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Assessing the Impact of Athens Great Walk on VRU Volumes: A Temporal Analysis

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Together with:
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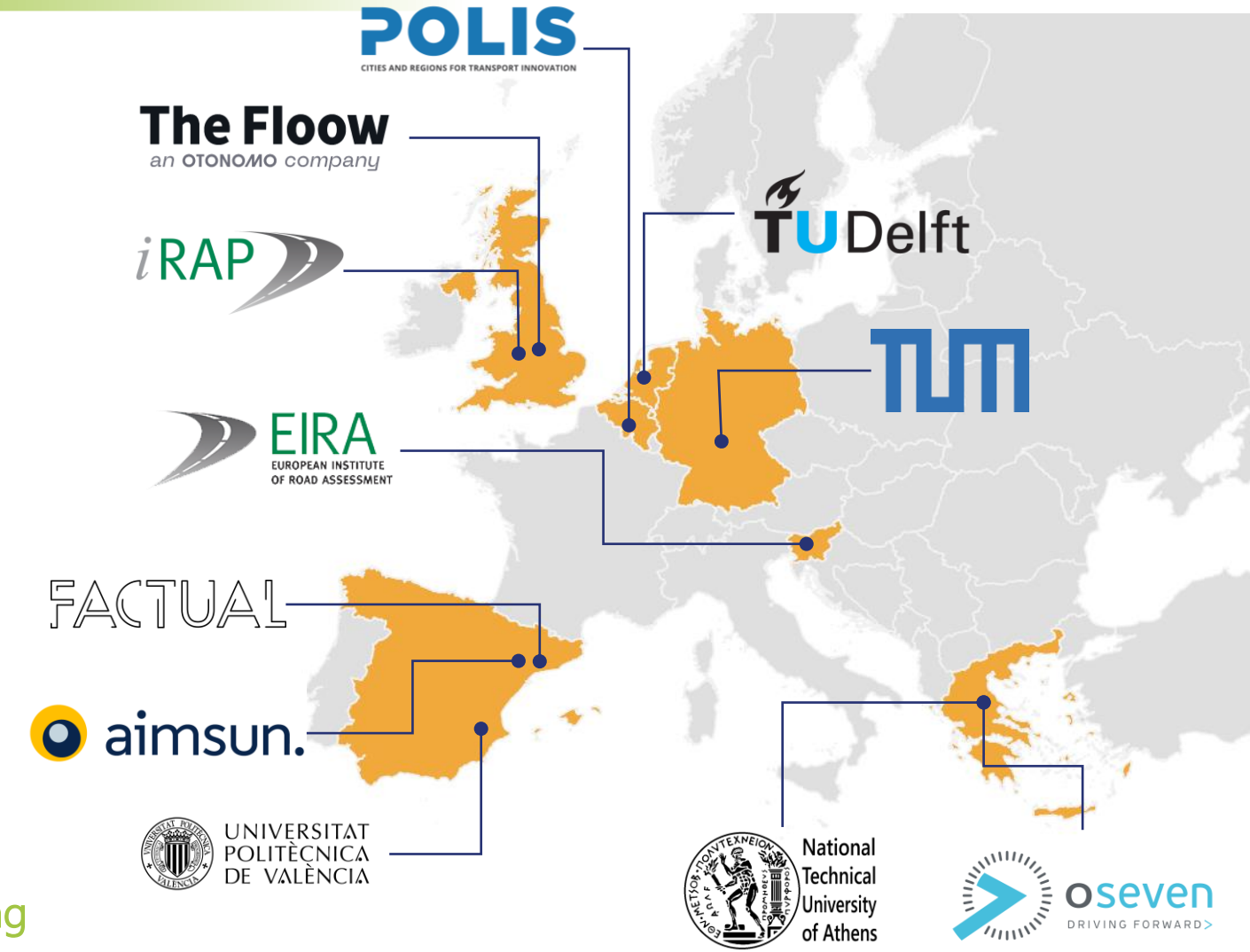
The PHOEBE project

- 11 Project partners
- Duration of the project:
  - 45 months (November 2022 – July 2026)
- Framework Program:
  - Horizon Europe

- Development of an integrated, dynamic and scalable human-centered predictive safety assessment framework for all road user types in urban areas.
- Brings together traffic simulation, road safety assessment, human behaviour, mode shift and induced demand modelling and new and emerging mobility data into a harmonised, prospective assessment framework for road safety.

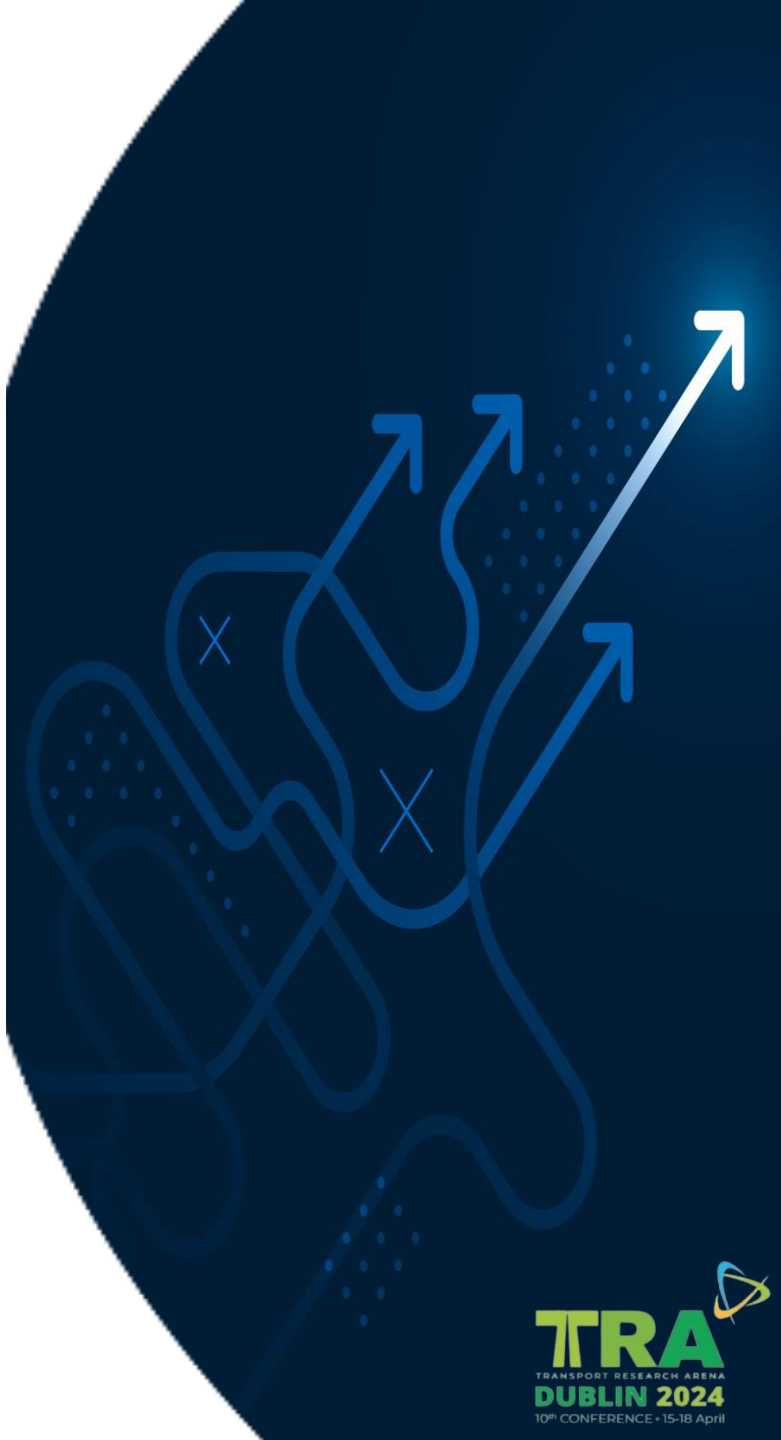


Introduction

- The rise in population density coupled with increased transportation demands necessitates a focus on efficient mobility solutions
- The safety of Vulnerable Road Users (VRUs) such as pedestrians, cyclists, and scooter riders must remain a priority despite the complexities of urban mobility
- Interventions, ranging from pedestrian-friendly pathways to cyclist-oriented infrastructure enhancements, represent a response to the evolving challenges posed by urbanization
- Understanding VRU interactions with the built environment and evaluating the effectiveness of mobility interventions are crucial for enhancing safety conditions

Objectives

- Analyze temporal variations in the volumes of vulnerable road users (VRUs) in the metropolitan center of Athens
- Evaluate how VRU volumes vary over time, considering factors such as weekdays, months, and hours of the day
- Examine the effectiveness of specific mobility interventions, in promoting safer and more accessible urban environments.
- Investigate the relationship between interventions like the Athens Great Walk (AGW) and the mobility behaviors of pedestrians, cyclists, and scooter riders to understand their implications on sustainable urban transport and road safety



Data Description

- In June 2020, in the city of Athens, a pilot implementation of the new mobility interventions was decided. Precisely the following interventions were implemented in Panepistimiou Street:
  - Increase of sidewalk with high pedestrian traffic
  - Exclusive lanes for pedestrians and cyclists by creating a new bike path
  - Three lanes for cars, instead of four
  - An exclusive bus lane
- The data of this study stem from the implementation of Panepistimiou Street, and span for a day per month at morning hours from eight o'clock till three 'clock :
  - six months before the implementation and
  - six months after the implementation of the pilot phase of AGW with the interventions for the pedestrians, cyclists and scooter riders

Interventions Background

- Athens Great Walk project aimed at reshaping the cityscape, prioritizing pedestrians and cyclists, and promoting sustainable transportation methods
- The project exemplifies a multimodal approach catering to diverse commuters, integrating cycling lanes, expanded pedestrian pavements, and scooter-friendly zones to create a comprehensive transportation network.
- These interventions not only create safer environment but also encourage the adoption of active transportation modes, contributing to the overall sustainability and liveability of urban areas.

Methodological Overview

- Data collected from the implementation of Panepistimiou Street, spanning six months before and after the pilot phase of the Athens Great Walk project. Data covers morning hours from 8 o'clock to 3 o'clock for pedestrians, cyclists, and scooter riders

- Explanatory analyses such as Generalized Linear Models (GLMs) are used to model the relationship between the count data of traffic volume and independent variables

- Generalized Linear Models (GLMs) are conducted for pedestrians, cyclists, and scooter drivers

- The independent variables include the day of the week, month, and hour of the day, believed to impact traffic volume

GLM Results (1/2)

- The day of the week variable shows a significant association with a coefficient of 0.5893, suggesting a weekday effect on pedestrian traffic volume.
- Statistically significant relationships exist between all three predictor variables and pedestrian traffic volume
- Particularly, the variable "Month" demonstrates a robust relationship, indicating notable changes in pedestrian volumes over time

Table 1: Generalized Linear Model Regression Results for Pedestrians						
	Coef	Std. Err	z	P > |z|	[0.025	0.975]
DayOfWeek	0.5893	0.119	4.938	0.000	0.335	0.823
Month	0.3416	0.027	12.451	0.000	0.288	0.395
HourOfDay	0.1179	0.055	2.150	0.032	0.010	0.225

GLM Results (2/2)

- Bicyclists:
  - the day of the week and hour of the day variables do not show statistically significant associations with bicyclist traffic volume
  - the coefficient for the variable "Month" is 0.2578, suggesting a positive relationship between the month and bicyclist traffic volume. While the coefficient is not statistically significant at the conventional 0.05 significance level, it is worth noting that there might be some suggestive evidence of a relationship. The confidence interval [0.030, 0.546] indicates that the true coefficient may fall within this range with 95% confidence

Table 2: Generalized Linear Model Regression Results for Bicyclists

	Coef	Std. Err	z	P > |z|	[0.025	0.975]
DayOfWeek	0.5116	0.637	0.804	0.422	-0.736	1.759
Month	0.2578	0.147	1.754	0.079	-0.030	0.546
HourOfDay	-0.1462	0.403	-0.363	0.717	-0.935	0.643

- Scooter Drivers:
  - The coefficient for 'DayOfWeek' is 0.9519, but it is not statistically significant (p = 0.424). Similarly, the hour of the day variable also does not exhibit a statistically significant relationship with scooter traffic volume, with a coefficient of -0.8370 (p = 0.261)
  - "Month" variable shows a statistically significant positive relationship, indicating a notable impact of time on scooter traffic volume.

Table 3 Generalized Linear Model Regression Results for Scooter Riders

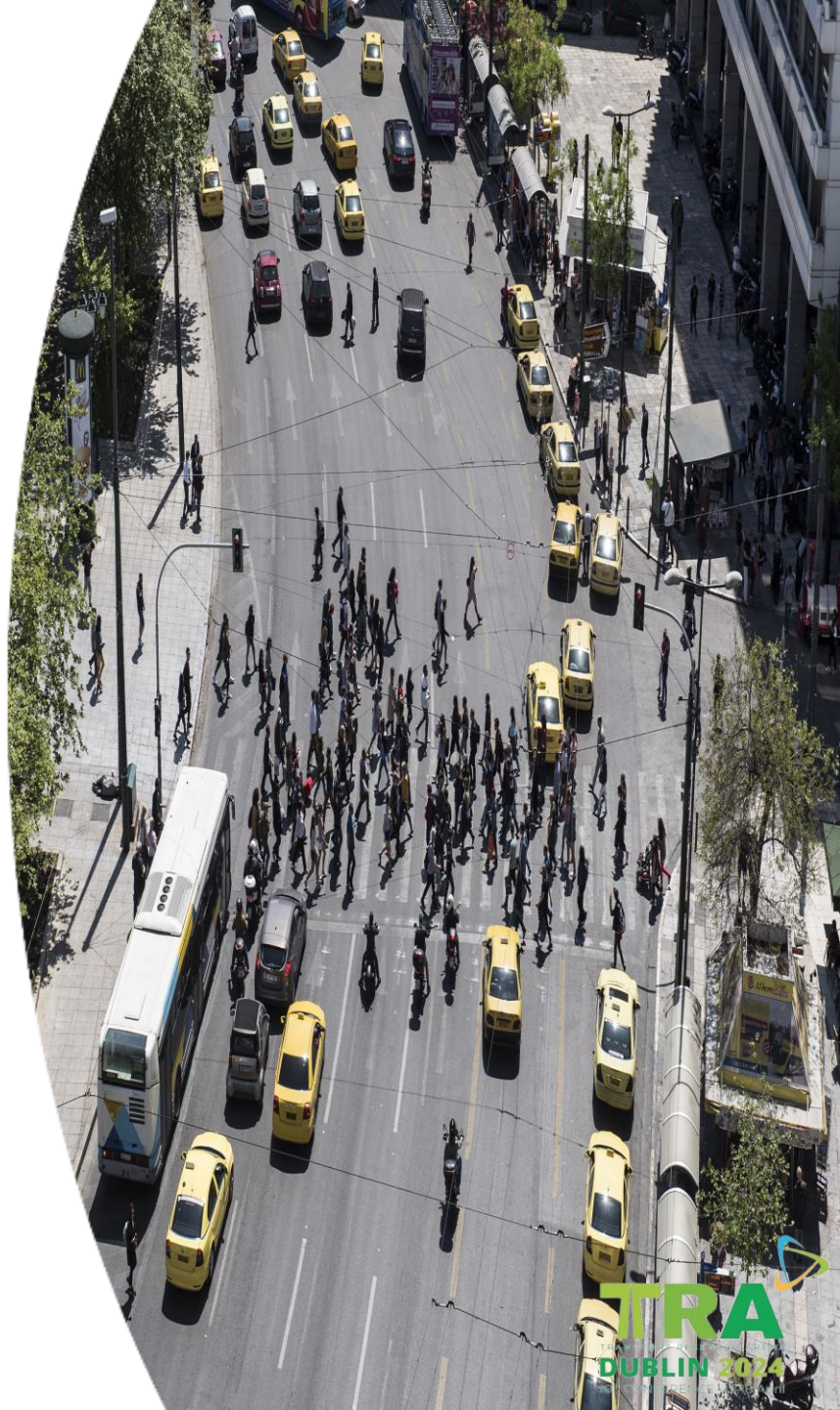
	Coef	Std. Err	z	P > |z|	[0.025	0.975]
DayOfWeek	0.9519	1.190	0.800	0.424	-1.381	3.285
Month	0.6287	0.267	2.353	0.019	0.105	1.152
HourOfDay	-0.8370	0.744	-1.124	0.261	-2.296	0.622

Discussion

- Significant increase observed post-intervention, with the "Month" variable showing a robust positive relationship, indicating successful measures like sidewalk expansions promoting pedestrian activity
- Limited statistical significance found post-intervention, suggesting interventions had minimal impact on cycling patterns
- Statistically significant increase post-intervention, indicating successful implementation of measures like dedicated scooter lanes. Highlights the potential of micro-mobility solutions in addressing urban transportation needs and reducing congestion
- The month variable emerges as a significant influencer across all transportation modes, emphasizing the importance of considering seasonality and temporal factors in transportation interventions

Conclusions

- Policymakers and stakeholders should leverage the findings of this research to inform future transportation initiatives aimed at enhancing safety and accessibility for Vulnerable Road Users (VRUs)
- Further investigation and tailored interventions are necessary to enhance cycling behavior. This could involve improving cycling infrastructure, implementing bike-sharing programs, and raising awareness about the benefits of cycling as a sustainable mode of transportation
- While acknowledging the positive outcomes of interventions, policymakers should also consider external factors like seasonal events and socioeconomic trends that may influence transportation patterns. Future research should aim to isolate these effects for a more nuanced understanding



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