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Metropolitan Bilbao Transit System:
A Three Point View

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Urban Setting

- A metropolitan area of one million undergoing massive renovation of both its economy, its transport system and its urban landmarks
- Its tight urban structure may be its best asset
- Its mobility profile includes a significant percentage of walking trips in downtown areas
- A trend towards suburban residence and employment is today its main threat

Transit System

- A very complex network of rail and bus services with many operators under different levels of the Administration
- Bilbao Metro is the future backbone
- Transit demand equals 450,000 daily rides, (2/3 are captives) representing roughly less than 20% of the overall mobility
- Many coordination measures still lacking

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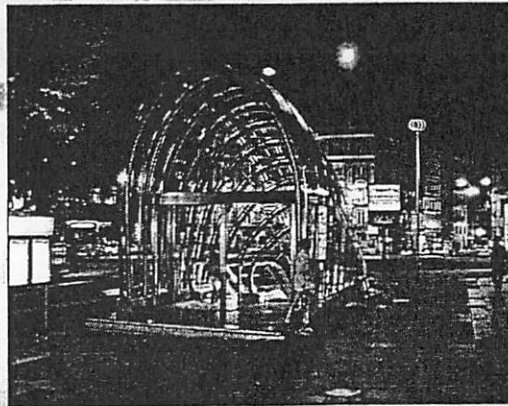
Policy Lessons

- No magic bullets; our goal a diversified and complex transport system
- Investing public funds is the easy part
- Any major transit project should be taken as a unique opportunity to transform the city
- The new ITS technologies if smartly applied could contribute towards the needed global vision of the transport system

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Part 1: Urban Setting



Urban Setting – *Table of Contents*

- A virtual tour of Metropolitan Bilbao
- In search of a new economic base
- Mobility profile
- The suburban threat

Metropolitan Bilbao



- A conurbation of close to one million people
- Bilbao, 400,000 people, 10 miles upstream
- Two hilly ridges along the river
- Socioeconomic differences along the two banks

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Bilbao

700 years of a medieval port city



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Bilbao

A commercially thriving Old Quarter pedestrianized more than 10 years ago to become an urban shopping mall



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Bilbao

A certain human scale at the "new" city



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Densities

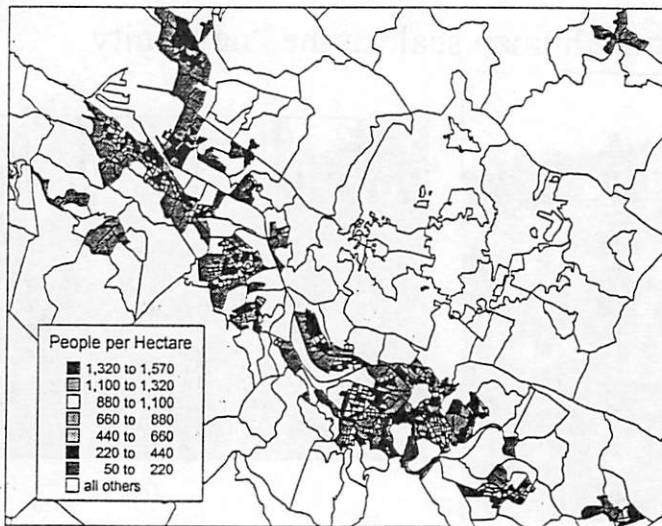


- Rather high residence densities
- Mixed uses throughout

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Residential Densities



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Metropolitan Bilbao



The river left bank is dotted with low-income housing serving the nearby industrial complexes

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Metropolitan Bilbao



A mostly residential right bank with higher mobility profiles

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Betting the farm

- We hit the bottom:
 - ✓ The old economic model was being dismantled
 - ✓ The unemployment figures were very high
 - ✓ Terrorism was not helping either
- A new image and new symbols were needed:
 - ✓ From a decaying industrial center to a new and modern service center
 - ✓ Cultural activities as a catalyst
- Our fiscal autonomy was essential to provide the needed financial funds

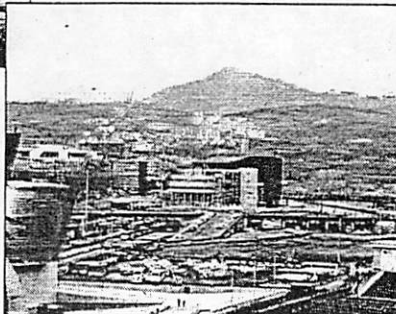
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Betting the farm



From an old shipyard
into a new Congress
and Music Hall



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Betting the farm



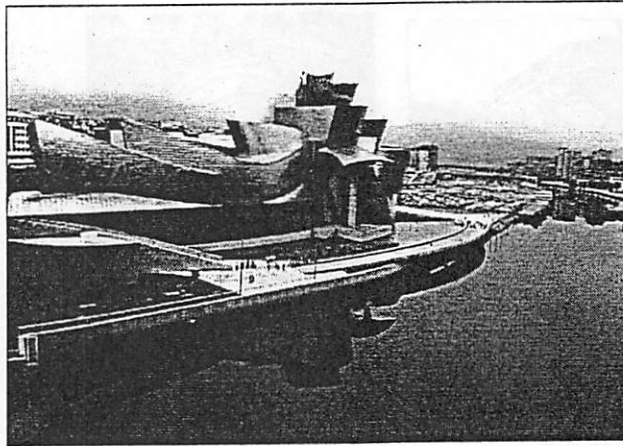
From the old steel mills
to new projects along
a renovated riverfront



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New hallmarks



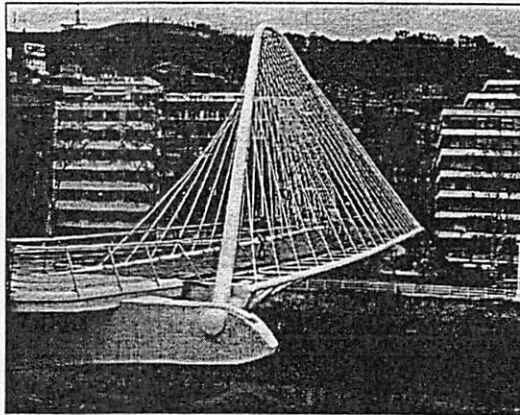
The New Guggenheim Museum by Frank Gehry

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New hallmarks

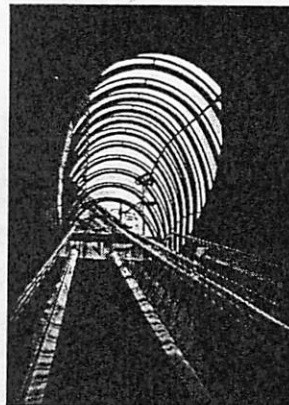
A new pedestrian
bridge by Santiago
Calatrava



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New hallmarks



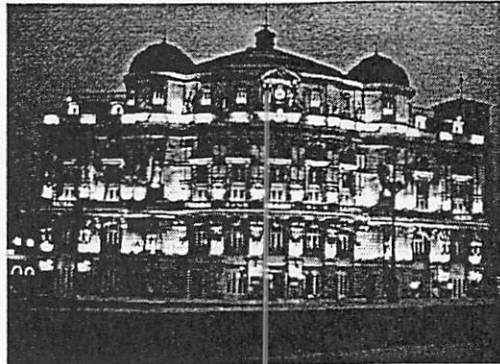
The Bilbao Metro by Sir Norman Foster

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New hallmarks

The renovated Arriaga Theater

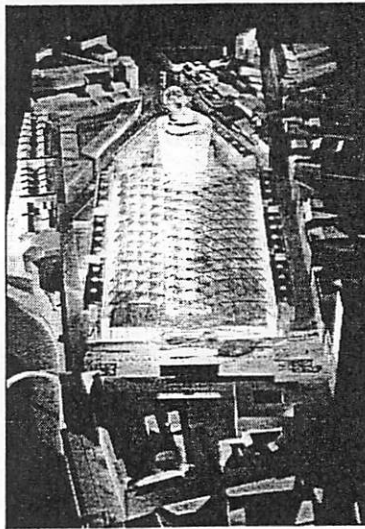


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New hallmarks

The Intermodal
Station Project
by Michael
Wilford

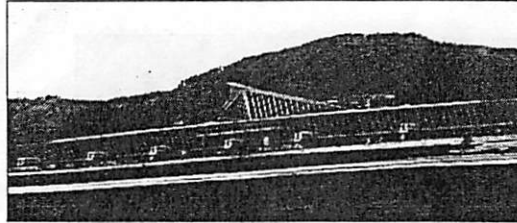


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New hallmarks

The new airport terminal by Santiago Calatrava



Plus many other big names in architecture: Cesar Pelli at Abando, Isonozuka at Aduanas,...

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New Infrastructure

- That investment frenzy has been accompanied by many new infrastructure projects:
 - ◇ New outer port
 - ◇ Many new bridges
 - ◇ New toll facilities: Artxanda tunnel, Lamiako underground pass

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New Infrastructure

The new stayed
bridge at Muskiz



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New Infrastructure

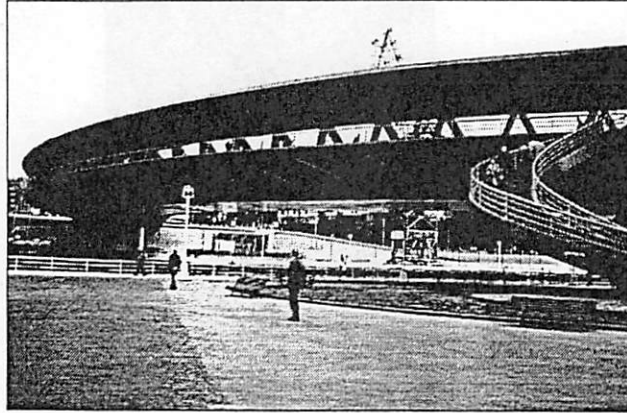
The award winning Miraflores bridge



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New Infrastructure

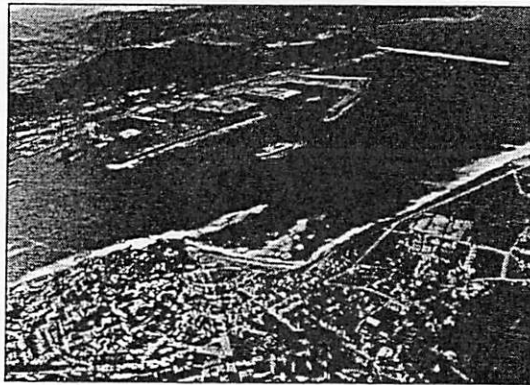


A new traffic and pedestrian bridge by the new Congress and Music Palace

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New Infrastructure



All port activities are being moved to this deep sea outer facility, with new road and rail access and a SOA Traffic Control Center

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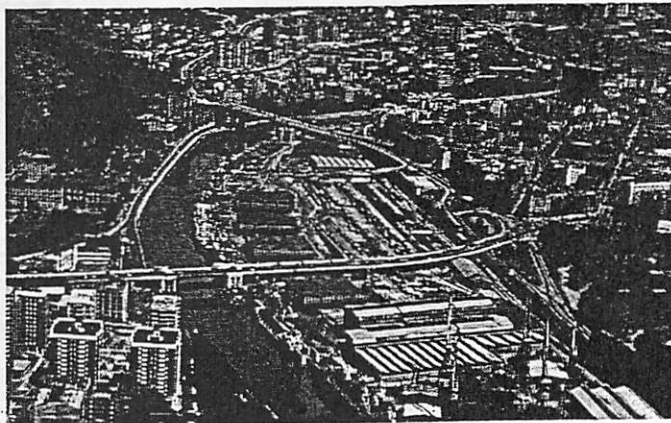
The Process

- The port activities are being moved away from Bilbao
- New areas of opportunity: From shipyards to cultural and congress centers
- The state-railways, RENFE, served the riverfront and its industrial activities. Again a new opportunity for redevelopment

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The Process



Only a few years ago

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The Process

Today a new blueprint for the future

(w or w/o debate)



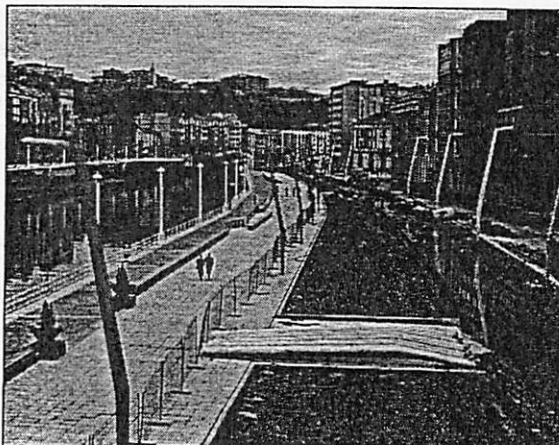
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The Process

From heavy
rail to Light
Rail .

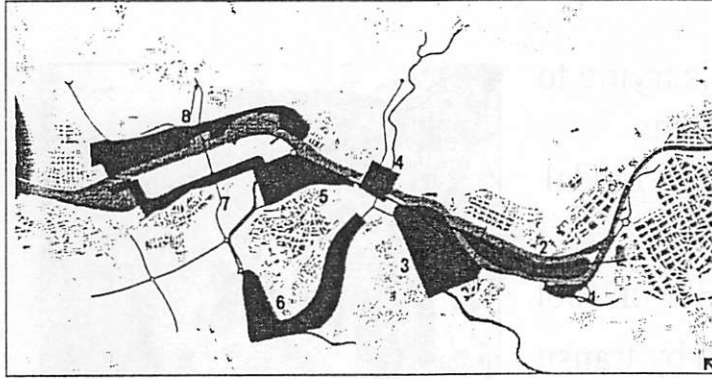
Plus a new
riverfront
promenade



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The Process



The new "areas of opportunity" presently under development along the old industrial riverfront

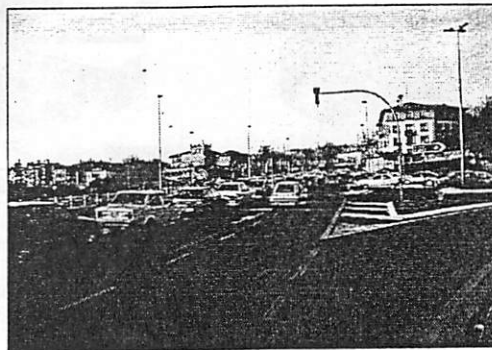
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Mobility Profile



In the last 30 years, we have gone from 0.2 to 1.4 automobiles per dwelling



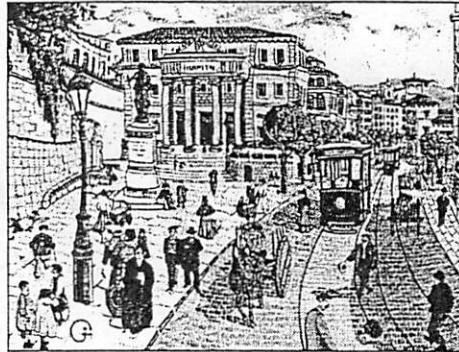
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Bilbao Mobility Profile

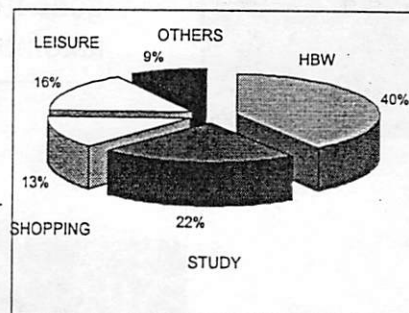
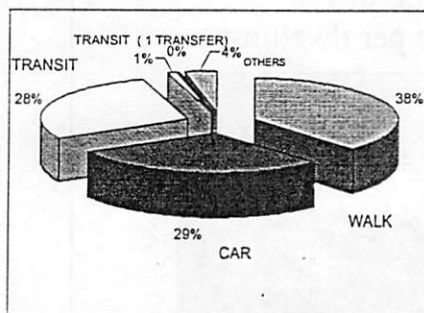
The city is trying to preserve its traditional modal split with:

43% on foot,
28% by transit,
29% by car



Bilbao Mobility Profile

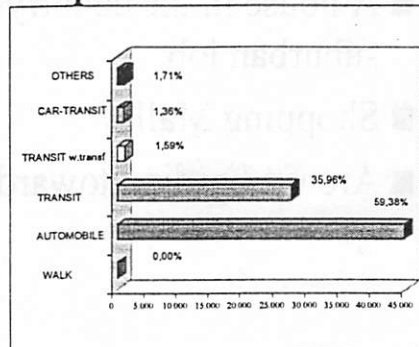
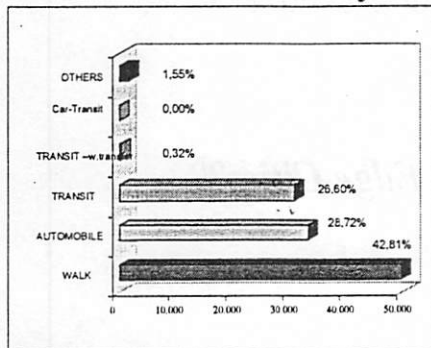
Modal share and trip purpose



Bilbao Mobility Profile

Modal share for Bilbao as destination when origin varies (Bilbao or other metropolitan cities)

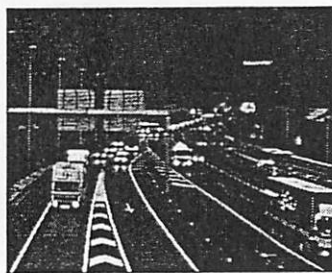
A very different profile



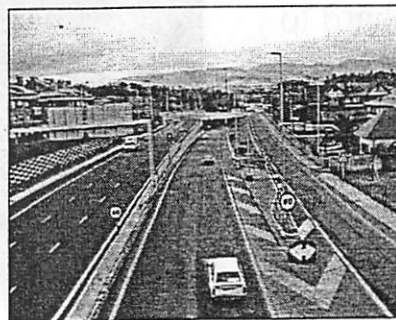
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Bilbao Mobility Profile



It is hard to ignore the induced demand effect of new highway projects



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The Suburban Threat

- Growth of automobile ownership
- A house in the countryside... And a suburban job
- Shopping Malls
- Are we heading towards *Edge Cities*??

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The Suburban Threat

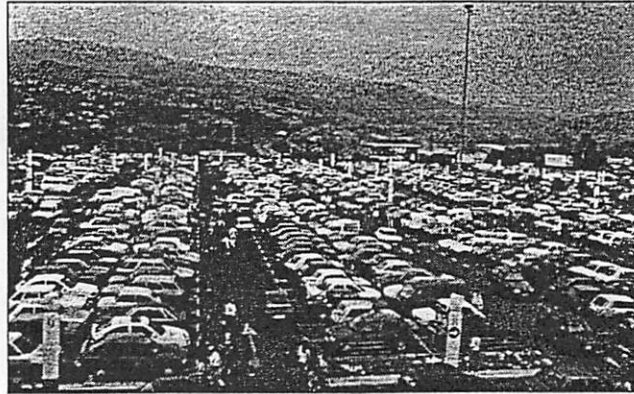
- New technology Parks
- Nowadays it is even hard to park there and...
- ...They request transit



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The Suburban Threat



How do you avoid today shopping malls??

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In a nutshell

- Bilbao has become a trendy name because of its many renovation projects and new hallmarks
- Its tight urban structure may be its best asset
- Its mobility profile includes a significant percentage of walking trips in downtown areas
- A trend towards suburban residence and employment is today its main threat

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Part 2: Transit System



Transit System – *Table of Contents*

- A complex network
- Rail Systems
- Bus networks
- Demand served
- *Work under construction*

A complex system

■ Metropolitan Rail Service:

- ✓ Bilbao Metro
- ✓ RENFE (State Railways)
- ✓ EuskoTren (Basque Railways)
- ✓ FEVE (State narrow-gauge railways)



■ Bus Service:

- ✓ BilboBus (operated by Bilbao City Hall)
- ✓ BizkaiBus (operated by the Provincial Govt)

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A complex system



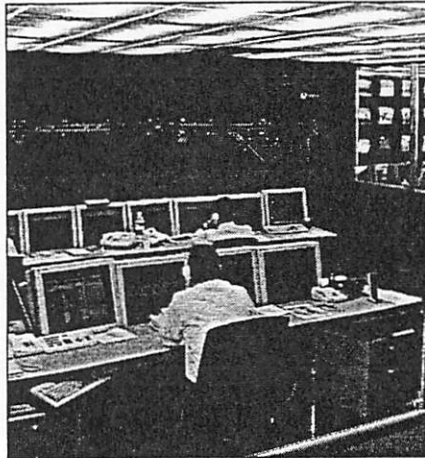
Metropolitan railway network

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Bilbao Metro

- ATO: Automatic Train Operations
- Video surveillance in all stations and in tunnels
- Flexibility for special events



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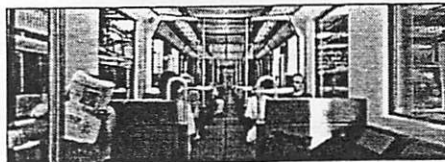


metro bilbao

49

Metro Bilbao

- A state-of-the-Art system regarding confort, safety, security and automatism
- A very efficient management system
- Farebox recovery ratio approaching 92%!



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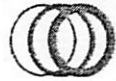


metro bilbao

50

Metro Bilbao

- Most of the demand served has come from other transit modes... And from pedestrians within downtown Bilbao
- Car traffic though has not decreased significantly

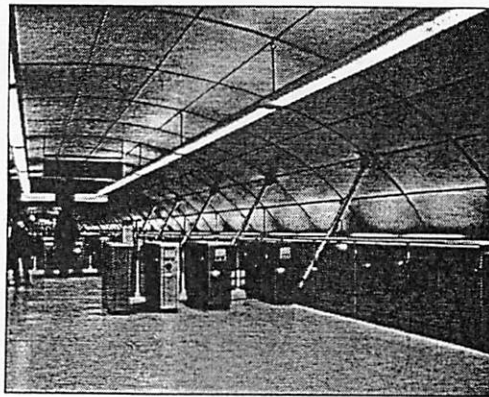


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Metro Bilbao



Some surprises in demand served plus ticketing machines process speeds forced some last minute changes

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Demand Served



- Two thirds are captives (as they cannot opt of a car)
- As it happens in Madrid, Brussels, Amsterdam...

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P&R they will...



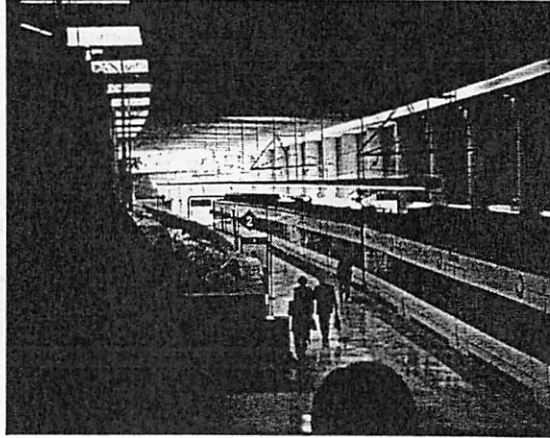
Our experience shows that P&R whether planned or unplanned will become a de facto reality near Metro stations

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State Railways

The Metro effect:
locating
urban new
stations less
than 1500 ft
apart

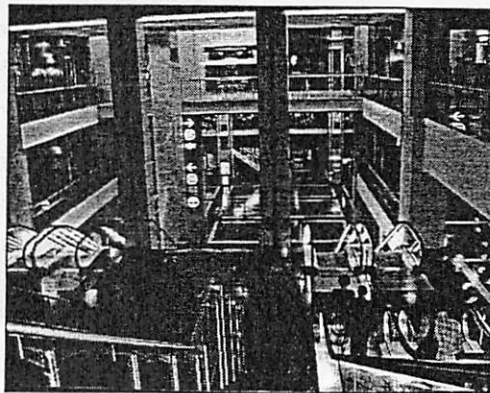


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State Railways

The refurbished
new Abando
station boasts
a thriving
commercial
center to turn
the station into
a more vital
place



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A New Light Rail

A first line of LRT along the riverfront
It could play eventually a metropolitan role



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A New Light Rail

- Operations are foreseen for January 2002
- It will be operated by EuskoTren

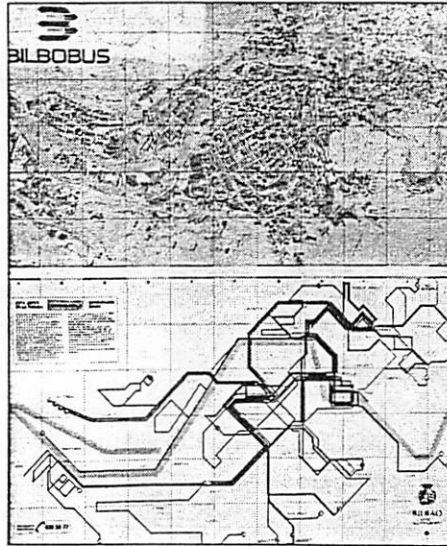


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Urban Bus Network

Bilbao Bus Network (BilboBus), dense and unchanged by the new Metro operations

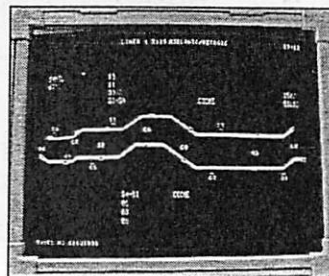
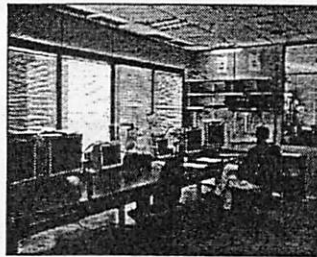


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Bus Network

Real time information on bus operations to manage the fleet, through fixed beacons and direct phone contact,



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Bus Operations

This real time information is being shared with waiting riders to decrease the uncertainty



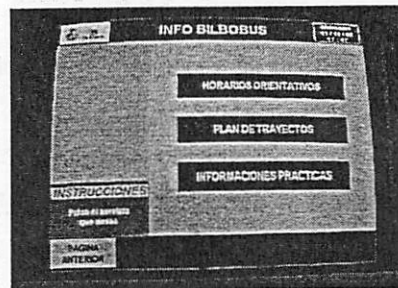
1000	BILBO / BILBO	22
1001	ITEL / ZIZEROLZA	10
1002	BETOLAZA	48
1003	OTXARROAGA	12
1004	LA PENIA	08
1005	ATXURI	01
1006	MUSKIZ (B. JUAN)	32

CONFIRMACION/BAIEZTATU GABE 17H57

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Bus Operations



As a PR effort, some trip planning kiosks are being provided

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Demand Served

- Some yearly figures: (million passengers)
 - ✓ Metro: close to 50
 - ✓ RENFE: 22
 - ✓ EuskoTren: 8
 - ✓ FEVE: 2
 - ✓ BilboBus: 25
 - ✓ BizkaiBus: 33
- Roughly 450,000 daily trips or 17% of the total metropolitan mobility

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Work under construction

- The needed role of the *Transport Consortium*
- Several interchange facilities:
 - ✓ Abando: RENFE-Metro-FEVE-Buses-LRT
 - ✓ San Mamés: RENFE-Metro-LRT-Coaches
 - ✓ Bolueta: Metro-EuskoTren
- But no effective single ticket system yet, with some bilateral agreements to ease transfers between some operators
- No single official source of pre trip info

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Part 3: Policy Lessons

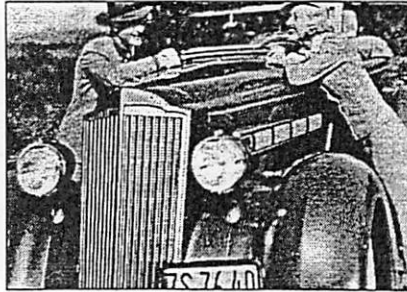


Policy Lessons - *Table of Contents*

- The Automobile: A servant turned master?
- What have we accomplished?
- Public Spaces
- Intelligent Transport Systems
- A Process, not an End-State Plan

Starting Point

- Yes, in Bilbao we are very proud of our new Metro and we love it.
- But we love even more our cars
- After all, our traffic congestion usually is not yet that bad



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If you can, you'll drive

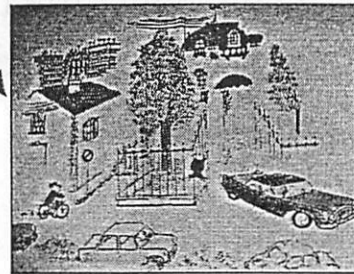
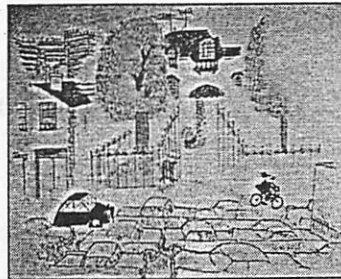
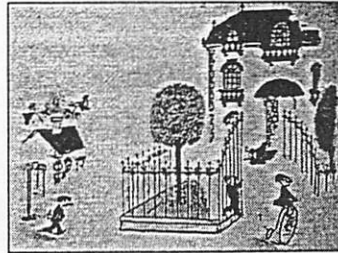
- In Europe too, we have suburban sprawl and a tendency to rely too much on the automobile



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Plus ça change...



By French cartoonist M.Sempé

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Demand Estimates

- Every major transit project (as every road scheme) is announced as “the solution”
- Today is easier than ever to quickly produce results from any fancy planning package
- It is harder though to see the opportunities which open if the right process is engaged

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Demand estimates

“It is wonderful when a calculation is made, how little the mind is actually employed in the discharge of any profession”

- Dr. Samuel Johnson

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Demand estimates

- We need different policy scenarios
- The bus vs rail debate
- Transit demand = **parking policy** plus **land use** activities (density, mixed uses...)
- Separate estimates for choice and captive riders



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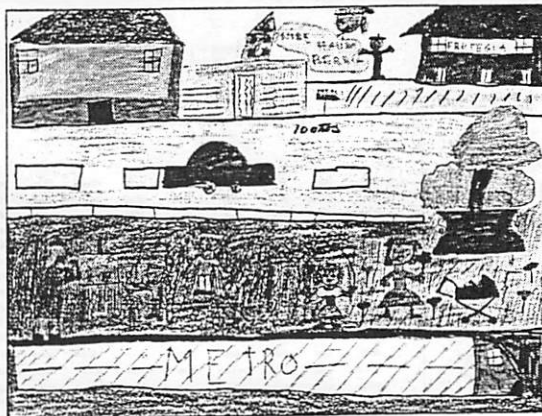
Demand Estimates

- Today's metropolitan reality shows:
 - ✓ 772,000 automobile trips
 - ✓ 450,000 transit trips
 - ✓ 1,095,000 walk trips
 - ✓ 140,000 mixed trips or by other means
- However we have (hopefully) initiated a new process of looking at the car-city nexus

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What have we accomplished??



- We all had great expectations with the new Metro. Not only our children!

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What have we accomplished??

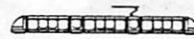
- Hopefully, we have started a new process
- On the other hand, the Metro represents our only reliable future transport capacity
- Those who ride the system, do so (sometimes) in style
- As we feel somehow guilty, we are changing (slowly) a few things

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We cannot forget that...

A transit vehicle with say **230 riders** is equivalent to **177 automobiles** with an occupancy ratio of 1.3 people per car... provided they are all choice riders



Un tranvia con 230 pasajeros equivale a



177 Turismos con un índice de ocupación de 1.3 Personas/Turismo

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Any lessons?

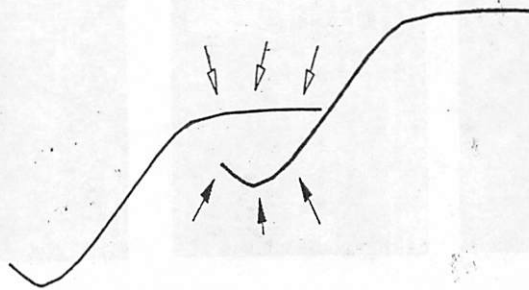
- The acid test on transit is to examine:
 - ✓ The % of patrons: captive vs choice riders
 - ✓ Total transit trips per capita
 - ✓ Transit share of the overall mobility market
 - ✓ The growth of city traffic
 - ✓ Downtown parking supply vs number of jobs
 - ✓ The impact on the real estate and retail markets

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The need for a new mental model

- As leaders with vision like Strasbourg Mayor Ms Catherine Trautmann have pointed out, transit may become an excellent excuse to change our mental model regarding the car-city nexus



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The need for a new mental model



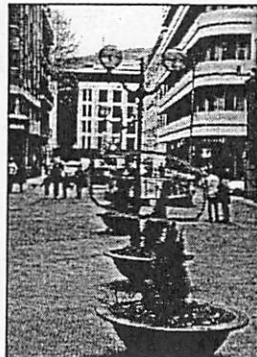
We always have at least two paths: (a) the obvious solution which fits our mindsets, and, (b) what observation of daily reality reveals

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New Opportunities

The opportunity to pedestrianize some cross streets.
Never an easy task nor a successful one.

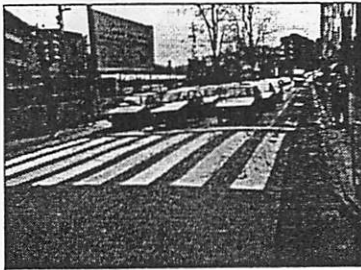


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New Opportunities

In Getxo, we have achieved some remarkable changes because of the new Metro



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New Opportunities

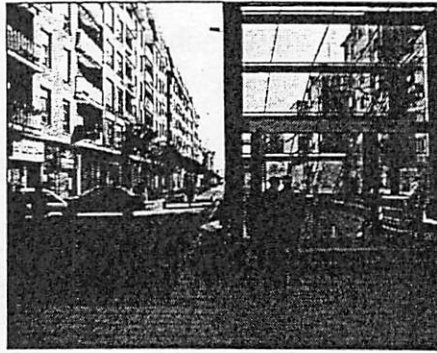
In Getxo, it is even hard to remember the way it was



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New Opportunities



Changes made possible
by the new Subway

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New Opportunities



Both the Metro passengers and the immediate
vicinity are now being protected by traffic calming

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New Opportunities

Why?? Because transport is just a mean to an end.
Because what we want really are **more livable places**



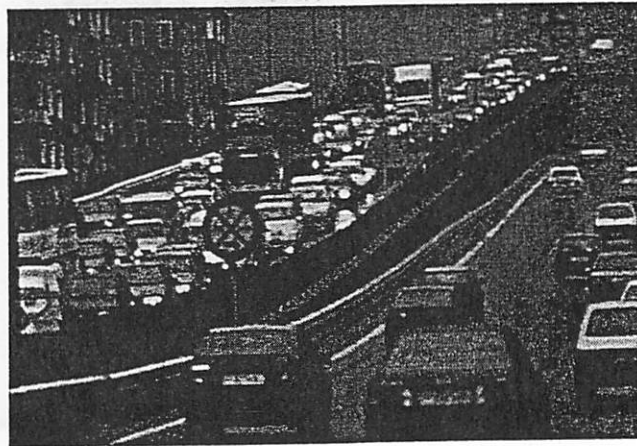
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Transport in Bilbao Today

Today we still witness this in spite of our new Metro

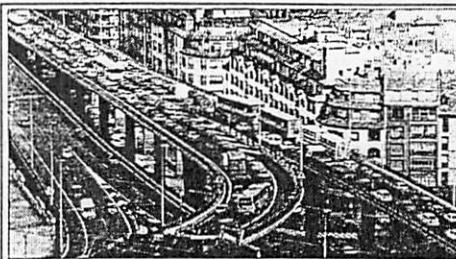


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Transport in Bilbao Today

- Growing pressures on the road system, despite heavy investments in transit
- Need to have a global vision with indicators
- Time to adopt supply and demand management policies



La Diputación hace una llamada desesperada para evitar el colapso total de la circulación

La bonanza económica origina el mayor aumento de tráfico de la década

PEÑERÍ APREHENDIDA EN LA...
La Diputación...
de la provincia...
de la provincia...
de la provincia...

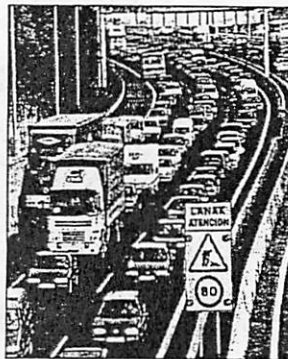
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Our Road System Today

Saturation on A-8 led us to suggest an 80 km/hr limit. Results?

- Accidents reduced 60%
- System Management as a New Credible Policy

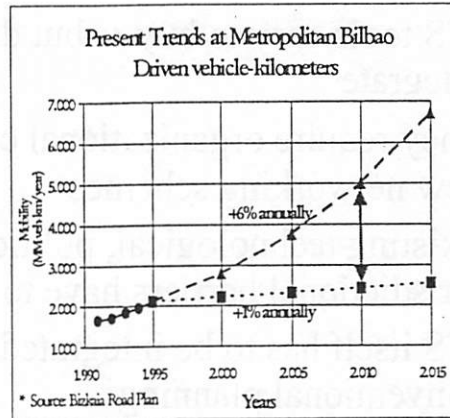


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Our Road System Tomorrow

- A new road plan under available sources cannot cope with >1% yearly growth
- ...But traffic is growing at 6-7%



Our Vision

- A growing popular belief that the automobile has to be curbed, at least within urban centers
- A committed will to protect, increase and improve the transit rail network
- A growing awareness that Intelligent Transport Systems may contribute to mitigate traffic problems and **to create a global transport vision**

The long road to ITS Deployment

- ITS tools easy to buy... but difficult to integrate
- They require organizational changes and new networking schemes
- Existing technological, political and jurisdictional barriers have to be addressed
- ITS itself has to be integrated into conventional planning

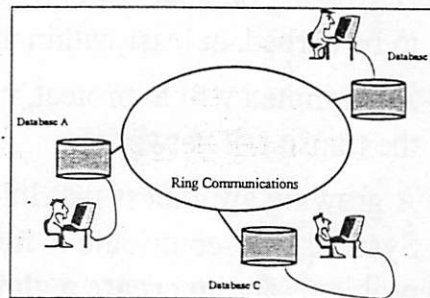
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91

Why ITS?

ITS serves 3 critical functions for the region:

- **Information**
- **Communications**
- **Integration**

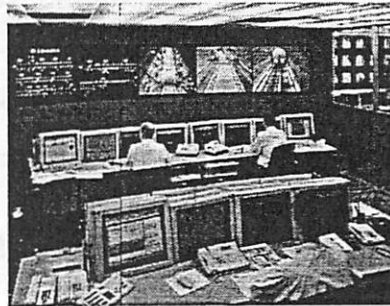


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Our present ITS Priorities

- Create a program of multi-modal indicators
- Integrate existing ITS subsystems
- Integrate ITS into conventional planning
- Disseminate real-time information as a first step towards demand management

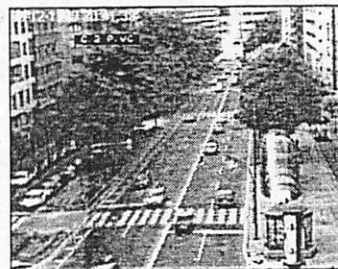


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ITS: Towards a Global Vision

Working towards real-time information on traffic, on public transport and on environmental indicators



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Information technologies

- Real time information at stops, on the vehicle, and on the Net
- Overall transport system information (from A to B)
- The future today: third generation cell phones based on the WAP protocol: **Internet anywhere anytime**



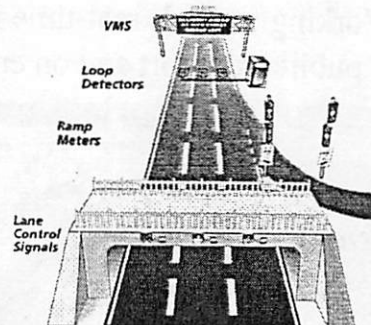
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ITS in a nutshell

ITS is not only a technical issue but a new frame for:

- Voluntary cooperation
- Seeing the big picture
- Bringing others into the decision process
- Adopting necessary new policies



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From Vision to Reality

- No single mode will be the needed magic bullet
- Planning is hard but starting the right process of change may be even harder, although far more effective
- Any major transit project may be taken as a unique opportunity to transform the city environment
- Similarly the new ITS technologies if smartly applied could turn into an equally unique opportunity



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97

Thank you!

Can we meet again
in June 2001?

Congreso y
Exposición de ERTICO

sobre aplicación de
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