How private transit responds to public transit: Evidence from Lagos

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This brief explores findings from a study of a new public bus system in Lagos, Nigeria, and how the city's existing private minibus sector responded to increased competition.

- The Lagos State Government launched the Bus Reform Initiative (BRI) in 2019, adding 820 modern buses on 64 routes by 2022 to provide a public alternative to minibuses.
- Private minibus operators reduced frequencies and fares on affected routes in response to public entry. Prices also fell on connected routes not directly served by public buses, showing that the effects spread across the network.
- Commuters gained an estimated USD 1.47 million per month from the reform, around 10% of which came from the competitive response of private operators.
- By contrast, minibus drivers lost about USD 0.75 million per month—roughly half the gains to commuters—which helps explain their resistance to reform.
- The findings highlight the importance of accounting for private responses when evaluating public transit investments, since informal operators are often invisible in official data.

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Policy motivation

Urbanisation is reshaping mobility worldwide. Today, 55% of the world's population lives in cities, a share expected to reach 70% by 2050. Much of this growth will occur in developing countries, investing heavily in mass transit to expand access to jobs and services. Yet in many cities, private minibuses already dominate daily transport.

Lagos, Africa's largest city, is no exception. With more than 22 million residents, Lagos relied on minibuses for 62% of all trips in 2009, compared with just 5% on public buses. Commutes average four hours, and minibuses are old and low-quality: the fleet is dominated by ageing, high-emission vehicles, with sulphur levels up to 200 times higher than American diesel standards.

These concerns led the Lagos State Government to launch the Bus Reform Initiative (BRI), adding 820 large modern buses on 64 new routes between 2019 and 2022. Each modern bus carries up to 70 passengers, compared with just 14 in the most common private minibus, and has Euro IV compliant emissions.

The reform raises important questions for policymakers. Public transit investments may benefit those who ride the new buses and travellers who remain on minibuses if private operators adjust their routes, frequencies, or fares. Traditional evaluations risk missing these indirect effects, since informal operators are usually invisible in the data. Yet these responses matter: if public entry pushes down minibus fares, even commuters who never board a public bus will gain. This study, therefore, examines how Lagos commuters benefited from improved transit options, how much of the impact came through the competitive response of private operators, and how incumbent drivers were affected by increased competition for passengers.

Overview of the research

The research seeks to answer the following questions:

1. How does the entry of public buses affect the prices and availability of private minibuses, and what are the consequences for congestion?
2. How do commuters' values change in transit attributes such as wait times and fares?
3. How important is the private sector's response to evaluating public transit investments, and how are the impacts shared between commuters and drivers?

Answering these questions required overcoming a major challenge: the lack of reliable data on Lagos's minibus system. While every payment on public buses is recorded digitally, informal private transit leaves no trace. The team mapped routes, tracked fares and vehicle frequencies, surveyed drivers and passengers, and observed commuting behaviour to address this gap. Using these data, they measured how the BRI affected minibus fares and wait times, ran a field experiment to gauge how commuters value them, and combined the results to analyse the BRI's distributional impact on passengers and drivers.

To collect the data that formed the backbone of the analysis, enumerators rode 759 minibus routes, covering nearly 30,000 km across the city. They tracked fares, queues and departures at the origins of 278 routes over 13 survey rounds spanning 15 months. A panel survey followed 854 drivers over five rounds—an unusually hard-to-reach group.

Measuring the impacts of public entry. The research focused on how the private market's wait times and prices changed in response to public entry. Since transit routes co-exist in one connected network, the study classified them as treated (sharing both endpoints with a new public route), connected (sharing one endpoint) or control (sharing neither endpoint).

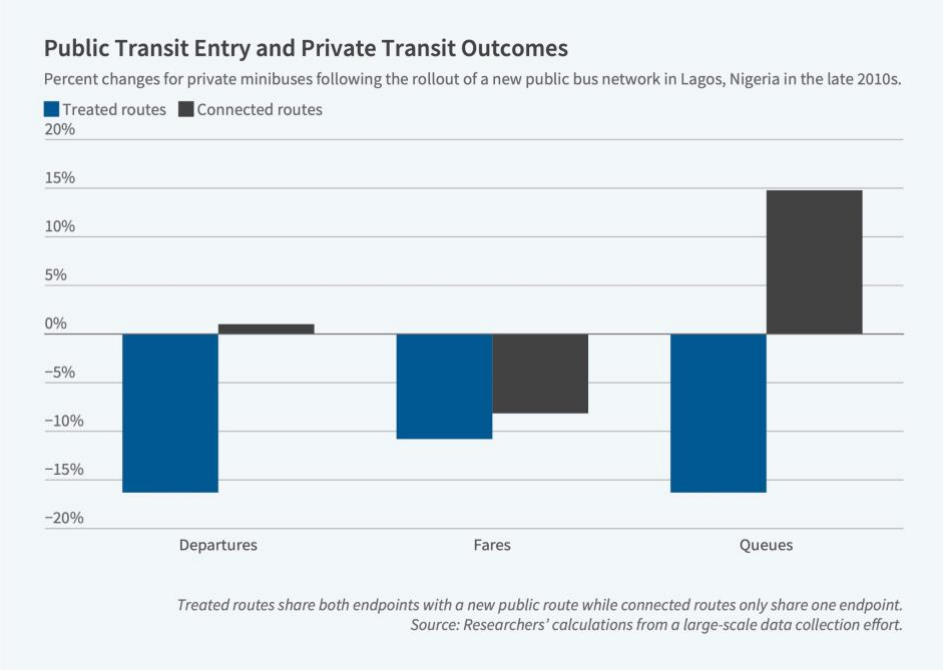
Measuring the value of public entry. Because price and wait time were key outcomes, the team also needed to know how commuters valued them. They ran an experiment at bus stops using a simple digital system to assess this. Commuters were enrolled at home on weekends to avoid selecting only those with a low value of time who might otherwise stop for enumerators. On their usual weekday rides, these commuters received random cash offers to wait a few extra minutes. Enumerators displayed codes on smartphones that changed every minute; participants could accept only by texting the code that appeared once the wait had elapsed. This design revealed actual choices in real commuting conditions, and allowed participation from commuters with basic phones instead of restricting to richer smartphone users.

Finally, the study used these findings as inputs into an economic model to place a monetary value on how commuters and drivers were affected across different parts of the network.

Key findings

The research shows that private operators' reaction shapes both the benefits of new public transit and who gains or loses.

FIGURE 1: Public transit entry and private transit outcomes



On routes with new public service, minibus fares fell, but waits lengthened. Where the government introduced new buses, minibus fares dropped by 5–10% and departure frequencies fell by 16%. Because public buses boarded in different locations, commuters faced longer waits regardless of which service they used. Drivers on these routes saw profits decline.

Impacts spread to connected routes. As profits fell on treated routes, many drivers switched to connected routes: queues on treated routes shortened by about 16%, while queues on connected routes increased. Fares on connected routes, in turn, fell by around 7% as more drivers became available. The reform, however, had no significant effect on congestion. This is not surprising given that the public buses we study share the roadways and do not pack passengers much more densely than minibuses on average**.**

Commuters place a high value on time. Passengers value waiting time at NGN 18.94 per minute, or nearly three times the average wage, highlighting the steep costs of long and uncertain delays.

Commuters gained an estimated USD 1.47 million per month from the reform, around 10% of which came from the competitive response of private operators. This boost from the private sector response was the net impact of increased wait times on treated routes (which hurt commuters) and reduced prices on both treated and connected routes (which benefitted commuters).

By contrast, minibus drivers lost about USD 0.75 million per month—roughly half the gains to commuters. The losses were concentrated among

11,000 drivers, while the gains were spread over more than a million commuters, helping to explain resistance to reform.

Public buses cut emissions. On corridors served by the new buses, replacing older vehicles reduced CO_2 emissions by an estimated 9%.

Policy implications

Public transit should be designed to complement, not replace, existing private services. In cities such as Lagos, where informal transit dominates, centralised systems are unlikely to entirely displace private services. The two will likely co-exist in a hybrid system for decades.

The study shows that rolling out public routes affects fares, changes minibus driver behaviour, and influences even those who continue to use private transport. These responses should be accounted for when forecasting the overall returns to transit investments.

At the same time, the sizable losses faced by incumbent minibus drivers must be addressed. Successful reforms will require ways to bring these drivers on board—or compensate them—if the policy is to succeed.