Copenhagen: The Cycling City

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City of Copenhagen

Paris Stage 3 city
technical workshop
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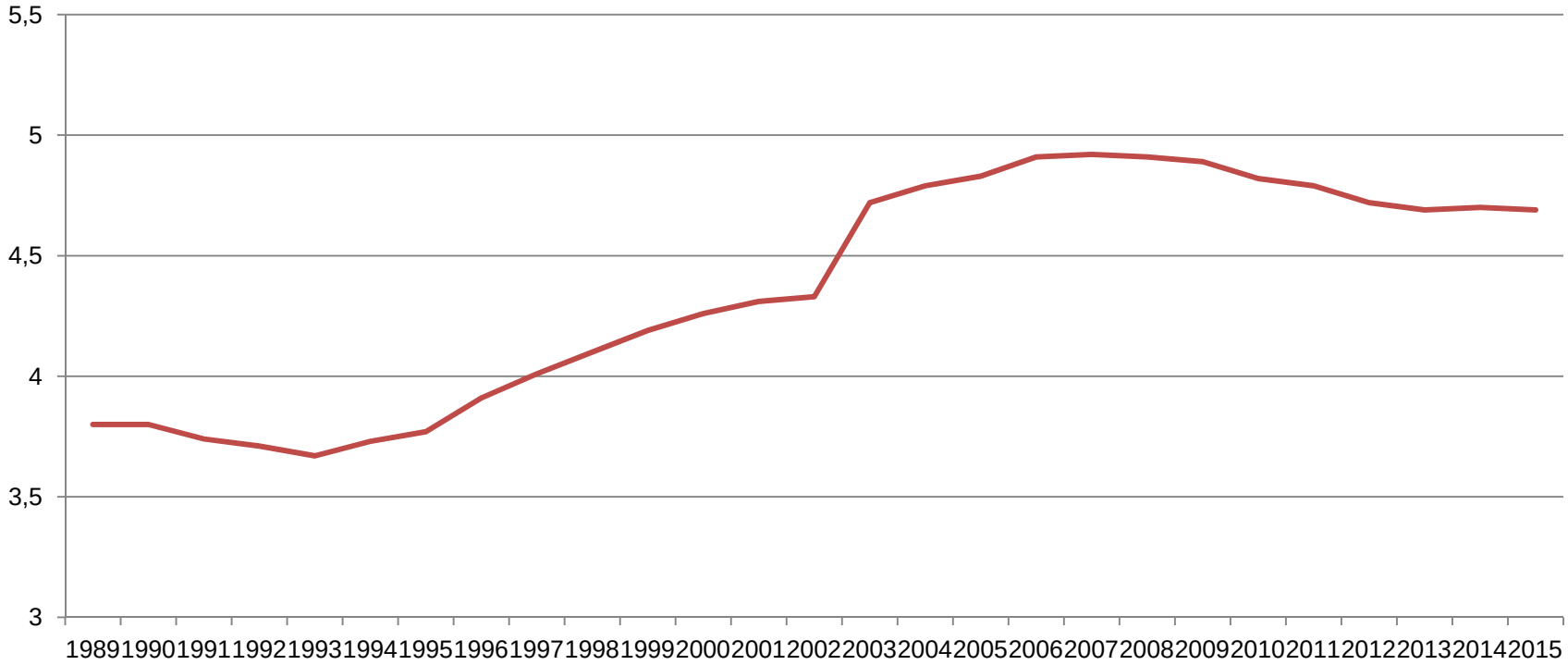
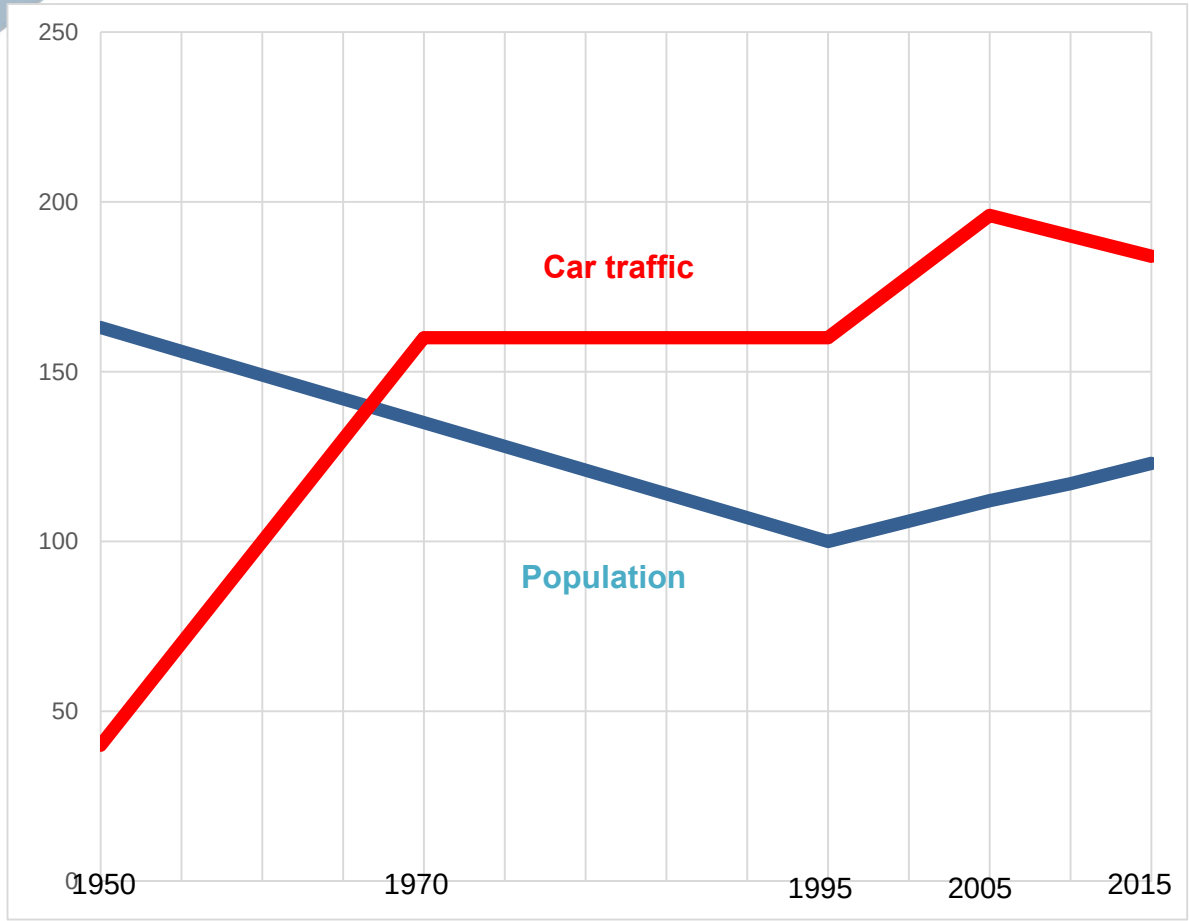
Copenhagen: Key figures

2005 – 2015		Lessons learnt
• Bicycle traffic	+ 19 %	Vision planning
• Car traffic	- 3 %	
• Car ownership	+ 21 %	Bikes – AND cars
• Public transport	+ 14 %	
• Inhabitants	+ 15 %	
• Jobs	+ 12 %	The “pull” factors

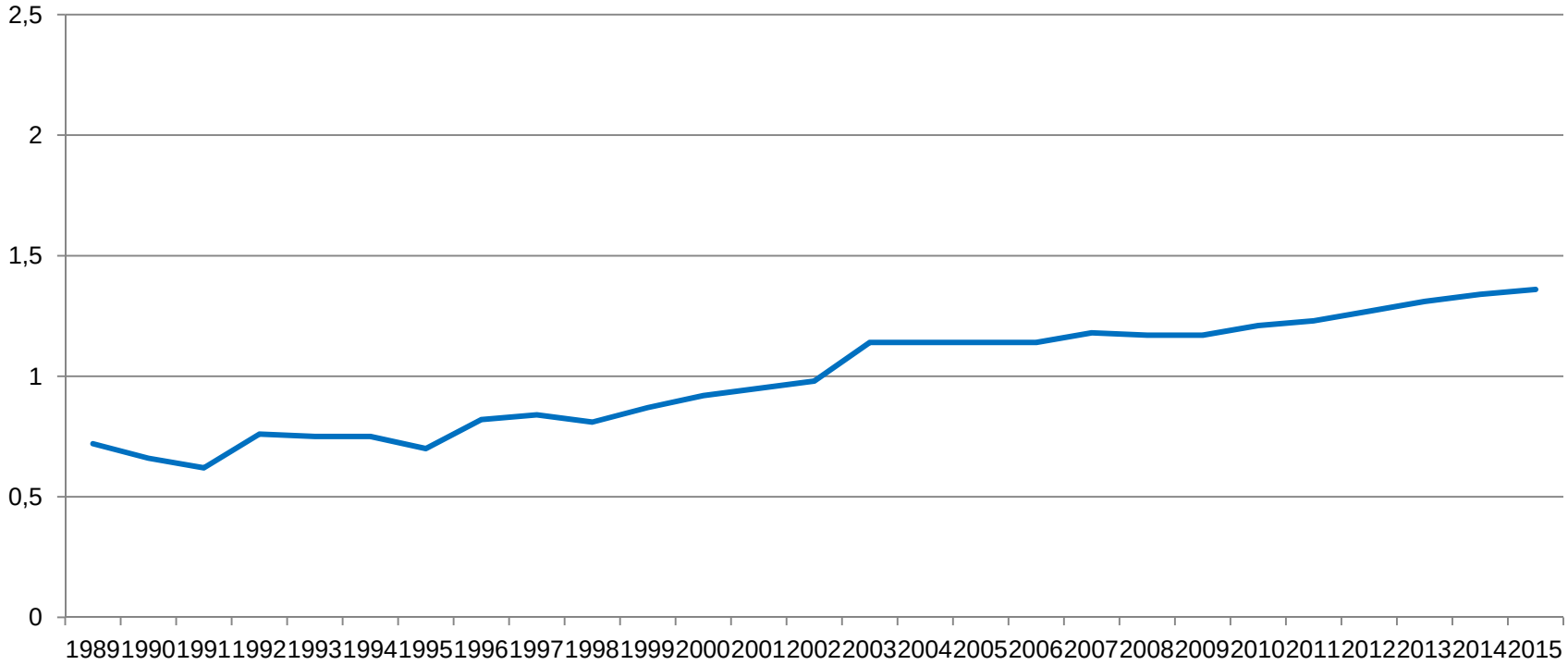
Car traffic increased from mid 1990'es up to mid 00's
(annual car kilometres (million))



And before – even more



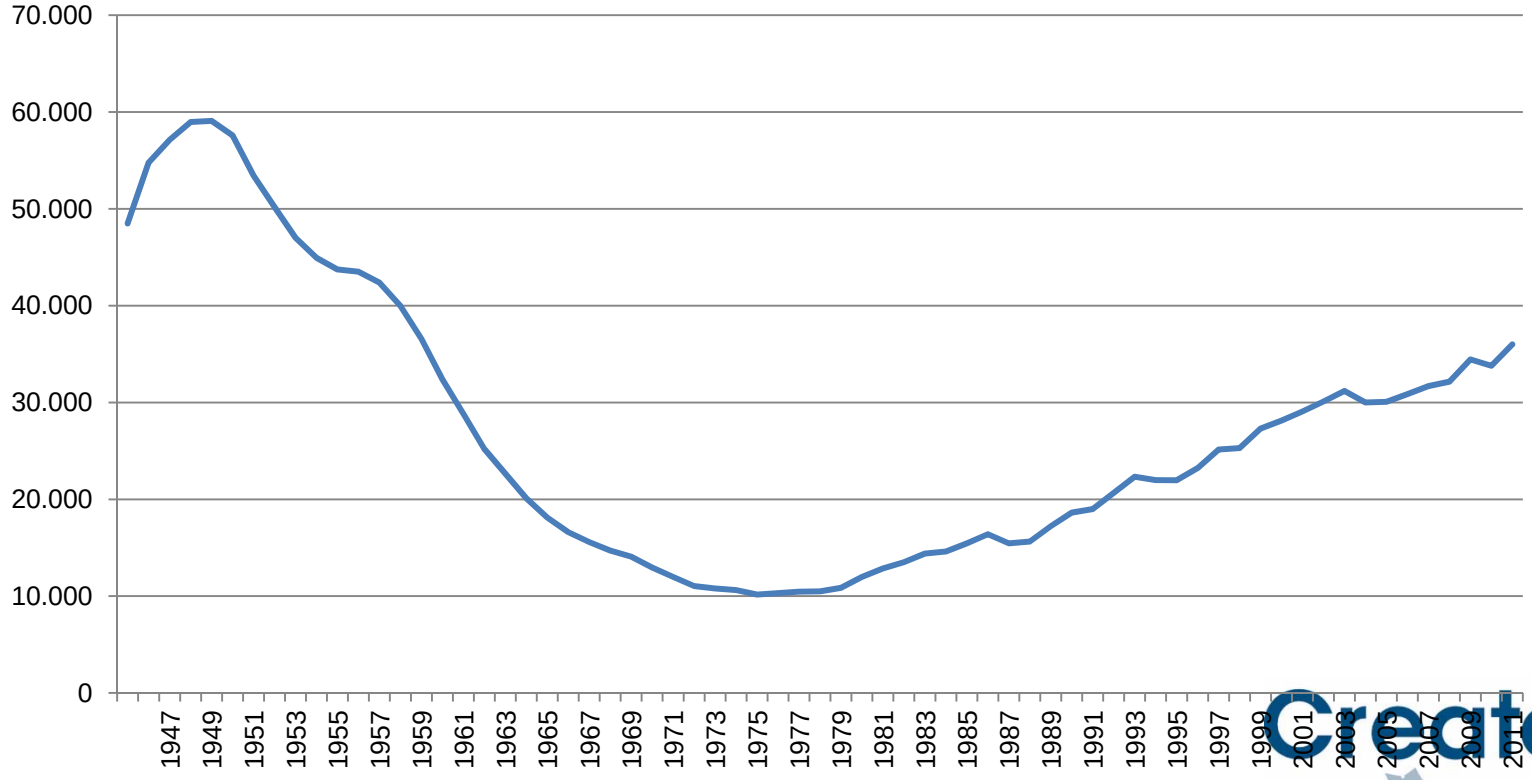
Bicycle traffic has more than doubled since we started to calculate
(annual bike kilometres (million))



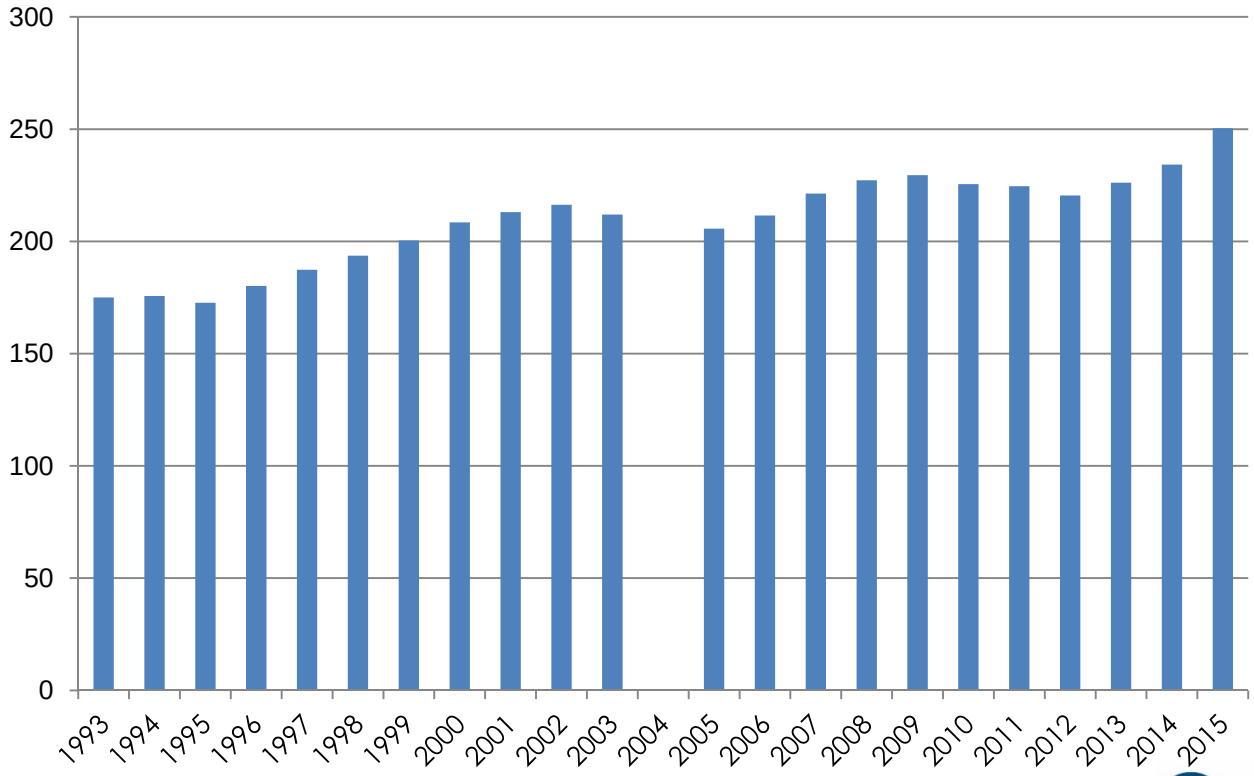
Cycling in Copenhagen has been popular before. It peaked between 1945 and 1950.

(Numbers from Nørrebrogade.)

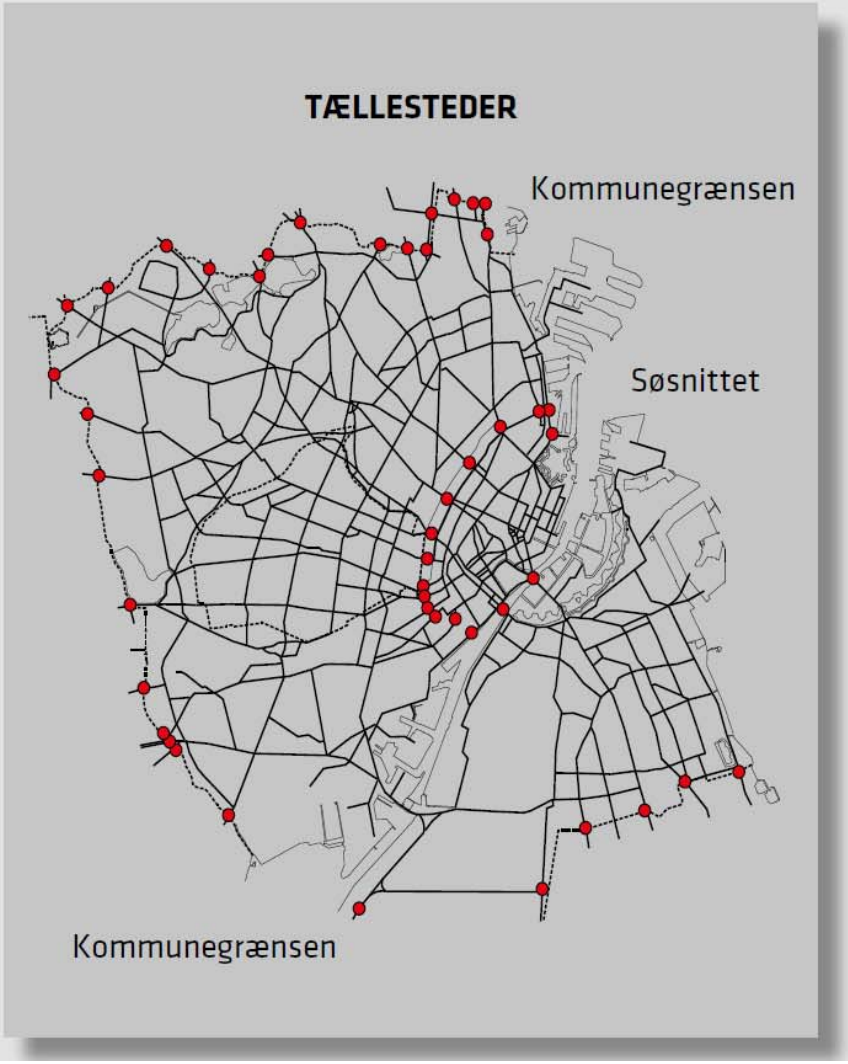
Development in daily number of cyclists (curve smoothened)

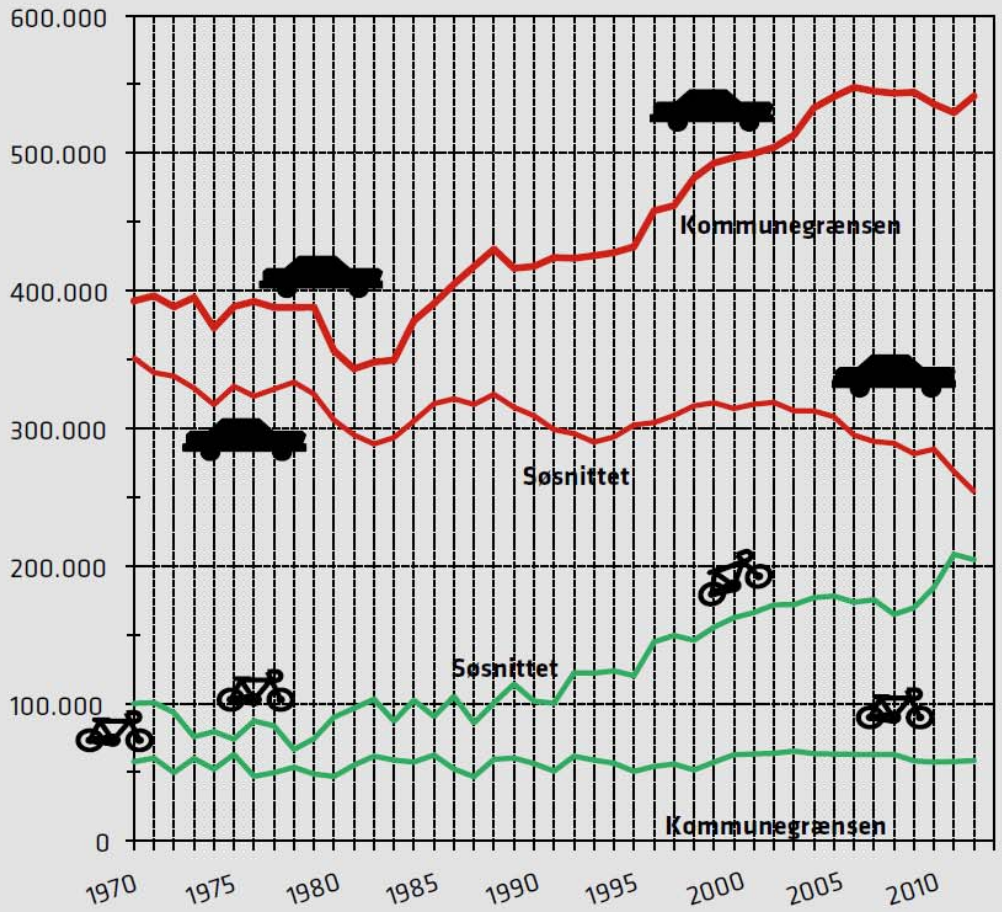


Car ownership is low and has been relatively stable for a number of year. But now increasing

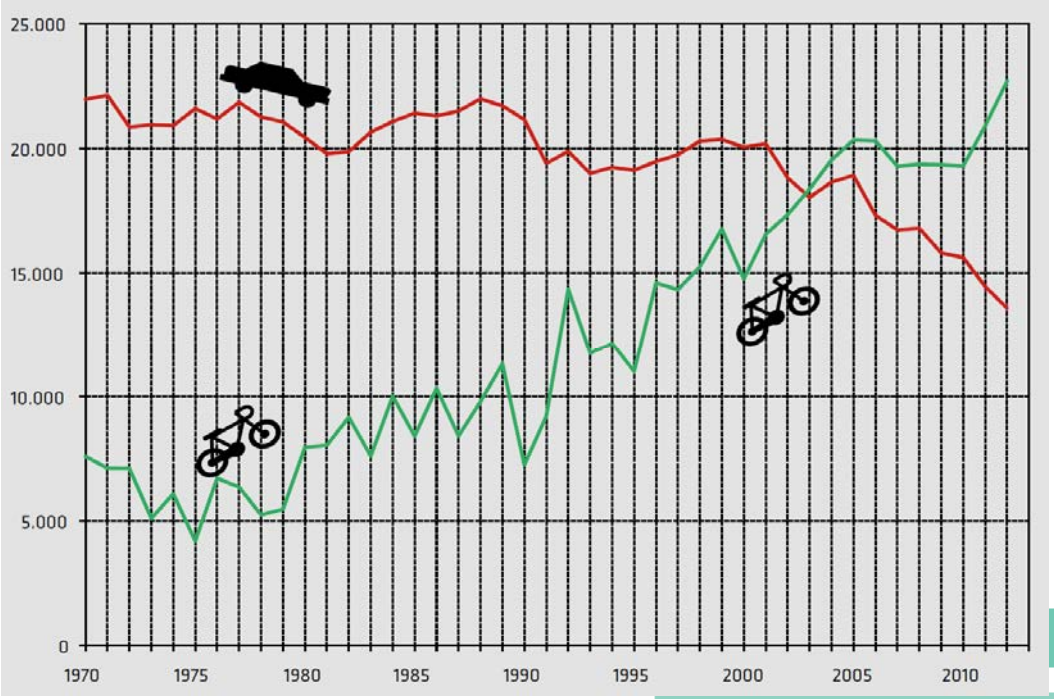


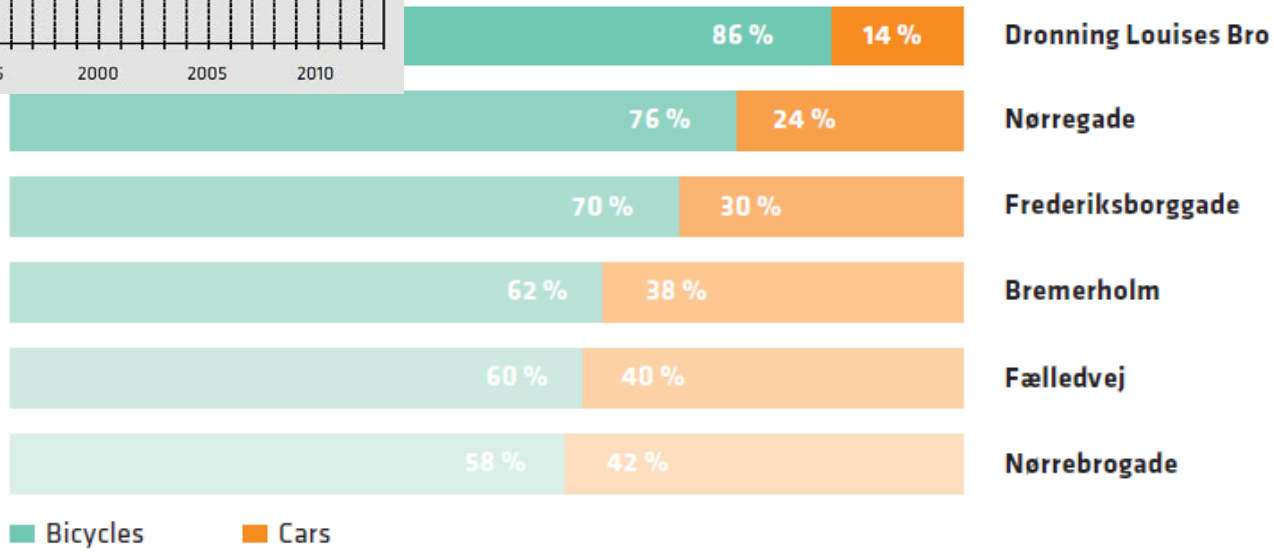
TRAFFIC DEVELOPMENT (6-18 HOURS)



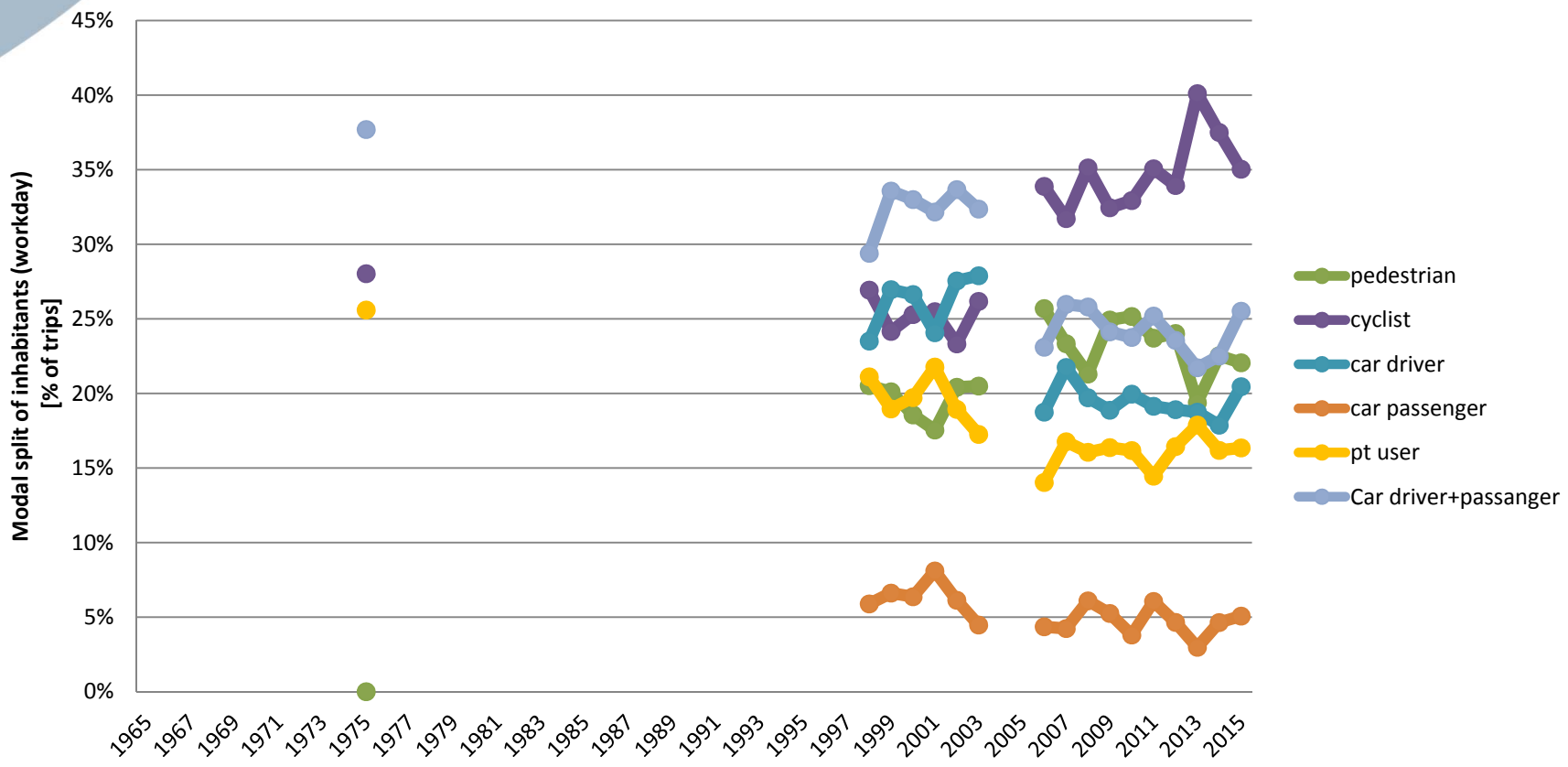


STREETS WITH MORE BICYCLE TRAFFIC





Modal split

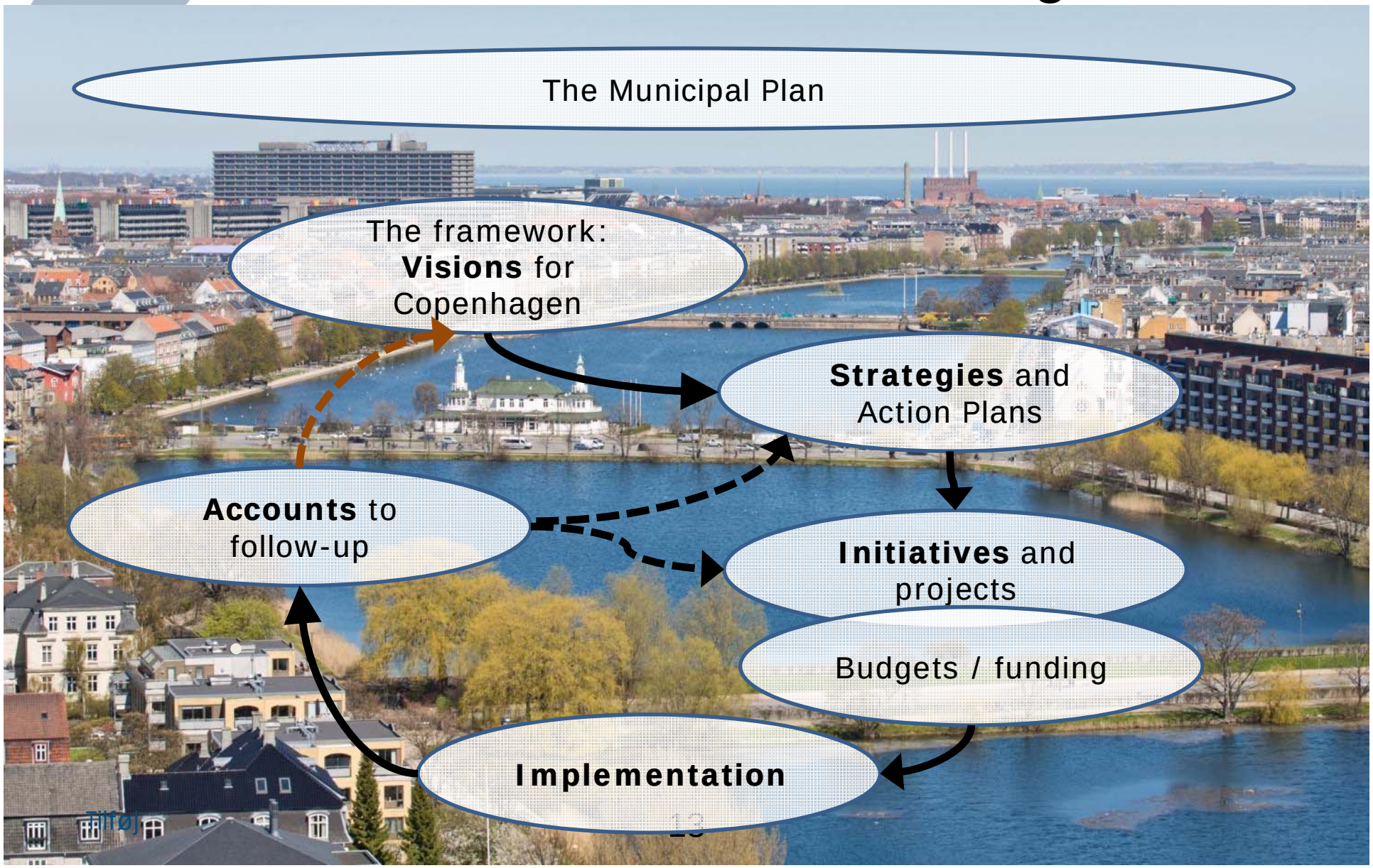

Modal split of inhabitants (workday)
[% of trips]
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
pedestrian
cyclist
car driver
car passenger
pt user
Car driver+passanger

So why is Copenhagen a cycling city?
Two waves with recognition of the role of cycling

1980's

2006 -

The last 10 years: Visions as basis for Political decisions and Planning



The Framework 2007-2015

ECO-METROPOLIS

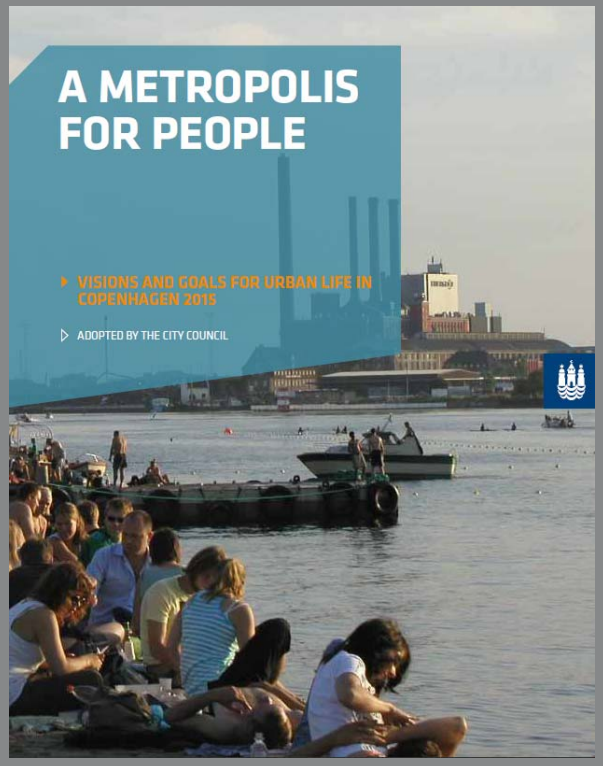
Vision and goals for 2015:

- Climate Capital
- World's best City of cyclists
- A green and blue capital city
- A clean and healthy big city

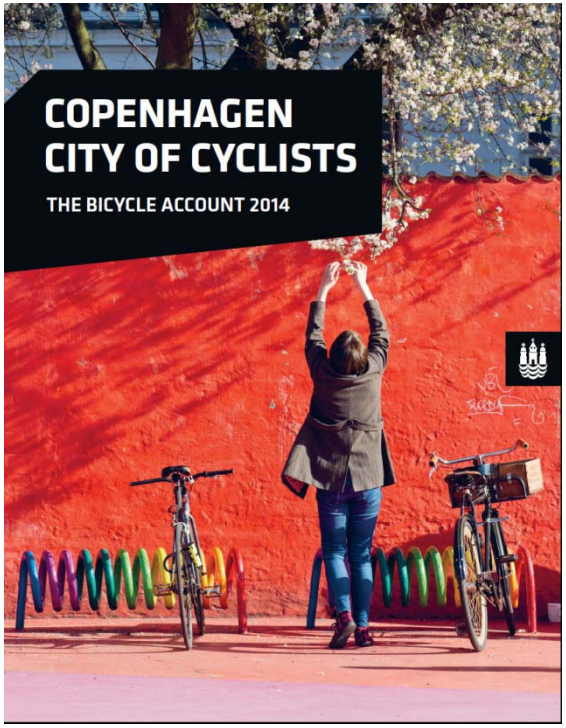
A METROPOLIS FOR PEOPLE

Vision and goals for 2015:

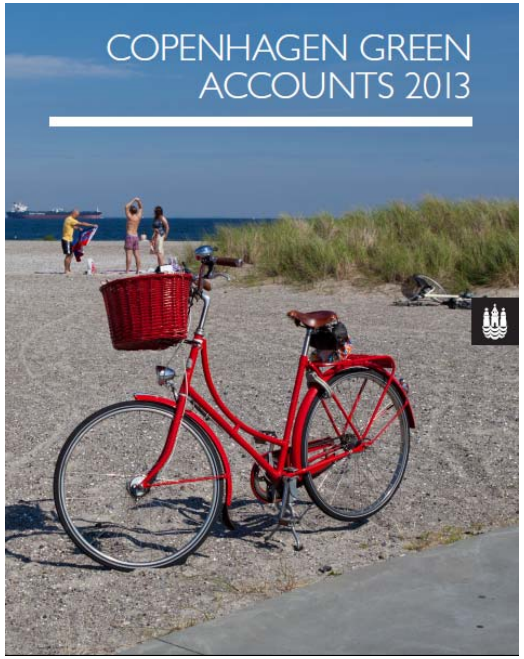
- More urban life for all
- More people to walk more
- More people to stay longer



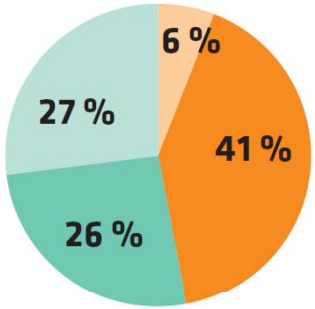
FOLLOW UP


COPENHAGEN
CITY OF CYCLISTS
THE BICYCLE ACCOUNT 2014

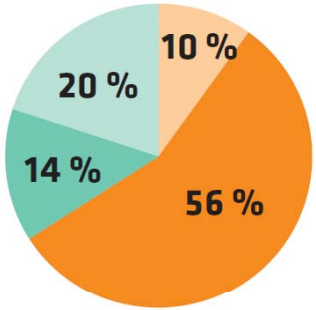

BYLIVSREGNSKAB
TENDENSER I DET
KØBENHAVNSKE BYLIV 2013
Københavnerne sætter stor pris på mulighederne for at få græs under fødderne, nyde solen på en bænk, eller opsøge kultur i byen. Københavnere går mere end gennemsnitsdanskeren og gerne på café, i Nyhavn eller på stranden om sommeren. Bylivsregnskab 2013 viser nemlig, at ni ud af ti københavnere er tilfredse med bylivet.
København har en vision om at være en by med et mangfoldigt og unikt byliv for alle. En metropol for mennesker. Vi har sat os tre mål for bylivet frem mod 2015: Mere byliv for alle, Flere går mere, og Flere bliver længere.
Bylivsregnskabet 2013 forsøger at beskrive nogle generelle tendenser for udviklingen og indeholder en kortlægning og tælling af menneskers aktiviteter i byen samt udsagn om borgernes oplevelser og holdninger. Vi får en status på de tre målsætninger og et indtryk af bylivets udvikling, årlige udsving, vejrets betydning osv. Det giver os grundlag for at justere indsatser og lære om, hvad der virker.
I Bylivsregnskabet 2013 gentages udvalgte målinger med en sammenligning af forrige år. Herudover tager Bylivsregnskabet 2013 temperaturen på børnenes leg i byens rum. Temaet Byliv i Børnehøjde, viser et *her og nu* billede af, hvordan byrummet ifølge københavnernes fungere. Tal og registreringer er suppleret med københavnernes kvalitative beskrivelser og ord.
SAMMEN OM BYEN
KØBENHAVNS KOMMUNE
Teknik- og Miljøforvaltningen


COPENHAGEN GREEN
ACCOUNTS 2013

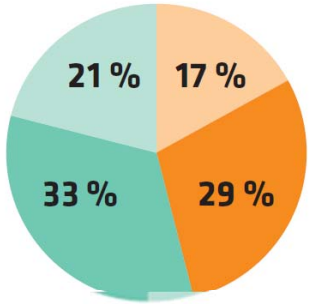
MODAL SPLIT 2015



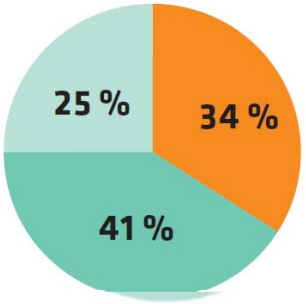
Journeys to work and education in the City of Copenhagen



Copenhageners' journeys to work and education in the City of Copenhagen



All journeys with start and/or stop in the City of Copenhagen



All journeys with start and/or stop in the City of Copenhagen, except walking

Goal 2025: 50%

Goal 2025: 75%

Goal 2025: 1/3

Bicycle Public transport Car Walking

EXAMPLE: THE BICYCLE STRATEGY

Comfort

Travel time

Safety

City life

COPENHAGEN TOGETHER
CITY OF COPENHAGEN
The Technical and Environmental Administration

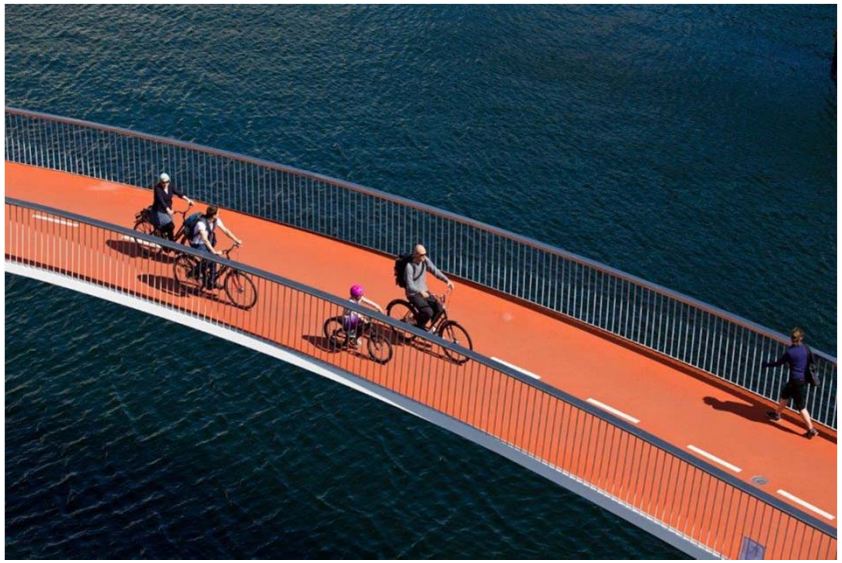
I ♥ CPH

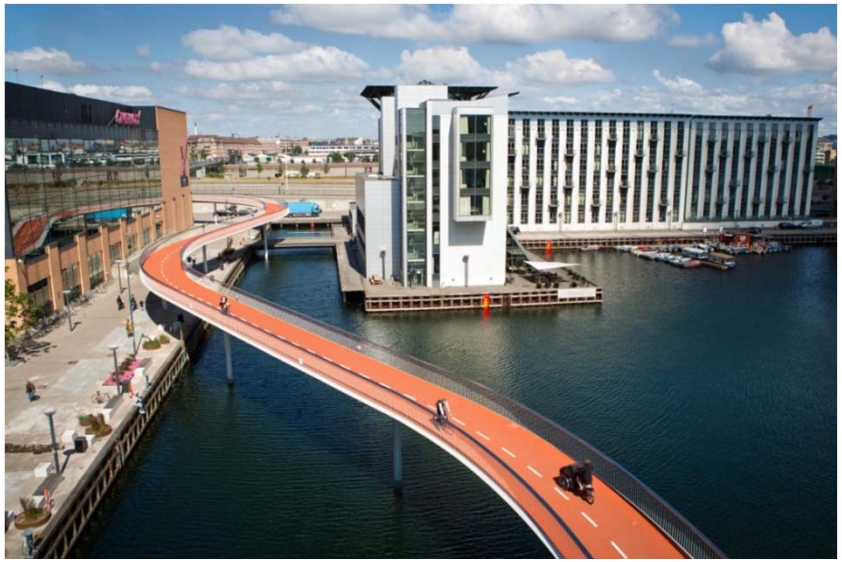
BICYCLE STRATEGY 2011-2025

GOALS:

MODAL SPLIT FOR BICYCLES:	2015	2020	2025
Share of all trips by bicycle to work and school in Copenhagen (2010: 35%)	50%	50%	50%
QUALITY:			
Share of the network that has three lanes (2010: 25%)	40%	60%	80%
Relative to 2010, cyclists' travel time is reduced by	5%	10%	15%
Percentage of Copenhageners that feel safe cycling in traffic (2010: 67%)	80%	85%	90%
Relative to 2005, the number of seriously injured cyclists will fall by	50%	60%	70%
Percentage of Copenhagen cyclists who find the cycle tracks well maintained (2010: 50%)	70%	75%	80%
Share of Copenhageners who think that bicycle culture positively affects the city's atmosphere (2010: 67%)	70%	75%	80%

CYCLE SNAKE





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City transport Cycling the city

Why can't all cities have bike bridges like Copenhagen's new Cycle Snake?

The two-lane elevated orange *Cykelslangen* – the latest of the city's continuous and safe bike lanes – is a joy to ride as it wriggles its way over the harbour

Helsinki's ambitious plan to make car ownership pointless

'We have been doing this for cars for decades' ... Copenhagen's Cykelslangen. Photograph: Sandra Hoj

INTERSECTIONS

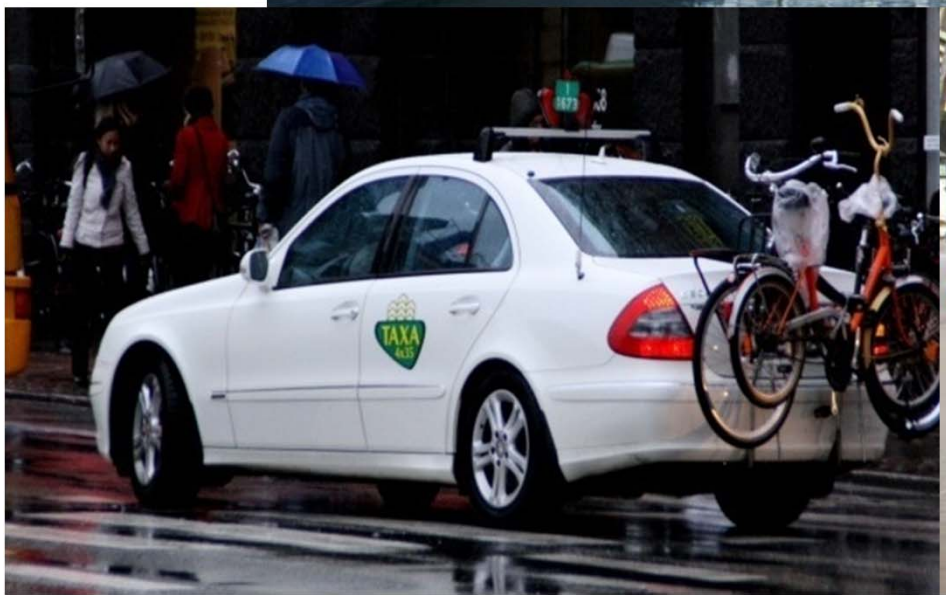
Withdrawn stoplines

Blue safety lanes

Pre-green

LED warning lights

FLEXIBLE AND CONNECTED MOBILITY NETWORK



NØRREBROGADE - HIGH STREET

WHAT HAPPENED?:

10%
Reduction in bus travel time

11%
More bicycle traffic in general on Nørrebrogade

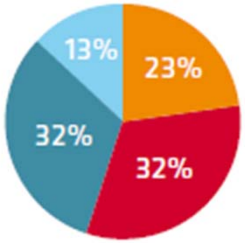
20%
More bicycle traffic on Dronning Louises Bro

60%
Reduction in car traffic on Dronning Louises Bro

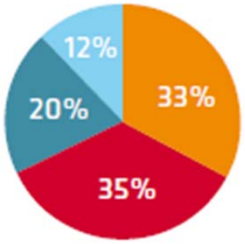
10%
Reduction in car traffic in general in the Nørrebro district

45%
Reduction in the number of accidents for all road users

USE OF OTHER TYPES OF DATA: SHOPPING AND CYCLING

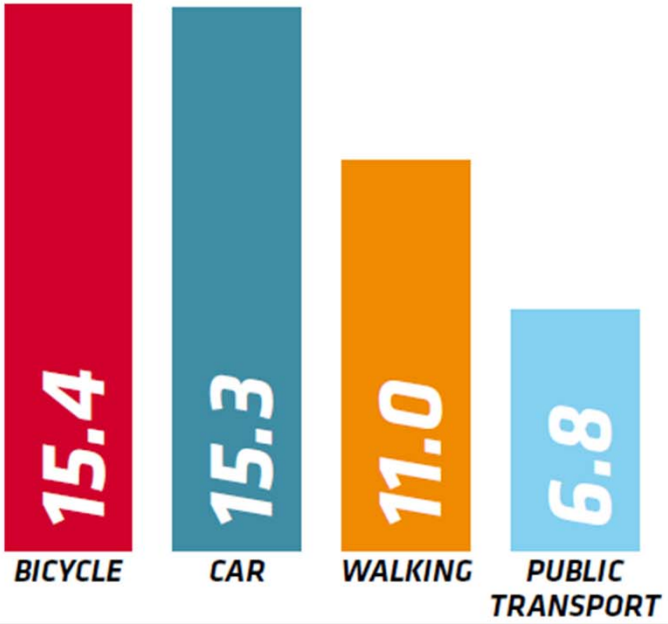


Revenue by mode of transport (%)



Shopping trips by mode of transport (%)

Revenue generated from the area equivalent of one car parking space, divided by the average turnover per shopping trip for motorists and cyclists (DKK)



Revenue in shops and supermarkets by mode of transport (DKK billion per year)

SOCIOECONOMIC BENEFITS

New km by bike in rush hour =

+ 20 Euro cents

New km by car in rush hour =

- 75 Euro cents

Cycling to work/study reduces overall mortality by 30 % (app. +5 years)

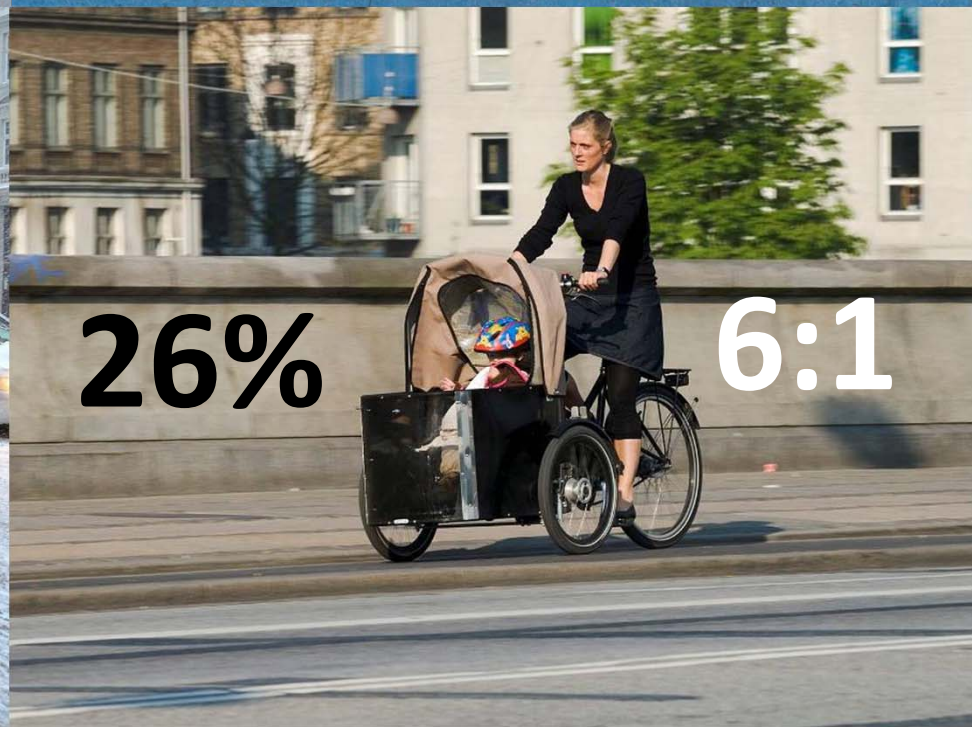
Net health impact of cycling:

- **0.6 € per km;**
- **225 million € per year**

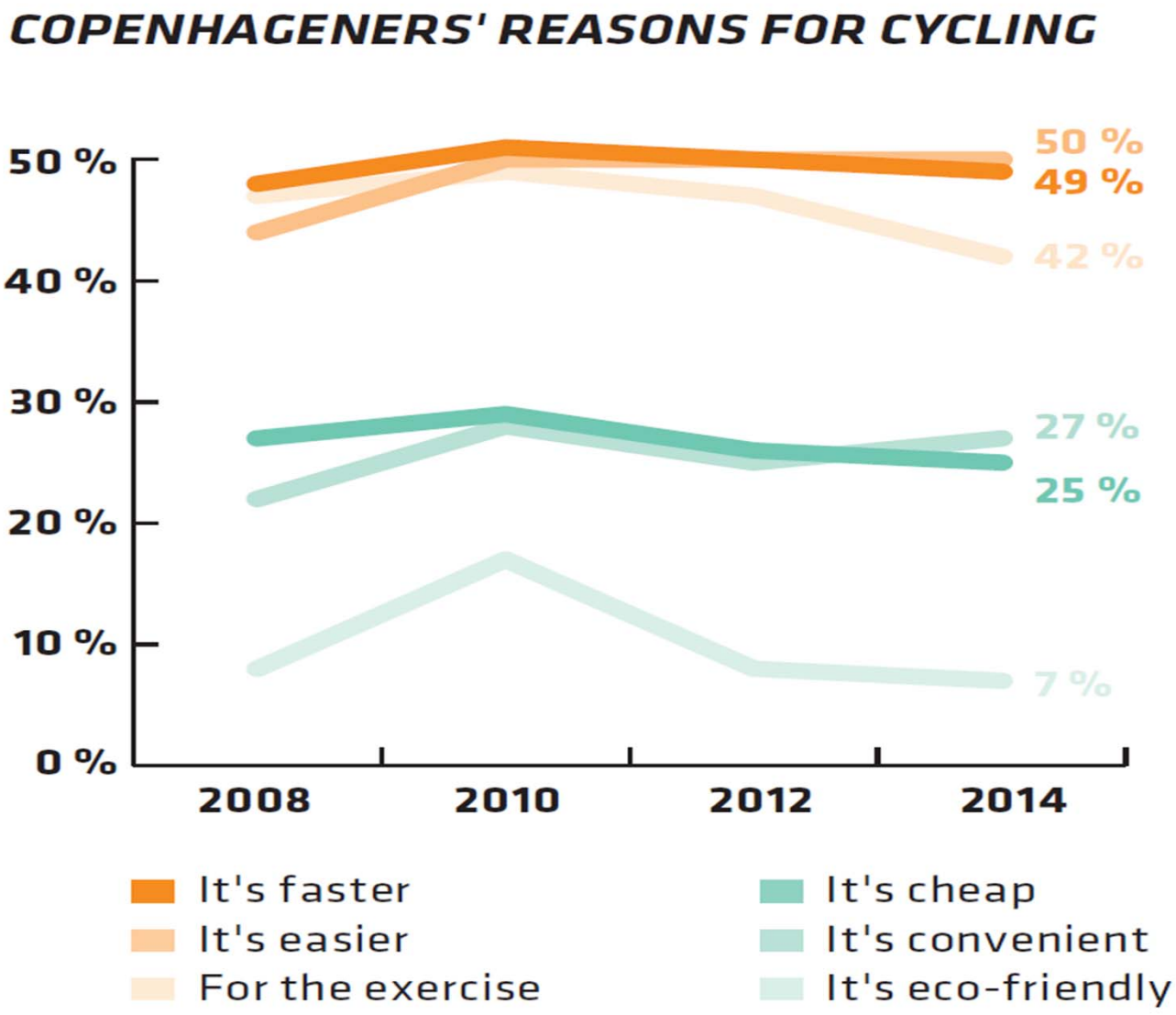

+40,000


1,360,000 km

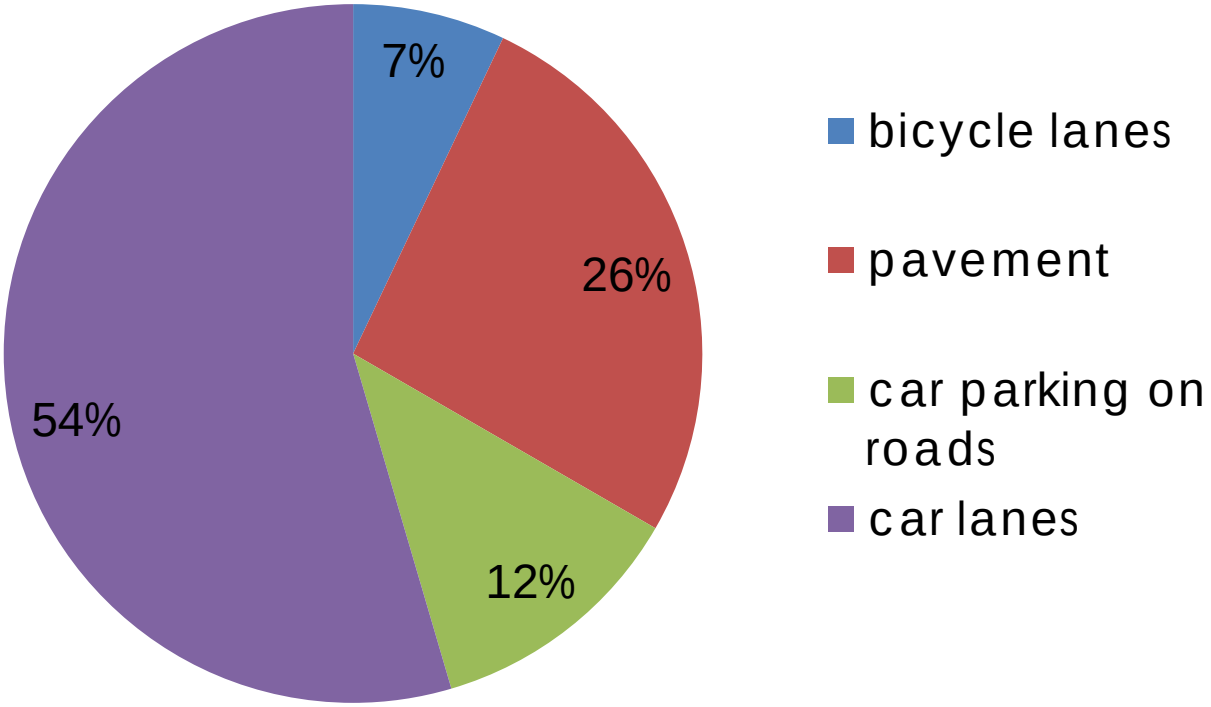

75 %
75%


26%
6:1

AND WHAT IS IN IT FOR THE CYCLISTS?



Use of the road space in Copenhagen



What did we learn about Copenhagen?

- Copenhagen builds for bikes – and cars
- Planning by visions, and goals
- We use the pull “story” about green mobility
- Political goodwill on cycling – for a long time
- Step-by-step development
- A cycling island in a more car oriented region

- We have a lot to learn from the other cities!

Some Reflections

IMPORTANT non-transport FACTORS

- Structural changes e.g. economy
- City planning is a key issue for mobility, e.g. Fingerplan, suburbs, mixed used
- Demographic changes e.g. the age of the population
- Public opinion
- Government, e.g. steady city council, cooperation with national and regional level
- Communication and dialogues with citizens and other stakeholders

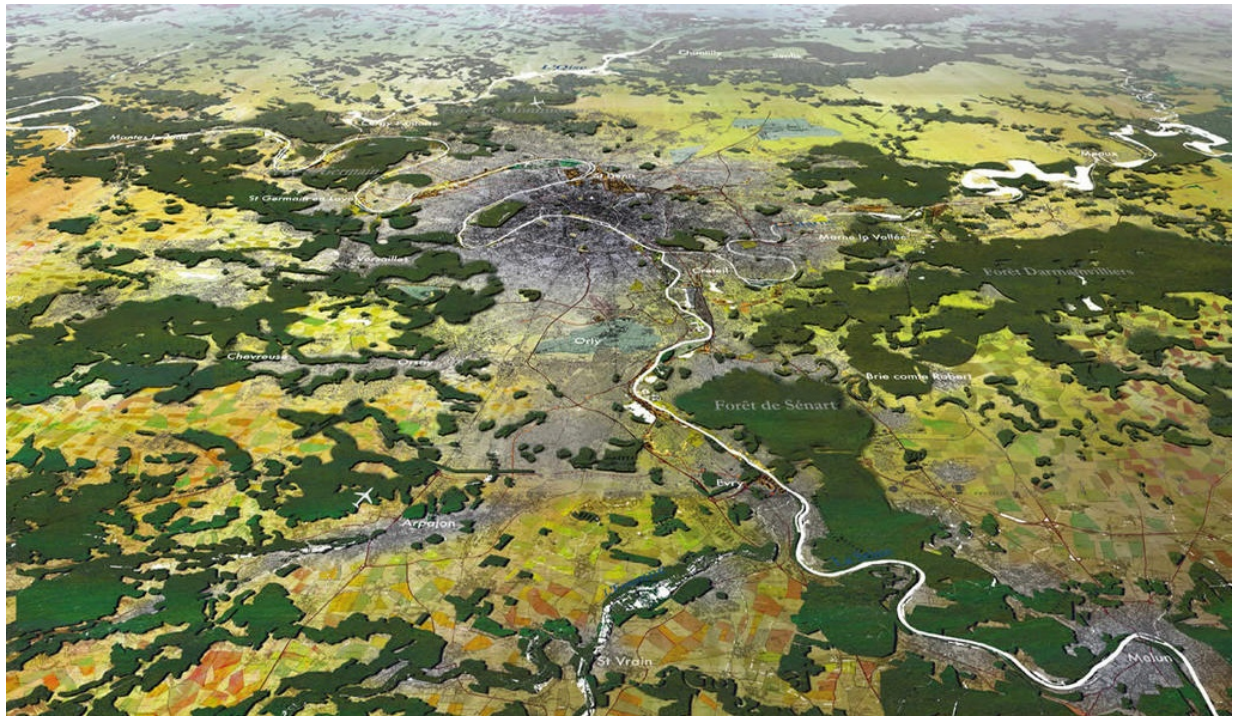
- Technological development

CAR TRAFFIC REDUCING

The case of Paris Region

CREATE WP3 Paris meeting / 9th March 2017

Jean-Pierre Orfeuil / Dominique Riou / Jérémy Courel



CAR TRAFFIC REDUCING

The case of Paris Region

CREATE WP3 Paris meeting / 9th March 2017

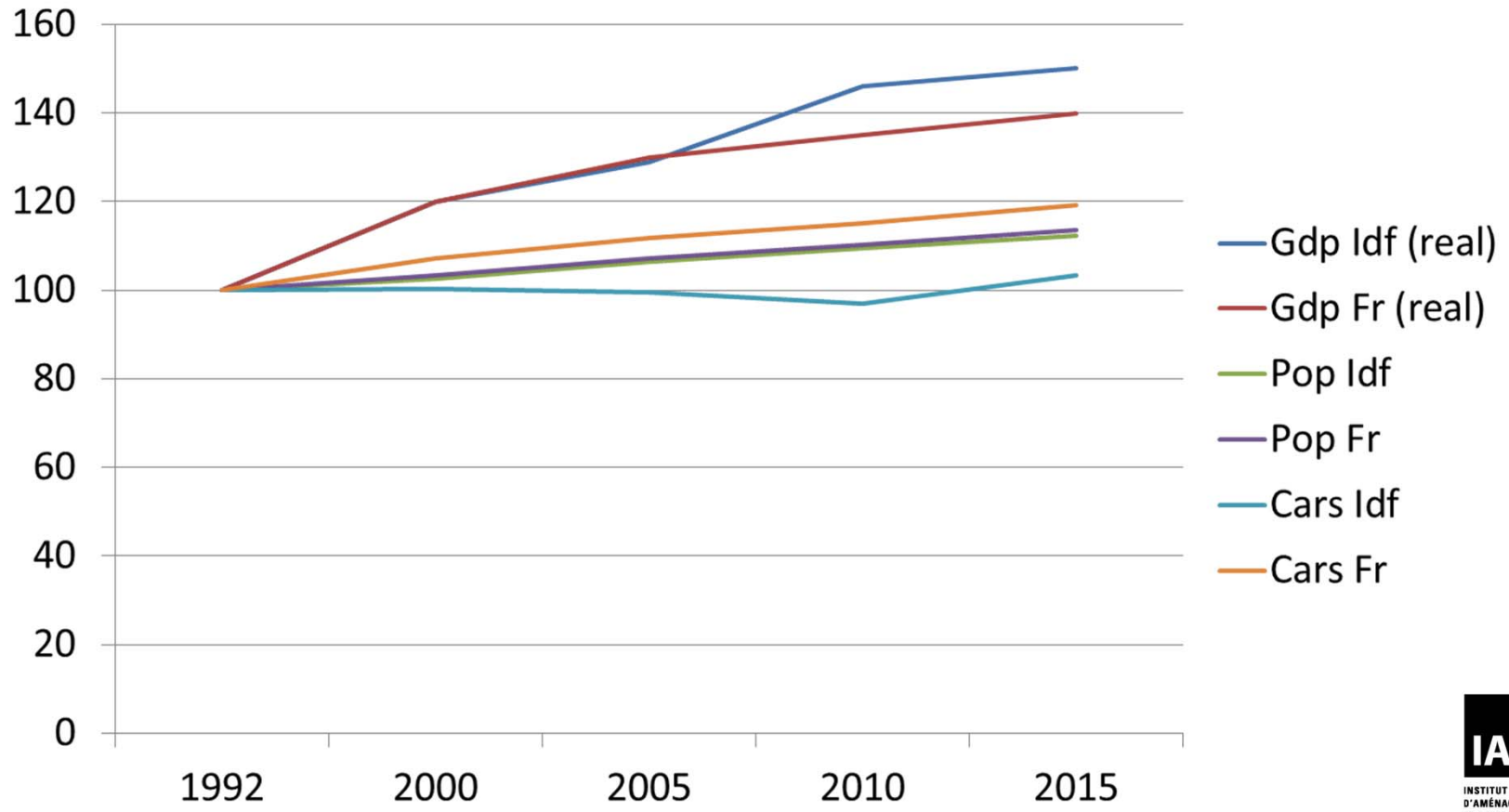
Jean-Pierre Orfeuil / Dominique Riou / Jérémy Courel

Synopsis

1. **Statistical evidences** concerning car traffic reducing process
2. **How to reduce** : the Paris region experience
3. **Planning and policies**: beliefs, laws, tools
4. **Planning and policies** : the different scales
   - metropolitan
   - infra-regional
   - rail station district
   - building and housing
   - Road management and design
5. **Conclusions**

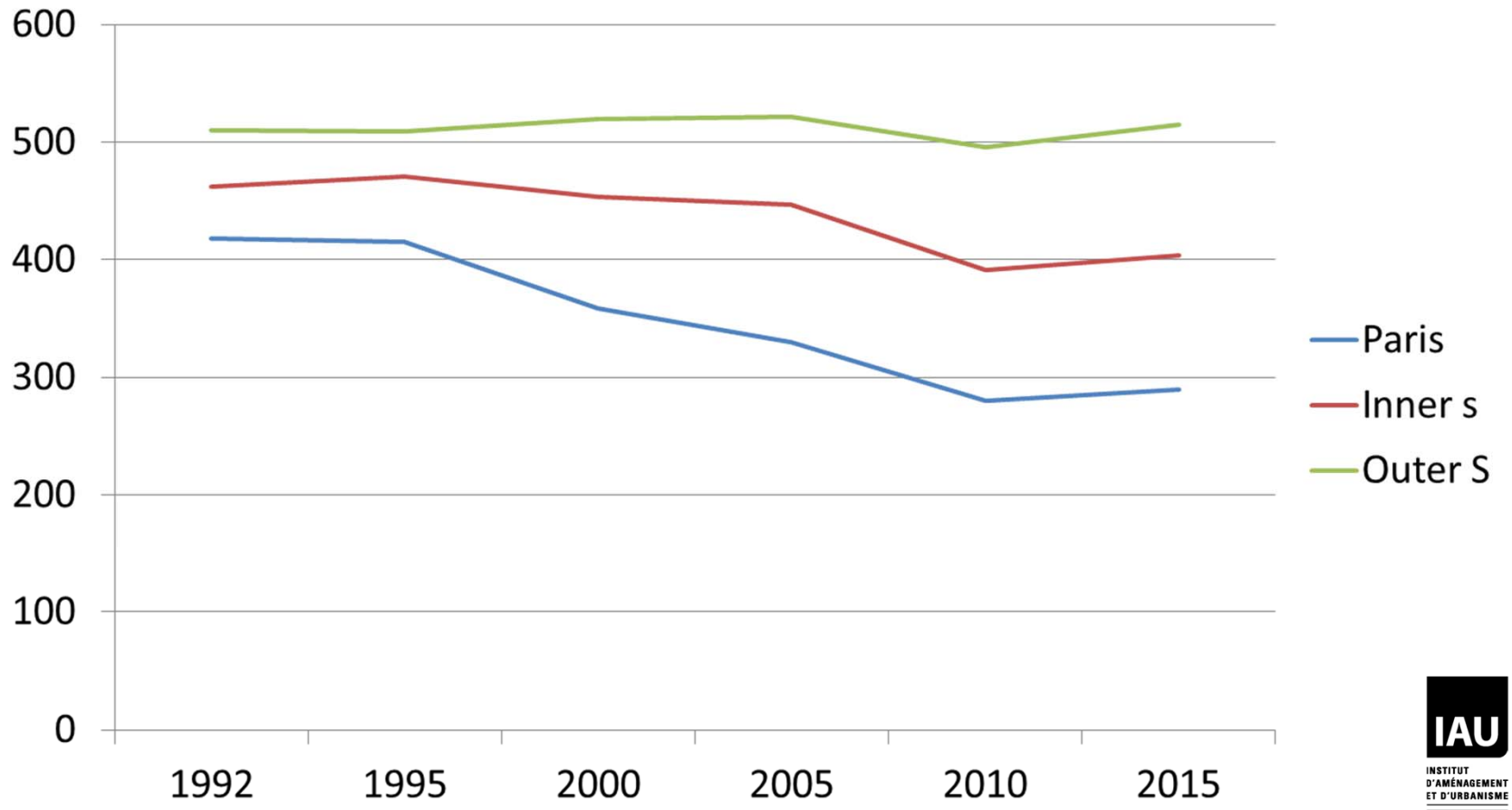
Statistical evidences

GDP vs pop vs cars fleet



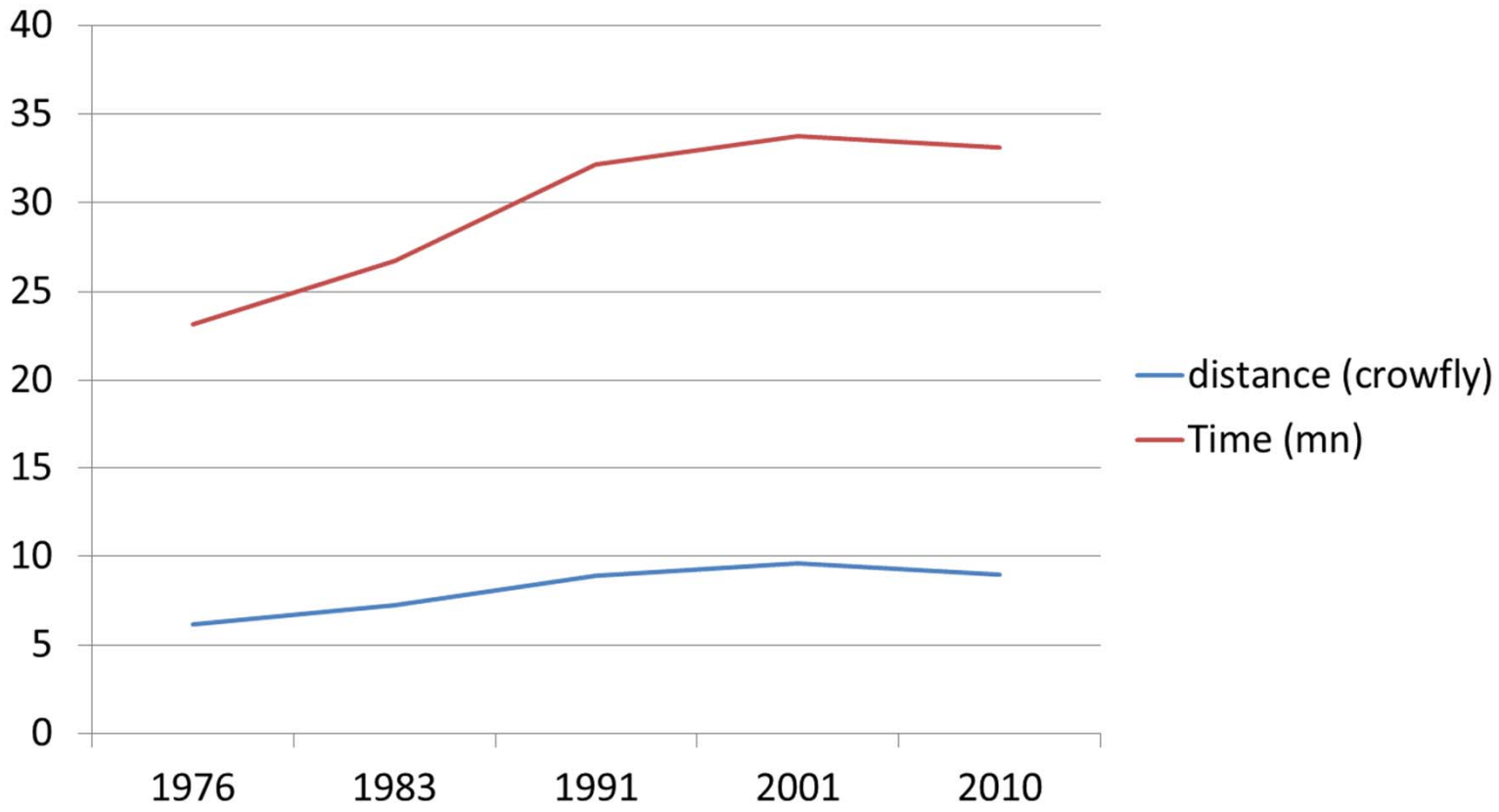
Statistical evidences

Cars ownership / 1000 persons



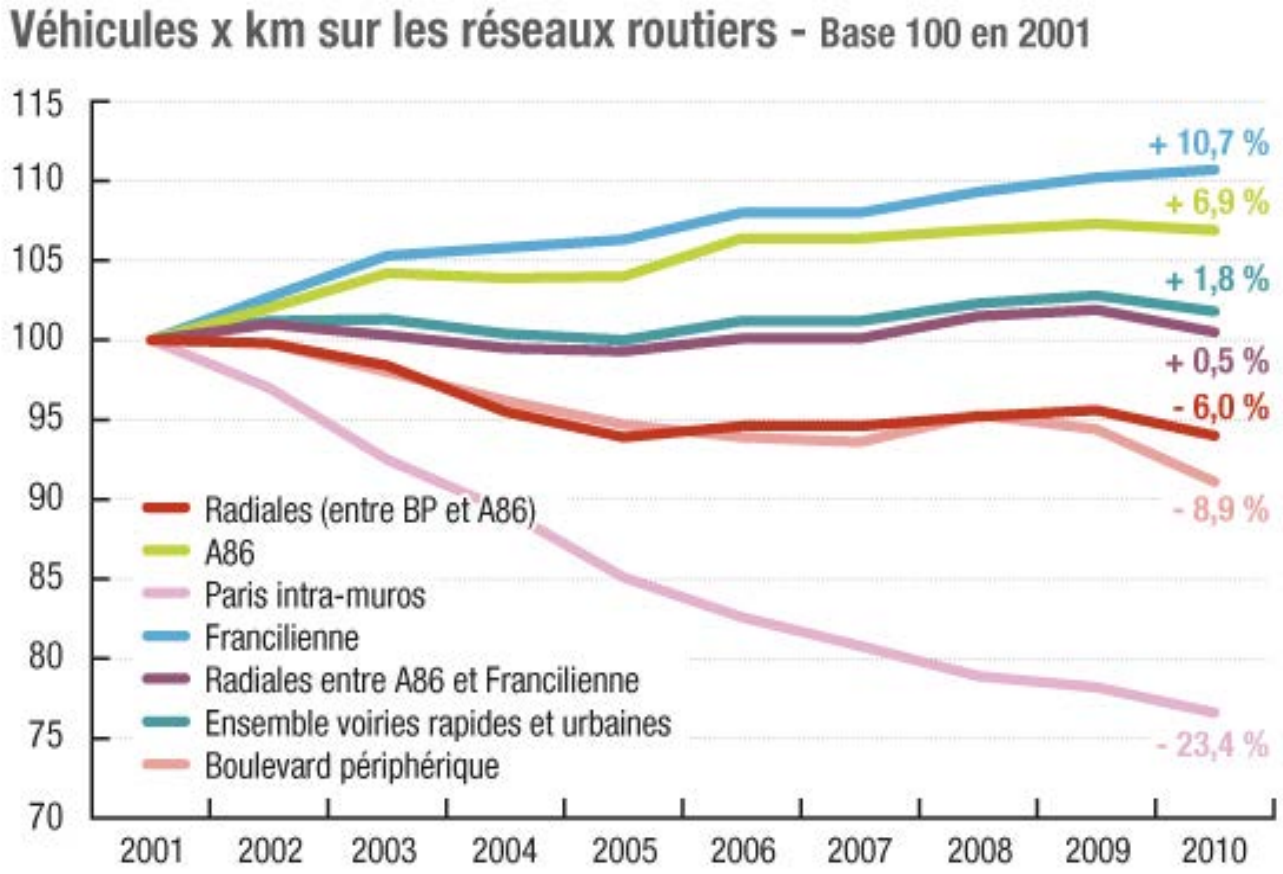
Statistical evidences

Daily trips by car : distance (km) and travel time (mn) evolutions



Statistical evidences

Traffic measures



Véhicules x km de 6 h à 20 h sur les VRU, véhicules x km par heure de 7 h à 21 h, ramenés au km d'axe instrumenté sur le BP. Source : DRIEA, Ville de Paris.

How to reduce : beliefs, laws, tools

Several ways to manage car traffic reducing

Economic instruments

Land Planning

Multimodal policies

Road network management

The change drivers

by the citizens and economic actors

- The end of the car as a “distinctive power”
- Tensions on the oil market
- The fear of health effects of pollution
- Detached houses prices are less dynamic than flats ones
- Favors to new “urban places” vs old fashion campus in outskirts

The change drivers

by the planners

- An unquestionable necessity : the environment protection
- The discredit of urban sprawl
- The tradition of a density prevention (local control of heights and land occupation for hygienist reasons) leaves the floor to the antisprawl logics, after the Newman and Kenworthy demonstration
- A strong belief in the potential of Public Transport to attract car drivers: modal shift as an autonomous objective

The change drivers

Some iconic actions

- traffic restrictions during bad air quality times
- Annual Car-Free Day
- Autolib
- Velib and renewal of bike policies
- Road renew, end of the urban motorways (eg Seine banks)

Impacts on law process

Law on air quality and rational use of energy (1996)

- Forces SUMP studies for cities > 100.000 inhabitants compulsory with a common aim:
  less car traffic in urban areas

Law on municipal cooperation (1999)

- Develops inter-municipalities structures of governance with transfer of competencies (French municipalities are often too small (close to 1300 in the Paris region) to promote most sustainability issues)

Law on cohesion and urban renewal (2000)

- Promotes urban density at the masterplan scale and social and functional mix at the local scale
- Key to environmental and social sustainability
- Integration of land use and transport development: places may be developed if (and only if) they are (or will be in a near future) served by P.T.

Impacts on law process

Law « National Commitment for the Environment » (2010)

- Masterplans must analyze land consumption over the preceding decade and take into account the need to master land consumption
- Local urban plans can propose a minimum threshold for density (not maximum) around PT stations
- A 30 % density bonus is offered when the energy efficiency of new buildings is over the conventional levels

Impacts on the different planning scales

Metropolitan level (Urban masterplan, Regional SUMP)

- From an extensive urbanization to an intensive one
- Huge investments in structural PT (Grand Paris Express)
- Higher densities around stations and along rail routes
- Special parking rules around stations

Inter-community level (local SUMPs, TOD contracts)

- A better coherence at the level of « daily life territories »
- Enhancing of bus networks

Communal / local level (urban plans)

- A new “state of art” for street designs
- Promotion of soft traffics

The level of the building (urban plans, mobility plans)

- Stronger parking rules, especially for offices

From an extensive urbanization to an intensive one

A new planning framework

- New rules in the 1994's regional masterplan, reinforced in 2013's one
- The "regional global accessibility" concept is no longer an aim, and its corollaries high speed road and rail infrastructures
- The "daily life territories" concept is put forward, and its concepts mass transit,

A new road management

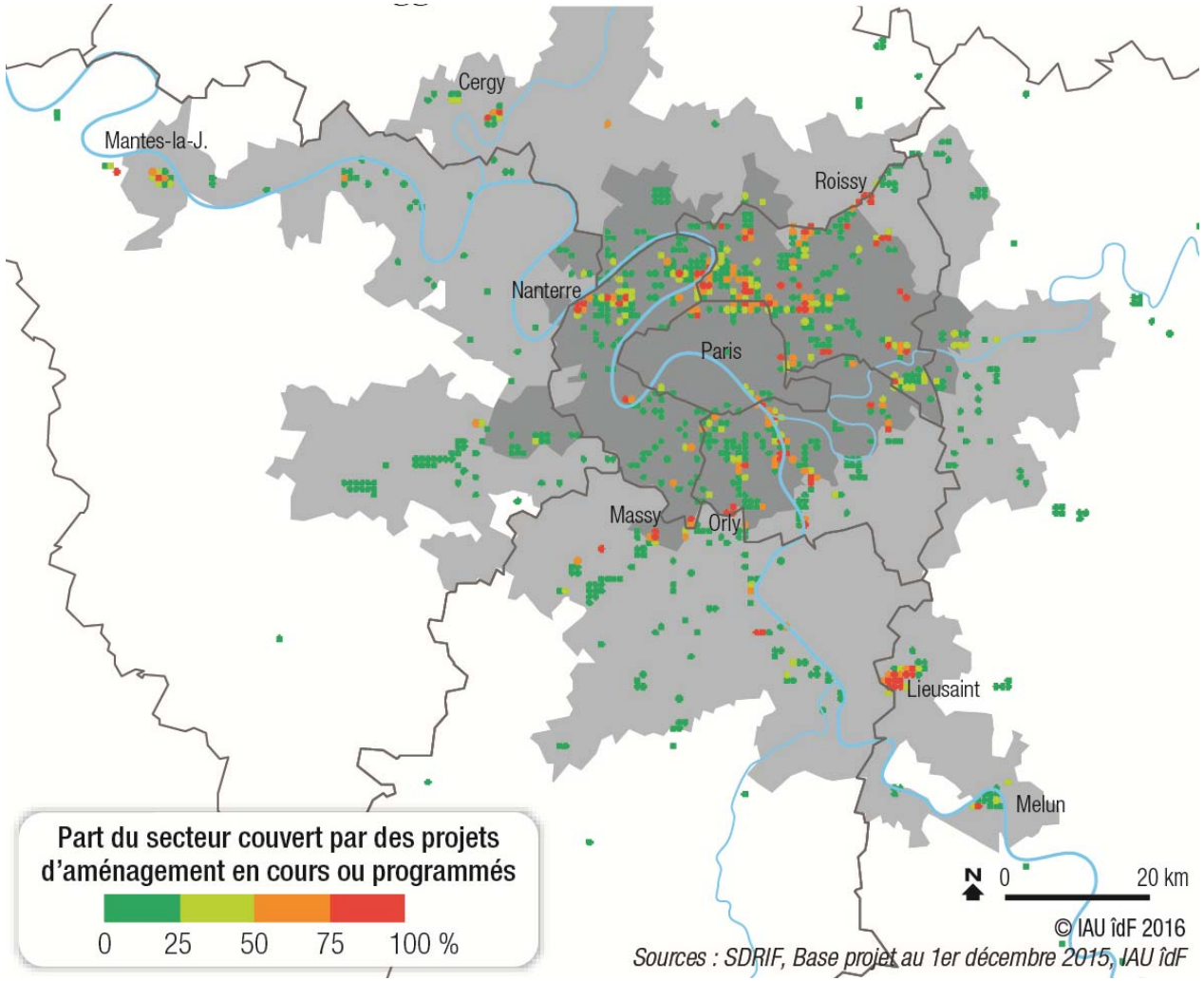
- sharp drop of speed on the road network, within a given travel time budget, less distance may be covered
- A new approach : fluidity vs speed in order to cope with higher traffic and security and reduce veh.km quantities

New behaviors

- some disappointment towards detached houses in villages

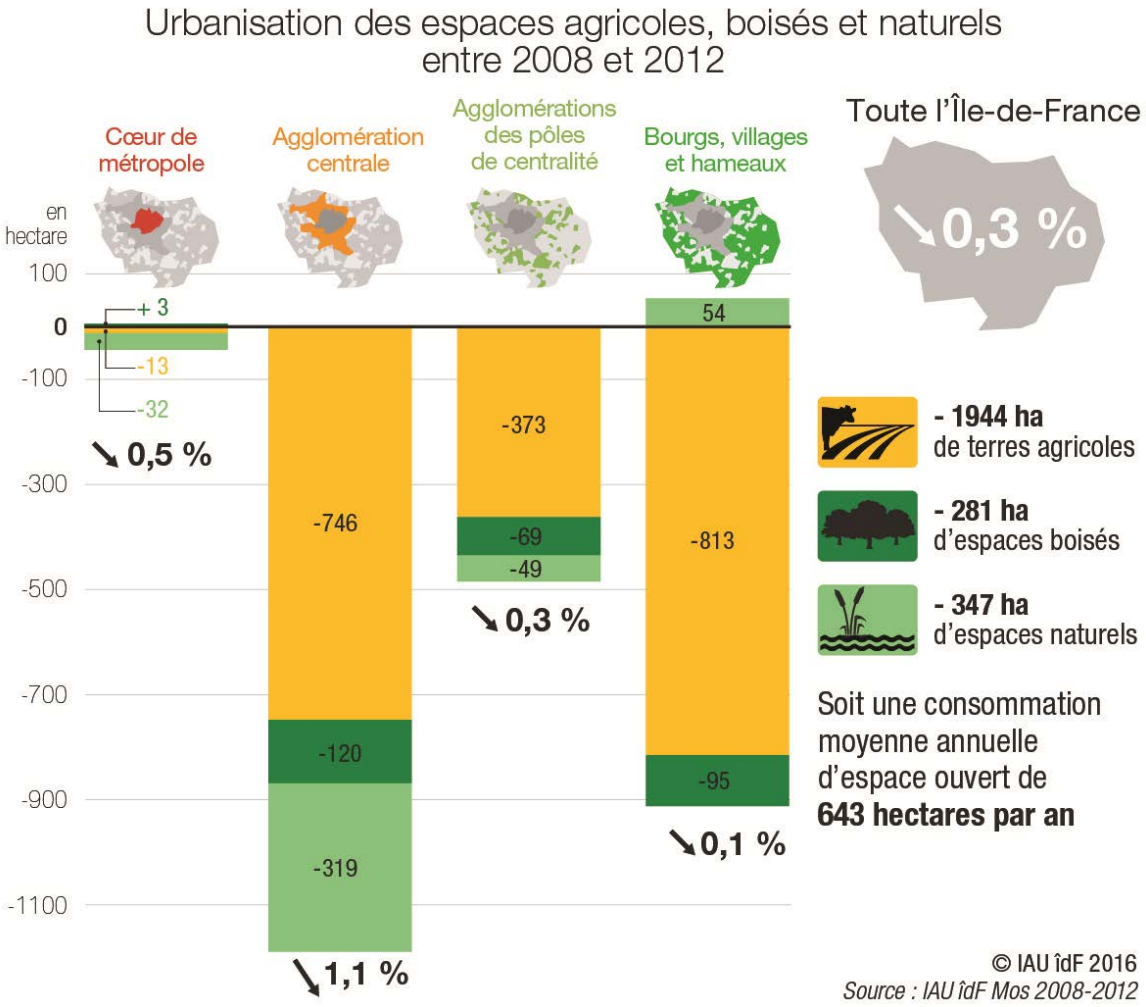
From an extensive urbanization to an intensive one

Densification spots



From an extensive urbanization to an intensive one

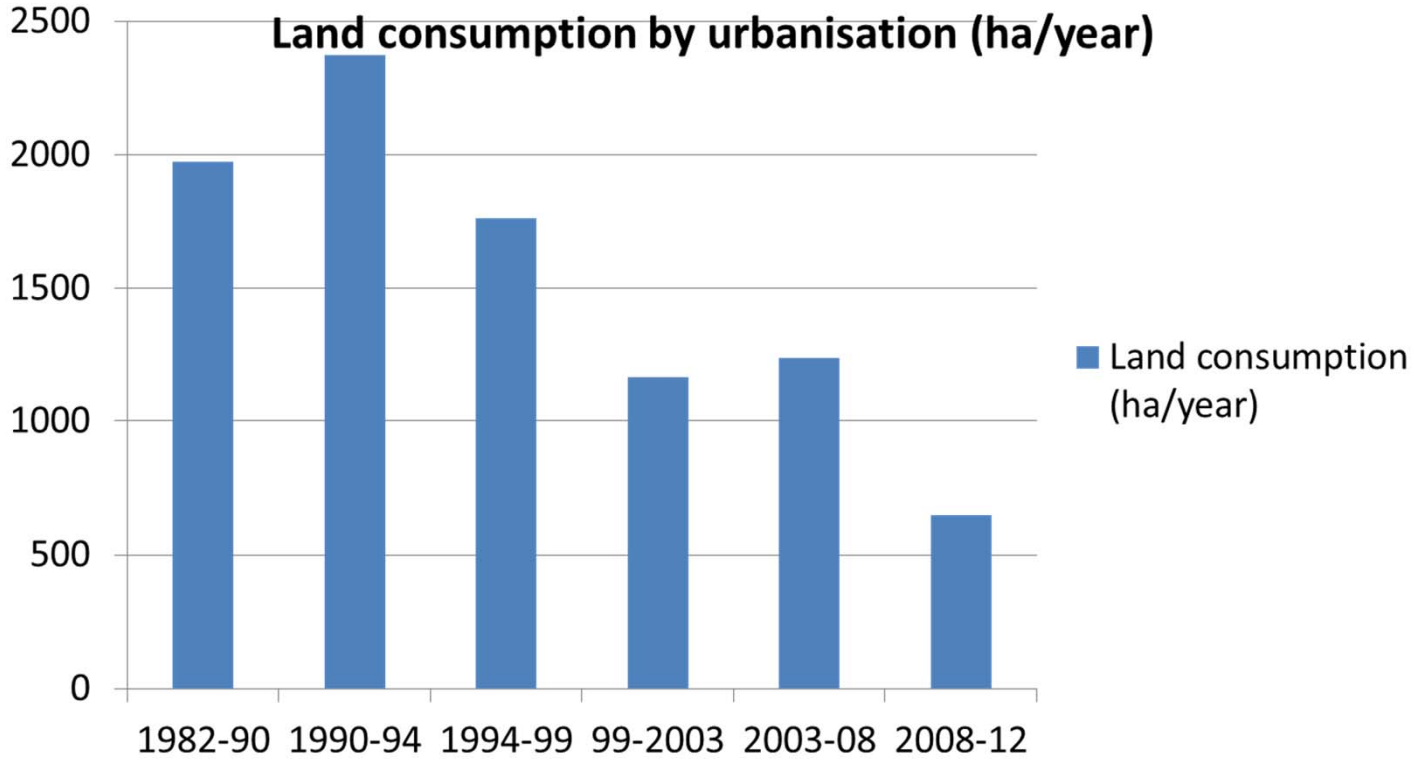
Lower green spaces consumption



From an extensive urbanization to an intensive one

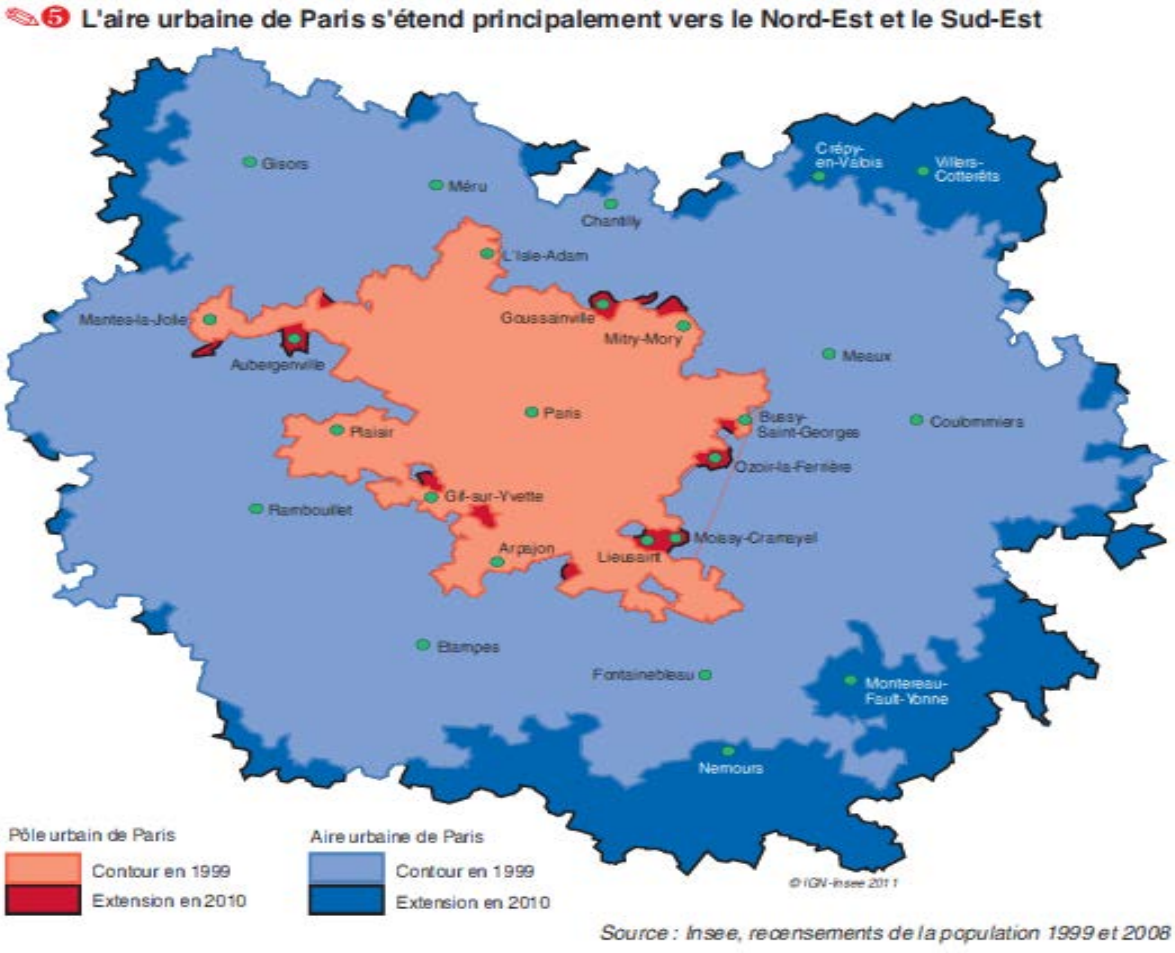
Recent figures of urban development:

- urban renewal:=1500 ha/year
- greenfields: 650 ha/year



From an extensive urbanization to an intensive one

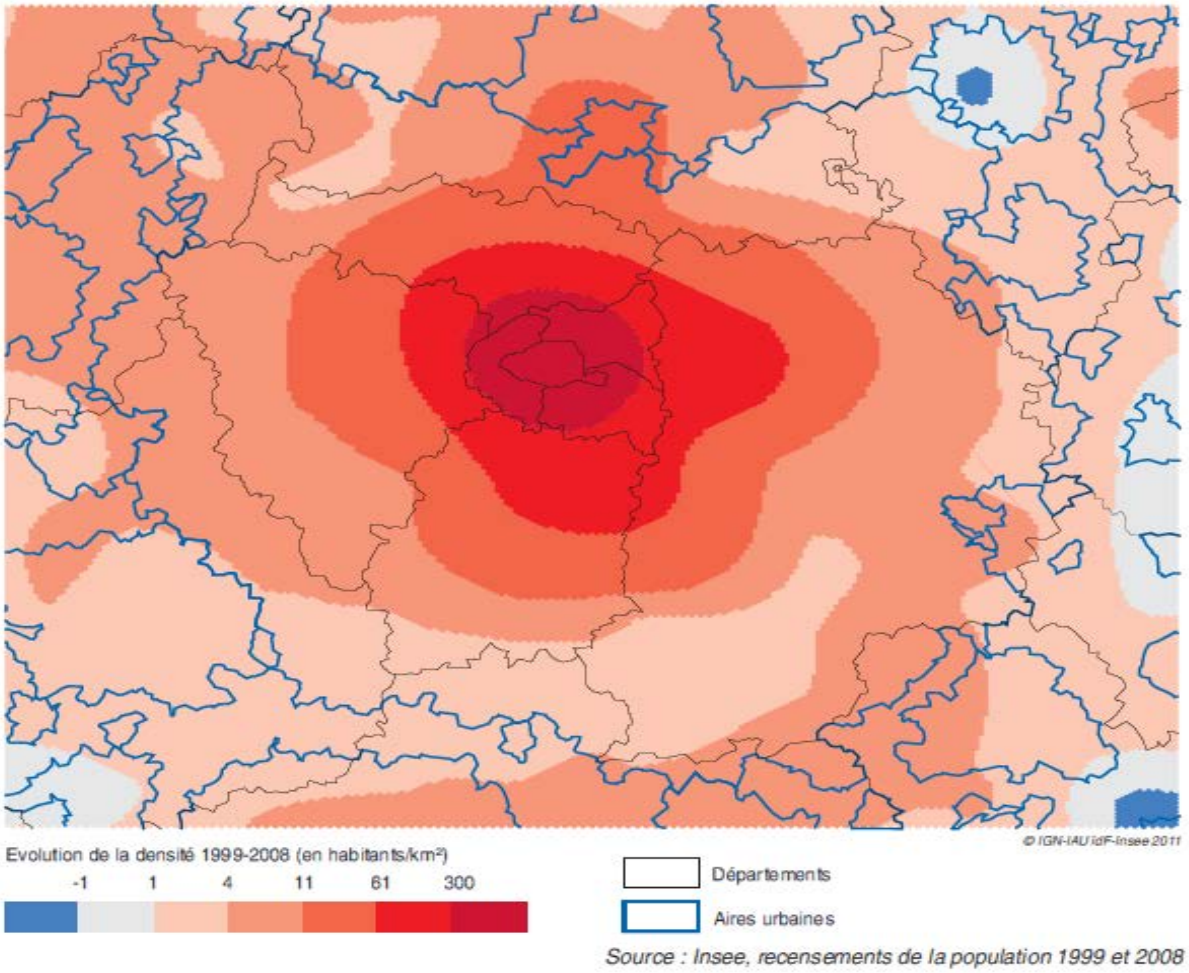
In 20 years, a quite small extension of the urban area, but a steady growth of the functional area



From an extensive urbanization to an intensive one

A new trend: progress of density in the dense area since 2000

4 La densification s'intensifie au centre de l'agglomération de Paris

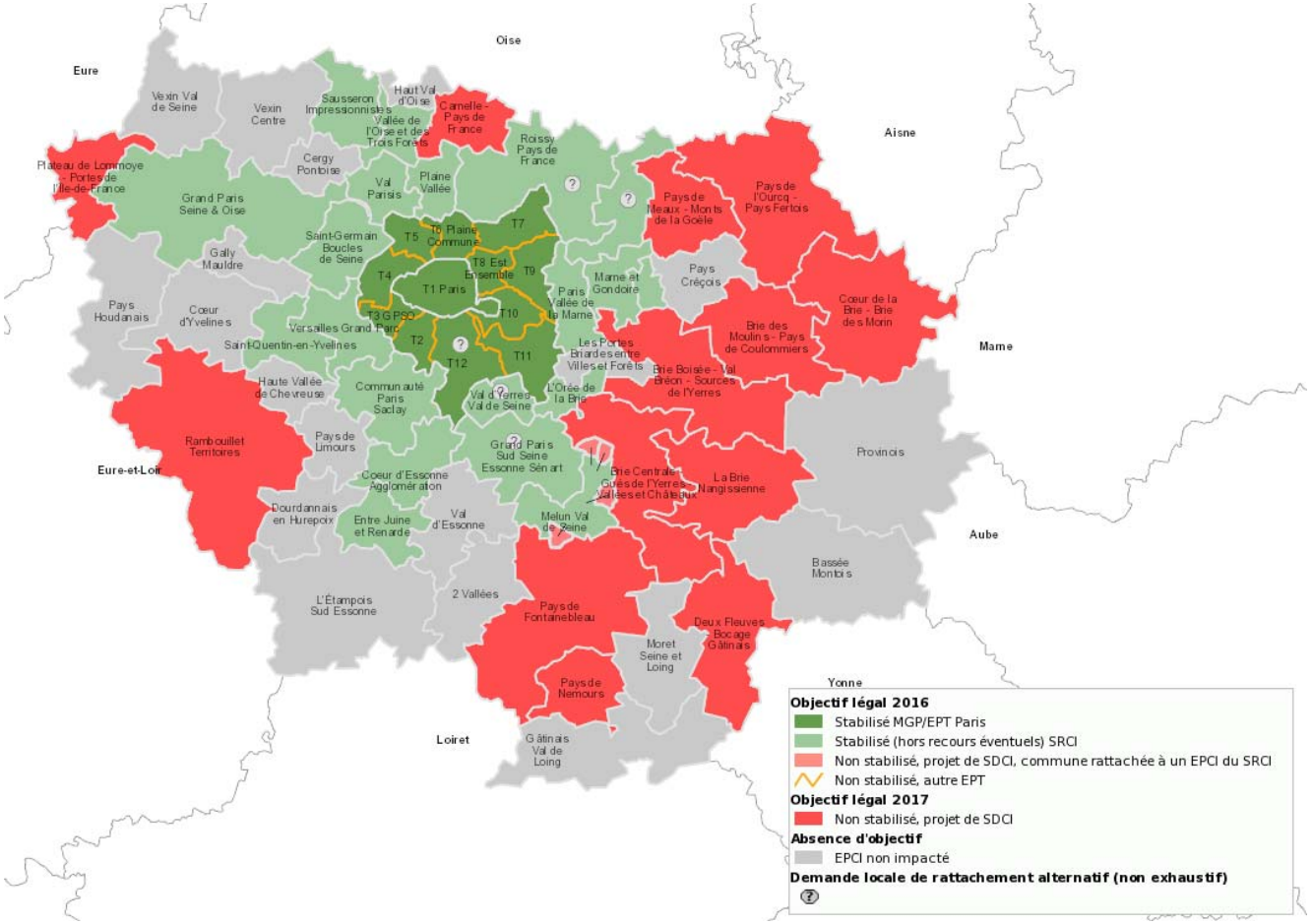


Source : Insee, recensements de la population 1999 et 2008

The sub-regional levels

Setting on the agenda the idea of subregional levels

- New inter-communal structures of governance, in charge of local SUMPs



The sub-regional levels

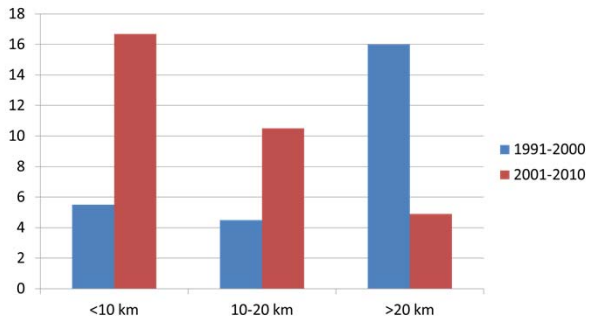
The local SUMPs

- Most of the actions of the regional SUMP are to be implanted at a territorial scale

Numéro	Quelles actions sur quels territoires ?	Paris et cœur de métropole	Agglomération centrale	Agglomérations des pôles de centralité	Bourgs, villages et hameaux
1.1	Agir à l'échelle locale pour une ville plus favorable à l'usage des modes alternatifs à la voiture				
2.1	Un réseau ferroviaire renforcé et plus performant				
2.2	Un métro modernisé et étendu				
2.3	Tramway et T Zen : une offre de transport structurante				
2.4	Un réseau de bus plus attractif et mieux hiérarchisé				
2.5	Aménager des pôles d'échanges multimodaux de qualité				
2.6	Améliorer l'information voyageurs dans les transports collectifs				
2.7	Faciliter l'achat des titres de transport				
2.8	Faire profiter les usagers occasionnels des avantages du passe sans contact Navigo				
2.9	Améliorer les conditions de circulation des taxis et faciliter leur usage				
3/4.1	Pacifier la voirie				
3/4.2	Résorber les principales coupures urbaines				
3.1	Aménager la rue pour le piéton				
4.1	Rendre la voirie cyclable				
4.2	Favoriser le stationnement des vélos				
4.3	Favoriser et promouvoir la pratique du vélo auprès de tous les publics				
5.1	Atteindre un objectif ambitieux de sécurité routière				
5.2	Mettre en œuvre des politiques de stationnement public au service d'une mobilité durable				
5.3	Encadrer le développement du stationnement privé				
5.4	Optimiser l'exploitation routière pour limiter la congestion				
5.5	Encourager et développer la pratique du covoiturage				
5.6	Encourager l'autopartage				
6.1	Rendre la voirie accessible				
6.2	Rendre accessibles les transports collectifs				
7.1	Préserver et développer des sites à vocation logistique				
7.2	Favoriser l'usage de la voie d'eau				
7.3	Améliorer l'offre de transport ferroviaire				
7.4	Contribuer à une meilleure efficacité du transport routier de marchandises et optimiser les conditions de livraison				
7.5	Améliorer les performances environnementales du transport de marchandises				
9.1	Développer les plans de déplacements d'entreprises et d'administration				
9.2	Mettre en place des plans de déplacements d'établissements scolaires				
9.3	Donner une information complète, multimodale, accessible à tous et développer le conseil en mobilité				
ENV 1	Accompagner le développement de nouveaux véhicules				
ENV 2	Réduire les nuisances sonores liées aux transports				

L'action est à réaliser prioritairement sur le territoire — *L'action est à réaliser sur le territoire* — *L'action concerne de manière marginale le territoire* — *L'action n'est pas territorialisée*

Priorités des actions en fonction des entités géographiques du PDUIF



Growth (%) in the trip numbers, by class of distance

The sub-regional levels

TOD process : the rail station becomes a center of an intense urban neighborhood

- 2 views of future suburban stations : the cars have disappeared

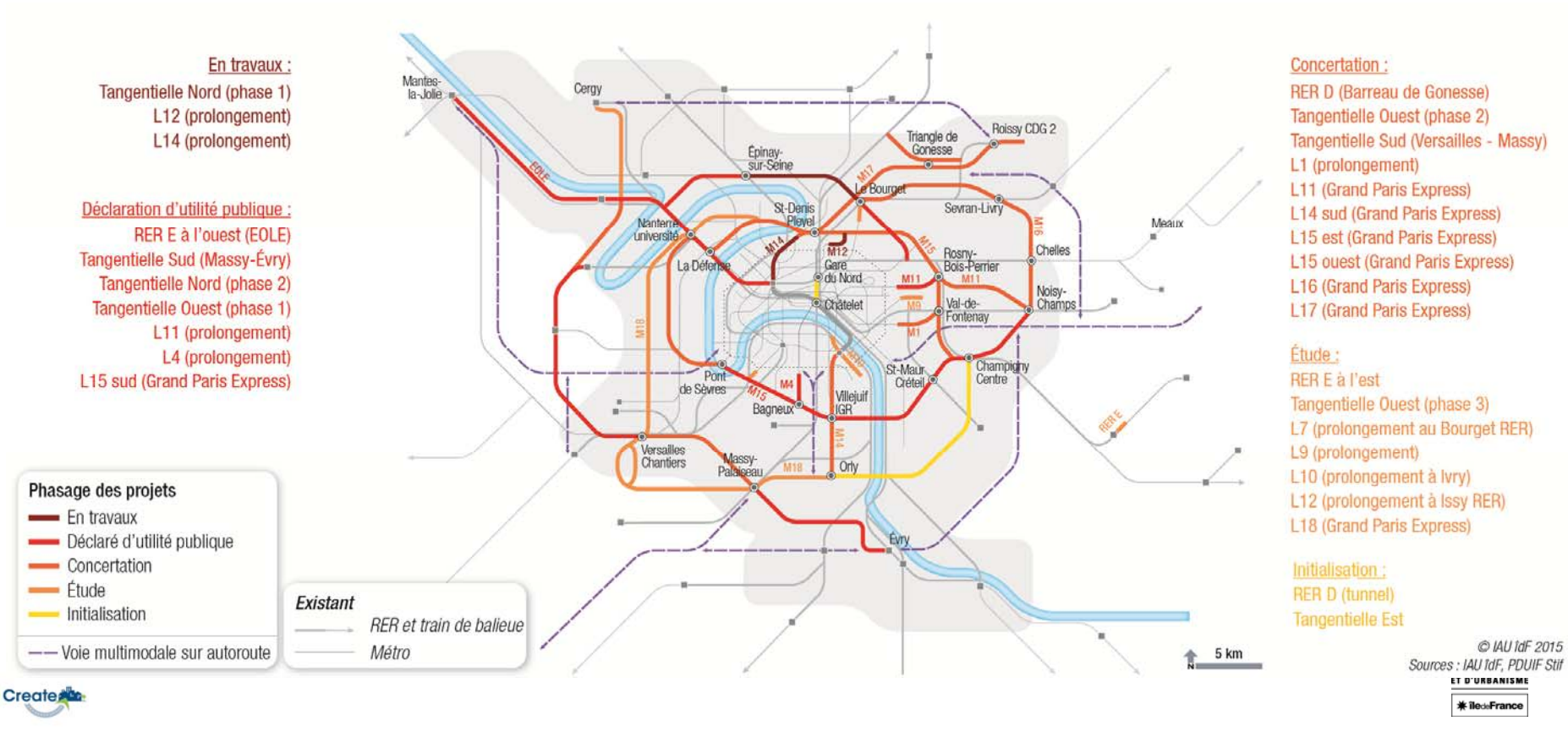
Villejuif Institut Gustave Roussy
Grand Paris Express Ligne 14 sud

Marne la Vallée Noisy Champs
Grand Paris Express Lignes 15 et 16 est
RER A

The sub-regional levels

TOD process : the rail station becomes a center of an intense urban neighborhood

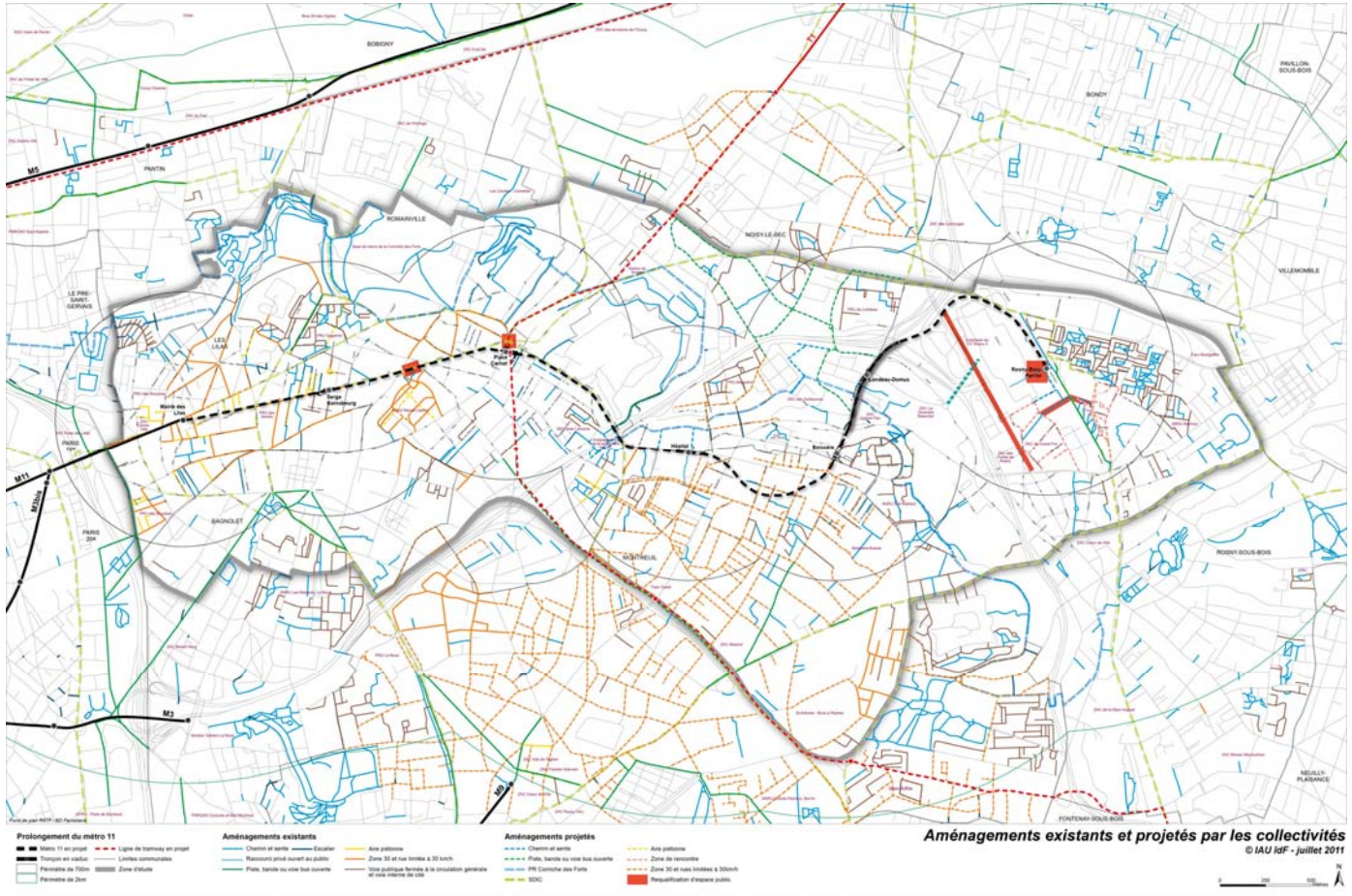
- And many new stations thanks to the expansion of the rail PT network



The sub-regional levels

TOD : walking and cycling accessibility to the stations

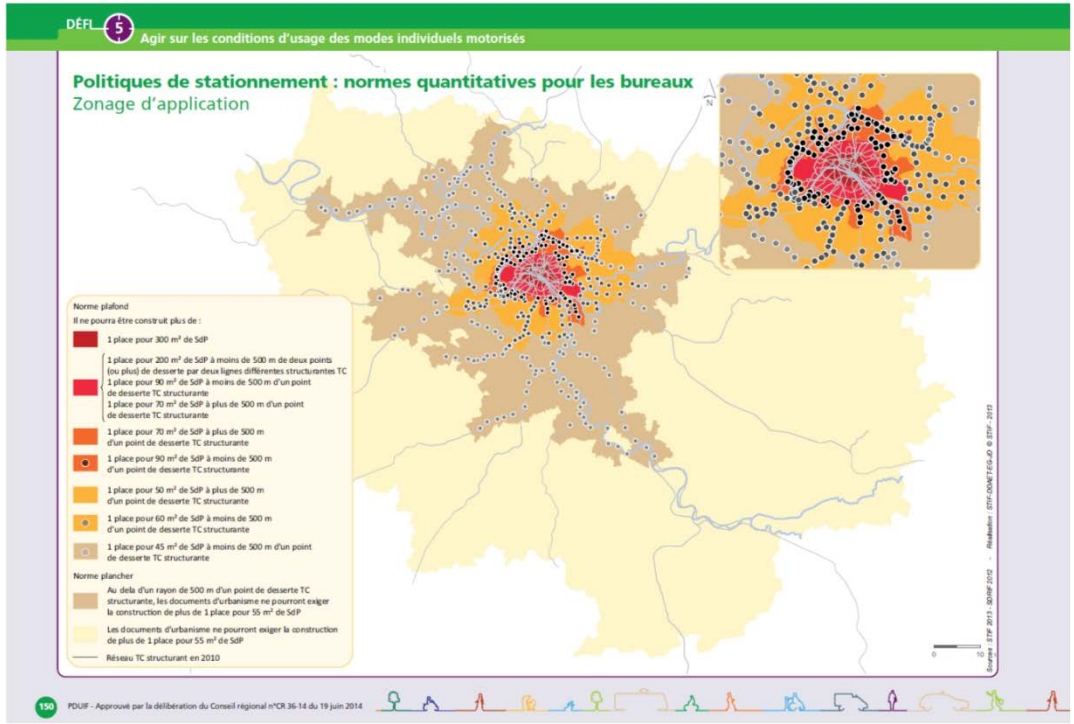
- The future metro line 11 : a first time approach in a such study



The building level

New rates and rules for building (housing and activity)

- Possibility to enforce minimum densities close to rail stations
- Possibility to exceed density norms for highly energy efficient buildings
- Obligation of lower parking rooms norms close to rail stations
- Obligation of bicycle parking rooms and electric plugs for cars.



The sub-regional levels

A transfer of the « power to act » from road engineers to urban planners and citizens

The introduction of a hierarchy in the network

- The « metropolitan » (motorways) network : priority to motorized flows
- The « urban network » : priority to urban life, the search of an balance in space allocation between pedestrians, cyclists, buses and car users
- The local network : priority to soft modes

Road management and design

On the « regional » network (motorways), implementation of dedicated lanes for buses, carpooling, taxis, priority vehicles

Road management and design

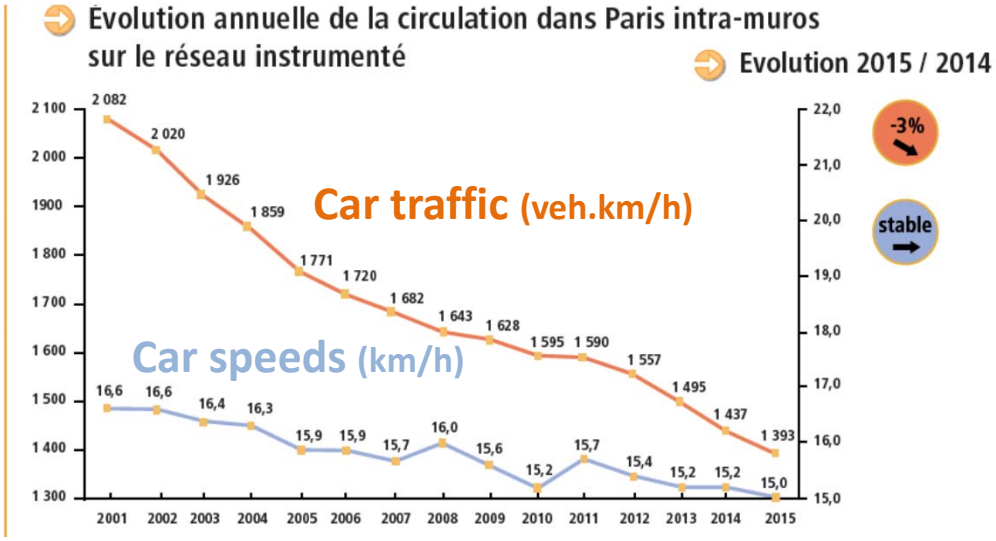
On the « metropolitan » network (avenues and boulevards), implementation of tramways, cycling paths, wider pavements

Road management and design

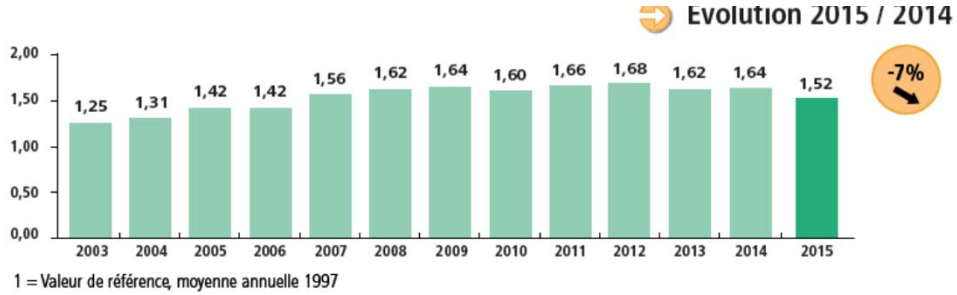
On the « urban » network (streets, alleys) : speed limits (20 km/h, 30 km/h), priority to soft traffics,

Focus on Paris City :

Car and PTW traffics



PTW traffic index 2003-2015



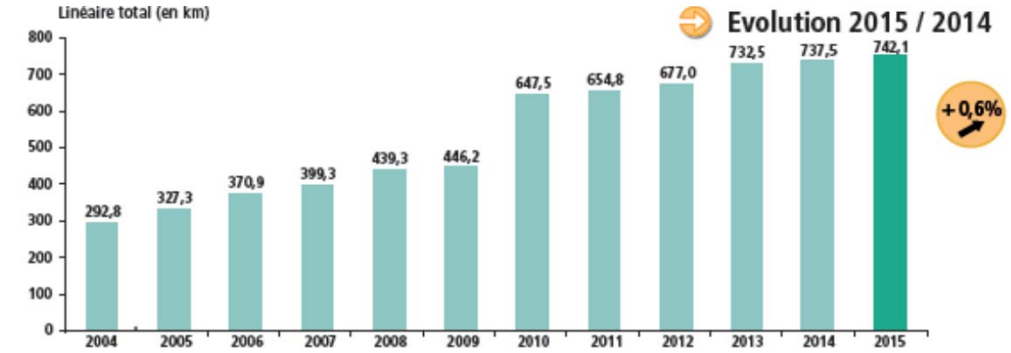
Source observatoire Ville de Paris

Focus on Paris City :

Cycling

Bicycle traffic index 2003-2015

Bicycle facilities lengths (km) 2003-2015



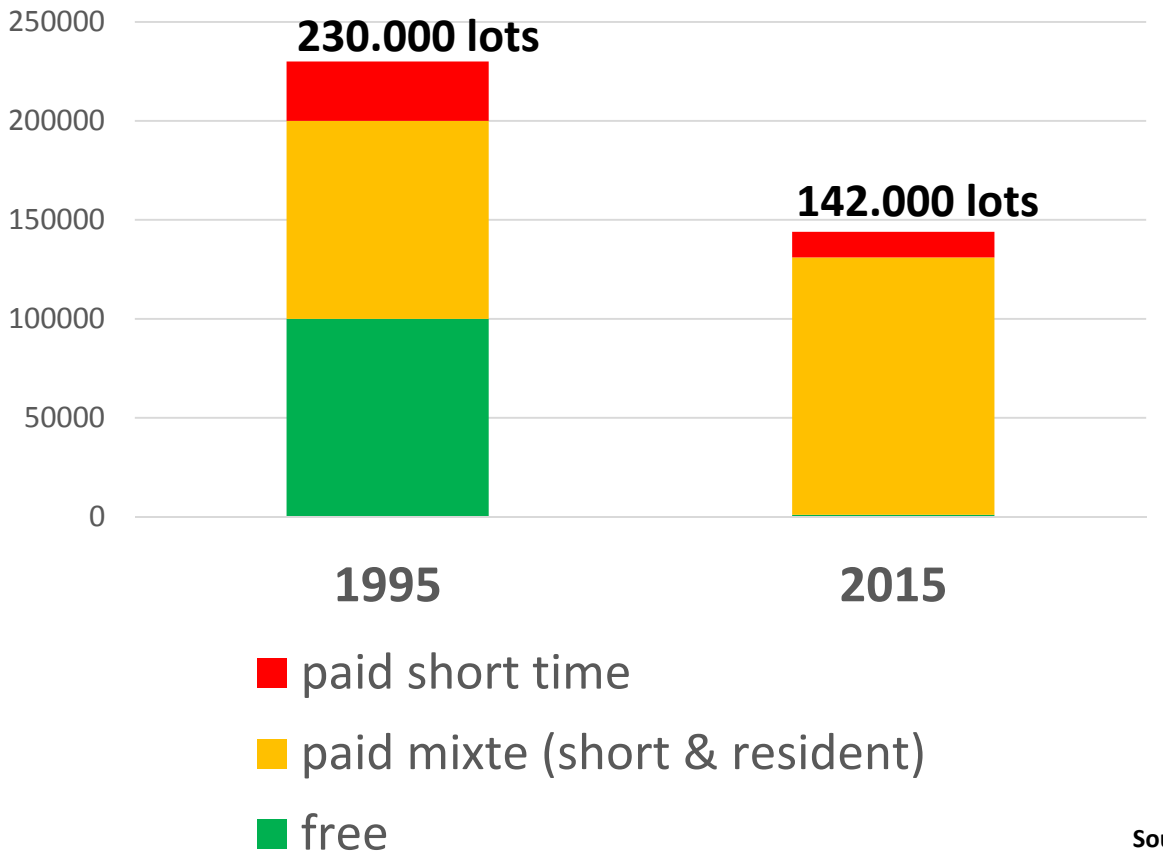
Aux aménagements existants s'ajoutent :

Anneaux de vitesse	8,2 km	Pistes cyclotouristiques dans les bois	23,2 km
Passerelles et ouvrages d'art	0,8 km	Pistes le long des canaux (hors Paris)	51,6 km

Source observatoire Ville de Paris

Focus on Paris City:

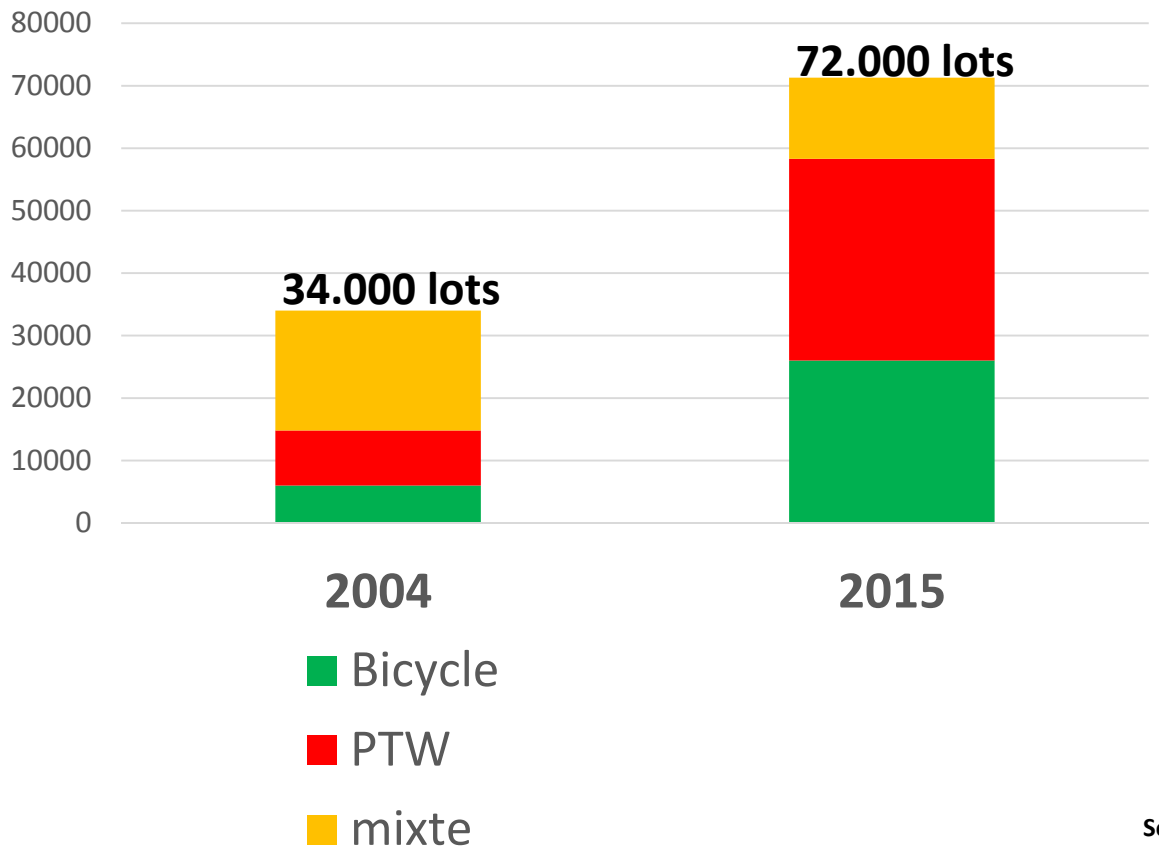
Onstreet car parking



Source observatoire Ville de Paris

Focus on Paris City :

Onstreet Two Wheels parking



Source observatoire Ville de Paris

Conclusions:

As an introduction to discussion

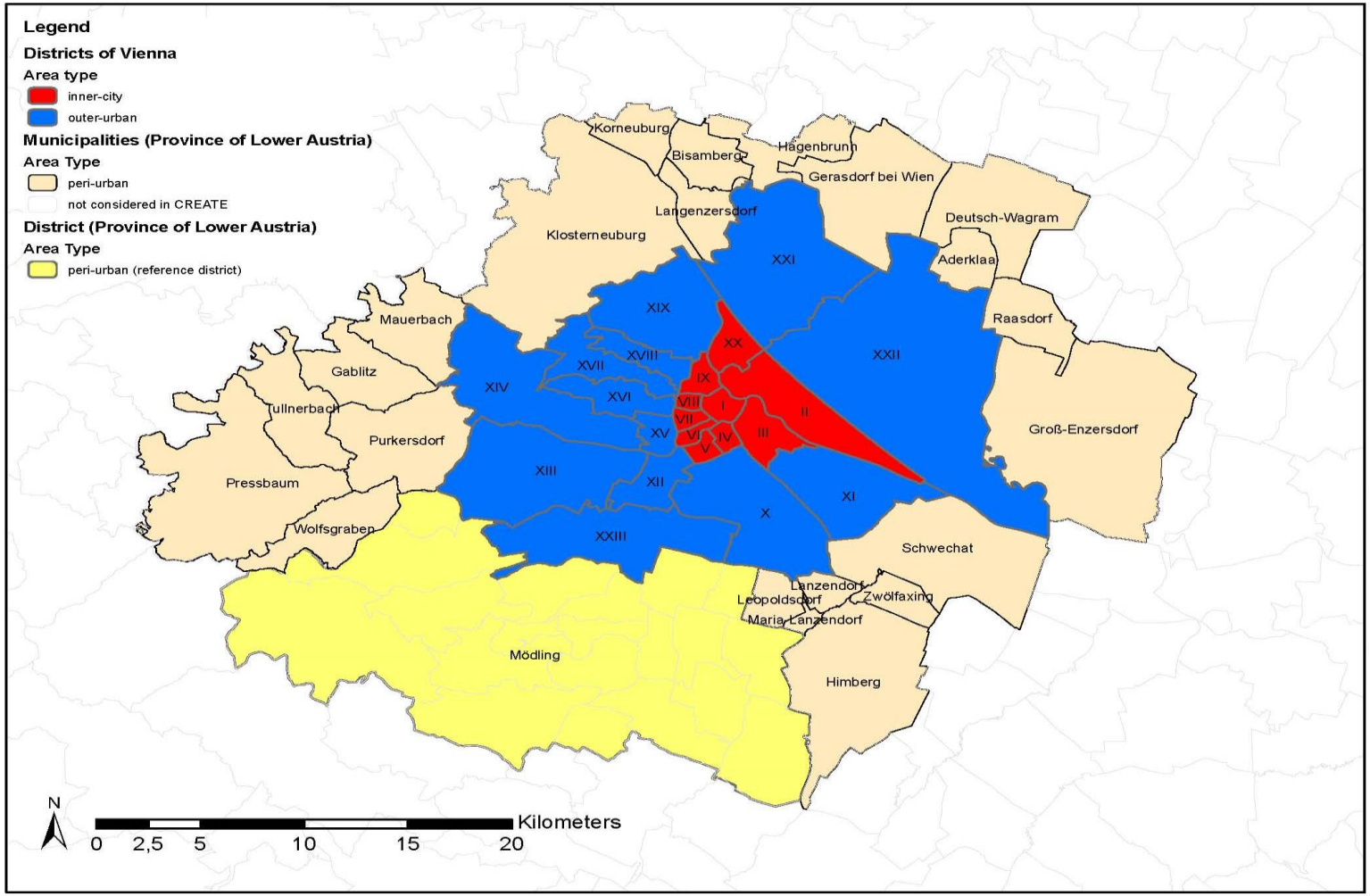
- Shared beliefs are a required condition to begin a new policy, pollution plays that role
- The importance of setting on the agenda themes with an indirect effect on car traffic
- The importance of a collaborative approach
- The interest to deconcentrate planning at sub regional levels
- Land planning is useful. To be efficient, it must go with a reduction of speed on the road network (compact city is not consistent to high speeds)
- Limits and problems may appear when dialogue is insufficient
- Less private cars: OK. What about deliveries, new forms of taxis?
- The bicycle appears to be a good substitute as an individual mode, very efficient in the dense city and more urban friendly
- In the Paris region, the development of P.T. and low fares (compared to European cities) helps in the « anti-car » attitude, but little evidence of financial sustainability in the future.
- What is the economic efficiency of a metropolitan area fragmented into several « life basins »?

City of Vienna
The role of PT
for changing car use

Oliver Roider
Roman Klementschitz

City of Vienna

Area types


Legend
Districts of Vienna
Area type
inner-city
outer-urban
Municipalities (Province of Lower Austria)
Area Type
peri-urban
not considered in CREATE
District (Province of Lower Austria)
Area Type
peri-urban (reference district)
Korneuburg
Bisamberg
Hagenbrunn
Gerasdorf bei Wien
Langenzersdorf
Deutsch-Wagram
Klosterneuburg
Aderklaa
Raasdorf
Mauerbach
Gablitz
Tullnerbach
Purkersdorf
Pressbaum
Wolfsgraben
Groß-Enzersdorf
Schwechat
Lanzendorf
Leopoldsdorf
Zwölfaxing
Maria-Lanzendorf
Himberg
Mödling
I
II
III
IV
V
VI
VII
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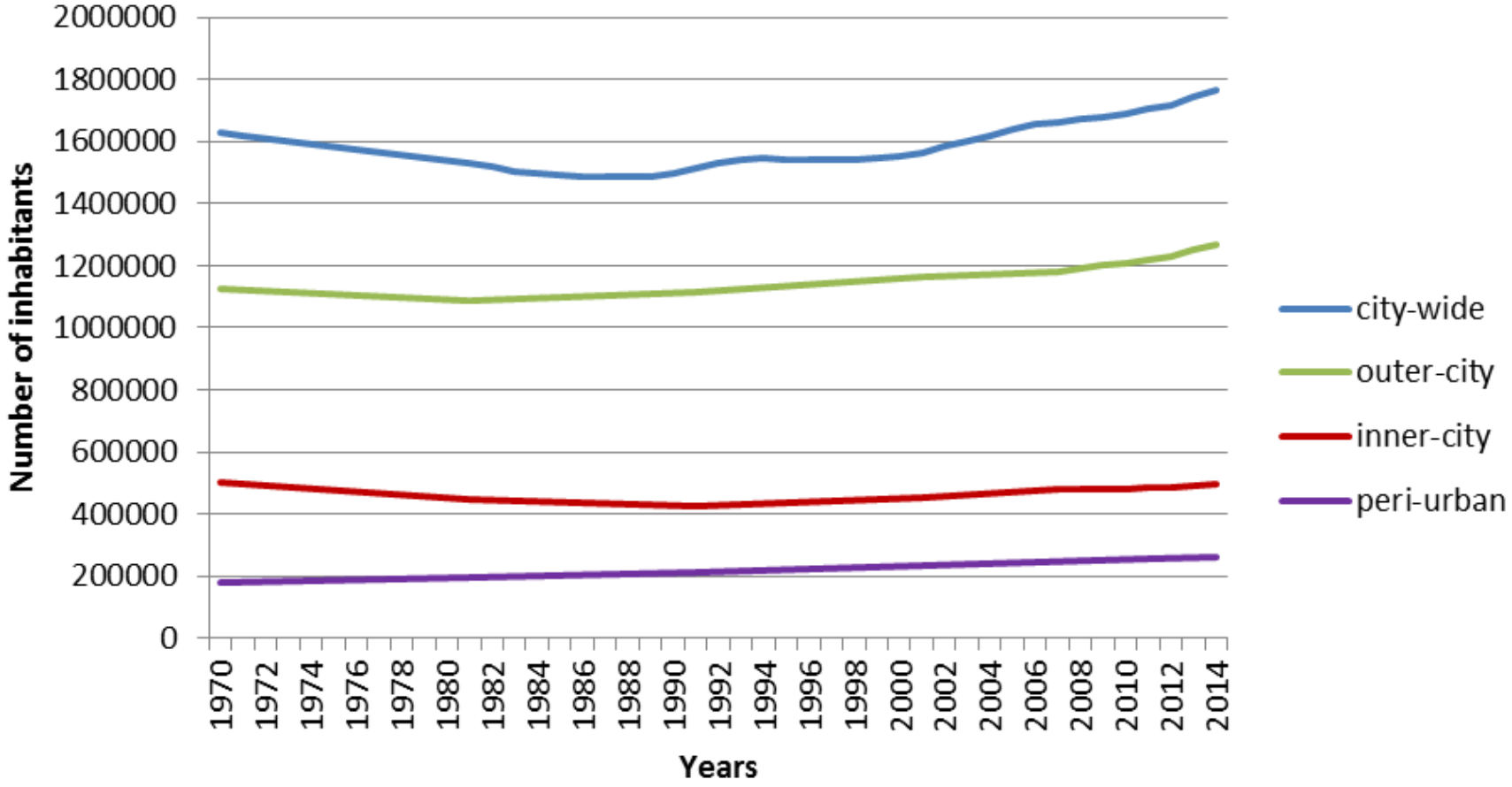
XIII
XIV
XV
XVI
XVII
XVIII
XIX
XX
XXI
XXII
XXIII
N
0 2,5 5 10 15 20
Kilometers

Statistical Data

- City: 1.794.770 million residents (1. Jan. 2015)
  Metropolitan region: 2.680.667
- 415 square km
- Metro: 80 km Network length, 5 different lines
- Tram: 225 km Network length, 29 different lines
- Bus: 826 km Network length, 115 different lines
- Rail: 9 suburban lines
- Road network: 2820 km
- Cycle path network: 1270 km

Population development



Source: (Statistik Austria, 2002), (Statistik Austria , 2015)

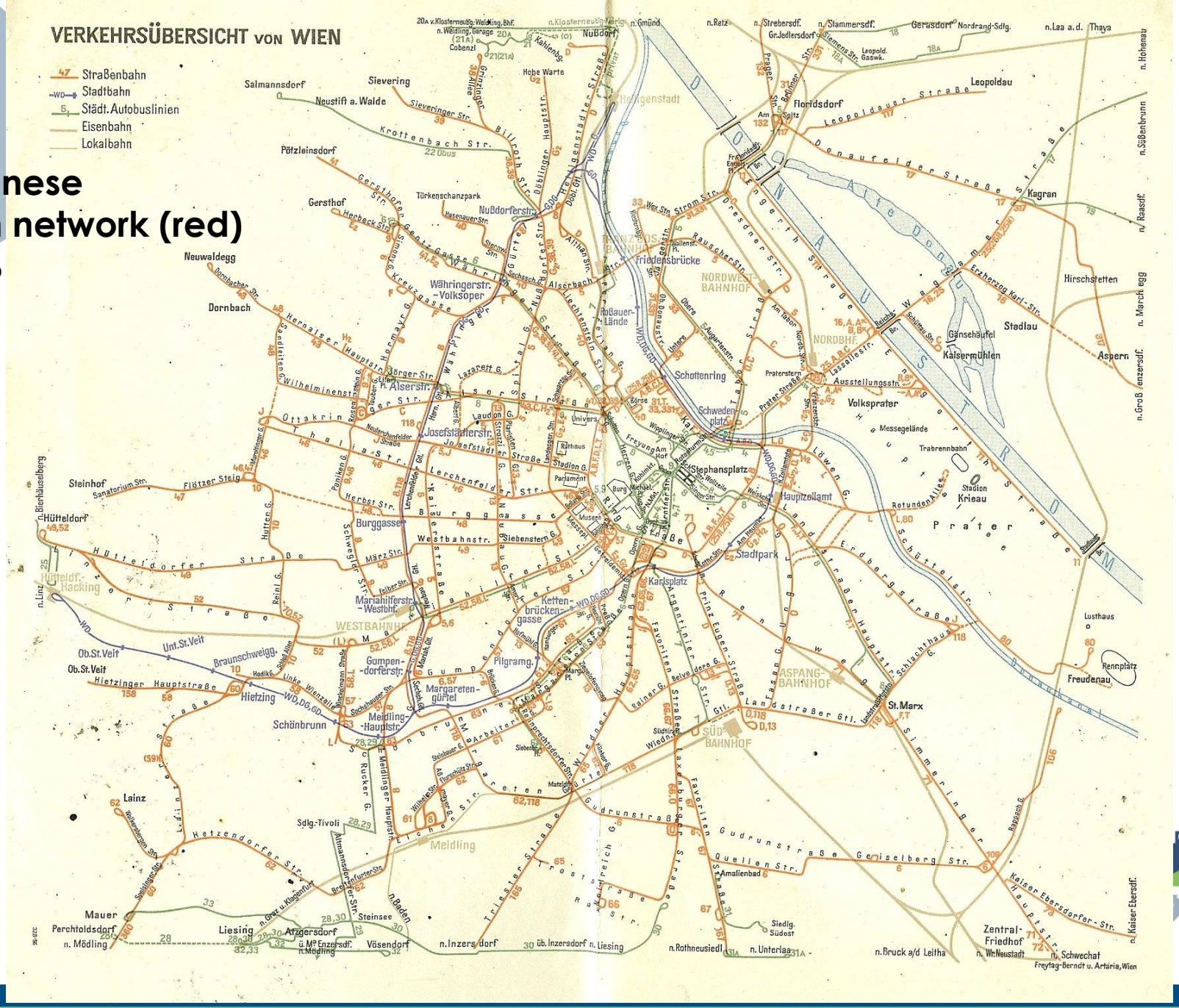
Organisational form of PT in Vienna

- Until 2001: Viennese public transport as part of the city administration
- Wiener Linien (since 2001) as part of the Viennese Holding (stock company) – 100 % owned by the City Government

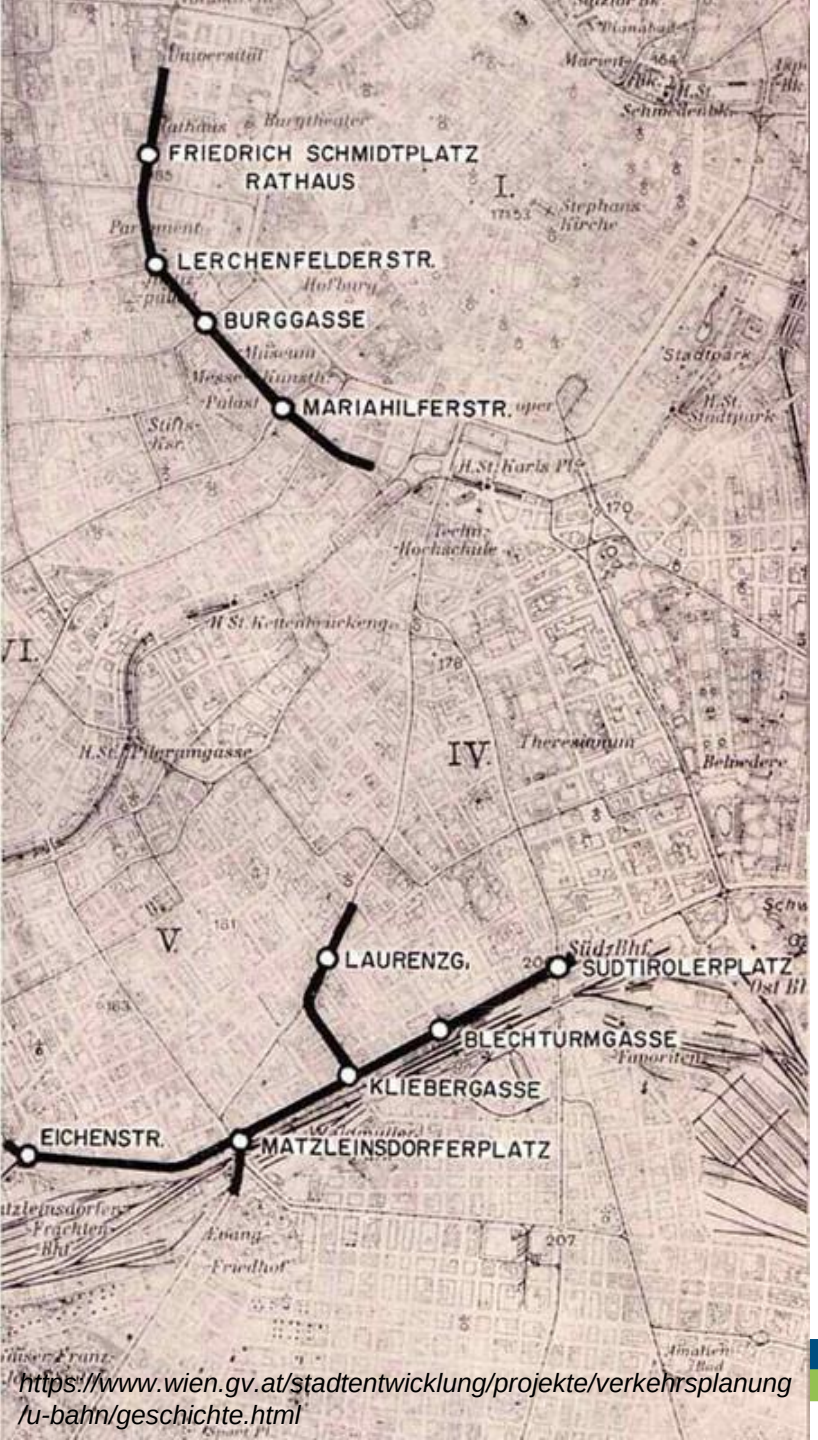
- National railway operator (ÖBB)
- private bus companies (commissioned by Wiener Linien)

Source: https://www.wien.gv.at/wiki/index.php/Wiener_Linien

Viennese tram network (red) 1956



http://www.strassenbahnjournal.at/wiki/index.php?title=Datei:Wien_Tram_1956.jpg

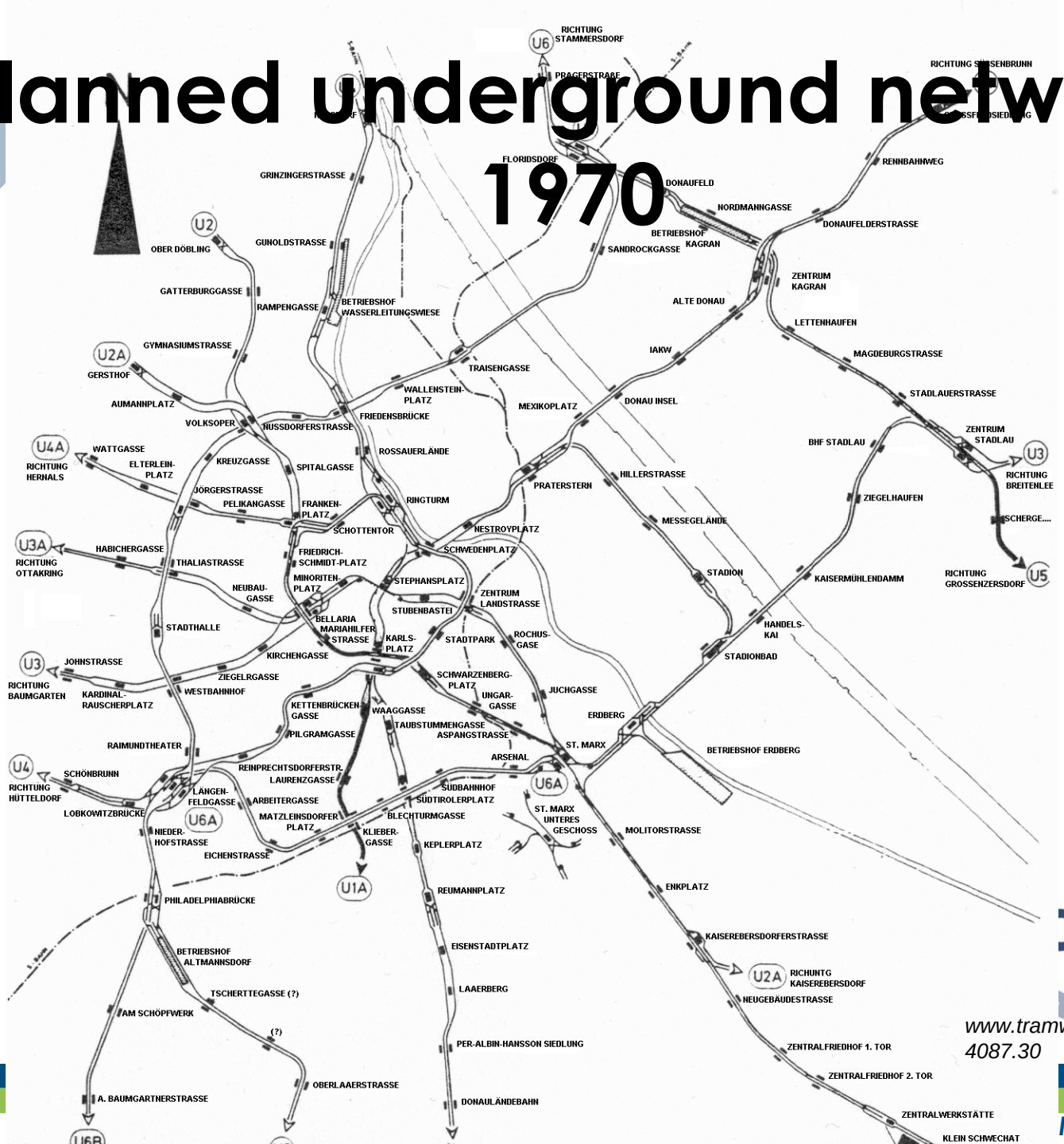


https://www.wien.gv.at/stadtentwicklung/projekte/verkehrsplanung/u-bahn/geschichte.html

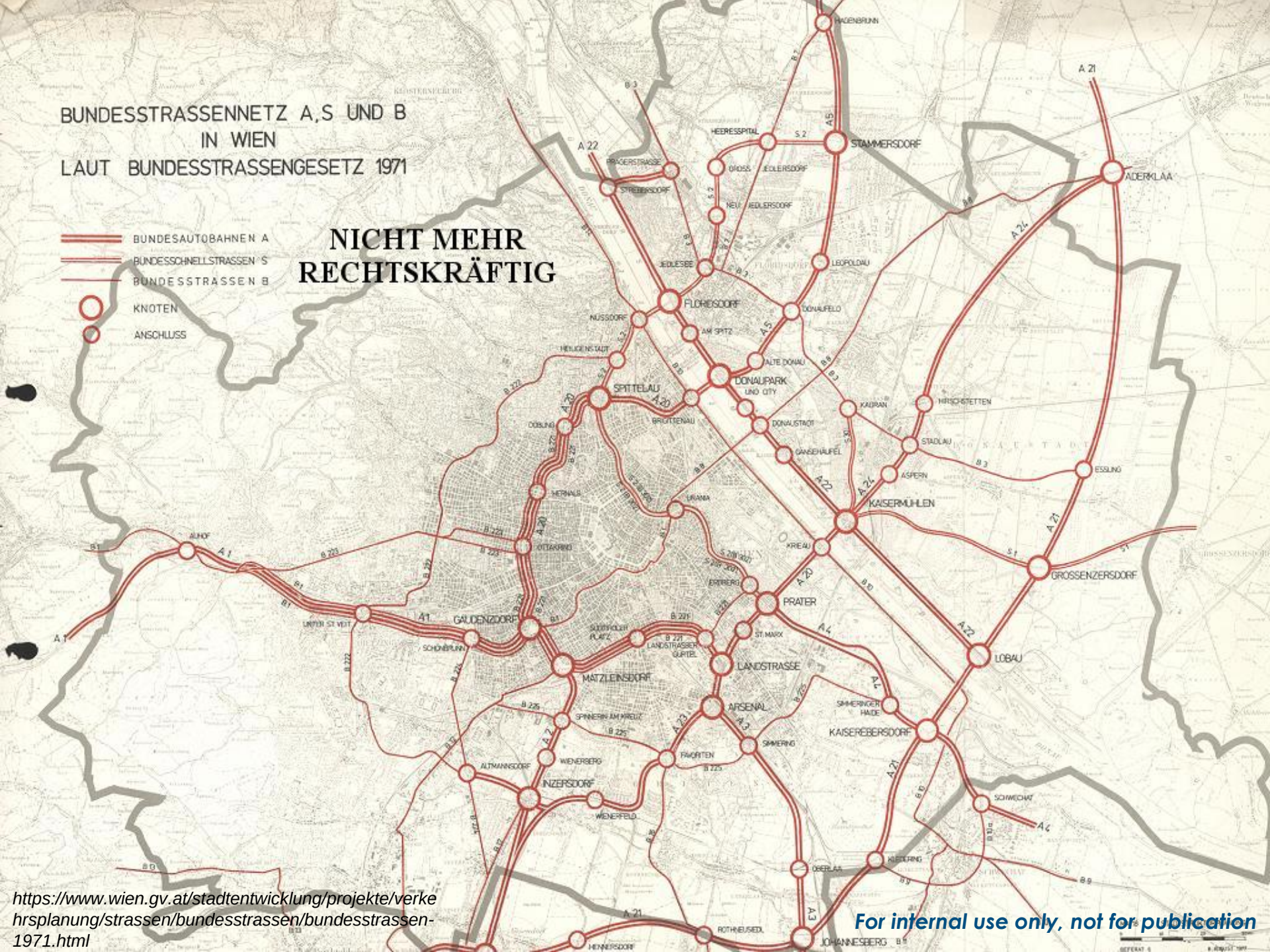
http://www.wikiwand.com/hu/B%C3%A9csi_metr%C3%B3

https://www.citycyclingschool.at/radrouten-in-wien/?album=1&gallery=39

Planned underground network 1970



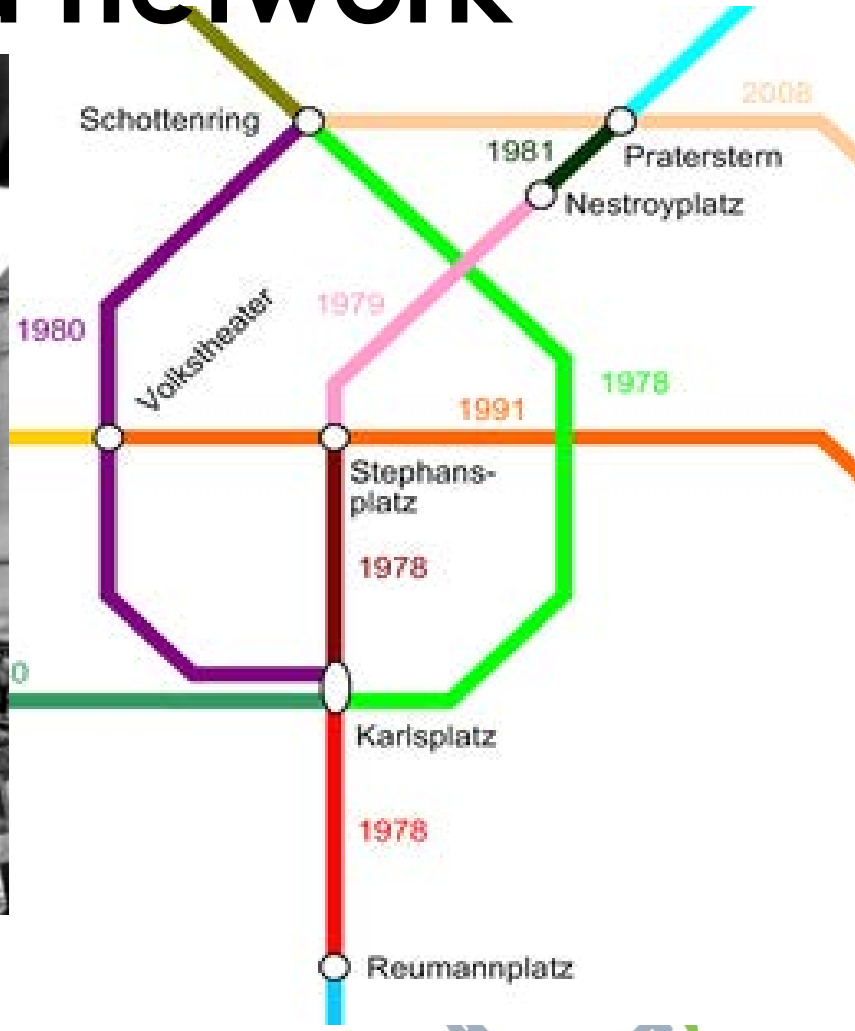
www.tramwayforum.at/index.php?topic=4087.30



https://www.wien.gv.at/stadtentwicklung/projekte/verkehrsplanung/strassen/bundesstrassen/bundesstrassen-1971.html

Underground network

https://www.wien.gv.at/wiki/index.php?title=U-Bahn



http://homepage.univie.ac.at/horst.prillinger/ubahn/deutsch/geschichte.html

Inner-city of Vienna

1970

http://derstandard.at/1392685746944/Wien-aus-Omas-Fotokiste?_slide=9

Since 1978

https://media-cdn.tripadvisor.com/media/photo-s/0c/14/27/8d/view-of-stephanplatz.jpg

Transport Masterplans – Technical Concepts

Masterplan Verkehr MPV 2003

STEP 2025

Fachkonzept Mobilität

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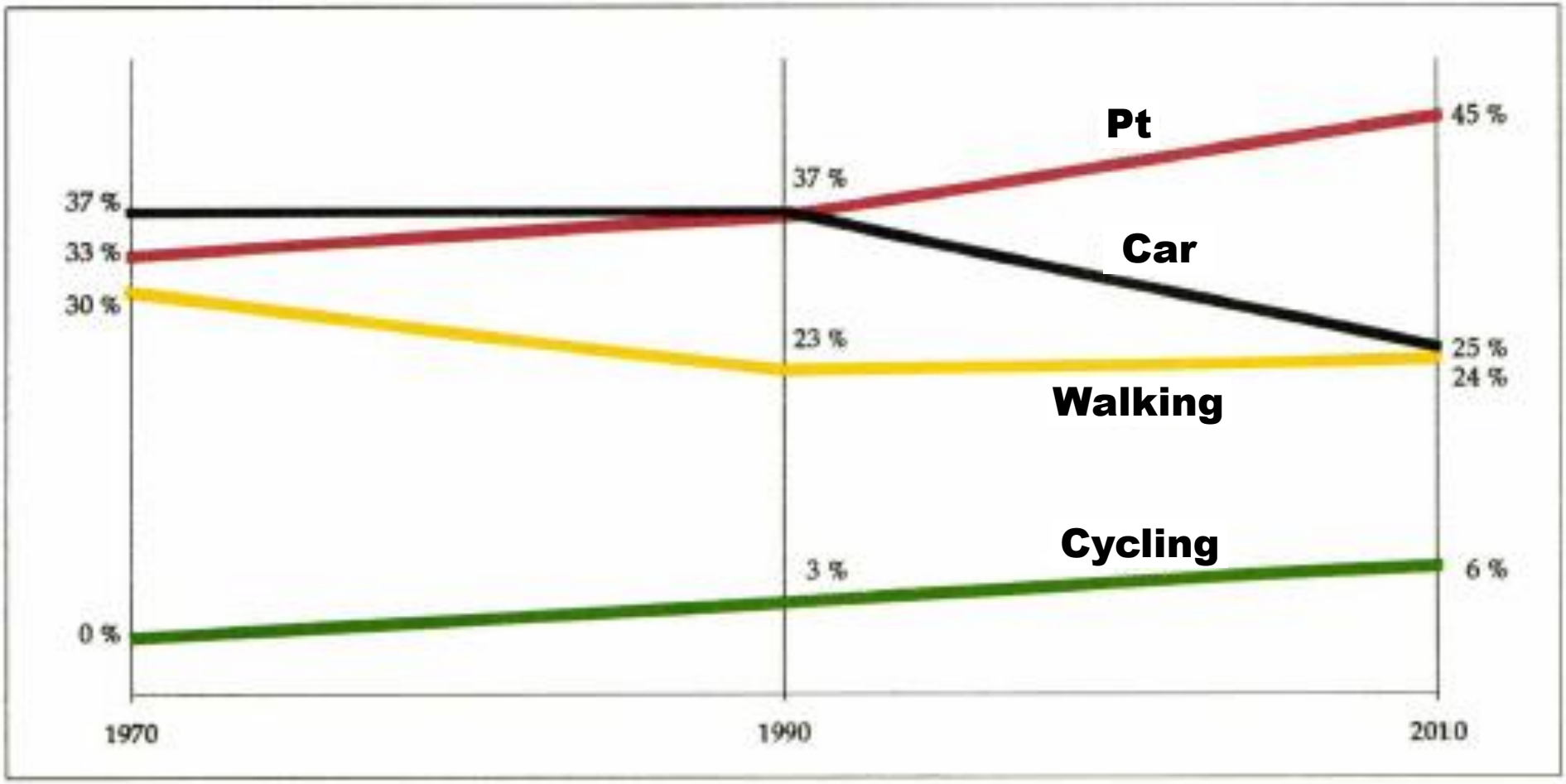
https://www.bmvit.gv.at/innovation/mobilitaet/forschungsforum/ffm_downloads/stratil_sauer_step_2025.pdf

Goals of the Transport Masterplan 1994

- Improving the quality of life in the city
  - (Re-)organisation of public spaces
  - Environmental issues
  - Traffic Safety

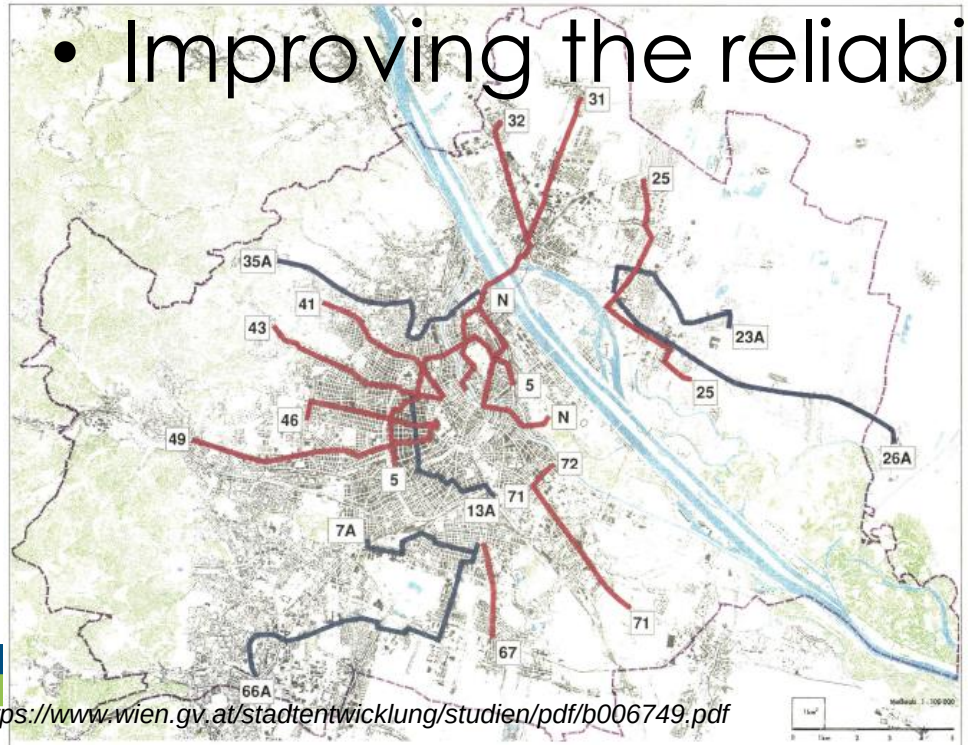
Goals of the Transport Masterplan 1994



https://www.wien.gv.at/stadtentwicklung/studien/pdf/b006749.pdf

Priority for public transport (Transport Masterplan 1994)

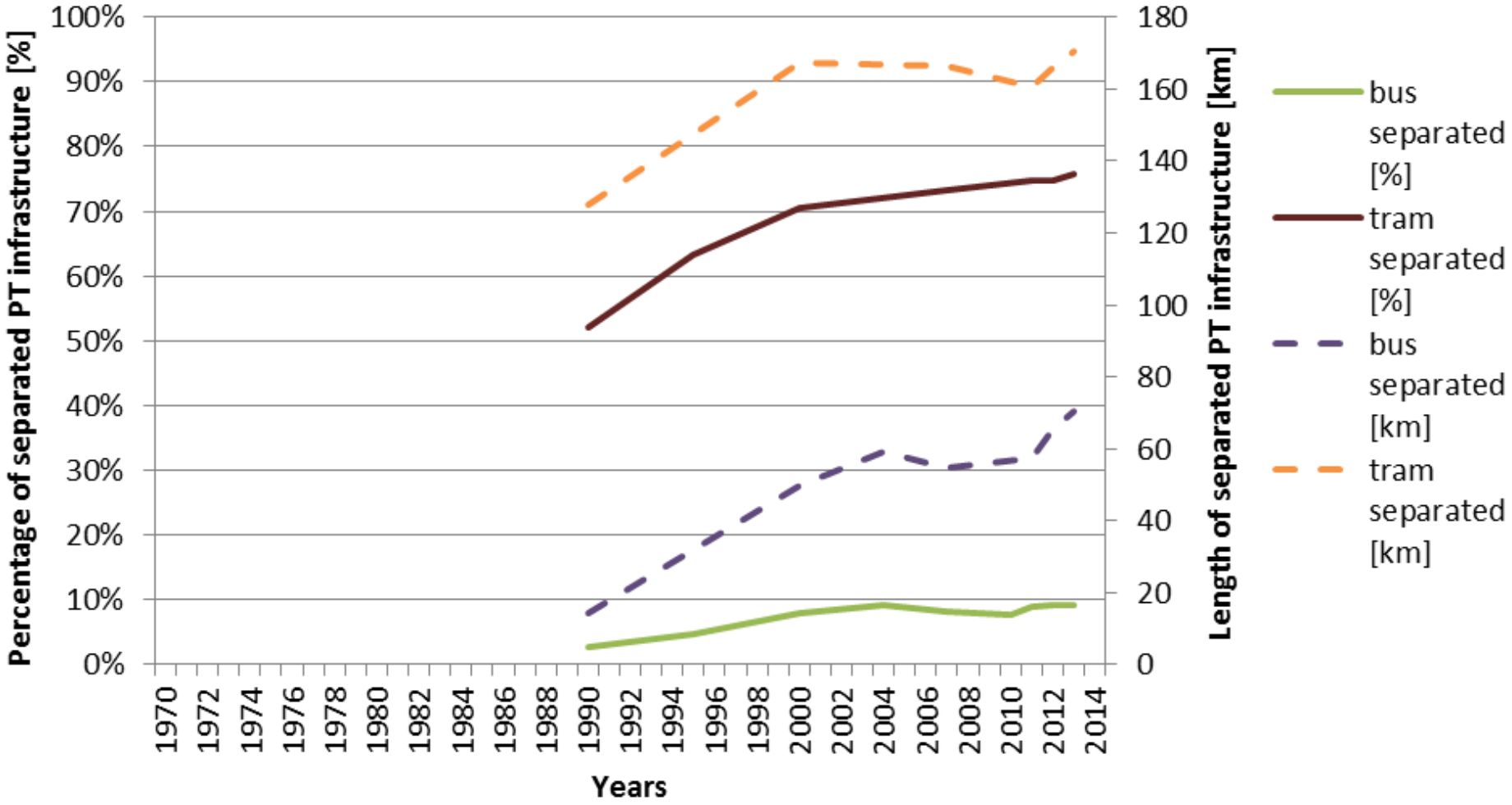
- Priorisation at traffic lights
- Acceleration due to separation
- Improving the reliability



https://www.wien.gv.at/stadtentwicklung/studien/pdf/b006749.pdf

https://de.wikipedia.org/wiki/Stuttgarter_Schwelle

Development of separated pt-lanes



Source: (Magistrat der Stadt Wien, various years 1970 to 2014)

Priority for public transport (Transport Masterplan 1994)

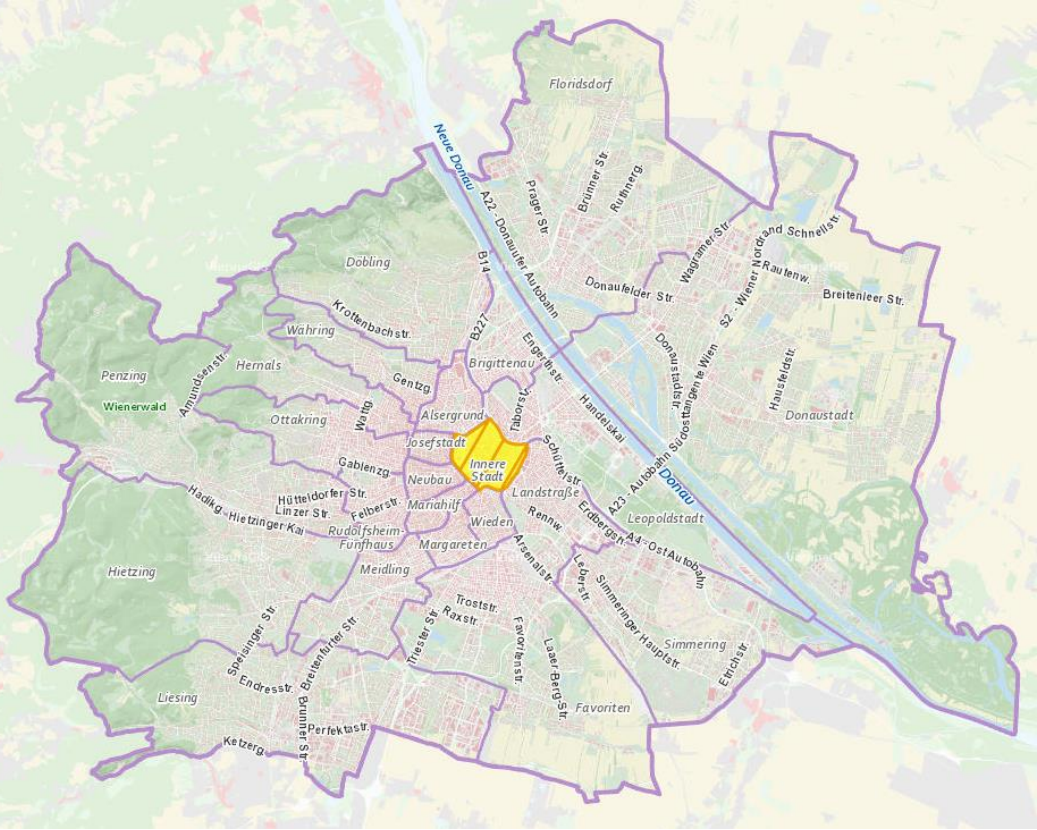
- Priorisation at traffic lights
- Acceleration due to separation
- Improving the reliability
- Denser intervals (in particular off-peak)
- Extension of operation time in the night
- Bus Nightline (1986, re-structured in1995)

NIGHTLINE

Create

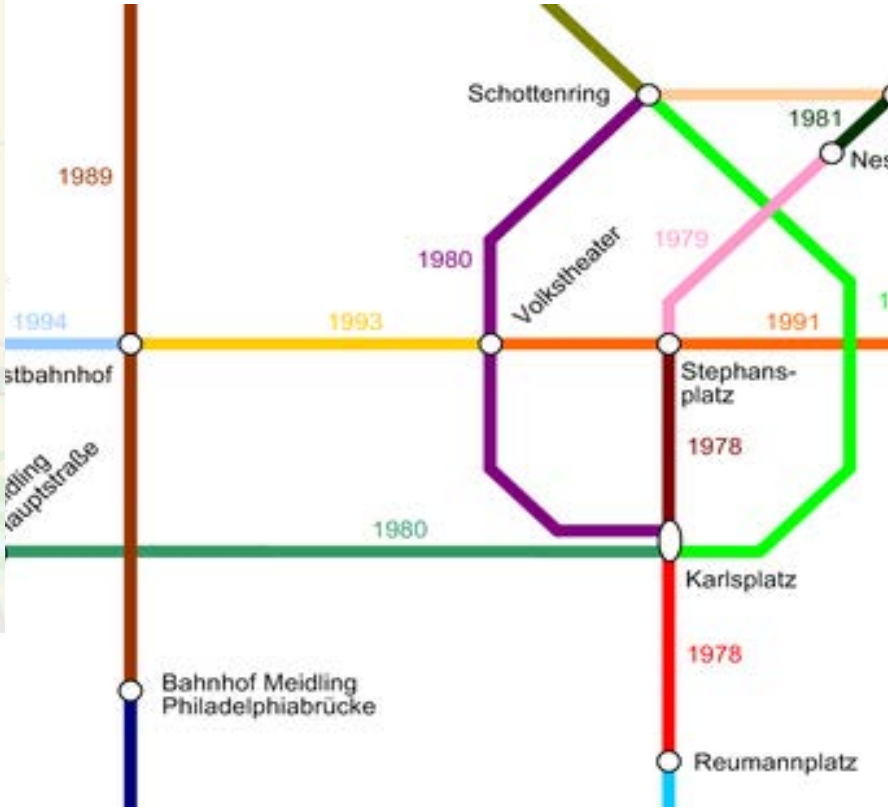
http://www.stadt-wien.at/wien/oeffentl-verkehrsmittel/nightline-nachtbusse-in-wien.html

1st district-wide short-term paid parking zone (1993)



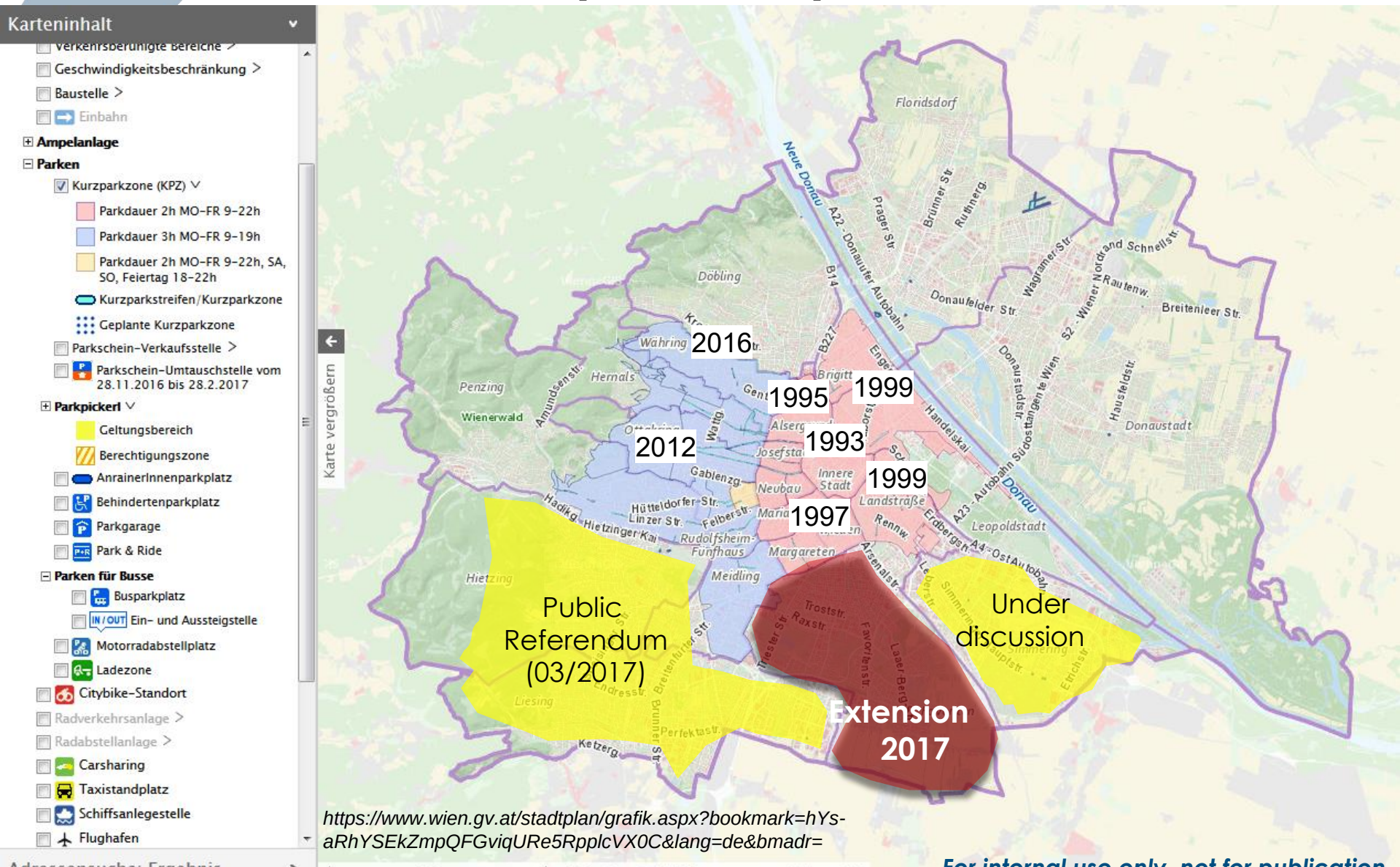
https://www.wien.gv.at/stadtplan/grafik.aspx?bookmark=hYs-aRhYSEkZmpQFGviqURe5RpplcVX0C&lang=de&bmadr=

http://homepage.univie.ac.at/horst.prillinger/ubahn/deutsch/geschichte.html



Paid on-street parking

(status 2017)



https://www.wien.gv.at/stadtplan/grafik.aspx?bookmark=hYs-aRhYSEkZmpQFGviqURe5RpplcVX0C&lang=de&bmadr=

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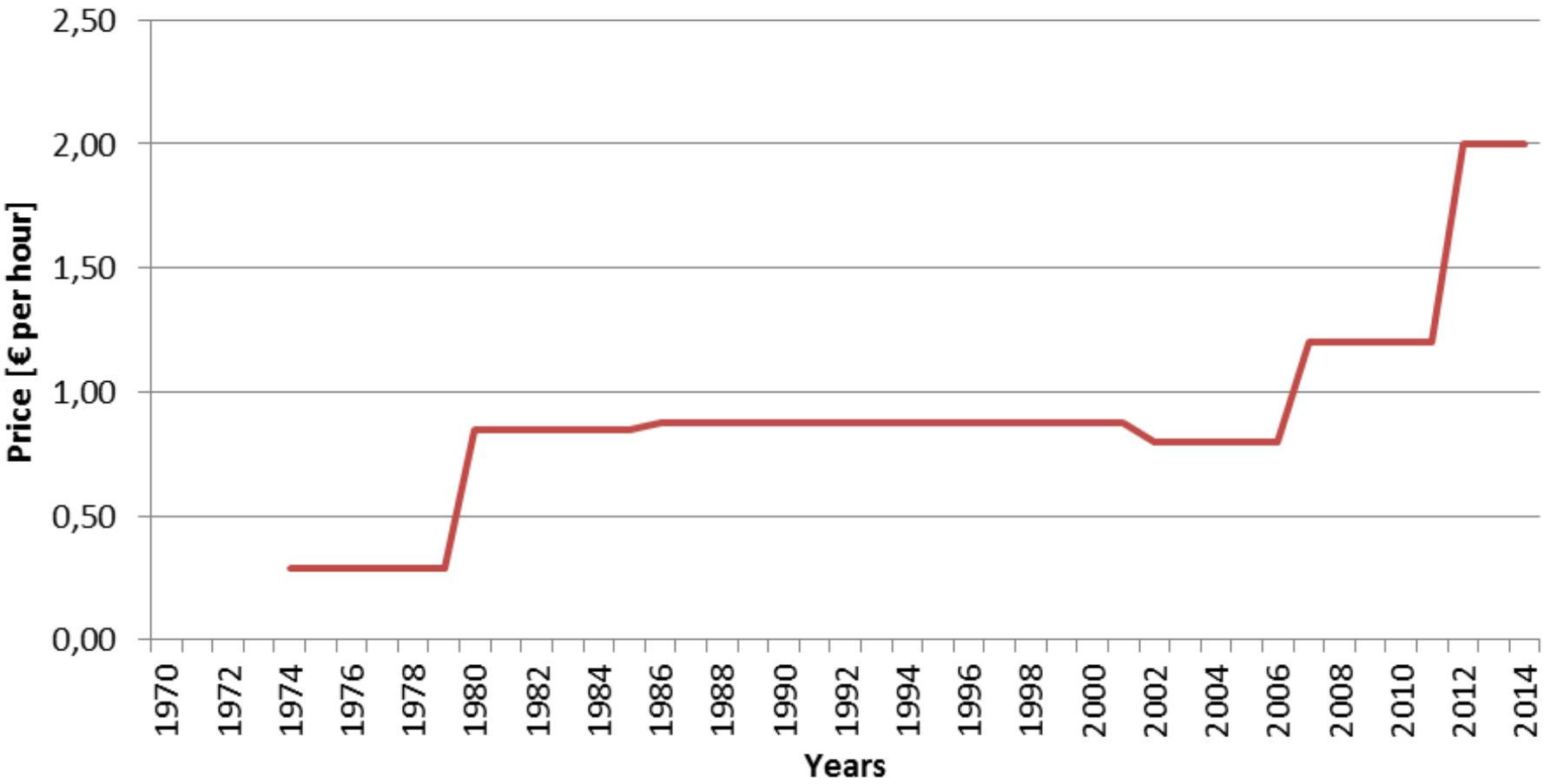
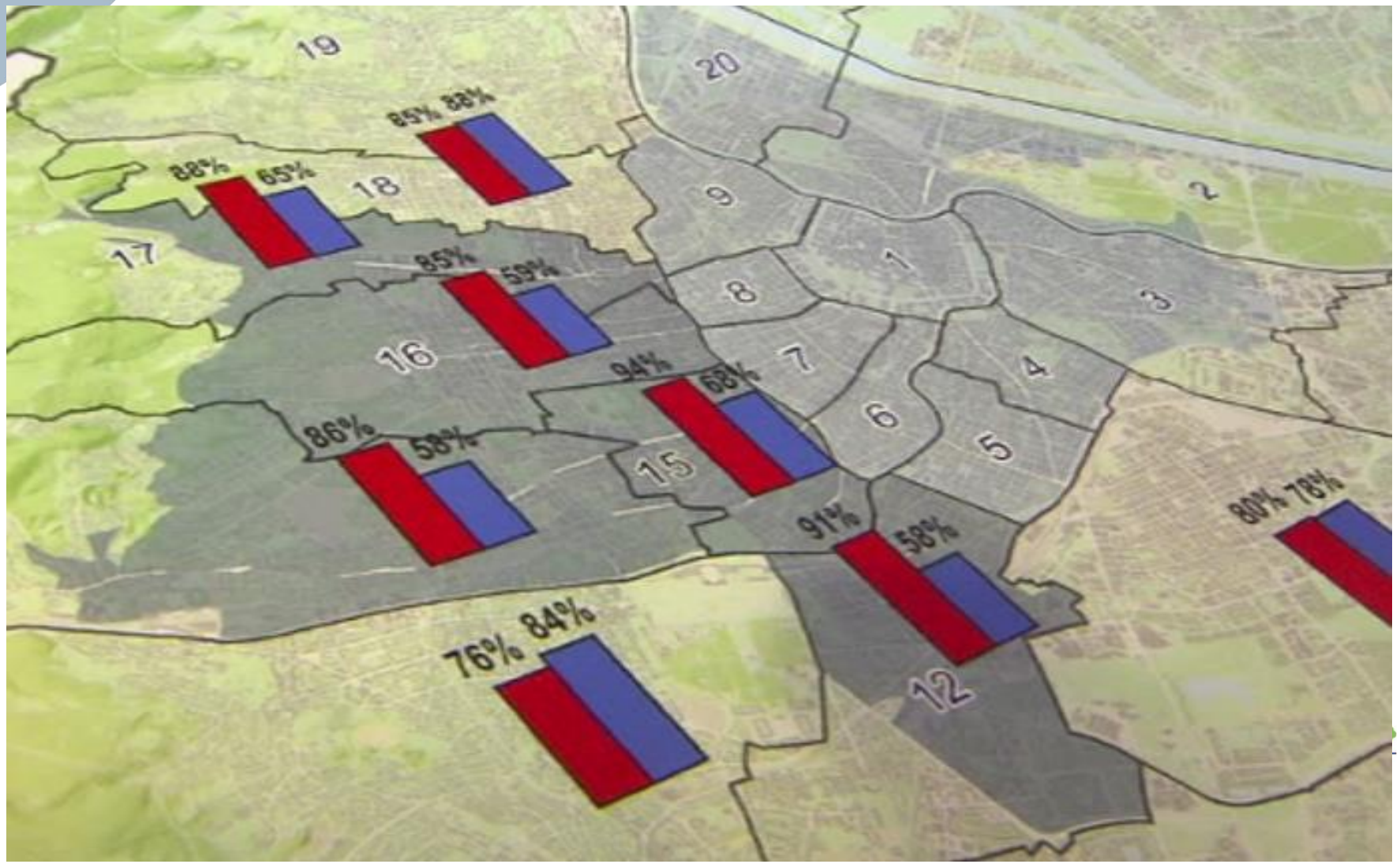
Price of short-term parking

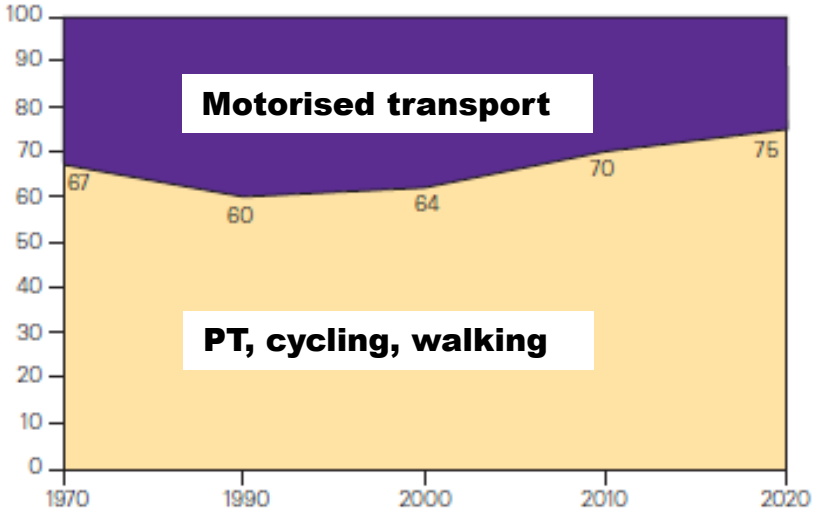


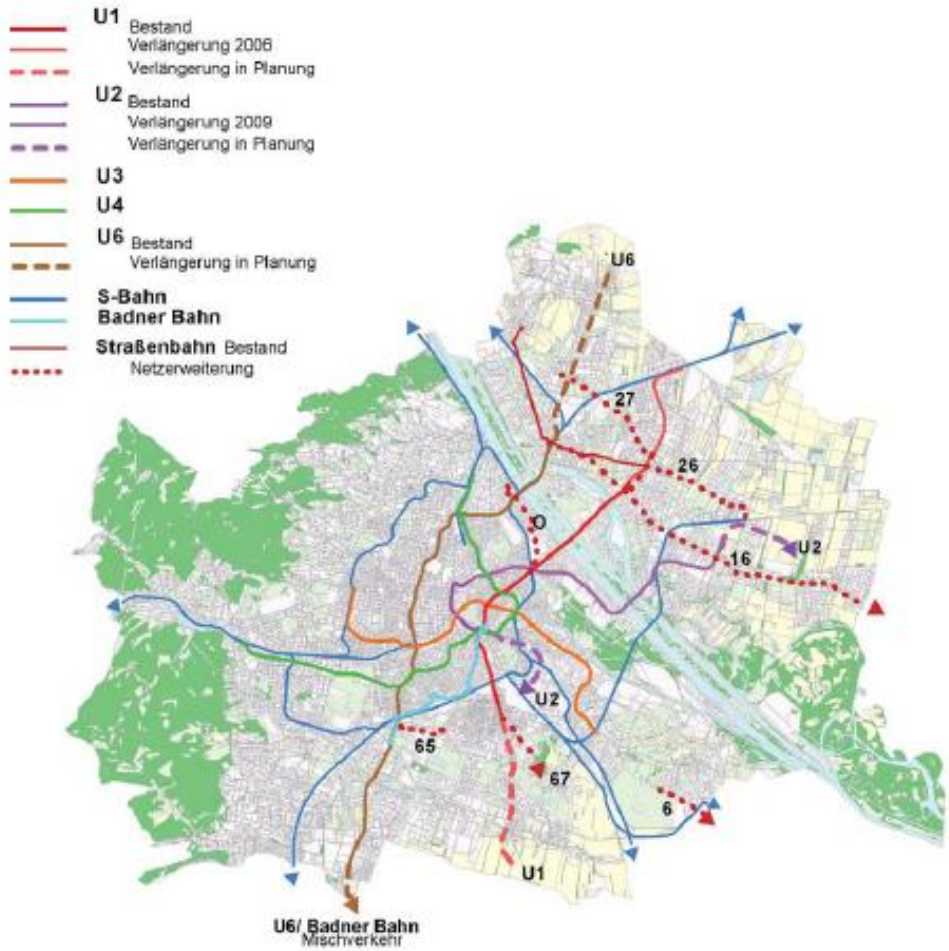
Load factor of parking lots before - after



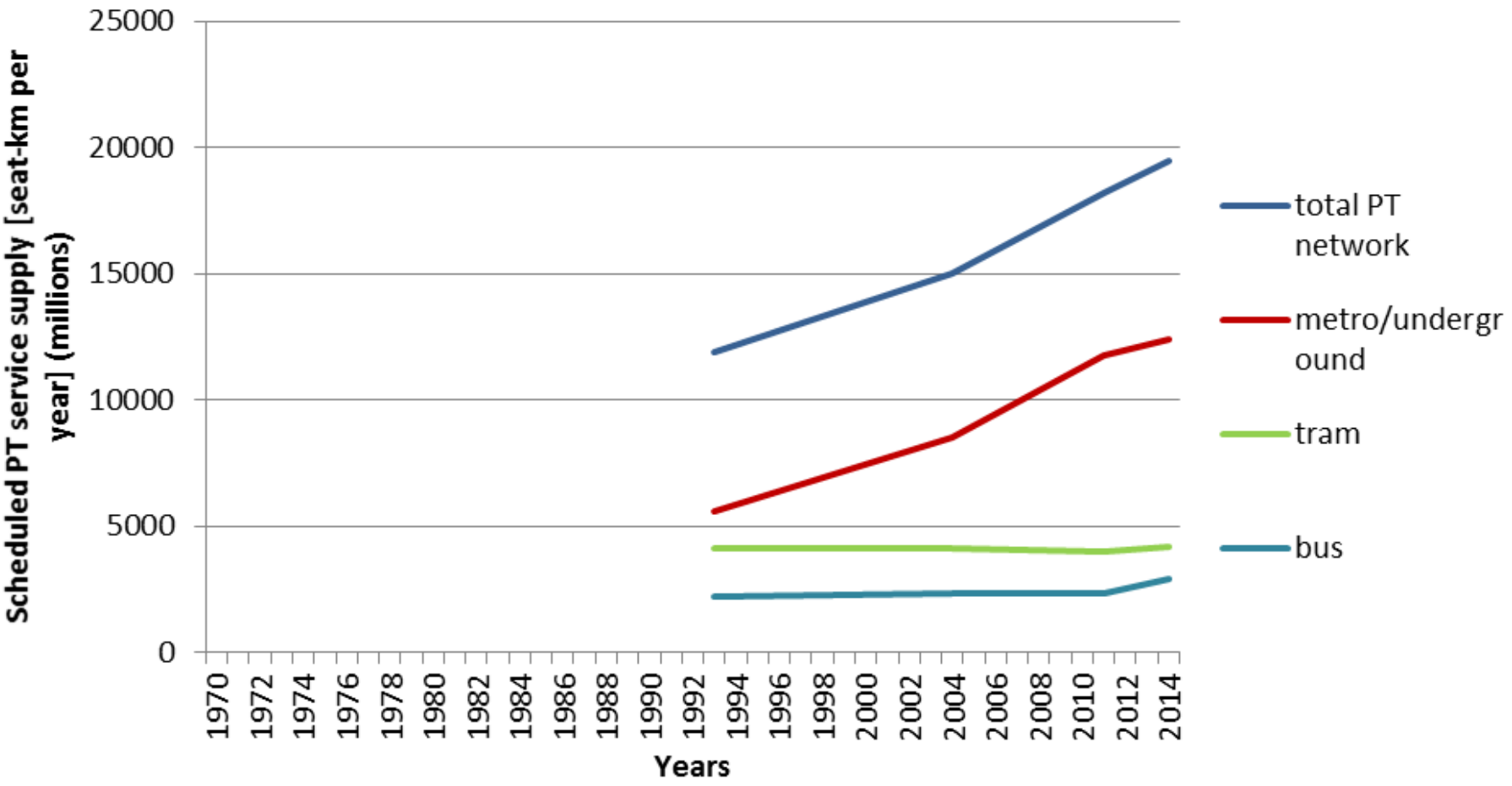
Goals of the Transport Masterplan 2003

- Sustainability
  - Traffic avoidance
  - Traffic shift
  - …



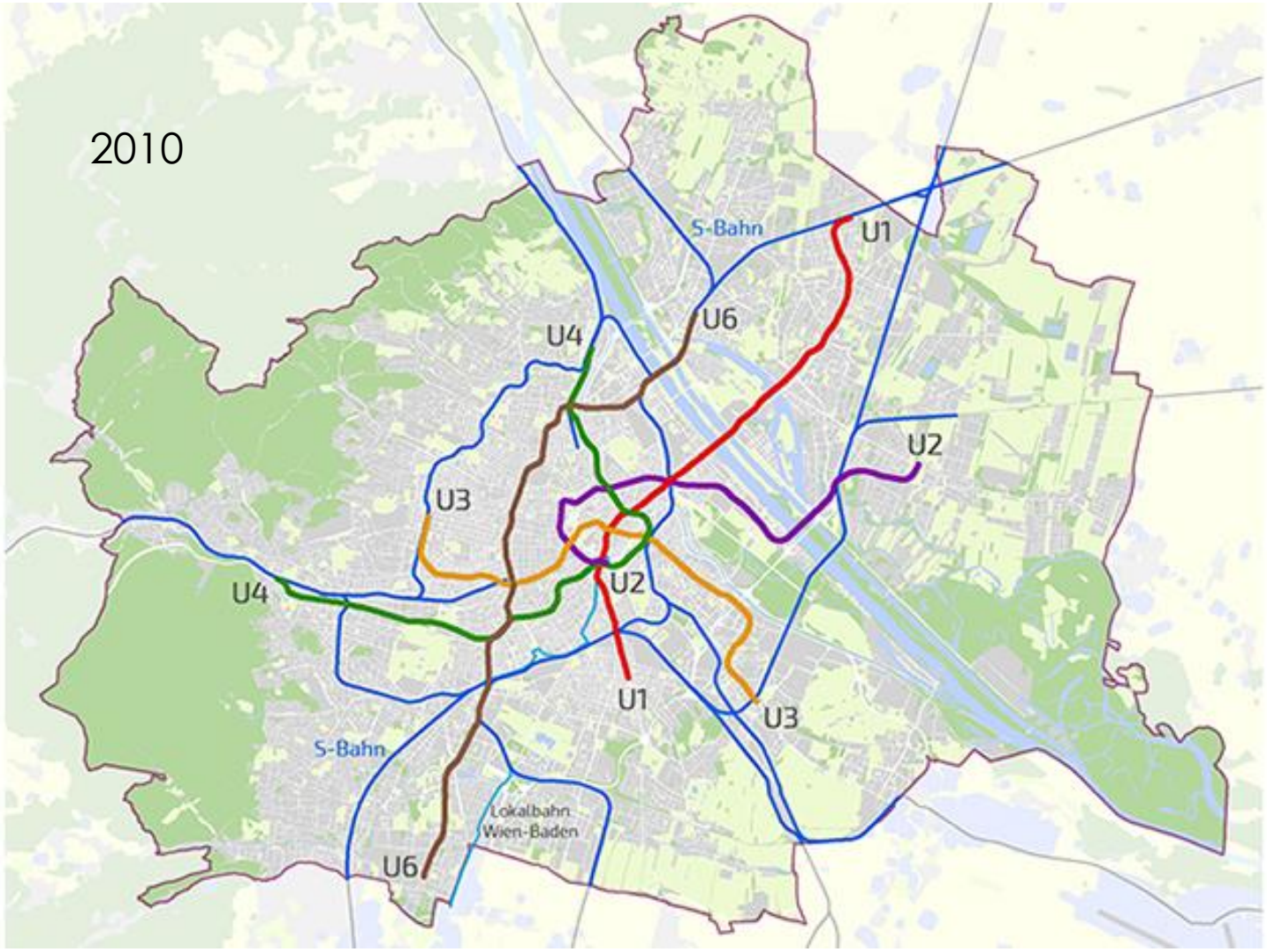


Public transport service supply



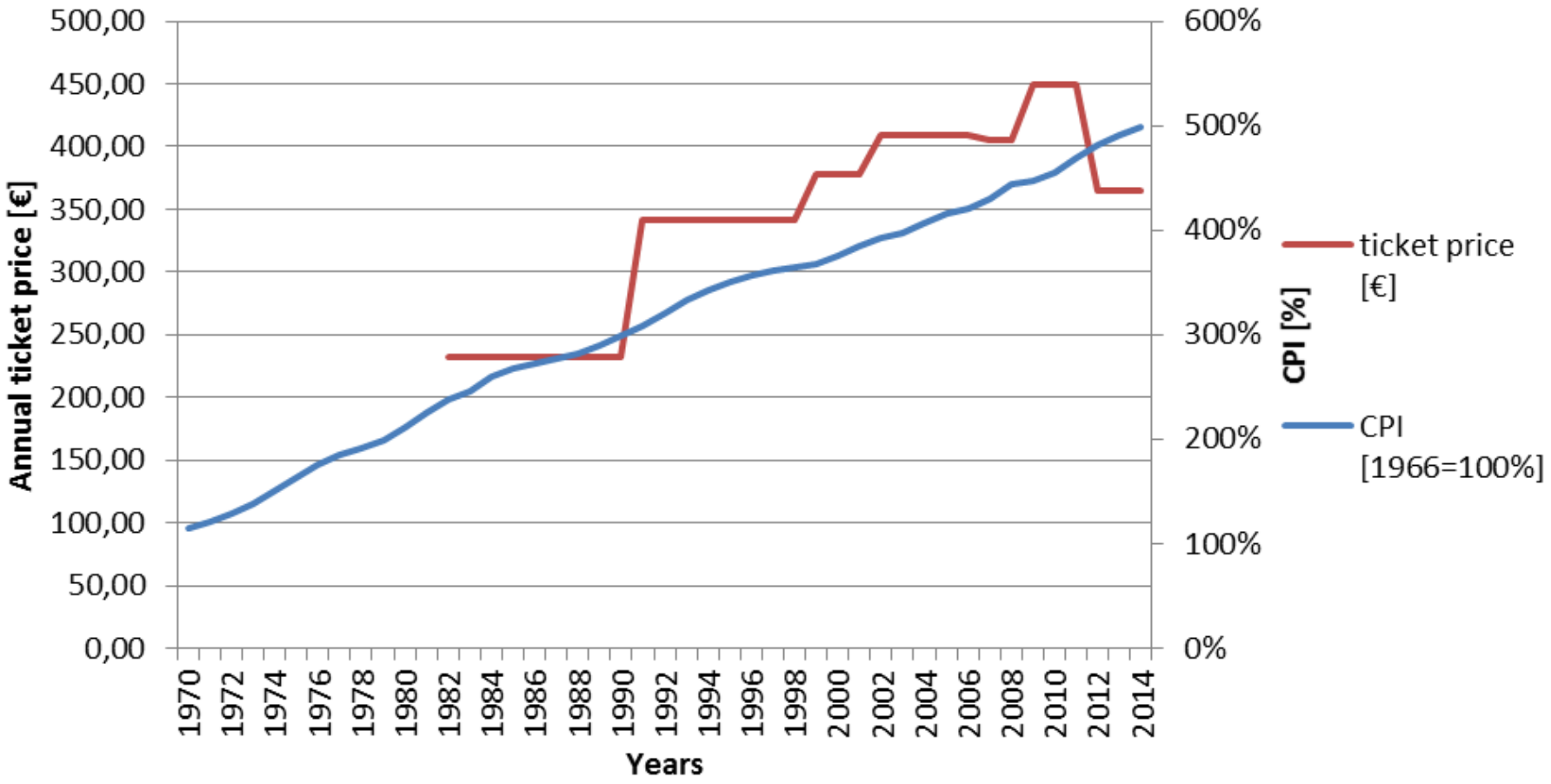
Source: (Wiener Linien, various years 1993 to 2015)

Underground and Railways



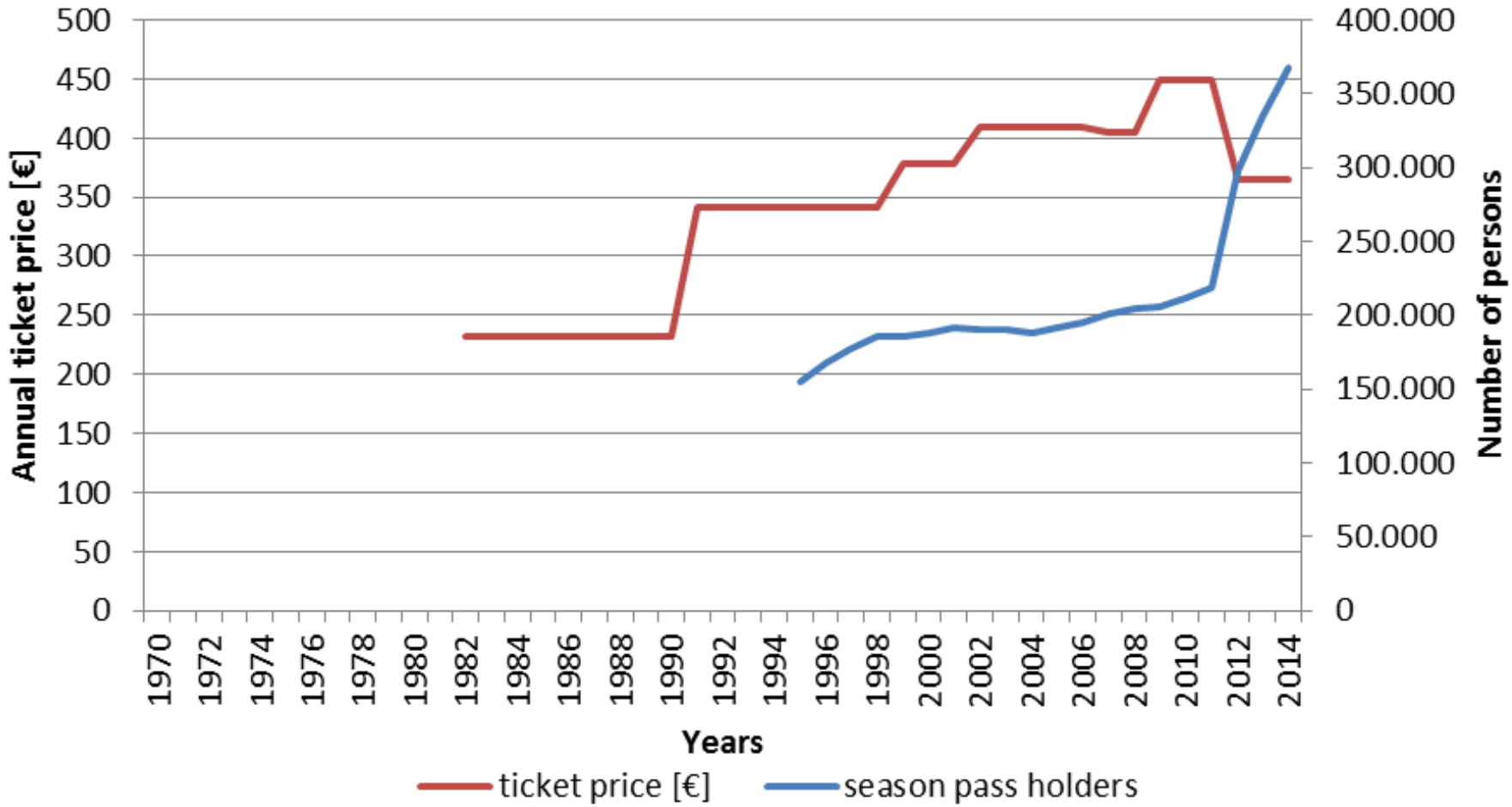
https://www.wien.gv.at/stadtentwicklung/projekte/verkehrsplanung/u-bahn/geschichte.html

PT annual ticket (central zone) National consumer price Index



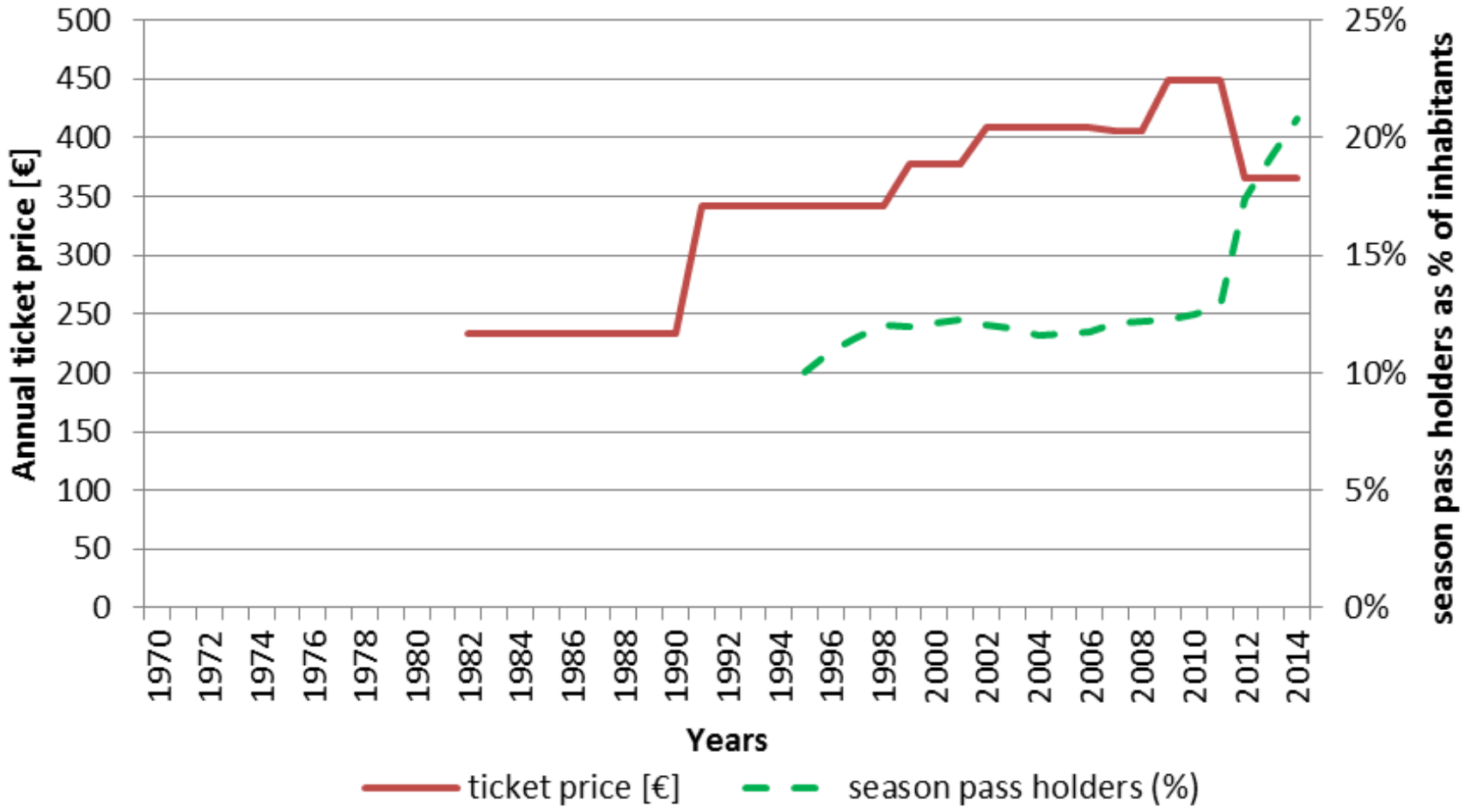
Source: (Wiener Linien, 2002), (Wiener Linien, 2004), (Wiener Linien, 2007), (Stadt Wien, 2007), (VOR, 2014), (Statistik Austria, 2016)

PT annual ticket price and total number of season pass holders



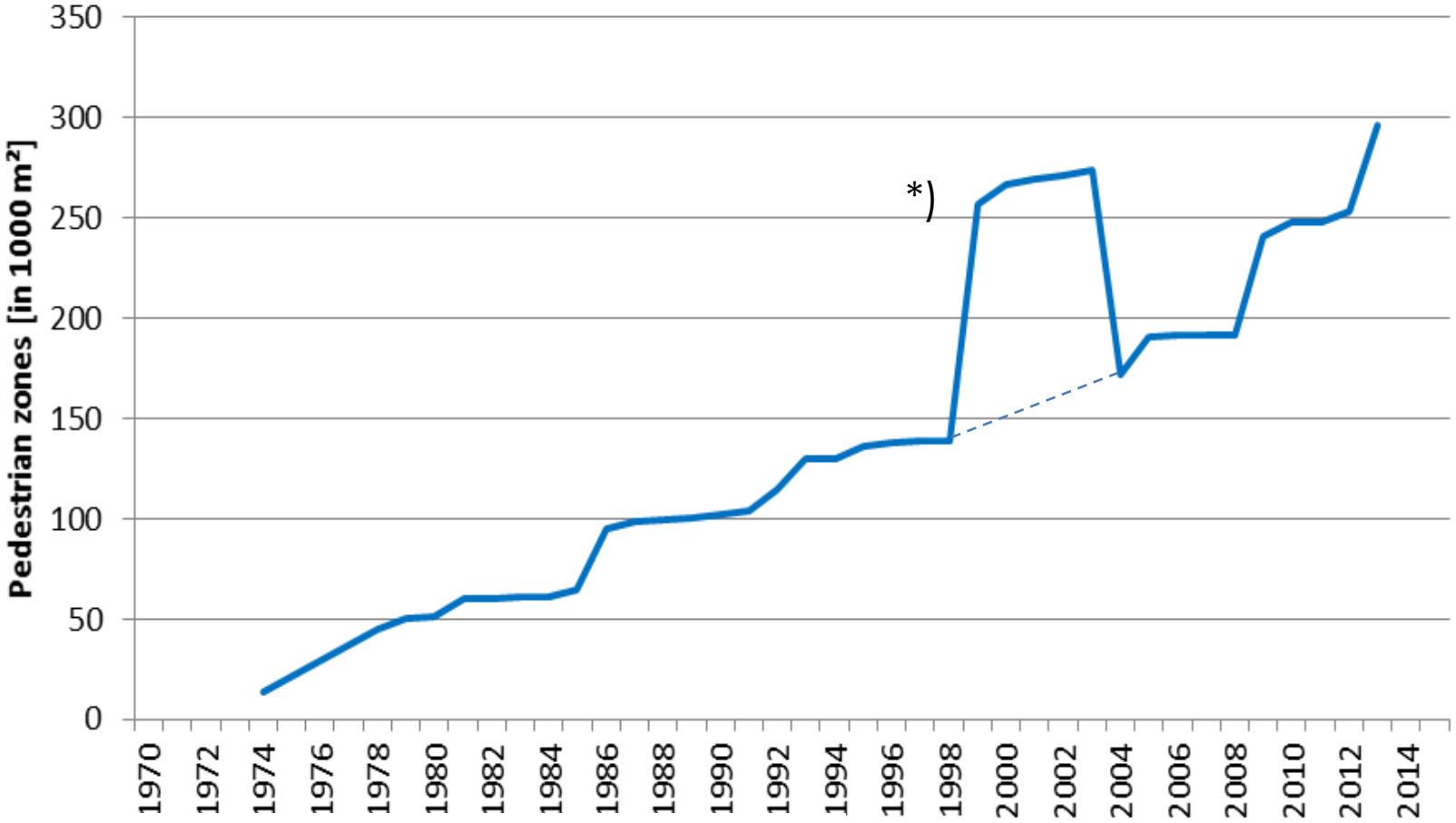
Source: (Wiener Linien, 2002), (Wiener Linien, 2004), (Wiener Linien, 2007), (Stadt Wien, 2007), (VOR, 2014), (Statistik Austria, 2016)

PT annual ticket price snd season pass holders (%)



Source: (Wiener Linien, 2002), (Wiener Linien, 2004), (Wiener Linien, 2007), (Stadt Wien, 2007), (VOR, 2014), (Statistik Austria, 2016)

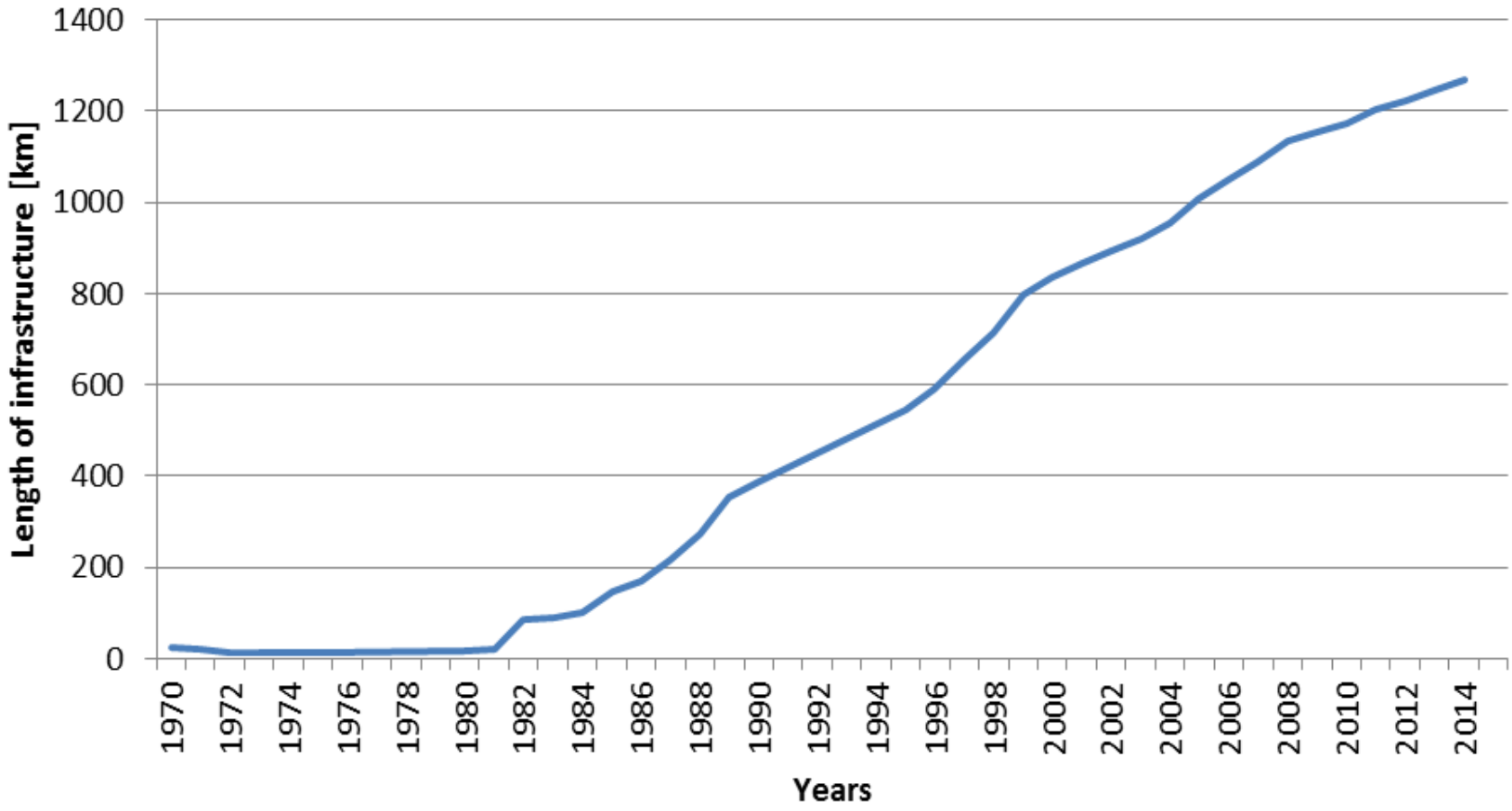
Car-free zones (pedestrian areas)



**) Street through major recreational area permanent closed, later Sat., Sun. and holidays only*

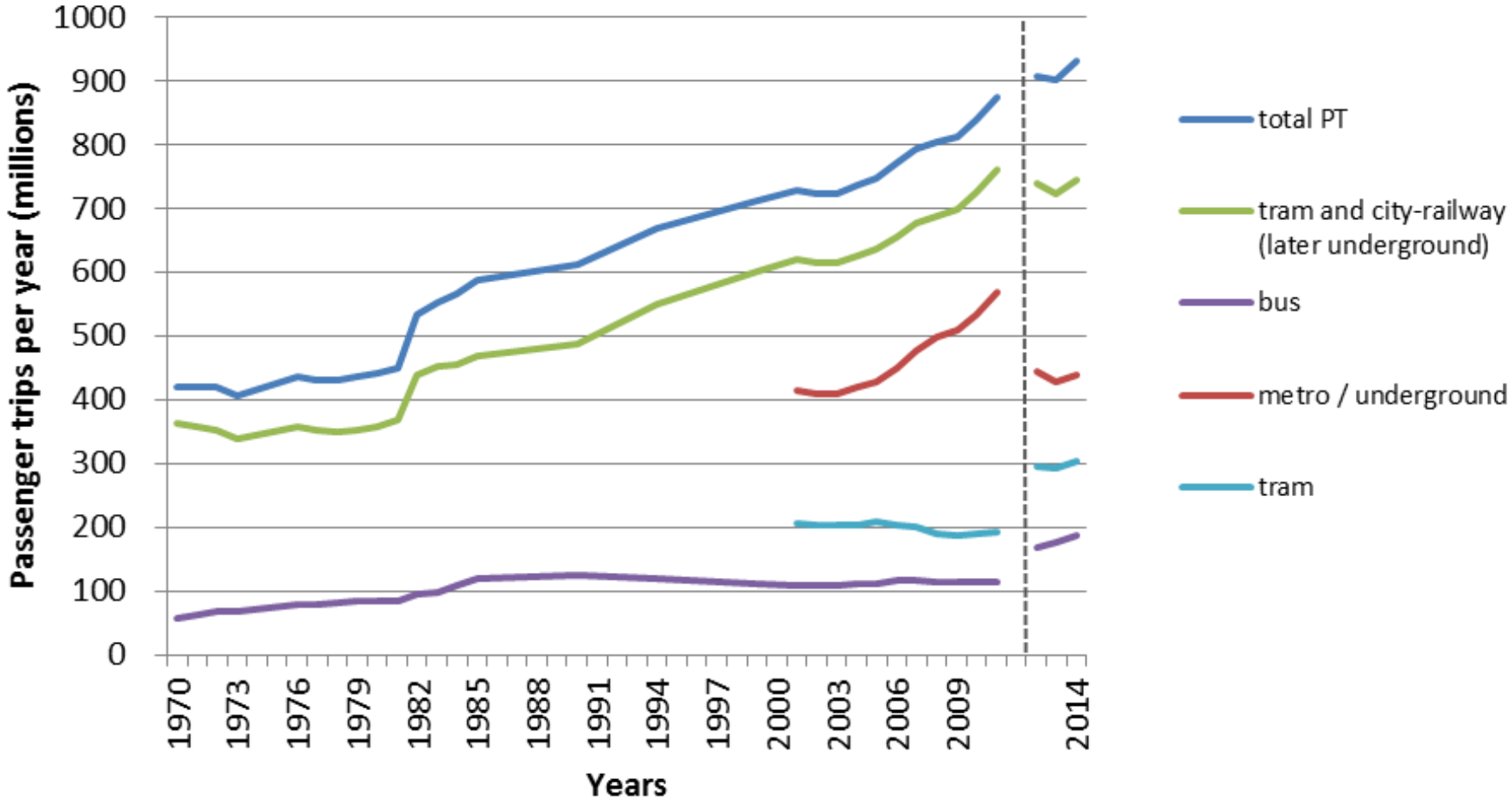
Source: (Magistratsabteilung 46, 2014)

Length of the cycling network



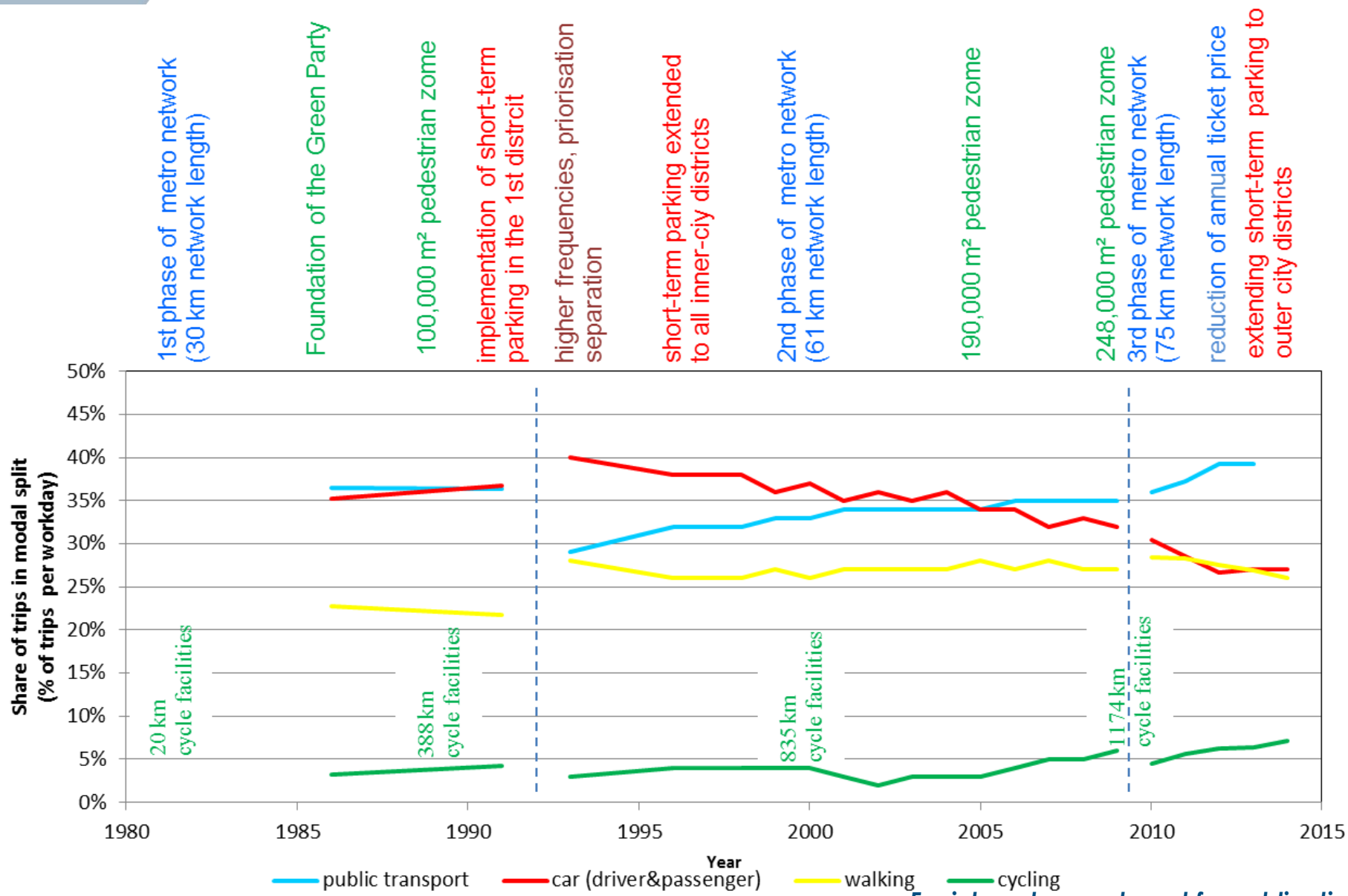
Sources: (Magistrat der Stadt Wien, various years 1970 to 2014), (Magistratsabteilung 46, 2015a)

PT passenger trips per year

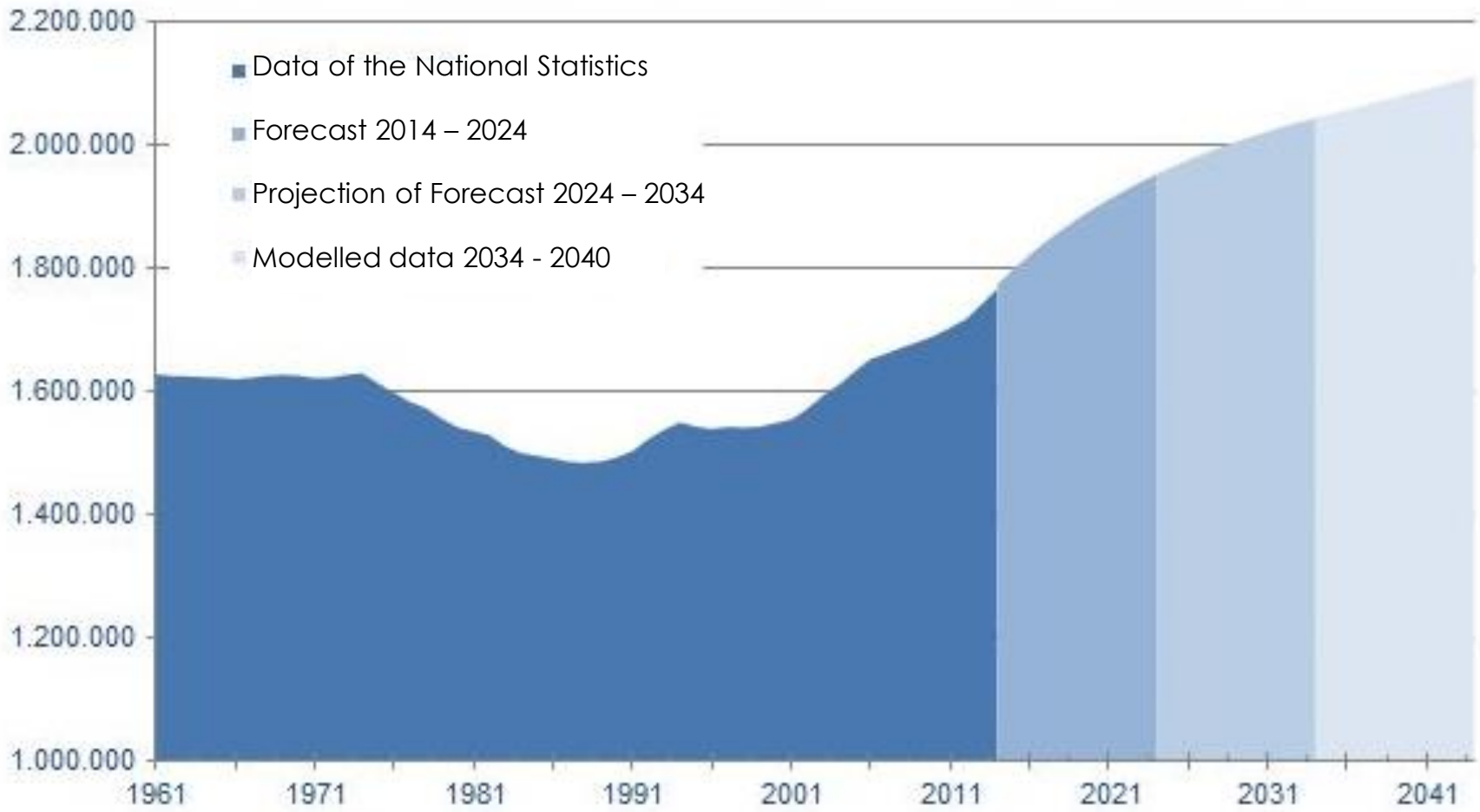


Sources: (Magistrat der Stadt Wien, various years 1970 to 2014)

Modal Split and transport measures

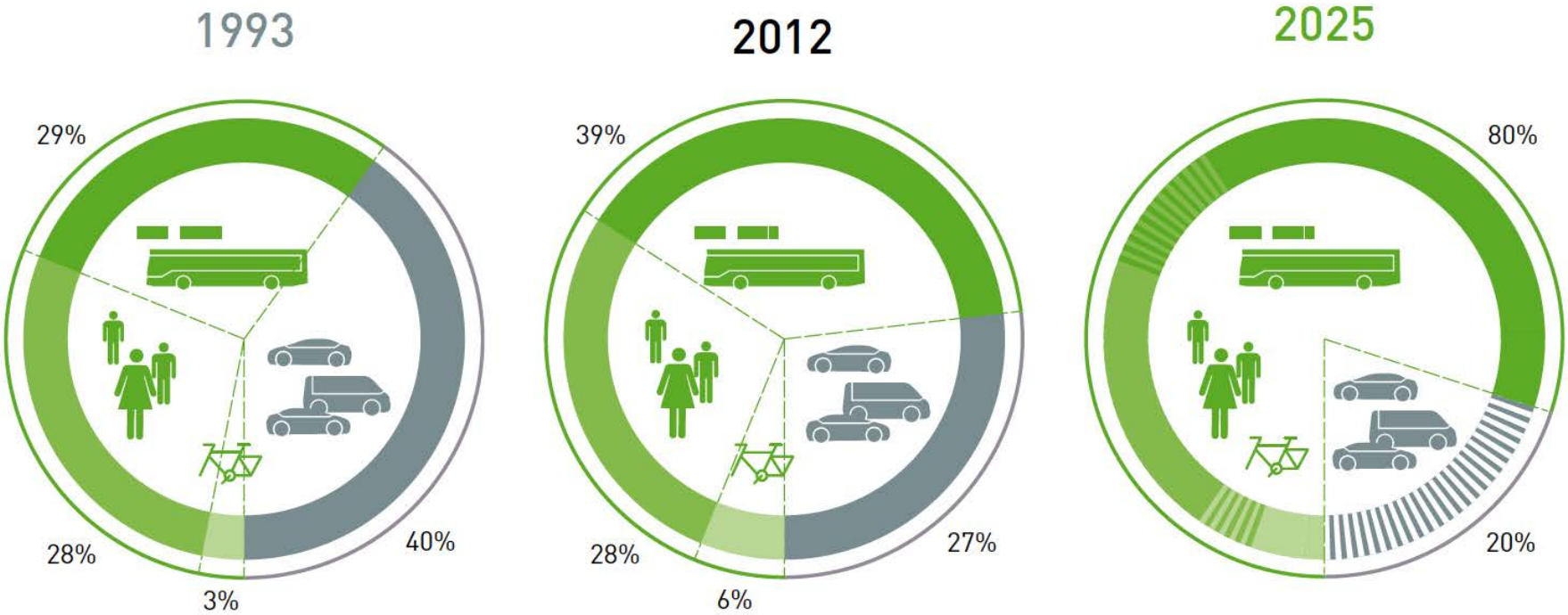


Population Forecast



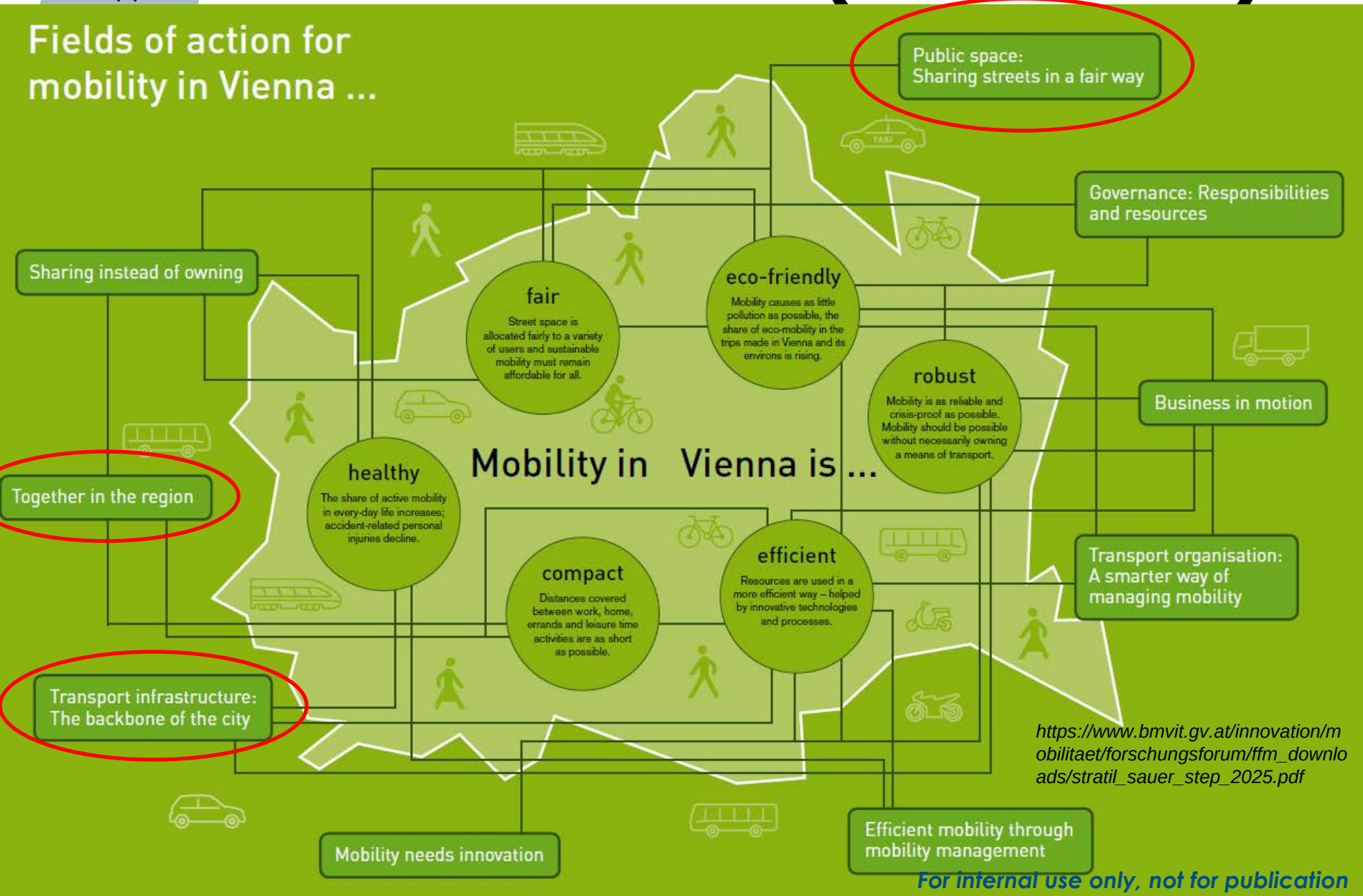
https://www.wien.gv.at/statistik/bevoelkerung/prognose/

Goals of the Urban Development Plan 2025 (STEP 2025)



https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008379a.pdf

„Fields of Action“ (STEP 2025)



https://www.bmvit.gv.at/innovation/mobilitaet/forschungsforum/ffm_downloads/stratil_sauer_step_2025.pdf

Topics of STEP 2025

"Mobility requires human-scale and eco-compatible forms of transport. The City of Vienna is committed to prioritising public transport, pedestrians and cycling as the most environmentally friendly mobility modes. Vienna embodies a future-oriented urban mobility policy that is not only ecologically, but also economically and socially acceptable and hence sustainable. It is economically sustainable because it is based on long-term investment that pays off for the city and location. It is socially sustainable because its declared goal is to ensure mobility for all citizens irrespective of their income, social position and life situation. It is ecologically sustainable because it helps to conserve natural resources and contributes to realising the Smart City Wien objective." Quote from STEP 2025

https://www.bmvit.gv.at/innovation/mobilitaet/forschungsforum/ffm_downloads/stratil_sauer_step_2025.pdf

Expanding public transport

Public transport passengers are offered the attractive, high-quality, efficient and affordable services they are used to.

Together with Wiener Linien, VOR and ÖBB, the City of Vienna continues to develop the primary public transport network, supporting the acceleration of important tram and bus lines.

A new mobility culture

Pedestrians, cyclists, public transport passengers, motorists, moped and motorbike riders respect each other.

The City of Vienna supports new forms of coexistence in shared spaces or temporary pedestrian zones which offer areas of learning and opportunities of encounter; the number of existing rules is reduced.

More space for pedestrians and cyclists

Pedestrians and cyclists feel at ease as they use vibrant street spaces.

Transport is organised in such a way that increasing pedestrian and bicycle traffic is given more space.

Sharing instead of owning

The citizens of Vienna do not need to own cars to be mobile. Cars can readily be hired if needed. Bicycle sharing systems supplement public transport.

The city of Vienna supports eco-mobility and rental systems for cars and bicycles.

What "Together on the move" primarily needs is...

Organising commercial transport efficiently

Motor vehicles and craft for commercial and passenger transport (by air, waterways, rail and road) are used in an efficient way. The modal shift to eco-mobility ensures a smooth flow of traffic even if there is higher demand and available spaces remain the same. E-mobility plays an important role in vehicle fleets.

The City of Vienna and players in business develop and implement new eco-friendly types of delivery, distribution and customer logistics.

Active and safe mobility for the youngest

On the way to school children walk, use their bicycles or public transport. There is enough space in front of their schools so they can arrive and depart safely.

The City of Vienna creates appropriate framework conditions for safe mobility; parents and carers support children as they are actively mobile.

Mobility partnerships in the region

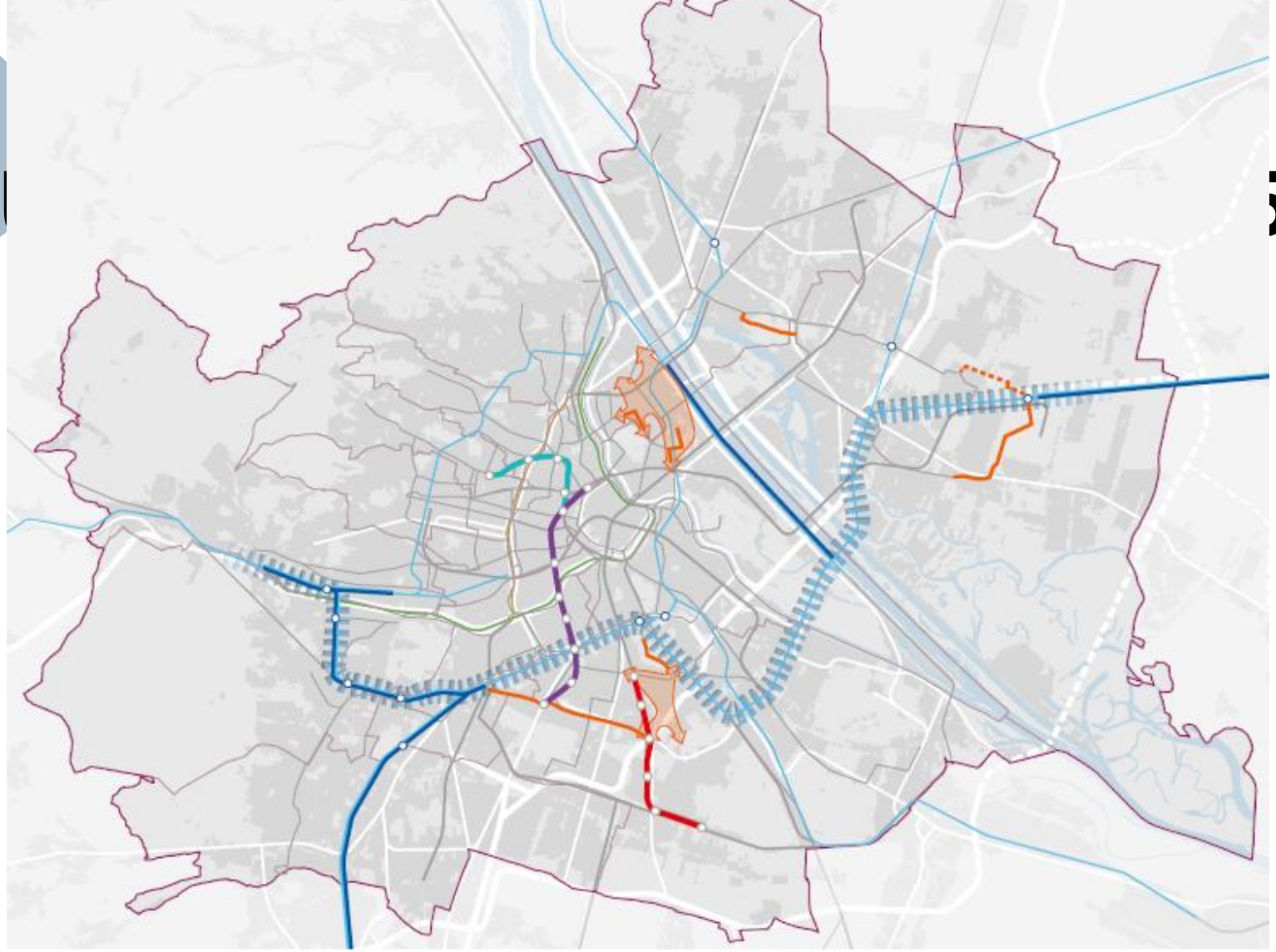
Cooperation between districts of Vienna and the municipalities in the Greater Vienna region strengthen eco-mobility in commuter transport.

Representatives from districts of Vienna and adjoining municipalities in the environs of the city discuss and team up as partners as they adopt measures for sustainable mobility within their mobility corridor.

Multi-modal transport from door to door

Everyone who is out and about in the urban area uses readily available mobility information about al means of transport. Changing from one mode of transport to the other at convenient nodes is attractive.

There is close cooperation between the major service providers.



Suburban rail
- Improvements in operations
- Infrastructure projects
- East-west axis

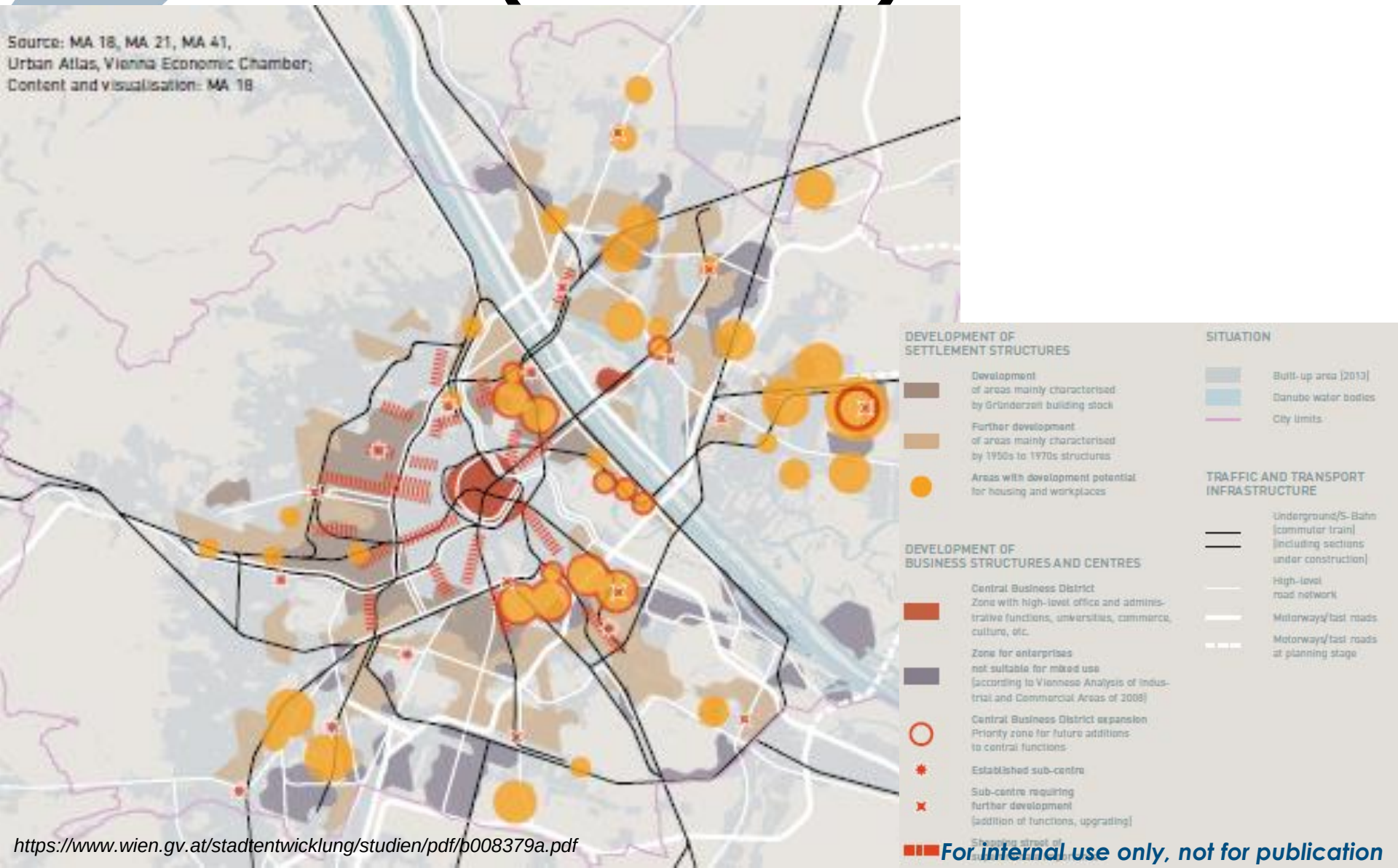
Tram
- Tram project planning areas under the public transport investment package of 27 June 2014
- Tram projects under the public transport investment package of 27 June 2014
- Further tram projects

Underground network expansion
- U1
- U2
- U5

Underground network modernisation and maintenance
- U4
- U6

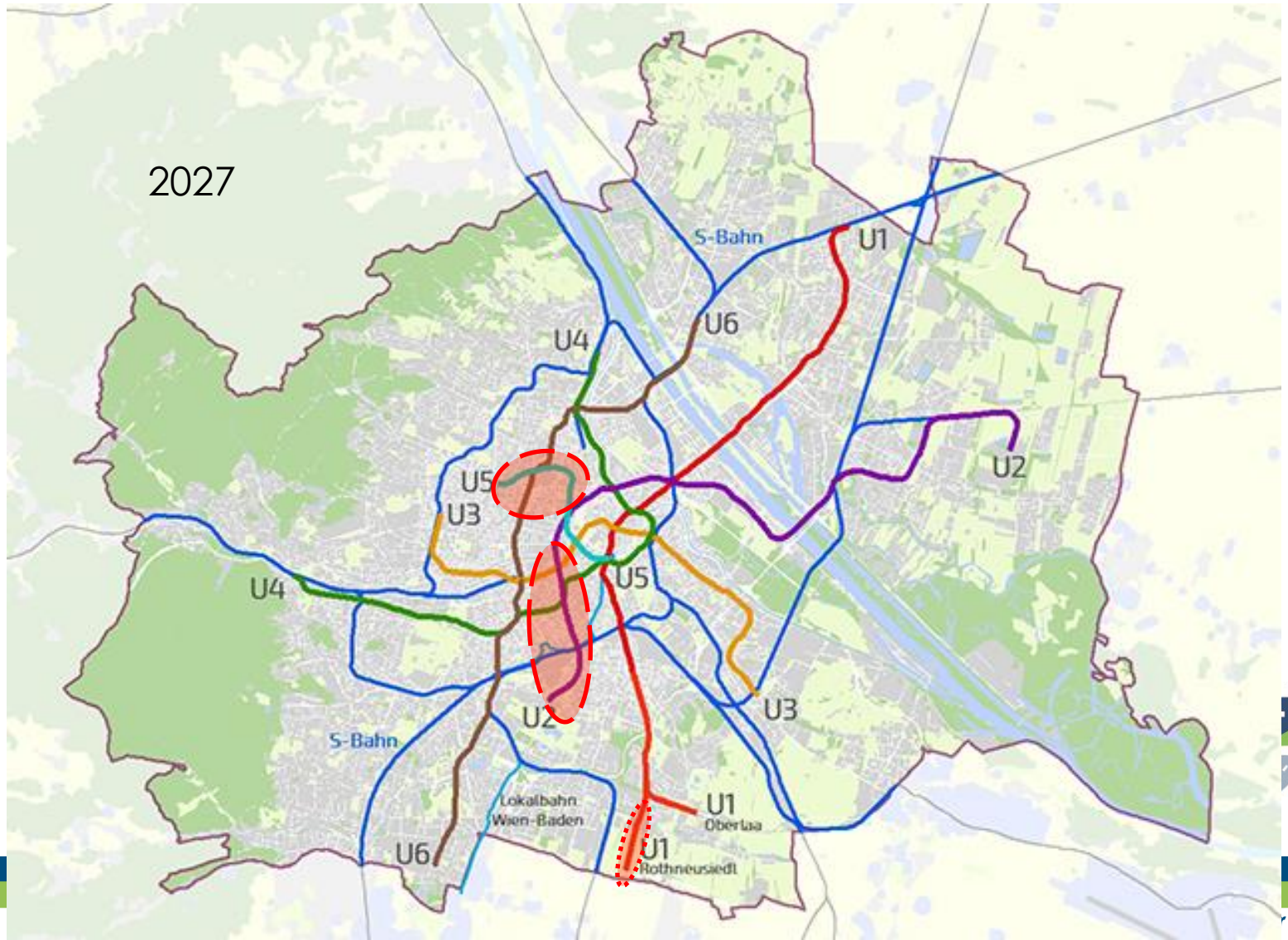
https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008390b.pdf

Urban Development Plan (STEP 2025)



https://www.wien.gv.at/stadtentwicklung/studien/pdf/b008379a.pdf

Extension of underground network



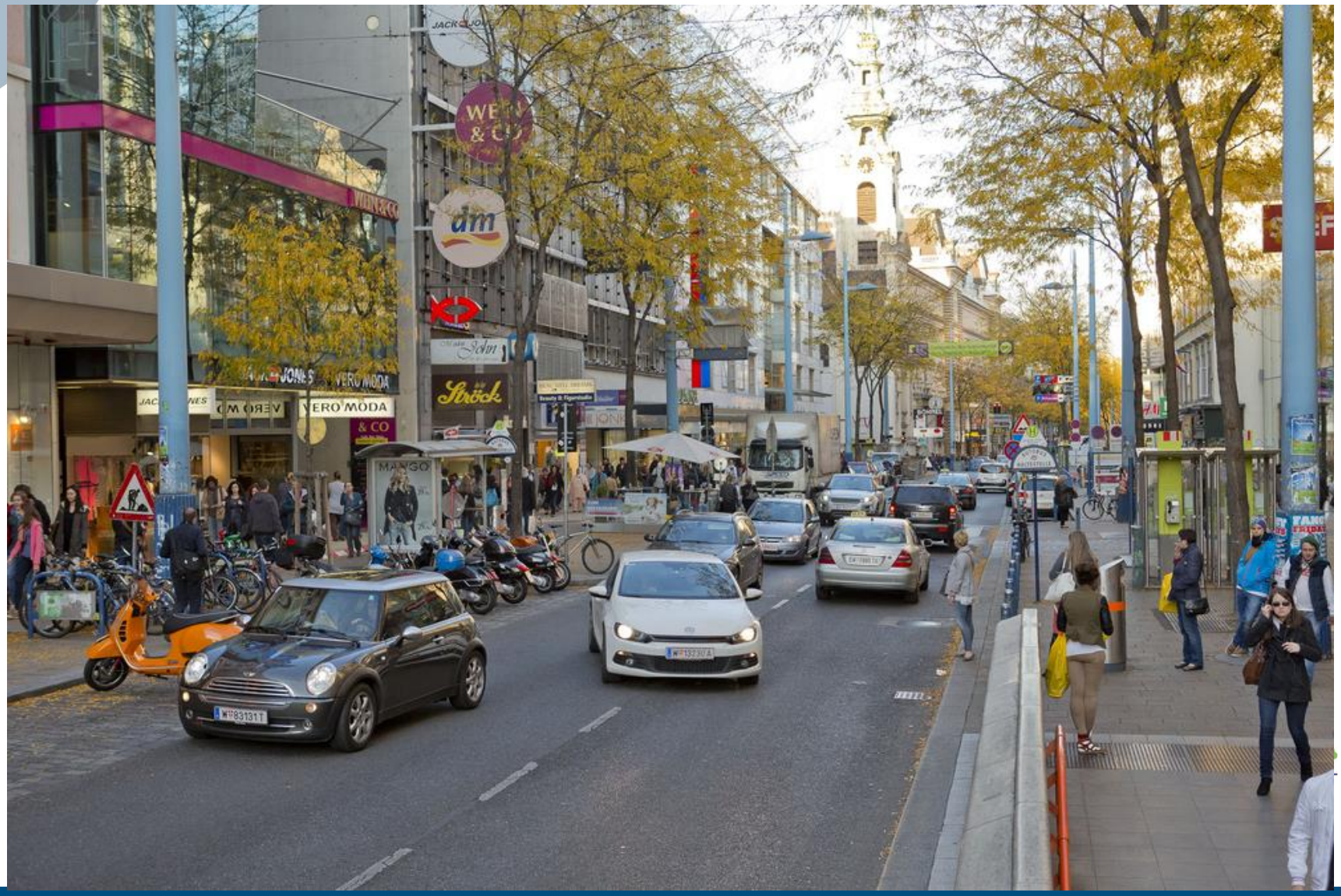
Mariahilfer Straße beginning of 20th century

Bezirksmuseum Mariahilf, Stauda

Mariahilfer Straße 1979

http://www.bildstrecke.at/Archiv-1980/Images/detail/10184

Mariahilfer Straße 1990



http://www.heute.at/news/oesterreich/wien/Neue-Mariahilfer-Strasse-ist-fix;art23652,801887

Mariahilfer Straße 2016

http://www.dijaspora.tv/uploads/pics/mariahilfer_strasse.jpg

Milestones of Viennese PT system

- Underground network as backbone (1978 – 2027)
- Night bus system (since 1986)
- Computer-aided operational control system (RBL), since 1992
- Increasing frequencies (in particular off-peak) and priorisation starting with masterplan 1994

Milestones of Viennese PT system

- Permanent improvement of quality of rolling stock and stops
  - ultra-low floor tram (since 1997),
  - bus and tram capes
  - passenger Information systems at stations and via app (since ~ 2000)
  - …

https://de.wikipedia.org/wiki/Stra%C3%9Fenbahn_Wie

tp://www.alleswerbung.info/component/content/ticle/32-kampagnen/1376-hafnotizzettel-gegen-ewalt-an-frauen.html

http://nahverkehr.wien/forum/index.php?topic=11552.0

http://www.vipress.at/uploads/tx_vipress/500._anzeige_mit_bus_24539_72ce.jpg

- Night Underground (since 2010)

Drivers of change:
Analysis of car use and its determinants

- Feedback and emerging insights from D3.2-reports -

Regine Gerike, Rico Wittwer (TUD)

CREATE Technical Meeting, Paris 8 March 2017

CREATE has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°636573

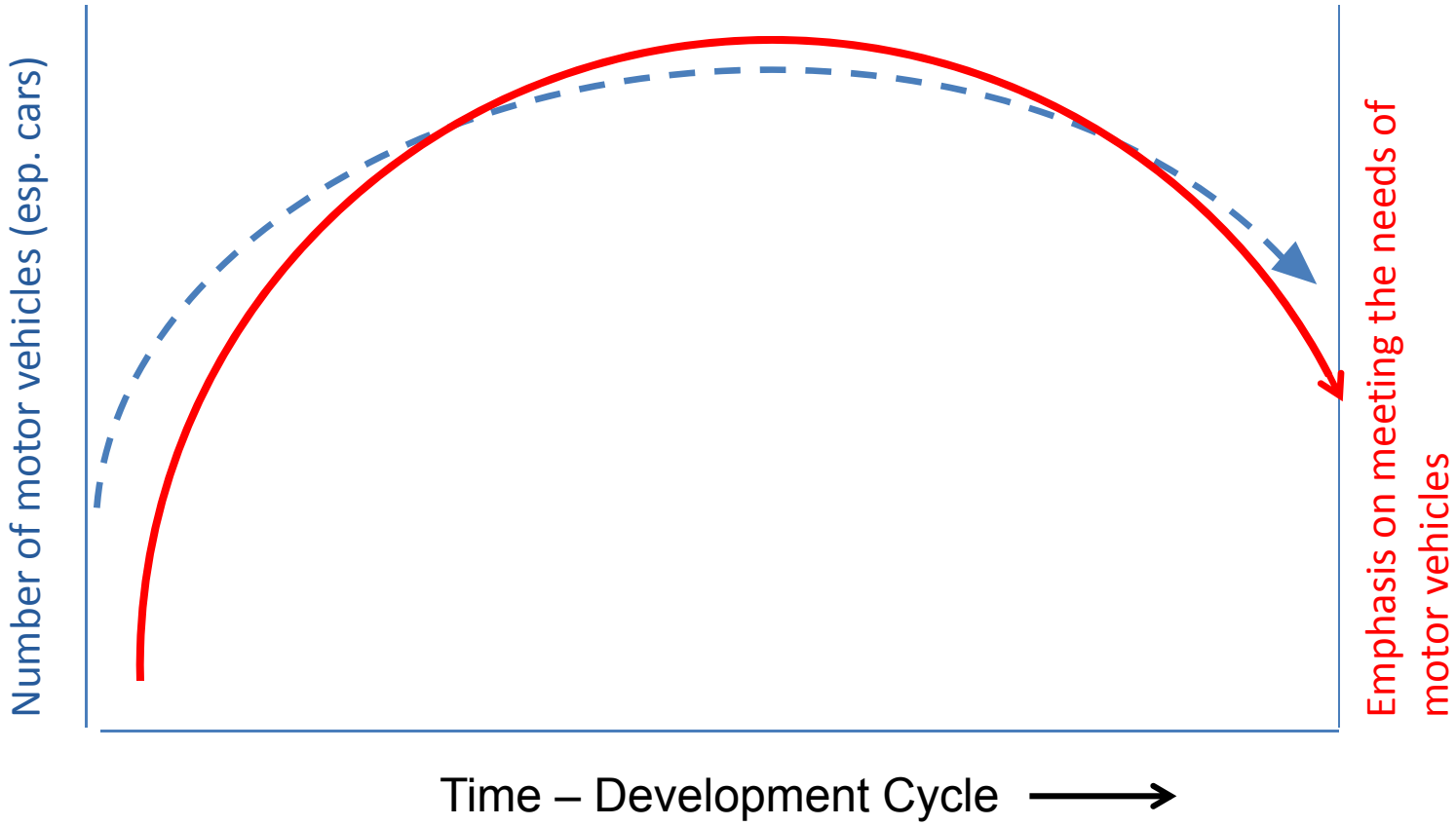
Create

Congestion Reduction in Europe,
Advancing Transport Efficiency

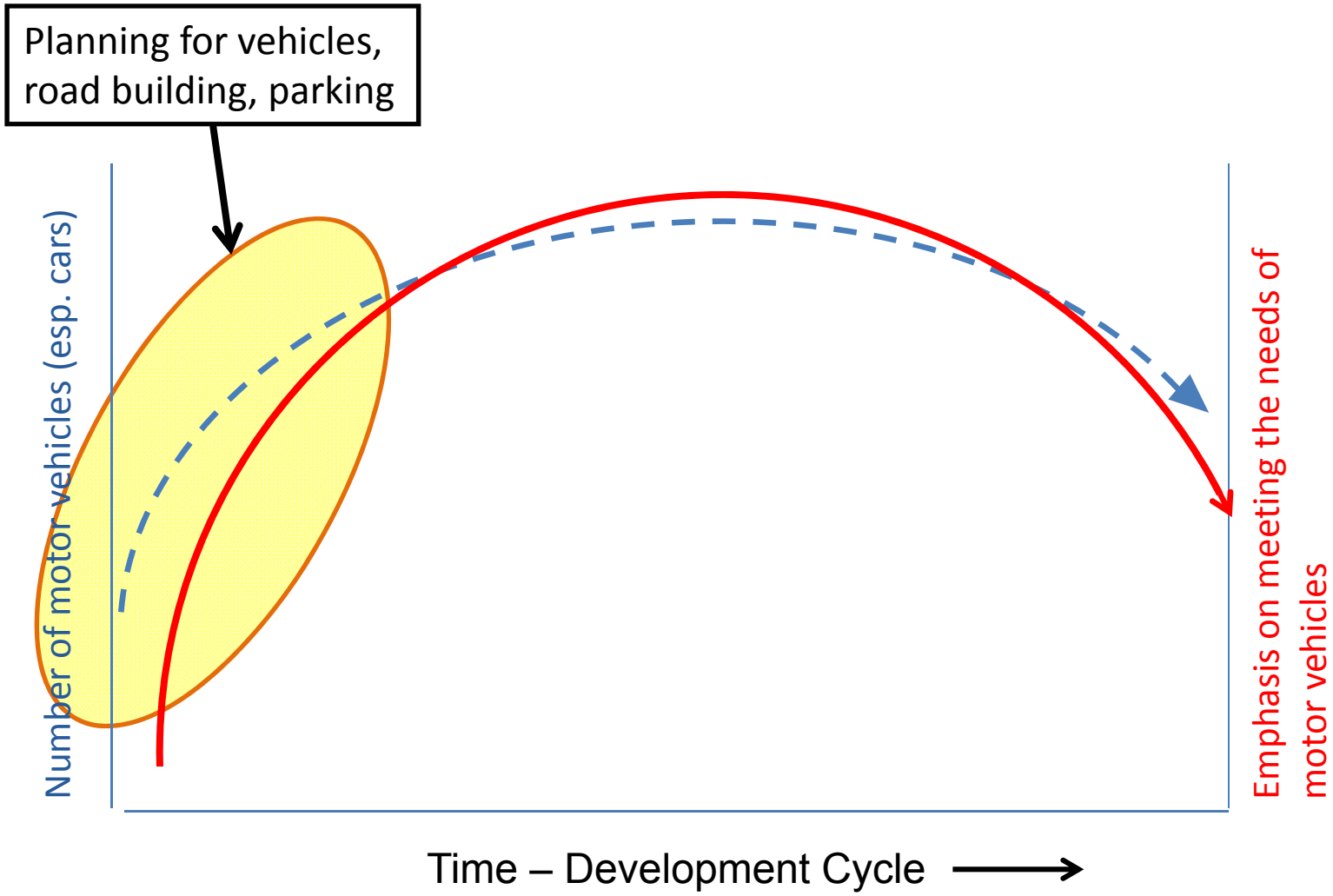
- Overview of the project -

Decoupling car use from economic growth

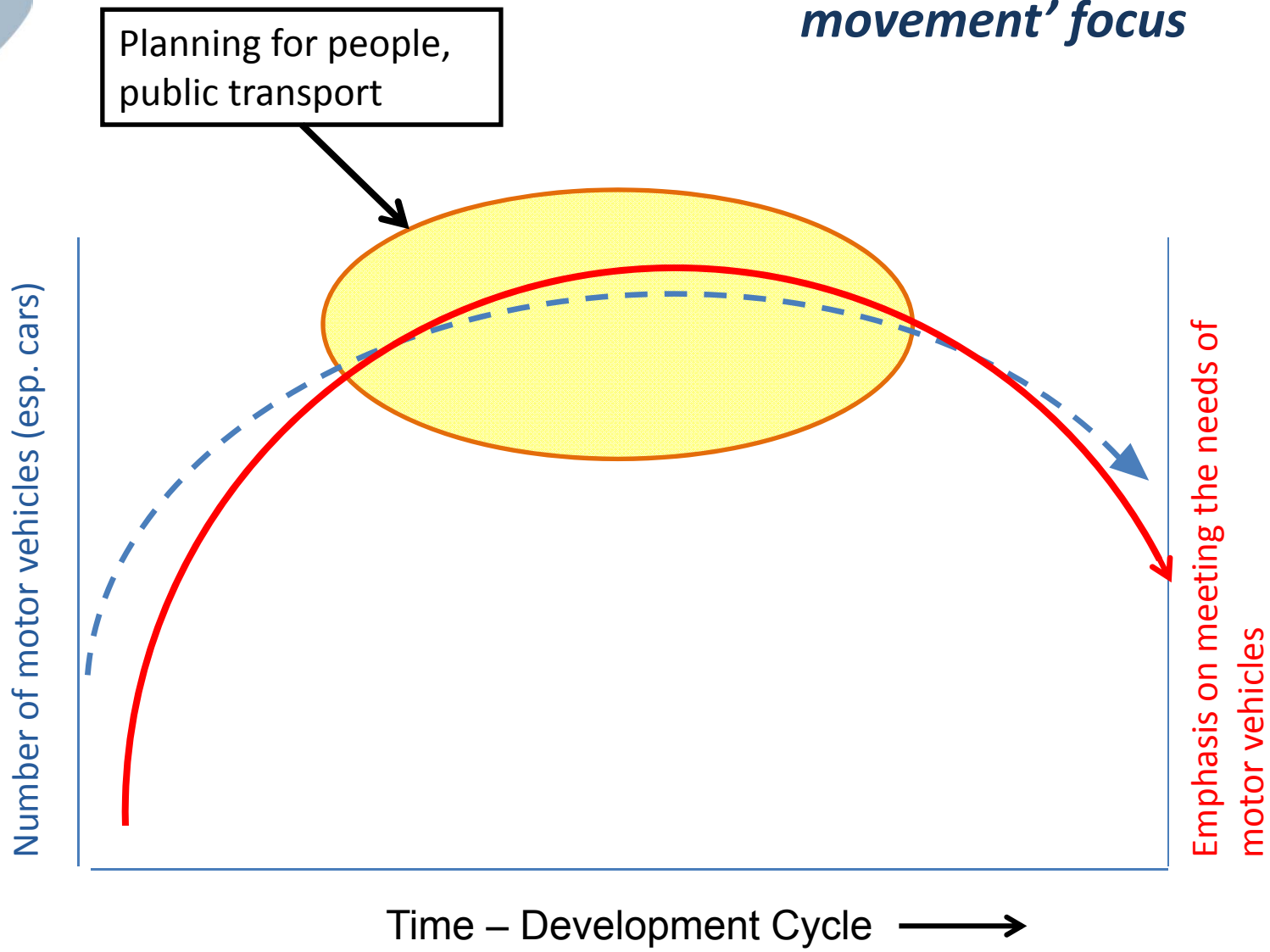
Typical Transport Policy Development Cycle



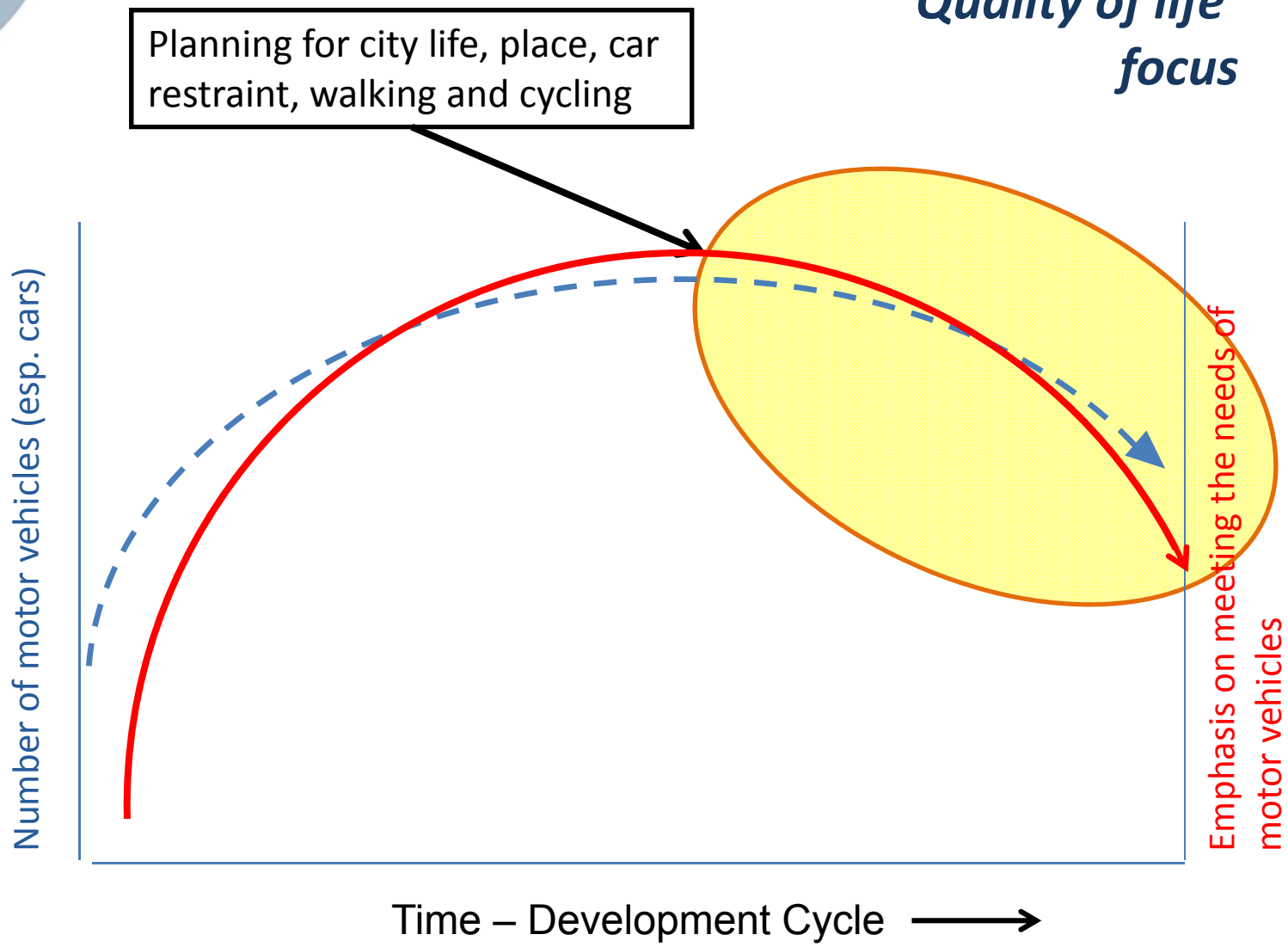
Stage 1: 'Vehicle' focus



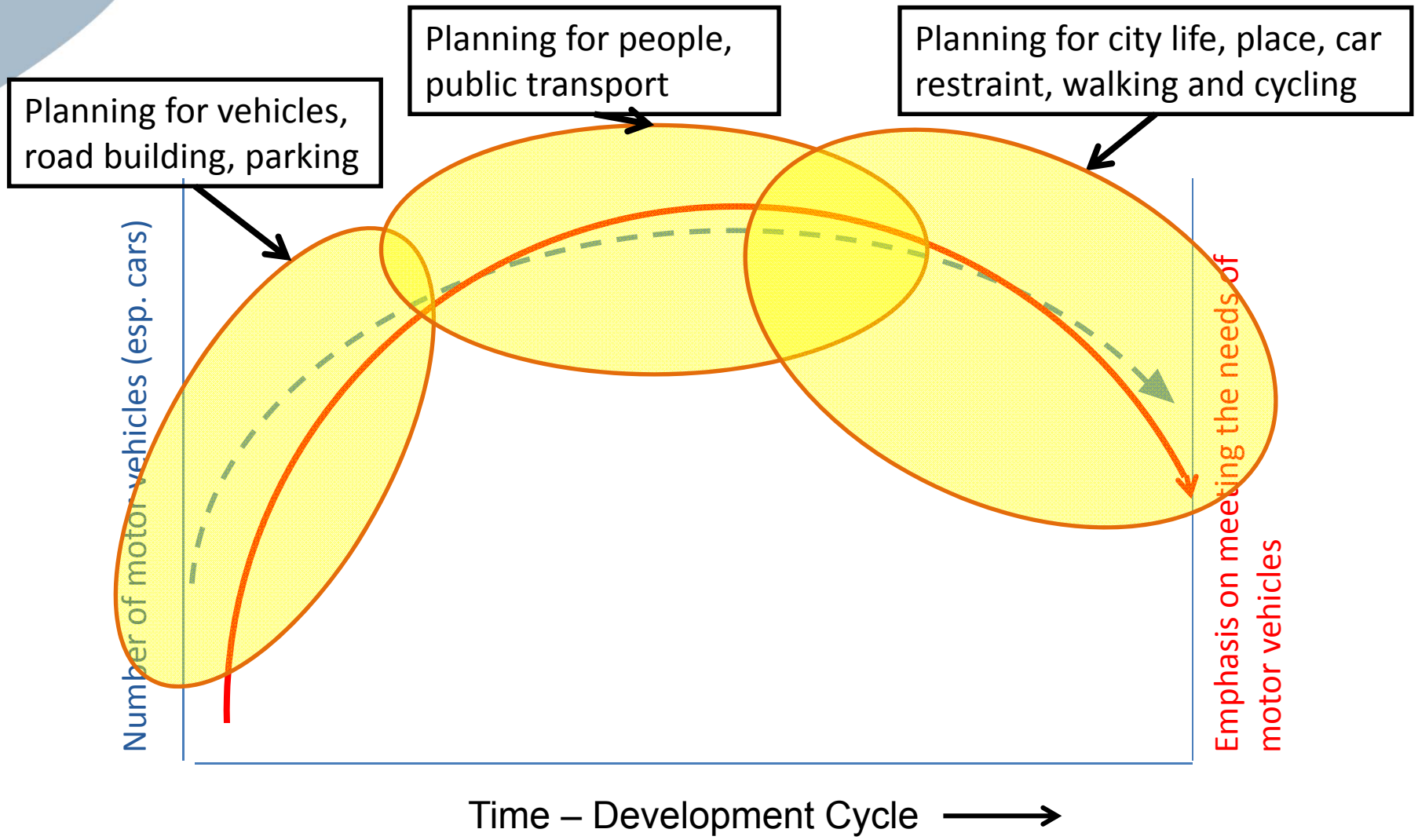
Stage 2: 'Personal movement' focus



Stage 3: 'Activity/ Quality of life' focus

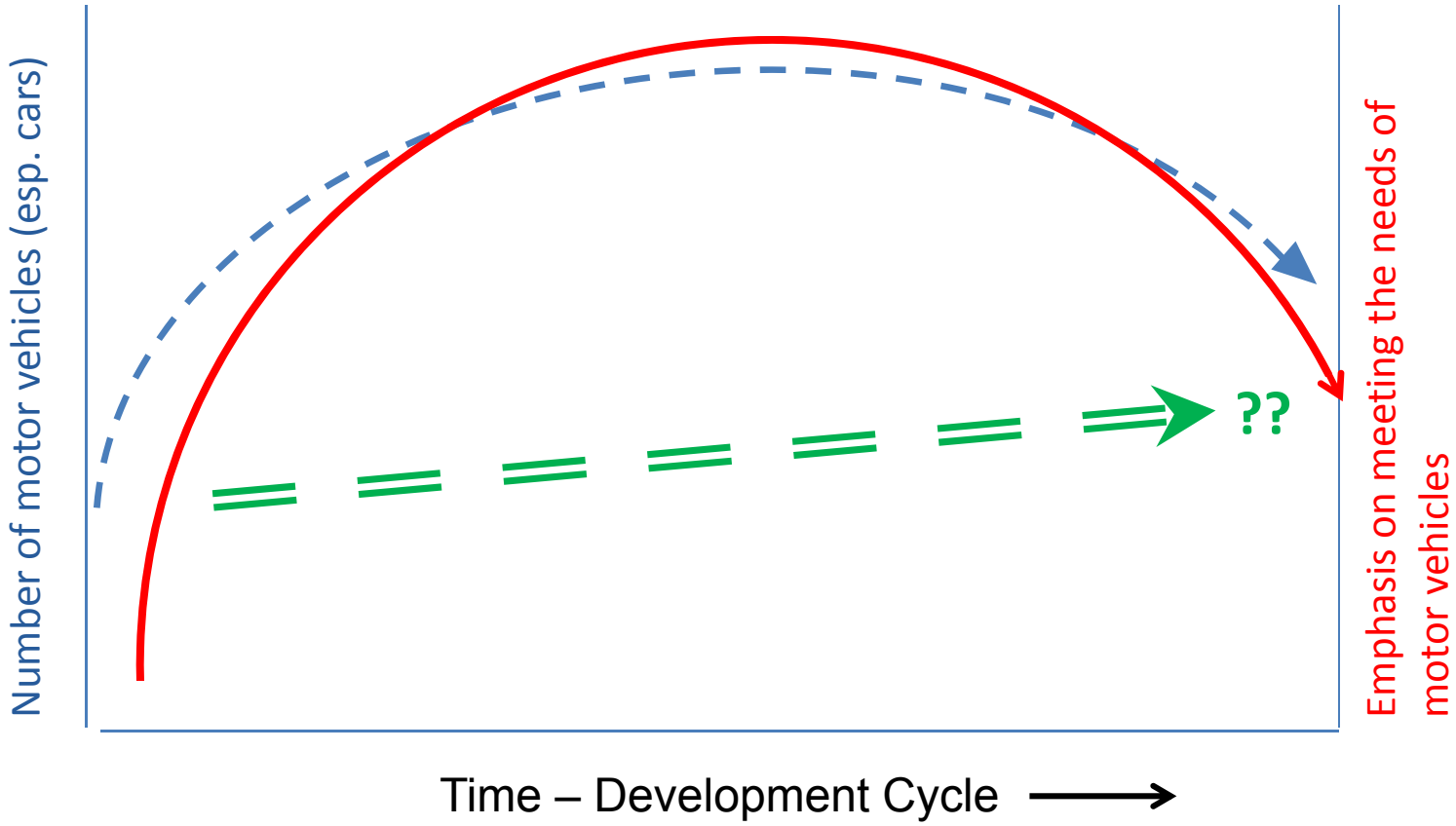


Typical Transport Policy Development Cycle



Typical Transport Policy Development Cycle

Can this evolutionary/learning process be short-circuited?



Objectives (I)

1. **Investigate nature and causes of urban road traffic congestion:**
   - Improved measures of congestion and broader measures of network performance
2. **Examine how 5 Western European ('Stage 3') capital cities have succeeded in reducing car use and developing a more liveable city**
   - Both quantitatively & qualitatively

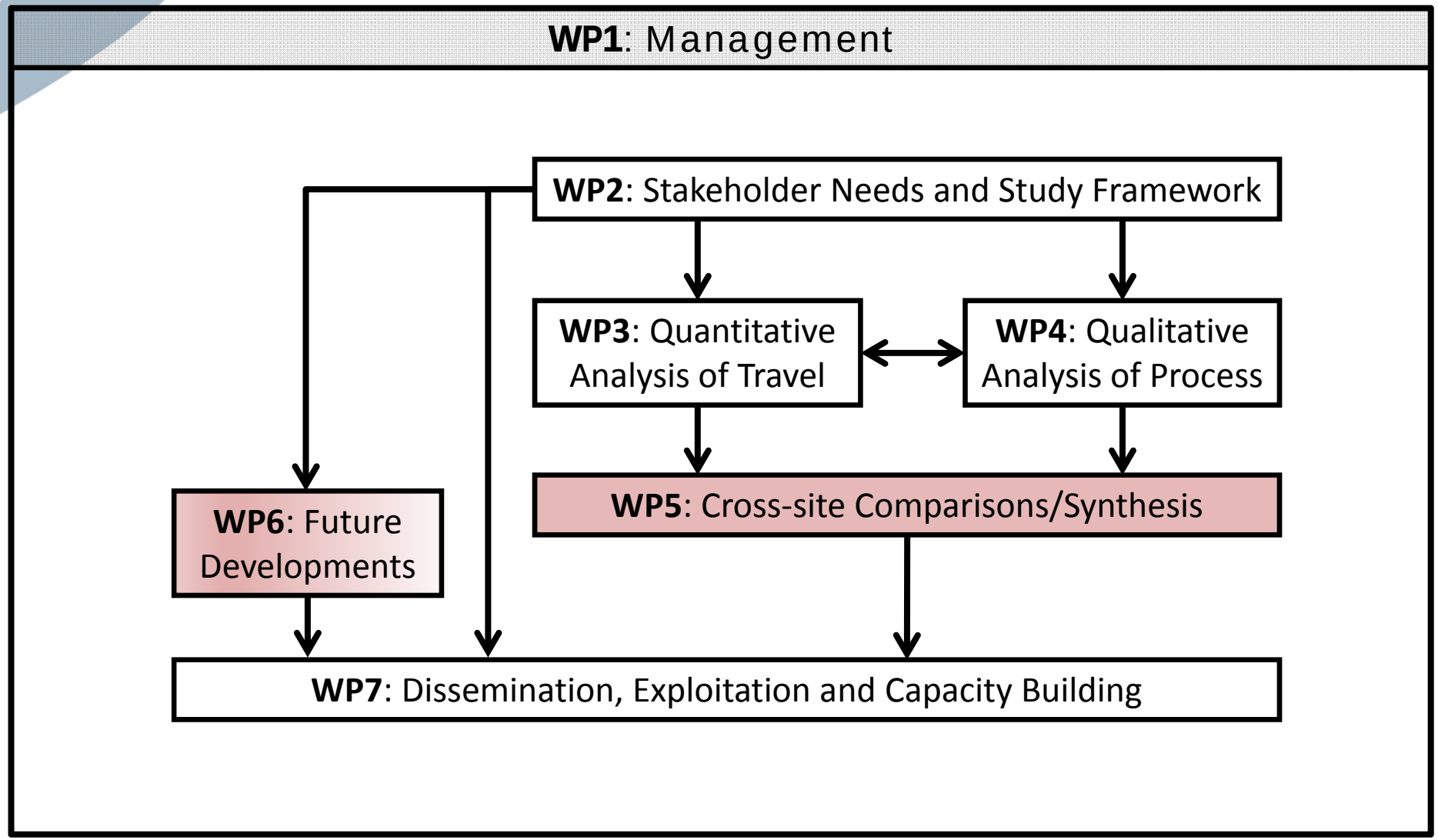
Objectives (II)

3. **Develop concrete guidance for 'Eastern European' ('Stage 1') cities on how to reduce car use and promote liveability**
   - Including development of business cases

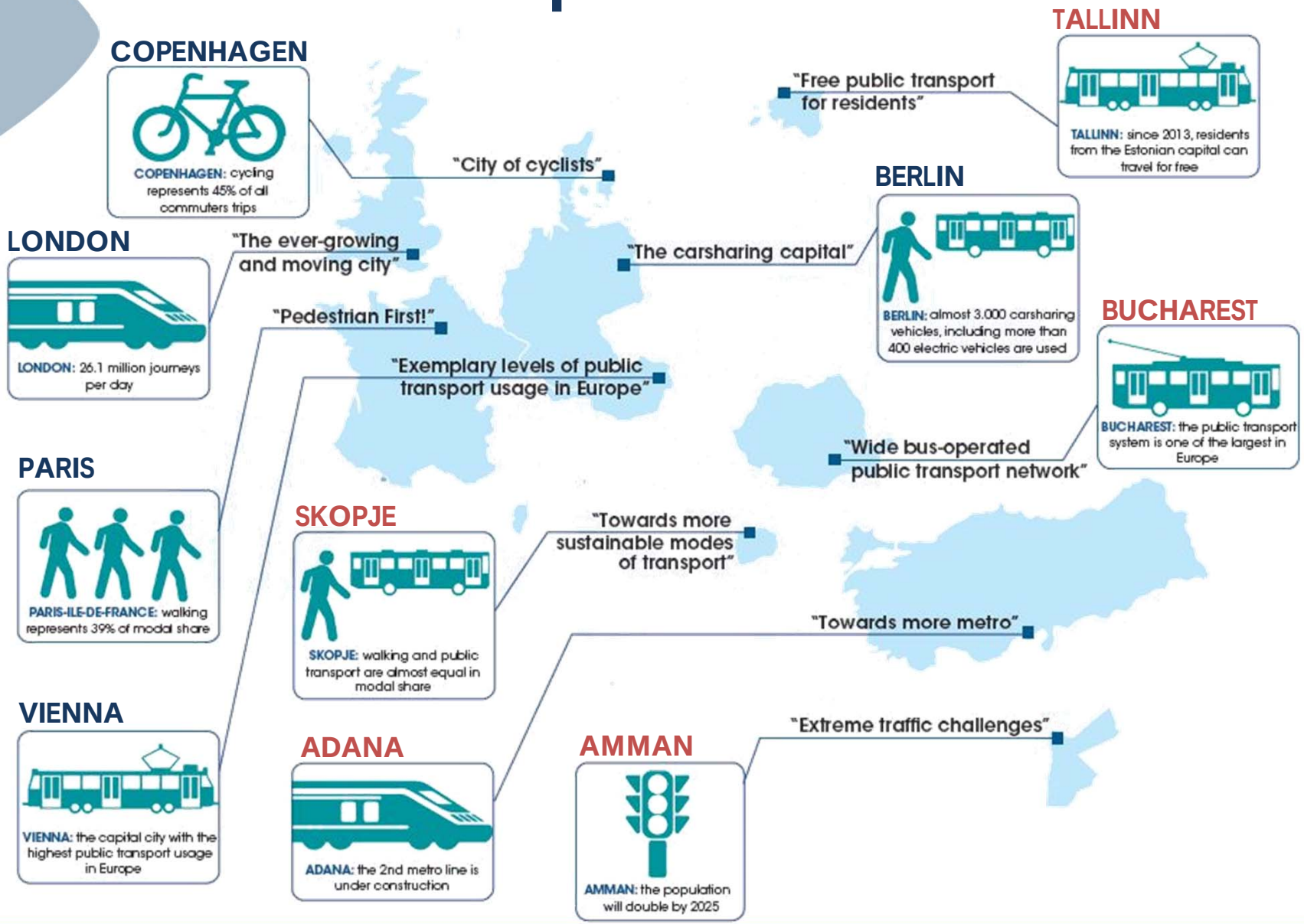
4. **Address challenges of city growth and resulting 'mobility densification'**

5. **Dissemination, stakeholder engagement, exploitation**

CREATE WP Structure



CREATE partner cities



CREATE WP3 Technical Meeting

„Qualitative assessment to explore main factors underlying change of car use"

- Brief self-introduction of attendees -

Objectives for this meeting

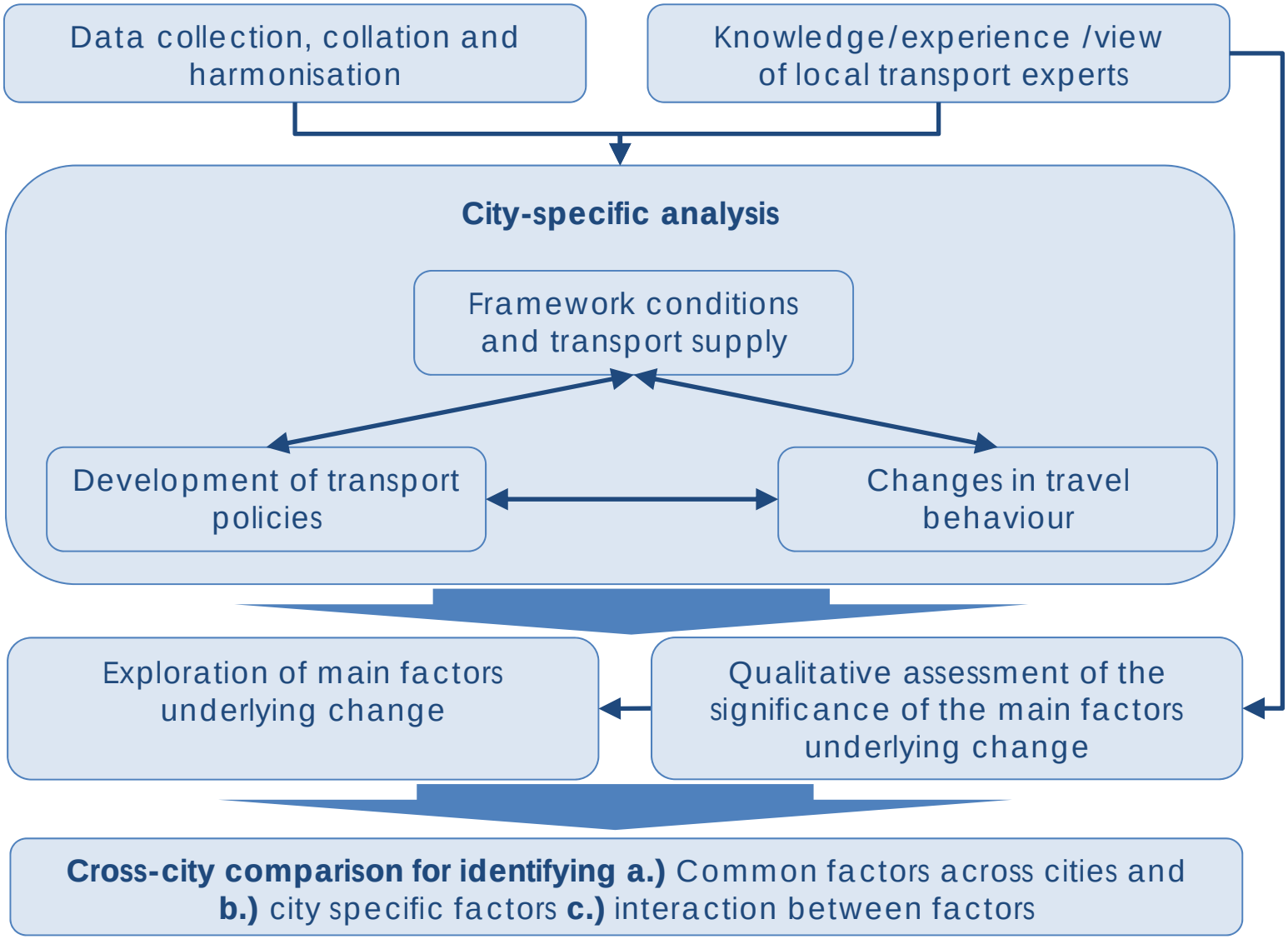
Overall objective:

- To better understand the trend of reducing car use in the stage 3 cities
- Based on insights from the CREATE project so far and on expert knowledge

Agenda items:

- Insights from the D3.2 reports
- Insights from the qualitative assessment
- Exploration of specific details from the individual cities' perspectives, reflection across all other cities on the relevance of the specific factors for their own case

Methodological approach for better understanding drivers and barriers



Methods for quantitative analysis

Steps for the analysis:

1. Describe developments: List travel behaviour indicators over time on their own or in combination with key determinants in cross-tables or graphs
2. Understand developments: Cross-tabulations, cohort-analysis

Analysis levels:

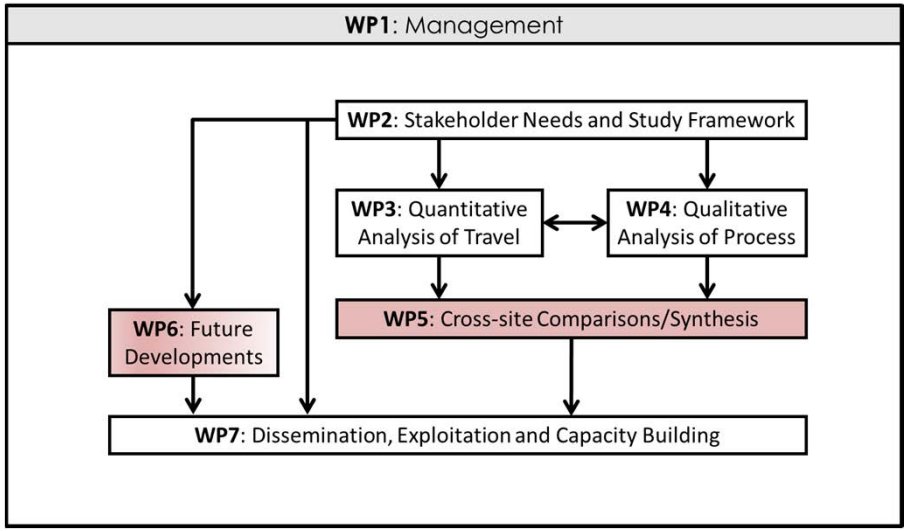
- Individual level, car ownership, travel behaviour
- Trip level, trip characteristics
- Aggregated level, travel behaviour
- Aggregated level, Framework conditions: demographics, land use, commuting, economic factors, aggregated car ownership, costs of car use

What will happen with the results of this meeting?

Expected results:

Knowledge exchange about

- strategic transport planning in the individual cities,
- data availability, data needs, data collection and data management strategies,
- experiences from the work on the D3.2-reports.



- **Combining qualitative assessment with the quantitative work in WP3**
- **To identify main factors underlying change of car use**
- **To explore the role of specific factors**

- Insights and inspiration for everybody's work

Exploitation within CREATE:

- For cross-city analysis in WP3
- For subsequent work packages

Outline

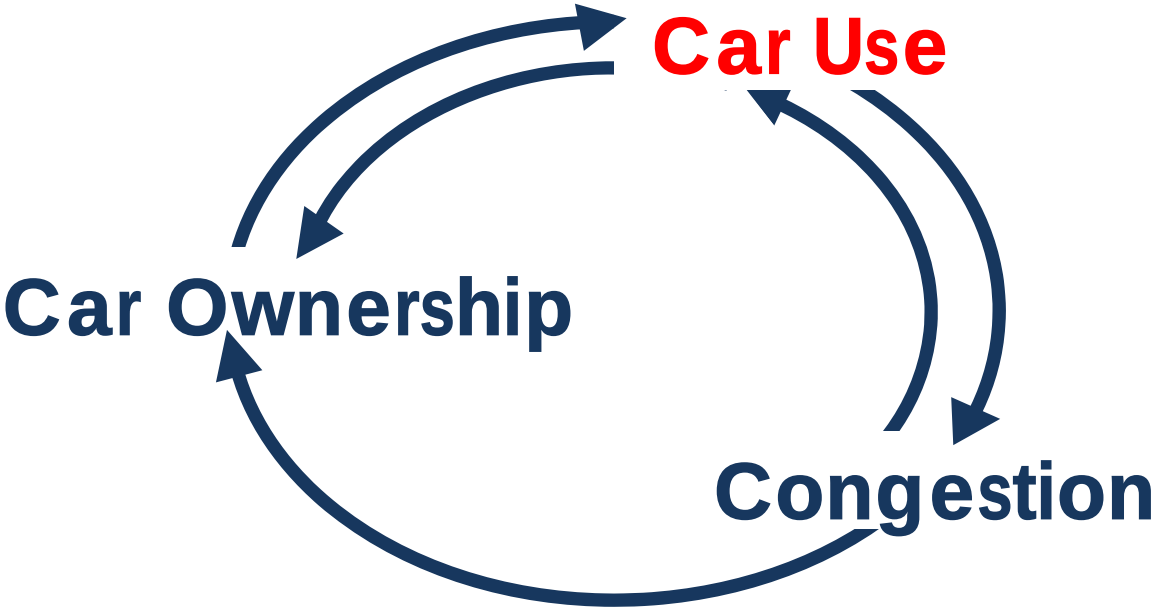
- Car ownership, car use, congestion
- Conceptual framework
- City size and land use
- Density: residents, work places
- Proportion of young persons, seniors
- Income and prices
- Travel behaviour, mobility tools
- Various interesting issues
- Summary of insights so far

Questions for the discussion
- For each set of indicators -

1. Are the developments over time plausible?
2. What explanations do you have for similarities and differences in changes over time, and in the absolute values?
3. How important are the indicators for understanding car use?

Car Ownership, Car Use, Congestion

Car Ownership, Car Use, Congestion



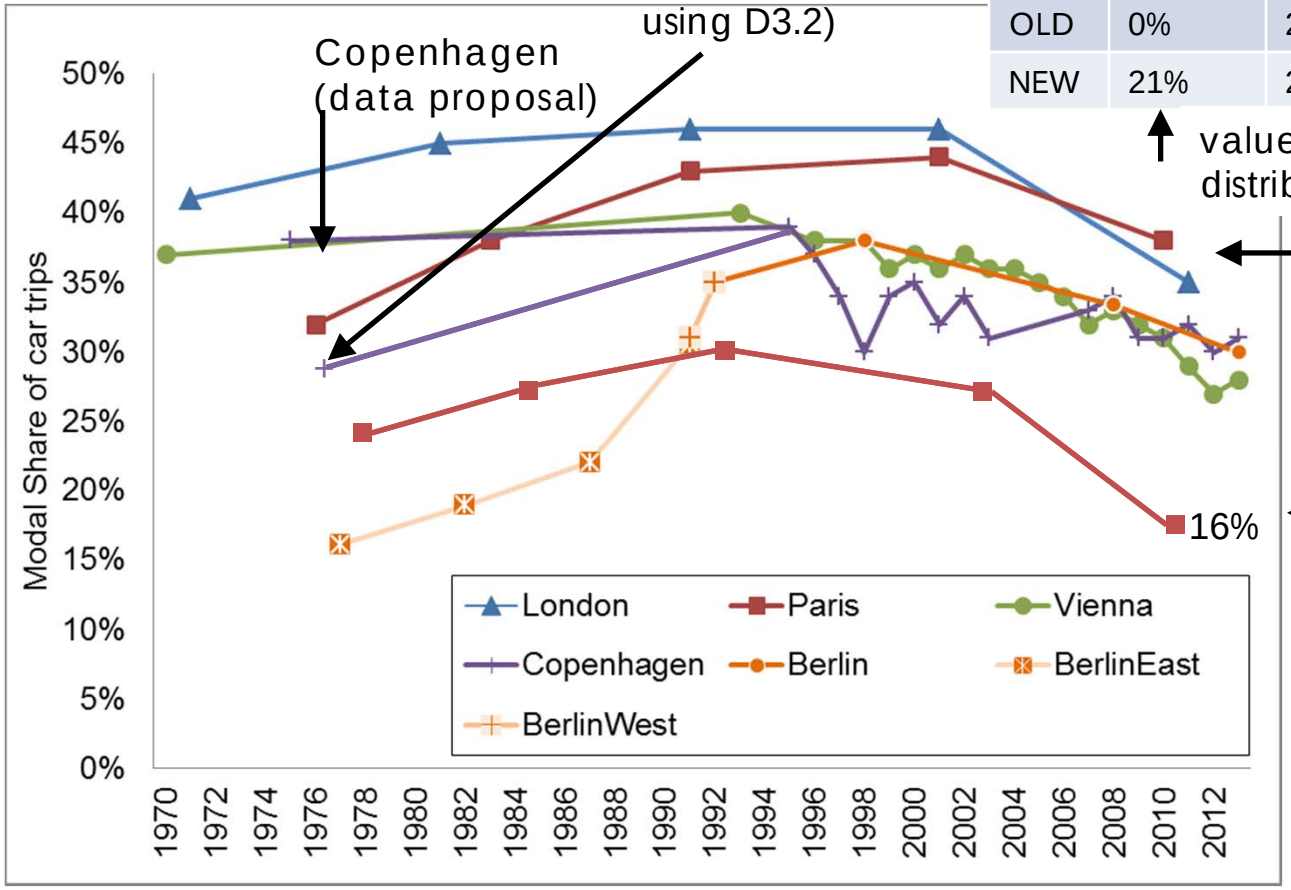
Describing the transport policy evolution cycle

Car driver modal shares over time

CREATE stage 3 cities.

	Pedes-trian	Cyc-list	Car	PT	Other
OLD	0%	28%	38%	26%	9%
NEW	21%	22%	30%	20%	7%

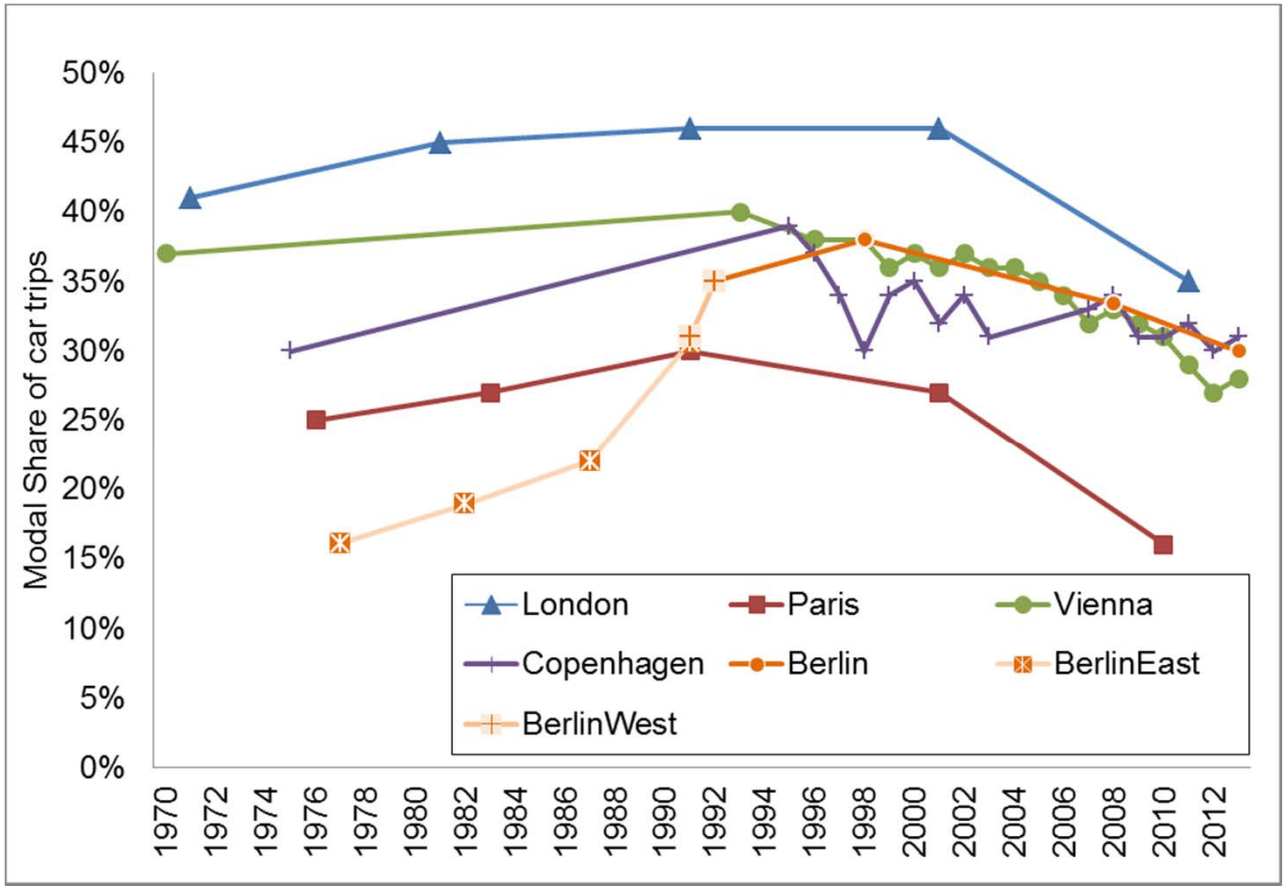
value 1998, diff = 79% relatively distributed



Describing the transport policy evolution cycle

Car driver modal shares over time

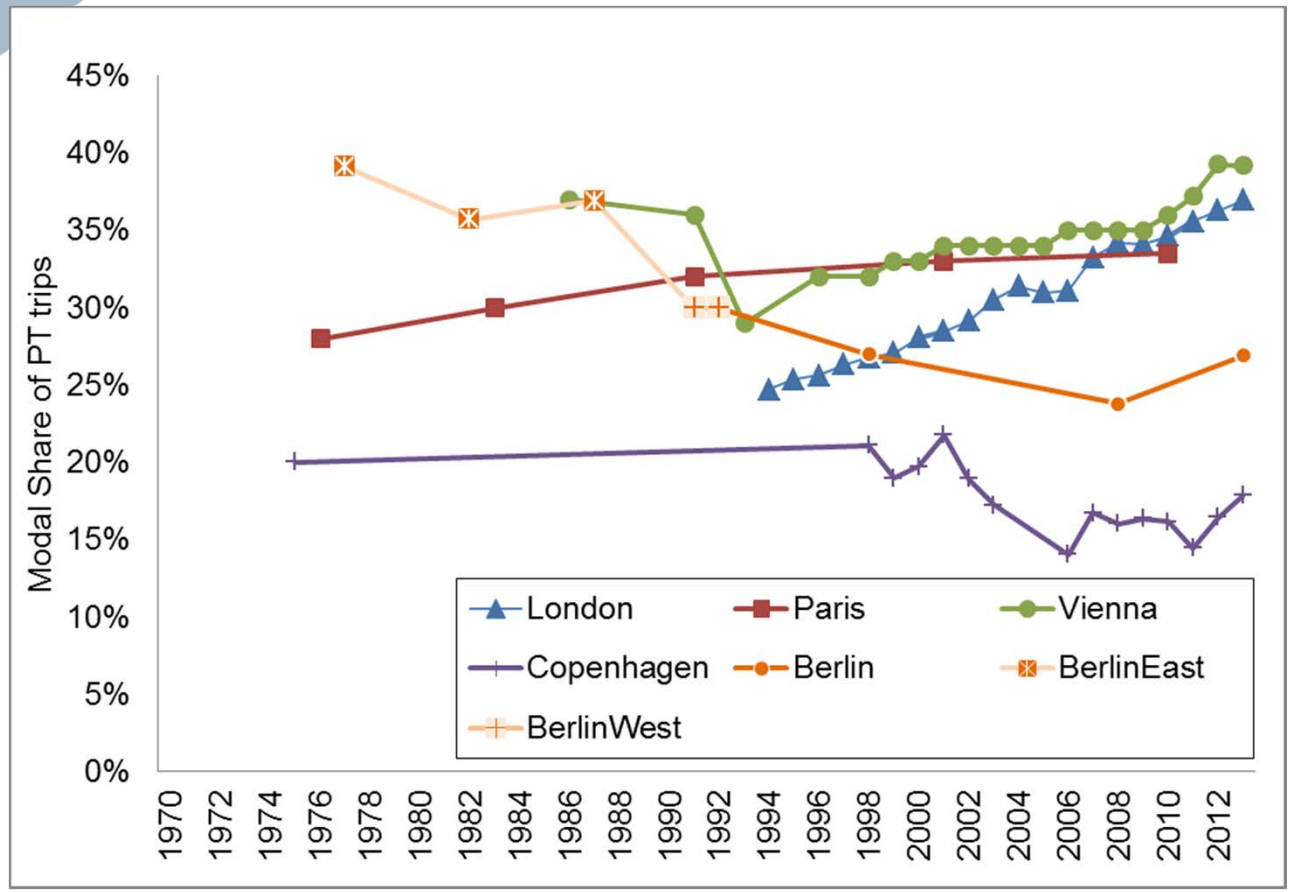
CREATE stage 3 cities (NEW visualisation).



Describing the transport policy evolution cycle

Development of PT modal share over time

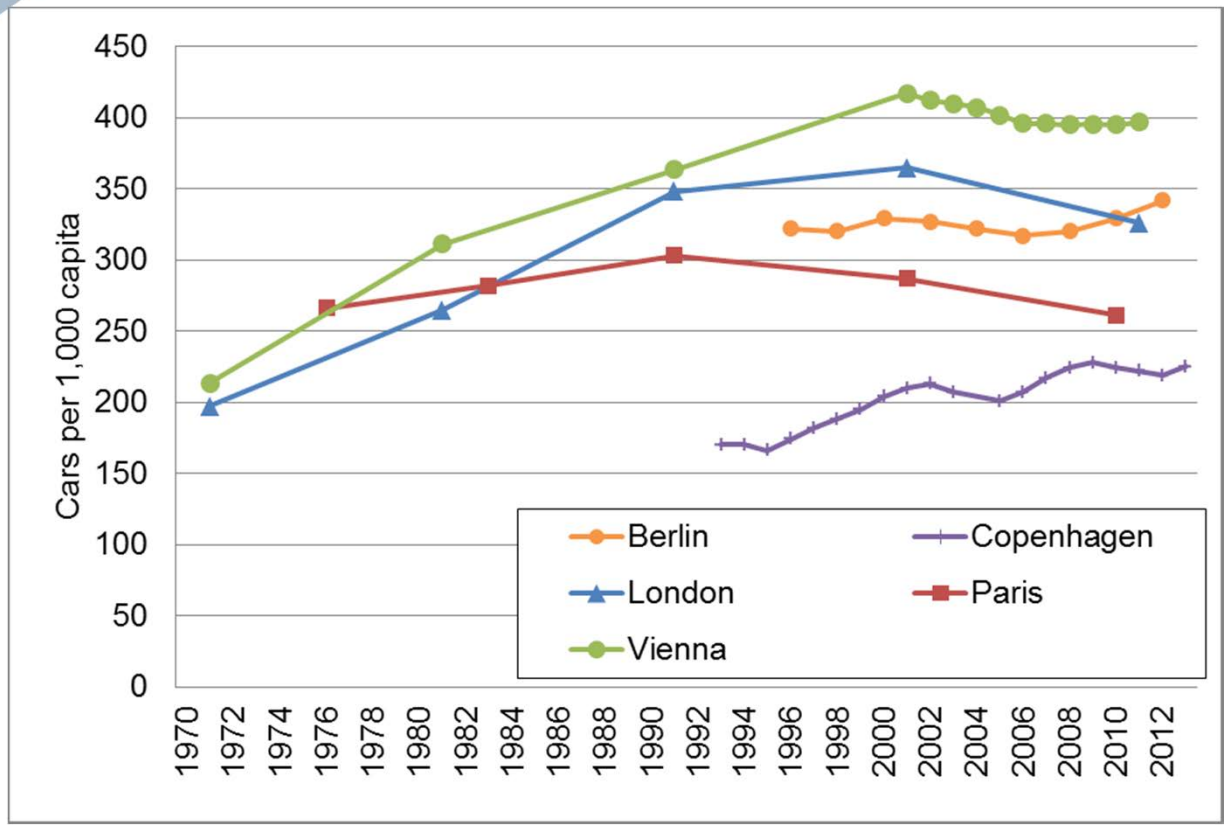
CREATE stage 3 cities (from D3.2 reports).



Describing the transport policy evolution cycle

Development of car ownership

CREATE stage 3 cities.



Development of speed: London

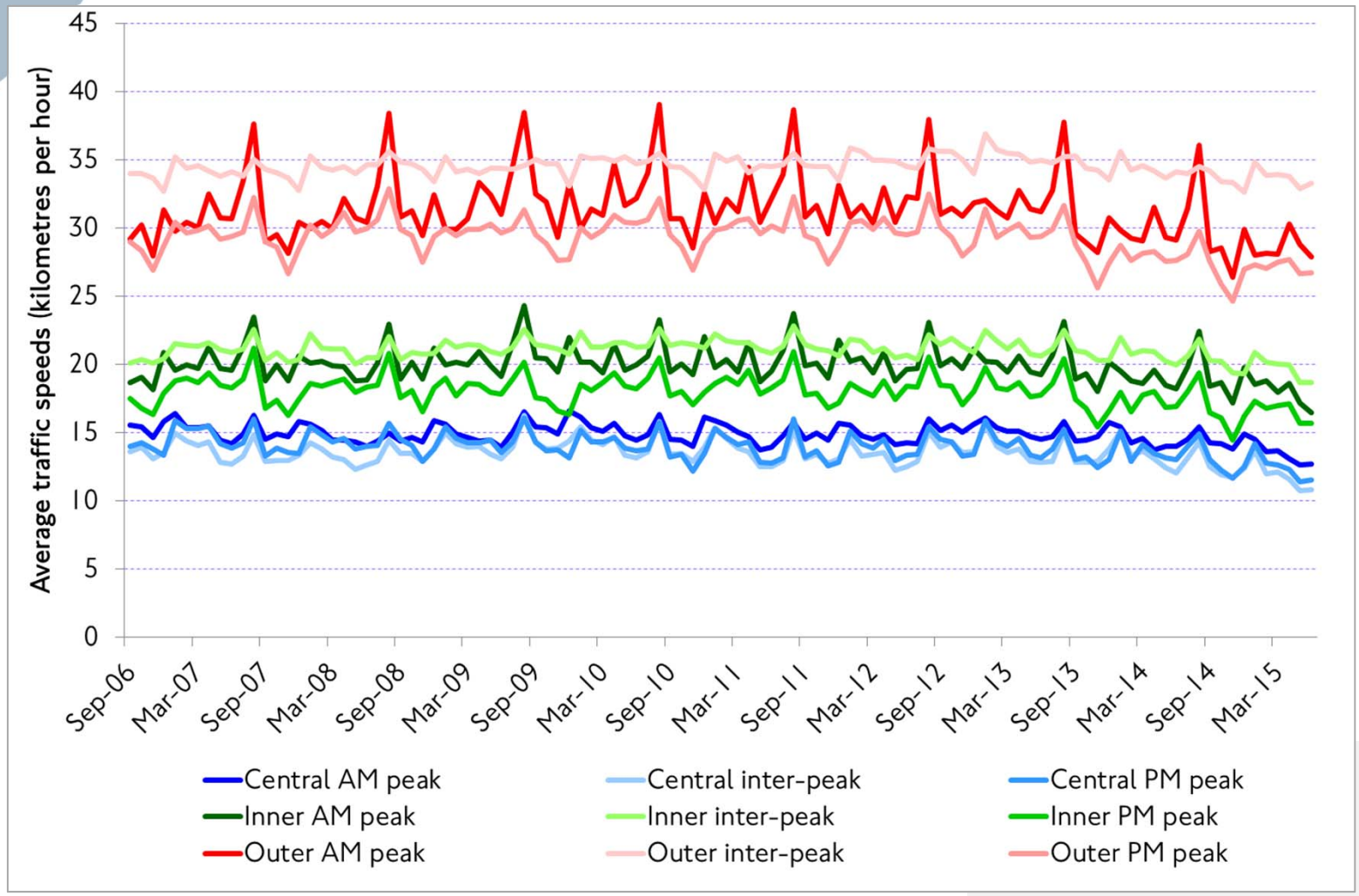


Figure 4.1.3 (b): Recent trend in average road traffic speeds in Greater London. GPS based continuous measurements. CREATE Zones 1 and 2.

Development of speed

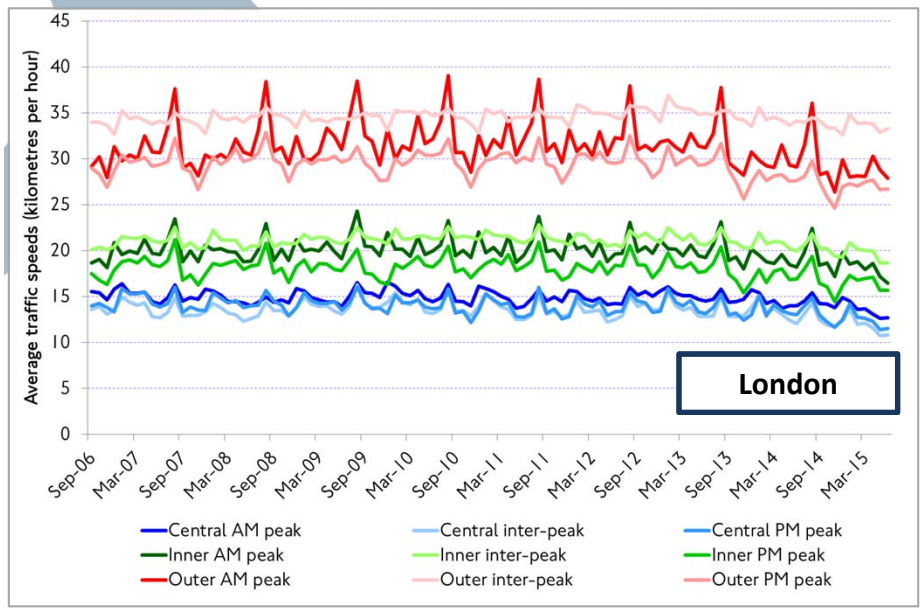


Figure 4.1.3 (b): Recent trend in average road traffic speeds in Greater London. GPS based continuous measurements. CREATE Zones 1 and 2.

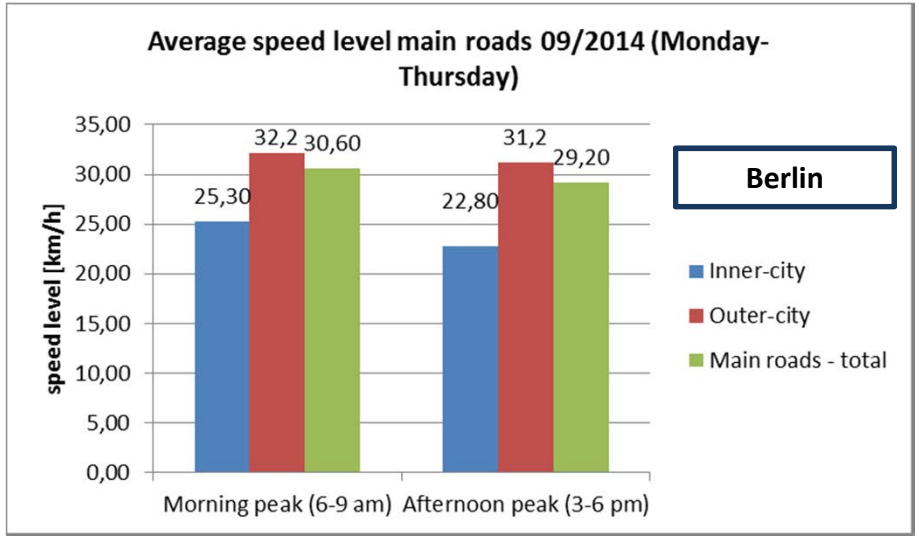


Figure 6 29: Average speed level main road network by city area, weighted by mileage (September 2014, Monday-Thursday)

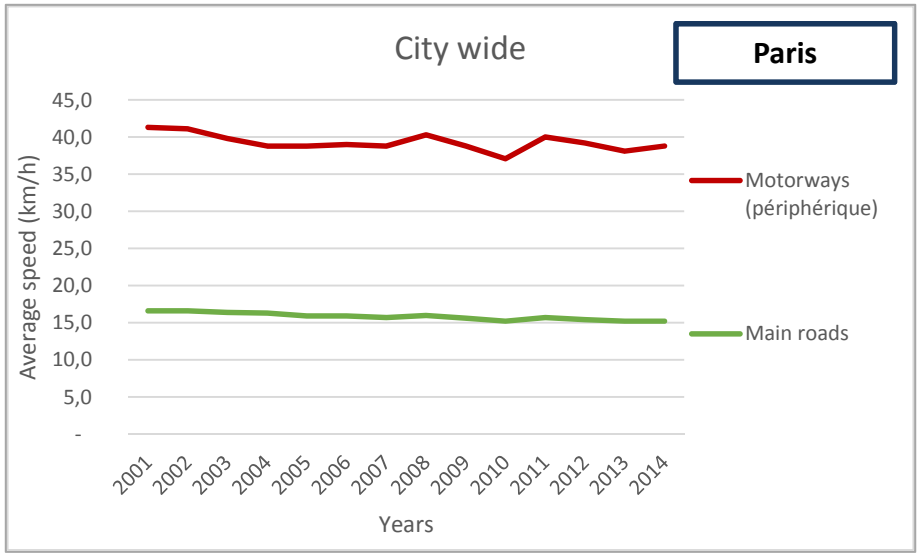


Figure 6 10: Development of average speed level, private vehicles [km/h]

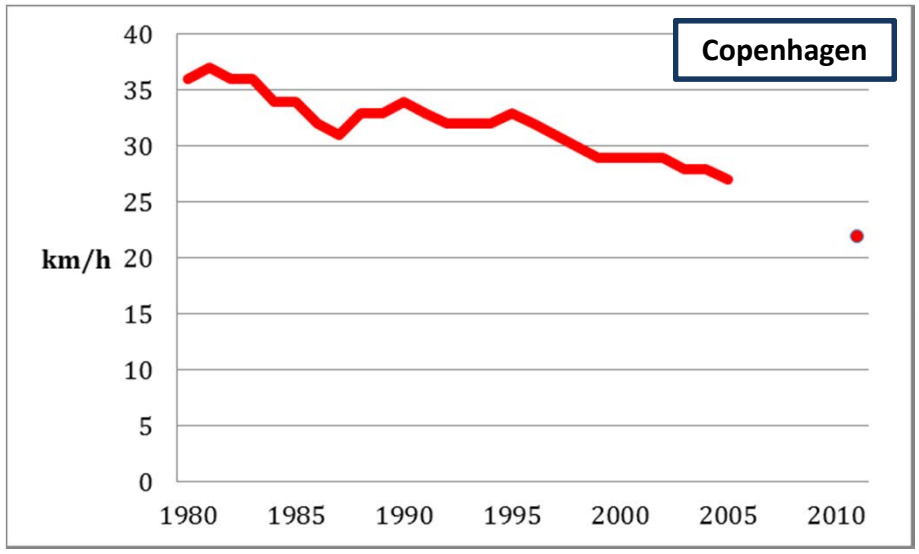


Figure 6 16: Development of the average speed level (peak hours) measured at the same six main road sections in City of Copenhagen each year.

Development of speed

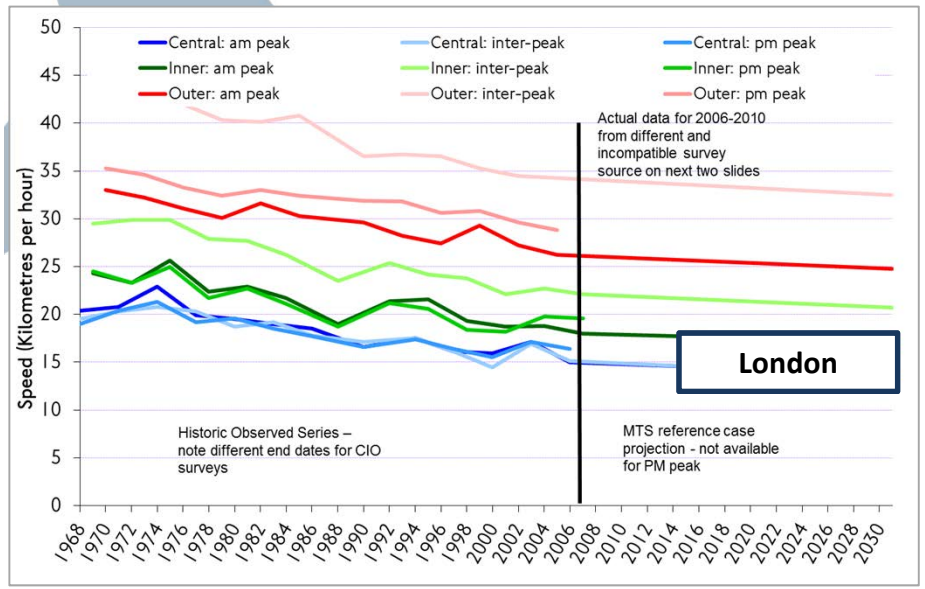
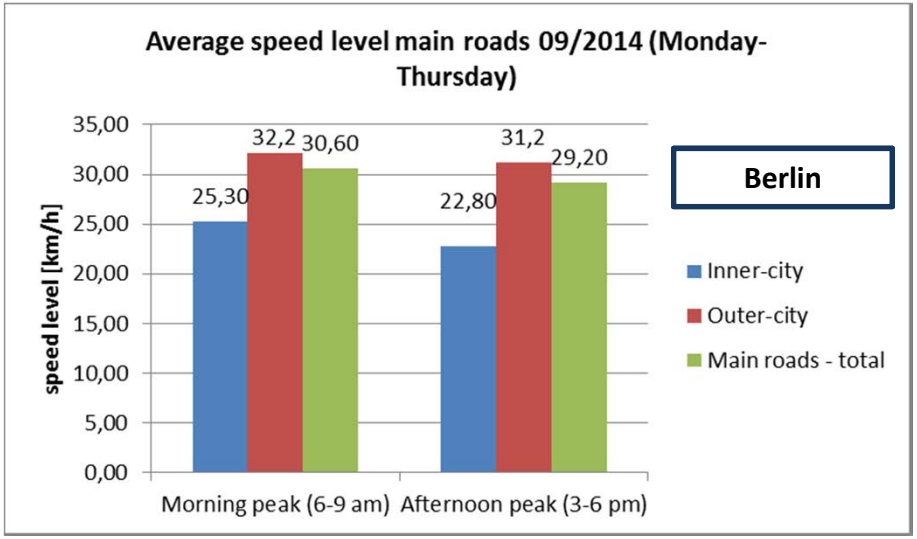


Figure 4.1.3 (a): Historic trend for road network congestion in London. Average London traffic speeds. Moving car observer periodic surveys. Zones 1 and 2.



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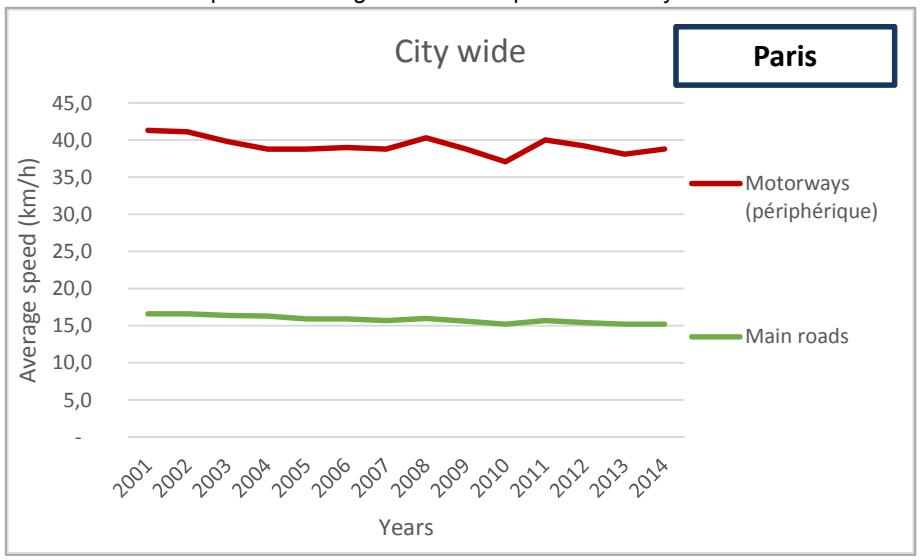


Figure 6 10: Development of average speed level, private vehicles [km/h]

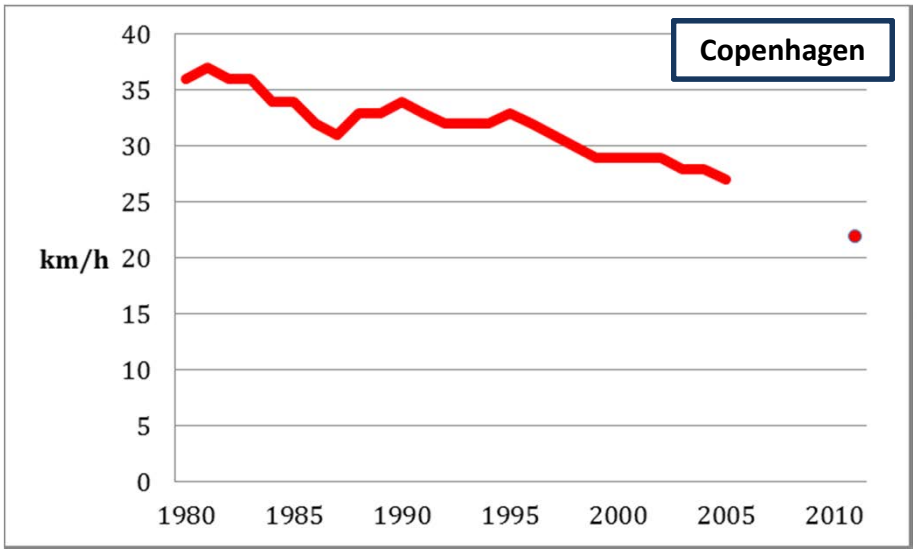


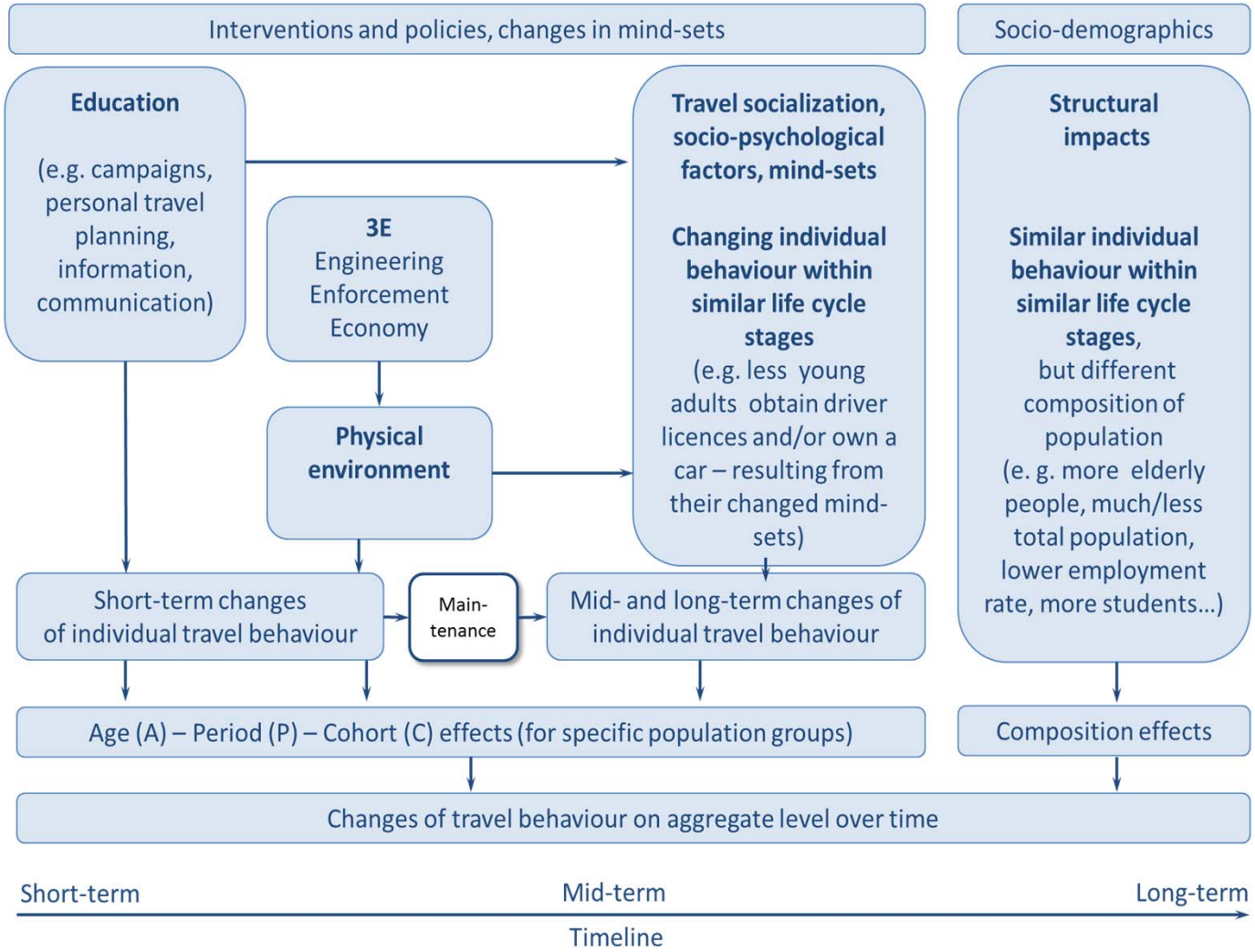
Figure 6 16: Development of the average speed level (peak hours) measured at the same six main road sections in City of Copenhagen each year.

Car ownership, car use, congestion

1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

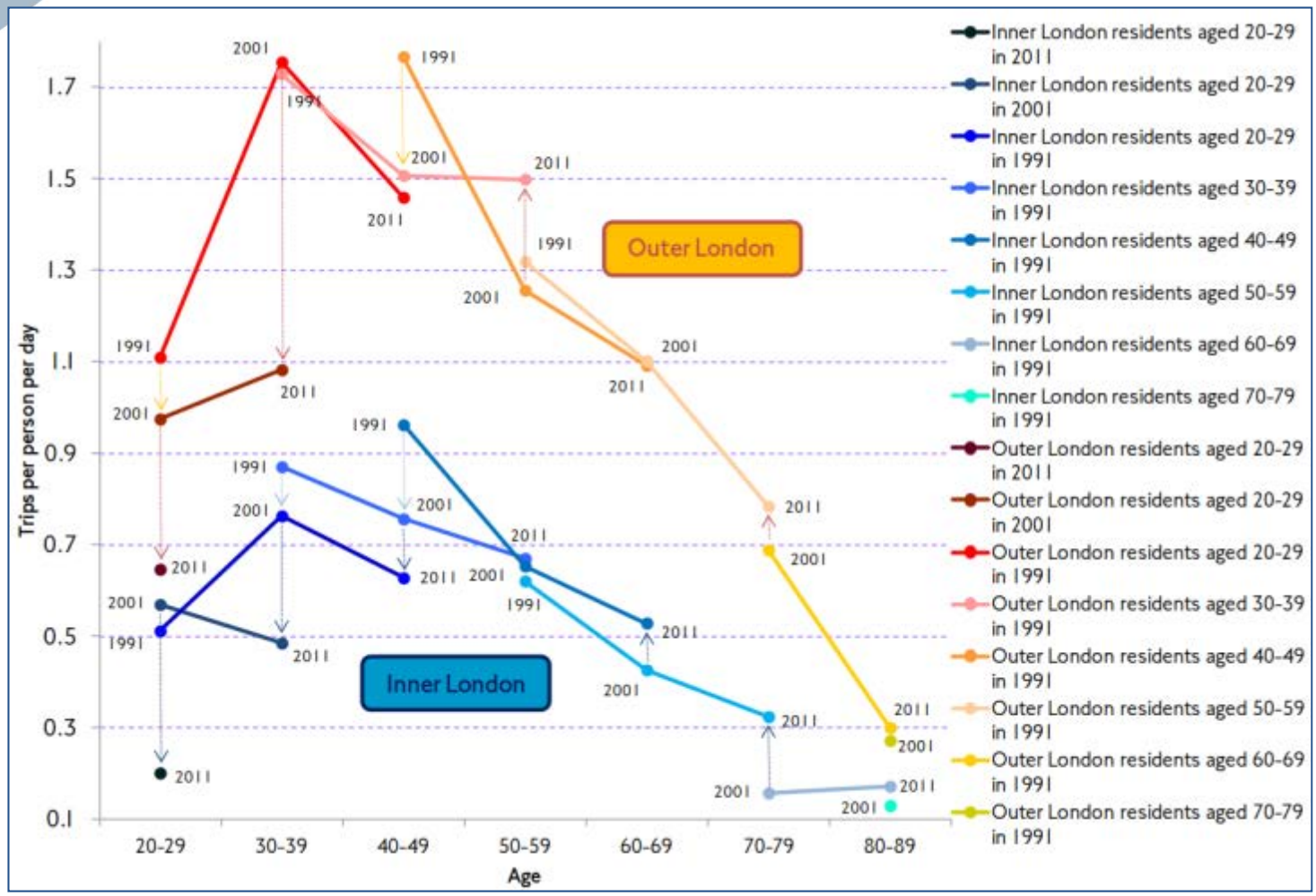
Conceptual framework for understanding the trend of reducing car use

Understanding Travel Behaviour



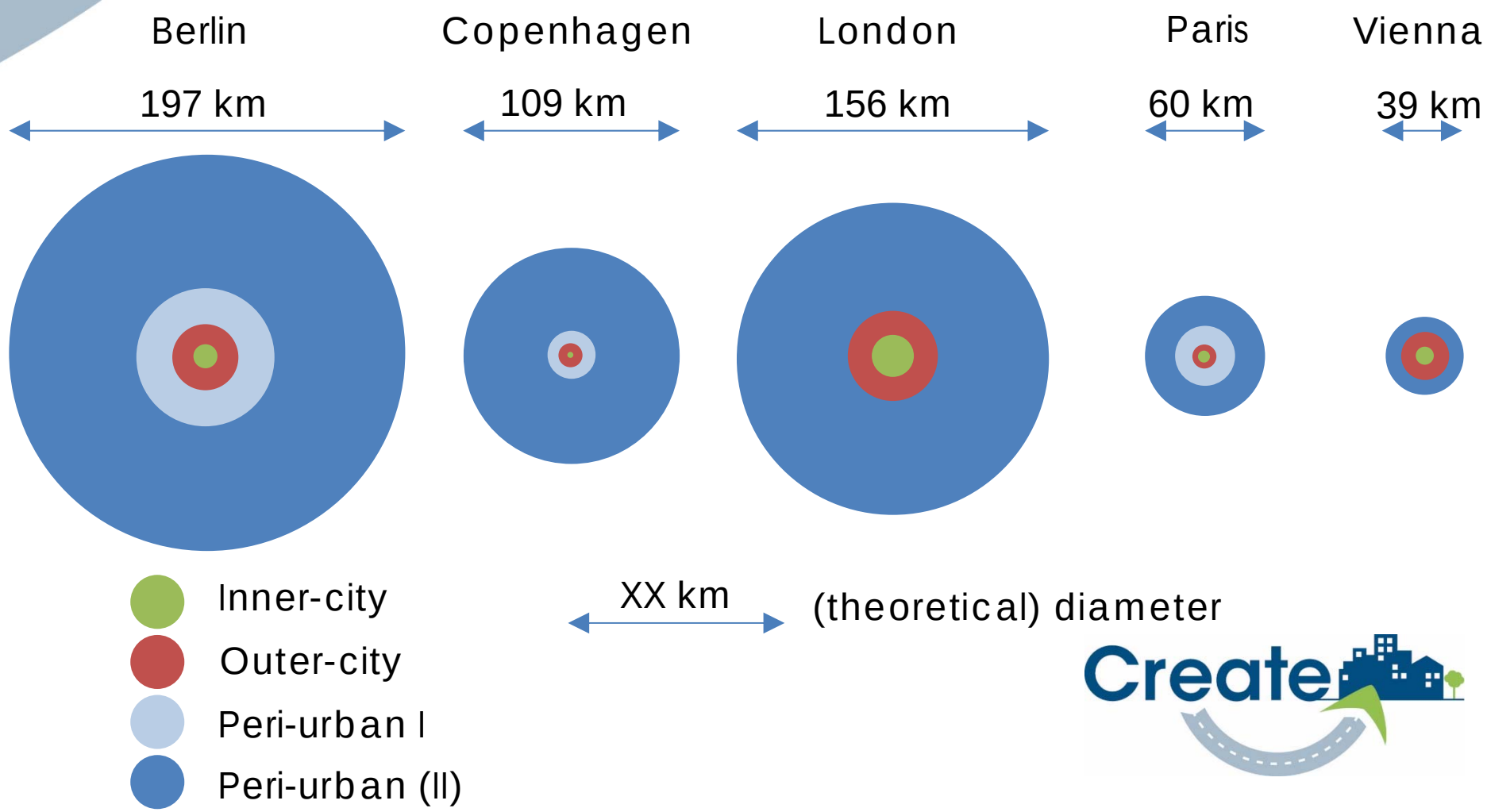
Car driver trip rates for London residents

Average weekday, by cohorts and inner/outer London, repeated cross-sectional data for the years 1991, 2001 and 2011

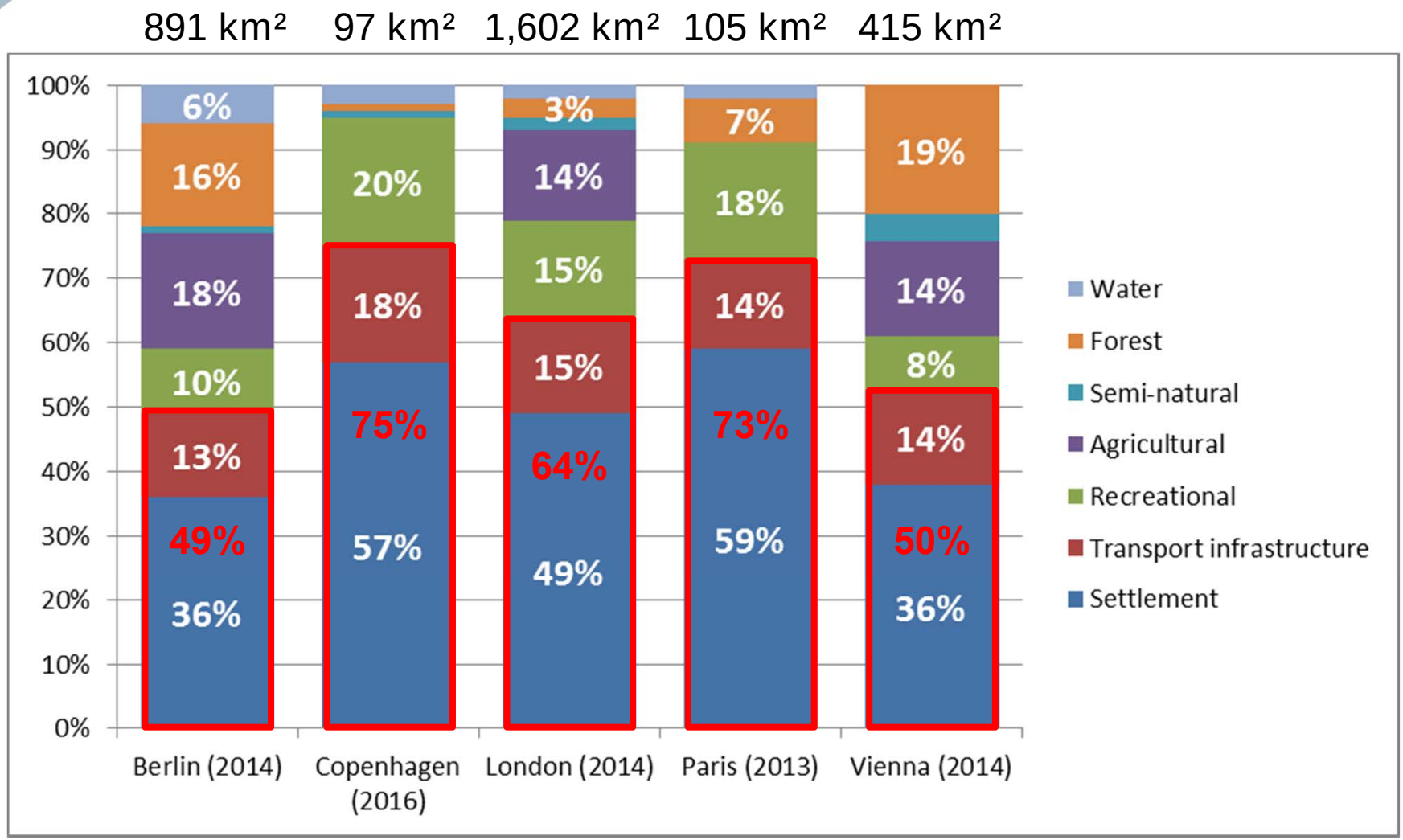


City Size and Land Use

Comparison of land-use categories



Comparison of land-use categories (City-wide)



Visualisation of developments

City / Indicator	Berlin		Copenhagen		London		Paris		Vienna	
Total number of inhabitants (City-wide) [Mio.]	→	3.47	↗	0.68	↗	8.54	→	2.23	↗	1.77
		2014		2015		2014		2013		2014

Indicator
() – spatial coverage
[] – unit of measure

Direction and intensity of development

Year of reference

City-specific value

↗ / ↘ = clear/significant increase/decrease (within the last 20 years)
↗ / ↘ = moderate/slight increase/decrease (within the last 20 years)
→ = nearly no change over time (within the last 20 years)

Time-span of developments

Comparison of land-use categories

Indicator \ City	Berlin		Copenhagen		London		Paris		Vienna	
Size of total City area [km²]	→	891 2014	→	97 2016	→	1,572 2014	→	105 2013	→	415 2014
(1) Size of total City area – area for forest or water [km²]	→	695 2014	N/A	93 2014	→	1,493 2014	→	96 2013	↘	315 2014
(2) Size of Settlement and transport infrastructure area [km²]	→	436 2014	N/A	73 2014	→	1,006 2014	→	77 2013	↗	207 2014
Share of settlement and transport infrastructure area (2) / (1) [%]	→	63 2014	N/A	78 2014	→	67 2014	→	80 2013	↗	66 2014

↗ / ↘ = clear/significant increase/decrease (within the last 20 years)

↗ / ↘ = moderate/slight increase/decrease (within the last 20 years)

→ = nearly no change over time (within the last 20 years)

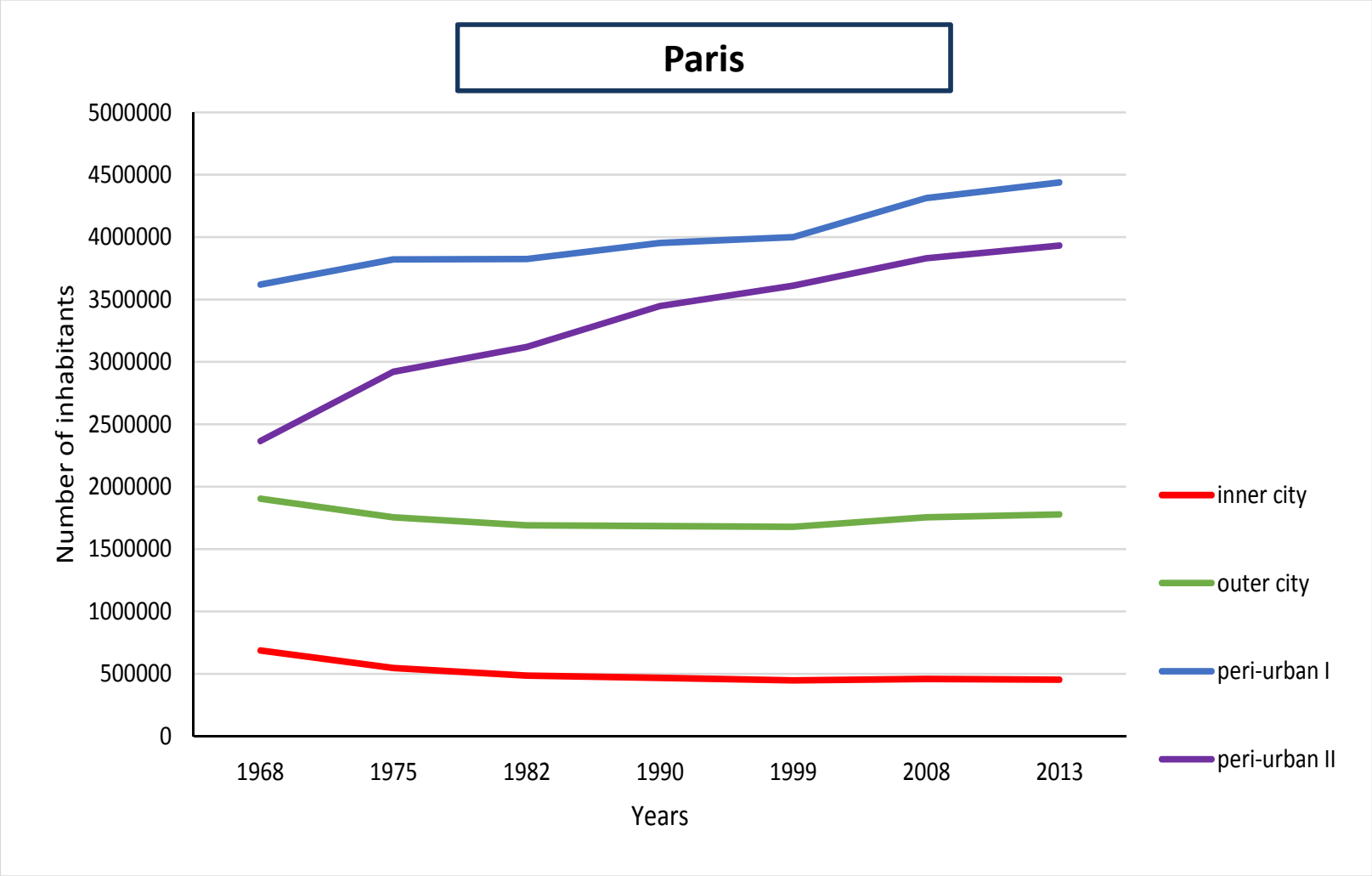
City size, land use

1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

Density: Residents, Work Places

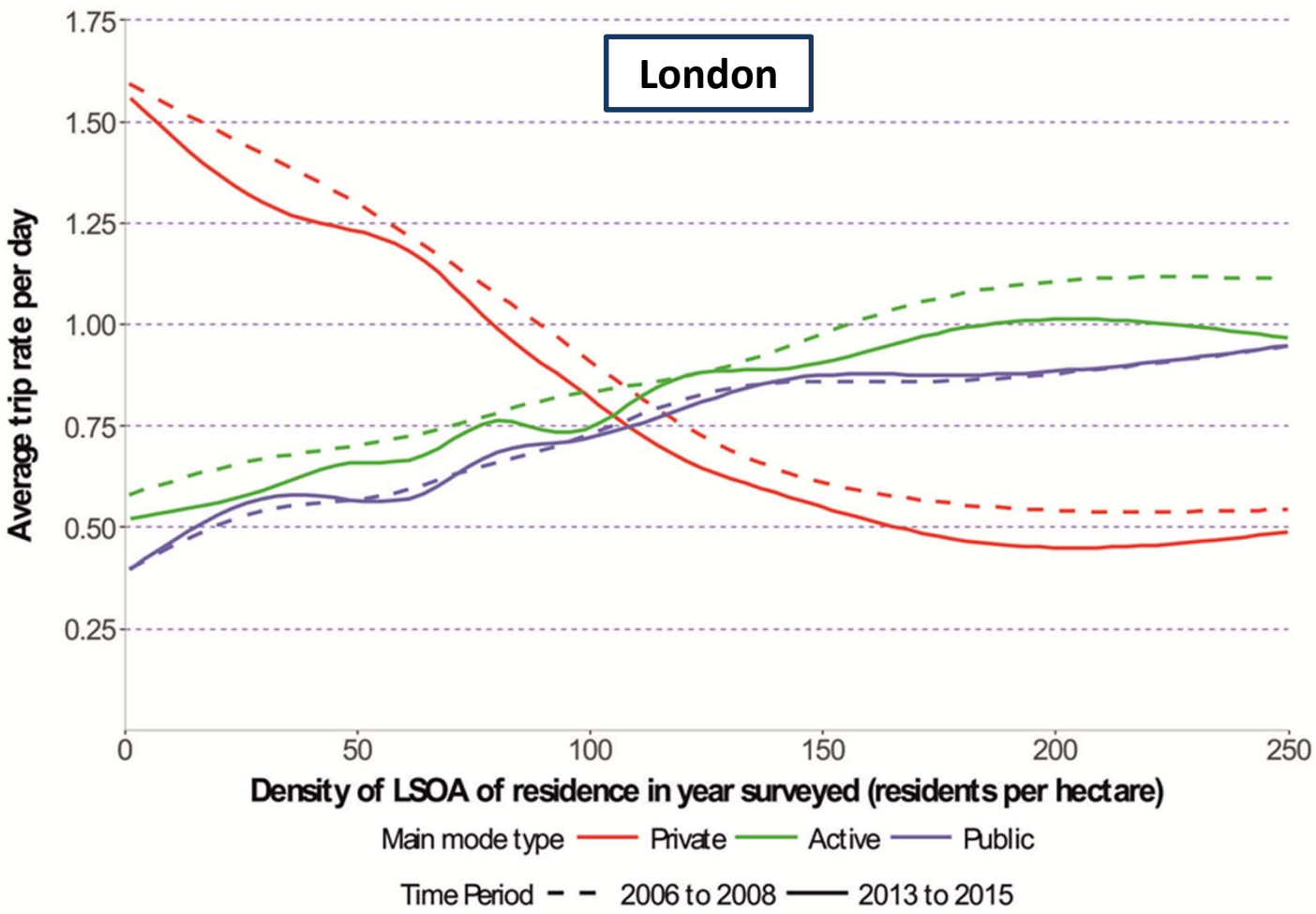
Structural impacts:

Population growth consistently in peri-urban areas



Trip rates as a function of density:

Density might be a good moderator variable for explaining the impact of land use, city development and transport supply on travel demand



Overall indicators for inhabitants

Indicator \ City	Berlin		Copenhagen		London		Paris		Vienna	
Total number of inhabitants (City-wide) [Mio.]	→	3.47	↗	0.68	↗	8.54	→	2.23	↗	1.77
		2014		2015		2014		2013		2014
Total number of inhabitants (Inner-city) [Mio.]	→	1.05	→	0.052	↗	3.40	→	0.45	↗	0.50
		2014		2015		2014		2013		2014
Total number of inhabitants (Outer-city) [Mio.]	→	2.42	↗	0.63	↗	5.14	→	1.78	↗	1.27
		2014		2015		2014		2013		2014
Total number of inhabitants (Peri-urban I) [Mio.]	↗	.93	↗	0,59	N/A	N/A	↗	4,43	↗	0.26
		2014		2015		N/A		2013		2014
Peri-urban I population : Total City population	→	1 : 3.73	↗	1 : 1.15	N/A	N/A	↗	1.98 : 1	→	1 : 6.8
		2014		2015		N/A		2013		2014

↗ / ↘ = clear/significant increase/decrease (within the last 20 years)

↗ / ↘ = moderate/slight increase/decrease (within the last 20 years)

→ = nearly no change over time (within the last 20 years)

Comparison of density

Indicator \ City	Berlin		Copenhagen		London		Paris		Vienna	
Size of Inner-city area (km²)	→	90	→	9	→	319	→	23	→	46
		2014		2016		2014		N/A		2014
Size of Outer-city area [km²]	→	801	↗	88	→	1,253	→	82	↗	369
		2014		2016		2014		N/A		2014
Size of Peri-urban I area (km²]	↗	2,864	↗	406		N/A	↗	567*	↗	797*
		2014		2016		NA		N/A		2014
Density of Total city inhabitants per area (City area – area for forest or water) [persons/km²]	→	4,995	↗	7,302	↗	5,718	→	23,272	↗	5,614
		2014		2015/16		2014		2013		2014
Density of Total workplace jobs per area (City area – area for forest or water) [jobs/km²]	↗	2,032	↗	4,196	↗	3,817	→	17,094	N/A	N/A
		2014		2014/16		2014/16		2012/13		N/A

↗ / ↘ = clear/significant increase/decrease (within the last 20 years)

↗ / ↘ = moderate/slight increase/decrease (within the last 20 years)

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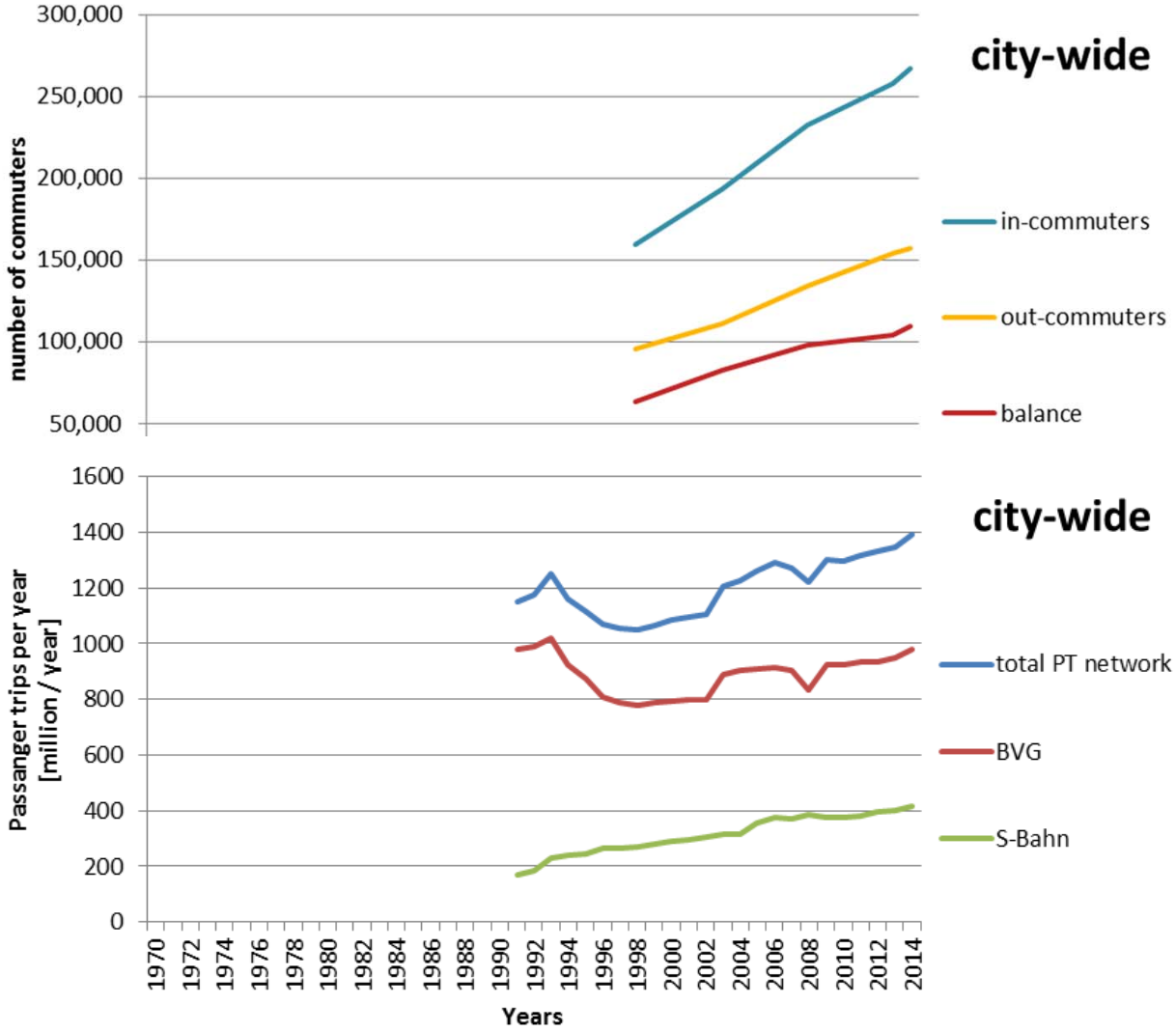
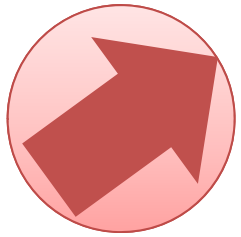
* Whole Peri-urban area

Changes in travel behaviour (Berlin):

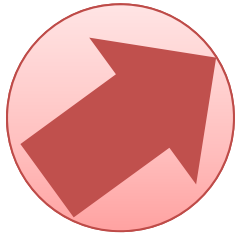
Dynamic increase of commuting, Increasing number of PT passengers after sharp drop due to the reunification



Commuting



PT passenger



Density: residents, work places

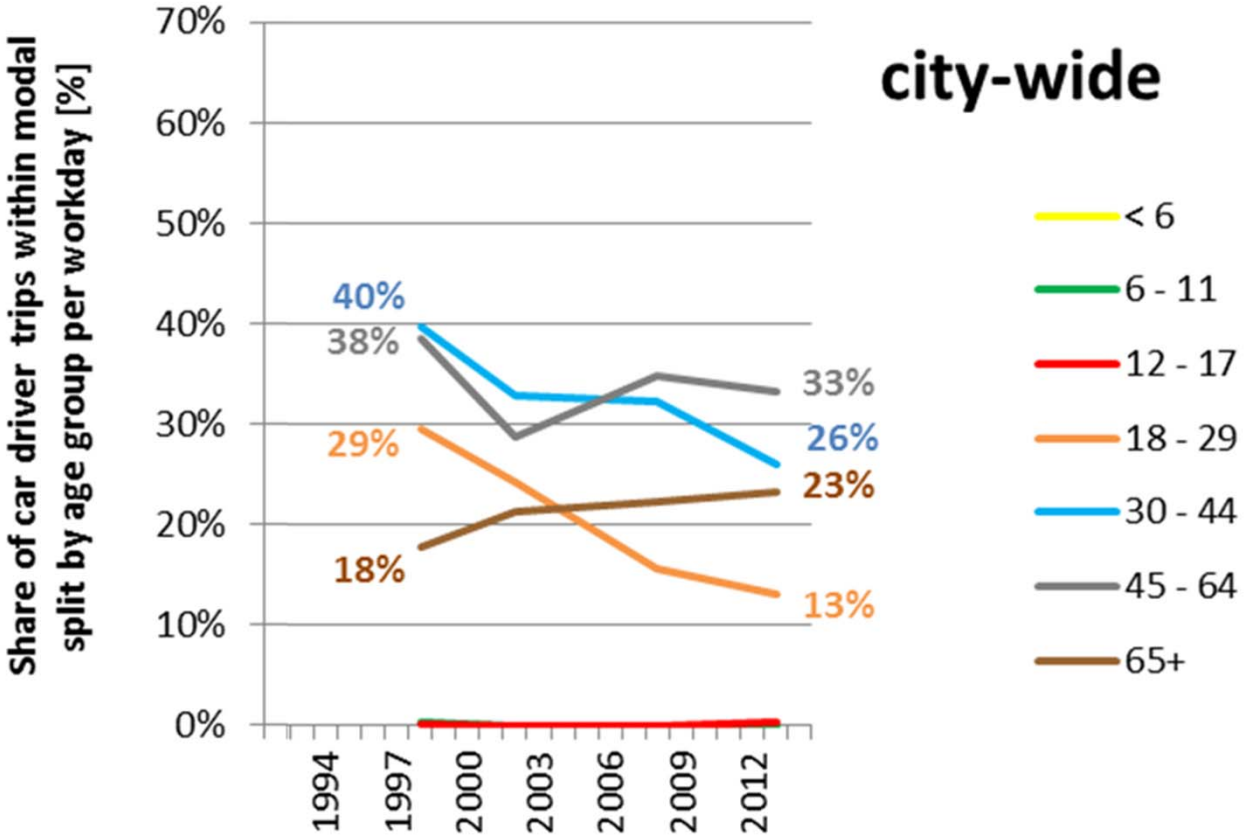
1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

Proportion of young persons, seniors

Describing the transport policy evolution cycle

Car driver modal shares over time, per age group

Example: City of Berlin.



Comparison of overall indicators for inhabitants

City / Indicator	Berlin		Copenhagen		London		Paris		Vienna	
Total number of inhabitants (City-wide) [Mio.]	→	3.47 2014	↗	0.68 2015	↗	8.54 2014	→	2.23 2013	↗	1.77 2014
Total number of young people < 18 (city-wide) [Mio.]	↘	0.54 2014	↗	0,12 2016	↗	~2.00 N/A	→	0.24 2010	→	0.34** 2014
Share of Young people [%]	↘	16 2014	↗	18 2014/15	↗	23 2011/14	→	11 2010/13	→	19 2010
Total number of seniors >=65 (city-wide) [Mio.]	↗	0.67 2014	↘	0,08 2014	↘	0,90 2011.	→	0.44 2010/13	↘	0.30 2014
Share of Seniors [%]	↗	19 2014	↘	12 2014/15	↘	11 2011/14	→	20 2010/13	↘	17 2010

↗ / ↘ = clear/significant increase/decrease (within the last 20 years)

↗ / ↘ = moderate/slight increase/decrease (within the last 20 years)

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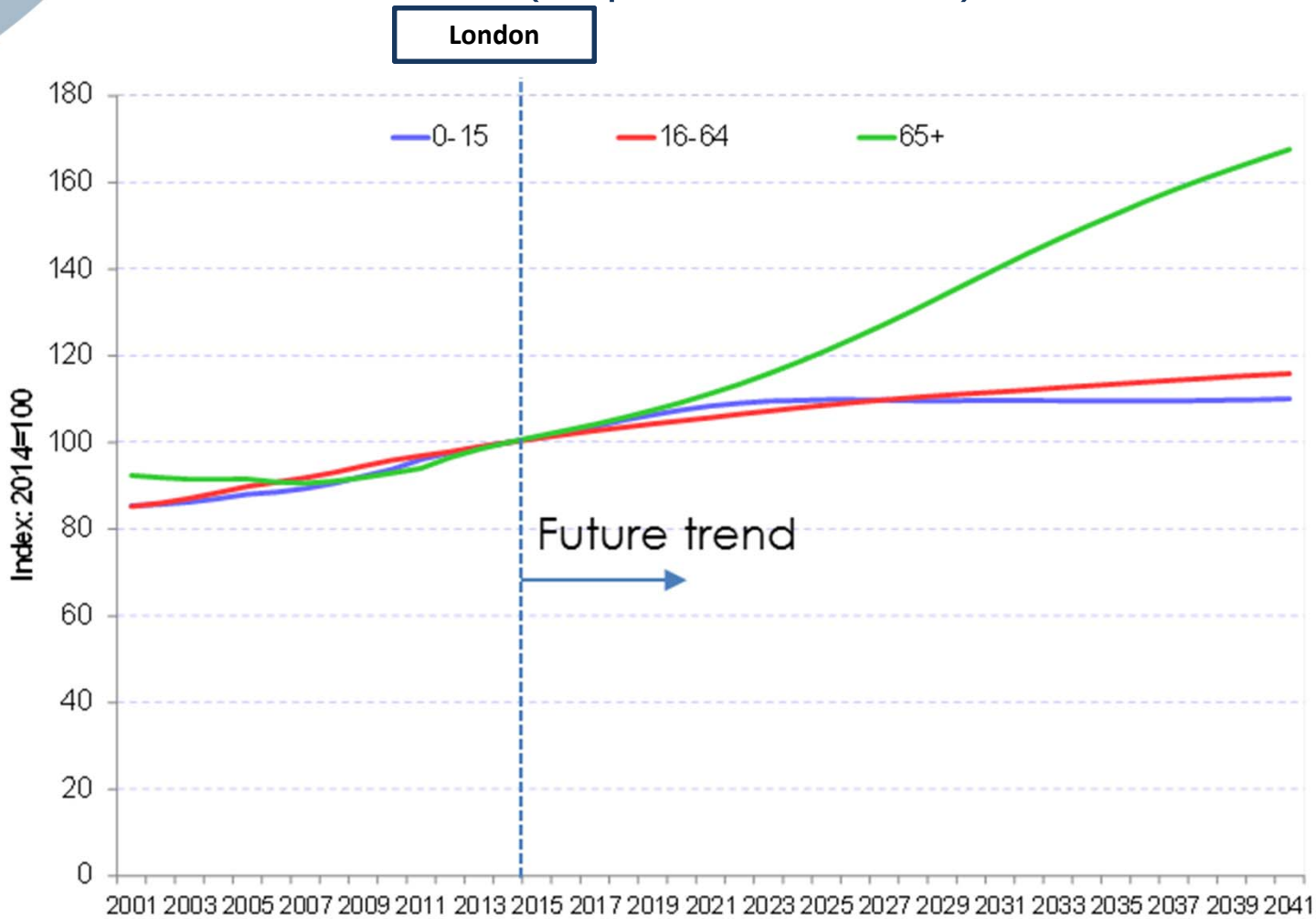
** <20 years of age

Structural impacts:

Population growth and aging of the population influence travel demand (coposition effects)



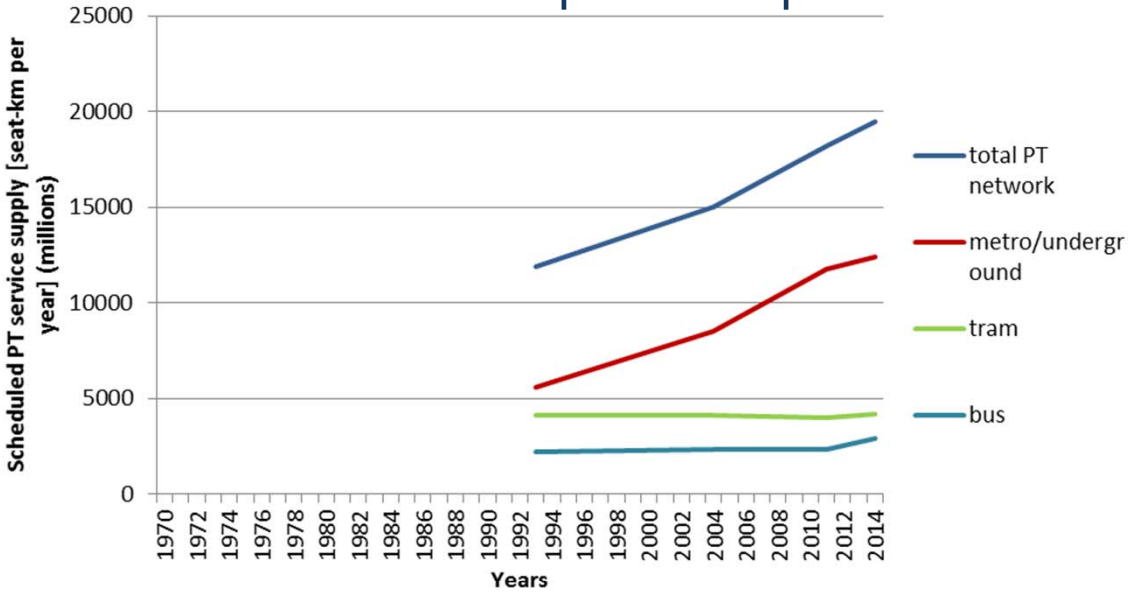
Proportion of young persons, seniors

1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

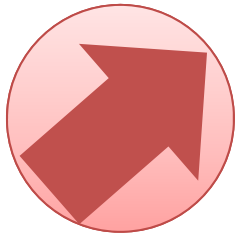
Income and Prices

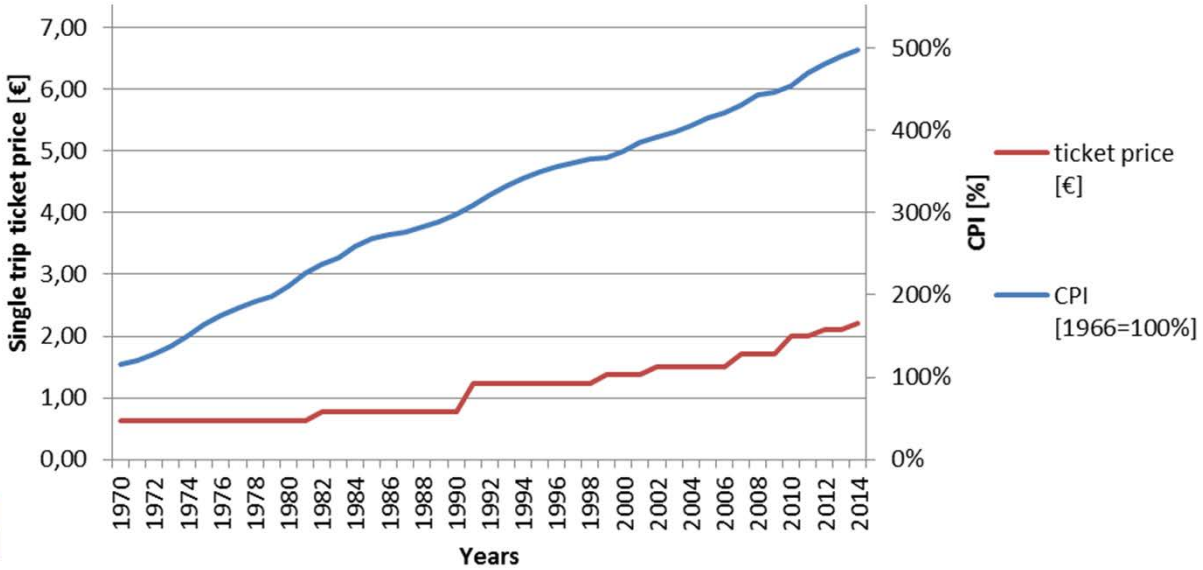
PT System City of Vienna

Efforts in increasing the attractiveness of the PT system, competitive prices

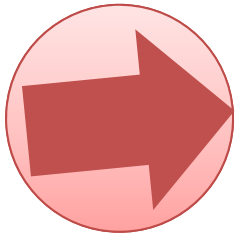


Service supply





Prices



Income and prices

Indicator \ City	Berlin		Copenhagen		London		Paris		Vienna	
GDP per capita (city-wide) [€/capita]	↗	31,526 2014	↗	65,467 2014	↗	60,761*** 2014	↗	53,617 2013	↗	47,200 2014
Price for a PT single trip ticket (central zone) (city-wide) [Euro]	↗	2.60 2014	↗	3.22 2015	↗	3.90***** 2014	↗	1.90 2016	↗	2.20 2014
Price for a PT annual ticket (central zone) (city-wide) [Euro]	↗	722 2014	↗	684 2015	↗	N/A N/A	↗	770 2016	↘	365 1014
Highest parking fee per hour (public streets, inner-city) [Euro/h]	↗	3.00 2017	↗	4.70 2017	↗	~13.50****** 2015	↗	4.00 2015	↗	2.00 2014

↗ / ↘ = clear/significant increase/decrease (within the last 20 years)

↗ / ↘ = moderate/slight increase/decrease (within the last 20 years)

→ = nearly no change over time (within the last 20 years)

*** GVA – Gross Value Added

**** Underground 1-4 Oyster Card

***** Congestion charge

Income, prices

1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

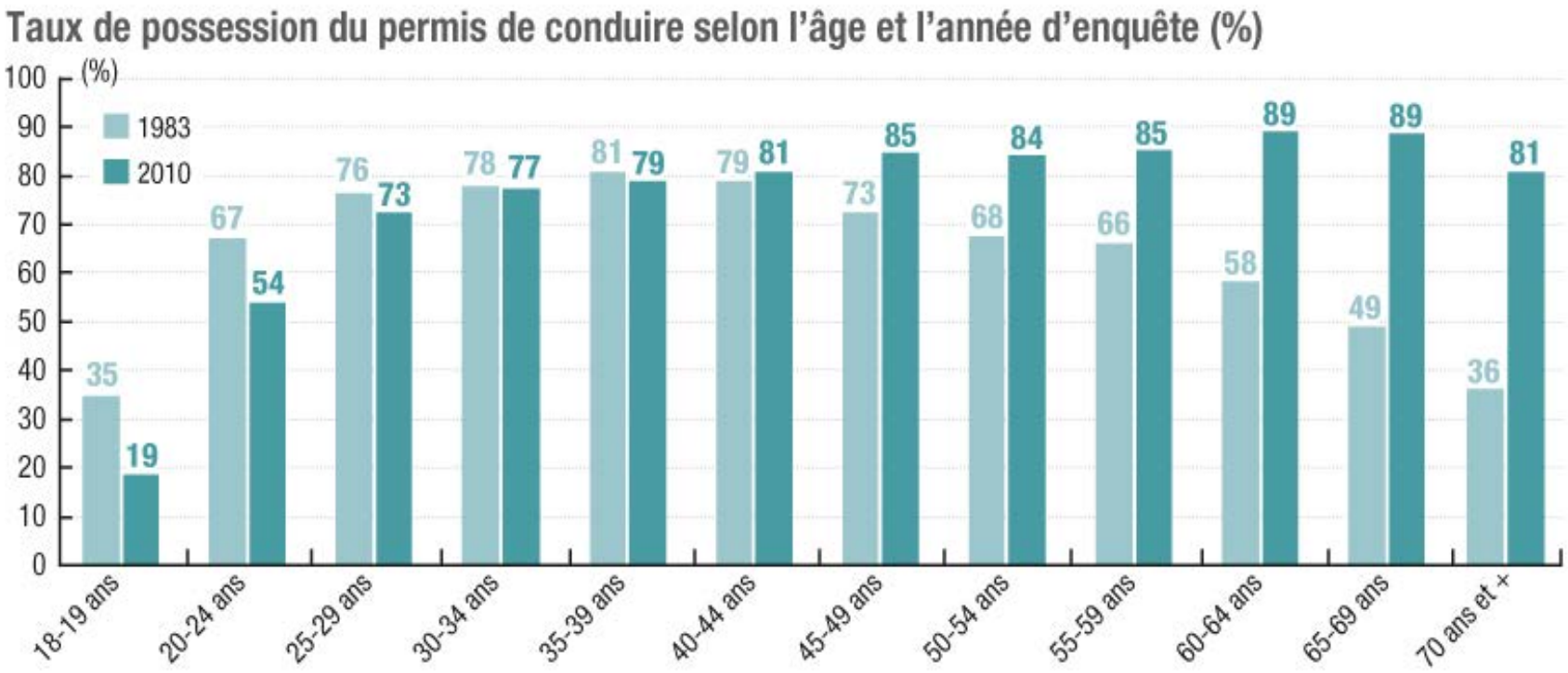
Travel Behaviour, Mobility Tools

Mobility tools/Access to transport modes:

Changes in driving license ownership

Paris

Driving license rate according to the age and the survey's year (%)



Source : EGT 2010 STIF - OMNIL - DRIEA - Traitements IAU ÎdF.

Mobility tools and travel demand

Indicator \ City	Berlin		Copenhagen		London		Paris		Vienna	
Number of private cars per inhabitant within the last 20 years (city-wide) [cars per 1,000 persons]	→	326*	↗	250	→	333**	↘	243	→	387
		2015		2015		2011		2010		2014
Number of driving licences per 1,000 inhabitants (city-wide) [%]	↗	729	N/A	N/A	↗	454	↗	642	N/A	N/A
		2015		N/A		2014/15		2010		N/A
Average number of trips per tripmaker and workday]trips / person, 24 h]	→	3.9	↘	2.9	↘	3.2***	→	3.9	↘	3,1
		2013		2015		2011		2010		2014
Development of share of car use on Modal Split within the last 10 years (driver and passenger) [%]	↘	30	→	26	↘	37***	↘	16	↘	27
		2013		2015		2014		2010		2014

* private and commercial passenger cars
** calculated by cars/household and average household size
*** per week day (Mo-Fr)

Travel behaviour, mobility tools

1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

Various interesting Issues

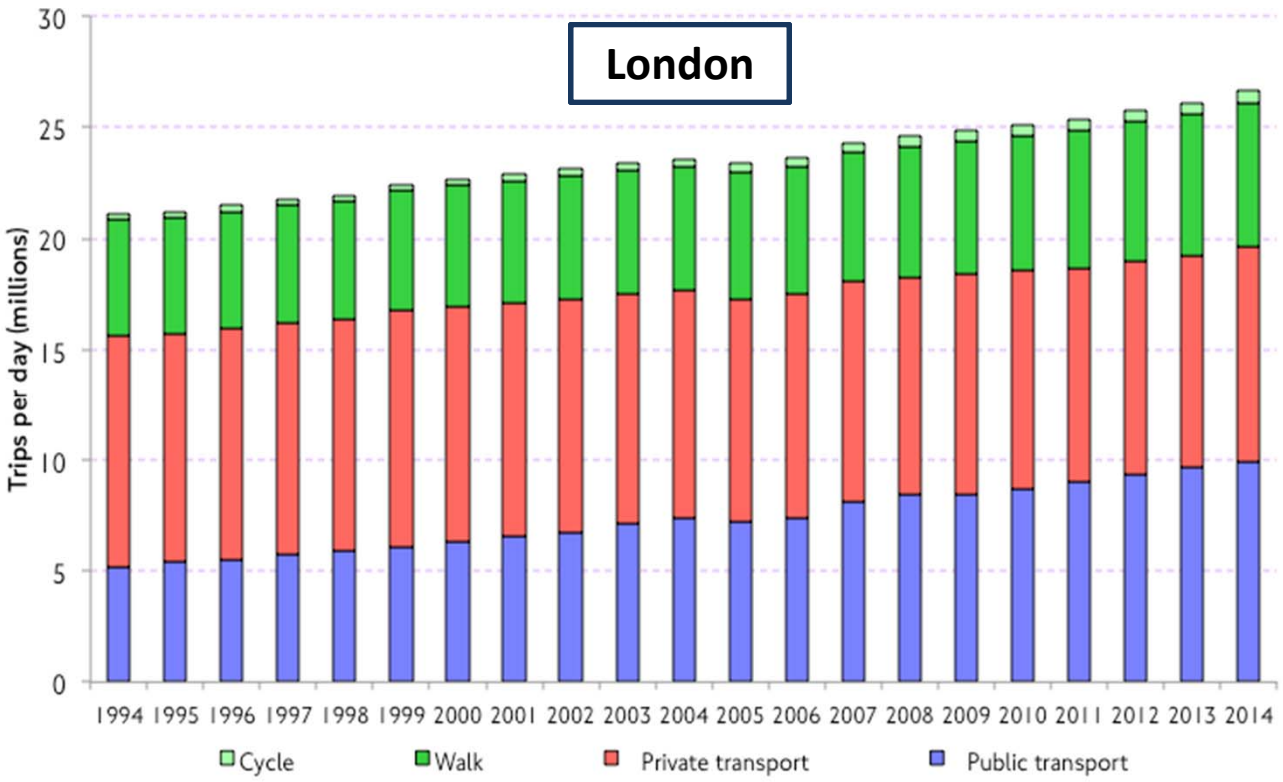
Thinking outside the box: Comparability issues to be solved

Issues to be checked or not to be checked:

- Length of main road network
- Length of PT network without bus-lines
- PT supply in seat-km/place-km/??
- Development of “real” car costs (fix and variable parts)
- Limited comparability of HTS indicators
- Traffic volume information
- Floating car data for congestion

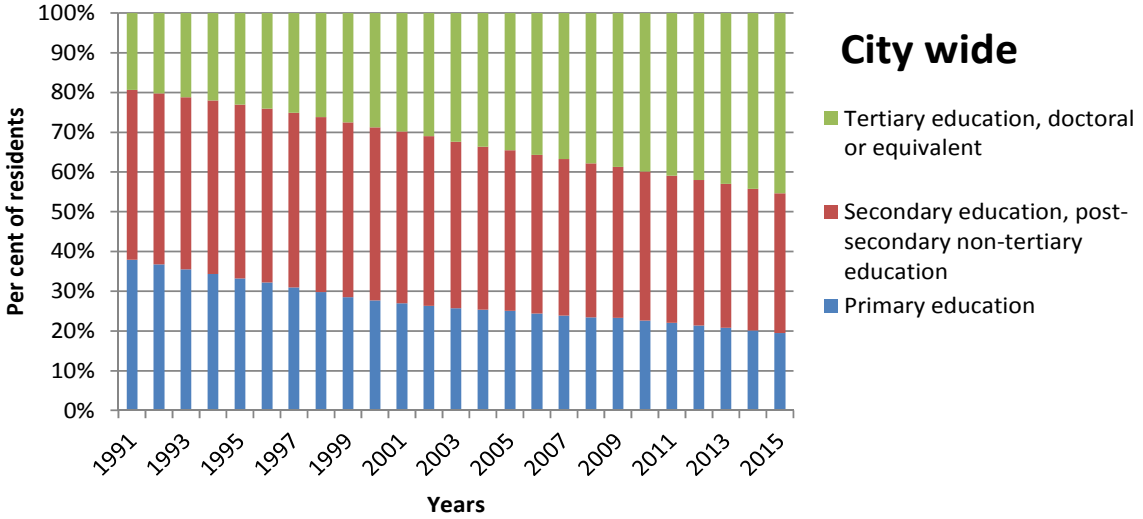
Changes in travel behaviour:

Travel volume has significantly increased, doubling of PT trips since 1994, decreasing car use

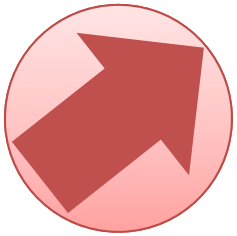


Structural impacts:

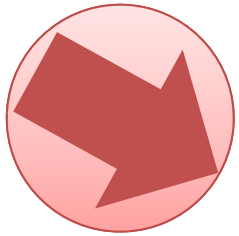
Increase of education level, younger population

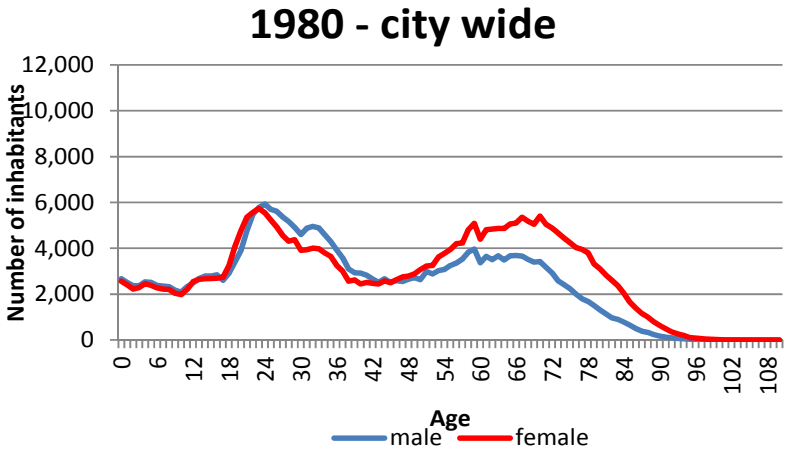


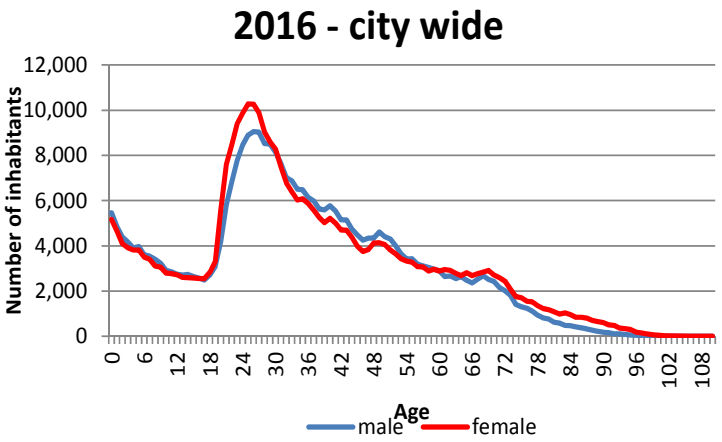
Education



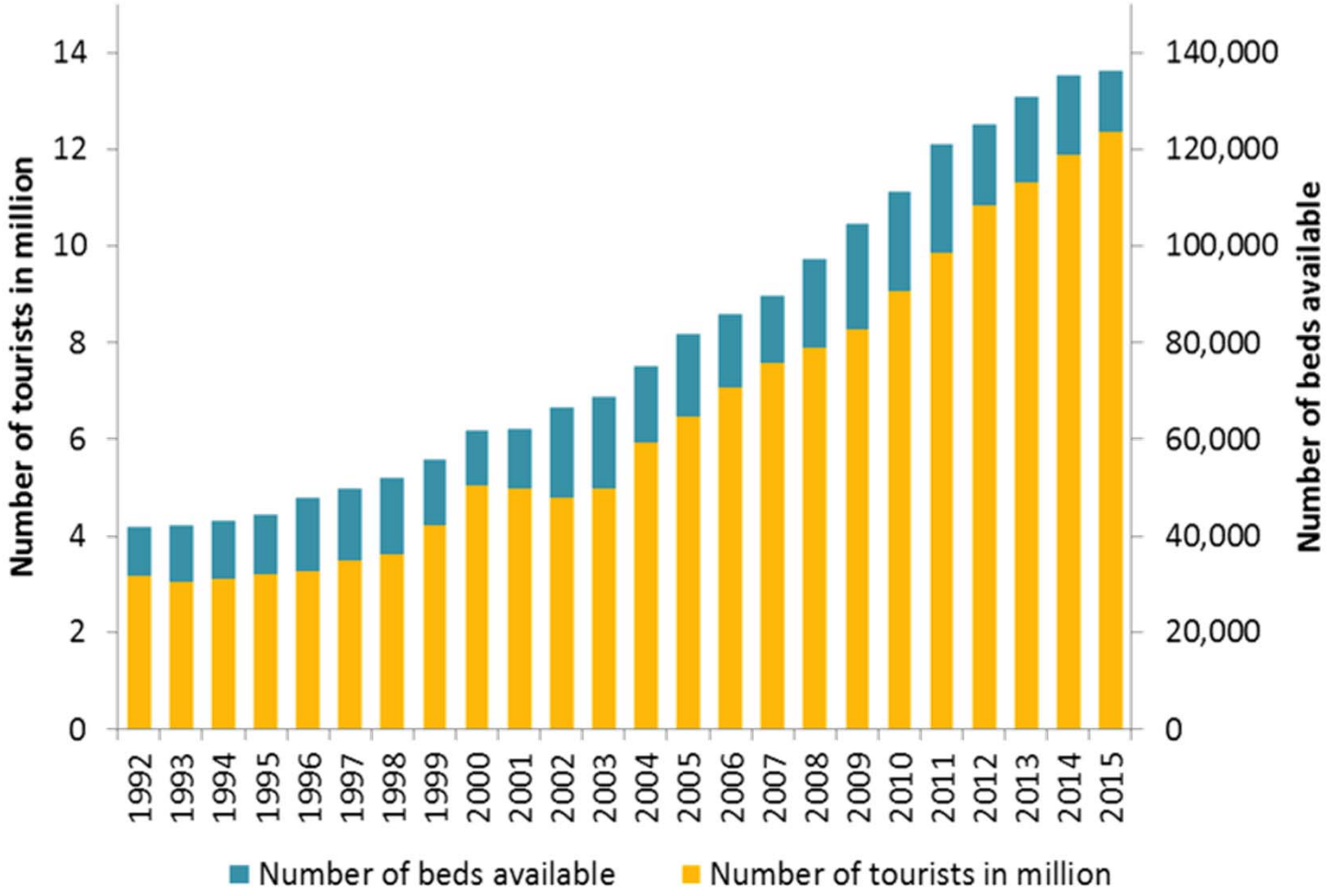
Population age







Berlin: Significant increase of tourists



Policy evolution cycle:

Offering a wider range of travel options

Operators (2015)	Type	Description
Cambio	Station-based	30 stations, mainly on public accessible private ground (small cars to vans)
car2go	Free-floating	1,100 cars (SmartForTwo, Mercedes-Benz A-class, GLA, CLA, B-class)
DriveNow	Free-floating	1,040 cars (BMW & Mini, 40 BMW i3 fully electric)
Drivy	Private cars, Station-based	Providing private cars for short-term rental (small cars, vans, luxury cars)
eMio	Free-floating	150 e-Scooter (scooter-sharing)
Flinkster	Station-based (partly hybrid)	64 stations, mainly on public accessible private ground, some stations on public ground (small cars, vans, luxury cars), 20 hybrid parking zones
Greenwheels	Station-based	50 stations, mainly on public accessible private ground (small cars to vans)
Multicity	Free-floating	currently 250 e-cars
Hertz 24/7	Station-based	4 stations (3 at IKEA furniture stores), service reduced on furniture transport + service for Lufthansa customers at Berlin-Tegel airport
Stadtmobil	Station-based	50 stations, mainly on public accessible private ground (small cars to vans)
Tamyca	Private cars, Station-based	Providing private cars for short-term rental (small cars, vans, luxury cars)

Various interesting issues:

Length of main road network, PT network without bus-lines
PT supply in seat-km/place-km/??
Development of “real” car costs (fix and variable parts)
Traffic volume information

1. Developments over time plausible?
2. Explanations for changes over time, for differences / similarities in the absolute values?
3. Importance of the indicators for understanding car use?

Summary of Insights so far

Summary of insights so far

- Similarities and differences between the cities
- Some indicators from the D3.2-reports are difficult to interpret
- Some data gaps for relevant indicators
- More insights expected from HTS analysis and INRIX data

Key hypothesis: Drivers of change – Consistencies across cities

Increasing peri-urban significance

- ✓ Pressure on urban transport systems
- ✓ Car-oriented commuting patterns
- ✓ Few data
- ✓ Fragmented responsibilities
- ✓ …

Increasing GDP/Income

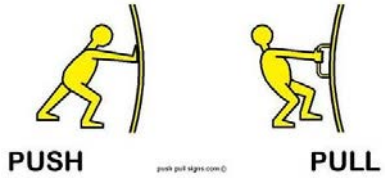
- ✓ More travel options
- ✓ Higher willingness to pay for time, travel
- ✓ Higher education
- ✓ …

Push: Parking prices/fees ↑

- ✓ Car less attractive
- ✓ Strong influence assumed but few data on parking supply
- ✓ …

Pull: PT supply ↑

- ✓ More attractive alternative to car
- ✓ Allows for road space allocation towards walking/ cycling
- ✓ More inclusive transport systems
- ✓ …



Key hypothesis: Drivers of change – Differences across cities

Population
City :
Peri-urban

- ✓ Differences in commuting patterns into/out of the city
- ✓ Differences in travel distances
- ✓ Differences in modal split due to car based in-/out-commuting

Ageing
Juniors :
Seniors

- ✓ Differences in travel needs
- ✓ Changes in attitudes and behaviour and availability of mobility tools within age groups
- ✓ …

Spatial structure
city-size and
land-use

- ✓ Differences in available space for settlement and transport
- ✓ Differences in leisure destinations within the cities
- ✓ …

Density
population
and jobs

- ✓ Differences in available space
- ✓ Differences in occupancy public transport and other modes/ pressure on the transport system
- ✓ …

Only for internal use

WP 3 – Example of Berlin

Structural and governance changes following reunification – how has this affected trends in car use?

Manuel Fiechtner, Dr. Julius Menge

SenUVK Berlin

WP3 - Technical Meeting, 8-9 March 2017

Agenda

- Recap: Reunification and it‘s effects
- Structural and governance changes following reunification
  - Effects on car use
  - Effects on transport policy
- Other factors & possible linkages
- Outlook

Fundamental changes in city structure, daily life – Brandenburger Tor (1989/2014)

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http://mauerweg.morgenpost.de/

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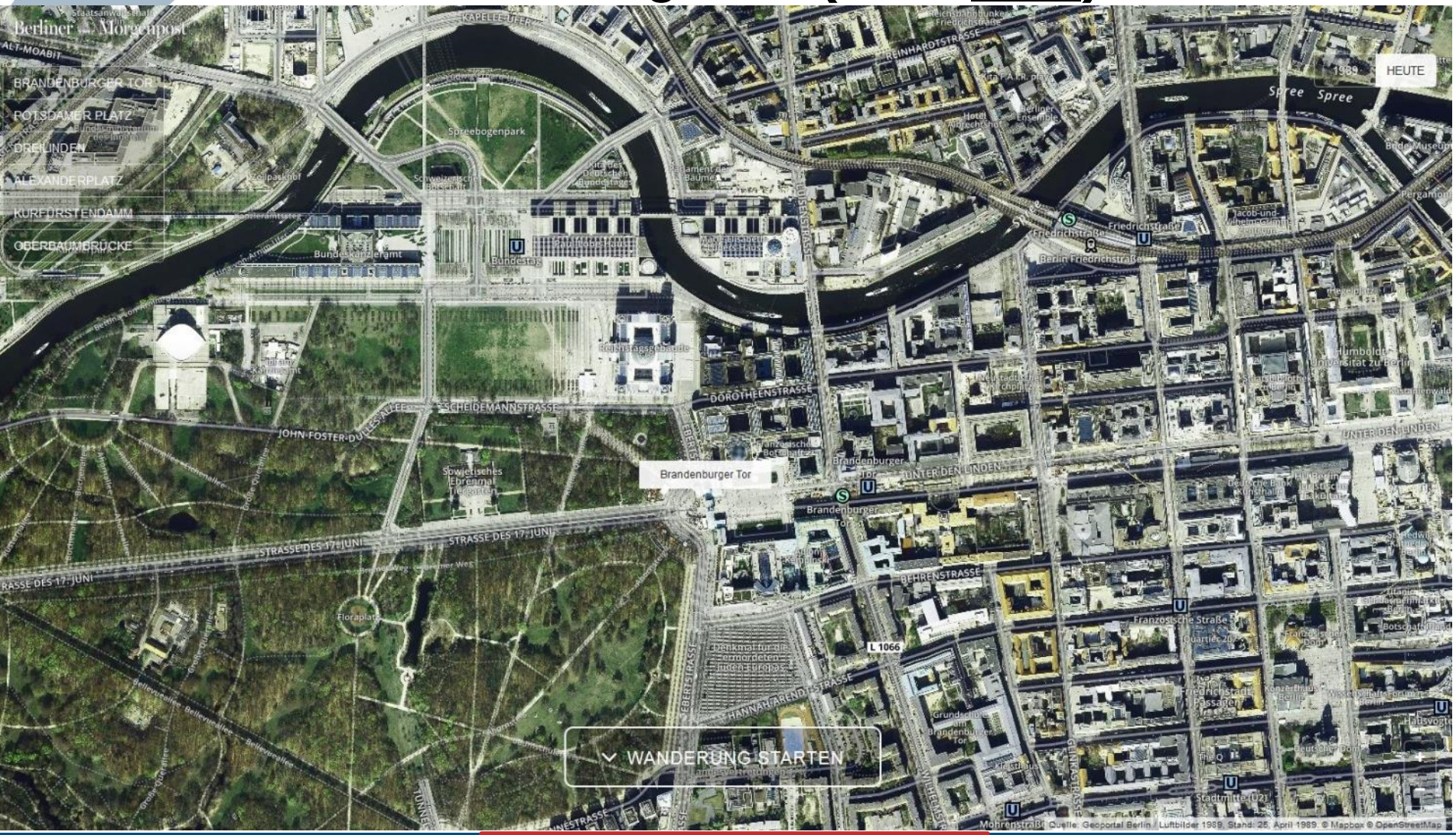

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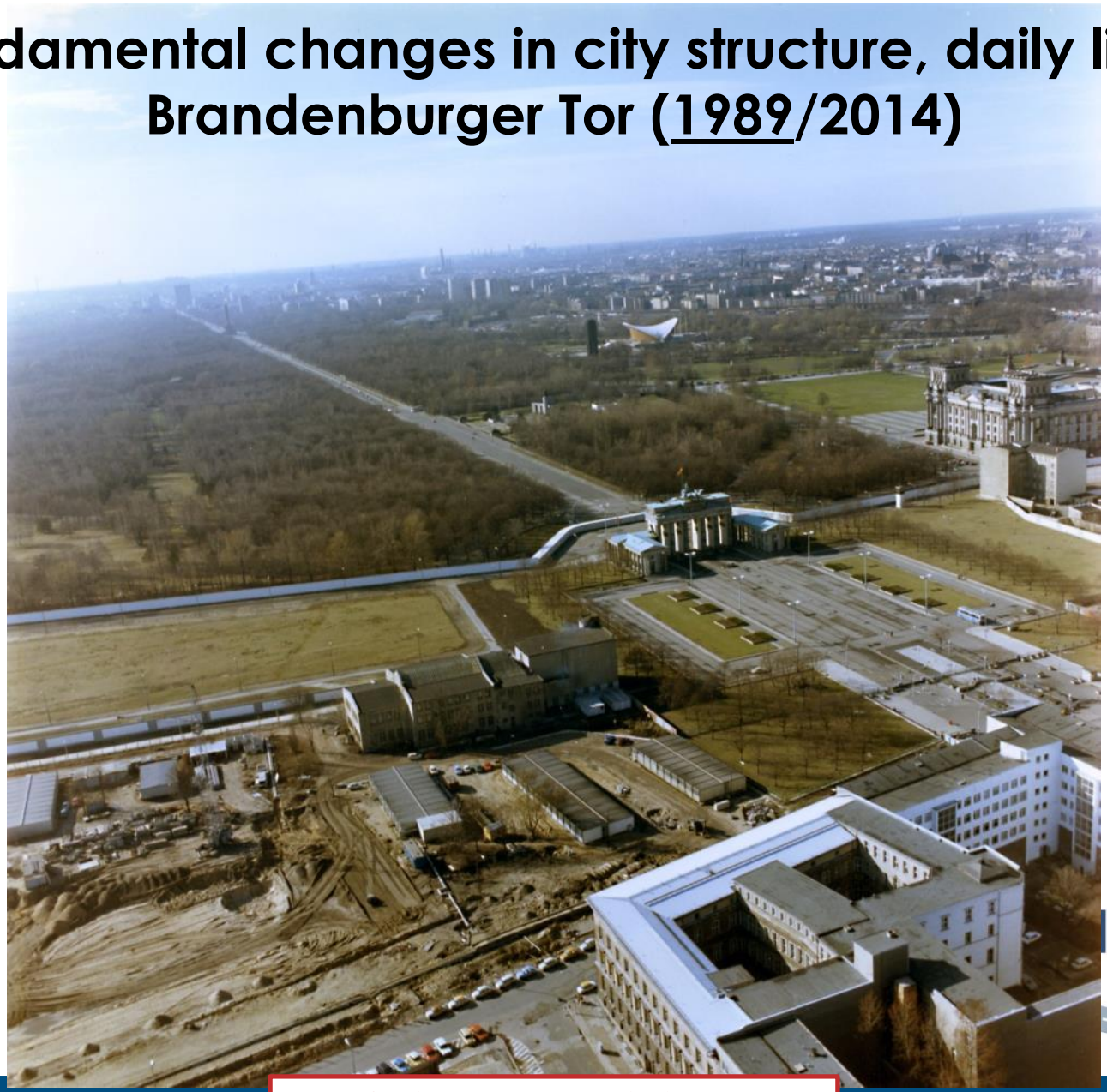

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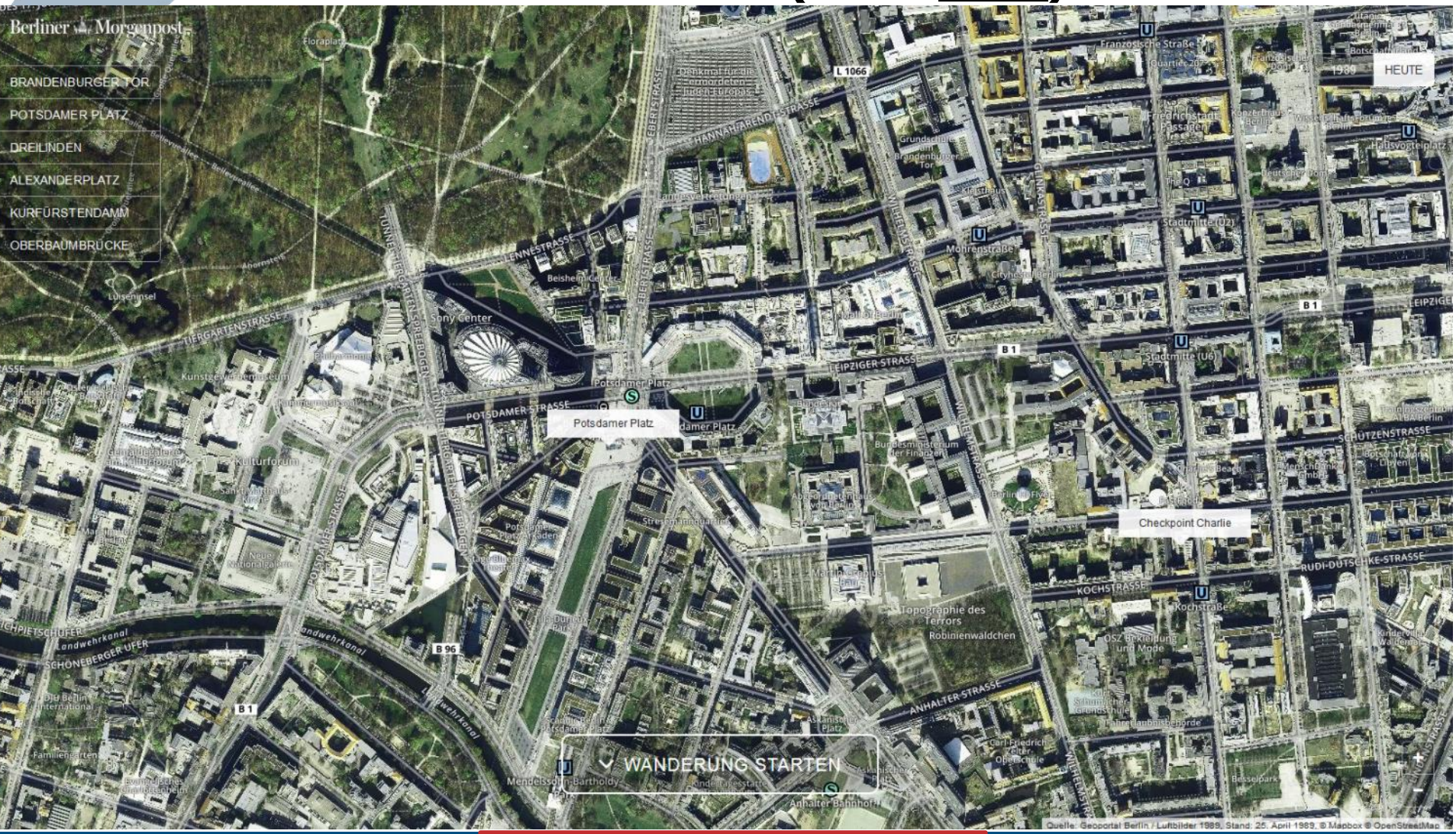

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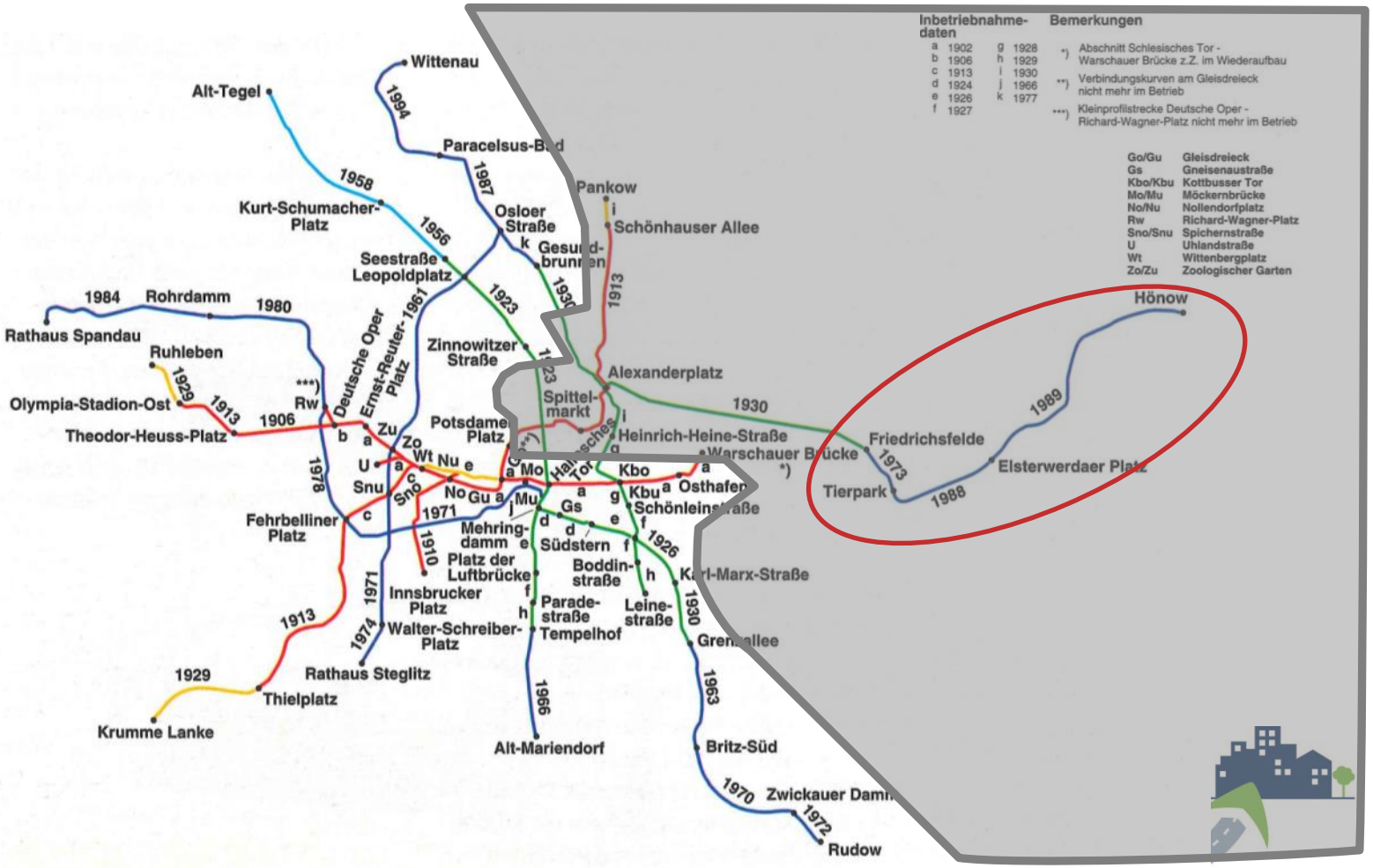
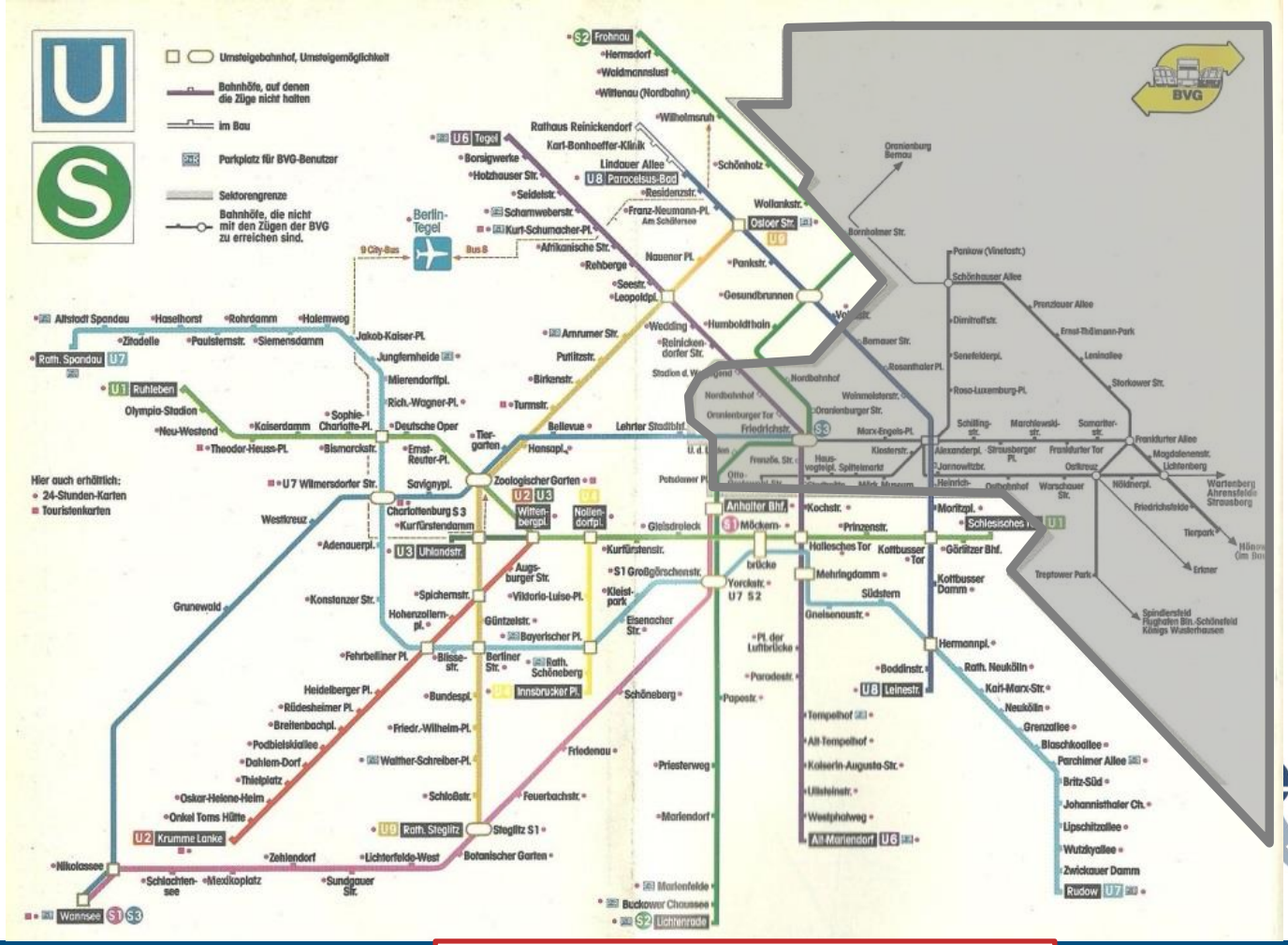
Fundamental changes in city structure, daily life and travel demand – Wollankstr (1980/2015)

Fundamental changes in city structure, daily life and travel demand – Wollankstr (1980/2015)

U-Bahn (metro) development in Berlin

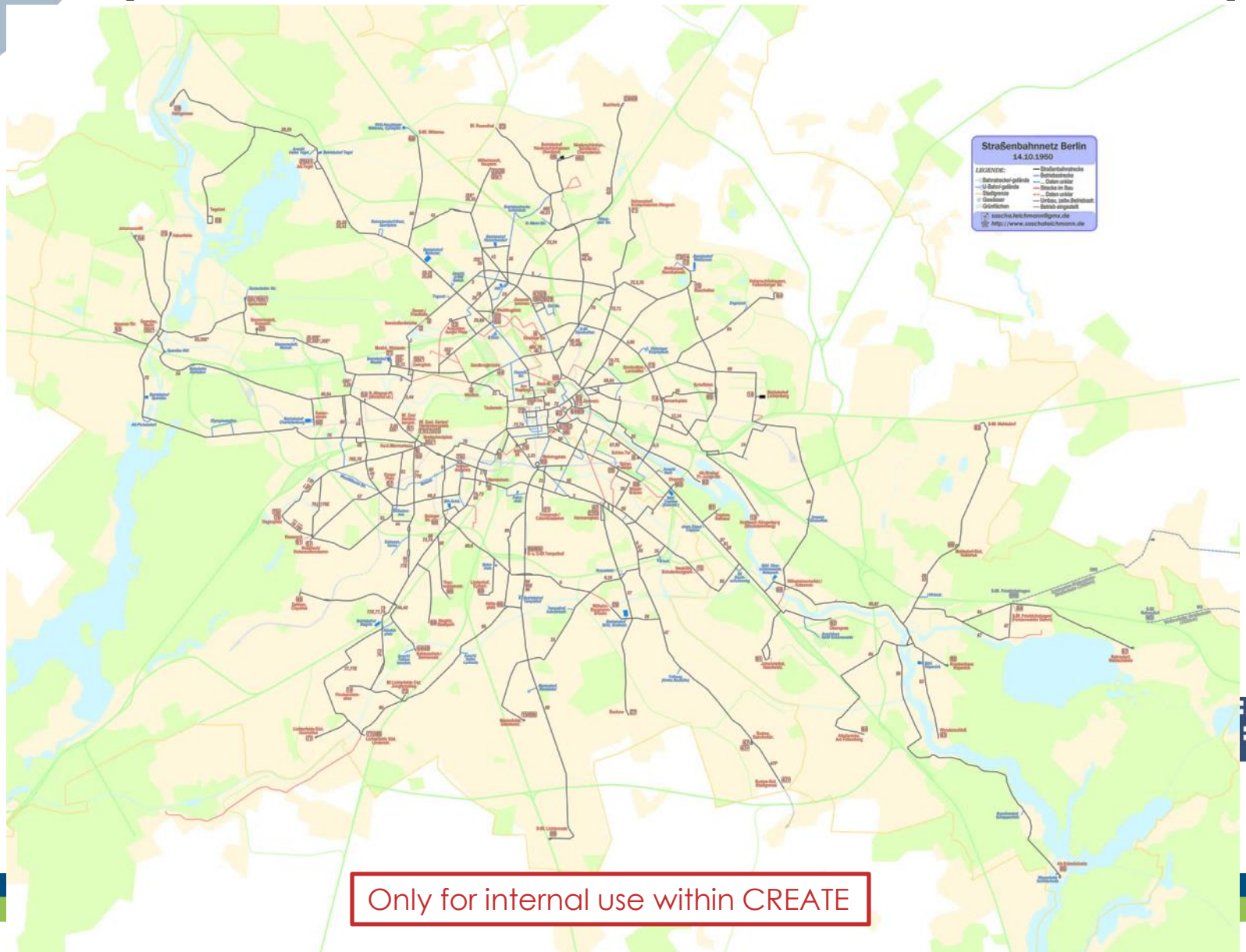


Divided public transport system
West-Berlin 1987 & East-Berlin 1989




Berlin. Alexanderplatz

Example: tram network 1950,1967,1988, today



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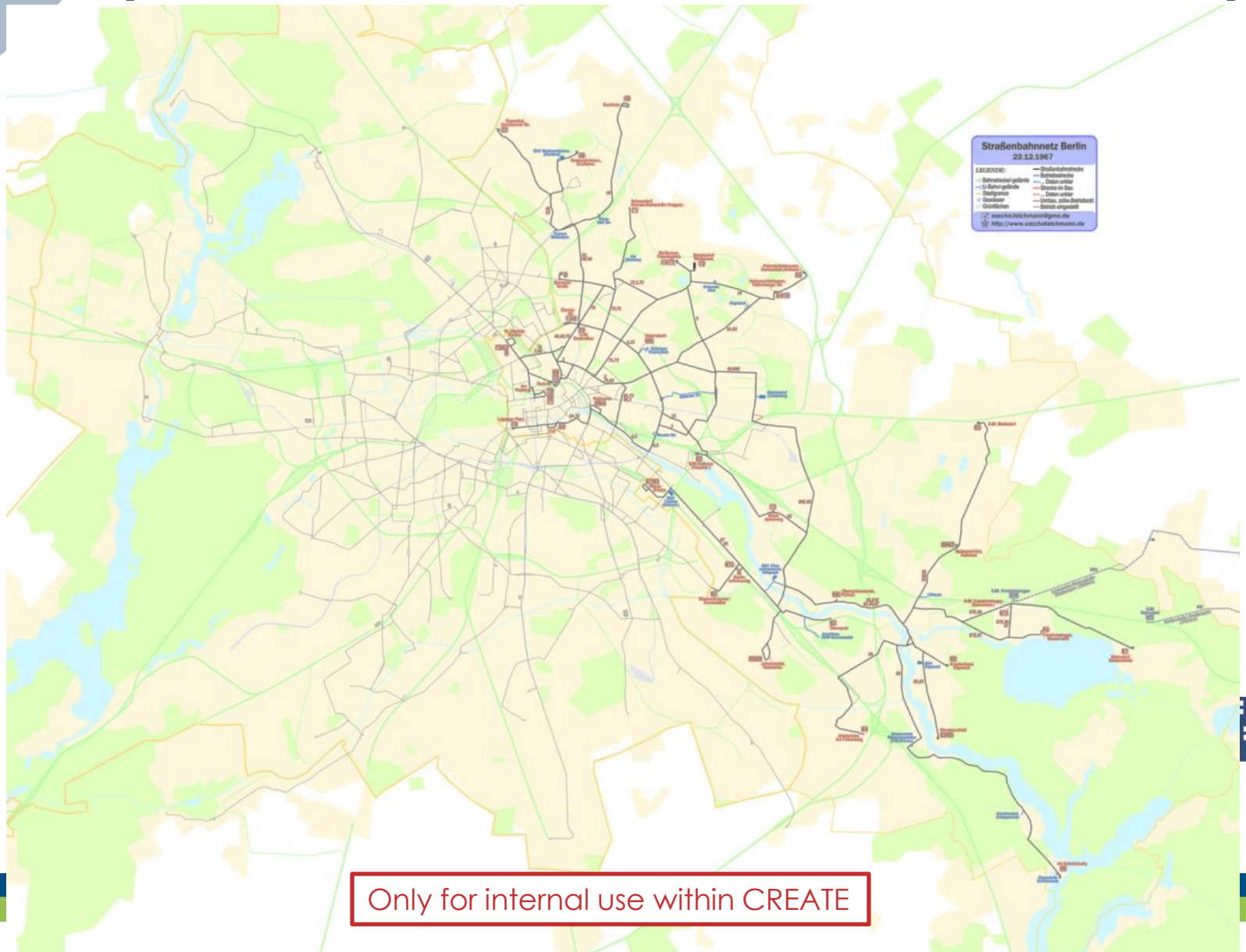
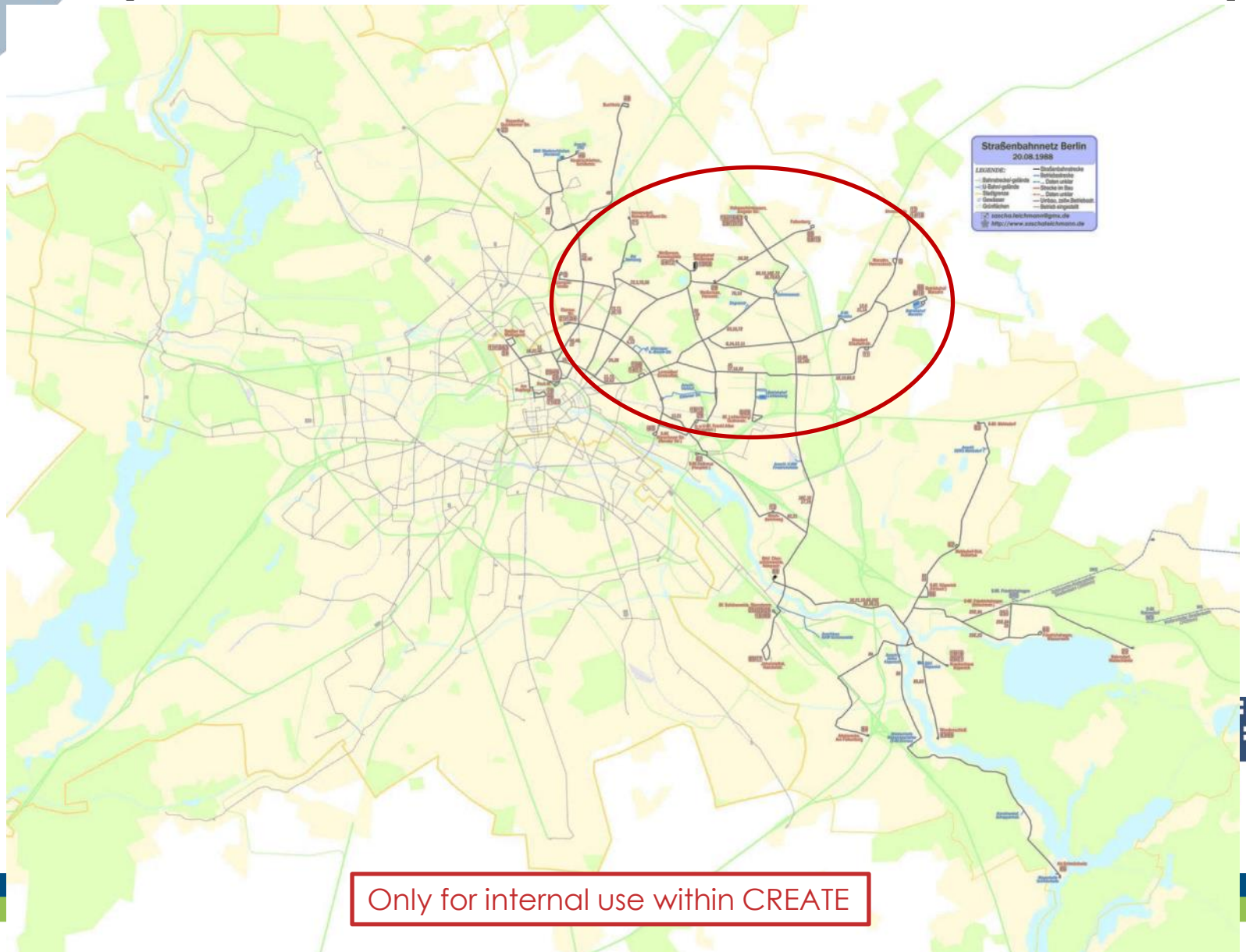
Example: tram network 1950,1967,1988, today



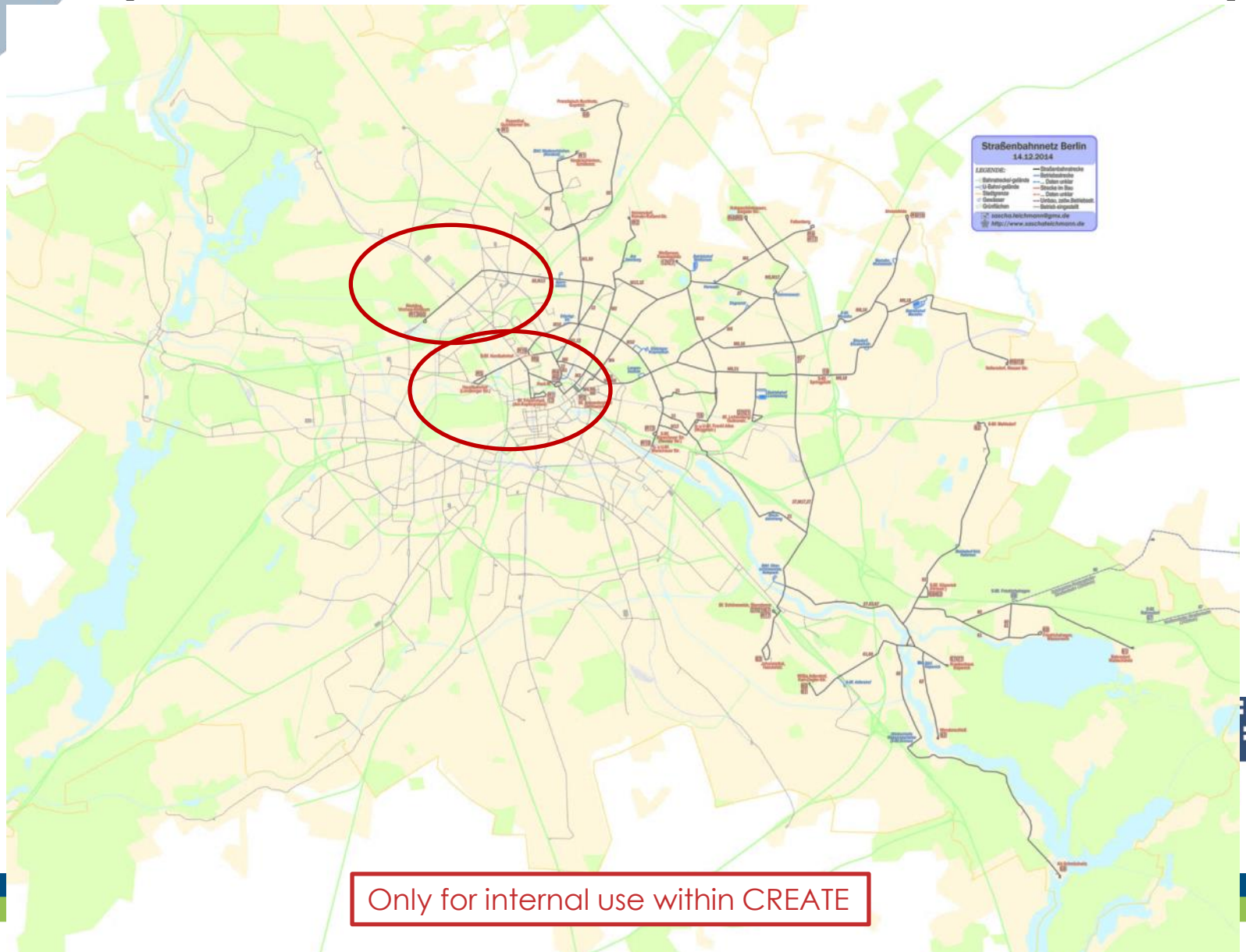
Only for internal use within CREATE

Example: tram network 1950,1967,1988, today



Only for internal use within CREATE

Example: tram network 1950,1967,1988, <u>today</u>



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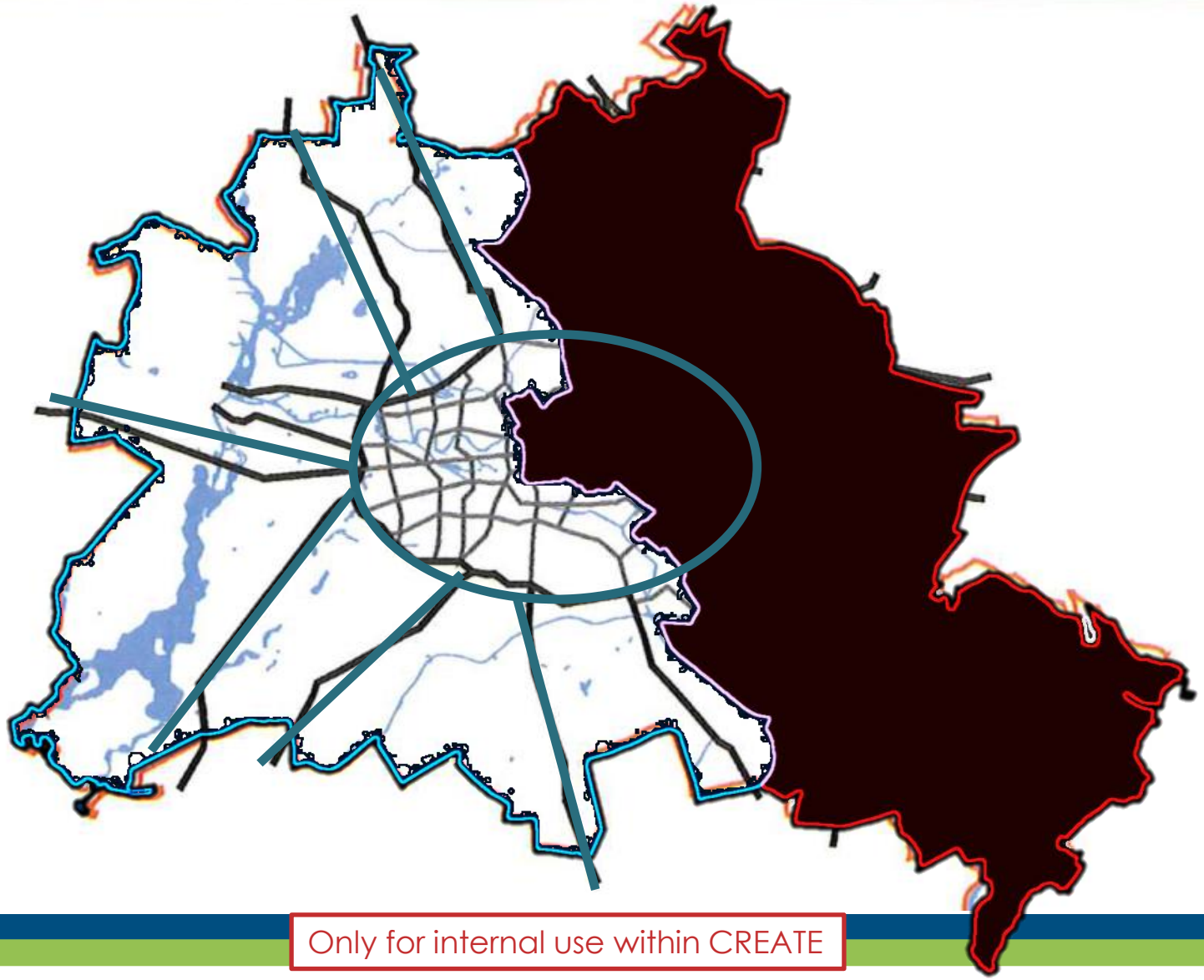
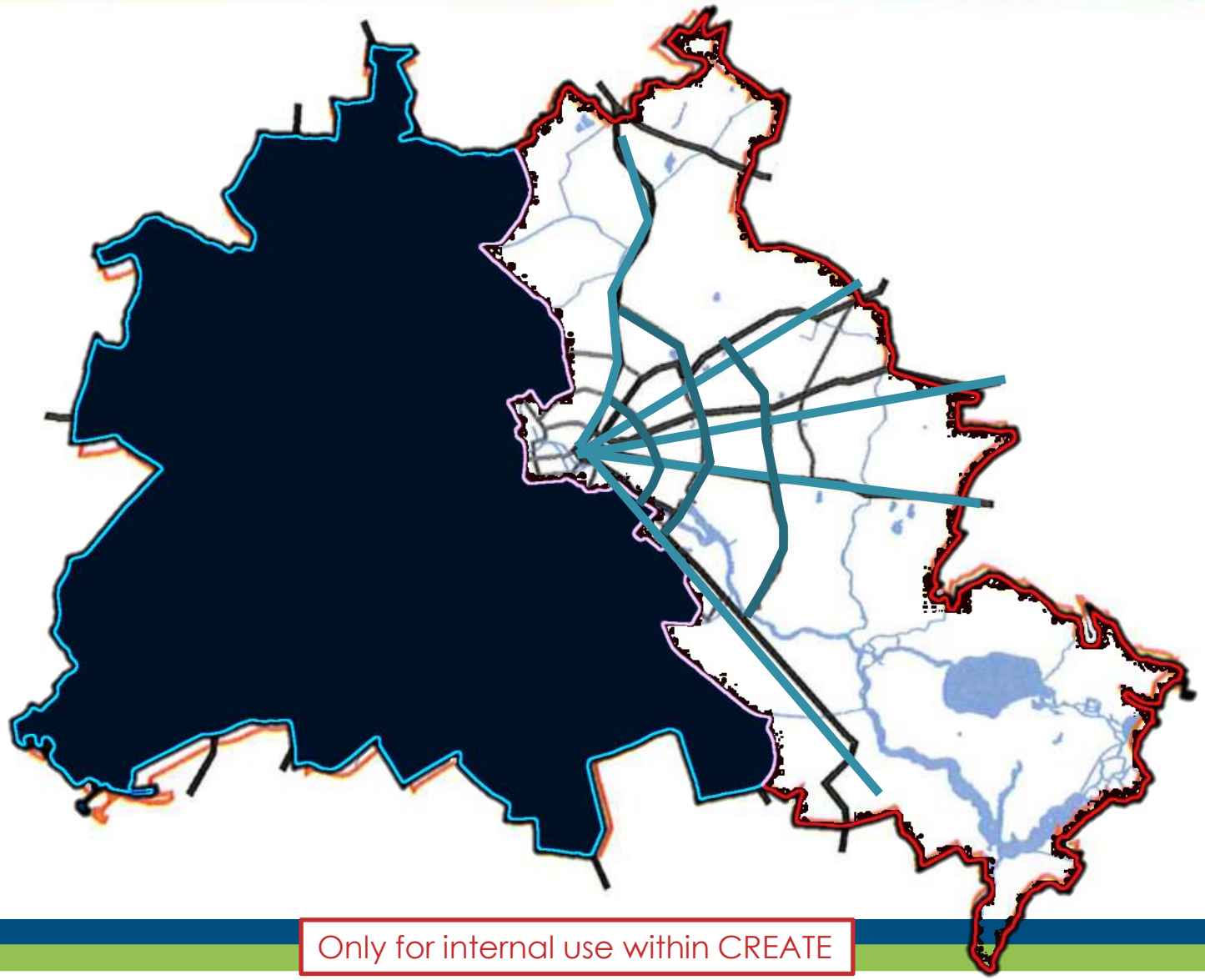
Main road structure: West Berlin vs. East Berlin



Main road structure: West Berlin vs. East Berlin



Car use: West-Berlin 53-59 – East-Berlin 1970

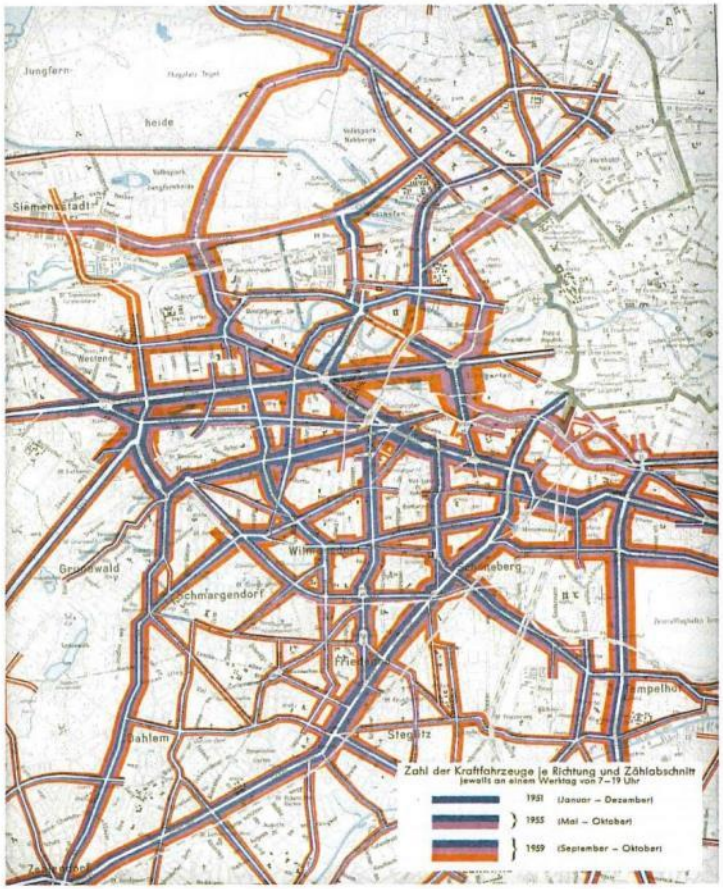
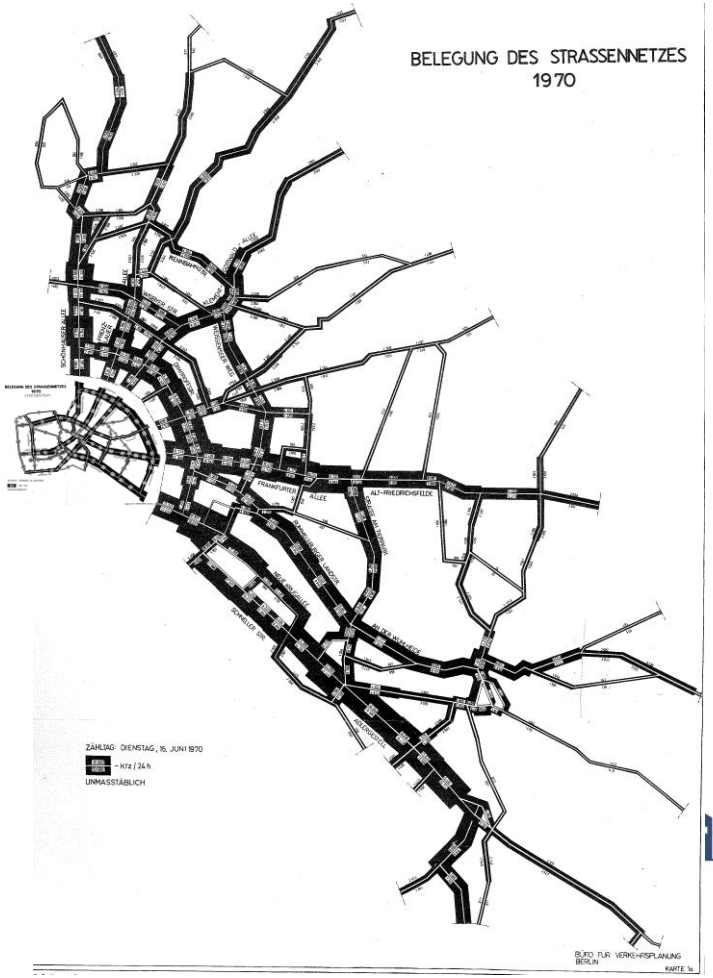


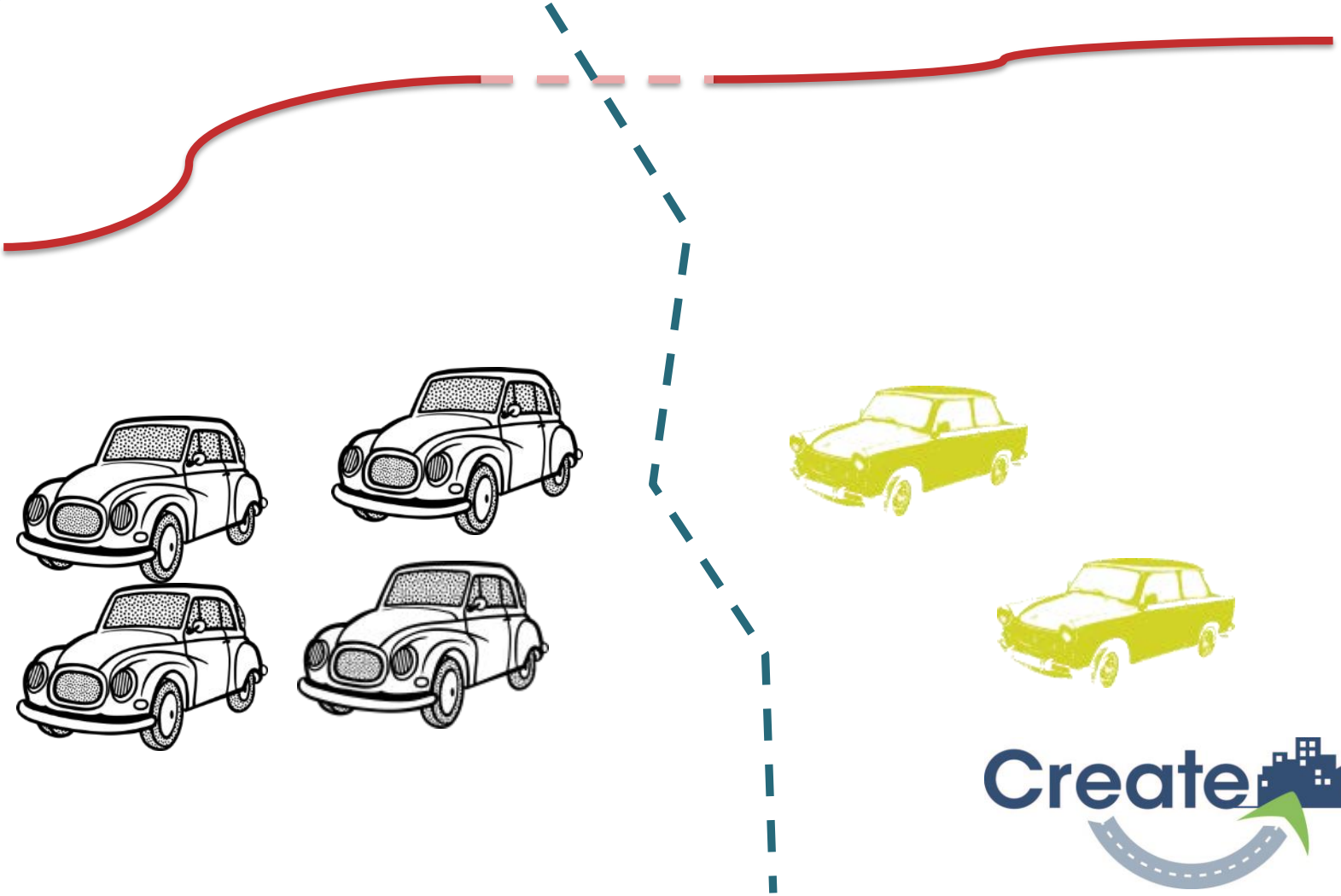
Bild 13.2: Ergebnisse der West-Berliner Straßenverkehrszählungen von 1951, 1955 und 1959



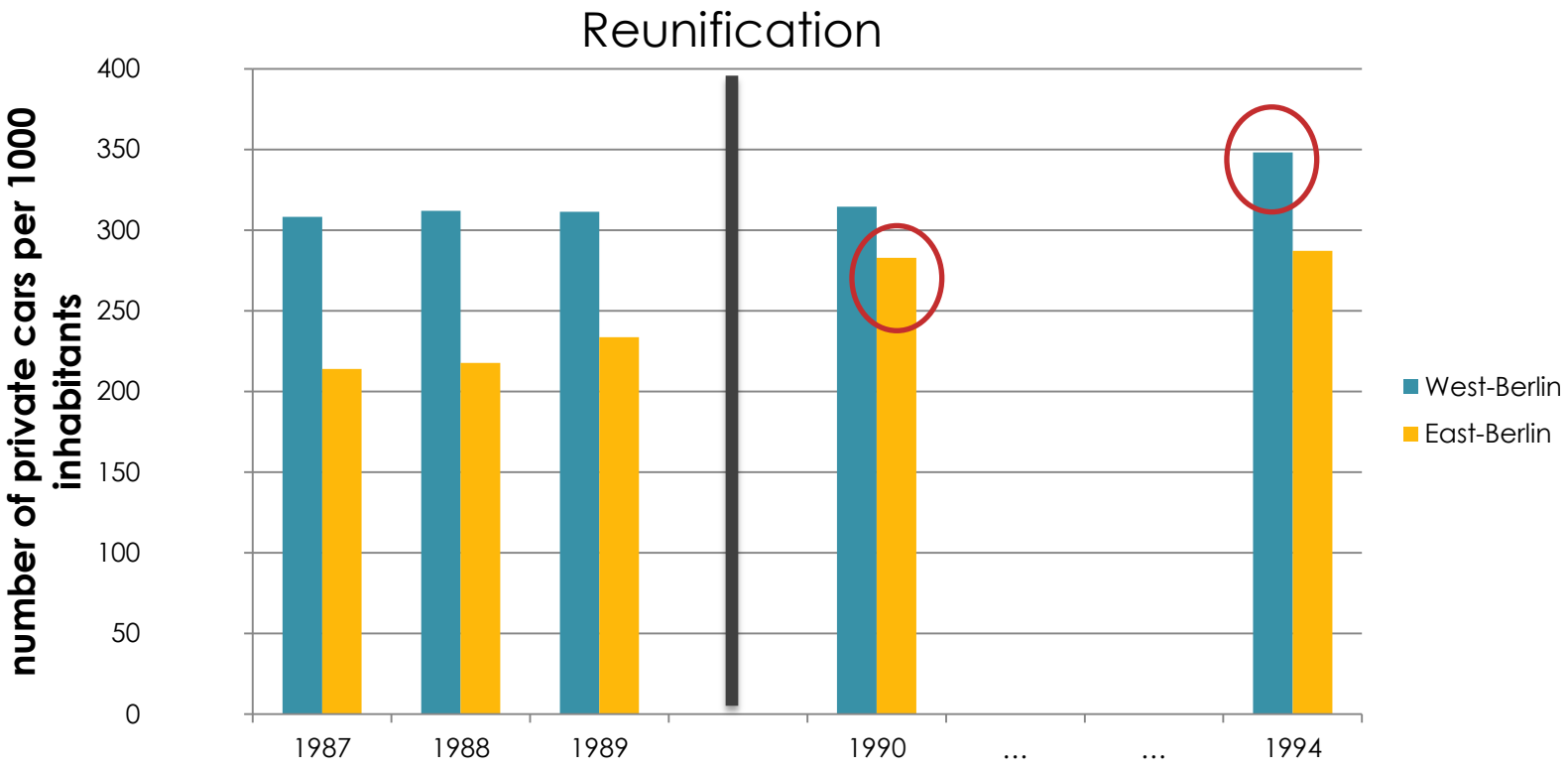

© westermann 44
Ostsee
Elbe
Lübeck
Fuhlsbüttel
Gudow
Zarrentin
Hamburg
Büchen
Schwanheide
Deutsche
Havel
Bundes-
Cumlosen
Schnackenburg
Berlin
(West)
(Ost)
Langenhagen
Buch-
horst
Stolpe
Heiligen-
see
Rühen
Staaken
Nedlitz
Tegel
Hannover
Wolfsburg
Griebnitzsee
Drei-
linden
Mittelland
kanal
Oebisfelde
Helmstedt
Drewitz
Marien-
born
Magdeburg
republik
Demokratische
Kassel
Halle
Elbe
Herles-
hausen
Leipzig
Wartha
Bebra
Erfurt
Republik
Höne-
bach
Gerstungen
Probstzella
Hirschberg
Ludwigsstadt
Gutenfürst
Hof
Rudolph-
stein
Deutschland
Tschecho-
slowakei


B-D 1853

Situation after reunification 89/90



Motorisation rates during reunification



Waiting for a car …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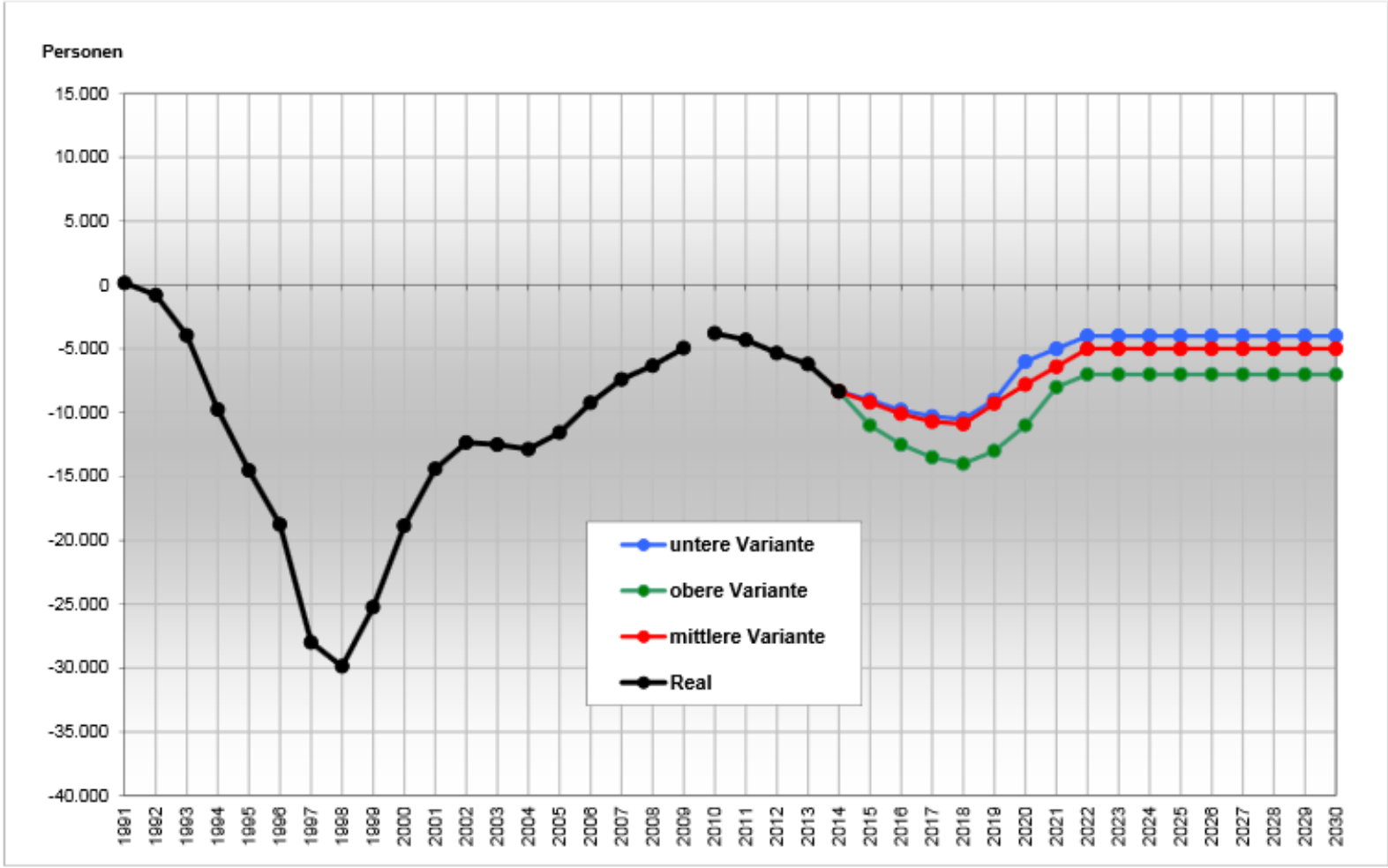
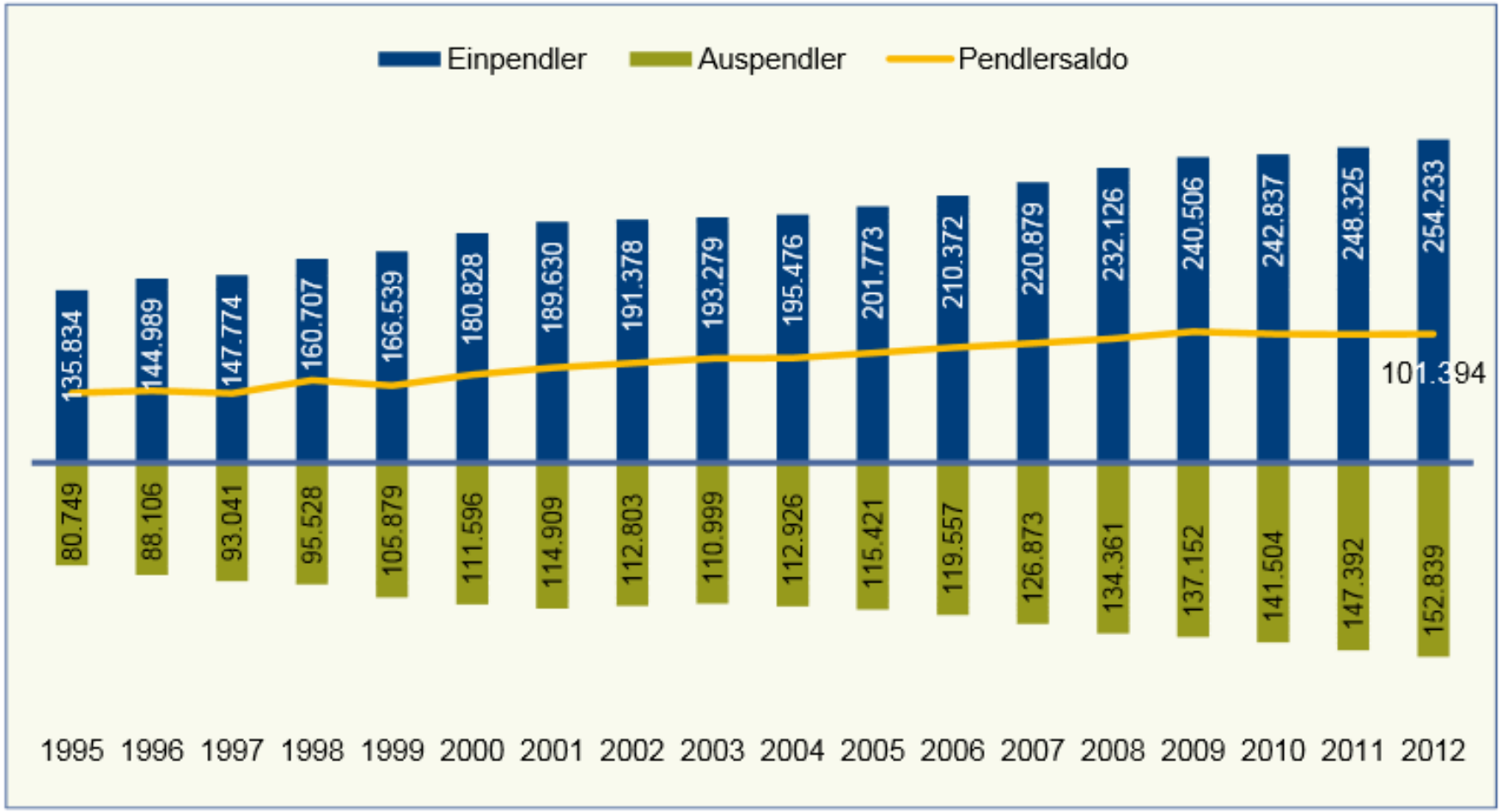
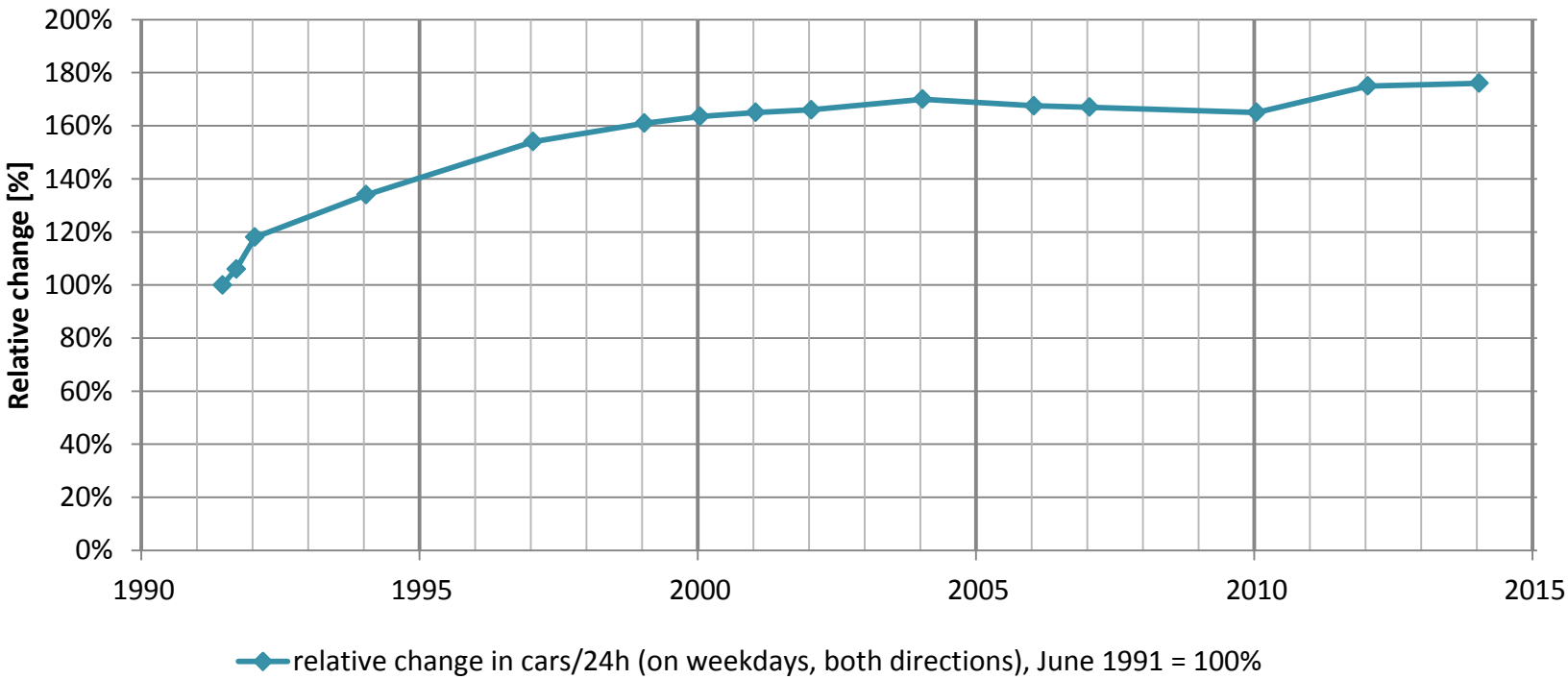
Balance of migration for Berlin and the peri urban area



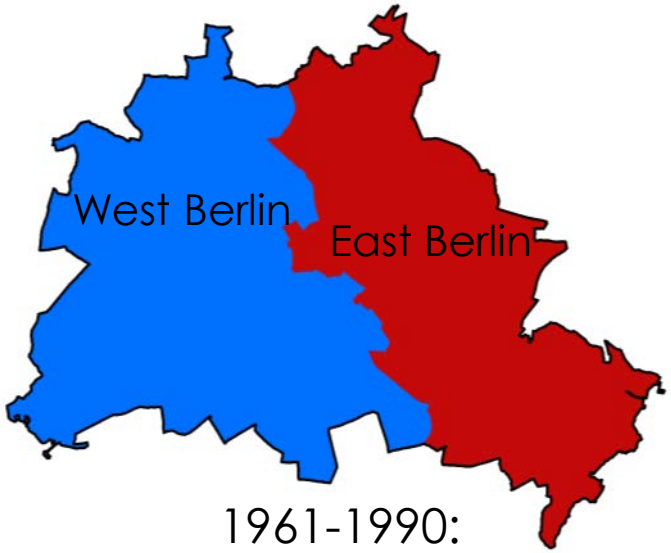
Commuters balance of Berlin 1995-2012



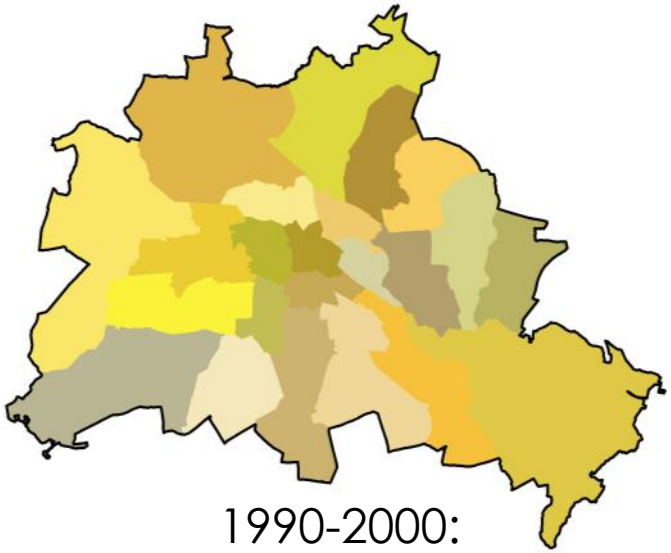
Relative change of cars entering and leaving Berlin in cars/24h (on weekdays, both directions), 1991-2014



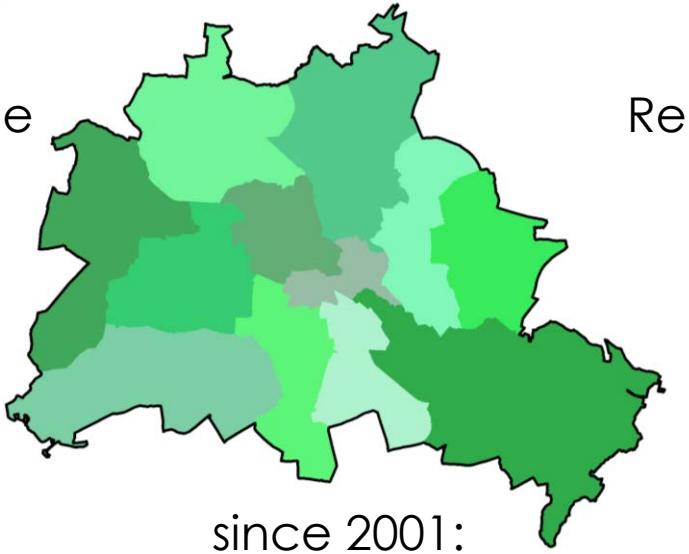
Structural Changes: Berlin devided



1961-1990:
Separated Berlin during the Cold War



1990-2000:
Reunited Berlin with 23 boroughs



since 2001:
Berlin with 12 consolidated boroughs

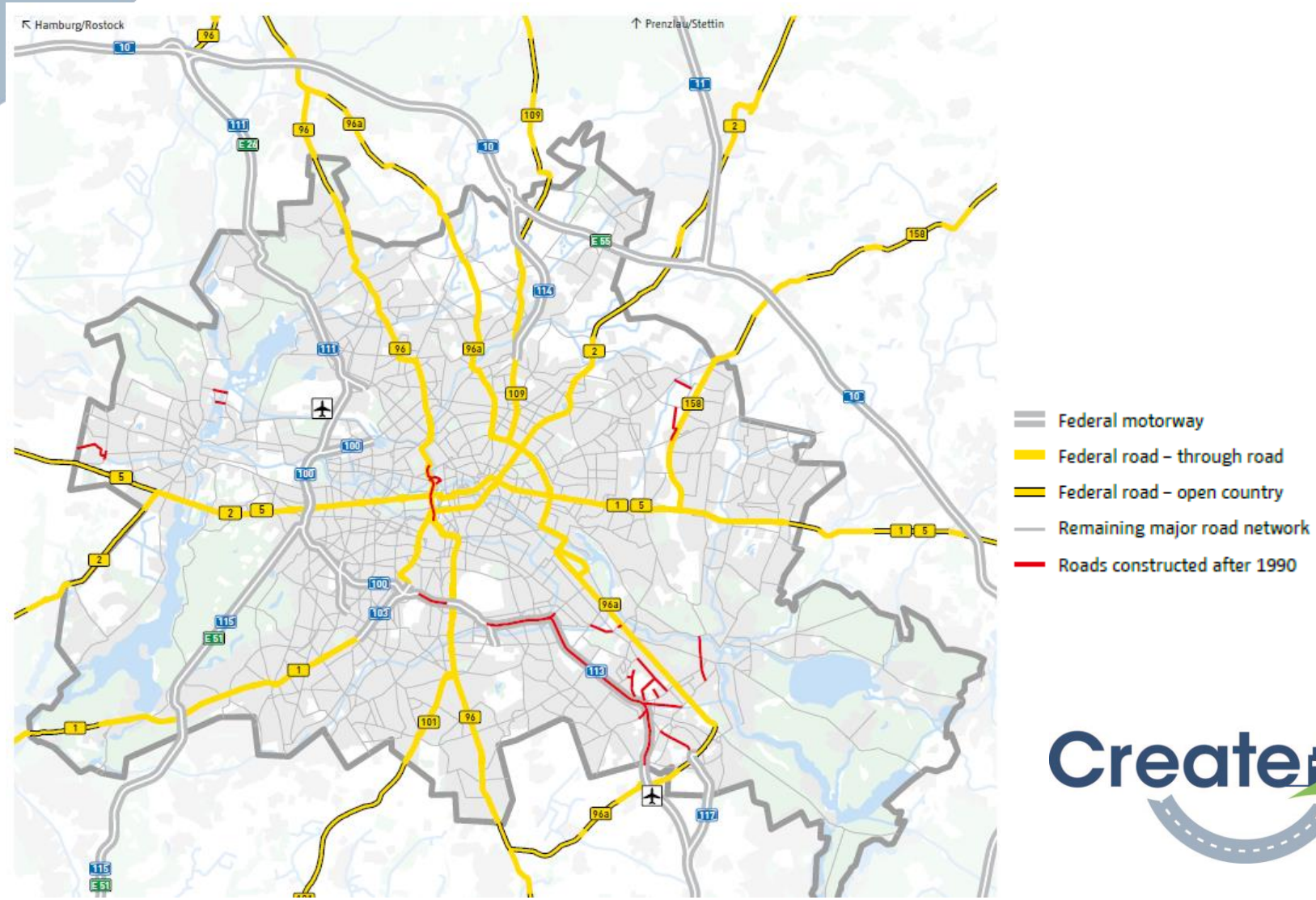
City of Berlin

0 5 10 20 Kilometer

Policy measures 1990-2000

- Focus on development of traffic infrastructural adequate for a reunited metropolitan area
- Main Infrastructure development:
  - Closing gaps in road and rail network
  - Enlargement of road infrastructure, especially inner-city motorway towards south-east
  - Re-establishing the S-Bahn network
  - Re-establishing a regional and long distance rail network (s.c. "Pilzkonzept"/ "mushroom concept")
  - investments on rail infrastructure per year almost twice as high as investments on road infrastructure
- Implementation of bus lanes and cycling lanes
- Introducing of parking management
- Common VBB tarif system (1999)

Motorway and major road network (2012)



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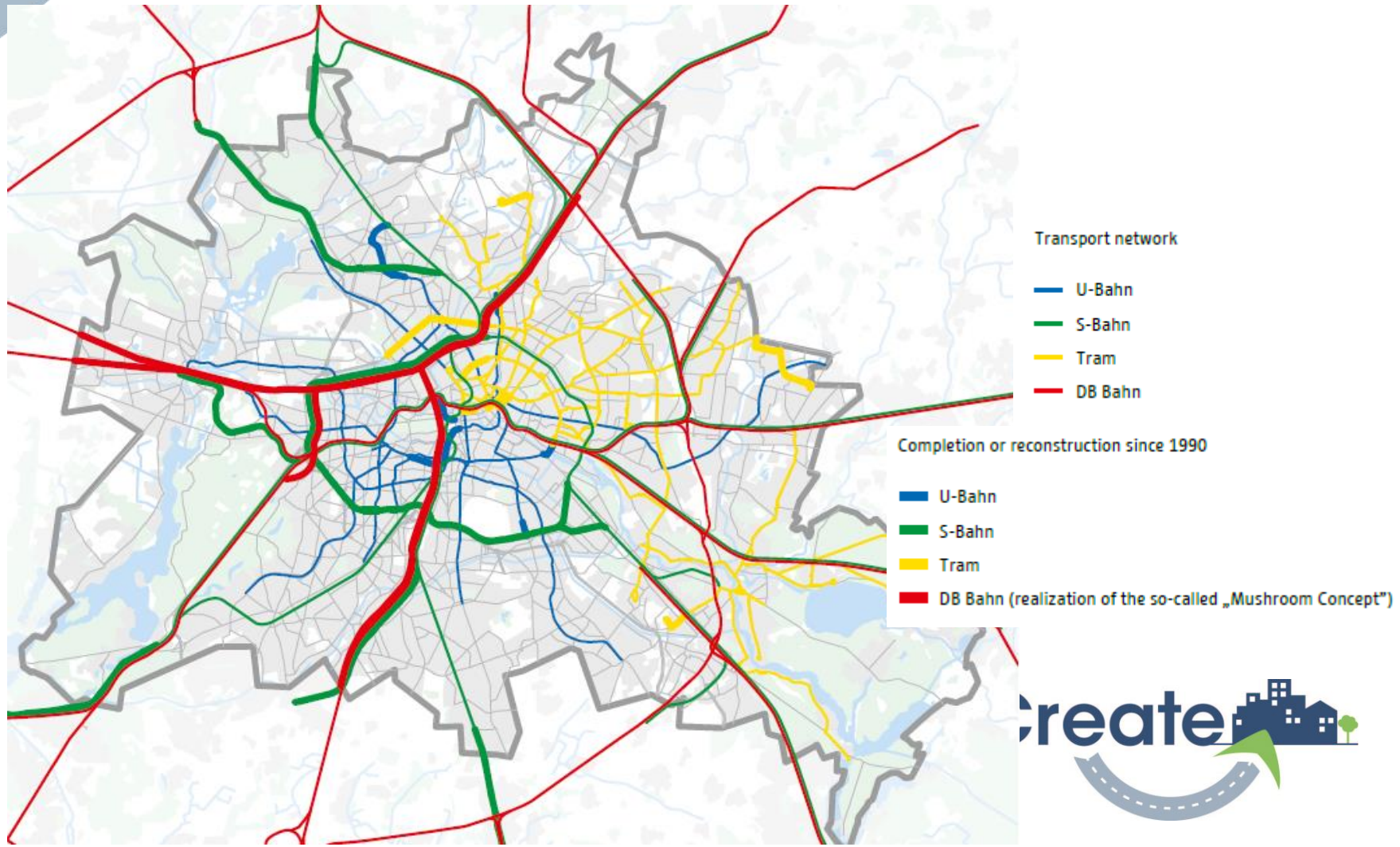
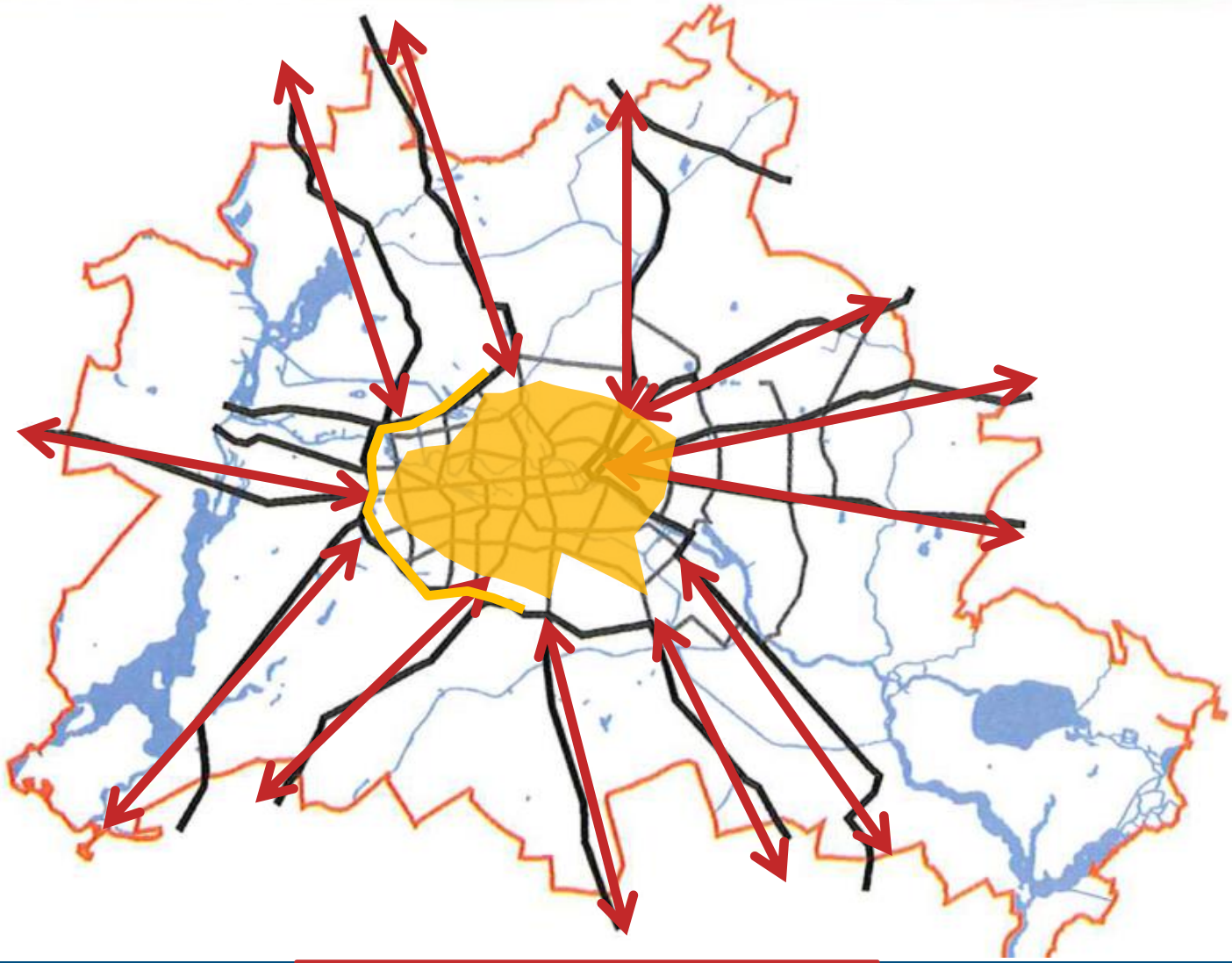
Development of the public transport network since 1990



Reunfication: Effects on car use



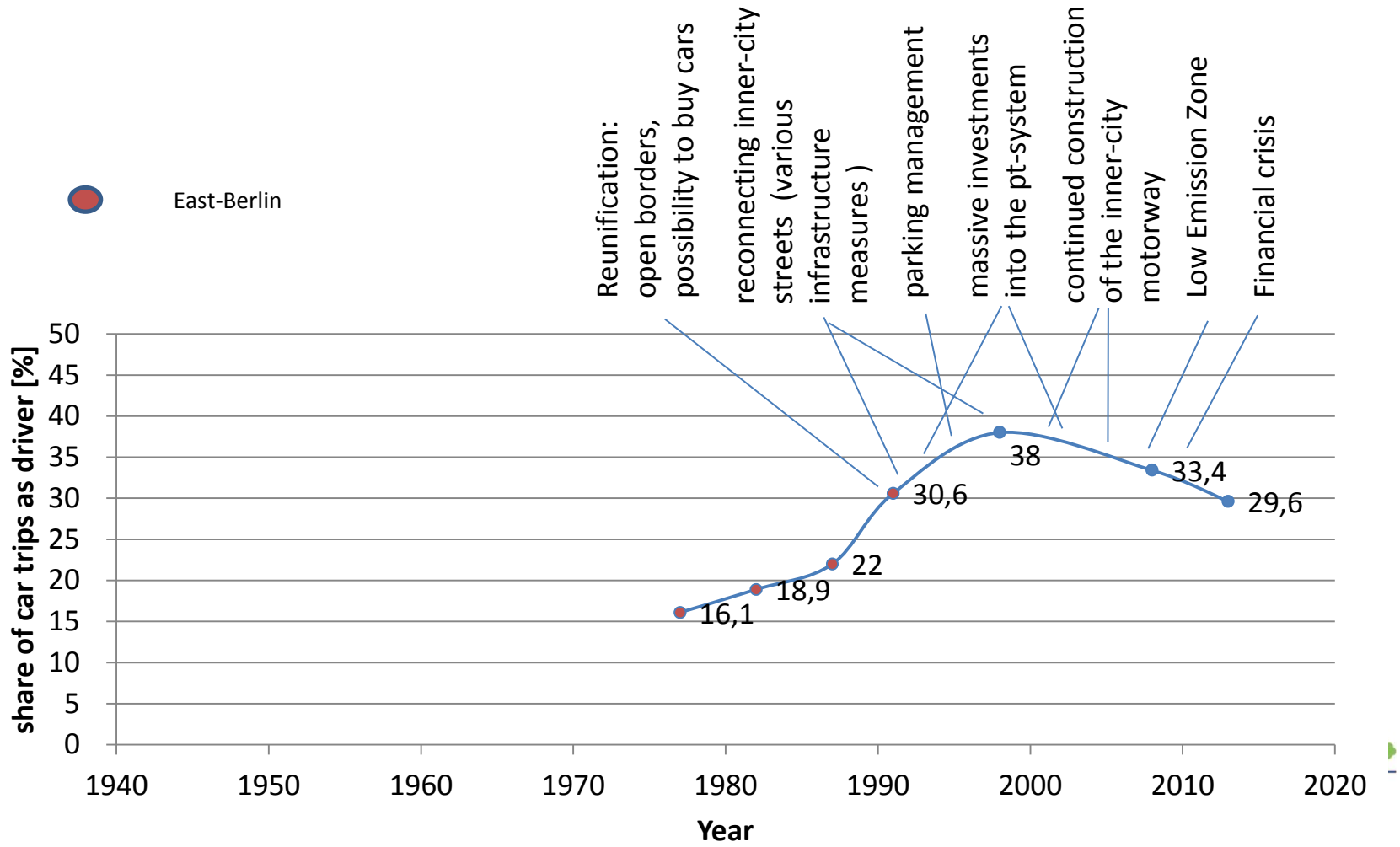
Other effects

- Strong increase in roads accidents until 1992/93
  - after increase in non-motorised traffic, and first road safety measures slightly decreasing numbers until recent years
- Strong increase of road traffic based pollution
- Increase in heavy goods vehicle traffic between Berlin ←→ Brandenburg from 91 to 94 by 60 %
- Delayed increase in rail based long distance traffic after establishing the mushroom concept

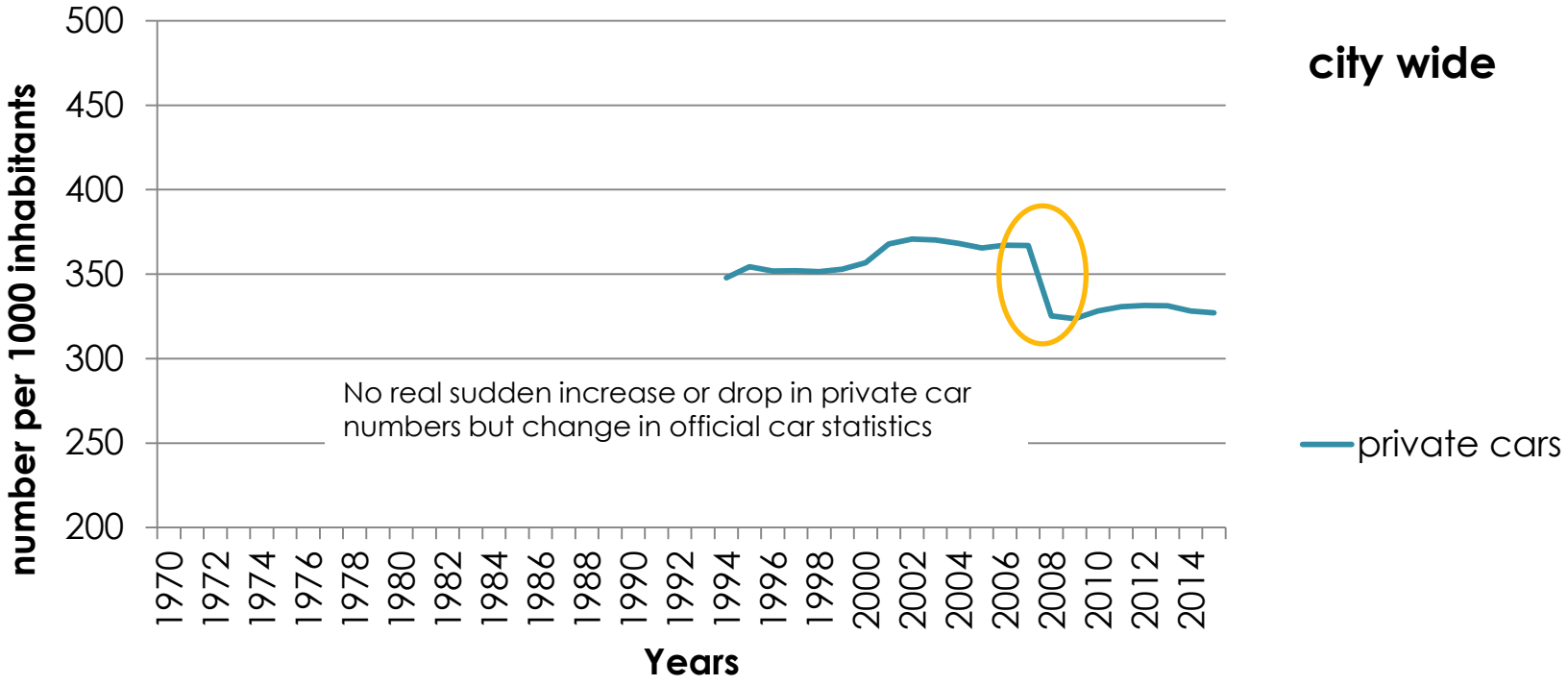
Shift in transport policy with first Urban Transport Development Plan (StEP Verkehr) in 2000

- Negative impacts of increasing car traffic & inefficient public transport
- Start of the StEP-process
  - Consensus-based "Transport Round Table"
  - Scientific advisory board
  - Project group of different divisions
- Strategy for Pedestrian Traffic & Cycling strategy
- Reorganising public transport funding
- Development of a coherent strategy on parking management (implementation by boroughs)

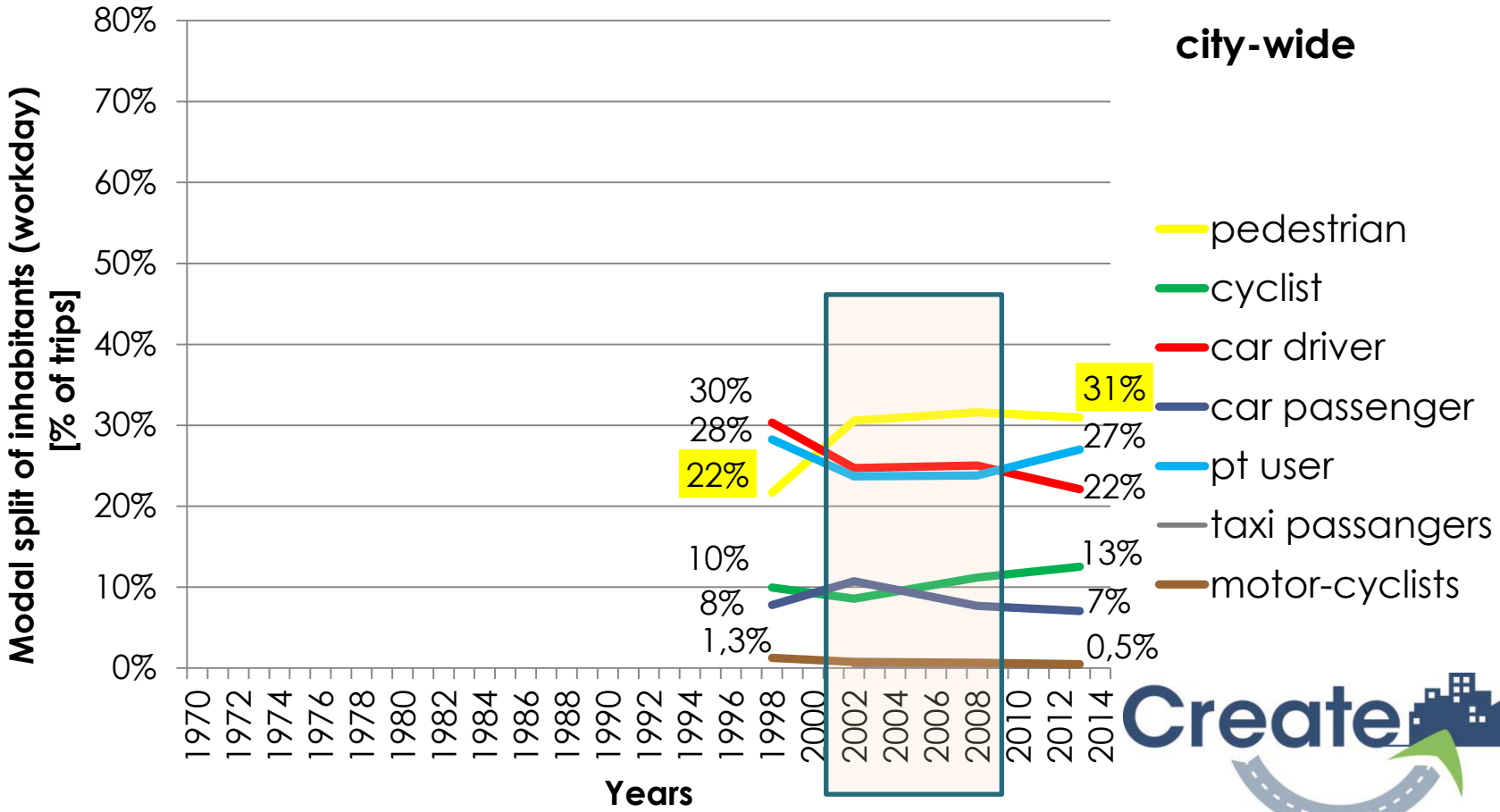
Share of car trips per inhabitants (indicated by policy action)



Number of private cars per 1,000 inhab.



Modal Split: shift towards stage 3



Thank you for your attention!

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Principle Affairs of Transport Policy
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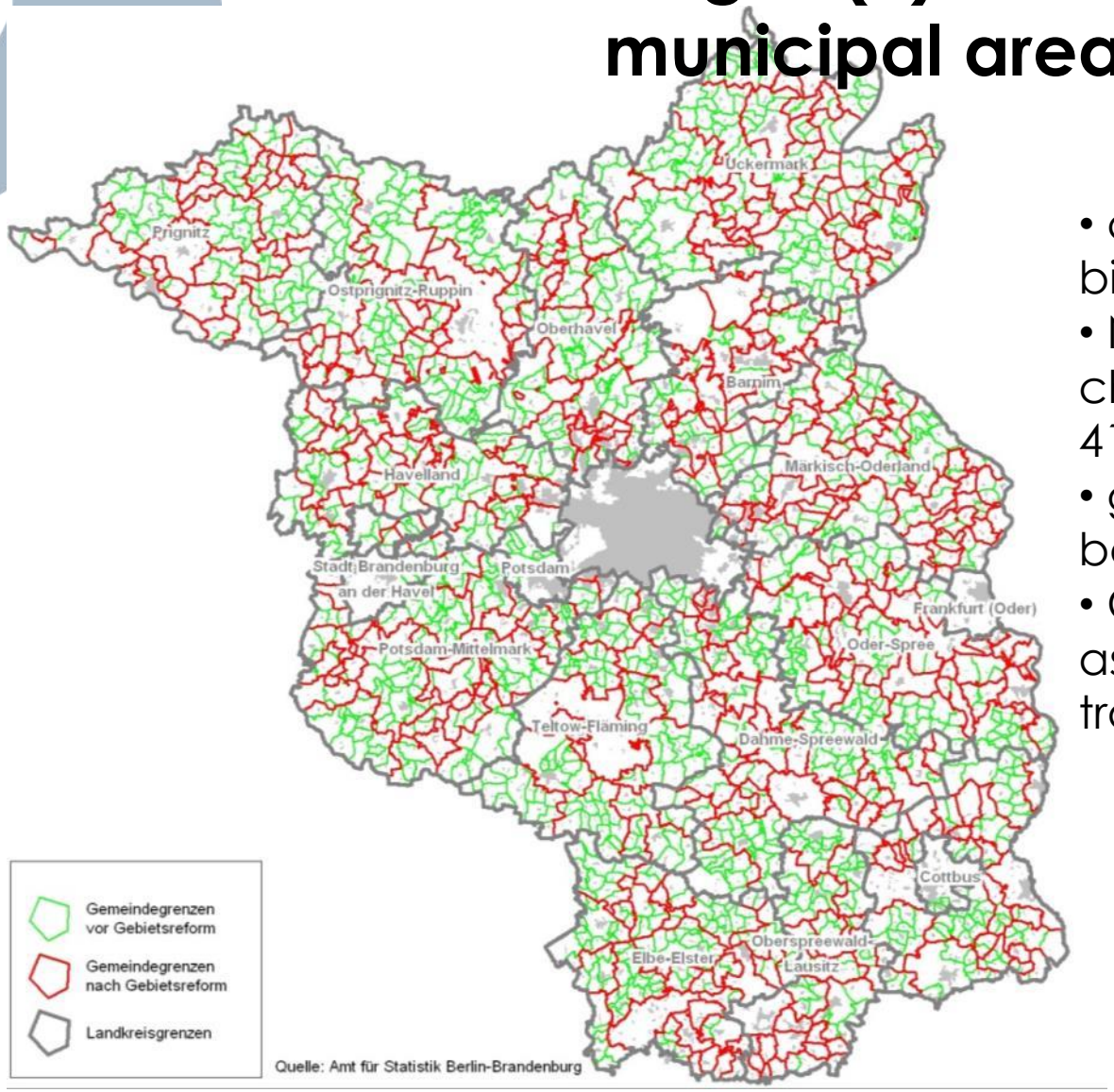
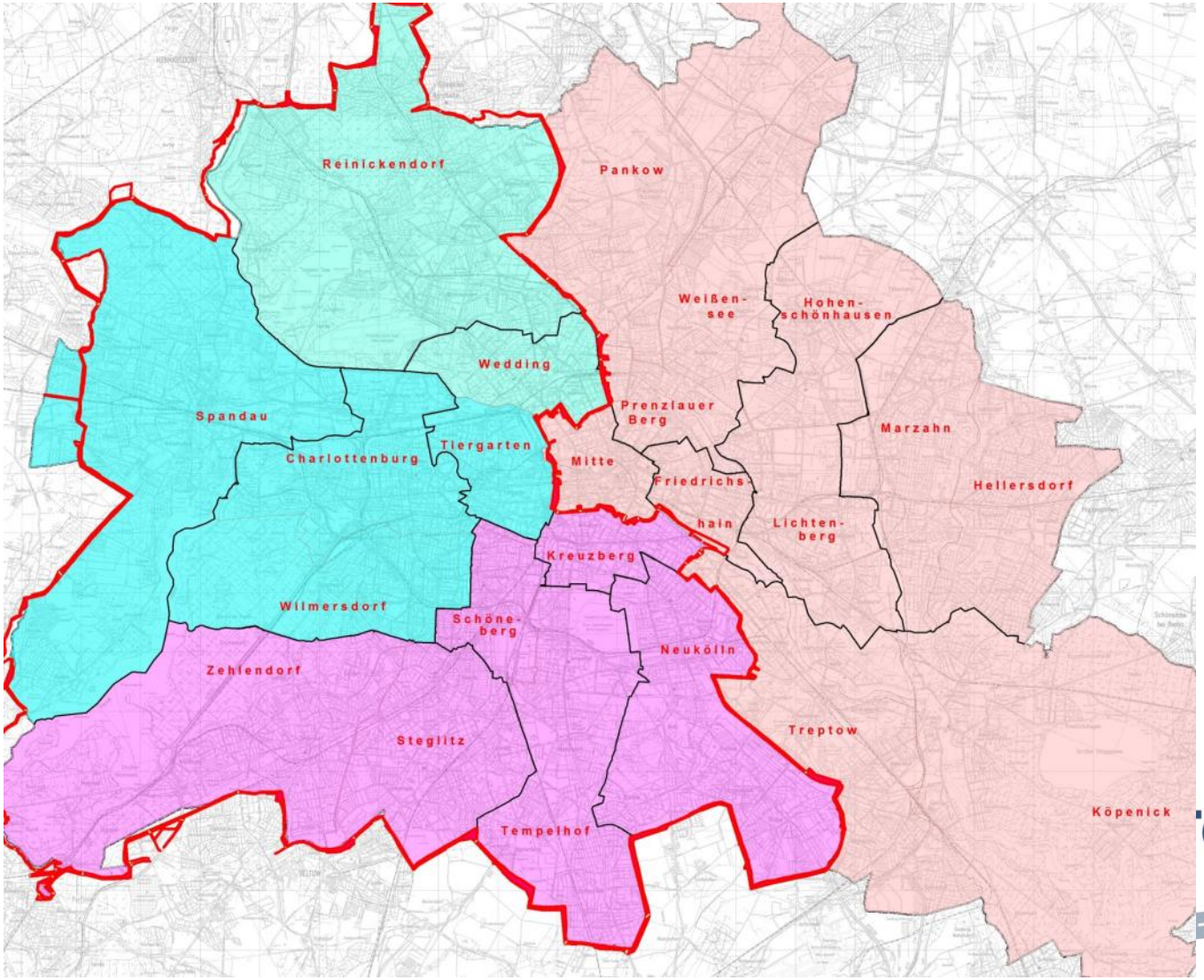
Structural Changes (II): reorganisation of municipal area

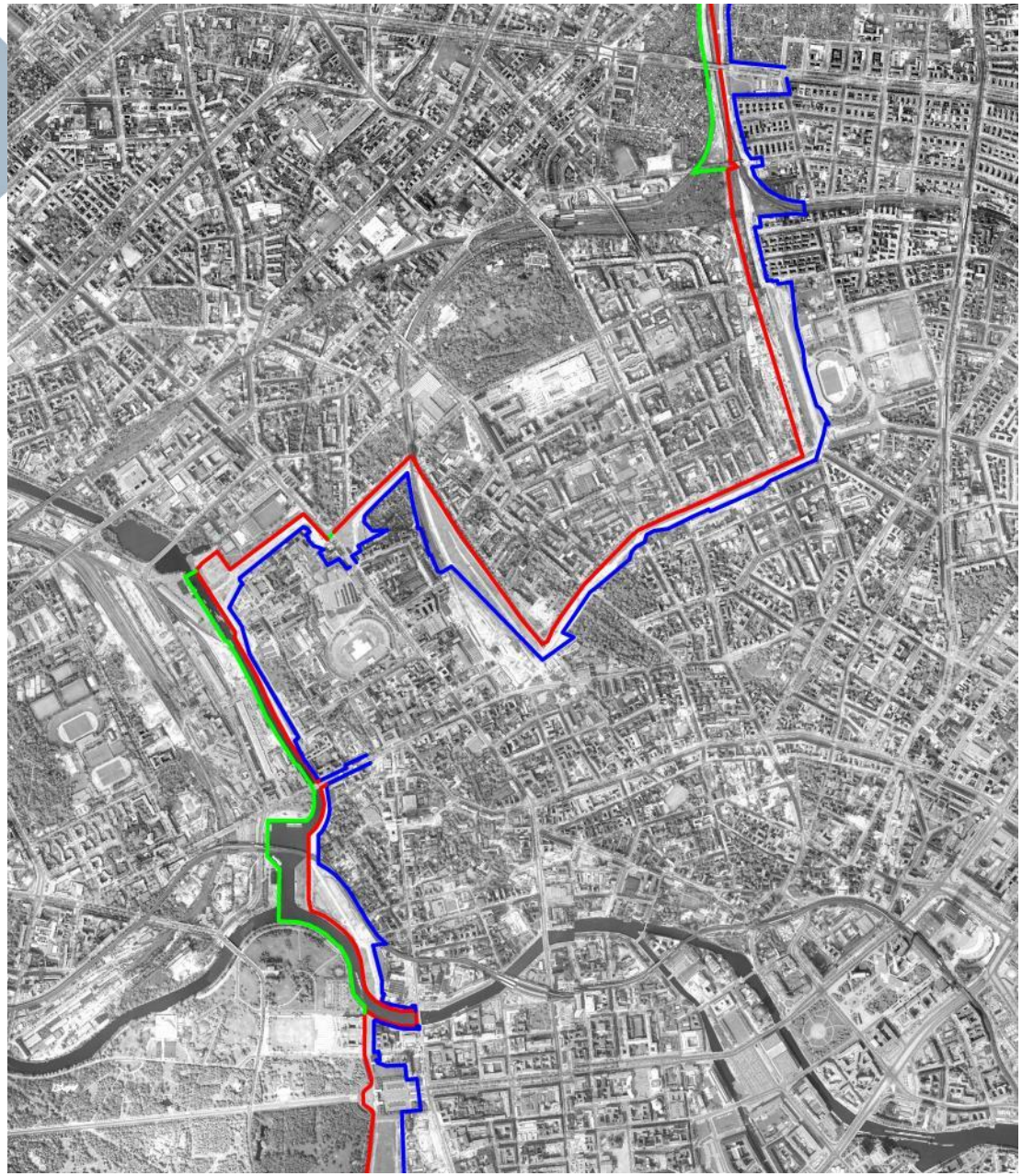


- constant structural changes, biggest in 2003
- Number of communities changed from 1.479 (1998) to 416 (right now it´s 419)
- green = old community borders, red = new borders
- Challenge for data handling, as old data is often not transferred

Berlin Wall around West-Berlin



The 2 Walls



Verlauf der Berliner Mauer, 1989

- Grenzmauer / politische Grenze
- Unterwassergrenze / politische Grenze
- Hinterlandsicherungsmauer / -zaun
- Politische Grenze abweichend vom Mauerverlauf