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# The Impact of Covid-19 on Urban Transit. The Case of Constantine, Algeria

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#### Abstarct

The onset of the COVID-19 pandemic in 2020 in Constantine has prompted urban transit to adapt to this situation and implement all measures that could protect users and contain the spread of the virus. However, the frequent use of this public service was considered from the beginning, but without any scientific evidence, a very serious source of contamination, especially during peak hours.

However, to prevent the spread of this virus, preventive measures have been taken such as physical distancing, limiting the seats to be used, cleaning vehicles and other means of transport. In addition, governments have taken advantage of this pandemic, especially during lockdowns, to implement an action plan to modernize this sensitive sector by using digital technologies. The article concerns the measures adopted and the impacts determined especially in the city of Constantine.

Key words: Covid-19, impact, transportation, security measures, action plan, Constantine.

### INTRODUCTION

The COVID-19 pandemic was first reported on December 31, 2019 in Wuhan, China, and then spread very quickly to the rest of the world. It is an infectious disease caused by a novel coronavirus called Coronavirus 2 Severe Acute Respiratory Syndrome (SARS-CoV-2) (WHO, 2020).

On an unprecedented scale, this "multi-faceted" pandemic (Delta, Omicron, BA1.2...) has been a serious challenge faced by all governments around the world and their administrations. COVID-19 has affected every country in the world and has been at the root of some of the businesses that have been shutting down, putting a strain on their economies, schools, the sports and recreation halls and other places of collective activities and on the other hand the total confinement of the populations. As a result, transit ridership dropped significantly to a total stop at the beginning of the pandemic.

Such a serious situation and the lack of precise information about the nature of this virus, have put on alert the populations and their leaders and also the international organizations and in particular the World Health Organization (WHO). The Commission, in close collaboration with other bodies, experts and partners, has quickly taken up the task of analysing the situation, to study the nature of the virus and possible ways of eradicating it or at least containing it. Not only has it followed the evolution of health but it has not failed to warn, at every moment, the leaders of all countries about the progression of the epidemic and the dangers it represents on the health of man, but it has also acted as a whistleblower and advisor in communicating the measures to be taken to protect populations and stem the spread of the virus.

The Algerian government reacted quickly to this situation by taking measures to contain this invisible evil that has come to the country. Constantine, through its local officials reacted by strictly applying the established guidelines by making the appropriate decisions. Transport officials have demonstrated their ability to manage this crisis, but they have had to face the reluctance of users who, as soon as the rate of contamination weakens, resume their habits.

The pandemic is underway. The trajectory and intensity of virus transmission can hold surprises. The number of deaths is increasing every day in a floating way worldwide. The latest WHO statistics from February 11, 2022, show that more than 405 million people have been infected with the virus and 5.8 million have died. It has slowed development and mobilized enormous human and material resources (health personnel, health structures, civil protection and other

services, importation of medicines and vaccines), this health crisis has had the positive effect of better guiding the future development of the transport sector. Several actions have been planned, including the registration of several digital start-ups, applications that are inexpensive and feasible in the short term. Just like the Yassir application which developed very quickly in Algeria during the pandemic thanks to its effectiveness and seriousness.

The COVID-19 crisis has demonstrated that urban public transit in Constantine, which was unable to provide service during the worsening situation, is an essential and essential means of economic, social and environmental recovery.

Several actions have been planned for the modernization of this sector, the latter to promote the use of digital technologies. Indeed, the operations of updates were included in the plan of the Ministry of Transport presented to the Council of Ministers on August 23, 2020. This plan aims to use new management and governance tools for the sector, to digitize the interactions between the central administration, transport stakeholders and users, improve the daily lives of citizens through better use of all types of transport.

### ALGERIA AND COVID-19 RESPONSE: MATERIALS AND METHODS

From the beginning of the spread of COVID-19, Algeria repatriated thousands of Algerians who were stranded in different countries, put in isolation for 14 days, as soon as they arrived. Following the worsening health situation, the Algerian government has suspended its air, sea and land links to and from certain countries.

The State has set up an electronic platform dedicated to monitoring the evolution of the pandemic at the national level in coordination with the Ministry of Health, Population and Hospital Reform. This national IT platform was developed and used for the daily monitoring of the status of the social activity and solidarity directorates of wilayas and institutions in the national solidarity sector, reporting in the event of COVID-19 infection.19 among officials or their families (Permanent Mission of Algeria to the United Nations, 2021).

The Algerian Government has gradually taken a series of general measures to contain the spread of the virus. These measures have been the subject of two main texts:

- Executive Order No. 20-69 of 21 March 2020 on measures to prevent and combat the spread of Coronavirus (COVID-19) and, the purpose of which is to establish social distancing measures to prevent and combat the spread of COVID-19;
- Executive Decree No. 20-70 of 24 March 2020 laying down additional measures to prevent and combat the spread of the Coronavirus (COVID-19) and which aims to put in place containment devices, traffic restriction, the framing of citizen trade and supply activities, rules on distancing, and the modalities of citizen engagement in the national effort to prevent and combat the spread of the COVID-19 pandemic.
- The State has established a COVID-19 monitoring and follow-up commission to coordinate the national response, which brings together representatives from several departmental sectors and institutions. It has strengthened the thermal camera-based detection system in various public spaces, the detection of suspected cases of COVID-19 and the systematic quarantine of those affected. A toll-free number (3030) was made available to citizens early in the pandemic. Other measures included:
- > The closure of various public spaces, schools, universities and event spaces;
- The mandatory cessation of certain employees, maintaining vital services necessary with maintenance of wages, and demobilization of working women with young children;
- > The suspension of all public and private public means of transport inside and inter-wilayas as well as rail traffic, with a mandatory curfew for different wilayas.

These measures have determined a control of the pandemic and flexibility from time to time based on the results of the contamination until its expiry at the end of 2021. Despite the control of the situation and the low level of contamination, the government insists, however, on maintaining compliance with barrier measures and especially social distancing.

The State has encouraged pharmaceutical manufacturing units to produce simple three-layer masks, protective goggles and gloves, so as not to fall into need like many countries.

# THE IMPACT OF COVID-19 ON URBAN TRANSIT IN CONSTANTINE. STUDY RESULTS AND DISCUSSIONS

From the beginning of the spread of COVID-19, In this article the focus is on the health measures adopted and the impacts determined especially on the public transport system in the city of Constantine. Reducing the congestion of public transport has led to new forms of access management for public means, notably through the use of App and new ICT (Information and Communication Technologies) instruments.

The number of vehicles in various urban transit hubs has been reduced to help combat the spread of Covid-19 virus (Tab. 1). For this purpose, the number of passengers transported has had a remarkable decrease following the required security measures and also with the introduction of the second extension of the tram line to the AbdelhamidMehri Constantine 2 University, in October 2021 (Tab. 2).

	2019	2020	2021
Bus	1 138	986	1 113
Collective taxis	7 239	6 458	1 032
Tramway line	27 trains L1 24 trains L1ex1	15 trains L1 8 trains L1ex1	27 trains L1 24 trains L1ex1 24 trains L1ex2
Cable car	20 cabins	13 cabins	in arrest

Table 1. Number of vehicles, buses, trainsets and cabins operated in the Constantine group between 2019 and 2021

Source: Field survey, 2021.

**Table 2.** Number of passengers transported by the various urban public transport modes in the Constantine group between 2019 and 2021

	2019	2020	2021
Bus	426 850 travel/day	294 709 travel/day	367 014 travel/day
Collective taxis	277 250 travel/day	150 098 travel/day	219 810 travel/day
Tramway line	10 million/an	8 million/an	13 million/an
Cable car	2 million/an	1 million/an	in arrest

Source: Field survey, 2021.

### Security Measures Against The Spread of Covid-19 In Constantine

Urban public transport in Constantine remains an essential means for the movement of the majority of citizens. During the pandemic, the majority of people avoided transportation, as the latter can easily spread COVID-19.19 due to the high number of people in a confined space with limited ventilation and contamination of commonly affected surfaces.

As part of the fight against the spread of COVID-19 and in accordance with the provisions of Article 3 of Executive Decree No. 20-69 of 21 March 2020 on measures to prevent and combat the spread of Coronavirus (COVID-19), urban and suburban transport activities, guided transport (metro, tramway, cable transport) and taxi transport have been temporarily suspended.

During this period of confinement, nearly 500 buses nationwide, including 17 buses from Constantine, were put by the Urban and Suburban Transport Establishments, at the disposal of local authorities for the movement of medical and administrative personnel in charge of combating the spread of COVID-19 and also the mobility of citizens repatriated from abroad, from airports to their places of confinement. At the level of 48 wilayas during the period of suspension of the activity, from 22 March 2020 to 12 June 2020.

In Constantine, serious restrictions were adopted concerning the various modes of urban public transport, namely:

Urban public transport operators (public and private), in collaboration with local authorities, must ensure cleanliness and good hygiene, and that all interior surfaces, including poles, seats, and parts that users touch, be thoroughly cleaned after each trip. In particular, for the tramway, CITAL initiated several disinfection operations for the tramway trams in collaboration with the operator and local authorities. This involves daily disinfection of all trains (Fig. 1).



Figure 1. Health and safety measures for the Constantine tramway. (Source: Web, 2022.)

All drivers and crew members must be checked in the depots before they start work to detect any visible signs of the disease, especially fever, and to ensure that their hands are disinfected before they start work (Fig. 2).



Figure 2. Hand hygiene measures for collective taxi drivers in Constantine. (Source: Author, 2021.)

Buses must carry sufficient quantities of hand sanitizer for passengers and crew, who are also required to wear masks. There must be a physical distance between users, which can be achieved by imposing limitations on the number of travellers (Fig. 3).



Figure 3. Security measures for Constantine ETUSC buses. (Source: Author, 2021.)

- During the early years of the COVID-19 pandemic, the various urban transit organizations in Constantine (public and private) have suffered a significant decrease compared to the daily profitability caused by unexpected stops from time to time and also the decrease in the number of passengers on board vehicles (Fig. 4).
- The public authorities of the Wilaya de Constantine have ensured the successive disinfection of outdoor spaces to combat the spread of the virus, avoiding contamination of passengers (Fig. 5).

The transportation sector in Constantine has also been affected by the COVID-19 crisis. A lot of vehicles were stopped for more than three months. It was critical for virtually every business. As a result, the loss of turnover was considerable,

up to 30%, not to mention the unemployment that awaits taxi drivers and private bus drivers. Constantine Urban and Suburban Transit (ETUSC) lost 30% of its revenue since the start of the pandemic (ETUSC, 2021).



Figure 4. Security measures for collective taxi in Constantine. (Source: Author, 2021.)



Figure 5. Security measures for public spaces in Constantine. (Source: Author, 2021.)

In addition, the tramway operating company (SETRAM) has put in place a specific sanitary device among the measures applied: the decrease in the number of passengers on board which must not exceed 50% of the capacity, half of 400 passengers on a single trip. So the company was hit hard by the containment measures, the severe reduction in the number of passengers caused considerable losses estimated at 50% of its turnover; One of the factors contributing to the decline in turnover is the closure of universities and schools, which play a crucial role in relation to the number of users.

Despite the lack of experience in managing such a health crisis, the actors of the city of Constantine have demonstrated their responsiveness and their ability to adapt to this situation; unfortunately after the decrease in the rate of contamination of the virus, the majority of citizens do not respect security measures.

At the urban stations and bus stations in Constantine, inspection teams have been permanently mobilized to ensure the strict application of the health prevention measures decreed, the control has been strengthened at the level of the stations where there is a high density of the population such as the bus stations of the new city Ali Mendjeli and the pole of exchange Sahraoui and the industrial zone Palma.

The COVID-19 crisis has demonstrated how essential urban public transit in Constantine is to ensure access to and continuity of essential services, This confirms that the public transit sector is highly interconnected with many other challenges and is an essential pillar of economic, social and environmental recovery.

Today, numerous scientific studies and empirical analyses show that the risk of catching COVID-19 in public transit is very low (Tang, 2020; Gomez, 2020) and pose much less risk than other public places at private gatherings; unfortunately, they too often stigmatize. For this purpose, travel by public transport remains the safest with the application of good safety measures.

### The Action Plan to Develop the Transport Sector in Constantine

This health crisis has prompted the State to develop the transport sector in order to manage this situation and may be similar to COVID-19 situations in the future. To this end, the managers have implemented several actions; most of them have proposed start-up projects. These applications, which are relatively inexpensive, reliable and achievable in the short term, are likely to trigger a virtuous circle of positive actions and reactions. For example, a better dissemination of information to transport operators and citizens will not fail to lead to a better adherence of the latter to the general policy of the sector.

To this end, several actions have been put in place for the modernization and adoption of digital technologies in the urban public transport sector. This is one of the axes concerned by the Action Plan of the Ministry of Transport presented to the Council of Ministries of 23 August 2020 to deploy new management tools and governance in the transport sector, digitise interactions between central government, transport actors and users and improve the life of the citizen through better use of all types of transport.

The 29 actions aim to take into account the pandemic-induced situation, the country's economic situation, the urgency to take charge of citizens' transport needs and the fight against bureaucracy. To this end, these actions were chosen in relation to the expected positive impact on the lives of citizens and their short implementation time.

To stimulate, encourage, promote and develop innovation in the transport sector, a dozen actions have been included in this plan. They were designed to bring digital technologies to life very quickly. They are already capitalizing on the local knowledge available and the creativity of Algerian startups to announce the digital shift in the sector.

The objectives of the action plan are to:

- adopt a smart city approach with a smart transportation system that leverages digitization, energy and clean technologies;
- modernise, adapt and generalise telecommunications infrastructures to promote the use of ICTs and promote the integration of society in a knowledge-based economy;
- ensure access to a safe and efficient public transport system with the rapid development of the infrastructure of the urban fabric of the Constantine agglomeration, as well as the modernisation of urban transport equipment and systems (tramway line, cable car);
- strengthen urban resilience through quality infrastructure and land use planning with the development of different modes of transport which must take into account the vocation and relative benefits of each of them for the local community, and be based on local transport plans favouring intermodal approaches and considering that investments in infrastructure and equipment, aimed at the promotion and development of intermodal combined transport, are a priority.

The actions are as follows:

- Implementation of a professional courier system with integrated collaborative production tools for central administration; this system will allow the sharing of applications and data in all their forms and will work even without the Internet because connected to the RMS/MPLS network of Algeria Telecom (Multi-Service Network/ Multi-Protocol Label Switching). It will also provide access to the information system and dashboards by sub-sector, according to the Open Data (production of data and statistics) recommended by the public authorities.
- Electronic ticketing and contactless control with the implementation of a mobile application of multimodal transport accounts. Dematerialisation of the transport ticket and the distribution network on a mobile application. This application allows a better traceability and usable data collection in relation to passenger flows and optimization of the operation of the lines with less handling of liquid money and less physical contacts during control operators.
- A mobile application allowing the citizen to orient himself, to know the means of transport available for the desired destination as well as the calculation of time and cost of travel. This application is in collaboration with the national institutions responsible for digitisation and between the various transport organizations.
- Installation of screens in all bus stations, urban stations and hubs, providing real-time information, centrally controlled remotely. This application makes the citizen aware of barrier gestures as well as good practices in transport and to

reduce the feeling of waiting in stations. This technology is called Digital signage, in collaboration with the various transport agencies, the station manager and the Ministry of Post and Telecommunications.

- Implementation of a data digitization and records management system for the sector. This integrated Electronic Document Management (EDM) system in the central administration is interconnected to the information system with a pending compatibility for and with the e-government system.
- Digitalization of interactions between transport actors and the administration allowing actors (private and public) of the sector (taxis, buses, transport organisations) to interact with the administration using simple digital tools (mobile applications, contact forms, online services, etc.) and establish a discipline within the administration and the different directions of the transport for a greater responsiveness on these new channels.
- A geo-localized mobile application accompanied by a website to provide the citizen with accurate and up-to-date information on the various transport networks and road traffic (deviation, signaling of accidents, changes in public transport schedules, roads under construction, etc.).
- Creation of a monitoring, prevention, security and support cell for cyber-attacks in the transport sector. This monitoring unit of type CERT and CSIRT (Computer Emergency Response Team and Computer Security Incident Response Team) to support the cyber security of the sector.

Among the online applications there are:

The Yassir application launched by two Algerian engineers in September 2017, the first VTC platform (transport cars with driver) inspired by the American giant Uber. Yassir is the first mobile application in Algeria to connect users to taxi drivers who are geolocated using their smartphone (Fig. 6). The price of the race is calculated according to the distance and the estimated duration of the journey. The entrepreneurs' long-term goal is to eliminate the cash payment and to make the Yassir vehicles equipped with an electronic payment terminal (EPT).



Figure 6. Yassir Online Application. (Source: Smartphone app, 2022. Map worked by the Author.)

The «Mahatati» application launched by the Algerian Bus Station Operating Company (SOGRAL) makes it possible to consult in real time the schedule of bus departures, the schedules, the price of the ticket, the name of the carrier and the routes. The application is available on the Play Store; it provides a technical sheet of the various bus stations managed by SOGRAL and displays their geographical location (Fig. 7).



Figure 7. Mahatati Online Application. (Source: Smartphone app, 2022. Map worked by the Author)

The application «ETUSA MOB» launched by the public urban and suburban transport establishment of Constantine (ETUSC). It makes it easier to travel on the bus network and gives the customer the opportunity to determine which routes are most used in order to follow all the relevant information (Fig. 8).



Figure 8. ETUSA MOB Online Application. (Source: Smartphone app, 2022. Map worked by the Author.)

## CONCLUSIONS

In cities, the road safety of citizens can be increased by the construction of pedestrian crossings (studded crossings) and also bicycle lanes for bicycle users.

Walking and cycling, if encouraged, would be a valuable asset, on the one hand in preserving the health of citizens and on the other hand an alternative to public transport and private cars. The use of "two-wheelers", non-polluting and space-saving, would be an important factor in relieving public transit congestion, which is often crowded and a source of disease transmissions such as COVID-19.

Not only does walking and "two-wheelers" make travel easier, but they also play an important role in the prevention of several diseases and in the preservation of health.

The health crisis that has been raging since 2020 has shown that urban public transport, which was far from reassuring some users, knowing that the observed influx of users could be a vector in the transmission of the coronavirus, still had to be preserved.

Awareness campaigns are frequent and measures are implemented, particularly in the transport sector, to prevent any contamination or at least contain the pandemic, but the incivism displayed by many users, is far from meeting the requirements of the moment. Indeed, non-compliance with hygiene rules (bibs, distancing, etc.) inside the bus or tram can be the cause of the worsening of the pandemic.

However, despite their polluting nature and despite the fact that they are a source of contamination, urban public transit has demonstrated, during the days of confinement and their shutdown, their importance in the daily lives of citizens.

In addition, the effects of this pandemic, which, when studied and analysed, can encourage the departments concerned to take action now to ensure, in addition to the marches and bicycles, the sustainable mobility of tomorrow. It should be noted that the implementation of this mobility or its improvement is conditional on the development of modern modes of transport with efficient online applications and meeting the criteria of safety, comfort, time savings, cost and ecology.

Putting these applications online will be the best way to disseminate information to transport operators and citizens in order to implement the use of digital technologies in the transport sector very quickly. It is a powerful lever for harnessing the immense potential of startups. The transport sector can also lead to the creation of several micro-enterprises, which provide jobs for young people.

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