



Exploring the Post-pandemic Effect: Infrastructure Design Solutions

By Antulio Richetta, Nikolaos Efstathopoulos and Stavros Papadimitriou

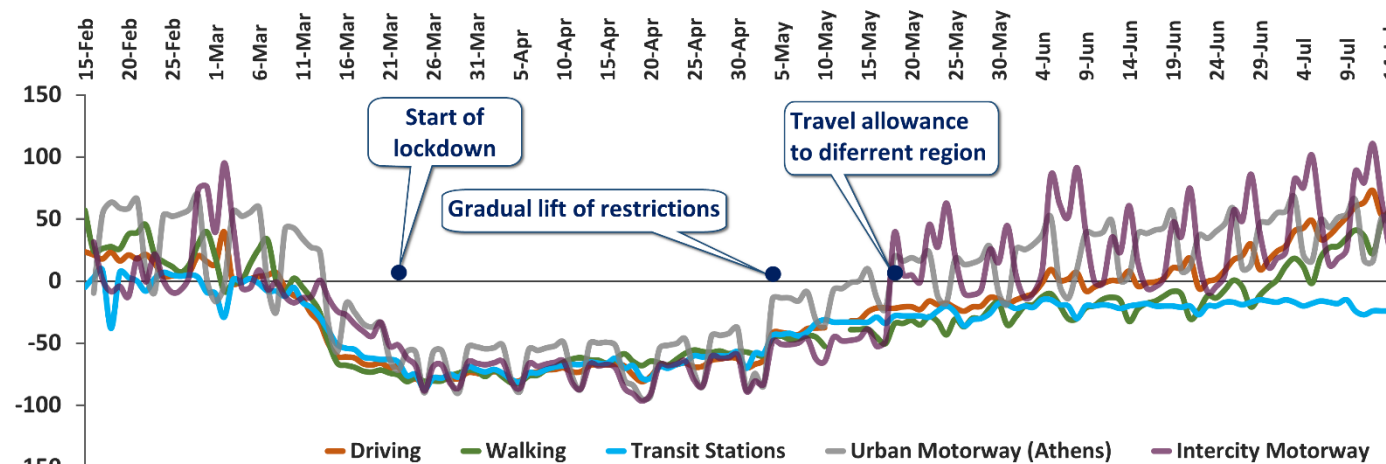
The COVID-19 crisis has brought unknown and major disruptions in the way we live, work and travel around cities. After experiencing the initial shock of global lockdowns in almost every possible corner of the globe, authorities and policy makers have now started facing the challenge of rethinking the cities of tomorrow. The present article discusses the following:

1. Impact of the COVID-19 pandemic on mobility.
2. Trends affecting the future of infrastructure design.
3. Infrastructure design in the post-pandemic period.

Impact of the COVID-19 Pandemic on Mobility

Exhibit 1 | Urban Mobility Trends (Athens)

% change over pre-pandemic levels, from February 15, 2020 to July 15, 2020



Sources: IBI Group, Apple, Google

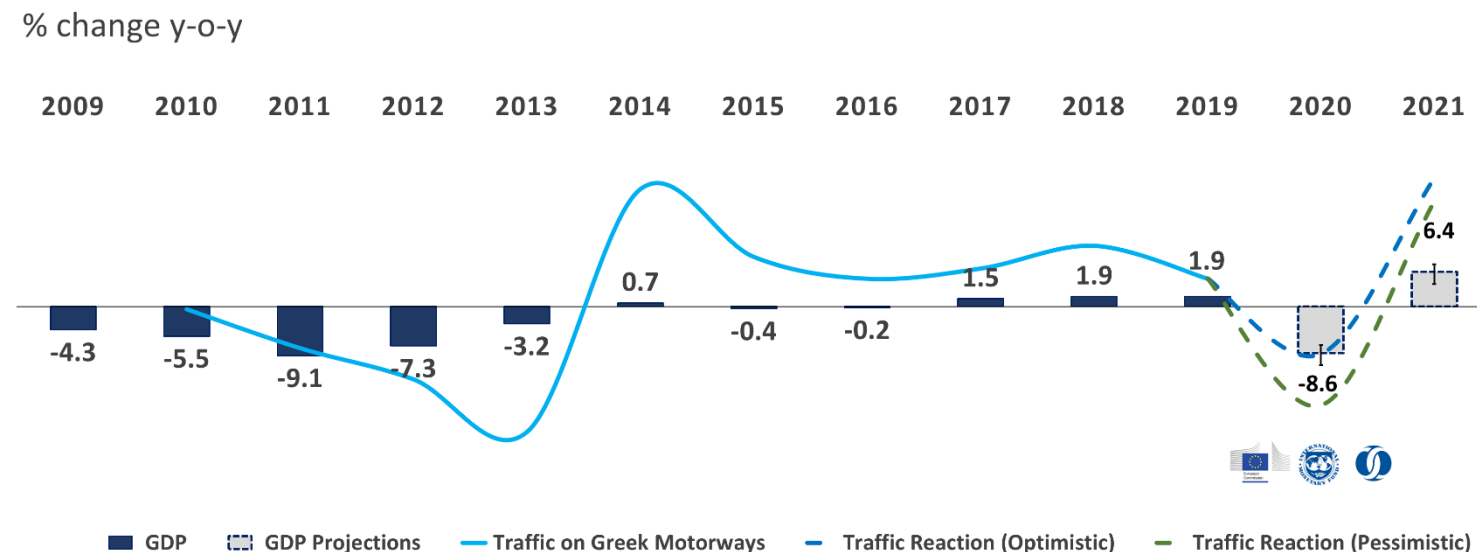
Mobility is undergoing one of the most transformational periods in its history, with previously predominant trends and business models now being debated or even rejected.

Greece, after successfully managing the first stage of the pandemic crisis, is now setting again the wheels in motion, aiming to achieve economic recovery. Attempting to look deeper on mobility's reaction during these months, the case of Athens in Greece has been used (Exhibit 1):

- a. During the lockdown, a decrease was experienced uniformly across all transport modes, reaching on average up to an 88% reduction on demand.
- b. The traffic levels on urban and intercity motorways were down by 37% and 32% respectively in May 2020 compared to May 2019.
- c. As restrictions on travel are gradually lifted, driving and active modes present noticeable bigger increases than mass transit. This indicates that social distancing and fear of contagion are important factors affecting the ridership of mass transit, which compounded with the lower fuel prices, introduce significant challenges to increasing ridership of the flagship transport mode for big urban cities.

The longer-term impact on traffic will depend mainly on economic conditions and whether the pandemic is eradicated or successfully managed. Even though it is still early to solidly conclude, it can be expected that the decrease in traffic in 2020 will be followed by a sharp increase in 2021, as presented in Exhibit 2.

Exhibit 2 | GDP Compared to Traffic Growth (Greece)



Sources: Hellenic Statistical Authority, European Commission, IMF, EBRD, IBI Group analysis

Trends Affecting the Future of Infrastructure Design

Apart from being a disruption, **the pandemic is also a catalyst for change, accelerating trends** that were already emerging; these trends achieved a tremendous rise during a short period that otherwise would have taken years.

Virtualisation of the economy

Over the last few years, a large part of the global economy shifted onto virtual platforms, and collaboration tools have become more effective, in such a way that virtual teams of hundreds of people can cooperate under the same project anywhere (and everywhere). In only a few days' time, the location for completing day-to-day work became irrelevant. In fact, we experienced a paradox: physical connectivity between the different parts of the world was almost eliminated, rendering distances between even neighboring cities practically infinite. This infinite physical distance, however, was instantly replaced by virtual connections. It now remains to be seen how sustainable this shift is, and whether we can achieve growth by having a large part of the economy being virtual.

Location for work is becoming irrelevant

During the lockdowns, many knowledge professionals who work across various industries had to shift their operations to a remote environment, with entire businesses running from employees' homes. At first, this way of operating created uncertainty, which was quickly overcome as most employees became productive and enjoyed the benefits of this new work reality. Due to this, in the post-pandemic era, a new working approach will most likely prevail for a large portion of the workforce, where offices are no longer essential. This will significantly impact and change office space design, usage, as well as cost of business operations. Additionally, as a change catalysed by the pandemic, our homes are now becoming fluid spaces where we can work, go to school (e-learning), or even receive basic e-health care. The connective tissue will be state-of-the-art technology systems, which will create a smart infrastructure to accommodate our new way of living.

As a direct effect of the “work from home” phenomenon, people found themselves rediscovering their neighbourhoods. Shopping, recreation and physical activities all performed within only short distances, reignited the sense of living and belonging to a place. Post pandemic life will introduce a more home-centric approach and eventually since the location of (and for) work becomes irrelevant, people will be able to choose for more space outside of city centres. It’s a new decentralization era.

Decarbonization of transport

Since the start of the pandemic, an unexpected drastic reduction in air pollution has been observed around the world. This created a significant motivational factor for both authorities and citizens to improve the environmental footprint of cities. Especially, due to the need for social distancing, we have seen (and hope to continue seeing even after the pandemic) increased use of green/active modes of transport such as walking, biking and e-scooter.

Infrastructure design in the post-pandemic period

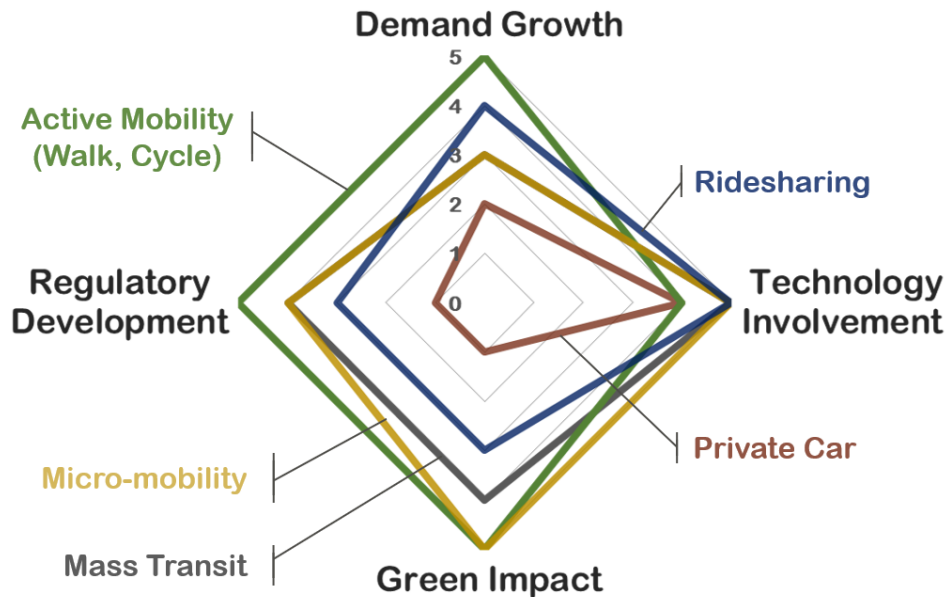
MORE FLUID PUBLIC SPACES

The pandemic will accelerate the shift towards more walkable, bike-friendly and transit-oriented communities. The design of infrastructure is following this paradigm in most cities worldwide. A variety of uses within the same space will create vibrant places that will stimulate local economies creating vibrant communities that are able to “live” and play beyond “office hours” in the same physical environment. Resilience in public space requires flexibility in its design

so that it can be quickly re-configured or re-purposed to respond to a crisis such as the pandemic. Infrastructure design needs to take into consideration the need for “fluidity or metamorphism”. This is especially pertinent for the healthcare sector.

THE NEW URBAN MOBILITY LANDSCAPE

Exhibit 3 | Urban Mobility, Mid-term Impact



Mobility business models will be using technology as the connective tissue between operators, users and infrastructure. Potential solutions that could come up include:

- Micro-transit: sharing between a trusted micro-network of commuters.
- Expansion of the concept to mass transit: trip reservations, a better level of service and better management of the demand.
- Integration with ridesharing and other modes towards mobility-as-a-service models.

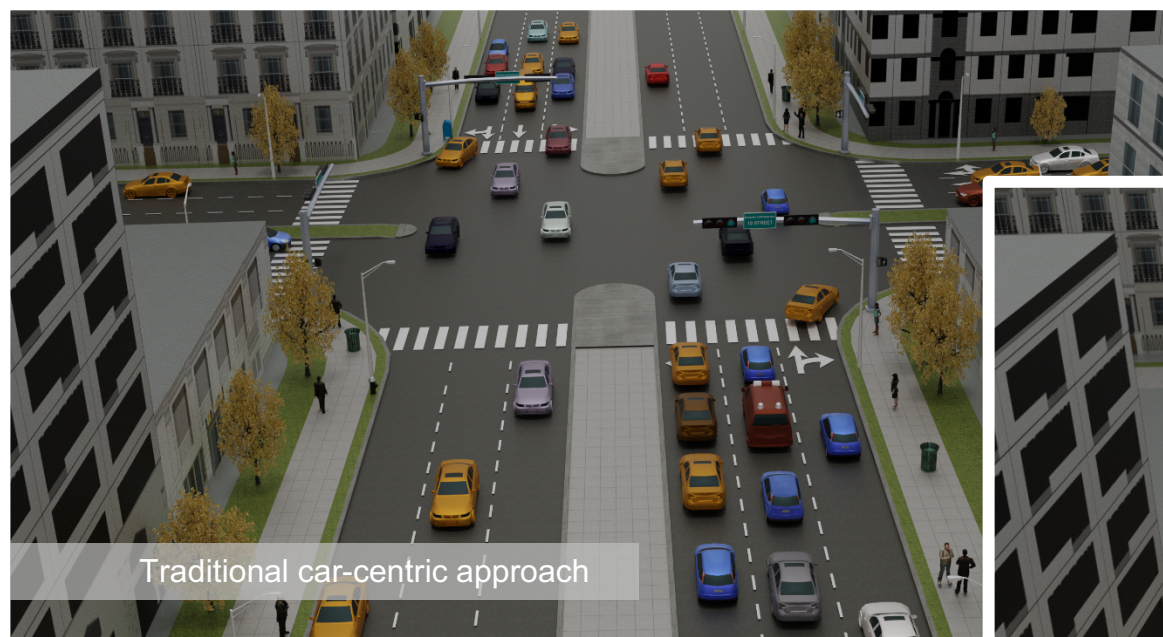
The role of technology will be crucial in the mid-term future, highly affecting the performance and evolution of almost all transport modes. On the other hand, governments and the related policies will attempt to keep this green impact by shaping the appropriate regulation, especially for promoting the usage of active modes (Exhibit 3):

The above will create the right environment for the advent of autonomous vehicles, particularly in transit and freight operations. This could also help reduce operational costs significantly.

SHAPING THE URBAN ENVIRONMENT

In the new norm of life, infrastructure design will be the key element to accelerate the integration of these changes, by putting humans at the heart of urban design, aiming to address mobility needs in a more resilient, sustainable and inclusive way than the traditional car-centric approach. Key features of this ecosystem will be:

- **Active transport modes** will take a preeminent share of the city's roadway cross section.
- **Mass transport** will continue to play an important role as part of transport solutions in the city.
- **Private vehicles** will require less space due to the combination of a reduction in private car usage and the fact that autonomous vehicles require narrower lanes.



Source: IBI Group, Infrastructure Design