



# Transportation planning to support access to opportunities

*A Dutch perspective*

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University of Toronto

November 22nd

# Which place offers the highest accessibility?



**Roncesvalles Avenue**

[Neighborhoodwalks.wordpress.com](http://Neighborhoodwalks.wordpress.com)



**Downsview Park Station**

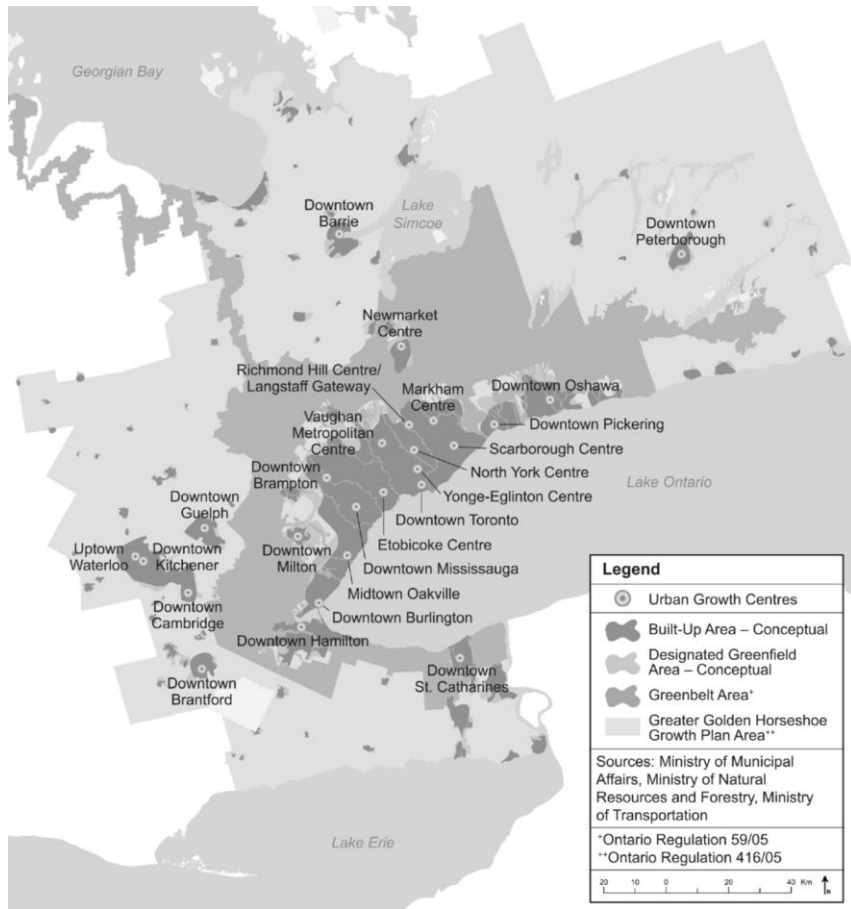
Richard Eriksson Flickr



Why do Dutch people cycle so much?

# Planning law: No big box retail for daily shopping





**Greater Golden Horseshoe**  
**33.500 km<sup>2</sup> - 9.2 million inh.**

**Netherlands**  
**33.900 km<sup>2</sup> - 17.2 million inh.**



Source: Canada TTS 2016, Netherlands - CBS 2016

# Same network different access



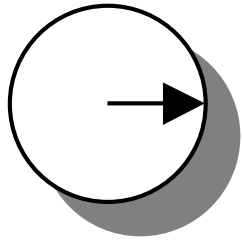
Access to labor



Access to jobs

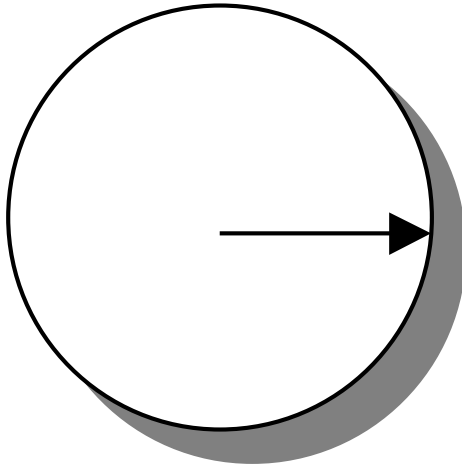


# Same accessibility different city & transport system



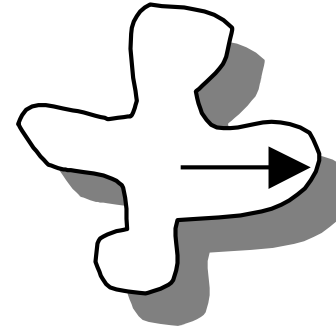
$S = 10 \text{ km/u}$

$D = 15.000 \text{ inh/km}^2$



$S = 30 \text{ km/u}$

$D = 1.400 \text{ inh/km}^2$



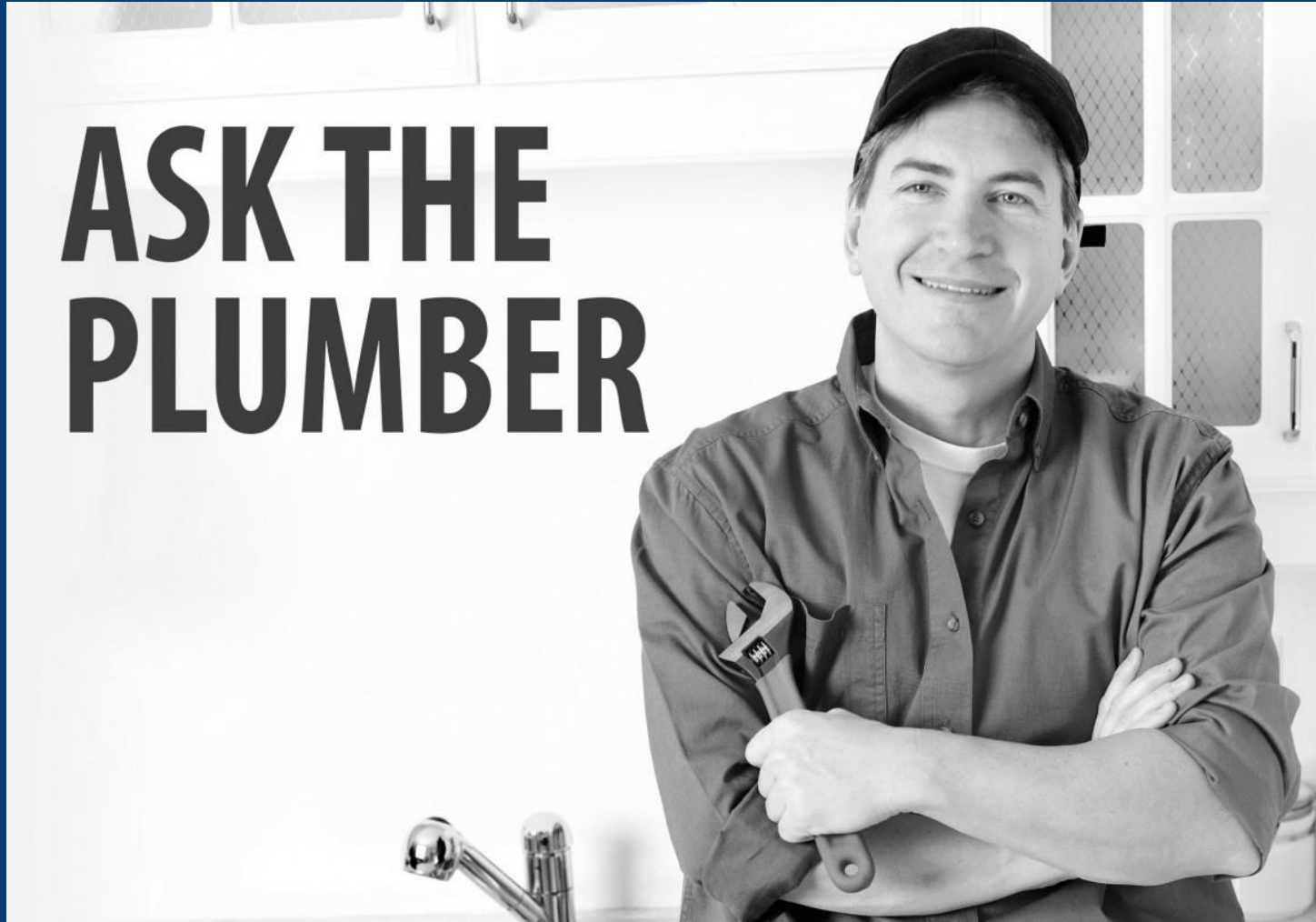
$S = 20 \text{ km/u}$

$D = 5.000 \text{ inh/km}^2$

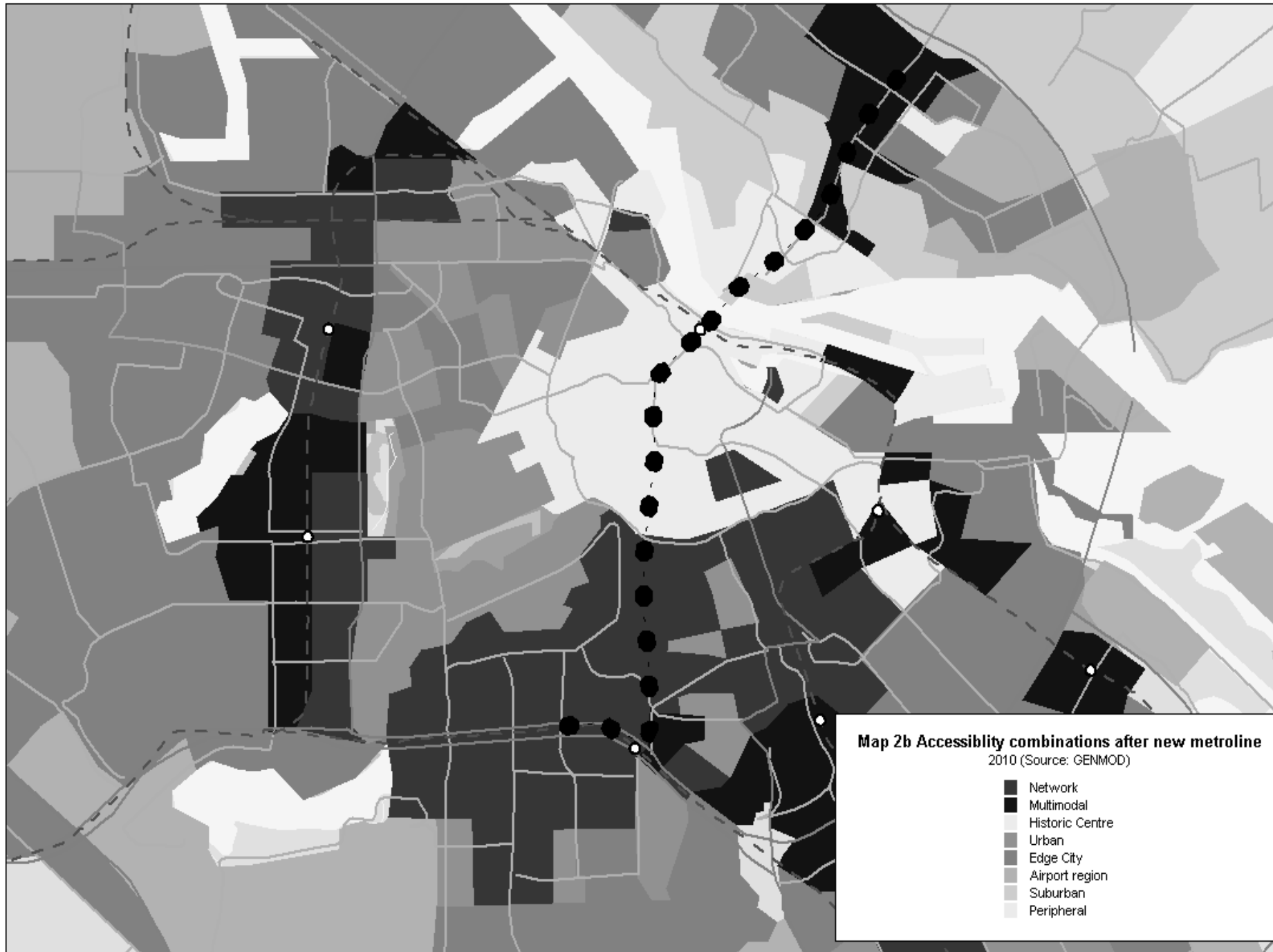




# ASK THE PLUMBER



# Implications of change in access?









**Sustainable urban  
transportation planner**  
20 years of Experience in NL  
5 months in Canada

Public:

City of Amsterdam (NL)

Science:

PhD University of Amsterdam (NL)

Private:

Consultant Goudappel Coffeng (NL)

Access Planning (CAN)

# Five strategies to improve accessibility

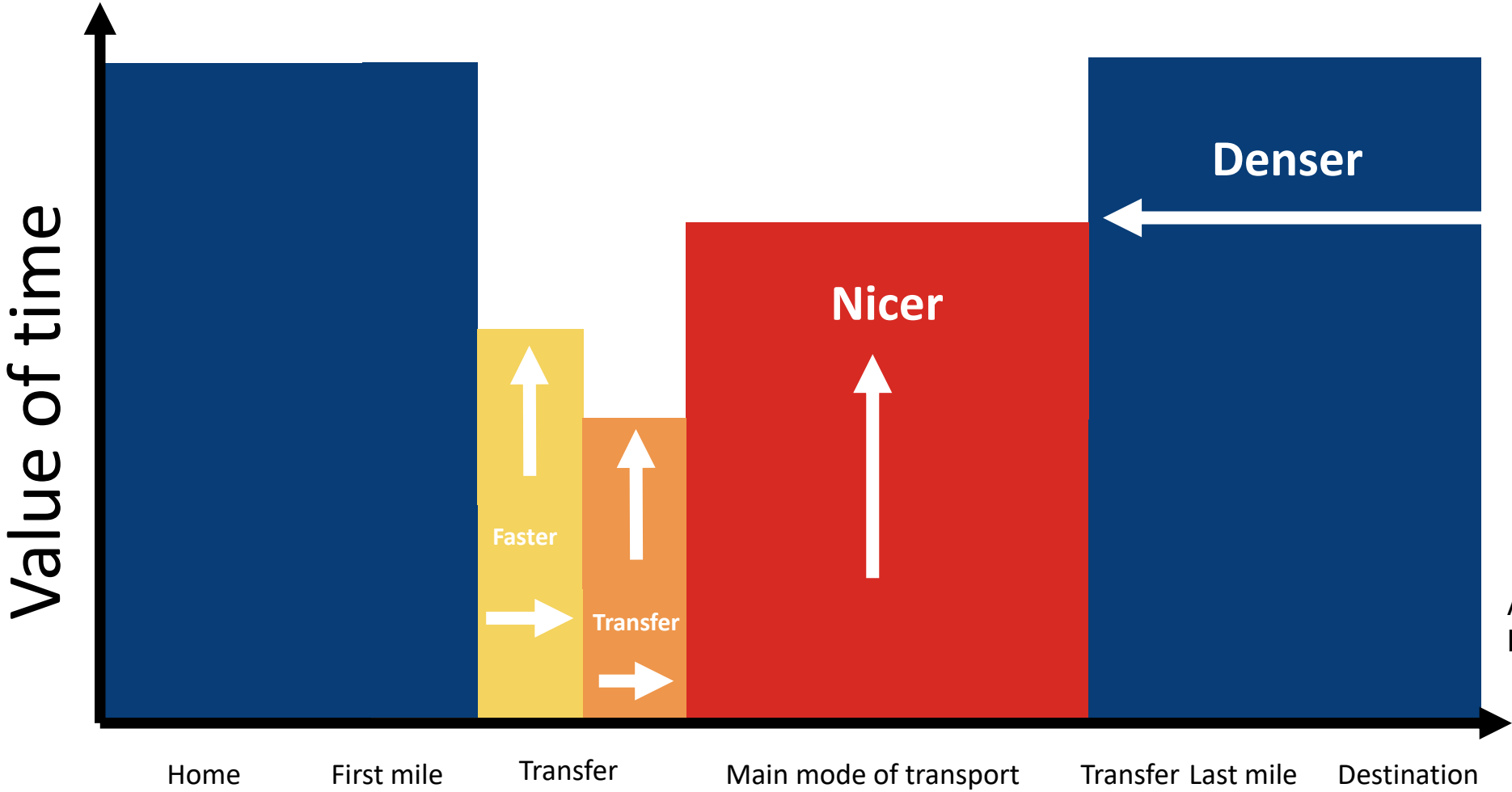
1. Speed-up
2. Slow down
3. Land-use
4. Transfer
5. Experience

**8,8 billion passengers km's Transit in Ontario**

**23,3 billion passenger km's Transit in the Netherlands**

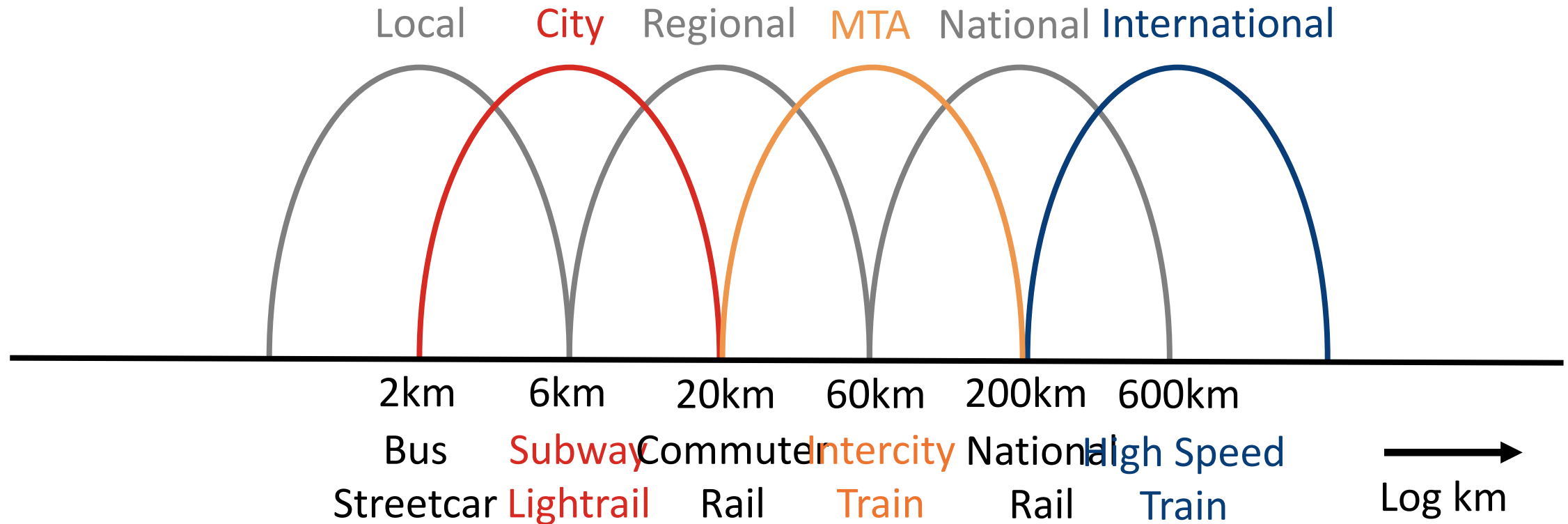


# A transit trip from home?



Adapted from Peek

Use of time

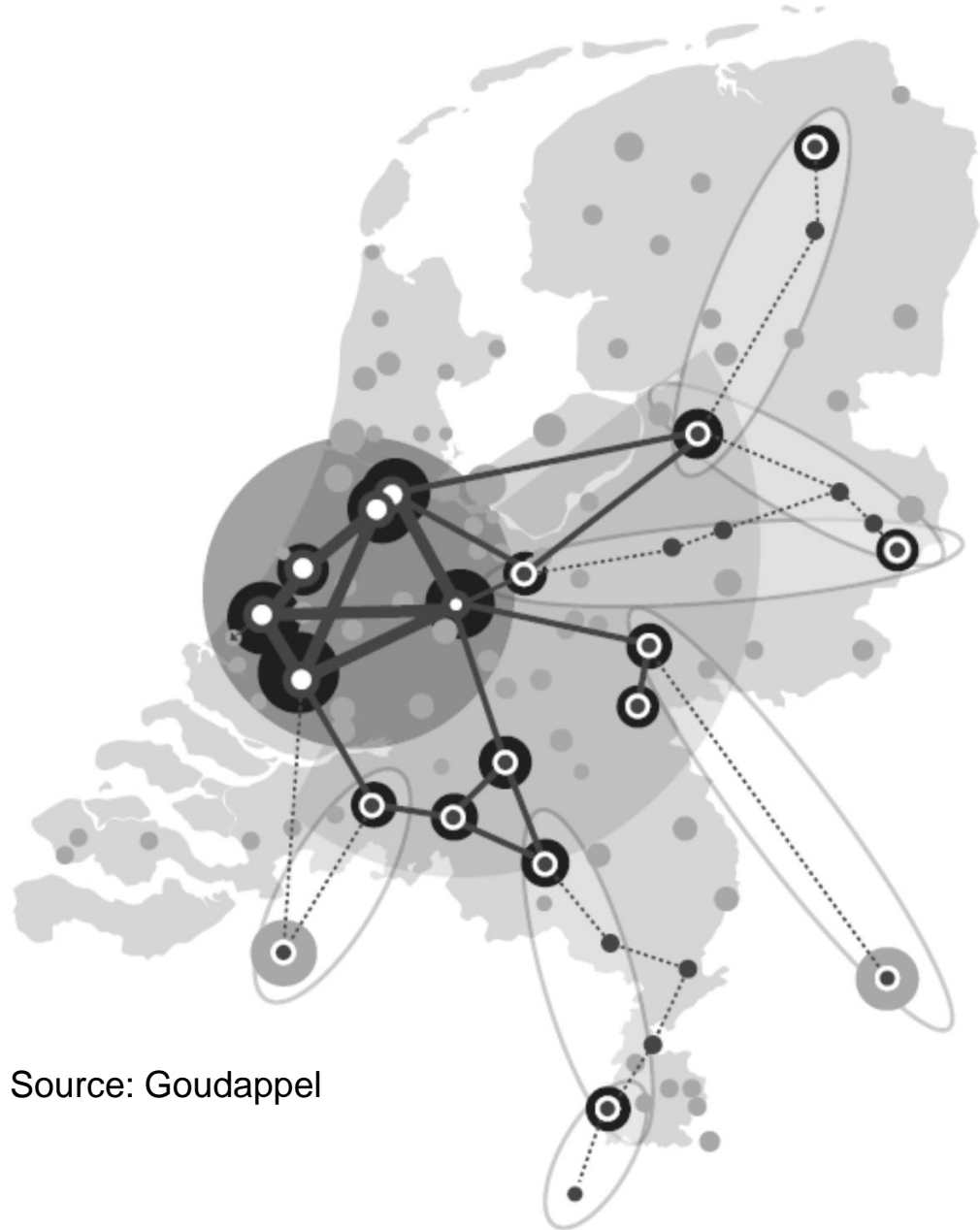


Source: Goudappel

# 1. Speed: Hierarchy in transit systems and nodes

# Ideal network qualities between nodes

Transit System	Operational speed	Distance between stops	Frequency
High Speed Train	200 km/h	200km	1x/hour
Intercity	80 km/h	20km	2-4x/hour
Commuter train	50 km/h	6km	4-6x/hour
Subway	40 km/h	2km	8-16x/hour
Streetcar/bus	25km/h	600meters	6-12x/hour



Source: Goudappel

**50% of all trips start or end at the top 20 intercity stations**

**What are possible intercity nodes in the GGH?**



**Four tracks on main corridors**



2. Slow down

## Traffic in central London moves at the same speed as horse-drawn carriages



Michael Graham Richard [Michael\\_GR](#)  
December 29, 2014

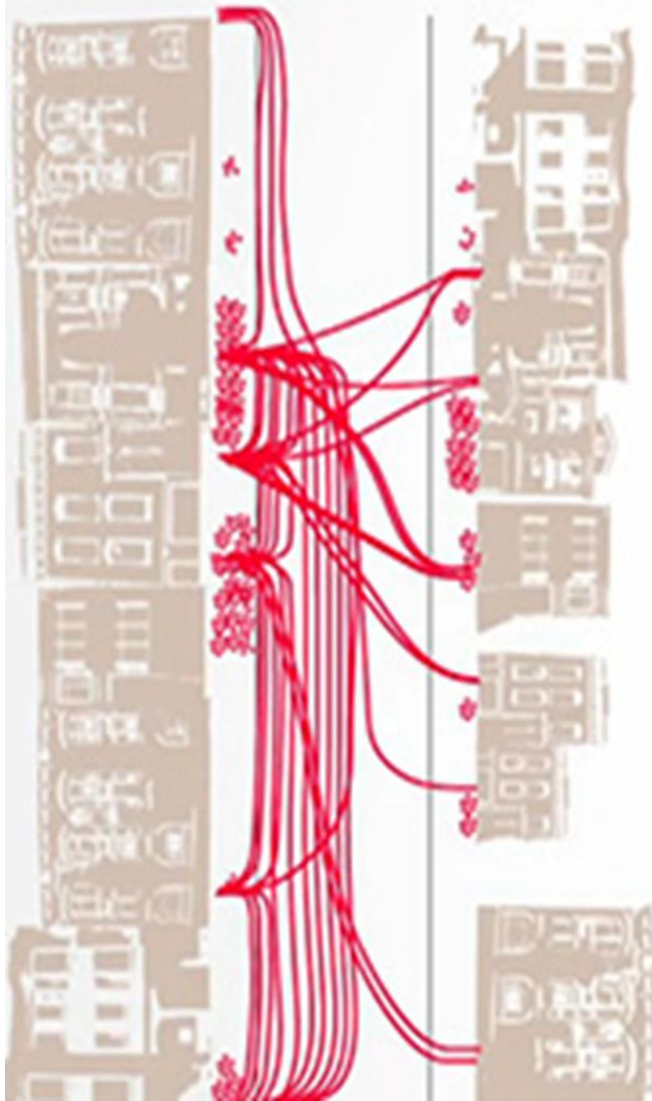


HANSOM CAB photographed in London in 1895.

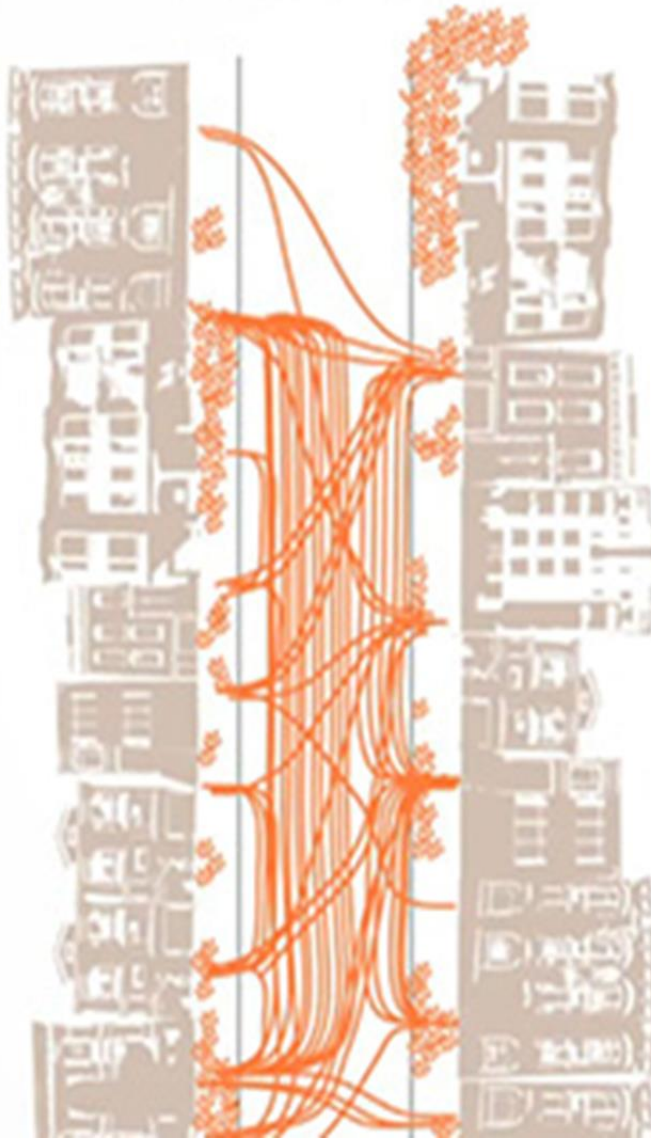
Public Domain Smithsonian

Source: Treehugger.com 2014

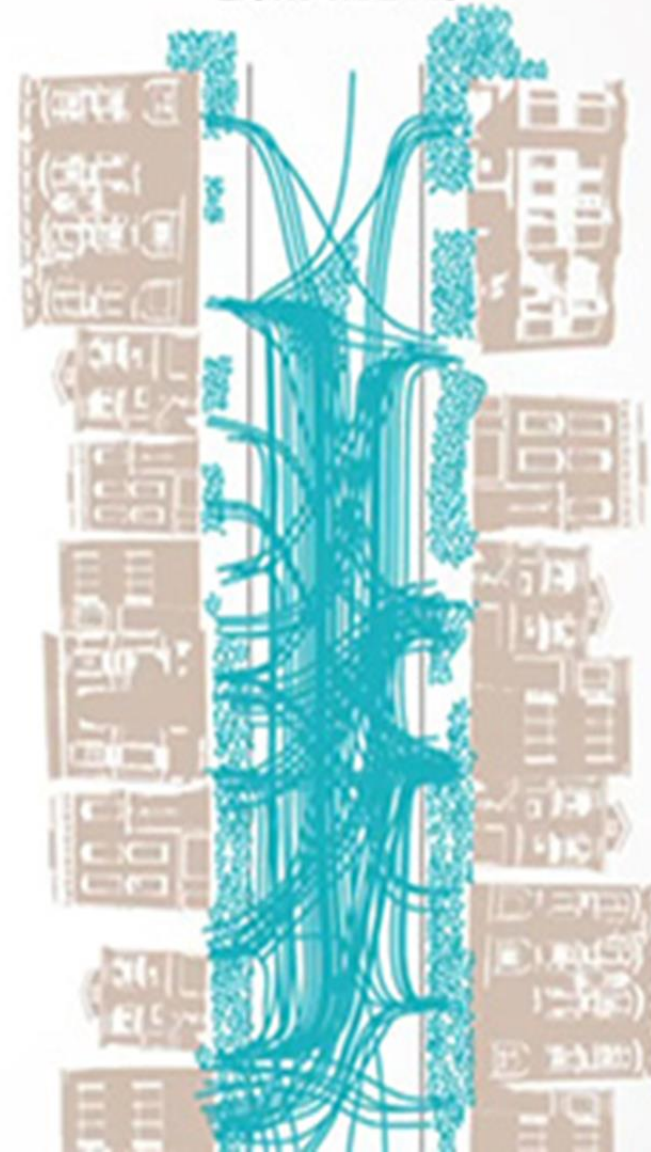
### HEAVY TRAFFIC



### MODERATE TRAFFIC



### LIGHT TRAFFIC



Source: Appleyard study 1969

# Do not put up a speed sign But design for the right speed



Before 43 km/h

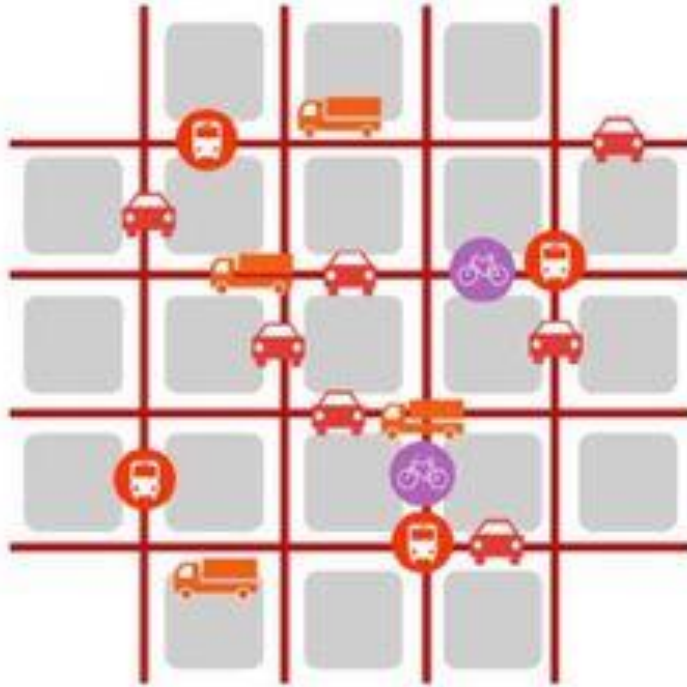


After 32 km/h

Source: Goudappel



## Model actual



## Model Superilles



- |   |   |   |                              |   |                                       |
|---|---|---|------------------------------|---|---------------------------------------|
|  | XARXA TRANSPORT PÚBLIC                          |  | VEHICLE PRIVAT DE PAS        |  | ÀREA PROXIMITAT DUM                   |
|  | XARXA PRINCIPAL BICICLETES (CARRIL BICI)        |  | VEHICLES RESIDENTS           |  | CONTROL ACCÉS                         |
|  | SENYALITZACIÓ VERTICAL BICICLETA (CONTRASENTIT) |  | SERVEIS URBANS I EMERGÈNCIES |  | XARXA BÀSICA CIRCULACIÓ               |
|  | PAS LLIURE DE BICICLETES                        |  | TRANSPORTISTES DUM           |  | PLATAFORMA ÚNICA (PRIORITAT VIANANTS) |

Source: Ajuntament Barcelona



LONA

ALCANTARA

Rehabilitación de fachadas  
Instalación de persianas  
Ferretería  
Pinturas y decoración

META

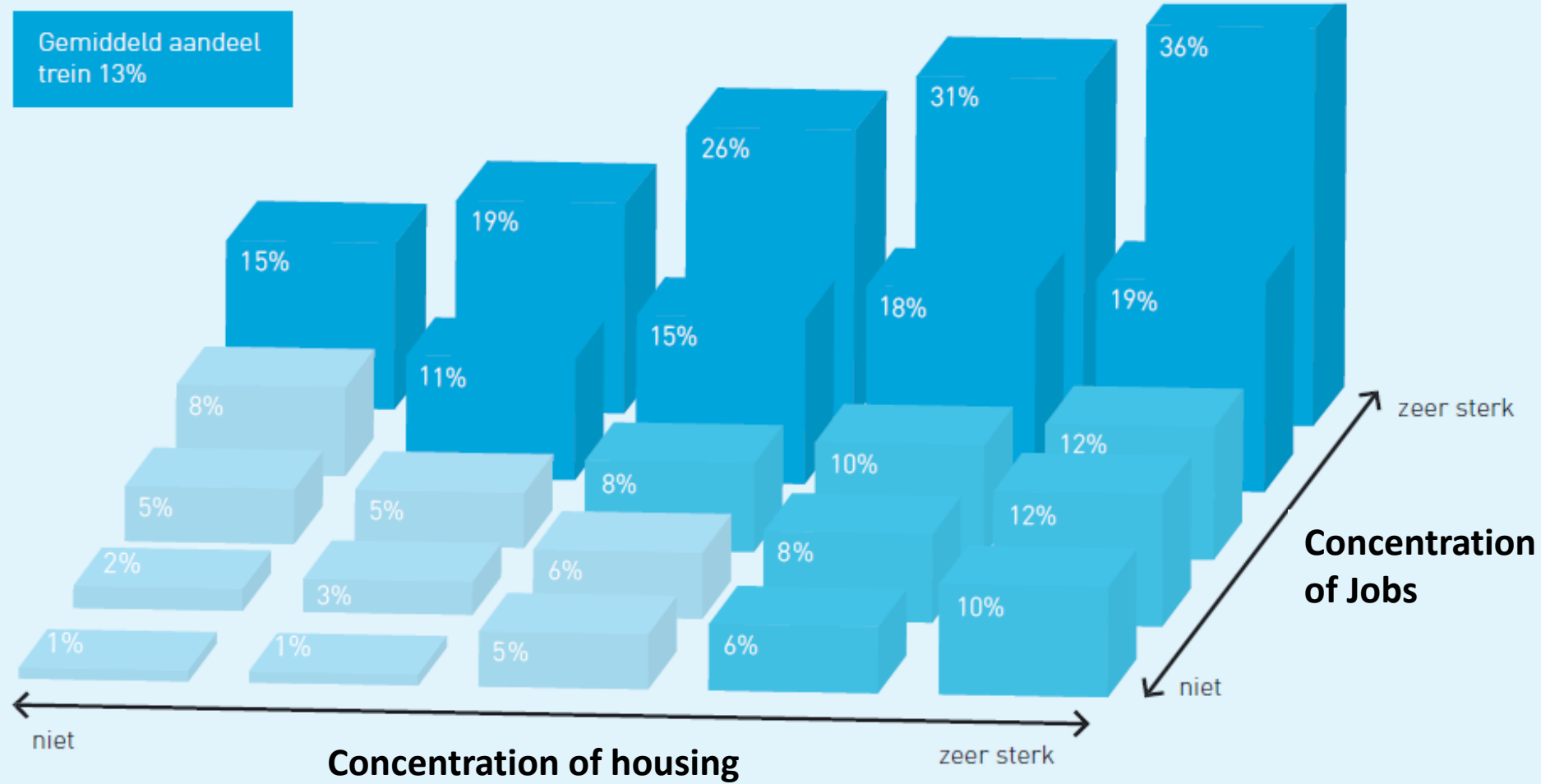
80m

# 3. Land-use: Concentrate development at hubs

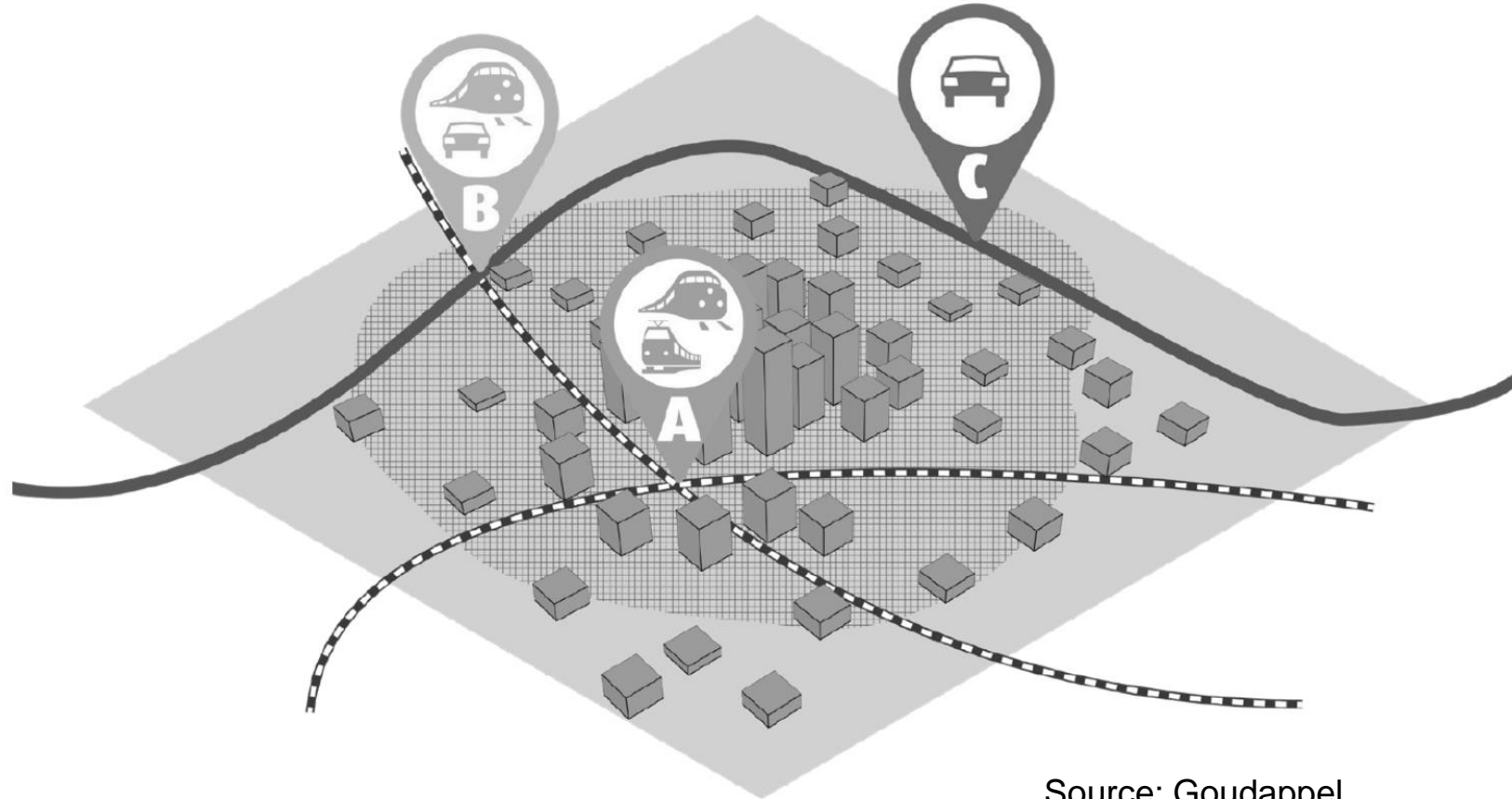


## Spitsreizen >10 km op werkdag in NL, naar woon- en werkconcentratie\* (% trein)

\* Alle inwoners en spitsbanen gerangschikt in vijf categorieën naar de mate van concentratie

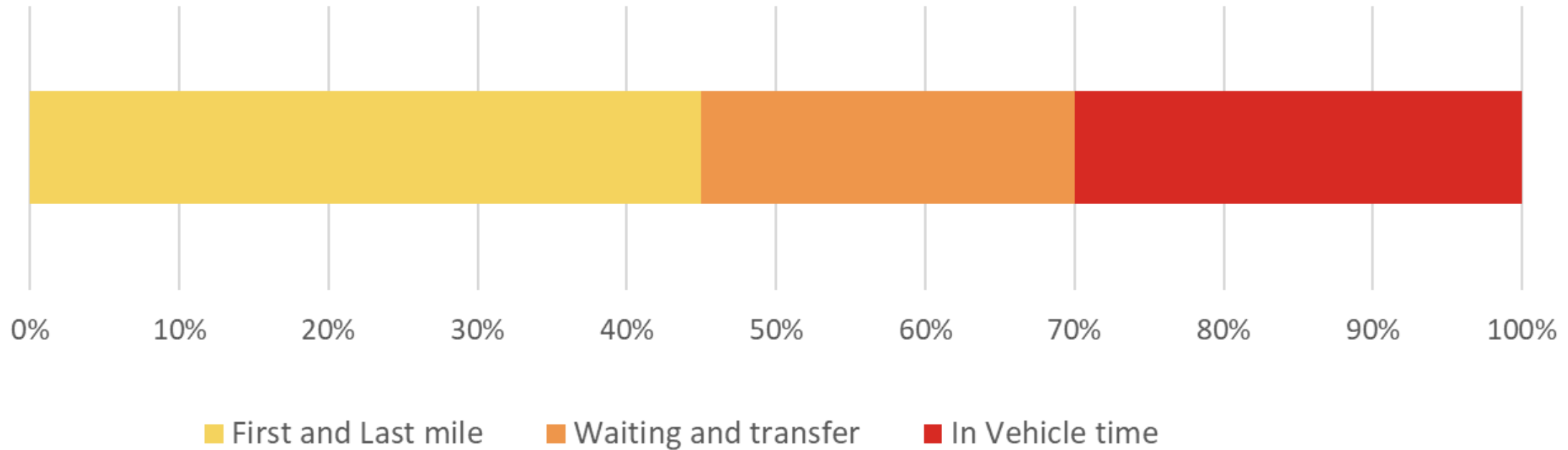


Source: Stedenbaanplusmonitor



**A locations – High job density – High # visitors – parking 1:10**  
**B locations – Medium job density – parking 1:5**

# 4. Transfer: Improving transit is not about running trains



Source: PBL

19% lives within walking distance of a train station

82% lives within cycling distance of a train station

# Train-bike system is the fastest growing mode of transport in the Netherlands



Source: Goudappel



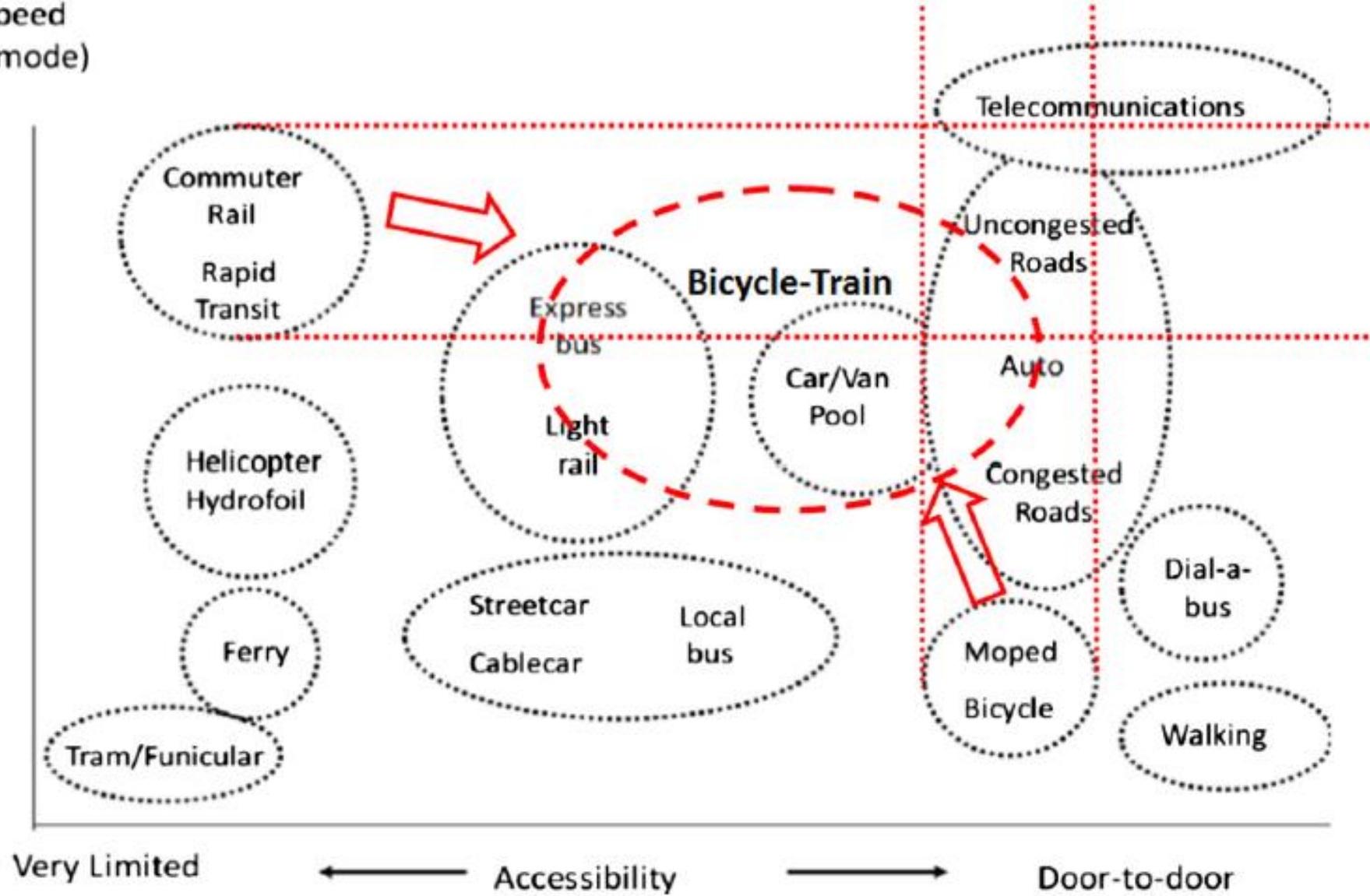
**4,2 million trips annually**



Typical Speed  
(on that mode)

High

Low



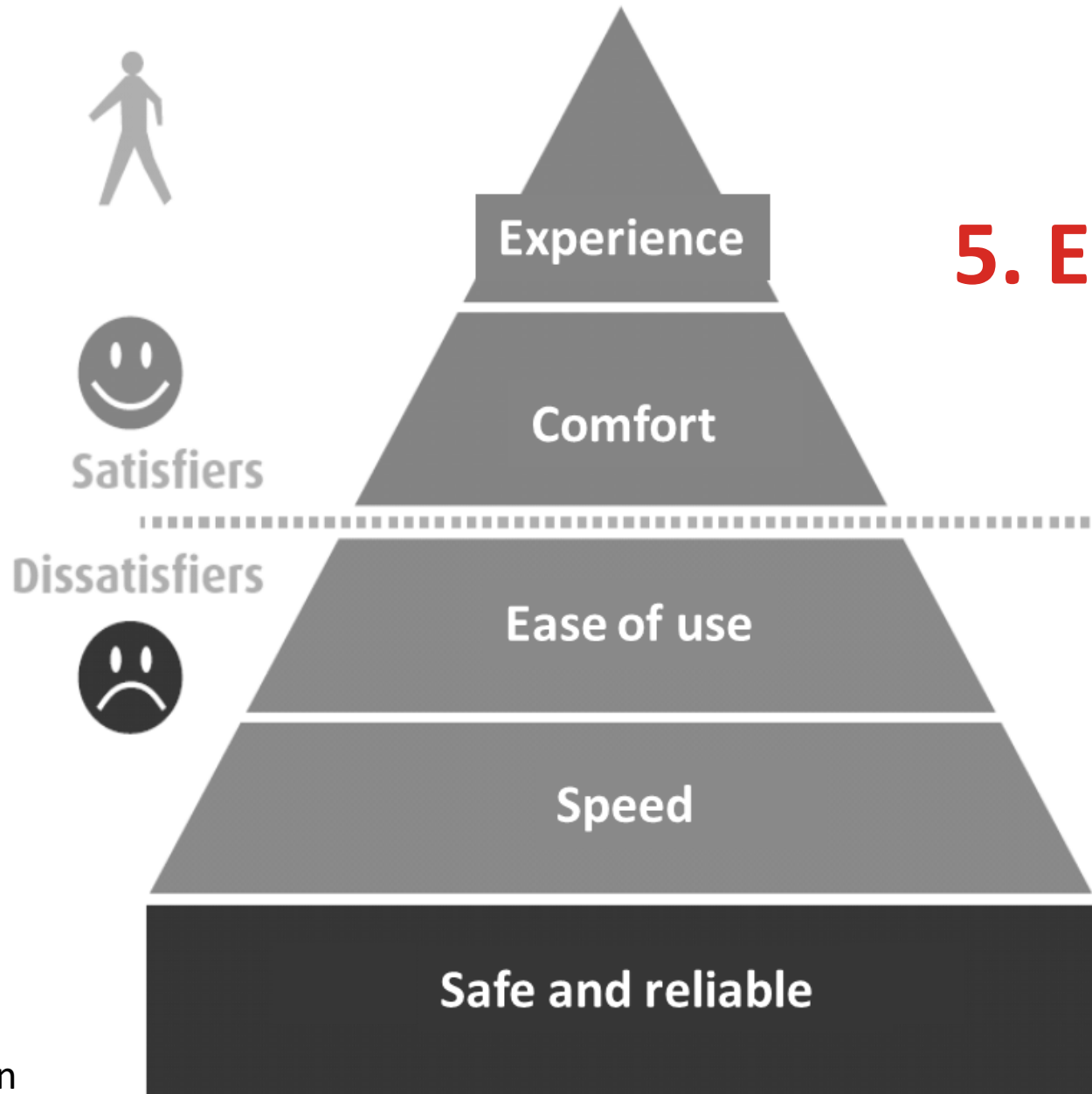
Source: Kager 2016 adapted from Meyer and Miller



**Transit + 10 min. walking**

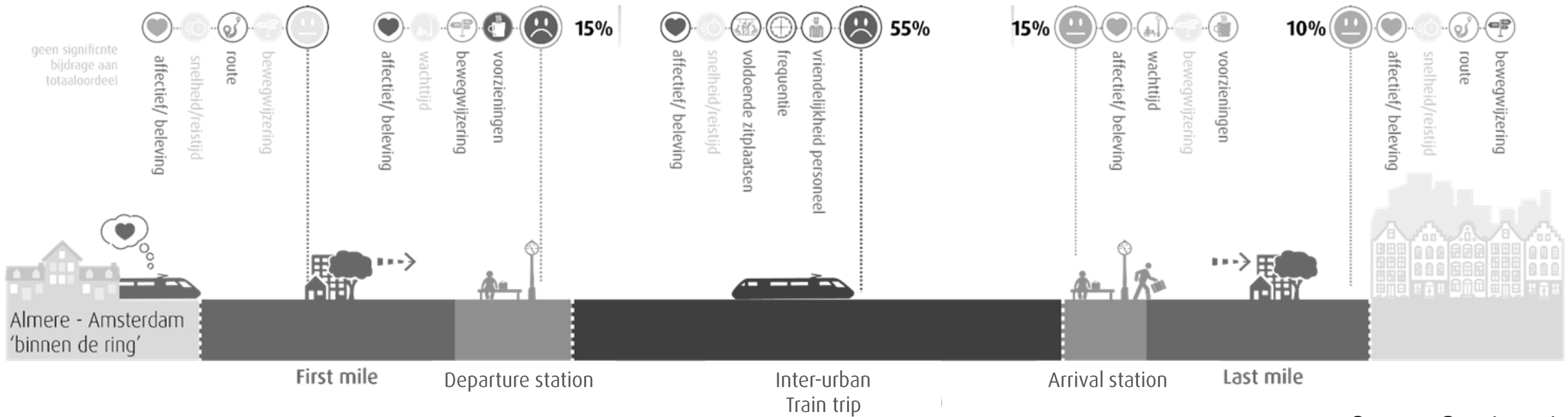


**Transit + 10 min. cycling**



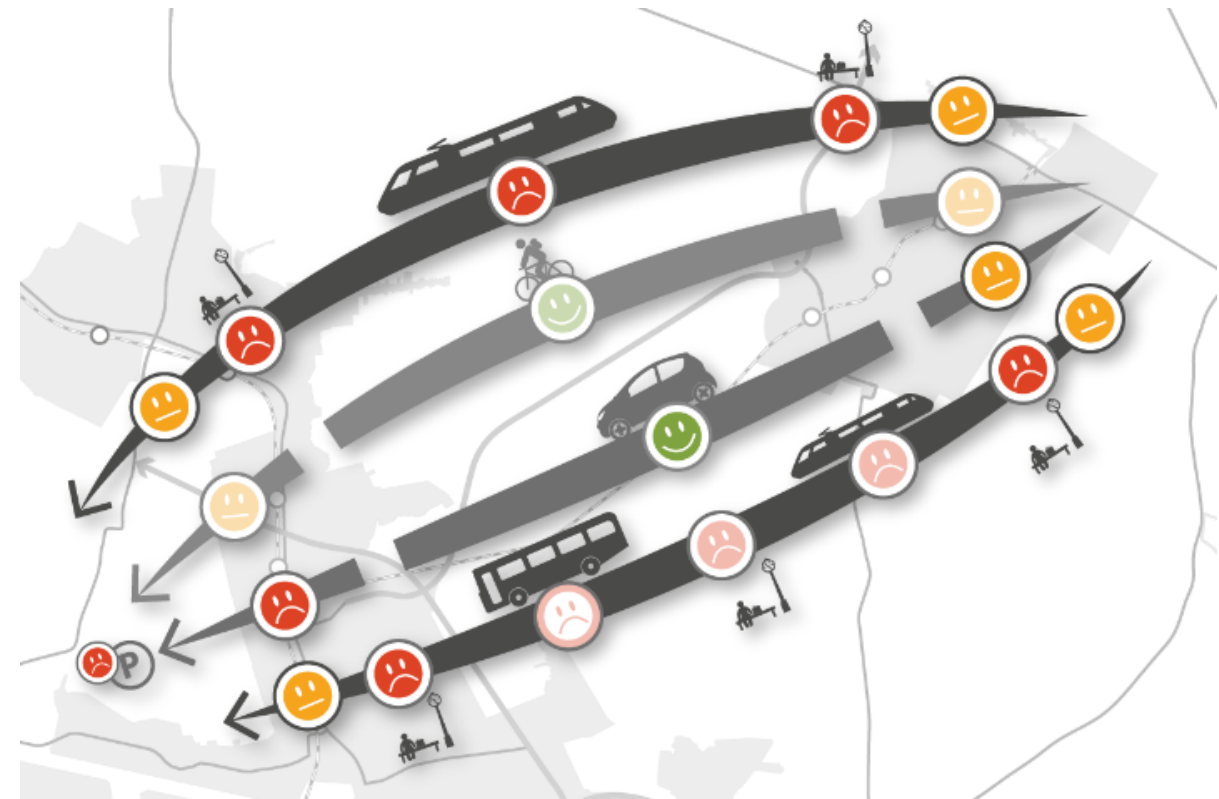
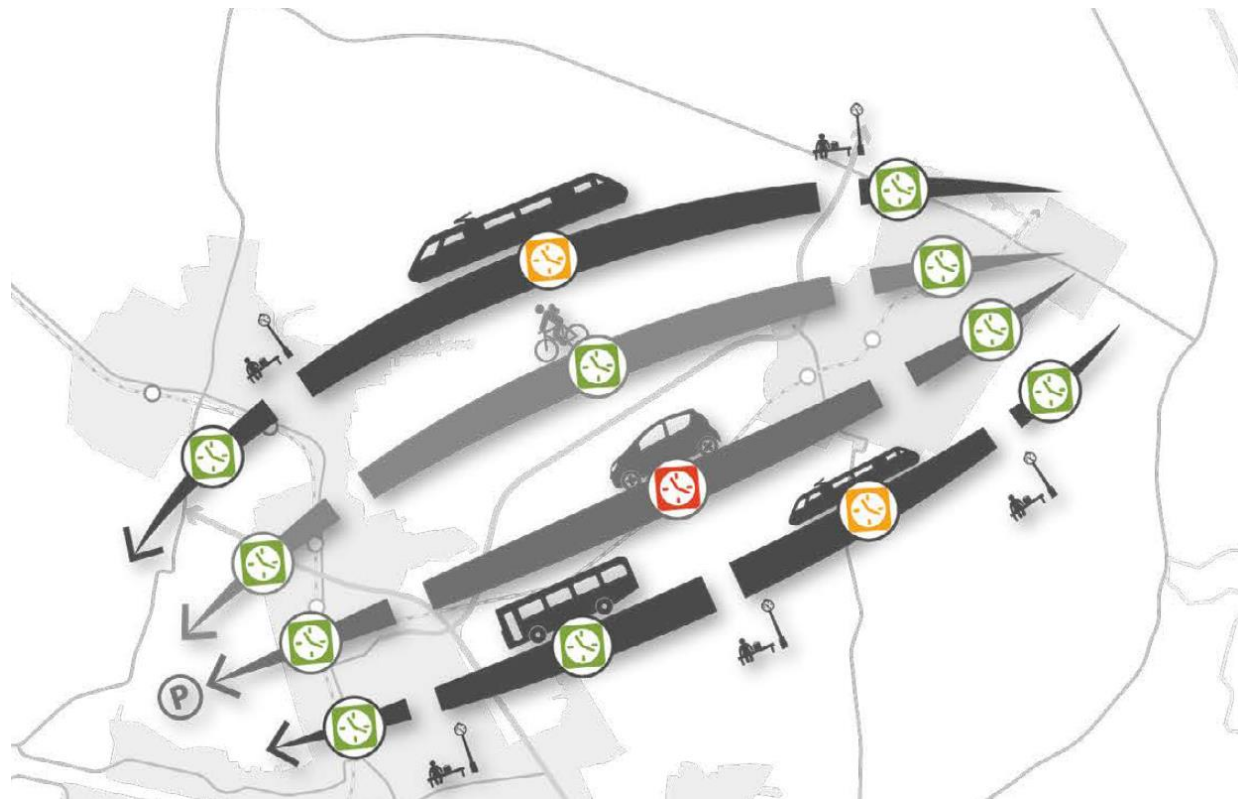
## 5. Experience

# Satisfiers make up > 40% of overall trip satisfaction



Source: Goudappel

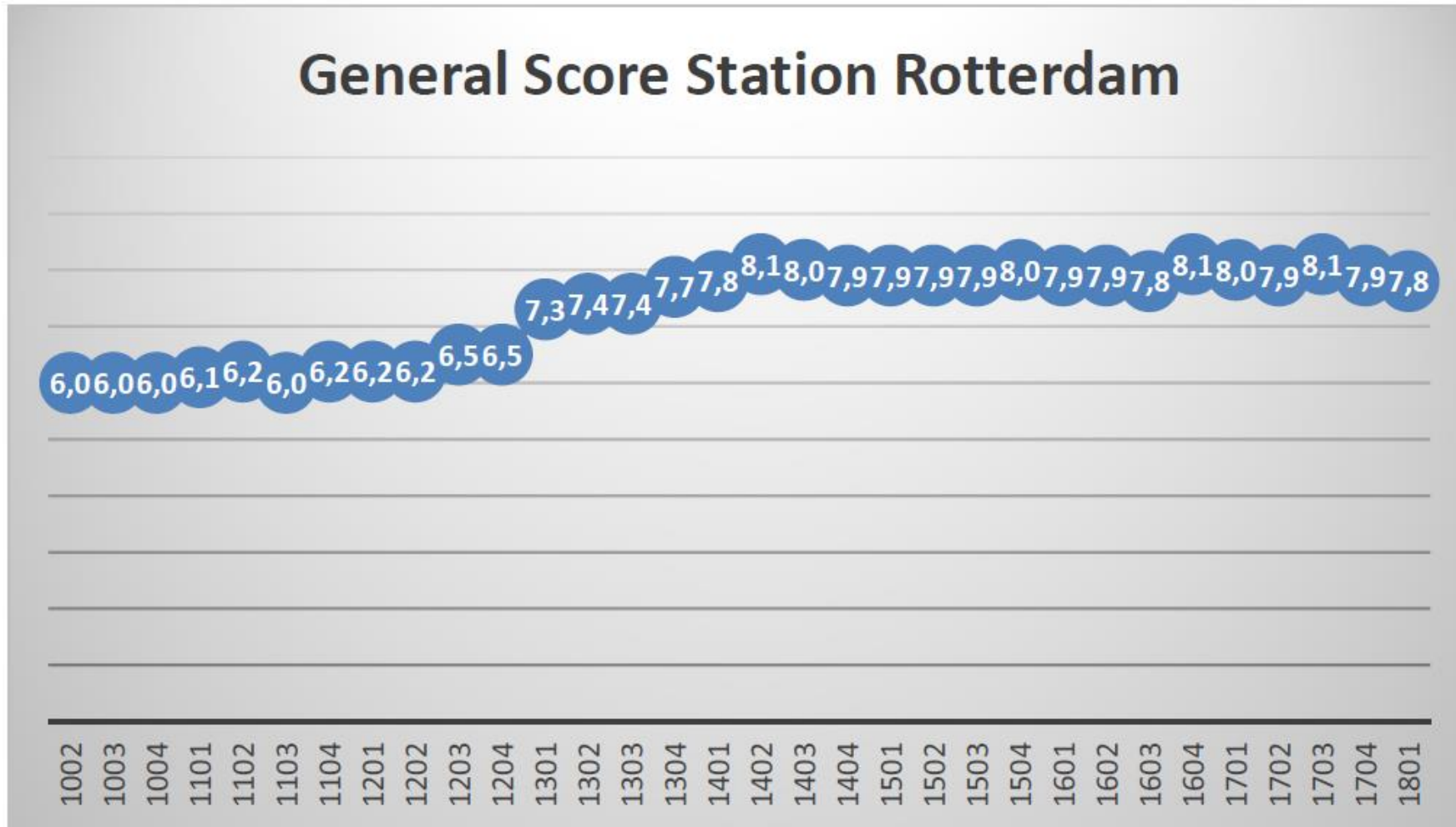
# Hard indicators versus experience



**What is the  
value of an  
improved  
station?**



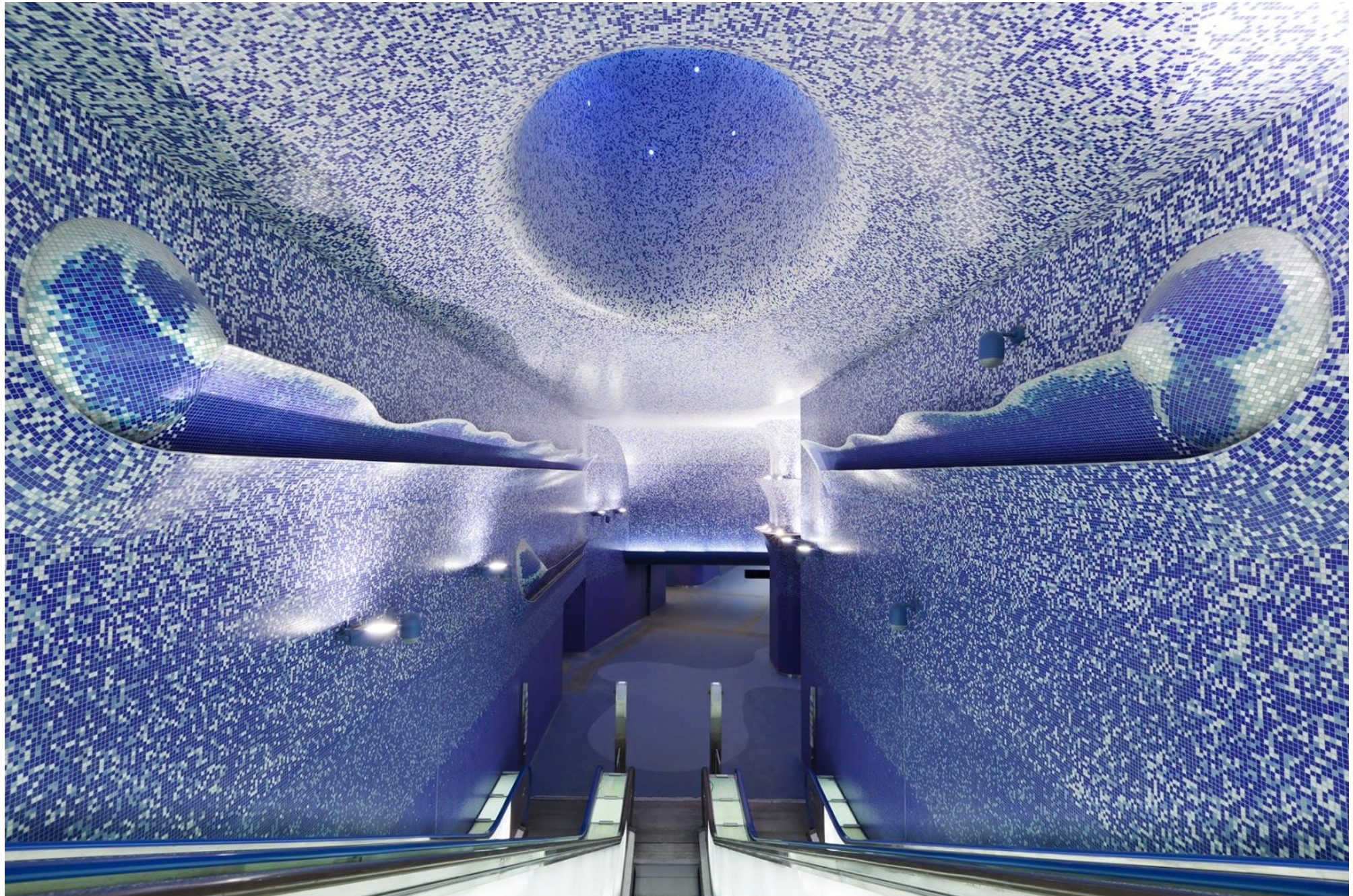
Source: Goudappel



Source:  
Mark van Hagen

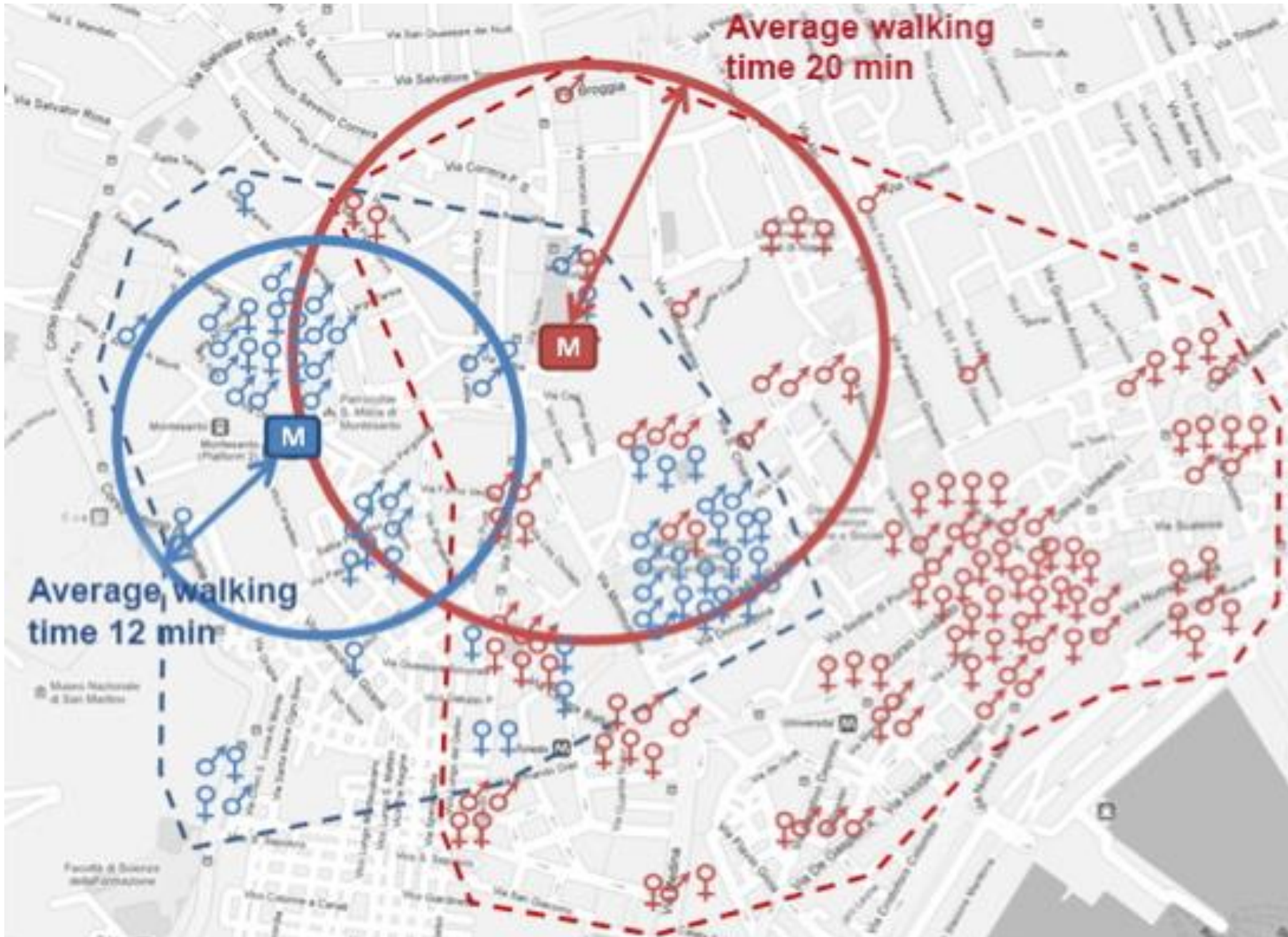
**2 points = 2 min. of travel time savings = 10 mil. EUR p/year**

# The case of Naples



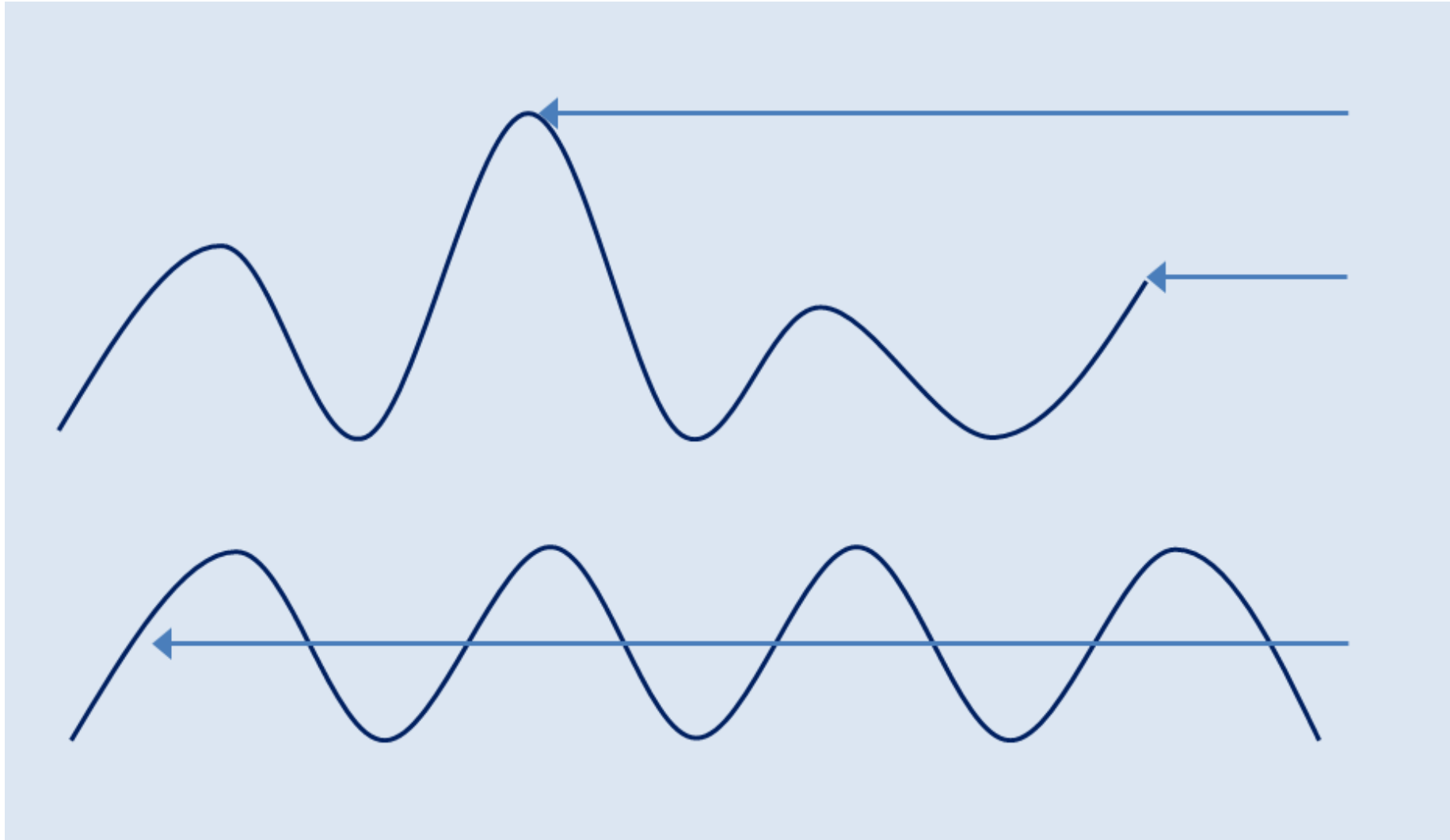
Source: Cascetta





Source: Cascetta

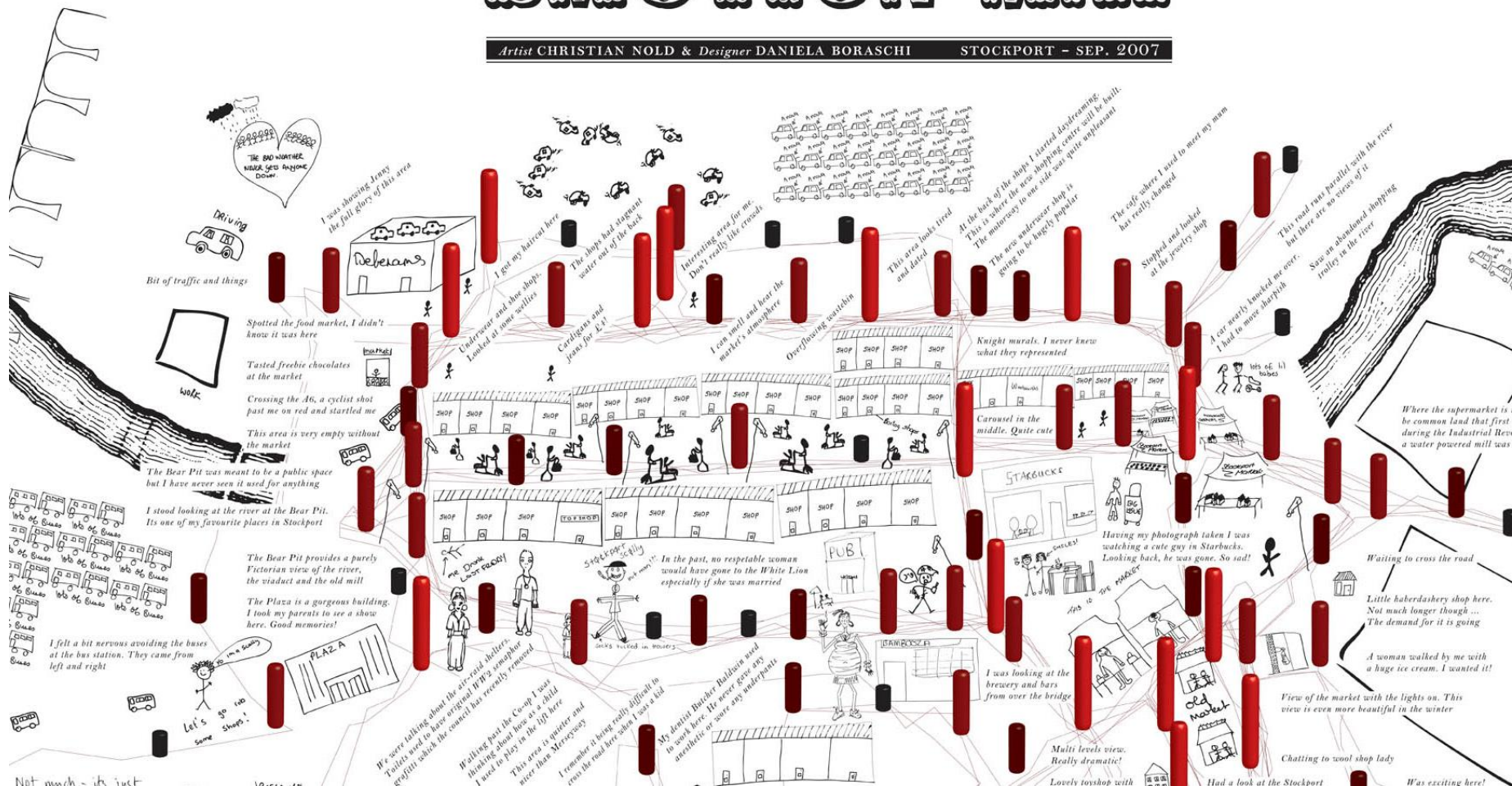
# The peak end rule



Source: Mark van Hagen

# STOCKPORT EMOTION MAP

Artist CHRISTIAN NOLD & Designer DANIELA BORASCHI STOCKPORT - SEP. 2007



Source: Christian Nold

# What is “smart mobility”?

$$M_{\text{smart}} = \frac{O_{\text{experienced time}}}{E_{\text{neg}}}$$

# Where is most to gain?

- Speed-up
- Slow down
- Land-use
- Transfer
- Perception

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