

Public Transport and Parking Policy as the Main Pillars of Sustainable Transport Policy

Yoram Shiftan

Transportation Research Institute,
Technion - Israel Institute of Technology

Brno

May 2016

Policy Measures for sustainable transport development

- Improving accessibility of non auto modes – **public transportation**
- Auto restrain policies (parking restrictions, physical restrictions)
- Pricing and taxing
- Integrated planning of transport and land use (growth management)
- Organizational changes: Telecommute, working hours
- Information and education

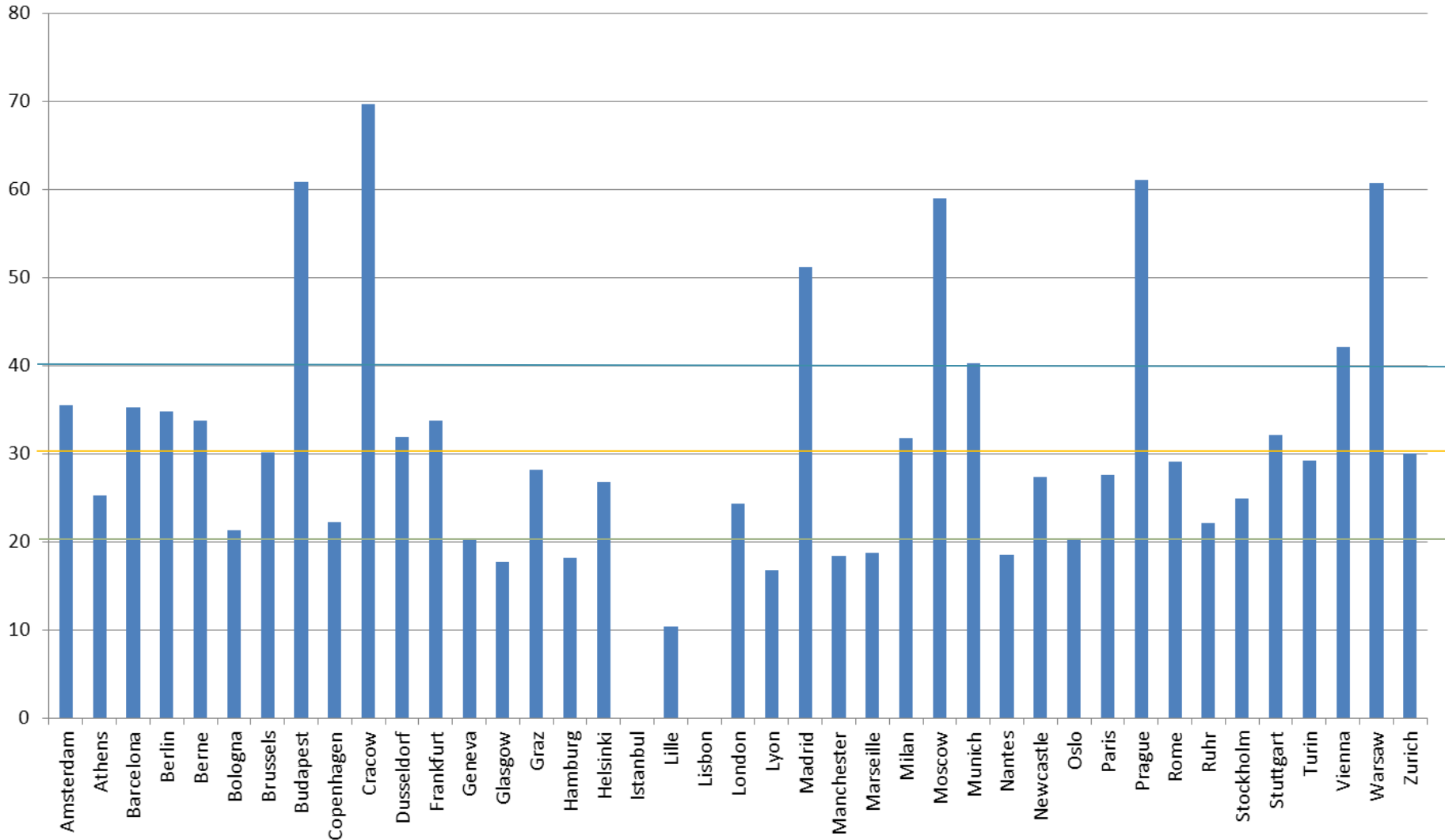
Sustainable transport implications on private car dependency

- The controversy is often presented as an economic vs. environmental consideration
- Market disruptions increase travelers' dependence on private cars:
 - Inconsideration on externalities in cost-benefit considerations
 - Under-pricing of road usage (users do not pay for the use)
 - Unique resource allocation for road development
 - Generous standards of level of service and parking
 - Covering travel and parking costs by employers
 - Company cars

RegionName ▾

Average of Percent PT trips of motorized trips

Percent PT trips of all motorized trips

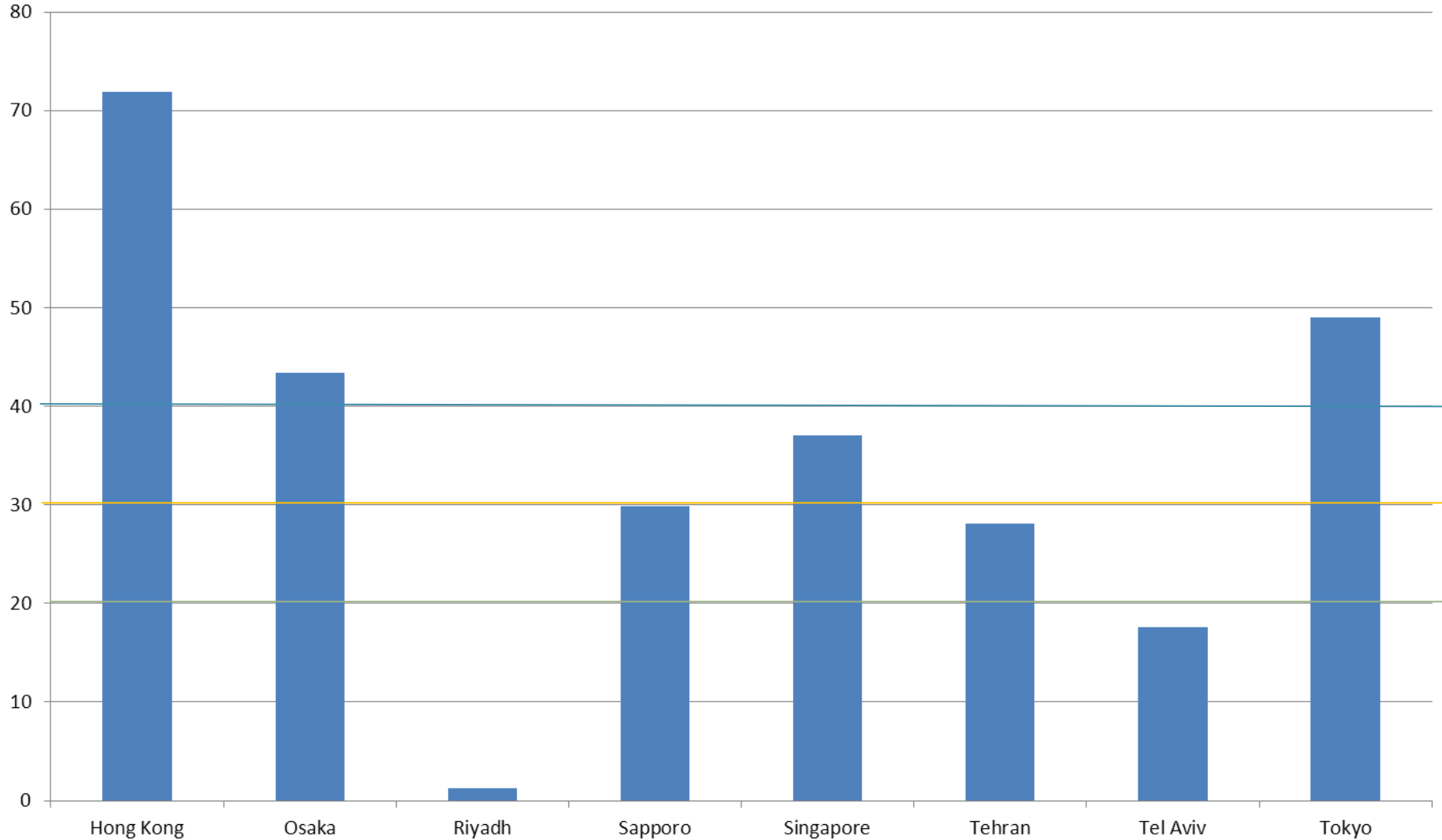


City ▾

RegionName

Average of Percent PT trips of motorized trips

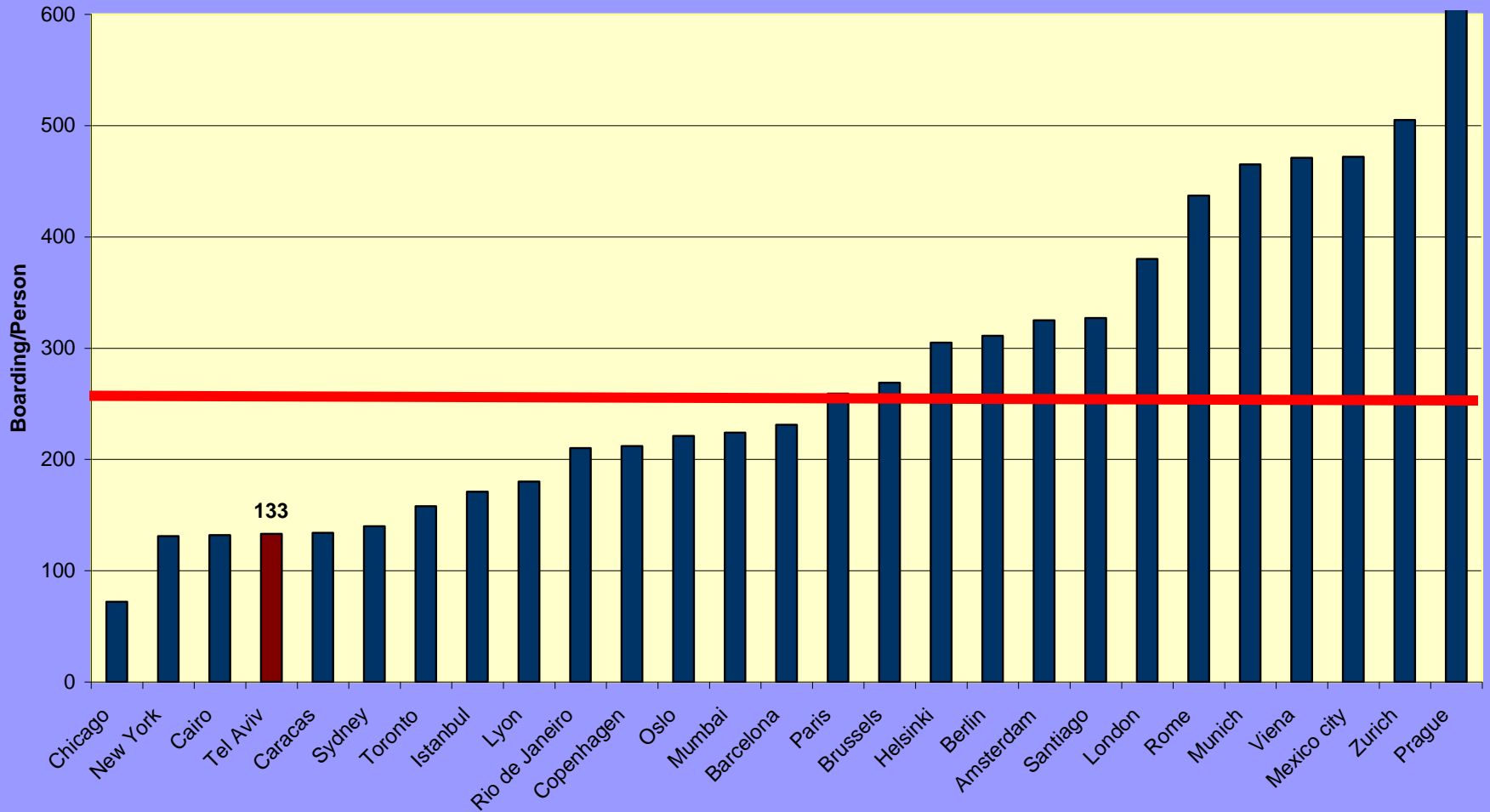
Percent PT trips of all motorized trips



City

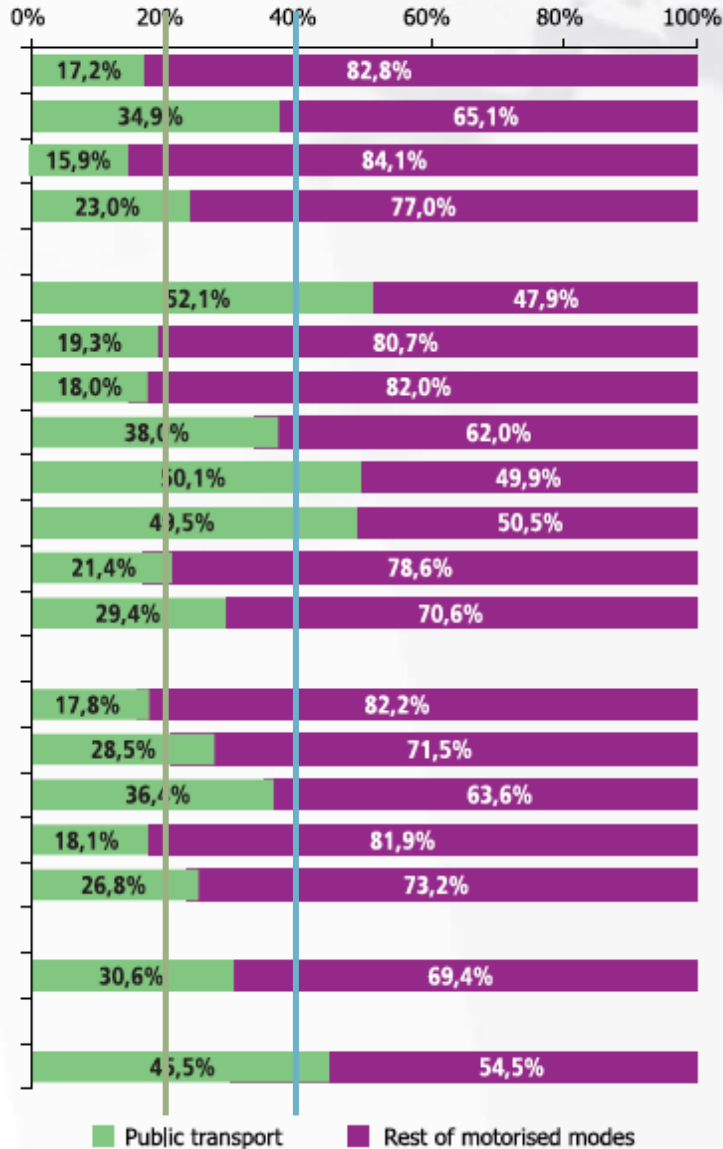
Annual PT Boarding per habitat

Total public transport boardings per capita

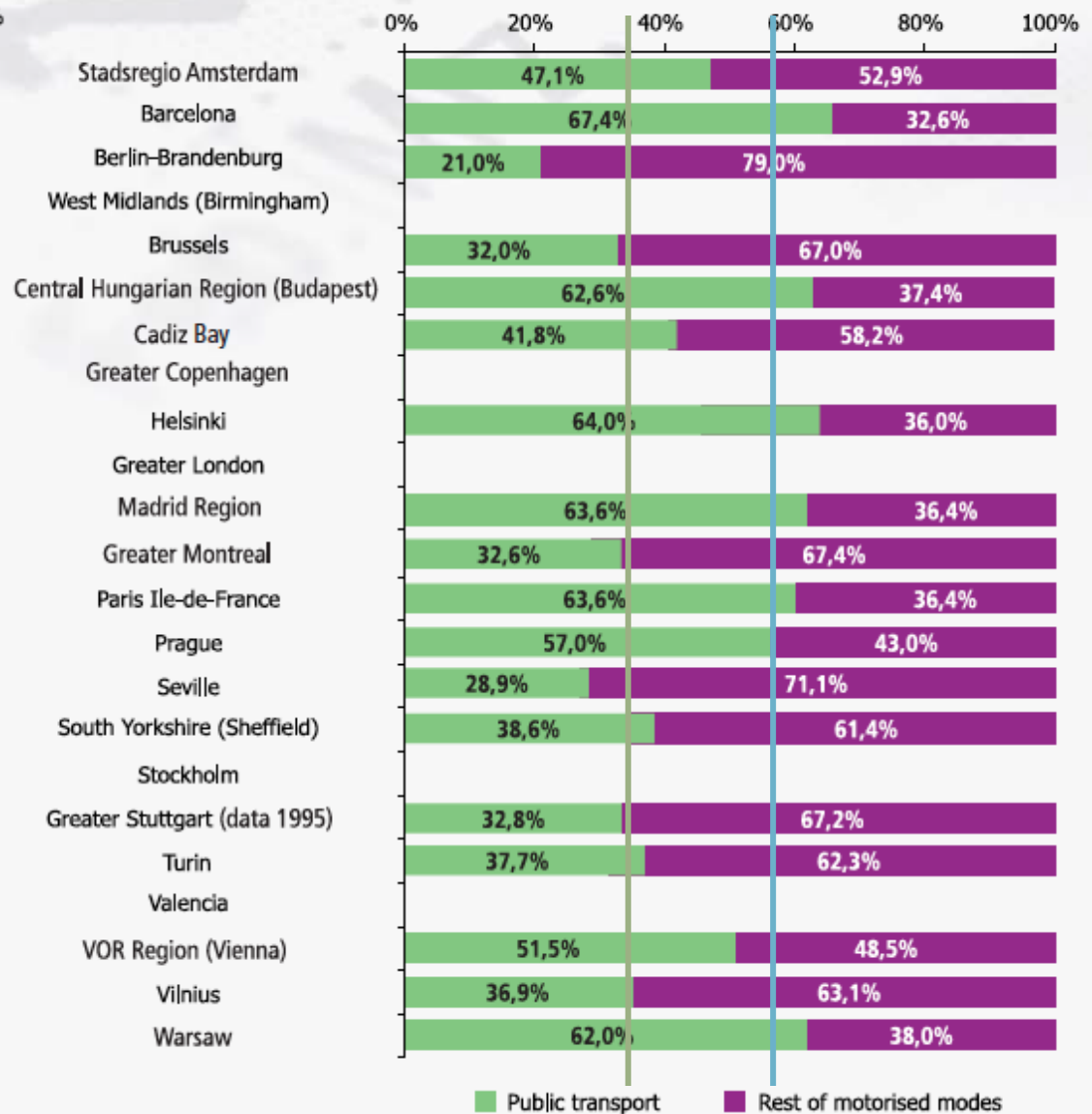


Modal share of motorized trips

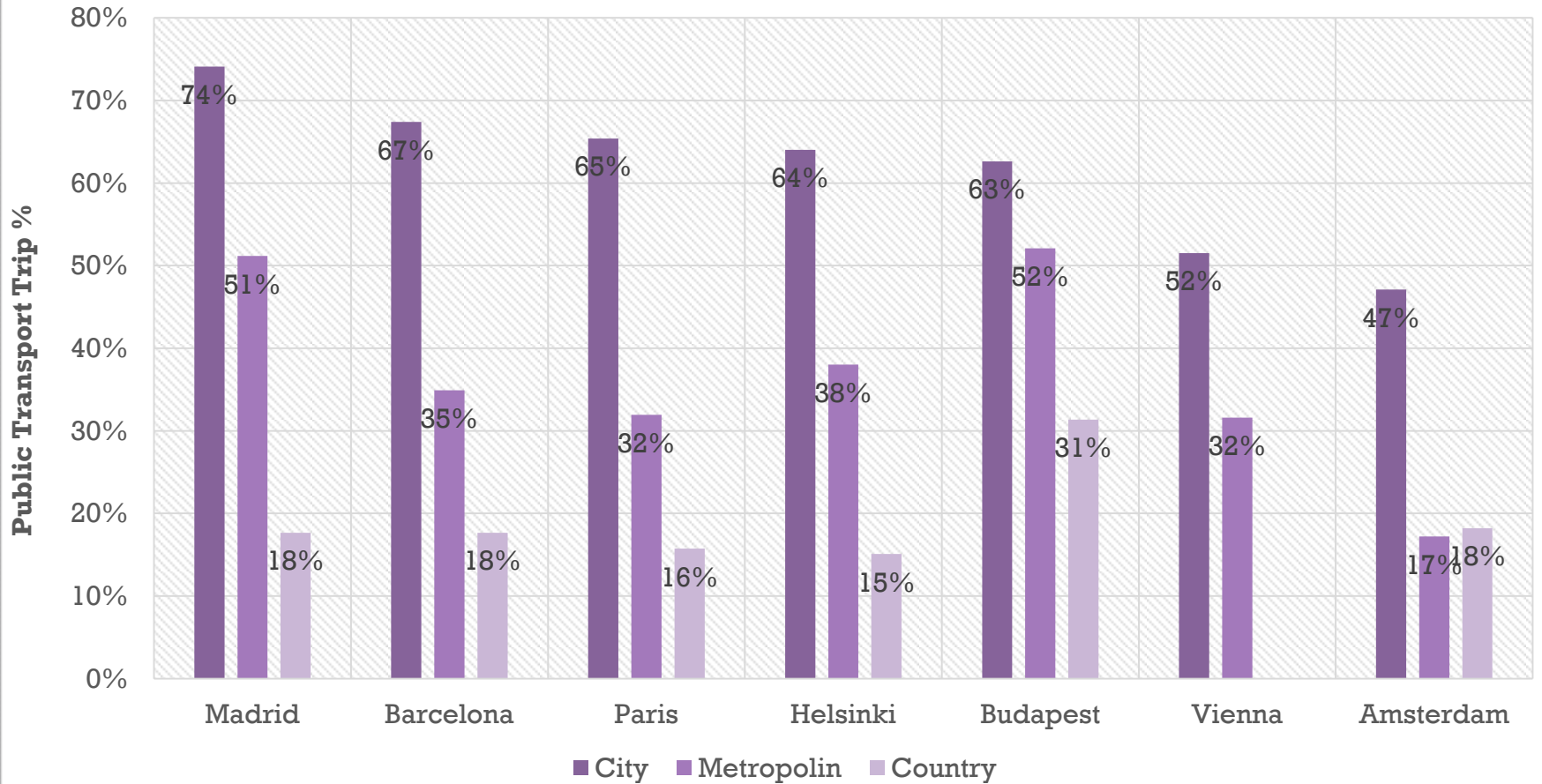
In whole metropolitan area



In main city

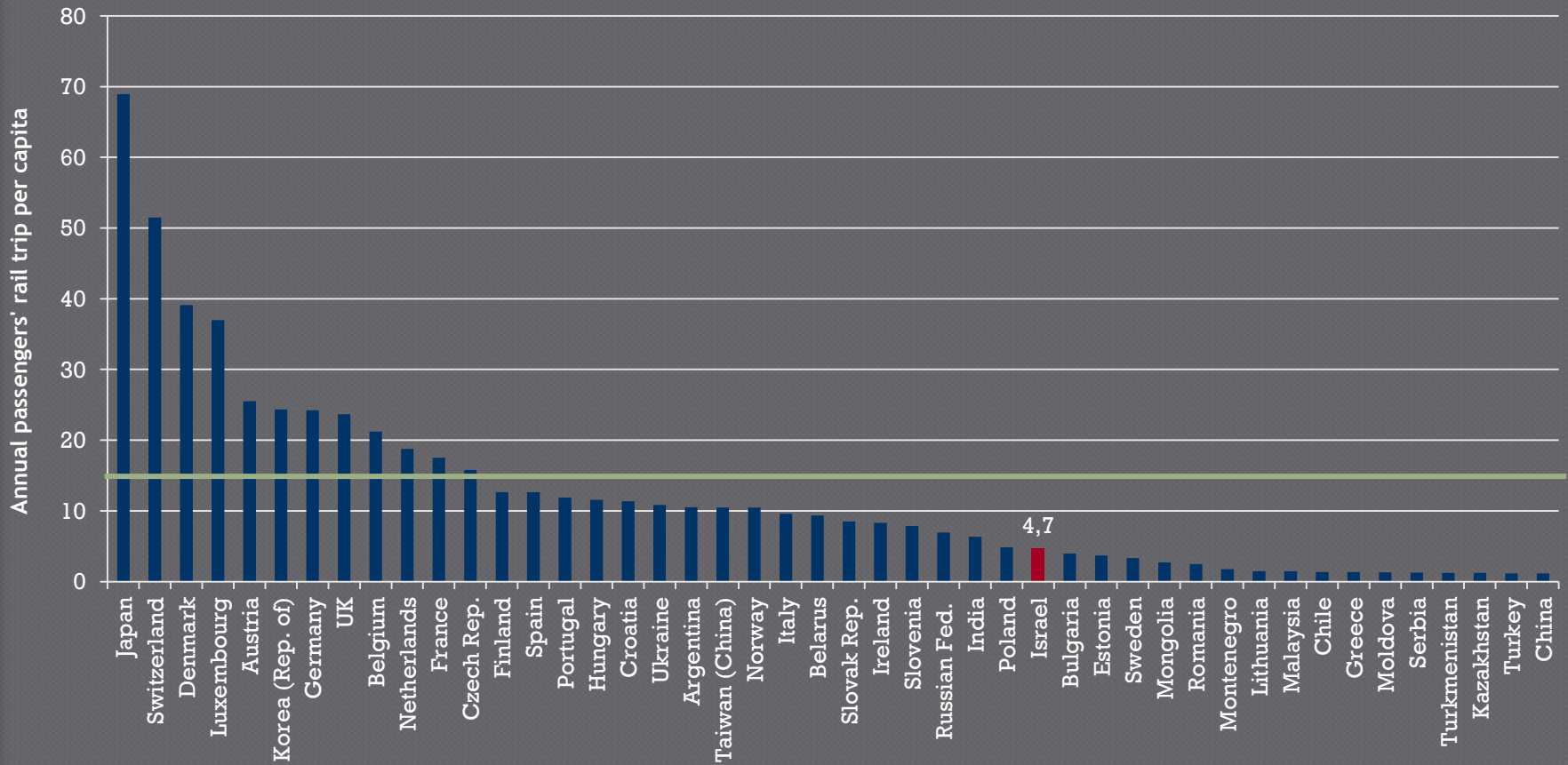


Public transport trip Share



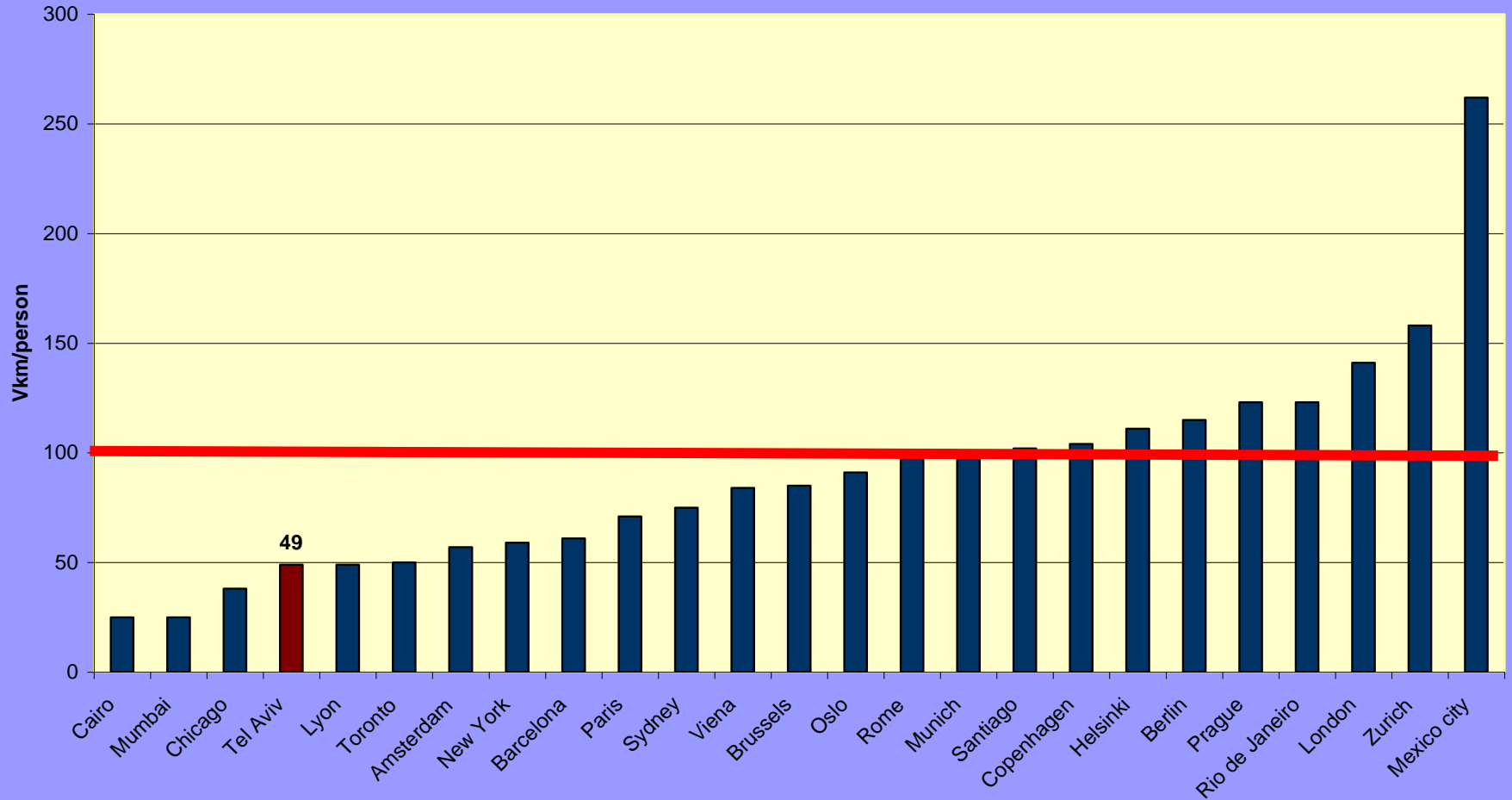
Rail Trips per Capita

Annual Passengers' Rail Trips per Capita



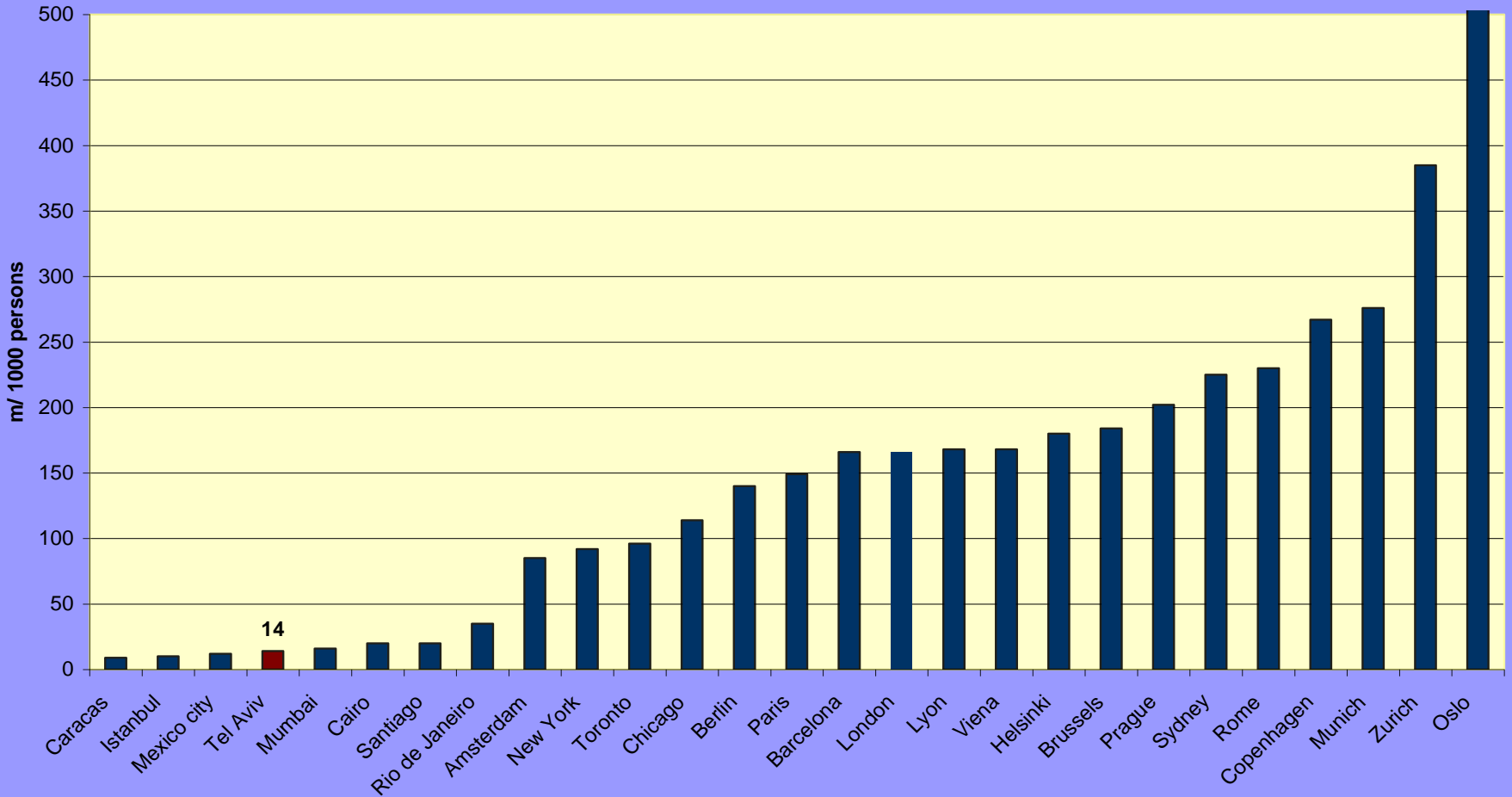
Total PT Vehicle KM of Service per Capita

Total public transport vehicle kilometres of service per capita



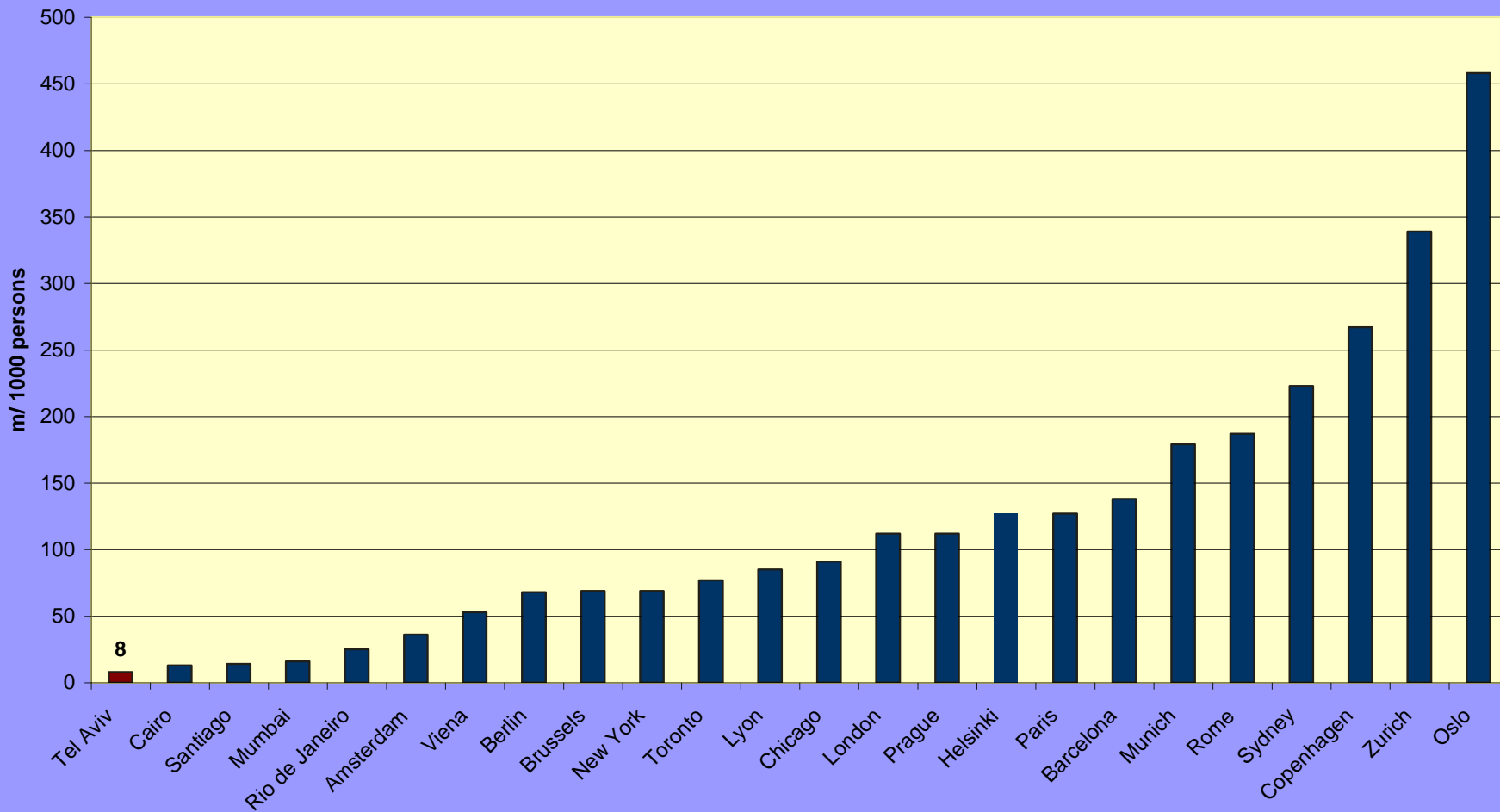
Length of Reserved PT Routes per 1000 People

Total Length of Reserved PT Routes per 1000 People



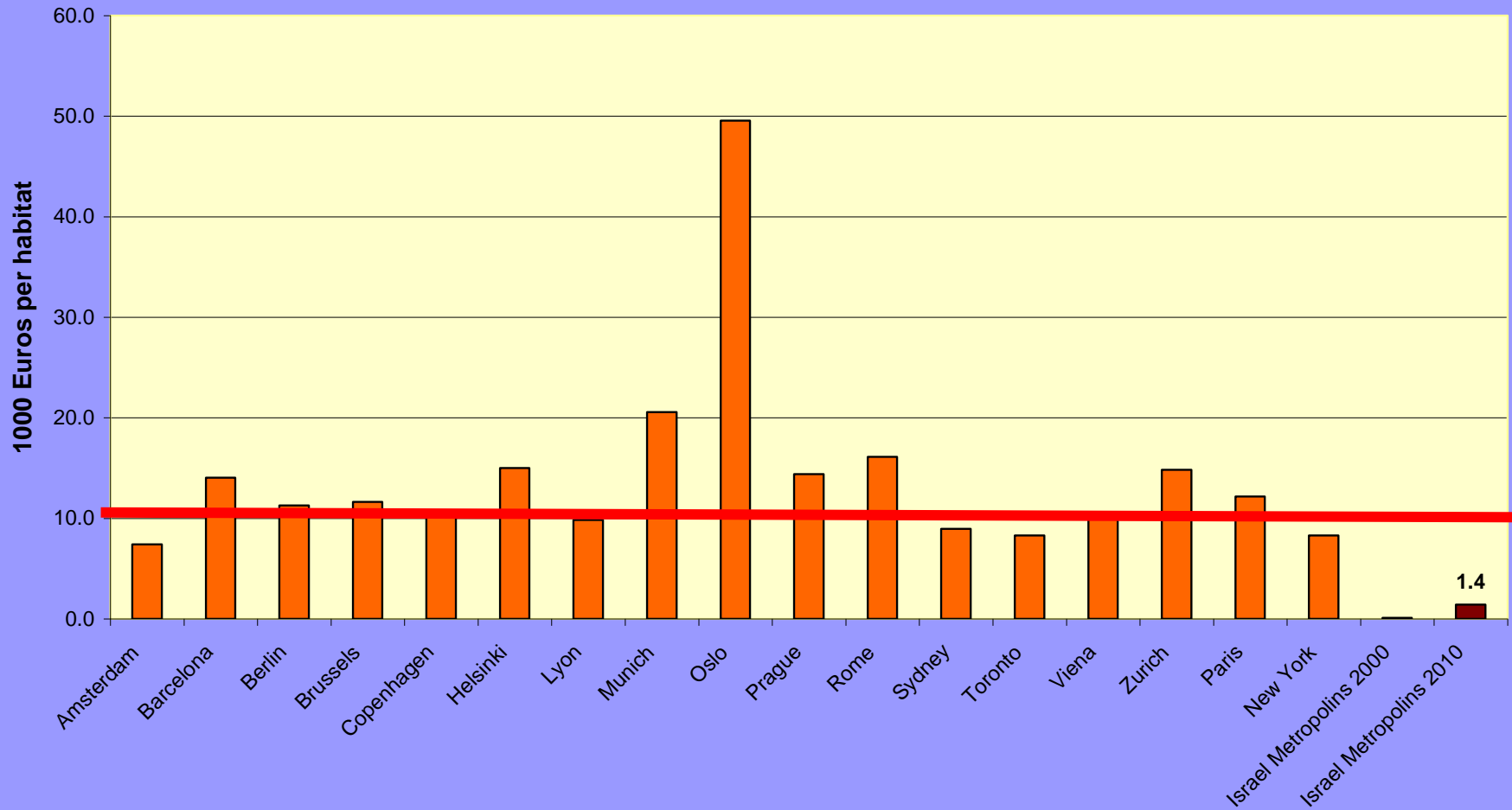
Suburban Rail Network Length per 1000 People

Suburban rail network length per 1000 people



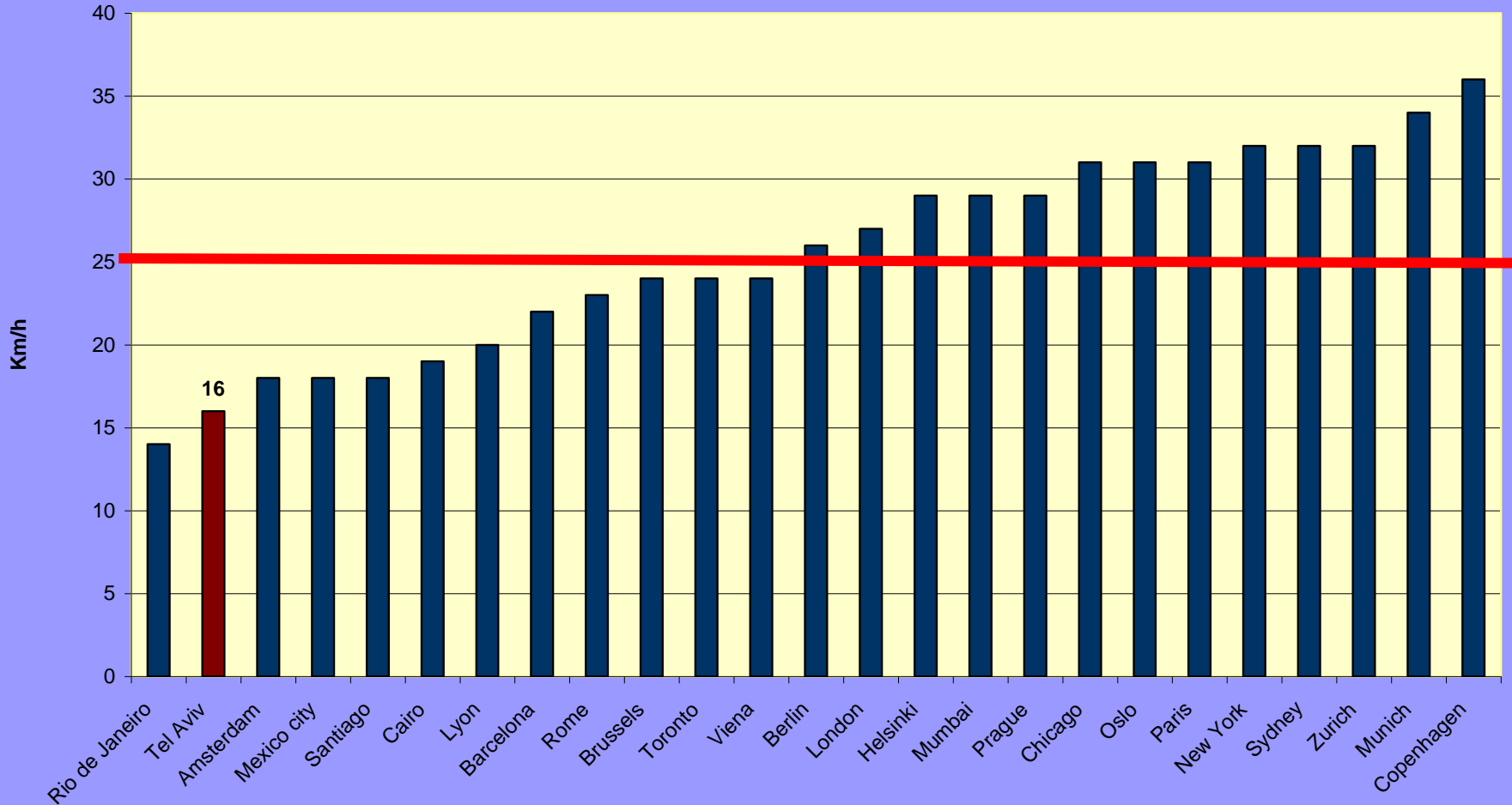
Average Investment in PT per Habitat

Average Investment in PT per Habitat (Inventory)



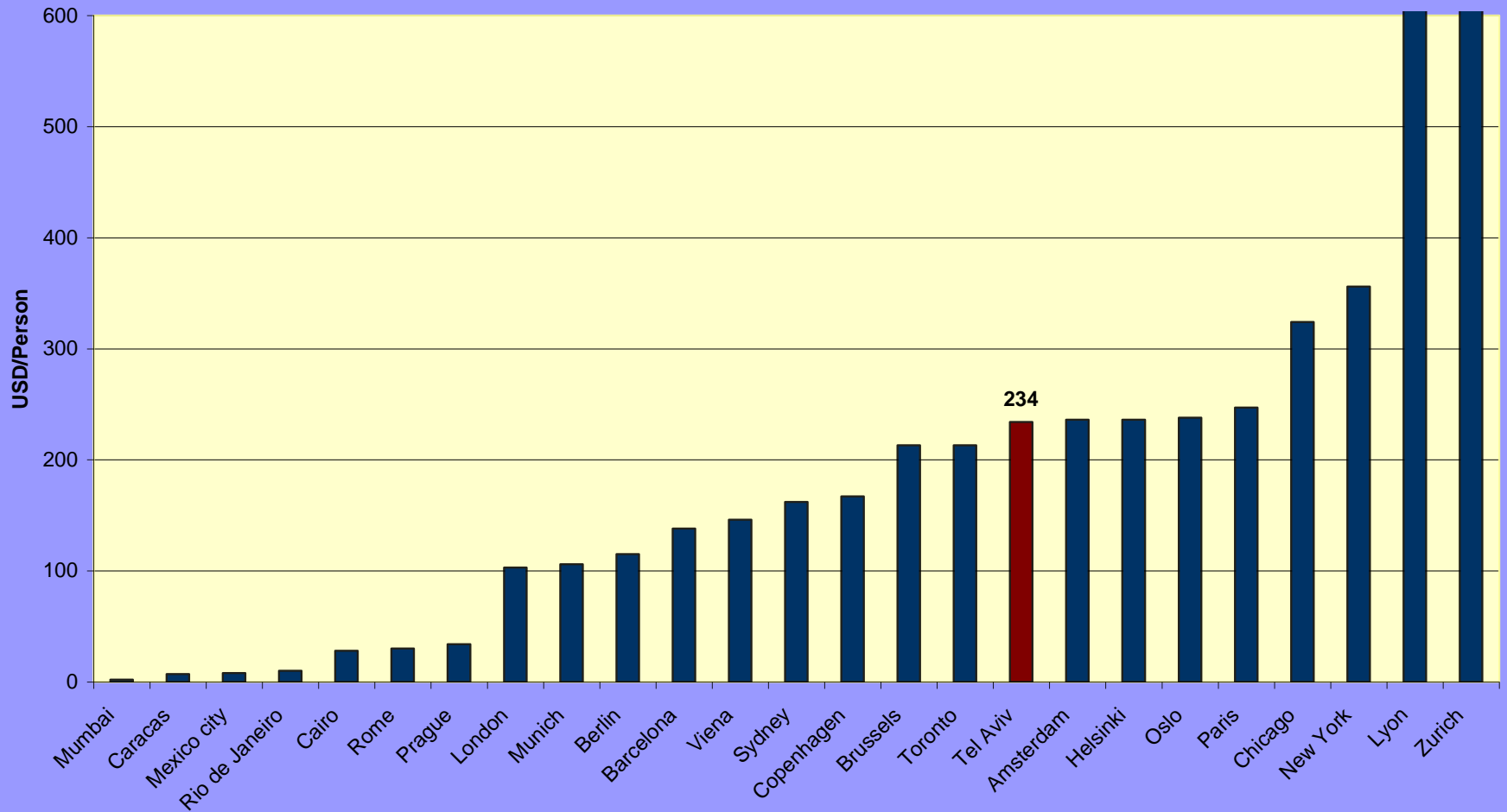
Average Speed of Public Transport

Average Speed of Public Transport



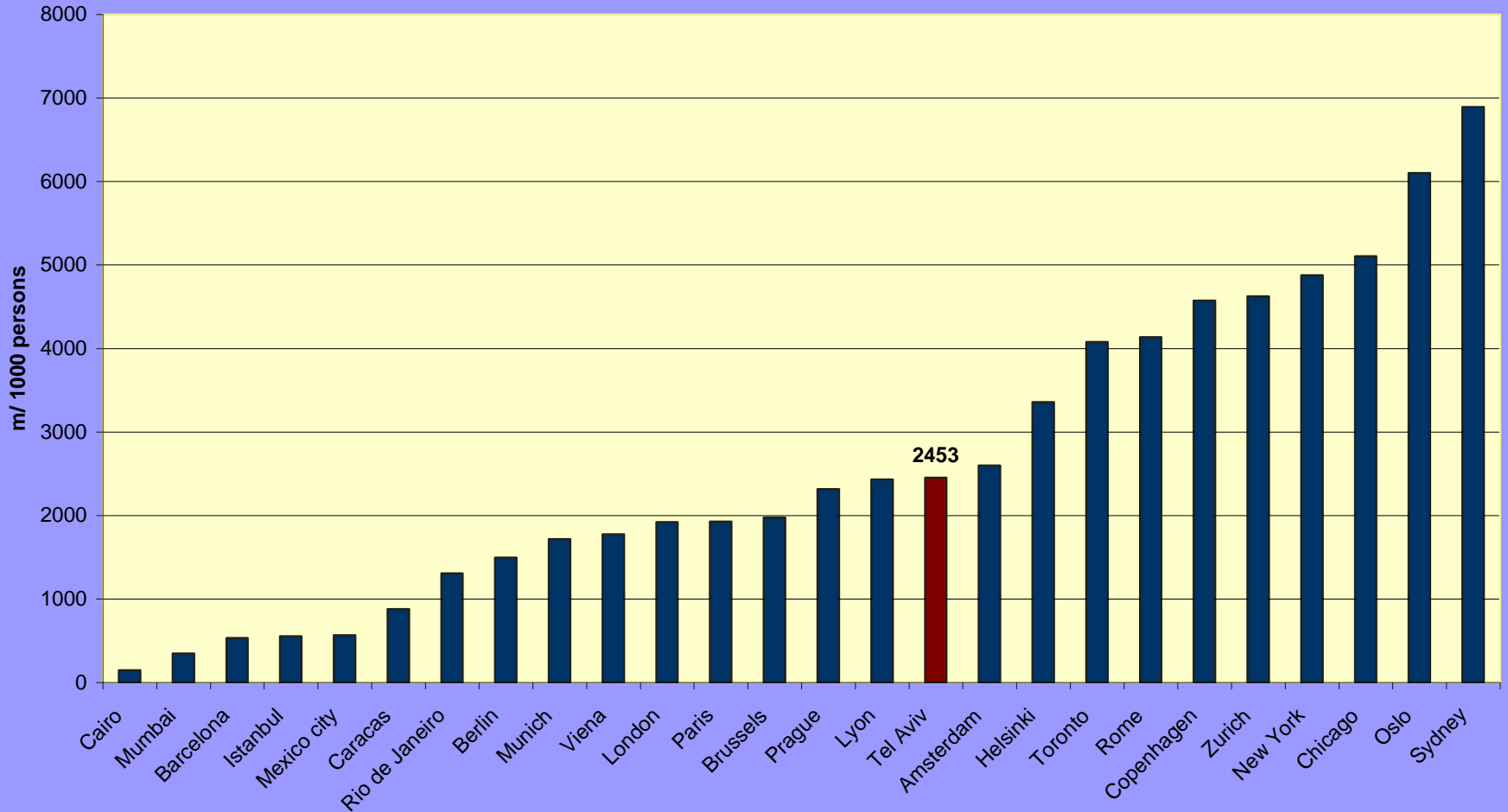
Road Investment per Capita

Road investment per capita



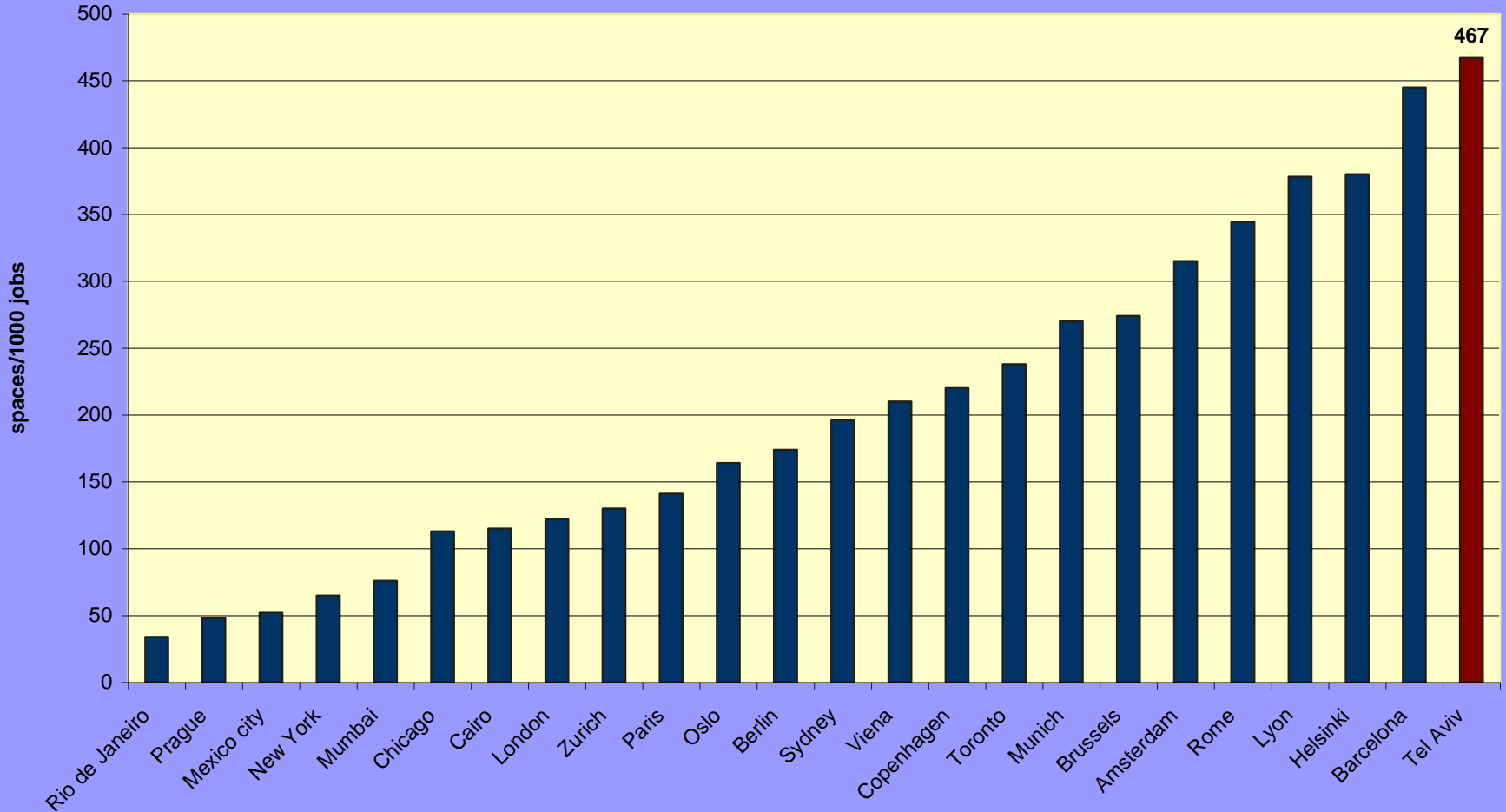
Length of Roads per 1000 People

Length of Roads per 1000 People



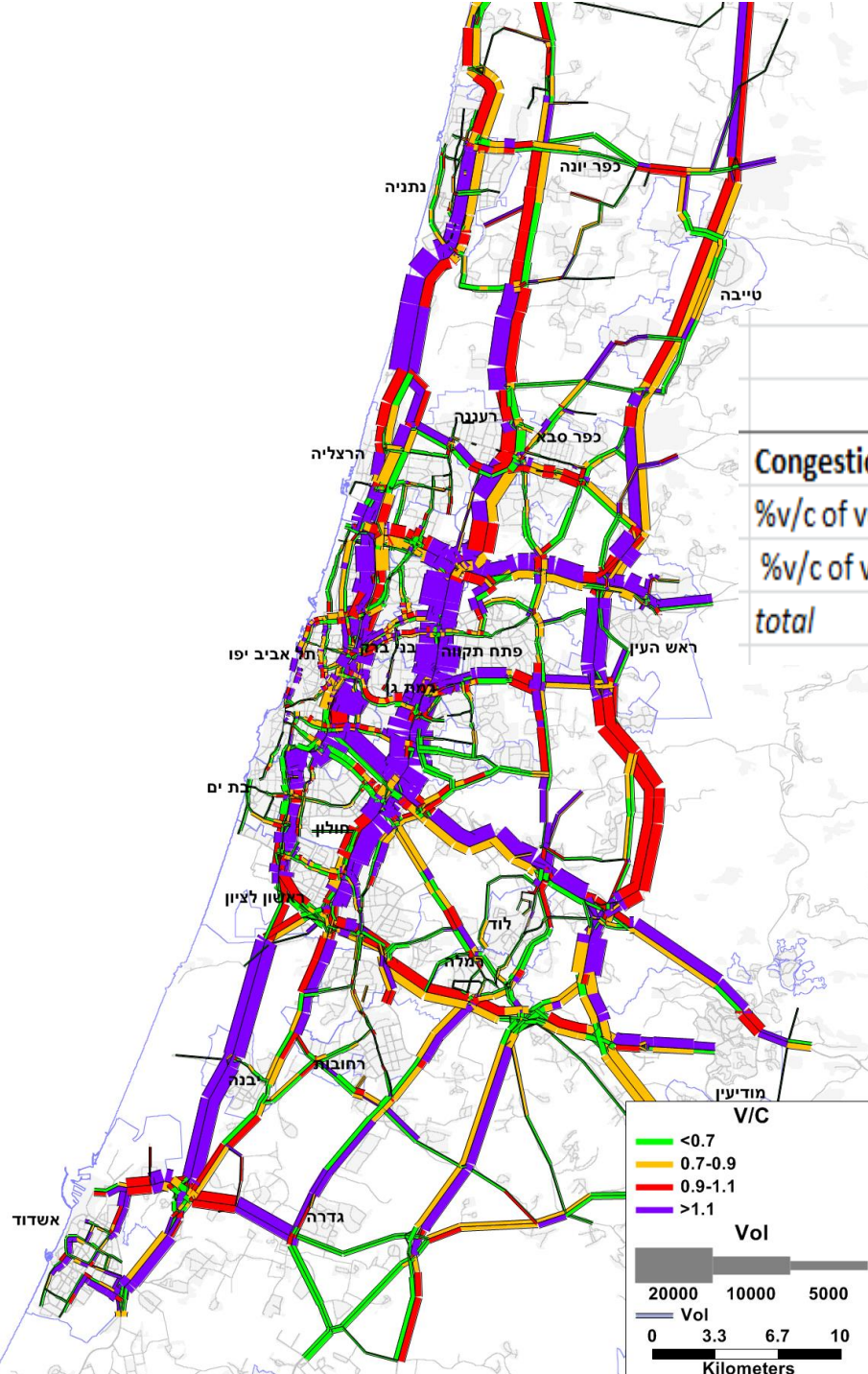
Parking Spaces per 1000 CBD Jobs

Parking Spaces per 1000 CBD Jobs



Private car

Volume & congestion map of morning peak hour



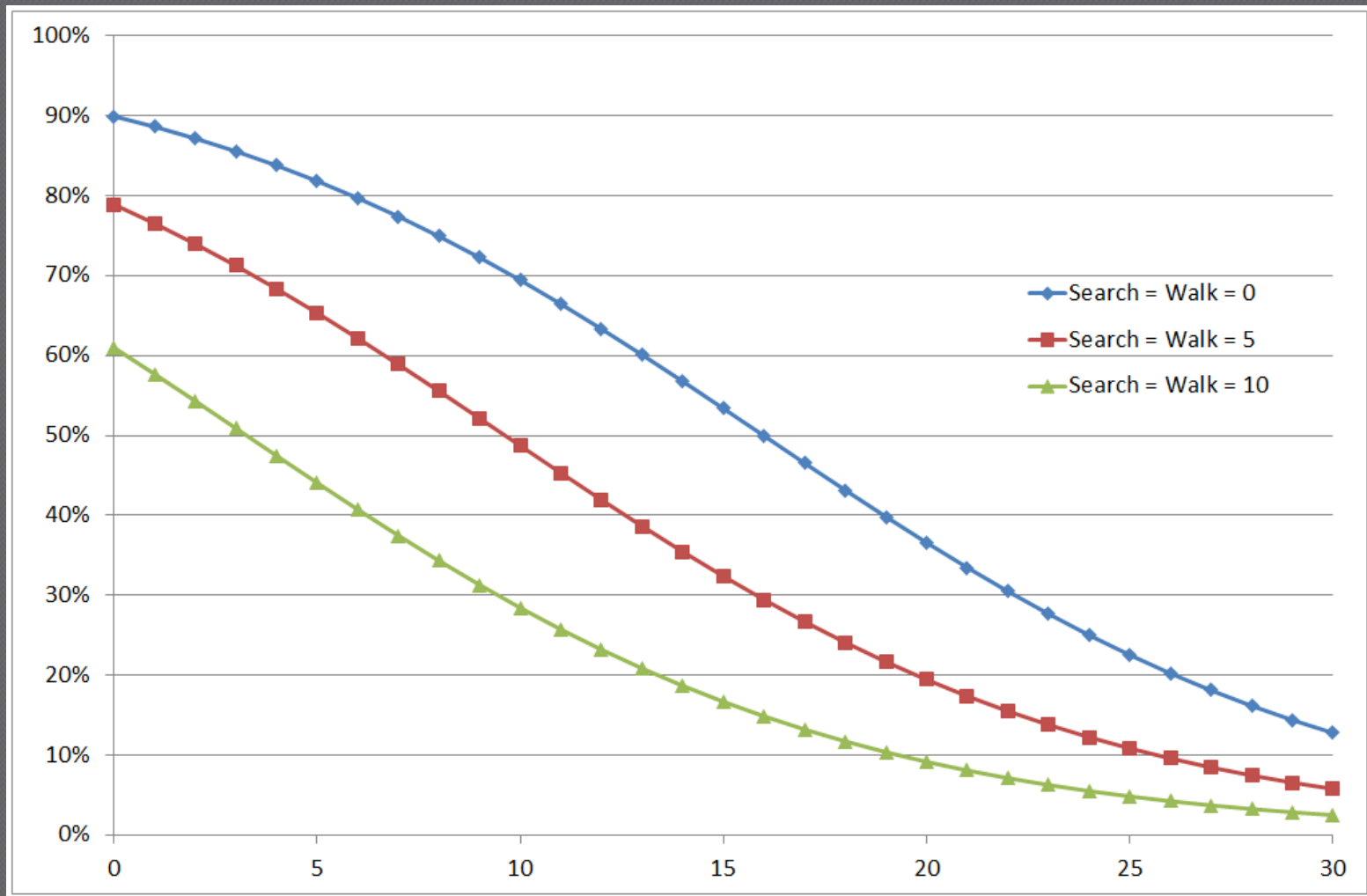
	Red line only		Masterplan		Difference	
	AM	Day	AM	Day	AM	Day
Congestion						
%v/c of veh km 1-1.25	17%	14%	16%	14%	-1%	0%
%v/c of veh km>1.25	22%	14%	19%	12%	-3%	-2%
total	39%	27%	35%	25%	-4%	-2%

% of road sections in congestion

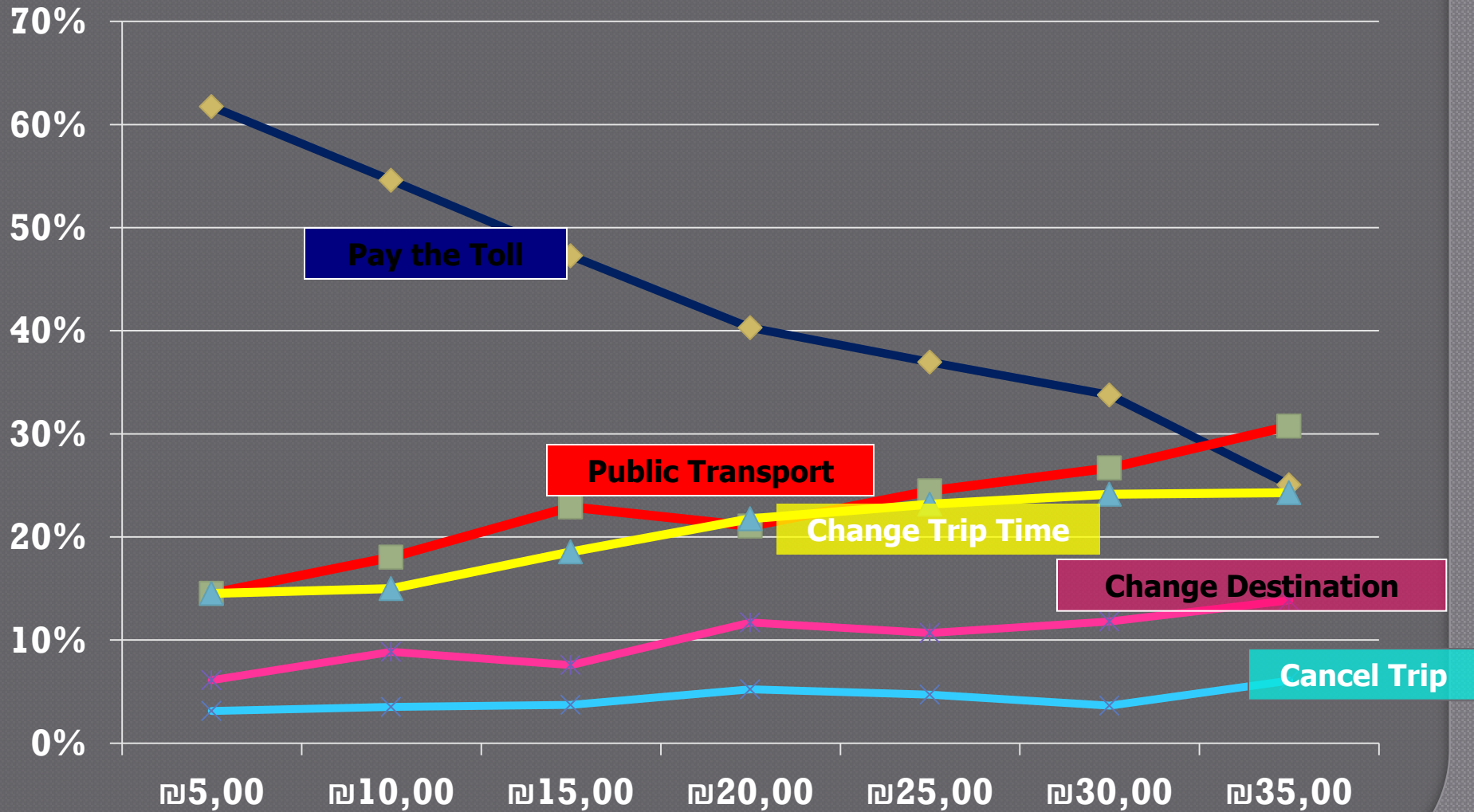
Estimated value of time lost in congestion
 2.5 Milliard Dollar = 2010
 7.5 Milliard Dollar = red line 2040

Source: Tel Aviv Transport Model

Probability of Continuing to Drive under different parking policy scenarios

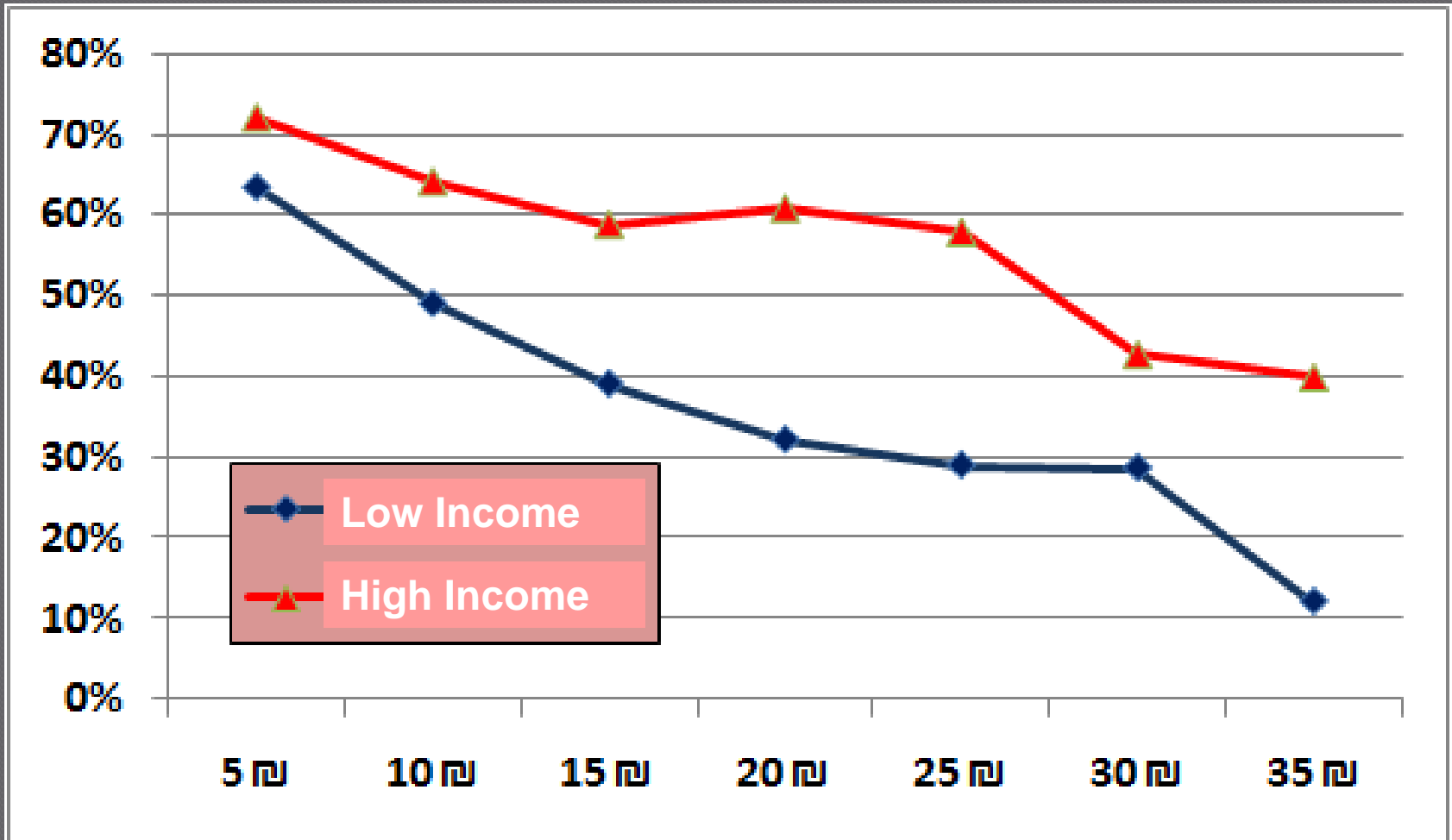


Response to Congestion Pricing



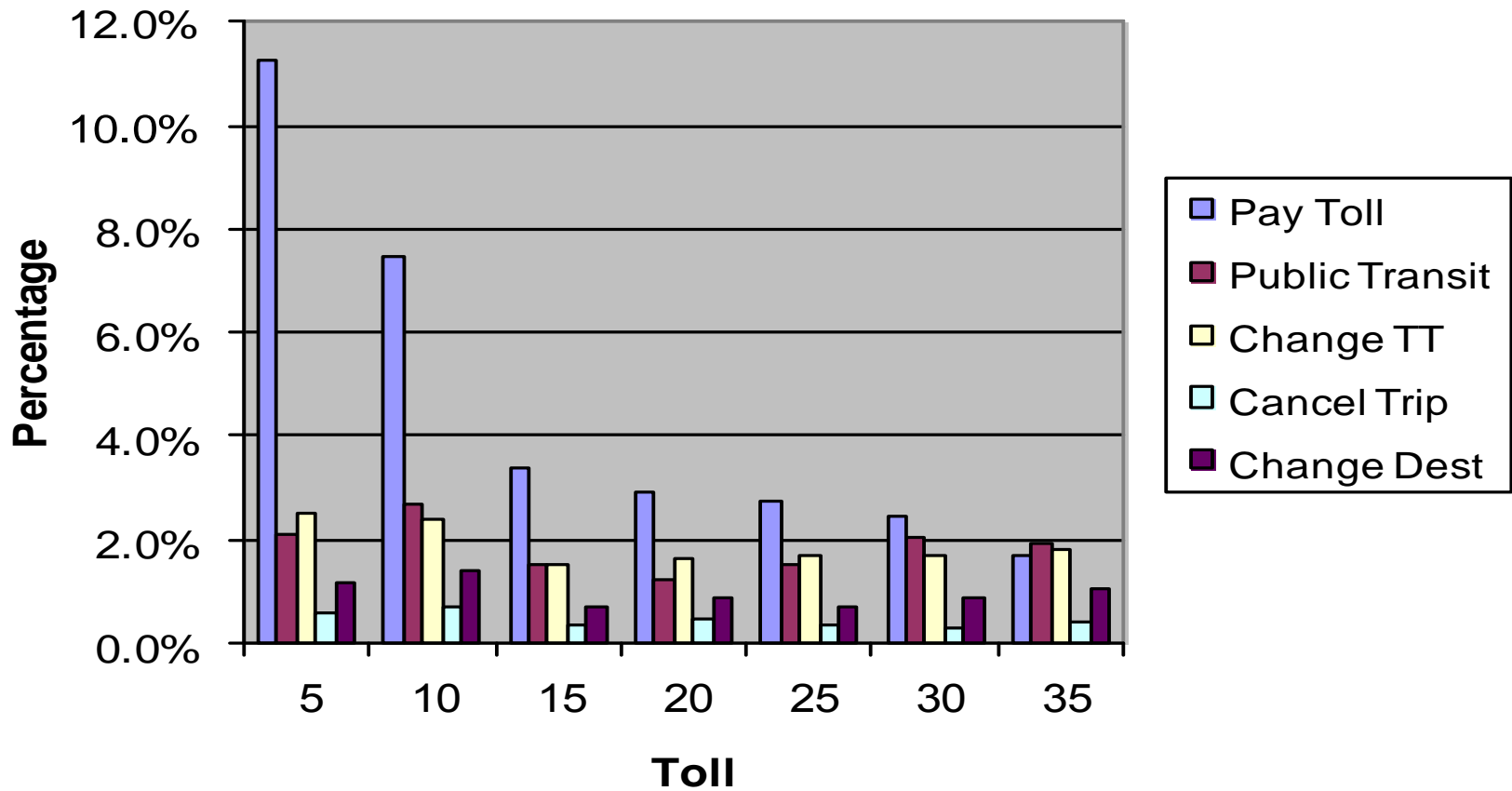
Response by Income Level

Pay Toll Distribution:



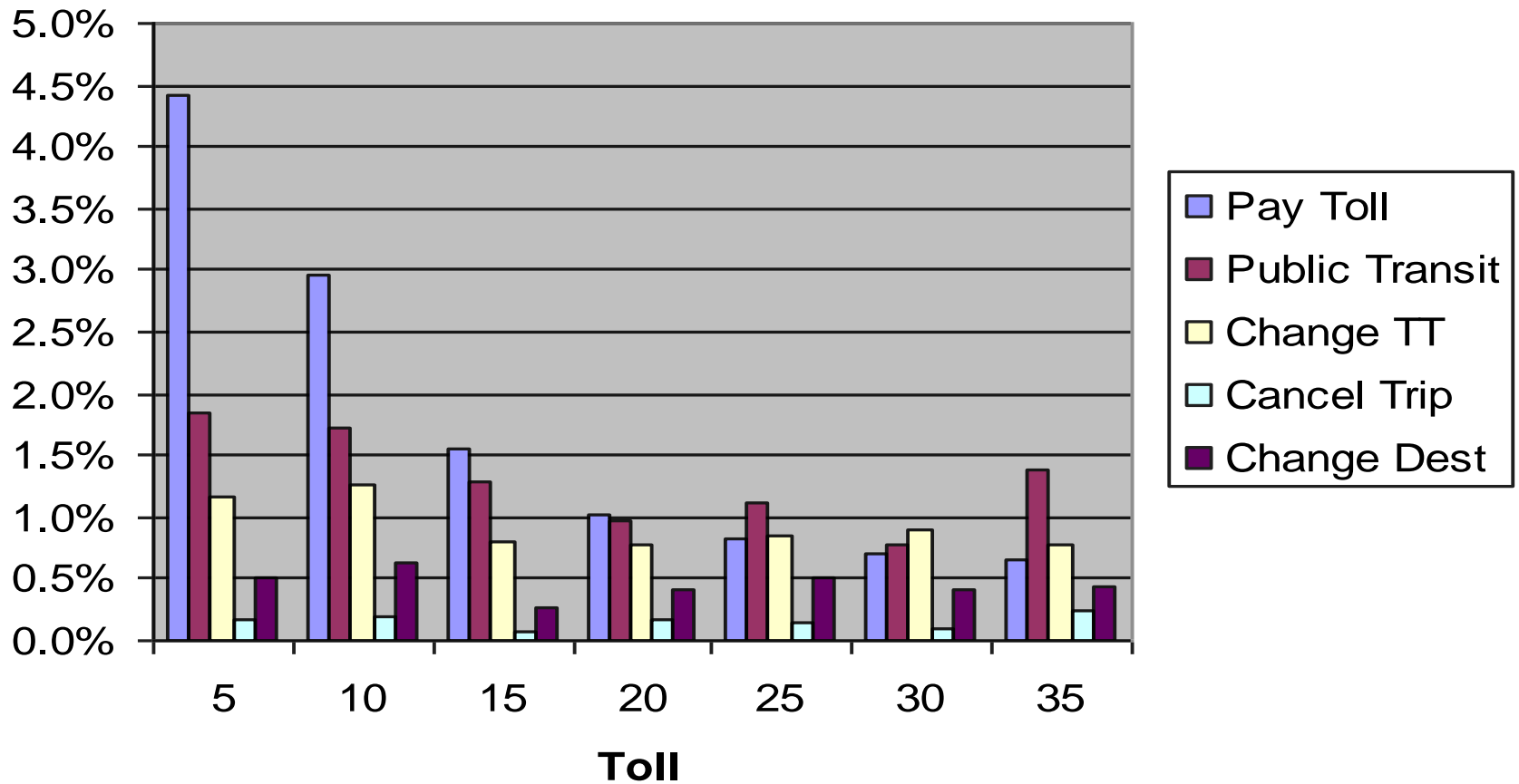
Workers' Responses

Workers



Non-Workers' Responses

NonWorkers



Scenario Analysis

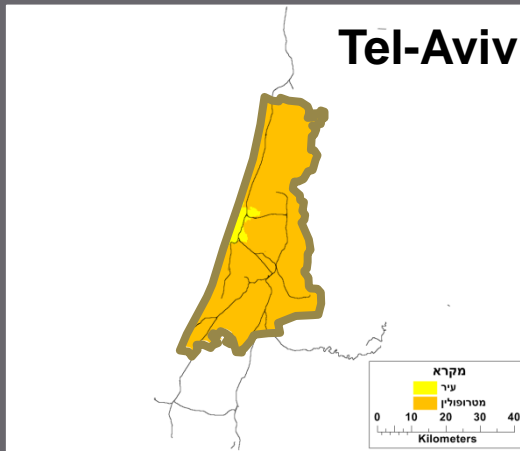
Percent change for morning peak hour, 2015, all the metro area toll of 15 NIS for entering, 3 NIS for residents.

	Trips	Speed (base 30.5) KMH	Travel Hours	Travel KM
Small Ring	-4	+4	-7	-3
Medium Ring	-6	+6	-12	-6
Large Ring	-6	+7	-13	-7
Small Area	-5	+5	-7	-3
Medium Area	-7	+7	-13	-6
Large Area	-8	+8	-14	-7

The large ring don't add much benefits as many of those entering the medium ring live in the large ring.

Metropolitan comparison

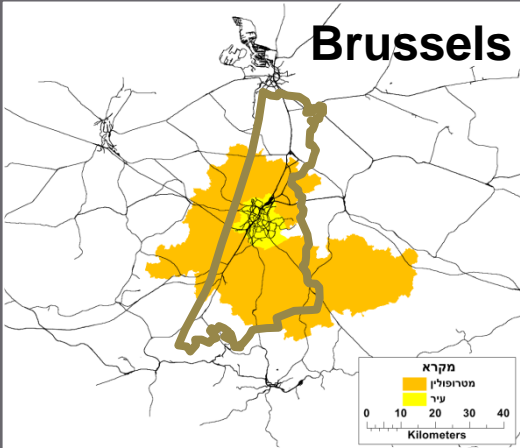
Tel-Aviv



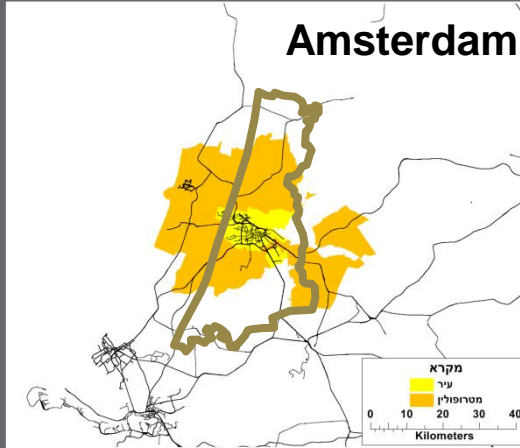
Legend



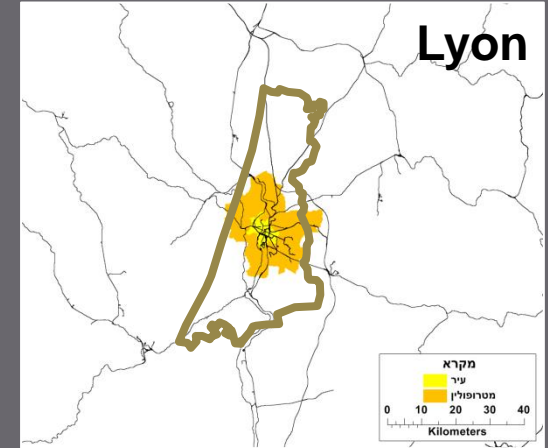
Brussels



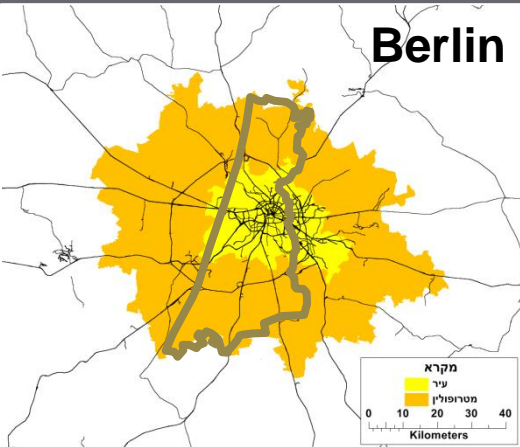
Amsterdam



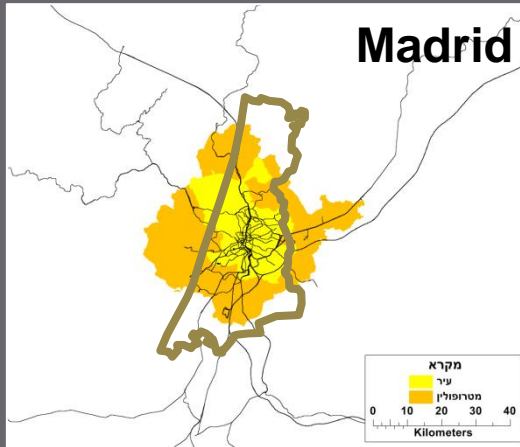
Lyon



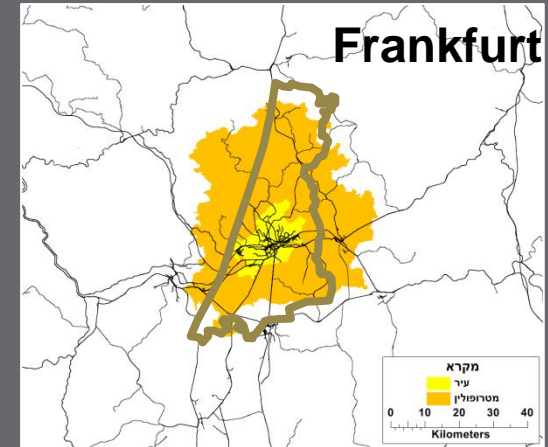
Berlin



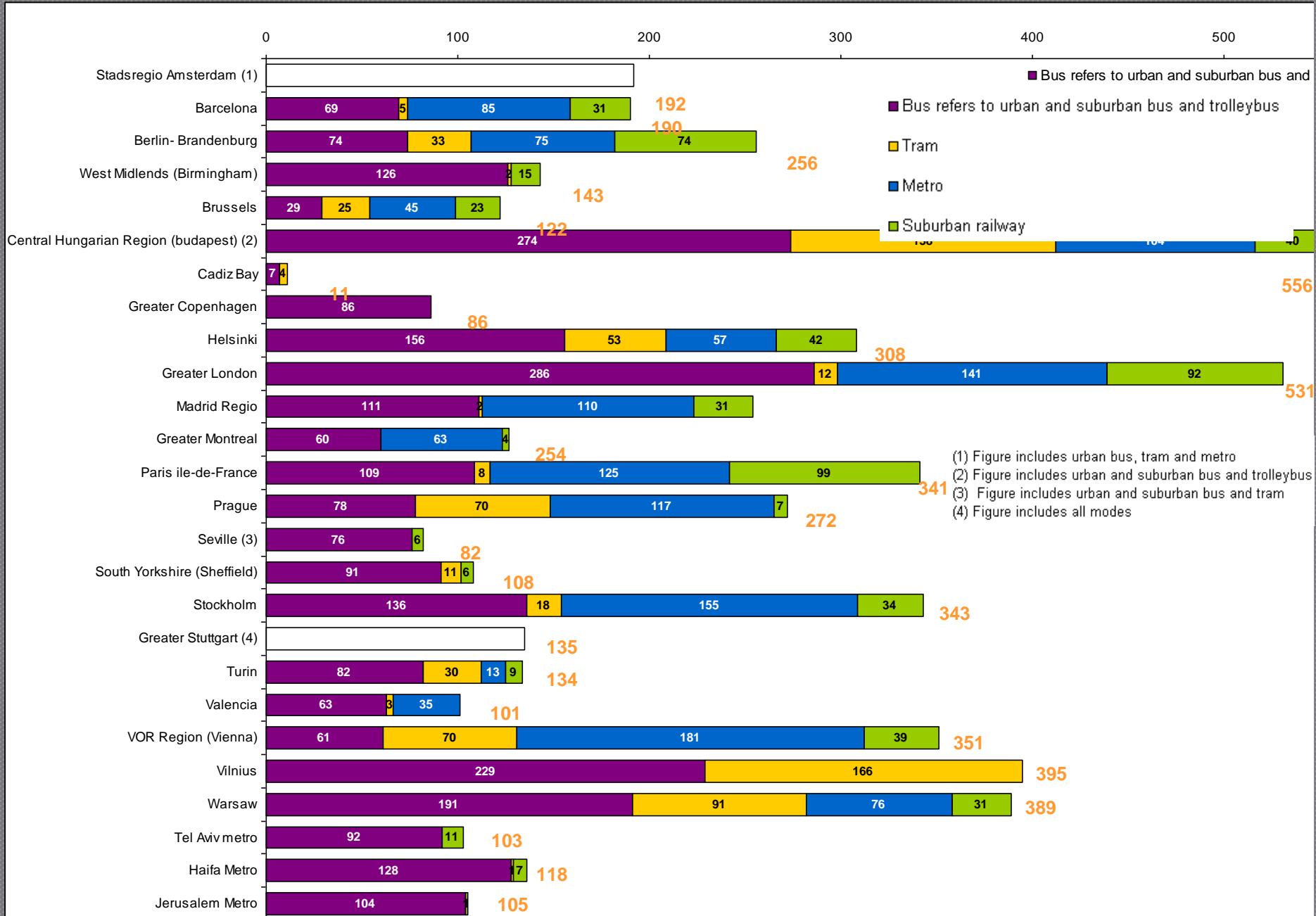
Madrid



Frankfurt



Annual PT Boardings per habitat



Lyon

Regional / intercity



Suburb



Integrates within the suburb train network that includes various train types

Urban
Mass capacity



4 metro lines (approx. 30 KM), mostly underground

Urban
Medium capacity



5 light rail lines (approx. 50 KM) + “express” light rail to the airport

Amsterdam



Regional / intercity

Regular fast trains



Suburb

Regular two-story trains in approx. 15 lines



Urban
Mass capacity



4 line metro,
mostly above
ground
(approx. 43
KM)

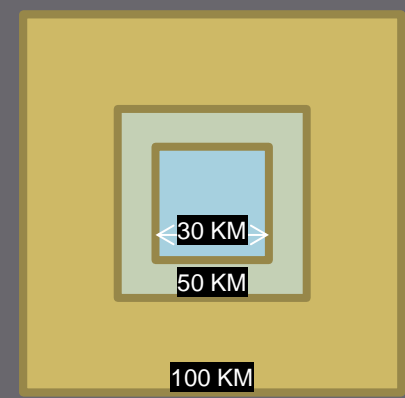
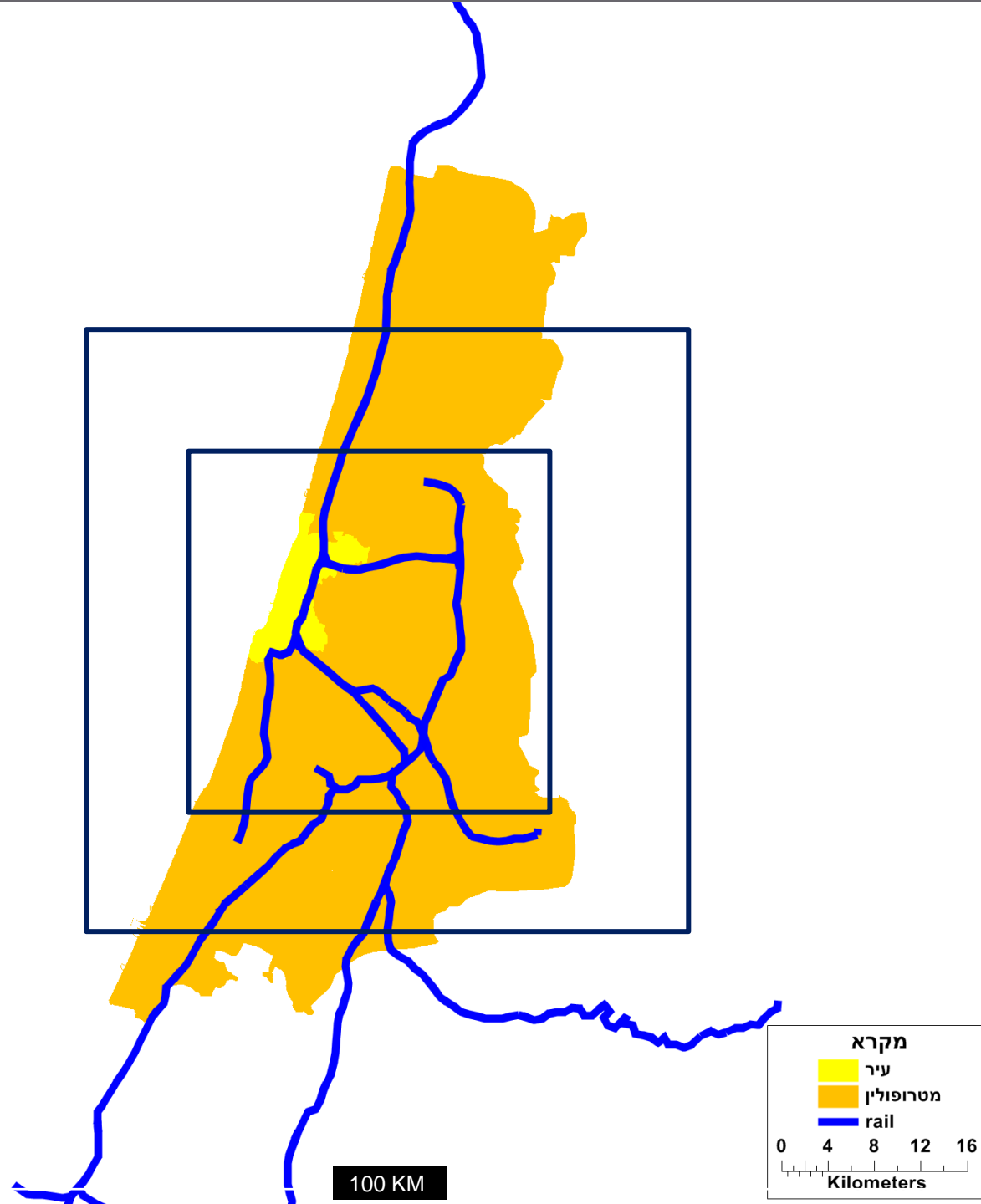


Urban
Medium capacity

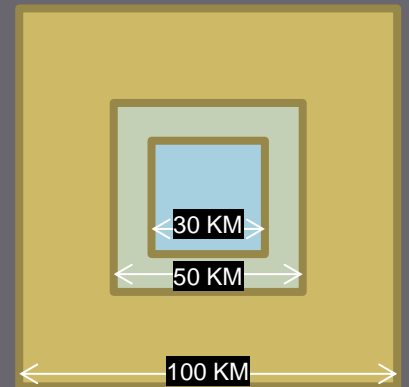
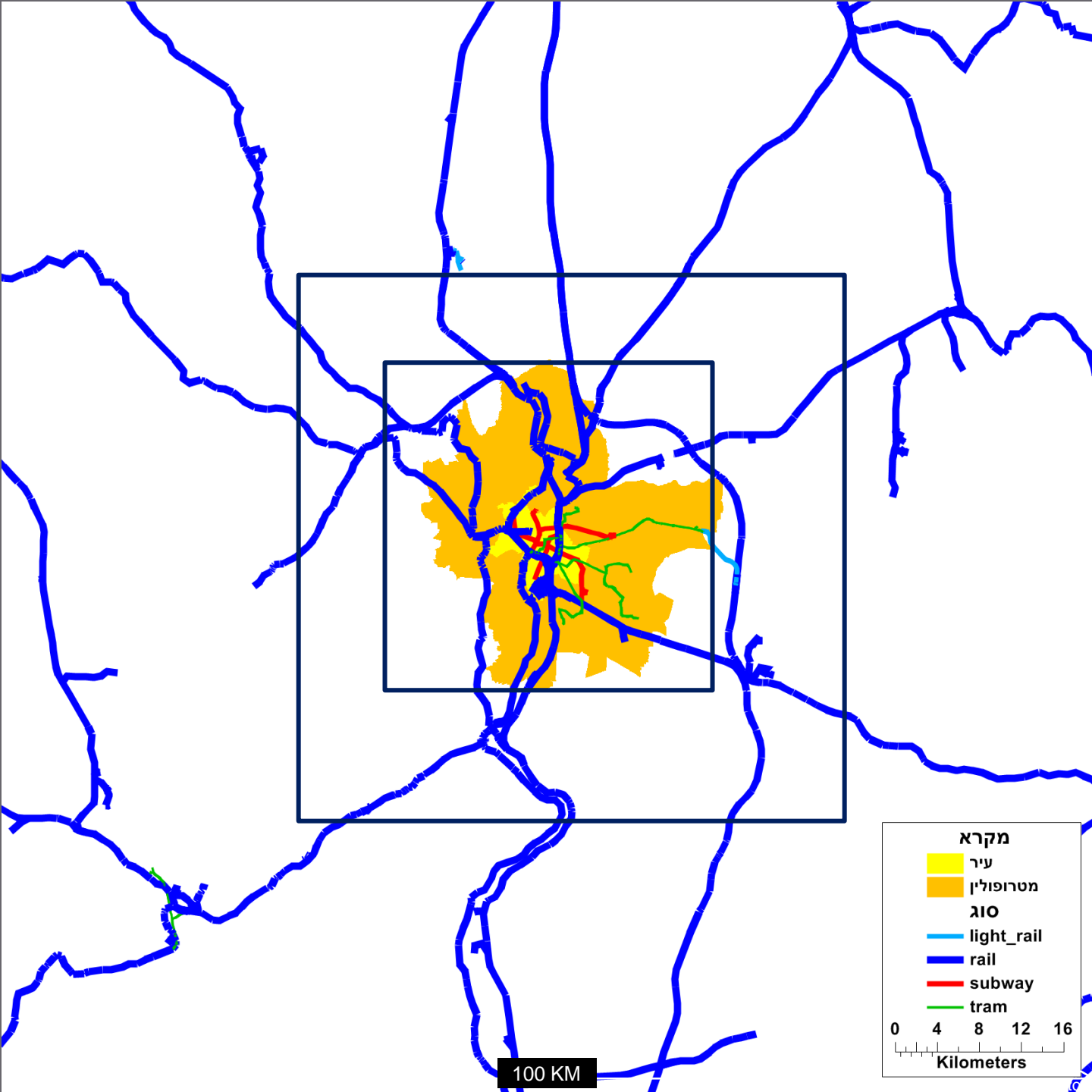


Light rail
BRT

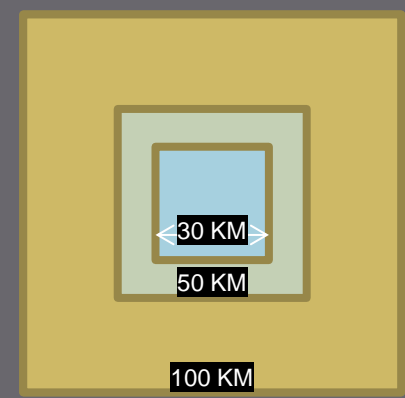
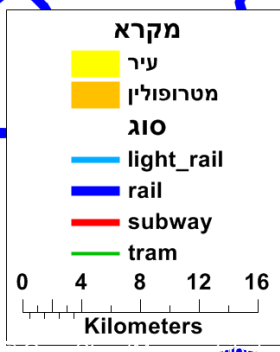
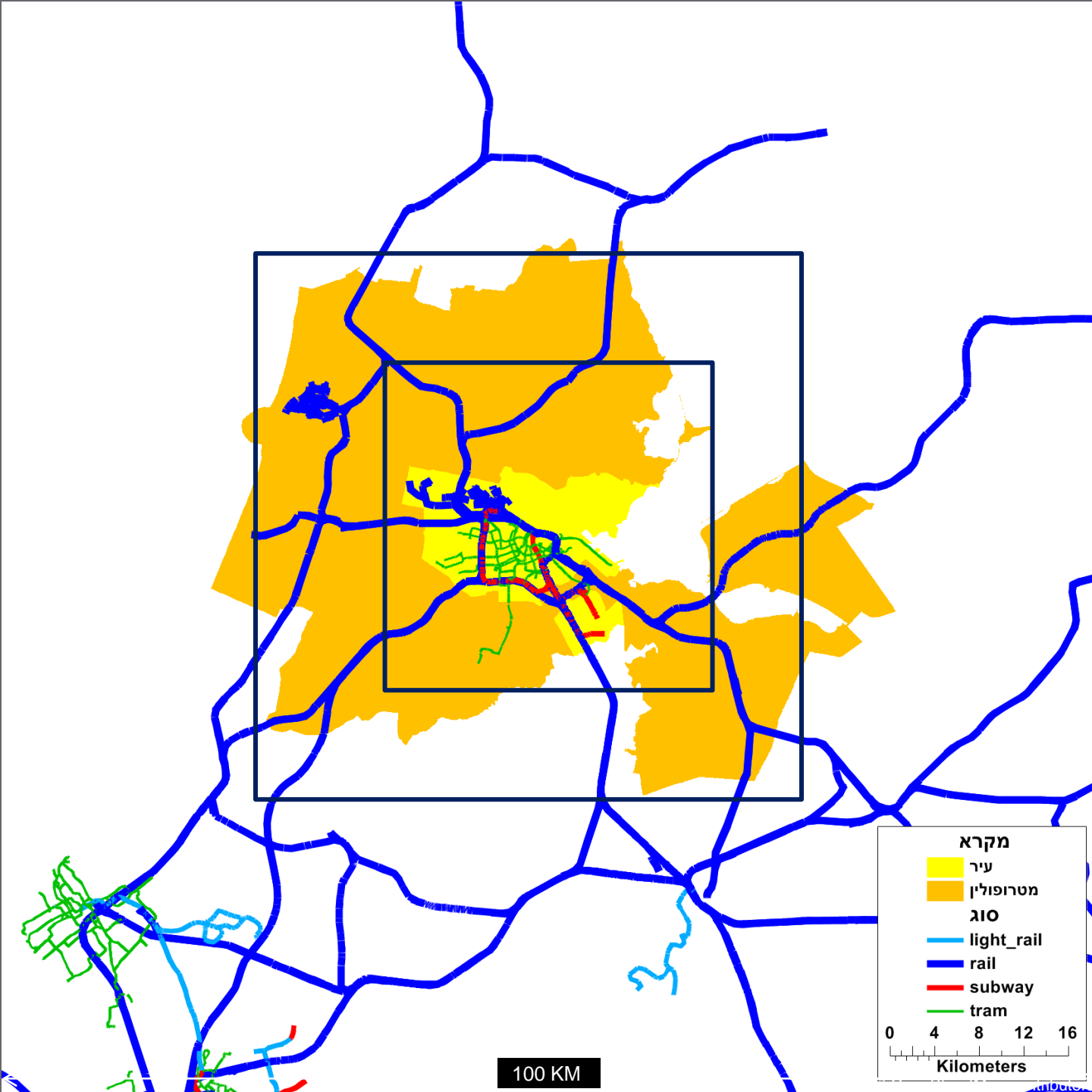
Tel-Aviv



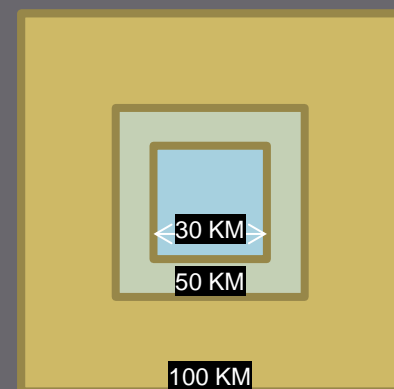
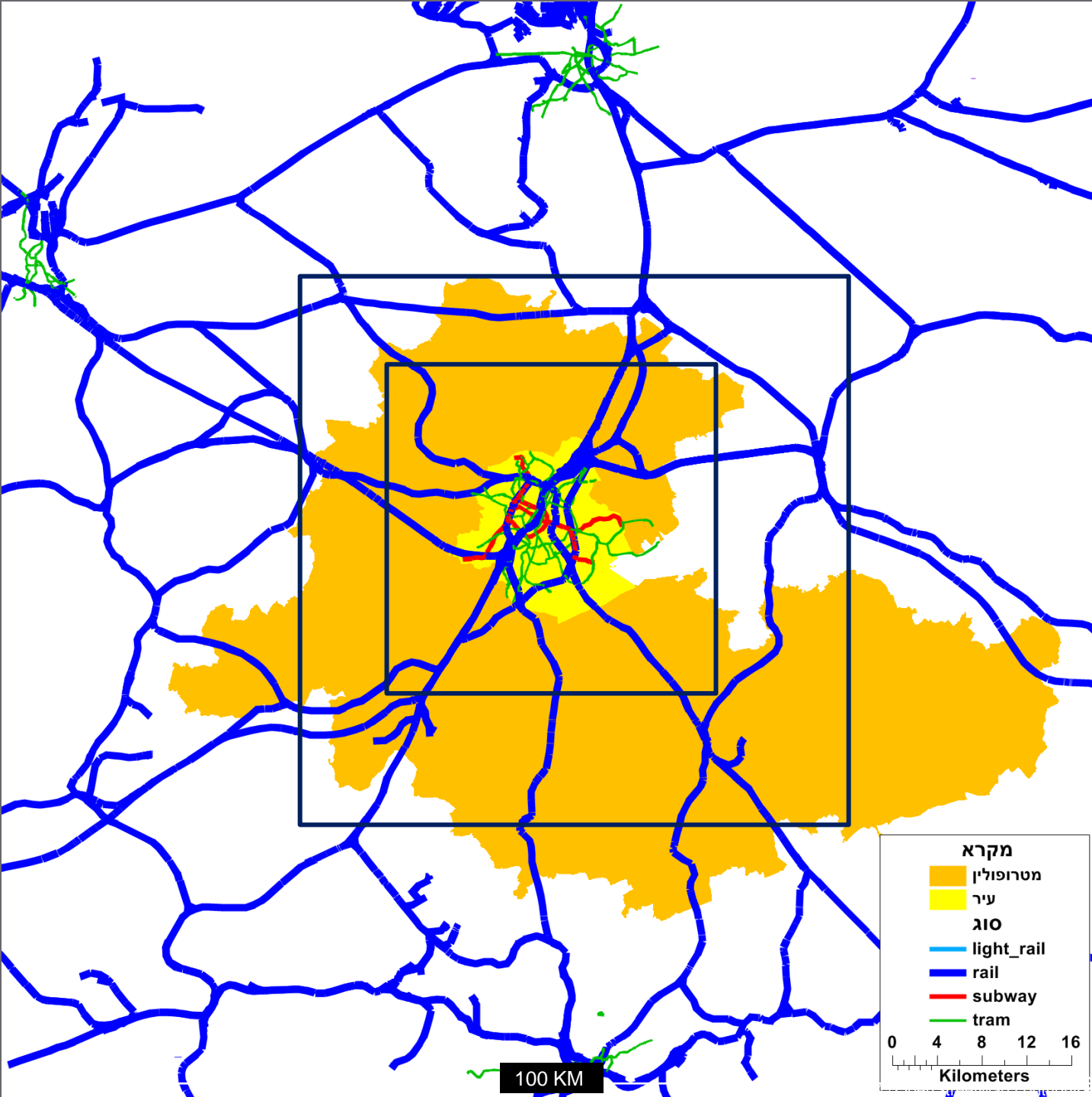
Lyon



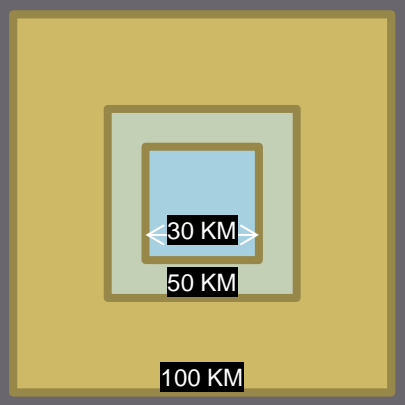
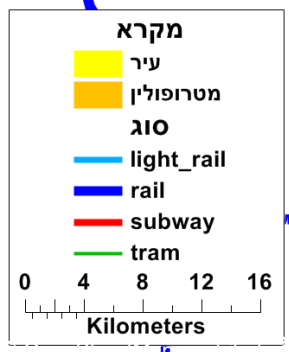
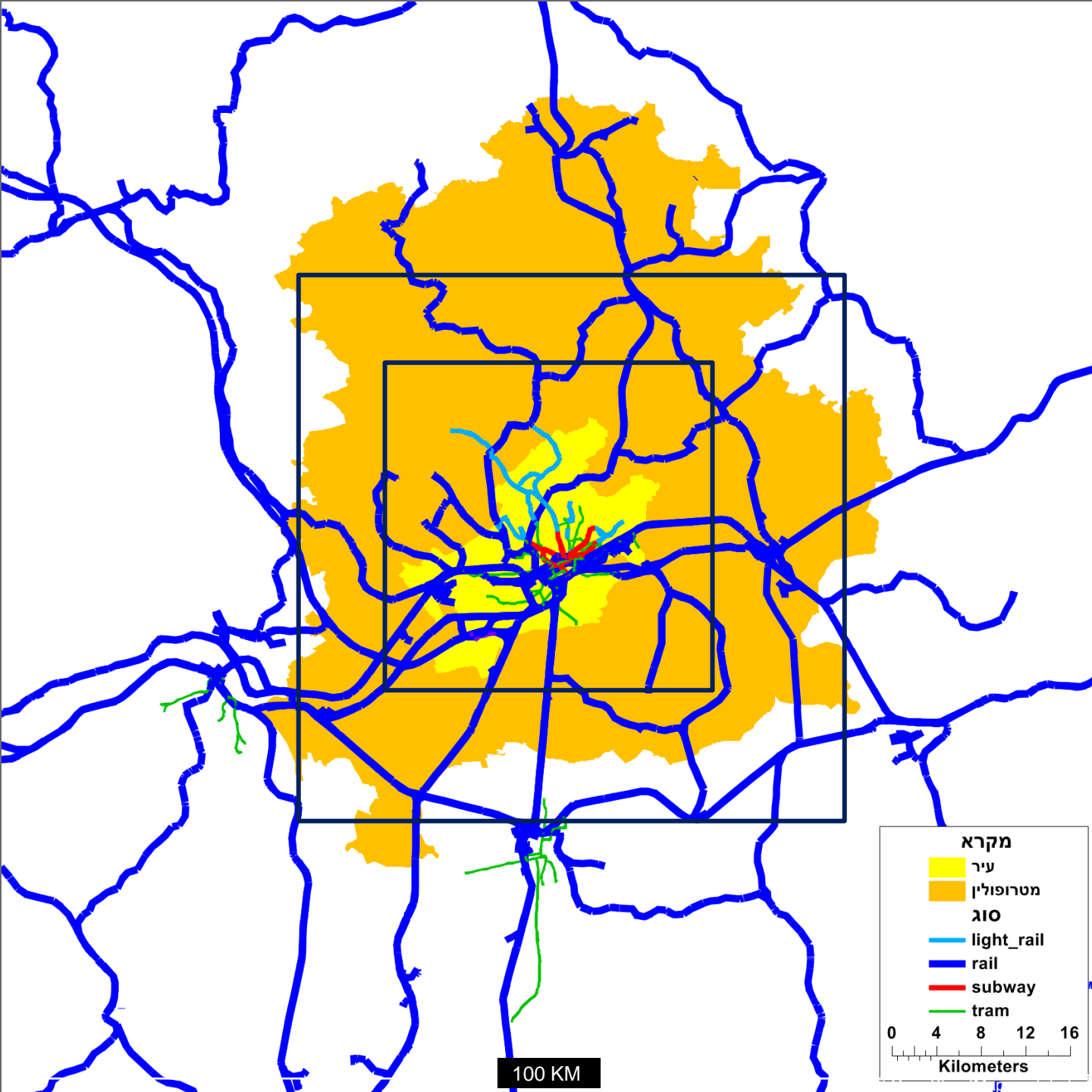
Amsterdam



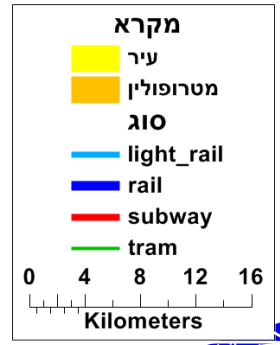
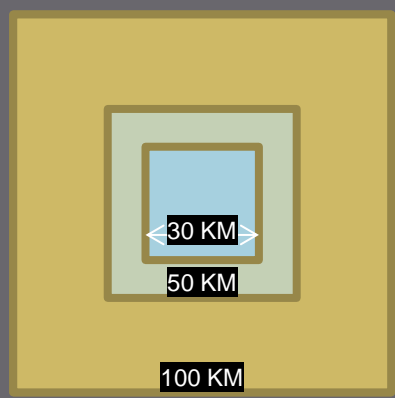
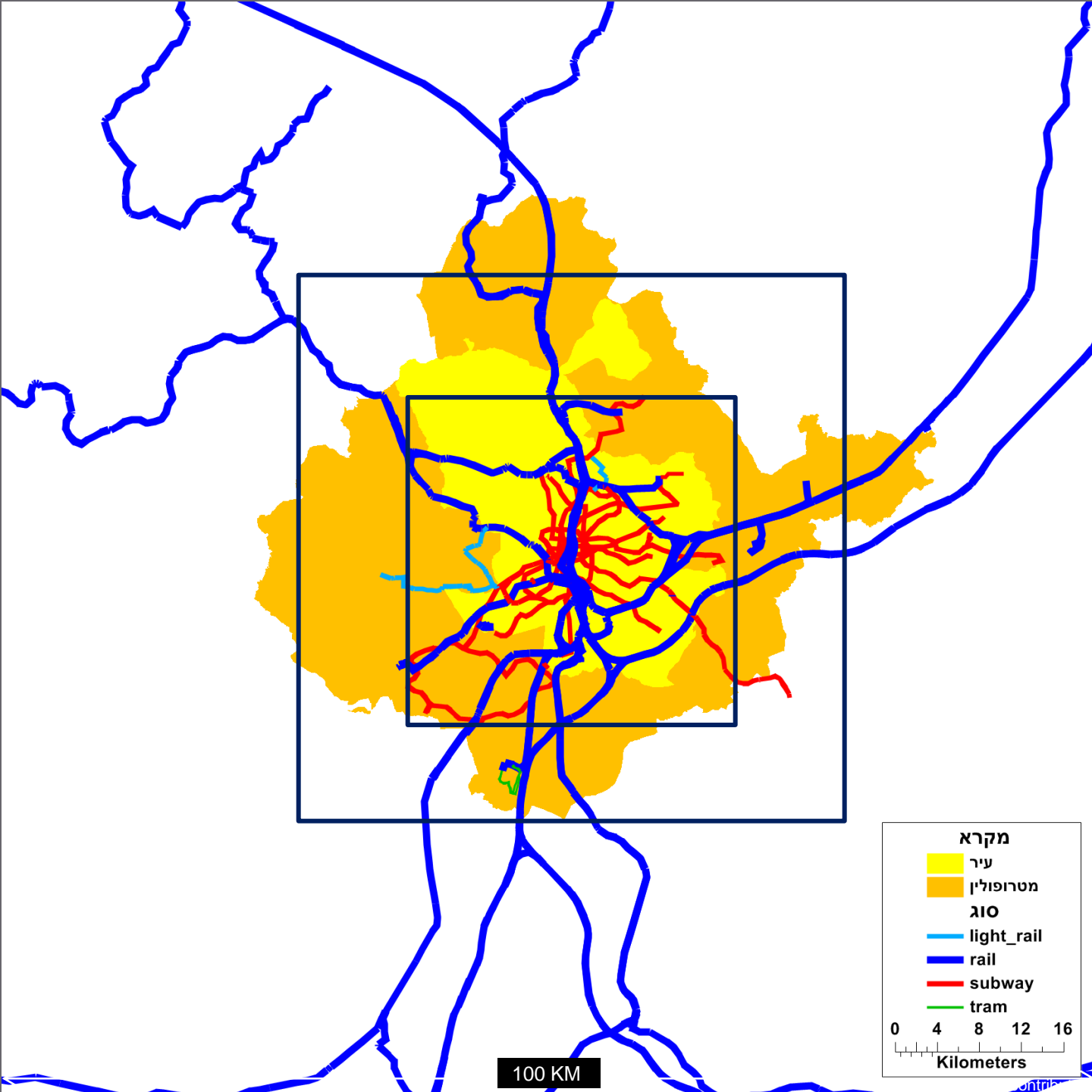
Brussels



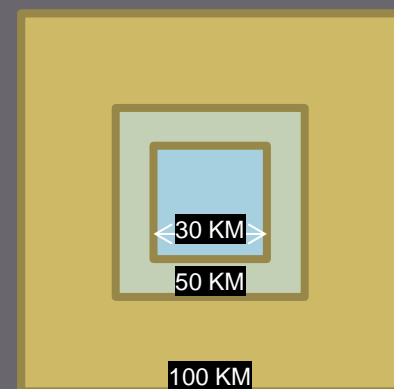
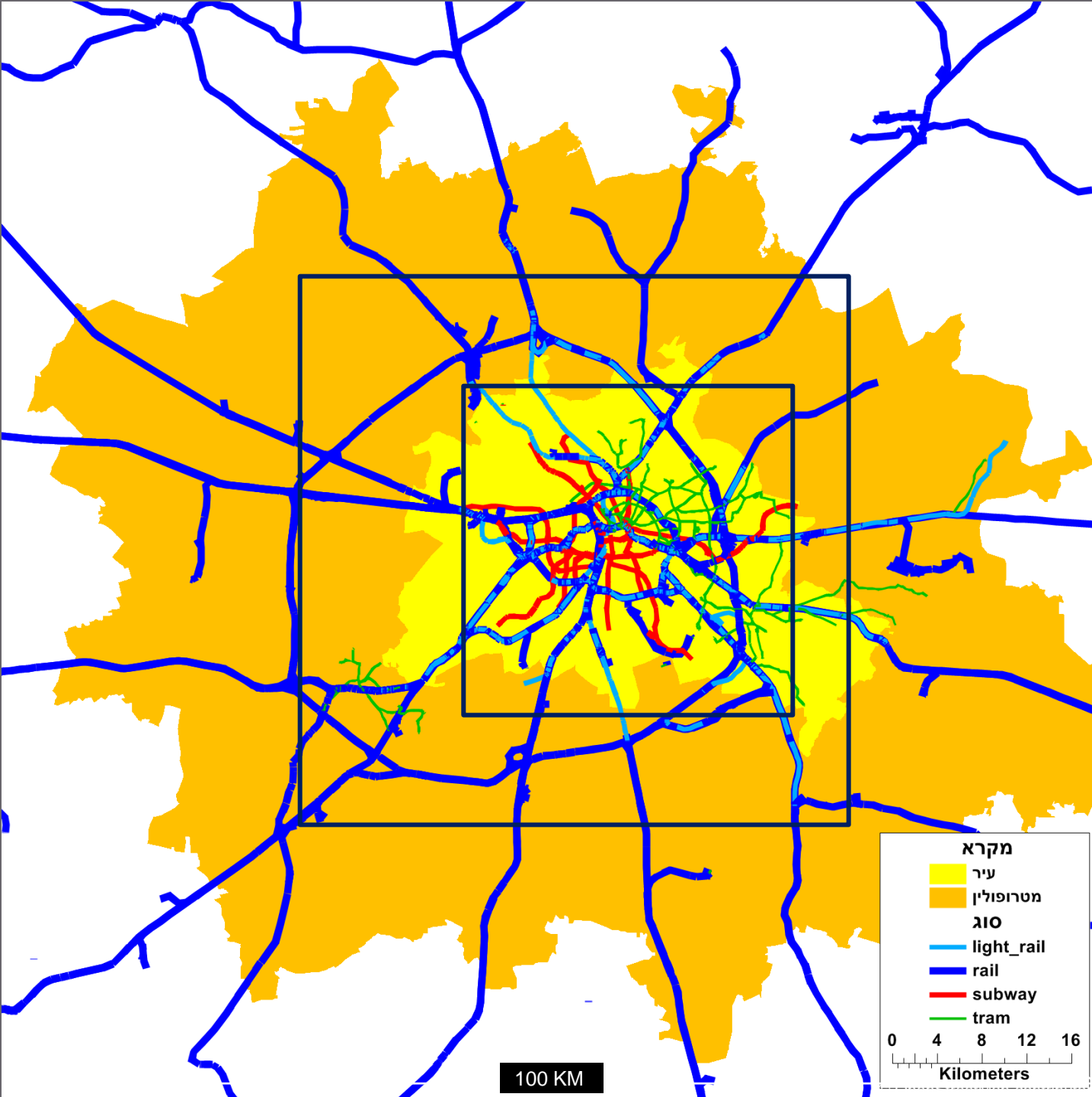
Frankfurt



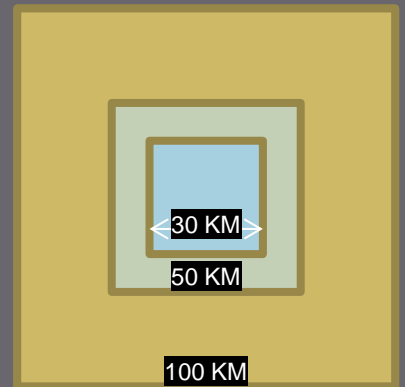
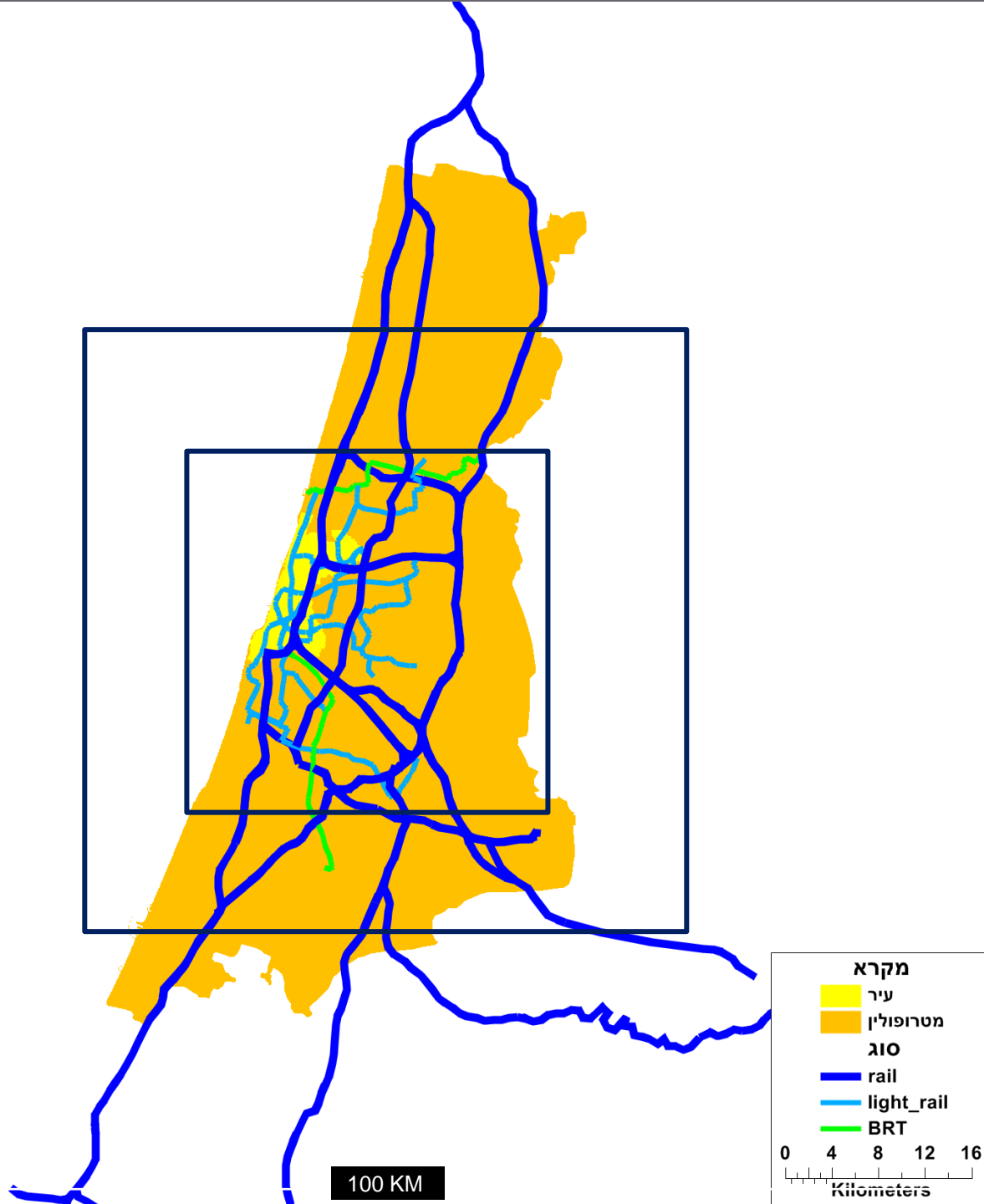
Madrid

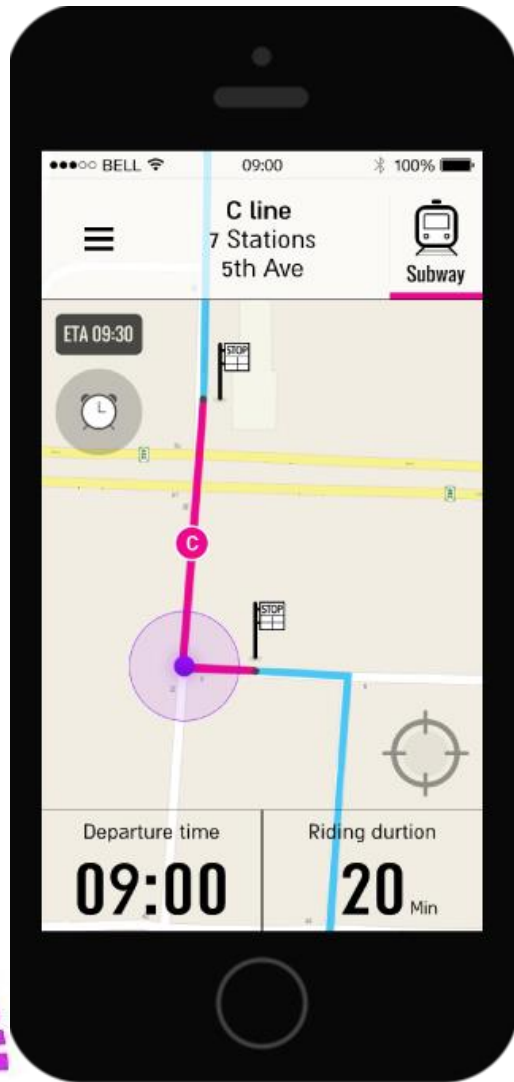


Berlin



Tel Aviv 2040





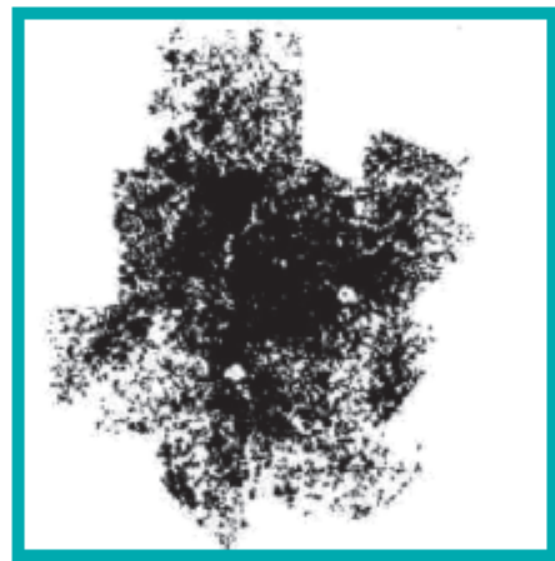

Ototo

Turning Transit Together



Comparison of two Cities:

Comparison of urban forms and transportation sector CO₂ Emission



Atlanta

50 km



Barcelona

Atlanta

Population
5.25 million

Urban area:
4280 km²

CO₂ emissions
7.5 tonnes per
hectare per year
(public + private
transport)

Barcelona

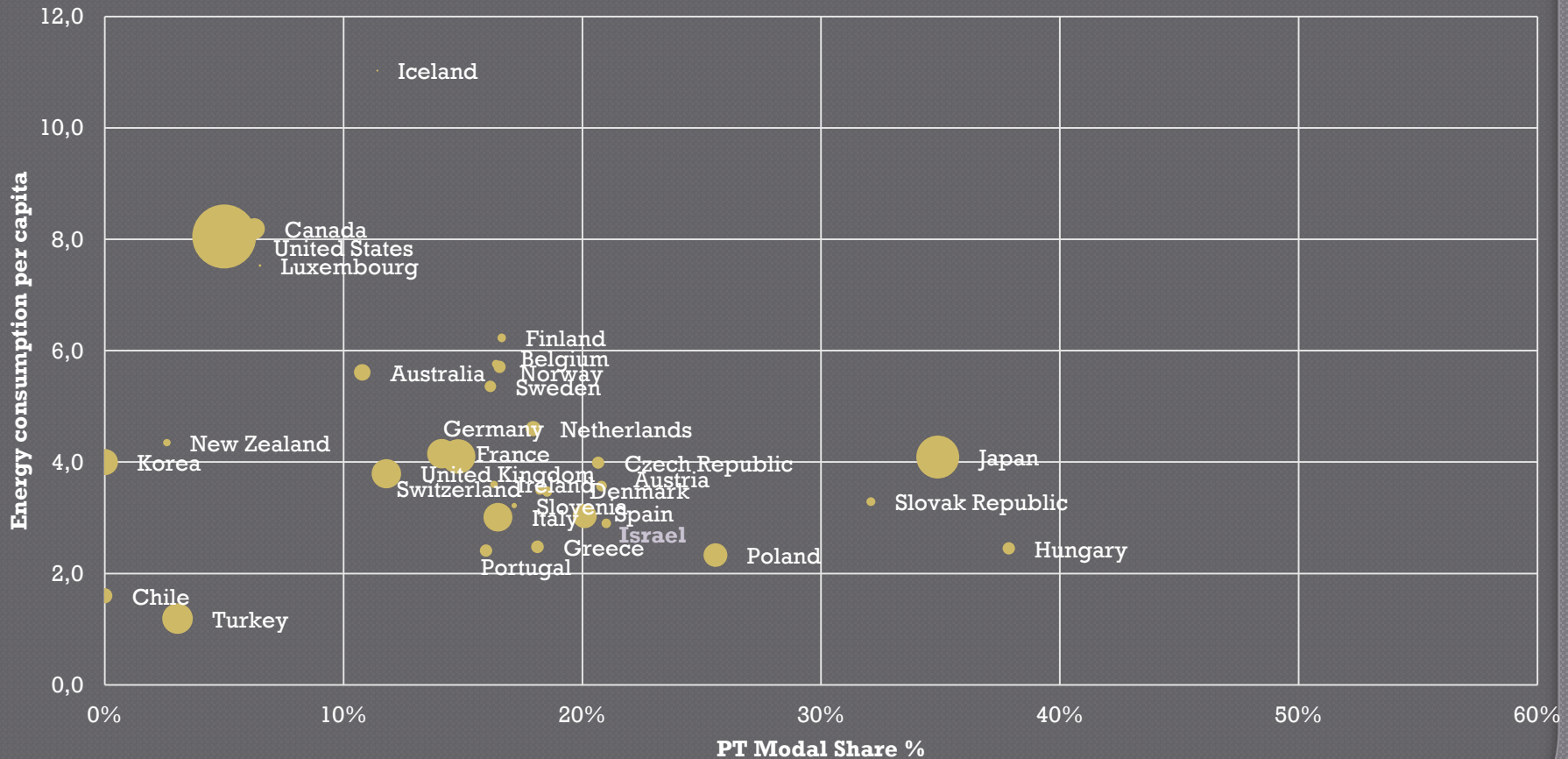
Population
5.33 million

Urban area:
162 km²

CO₂ emissions
0.7 tonnes per
hectare per year
(public + private
transport)

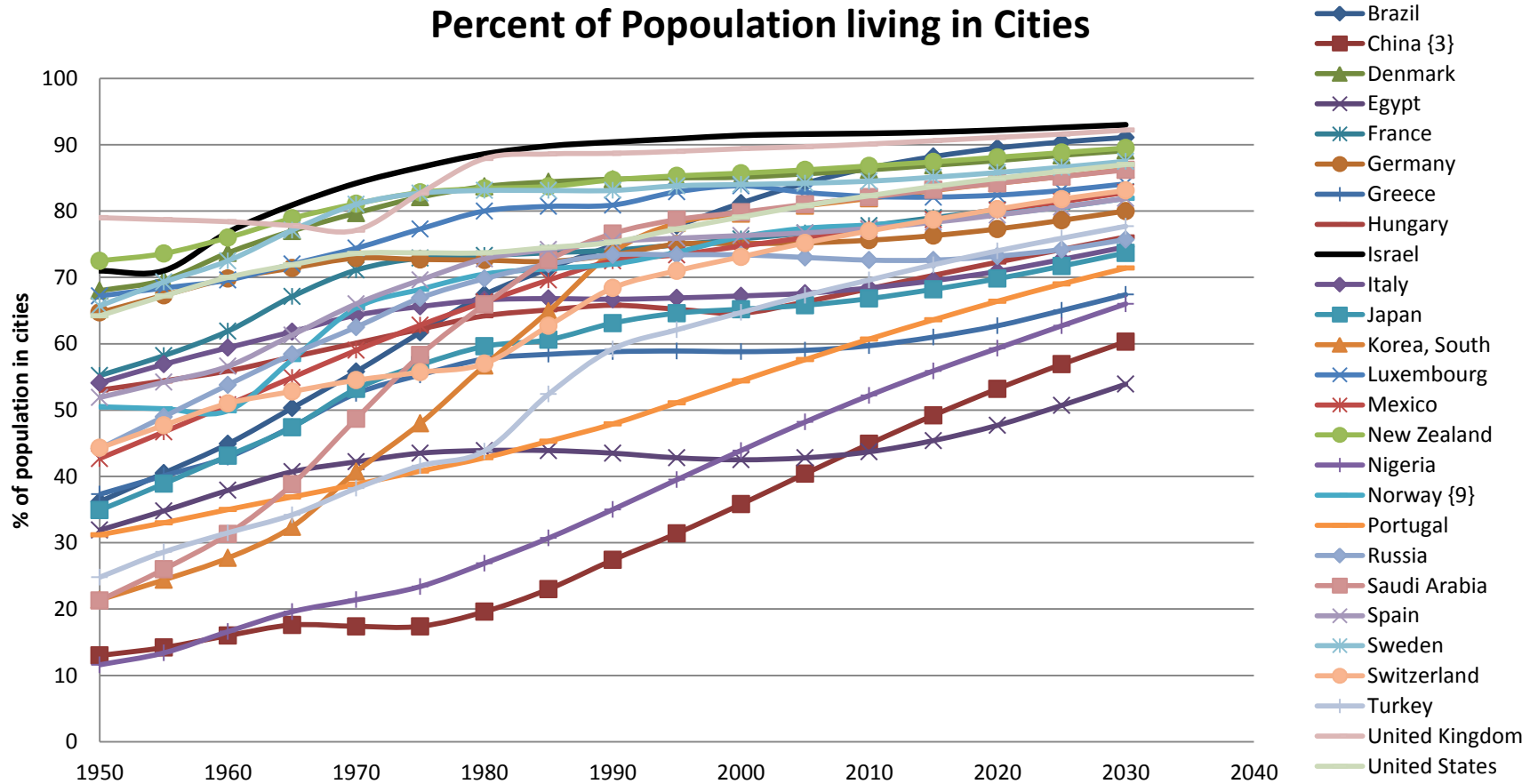
Energy Consumption and Mode Share

Energy Consumption Modal Split and Population



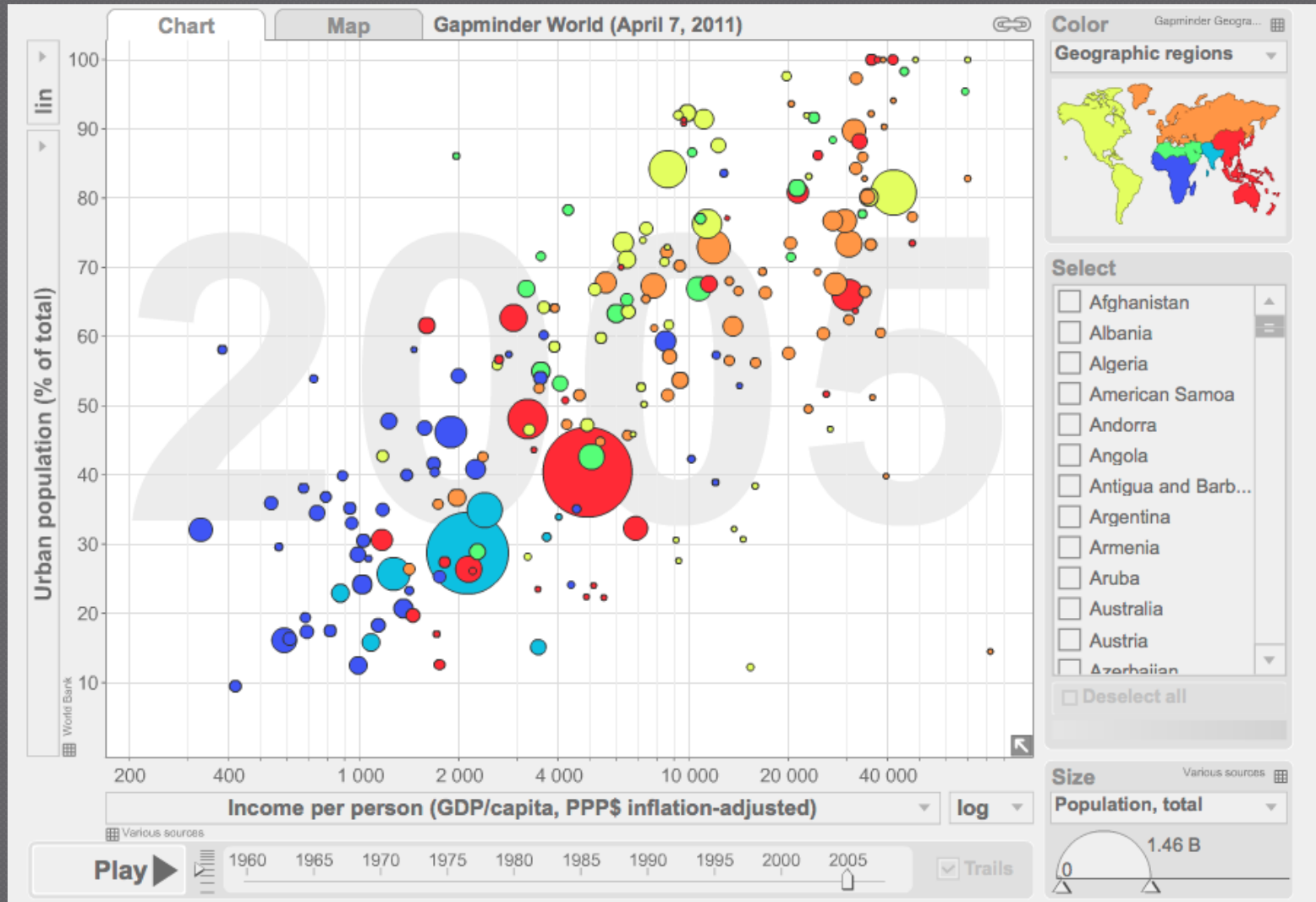
Source: Author analysis of OECD database for the year 2000

Urbanization Continue



Source: United Nations, Department of Economic and Social Affairs, Population Division. 2006

% urban vs. income



Source: Gapminder World, analysis of UN database 2011

Economic impact of public transport investments in the USA

Summary of the Short-term Economic Impact per Billion Dollars of National Investment in Public Transportation (includes indirect and induced effects)^A

Economic Impact	Per \$ Billion of Capital Spending	Per \$ Billion of Operations Spending	Per \$ Billion of Average Spending^B
Jobs (Employment, thousands)	23.8	41.1	36.1
Output (Business Sales, \$ billions)	\$ 3.0	\$ 3.8	\$ 3.6
GDP (Value Added, \$ billions)	\$ 1.5	\$ 2.0	\$ 1.8
Labor Income (\$ billions)	\$ 1.1	\$ 1.8	\$ 1.6
Tax Revenue (\$ millions, rounded)	\$ 350	\$ 530	\$ 490

Source: Weisbord Glen, American Public Transport Association, 2009.

Thank You For Your Attention!



"YES DEAR, I KNOW YOUR LIBRARY BOOK ISN'T DUE UNTIL NEXT WEEK, BUT WE HAVE TO START LOOKING FOR A PARKING SPACE NOW."