

Urban development and mobility

— Reflections on cities and their transport systems.
How they develop and grow together
— And some economics of the wasteful use of resources

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Why do we live in cities?

The places that you can reach contain **your life**

Everyone wants to have as many **opportunities** as possible to work, study, buy, sell, spend time, meet interesting people...

We seek a compromise between two vital variables: **vicinity and space**



Space in a city

Space is a resource. There is no
"useless" space in a city!

We trade vital space for:

- Proximity
- Connectivity
- Security

Every activity must compete for space
with other activities.



Space is precious

Dwelling density is determined
by the space required per
person.

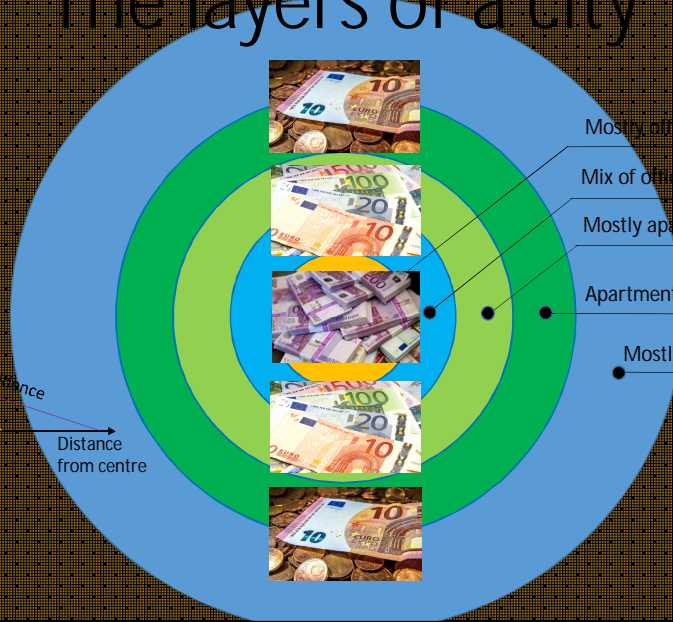
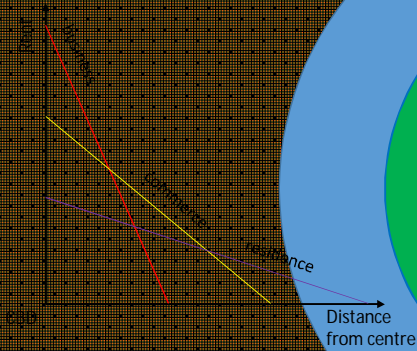
Private space minimums:
desk worker - 7-12 m² per
person.

Apartment in multi floor
building - 20-25 m² per person.

Detached house with garden -
60-75 m² per person.



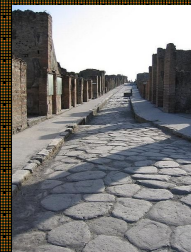
The layers of a city



- Mostly offices, commercial
- Mix of offices, commercial, apartments
- Mostly apartments - commercial
- Apartments and detached houses
- Mostly detached houses



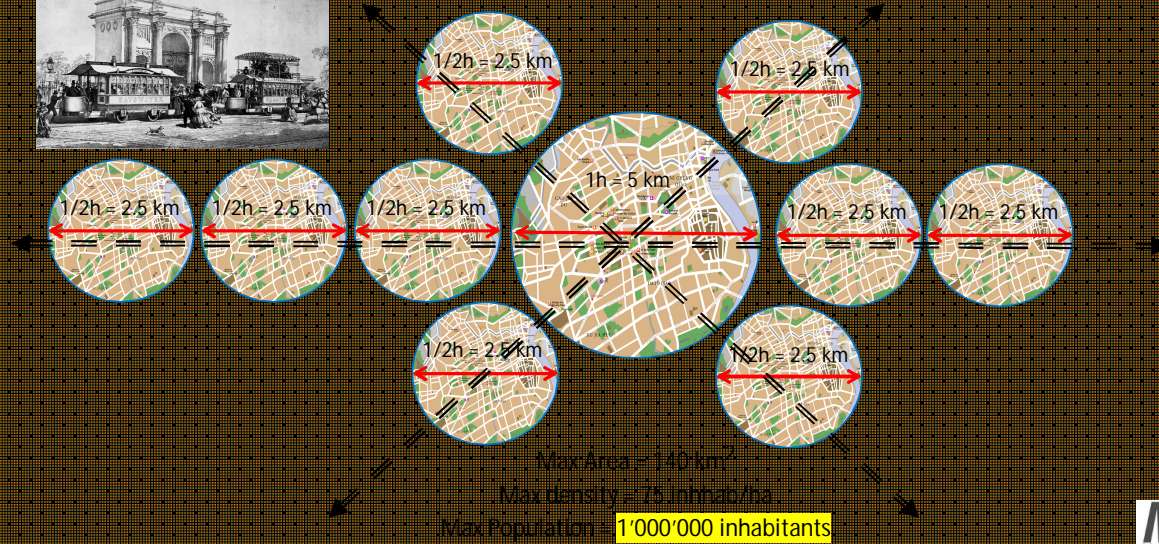
The city of walking



Max Area = 20 km²
 Max density = 100 inhab/ha
 Max Population = 200'000 inhabitants



The city of tramcars

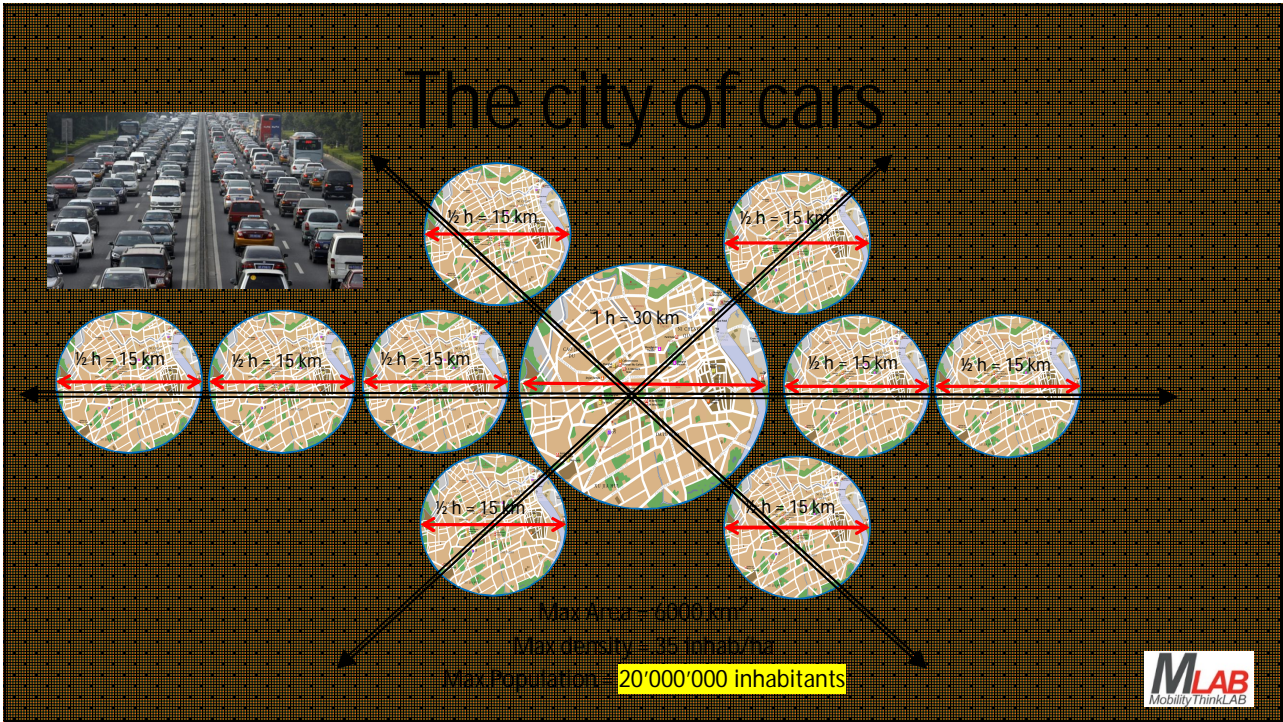


The city of cars



Max Area = 700 km²
 Max density = 30 inhab/ha
 Max Population = 3'000'000 inhabitants





Space for mobility



165 Renaissance center of Florence



A highway interchange in Atlanta, CA

from <http://www.trafficjams.org/>



Space for mobility

Some extreme cases*

city	Street space	Parking space	Total space
Houston, TX	39,7%	21,3%	61%
Little Rock AR	32,0%	26,5%	58,5%
Milwaukee WI	38,8%	11,5%	50,3%
Washington DC	43,3%	1,1%	44.4%

As a comparison, the Renaissance period historical center of a typical Italian town has about **10% of the space dedicated to mobility**

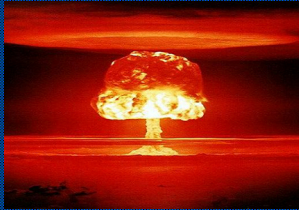
From: Charlie Gardner, 2011



Street diet

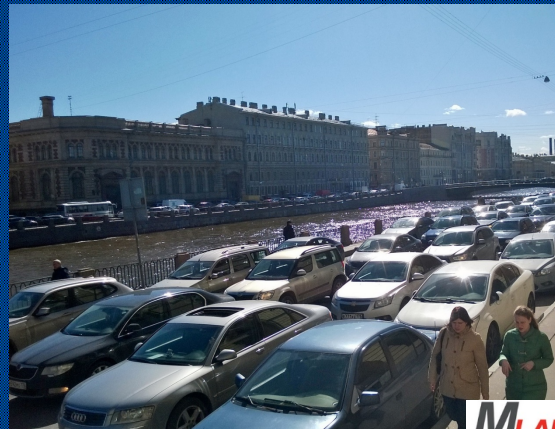


What was the most «impacting» invention of the XX century?

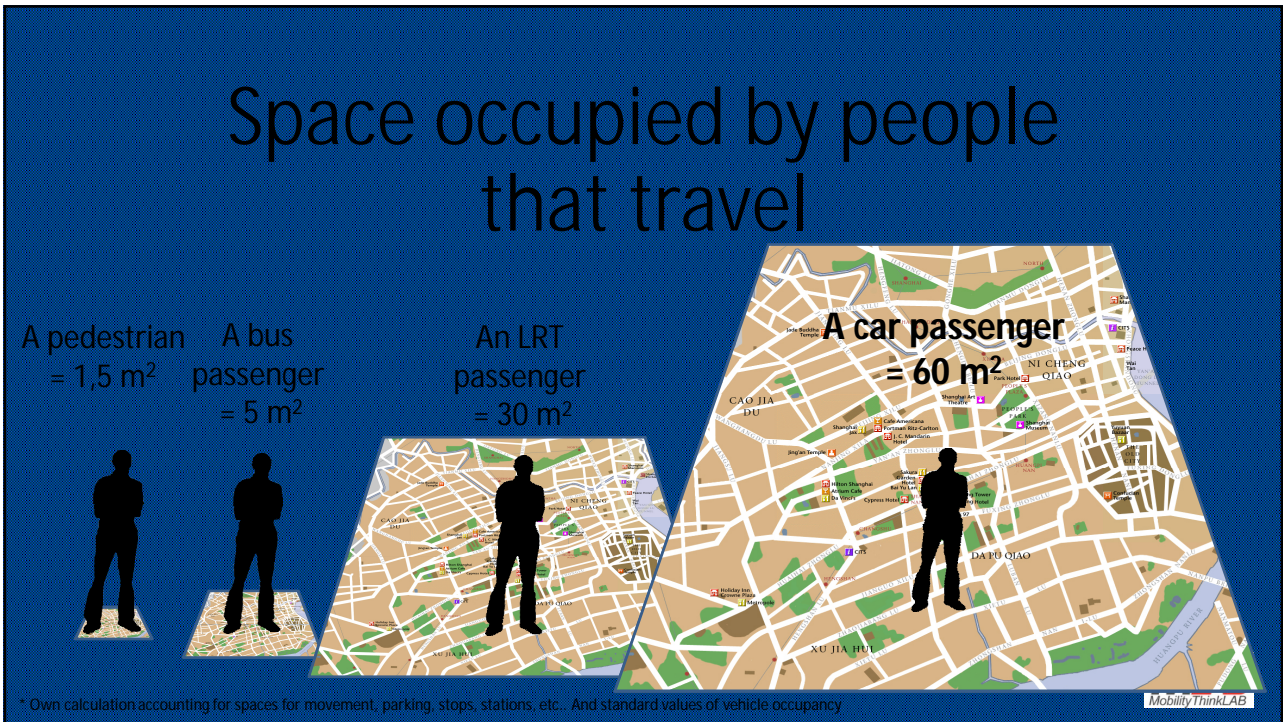
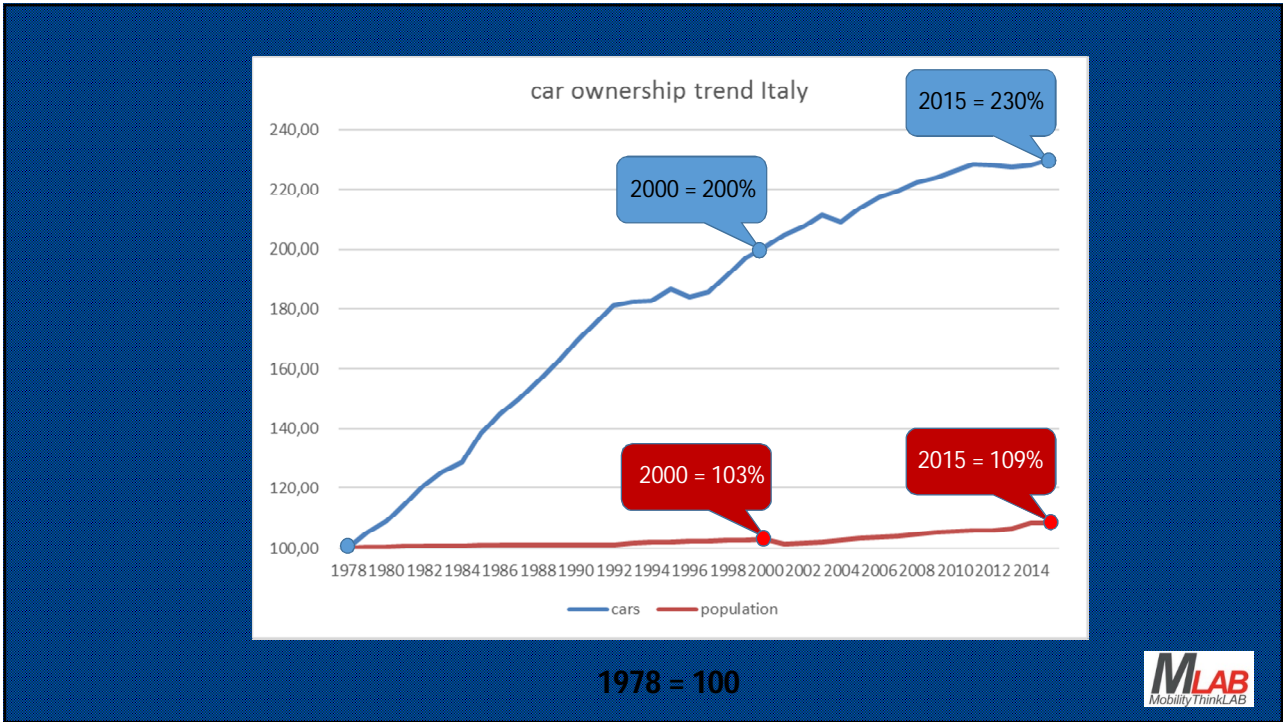


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Is the car the most impacting invention of the XX century?



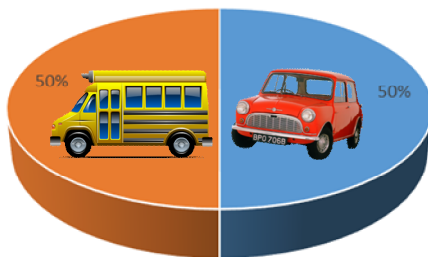
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A1

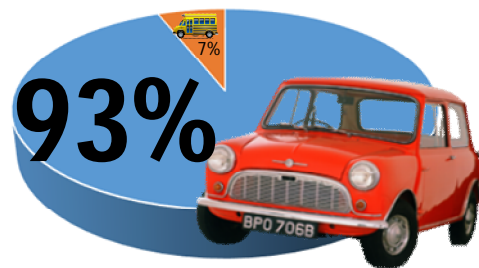
Space occupied by cars

bus users and car users



■ car users ■ bus users

space used by buses and by cars



■ space for cars ■ space for buses

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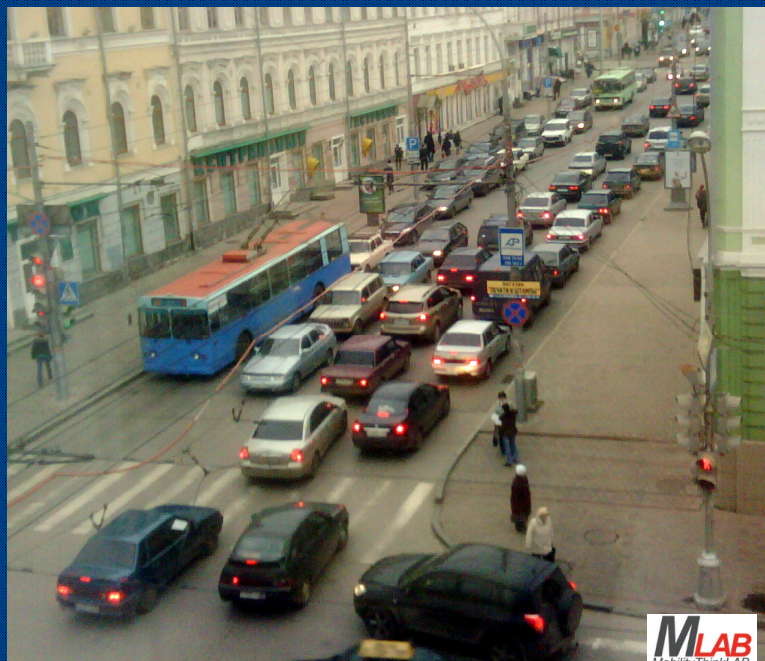
At a glance, in this photo are there more people in cars, or on PT?

2 buses, 50% full =
45+45 = **90 persons** on public transport

46 cars: 1.5 persons per car =
69 persons in cars

There are 21 more people on public transport...

BUT ALL WE SEE ARE CARS!



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Diapositiva 19

A1 chi non usa l'auto occupa così poco spazio che scompare, letteralmente, e con loro, scompaiono dalla vista i loro problemi

ASUS; 02/04/2016

Space occupied by cars



Space occupied by cars



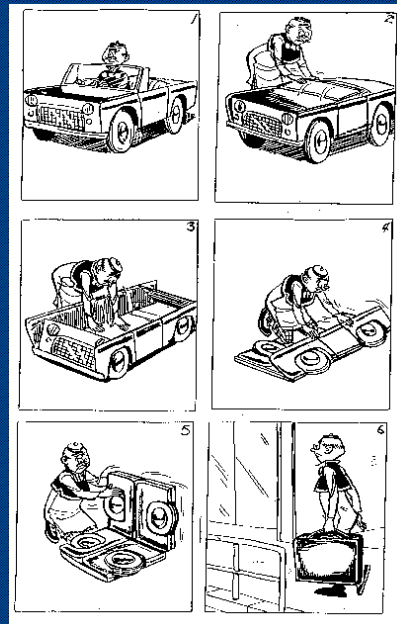
Is there a solution?

All cities of the world are overwhelmed by the space occupied by **transportation**

We are giving away more and more space which could be used more proficiently

In some cases, the cities lose their **identity** in order to accommodate transportation

Is it necessary to occupy so much space?



There is a solution

So, it would be enough to:

- Reinforce **public transport**
- Improve **pedestrian mobility**
- Build infrastructures for **cyclists**
- Favour **compact** and **mixed** urban growth
- Make sustainable individual **travel choices**
- Demolish** some great road infrastructures (which have become obsolete anyway)



Brussels, Belgium



Samara, Russia

So, why don't we do it?



If solutions exist, why don't we
adopt them?

The trouble is that we
constantly make bad decisions:

We decide «by problems»

We decide «for ourselves»

And we are victims of the «paradox of abundance»



Deciding by problems

I HAVE A PROBLEM



I SOLVE IT



DONE





this is a network

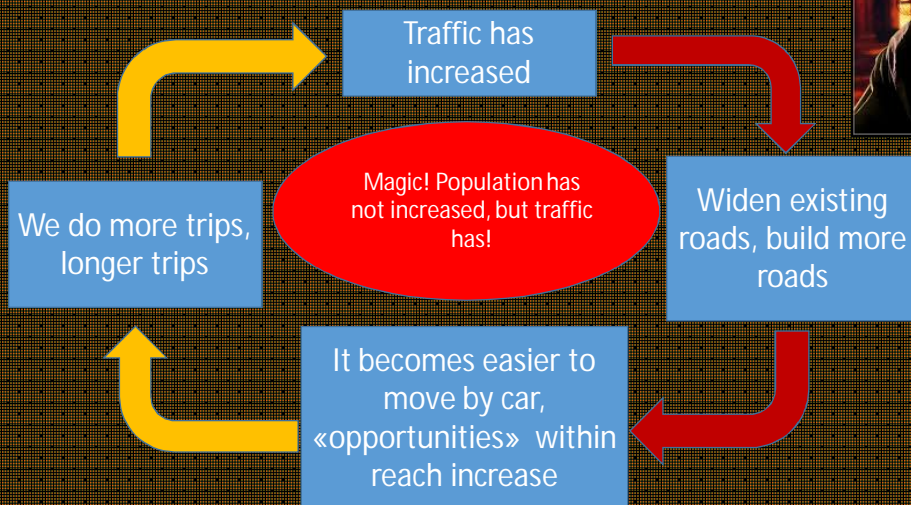


this is not

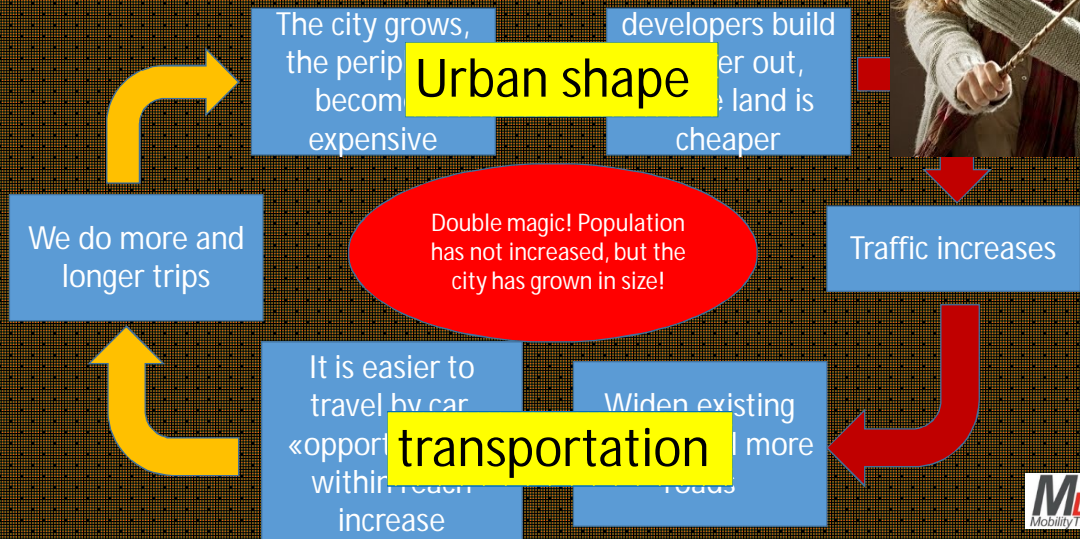
A common mistake is a «stack» of uncorrelated interventions do not add up to a working network.



Deciding by problems: the first vicious circle



Deciding by problems: the second vicious circle



Deciding for ourselves



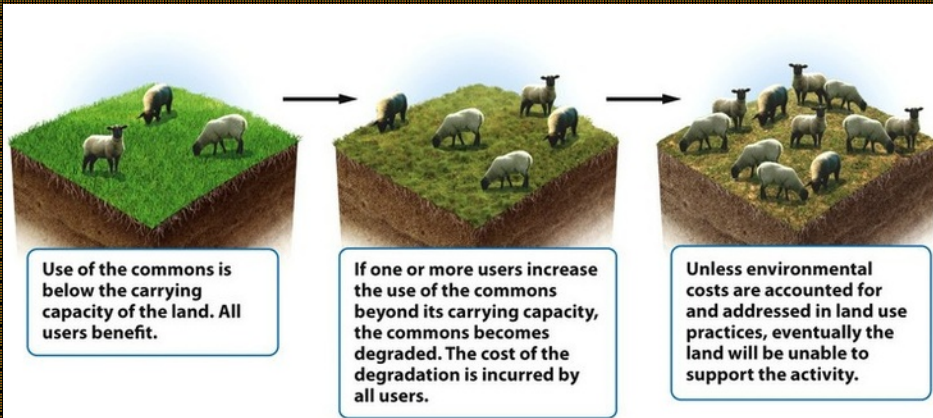
Deciding for ourselves



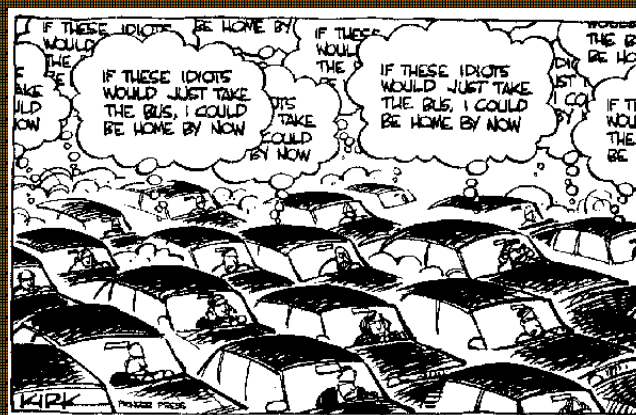
Who pays for the costs of mobility?



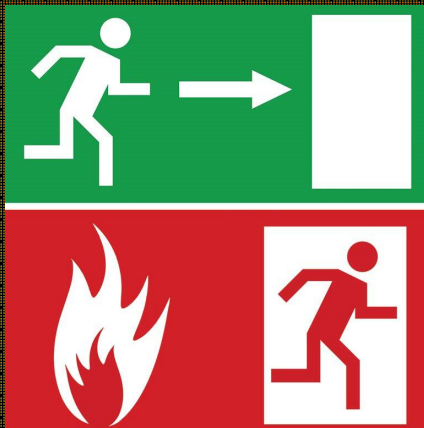
The tragedy of the commons



The tragedy of the commons (transport version)



A tragical example: evacuation



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The tragedy of the commons

We have fallen in a non-optimal «Nash equilibrium»

Nobody has any convenience in changing their behaviour even if aware of the collective cost inflicted.

Behaviour change does not happen spontaneously.

It is necessary to act together.

Some kind of enforcement is required.

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The paradox of abundance

When something is abundant
(or underpriced) it is wasted:

- Water
- Fuel
- Clean air
- Forest wood
- money
- building space
- Parking space
- Time

And often we only realize too
late **what we have wasted**



Which way out?

- **Internalization** of externalities
(those who use, pay)
- A clear **knowledge** of the
consequences of the actions
- A clear **planning** process
 - A global **vision**
- A change of **paradigms**
- A strong **social sense**
- A strong regulating **authority**
- «right» **pricing** of resources



Which way out?

XX Century:

Cars

PublicTransport

Pedestrians

(bicycles)

XXI Century:

Pedestrians

PublicTransport

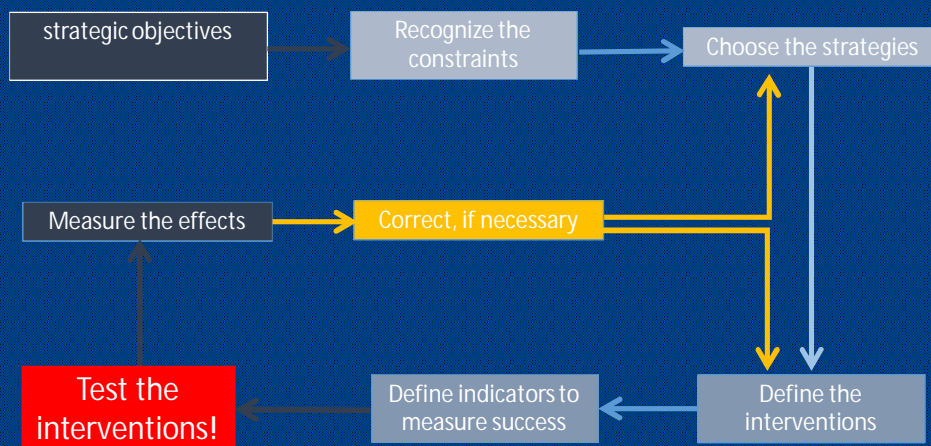
Bicycles

Cars

A new paradigm for the XXI Century



A better planning



A better planning method



Better planning, a better city



Broadway, New York



Social equity and health



- The evolution toward **better** planning:
- 1) doing the wrong thing.
 - 2) doing the wrong thing "better."
 - 3) trying to have your cake & eat it too.
 - 4) doing the **right** thing.

Where is **your city** today?

 TODERIAN UrbanWORKS

You can't go from «bad» planning to «good» planning in one easy step

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Mobility and accessibility



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Mobility and accessibility

«**mobility**» means moving people or goods in space. It is measured in terms of quantity of people or goods moved over a given distance, in a given time. For example: passengers per km per year.

Mobility is strictly connected with «distance» and «speed»

«**accessibility**» means allowing persons to access to opportunities when and where they need to. «Opportunities» are other persons, goods, services and activities. It is measured in terms of «access time» and «access cost».

Accessibility can be different for different categories of persons (young, old, rich, poor, disabled, etc.)



Proximity and connectivity

«**proximity**» means how close an opportunity is: therefore how little «mobility» is necessary to gain access to it. It is measured in terms of «access distance».

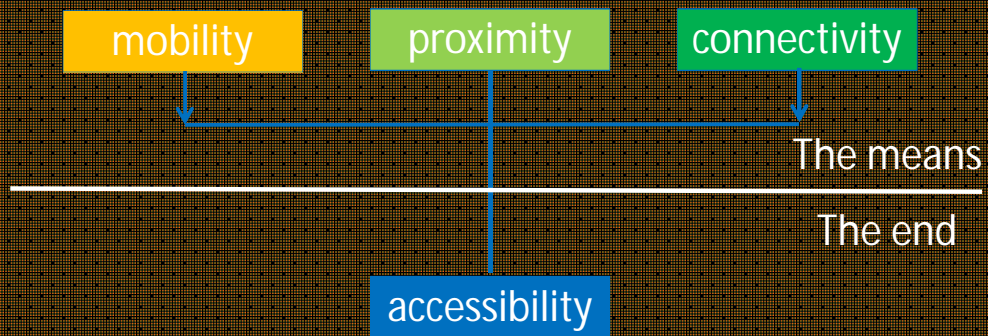
The closer are two places where opportunities are, the greater is the «proximity»

«**connectivity**» means how «direct» are the routes that connect two places where opportunities can be found: it is measured in terms of «distance of access» compared to «direct distance».

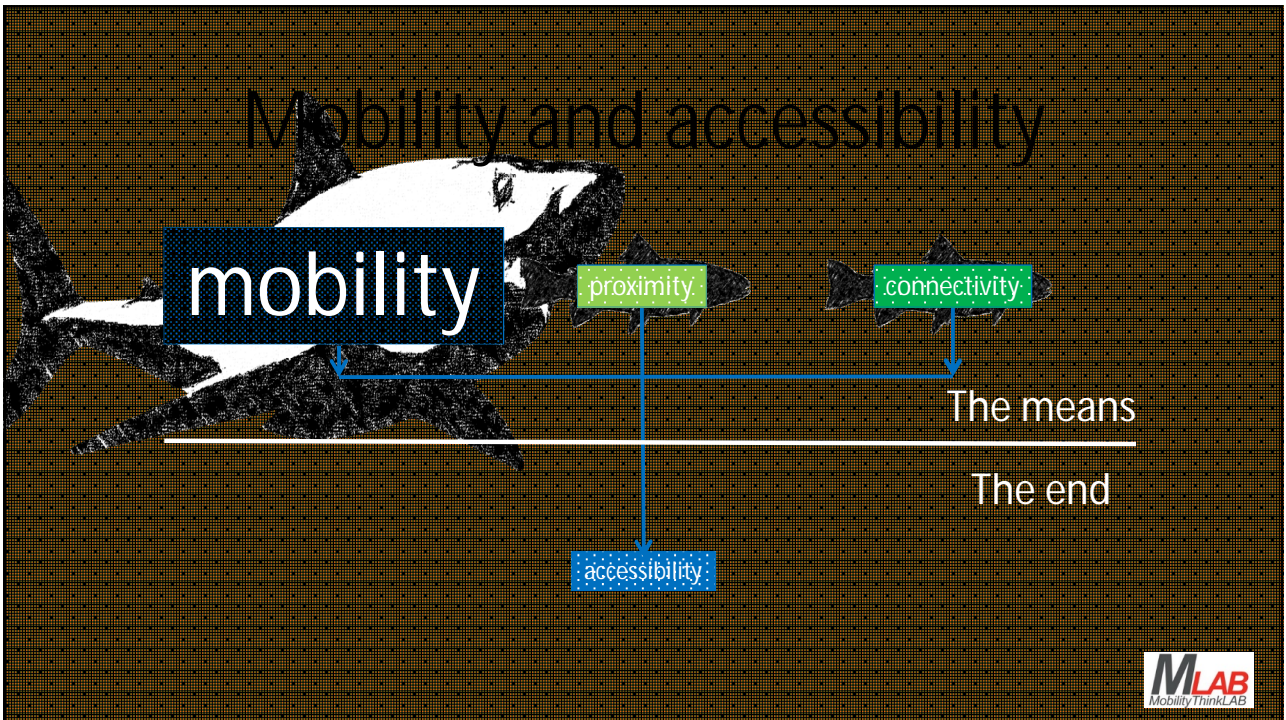
The less tortuous are routes, the more «connected» is a network



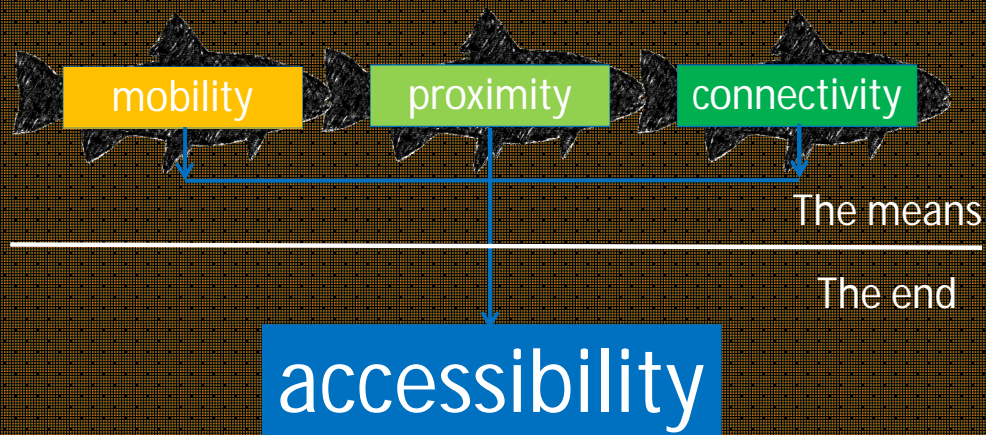
Mobility and accessibility



Mobility and accessibility



A good mix of solutions



Are there too many roads?

During the 1950s in the small hamlet of Siddi (Italy) there lived tziu Luciferu, a «divinator» to whom people from the surroundings asked advice and prophecies.

He once said:

«miserinu e tristi, a chi s'ait a acattai candu tottu su mundu ait a essi arrogau de istradas»

«miserable and sad he who will find himself when all the world will be broken-up by roads»

Sixty years ago tziu Luciferu, «the divinator of Siddi» had seen right.