

# Sustainable mobility: Illusions and successes

Dutch Ministry of Infrastructure  
and Water Management

22 maart 2022

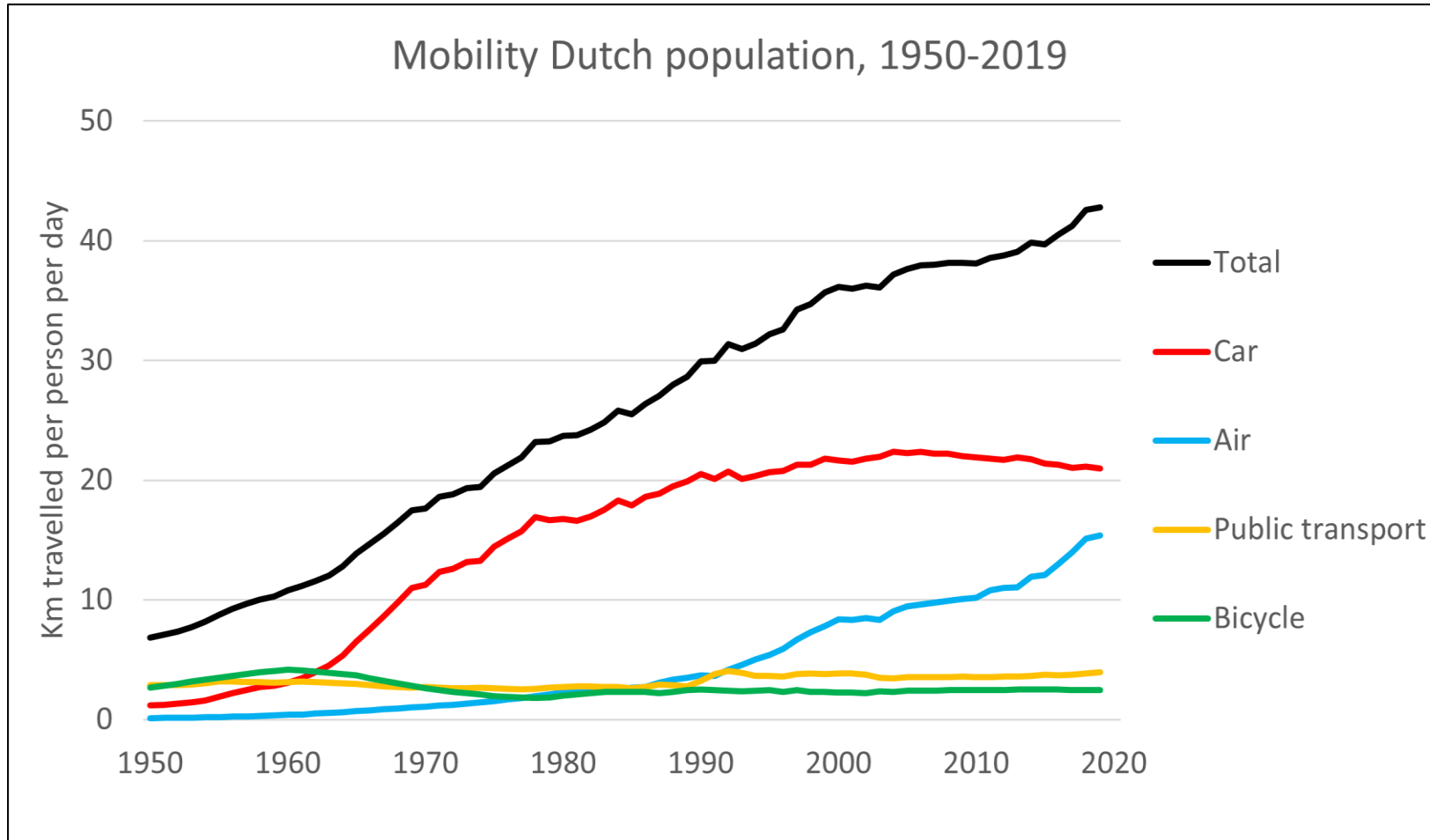
Arie Bleijenberg



# Thirty years sustainable mobility

Illusions	Successes
Improving public transport	Environmental standards vehicles
Shorter travel distances	Environmental standards fuels
Higher load factor of trucks	Differentiated sales and vehicle taxes
Fuel efficient driving	Urbanisation
Road pricing	Reallocating urban space
Voluntary agreements	Parking policy
R&D clean technology	
Reduce congestion	
	Downsizing cars

# Seventy years growth in mobility



# People do not travel from A to B, but to C, D, and E!

## Complex system of mobility and locations

Mobility is spatial behaviour

Every transport mode creates its own destinations (Say's law)

Faster travel results in longer travel distances

Supply of travel opportunities determine mobility (not demand!)

Companies and inhabitants choose where to locate

# Explaining mobility growth

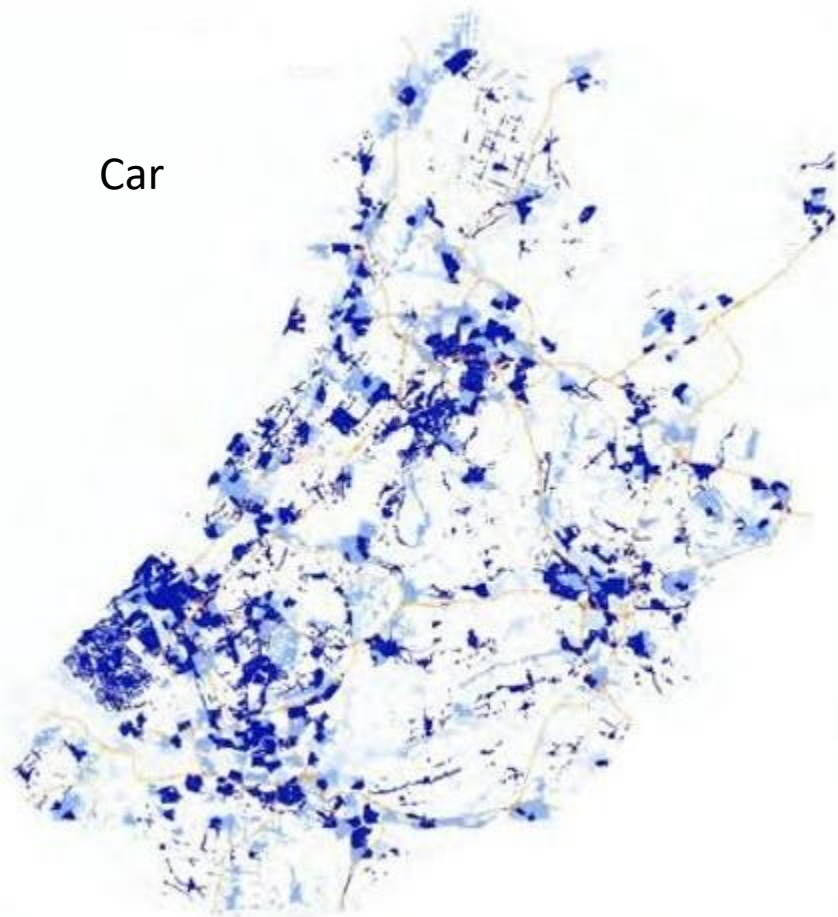
$$\mathbf{Mobility} \left[ \frac{km}{day} \right] = \mathbf{Population} [size]$$

$$\mathbf{x Travel\ time} \left[ \frac{hour}{person \cdot day} \right] \mathbf{x Speed} \left[ \frac{km}{hour} \right]$$

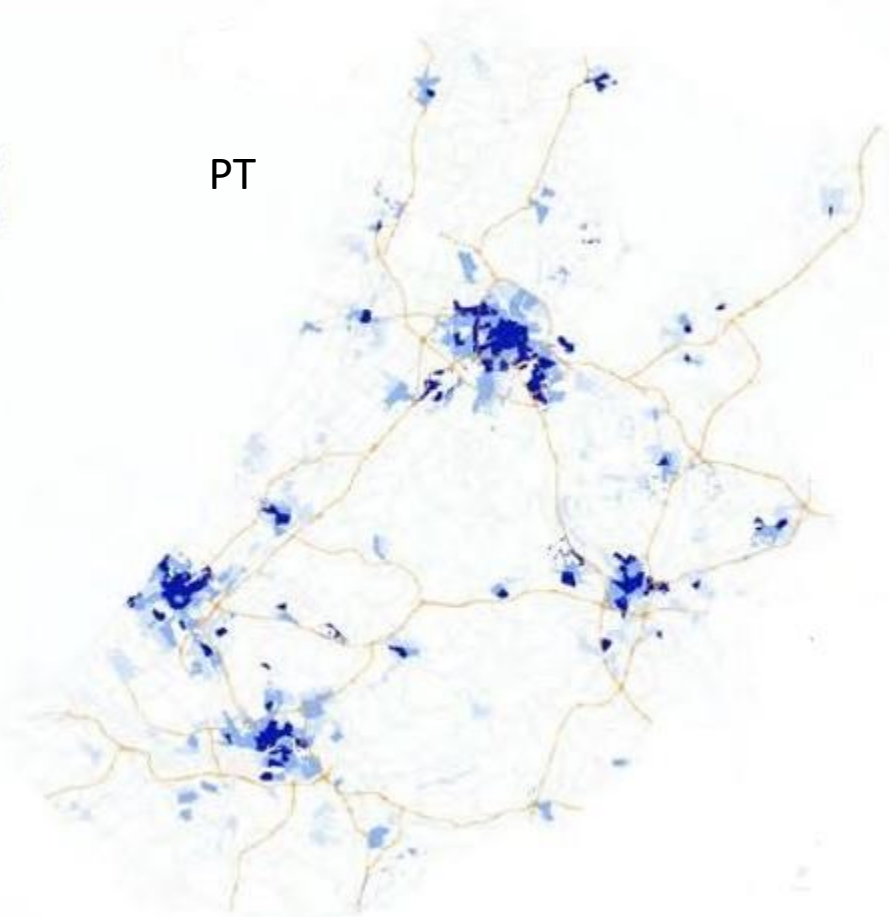
*Travel time ~ constant*

# From car to public transport?

Car

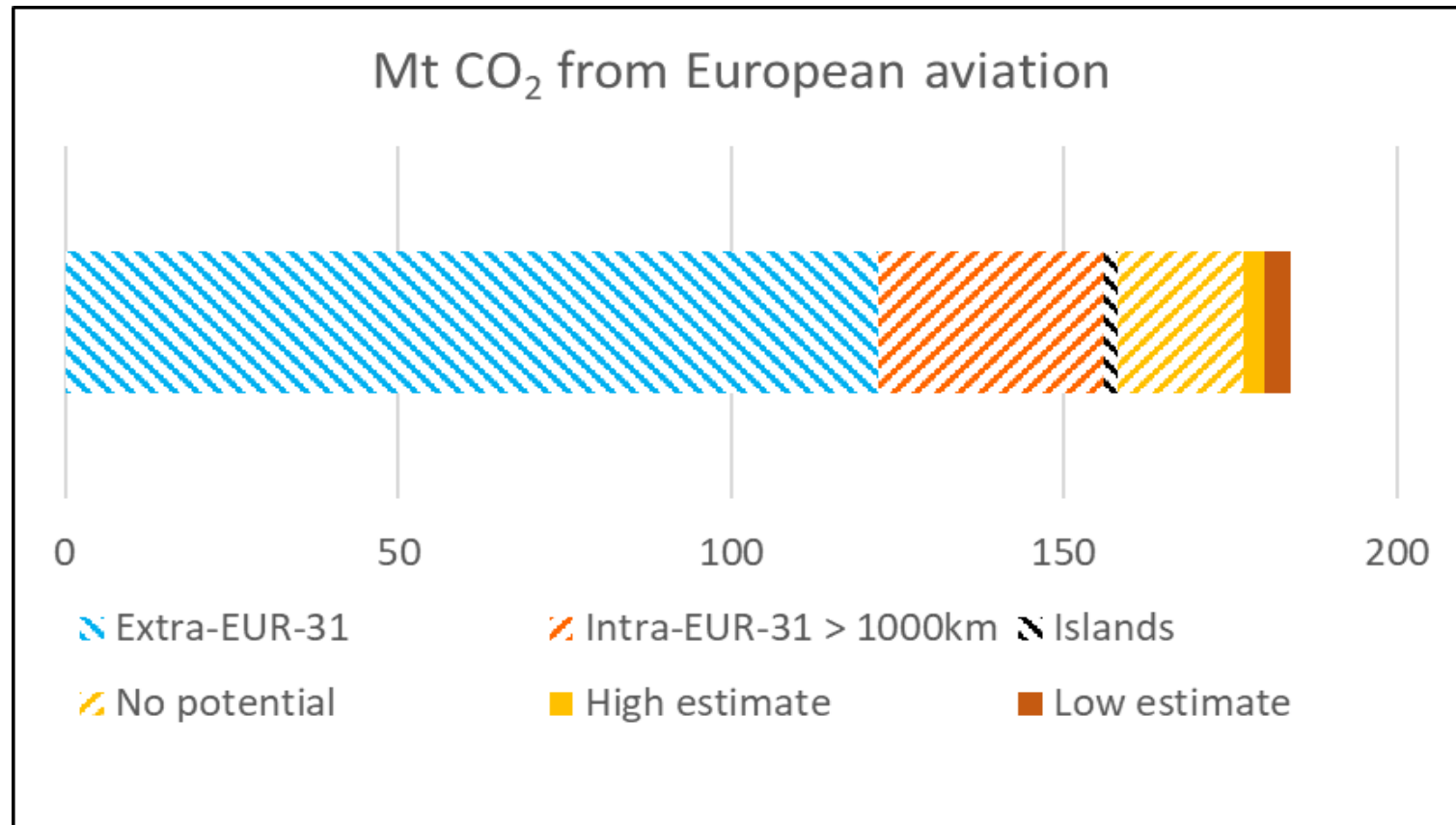


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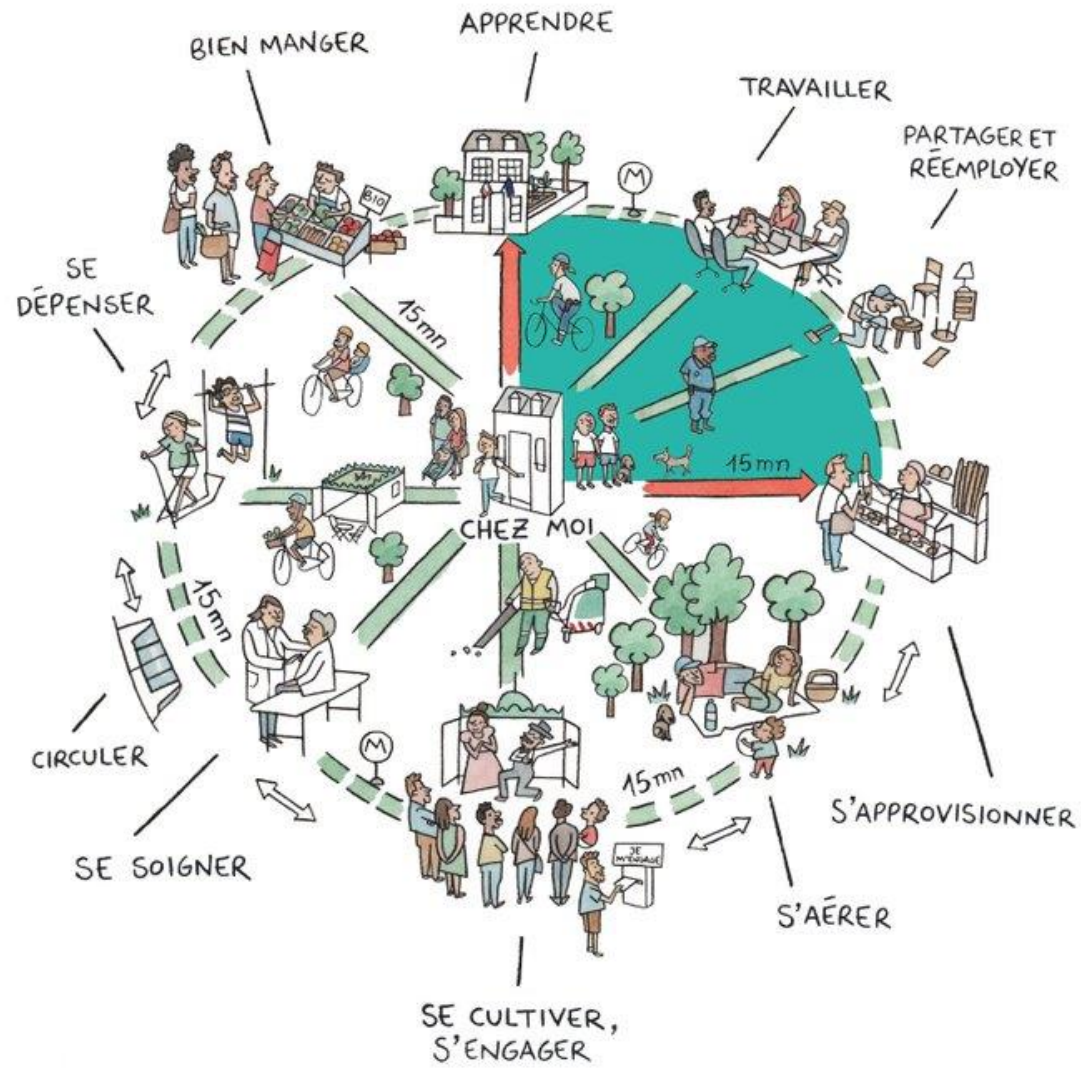


Number of destinations weekday Randstad

# From plane to train?



# LE PARIS DU 1/4 HEURE



Fifteen minutes city?



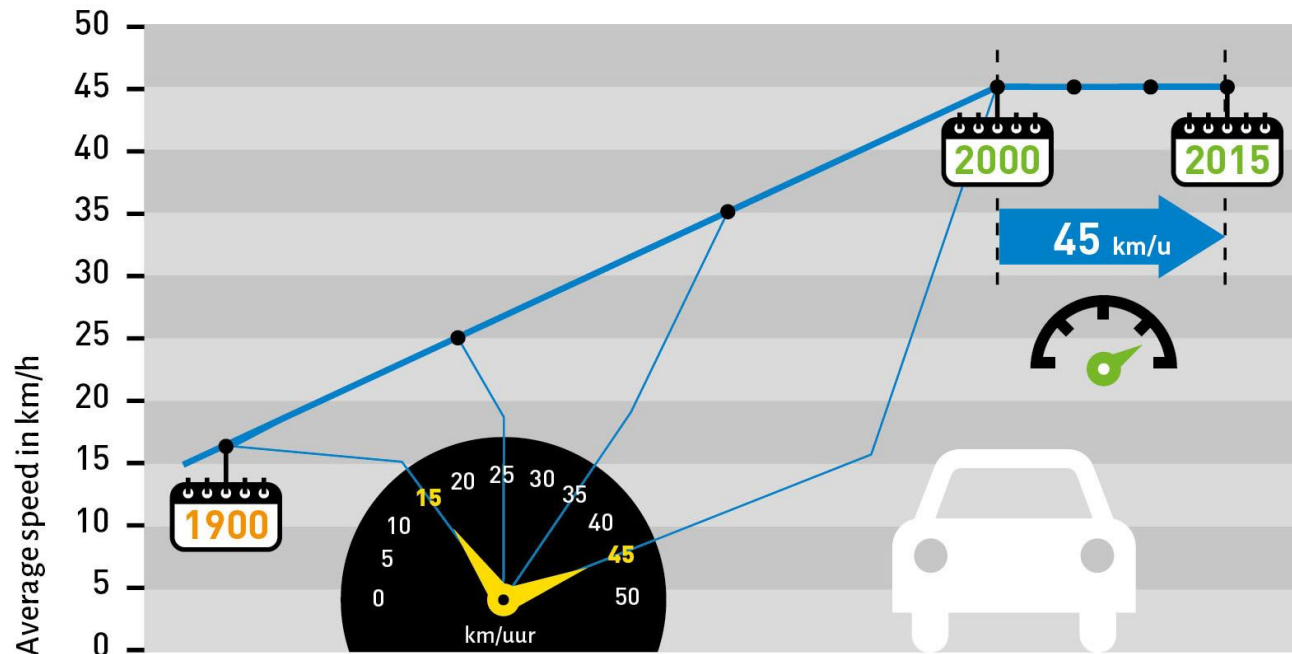
# Working from home?



# Road pricing?

$$\text{Mobility} \left[ \frac{\text{km}}{\text{day}} \right] = \text{Population}[\text{size}] \times \text{Travel time} \left[ \frac{\text{hour}}{\text{person} \cdot \text{day}} \right] \times \text{Speed} \left[ \frac{\text{km}}{\text{hour}} \right]$$

***Speed = f (Transport technology, Affordability, Adoption)***



# Road capacity!

## Impact opening eastern Ring road Amsterdam/Zeeburgertunnel in 1990

After two years

Crossing of North sea channel

+ 4,5% car trips

+ 1% commute trips (all modes)

+ 5% other trip motives (all modes)

+ 16% cars in morning peak

+ 31% car drivers different departure time

Noord-Holland (north NSC) to Amsterdam

- 11% car occupancy rate (all motives)

- 7% car occupancy rate (commutes)

Source: Rijkswaterstaat 1992

## International research

[\*The fundamental law of road congestion \(2011\)\*](#)

Statistical research of 228 metropolitan areas

USA

1% extra road capacity generates 1% extra road traffic

[\*Induced vehicle travel in the environmental review process \(2020\)\*](#)

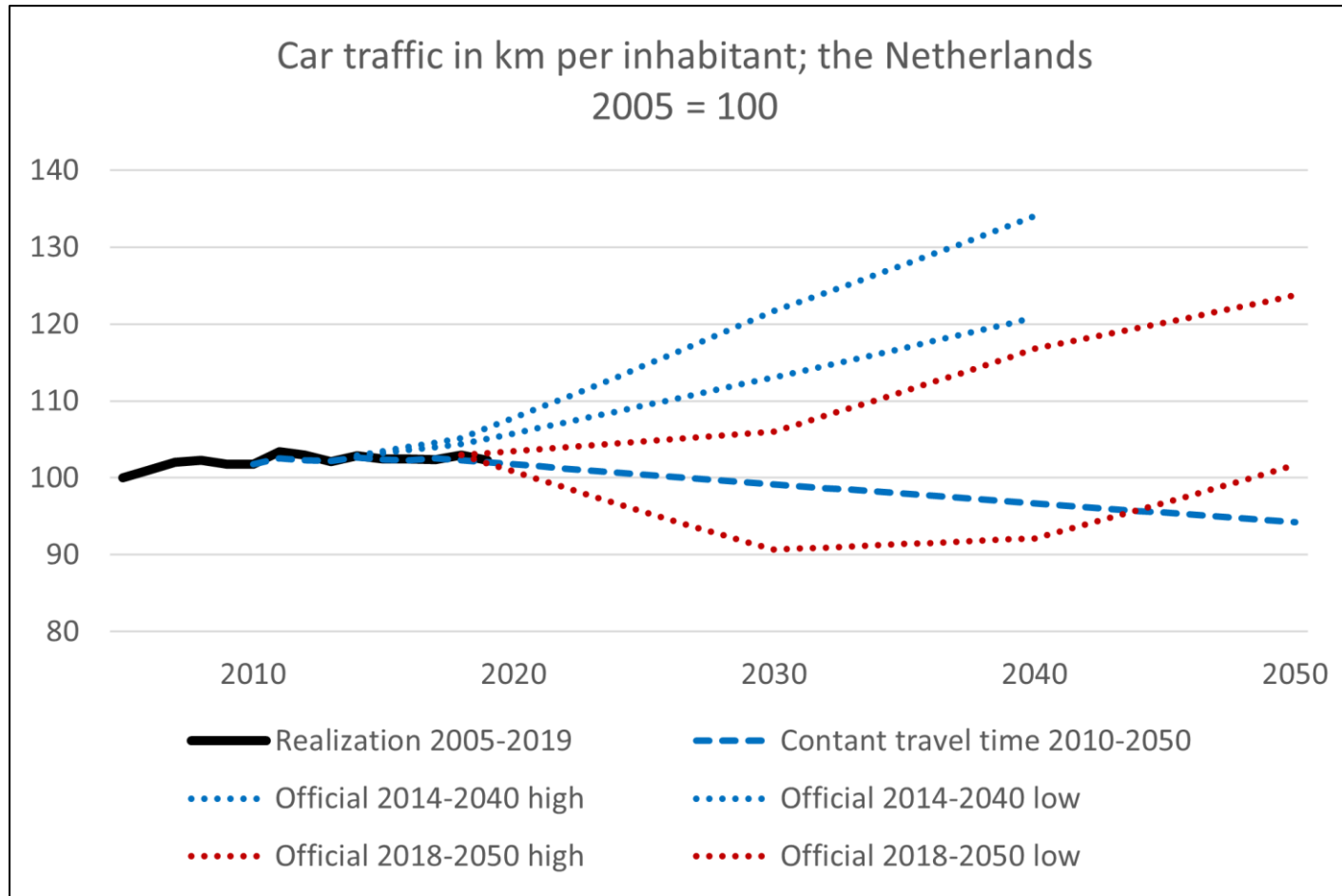
International overview

In urban regions 1% extra road capacity generates

- Highways: 1% extra road traffic

- Main urban roads: 0,75% extra road traffic

# Road capacity!



# Urbanisation!

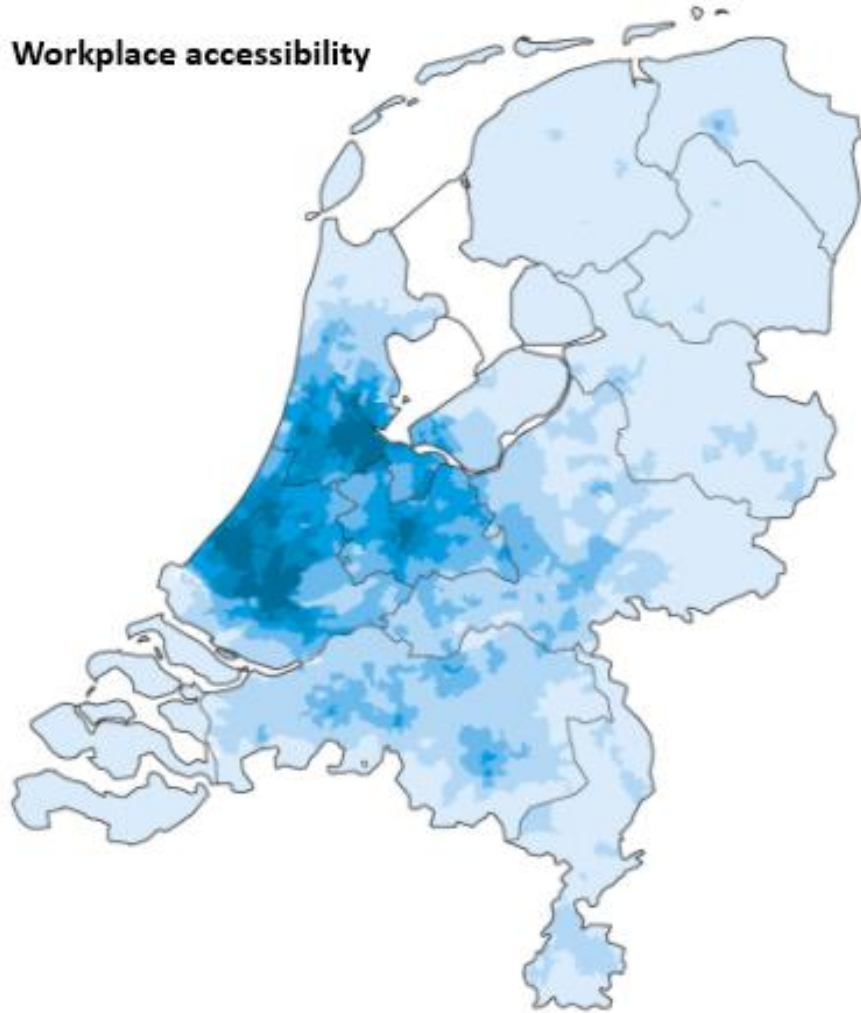
	METROPOLIS	MAJOR CITY	RURAL AREAS	COUNTRY AVERAGE
Trip distance	5 km	10 km	15 km	10 km
Commuting distance	10 km	15 km	20 km	15 km
Speed	15 km/h	25 km/h	35 km/h	30 km/h
Car speed	20 km/h	35 km/h	50 km/h	45 km/h
Trip share of car	15%	50%	70%	60%
Car-kilometres	10 km/day	25 km/day	35 km/day	25 km/day

# Accessibility is the aim, mobility is a means

$$\mathbf{Accessibility} \left[ \frac{1}{\text{hour}} \right] = \frac{\mathbf{Speed} \left[ \frac{\text{km}}{\text{hour}} \right]}{\mathbf{Distance} [\text{km}]}$$

# Accessibility and urbanisation

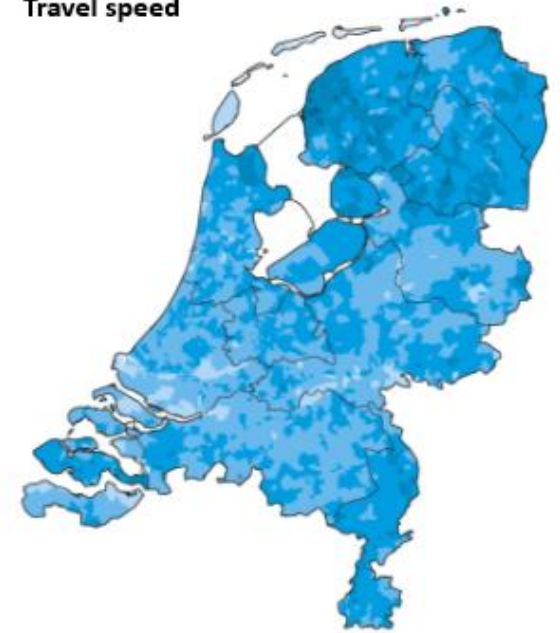
Workplace accessibility



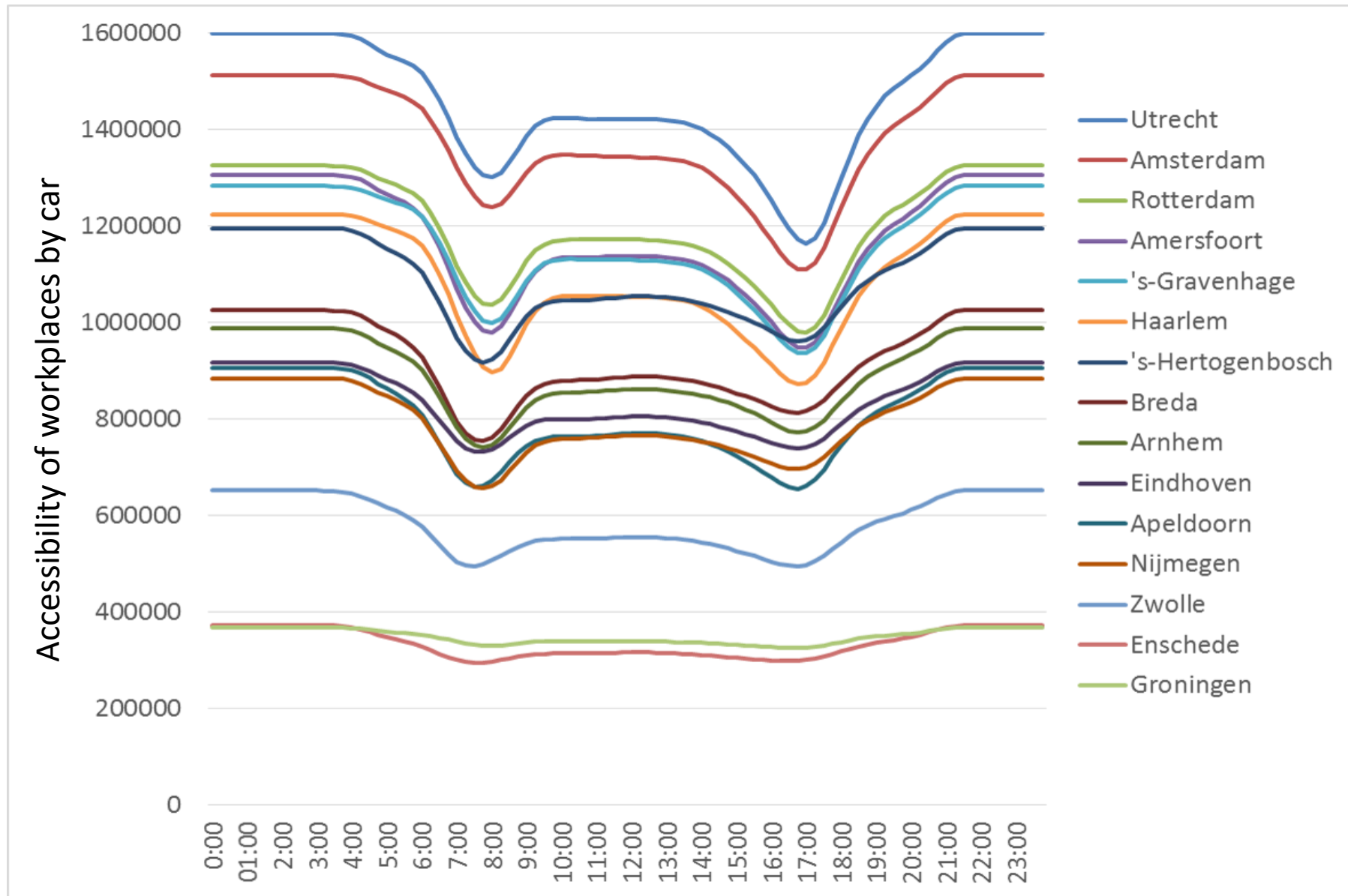
Workplace proximity



Travel speed



# Accessibility and congestion





# Less car traffic?

## Exhaustive

Urban density and spatial concentration

Redistribution of urban space

Parking policy (parking places and tariffs)

All offices at public transport hubs

Reducing highway capacity

# Sustainable accessibility

## Effective policy package

Strict environmental standards for cars, trucks, planes, ships, electricity and fuels

Urban density and spatial concentration on all geographical scales

Investing in accessibility instead of mobility

Funding of urban mobility instead of interurban

All offices near public transport hubs

Reallocation of urban space

Strict parking policy

No new highways and no widening of existing ones

Taxes and charges on aviation

# Thanks for your attention!

## Questions?

## Dialogue!



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Further reading:

The transport-urbanisation dialectic

End of car growth?

New mobility– beyond the car era

Air2Rail

Speed - it's what drives mobility