Institut für ÖKO-LOGISCHE STADT ENTWICKLUNG

Strategies towards **large-scale carfree areas**

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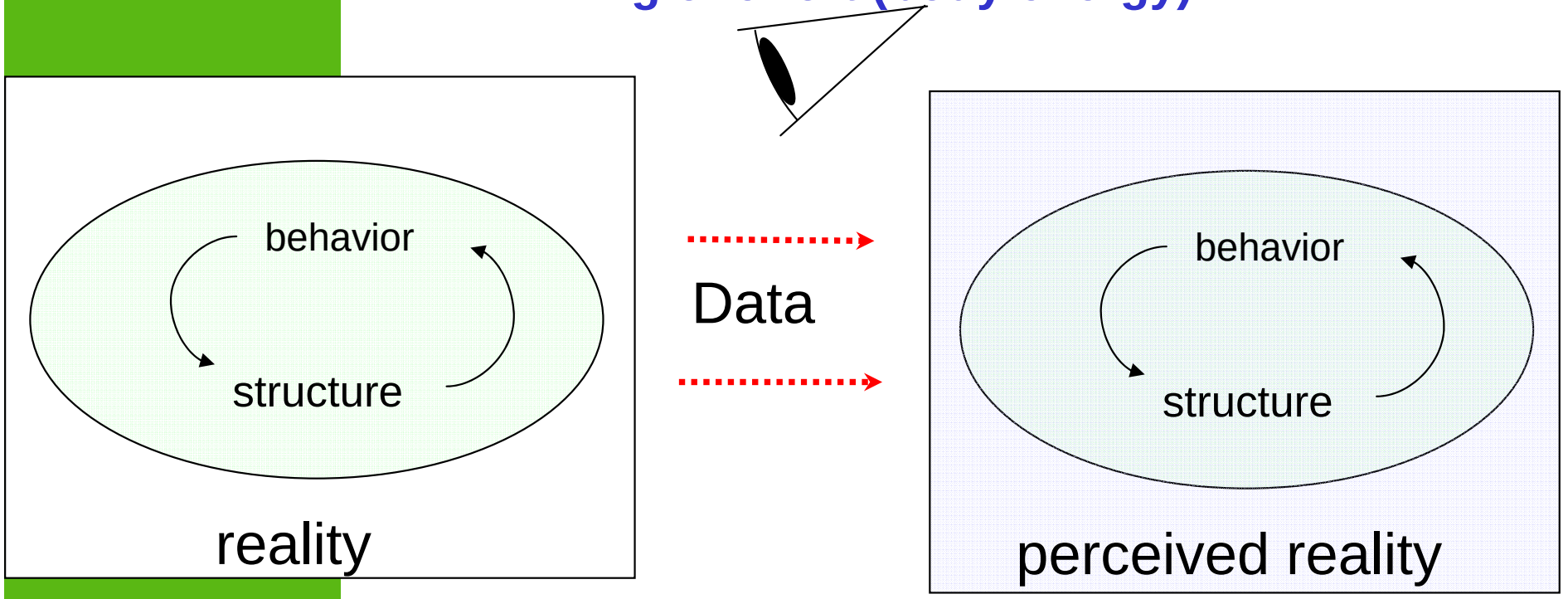
European-level activities to promote strategies towards large-scale carfree areas

Towards Carfree Cities Conference IX 28.06.2010

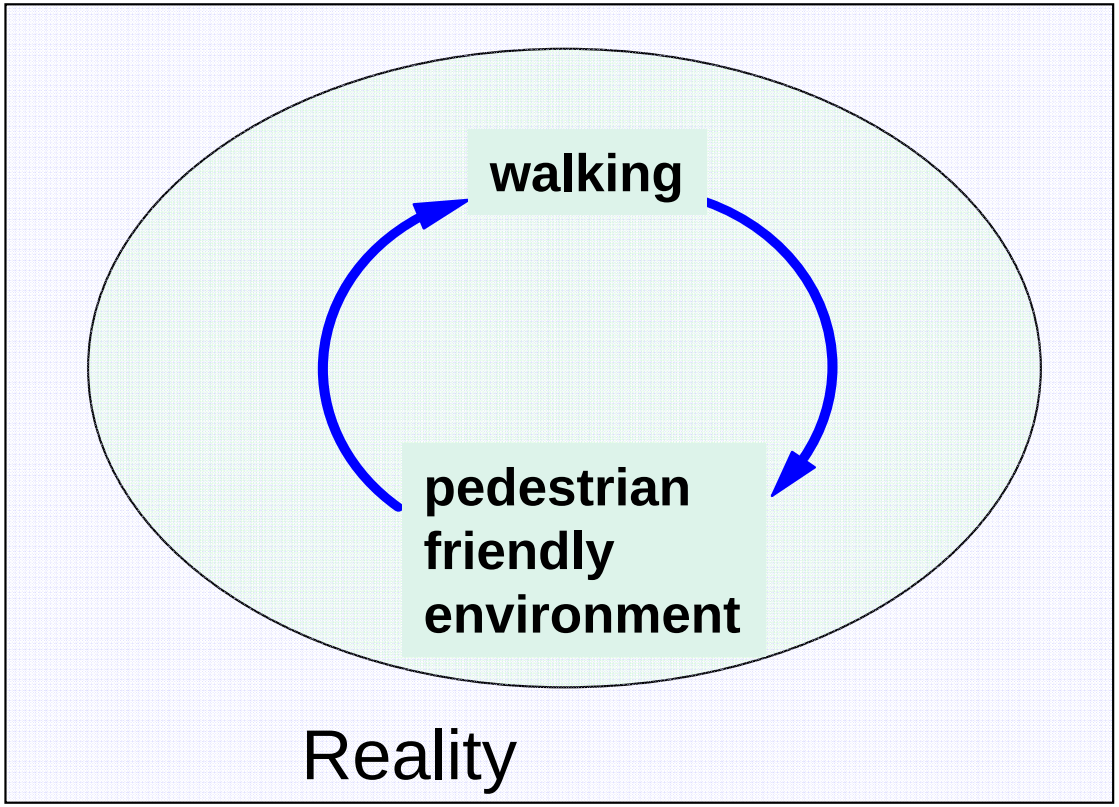
Understanding human behaviour
Reality – perceived reality

human behavior → maximizing utility
= minimizing of effort (body energy)



humans adapt their behavior according to their perceived structure !
Surrounding structure is man made!!
Feedback

Understanding human behavior

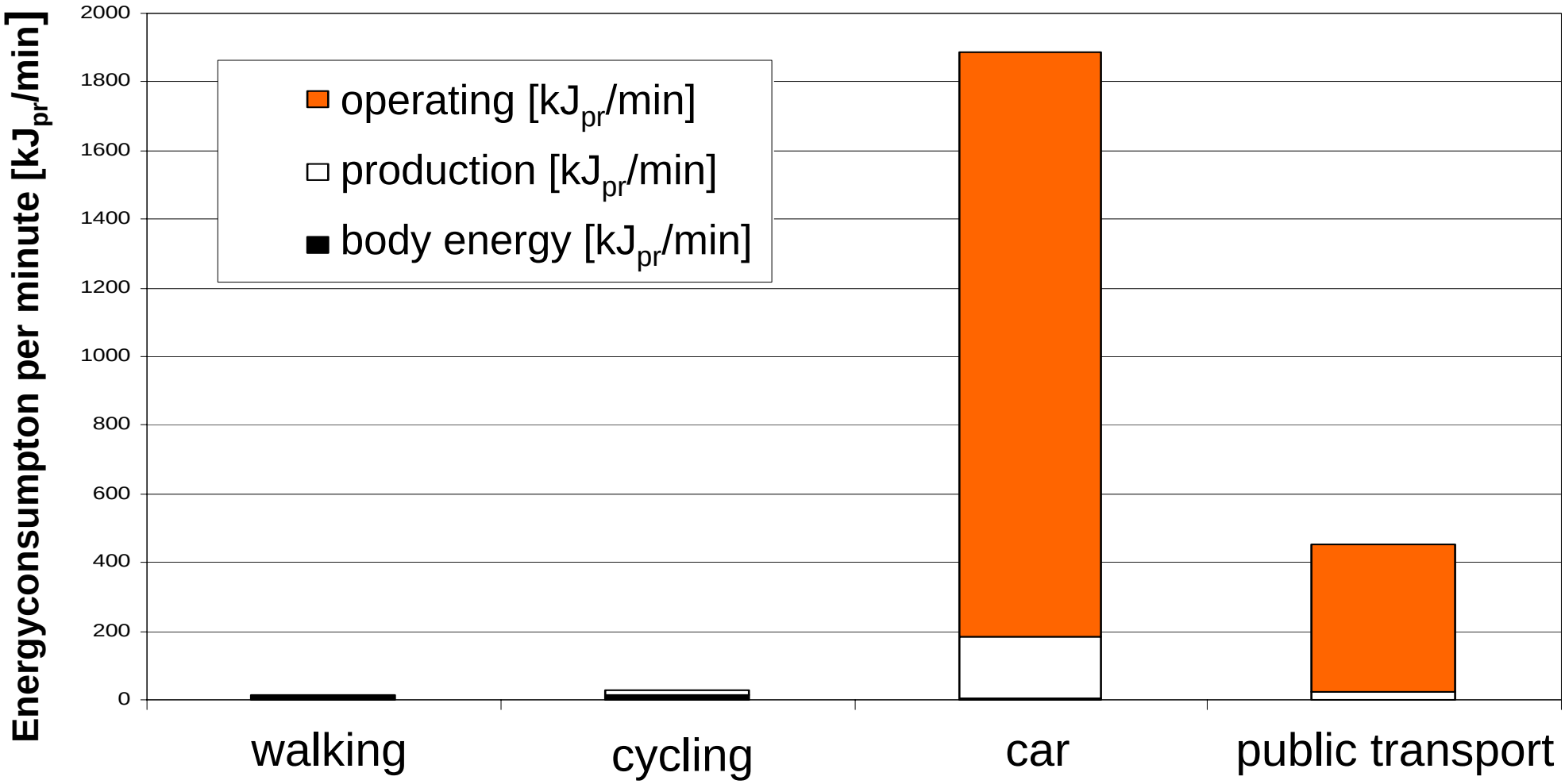


Understanding human behaviour

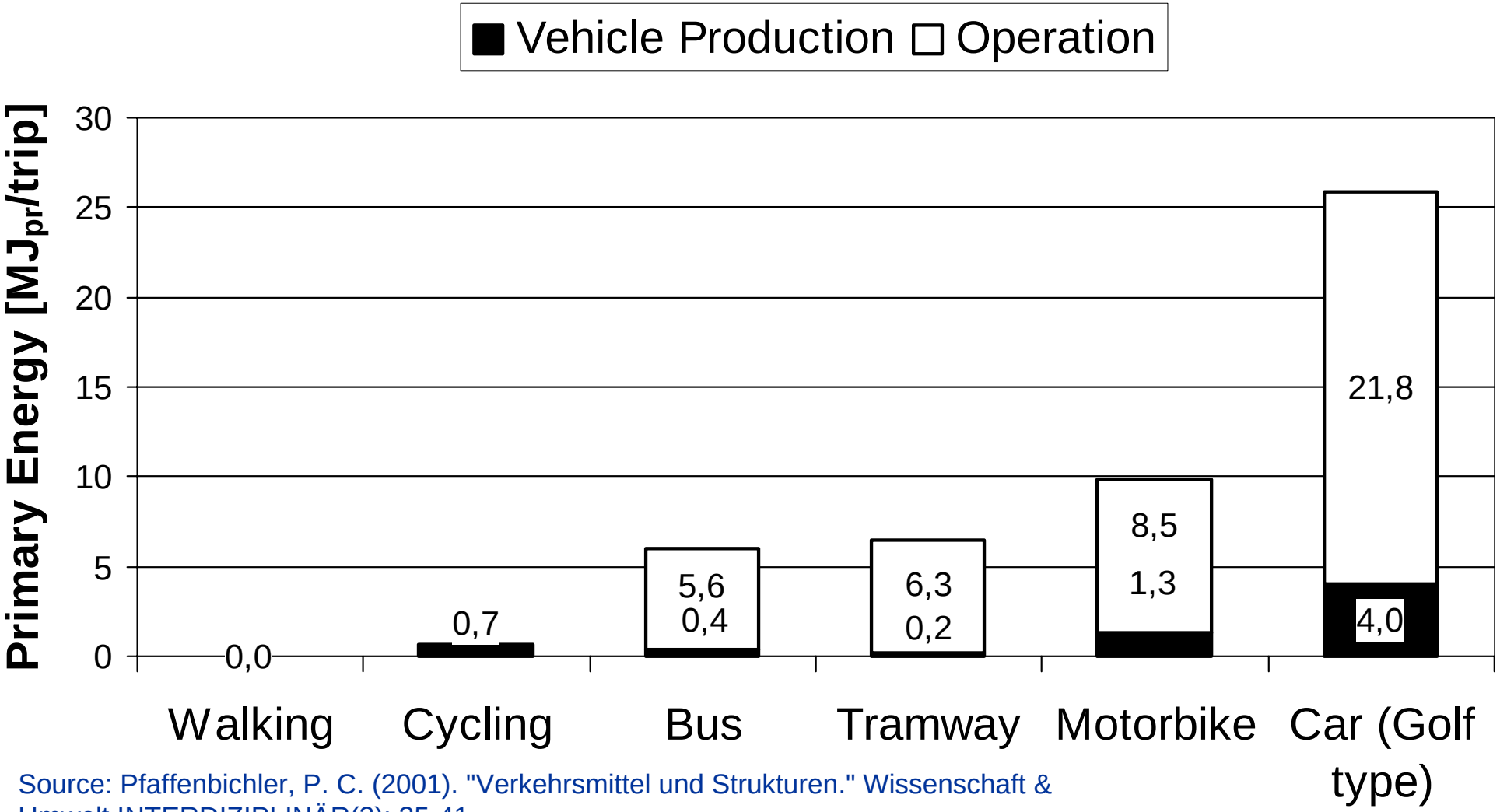
type of activity	KJ/Min	in relation to walking (=100%)
sitting	6.3	34,9
standing	7.5	41,9
walking (4km/h)	18.0	100
walking (6km/h)	27.2	151,2
running (12km/h)	52.8	293,0
running (20km/h)	101.3	562,8
up hill walking (10%,3km/h)	30.1	167,4
cycling (10 km/h)	16.7	93,0
cycling (15km/h)	24.7	137,2
cycling (20 km/h)	37.7	209,3
car driving (urban)	10.0 -17.6	60,5-97,7
car driving (rural)	9.2	51,2
car driving (116 km/h)	8.4	46,5
car driving (119km/h)	8.8	48,8
car driving (142km/h)	12.1	67,4
Lorry driving (rural)	11.3	62,8

Source: „Gesamtumsatz an Körperenergie bei den Grundmustern der Verkehrsteilname“ (aus Schopf, J.M.,1992)

Comparison of energy consumption per mode and minute



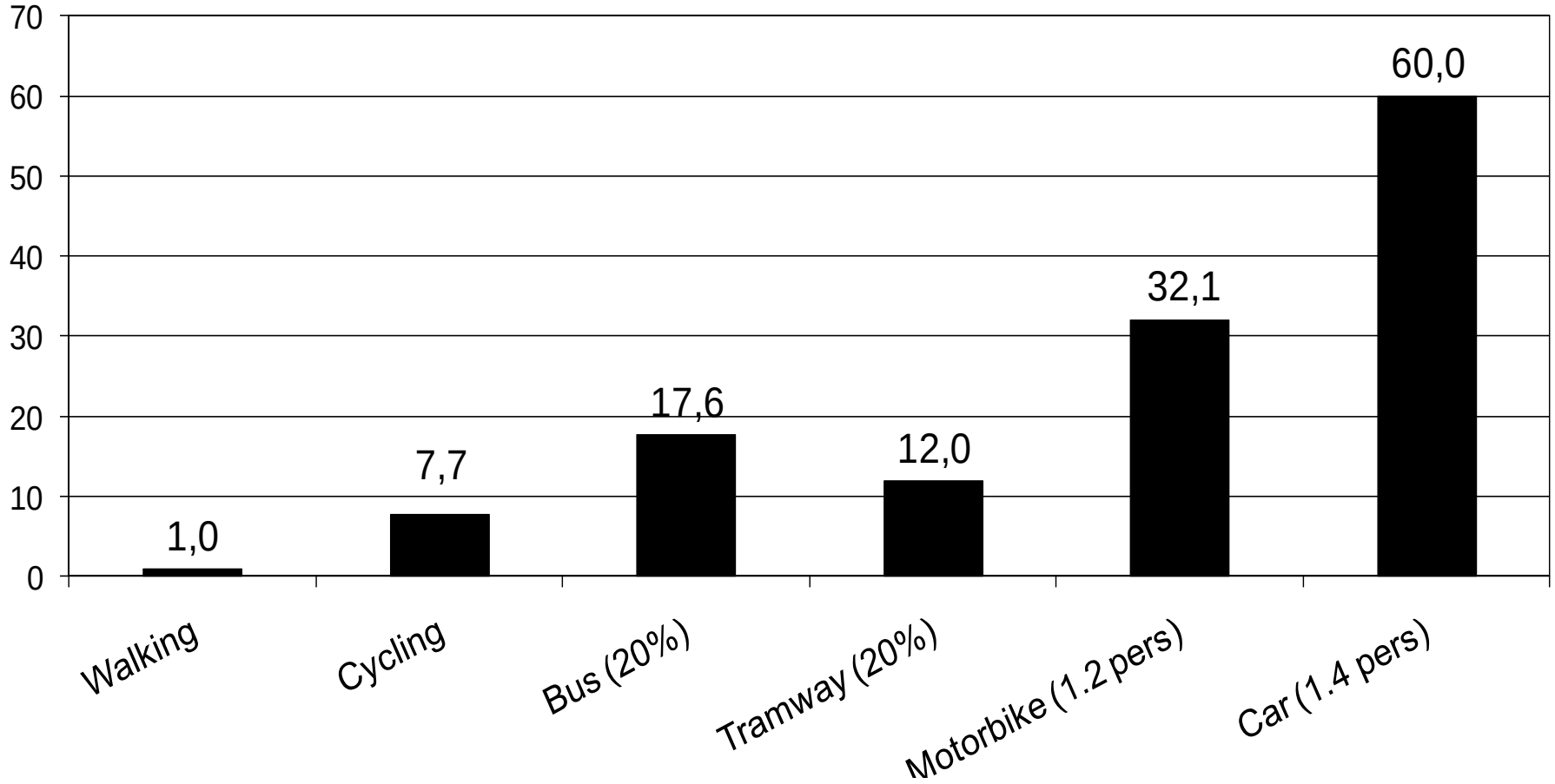
Comparison energy consumptions per trip



Source: Pfaffenbichler, P. C. (2001). "Verkehrsmittel und Strukturen." Wissenschaft & Umwelt INTERDIZIPLINÄR(3): 35-41.

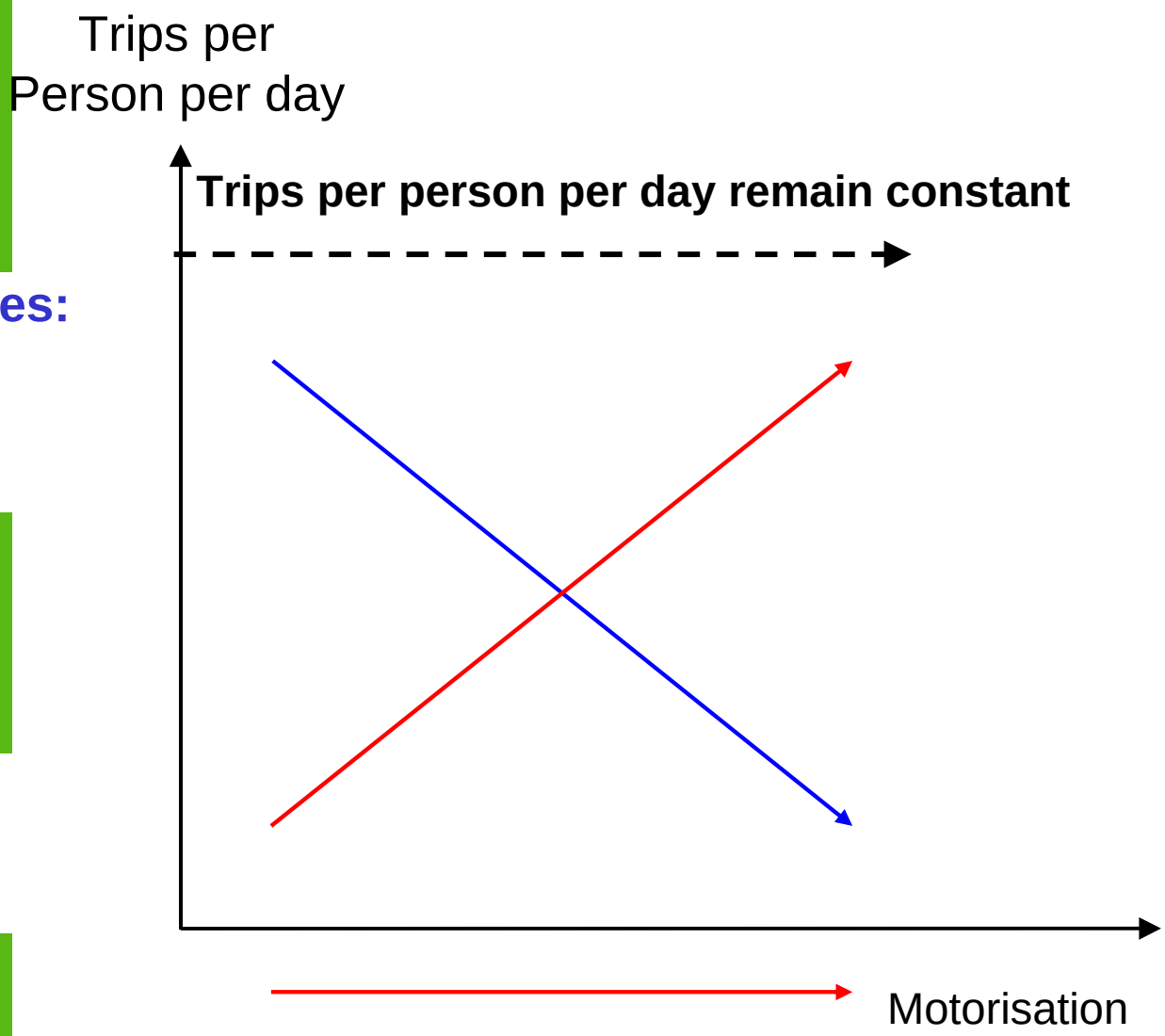
Comparison space consumptions

Area consumption [m²/person]



Source: Pfaffenbichler, P. (2001). "Verkehrsmittel und Strukturen." Wissenschaft & Umwelt Interdisziplinär(3), 35-42., own additional calculations

No growth of mobility

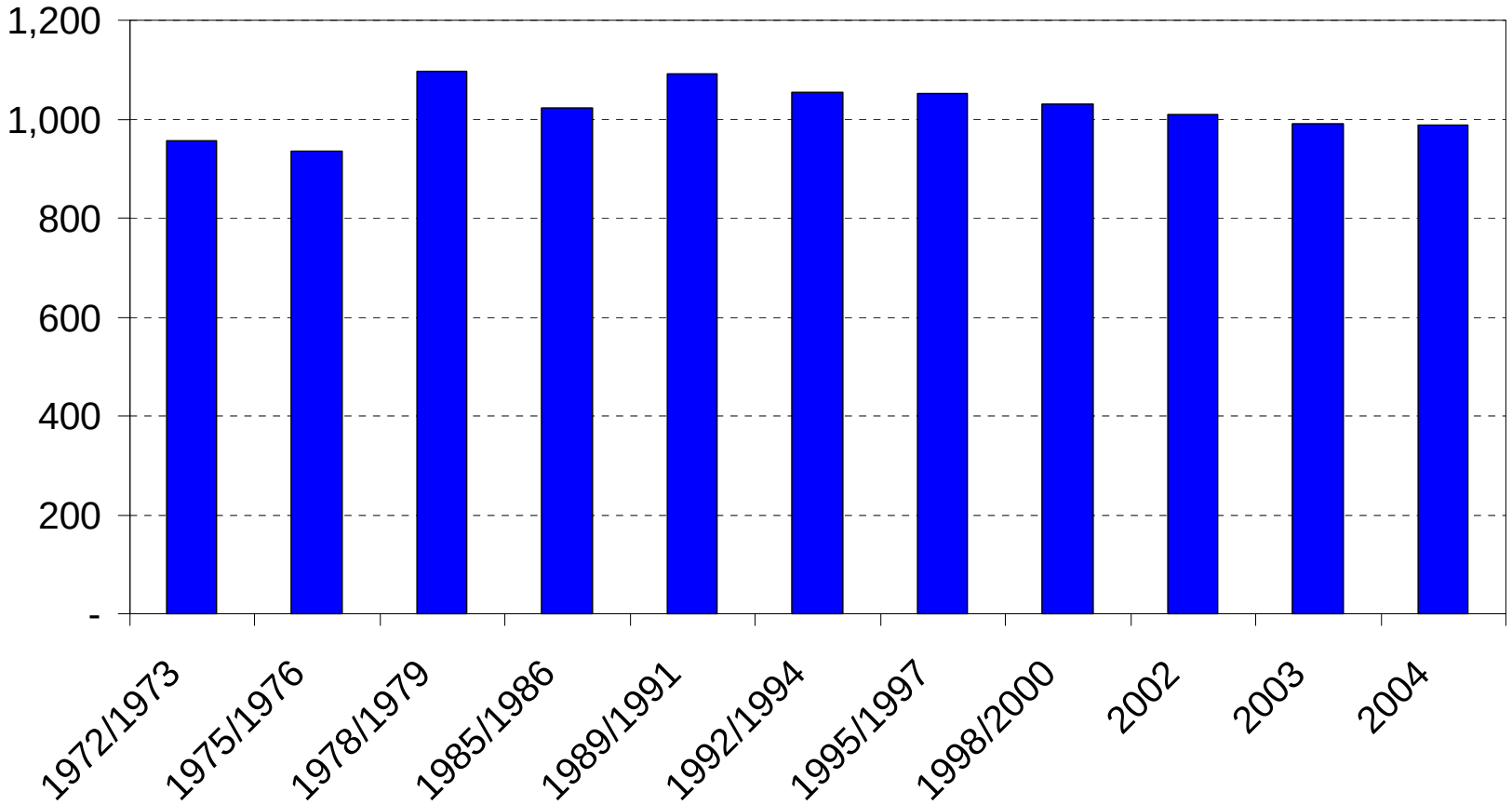


The Urban modes:
Pedestrian -,
Cycle-,
PT-trips

The non-urban mode:
Trips by car

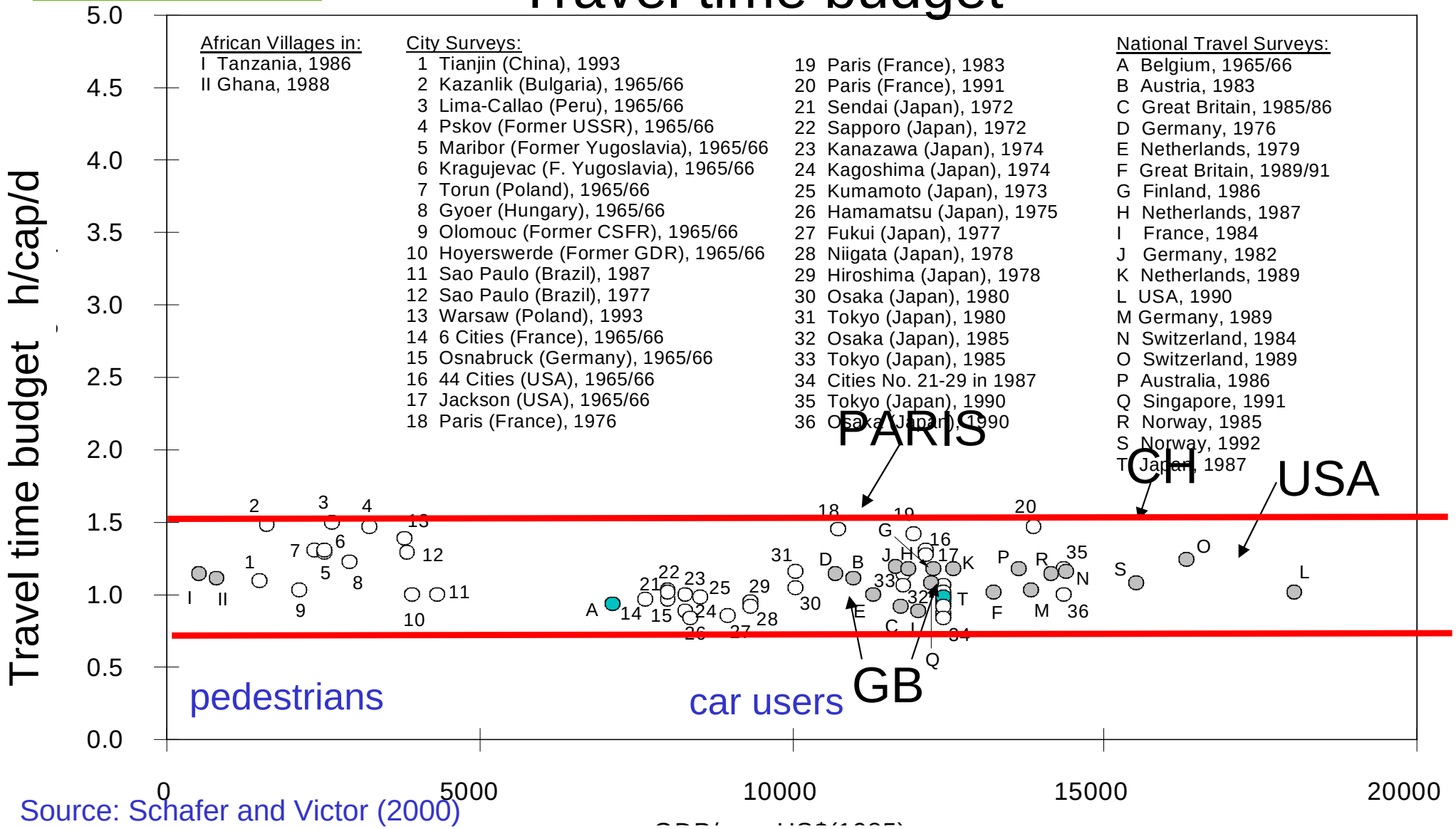
Trip number - purposes

Time series - number of trips in the UK



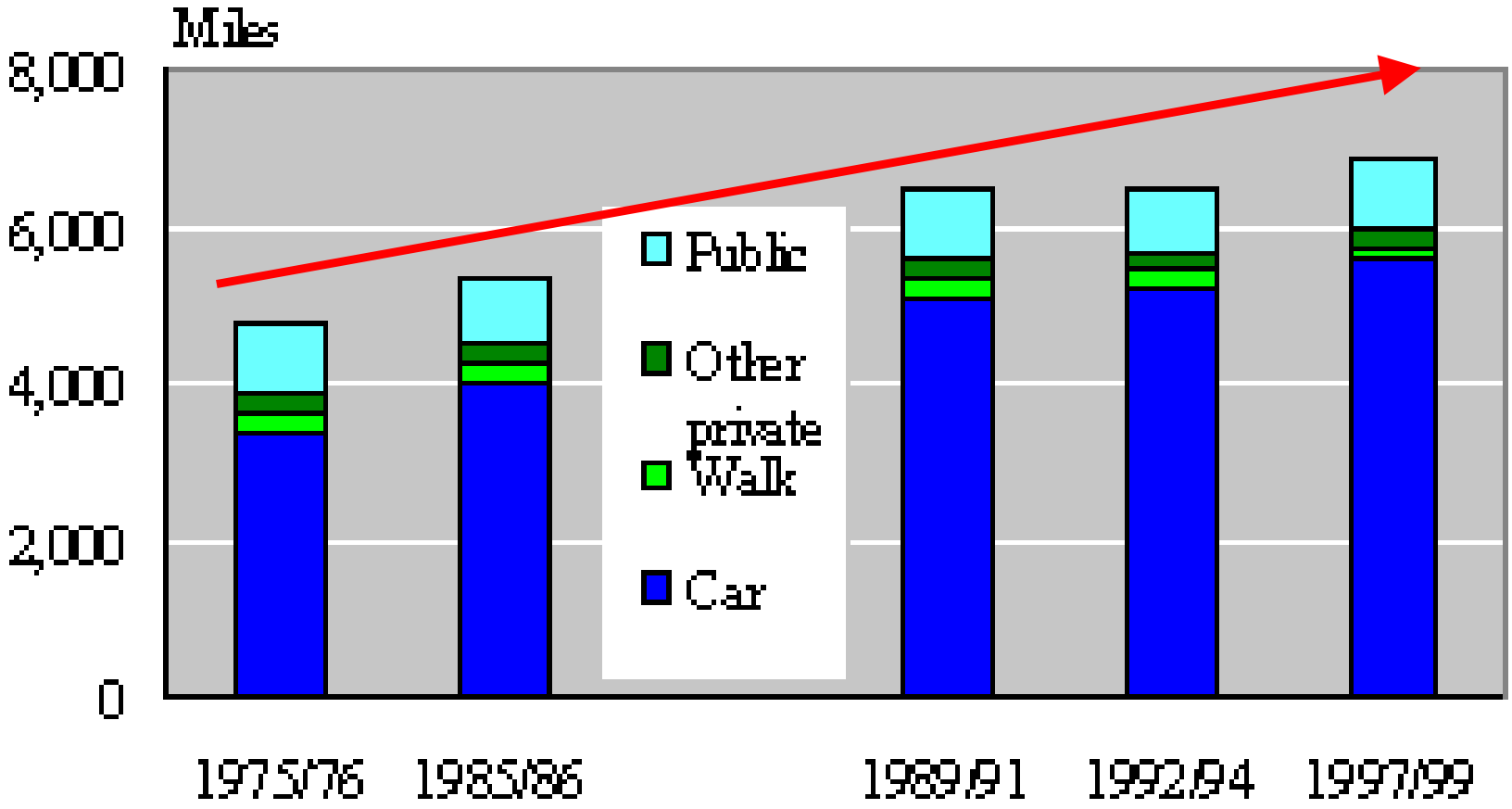
Source: http://www.dft.gov.uk/stellent/groups/dft_transstats/documents/page/dft_transstats_039316.xls

Travel time budget



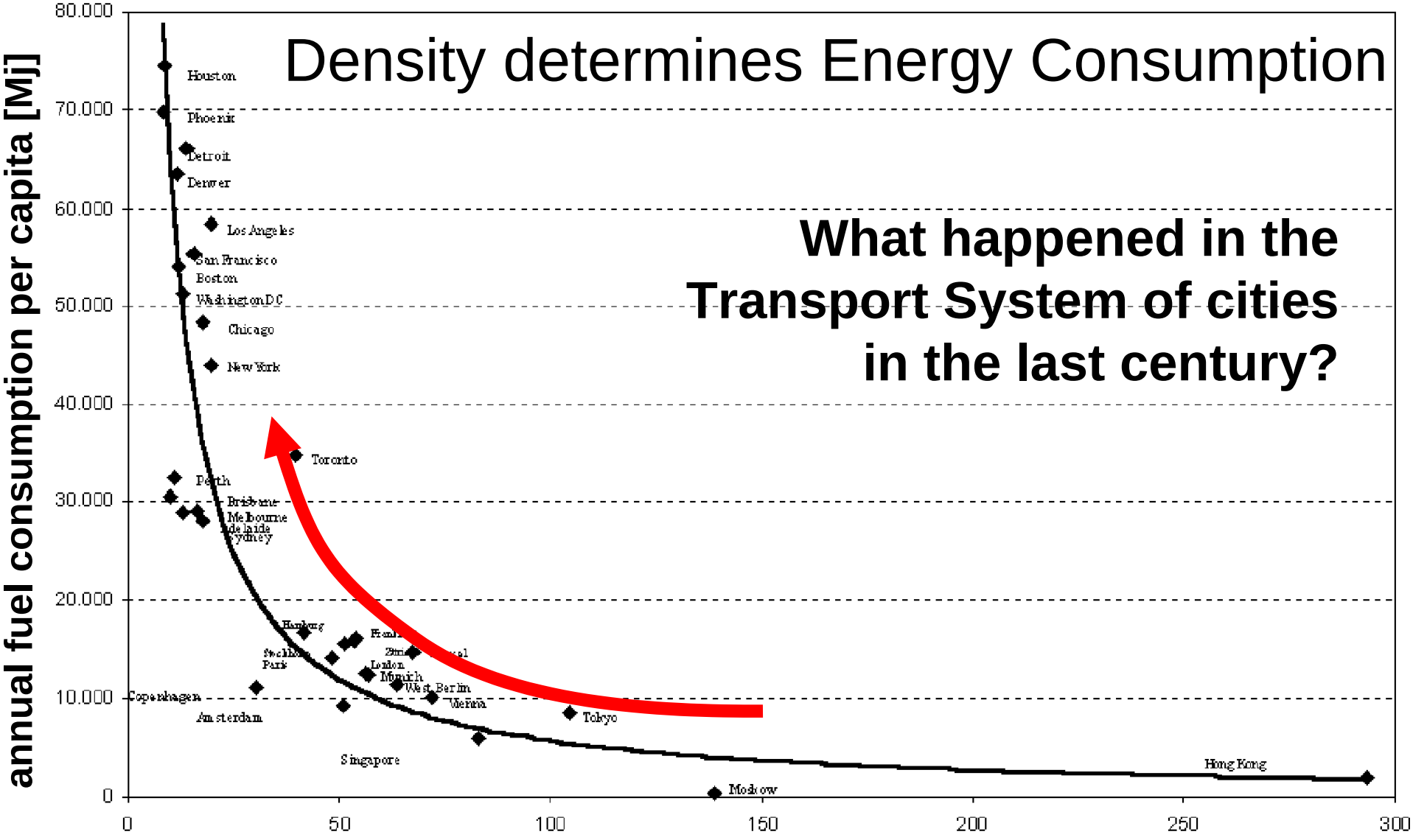
Source: Schafer and Victor (2000)

What increases is the distance travelled per person per year by main mode!



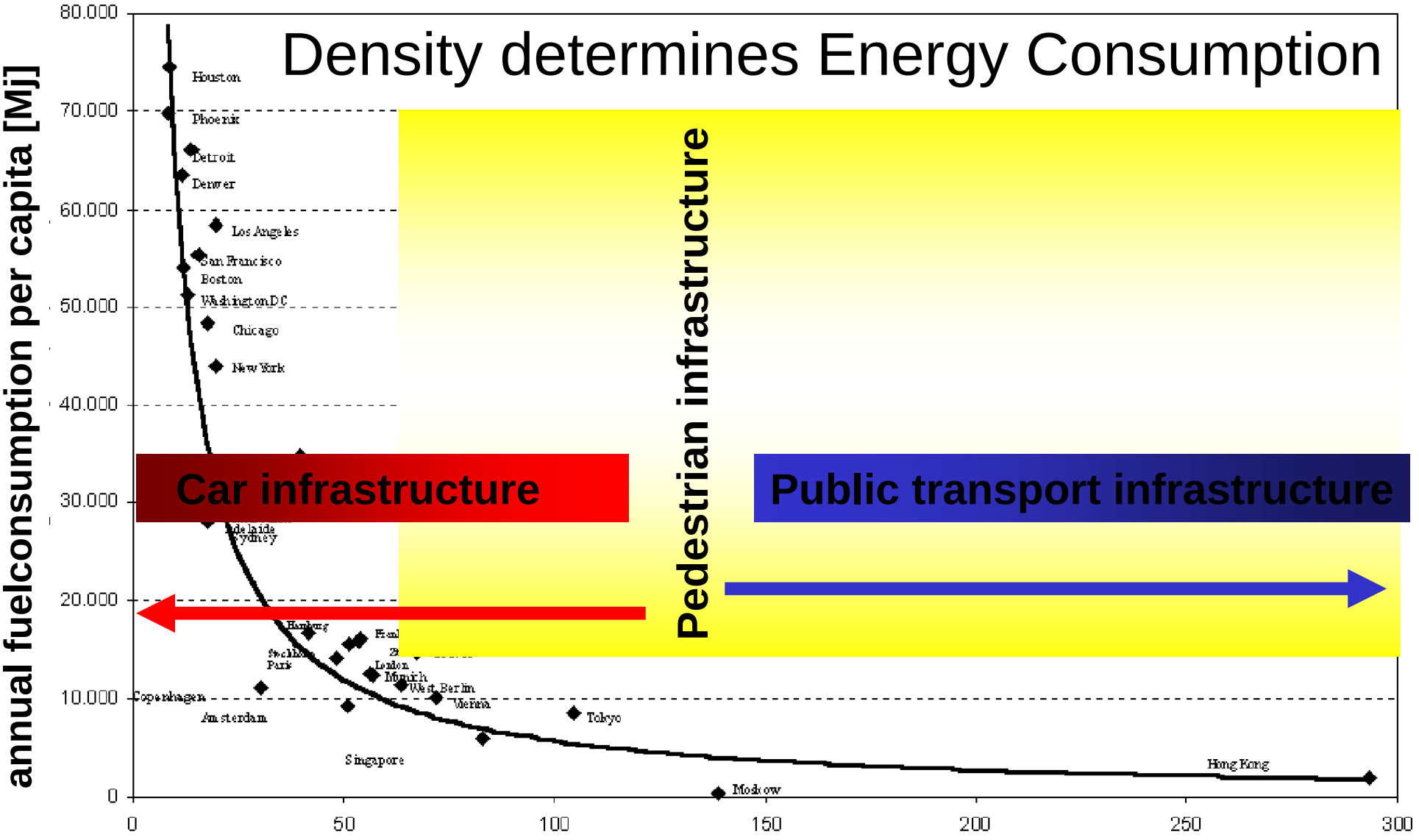
source: http://www.transtat.dft.gov.uk

Density determines Energy Consumption



What happened in the Transport System of cities in the last century?

Source: Schafer and Victor (2000)



Source: Schafer and Victor (2000)

USA

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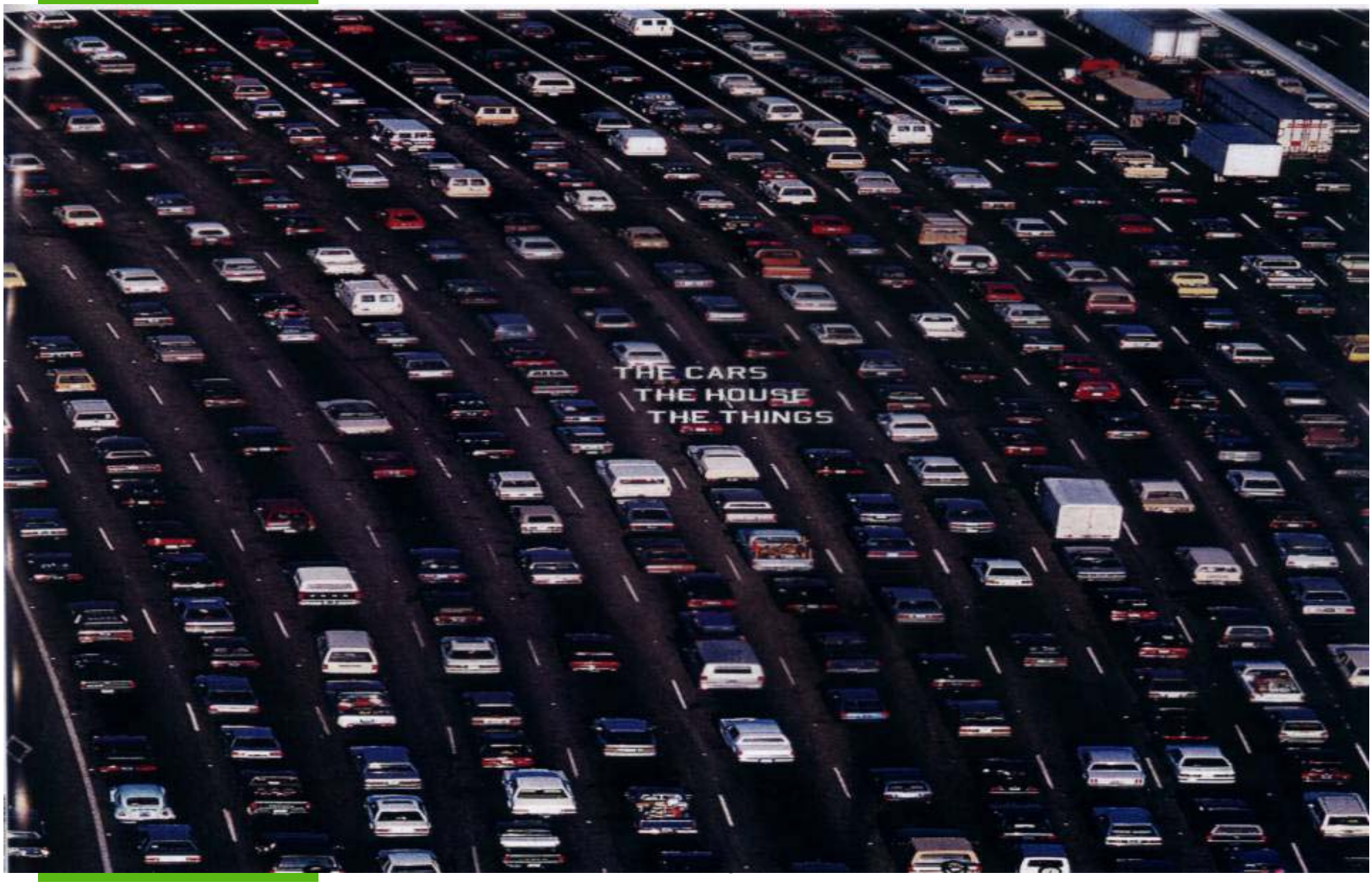
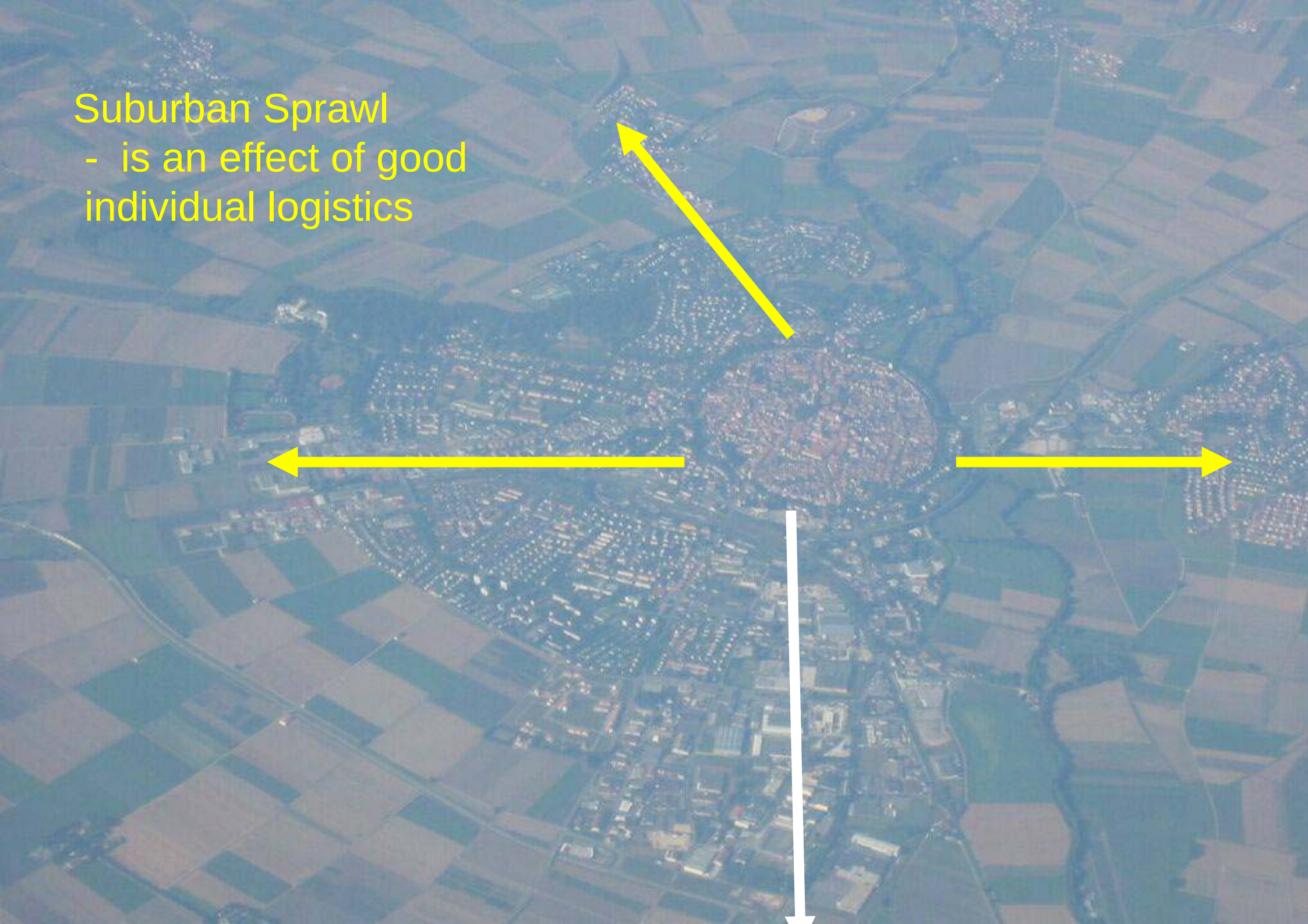



Suburban Sprawl
- is an effect of good individual logistics

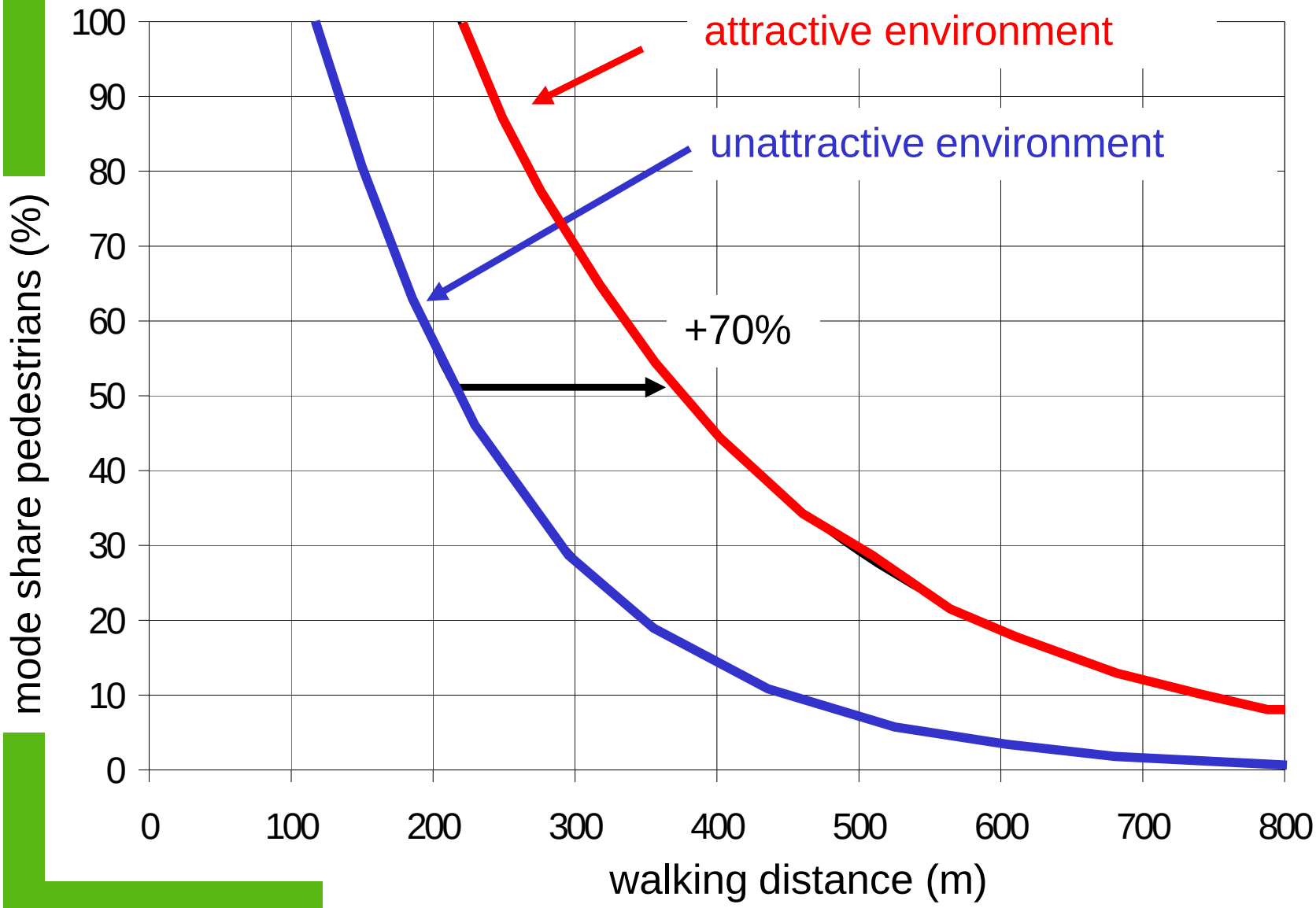
Eisenstadt before (1980ties):

10 000 cars, 6000 pedestrians per day

Eisenstadt after (today):

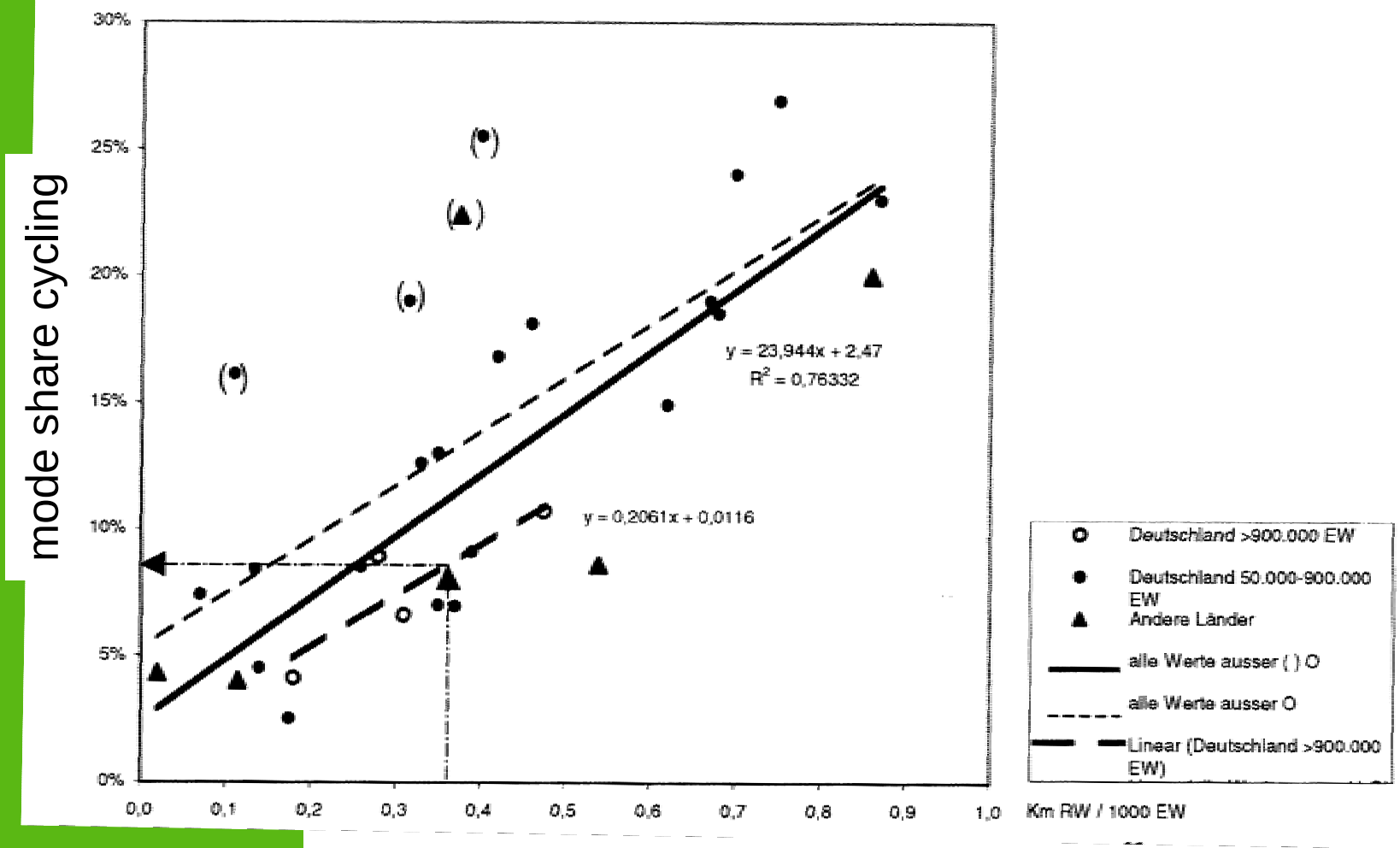
30 000 pedestrians per day plus .....

Structure and behaviour



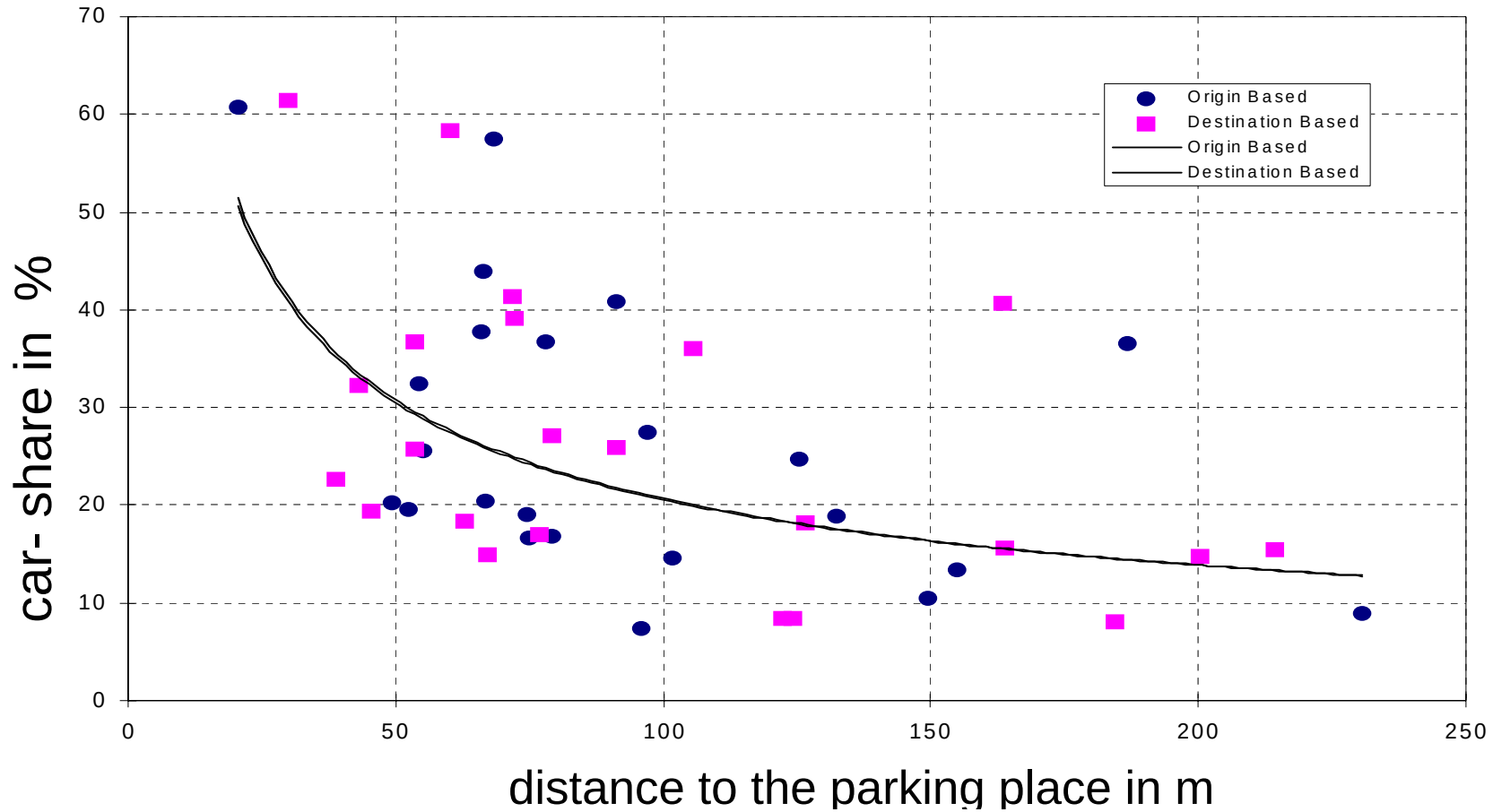
Source: Peperna, O. (1982). "Die Einzugsbereiche von Haltestellen öffentlicher Nahverkehrsmittel im Straßenbahn- und Busverkehr," Masterthesis, Technische Universität Wien.

Bike Infrastructure – bike use



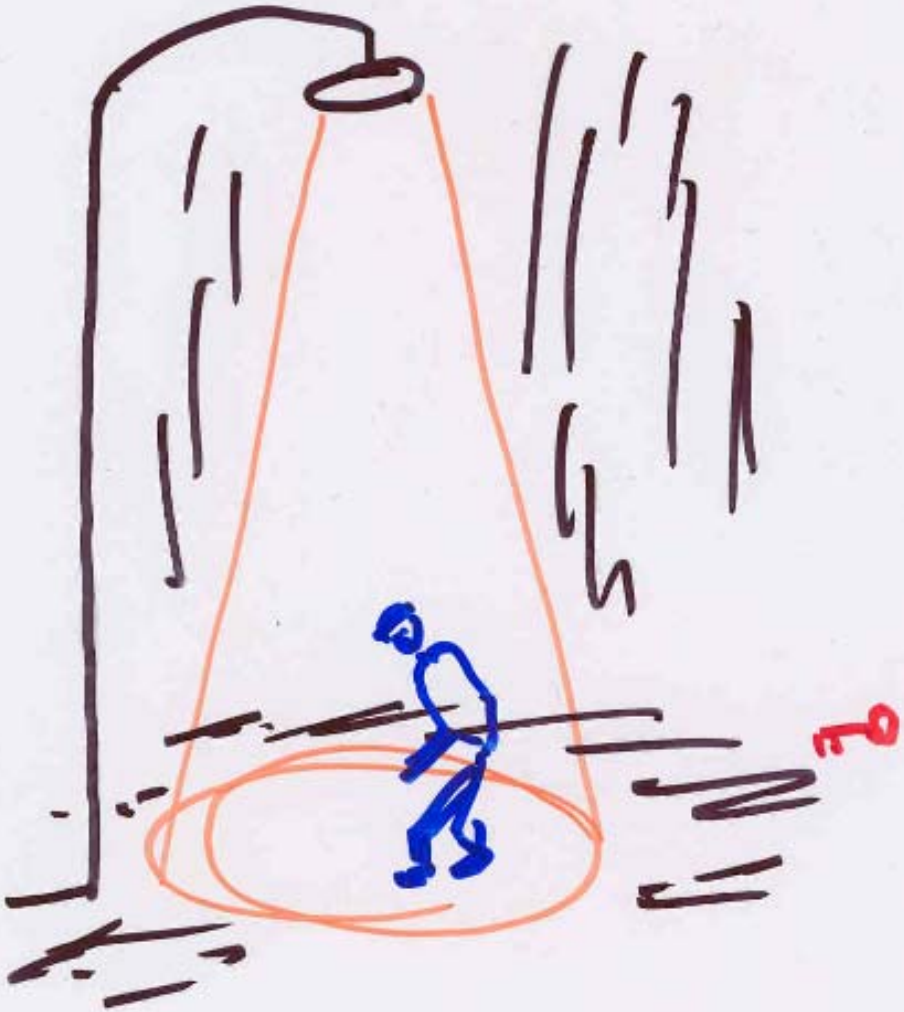
km bike lanes per 1000 Inhabitants

Car share depending on parking place distance



Source: Emberger, G., and Knoflacher, H. (1995). "Sustainable Development - Öko-City, Projektgruppe 1: "Mobilität in der Stadt" (Stadt und Verkehr). Band 3: Mobilitätsverhalten der Wiener Bevölkerung. Durchgeführt im Auftrag der Wiener Internationalen Zukunftskonferenz (WIZK).„

Where is the solution?



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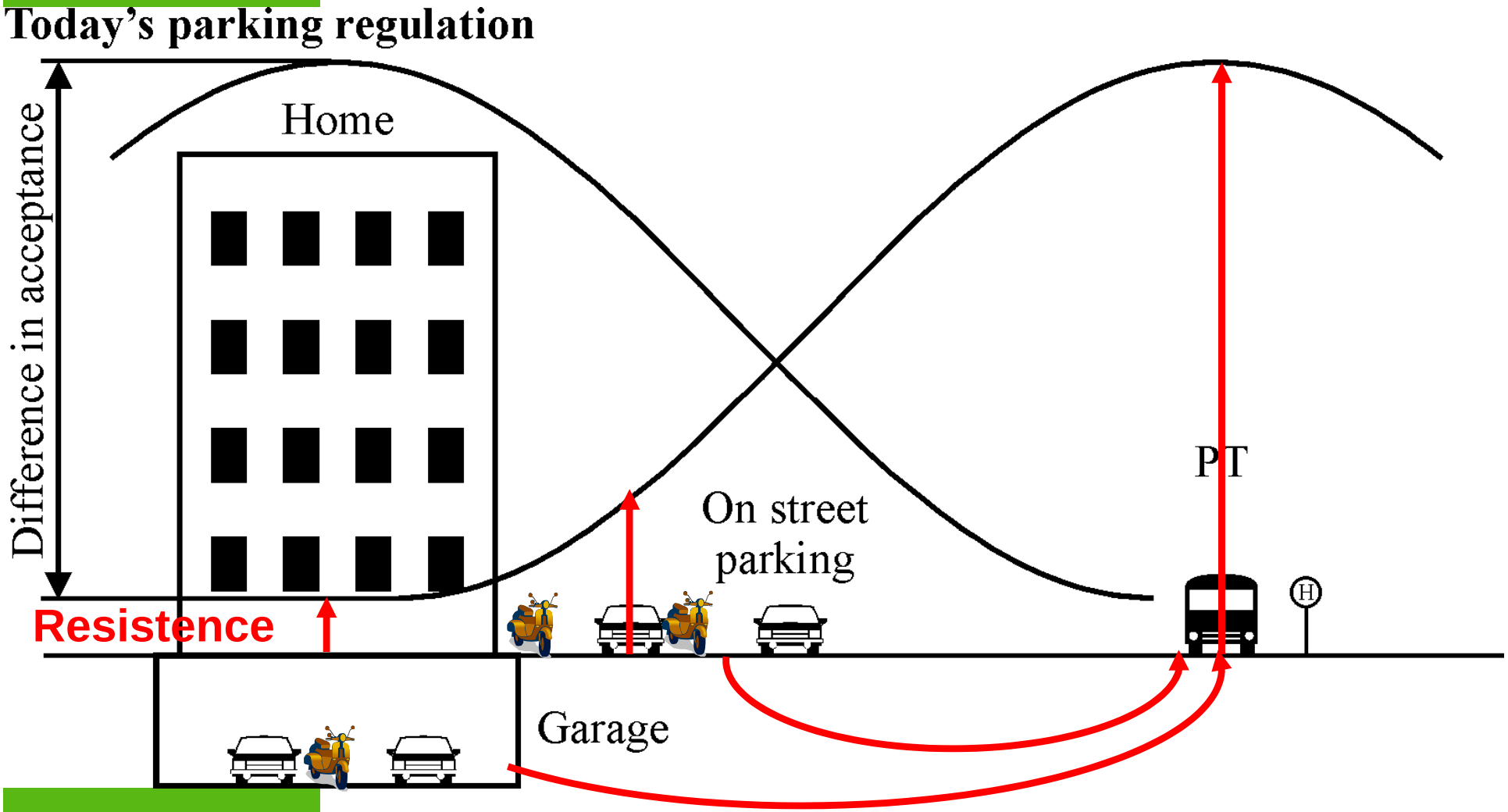
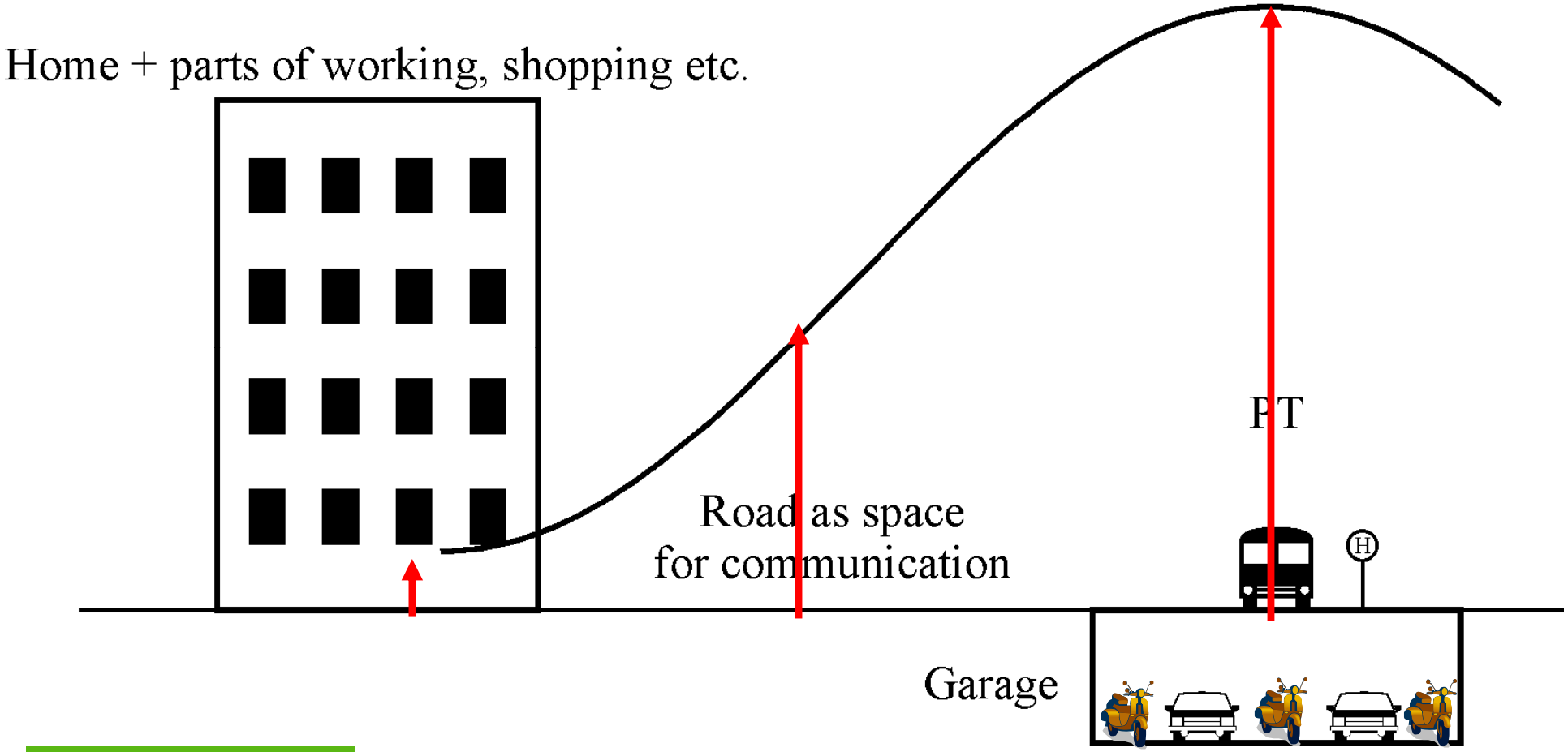
Alternative policies -Parking organisation



Source: (Knoflacher 1980)

Alternative policies -Parking organisation

The basic solution



Source: (Knoflacher 1980)

Conclusions part 1

- Traditional demand driven transport planning doesn't solve problems – it is the cause for the problems!!
- Car traffic is the "wrong" mode for cities – Oil Peak, CO_2 emissions, space consumption, etc.
- Car (motorised individual transport) infrastructure destroys settlement structures.
- A new systemic view on the land use - transport - system reveals cause - effect relations
- **Built structure influences behaviour** – "right" (infra)structure leads to "right" behaviour (sustainability)

Conclusions part 2

- Solutions cannot be found in car/motorcycle traffic management.
- Technological improvements of the car cannot contribute significantly to solutions.
- Higher average car /motorcycle speed (motorised transport) increases the attractiveness of its use.
- Solutions for transport problems can be found in the organisation of parking space.
- Responsible transport planners have to provide infrastructure for sustainable means of transport – pedestrians, cyclists and public transport.

- There are huge time lags in the system!
- We have to change it now – or we are too late!!

Steps from Carfree Day to Carfree Cities

Temporary carfree

Carfree Parking Space

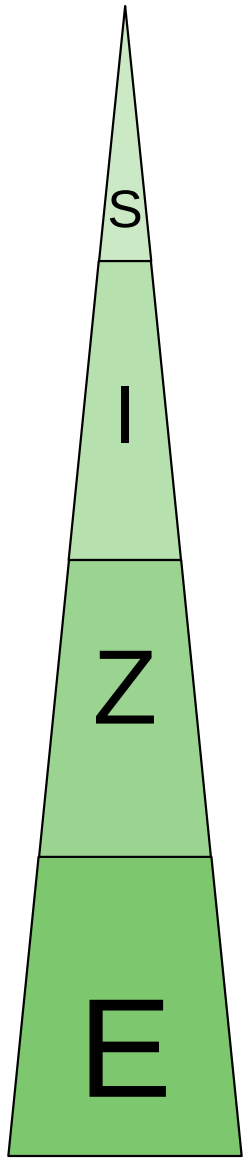
Carfree Street on Carfree Day

Permanent carfree

Carfree Streets and Squares

Carfree Area

Carfree City



Steps towards Carfree Cities

Temporary carfree

Carfree Development Step	infrastructure elements / tools	Car ownership	Approach
Carfree Parking Space	metered parking spots temporary public design (plants, benches, etc.)	No change	Awareness rising
Carfree Street on Carfree Day	closing sections of streets for cars temporary public design (plants, benches, etc.)	No change	Awareness rising
Carfree Street on other occasions *	closing sections of streets for cars markets	No change	Demonstration of feasibilty

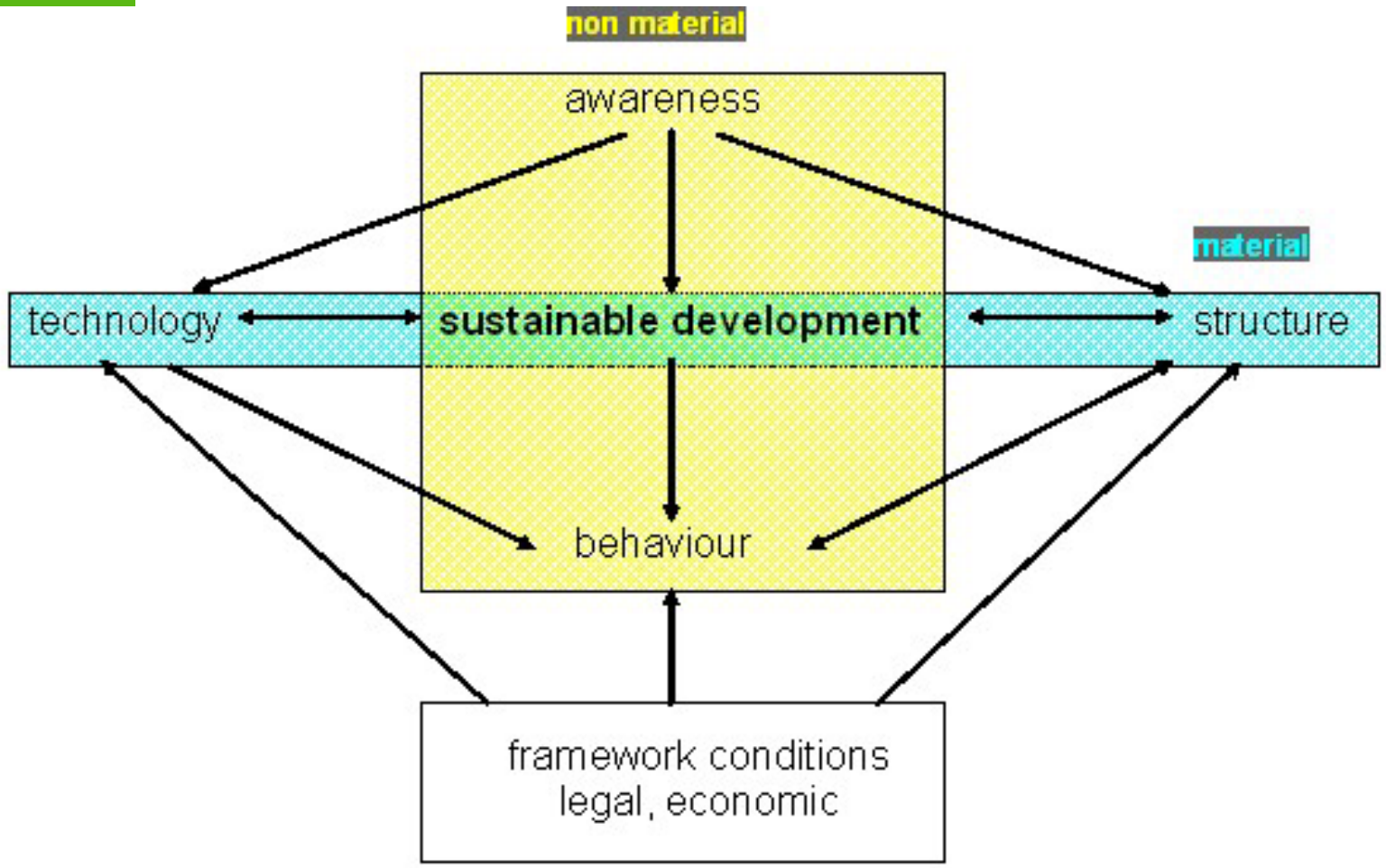
* Sport events (Marathon), business events (Christmas)

Steps towards Carfree Cities

Permanent carfree

Carfree Development Step	Appropriate transport infrastructure elements	Car ownership	Approach
Carfree Streets and Squares	Attractive Public Design Collective garages	small reduction	structural
Carfree Area, transition step	Convenient Pedestrian and Cycling Paths Collective garages	significant reduction	structural behaviour
Carfree Area	Convenient Pedestrian and Cycling Paths	no private car	structural behaviour
Carfree City	Convenient Pedestrian and Cycling Paths Public transport - tram lines	significant reduction	structural behaviour
Public Transport Region	Compact settlements around stops; Public transport - (light) rail connections	significant reduction	structural behaviour

APPROACHES


non material
awareness
material
technology
sustainable development
structure
behaviour
framework conditions
legal, economic

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