"Comprehensive Analysis of post-COVID-19 Changes in Behavior and Perception of Public Transit Users in the Urban Region of a Medium Sized City of India- Greater Noida (Delhi NCR)"<sup>#</sup> #D. Sai Kiran Varma, Shalini Rankavat and Anuj Bhardwaj

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## Introduction

- Indian cities have a high share of public transport dependent users
- There is rapid urban sprawl in India with an annual increment of 2.4 % leading to urban population to double the existing by year 2050 (MoHUA, 2018)
- Formal bus and rail-based systems cater to the majority of the demand in metro cities
- Majority of the current users are captive users and less potential users with limited personal choices, comfort and accessibility to travel
- COVID-19 has disrupted peoples' lifestyle and their transit preferences
- In the past two years, since the pandemic has hit the world, the possibility of user attraction toward personal vehicles has been observed due to fear of attracting COVID-19 and **associated changes in preferences**
- Public transportation agencies need to find the significant reasons for the decline in the trips using public vehicles and plan to increase serviceability.



Image Source: Planet Outlook

## **Study Area**

- The area considered for conducting the present study is Greater Noida, an extension to Noida located in the Gautham Buddha Nagar district of Uttar Pradesh state of India
- The city's planning has a mixed land policy(Greater Noida Master Plan, 2021) with a highly densified infrastructure
- The significant public transit line to the city is the metro, The Aqua-line connecting Depot station to Noida Electronic City station. Also, the metro route is partially supplemented by public buses (Uttar Pradesh Parivahan)



Figure 1. Study Area

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## **Preliminary Analysis**

#### Options

I am travelling less number of trips after the COVID-19 pandemic in BUS than I used to before

I am travelling more trips after the COVID-19 pandemic in BUS/Metro than I used to before

The COVID-19 pandemic had no impact on Public Transport (Bus/Metro) as my travel preference

*Figure 2:* Sample data for the change in public transport usage pre-post COVID

Reasons

Fear of attracting COVID

Overcrowding at Stops/Buses & Metro running over its capacity Negligence of fellow passengers (i.e., not wearing masks, maintainin.. Inadequate facilities/amenities provided for maintaining hygiene (i.e..

#### None

*Figure 3:* Sample data N=107 for the reasons of less travelling using Bus/Metro Post-COVID



*Figure 4:* User characteristic variables of the respondents



## Methodology



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# **Trip Purpose vs. Transit Mode (pre and post- COVID-19)**



*Figure 5: Graphical data for the post-COVID mode of commute for different purposes* 

*Figure 6: Graphical data for the pre-COVID mode of commute for different purposes* 

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## **Changes in User Preferences & Mode Shift**



*Figure 7: Comparison of changes in transport user preferences pre and post-COVID* 

*Figure 8: Shift in private transport from public transport after COVID* 

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## **User Priorities Ratings**



Figure 9: Cumulative scores of user priorities' ratings (pre and post-COVID 19)



## Willingness to Walk/Bicycle (NMT) as a connecting mode to Public-Transit

How much maximum distance are you willing to walk to reach bus / metro stops from your origination?



*Figure 10: Maximum distance user willing to walk to reach (metro/bus) stations from origin* 

*Figure 11: Maximum distance user willing to use a bicycle to reach (metro/bus) stations from origin* 

Willingness to cover the distance through bicycle (if facilities are

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### **Promotive Measures for Public Buses**



## **Conclusion/Inferences**

- It can be concluded that there has been a significant shift in the priorities of transport users and a change in public transit users' perceptions pre and post-COVID.
- A significant increase in private vehicle usage is observed post-COVID for trips categorizing different purposes
- Hygiene is given more priority post-COVID
- Maximum public transport users find the comfort of travelling less than 0.5 kilometers to reach the nearest Bus/Metro
- McNemar test p-value shows that private transport use increased significantly post-COVID-19.
- Chi-Square p-value < 0.05 shows the change in the preferences of individuals in the pre and post-COVID scenarios are substantial in a few cases and not significant in a few instances as well.
- Users' transition from public to private transport can be associated with hygiene and fear of attracting COVID.
- Promotive measures such as the Free Bus-Ridership Scheme can effectively increase the number of Bus users and promote bicycle use to reach bus/metro stops.



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