



The effect of incentive structures on driver behaviour and urban road safety in Addis Ababa

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- This brief explores findings from a pilot study of minibus drivers in Addis Ababa seeking to understand how financial and non-financial incentives can improve their driving behaviour and road safety outcomes.
- GPS monitoring devices were installed in 50 minibuses, which captured high-frequency road safety alerts, including speeding (> 70 km/hr) and sharp braking.
- A non-financial incentive where drivers are added to a Telegram group chat and their weekly safety scores (i.e. the number of safety alerts they generate) are revealed to the group, leads to a small decrease in speeding and sharp breaking (one to two fewer safety alerts per week).
- In comparison, a financial incentive where drivers are given a maximum prospective weekly bonus with a small amount deducted for every safety alert they trigger is less effective.
- This brief highlights some preliminary, suggestive evidence that non-financial incentives can be an effective and feasible tool to improve road safety outcomes in Sub-Saharan Africa, and recommends a scaled-up version of the pilot study to more precisely measure effects and guide policymaking in this space.

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Policy motivation

Poor urban road safety is a pervasive issue across cities in Sub-Saharan Africa, and one that will only grow as urbanisation accelerates across the region. In Ethiopia, the accident rate is 163 per 100,000 people per year (Abegaz & Gebremedhin, 2019), and in Addis Ababa alone, there were 408 reported road fatalities in 2022-23. Pedestrians accounted for 86% of these reported deaths, while males made up 77% of the reported fatalities.

A key contributor to poor urban road safety is the prevalence of informal minibus systems, which facilitate the majority of public transit in Addis Ababa and Sub-Saharan Africa more broadly. For instance, although minibuses only account for 10% of all motor vehicles circulating in Kenya, they are responsible for 70% of all accidents (Macharia et al., 2009). Likewise, in Addis Ababa, minibuses account for a quarter of all crashes causing injuries, and 48% of minibuses were caught speeding in 2023 (Addis Ababa Police Commission et al., 2024).

The Addis Ababa city administration has introduced various interventions to reduce accidents, including safer street designs, enforcement of traffic laws, and mass media campaigns (Addis Ababa Police Commission et al., 2024). Despite these efforts, accidents remain high. As a result, policy makers in Ethiopia (especially the Addis Ababa Transport Bureau and Addis Ababa Traffic Management Authority) are keen to obtain rigorous evidence on the effectiveness of alternative monetary and/or behavioural interventions in improving driving behaviour and road traffic accidents in Addis Ababa.

Overview of the research

Past work on improving road safety outcomes among minibus drivers in Sub-Saharan Africa has focused on interventions that either provide information to minibus owners to reduce moral hazard (Kelley, Lane and Schonholzer, 2024), or information to passengers, such as pamphlets highlighting the safest minibus operators (Lane, Schonholzer and Kelley, 2025) or stickers encouraging passengers to speak up against unsafe driving (Habyarimana & Jack, 2011).

Instead, we focus on designing two feasible interventions, one financial and one non-financial, that directly incentivise drivers to improve their road safety behaviour. Specifically, we run a pilot version of a randomised controlled trial (RCT) with 50 minibus drivers in Addis Ababa. These drivers work daily along the same routes, and none of them owns the minibus they operate. Their earnings are based on a contract structure whereby they pay a fixed daily fee to the minibus owner and keep any remaining revenue.

Each minibus is first fitted with a GPS monitoring device, which tracks location, speed, and sharp braking in real-time. Based on this data, we define a 'safety alert' as any time a driver speeds over 70 km/hr, or suddenly brakes. A driver's weekly safety score is calculated as the sum of alerts they trigger. Drivers are randomised into three groups:

- Control group where drivers are monitored by the research team, but their safety information is not shared with anyone else (including themselves or their minibus owner)
- Financial treatment group where drivers receive a maximum prospective weekly bonus of 1000 Ethiopian birr, with 100 birr deducted for every safety alert they trigger. (For reference, 1 USD was equal to roughly 134 birr during our study period).
- Non-financial treatment group where drivers are placed into a group chat on the messaging app Telegram. At the end of each week, their safety scores (i.e. the number of alerts they triggered that week) are shared publicly on the group chat.

Drivers are surveyed at baseline, then midline (four weeks later), and endline (an additional two weeks later). As a part of these surveys, we elicit drivers' willingness to pay for both of the treatment groups (using a multiple price list method), as well as their beliefs about how safe they think they would drive under each of the treatment groups.

Key findings

As this is a pilot study run on a very small sample of only 50 minibus drivers, the findings from this study should be treated as preliminary and merely suggestive. Moreover, in order to make our willingness-to-pay elicitation incentive compatible, we had to offer a subset of participants the ability to choose which program they were assigned to. As such, the sample on which we estimate treatment effects is even smaller. Nevertheless, there are several key findings and patterns that emerge.

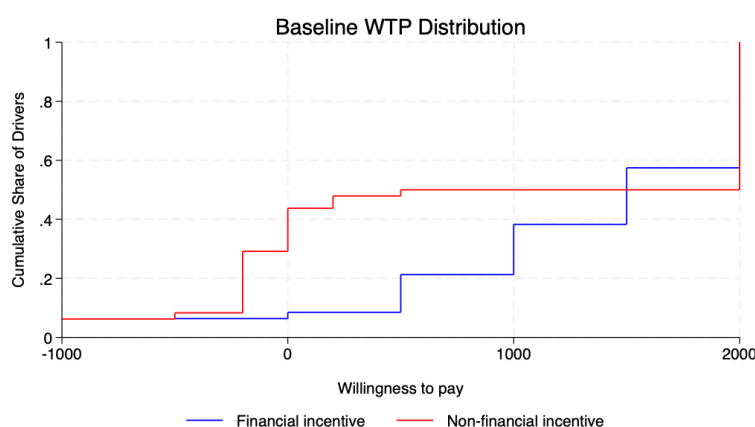
The non-financial treatment led to improvements in road safety behaviour, with drivers generating **one to two fewer safety alerts** on average in the post vs pre-treatment period, relative to the control group. The exact magnitude varies based on the type of regression used, but all regressions we ran show a reduction in the number of alerts.

The financial treatment also led to fewer safety alerts in some of our regressions, but not others, meaning the effect of this incentive program is inconclusive at best.

The willingness to pay for the financial program was higher than for the non-financial program at baseline (see Figure 1 below), and this persisted at both midline and endline. Regarding driver beliefs, drivers in our sample were overconfident at baseline, believing that they would perform better under both incentives than they actually did.

We also found that drivers were safer than expected in our sample, with a median number of weekly alerts of 1 (at baseline). Drivers are also quite experienced (nine years driving minibuses on average), relatively educated (63% high school completion rate), and easily meet their daily revenue targets at baseline. These facts suggest that inexperience and/or pressure from the contract structure is likely not what drives unsafe driving behaviour in our setting.

FIGURE 1: Distribution of willingness to pay at baseline



Note: This figure plots the share of drivers who are willing to pay at most a certain amount of money (in Ethiopian birr) to participate in the financial (blue line) or non-financial (red line) program. For example, the value of the blue line at 1000 birr is 0.4, meaning 40% of drivers are willing to pay 1000 birr or less for the financial program. The red line is above and to the 'left' of the blue line, suggesting that the willingness to pay for the financial incentive is higher.

Policy implications

This study provides some preliminary, suggestive evidence that non-financial incentives designed to create social comparisons may be a feasible, low-cost way to improve urban road safety. Of course, this result comes with the caveat that our pilot sample was very small, and thus it is possible that financial incentives could work in a larger sample, or that neither incentive can be scaled up.

Nevertheless, we believe the next steps for policymakers would be to scale up these treatments to a larger sample of minibus drivers in Addis Ababa (or other

African cities), to rigorously measure impacts. We also believe that while our incentives (especially the non-financial program) are low-cost and feasible, they may need to be slightly modified if the aim is to roll them out at a city-wide scale. For instance, perhaps the city administration would need to design an app to effectively facilitate social comparisons and publicly share the safety scores of drivers, instead of a Telegram group chat.

We also believe that our interventions can be tested on other types of drivers in African cities, who may also engage in unsafe driving. For instance, motorcycle taxi drivers in cities such as Nairobi and Kampala, and rideshare drivers, are growing in popularity across the continent.



A minibus station in Addis Ababa. Image Credit: Eyoual Demeke.

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