

## SUSTAINABLE LAND AND TRANSPORT PLANNING IN METROPOLITAN BILBAO

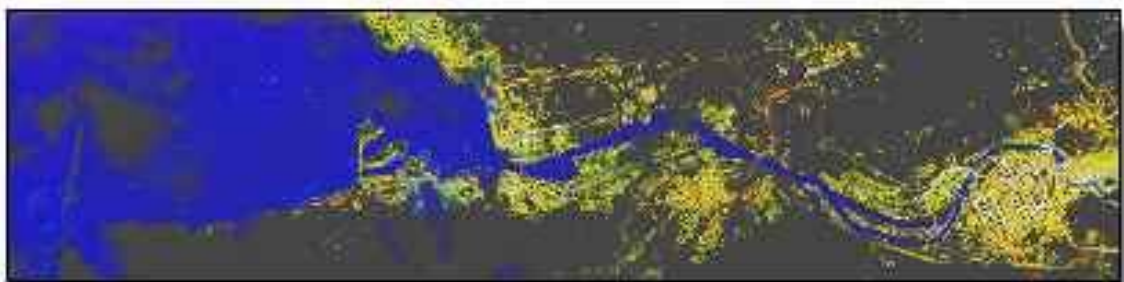
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The IETB, Institute for land studies in Bizkaia, was created in 1987 as part of the Bizkaia County Council. The idea was to have a think tank inside the Bizkaia administration to deal with topics such as planning, transportation, environment, etc.

Bizkaia is a small county ( 2.117Km<sup>2</sup> ) inside the Basque Country in Spain, with a very high density of 539 inh/km<sup>2</sup> .



Most of the population of Bizkaia lives in the metropolitan area of Bilbao, which is mostly an estuary surrounded by mountains.



After a dramatic crisis in the 80's which affected its steel and shipyard industries, Bizkaia reinvented itself and built new infrastructures such as the Guggenheim Museum ( Frank Gehry) Bilbao Underground ( Sir Norman Foster), new airport terminal ( Santiago Calatrava), Congress and Music Hall ( Soriano), new bridges, highways as well as the expansion of the Bilbao Port.



Big companies have their headquarters in Bilbao, such as BBVA (Eurostoxx 50) and Iberdrola, both part of the Ibex 35.

Its two metro lines as well as the six railway lines that connect the city of Bilbao with the metropolitan area and the tram that runs close to the new developments of the inner city such as the Guggenheim Museum and the Congress Hall have a significant importance in the modal share of the trips in Bilbao. But what we have to think about now after coming back from the crisis is: Are we sustainable?

## SUSTAINABILITY

Let's begin with the definition of sustainability as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This includes the basic principles of:

- intergenerational equity: we haven't inherited our father's world but rented our children's.

- intergenerational equity: social justice, all people currently alive have an equal right to benefit from the use of resources.

- transfrontier responsibility: sustainability in one region cannot be achieved at the expense of environmental conditions elsewhere.

- the public trust doctrine: places a duty on the state to hold environmental resources in trust for the benefit of the public.



-precautionary principle: lack of full certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation.

-subsidiarity principle: decisions should be made by the communities affected, or, on their behalf, by the authorities closest to them.

-the polluter pays principle: costs of environmental damages should be borne by those who caused them.

Are we in Bizkaia on the left hand side of the drawing or on the right hand side?



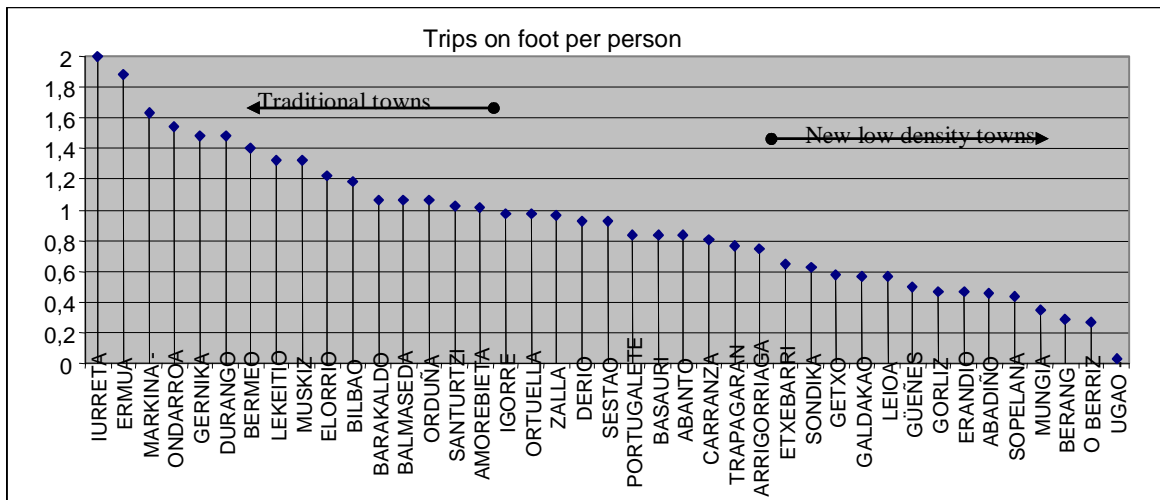
It is true that we don't use the cars as much as the rest of the Europeans do but what may cause surprise is that we are more sustainable than Dutch and Danish in our trips in the city. We have 50% of the trips in our cities on foot which is more than the foot + bike share in Copenhagen and similar to Amsterdam, although they move a lot by bike. Even our public transport share is bigger than theirs and as a result we use the car less than they do.

| CITY        | % PED | % BIKE | PED + BIKE | CAR | PUBLIC TRANSP |
|-------------|-------|--------|------------|-----|---------------|
| Bilbao Metr | 50    | <1     | 50         | 24  | 26            |
| Barcelona   | 33    | <1     | 33         | 24  | 43            |
| Amsterdam   | 23    | 28     | 51         | 37  | 12            |
| Copenhagen  | 15    | 26     | 41         | 37  | 22            |

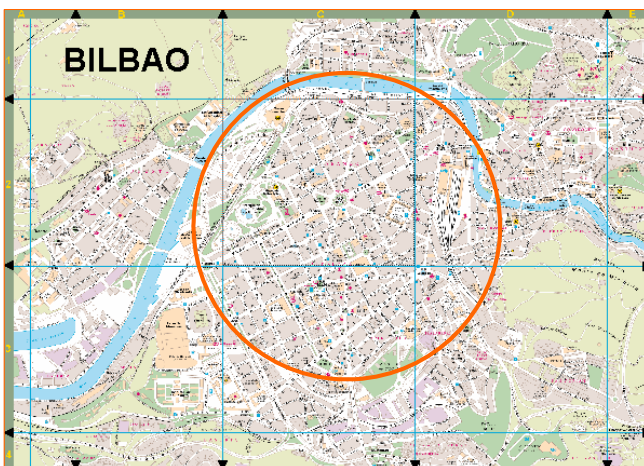
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One could think this is because we do not have enough cars but if you have a look closer you can realize that it is the area with the highest ownership of cars in the city, where we move more on foot and by public transport.

The old traditional towns in the metropolitan area are the towns with bigger number of trips per person on foot. On the other hand, the new low density areas are the ones with more trips on motorized means.



The city of Bilbao is a good example. Taking out the old city core and the new neighbourhoods the rest of the city is a flat almost circular area with a radius of 0.8-1 km which means a maximum travel time of 20 minutes walking or 8 minutes by bike.

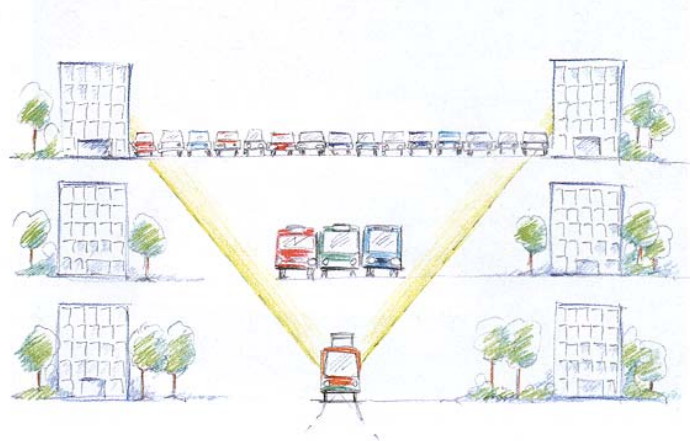


The reason for this is a good mixture of uses and a significant urban density taking as a result:

- less dependence on private vehicles
- shorter trips
- bigger percentage of pedestrians
- social mix and inclusion.

But still, we move a lot by car instead of by public transport. In the ring road around Bilbao we have a one in two probability of getting stuck by the traffic but we still use it.

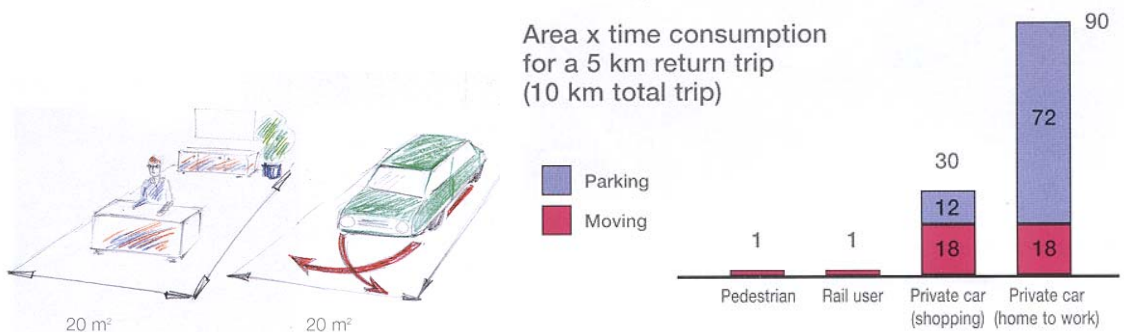
We could follow the International Association of Public Transport (UITP) recommendations that to move 50.000 people each way in one hour we need a 175m wide highway or a 35m dedicated bus lane or 9m wide rail track.



UITP teaches us also that all the people in the photo fit in either 70 cars or in one bus.



But once we reach our destination the problem gets far from over. We need the same space for working as for parking, that is 20 m<sup>2</sup> (considering 1 person per car) and if we consider area\*time consumption it is 90 times bigger by private car than walking.



Let's have a look at a typical street. We have like a 30% of the width for the sidewalk, another 30% for parking purposes and 40 % for driving. But if we move 50-60 % on foot, to have only 30% for this movements does not make sense at all! And we even fill the sidewalks with trees, benches, traffic signalization, traffic lights, propaganda, etc.

We live in a society which is decreasing in population ( although it is recently maintaining or even increasing due to immigration), but increasing in number of families and increasing more and more in number of cars and even more in kilometres travelled .

#### URBAN SPRAWL

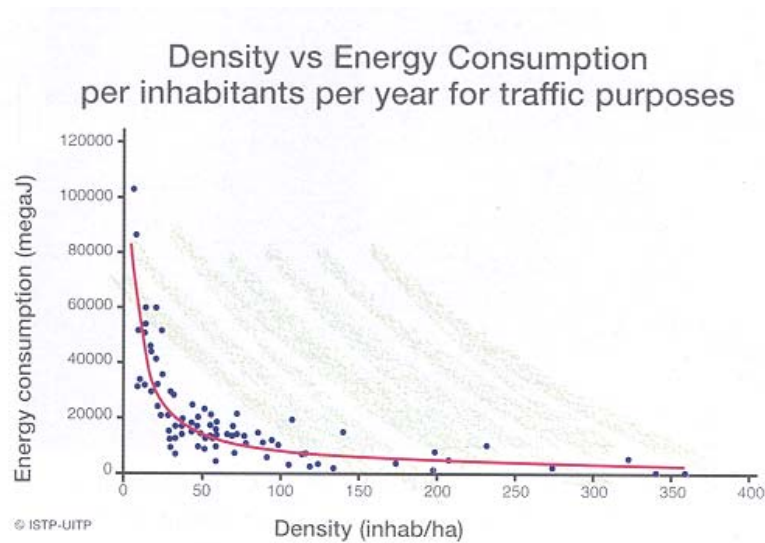
UITP says that if we reduce urban density ( hab/ km<sup>2</sup>) by two thirds, then:

- pedestrians, bikes and public transport use fall by a factor of four;
- the cost of each trip grows by 50%;
- the number of accidents involving injuries or death multiplies three-fold;
- energy consumption multiplies three-fold, as well as the emission of greenhouse gases.

The following figures show the relationship between density and the cost of trips.

| Urbanas areas in           | Density inhab/ha. | % trips other than car | Cost of trips (%PIB) |
|----------------------------|-------------------|------------------------|----------------------|
| USA, Canadá, Oceanía       | 18                | 15%                    | 12,7%                |
| Europa Occidental          | 55                | 52%                    | 8,3%                 |
| Japón, Hong Kong, Singapur | 134               | 62%                    | 5,4%                 |

And the next diagram shows the link between energy consumption for travel purposes and density.



The known consequences of urban sprawl are:

- more car dependency
- more pollution
- more noise
- less schools, less shops, less infrastructures
- more traffic jams
- environmental damages
- buses are very expensive to run
- metro and trains are simply not possible
- more shopping centres and less shops

But what we do not usually know is what we discovered in a recent research about urban sprawl in Bizkaia. We asked the providers of different services about the real cost of those services in the low density areas. The real cost of the services in the low density areas is much higher than in the traditional towns. The cost paid by the inhabitants is the same so it is easy to guess who pays the difference: it is the whole of the society that pays.

| <b>Costs in low density areas compared to those in inner city</b> |                         |
|---|-------------------------|
| <b>Infrastructures for water &amp; sewage</b>                     | <b>3,5 times higher</b> |
| <b>Maintenance of infr. for water &amp; sewage</b>                | <b>2,5 times higher</b> |
| <b>Cost of public lightning per inhabitant</b>                    | <b>4 times higher</b>   |
| <b>Urban infrastructure</b>                                       | <b>2,5 times higher</b> |
| <b>Street cleaning</b>  | <b>2,5 times higher</b> |
| <b>Infrastructures for telephones</b>                             | <b>6 times higher</b>   |
| <b>Infrastructures for electricity</b>                            | <b>5 times higher</b>   |
| <b>Courier services</b>   | <b>20% higher</b>       |



This means that when you decide whether to buy an apartment in the centre or a house or chalet in the outskirts worth both, let's assume, 500.000 €, the society is paying the difference for you if you choose the chalet!

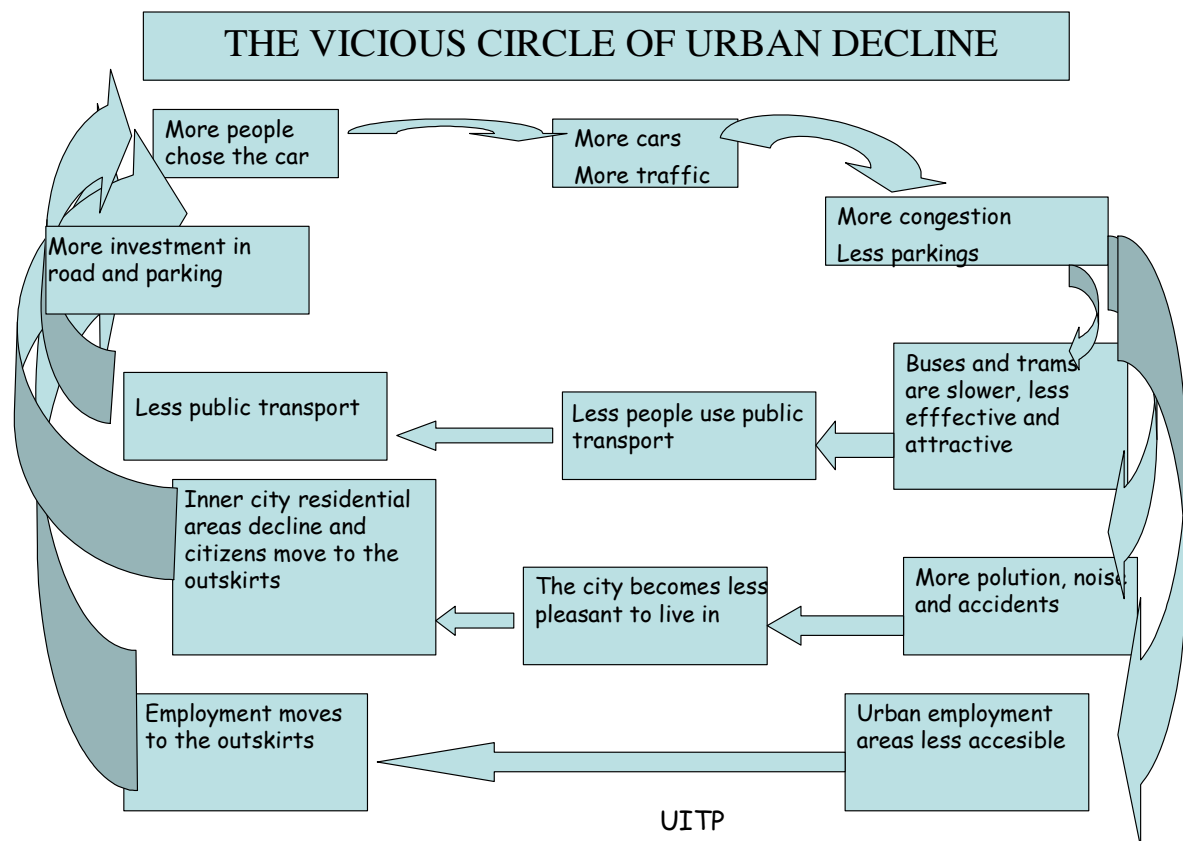
Motorways, trams, metro and trains bring new developments that must be planned and controlled.

Residences, employment and shops move to the outskirts with costs that must be paid by the whole society.

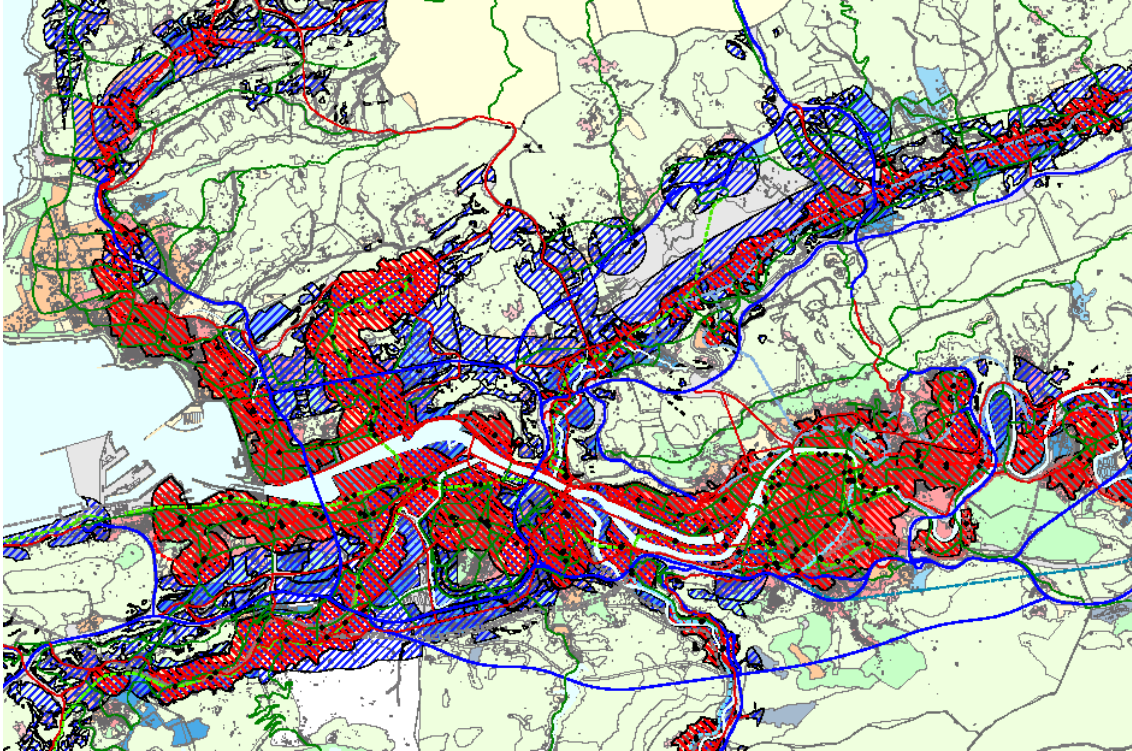
Public sector does not take advantage of the infrastructures and the increment of the value of the land surrounding them.

### EMPLOYMENT SPRAWL

One of the last tendencies is what we could call employment sprawl or suburbanization of employment. As a probe of the certainty of the "Vicious circle of urban decline" new jobs are moving to the outskirts of the city. These jobs are very difficult to reach by public transport and there is usually parking space there so commuters will use their cars anyway. As a result our trips to work are longer in distance as well as in time.



Let's have a look at the map showing the 10 minute walk from metro or train stations isocrones. There is still space available in these areas both for residences and for employment.



#### FUTURE ACTION

We need to:

- Rethink trains as a way to attract residents and employment around its stations
- Build no more shopping centres in the outskirts
- Use the Dutch ABC law to coordinate the accessibility and mobility profiles of our businesses.
- Move part of the university to the inner city and/or establish new faculties and schools in the city.
- Reestablish the traditional mix of uses of European cities.
- Relocate jobs in the city.
- Maintain the share of public transport and walking.
- Take into account inductive and non-served demand.
- Implement parking measures.
- Think about tolls or congestion charges.
- Apply to land and transport planning the usual steps of planning: mission, vision, objectives, strategies (goals) and programs.

I took the following photograph several years ago. That zebra crossing is still there and my daughter is now 9 years old!



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