

MIT

The Bilbao Experience: Findings and Lessons



Massachusetts Institute of Technology

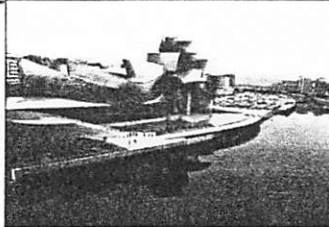


Mikel Murga, MIT Research Associate and Lecturer
9th UPR-MIT Conference on Tren Urbano
January 7-12, 2003

Tren Urbano, Jan 7-12, 2003



The Bilbao Experience



- Socio-Economic Context
- Mobility Profile
- **Findings and Policy Lessons**
 - Transit Network
 - Transit and the Automobile
 - Transit and the City

Bilbao

2



Part 1: Socioeconomic context

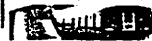


- A metropolitan area of one million people undergoing massive renovation of:
 - its economy,
 - its transport system and
 - its urban landmarks

- Its high density and mixed-use policies in urban areas, its best asset



Part 2: Mobility Profile



- Walking is still the main transport option in downtown areas
- Transit is today an quality option to the automobile
- Automobile congestion (and road incidents) a daily wake-up call
- Suburban sprawl of jobs and residences, a trend to contend with



Part 3: Findings and Policy Lessons



- No magic bullets; just new transport options
- Investing public funds is the *easy part*
- Inauguration Day means Commencement Day
- Transit vs Automobile – Accommodation?
- Any major transit project should be taken as a **unique opportunity to transform the city**

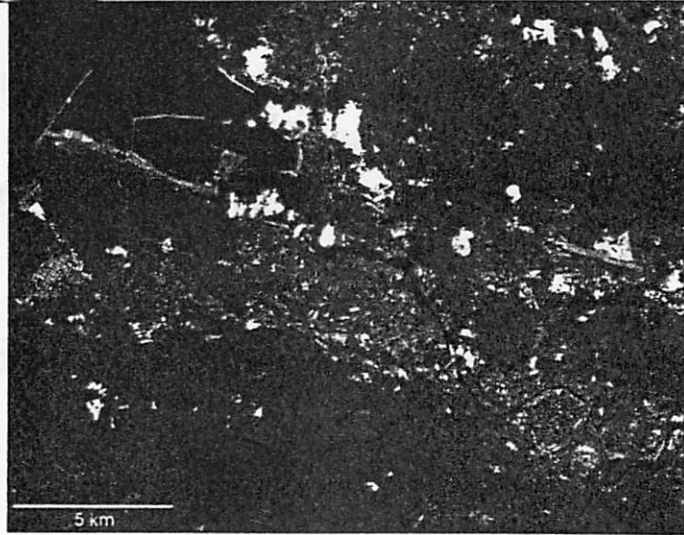


Part 1





Part 1: Socioeconomic context



Bilbao

7



The original city core



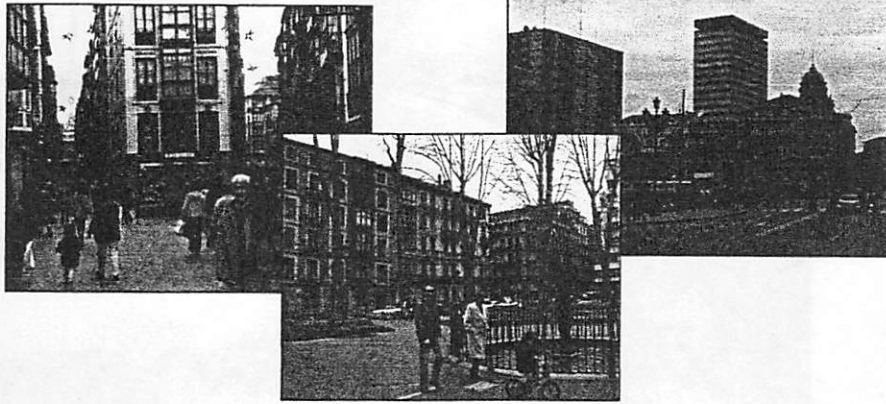
Bilbao

700 years of a medieval port city

8



Mixed uses and high densities



A typical mid-sized European city built to a human scale with high density and mixed uses

Bilbao

9



Metropolitan Bilbao



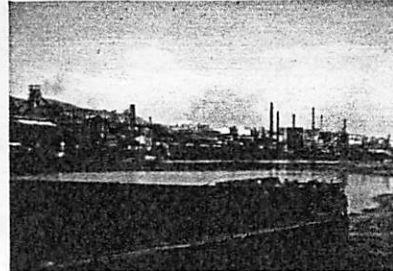
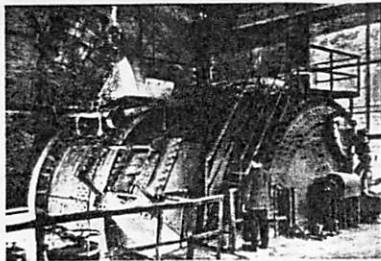
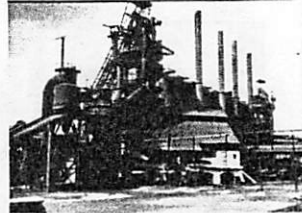
- A conurbation of one million people
- City of Bilbao, 400,000 people, 10 miles upstream
- Linear settlement with hilly ridges along the river
- Socioeconomic differences along the two banks

Bilbao

10



The industrial past

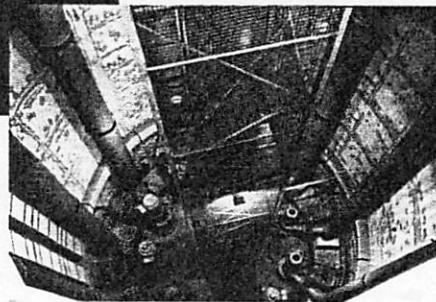
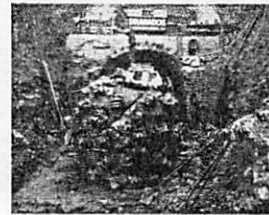
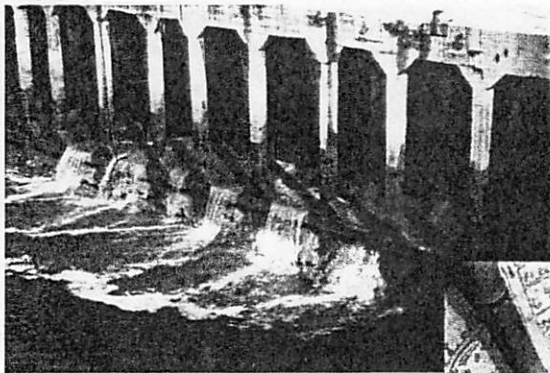


Bilbao

11



The price of the industrial past



Bilbao



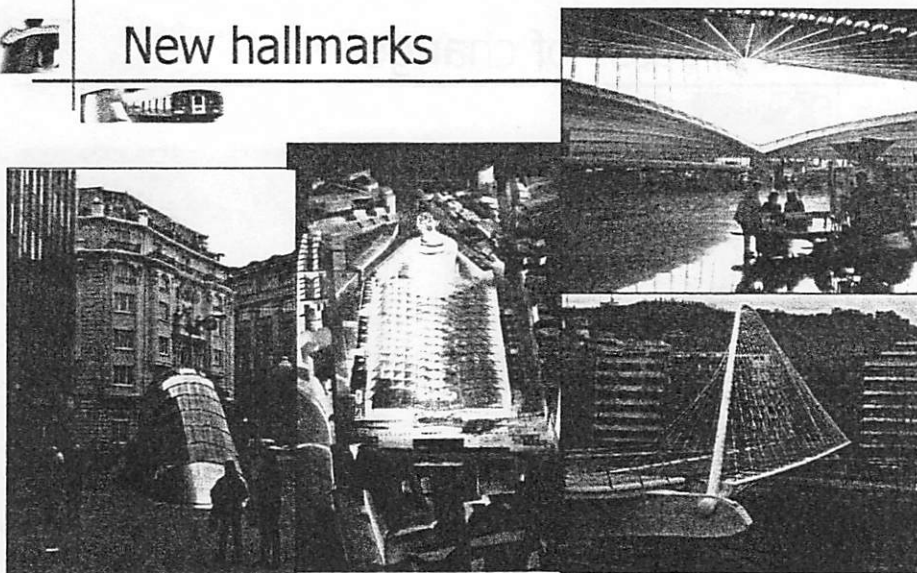
Recent history: *Betting the farm*



- 1990's, we hit 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



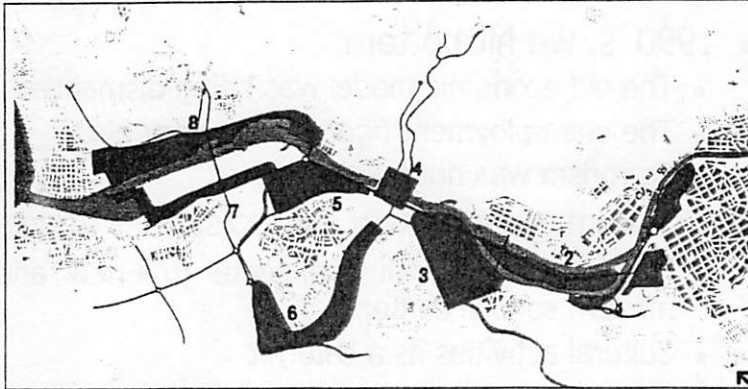
New hallmarks



Competing with Berlin to attract world-known architects



New areas of opportunity



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



A process of change



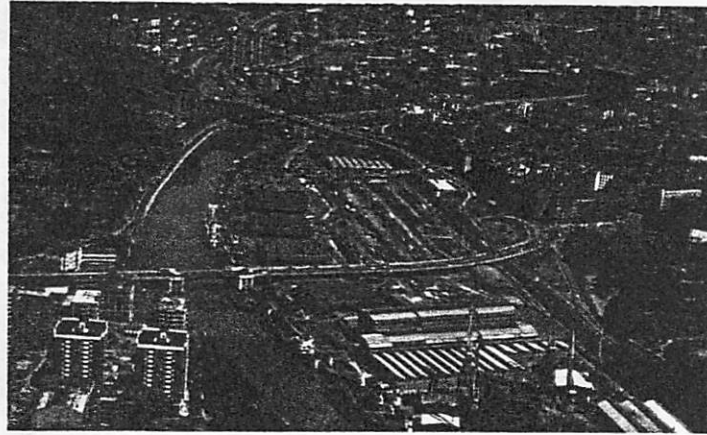
Before



Nowadays



The riverfront



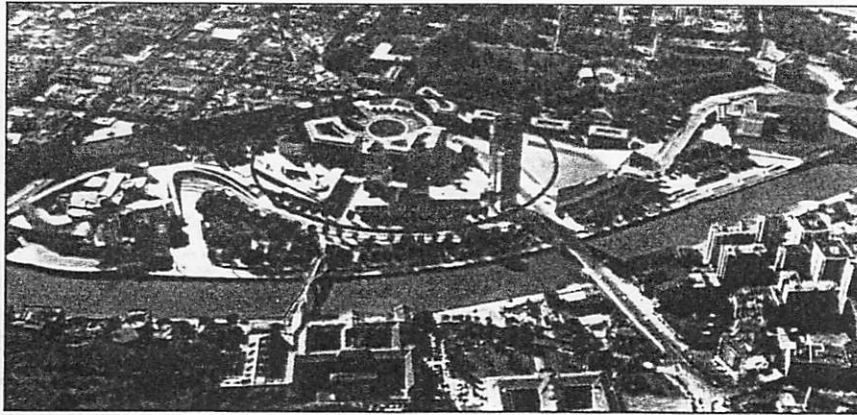
Only a few years ago, a decaying container port

Bilbao

17



The riverfront



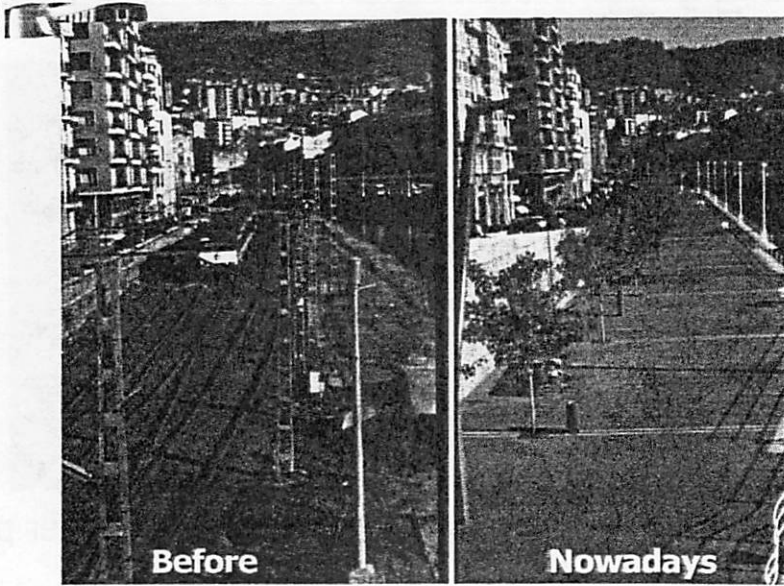
Today a new blueprint for the future
(with some debate)

Bilbao

18



A process of change

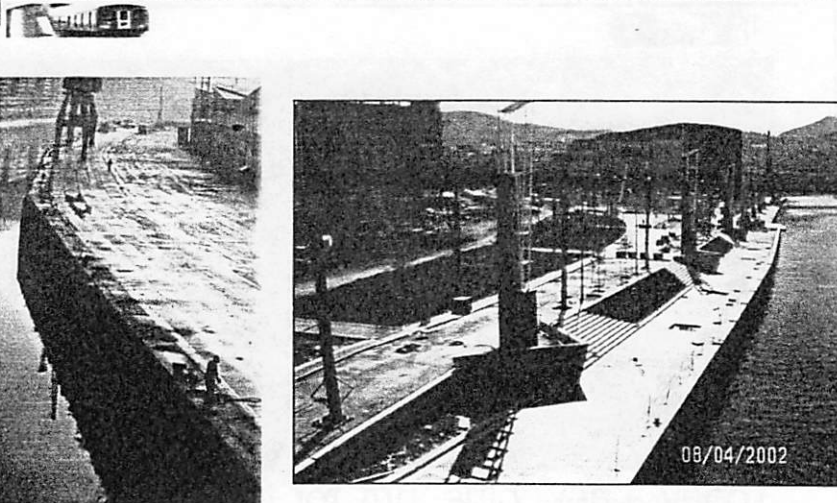


Bilbao

19



A process of change

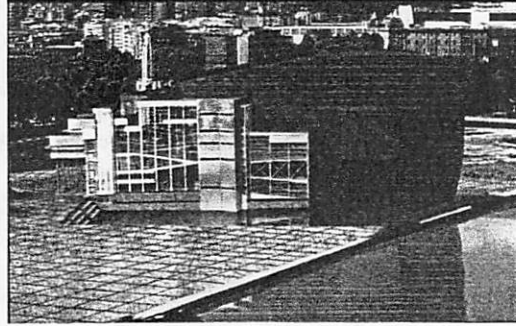
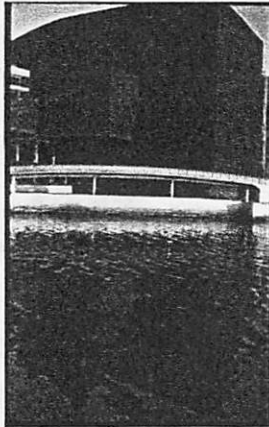


Bilbao

20



A process of change



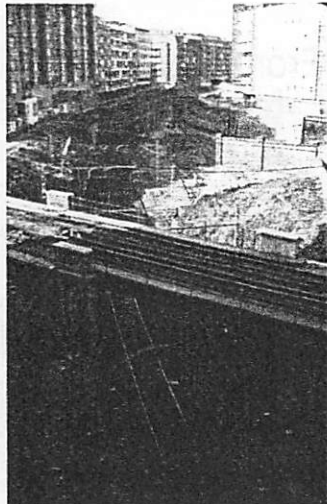
New "vessels" in the new shipyard

Bilbao

21



A process of change



Before



Nowadays

Bilbao

22



A process of change



Bilbao

23



Process of change



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

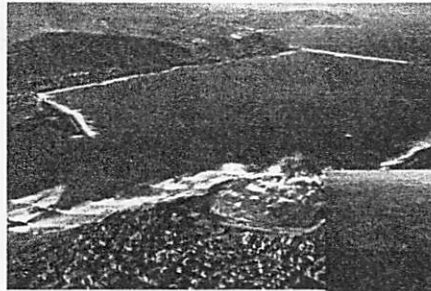


Bilbao

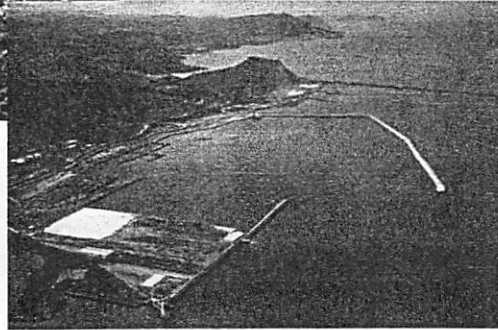
24



A process of change



Before



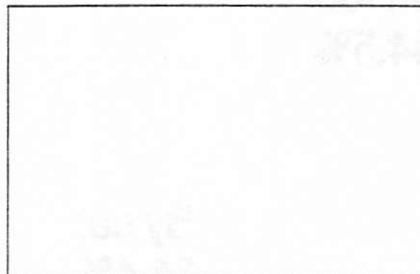
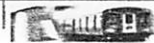
Nowadays

Bilbao

25



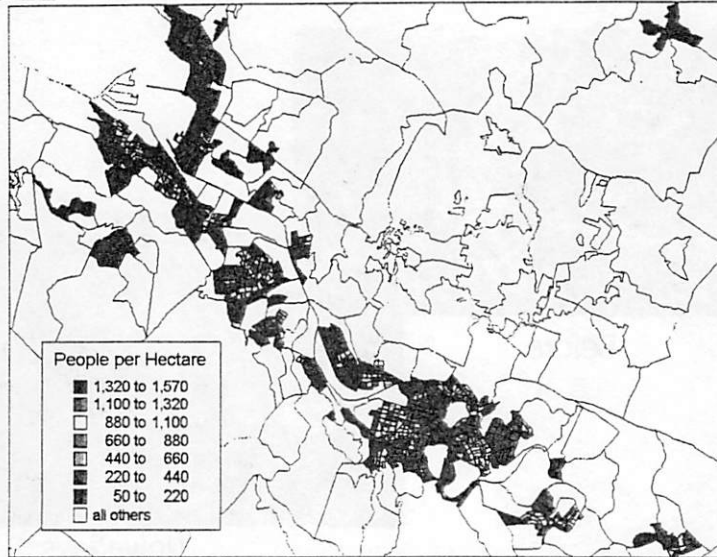
New Infrastructure



Bilbao

26

But still, we have retained from the past, high densities – Key for transit



Bibao

27

Part 2: Mobility Profile



On foot
44.5%

By PT
17.4%

By car
31.4%

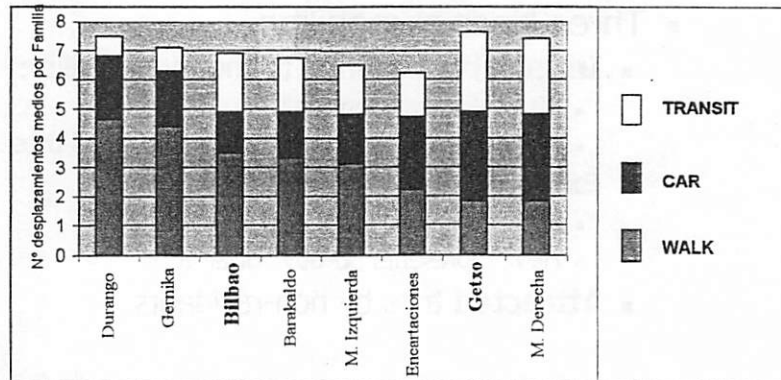
Others
5.6%

Bibao

28



Mobility Profile: Trips/family



- Total no of trips per family rather constant
- Main difference is the number of walk trips



Mobility Profile



This unique modal split is threatened by the present trend towards the suburbs





Mobility Profile

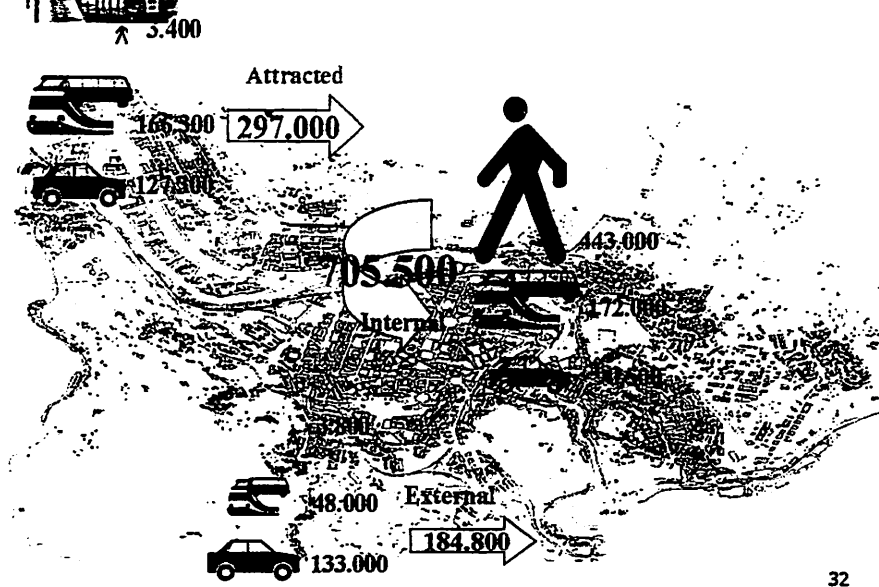


- Three kinds of mobility:
 - **Internal** or confined to the municipality:
 - 50-60% of trips on foot
 - HBW represents no more than 30% of all trips
 - **External** or extra-municipal:
 - 95% motorized trips
 - HBW represents 50-60% of all trips
 - **Attracted** trips by non-residents

The ratio of internal to external trips is a direct function of each town employment supply versus the number of its employed residents



Bilbao proper Mobility Profile

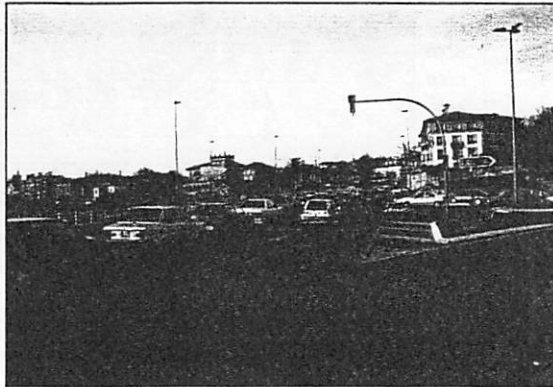
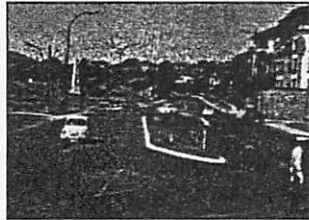




Mobility Profile



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

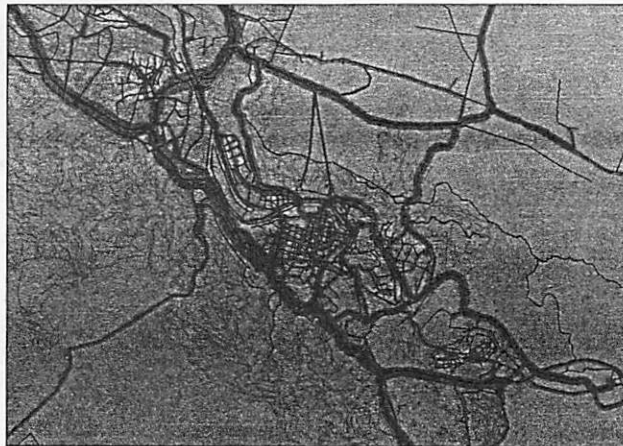


Bilbao

33



Automobile congestion...



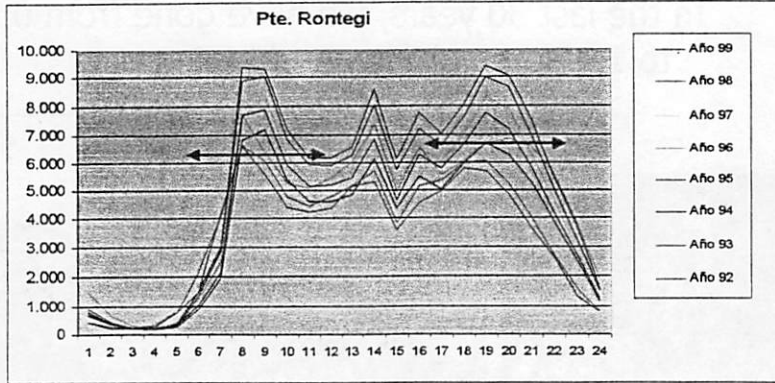
... delays, road incidents, unreliable car commutes, accidents, road rage, etc. etc.

Bilbao

34



Automobile congestion...



... delays, road incidents, unreliable car commutes, accidents, road rage, etc. etc.



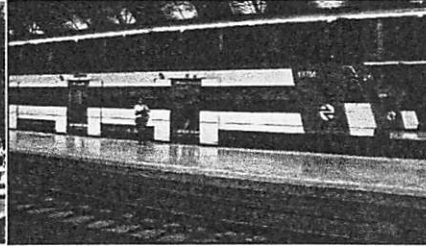
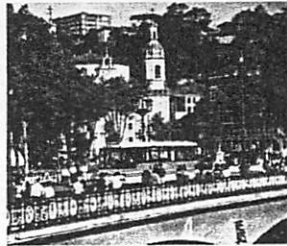
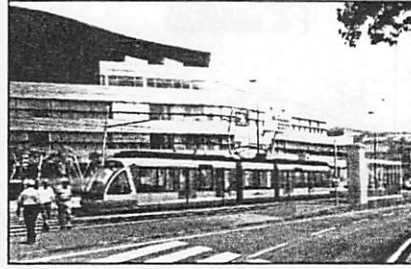
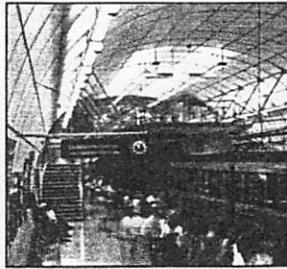
Car congestion + new roads + ITS =



... the transit system as the ultimate transport **capacity reserve** in Metropolitan Bilbao



How is Transit faring?



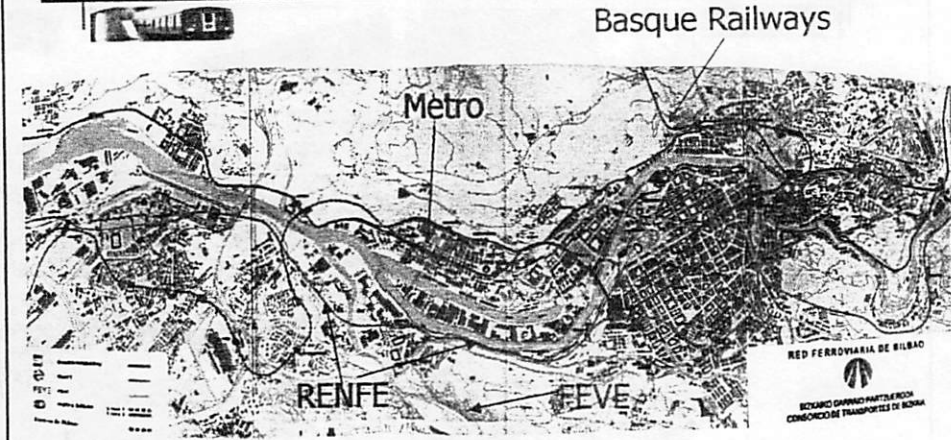
A complex system



- Metropolitan Rail Service:
 - Bilbao Metro
 - RENFE (State Railways)
 - EuskoTren (Basque Railways)
 - FEVE (State narrow-gauge railways)
 - EuskoTran (Basque Railways)
- Bus Service:
 - BilboBus (operated by Bilbao City Hall)
 - BizkaiBus (operated by the Provincial Govt)



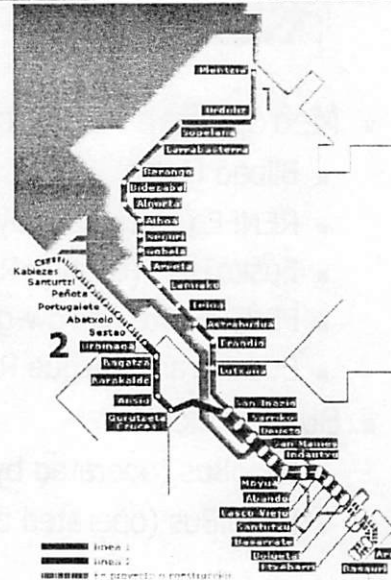
A complex system



Metropolitan railway network

Metro Bilbao: The New Backbone

- Evolved from an old suburban rail in 1995
- Radial system aimed at the jobs and services of the capital
- Three-zone tariff system
- Huge success from 26 million passengers/year to > 67 million today

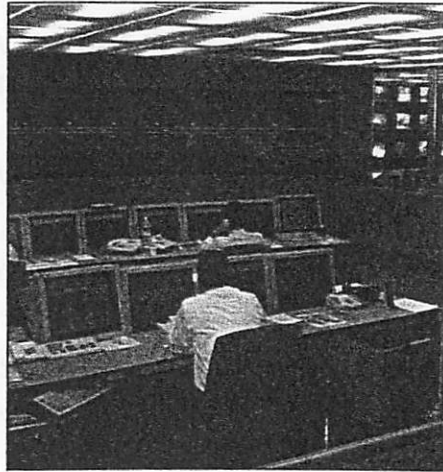




Bilbao Metro



- ATO: Automatic Train Operations
- Video surveillance in all stations and tunnels
- A firm anti-vandalism program
- Flexibility for special events



metro bilbao

Bilbao

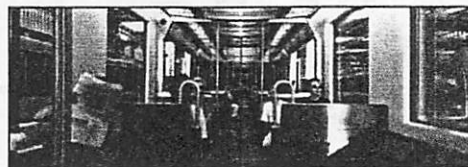
41



Metro Bilbao



- State-of-the-Art system regarding comfort, safety, security and automatism
- Very efficient management system
- Farebox recovery ratio well above **90%!**



metro bilbao

Bilbao

42



Metro Bilbao



- Most of the demand served has come from other transit modes...
- Some from pedestrians within downtown Bilbao
- Of course, some car drivers do now ride the Metro
- But automobile traffic keeps growing at 4%-6% per year



metro bilbao

Bilbao

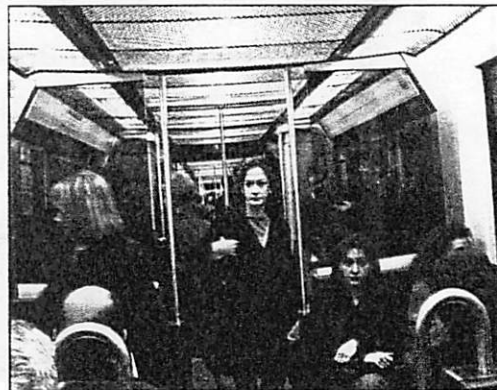
43



Metro Bilbao



- Two thirds of Metro passengers are still captives
- Just like in Madrid, Brussels, Amsterdam...
- But it is a **high quality and reliable option**



Bilbao

44



The threatened status quo...



- Growth of automobile ownership
- A house in the countryside... And a suburban Technology Park
- Shopping Malls
- All outside Metro catchment areas



Bilbao



45



Part 3: Findings and Policy Lessons



Bilbao

46



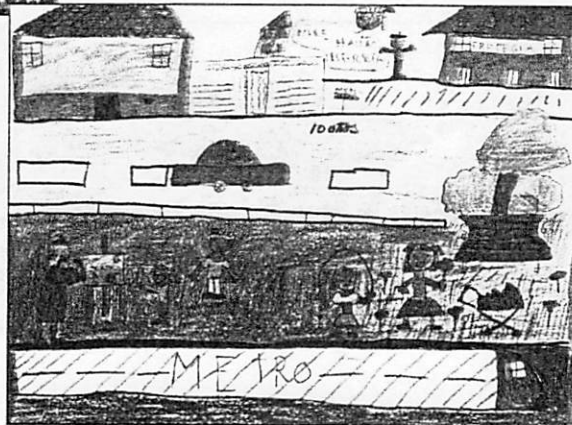
Findings and Policy Lessons



- The Transit Network
- Transit and the Automobile
- Transit and the City
- Summary of Lessons
- Closing thought



What have we accomplished??



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



Metro' success as a harbinger...



- RENFE chose to relocate urban stations less than 1500 ft apart
- FEVE has renovated its rolling stock and its planning a tram service
- EuskoTren has started a new Light Rail Service, EuskoTran
- Both BilboBus and BizkaiBus are upgrading their real time information

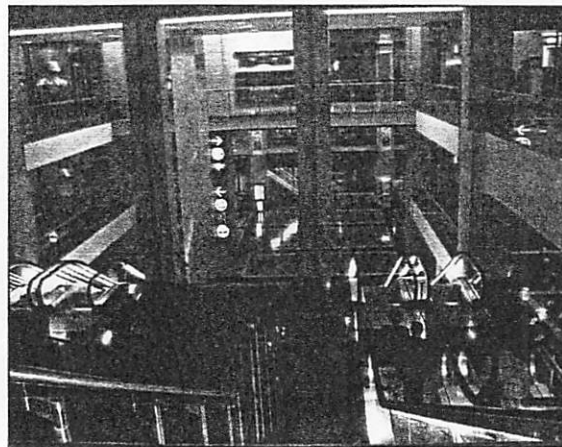


Metro-induced competition...





RENFE has:

- Created new urban stations
- Refurbished its main station with a thriving commercial center

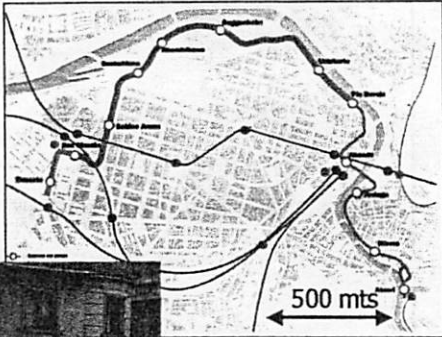



Tren Urbano, Jan 7-12, 2003

A New Light Rail

The Metro Effect






Not easy to take road space

51

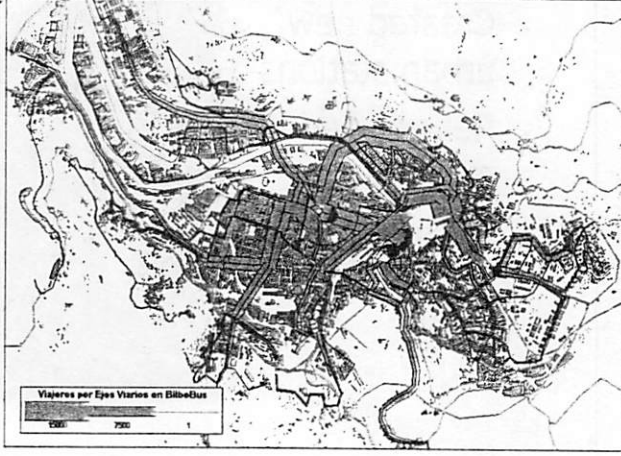
Tren Urbano, Jan 7-12, 2003

The Transit Network

The Metro Effect

New bus priority lanes for BilboBus



52



The Transit Network



The Metro Effect:
Upgrade of real time information through GPS to manage the bus fleet operations and to inform passengers on expected arrival times



Bilbao

53



Transit and the Automobile



- 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 is not yet *that bad for some*



Bilbao

54



If you can, you **will** drive



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



Bilbao



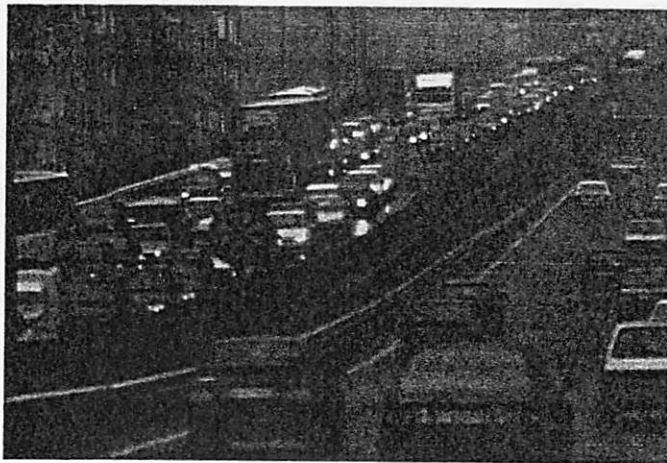
55



Transit and the Automobile



Today we still witness this...



Bilbao

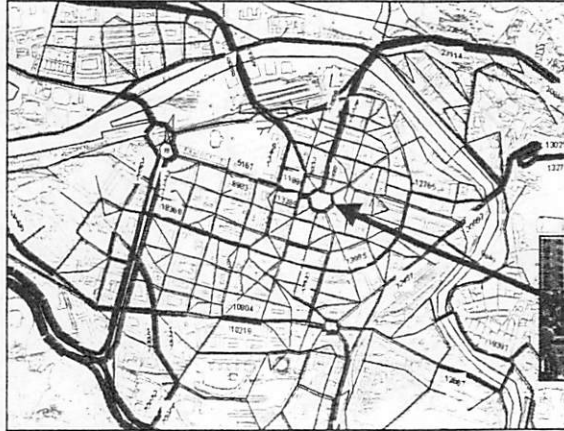
56



Transit and the Automobile



Today we still witness this...



But on Car Free Days...



Bilbao

57



Proposed Road and Street New Hierarchy

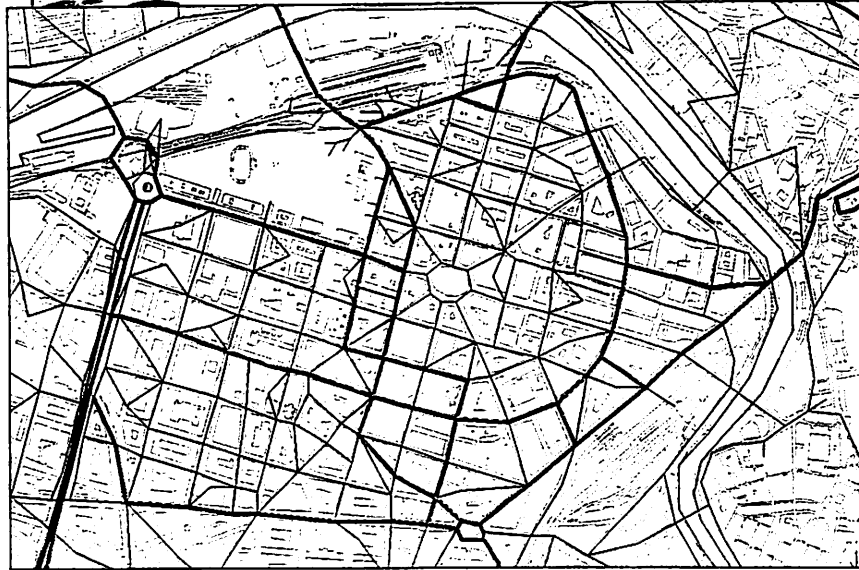


Bilbao

58



Proposed Road and Street New Hierarchy

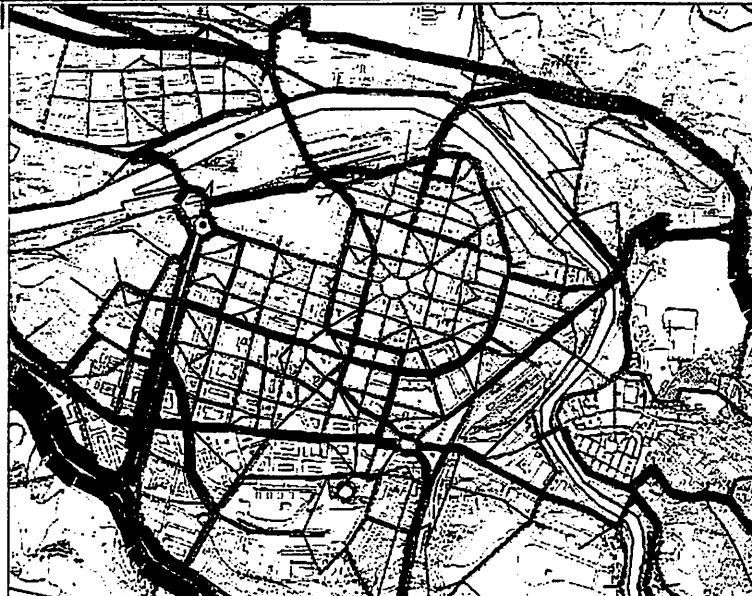


Bilbao

59



Proposed Road and Street New Hierarchy

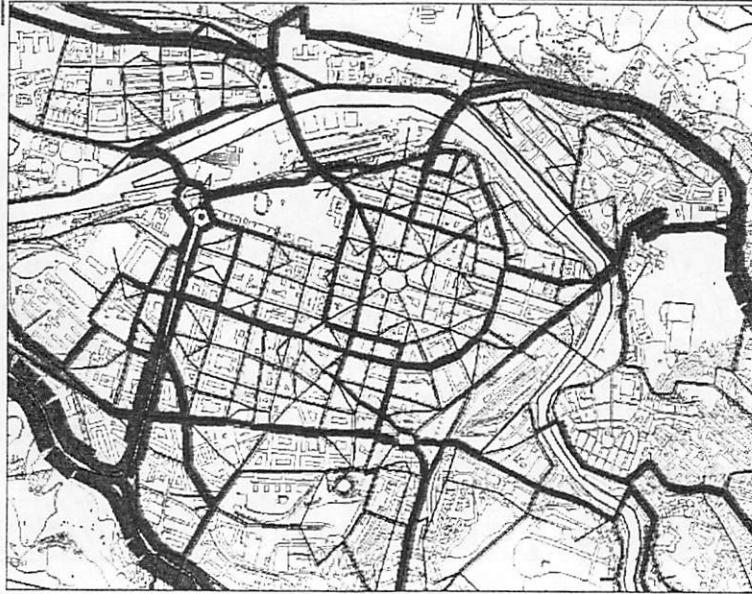


Bilbao

60



Proposed Road and Street New Hierarchy



Bilbao

60



Proposed Road and Street New Hierarchy



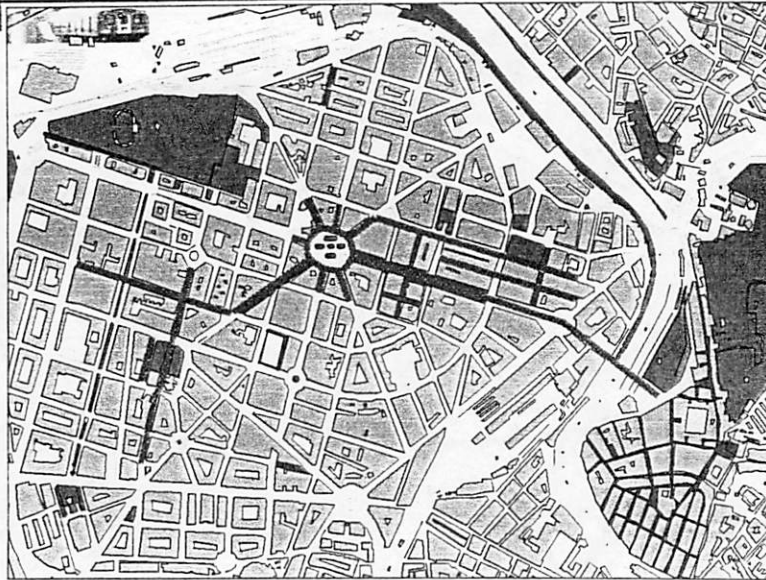
...As a prerequisite for preference for surface transit

Bilbao

61



... And for new pedestrian axes

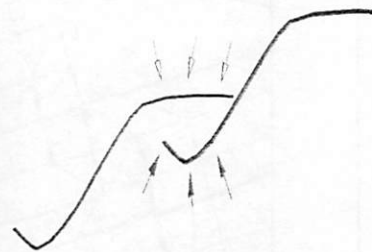
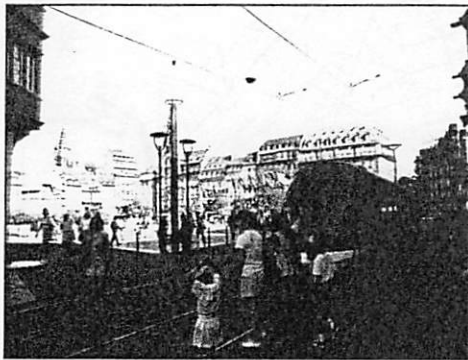


Bilbao

62



Transit and the City



Leaders with a vision understand that transit may become an excellent excuse to change our cities

Bilbao

63



Transit and the City



Transport is just the means to an end.
The real target is **more livable places**



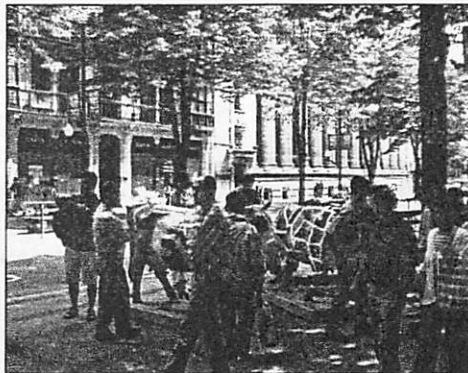
Bilbao



64



The Metro-induced transformation



- Not against cars, but in favor of city life
- Not just transport, but social life
- The city as a meeting point cutting across income and social differences

Bilbao

65

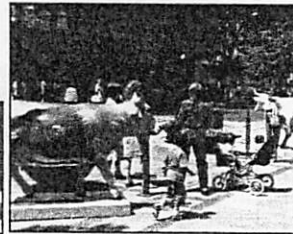
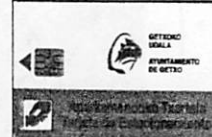


Transit as an Alibi for Change



- Once Metro was perceived as a success, local **elected officials felt confident enough** to adopt car restraining measures:

- New on-street parking policy
- New pedestrian areas
- New public spaces
- New traffic schemes
- **Quality of Life!**



Bilbao

66



Transit and the City



Before you stepped into traffic. Today the traffic has been detoured



Bilbao

67



Transit and the City



Both the Metro passengers and the immediate vicinity have benefited by traffic calming measures around stations

Bilbao

68



Transit and the City



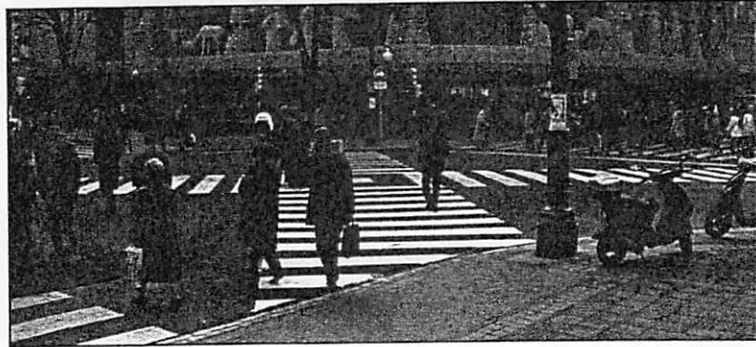
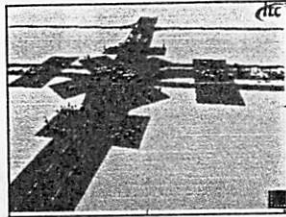
Bilbao has now started a strong program in favor of public transport and pedestrians
(Pedestrians = O-D on foot + transit users + (yes!) car drivers)

Bilbao

69



Transit and the City



Bilbao

70



Transit and the City



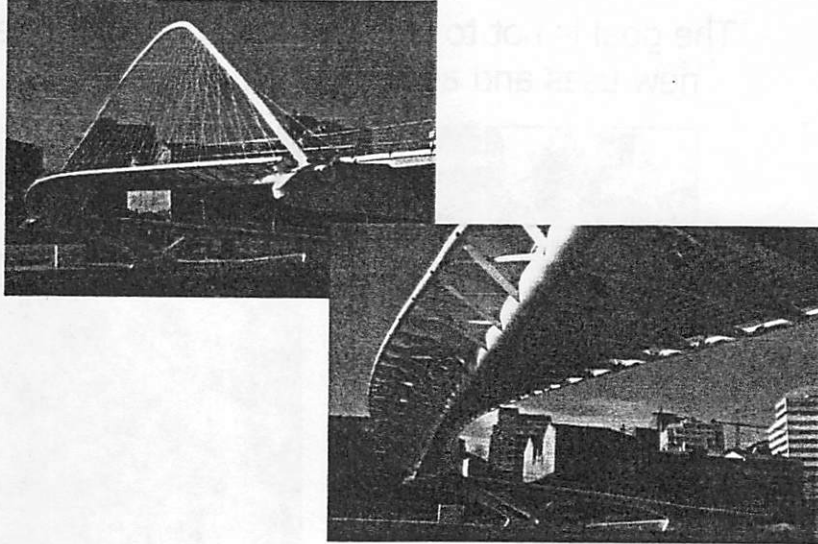
The new schemes go now beyond
Metro stations

Bilbao

71



Pedestrian bridge as a new icon

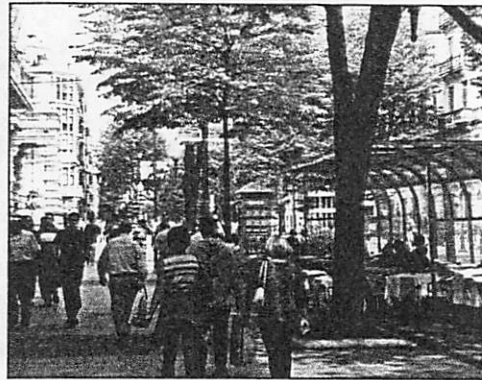
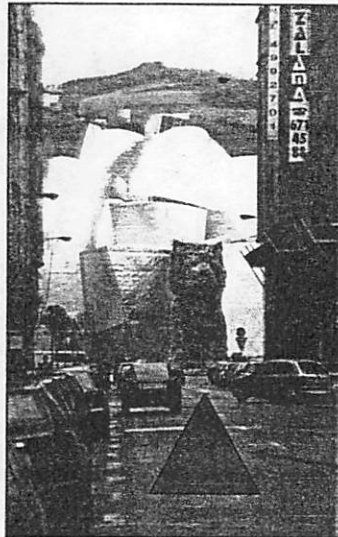


Bilbao

72



New emphasis on the walker



— Soon to be pedestrianized

Bilbao

73



Lesson (1): Density and Development



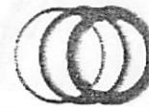
- Density and Mixed Uses are critical
- Basic catchment area: Approx 5 mins
- Traffic calming and Urban Quality a must around stations



(2) The Importance of a Symbol



- Symbolism: Efficient, reliable, modern, high-tech, clean, safe...
- Bilbao Metro has witnessed remarkable changes in behavioral patterns
- A firm upper level management commitment a must

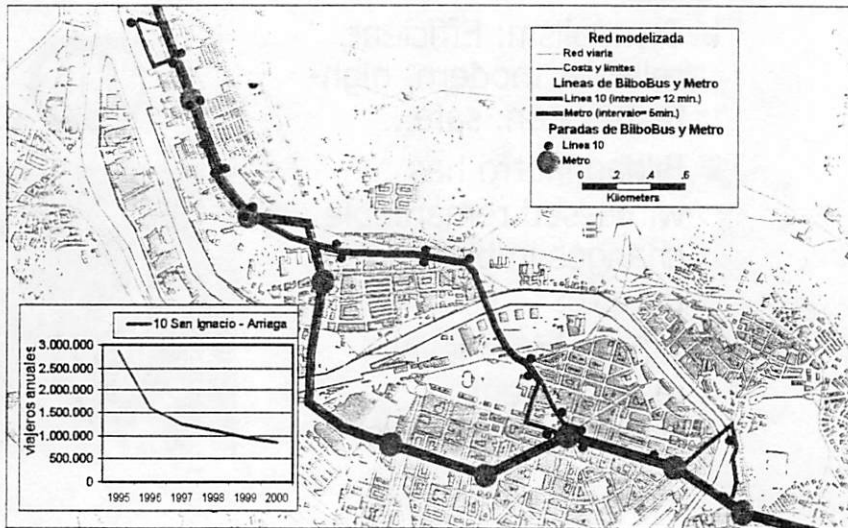


(3) Operations Flexibility

- From 140,000 pax to 240,000 on special days
- Visible in sports events
- Soccer matches, special events, weekend nights owl service...
- Client panels for passenger feedback

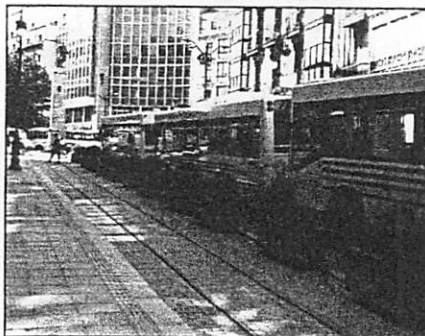


(4) Some Love Buses





(5) Bus vs Rail A Biased Debate



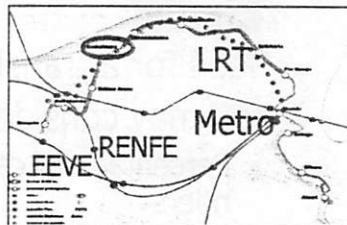
- BilboBus goes where neither Metro nor LRT will ever go
- It ONLY needs proper tools (ie Real-time info), proper accounting and its share of road space
- Uniform transit quality all throughout

Bilbao

80



(6) Cooperation Never Easy



- Never easy to create:
 - A common ticket across modes
 - A joint information system: maps, call centers...
- Cut-throat fight for customers by public agencies
- You cannot push with a string, but you can lead by example
- The United Nations leadership model works - *Budget but no real authority*

Bilbao

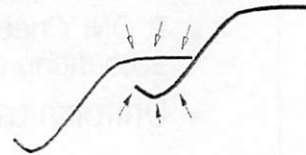
81



(7) The Transit Challenge



- Ford T's in any color as long as it is black
- Transit: reactive or pro-active?
- New working language:
 - Investments
 - Vph at morning peak
 - L.O.S. "E"
 - Average speed
 - Deficit
 - 67 million pax/year
 - L.O.S.???
 - % Lateness
- Energy and Telecoms have done it. Shouldn't transit go beyond its traditional role?



Bilbao

82



(8) How Do we Rate Success?



- Need for a transit acid test
- You may consider as indicators:
 - Percentage of captive vs choice riders
 - Total transit trips per capita
 - Transit share of the overall motorized mobility market
 - Real estate changes around stations
- A continuous process of monitoring and feedback within **and beyond** transit



Bilbao

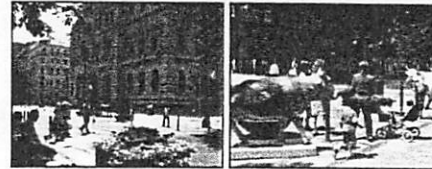
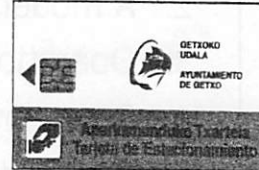
83



(9) Transit as an Alibi for Change



- Once Metro was perceived as a success, local elected officials felt confident enough to adopt car restraining measures:
 - New on-street parking policy
 - New pedestrian areas
 - New public spaces
 - New traffic schemes
 - Urban Quality

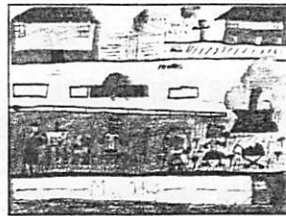


Bilbao

84



(10) Inauguration Day is **Commencement**



- People's expectations and perceptions
- The interpretation of the mass media
- Learning curves and unintended consequences
- Only when proved, **the real action** will begin
- Time lag till Metro and the City consolidate their marriage vows – A good *casamentero* needed

Bilbao

85



In a nutshell..



1. Density and Development
2. A modern symbol
3. Operations flexibility
4. Some love a bus...
5. A biased debate
6. Cooperation never easy
7. The Transit Challenge
8. How to rate success
9. Alibi for change
10. Commencement Day

Fred Salvucci's *Stone Soup* story



In closing, a thought by Ortega y Gasset



- "El menesteroso de una ciencia, el que siente la profunda necesidad de la verdad, se acercará cauteloso al saber ya hecho, lleno de suspicacia, sometiéndolo a crítica; más bién con el perjuicio de que no es verdad lo que el libro sostiene"

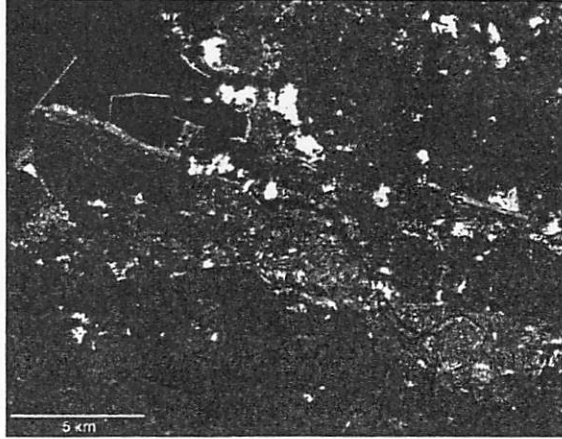
Sobre el estudiar y el estudiante (Primera lección de un curso)

Ortega y Gasset, 1933

It is up to you to ponder, challenge and enrich our findings and solutions, as that is the only way to improve scientific knowledge



Thank you for your attention!



**From above most cities look the same!
At ground level, they may be even more alike**