Living Lab: Impacts of COVID-19 on urban mobility measures
Monitoring actions in Rethymno
Prof. Theocharis Tsoutsos, Technical University of Crete
Public transport and shared mobility are facing challenges driven by COVID-19 and **commute needs** (work, food supply, health).

- How has **quarantine** affected people’s **mobility behaviour**?

- Have the citizens developed **travel patterns** that they maintain and **after the lockdown** lifting?

- Do they **feel safe** to use **public transport** or to **share** a car ride?
CIVITAS DESTINATIONS Sites: Responding to safety and security concerns due to COVID-19

Canary Islands

- Retail & recreation: -94% compared to baseline
- Grocery & pharmacy: -75% compared to baseline
- Parks: -92% compared to baseline
- Transit stations: -87% compared to baseline
- Workplace: -66% compared to baseline
- Residential: +20% compared to baseline

Las Palmas

- Toscana

Elba
CIVITAS DESTINATIONS Sites:
Responding to safety and security concerns due to COVID-19

![Graph showing road traffic evolution in Funchal](image)

### ROAD TRAFFIC EVOLUTION IN FUNchal

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/02/2020</td>
<td>Pré Covid-19</td>
</tr>
<tr>
<td>02/03/2020</td>
<td>First case of COVID-19 in PT</td>
</tr>
<tr>
<td>14/03/2020</td>
<td>Alert period</td>
</tr>
<tr>
<td>19/03/2020</td>
<td>1st emergency period</td>
</tr>
<tr>
<td>03/04/2020</td>
<td>2nd emergency period</td>
</tr>
<tr>
<td>22/04/2020</td>
<td>3rd emergency period</td>
</tr>
<tr>
<td>04/05/2020</td>
<td>Calamity period</td>
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</tbody>
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CIVITAS DESTINATIONS Sites: Responding to safety and security concerns due to COVID-19

How did the number of visitors change since the beginning of the pandemic?, Greece

The data shows how visitors to (or time spent in) categorized places change compared to baseline days – the median value from the 5-week period from January 3rd to February 6th 2020. This index is smoothed to the rolling 7-day average.

Source: Google COVID-19 Community Mobility Trends – Last updated 24 August, 20:31 (London time)  OurWorldInData.org/coronavirus • CC BY
Note: It's not recommended to compare levels across countries; local differences in categories could be misleading.
DESTINATIONS partners campaigning to ensure safety on public transport

Las Palmas, Canarias

NUEVOS CARRILES
BUS-TAXI

Elba

CIVITAS DESTINATIONS • UMD, 29/09/2020
DESTINATIONS partners campaigning to ensure safety on public transport

Madeira

USE MÁSCARA PARA PROTEÇÃO DE TODOS

https://www.covidinmadeira.pt

Malta

TRANSPORT MALTA HAS ASKED FOR THE BUSES TO BE DISINFECTED USING SPECIALISED CHEMICALS.

Rethymno, Crete

DEN ΧΡΗΣΙΜΟΠΟΙΟΥΜΕ ΣΙΣΜΕΝΕΣ ΜΑΣΚΕΣ
DEN ΠΑΙΔΑΚΙΟΥΜΕ ΤΗ ΜΑΣΚΑ ΟΤΑΝ ΤΗ ΦΟΡΑΜΕ
DEN ΠΑΙΔΑΚΙΟΥΜΕ ΤΗ ΜΑΣΚΑ ΟΤΑΝ ΤΗ ΦΟΡΑΜΕ
DEN ΚΑΤΕΒΑΣΟΥΜΕ ΤΗ ΜΑΣΚΑ ΣΤΟ ΠΙΤΟΥΝΙ
DEN ΠΑΙΔΑΚΙΟΥΜΕ ΤΗ ΜΑΣΚΑ ΟΤΑΝ ΤΗ ΦΟΡΑΜΕ
DEN ΧΡΗΣΙΜΟΠΟΙΟΥΜΕ ΣΙΣΜΕΝΕΣ ΜΑΣΚΕΣ
DEN ΠΑΙΔΑΚΙΟΥΜΕ ΤΗ ΜΑΣΚΑ ΟΤΑΝ ΤΗ ΦΟΡΑΜΕ
Rethymno, during COVID19
COVID-19 outbreak in Greece, lockdown phases and restrictions easing timeline

- **26/2**: First COVID-19 case in Greece
- **14/3**: Shopping malls, restaurants, bars, cafes, libraries, cinemas, museums, sport facilities, hairdressers closure
- **23/3**: Complete lockdown, self isolation
- **4/5**: Stores, senior high school classes reopening
- **11/5**: Shopping malls, middle & high school classes reopening
- **18/5**: Restaurants, cafes reopening
- **25/5**: Hotels, primary school classes reopening
- **1/6**: Gradual lifting of confinement measures
- **1/7**: International flights reopening
Rethymno: Changes in mobility & environment

Method

The citizens’ travel habits during:
• the pre-pandemic period (January-February),
• the first week of the complete lockdown and the guidelines for self-isolation/movement restrictive measures (16/3-22/3/2020)
• the quarantine period (April), and
• the post-quarantine/lockdown period (1/6-7/6/2020).

Analysis of
• travel mode choice and determinants
• the trend on private vehicle use
• safety for car sharing
Diagram 2: Change of commuting habits due to COVID-19

- Private Car (Driver): -39.3%
- Private Car (Passenger): -28.9%
- Bus: -17.6%
- Taxi: -9.4%
- Bicycle: -14.6%
- Walking: -10.7%
Impact on the daily travel mode choice due to COVID-19 in Rethymno

(%)
Feeling safe to share a car ride as a driver and as a passenger, by gender

(Phase 1)

(Phase 2)
## Modal’s choice determinants classification

<table>
<thead>
<tr>
<th>PHASE 1</th>
<th>PHASE 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Flexible departure time</td>
</tr>
<tr>
<td>Travel time</td>
<td>Travel time</td>
</tr>
<tr>
<td>Flexible departure time</td>
<td>Safety</td>
</tr>
<tr>
<td>Travel cost</td>
<td>Travel cost</td>
</tr>
<tr>
<td>Weather conditions</td>
<td>Weather conditions</td>
</tr>
<tr>
<td>Ecological footprint</td>
<td>Ecological footprint</td>
</tr>
</tbody>
</table>
Impact to air quality due to COVID-19
Change in CO level, Rethymno-old city

Month | 2019 | 2020 | Difference
--- | --- | --- | ---
Jan | | | 
Feb | | | 
Mar | | | 
Apr | | | 
May | | | 

Impact to air quality due to COVID-19
Change in CO level, Rethymno-old city

CO (ppm) vs Difference (%) chart showing:
- Jan: 2019: 0.06, 2020: 0.06, Difference: 0%
- Feb: 2019: 0.06, 2020: 0.06, Difference: 0%
- Mar: 2019: 0.12, 2020: 0.06, Difference: -50%
- Apr: 2019: 0.16, 2020: 0.1, Difference: -30%
- May: 2019: 0.16, 2020: 0.1, Difference: -10%
Impact to air quality due to COVID-19 NOx vs traffic load, Rethymno-old city
Discussion

- cities face new unprecedented challenges. The pandemic crisis has **transformed mobility habits**.
- COVID19 offer a **unique opportunity**. It is required to **redesign** of sustainable transport systems from a different perspective; to develop **effective** and **resilient** transport systems.
- air quality improved significantly due to the increase in active travel modes (walking, cycling), so are required additional monitoring systems to offer **health and environmental safety**
- The society should learn how to live radically different; more **digitalized, decarbonized, democratized, decentralized**
Special Issue: Impact of COVID-19 on Energy Sources, Environment and Resources

• Impacts on Energy Production and Consumption
• Atmospheric pollution, immediate and long-term
• Impacts on the Environment incl. Climate Changes
• Analysis of GHGs during lockdown period
• Fossil fuel consumption
• Energy Resilience Assessment
• Future Energy Market after COVID-19
• Challenges and Opportunities for Energy Transition after COVID-19
• Disinfection technologies for COVID-19
• Wastewater treatment and COVID-19 impact
• Impact of COVID-19 on plastic waste issue
• Impact of COVID-19 on mobility and transportation
• Energy systems under lockdown

Deadline: 01 November 2020
SUSTAINABLE MOBILITY FOR ISLANDS DESTINATIONS
GREENING THE ISLAND TRANSPORT

Open, Coming @November 2020
Thank you!

Prof. Theocharis Tsoutsos

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