16-17 June, 2021
2021 HERAKLION MTS2021 VIRTUAL EVENT
7th International IEEE Conference on Models and Technologies for Intelligent Transportation Systems

# Investigating the acceptance of an environmental transport charging policy.

## The case of Athens.

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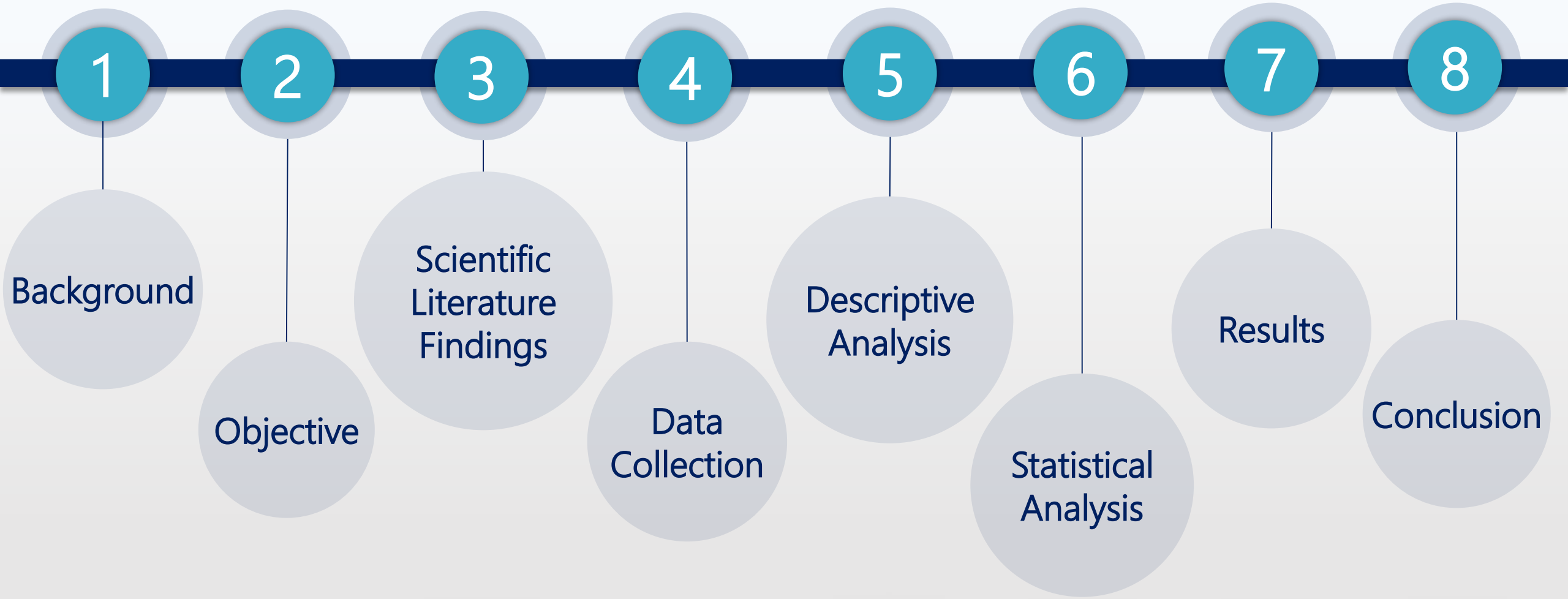
17 June 2021

# Outline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# Background

- Considering that the 60% of European citizens live in cities of over 10,000 inhabitants, the environment and the life quality in urban areas are of vital importance
- The average Greek driver spends approximately 36 hours in traffic congestion, the 5th higher waste of time comparing to other European countries
- Transport charging policies consist a basic tool for sustainable mobility while they are increasingly applied in urban centers
- Several cities apply access regulations into urban areas such as Congestion Charging Zones (CC), Low Emission Zones (LEZs) or a combination of both
- However, there is an important precondition for the successful implementation of urban access restriction schemes; that is public acceptability

# Objective

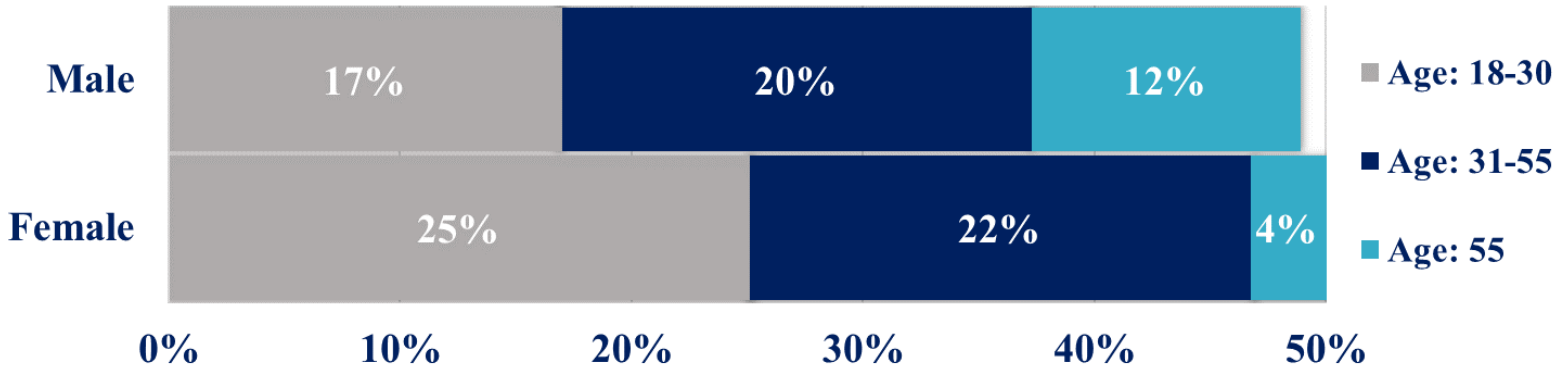
- The objective of the present research is to investigate the drivers' acceptance of the Annual Congestion Charging Card in Athens, based on questionnaire data and through a stated preference survey
- The Annual Congestion Charging Card is a suggestion for an urban access restriction policy for passenger cars access in the center of Athens
- The principle of that policy is the annual charging of passenger cars for the burden they cause on traffic and consequently on the environment and public health, with a charging variable depending on the year of 1st Registration of each vehicle

# Scientific Literature Findings

- Results of the implementation of transport charging policies in urban centers include:
  - Reduction of traffic congestion
  - Reduction of air pollution
  - Reduction of traffic noise
  - Increase the use of Public Transport
- Significant progress has been made on understanding public acceptance of transport charging policies
- Factors that affect public acceptance are:
  - Demographics (Gender, Age)
  - Personal-outcome expectations
  - The concrete use of its revenue
  - The complexity of the charging scheme

# Data Collection

- A questionnaire-based survey
- Study Area: Athens
- 370 valid answers
- Questionnaire Structure




## **Section A**: Drivers' Travel Profile

- Main transport mode
- Weekly Trips & Travel Cost
- Drivers' satisfaction on their typical daily trip
- Car's characteristics (Euro standard, cc, fuel type)

## **Section B**: Environmental Awareness

- General environmental questions
- Environmental problems related to road transport
- Degree of acceptance of environmental transport charging policies

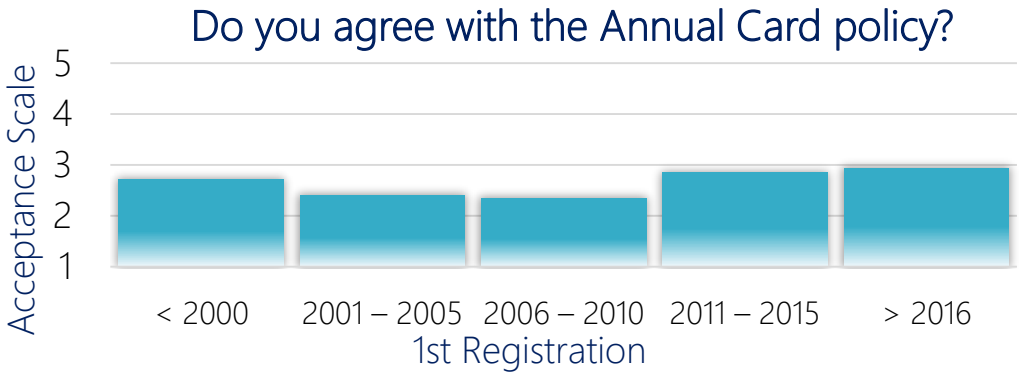
## **Section C**: Annual Card Scenarios

- Depending on the age of the vehicle (1st Registration), **3 possible Annual Card fees** (low, medium, high) have been set
- The driver is asked to answer if she/he is willing to pay the 3 possible annual card fees to reduce by **5, 10 or 15 minutes** her/his daily typical trip

## **Section D**: Demographic Characteristics

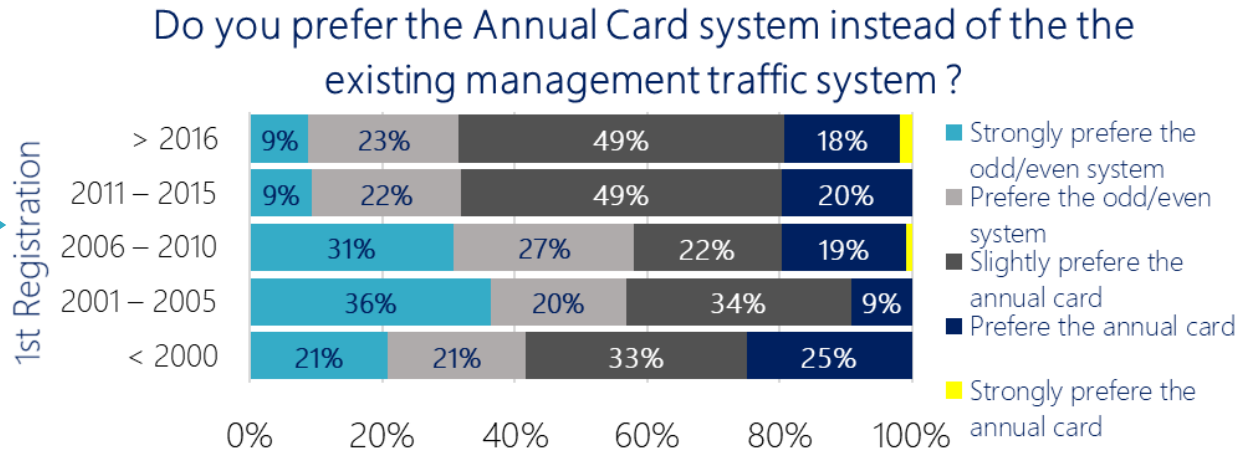
- Gender
- Age
- Annual Income
- Education Level

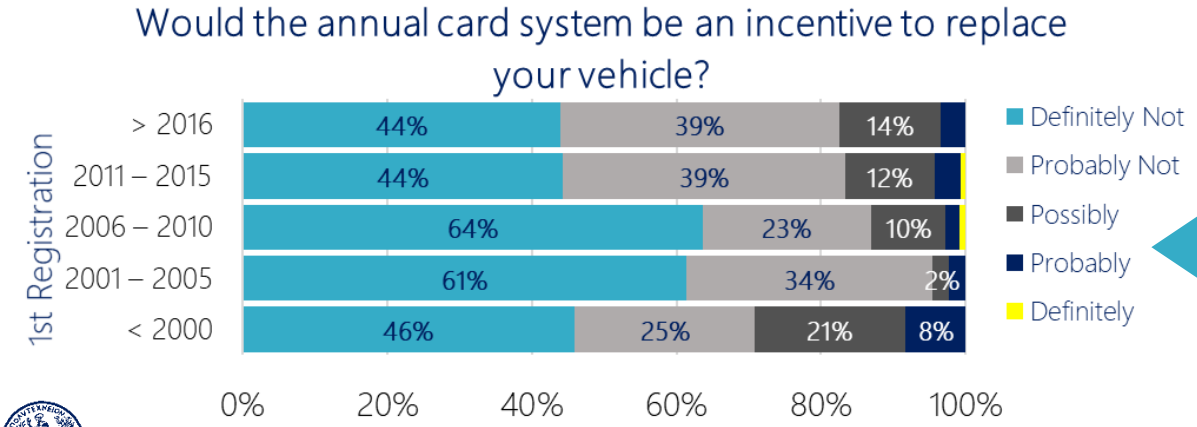
# Descriptive Analysis




- Most drivers are willing to accept the Annual Card policy for their access into the center of Athens
- Respondents with the newest and oldest technology cars accept the proposed policy to a greater extent compared to those who own a car with 1st Registration between 2001 - 2010

- The 57% of survey participants prefer the Annual Card instead of the existing management traffic system in the center of Athens (Athens Ring)
- The owners of vehicles with 1st Registration >2015 are more positive towards the Annual Card system




- 1 out of 3 older technology vehicle owners is willing to replace her/his car in case that annual card system is applied
- Drivers of cars with 1st Registration between 2001 - 2005 have the lowest percentage of willingness to replace their car

# Statistical Analysis

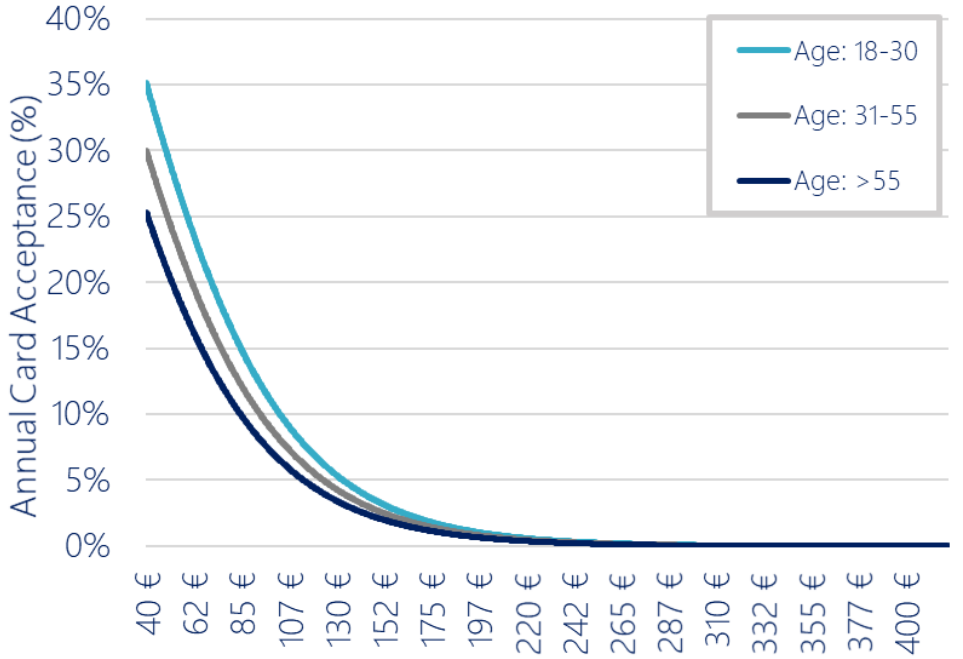
- A Binary Logistic Regression model was developed to identify public acceptance of the proposed environmental transport charging policy in Athens

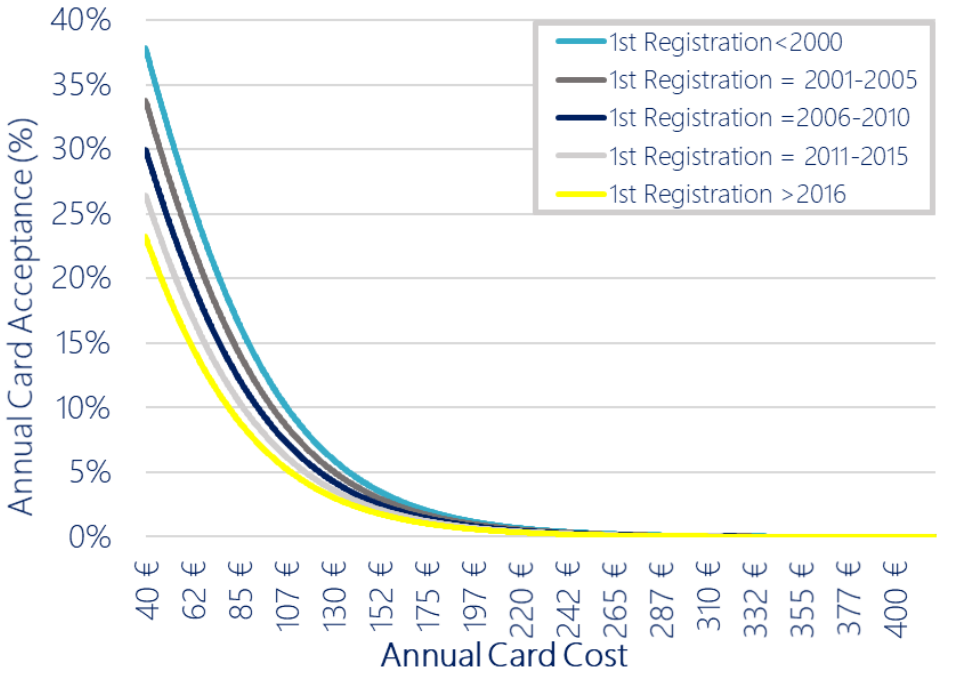
| Independent Variables | Description | B | Std. Error | Wald | Sig. | Absolute elasticity | Relative elasticity |
|---|---|---|---|---|---|---|---|
| Annual Card Cost | Three different price values depending on the year of 1st Registration of the respondent's car<br>• Low=40-140€, Medium=80-280€, High=160-560€ | -0.026 | 0.002 | 187.327 | 0.000 | -14.332 | 60.25 |
| Travel time saving | The time saving of a typical everyday trip in case of the implementation of the Annual Card<br>• 5, 10 ,15 minutes | 0.336 | 0.022 | 230.029 | 0.000 | 2.555 | -10.74 |
| Gender | Respondent's gender<br>• Female, male | -0.272 | 0.148 | 3.285 | 0.032 | -0.176 | 1.00 |
| Age | Respondent's age<br>• Age Groups: 18-30, 31-55, 55+ | -0.326 | 0.114 | 7.890 | 0.040 | -0.238 | 1.00 |
| Private car's 1st registration | The year of 1st Registration of the respondent's passenger car<br>• ≤2000, 2001-2005, 2006-2010, 2011-2015 and ≥2016 | -0.164 | 0.085 | 3.729 | 0.039 | 0.406 | 1.70 |
| Weekly trips for work & education | The number of trips that occur in the greater area of Athens per week for work or education | 0.511 | 0.122 | 17.687 | 0.000 | 0.735 | -3.09 |
| Engine capacity | The engine capacity of the respondent's passenger car | 0.483 | 0.057 | 21.743 | 0.000 | 0.385 | -1.62 |
| Annoyance from exhaust fumes | The annoyance level from exhaust fumes on roads and from road traffic noise in the center of Athens, respectively<br>• 1=not at all annoying,..,5=very annoying | 0.105 | 0.129 | 3.043 | 0.000 | 1.056 | -4.44 |
| Annoyance from road traffic noise | | 0.603 | 0.098 | 32.433 | 0.089 | 0.349 | -1.47 |
| Constant | - | -6.156 | 0.750 | 65.804 | 0.000 | - | - |
| Adjusted $R^2$ | | 0.453 | | | | | |

# Results

- The Annual Card cost has the most significant influence and is the main factor that affects the level of acceptance of that policy
- An increase of 1% of the Annual Card cost decreases the possibility of acceptance by 14.3 %
- The time saving of a typical travel with a car is also a critical factor, an increase of 1% of the travel time saving increases the acceptance by 2.5 %
- The third most important factor is the level of annoyance from the exhaust gases on roads, an increase of 1% of that variable increases the acceptance of the Annual Card by 1%
- Respondents:
  - who make many weekly trips for the purpose of work/education,
  - who drive old technology and large capacity cars
  - disturbed by traffic noise
  - who are men and young

  are more likely to accept the Annual Card system than the other ones



# Conclusions

- Most drivers are willing to accept the Annual Card policy for their access into the center of Athens
- The cost of the Annual Congestion Charging Card is the main factor that affects the acceptance of the policy - an increase in the annual charging leading to a decrease in public acceptance
- The next most significant factor that affects positively the public acceptance is the travel time saving of a typical trip in case of the implementation of the Annual Card
- A respondent who is more environmental aware is more likely to accept the present transport charging policy
- Considering demographics, men and young drivers are more positive on the Annual Card policy
- Considering the adequate goodness-of-fit measures, the main contributing factors of Annual Congestion Charging Card acceptance have been captured by the current study

# Future Challenges

- The investigation of the socio-economic impact of the Annual Congestion Charging Card in Athens based on the estimated level of acceptance should be further explored
- Additional environmental charging policies could be explored, like :
  - incentives to purchase new technology vehicles,
  - circulation tax,
  - parking fees and,
  - motorway tolls
- Any environmental/ congestion charging plan requires strong social acceptance and related political support

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