

Category: **Student Work**

Project: **Car or bicycle?**
A comparison of the means of transportation in Curitiba

What was the challenge?

Initially, the project derives from the larger goal of bringing the community awareness and reflection about their commuting habits as well as its impacts over their own lives and to the environment.

So this project aims to transform, through graphic design, the results of the four Intermodal Challenges that have already taken place in Curitiba into interesting and user-accessible information. Setting off from a strictly numerical data set, the final goal was to graphically translate it into a single data visualization capable of establishing a global comparison among the efficiency of the transport modalities. How to convert into an intelligible and entertaining image a total of 225 individual numerical data crossed among 7 different categories (participants, modes of transportation, years of the challenges, expenses, pollutant emissions, average speeds and rankings)?

Modalidade	velocidade (km/h)	velocidade média (km/h)	despesa (R\$)	despesa média (R\$)	CO (g)	HC (g)	NOX (g)	MP (g)	CF (g)
carro	23,64	19,01	0	0	0	0	0	0	0
carro	22,9	19,01	0	0	0	0	0	0	0
carro	21,76	19,01	0	0	0	0	0	0	0
carro	19	1.3671426	0	0	0	0	0	0	0
carro	17,21	18,1578992	0	0	0	0	0	0	0
carro	16,6	18,1578992	0	0	0	0	0	0	0
carro	15,5	18,1578992	0	0	0	0	0	0	0
bicicleta	15,46	14,56	18	0,6	5,45	2,03	1,01	0,0	0,0
bicicleta	15,2	14,56	17,4	0,58	5,31	2	1,01	0,0	0,0
bicicleta	14,9	14,56	17,4	0,58	5,31	2	1,01	0,0	0,0
carro	14,8	15,982307	0	0	0	0	0	0	0
carro	14,7	15,982307	0	0	0	0	0	0	0
carro	13,86	15,982307	0	0	0	0	0	0	0
bicicleta	13	13,457142	30	1	5,45	2,03	1,12	0,0	0,0
móvel	12,96	11,311111	33,3	1,11	3,2	0,75	0,48	0	1

(original data sets)

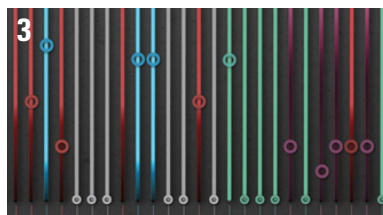
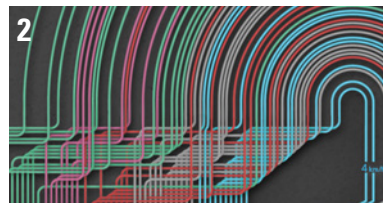
What was the solution?

We decided to work the user experience both through the striking data and by making it visually appealing. Therefore, we sought to balance form and content through a not so conventional graphical approach, while still keeping it understandable so the user could extract the meaning and draw an immediate comparison of all the quantities presented.

Prior to the development of the chart itself, we did some research among infographics similar in complexity and number of informational variables in order to observe trends and set some quality standards as well as visual and functional guidelines.

After several trials and user testings we ended up with a multiple-feature graphic representation. The strategy chosen was to represent the performance of each participant of the challenges by a single graphic unit: a line that runs from beginning to end of the graph, gathering the data from the six other categories through changes in its visual attributes, as follows:

- to identify the categories of transport were used icons as well as color coding (1)
 - the average speed was represented by the diameter (and therefore the position) of the semicircles formed by the lines in the middle of the chart (2)
 - by consequence, the final ranking got implied by the order of the lines on the graph
 - the year of the participant's challenge is showed at the end of the graph by a timeline
 - the expenses are shown by a small overlapping "coin" at the end of the path.
 - the higher the coin on the axis, the greater is the expense of the participant (3)
 - finally, the total pollutant emission is represented by a dark stain on the final portion of the line. The larger and the darker the bar, the higher is the participant's pollutant emissions (3).
- This data visualization was designed to be part of the Intermodal Challenge Report (a free compilation of each year Challenge's edition), as well as to work as an individual poster.



What was the effect?

Even though the project was based on real data and was developed for real conveying, it was still a graduation project with a few financial restrictions for its implementation. For this reason, unfortunately, the results could only be accurately measured until the project's final development stages, through user testings and interviews. However, the results of these testings were quite encouraging since the final target-users showed a very high rate of comprehension and delight while interacting with the piece (fulfilling the goals of the project). Through an experience design approach we could measure positively the effectiveness of the visualization on the perception and cognition fields, which encompasses aspects such as usability, understandability, attractiveness, instigation and pleasure. The only spectrum of the user's experience that we couldn't measure precisely was the aimed subjective behavior effect, though we designed the visualization always keeping this aspect in mind.

CAR OR BICYCLE?

COMPARISON OF THE MEANS OF TRANSPORTATION IN CURITIBA

Six o'clock in the afternoon. What would be the most efficient way to cross the city in the midst of a crowded traffic?

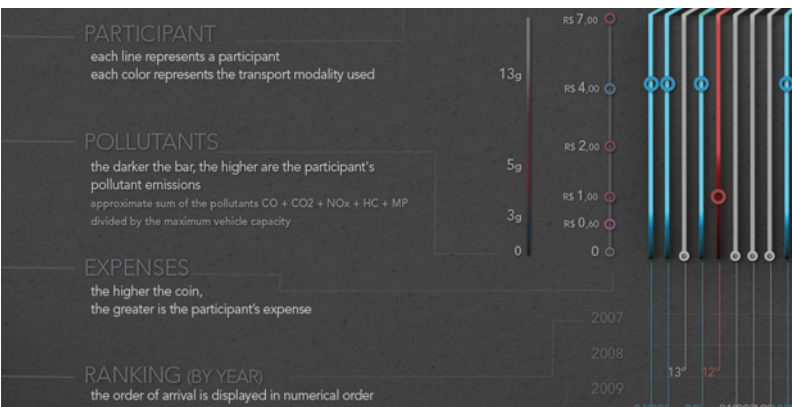
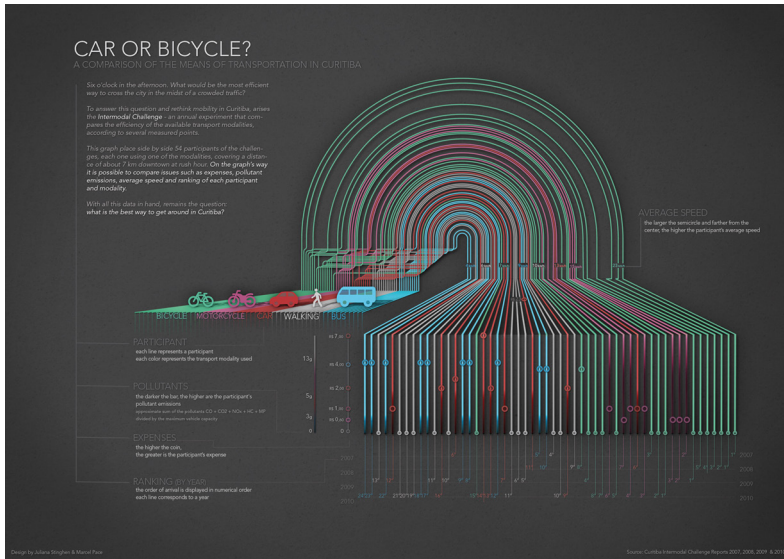
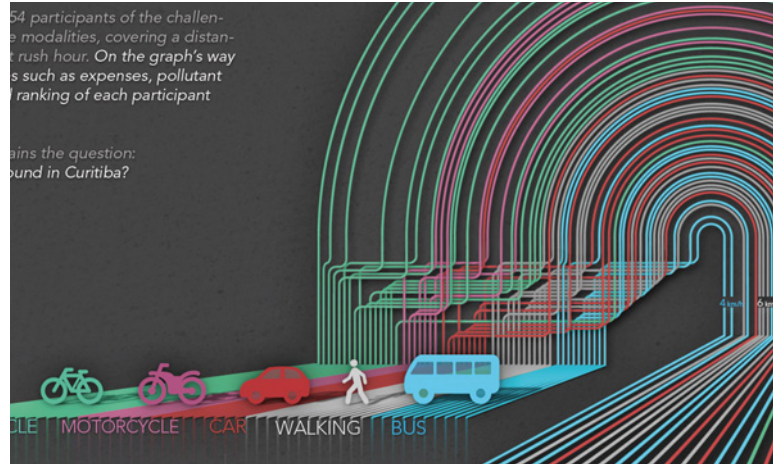
To answer this question and rethink mobility in Curitiba, arises the **Intermodal Challenge** - an annual experiment that compares the efficiency of the available transport modalities according to several measured points.

This graph place side by side 54 participants of the challenge, each one using one of the modalities, covering a distance of about 7 km downtown at rush hour. On the graph's way it is possible to compare issues such as expenses, pollutant emissions, average speed and ranking of each participant and modality.

With all this data in hand, remains the question: what is the best way to get around in Curitiba?

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