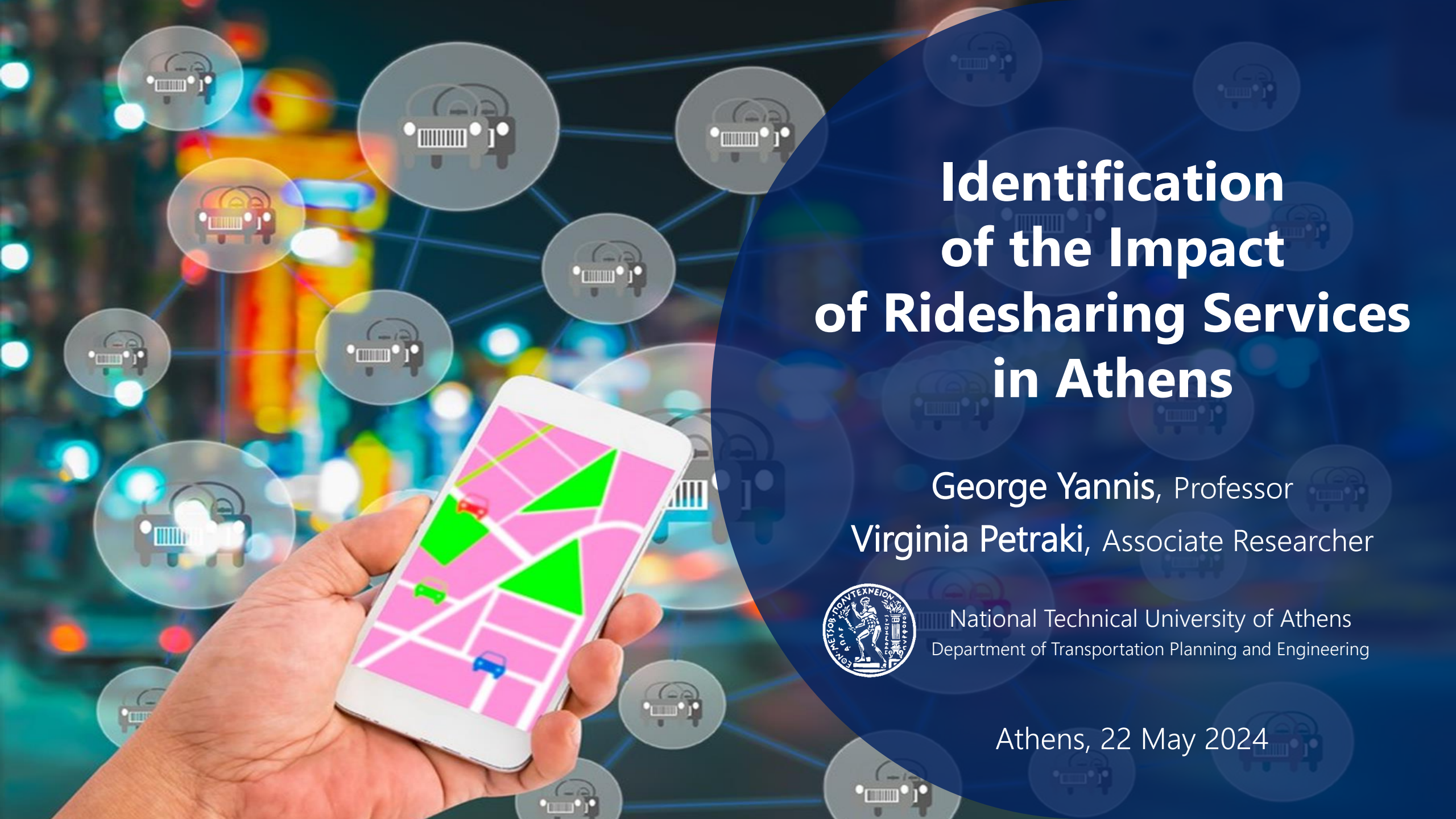

Identification of the Impact of Ridesharing Services in Athens

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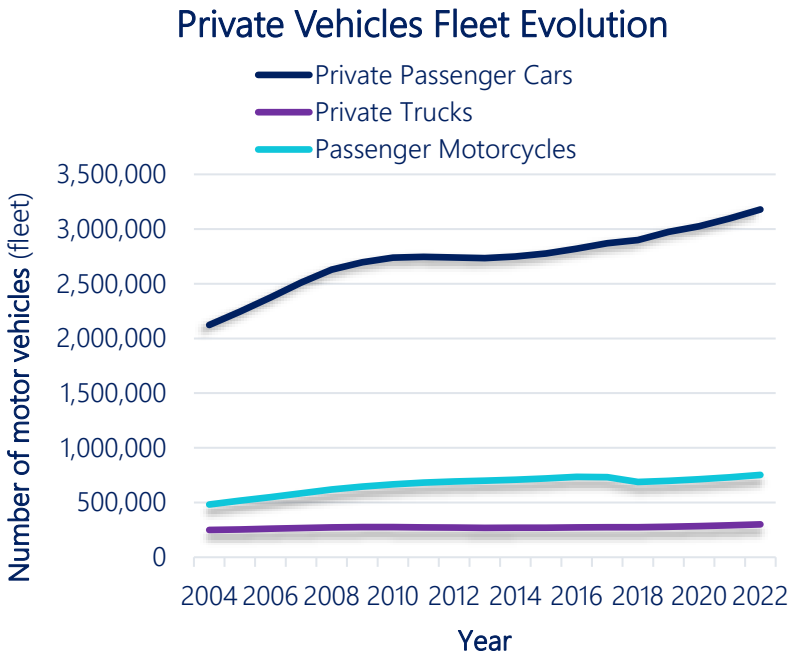
Athens, 22 May 2024

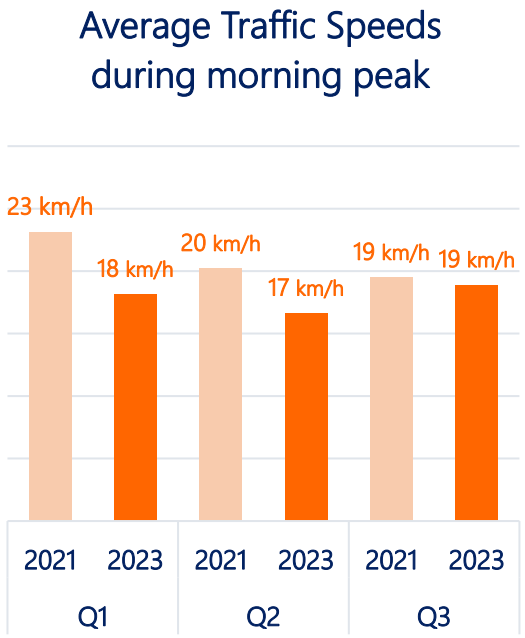
Introduction

- Urban population growth, expected to reach 82% of the global total in 2050, coupled with increased short distance trips is intensifying the challenges of urban mobility like congestion
- Sustainable urban mobility aims to meet modern needs promoting eco-friendly and innovative travel services, and controlling the use and ownership of private cars
- Innovative on-demand transport services like ride-hailing, are on the rise globally, spurred by technological advances notably smartphones, geo-localisation possibilities and ease of public access to internet
- Despite various legal, institutional and social challenges, urban travelers are increasingly embracing those services for their affordability, accessibility, and convenience

Transport in Athens

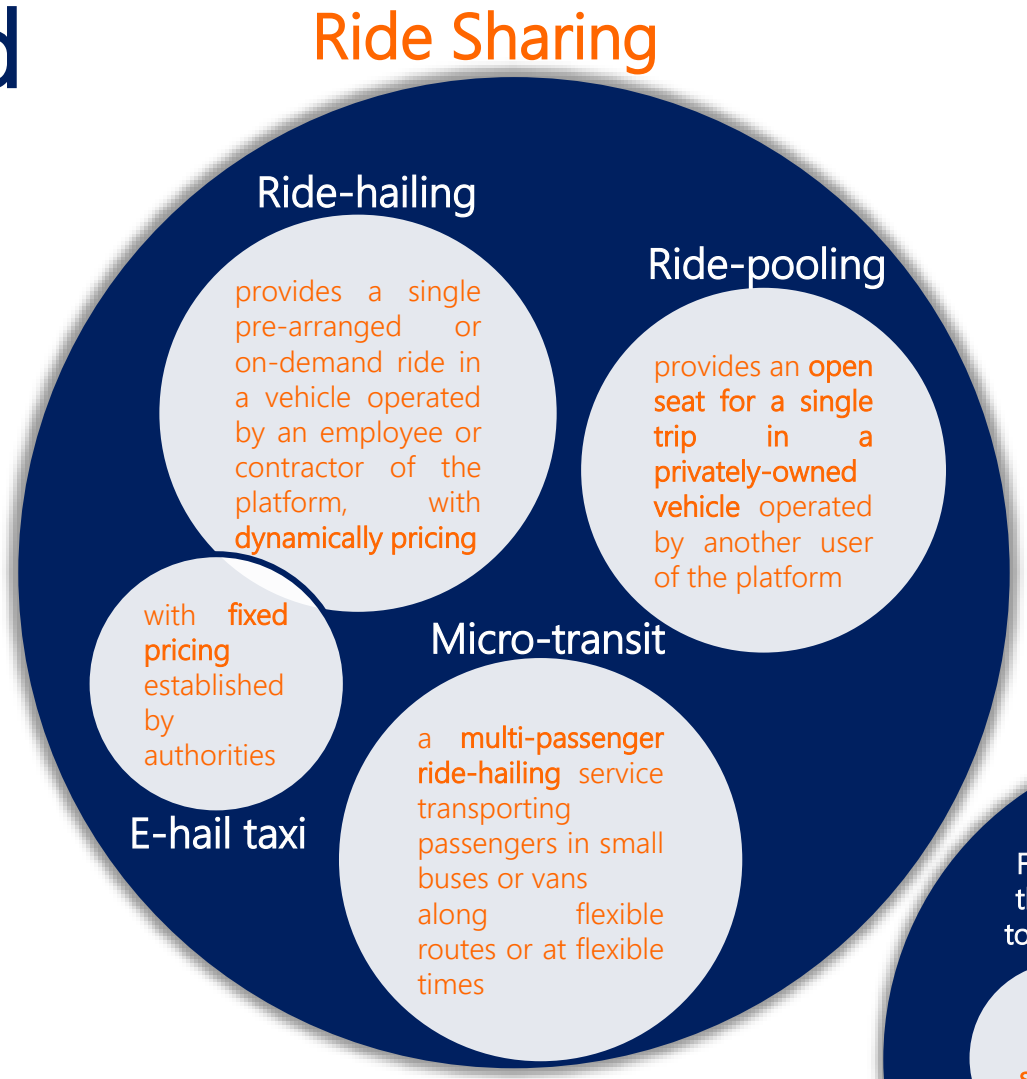
- Athens ranks as the 16th most congested city in Europe
- The average traffic speed is 18 km/h during morning peak hours
- Private cars constitute the 74% of the total vehicle fleet
- There are 13,589 taxis currently operating in Athens

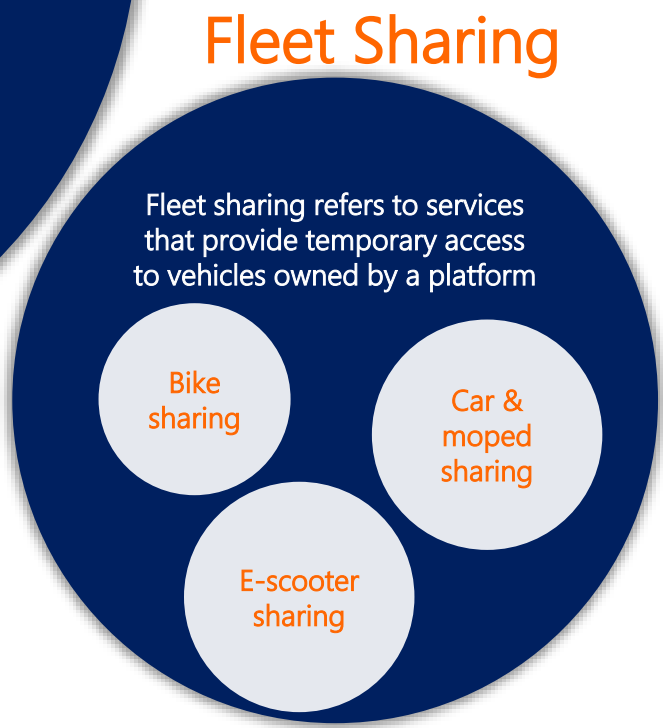




Transport on-demand

- Transport services with a car and a driver, which happen on demand of the passenger, is and has been an important part of the mobility offer available to citizens
- These services are usually carried out by taxis and/or Private Hire Vehicles with driver (PHV)
- Due to technical developments, pre-booking has basically become 'instantaneous pre-booking', blurring the differences between taxis and PHV
- Traditionally, taxi fares are set by authorities and PHV prices are negotiable between service providers and customers
- Today, when hailing a PHV on an online-app, it is generally the ride-hailing company which establishes the price dynamically for the offered service





Ridesharing in Greece

2012 Since 2012, travel agencies and car rental companies can offer services of hired cars with drivers, following prior reservation of a minimum of 6 hours

2014 Uber ride-hailing services were launched for the first time in Greece on December 2014 through UberX service, however currently only e-hail taxi services are available in Greece e.g. UberTAXI, FREENOW

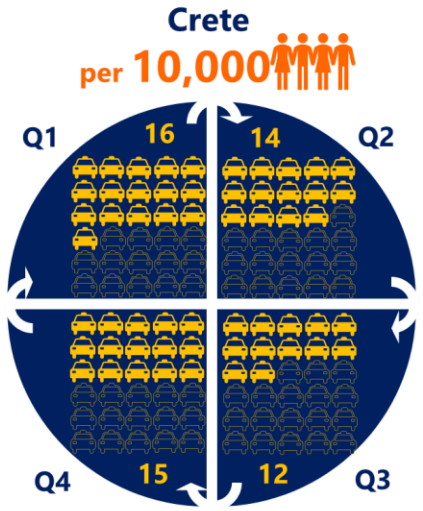
2018 The existing legal framework (Law 4530/2018) treats ride-hailing platforms as transportation service providers (and not ICT service providers), and sets strong barriers in their operations, with special focus on tariff subsidization by platforms

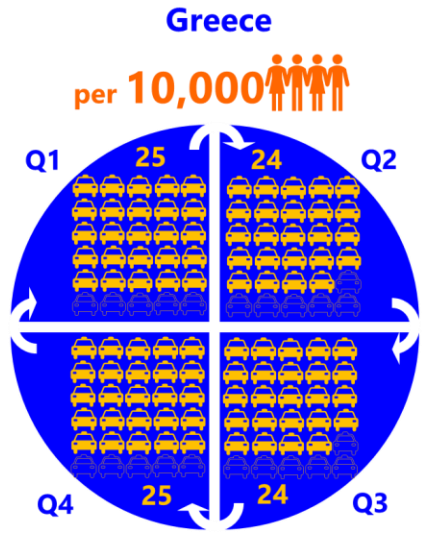
2022 EC published a 'guidance notice' (2022/C 62/01) recommending the removal of unjustified country rules (e.g minimum waiting times, license caps etc.)

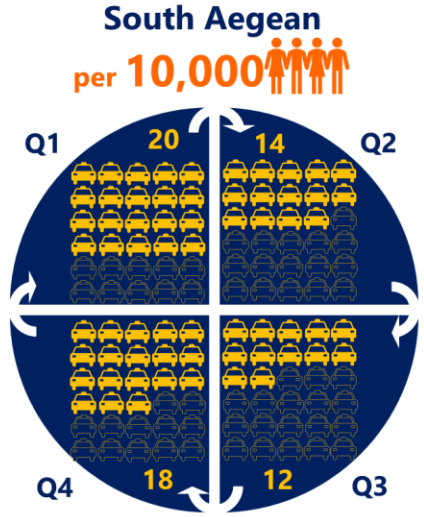
2024 To date, legislation and especially Law 4530/2018 provisions set strong barriers in the introduction of ride-hailing services

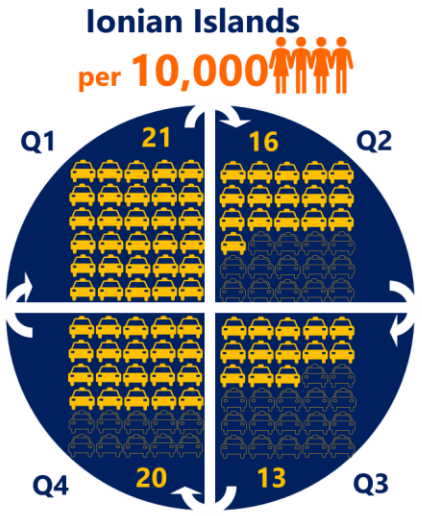
Ridesharing in Greek Islands

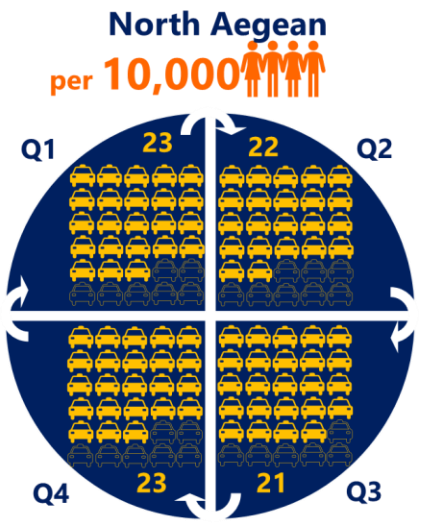
- The transportation needs vary widely across the islands, yet a common challenge emerges: local road transport services struggle to meet transportation demand due to high seasonality
- While taxis, public buses and rental cars have long been the mainstay of transportation services, the need for more flexible, efficient, and cost-effective travel options is increasingly apparent
- The availability of taxis is critically low, with Ionian islands and South Aegean islands, including the islands of Rhodes and Mykonos, dropping to only 12 taxi available per day and per 10,000 travelers during July to September
- Crete exhibits the lowest ratio of available taxis per travelers compared to other islands and is also lower than the national average
- This low availability, coupled with the stringent taxi market regulations and the inadequate frequency and coverage of public buses, leads to a reduced quality of transport services











Scope & Objective

Scope

The market and socioeconomic impact analysis for the full deployment of real-time, fee-based ridesharing services in Athens

Objective

The assessment of ridesharing impacts in the Athens economy and society as well as the emergence of ridesharing service in Greek islands

Methodology

Socioeconomic Analysis

Ridesharing **Business Models Definition** for Athens

Market Analysis for ridesharing in Athens

Estimation of the Initial Investment and Operational **Costs**

Estimation of the Ridesharing **Benefits**

Estimation of the **Economic Performance** of each Scenario through NPV and IRR

Business Models

Given current conditions and prospects in the Athens transportation market, service provision and possible legislative regulations, a fairly regulated market could consider 2 alternative business models for introducing ridesharing services:

Scenario A (Fully licensed service provision)

It assumes that ridesharing services are **offered by car-rental companies and travel agencies**, as a car-hiring service with professional drivers (Europe)

- **Abolishing the minimum duration of the service** for car-rental-with-a-driver (OECD's recommendations)
- Removing the artificial segmentation of the market, consumers will benefit from **choosing freely from a wider range of services**
- Services are only **booked online or via telephone** (street hailing are not possible)

Scenario B (Light licensed service provision)

It considers ridesharing services **offered by properly licensed individuals** in the form of small businesses (mainly out of Europe)

- **Market entrance** is allowed at a small fee, to any interested individual complying with pre-defined standards for vehicles and driver qualifications
- Regulated real-time ridesharing offered by individuals, but street hailing is reserved for taxis only
- Services are only booked online, and telephone reservation or **street hailing are not possible**

Socio-economic Analysis

- The socioeconomic analysis is performed up to **2030** and considers:
  - **Scenario A (full)**: a scenario requiring full licensing of services
  - **Scenario B (light)**: a light-licensing scenario
- Each Scenario is compared with the **Business-as-Usual Scenario (BAU)** where no ridesharing service is available
- **For each Scenario**, the following initial and operational costs and the direct socio-economic benefits are estimated

Costs (-)

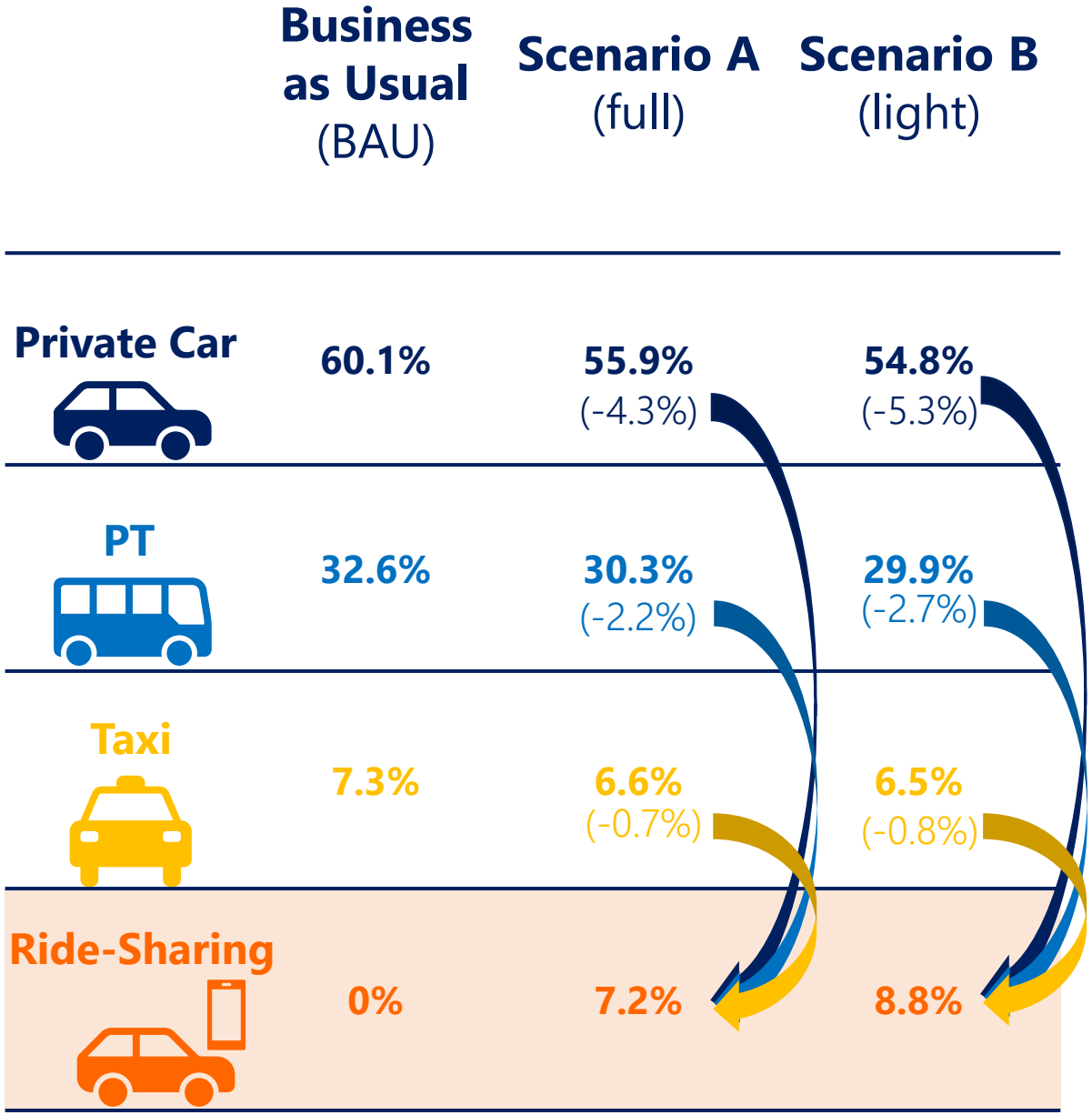
- **Initial Investment Cost**
  - Professional Driver License
  - Vehicle Purchase Costs
  - Administrative Costs
- **Ridesharing Drivers Operational Costs**
  - Ridesharing Operational Costs
  - Ridesharing Platform Cost
  - Vehicle Leasing

Benefits (+)

- **Ridesharing Users Surplus**
  - Travel Time Savings
  - Private Vehicle Operating Cost Savings (VOCs)
- **Externalities**
  - Reduction in Road Casualties
  - Environmental Impact (CO_2, NO_x)

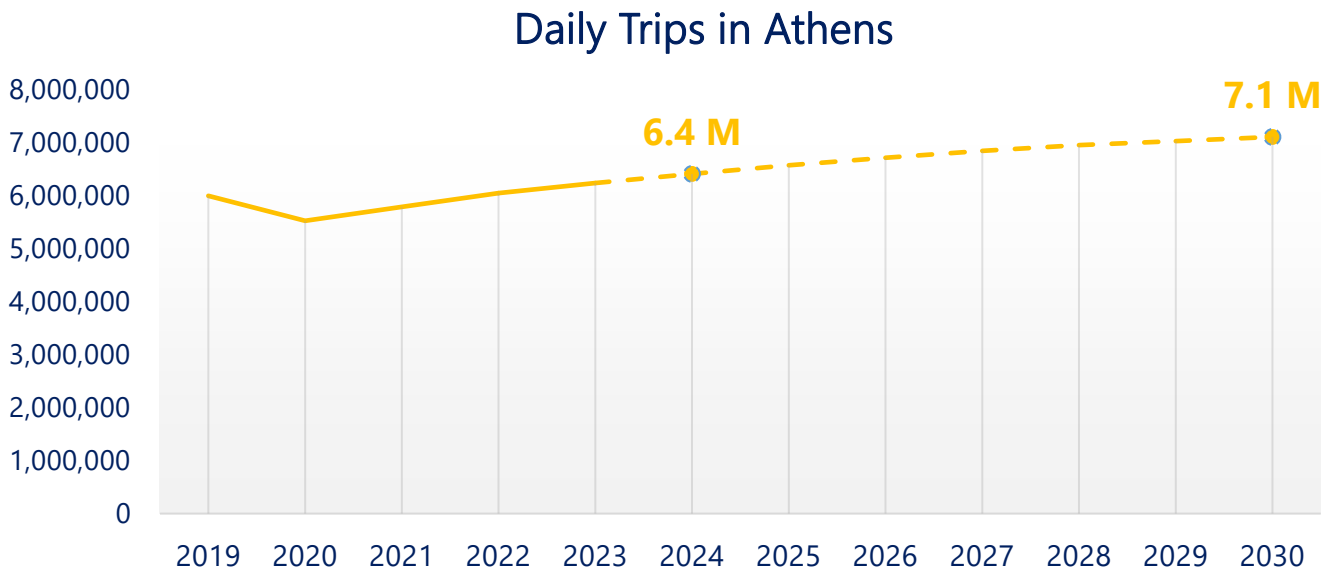
Mode Choice Model

- We interviewed 440 Athenians, aiming to investigate
  - the level of understanding ridesharing services
  - the level of choosing ridesharing services over other travel options, in the case of introducing real-time, fee-based ridesharing services in Athens
- A multinomial logistic regression model was developed to define the utility of private car, taxi, Public Transport and ride-hailing services
- Travel time, cost and comfort were selected for representing choice preferences
- The introduction of ridesharing in Athens:
  - is expected to have a positive impact towards reducing private car usage over the BAU scenario,
  - while it will slightly affect usage for public transport and taxis



Demand Analysis

- Typical daily linked person-trips in Athens are estimated at about 6 million during 2019 and are anticipated to grow, following estimated trends of the country's GDP until 2030
- Ridesharing services in Athens is estimated to attract from 647K to 772K daily travelers up to 2030
- Total daily demand for ridesharing in person-trips is estimated for target year 2030; this consists of the following parts:



		Scenario A (full)	Scenario B (light)
Base Demand	trips attributed to shifting travelers from other modes, based on trip forecasts of previous years	**512,141 trips**	**625,950 trips**
Induced Demand	additional trips generated due to the full deployment of ridesharing services	**114,302 trips**	**126,150 trips**
Seasonal Demand	additional trips due to non-captured, recent increase in tourism flows in Athens	**20,274 trips**	**20,274 trips**
	Total Daily Person Trips	**646,717 trips**	**772,373 trips**
	Total Daily Vehicle Trips	**380,422 trips**	**454,337 trips**

Costs

Considering the different business structure of each scenario, the costs are estimated as follows:

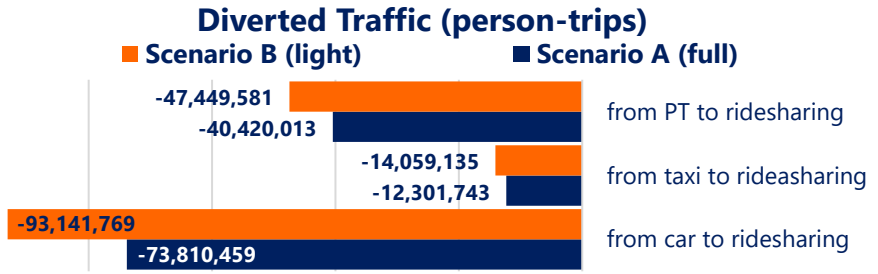
		Cost Type	Description/ Equation	Scenario A (full)	Scenario B (light)
Investment	1	Professional Driver Licenses	= (New ridesharing drivers) × (License cost)	●	
	2	New cars purchase	= (Av. shadow price of a new car) × (Ridesharing drivers) × (%Drivers who will buy a new car)		●
	3	Market entrance	= (Ridesharing drivers) × (Market entrance fee)		●
Operational	1	VOCs	This cost includes the fuel, maintenance & tires costs for ridesharing drivers	●	●
	2	Platform fee	= (Platform fee%) × (Shadow ride cost) × (Ridesharing veh − trips)	●	●
	3	Leasing	= (%leasing cars) × (Leasing cost) × (Leasing months/year)	●	

Benefits

Ridesharing Users Surplus

Travel Time Savings

Travel time savings refer to the **monetized time gains because of traffic diverted to ridesharing** services from private cars, taxi & Public Transport



Vehicle Operating Costs (VOCs)

- VOCs are defined as the **costs borne by owners of vehicles to operate them**, including fuel consumption, tires deterioration, maintenance costs, etc.
- **The avoided VOCs for the users switching from private cars to ridesharing services** are estimated

Externalities

Reduction in Road Casualties

- Reduction in road casualties is estimated by considering **a lower crash risk** (measured in injuries per vehicle-kilometer) for ridesharing and taxi drivers, compared to private cars and public transport
- The **Value of Statistical Life** (VOSL) is considered

Environmental Impact (CO_2, NO_x)

To estimate the total volume of emissions avoided from the full deployment of ridesharing services in Athens, the following parameters are considered: (●) annual vehicle kilometers per mode, (●) emission factors expressed in gr/ km, (●) unit costs per pollutant expressed in €/ ton

Benefits Estimation

Ridesharing Users Surplus

Travel Time Savings

$$= \sum_i \left(\frac{Diverted\ Person-trips}{year}\right)_i \times \left(\frac{Travel\ time\ saving}{trip}\right) \times (Value\ of\ Travel\ time)_i$$

Vehicle Operating Costs (VOCs)

$$= \sum_i \left((fuel\ cost) \times (fuel\ consumption)_i \times \left(\frac{Vehicle-km}{year}\right)_i \right) + Tires\ Cost_i + Maintenace\ Cost_i$$

Externalities

Reduction in Road Casualties

$$= \sum_i \left(\left(\frac{light\ injuries}{veh-km}\right)_i \times (0.05M€) + \left(\frac{serious\ injuries}{veh-km}\right)_i \times (0.3M\ €) + \left(\frac{fatalities}{veh-km}\right)_i \times (2M\ €) \right) \times \left(\frac{Vehicle-km}{year}\right)_i$$

Environmental Impact (CO_2, NO_x)

$$= \sum_i \left(\frac{€}{\text{ton of pollutant}}\right) \times \left(\frac{Veicle-kilometers}{year}\right)_i \times \left(\frac{\text{tones of pollutant}}{km}\right)_i$$

Benefits up to 2030

For society

Road Safety

21
less **road fatalities**

116-150
less **road injuries**

Traffic

92-116
million
less hours travelling with private cars

2-2.6
minutes
travel time savings per average trip

Employment

17-36
thousand
addition full & part time jobs
by the market shifting from private cars

Urban Space

1.7-2.1
sq. km
urban space savings

For the environment

Fuel Consumption

29-37
million lt
fuel savings from private cars

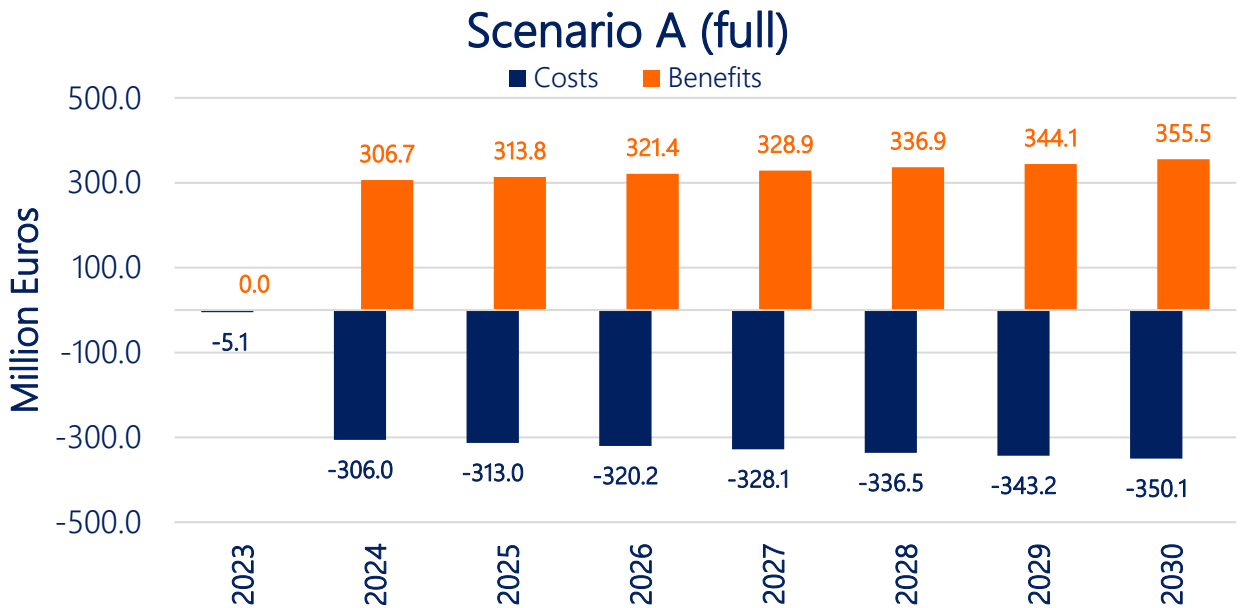
Emission

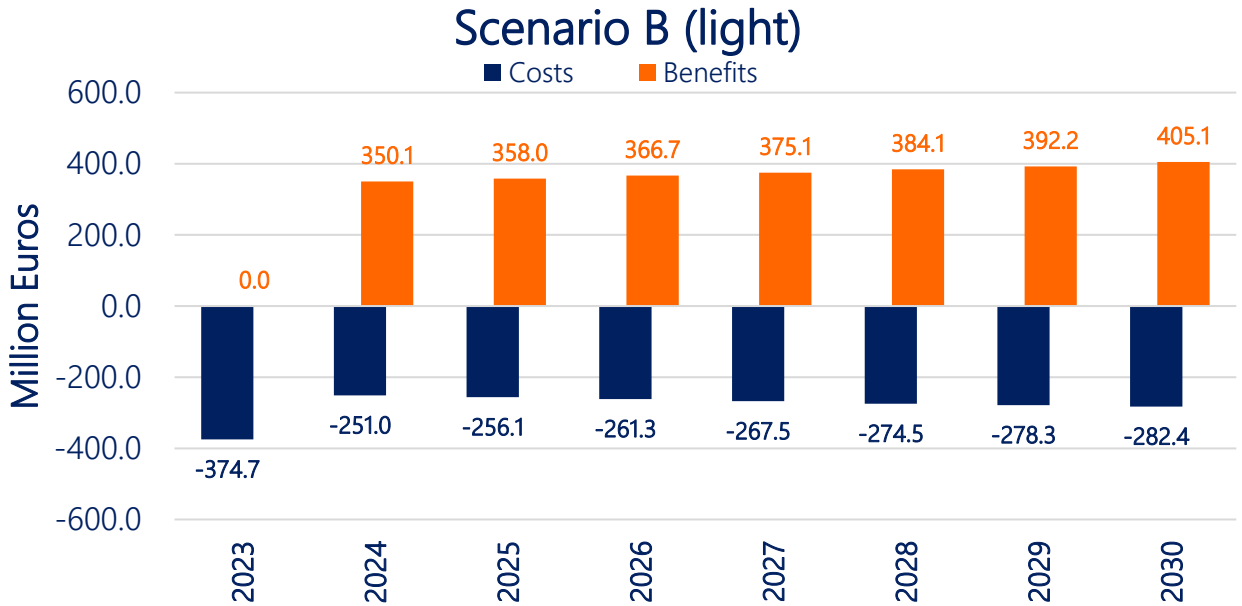
71-90
million kg
CO_2 savings

Economic Performance

- Investigation of the economic performance until the year 2030, discounting using a Social Discount Rate equal to 5%
- Identification of the economic feasibility using the following criteria:
  - Net Present Value (NPV) > 0
  - Internal Rate of Return (IRR) > Social Discount Rate (5%)
- Both Scenarios meet the feasibility criteria

	Scenario A (full)	Scenario B (light)
NPV	2.7 mil. €	237.9 mil. €
IRR	15%	21%





Discussion

- The diverted travel time mainly from private cars to ridesharing causes the most important economic benefit (47%-51%) comparing to the overall impact
- It is observed that both ridesharing scenarios are economic feasible showing a positive NPV and IRR indicators greater than the considered social discount rate (5%) with Scenario B (light) presenting the highest NPV
- By the year 2030, the adoption of ridesharing services in Athens metropolitan area is expected to:
  - ✓ attract **travelers mainly from private cars, reducing private cars use**
  - ✓ create **full and part-time driver jobs**
  - ✓ **reduce travel time**
  - ✓ **save public spaces** by reducing the need for parking
  - ✓ **reduce CO_2 emissions and fuel consumption**
  - ✓ **improve road safety**

Conclusions

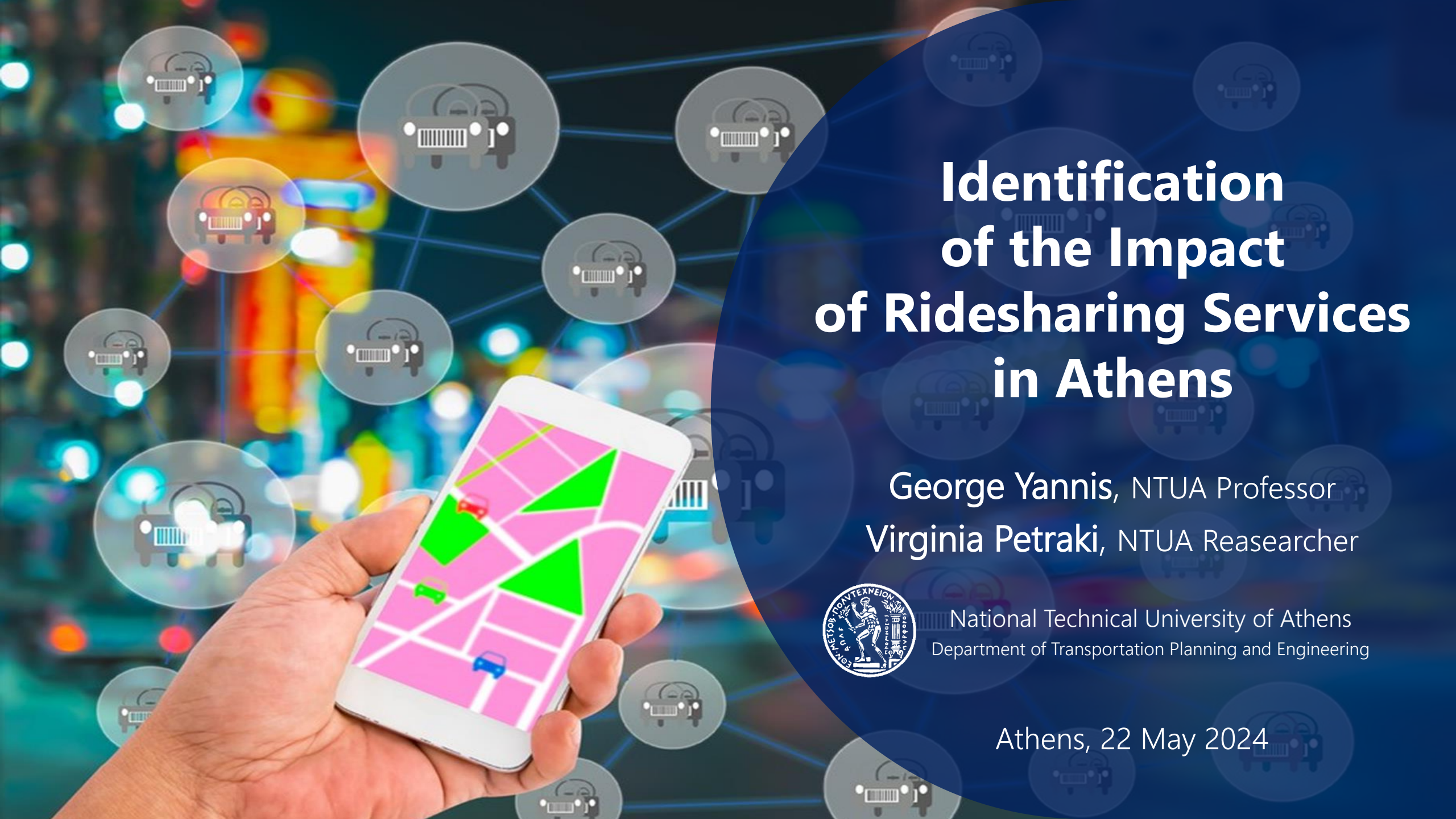
- In Greece, real-time ridesharing services are currently under restricting regulatory schemes, which somehow limit the potential of implementing a shared economy
- With the introduction of ridesharing in Athens, travelers would mostly shift from private cars (4.3% to 5.3%) and to a much lesser extend from Public Transport (2.1%-2.7%) and taxis (0.7%-0.8%)
- The introduction of both ridesharing Scenarios in Athens contribute significantly to social welfare contributing positively to economy, traffic conditions, pollution and road safety
- The introduction of ridesharing services in Greece is a matter of vital upgrading of tourists convenience, supporting sustainable tourism and economic growth

Key Messages

1 The introduction of ridesharing in Athens, in a fair regulated manner, could **benefit the economy and the society**

Ridesharing services attract commuters mainly from private cars and few from taxis 2

3 Ridesharing services can contribute to a better quality of transportation service for the tourists of Athens and the Greek islands



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