



COVID-19 redefines public transportation

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Knowledge Partner



Message from MoRTH

COVID-19 pandemic is having a profound impact on human interaction and has altered all systems requiring human co-operation. It has disrupted the way people interact with businesses and government, requiring reimagining of modes for interaction of citizens with Governments and businesses.

Public transport sector was the first to bear the brunt of the panic caused by the pandemic. While public transport was suspended across cities worldwide, during February-March, Google mobility report tracking visitors to public transit locations reported a decline of 60-90% traffic. On the same line, as per a World Bank-UITP study on the impact of COVID-19 on public transport in India, the passenger traffic has reduced by 80-100% during the lockdown, whereas, the economic fallout to bus operators has been to the tune of INR 69,000 Crores. Though there has been gradual recovery to the extent of 40-70% of normal traffic, the traffic pattern has shifted at least temporarily to increased use of private cars and bikes. The shift not only creates more than usual congestion on roads and increase in vehicular pollution but also results in continued revenue loss to public transport operator. It makes accessibility of urban workspaces difficult impacting related sectors like real estate and construction. The recovery pattern for public transport will largely depend on measures and actions taken by government and public officials to contain the pandemic, support provided to operators and the efforts made by operators to provide safe and sanitized travel spaces to passengers.

Government of India has been proactive in dealing with the continuously evolving situation, from the onset of the pandemic. Several steps have been undertaken by Gol and MoRTH to deal with the disruption in goods and people movement. MoRTH was at the forefront of the fight against COVID-19 and initiated an early response to handle the public health concerns. Even before the public lockdowns were announced, MoRTH issued public advisories on sanitation, social distancing, minimization of non-essential travel and directed transport officials to mobilize all its resources to prepare, control and contain the impact of the pandemic. During the early days of onset of lockdown guidelines

were issued for deemed extension of licences, permits and fee payments as measures of citizen facilitation. The ministry has also issued guidelines to increase the extent of contactless travel through speedier adoption of technology.

The way forward, for recovery of operations and to ensure service delivery to passengers will largely depend on creating safe and sanitized personal bubbles around the passengers and the drivers. While individuals have to be mandated to wear protective clothing, use sanitizer and ensure personal hygiene, STUs and operators will have to ensure continued disinfection before every trip, physical distancing and ensuring complete adoption of contactless ticketing and travel. STUs will also have to increase the number and frequency of buses on high demand routes to cater to the supply reduction due to physical distancing. Shared public transport operators like cab aggregators, taxi associations, transport associations need to lead the effort in deploying technology to safeguard passengers and designing innovative personal hygiene protocols to prevent spread of the virus. Similarly, the hospitality industry specifically the HoReCa (Hotels-Restaurants-Cafeteria) segment will have to ensure similar sanitation arrangements for their continued operations recreating demand for individual travel and thereby the revival of public transport. Ministry of RT&H will continue to deploy adequate resources to build public confidence in public transport sector and to support operators in their endeavour to restore growth of the sector.

Giridhar Aramane

Secretary, Ministry of Road
Transport and Highways



Foreword

Public transportation has been one of the hardest-hit sectors owing to the COVID-19 pandemic. The lockdown imposed to curb the spread of the contagion put a stop to large parts of public transportation services and only recently, has it begun to open up to the general public in a phased manner. Before the pandemic, public transportation in India had been under increasing pressure, serving as the primary mode of transit in large cities and growing urbanisation leading to more people coming to metro cities.

Recent guidelines signal the Government's intention to fully unlock the economy and open public transportation for the citizens, in a phased manner. However, even with metro services resuming in early September, challenges would continue regarding the fear of the contagion, making people hesitant to return to public transportation.

The COVID-19 pandemic has significantly impacted the human way of life and business, making safety and hygiene the top concerns for people when the lockdown fully eases. It is therefore essential for public transport authorities to develop protocols and take steps to maintain higher hygiene standards that can instil a sense of confidence among the passengers. Implementing measures such as the mandatory use of masks for all staff and passengers, use of the Aarogya Setu app, disinfection of all vehicles and maintenance of social distancing, will go a long way in assuaging fears among travellers.

With many users of public transport now preferring to work from home, it will take some time before public transport witnesses pre-lockdown levels of passengers. Though people would choose to use their personal vehicles even after the country is fully unlocked,

many would return to using public transport. The carrying capacity of buses may drop to half due to social distancing requirements and could significantly strain finances for the public transportation authorities. Meanwhile, sanitising buses and providing protective equipment to drivers and staff will further increase costs. Despite the challenges brought forth by the pandemic, there is an opportunity to transform the way public transport functions and introduce technological developments such as contactless ticketing, making way for an efficient and secure public transport system.

We hope that this report by ASSOCHAM and Primus Partners will support Government in transforming public transport in the face of the pandemic. It shares recommendations wherein various innovative solutions can be introduced to deal with the current challenges and improve long-term efficiency, without comprising on the safety of its passengers.



Niranjan Hiranandani

President - ASSOCHAM & Co-founder - Hiranandani Group



Deepak Sood

Secretary General ASSOCHAM



Foreword

COVID-19 has challenged the basic premise of public transport and has posed many unanswered questions. Ever since the lockdown announcement in the country, a large part of public transport services remains non-operational or have been operating at reduced capacity, even though the lockdown has been removed in most of the country. Passengers are concerned about cleanliness and disinfecting of vehicles and adherence to social distancing norms. They would like to work from home (WFH) to continue for some more time or other policy measures to be adopted, including flexible working hours and staggered office schedule. For public transport authorities, the challenge lies in ensuring that drivers and conductors are adopting safety measures, vehicles are cleaned and disinfected at a regular frequency, and all norms of social distancing are strictly enforced. Reduced passenger load also means that the financial situation of public transport authorities and aggregators can be further strained. However, this is also an opportunity for public transport authorities and governments to facilitate the adoption of technological advancement, including contactless ticketing and digital payments, thus boosting the vision of Digital India.

ASSOCHAM and Primus Partners have conceptualized and prepared this report with the perspective to help look into the concerns raised by passengers and challenges faced by the public transport operators in India. The report also outlines the steps that can help win back the confidence of the passengers without any compromise in safety and hygiene. The report is based on inputs received from citizens across the eight large cities or metropolitan regions in India, in addition to the views of senior officials in

Government and the private sector involved in the business of transport and its allied services. In a well-rounded approach, the views of transport authorities; app-based cab aggregators; technology majors; contactless ticketing and digital payment service providers have been considered. Also, the report looks at the global perspective on how other countries across the Americas, Europe and Asia have reacted to this crisis so that the learnings are documented, and India doesn't have to reinvent the wheel.

The report would provide public transport authorities/operators, aggregators and governments with clear points to ponder and act upon so that public transport can be brought on track at the earliest without compromising on safety and hygiene. We endeavour to provide the stakeholders with clear-cut recommendations and learnings so that India can operate the much-needed engine of public transport very soon and with full rigour.



Devroop Dhar

Co-Founder & MD
Primus Partners



Davinder Sandhu

Former Advisor
World Bank





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1. Background

The COVID-19 pandemic has significantly impacted everyone and almost every aspect of life. The world is dealing with challenges which were hitherto unknown and the impact of this is visible on the global economy. The Transport sector, especially public transport, has been impacted significantly by the pandemic.

ASSOCHAM and Primus Partners, through this publication, have looked the public transport ecosystem in eight (8) of the largest cities and metropolitan regions in India through citizen

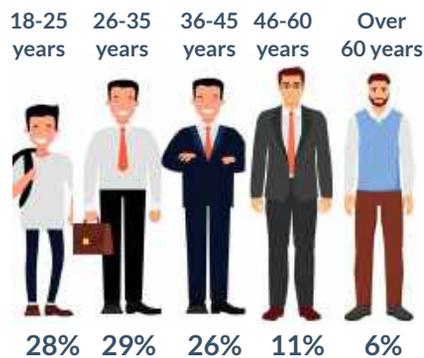
viewpoint, expert opinion and our in-depth analysis. The focus was on gauging the impact of the pandemic on public transport and what needs to be done to bring back people's confidence in it. The findings of the survey, views of experts and analysis are presented across five chapters of this report. Each chapter covers these aspects in detail.

Characteristics of Sample set

Gender



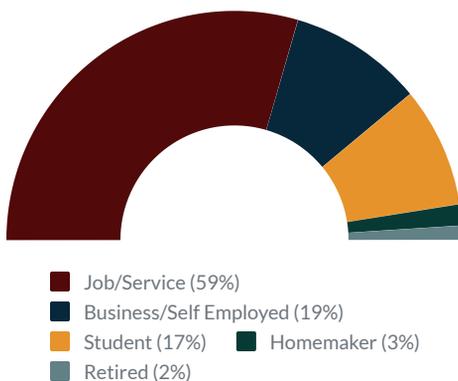
Age Group



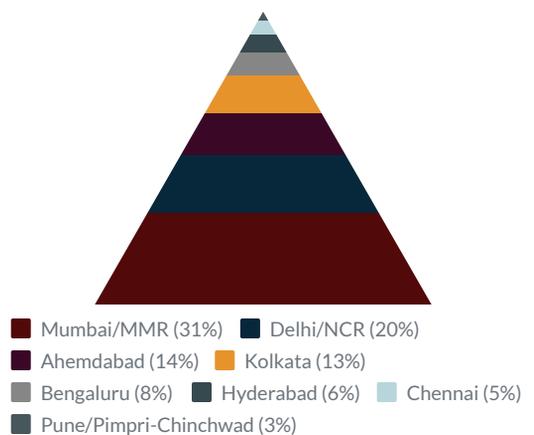
Monthly Income (INR)



Occupation



City



2. Public Transport hits a roadblock post-lockdown

As more and more people prefer to use their own vehicles post lockdown, it may lead to traffic congestion in cities

With the rapid growth of urbanisation in India, public transport has become an intrinsic part of city life for intra and intercity commute. Public transportation is the primary mode of transit in large cities and urban regions in India. With the introduction of Mass Rapid Transit (MRTs), Bus Rapid Transit System (BRTS), improved quality low floor buses, App-based Cabs, more and more people in urban areas are finding usage of public transport reliable, convenient, comfortable and safe.

However, the COVID-19 pandemic has significantly changed this as we have seen from our survey in the eight cities.

Based on the survey conducted by us, we found that before the lockdown, 55% of the people in these cities or metropolitan regions were using public transport. Public transport was preferred by more than 2/3 (>67%) of the people in two of the most densely populated cities - Kolkata and Mumbai. It was less prevalent in cities like Pune and Ahmedabad.

Did you prefer public transport before the lockdown?

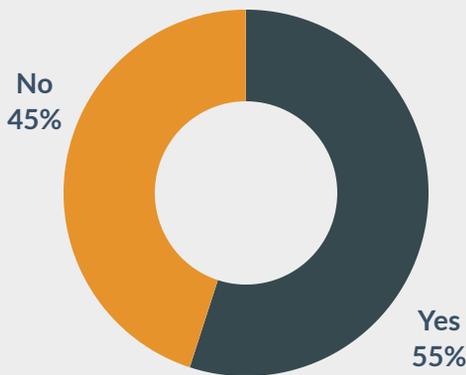


Fig1: Preference for Transport before Lockdown

What was the city-wise usage of public transport pre-lockdown?

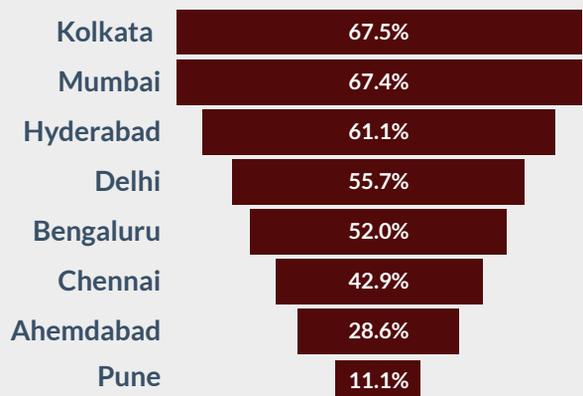


Fig2: Preference for Transport before Lockdown



Bus travelers maintaining social distancing in Mumbai



Passengers in London keeping distance while boarding the train
Source: BBC

However, post lockdown, 73% of the respondents would prefer to use their own vehicles (either 2-wheeler or 4-wheeler) and only 21% are looking at continuing to use public transport, which is down by a whopping 34%. Car sales in India have already started looking up with 1,97,523 units being recorded in July 2020, which is 69% more than the previous month and just 1% less than July 2019[1]. This trend, along with a reluctance to use public transport, may lead to congestion in large cities in times to come.

Post-lockdown, what would be your preferred mode of travel for your daily commute?

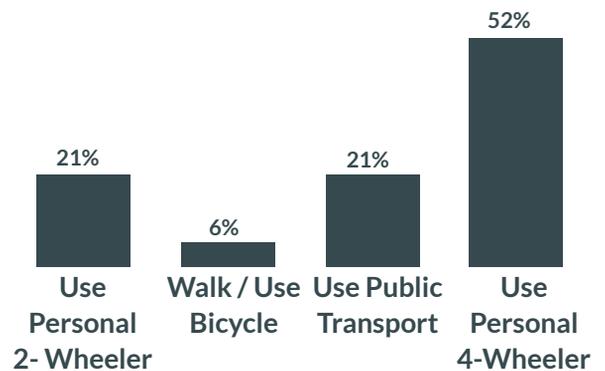


Fig 3: Post-lockdown, what would be your preferred mode of travel



In Singapore, trains marked with stickers, indicating available seats and standing room.

[1] "Car sales rev up in July", Domain-B, 03 August 2020

Our View

Governments, Corporates and Public Transport Agencies and operators need to reinvent themselves to cope up with this challenge, as we embrace the new normal.

Public Transport Agencies need to look at various means to make travel safer for commuters and thus win back the confidence of people –

- Ensure all frontline employees (e.g. drivers, conductors etc.) wear safety gears (masks, gloves, face shields) at all times
- Use of touch-free sanitizers and Contact-less washbasins with soap dispensers at offices, railway and metro stations, bus depots etc.
- Disinfecting the vehicle after every ride
- Ensure no passenger is allowed without wearing masks
- Explore possible options in local trains, metro trains and buses to create external airflow to dissipate viral particles
- Change of airflow systems in an air-conditioned environment to avoid infectious particles dissemination
- Increase adoption of digital payment and contactless ticketing

Increased usage of private vehicles would lead to congestion and choke up our cities. This may lead to an increase in travel time, higher pollution and CO2 emission and higher fuel usage. Governments and Corporates need to usher in reforms and policy level changes to help tide over this crisis. Corporates can look at staggered working hours so that everyone doesn't have to report to the office at the same time. Working from home can be encouraged wherever possible and permissible. Also, the day off for employees can be balanced across days, so that the load on the road can be reduced in equal proportion.

Governments would need to look at reforms which facilitate work from home (e.g. allowing computers, laptops to be taken home with adequate checks, when company operates from export promotion zones, etc.). Governments would also need to rework their project financials for public transport and adopt newer models to make transport projects viable (e.g. the financial modelling of PPP projects would undergo change as the passenger load numbers may change). Governments should consider urban design changes, which promote pedestrianization and the use of non-motorized transport. This can significantly decongest cities and would be beneficial not just now, but also in the long run.



Navi Mumbai Municipal Transport: Leading the Way

Navi Mumbai Municipal Transport (NMMT) was established in 1996 and presently has a fleet of 510 buses, doing on an average 2682 trips daily. NMMT ferries about 2.5-3 Lakh passengers per day on an average. It is the lifeline for the city of Navi Mumbai and its adjoining areas and over a period of time has established itself as a leading technology driven public transport authority.

NMMT has implemented Integrated Transport Management System (ITMS) for managing and driving bus operations and has a state of the art command and control centre to help operate its fleet. NMMT has one of the first Public Transport Authority in India to bring in contactless ticketing and digital payments, which would be extremely important as public transport in India readies itself to the post lockdown world.

While Covid-19 has disrupted operations of NMMT to some extent, but we have started operations again. Presently, as on 31st July 2020, we are operating on an average about 200 buses, which is less than 50% of our normal capacity. NMMT has taken multiple steps to ensure safety and security of passengers and staff members during this time. We are happy to say that there have been zero fatalities as on 31st July among the drivers and conductors at NMMT. Some of the steps taken by us include –

- All drivers and conductors are given masks and gloves on a daily basis from the depot
- All drivers and conductors are provided with sanitizers
- Strictly enforcing social distancing with one passenger per two seats and a maximum of 5 standing
- Buses are disinfected after every trip
- Buses are cleaned thoroughly on a daily basis
- Mostly younger drivers and conductors pressed into frontline service as the number of trips have come down

NMMT has always been a frontrunner in usage of digital payment and contactless ticketing. Our focus on digital payments and contactless ticketing is also expected to help in this situation as more and more people prefer using digital payments. We have introduced payments through ways and means like our Mobile App, use of credit and debit cards, Google Pay, Paytm amongst others. NMMT was probably the first public transport authority in India to introduce an open loop card. Our Navi card can be used for purchase of tickets and monthly passes, as well as can be used for regular retail use.

Focus on digital payments and contactless ticketing, as well as safety and hygiene are the two crucial aspects as we move into post lockdown world, and NMMT has adopted both to make travel safer for all commuters.



Shirish Aradwad
General Manager, NMMT

Cleaning and disinfection of buses
in Maharashtra



3. India would prefer to Work From Home (WFH)

74% of the respondents would prefer some form of work from home to continue post lockdown

The current pandemic and accompanying lockdown have forced businesses and organizations to reevaluate their short to medium term plans and strategies to ensure the sustainability of operations. Facilitating remote working for employees during the lockdown has been critical and the most challenging aspect for companies worldwide. Companies that did factor in such disruptions before the pandemic and incorporated adequate measures into their business strategies have been able to respond to the changing conditions to ensure seamless continuity of operations.

Our survey shows that 79% of the respondents in these eight cities or metropolitan regions were able to work from home during the pandemic.

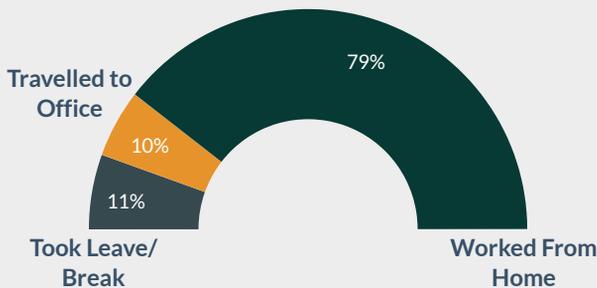
Post lockdown, we see that people would prefer some amount of work from home to continue, with 74% favouring it.

Companies have also seen the benefit in WFH, as it becomes location agnostic, allows companies to cut down cost on expensive real estate (which can be redeployed for employee benefits, training, R&D etc.)

People want to continue working from home and expect corporate policies to accommodate this flexibility

and hire talent across the country without having to focus on relocation. Recently, Zensar (a leading IT firm) had 112 new joiners who would permanently work from home from cities and towns such as Indore, Bhopal, Jabalpur, Vijayawada, Chandigarh, Patna and Nashik. This would allow employees to have a better work-life balance and not congest any of the bigger cities. Such initiatives would also lead to the growth of tier 2, tier 3, tier 4 cities and towns in India.

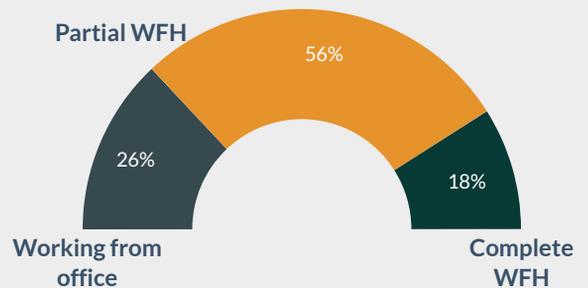
How did you work during the lockdown?



79% people managed to work from home during the lockdown

Fig4: Working venue during lockdown

How do you want to work post-lockdown?



74% people would prefer some form of WFH to continue post lockdown

Fig5: Preference for working post-lockdown

Corporate Policy changes – Need of the hour

Corporates must consider and revise policies to incorporate a decentralized working structure, to ensure preparedness for future pandemics. Professionals surveyed displayed hope that companies would review and/or incorporate remote working, staggered working hours (so that everyone doesn't report to work at the same point of time, thus ensuring less congestion in the city and lesser travel time) and staggered/flexible working days.

While work from home should be encouraged, however, corporates would also need to look at critical aspects like

- **Information and data security**
- Effective use of **business collaboration and meeting tools**
- Bringing in impactful **employee engagement initiatives** to prevent feelings of loneliness and social isolation amongst employees
- Creating a **platform for providing emotional support** to employees as they feel the impact of social isolation in the absence of physical interactions in the office
- Focusing on **mental well-being** of employees
- Provide **additional allowances and reimbursements** like internet charges, electricity bill, phone bill etc.

What are the top 3 policies that corporates can implement?*

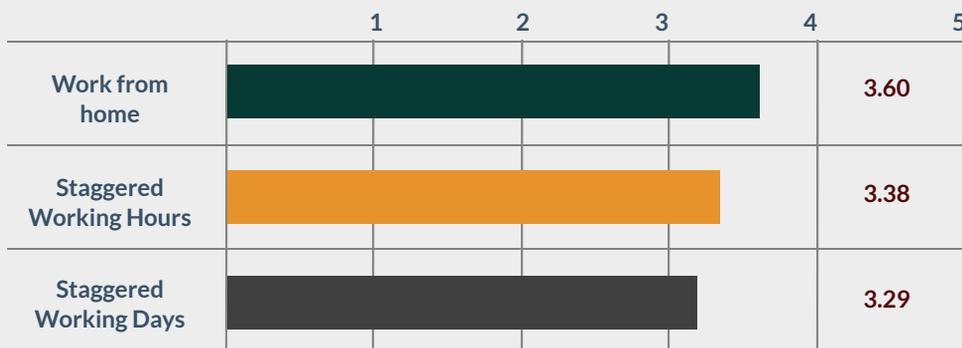


Fig6: Preference for corporate policies

Remote working - the new normal

As companies and governmental organizations slowly start resuming normalcy, it is seen that remote working can provide tremendous benefits to companies and governments as it would:

- Decongest large cities and facilitate reverse migration
- Lead to growth and development of smaller cities and towns, thus helping in Government's agenda of overall growth in the country
- Help companies reduce cost on real estate, which can be redeployed for aspects like employee benefits and R&D. It can ease the bottom-line pressure of companies to a great extent in the long run.

Our View

As the world recuperates from the effect of COVID-19, organizations worldwide will need to embrace the possibility of future disruptions to work and need to revise their strategies to ensure preparedness for future pandemics. Companies will need to do a thorough risk assessment to identify gaps in remote working procedures, implement policies and measures to ensure business viability and sustainability despite external threats.

*Note: On all similar graphs across the report, the respondents rated the parameters on a scale of 1 (lowest / least important) to 5 (highest / most important). The final scores shown here is the average of scores based on the responses given.

'Secured Remote Worker' is key to business continuity

Over past couple of years, while a lot of organisation heavily encouraged flexible workforce, COVID-19 has compelled almost all businesses to look for a reliable Work From Home (WFH) solution to ensure business continuity. While the tech industry was more or less tuned to WFH even before the pandemic hit us, but many other organisations and industry desperately needed to enhance their infrastructure for business continuity planning. For past few months it has been a new work culture of a flexible, yet productive work environment. However the success heavily depends on the following:

1. Seamless connectivity
2. User experience
3. End to end Security

There are technology solutions that can create an agile, resilient and secure infrastructure which can ensure the above. The most important solution components ensuring a '**Secured Remote Worker**' in such an unprecedented situation are:

- VPN connectivity with end to end encryption so that a user can connect from his/her home securely to the enterprise.
- Identity management with Multi factor authentication to ensure legitimate devices are only connected to the enterprise network.
- Seamless collaboration platform for audio, video and chat. User friendly options to share and collaborate amongst various teams.
- Connect, access and collaborate from anywhere, anytime and any device.
- Malware, data protection and compliance
- Zero touch deployment of a Secure Remote Worker infrastructure.

While Work from Home would reduce the chances of spread of the pandemic to a great extent, however that does not rule out the need for public transport completely. People may still need to travel for essential work or attending meetings or office on few occasions etc. People are still scared or apprehensive to avail public transport and we feel that technology can address the concerns and allow them to travel safe and healthy.

Public transport is the backbone of cities, providing an essential service to keep cities moving. However, Public transport has been hit hard by COVID-19. With ridership significantly down, operators will have to face difficult questions for their future viability. Businesses and all other activities across the globe have been adversely affected which in return is impacting the economy. The demand-supply gaps are clearly visible in every sector. Lets look at a few use cases of technology enabling public transportation to become more safe in era of social distancing.

- Use of AI based technologies and video analytics for real-time information flow between commuters and transport providers, Artificial Intelligence (AI) and video analytics will help commuters to see real time public transport vehicle occupancy and alert authorities in case of commuters occupancy is more the allowed limit.
- Real Time vehicle tracking will help commuters to know when their public transport vehicle will arrive at their stop and helps unnecessary crowd gathering in public transport stands.
- E-Tickets for contactless travel and transactions
- Technology enabled V2I (Vehicle to infrastructure) solutions which can help manage traffic light intelligently so that travel time is less, and commuters can spend less time in public transport.
- Use of edge gateway for real time data transmission from vehicle to central control centre
- Edge based computing to run video analytics like maintaining social distancing and face mask enforcement.

Covid-19 has thrown unforeseen challenges that needs us to rethink our work environment and public transportation. At Cisco, we are working with Governments and Organizations globally to be the bridge between these challenges and potential solutions and looking forward to creating unique solutions in Indian context.



Ashish Wattal
Director, Public Sector,
Cisco India

4. Hygiene and Safety – the crucial ingredients to get Public Transport going

Working professionals are eager to get back to work, although they are concerned about their health and safety while commuting on public transport. Public Transport Operators need to take decisive steps to bring back people's confidence in using public transport. The respondents of our survey were asked about changes that would reinstate their faith in public transport and help them prefer their previous methods of public transport.

It should be mandatory to wear masks in public transport

Top 3 behavioral changes wanted in fellow passengers

| | Least important | 1 | 2 | 3 | 4 | 5 |
|------------------------|-----------------|---|---|---|---|-----|
| Mandatory Masks | | | | | | 4.0 |
| Mandatory Gloves | | | | | | 3.4 |
| Mandatory Face Shields | | | | | | 3.2 |

Fig7: Behavioral changes wanted

Top 3 concerns while using Bus or Metro

| | Least important | 1 | 2 | 3 | 4 | 5 |
|---------------------------|-----------------|---|---|---|---|-----|
| Lack of Social Distancing | | | | | | 3.9 |
| Having to touch things | | | | | | 3.8 |
| Irregular disinfection | | | | | | 3.7 |

Fig8: Concerns in using Bus/Metro

The most critical priority for commuters while travelling with fellow passengers was making masks mandatory for all passengers and drivers/conductors, during the entire duration of the journey. Buses, Metros and Trains are confined spaces with a high probability of transmission and with many common contact surfaces. A compulsion to wear face masks followed by gloves and face shields, can help offset concerns of commuters and tip their preference to favouring public transport over their personal vehicles.

Lack of social distancing is a key concern in buses and metros

Improper cleaning and disinfection of taxis/ autos/ and app-based mobility vehicles such as Uber, Ola was the top concern of passengers, followed closely by having to touch many common contact surfaces which might increase the rate of transmission. Commuters were equally concerned about drivers not undertaking temperature checks on a frequent basis.

Cleaning & disinfection and touch remains key concern for travel by taxis and autos

Top 3 concerns while using Taxi / Auto / App Taxi

| | Least important | 1 | 2 | 3 | 4 | 5 |
|------------------------------|-----------------|---|---|---|---|-----|
| Improper cleaning | | | | | | 3.9 |
| Having to touch things | | | | | | 3.8 |
| No driver temperature checks | | | | | | 3.7 |

Fig9: Concerns in using Taxi

What do people want?

Public Transport Authorities and operators need to focus on all aspects of safety and hygiene to ensure that passengers come back. Masks for drivers, availability of hand sanitizers, cleaning and disinfection would become the most critical aspects to win back passenger confidence.

Autos, Taxis and App based Cabs: Masks for drivers, availability of hand sanitizers and disinfecting after every ride will remain important

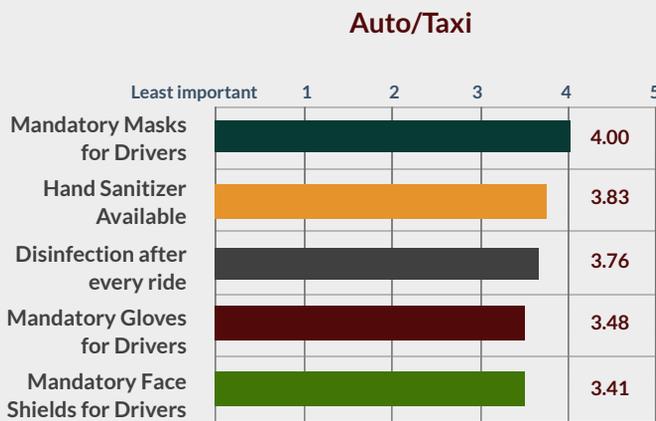


Fig10: Preferences when using Taxi

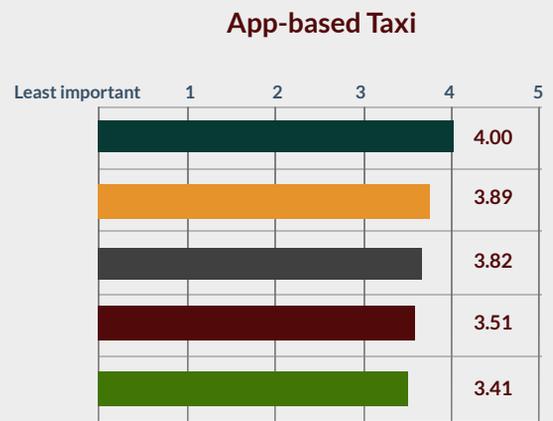


Fig11: Preferences when using App-based Taxi

Buses, Metro & Train: People want operators to focus on disinfection & cleaning and contactless ticketing for safer travel



Fig12: Preferences when using Bus/Metro



Sanitizer being provided to all bus staff

Our View

Safety and hygiene would remain the top concern for people once lockdown eases, and public transport authorities, operators and stakeholders need to take steps for it. Some critical aspects that should be taken up include:

- Mandatory masks for all passengers - 'no mask - no ride'
- Drivers and conductors should be wearing masks and other protective gear like face shields, gloves etc.
- Mechanism of screening of passengers and drivers to ensure that there are no apparent symptoms of the disease
- Focus on cleaning and disinfecting vehicles
- Cleaning and disinfecting bus stops, bus depots, and stations
- Move to contactless ticketing and digital payments across all modes, right from buses, metros, app-based cabs to autorickshaws and regular taxis.
- Redesigning cabs, auto-rickshaws by introducing acrylic sheets or plexiglass to separate the driver from the passengers
- Encouraging the use of the Aarogya Setu app



Hygiene & Safety – crucial ingredients to get Public Transport going

As countries across the world edged towards a “stay at home” approach in the face of the pandemic, the first thing that got affected was the public transport sector. As people stayed at home in India the flights stopped, the passenger trains were halted including the inter-city & the intra-city buses and the metro.

Different modes of public transport are used in India from auto-rickshaws and taxis to railways and buses. As the country opens up the biggest challenge in the public transport sector would be to implement social distancing along with safety and sanitization protocols, and hence it would need a lot of planning.

One thought is that to properly enforce social-distancing, additional fleets with larger frequency could be required to adjust the restricted number of commuters in each fleet. However, the possibility is that due to the fear of infection spreading due to the crowd most commuters could choose traveling in private modes like two-wheelers. At the same time, the carrying capacity of buses could drop due to social distancing requirements. Such dynamic changes in demand and supply will require great agility and planning in public transport to keep the country and its cities moving.

Measures are needed to maintain safety and sanitization to gain the public's confidence in mass transport modes, to avoid a significant modal shift to road traffic which is not environmentally sustainable.

Digital and analytical tools are needed to improve efficiency in public transport service delivery: Industry needs to innovate to deliver better digital solutions, there's significant scope to improve on applications like Automatic Vehicle Location Systems (AVLS), passenger information systems, digital ticketing & payment systems and data analytics for performance management and service planning so as to maintain safety & social distancing.

Precautions to prevent the spread of infections & sanitisation: Hygiene and safety both are of utmost importance to curtail the spread of the pandemic. For

mobility to resume, safe behavior is non-negotiable – Buses must-have thermal screening, spaced seating; masks (compulsory); supervised boarding (from back) and de-boarding (from front); and open windows. For metros, thermal screening; orderly boarding and de-boarding procedures; and spaced seating, wherever possible. Mandatory masks, and not riding if you have a cough, cold, fever, or were in contact with a positive person are some obvious precautions. Professional sanitisation of vehicles is a necessity to prevent the spread of the coronavirus. Due to the long distances they cover, it may be impractical to halt and sanitise local buses and trains every two hours, thereby increasing the risk.

Government initiatives needed to improve policies and regulations governing public transport: The Government would need to take initiatives to improve transit attractiveness such as effectively implementing bus priority lanes and pricing regulations also increase service coverage is the other key measure needed to improve public transport in smaller cities, suburban areas of the larger cities and in rural areas. We need to disincentivise private vehicle adoption through congestion pricing, parking charges, and variable pricing to modulate demand. Urban mobility needs to be rethought with the rapid rollout of walking and cycling infrastructure at low costs while creating space for other sustainable options over a long time horizon.

Other initiatives: At TCI we have opted for the Aarogya Setu APP and the remote Gate entry APP which is used for contact less attendance and we have staggered our office timings as well.

Similarly, we should try to encourage employers to stagger office hours to reduce crowd density of peak hours. Another option is using the government's contact-tracking app Aarogya Setu, which is being used by 154.5 million users, to track risk and allow only safe passengers to board.

We need action to be taken by both the authorities and the public to keep our public transport systems safe. If strict protocols are not maintained and a serious level of viral transmission is later traced to public transport, the result will be a mode shift to private vehicles. We need to understand that pollution and accidents kill more people in India than the pandemic is doing now and a mode shift away from public transport will have long-term consequences. Our public transport must be perceived as safe and in the long run, it will require significant investments to improve the overall service levels, to support its transition to zero-emission fleets, and to deliver quality services that attract users to choose public transport over their personal vehicles.



Vineet Agarwal
Senior VP – ASSOCHAM,
Managing Director, TCI Group

Uber: Moving Cities Safely

The CoVID-19 pandemic has ushered a “new normal” across sectors, including public transportation and shared mobility. Despite the numerous challenges posed by the spread of CoVID-19 and subsequent lockdowns across the country, Uber continued supporting the cities we operate in. Our mantra of #MoveWhatMatters during the lockdown led to a truly humbling experience of providing over 250 thousand free rides to frontline health workers and non-CoVID patients, in coordination with the National Health Authority and state governments. With the nation now firmly on the path of ‘unlock’, the ridesharing industry too has responded with mobility services to serve people meet their intra-city and inter-city travel needs, keeping in line with local restrictions.

As cities begin to reopen, Uber has a significant role to play in building a safe ecosystem for commuters and drivers on our platform. Working with the World Health Organization (WHO) and the US Centre for Disease Control and Prevention (CDC), we have put together safety recommendations geared towards ridesharing. Uber worldwide has allocated \$50 Million to provide PPE supplies like masks, disinfectant sprays and wipes, hand sanitizers and gloves to driver partners and delivery partners.

Some of the steps we have been following in the 70+ cities in India that we are operational in are:

- #NoMaskNoRide
- Safety checklist for drivers before they go online
- Before every trip, riders must confirm that they’ve taken precautions like wearing a face cover and washing or sanitizing their hands
- If a driver shows up without a mask on, the rider can cancel the trip without penalty, and report the issue to us via the app. Uber’s two-way feedback system has helped ensure both riders and drivers uphold certain standards by requiring feedback on issues like vehicle quality, navigation and speeding

- Each driver partner is provided with masks, sanitiser and disinfectant liquid and trained to use these effectively for self and vehicle hygiene
- Our new technology will verify if the driver is wearing a mask by asking them to take a selfie. After we verify the driver is covering their face, we’ll let the rider know via an in-app message. (Unlike the normal system, this technology detects the mask as an object in the photo and does not process biometric information or compare mask selfies to driver photos in our database.)
- We are increasingly installing plastic separators between the driver and riders, to instil a sense of safety and social distancing. In fact, we pioneered this concept in India earlier in our specialised Uber Medic service that catered to healthcare workers

The mobility landscape has definitely changed and it is in times such as these that technology proves its mettle by allowing platforms like Uber go the extra mile and provide solutions that help mitigate critical issues like overcrowding. Technology also allows us to geofence certain locations like containment zones, if required. We are committed to partnering cities as they kickstart the economy by providing livelihood opportunities; we are committed to moving the world safely.



Rajiv Aggarwal
Head of Public Policy,
India South Asia, Uber

5. Contactless Ticketing and Digital Payments would be a gamechanger

Contactless ticketing and digital payment is the second most important aspect for passengers from a safety perspective

The Government of India has been promoting the use of Digital Payment methods over the past few years, the use of which increased drastically over time. Now, with the rise of COVID and the hygiene regulations that are to be followed to minimise the risk of spreading the virus, contactless and cashless options are becoming more popular and are being widely used. Digital payments have already been taken into use in most metropolitan cities. For example, the Metro Rails in Delhi and Mumbai employ the use of Smart Cards that also doubles up as a ticket being paid for through a single tap.

Digital or Cashless payment methods are being used increasingly as they are secure, inexpensive, convenient, and efficient for the user. Online payments also aid in ensuring that cash flow is transparent and promotes accountability. During the times of COVID-19, cashless payments and contactless ticketing are proving to be a saving grace for many as it removes the chances of contact, thus reducing the scope of the virus to spread. In fact, as per the survey conducted, “having to touch things” features as the second most substantial concern that people have, whether using App-based cabs, autorickshaws, bus or metro (Refer to the previous section for details).

However, the lack of awareness regarding digital payments and contactless ticketing reduces the likelihood of passengers going cashless. Many are sceptical due to perceived security fears such as an increased risk of hacking and thefts of large amounts. However, if guided well in the use of cashless methods, several of these fears may be allayed. There also may be a belief among passengers that online payments make use of advanced technology that requires steady internet access and may be out of their reach.

On the contrary, there exist multiple options for money transfer that are inclusive for all citizens. Users can make payments through text messages using USSD via the National Payments Corporation of India (NPCI) or biometric fingerprint using the BHIM application or through their Aadhar Cards via the Aadhaar Enabled Payment System (AEPS). The advantages of online payments and contactless ticketing have not gone unnoticed by passengers. The adoption of contactless or mobile ticketing is among the top three measures that passengers feel need to be ensured for safe transport in buses, metros and trains. People gave the second highest importance to contactless ticketing and digital payments in making public transport safer for passengers post-lockdown.

Key factors when using public transport, post-lockdown



Fig13: Top concerns in using public transport

Our View

Governments and Public Transport Authorities should focus more on contactless ticketing and digital payments. There can be incentive provided like discounts, additional rides etc. for the use of contactless ticketing and digital payments. Use of open-loop card should be encouraged more and more which can be used for travel, and other payments by passengers and all other use of the passengers. The efforts for introducing single mobility cards to promote seamless travel between modes, contactless ticketing and digital payments may be revived and fast-tracked.

Contactless ticketing can ease the pain of public transport authorities

The Transportation sector faces enormous challenges, exacerbated by the COVID-19 crisis. Public transport is heavily impacted and continues to feel the effects of citizens' fear of using mass transport solutions. Conversations around transportation systems are no longer about "why" but "how quickly" can the systems adapt to provide touchless safe experience to commuters. The ability of PTA's to provide a safe commuter experience is going to be the key how citizens perceive usage of public transport in the future and will be the deciding factor for PTA's sustainability.

While contactless ticketing can be achieved through use of contactless bank cards to tap and ride on public transport systems, there are many other types of contactless ticketing systems available including Mobile Ticketing and Account-Based Ticketing, using smartcards and mobile barcodes. The need for contactless ticketing is now, more than anytime else.

Contactless ticketing can help public transport authorities and transport majors are adopting it globally

As a global transit solution provider, LIT has helped more than 45 cities worldwide to transform their transit operations with smart mobility solutions. Cities in Oman, India and Azerbaijan (to name a few) have transformed using ticketing solutions. What we are seeing is an acceleration of all of these urban mobility-based contactless projects, especially because it is now more important than ever to provide a touchless payment experience.

The PTA's need to adapt quickly to be ready for the post-COVID-19 society, and contactless ticketing solutions make this adaption more painless. COVID-19 has accelerated the implementation and adoption of contactless ticketing in public transport around the world, the benefits were already widely acknowledged:

- **Experience:** Contactless ticketing is unique in the fact that there is no need to purchase a ticket before traveling. A simply 'tap and go' works seamlessly providing a frictionless experience.
 - **Simplicity:** Reduces the burden on human resources and provides a clear and simple way to use Public Transport.
 - **Flexibility:** Helps rapid implementation of fares and transfer rules from the back office/core applications.
 - **Security:** Secured and encrypted and thus reduces risk of internal frauds.
 - **Safety:** Reduced interaction with drivers, lesser cash handling reduces risk significantly.
- **Speed:** Significantly reduces transaction time compared to other payment methods involving chip and pin, cash & change.
 - **Scalability:** No legacy constraints and highly scalable and adaptable to future needs.

Globally, we are also seeing a big push from many PTA's for EMV contactless projects & account-based ticketing solutions as more they seek to be future ready with new mobility initiatives and mobility as a service. Also, our experience shows that when a city successfully launches a contactless ticketing scheme, the neighbouring cities tend to follow suit. In the Indian context, it may be the right time for transport authorities to focus on and adopt contactless ticketing in a big way. They can adopt the best practices of such implementation and operation from cities where it is working for a faster adoption curve.



Urša Hribernik
Head of Mobility,
LIT Transit

Smart Electronic Payments: A lever for efficient mass transport in India

Economic development centred around the cities is leading to spiralling urban population. Naturally, there is an escalated need for evolved mass transit systems which can accommodate higher volumes of traffic and congestion. Therefore, as our cities swell and mature, there is an urgent and critical role to be played by the public and mass transport systems globally. The car is no longer the king and planners are now focused on making mass urban transit seamless, convenient and efficient.

Mass transit and transportation has been facing major challenges for humanity:

- Ecological – to reduce pollution.
- Societal – to cope with growing urbanization.
- Economic – to adapt business model to travellers' needs and expectations.

Technology is playing a critical role in addressing this, accelerated by the rise of smart cities and supported by intelligent solutions. Integrated transport systems have now become a core element of Smart City planning, and authorities worldwide are upgrading their infrastructure to accept a full suite of payment methods to reduce friction for users. Smart cities deploy information and communication technologies (ICT) in order to achieve sustainable growth and economic development while enhancing the quality of life of local communities.

This presents the unique opportunity for improving the efficiency and effectiveness of mass transportation in India. While e-payment solutions already have an established presence, one needs to identify specific solutions addressing the transport segment.



Sudarshana Mitra
Head – Products and Solutions
Ingenico International India Pvt Ltd

Ingenico Group has designed and developed a range of solutions in this space. One of the efficient solutions has been the queue-busting ticket vending machine (TVM). These self-service machines provided a PIN pad and multi modes of card acceptance bundled in a device to allow travellers to buy their paper-based tickets from the machines which have been installed at various metro stations and buses. A range of Self Service terminals with complete touch experience are now introduced in this segment that enable swift processing of QR and contactless transactions offering a great consumer journey.

Another rapid movement in the mobility space has been with the use of Electronic Ticketing Machines (ETM) as Point-of-Sale (POS) terminals for control and payment of fares and fines, in India, both on Android and traditional platforms.

The latest offer enabling e-payments is with the advent of open payment solutions combining the traditional payment terminals and Gate Validators with dedicated payment gateway to manage the transaction between the ticketing platform and the bank. With open payment, transport providers and especially mass transit operators contribute to the development of new urban solutions that are 3 times less expensive than paper ticketing.

Open payment technology is changing the way we travel by swapping paper-based tickets for secure contactless readers accepting both closed- and open-loop cards. No prior registration is required. Travellers just tap the validator to enter and exit, then the system automatically calculates the best-value ticket for them at the end of their journey, whether it be a single trip, day pass or multi-day card. Ingenico's OP2GO also integrates with all ticketing platforms that offer Traveller portal and RTA portal to add great deal of convenience to the operators along with the users.

Open payment solutions have been implemented and proven effective for metro systems and bus networks in cities such as Kiev, Bratislava and Milan in 2019 by Ingenico, followed by implementations in United States, Canada, Brazil, France, Finland, Sweden, Spain, Italy, Poland, Vietnam, Taiwan and Australia.

Smart cities in India such planned, would encourage citizens to use public transport over using motored vehicles. This will support decongestion of traffic, easier traffic management and lower toxic emissions and building a sustainable urban future. Smart electronic payment solutions provide the Future proof technology that helps bridging the gap and would facilitate the free flow in the economy between the users and the facilitators.

Lessons from Netherlands: Technology adoption can help to wade the crisis

The Covid-19 pandemic has necessitated the much-needed shift towards digital payments in the transportation sector. While use of digital payments in transport is ubiquitous in countries like Netherlands, however, this is a scope for India to fast track it.

In Netherlands, probably more than 99% of the people use a chip-based card for their travel. It is an All-in-one travel card that can be used in buses, trains, trams and even in some ferries. It is a prepaid card and it simplifies the whole travel. The person using it just has to load the card before travel. There are consoles available at train stations/buses/malls where one can load the card. Similarly, there are certain deals available that one can subscribe to at an additional cost. For example, one can get a discounted fare if the travel is during off peak hours in train, or get free travel during the weekends etc. The important aspect to note that digital payments have made this hassle free travel possible in Netherlands.

An All-in-one travel card that can be used in buses, trains, trams and even in some ferries. It is a prepaid card and it simplifies the whole travel.

Adoption of digital payments in India would be extremely crucial and the success of it would depend upon -

- **Infrastructure:** In Netherlands, the infrastructure needed to accept cards and contactless ticketing have been built efficiently. There are access controls at the train stations. Using the card, one can open the gate/turnstile. One swipes in while entering the station/bus/tram at Point A and swipe out upon reaching the destination (Point B). The system calculates the fare and it is automatically debited from the card. Similar infrastructure needs to be built in India (and across multi modes) to enable passengers to get the real benefit of contactless ticketing and digital payment.

- **Exception handling:** While contactless ticketing and use of digital payment is the most commonly used method in Netherlands, but it is still possible to purchase a paper ticket instead of a card, though very few people (typically foreigners) who are new to the country use it. The bar code printed on the paper ticket is used to open the gate. These tickets can be bought from the consoles 24X7. Thus while contactless ticketing needs to be adopted, however a provision for exception handling and paper tickets may be kept as well.
- **Reliability:** The backend IT systems supporting these would have to be extremely robust with high levels of reliability and almost zero (0) downtime. This would enable passengers to gain confidence in the system and make it ubiquitous for effective usage.

Apart from adoption of contactless ticketing and digital payments, passengers need to adhere to safety measures like use of masks when they use public transport after the lockdown. While the number of people traveling by public transport has reduced, people still need to adhere to the social distancing measures and other rules and norms that have been laid out by the government for their safety.



Swami Krishnamoorthy
Commercial Director
MSTs, Netherlands



Stickers in the Netherlands railway station instructing travelers to keep their distance and to keep right when walking

6. Aarogya Setu gets a thumbs up from citizens

Nearly 3 out of 4 people surveyed are using it and only 11% don't find it useful

The Aarogya Setu application has been developed by the Government of India to connect essential health services with the people of India in the fight against COVID-19. The App is aimed at augmenting the initiatives of the Government of India, particularly the Department of Health, in proactively reaching out to and informing the users of the app regarding risks, best practices and relevant advisories pertaining to the containment of COVID-19.

One of the key purpose of the application is to raise an alert when someone you have crossed paths with within the last 30 days is impacted by the virus. It is a multilingual platform that only requires the download of a single application and provides important health and safety related information as well as advice if a person is at risk of having been infected. The application utilises the Bluetooth and Location settings to collect information from an individual's mobile device.

The App has recorded more than 15 Crore downloads as on date and has more installations than any other similar app in any country[2]. The Government has also taken many proactive steps to allay fears regarding privacy by making the source code available, announcing rewards for finding bugs and vulnerabilities etc.

According to the survey conducted, around 73% of respondents or almost 3 out of 4 people have installed and begun using the Aarogya Setu Application.

From these, approximately 61% of users found the application useful, while roughly 28% of users were unsure about the usefulness of the application and only a small minority of 11% users did not find the application useful.

Have you been using the Aarogya Setu app?

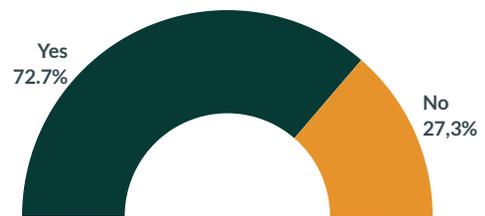


Fig14: Usage of the Aarogya Setu App

Do you find the Aarogya Setu app useful?

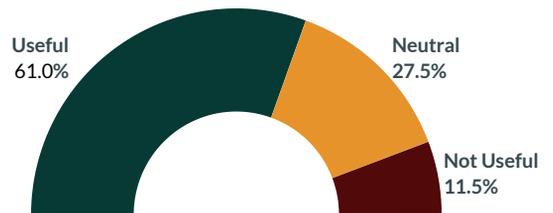


Fig15: Usefulness of the Aarogya Setu Application

Our View

Aarogya Setu app has been a useful tool for the country in the fight against the pandemic. It can be extremely useful in contact tracing and help Governments quickly trace people who have come in contact with a COVID-19 positive patient, and thus potentially save lives. The concerns regarding privacy and security have been addressed to a great extent by making the source code of the application public, and the endeavour towards the same should continue (e.g. making the server-side code public etc.).

[2] Newsroom Post

Making Public Transport Safe and Responsive to COVID – 19: A Global Perspective

Public transport is the backbone of many cities, allowing millions of people to get to work. The COVID-19 crisis has severely impacted public transport agencies all over the world in their ability to provide this service. Agencies are responding in various ways to cope with the crisis, and enable people to get back to work.

Public transport was identified as a danger zone as under "normal" (over-)crowded conditions, either on the rail platforms or in the trains and buses, social distancing was nearly impossible to maintain.

At the same time, people just stayed home to work, or stayed home due to a lock-down or quarantine regulation; public transport ridership just disappeared, with ridership drops between 70% to 90%, creating a huge financial impact as revenue from tickets dropped.

Public Transit Ridership Trends – France and Germany, Indexed



Fig14: Ridership Trends

Source: Apple Maps mobility trends report, Analysis THPG

Now, as ridership picks up again, it does so under new conditions. In most countries there are a number of key pillars to the COVID-19 responses that have since then been implemented to enable the ridership to come back, slowly.

Face Masks. Most commonly, face masks are required to be worn inside trains and busses. Most common face masks do not protect the wearer very much, but do inhibit the wearer's own droplets and breath from spreading. Hence, the measure works only if all passengers and staff wear the masks; it is the most powerful symbol of solidarity amongst the users of the public transport system, and a basis for mutual protection.

Choreography with Posters and Stickers. Travelers are actively being "choreographed" in their behavior with posters and stickers, instructing them to keep their distance and to guide them to keep right, so as to not mix up the flows of passengers.

Blocking Seats. In many countries, operators are blocking off seats to create the desired space between passengers, and expressly indicate where passengers are supposed to stand inside the carriage. The clear impact is however that the capacity is thus severely reduced.

Sanitation. Disinfection of trains and busses has become a new standard in many countries, with active support from the various international public transport associations such as UITP and APTA to provide technical information.



Disinfection process in the USA

Demand management. While operators obviously would like to have their passengers back, operators are also asking universities, schools and employers to assist them by spreading out the working hours so not everybody comes into the bus or train at the same time anymore as people emerge from lock down. In some cases, non-critical travel was initially forbidden.

Financing. The drop in ridership is both a blessing and a liability: with fewer passengers, social distancing may be better maintained, but it will also negatively impact the finances of the operators into the future. While operators are now able to block seats in between passengers to create the required spacing, that will also cut into the capacity of the system and limit its earning power once the ridership picks up again.

The services of bus and rail operators were cut back dramatically, such as to weekend service levels, when the ridership dropped, and were slowly restarted as financial support became available and as the Lock Down eased up. In Germany services were back to normal in May, and in The Netherlands, services went back to normal in June.

COVID-19 redefines public transportation

These services were slowly reinstated with the support of the governments at various levels. The Netherlands Government provided temporary "availability payments" covering 95% of costs to re-open the services, a provision which will expire by the end of the year. The Federal Government of Germany contributed Euro 2.5 bn. to the German public transport, citing that the balance had to come from the regional governments.

Public transport will need structurally reliable financing for their operations if they are to be able to continue services with reduced ridership into the future. New financing should be based on 'availability payments', ensuring services will continue at service levels to be determined by the government, even in the face of reduced ridership (e.g. "Between 8.00 am and 8.00 pm, make 4 trips per hour at 15 minute intervals between suburb A and the city center B").



Autonomous vehicles are being used to transport medical supplies and COVID-19 tests at Mayo Clinic in Florida



Rein Westra
CEO
The Hague Policy Group

This will need to be the new normal structurally, as we also cannot anymore afford to see such overcrowded busses and trains as we have seen before COVID-19 struck. In this respect the governments need to step in to ensure sufficient capacity is provided with normal, acceptable levels of congestion, and take over financial responsibility to deliver these service levels; in return they keep all the revenues, and it will become truly a *public* service, even when actually operated by private companies.

Innovation. A famous Dutch soccer player Johan Cruyff said: "Every disadvantage has its advantage". So too, the COVID crisis may be a strong catalyst for innovation. While there is a fear that passengers will revert back to car driving to avoid public transport contagion risk, the answer to that aspect may come in the form of small scale autonomous, on demand vehicles, where the risks are much reduced and transport is still collective, with more than one passenger per vehicle.

Further critical innovations in the area of cashless ticketing will need to be accelerated, to enable secure collection of funds, and to reduce contagion through physical contact with the cash.

Strategic System Approach. Perhaps most impact will come from a structural re-think of urban life, where the various crisis-related measures may become more integrated, and take on a more permanent character in our social landscape.

- Long term view of working habits, promoting working from home and facilitating this with company and government support to enhance, as needed, internet access and service
- Long term view of the overall public transport system, integrating MaaS, with rented bikes, autonomous on demand vehicles, integrated bus and rail systems with sufficient capacity to allow for normal distancing even at the peaks
- Structural review of public transport characteristics, maintaining the sanitation protocols as a new standard, maintaining a level of social distancing through better "choreography" of the passenger flows at stations
- Financial and technical innovation, restructuring the governance to enable specified service levels as dictated by these "new normal" requirements to be financed by the government while mobilizing private sector capital and innovation.

About ASSOCHAM

ASSOCHAM initiated its endeavour of value creation for Indian industry in 1920. Having in its fold more than 250 Chambers and Trade Associations, and serving more than 4,50,000 members from all over India. It has witnessed upswings as well as upheavals of Indian Economy, and contributed significantly by playing a catalytic role in shaping up the Trade, Commerce and Industrial environment of the country.

Our legacy has helped build a strong foundation for future endeavors wherein we serve as the Knowledge Chamber for the industry and become the conduit between them and the Government to foster development of a New India. Seen as a proactive and forward looking institution, ASSOCHAM is fully equipped to meet the aspirations of Corporate India in the new world of business.

ASSOCHAM has emerged as the fountainhead of Knowledge for Indian industry, which is all set to redefine the dynamics of growth and development in the technology driven cyber age of 'Knowledge Based Economy'. We aim to empower Indian enterprise by inculcating knowledge that will be the catalyst of growth in the technology-driven global market and helps them upscale, align and emerge as formidable player in respective business segments.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. ASSOCHAM is seen as a forceful, proactive, forward looking institution equipping itself to meet the aspirations of corporate India in the new world of business. ASSOCHAM is working towards creating a conducive environment of India business to compete globally.

As a representative of Corporate India, ASSOCHAM articulates the genuine, legitimate needs and interests of its members. Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development.

ASSOCHAM derives its strength from its Promoter Chambers and other Industry/Regional Chambers/Associations spread all over the country.

About Primus Partners

Primus Partners has been set up to partner with clients in 'navigating' India, by experts with decades of experience in doing so for large global firms. Set up on the principle of 'Idea Realization', it brings to bear 'experience in action'.

'Idea Realization'— a unique approach to examine futuristic ideas required for the growth of an organization or a sector or geography, from the perspective of assured on ground implementability.

India is and will continue to be a complex opportunity. Private and Public sector need trusted advisory partners in order to tap into this opportunity. Primus Partners is your go-to trusted Advisory for both public and private sector organizations involved intricately with nation building, and the creation and growth of robust corporations as engines of progress.

Our core strength comes from our founding partners, who are goal-oriented, with extensive hands-on experience and subject-matter expertise, which is well recognized in the industry. Our core founders form a diverse cohort of leaders from both genders with experience across industries (Public Sector, Healthcare, Transport, Education, etc), and with varied specialization (engineers, lawyers, tax professionals, management, etc).

Primus Partners brings experience of working in more than 30 countries with private and public sector, including working with Government of India, building and leading large consulting teams at the leadership level, and creating one of the largest public sector consulting practice in India. They also represent 200 person years of experience in leading global and Indian consulting firms and the public sector.

The founding team is supported by a distinguished advisory board that includes experts with leadership experience across government, large corporate and notable civil society organisations.

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