



Impacts and Evidence Webinar:
How to move from regulation to effectiveness of speed reduction strategies

Online, 14 March 2025

Review of 30 km/h speed limit benefits in Europe

George Yannis
NTUA Professor

Together with: Eva Michelaraki, Research Associate



Department of Transportation Planning and Engineering
National Technical University of Athens

Outline

1. Key facts about speeding
2. Scientific evidence on 30km/h city-wide schemes
3. Cost benefit analysis example
4. Conclusion
5. 30 Marathons in 30 months campaign



Objectives

Two published literature reviews:

- Assessment of changes **before and after** the implementation of city-wide 30 km/h speed limits in Europe (meta-analyses of 70 studies from 17 cities)

Yannis, G., & Michelaraki, E. (2024). Review of City-Wide 30 km/h Speed Limit Benefits in Europe Sustainability, 16(11), 4382

- Assessment of the effectiveness of 30 km/h speed limit through **simulation studies** (meta-analyses of 60 studies)

Yannis, G., & Michelaraki, E. (2024). Effectiveness of 30 km/h speed limit - A literature review. Journal of Safety Research, Vol. 92, November 2024



Safety



Emissions



Energy



Traffic



Liveability

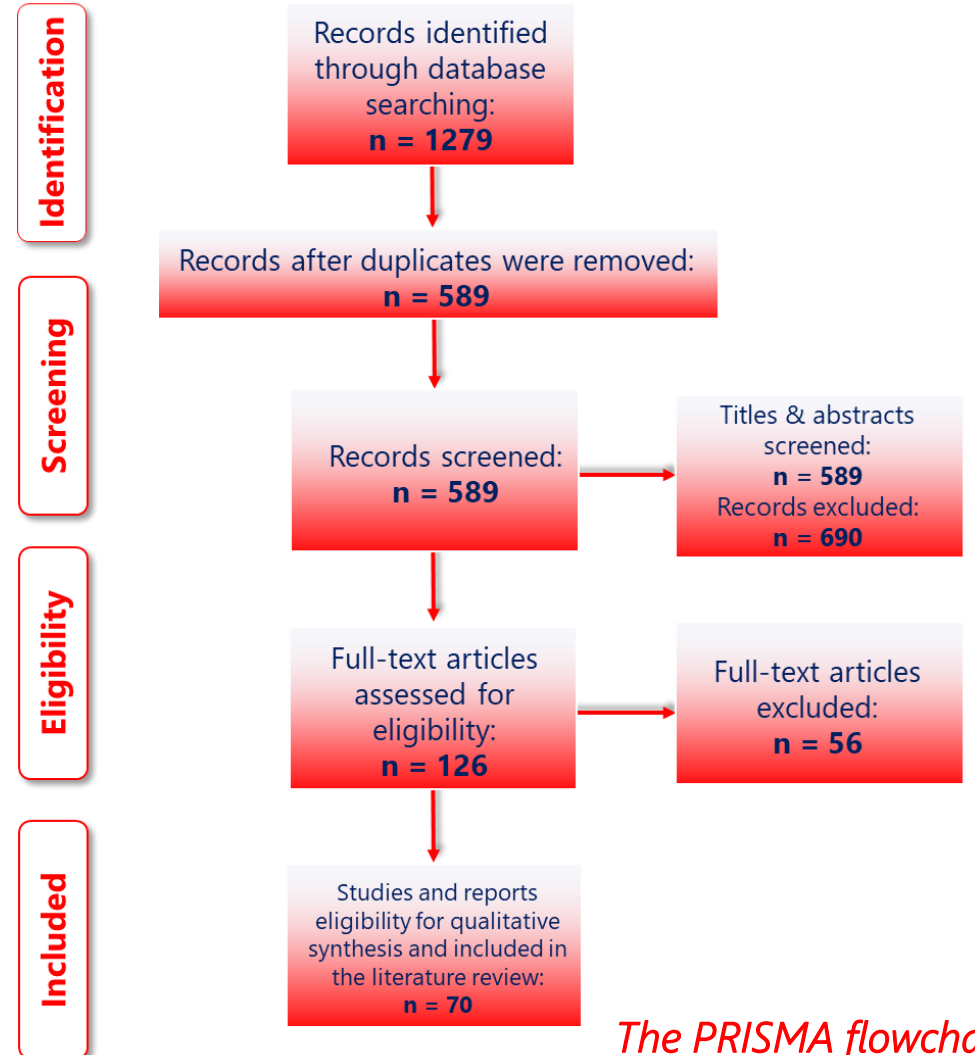


Health

Methodology

- **Meta-analyses of 70 studies from 17 cities** were reviewed
- Systematic search of relevant scientific and grey literature, according to the **Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA)**
- The **inclusion criteria** for selecting relevant studies were:
 - ✓ Search term included in title, abstract or key words
 - ✓ Studies published from 1992 and onwards
 - ✓ Studies including information with regards to 30 km/h speed limit in the title or abstract
 - ✓ Source: peer-reviewed journals before peer-reviewed conference papers before scientific papers/articles

Key search phrase	Search terms	Screened papers	Included papers
30 km/h speed limit	"30 km/h" OR "20 mph" OR "30 km/h speed limit" OR "speed limit" OR "speed limit reduction" OR "maximum speed" OR "reduced speed" AND "traffic calming" AND "mobility" AND "city-wide" AND "cities" AND "implementation modalities" AND "benefits" AND "urban areas"	589	70



Key Facts about Speeding



**Speeding
kills**

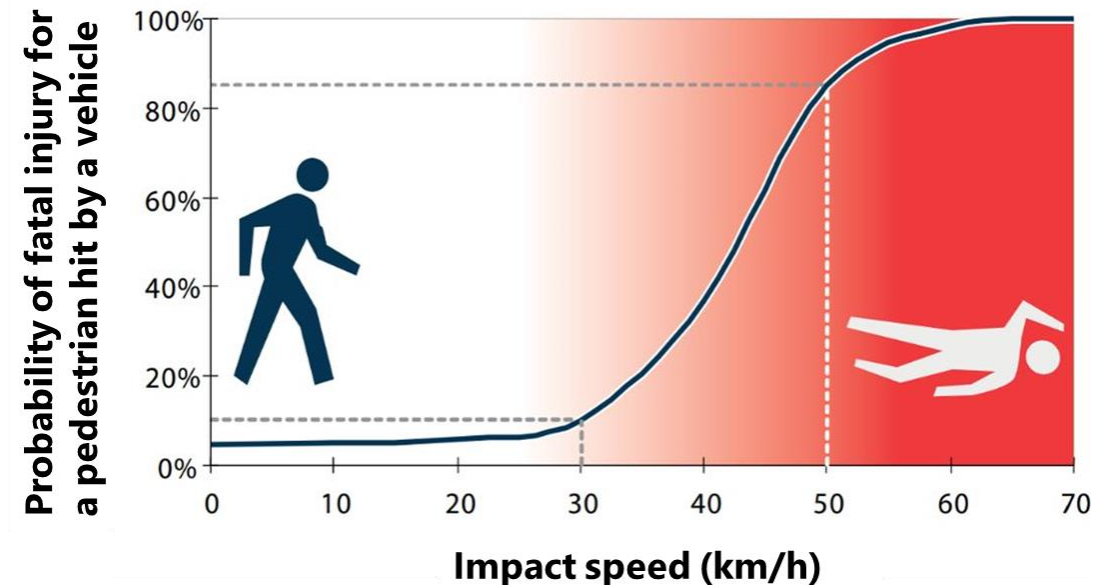
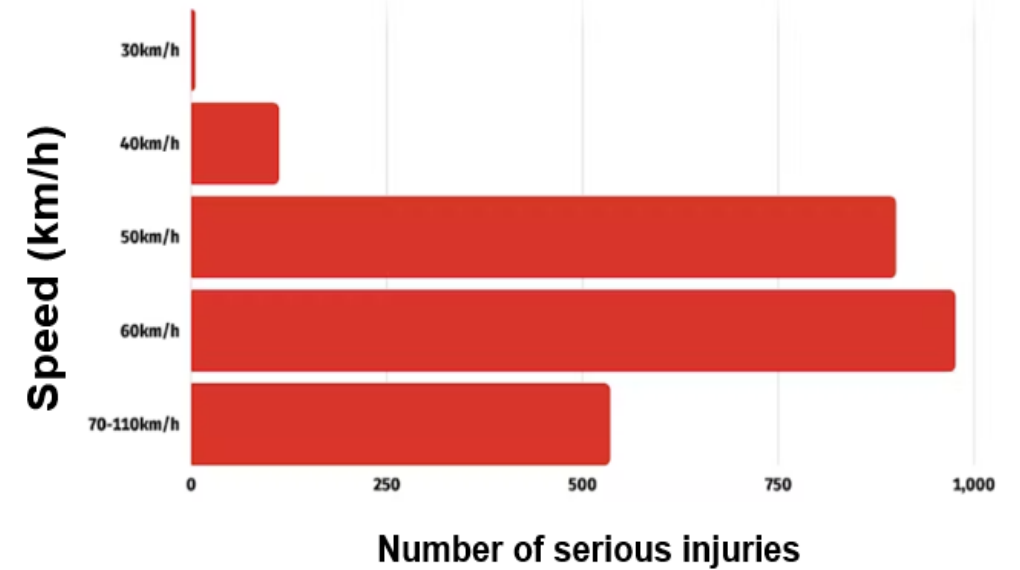
Speeding Kills (1/2)

- Road crashes is a **major societal problem** worldwide, with 1,19 million road fatalities per year and more than 50 million of road injuries
- Speeding is the **number one cause of road crashes** worldwide, especially in cities where pedestrians, cyclists and motorcyclists are highly exposed and vulnerable in case of a collision (70% of fatalities in urban areas are VRUs)
- Speed has been found to be a **major contributory factor** in around 10-15% of total crashes and in around 30% of fatal crashes
- Speed effects the **quality of life** of urban residents, especially the safe mobility of vulnerable road users

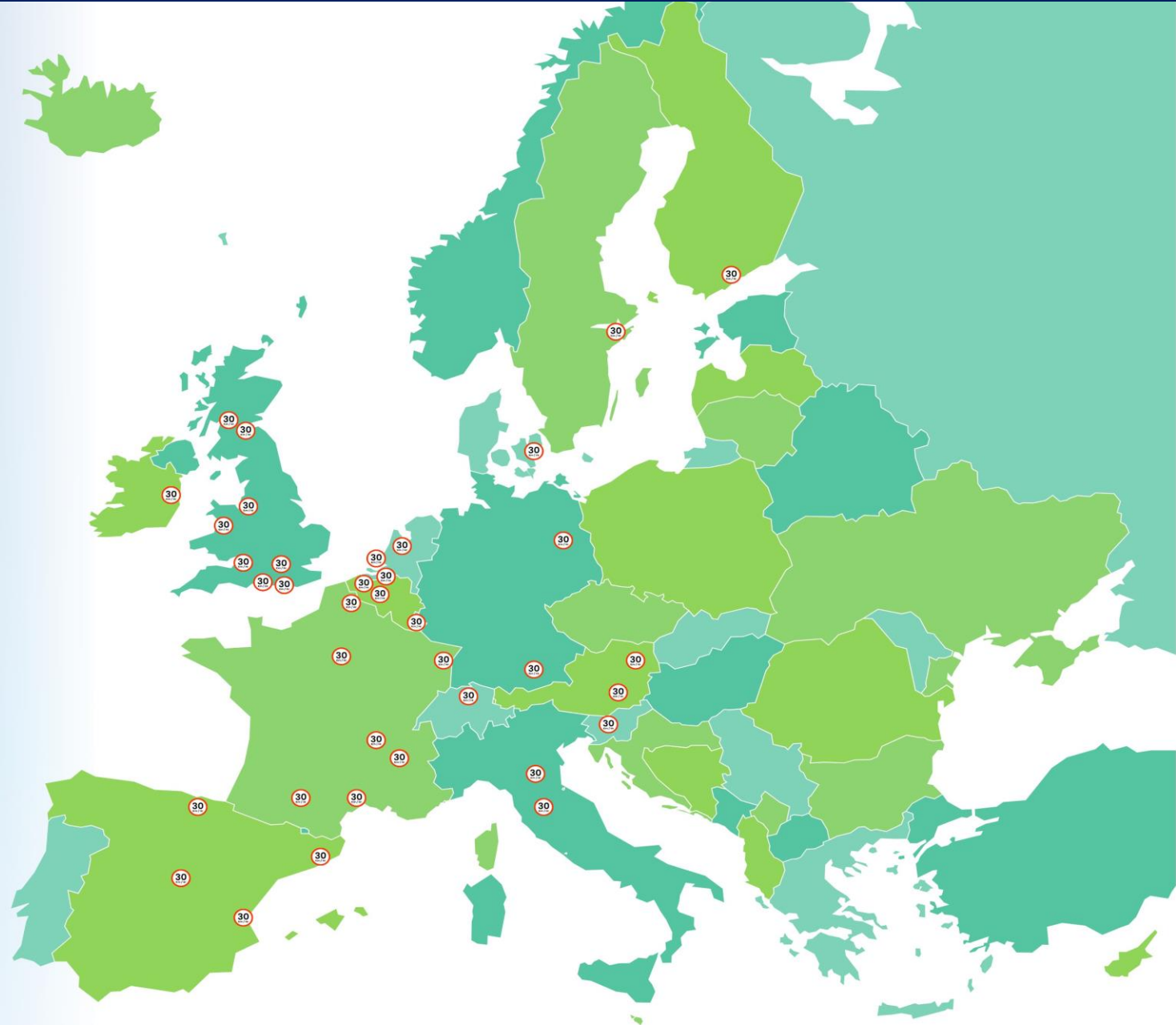


Speeding Kills (2/2)

- When speed increases, the risk of a **crash and of its severity** increases as well
- A 5% increase in average speed leads to approximately a 10% increase in all **injury crashes** and a 20% increase in **fatal crashes**
- The increase in crash risk is usually attributed by the fact that when speed increases, the **time to react** to traffic situations is shorter and manoeuvrability of a speeding car is limited
- **Pedestrian fatalities** increase from 10% in 30km/h collisions to 90% in 50km/h collisions



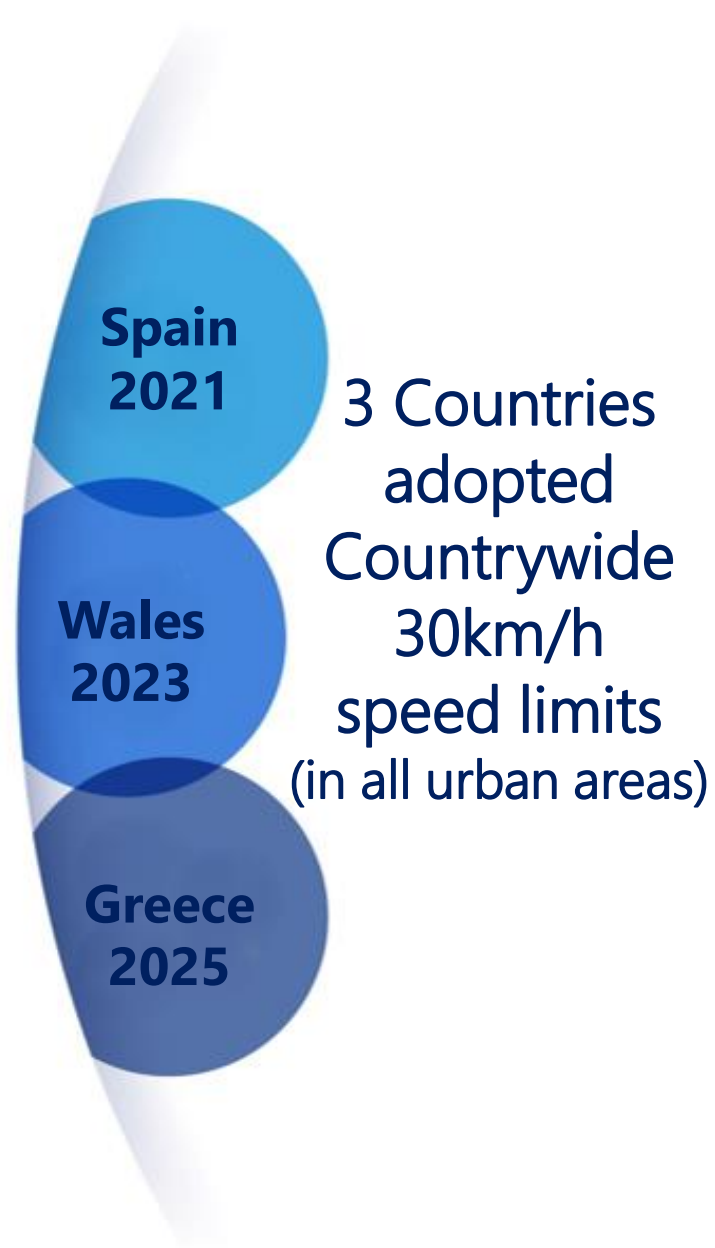
Scientific Evidence on 30km/h City-wide Schemes



Cities with 30 km/h Speed Limit

A/A	City	Implementation Started
40	Amsterdam	December 2023
39	Wales	September 2023
38	Bologna	July 2023
37	Florence	November 2022
36	Copenhagen	June 2022
35	Lyon	March 2022
34	Den Haag	December 2021
33	Zurich	December 2021
32	Toulouse	November 2021
31	Vienna	September 2021
30	Paris	August 2021
29	Montpellier	August 2021
28	Münster	July 2021
27	Valencia	May 2021
26	Leuven	April 2021
25	Brussels	January 2021
24	Nantes	August 2020
23	Glasgow	January 2020
22	Antwerp	January 2020
21	Barcelona	December 2019

A/A	City	Implementation Started
20	Lille	August 2019
19	Helsinki	May 2019
18	Madrid	September 2018
17	Bilbao	June 2018
16	Strasbourg	February 2017
15	Dublin	January 2017
14	Berlin	January 2017
13	Edinburgh	July 2016
12	London	June 2016
11	Grenoble	January 2016
10	Ljubljana	September 2015
9	Luxembourg	August 2015
8	Ghent	April 2015
7	Bristol	2015
6	Munich	2011
5	Brighton	2010
4	Hove	2010
3	Warrington	July 2005
2	Stockholm	2004
1	Graz	September 1992



30km/h Speed Limit in Cities (1/2)

Yannis, G., & Michelaraki, E. (2024). Review of City-Wide 30 km/h Speed Limit Benefits in Europe Sustainability, 16(11), 4382

City-wide 30km/h speed limits led to **average reduction** in:
(meta-analyses of 70 studies from 17 cities)

- Fatalities by **37%**
- Serious injuries by **38%**
- Road crashes by **23%**
- Emissions by **18%**
- Noise by **2.5 db**
- Fuel consumption by **7%**
- Traffic congestion by **2%**



30km/h Speed Limit in Cities (2/2)

Yannis, G., & Michelaraki, E. (2024). Review of City-Wide 30 km/h Speed Limit Benefits in Europe Sustainability, 16(11), 4382

Fatalities:

- 63% and 55% reduction in Bristol and Brussels

Serious injuries:

- 72% and 50% reduction in Münster and Grenoble

Road crashes:

- 46% and 40% reduction in London and Paris

Emissions:

- 29% and 25% reduction in Berlin and Graz

Noise:

- 3 db reduction in Paris and Berlin

Energy:

- 12% and 10% reduction in Münster and Brussels

Traffic congestion:

- 9% and 2% reduction in Grenoble and Bilbao

City	Safety			Emissions		Energy	Traffic
	Crashes	Fatalities	Injuries	CO ₂ , NO _x , PM	Noise	Fuel	Congestion
Bologna	-38%	-33%	-10%	-23%			-3%
Zurich	-16%	-25%	-20%		-1.7 dB		
Paris	-40%		-25%		-3 dB		
Münster			-72%	↓	↓	-12%	
Brussels	-10%	-55%	-37%		-2.5 dB	-10%	
Glasgow		-31%					
Helsinki	-9%		-42%				
Bilbao	-28%			-19%			-2%
Berlin	-10%			-29%	-3 dB		
London	-46%	-25%	-25%	-10%			
Grenoble	↓	↓	-50%				-9%
Edinburgh	-38%	-23%	-33%	-8%			-2.4%
Bristol		-63%					
Brighton			-45%				
Hove			-45%				
Warrington			-43%				
Graz	-12%		-20%	-25%	-2.5 dB		

* grey colour indicates that the impact of the implementation of 30 km/h in this city has not been examined yet

** the symbol ↓ indicates that the quantitative effect of this measure has not been provided; only qualitative impact is given

*** these reductions refer to a comparison period before and after the implementation of 30 km/h speed limits which is not the same among all cities examined



Effectiveness of 30 km/h Speed Limit

Yannis, G., & Michelaraki, E. (2024). Effectiveness of 30 km/h speed limit – A literature review. Journal of Safety Research, Vol. 92, November 2024

Environment

- reduce air pollution
- reduce car dependency



Energy

- reduce fuel consumption
- promote smoother eco-driving



Road safety

- decrease average travel speed
- decrease conflicts with VRUs



Traffic flow

- reduce traffic volumes
- reduce congestion



Sustainability

- increase Public Transport use
- increase pedestrian, cyclists and e-scooter active mobility



*Setting a speed limit of 30 km/h where people and traffic mix, make streets
safer, healthier, greener and more liveable*



Cost Benefit Analysis Example

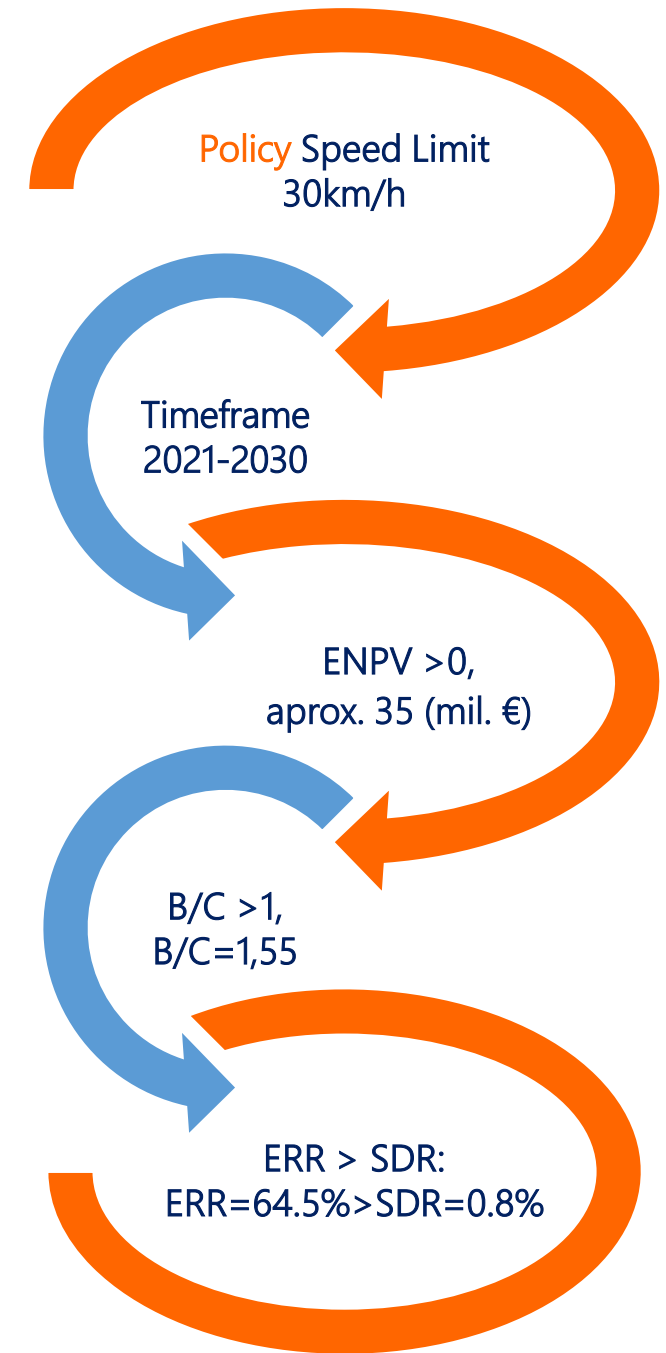


Cost Benefit Analysis Results – Athens (1/2)

Roussou, S., Petraki, V., Deliali, K., Kontaxi, A. & Yannis, G. (2024). Cost benefit analysis of reducing speed limits in Athens to 30 Km/h. Case Studies on Transport Policy, 101289, October 2024

A Cost Benefit Analysis for the City of Athens was implemented till the year 2030, by including all the **Costs** (Implementation and Operational) and all the **Benefits** (Road Crashes, Fuel Consumption, Emissions) which concludes to the following **results**:

- The most important economic benefit arises due to the improvement of **road safety** through the reduction of fatalities on road crashes:
 - ✓ Expected Net Present Value (ENPV) > €35 million
 - ✓ Benefit-Cost Ratio (B/C) = 1,55
 - ✓ Economic Rate of Return (ERR) = 64.5%
 - ✓ Social Discount Rate (SDR) = 0.8%
- All the examined policies present a **positive ENPV** and an ERR higher than the SDR, indicating their feasibility over time



Cost Benefit Analysis Results – Athens (2/2)

Roussou, S., Petraki, V., Deliali, K., Kontaxi, A. & Yannis, G. (2024). Cost benefit analysis of reducing speed limits in Athens to 30 Km/h. Case Studies on Transport Policy, 101289, October 2024

- It is estimated that city-wide 30 km/h speed limits on the road network of City of Athens (with the exception of major axes) will save lives annually:
 - 33 **fatalities**
 - 83 **seriously injured** and 830 **slightly injured**
 - **fuel consumption** by 48 million litres
 - 65.5 thousand tonnes of **CO₂, NO_x και PM**
- The **traffic congestion** change is negligible
- The indirect benefits of increasing the use of **Public Transport** and **active travel** are also significant



Benefits from Countrywide New Speed Limits (New National Law expected for next month)

It is estimated that city-wide 30 km/h speed limits on the road network of all cities in Greece (with the exception of major axes) will save lives annually:

- 104 **fatalities** (out of 635 in all of Greece)
- 123 **seriously injured** (out of 636 in all of Greece)
- 783 **slightly injured** (out of 12,533 in all of Greece)



Conclusion

30km/h
Speed Limit for
Safer, Healthier and
Greener Cities



The background of the slide is a photograph of a road. In the foreground, there is a white speed limit sign on the asphalt, which is a circular sign with a blue border and a white center. The sign is slightly out of focus. In the background, there is a concrete curb and a road surface. The overall scene is a city street.

City-wide 30km/h speed limits: the road safety catalyser

The since-long waited **single road safety measure**
with such a **significant benefit** at such a low cost

Such a **high societal impact**
for such a small change in our habits

More than a simple new traffic rule:
a catalyser for a new road safety culture

Conclusion

More livable cities

Speed limits reduction gaining rapid acceptance across Europe and **more and more European cities** adopting lower speed limits

Significant socio-economic impact

The reduction of speed limits in cities (30km/h) leads to a **significant reduction** in:

- road crashes and casualties
- fuel/energy consumption and air pollution without a significant decrease in travel times

Increase of acceptance

- **Public acceptance** of speed limits reduction tends to improve over time, especially by pedestrians, cyclists and Public Transport passengers
- **Inertia and reactions** from car drivers need to be addressed



What about outside Europe?

Lessons for Global Application:

- City-wide 30km/h speed limits are very appropriate for European cities, as most of them are **densely populated areas**, with significant traffic of pedestrians, cyclists, e-scooters and motorcyclists in need of protection from cars' high speeds
- Outside Europe, 30km/h speed limits should be beneficial for the densely populated areas with high presence of **Vulnerable Road Users**, but not easily applicable for not densely populated areas with low presence of pedestrians, cyclists, e-scooters and motorcyclists



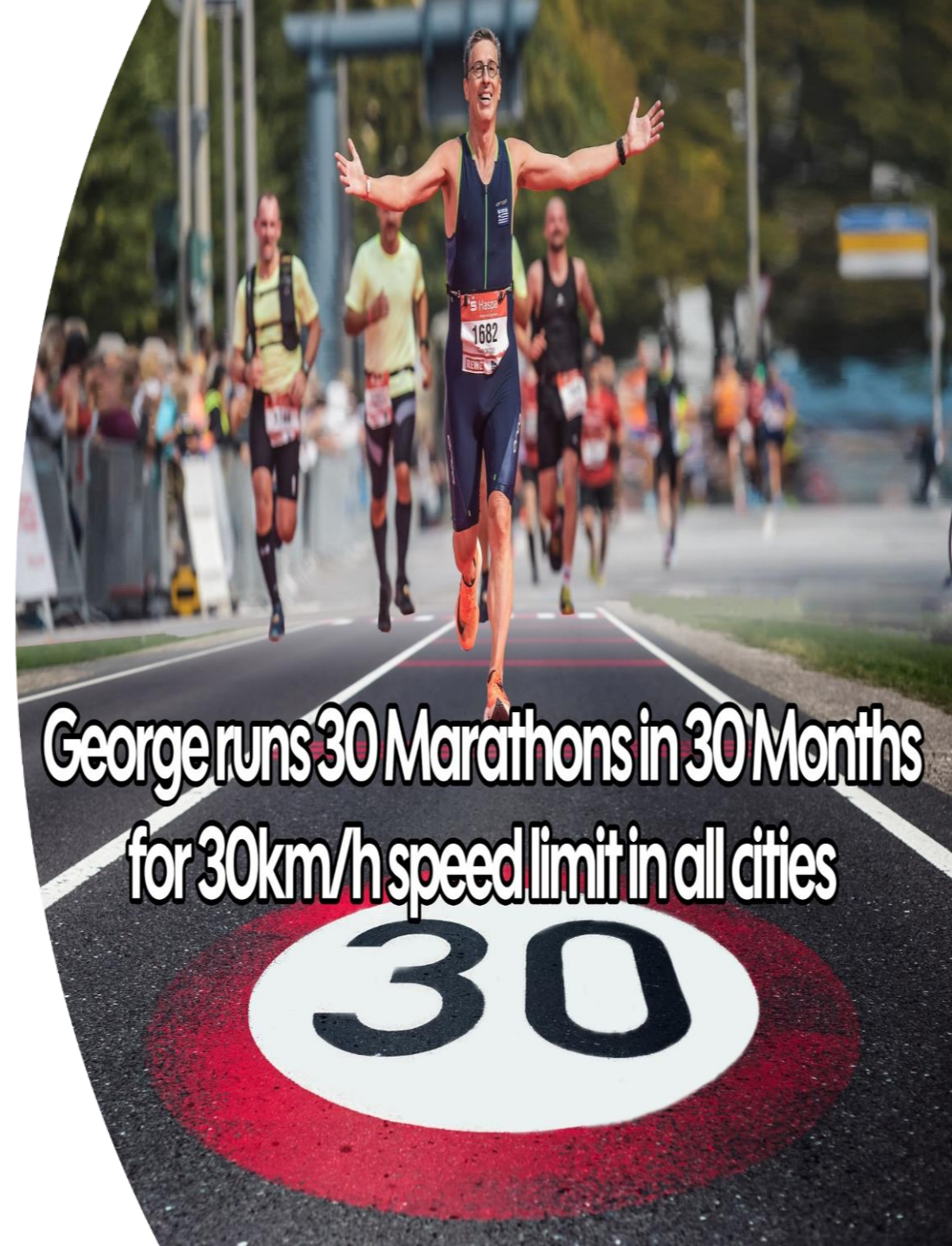
Accompanying Measures

- Public consultation and **awareness campaigns**
- **Public transport** and active mobility promotion
- Traffic **calming** measures
- **Intelligent transportation** systems
- **Monitoring** and evaluation
- **Enforcement** and police cooperation



30 Marathons Campaign

- In order to make scientists' voices louder, I engaged in a global campaign of running **30 Marathons in 30 months in order to actively promote the adoption of city-wide 30 km/h speed limit** in as many cities as possible worldwide
- This campaign was concluded in November 2024 in Athens (all Marathons in under 4 hours) with a **particularly significant global impact**





Zagori - Jul 2022

Helsinki - Aug 2022

Antwerp - Sep 2022

London - Oct 2022

Athens - Nov 2022

Valencia - Dec 2022



Malta - Feb 2023



Rome - Mar 2023



Paris - Apr 2023



Belgrade - Apr 2023



Copenhagen - May 2023



Stockholm - Jun 2023

George - 30 Marathons - 30 Months



Apeldoorn - Jul 2023



Tallinn - Sep 2023



Brussels - Oct 2023



Lyon - Oct 2023



Athens - Nov 2023



Florence - Nov 2023



Nicosia - Dec 2023



Dubai - Jan 2024



Sevilla - Feb 2024



Barcelona - Mar 2024



Paris - Apr 2024



Zurich - Apr 2024



Utrecht - May 2024



Torhout - Jun 2024



Paris - Aug 2024



Warsaw - Sep 2024



Munich - Oct 2024



Athens - Nov 2024



30

Campaign Social Impact

*An Integrated Communication Policy
with Strong Global Impact*

- **26 cities** with Marathon finish
- **10 International Organisations** Allied
- **500.000+** pageviews per year
- **100.000+** global audience at social media
- **200 republished posts** from scientific organisations and institutions (with 80.000+ post impressions)
- **40 social media** posts
- **25 interviews** in the electronic media
- **32 newspaper/magazine** articles
- **3 papers** in scientific journals
- **20 presentations** in conferences/webinars



Impacts and Evidence Webinar:
How to move from regulation to effectiveness of speed reduction strategies

Online, 14 March 2025

Review of 30 km/h speed limit benefits in Europe

George Yannis
NTUA Professor

Together with: Eva Michelaraki, Research Associate



Department of Transportation Planning and Engineering
National Technical University of Athens