



An autonomous electrified cargo robot to support walkability of cities

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INTRODUCTION

IDEA

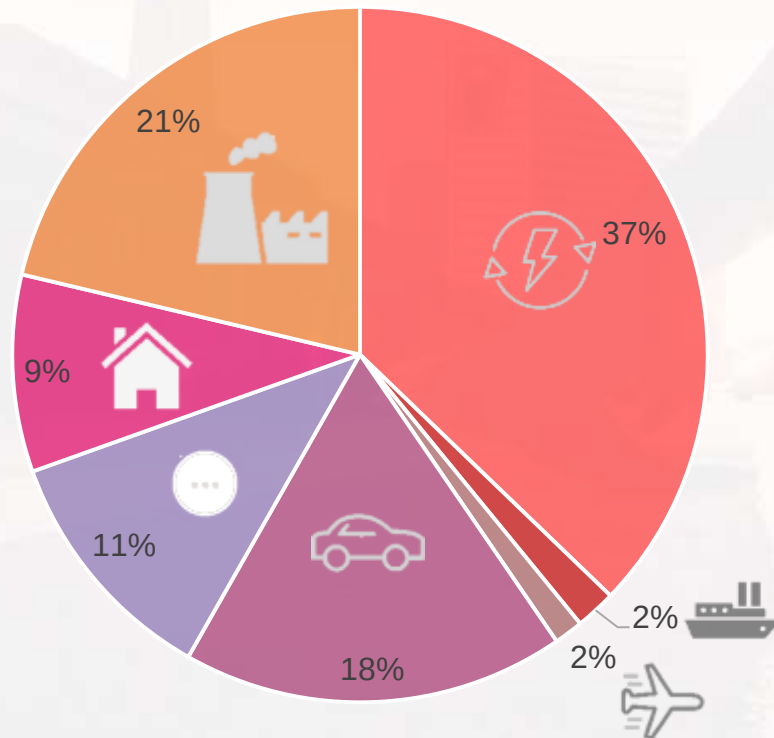
CONCEPT AND TECHNOLOGY

RESULTS AND OUTLOOK

INTRODUCTION

Emissions per sector in Europe

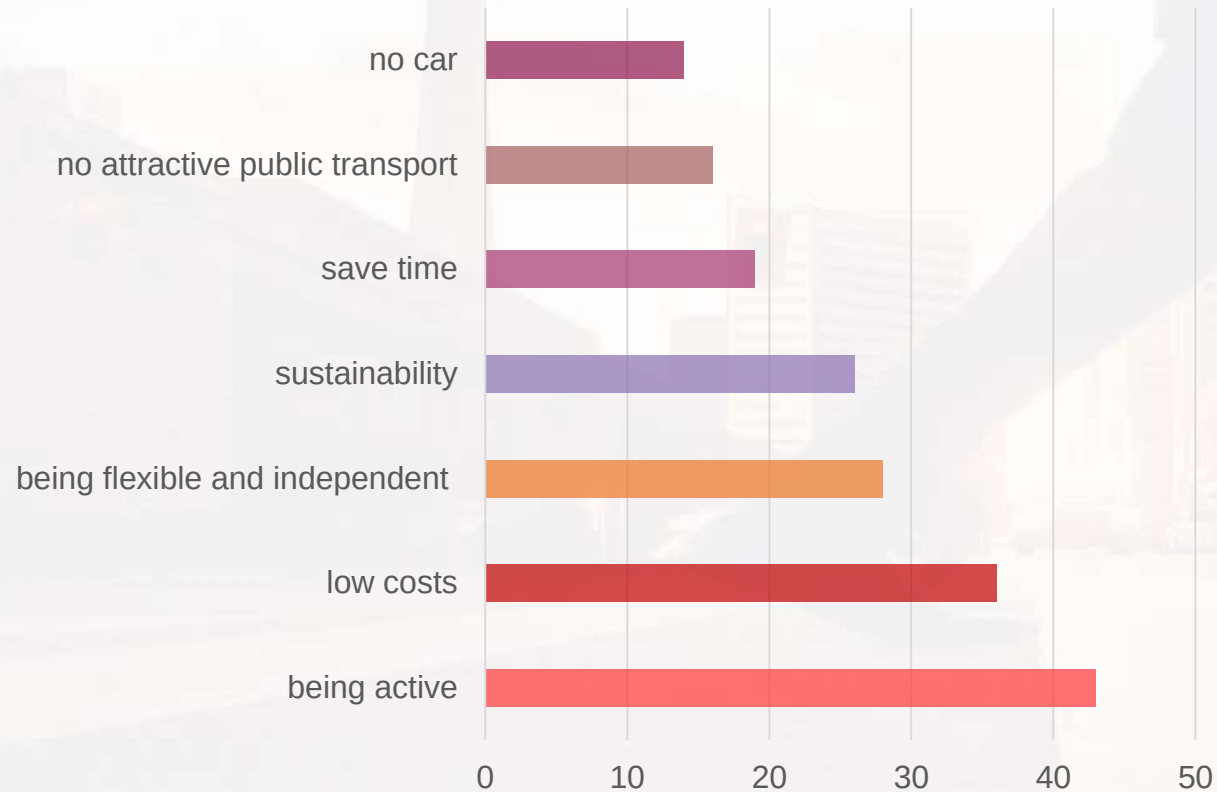
- Energy
- international air traffic
- other sectors
- industrial combustion
- international shipping traffic
- traffic national
- buildings



- High negative influence of global traffic emissions on the environment and climate
- Active mobility (walking and cycling) are emission-free and health-promoting
- Walking is a high speed transportation within in the city

INTRODUCTION

Reasons for walking



Possible reasons against walking

- **Transport of luggage**
- Longer distances (and therefore longer times to travel)
- **impaired mobility / handicaps**
- Weather conditions
- No attractive paths

INTRODUCTION



PROBLEM OF LUGGAGE TRANSPORT ON FOOT WAYS

→ especially a big problem for
people with handicaps or limited
mobility



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Walking is not only an ecological method of transport that produces no emissions and thus protects the environment, but is also beneficial to health.



But walking is not suitable for every path. Walking is only suitable for short distances. Walking is often ruled out when luggage has to be transported, especially for people with limited mobility.

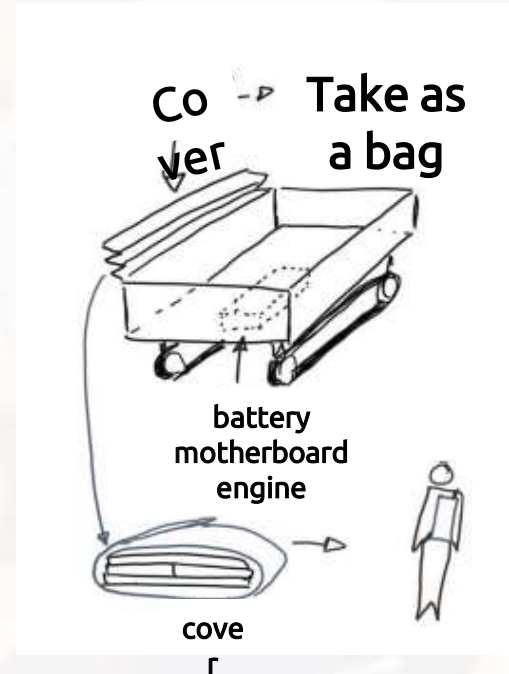


Our idea is an autonomously driving and electrically driven transport robot that can follow a person and transport his luggage. Thus walking can also be an alternative with luggage, especially for people who have physical limitations.

IDEA



The robot called "WALDI" (some Germans call their dog "WADLI" and our idea war the robot will follow his human like a dog ☺) identifies his owner and keeps a fix distance to follow.



Whenever the cargo robot is not needed, you have the possibility to fold WALDI up into a cover and take it as a bag.



You can install different modules on the chassis to use for different use cases.

The background of the slide features a light gray, stylized circuit board pattern with various lines, nodes, and rectangular components, creating a technical and futuristic aesthetic.

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CONCEPT AND TECHNOLOGY



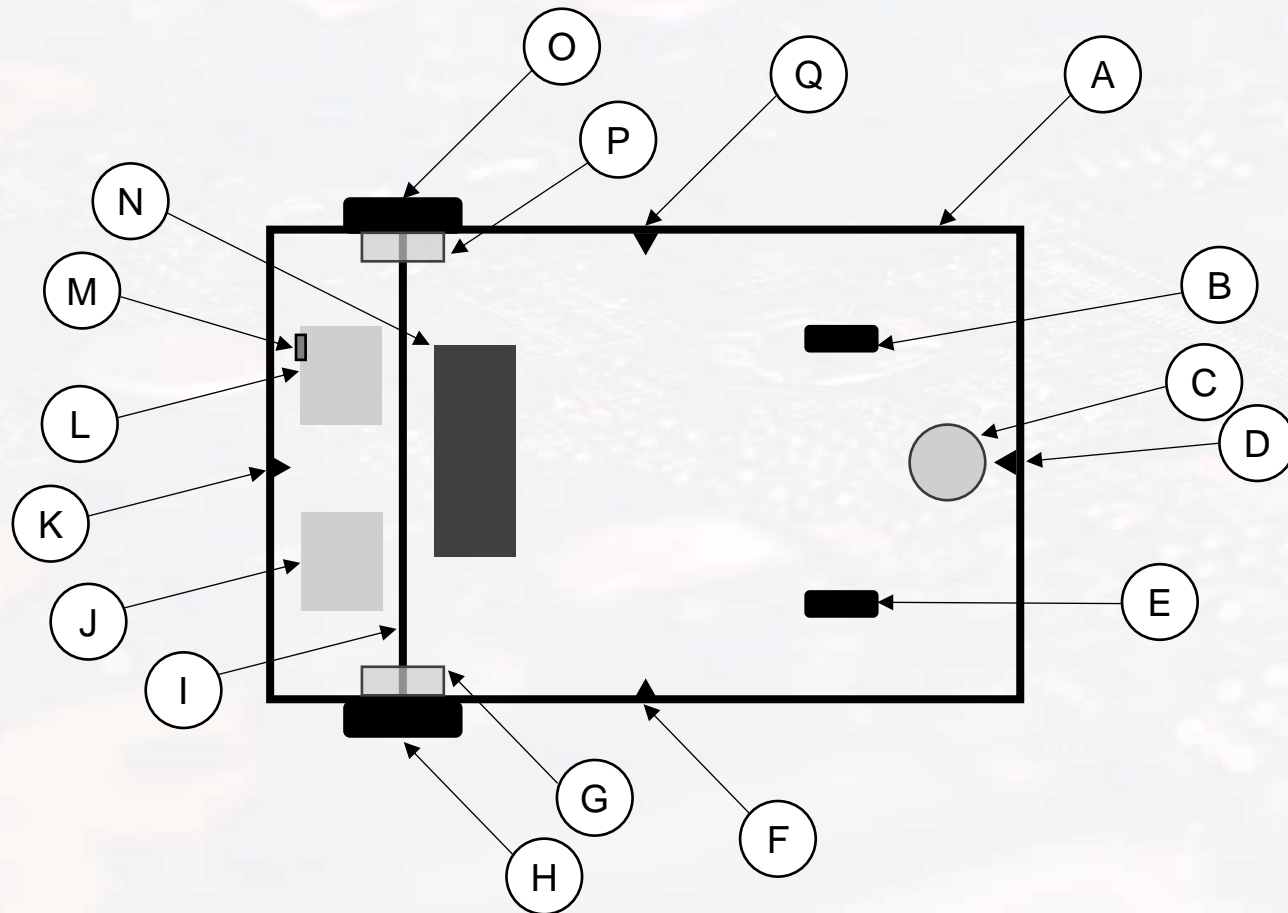
WALDI is developed from a conventional hoverboard as it can be bought in every electric or sports shop.

Following components are used from the hoverboard:

- rear wheels
- Wheel hub motor
- 2 motherboards
- Battery
- Rear axle

At the moment the sensor is reused from a playstation 2 gametrak. For the future we intend to use a camera system and distance sensors like they are used in autonomous cars.

CONCEPT AND TECHNOLOGY



A	Chassis
B	Front wheel right side
C	Sensor and camera system
D	Front fixing point for modules
E	Front wheel left side
F	Left fixing point for modules
G	Wheel hub motor left side back
H	Back wheel left side
I	Rear axle
J	Motherboard controlling left side back wheel
K	Back fixing point for modules
L	Motherboard controlling right side back wheel
M	USB Port (programming interface)
N	Battery pack
O	Back wheel right side
P	Wheel hub motor right side back
Q	Right fixing point for modules

CONCEPT AND TECHNOLOGY

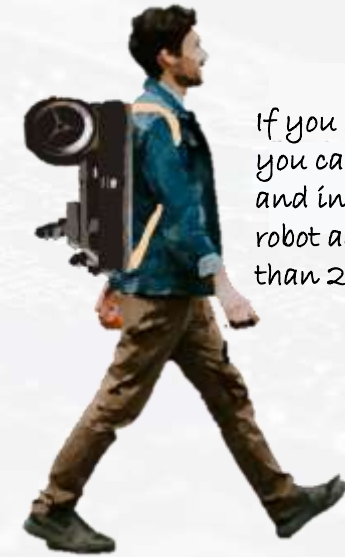
WAL▷I follows his human autonomous with help of sensors and cameras in a fix distance of 1 meter



WAL▷I can be fixed up with different modules. The standard module is able to carry things up to 100 kg and 40x40cm



If you don't need WAL▷I you can take it as a bag and install it as a cargo-robot again in not more than 2 minutes



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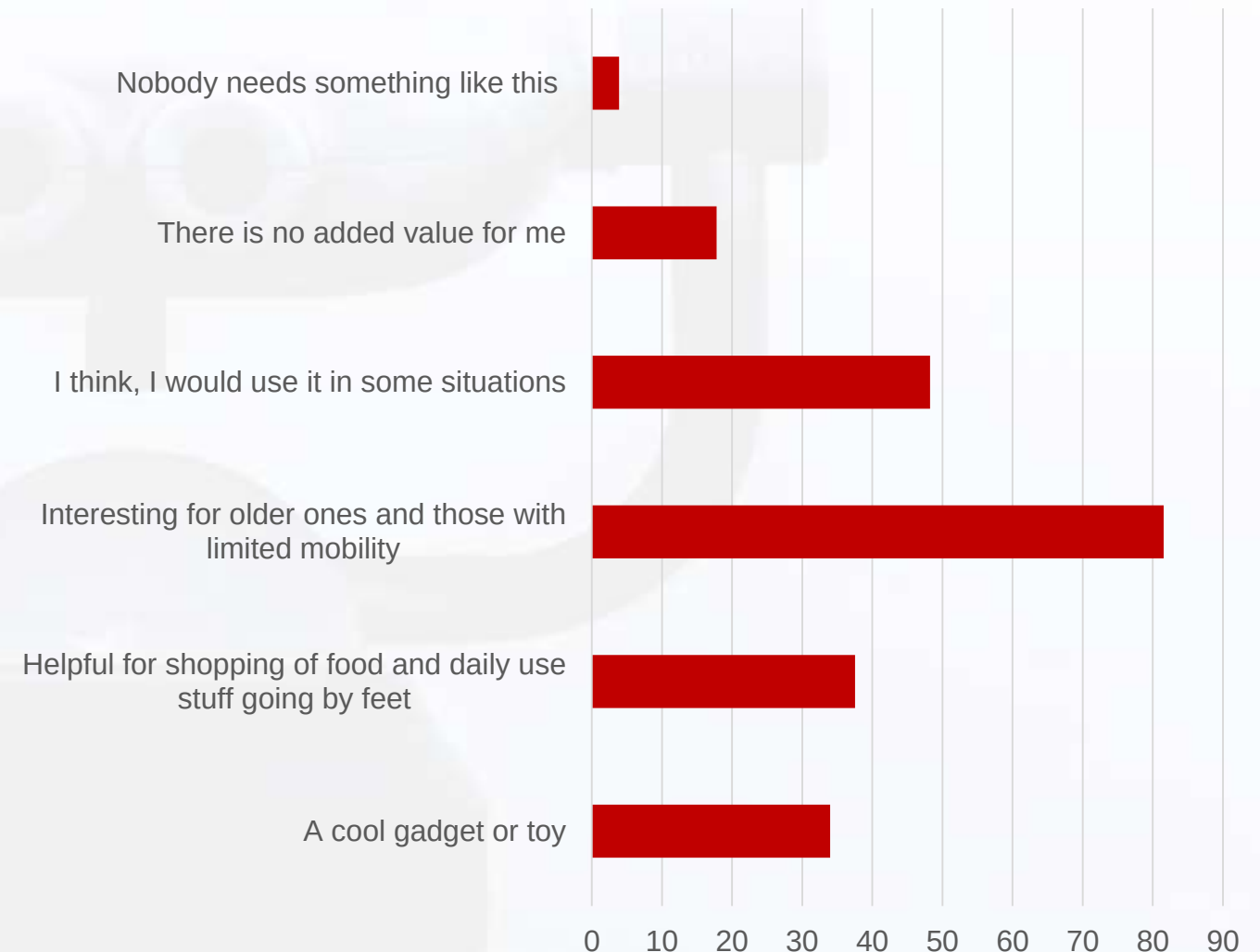
RESULTS

SURVEY WITH 323 PARTICIPANTS

Evaluation of the intermediate status
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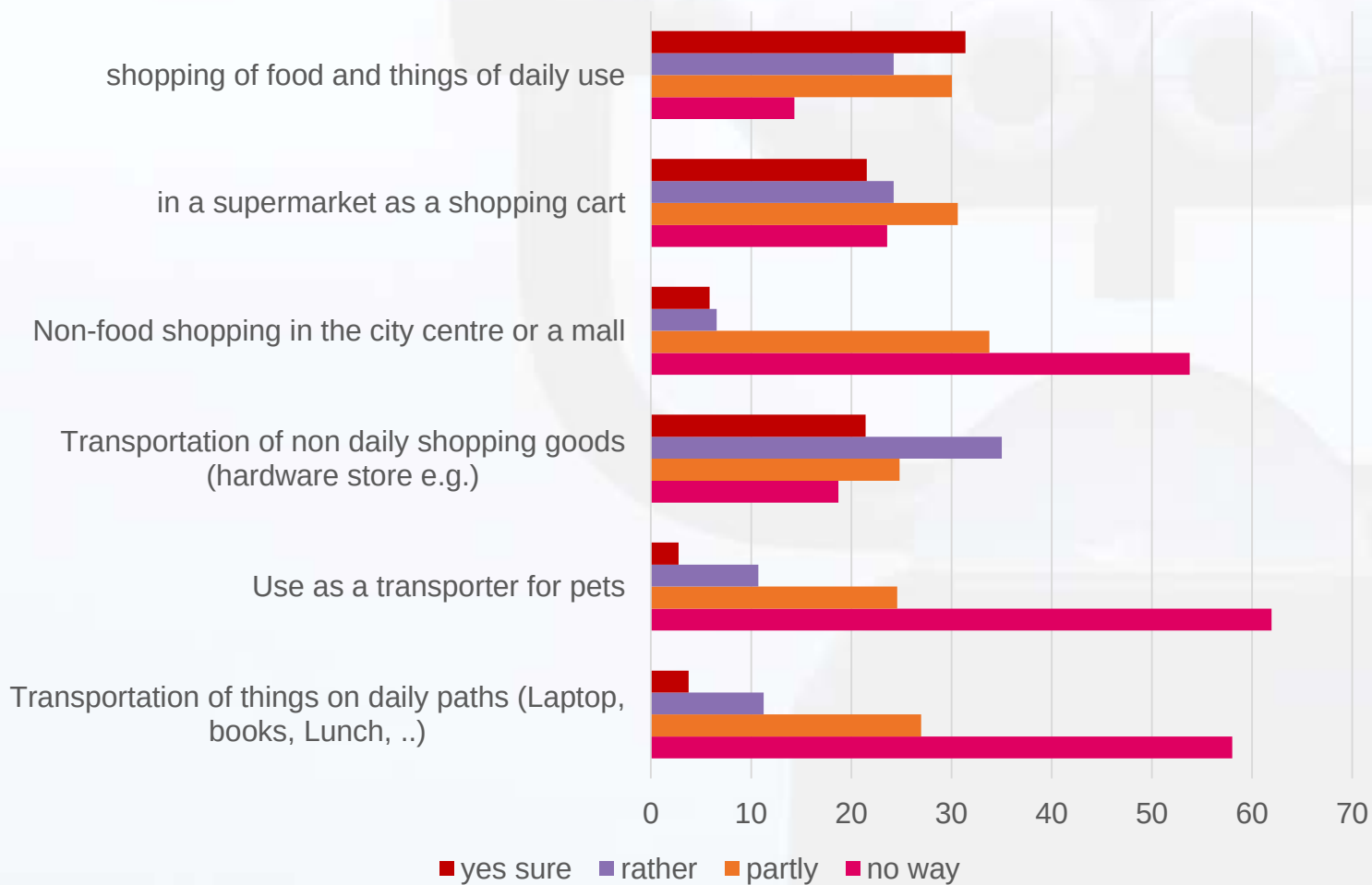
- 87% did not go by feet because carry luggage made it uncomfortable
- Nearly 90% of participants go by feet some times a week and oftener
- 2/3 of participants have their main paths in urban areas

Spontaneous associations after getting informed about WALDI



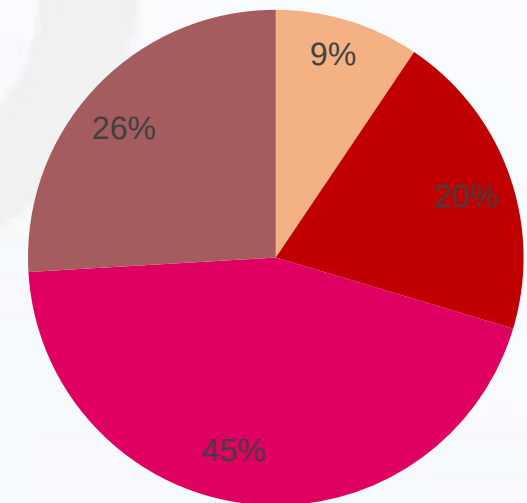
RESULTS

WALDI for doing what?



Type of purchase

- I would buy such a cargo-robot
- I would rent or hire such a cargo-robot
- I would use such a cargo-robot in a sharing-system
- I wouldn't use such a cargo-robot



OUTLOOK

GENERAL FEEDBACK AND THOUGHTS ABOUT WALDI



The feedback was quite positive



The people were fascinated about the gamify character of WALDI. Many, especially younger people, liked WALDI not as a robot to carry their luggage, but as a gamify tool



In actual pandemic crisis we think about further usage of WALDI for contactfree shopping and settlements

Contact

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Thank you for your attention.