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# **Analysing and Mapping the Cyclable City – A GPS-based Analysis of the Real and Potential Cyclability of Madrid**

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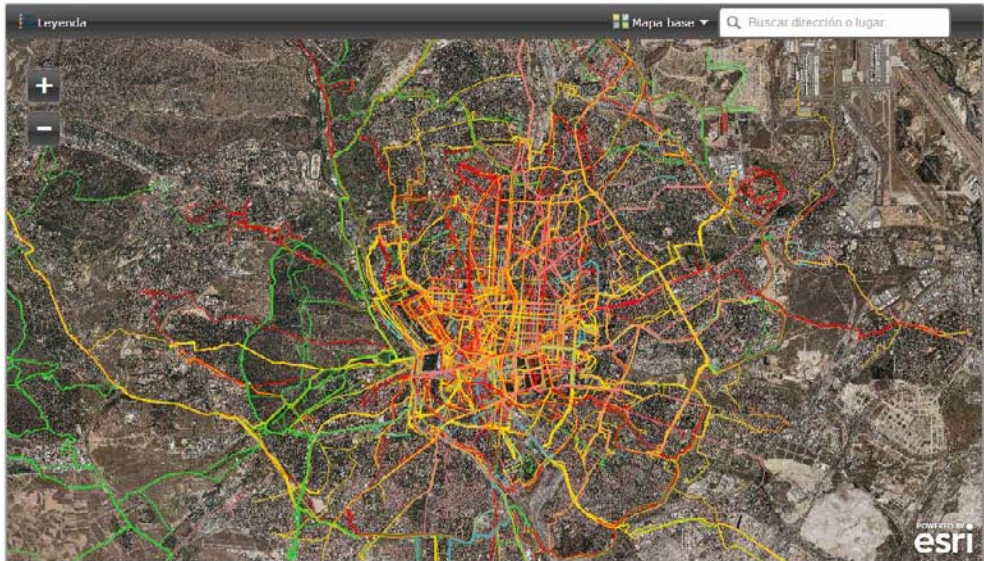
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## **Extended Abstract**

In the last years, sustainable policies have begun to promote cycle mobility plans in many cities, and, in the context of a deep financial crisis, urban planners now face the challenge of developing cycling networks with limited resources. The main objective of this research is to identify what are the most important potential cyclist arteries of a city and what are the most efficient infrastructures to be developed, by analyzing the real urban cyclist behavior and their route decision-making.

We have collected GPS data from smart phone users in Madrid. We launched the initiative [www.huellaciclistademadrid.es](http://www.huellaciclistademadrid.es) (Madrid cyclist track), a website where the volunteers could see how they were designing the collective cyclist track of the city over the time, by visualizing all their routes together. This way they have felt part of a community, increasing their participation, and finally we got over 20,000 km of cyclist routes, over 2,000 GPS different tracks from more than 250 volunteers.

On a first step, a Multinomial Logit Model has been developed to evaluate the impact of a wide range of different factors and characteristics of the network in the route decision-making process, such as slope, type of existing bikeway, motorized traffic density, traffic sense, existence of on-street parking, crossings, dependent turning delays or “green-environmental comfort”. On a second step, general urban mobility patterns have been analyzed in order to estimate the potential bicycle flow demand according to the location of the origin- destination points and travel distance. Finally, both analyses are integrated in a Potential Cyclist Flow Distribution Model, in order to select the best cyclist network in terms of potential cyclist flow covered by the selected bikeways. Once we have defined a cyclist network, a new Potential Cyclist Map of the city is compared with the Real Cyclist Map revealed from the GPS collected, so it is possible to visualize and evaluate the impact of the infrastructure. Mobility data were obtained from the Transport Consortium of Madrid Household Survey and from different official studies and surveys that evaluated potential cyclist demand in Madrid. Network data were obtained from various Madrid Council Transport Public Agencies.



**Fig. 1:** Map of the collected GPS cyclist routes composing the Madrid Cyclist Track

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