National Technical University of Athens
Road Safety Observatory

Online workshop in the framework of 6TH UN GLOBAL ROAD SAFETY WEEK 17 - 23 May 2021
Streets for Life
#Love30
DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030
30 KM/H
Thursday 20 May 2021
Innovation in Road Safety Research

COVID-19 impact on mobility and safety

Eva Michelaraki

Transportation Engineer, PhD Candidate

Together with:
Christos Katrakazas, Marios Sekadakis and George Yannis

Introduction

- COVID-19 disease initially diagnosed in patients in Wuhan, China in December 2019
- Declared as a pandemic on the beginning of March 2020
- The majority of countries in a "lockdown" restricting everyday life activities to only the most essential
- As a result, road traffic volumes and mobility activities in general have immensely dropped

Background

Traffic Volumes

- Travel demand was decreased and many countries have witnessed sizeable drops in car traffic and public transport ridership
- A 37% and 35% decrease in driving days per week and vehicle miles driven, respectively among adolescents was identified

Driving Behavior

- Fixed safety cameras detected that speed violations have been increased by 39% and average driving speed by 6–11%
- Reduced traffic volumes due to lockdown, led to more frequent harsh accelerations and harsh brakings per 100km (up to 12%)

Road Traffic Accidents

- The total number of road traffic accidents, serious and slight injuries was decreased by half, mainly due to the dramatic traffic reduction
- Fewer fatalities were observed but, unfortunately, the rate of reduction has slowed

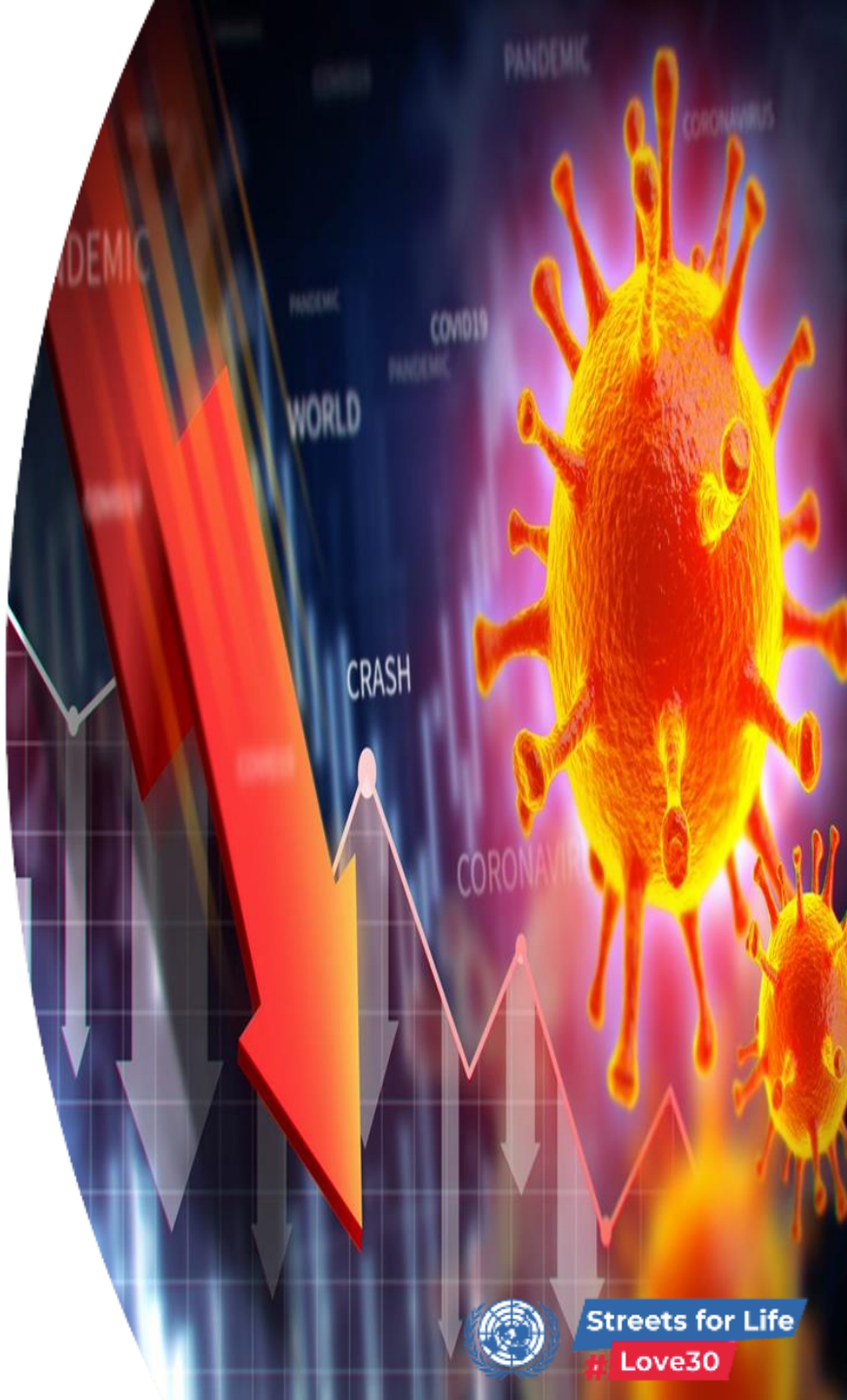
Data Collection and Analyses

- Data from the Mobility Trend Report of Apple

- Data from the smartphone sensors were collected using the smartphone applications technology that has been developed by OSeven

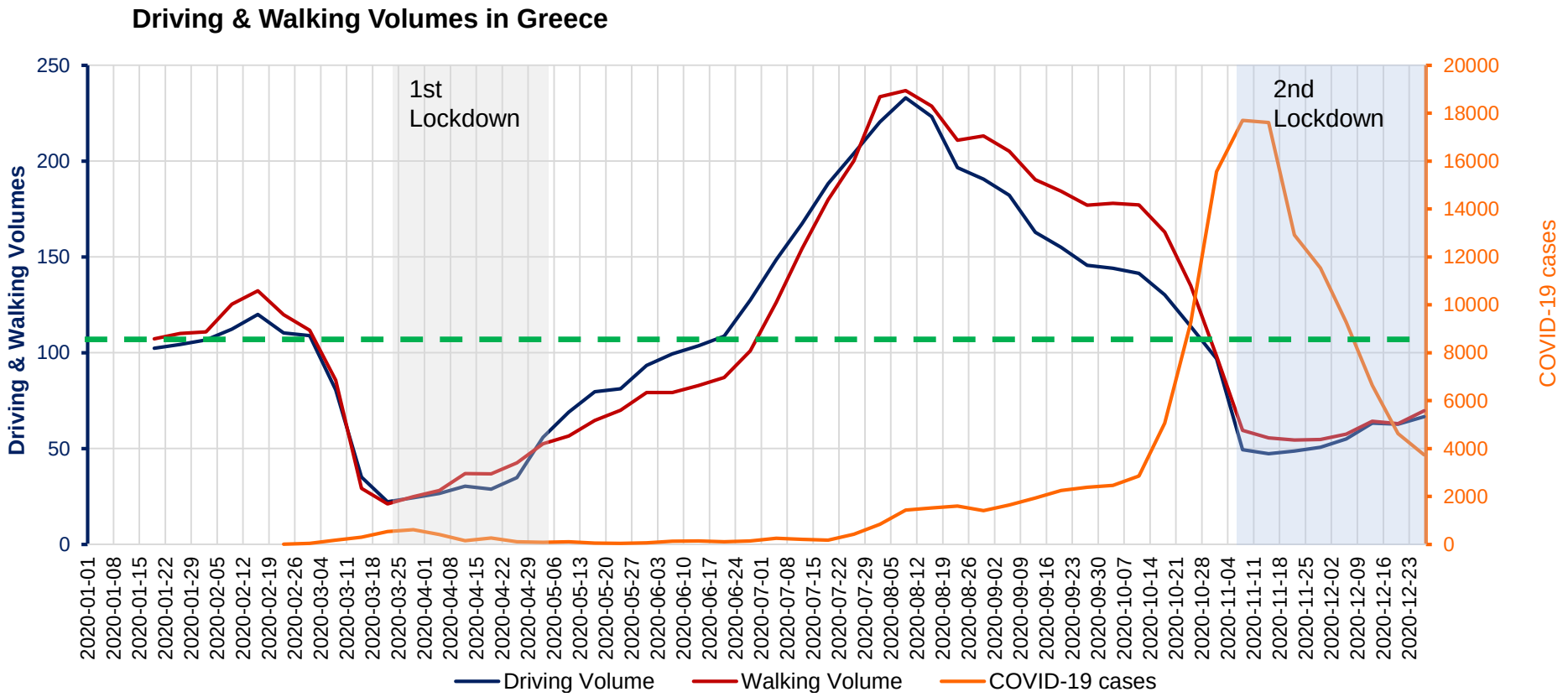
- Monthly road traffic accidents, fatalities, and slight injuries data were derived from the Hellenic Statistical Authority

- Advanced Statistical Analyses
  - Machine Learning (XG Boost, Clustering, Neural Networks)
  - Time-series (ARIMA, SARIMA, SARIMAX)



Traffic Volumes

- The total number of trips as well as the distance travelled was reduced considerably
- Increased driving and walking volumes, roughly by 100%, during the 2nd COVID-19 lockdown compared to the 1st one
- A 57% and 58% reduction on people driving and walking was identified in the 2nd lockdown compared to the period between the 1st and the 2nd lockdown



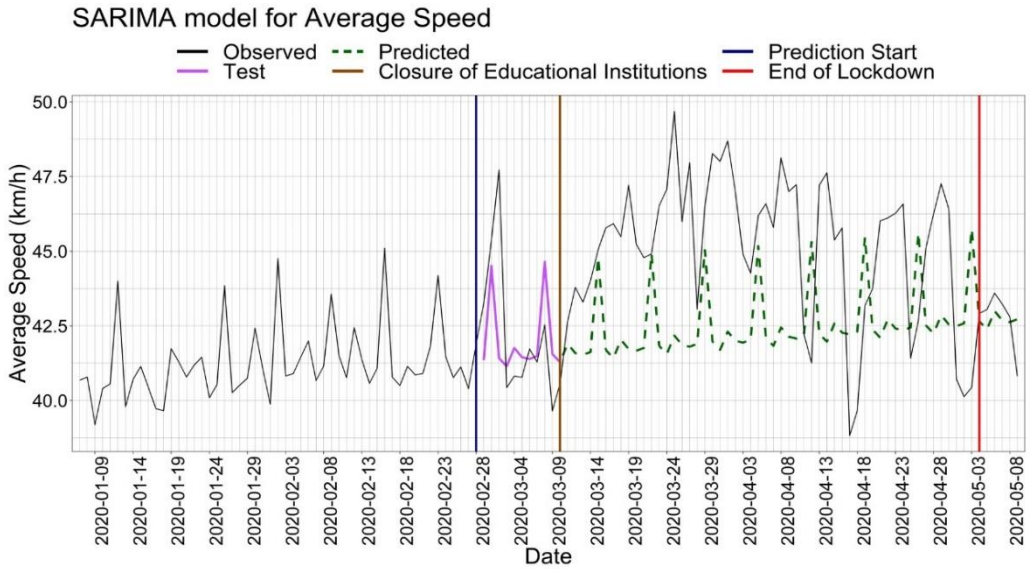
Source: Apple

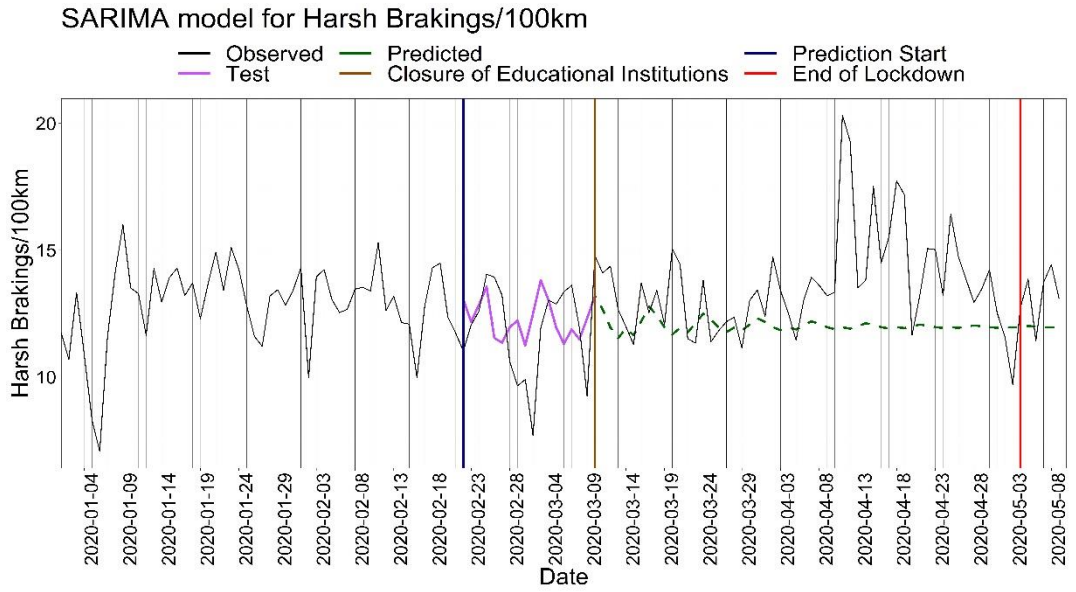
Streets for Life #Love30

Driving Behavior

- During the 1st lockdown period, an **overall 10% increase** in average speed was identified compared to the period before the appearance of COVID-19 pandemic. Interestingly, during the 2nd lockdown period, a 6% decrease in average speed was identified in Greece compared to the 1st one
- **Comparison** between normal evolution and COVID-19 period data

- Higher **speed** values up to 7.5 km/h more than the "normal" time-series evolution
- Values for harsh brakings/100km were **much higher** than the forecasted values

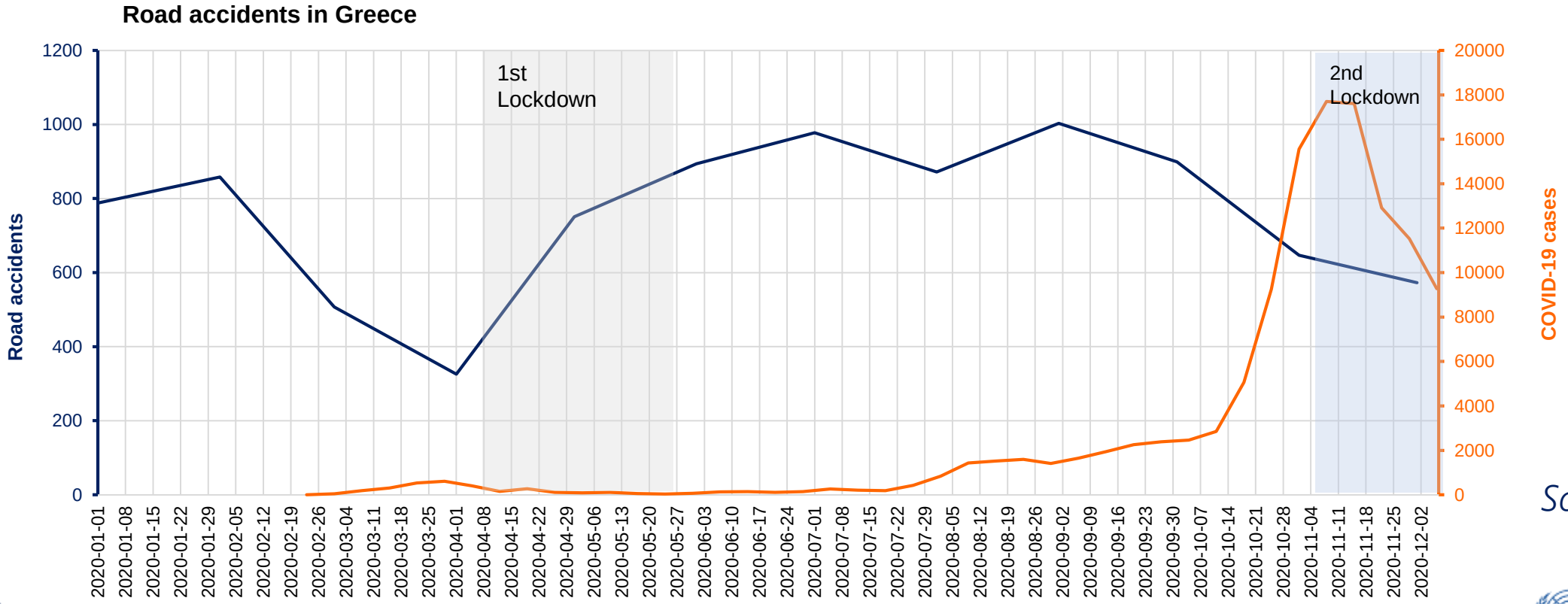




Source: OSeven

Road Traffic Accidents

- After the appearance of COVID-19 pandemic in 2020, a significant 15% reduction in road traffic accidents was found compared to 2019
- A 32% reduction in road accidents was observed in November-December 2020 compared to the period between the 1st and the 2nd lockdown
- During the 2nd lockdown period, a 46% increase in the total number of road accidents was identified compared to the 1st one



Source: ELSTAT

Streets for Life #Love30

Significant Findings

- A dramatic change in traffic was observed and traffic volumes **were substantially increased** when comparing the 1st and the 2nd lockdown
- As traffic levels reduced and police time was spent on other things, **speeding went up** and in some cases **more casualties per traffic** were occurred
- Increased **average speed** and more **frequent harsh events** per distance were demonstrated. This indicates that with fewer vehicles on city streets, slightly more drivers were blowing the speed limit
- The **fatality and slight injuries rates** per collision were increased compared to assumed conditions without COVID-19

Scientific and Social Impact

- The COVID-19 pandemic has shown how quickly global mobility and safety conditions can change
- Road safety is also a pandemic, and should also be treated as such
- On a positive note, as cities put in place new cycling infrastructure, cycling use numbers increased
- After the pandemic, we need to build a safer and more equal system for all road users – giving back separated space for healthier and sustainable active travelling

Future Challenges

- A more in-depth understanding of how the pandemic has affected road safety, and how a gradual re-opening and possible subsequent restrictions may affect driver behaviors is still to be determined
- The impetus that COVID-19 is placing on installations of temporary or permanent infrastructure to facilitate more pedestrians and cyclists, is a positive result of this crisis and should be further explored
- COVID-19 crisis can be the trigger also for a new and serious behavior of the Authorities and the citizens for safer roads for all, everywhere in the world

National Technical University of Athens
Road Safety Observatory

Online workshop in the framework of 6TH UN GLOBAL ROAD SAFETY WEEK 17 - 23 May 2021
Streets for Life
#Love30
DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030
30 KM/H
Thursday 20 May 2021
Innovation in Road Safety Research

COVID-19 impact on mobility and safety

Eva Michelaraki

Transportation Engineer, PhD Candidate

Together with:
Christos Katrakazas, Marios Sekadakis and George Yannis