Ucarpooling: decongesting traffic through carpooling using automatic pairings

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PROCIENCIA
PROGRAMA PARAGUAYO PARA EL DESARROLLO DE LA CIENCIA Y TECNOLOGÍA

60 años 1960-2020 "Compromiso de la Iglesia con el Paraguay"

Universidad Católica Nuestra Señora de la Asunción

UNIVERSITÀ DI TRENTO

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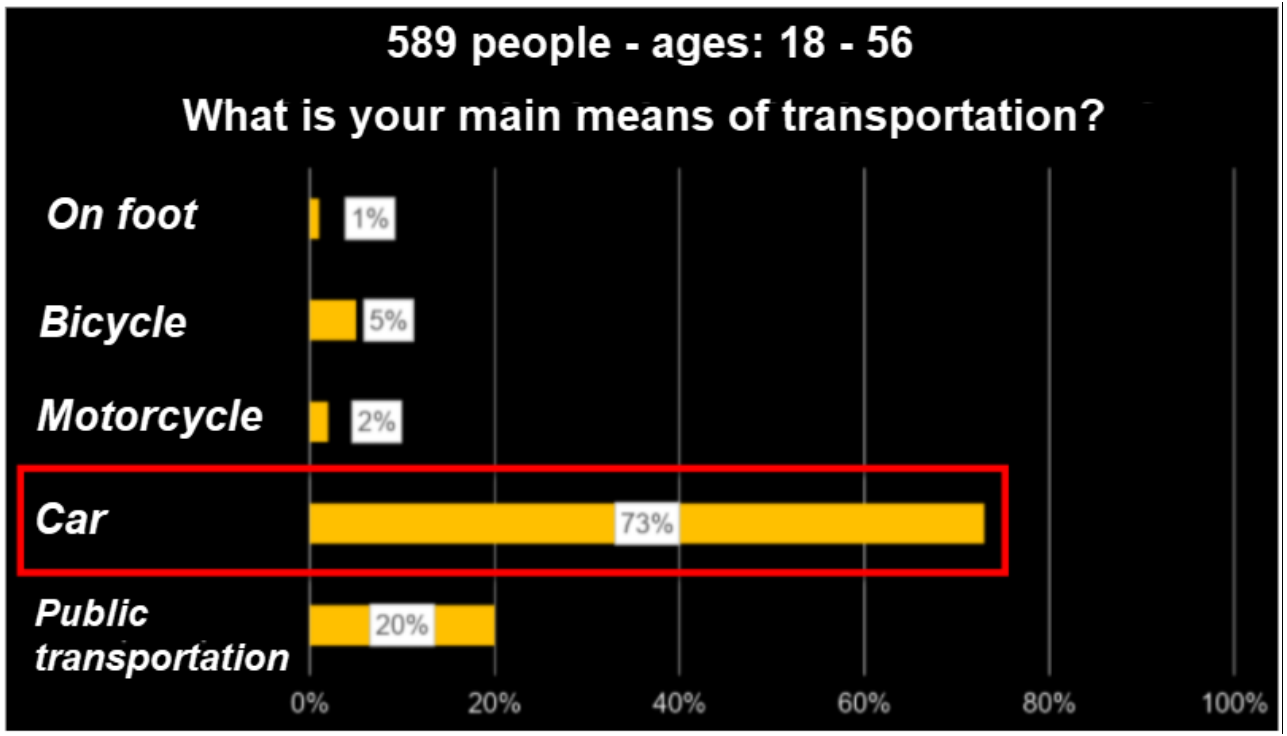
Survey



73% of people use their own vehicle as their main means of transportation

Street space not optimized

Average of **12** to **15** people per private vehicle

- [*plan CHA(2016)* http://plancha.gov.py/texto-completo-del-plan/tomo-1/]

Solution: *Carpooling*

Reduction of amount of vehicles while sharing the car

Carpooling: disadvantages

➔ Not safe

➔ Harassment

➔ Dispute or violence

Uncertainty due to the possibility of **violent** and / or **illegal** situations

Opportunity: match for carpooling confined to people from an institution

- Giving trust to the user by matching him only with people from his work or university
- Carpooling for trips to and from the institution
- Long-term carpools because the same destination is shared

Goal

Design a non-profit car-sharing system for communities

Analyze the feasibility of developing the system through a deployment simulation in a particular institution

Our solution: Ucarpooling

- ➔ Carpooling between people in a community to enhance safety
- ➔ Automatic pairing presenting the user with their carpool options ordered by compatibility percentage
- ➔ For the match, take into account logistical and social variables

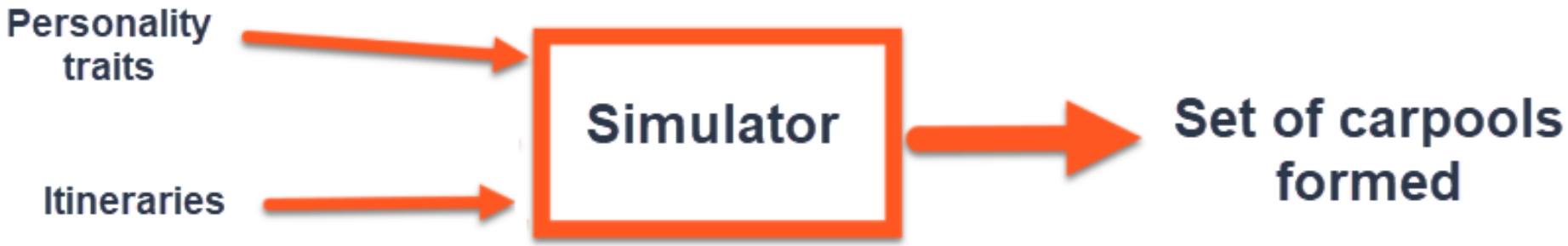
Analysis

- ➔ Check the impact it would have by comparing the absence situation with the presence of the system
- ➔ Verify the pairings that could be given to quantify the decrease in vehicle volume and the total distance traveled by vehicles

Simulator

➔ An Ucarpooling utilization simulator is developed with an established user base

➔ Gather potential user data as input for the simulator



Use case: Universidad Católica “Nuestra Señora de la Asunción”

- For our analysis and simulation we decided to check the impact that Ucarpooling would have on the Universidad Catolica “Nuestra Señora de la Asunción” located in Asunción, Paraguay
- The campus has the characteristics of an institution that about 6146 people come and go every day
- We gathered data from 648 people representing 10.54% of the total students

Simulation results

- ➔54.24% of vehicle volume reduction
- ➔54.06% of total distance traveled
- ➔825 liters of fuel saved per day
- ➔126,107$ USD saved per lecture year

Conclusion

- ➔ Favorable results in our simulation
- ➔ Controlled factors but we still expect favorable results in real life
- ➔ If many institutions adopt Ucarpooling a change in traffic will be perceived

Thank you very much!!