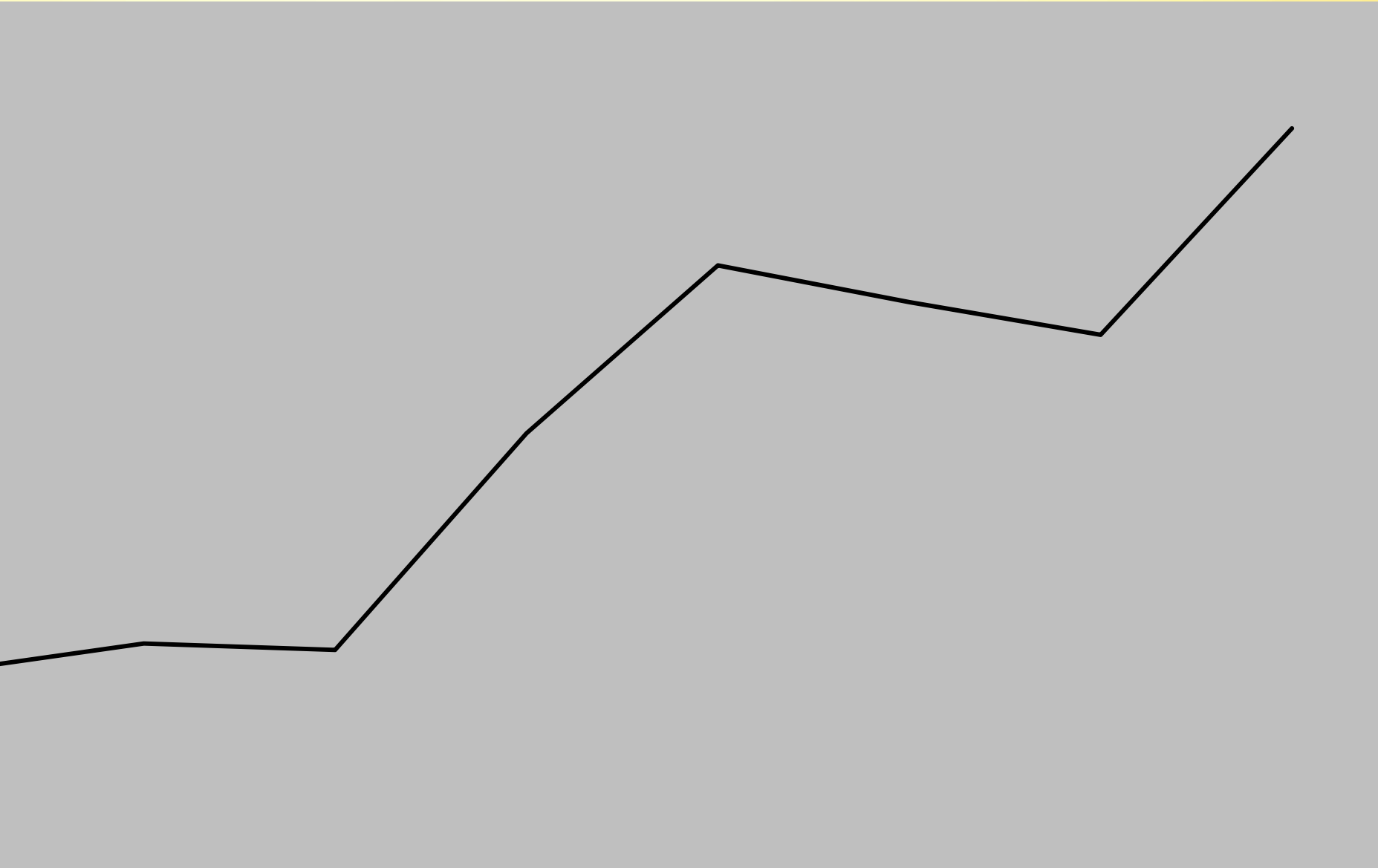
Needs set out in the 2010 – 2030 Buildings Asset Management Plan the Campus Master Plans are being reviewed.

# ers – Potential Student Growth



# ers – Research Income

Figure Two - Total Research Income (\$)



# Space Benchmarks and Modelling

	2009				2014		
	EFTSL	ECU BM	ECU BM UFA	Actual UFA	EFTSL	ECU BM UFA	UFA variance
	14,354	47%	57,239	58,584	18,770	77,941	19,357
ative		14%	17,050	16,975		23,217	6,242
pled		10%	12,179	12,730		16,583	3,853
		9%	10,961	9,077		14,925	5,848
f		6%	7,307	7,732		9,950	2,218
		8%	9,743	5,162		13,267	8,104
		6%	7,307	1,173		9,950	8,777
AREA			121,785	111,433		165,833	54,400
REA	14,354		194,857	209,607	18,770	265,332	87,040

burbs Legal Centre

t, Lincoln Lane and Joondalup House

# y Drivers

## Initiatives

ty Hall

rcial Development (existing Call Centre)

s Incubator

er Clinic

## sation

o grow through improved use of the asset via timetabling

## tability

l of teaching and research spaces

## ndition

l of transportable buildings due to limited life

on and replacement of unsustainable buildings e.g. ML B 7, 14, 12,

# Term Plan (Next Five Years)

## Construction

Engineering and Technology Building \$40M

Up Sports and Fitness Centre \$7.5M

Infrastructure \$5.0M

Renewal (\$2M-\$3M annual program)

Improvement and Maintenance Program (currently \$5M in deferred maintenance)

## Planned

Up Campus additional space to accommodate growth for teaching, research and student support administration

Lawley Campus additional space to accommodate growth for teaching, research and student support administration

# and Long Term Plans

nned

up Campus additional space to accommodate growth for teaching,  
n and administration

awley Campus Visual and Performing Arts Centre to accommodate  
or teaching, research and administration in these fields and replace  
inable buildings

up Campus University Hall to accommodate graduations,  
ations and conferences

own centre campus at St Andrews



## Additional Properties Leased (Costs of \$400,000/year)

- Joondalup for Engineering and Psychology
- Mount Lawley with Education Department (Sports Centre and two tier car park)
- Margaret River Education Campus

## Leased Out Property (Income of \$1.3m/year)

- Joondalup Call Centre
- Cafes
- Services
- Telecommunication Towers

## Masterplanning Principles

- Appropriate entry points and a site address for each campus to facilitate easy community access
  - Identifying a site structure for each campus incorporating locations for organisational units, green and other spaces
  - Managing vehicular access and circulation
- Developing car parking facilities based on the numbers of staff and students and relevant statutory requirements
  - Providing for safe and secure pedestrian movement
- Appropriate siting and orientation of buildings
- Strategies for the management of open space including hard and soft landscape treatments
  - Provision of appropriate signage
  - Provision for services including service corridors

## Key Principles of how Masterplan is used

- Live Document
- Always Current
- Accessible from anywhere
  - Portal to the big picture
- Relevant to diverse stakeholders

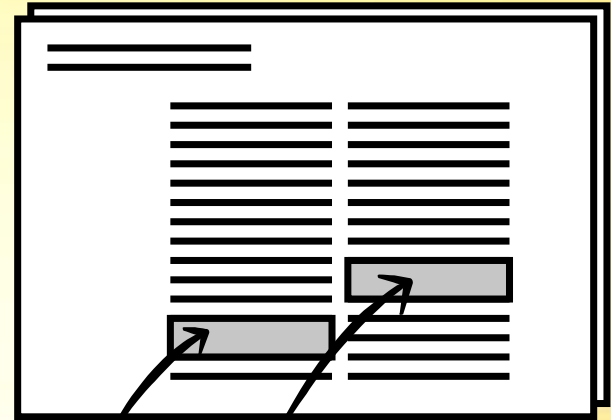
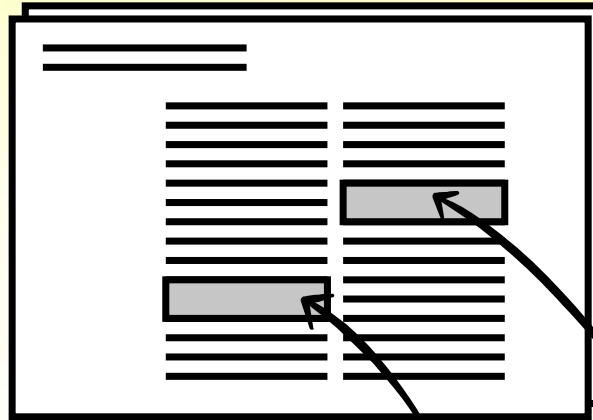
## ECU MASTERPLAN APPLICATION

3 Campuses 1 University

- **Joondalup** Precincts, Growth, City Campus
- **Mt Lawley** Consolidation, demolish underused buildings, increase density, urban laneway campus

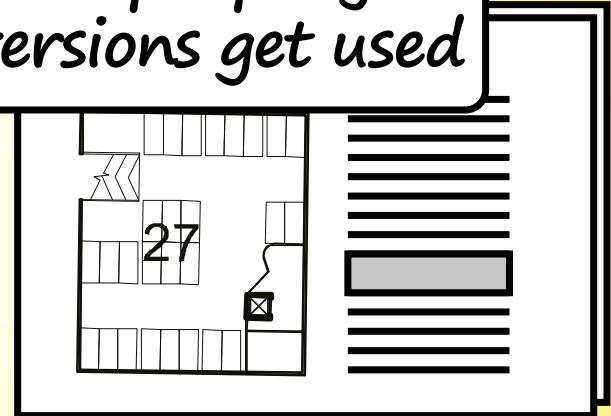
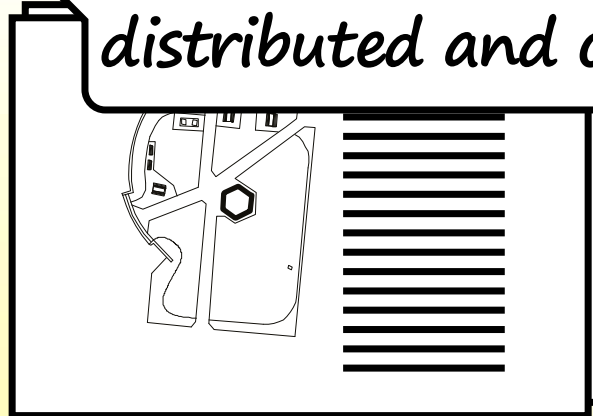
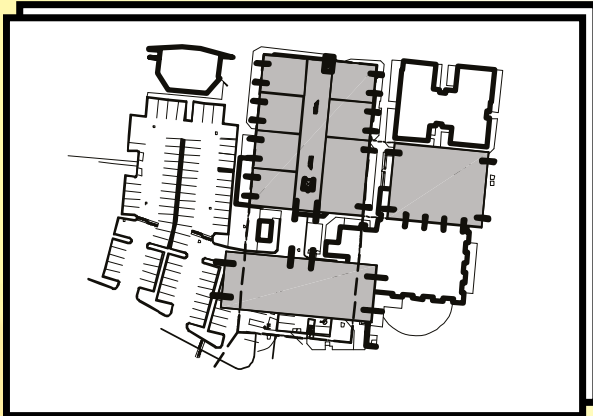


*Date Done  
(Static)*

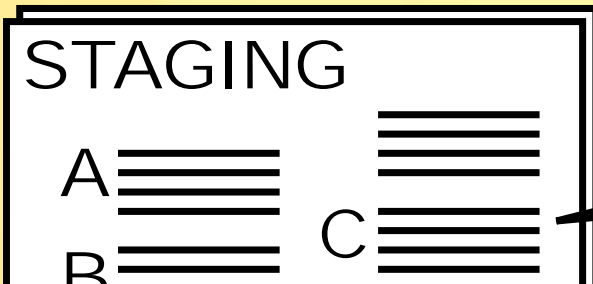


*in many pages, few facts and pertinent points*

*Versions revised but not properly distributed and old versions get used*



*Many individual drawings describing the project in individual ways*

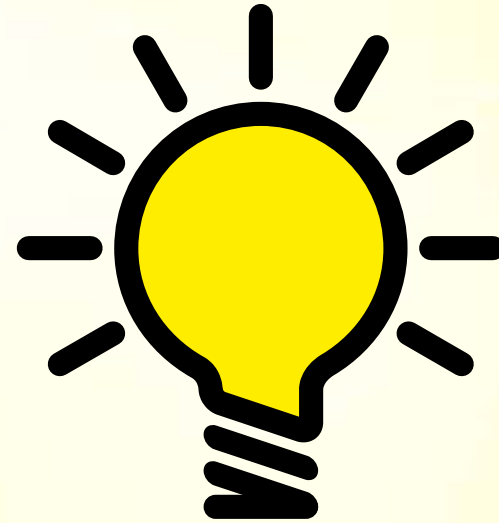


*What if we do 'C' first???*  
*Document becomes out of date*

picture says a thousand words'



Not a 'Report'



But a layering or web of visual information  
Held in a central interactive environment

Websites

Graphs & Diagrams

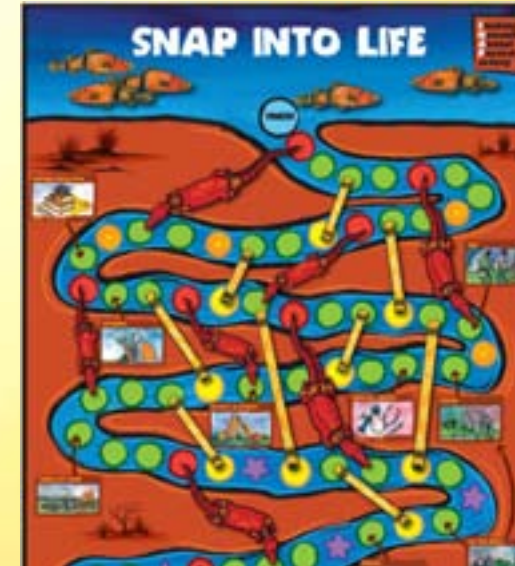
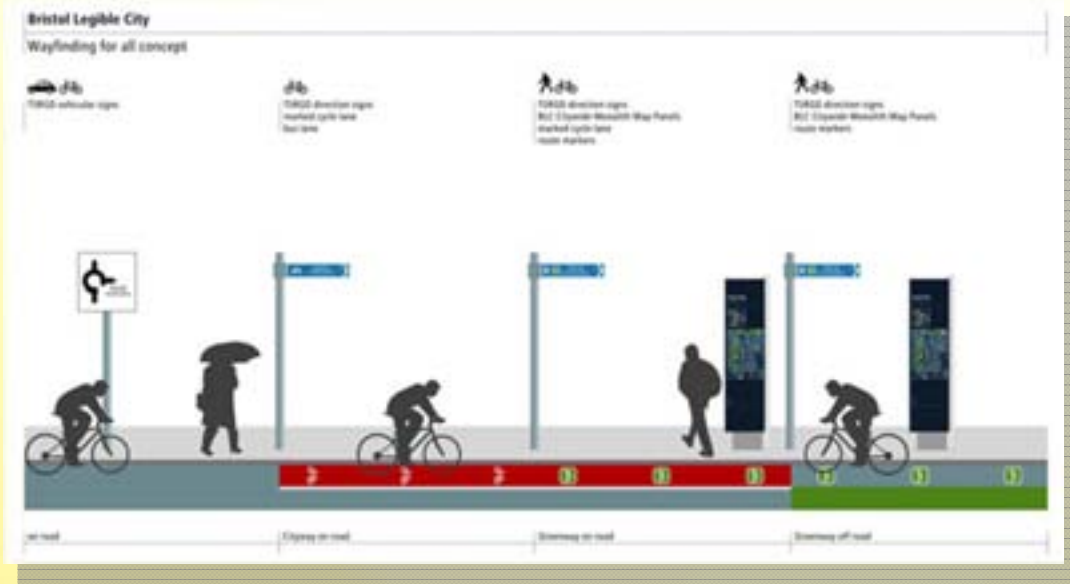
Publications




Advertising

Signage

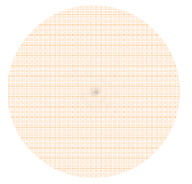
Puzzles

Games

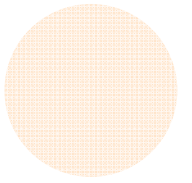


 **CNT**  **OIL**  **DRY**  
 15 7 22  
 ation (m) 103

815,089

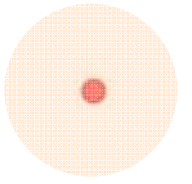


6.7%



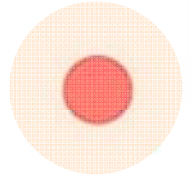
habitants

4

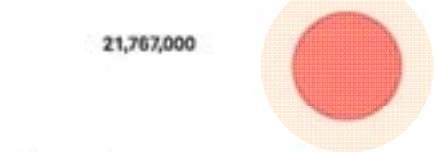


**Climate**  
 Average January temperature (°C)  
 Average July temperature (°C)  
 weatherbase.com

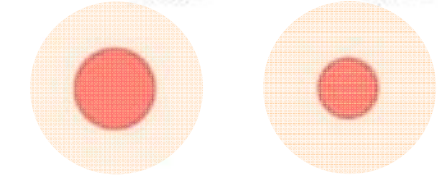
1.1  
18.3



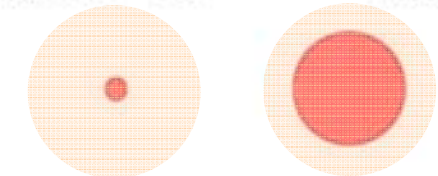
MET 3 CNT 13 OIL 6 DRY 21 PAX 22+23 CRG 11+20 MOV 20 TEL 1



**Development**
  
 1965 2003
   
 Population 16,325,000 21,767,000
   
 Urban core 8,085,000 8,086,000
   
 Urban core % 49.5% 37.1%
   
 Urban periphery 8,240,000 13,681,000
   
 Urban periphery % 50.5% 62.9%



Metr. Area 11,518 100%
   
 CBD 28.2 0.2%
   
 Employment/km² 812 113,200
   
 Average July commuting time (minutes) 35



Population/km² 19,173
   
 Population per capita (k) 35,044
   
 Population per capita % 5.3%



Population 4,032



**Metropolitan density**
  
 Inhabitants 20,270,000
   
 Built-up area (km²) 11,518
   
 Population density (inhabitants/km²) 1,760
   
 demographia.com, 2000



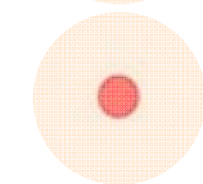
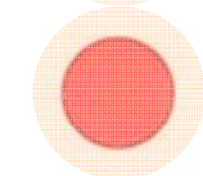
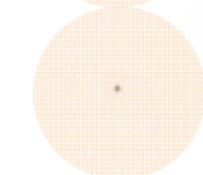
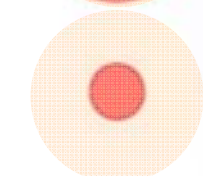
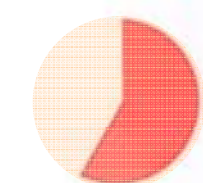
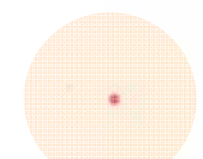
**Traffic and transport**
  
 Public transport market share 9.8%
   
 Private vehicle market share 90.2%
   
 Average commuting time (minutes) 35
   
 publicpurpose.com, 1990, bestplaces.net, 1998

**Road use**
  
 Average road speed (km/hour) 38.3
   
 Vehicle density (vehicle km/km²) 47,703
   
 publicpurpose.com, 1990

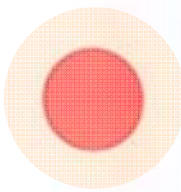
**Railway use**
  
 Passenger density (passenger km/km) 44,805
   
 Rail vehicle density (vehicle km/km²) 238,081
   
 publicpurpose.com, 1990

**Climate**
  
 Average January temperature (°C) -3.3
   
 Average July temperature (°C) 29.4
   
 weatherbase.com

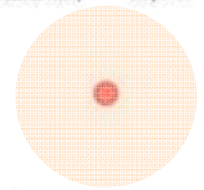
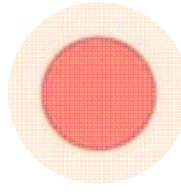
**Pollution**
  
 NOx (tonnes/km²) 40.9
   
 CO (tonnes/km²) 359.5
   
 VOC (tonnes/km²) 39.4
   
 Total pollution (tonnes/km²) 439.8
   
 demographia.com, 1990



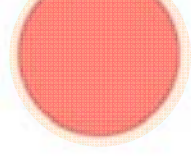
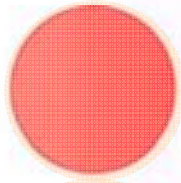
CRG 15+26 TEL 16  
 Metropolitan density  
 Inhabitants 19,920,000  
 Built-up area (km<sup>2</sup>) 1,191  
 Population density (inhabitants/km<sup>2</sup>) 16,725  
 demographia.com, 2000



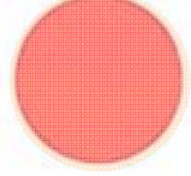
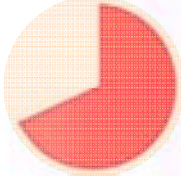
Residential density  
 Year 1985  
 Inhabitants 13,665,000  
 Residential area (km<sup>2</sup>) 885  
 Residential density (inhabitants/km<sup>2</sup>) 15,441  
 demographia.com



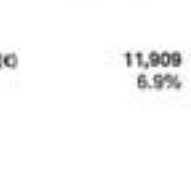
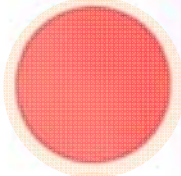
Change in density (1970-1990)  
 Change in inhabitants 2,540,000  
 Change in area (km<sup>2</sup>) 88  
 Change in density (inhabitants/km<sup>2</sup>) 28,749  
 demographia.com



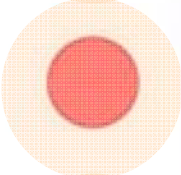
Traffic and transport  
 Public transport market share 47.8%  
 Private vehicle market share 52.2%  
 Average commuting time (minutes) 41  
 publicpurpose.com, 1990



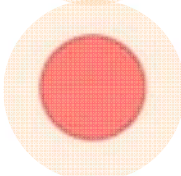
Road use  
 Average road speed (km/hour) 24.0  
 Vehicle density (vehicle km/km<sup>2</sup>) 141,864  
 publicpurpose.com, 1990



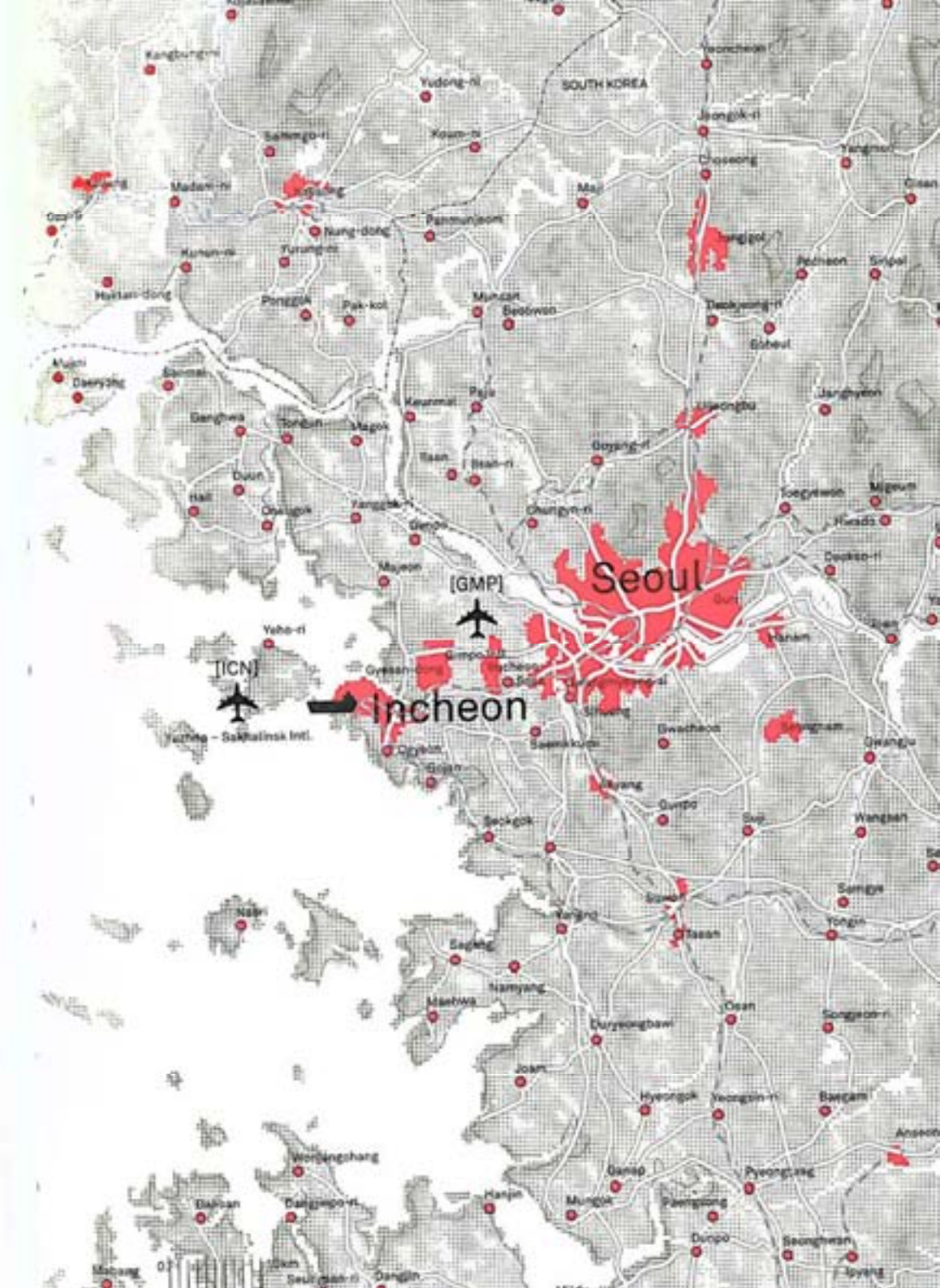
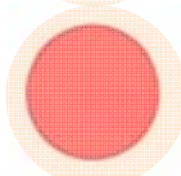
Railway use  
 Passenger density (passenger km/km) 134,190  
 Rail vehicle density (vehicle km/km<sup>2</sup>) 4,490,766  
 publicpurpose.com, 1990



Climate  
 Average January temperature (°C) -6.1  
 Average July temperature (°C) 27.8  
 weatherbase.com



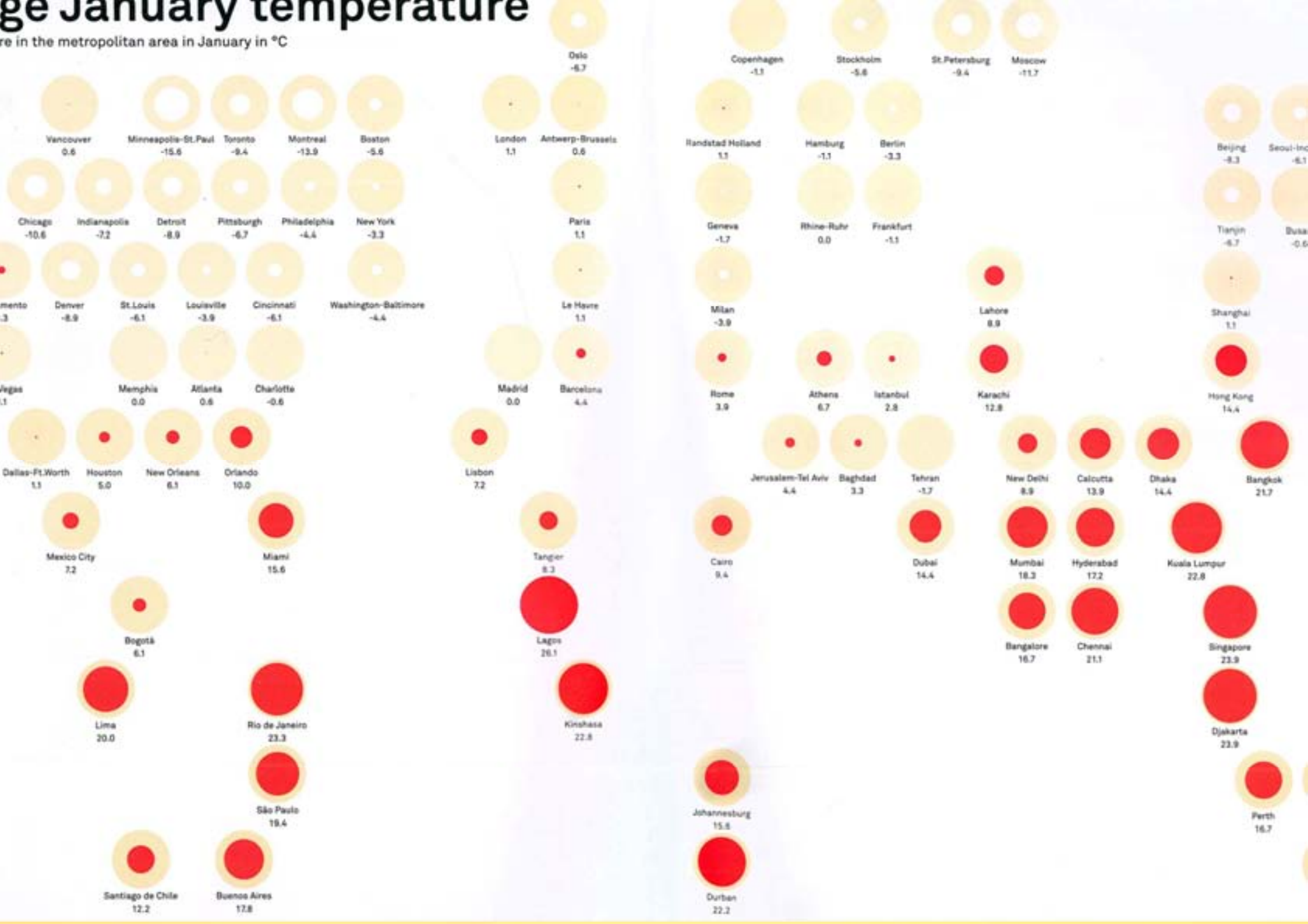
Pollution  
 NOx (tonnes/km<sup>2</sup>) 300.0  
 CO (tonnes/km<sup>2</sup>) 971.0  
 VOC (tonnes/km<sup>2</sup>) 121.2  
 Total pollution (tonnes/km<sup>2</sup>) 1,392.3  
 demographia.com, 1990

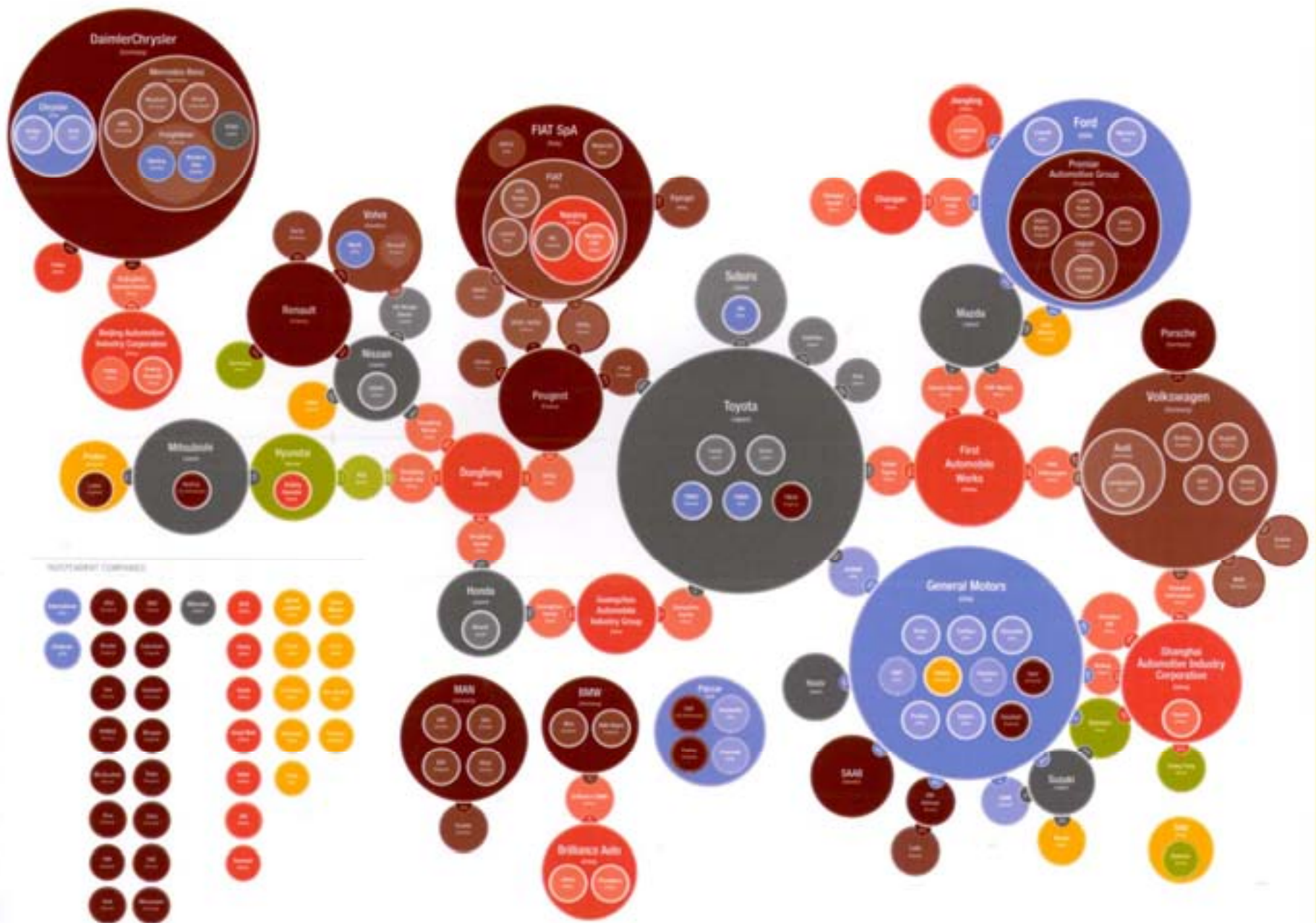




# January temperature

Temperature in the metropolitan area in January in °C





## World Auto Industry

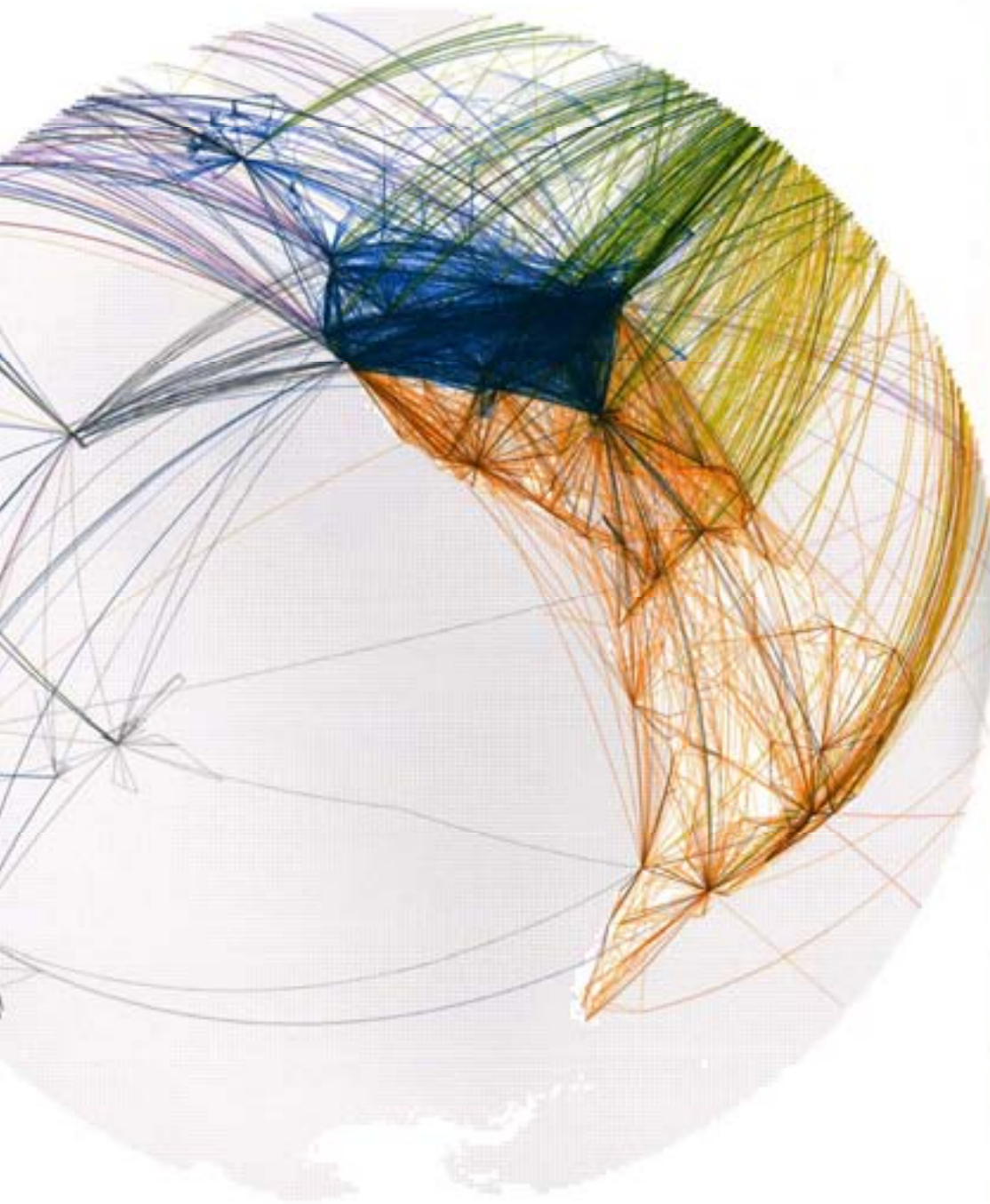


Source: Statista, based on data from the International Council on Automotive Industry (ICV) and the International Council on Heavy Vehicle Industry (ICVH), 2017.





Travel is one of the  
...ion, bringing cities into  
...e same time, highlight  
... them.





liters of water for one bushel (25.4 kg) of Corn

It takes about 100 gallons of water to produce one bushel of corn. This is because corn is a thirsty crop that needs a lot of water to grow. The amount of water needed depends on the weather and the soil conditions.



**500**

liters of water for one pound (454 g) of Wheat

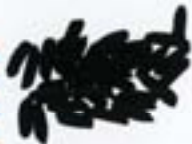
Wheat is a thirsty crop that needs a lot of water to grow. The amount of water needed depends on the weather and the soil conditions. It takes about 500 gallons of water to produce one bushel of wheat.



**1700**

liters of water for one package (200 g) of Rice

Rice is a thirsty crop that needs a lot of water to grow. The amount of water needed depends on the weather and the soil conditions. It takes about 1700 gallons of water to produce one package of rice.



**900**

liters of water for one pound (454 g) of Soybeans

Soybeans are a thirsty crop that needs a lot of water to grow. The amount of water needed depends on the weather and the soil conditions. It takes about 900 gallons of water to produce one pound of soybeans.



**70**

liters of water for one single (100 g) Apple

Apples are a thirsty crop that needs a lot of water to grow. The amount of water needed depends on the weather and the soil conditions. It takes about 70 gallons of water to produce one apple.



**50**

liters of water for one single (100 g) Orange

Oranges are a thirsty crop that needs a lot of water to grow. The amount of water needed depends on the weather and the soil conditions. It takes about 50 gallons of water to produce one orange.



**250**



liters of water for one big piece (100 g) of Cheese

It takes about 650 gallons of water to produce one big piece of cheese. This is because cheese is made from milk, which is a thirsty product. The amount of water needed depends on the type of cheese and the production process.



**650**

liters of water for one package (100 g) of Toast

Toast is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of bread and the toasting process. It takes about 650 gallons of water to produce one package of toast.



**90**

liters of water for one pot (200 ml) of Tea

Tea is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of tea and the brewing process. It takes about 90 gallons of water to produce one pot of tea.



**840**

liters of water for one pot (200 ml) of Coffee

Coffee is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of coffee and the brewing process. It takes about 840 gallons of water to produce one pot of coffee.



**720**

liters of water for one bottle (750 ml) of Wine

Wine is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of wine and the production process. It takes about 720 gallons of water to produce one bottle of wine.



**150**

liters of water for one bottle (330 ml) of Beer

Beer is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of beer and the production process. It takes about 150 gallons of water to produce one bottle of beer.



**4500**

liters of water for one stick (100 g) of Beef

Beef is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of beef and the production process. It takes about 4500 gallons of water to produce one stick of beef.



**1200**

liters of water for one stick (100 g) of Goatmeat

Goatmeat is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of goatmeat and the production process. It takes about 1200 gallons of water to produce one stick of goatmeat.



**1440**

liters of water for one stick (100 g) of Pork

Pork is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of pork and the production process. It takes about 1440 gallons of water to produce one stick of pork.



**1830**

liters of water for one stick (100 g) of Sheepmeat

Sheepmeat is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of sheepmeat and the production process. It takes about 1830 gallons of water to produce one stick of sheepmeat.



**1170**

liters of water for one bird (100 g) of Chicken

Chicken is a thirsty product that needs a lot of water to produce. The amount of water needed depends on the type of chicken and the production process. It takes about 1170 gallons of water to produce one bird of chicken.



**20**

# 29%

of the population was employed in manufacturing in 1964

# 20%

of the population was employed in manufacturing in 1980

# 4%

of the population was employed in manufacturing in 2005

## 93%

jobs in the service sector

## 55%

of New Yorkers use public transport to get to work

## \$1.3m

for average Manhattan apartment

## \$225,000

for a Manhattan parking space

## 24,000

people/km<sup>2</sup> is the average density in Manhattan

## 830km<sup>2</sup>

area of NYC

## 27,070km<sup>2</sup>

area of the Metropolitan region

## 33%

of homes are owner occupied

## 43m

visitors in 2005

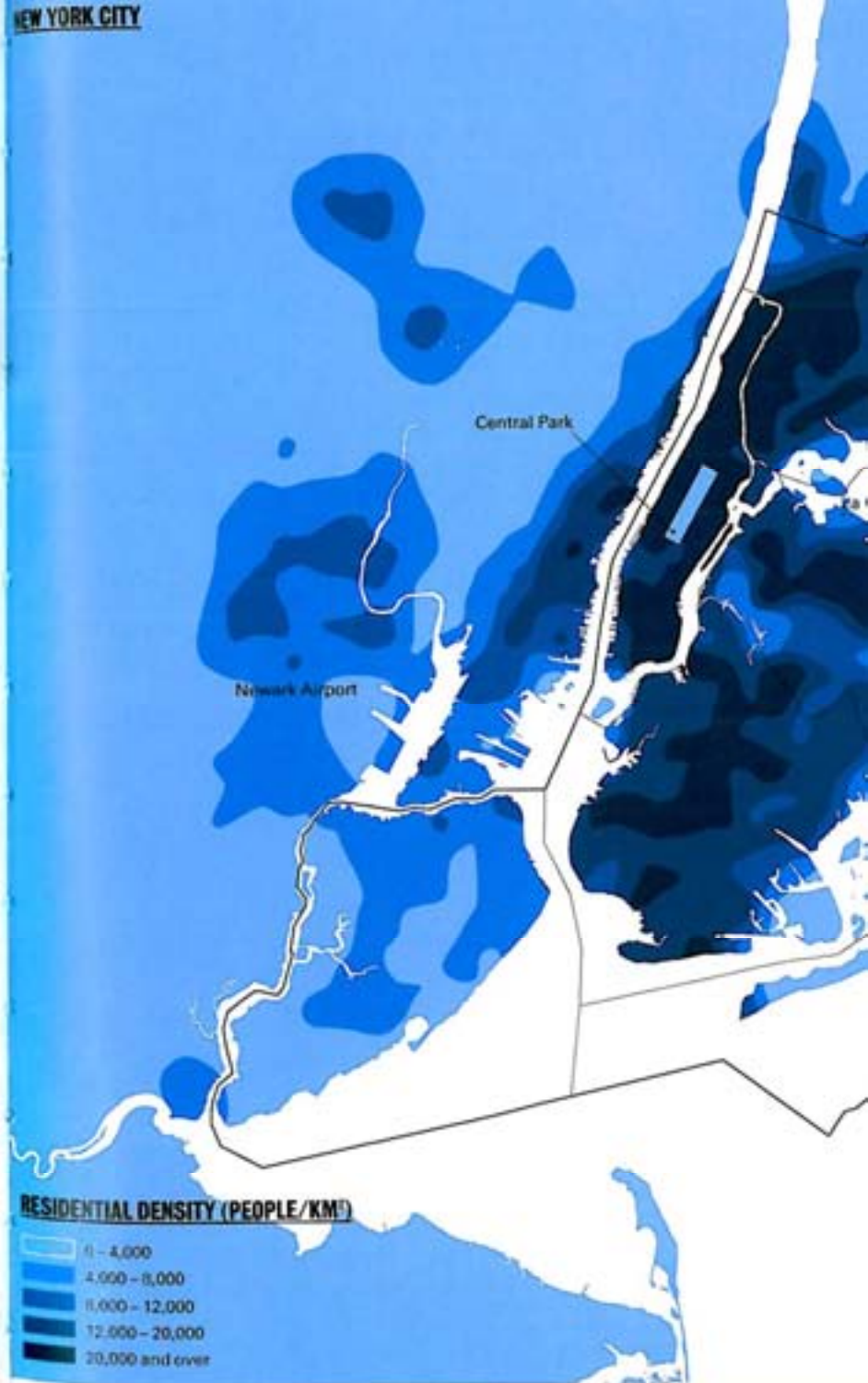
## \$23bn

spent by visitors in 2005

## 14%

green, open space

NEW YORK CITY



# 0.4m

people lived in the Metropolitan zone in 1900

# 3.1m

people lived in the Metropolitan zone in 1950

# 19m

people lived in the Metropolitan zone in 2000

**7.5%**  
land used for recreation in the Metropolitan zone

---

**3.7**

average number of people living in a household

**25,000**

informal street vendors

**5,877**

people/km<sup>2</sup> is the average residential density of the Federal District

**200km**

length of underground system, compared to

**408km**

in London

**76%**

owner-occupied housing in the Federal District

**1,484 km<sup>2</sup>**

area of the Federal District

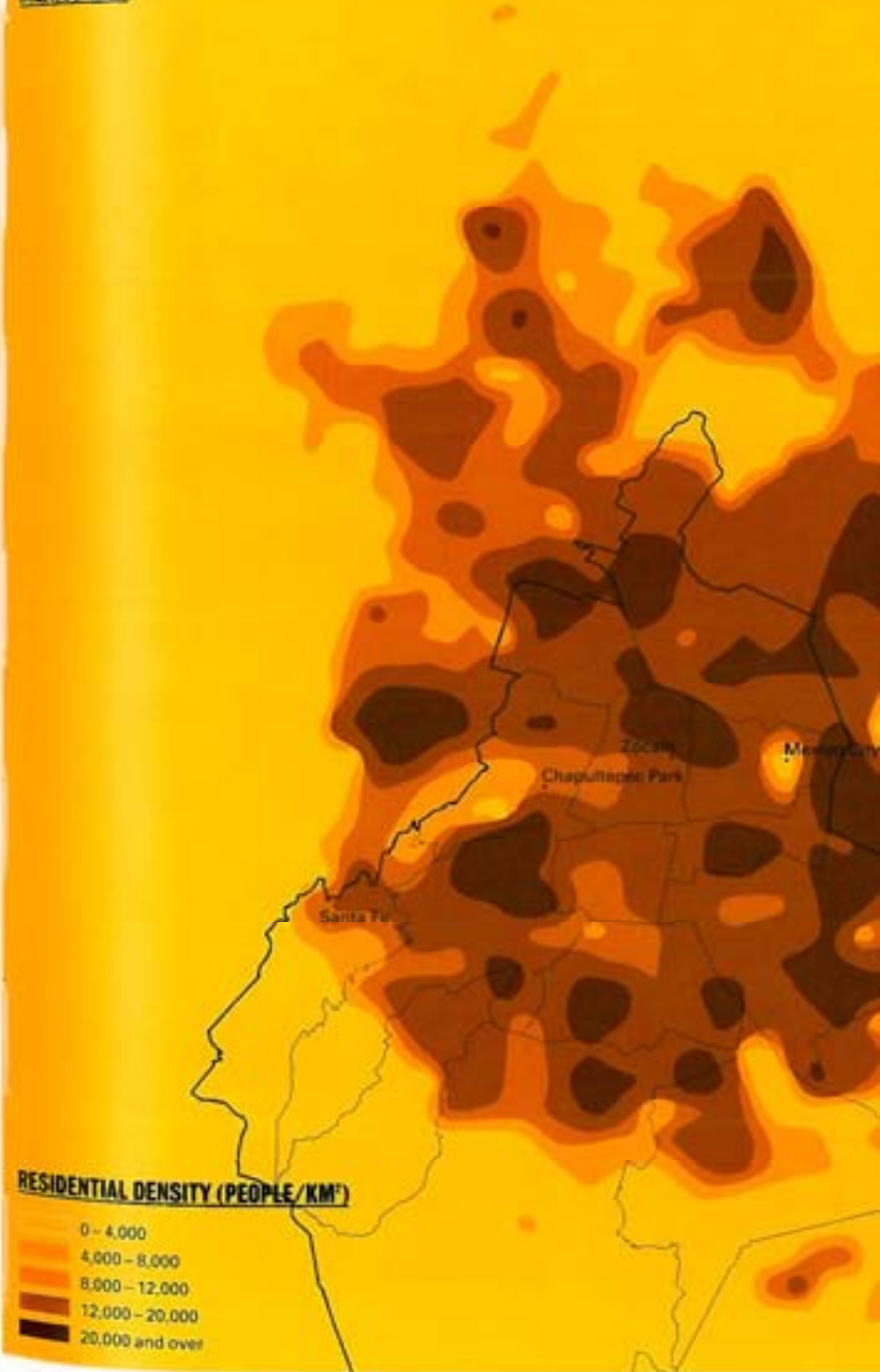
**4,979km<sup>2</sup>**

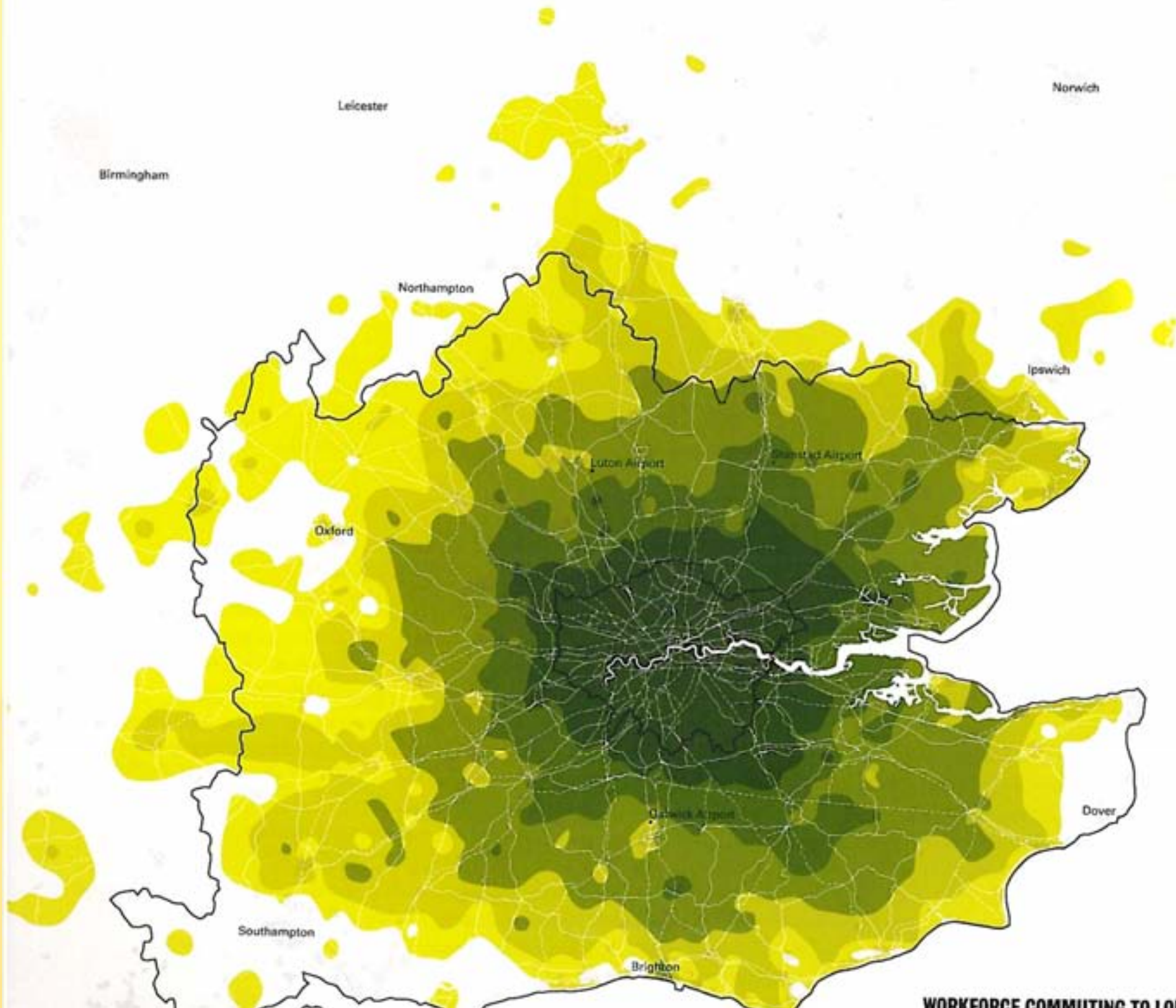
area of the Metropolitan zone

**22%**

of Mexico's GDP is contributed by Mexico City

MEXICO CITY





**WORKFORCE COMMITTING TO LONDON**



**CITY**

the physical structure  
economic lives of  
by this selection  
overview of the DNA  
By comparing the  
its average density  
energy each resident  
give an indication of  
entrated and how  
resources. The dramatic  
ic well-being, purchas-  
curity is captured by  
ribe variations in  
travel - reflecting  
in each city and its  
omy.

	POPULATION	DENSITY Average density people/km <sup>2</sup>	HOUSING Average rent per month in US\$	INCOME GDP per capita in US\$	WEALTH Working time required in minutes to buy 1 kg of bread	TRAVEL Average cost of public transport ticket in US\$	CRIME Murder rate per 100,000 inhabitants	ENERGY kWh per capita per annum	WATER Litres per ca per day
<b>NEW YORK CITY</b>	7,960,000	8,610	2,500	58,700	16	2.0	6.7	63,000	500
<b>SHANGHAI</b>	16,610,000	2,590	360	6,900	35	0.5	1.5	5,600	1,860
<b>LONDON</b>	7,540,000	4,800	2,390	38,400	9	2.7	2.1	20,500	160
<b>MEXICO CITY</b>	18,900,000	3,700	810	16,400	53	0.2	17.6	1,800	360
<b>JOHANNESBURG</b>	3,230,000	1,960	640	5,100	12	1.2	18.9	5,600	380
<b>BERLIN</b>	3,400,000	3,810	750	28,300	10	2.5	1.4	21,600	180



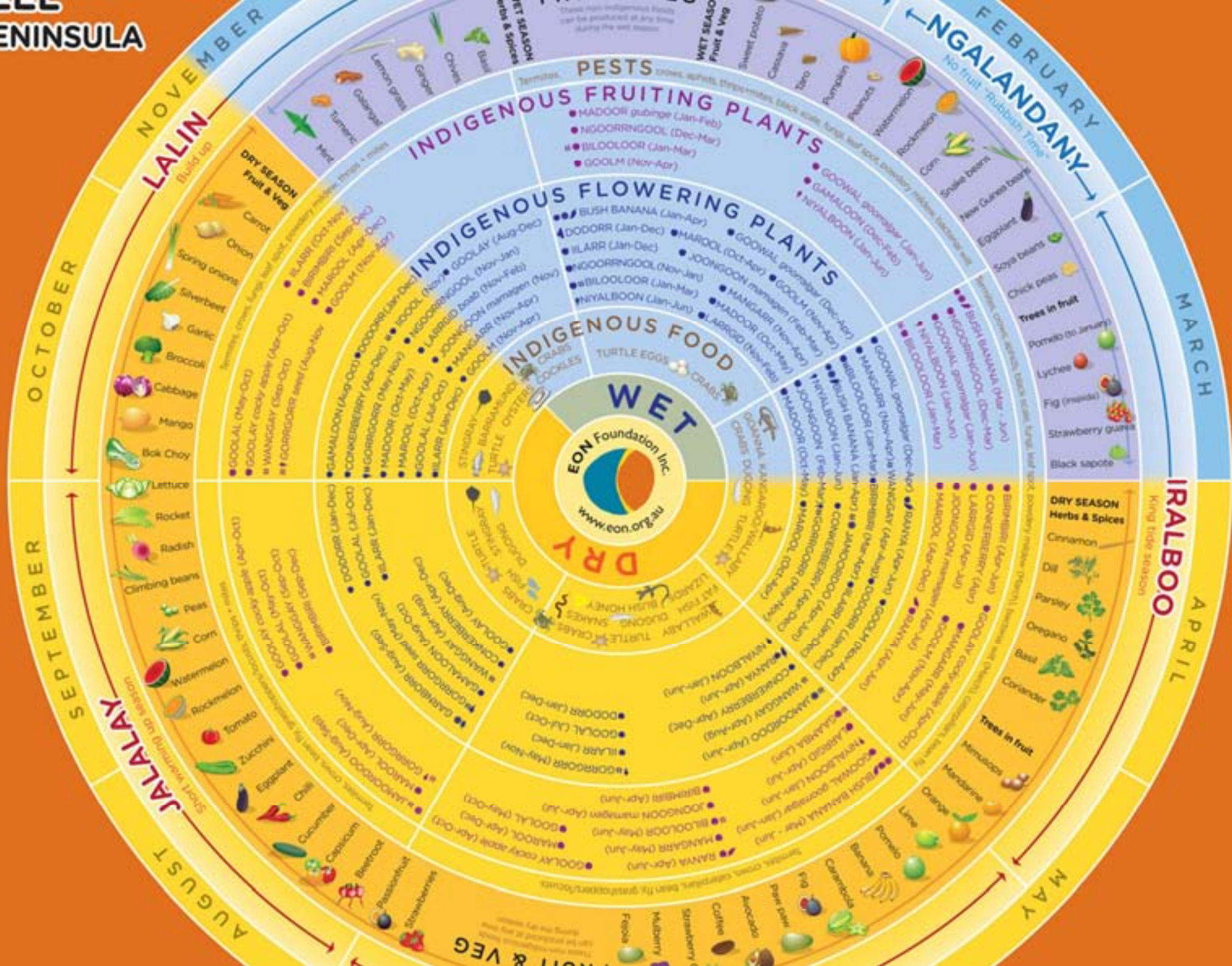


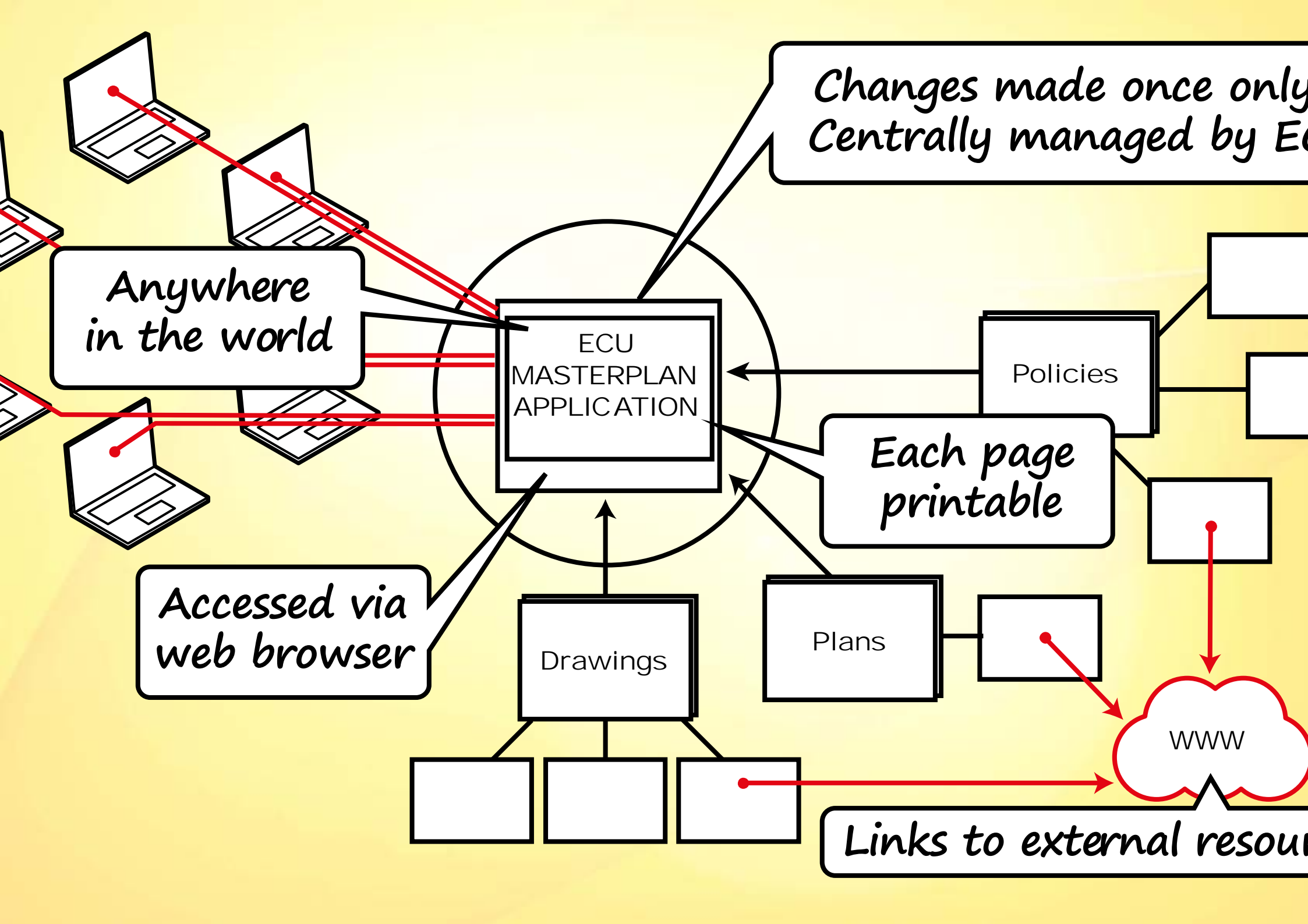
**REFERENCE**

DISTRICT RAILWAY	METROPOLITAN RLY
BAKERLOO LINE	METROPOLITAN RLY
PICCADILLY LINE	GREAT NORTHERN CITY SECTION
EDGWARE, HIGHGATE & MORDEN LINE	EAST LONDON RAILWAY
CENTRAL LONDON RLY	INTERCHANGE STATIONS
	UNDER CONSTRUCTION



WITELL  
EMPIER PENINSULA





# TERPLANNING DNA

## TURE





- Joondalup**
  - Planning of Precincts
  - Increased Development
- Mount Lawley**
  - Replacement of ineffective buildings
  - Higher Density
  - Urban campus feel (laneways etc).
- Southwest**
  - Growth within small land parcel
  - Conservation of greater bushland


USES

- Live – accessible from anywhere.

ndalup

- Quick to navigate and obtain information (Skip forward and demonstrate menu).
- Specific parts with it can be used independently, tailoring it to the particular audience (Get audience types fr




Masterplan Future

- Layered as opposed to linear (demonstrate legend, icons, cadastral, gfa overlays).
- Ability to view specific information in isolation, without clutter. 


precincts

Sustainability

Community


- Data revealed through graphics - clusters of icons creating the hearts of the precincts. 
- Ability to link to external websites. 
- Ability to link to external websites, pdf, google maps.
- Platform in place to use as a marketing tool, down the track you could provide this information via the web password protect certain areas, making it a versatile tool for both management and marketing purposes. 

Traces & Levels

- Value of displaying the masterplan in 3D 

Quick run thru

Staging

- Accessibility through to Staging, showing types of information. 
- Ability for ECU to update data, ensuring that it is always current.

up

- Proven to be very successful, in constant use by ECU staff, whether it be to present with or simply to refer to - that's testament to how easy it is as a presentation tool but also how quickly information can be obtained fr