



CEĻU SATIKSMES  
DROŠĪBAS PADOME



## Road Safety Performance Index debate - PIN Talk Speed and improving the safety of vulnerable road users

Rīga, Latvia, 11 September 2024

# Review of 30 km/h speed limit benefits in Europe

**Eva Michelaraki**

Research Associate

Together with: George Yannis, Professor



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

- **Critical assessment** of the effectiveness of city-wide 30 km/h speed limit in order to enhance urban sustainability
- Identification of **changes before and after the implementation** of city-wide 30 km/h speed limits in terms of:



Safety



Emissions



Energy



Traffic



Liveability

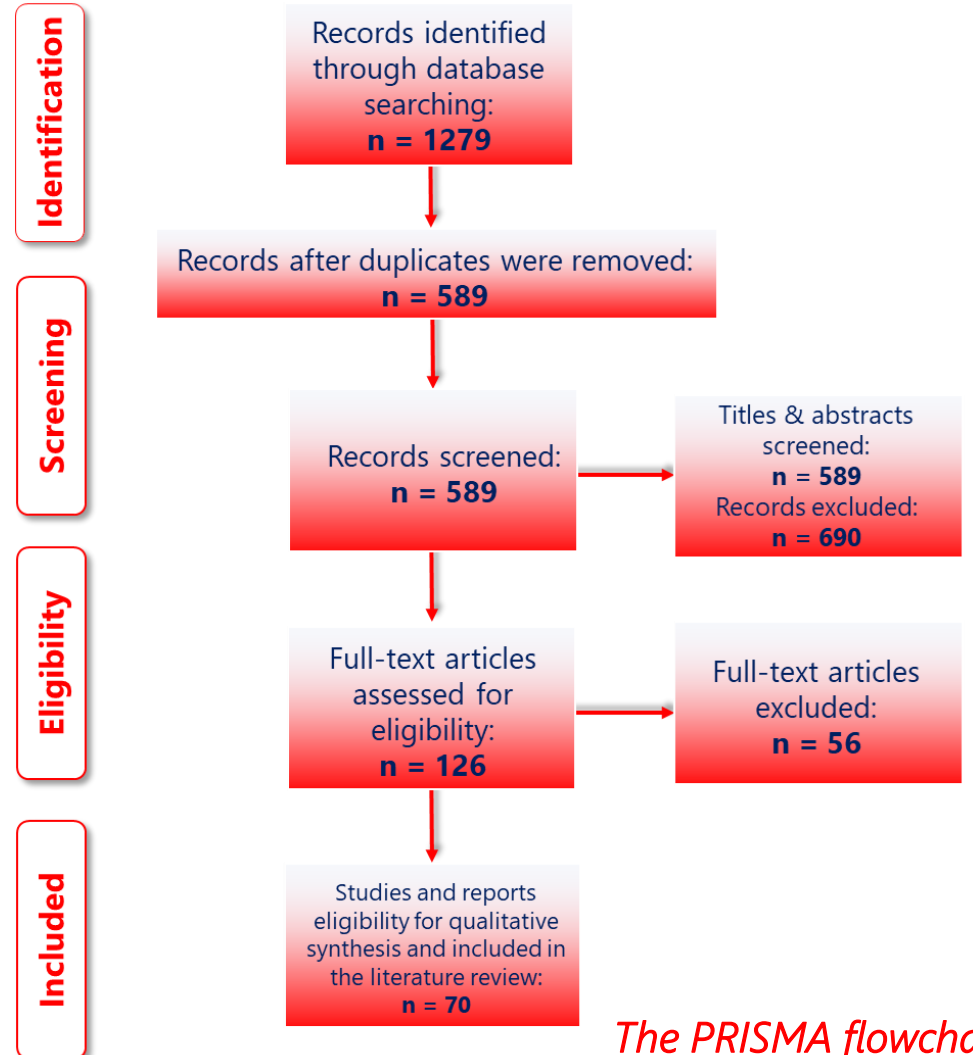


Health

# Methodology

- **Meta-analyses from 17 cities and 70 studies** 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**



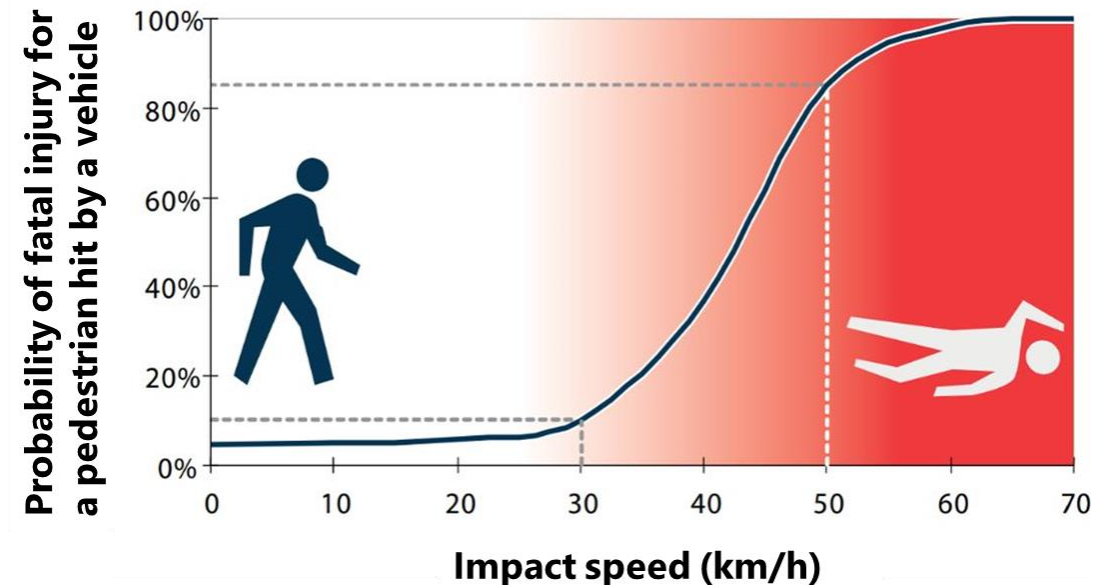
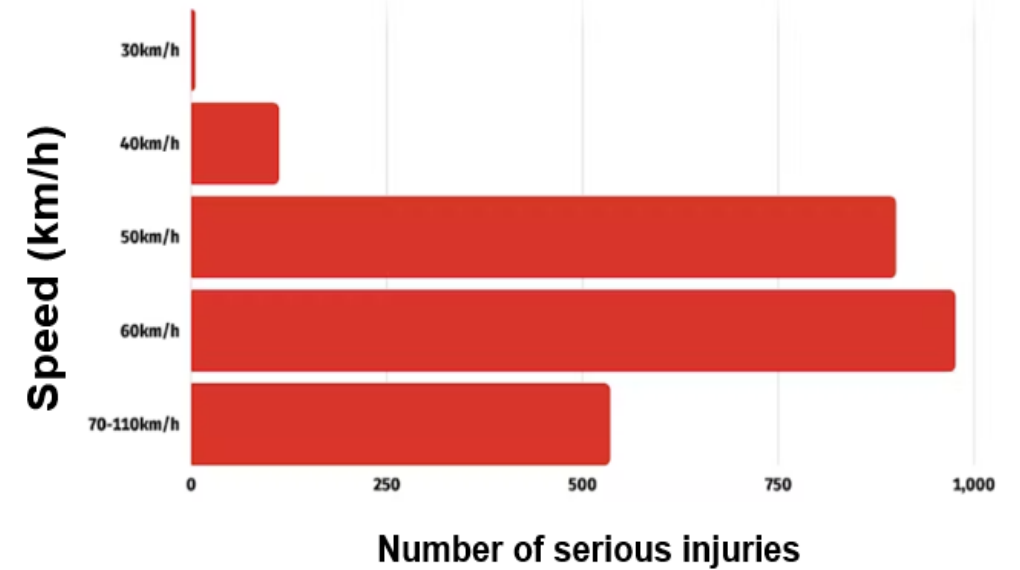
# Speeding Kills (1/2)

- 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

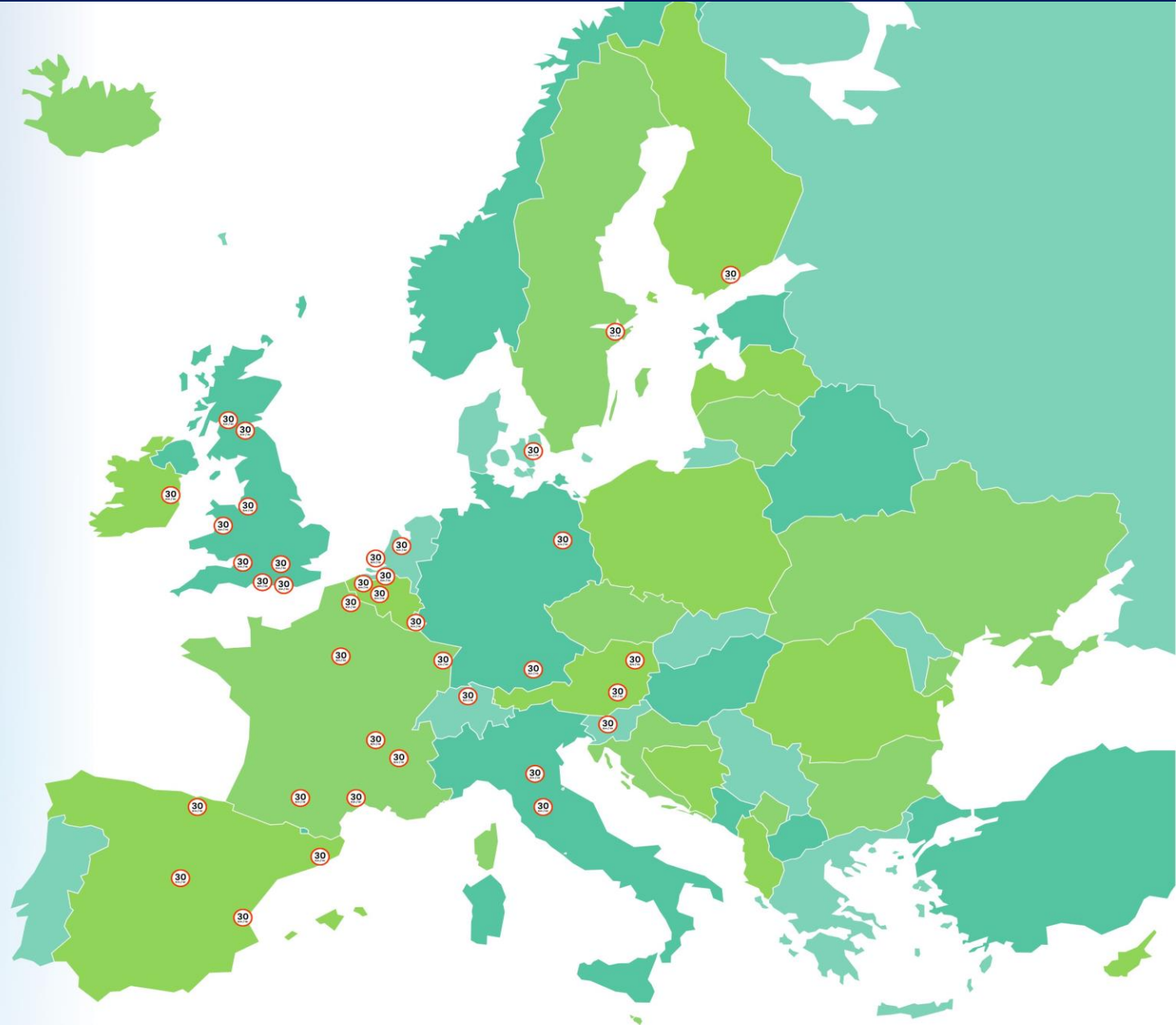


# Speeding Kills (2/2)

- 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





# Benefits from 30km/h Speed Limit (1/2)

*according to international literature*

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

## Road crashes reduction

- Reductions in speed limits are intended to improve road safety by **decreasing travelling speed** and thus reducing the risk of crashes occurring and the severity of crashes that do occur
- The risk of death is almost **five times higher** in collisions between a car and a pedestrian at 50 km/h compared to the same type of collisions at 30 km/h

## Air pollution reduction

- Streets that promote safe walking and cycling can **reduce car dependency** and harmful vehicle emissions that contribute to climate change
- City-wide 30 km/h speed limit reduce carbon dioxide and nitrous oxide emissions from diesel cars, and particulate matter emission from both diesel and petrol cars, thus **reducing air pollution**





# Benefits from 30km/h Speed Limit (2/2)

*according to international literature*

## Fuel consumption reduction

- Lower speeds lead to **lower fuel consumption**
- **Smoother traffic flow** leads to additional fuel economy (eco-driving)

## Traffic flow improvement

- **Motor traffic volumes decrease**, since slower speeds encourage active, sustainable and shared travel
- Reducing the speed limit at 30km/h improves traffic flow, **reduces congestion** and improves travel times as there is less stop/start traffic movement

## Sustainable improvement

- Calm driving in lower speeds is a mean of **healthier living** for all road users; and especially children and the elderly walk more freely
- Significant increase (in the mid-term) of **pedestrian, cyclists and e-scooter active mobility** and Public Transport passengers





# 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 from 17 cities and 70 studies)

- Fatalities by **37%**
- Serious injuries by **38%**
- Road crashes by **23%**
- Emissions by **18%**
- Noise by **2.5 db**
- Fuel consumption by **11%**
- Traffic congestion by **4%**





# 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 <sub>2</sub> , NO <sub>x</sub> , 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





# Cost Benefit Analysis Example

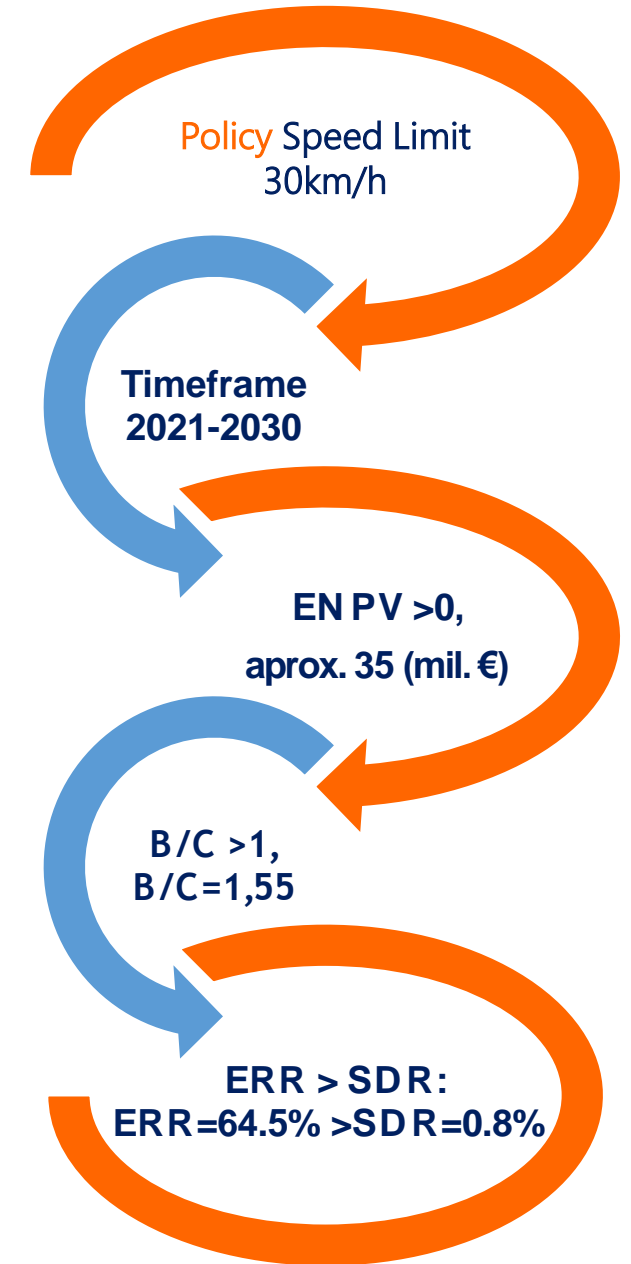




# Cost Benefit Analysis Results – Athens (1/2)

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**:

- In the case of the reduction of the speed limit to 30 km/h in the city center, the **society benefits** from a reduction in road casualties amount to **€130 million** over a 10-year period
- All the examined policies present a **positive ENPV** and an ERR higher than the Social Discount Rate (0.8%), indicating their feasibility over time
- The most important economic benefit arises due to the improvement of **road safety** through the reduction of fatalities on road crashes



# Cost Benefit Analysis Results – Athens (2/2)

- 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 **CO<sub>2</sub>, NO<sub>x</sub> και PM**
- The **traffic congestion** change is negligible
- The indirect benefits of increasing the use of **Public Transport** and active travel are also significant





# Cost Benefit Analysis Results – Greece

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





# 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:

- fuel/energy consumption and air pollution
  - road crashes and congestion
- 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





# The road safety catalyser

The implementation of city-wide 30km/h speed limit is the since-long waited, **single road safety measure with such a significant improvement** at such a low cost

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



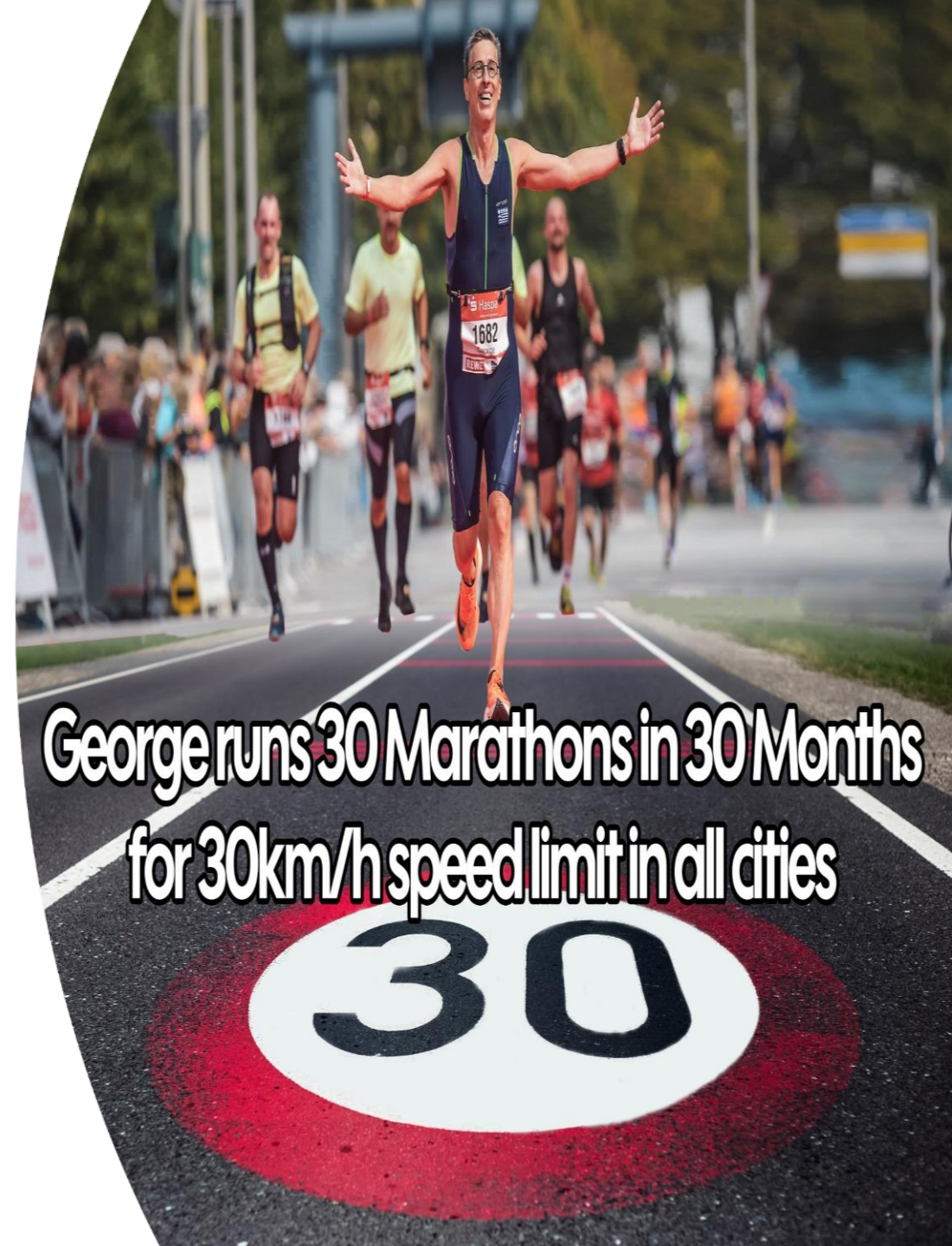
# Accompanying Measures

- 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

- Despite the blatant scientific evidence, the discussion and introduction of city-wide 30 km/h speed limit faces strong reactions and rigid inertia, whereas supporters' voices are often **weak and inefficient** resulting in hesitant politicians and Authorities
- After more than 30 years of dedication to road safety science and several Marathon races, **Prof. George Yannis** decided to step beyond the traditional scientific pleas and combine both passions for a cause: to run **30 Marathons in 30 months** to actively promote the adoption of city-wide 30km/h speed limit in as many cities as possible worldwide



**George runs 30 Marathons in 30 Months  
for 30km/h speed limit in all cities**







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



Apeldoorn - Jul 2023



Tallinn - Sep 2023



George runs 30 Marathons in 30 Months  
for 30km/h speed limit in all cities



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





CEĻU SATIKSMES  
DROŠĪBAS PADOME



## Road Safety Performance Index debate - PIN Talk Speed and improving the safety of vulnerable road users

Rīga, Latvia, 11 September 2024

# Review of 30 km/h speed limit benefits in Europe

**Eva Michelaraki**

Research Associate

Together with: George Yannis, Professor



Department of Transportation Planning and Engineering  
National Technical University of Athens