

# Urban toll cordon and measurement of inequalities: the example of the French Lyon metropolitan area

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## **Submission for track: G: PLANNING, POLICY AND MANAGEMENT**

### **1. Objective**

In the context of sustainable cities development, this paper investigates an urban cordon toll scenario surrounding the city of Lyon, France. It proposes to assess impacts on inequalities of a 5€ tolling scheme to enter the metropolitan area center. Results are compared to a base situation without charging scheme.

The main issues developed in this paper are the following: among the different measures proposed in the literature, what are the best ones to reflect inequalities? What are sensitivity and limits of proposed measures? Is the impact of tolling on inequalities spatially identify ?

### **2. Data/Methodology**

Inequalities are assessed combining two different types of indicators measuring spatial and social inequalities. First Gini's and Theil's statistical indexes examine the income distribution and inequality for the Lyon population. Atkinson's measures more generally refers to welfare indicator. Then the accessibility to jobs, with a gravity-based approach, is also tested. It allows to measure impacts of a toll scheme on spatial inequalities for car drivers according to their residential location. Income data are given for 2006 French Households trip survey made on the Lyon metropolitan area. Travel times are computed for the morning peak period using the modeling platform MOSART.

Such approach allows using some inequality indicators quite rarely mentioned in the transport literature to analyze impacts of tolling scheme on income concentration. The combined analysis prevents from weakness of one or several indicators to understand inequalities evolution.

### **3. Results/Findings**

Results underline both social and spatial inequalities increase. Nevertheless results at a zonal level are contrasted with those at a global one. The social inequalities analysis shows an income transfer from the richest category to poorest ones, except for some outlying areas economically independent from the central tolled area. Spatial inequalities are increasing growing with the distance to the tolled center. Furthermore, the cordon tolled scheme has not modified accessibility for city center residents. Conversely, car drivers located on the outlying districts closed to the cordon area are the most penalized.

### **4. Implications for Research/Policy**

Urban road pricing scheme have been implemented for 20 years in some European city. Since 2011, this policy tool has been allowed by the French law and in Lyon. Also it is defined as a priority in the Atmosphere Protection Plan in Lyon. Whatever its objective (financing, road traffic control, environmental protection), this paper highlights some disparities of such a toll. It provides some elements to policymakers to avoid social, spatial and urban disparities.