Economic and Financial Study of the Contribution of Public Bike-sharing Services to the Sustainability of Cities in Brazil: The Need of a Change of Paradigm for Public Funding

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Presentation Roadmap

1. Bike Sharing Systems in Brazil
2. Results
3. Sustainability
- Environmental
- Social
- Economic
4. Economic and financial study
5. Conclusion

Bike Sharing Systems in Brazil
Initial Situation

Bike Sharing Systems in Brazil – 2012

Just five pilot projects throughout the country

- Rio de Janeiro (1st) – 60 stations
- Sorocaba (2nd) – 15 stations
- São Paulo (3rd) – 100 stations
- Porto Alegre (4th) – 40 stations
- Santos (5th) – 14 stations

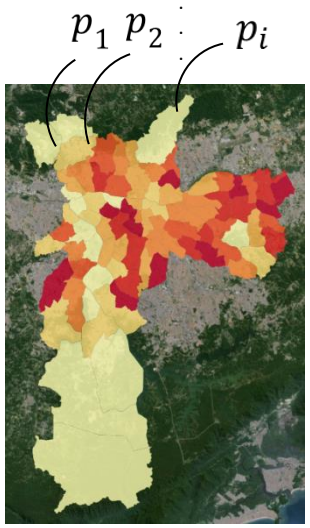
Bike Sharing Systems in Brazil
The Challenge

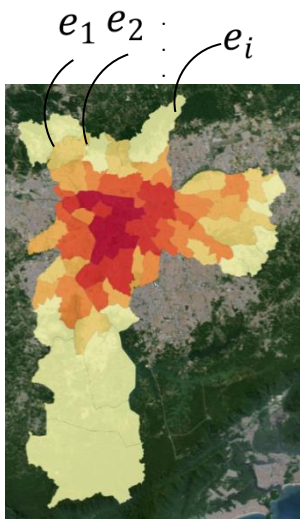
To find the most suitable area, both in size and potential to uptake the cycling demand, for a bike sharing service in 2 of the world's biggest cities.

Analyze the expanding project for the existing services of Rio de Janeiro and São Paulo and create our own proposal.

- New services size still way below the ideal
- Projects created without focus on mobility
- No experience about ideal area to install the service

Bike Sharing Systems in Brazil
The New Methodology

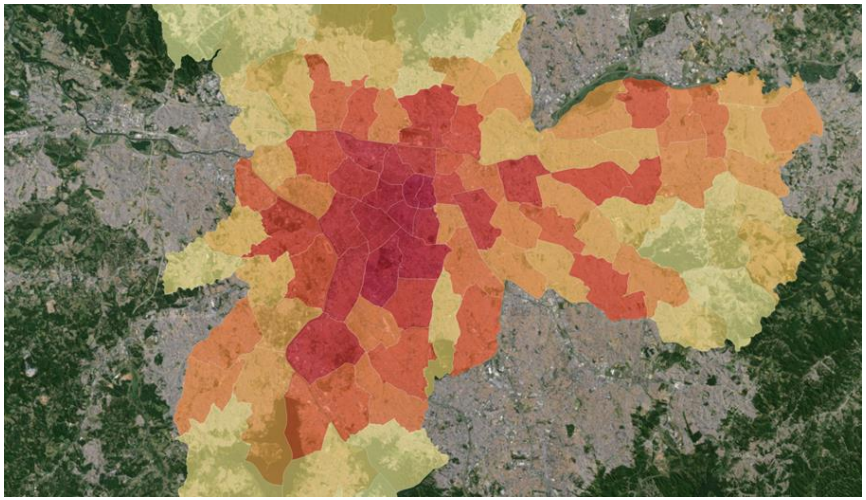


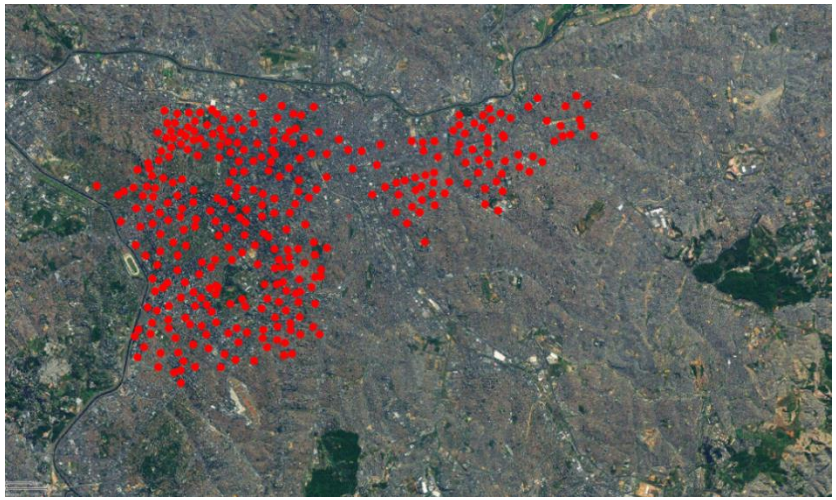


Homogenization PATTERN

	p (Population)	e (Employments)		p-hom (Population)	e-hom (Employments)	
District 1	12.528	5.317	...	0,24	0,20	...
District 2	9.721	4.251	...	0,19	0,17	...
District 3	15.213	3.081	...	0,28	0,13	...
District 4	10.875	3.850	...	0,21	0,15	...
...	...	...	...	...	...	...
District n	6.345	7.133	...	0,14	0,26	...

suitability district X = $w_p \cdot p_x + w_e \cdot e_x + w_b \cdot b_x + w_u \cdot u_x + w_{pt} \cdot pt_x + w_{ci} \cdot ci_x + w_t \cdot t_x$





Bike Sharing Systems in Brazil
Evolution

Opening Bike Rio
Rio de Janeiro - RJ
28.oct 2011

Opening Bike Sampa
São Paulo - SP
jan 2012

Opening IntegraBike
Sorocaba - SP
24.may 19.may

Opening Bike PoA
Porto Alegre - RS
26.nov 22.sep

Opening Bike Santos
Santos - SP
jan 2013

Opening Bike Pe
Recife - PE
23.may 15.jun

OpeningPetro Bike
Petrolina - PE
22.sep 2013

Opening Bike Salvador
Salvador - BA
jan 2014

Opening Caju Bike
Aracaju - SE
30.mar 28.may

Opening Bike Brasília
Brasília - DF
07.jun 2014

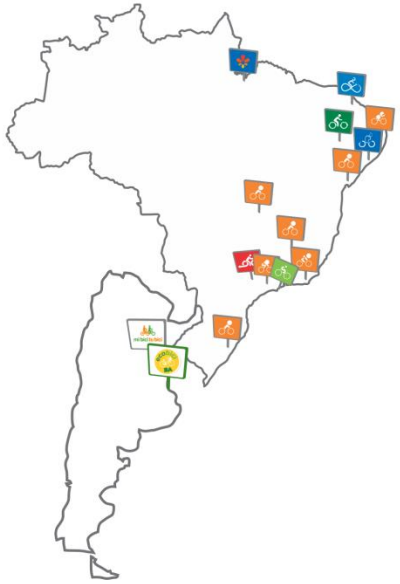
Opening Bike BH
Belo Horizonte - MG
15.dec 2015

Opening Bicicletar
Fortaleza - CE
29.mar 08.apr

Opening Mi Bici Tu Bici
Rosário - Argentina

Opening EcoBici BA
Buenos Aires - Argentina
fev 2016

Opening Hapbike
Belém - PA



1.192 Journeys

1.036 Passes

60 Stations

12,1 milhões Trips

2,5 milhões Passes

1.500 Contracted stations

Results

12,1 MILLIONS Trips
2,5 MILLIONS Passes
2,1 MILLIONS Entries
1.500 Contracted Stations
15.000 Contracted Bikes
20.300.196,85 miles and still counting...

=

817 AROUND the World

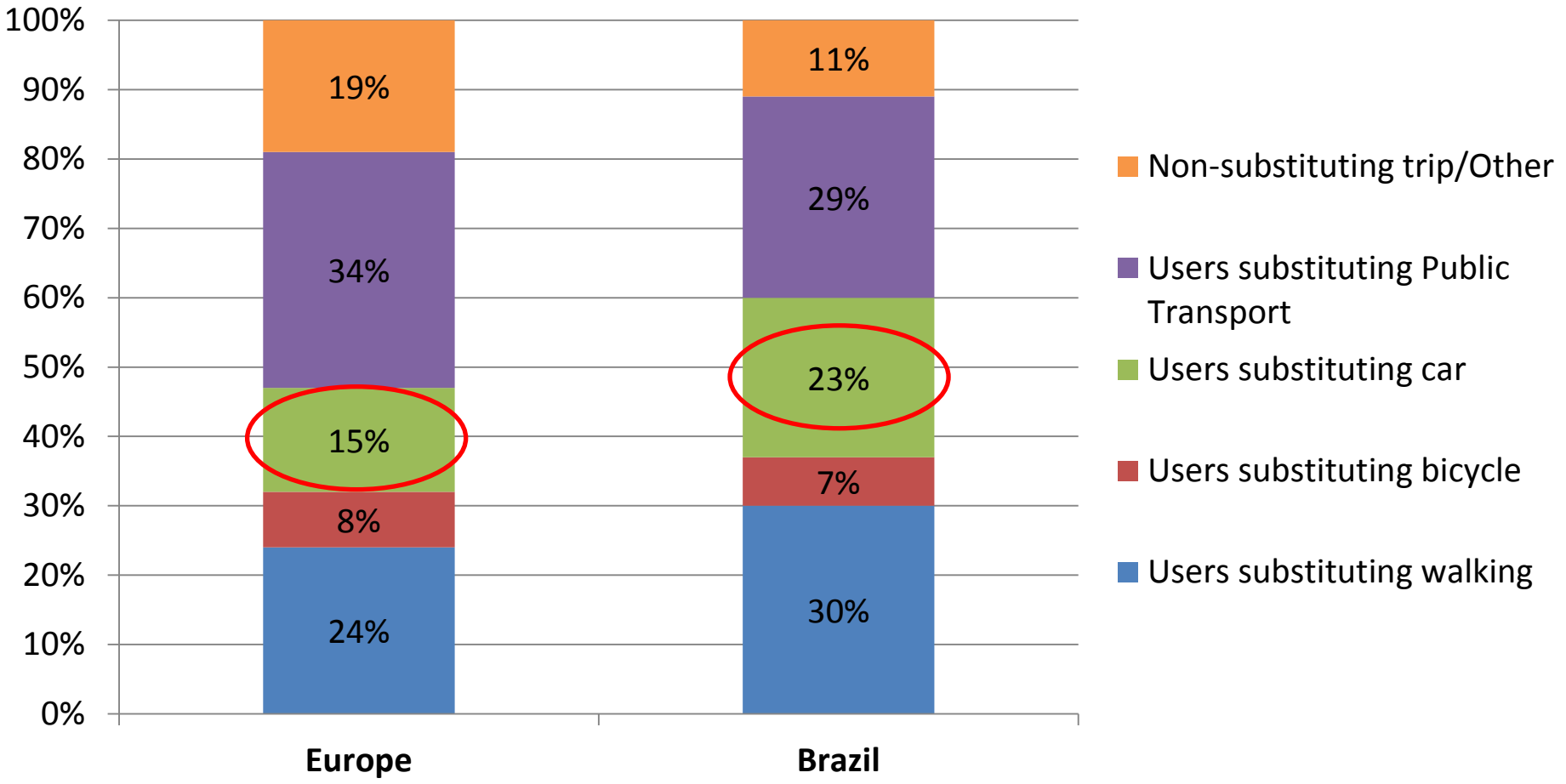
Rio de Janeiro is the seventh city in the world with better use of its public bicycle system, according to a study by the ITDP.

ITDP | Institute for Transportation & Development Policy

Promoting sustainable and equitable transportation worldwide.

Results

Mean of transport used by bike-sharing members before using the service



Sustainability

Environmental

With public bicycle systems use in 2015, it has been estimated(*) a significant reduction of pollutant emissions

REDUCTION CO_2
17.171 Ton CO_2/year

REDUCTION NO_X
51,5 Ton NO_X/year

(*) EMET – CORINAIR. European Union

Sustainability

Social

Sustainability

Economic?

Economic and Financial Study

Sustainability of bike sharing services

$$T = \frac{I}{E + AS - M}$$

- T (years)= payback period
- I (R$)= initial investment
- E (R$/year)= annual energy saving
- AS (R$/year)= annual social and environmental saving
- M (R$/year)= annual maintenance costs

Economic and Financial Study

Annual energy saving

$$T = \frac{I}{E + AS - M}$$

ENERGY REDUCTION	FUEL REDUCTION
4.111 TOE/year	**5.385.545 Liter/year**

TOE: Ton of oil equivalent

(*) EMET – CORINAIR. European Union

Economic and Financial Study

Annual social and environmental saving

$$T = \frac{I}{E + AS - M}$$

Social	Accidents	$ 2.906.573,10
	Urban effects	$ 218.744,92
Environmental	Noise	$ 710.920,98
	Nature and landscape	$ 396.475,16
	Pollution	$ 1.834.723,00
	Greenhouse effect	$ 2.542.909,68
TOTAL		$ 8.610.346,84

$ = USD

IDAE (Institute for Energy Diversification and Saving – Spain)

Economic and Financial Study

Sustainability of bike sharing services

$$T = \frac{I}{E + AS - M}$$

T approximately 10 years

INCLUDING THE INCENTIVE EFFECT ON PRIVATE BIKE (BRAZIL = 2/1)

$$T = \frac{I_{public} + I_{private}}{E_{public} + E_{private} + AS - M}$$

>> E

T less than 5 years

Conclusion

The study clearly defines the contributions of bike-sharing services to the sustainability, quantifying economically the benefits and demonstrating that the investment is recovered in a short time. The investment in bicycle is economically sustainable, contrary to what is generally thought, and really profitable

Given these results, public administrations should see public bicycle services as an investment and not an expense, and should start funding them.

To implement a bike sharing service, this study is not enough, it should always carry out a feasibility study and project planning

Thank you!

Obrigado!

Serttel

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