UNIVERSITÀ DEGLI STUDI FIRENZE

La mobilità sostenibile

come sfida e opportunità

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Bruxelles 1910, cartolina d'epoca

33 Personal jet propulsion.

34 The experimental monorail track of S.A.F.E.G.E. TRANSPORT near Paris. The car is suspended from rubber tyred bogies running inside the duct, and operation is thus silent and impervious to weather.

The future of the motor vehicle

36. The picture we have drawn so far shows a high degree of dependence upon the motor vehicle for transportation purposes, yet in many ways the arrangements for its use are grossly inefficient, self defeating of the motor vehicle's own peculiar properties, and productive of side effects which add up to a major social problem. In the circumstances it is justifiable to examine the motor vehicle itself as a means of transport, and to enquire whether it really does seem to have a long term future before it. This obviously involves some speculation, but it would be foolish to embark upon drastic and expensive alterations to towns to accommodate motor traffic if there were any serious doubt as to its continuance as a means of transport.

37. The motor vehicle of course cannot simply be 'disinvented'. Events have passed far beyond the point at which it would have been possible to revert to railways, though doubtless some loads could even now be transferred with advantage from road to rail. The fact is that a vast amount of development has been disposed around the country—including great suburban estates round the cities—based on the motor vehicle as the form of transport, and life in these areas could not continue to thrive except with a substitute offering the same range of services as the motor.

Individual air travel

38. The possibility most usually canvassed is that within a measurable time some kind of individual jet-propulsion unit will be developed, of which a rudimentary form has already been tried out in the U.S.A. for military use. This may well come about, but the problems of weather, navigation, air-space, and traffic control appear so formidable that it may be questioned whether such a device would ever be practical for mass use, for either freight or passengers, in the crowded conditions of the modern city. One only has to think of the rush-hour conditions in any large city to realise what would be involved. Another factor, it may be hoped, will exercise a strong restrictive influence on a technical development of this kind, namely the preservation of privacy. The motor vehicle has been eroding many of the common amenities of life, but there is still some privacy left in back gardens, verandahs, bedrooms and on roof-tops. All these would be threatened if people could take off vertically at will, proceed in any direction, and hover about just as they pleased. Strict canalisation of movement would almost certainly be demanded, and if this resolved itself into the equivalent of roads up in the air then the advantages of this kind of transport might not be as overwhelming as they appear at first glance. This is not to say however that vertical-take-off aircraft may not be developed considerably as freight cars and multi-passenger units, but in this case they would not be providing the individual, highly flexible, door-to-door service which, unquestionably, is the feature of the motor vehicle that gives it its greatest appeal. The competition would tend to be with existing methods of public transport, particularly long-distance transport, and the result might well be to leave motor transport in towns more or less unaffected.

Other possibilities

39. The same argument would probably apply to the development of other means of transport such as monorails (which offer the great virtue of silence), and tracked hovercraft (which offer the possibility of very high speeds). In both cases the competition would tend to be with existing forms of longer-distance public passenger transport, particularly the railways, rather than with motor transport in towns. A development which may offer a more direct challenge to the motor car, assuming the problem of noise can be overcome, is the air-cushion craft. It seems to give scope for development as a small personal machine, useable perhaps eventually on ordinary pavements as a substitute for walking. Yet it may be questioned whether it would really take this form, whether the urge to put a perspex cover over it for weather protection, to use it at higher speeds, to add

35 A vast amount of development disposed on the basis of the motor vehicle as the form of transport.

extra seats, and to affix luggage containers, would not soon convert it into a motor car in all respects but the possession of wheels.

The need for study of transport methods

40. It is possible, of course, if serious technological studies were undertaken, that a whole range of new ideas for moving people and goods in cities would be produced. It is indeed to be hoped that we are not at the end of our ingenuity in the matter. The bus, for example, for all its convenience, does not appear to be the last word in comfort. The travelator seems to offer much scope for development. Continuously operating chair-lifts might be used in a highly attractive way between points of pedestrian concentration to augment existing means of travel. Conveyor belts, pneumatic tubes, and pipelines might well be developed for the conveyance of goods, perhaps even justifying rearrangement of commercial processes to facilitate their use. Why, for example, should the streets have to carry large tankers delivering fuel oil to individual buildings, when it could be piped in the same manner as water or gas or (as in New York) steam?*

36 The tracked hovercraft.

Advantages of a ground-based individual machine

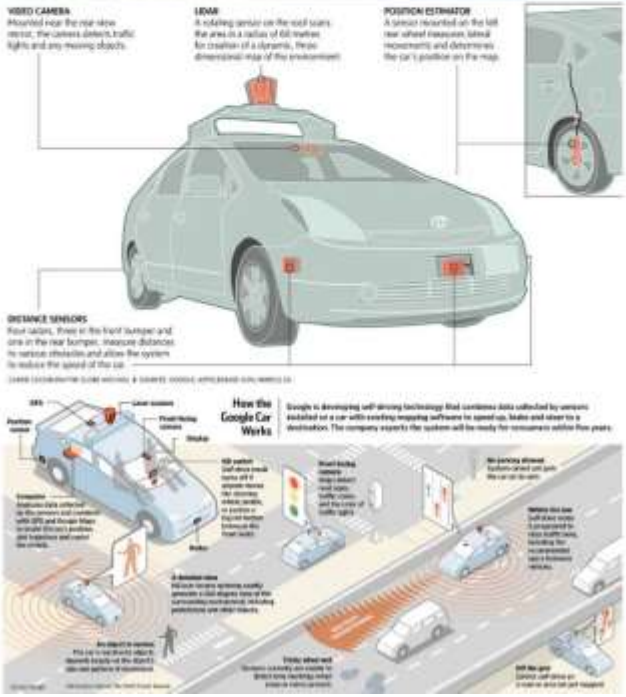
41. Even so, it is difficult to see any new method of movement coming along which will be seriously competitive on a big scale with the motor vehicle. There are so many advantages in a fairly small, independent, self-powered and highly manoeuvreable means of getting about at ground level, for both people and goods, that it is unlikely we shall ever wish to abandon it. It may have a different source of motive power so that it is no longer strictly a motor vehicle, it may be quicker and without fumes, it may be styled in some quite different way, it may be produced in smaller forms, it may be guided and controlled in certain streets by electronic means, it may have the ability to perform sideways movement, but for practical purposes it will present most of the problems that are presented by the motor vehicle of today.

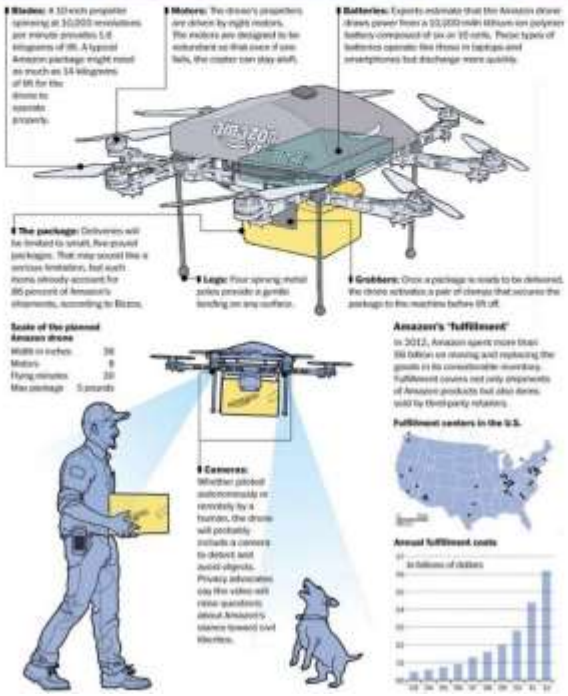
42. Our conclusion, therefore, is that the future of the motor vehicle, or of some equivalent machine, is assured. We think it follows that a close, constructive examination must be made of towns and cities in order to see how the best use of the motor vehicle can be achieved in those places, and how the present difficulties can be overcome. This represents the basic standpoint of our study. We accept the motor vehicle as a potentially highly beneficial invention. It is implicit in this that we reject, as an initial standpoint, a currently held view that the traffic problem in towns would take on an altogether different complexion—that it might indeed almost disappear—if motorists were obliged to pay the full economic costs of running their vehicles, including the rental of road space. We think the public can justifiably demand to be fully informed about the possibilities of adapting towns to motor traffic before there is any question of applying restrictive measures.

37 The air-cushion craft.

* Developments of this kind would be assisted if the archaic practice of burying pipes and cables in the ground underneath the road surface were abandoned, as urban reconstruction proceeds, in favour of capacious service ducts constructed integrally within the road. The idea is illustrated in the study for a central metropolitan block in Chapter III (Part Four).

Colin Buchanan, Traffic in Towns, Londra, 1963





Google car, Amazon drone: un future senza autisti?

….o un cambio di paradigma nella mobilità individuale?

Sviluppo sostenibile

Gro Harlem Brundtland

WCED
Rapporto Brundtland
Il futuro di tutti noi, 1987

«Lo sviluppo sostenibile è uno sviluppo che soddisfa i bisogni del presente **senza compromettere la possibilità delle generazioni future** di soddisfare i propri bisogni.»

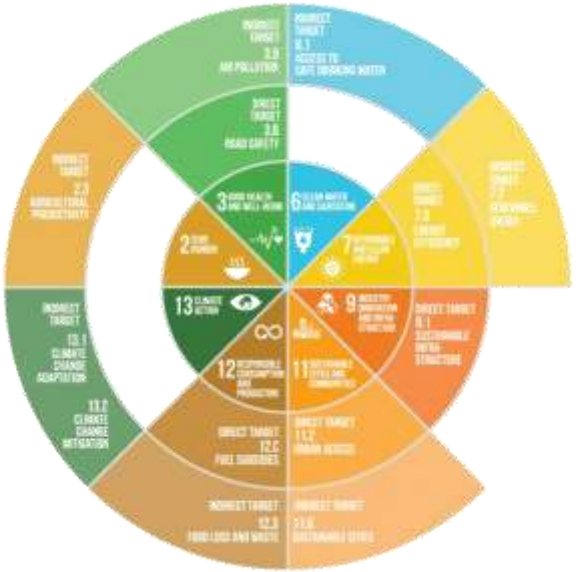
«Lo sviluppo sostenibile, lungi dall'essere una definitiva condizione di armonia, è piuttosto **processo di cambiamento** tale per cui lo sfruttamento delle risorse, la direzione degli investimenti, l'orientamento dello sviluppo tecnologico e i cambiamenti istituzionali siano resi coerenti con i bisogni futuri oltre che con gli attuali.»

<http://www.un-documents.net/wced-ocf.htm>


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 POVERTÀ ZERO
2 FAME ZERO
3 SALUTE E BENESSERE
4 ISTRUZIONE DI QUALITÀ
5 UGUAGLIANZA DI GENERE
6 ACQUA PULITA E IGIENE
7 ENERGIA PULITA E ACCESSIBILE
8 LAVORO DIGNITOSO E CRESCITA ECONOMICA
9 INDUSTRIA, INNOVAZIONE E INFRASTRUTTURE
10 RIDURRE LE DISUGUAGLIANZE
11 CITTÀ E COMUNITÀ SOSTENIBILI
12 CONSUMO E PRODUZIONE RESPONSABILI
13 AGIRE PER IL CLIMA
14 LA VITA SOTT'ACQUA
15 LA VITA SULLA TERRA
16 PACE, GIUSTIZIA E ISTITUZIONI FORTI
17 PARTNERSHIP PER GLI OBIETTIVI
OBIETTIVI PER LO SVILUPPO SOSTENIBILE

Impatti economici	Impatti sociali	Impatti ambientali
▪ Congestione del traffico ▪ Inaccessibilità ▪ Danni dovuti a incidenti ▪ Costi delle infrastrutture ▪ Costi vivi dei trasporti ▪ Consumo di risorse non rinnovabili	▪ Distribuzione non omogenea degli impatti ▪ Disuguaglianze nell'accesso alla mobilità ▪ Impatti sulla salute umana ▪ Coesione sociale ▪ Vivibilità urbana ▪ Impatti visivi	▪ Inquinamento atmosferico ▪ Cambio climatico ▪ Impoverimento dell'habitat ▪ Inquinamento dell'acqua ▪ Impatti idrogeologici ▪ Inquinamento acustico

Fonte: VTPI, Victoria Transport Policy Institute, Canada (2011), *Online Transport Demand Management (TDM) Encyclopedia* <http://www.vtpi.org/tdm/tdm67.htm>



Gli impatti della mobilità sulle tre dimensioni della sostenibilità

Commissione delle comunità europee
Strategia tematica sull'ambiente urbano

Una prospettiva europea per un trasporto urbano sostenibile

Un sistema di trasporto urbano è sostenibile se:

– favorisce la libertà di movimento, la salute, la sicurezza e la qualità della vita dei cittadini delle generazioni attuali e di quelle future;

– è efficiente sotto il profilo ambientale;

– aiuta un'economia dinamica, senza esclusioni di sorta, che dia a tutti, compresi i ceti meno abbienti, gli anziani o i cittadini disabili, accesso a opportunità e servizi.

Commissione delle comunità europee
Strategia tematica sull'ambiente urbano

Questi obiettivi vengono conseguiti in vari modi, ad esempio:

– incentivando un uso più razionale dell'auto privata e privilegiando il ricorso a veicoli puliti, silenziosi ed efficienti sotto il profilo energetico, alimentati da combustibili derivanti da fonti rinnovabili o alternative;

– offrendo una rete ben collegata di trasporto pubblico che garantisca un servizio frequente, regolare, comodo, moderno, a prezzi competitivi;

– potenziando la quota di trasporti non a motore (cioè l'uso di biciclette e gli spostamenti a piedi);

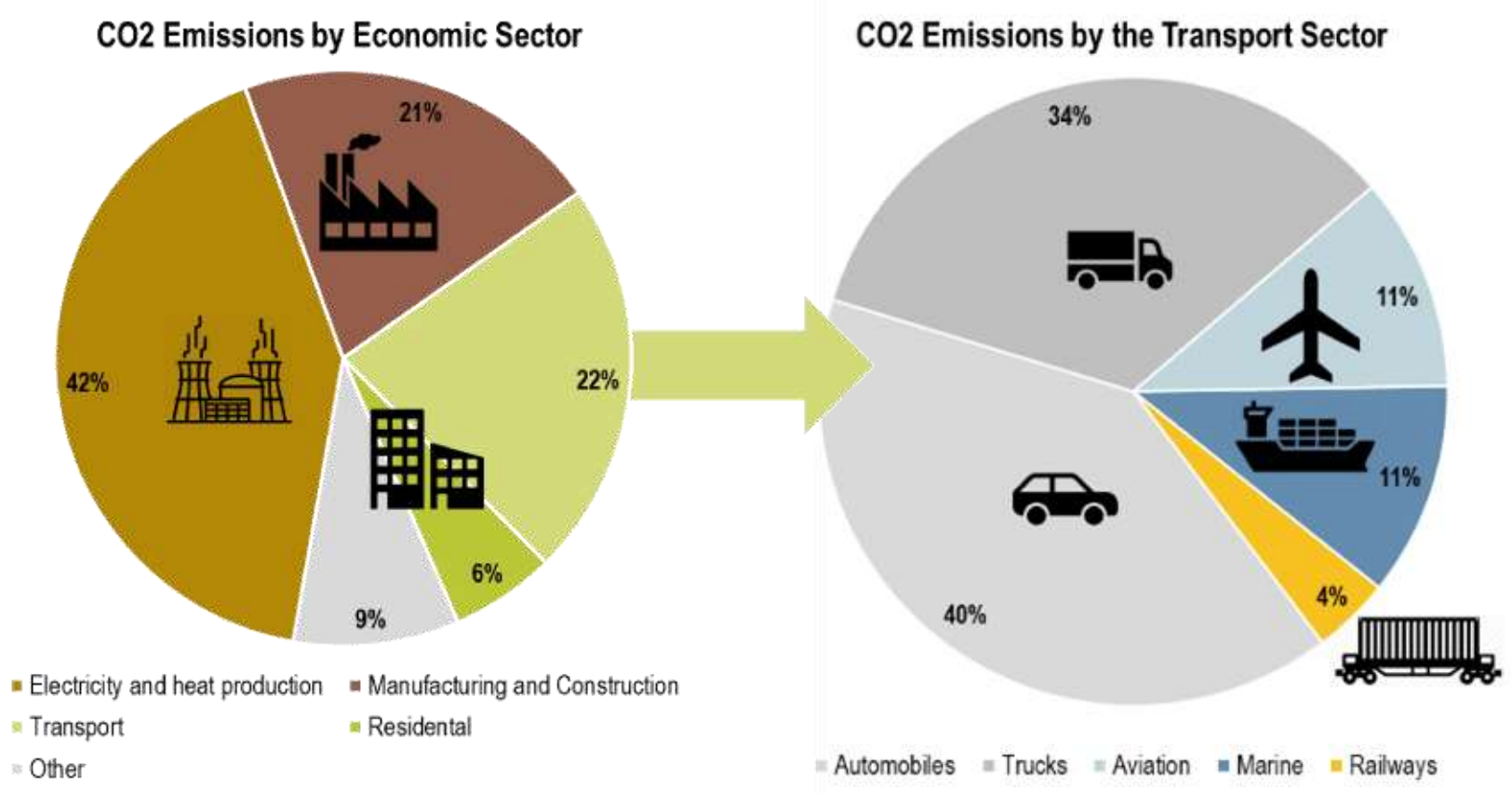
– sfruttando al massimo l'uso del territorio;

– gestendo la domanda di trasporto attraverso strumenti economici e piani che favoriscano un cambiamento comportamentale e la gestione della mobilità;

– garantendo una gestione attiva e integrata, che preveda la partecipazione di tutti i soggetti interessati;

– definendo obiettivi quantificati a breve, medio e lungo termine e disponendo di un sistema di monitoraggio efficace.

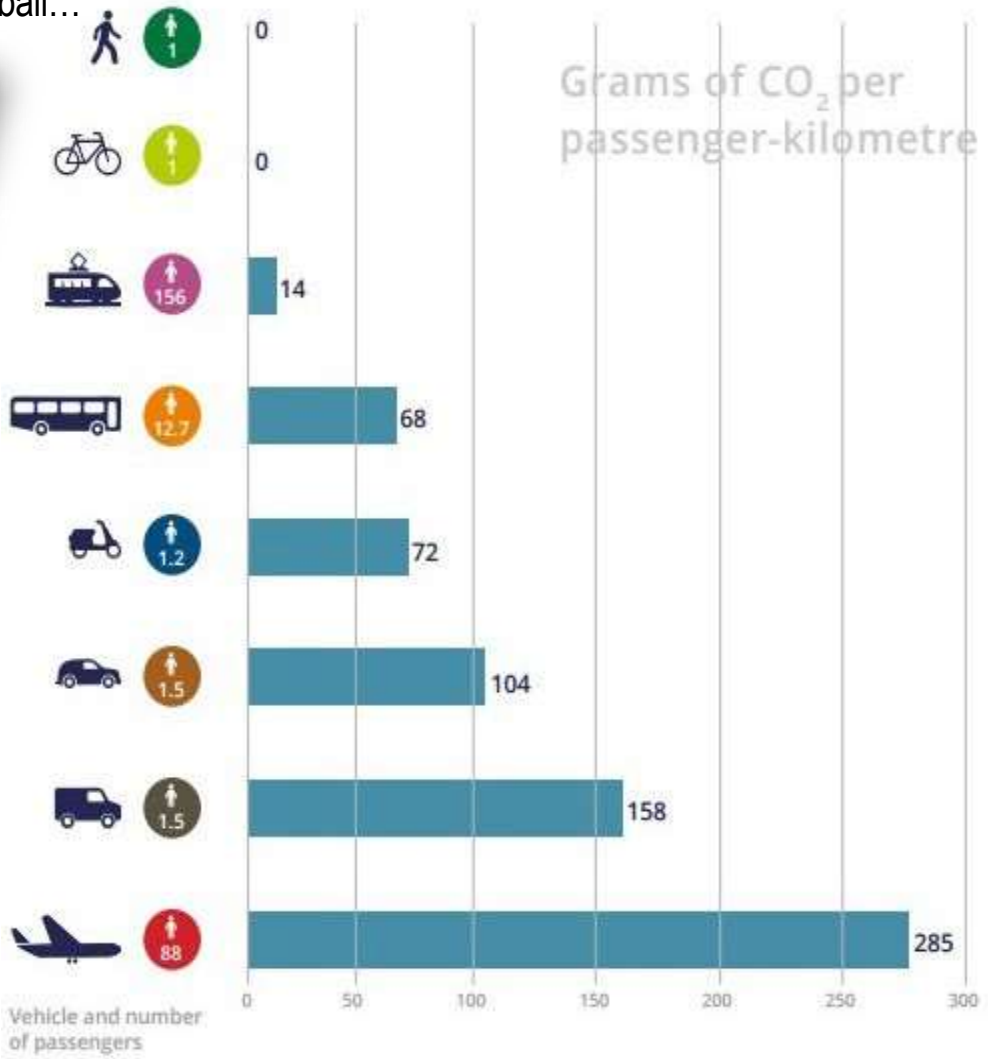
L'impatto della mobilità sul clima



Emissioni globali di CO2 per settore e loro ripartizione per modalità del settore trasporti

Impatti locali…

Impatti globali…



Oltre il **90%** della domanda di energia nel settore dei trasporti terrestri è coperta da **combustibili fossili**

Emissioni di CO2 per passeggero/km relative a diversi modi di trasporto

Commissione Europea

European Green Deal

Commissione Europea
Green Deal Europeo
(COM(2019) 640 final), 11/12/2019

Obiettivo (31/12/2050):
- Neutralità climatica

- 90% emissioni dal settore trasporti

Nei prossimi dieci anni dobbiamo cambiare qualcosa...

- Il **73%** del trasporto passeggeri su terra (pkm) avviene in **automobile**
- Circa il **10,5%** avviene su **mezzi pubblici urbani** (su ferro e gomma)
- Il **parco auto** è cresciuto nel periodo 1990-2011 del **49%** (EU 27)
- La **media di occupanti** per auto è prossima a **1**
- Il **50%** degli spostamenti in auto è **inferiore a 5 km**, il 30% è inferiore a 3 km
- Meno del **5%** degli spostamenti urbani avviene in **bicicletta**

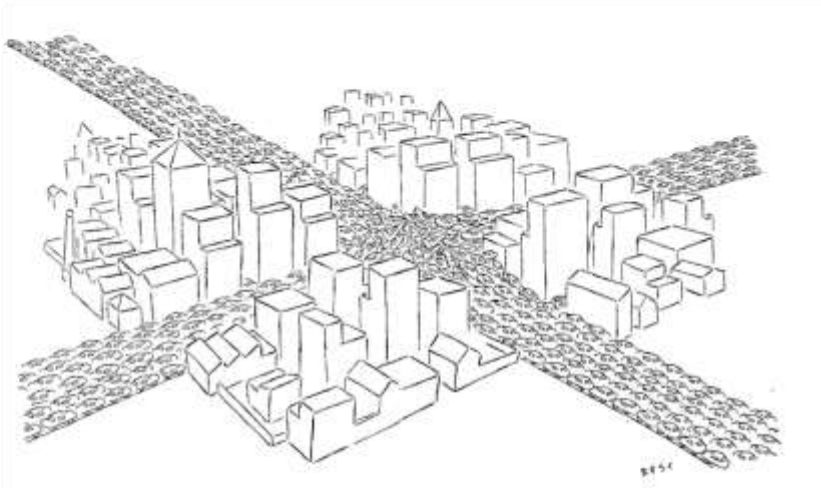
CAR DEPENDENCY

Nei prossimi dieci anni dobbiamo cambiare qualcosa...

USA	**77**
New York (Manhattan)	20 (13)
San Francisco Bay Area	64
Los Angeles	57

UE	**47**
Copenaghen	27
Madrid	32
Berlino	35
Londra	36
Stoccolma	38
Vienna	38
Barcellona	41
Parigi	41
Amsterdam (area metro)	52

CAR DEPENDENCY



ITALIA	**62**
Firenze	55
Milano (Comune)	63
Roma (Comune)	76

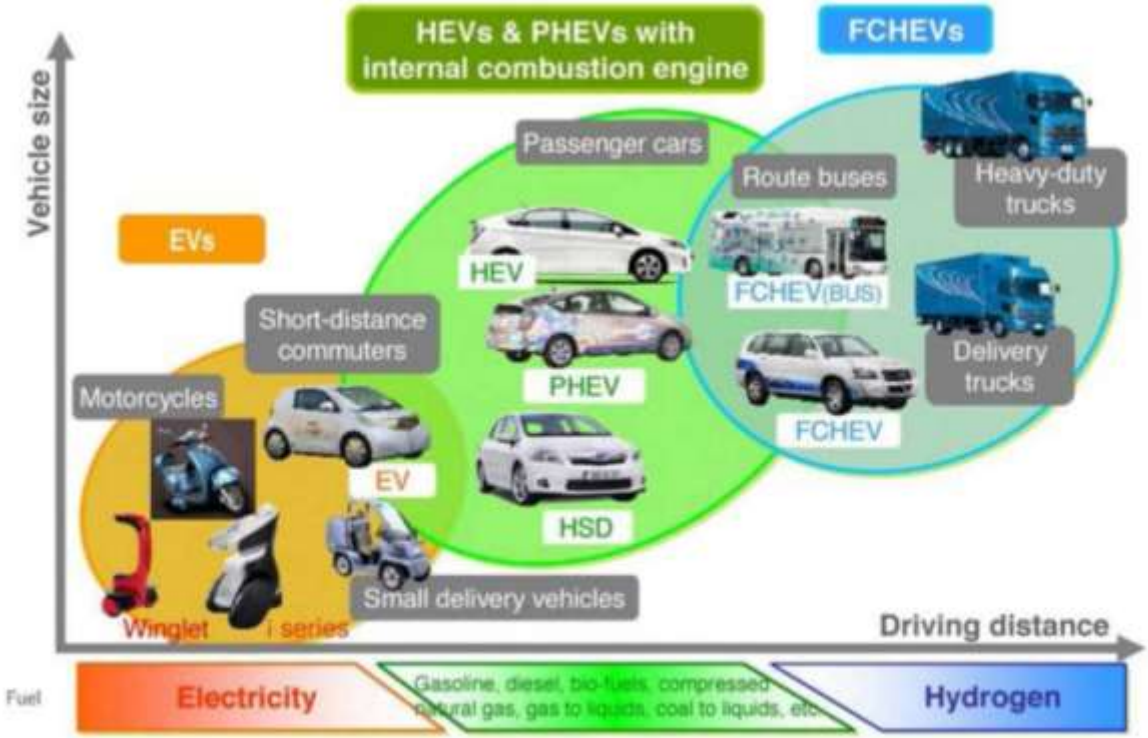
Nei prossimi dieci anni dobbiamo cambiare qualcosa...

- solo l'automobile?

L'OBIETTIVO DELL'UE

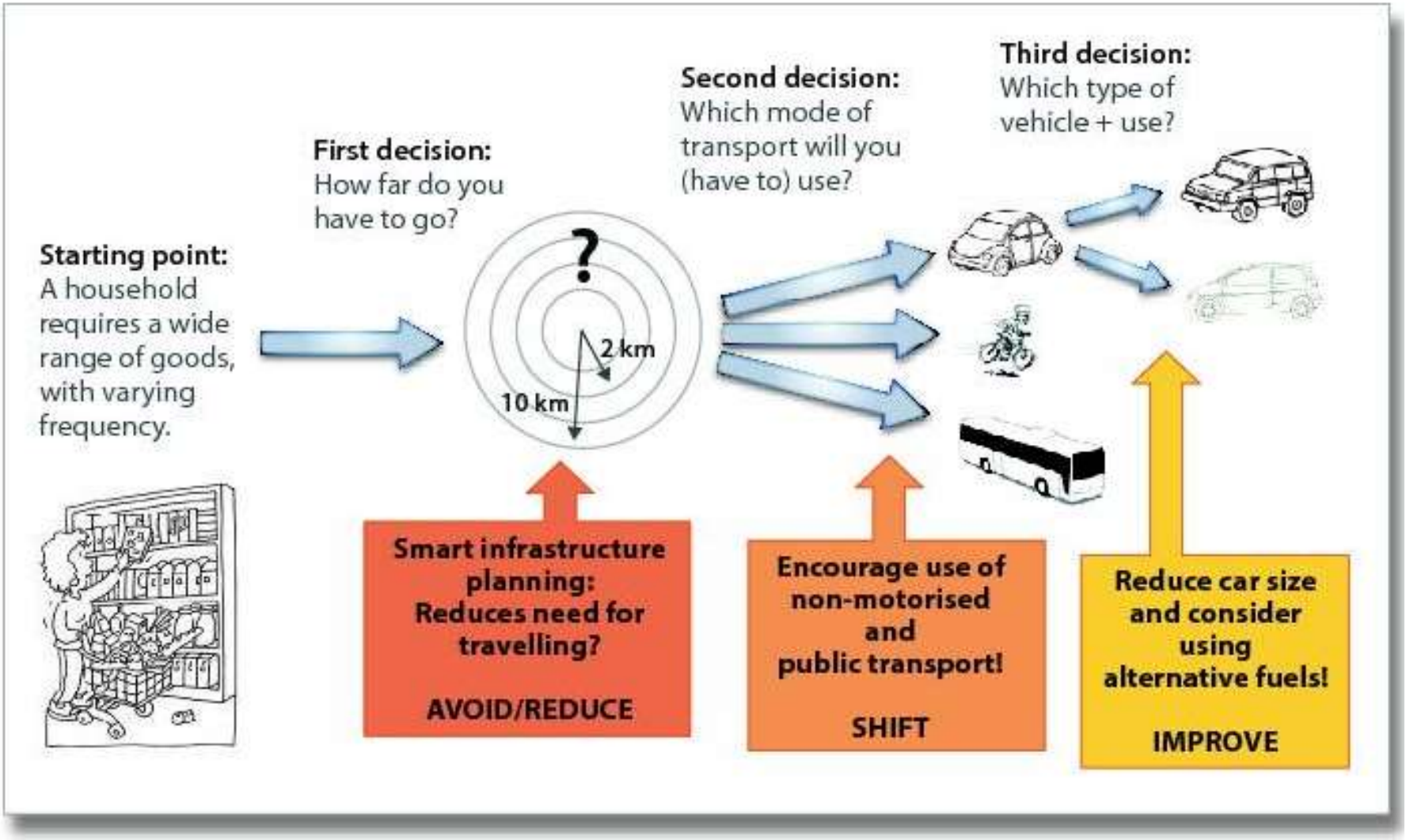
Dimezzare entro il 2030 l'uso dei veicoli «alimentati con carburanti tradizionali» nelle città ed eliminarlo del tutto entro il 2050.

(Libro bianco dei Trasporti, 2011)



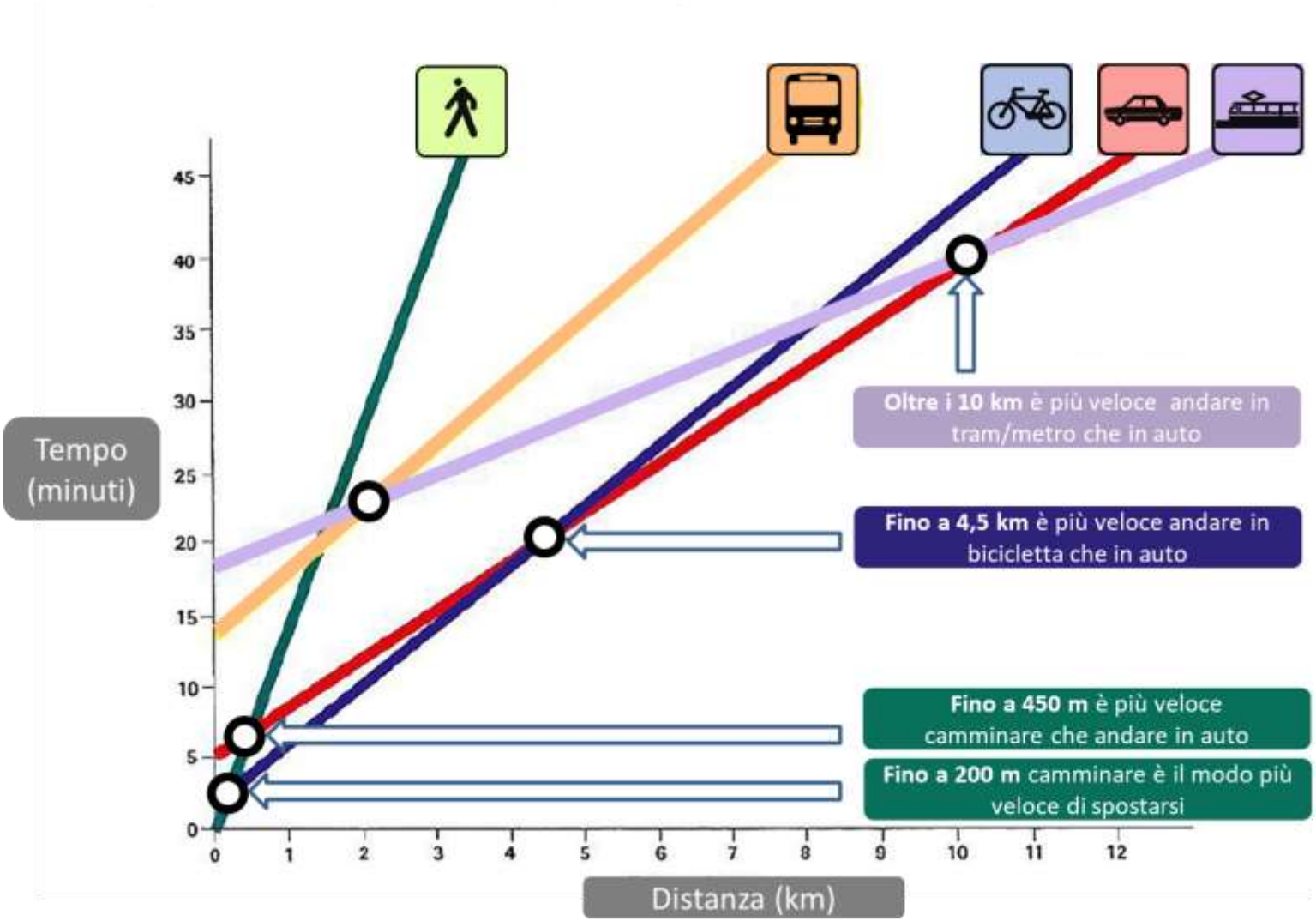
Nei prossimi dieci anni dobbiamo cambiare qualcosa...

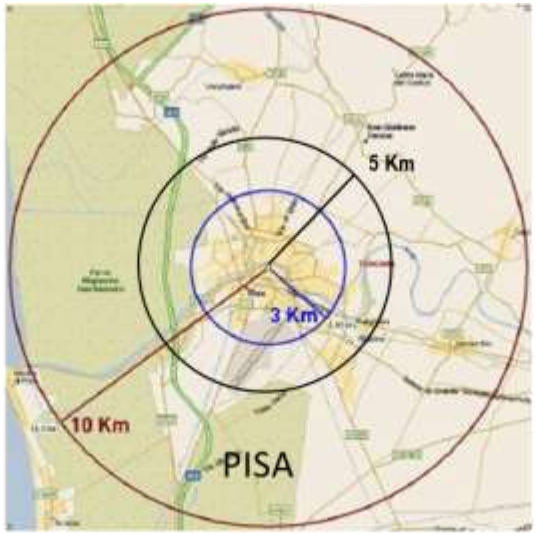
- Trasformare le **minacce globali** in **opportunita' locali**
- Rendere le nostre **città più vivibili, sostenibili e "resilienti"** al cambiamento climatico e al picco petrolifero



Il modello ASI (Avoid-Shift-Improve)

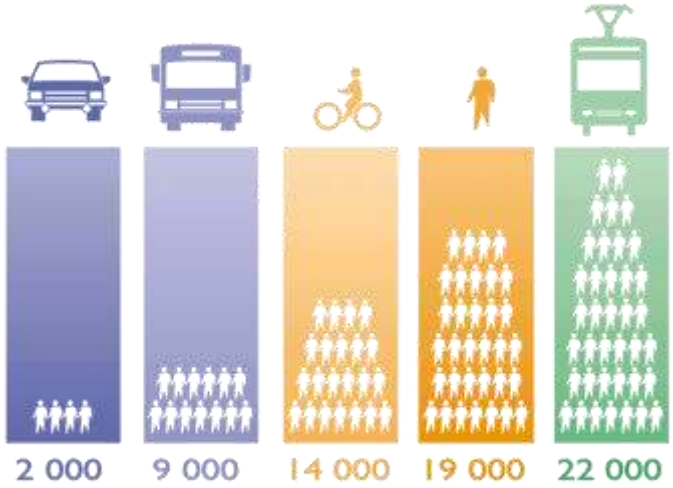
Tempi di spostamento door-to-door con diversi modi di trasporto in area urbana





Confronto dimensionale tra diversi centri urbani italiani

La “riconquista” dello spazio perduto



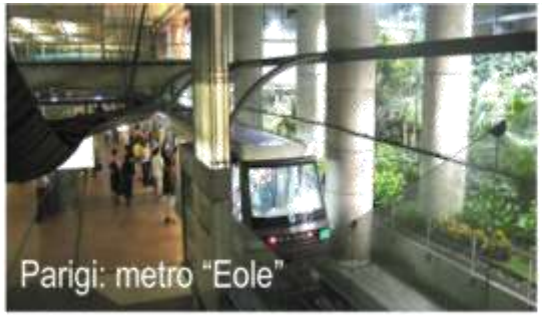
Numero di persone che attraversano una sezione stradale di 3,5 m in un'ora. (UITP, *Ticket to future. 3 Stops to Sustainable Mobility*, 2003)

Ingombro per la sosta: auto/bici (Malmö, 2007)

Spazio richiesto per trasportare 72 persone con diversi mezzi: bicicletta, automobile, autobus (Münster, 2001)

Innovazioni nel campo dei trasporti urbani


Lione: metrotram


Parigi: metro "Eole"


Brescia: metro


Innsbruch: funicolare


Perugia: people mover

Parigi: bike e car sharing

Innovazioni nel campo dei trasporti urbani

informazione e segnalazione

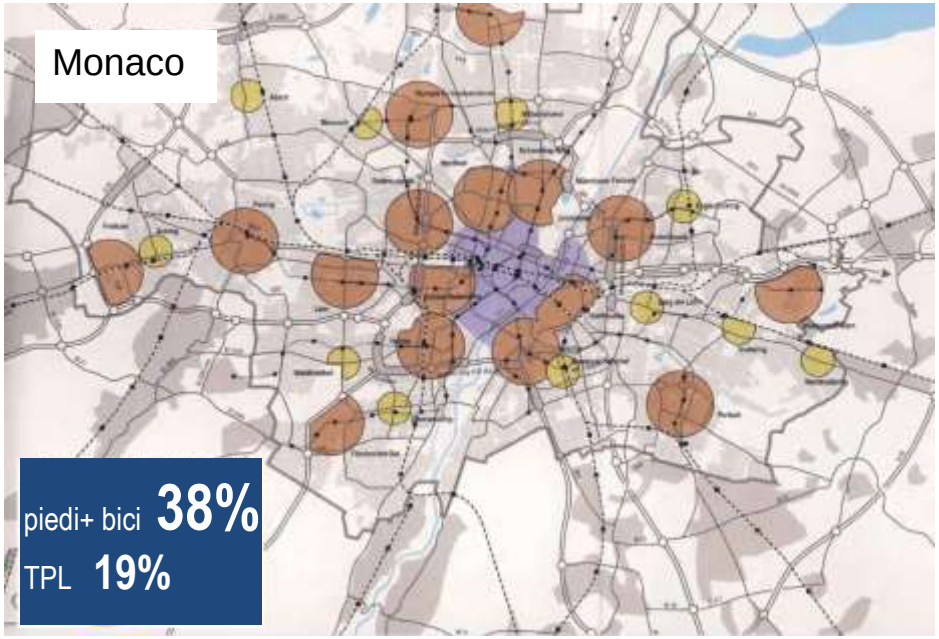
app

controllo

infomobilità e servizi smart

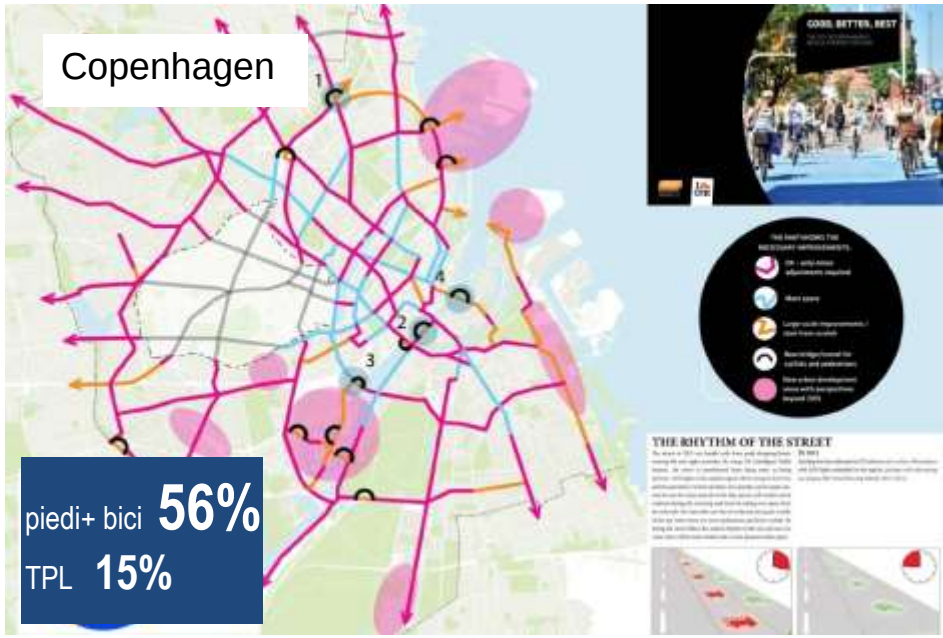
Un nuovo concetto di mobilità: mobility as a service

Monaco



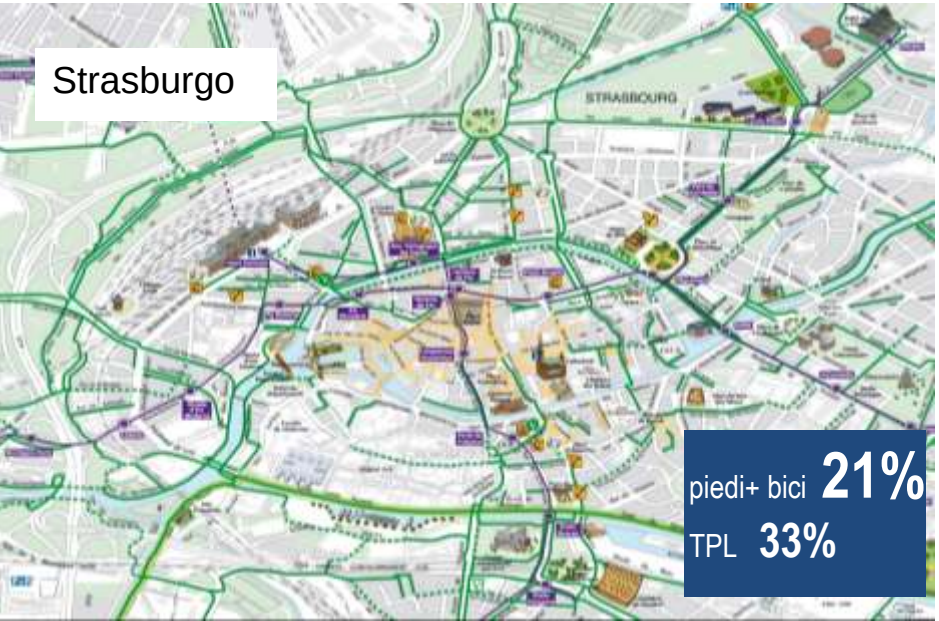
piedi+ bici **38%**
TPL **19%**

Copenhagen



piedi+ bici **56%**
TPL **15%**

Strasburgo



piedi+ bici **21%**
TPL **33%**

piedi+ bici **35%**
TPL **20%**

Graz

Car free city life in Oslo

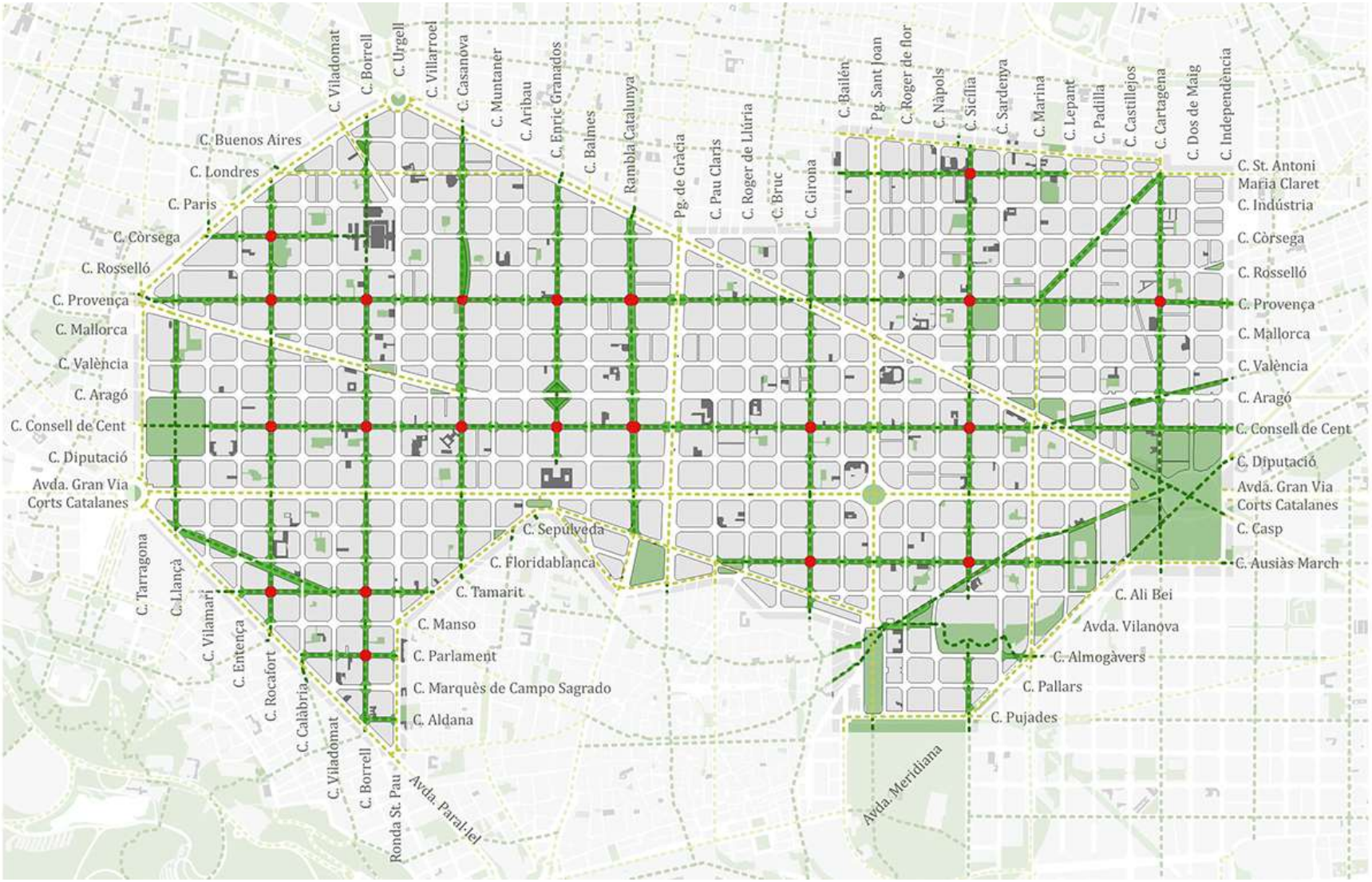
The City Government wants to create a greener and warmer city with room for everyone. A city center with less cars make more room for life in the streets and pleasant meeting areas.

In 2017, the first changes in the city center have taken place to create more room for a city life where pedestrians and cyclists take precedence over private cars.

An area of approximately 1.3 km2 will be transformed to a better urban environment during the City Council period 2015–2019.

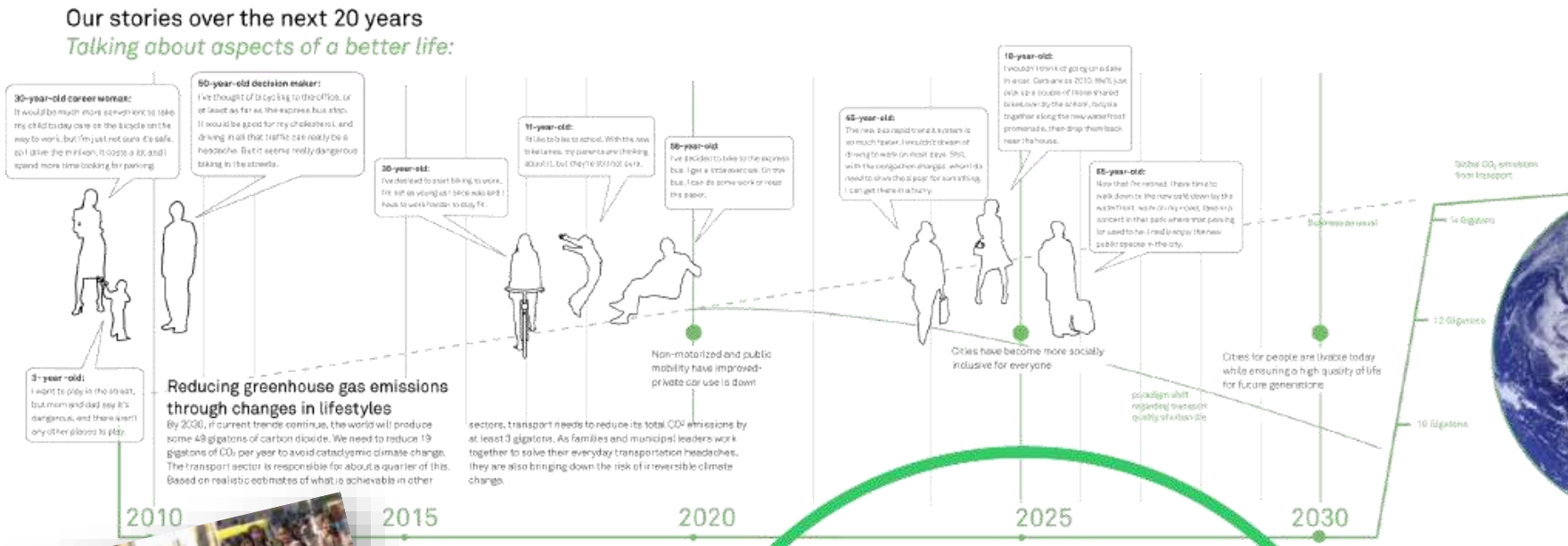
Malmö (Svezia), campagna “No ridiculous car trips” (dal 2007)

Supemanzana Sant Antoni



Barcellona, Estensione del programma Superilla a tutta l'area dell'Eixample (2019)

Barcellona, Passeig de St. Joan (Lola Domènech, 2008-2011)



(Ghel Architects, *Our cities ourselves. The future of transportation in urban life*, ITDP, 2010)

18 anni:

Stasera prendiamo un paio di quelle bici in sharing a due passi dalla scuola, passiamo per il nuovo lungofiume e le lasciamo vicino a casa. Non mi sogno nemmeno di venire in auto. Le auto sono così "anni dieci"!

2025

65 anni:

Ora che sono in pensione, ho tempo di scendere giù al caffè sul lungo-fiume, lavorare al mio romanzo, fermarmi a un concerto nel parco dove una volta c'era un parcheggio. Mi piacciono molto questi nuovi spazi pubblici in città.

Le città sono diventate più accoglienti per tutti

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Firenze, 23 febbraio 2023