

## PROJECT PARTNERS



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## GENERAL INFORMATION

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<b>Title of the case</b>	DriveGreen: Development of an ecodriving application for a transition to a low-carbon society			
<b>Sales pitch</b>	Development of an ethnography-based smartphone app supporting sustainable mobility and contributing to the reduction of greenhouse gas emissions.			
<b>Organisations</b>	<ul style="list-style-type: none"><li>• University of Ljubljana, Faculty of Electrical Engineering, Laboratory for Telecommunications</li><li>• Research Centre of the Slovenian Academy of Sciences and Arts (ZRC SAZU)</li><li>• CVS Mobile (IT company)</li><li>• Ljubljana Municipality (stakeholder)</li></ul>			
<b>Country</b>	Slovenia, UK, Serbia, Hungary			
<b>Authors</b>	<ul style="list-style-type: none"><li>• Sara Arko (IRI UL)</li><li>• Dan Podjed (Research Centre of the Slovenian Academy of Sciences and Arts)</li></ul>			
<b>Nature of interaction</b>	University-industry engagement project addressing city challenges			
<b>Level of mechanism</b>	<input type="checkbox"/> Government policy (e.g. law, funding framework) <input type="checkbox"/> Organisational strategy (e.g. university/business/agency) <input type="checkbox"/> Structural element (e.g. centre, lab, office) <input checked="" type="checkbox"/> Operational level (e.g. activity or programme)			
<b>Length of programme</b>	<table border="1"><tr><td>Not specified</td><td>Formality</td><td>Informal</td></tr></table>	Not specified	Formality	Informal
Not specified	Formality	Informal		
<b>Curricula-bound, co or extra-curricular?</b>	<table border="1"><tr><td>Co-curricula</td><td>Level of initiative</td><td>Cross-disciplinary</td></tr></table>	Co-curricula	Level of initiative	Cross-disciplinary
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## Summary

DriveGreen was an applied research project, co-funded by the Slovenian Research Agency (ARRS), involving three research & development partner organisations: Research Centre of the Slovenian Academy of Sciences and Arts (ZRC SAZU), University of Ljubljana (Faculty of Electrical Engineering), and an industry partner CVS Mobile. The three-year project ran between June 2014 and June 2017. It was an interdisciplinary project, combining anthropological approaches with mechanical engineering and addressed urban challenges in the field of mobility, aiming to encourage more sustainable modes of transportation within cities (walking, cycling, use of public transport etc.).

The main goal of the applied project was the development of a smartphone app, which would help support sustainable mobility and contribute to the reduction of greenhouse gas emissions in urban centres. The development of the app was based on multi-sited ethnographic, qualitative research in five European cities: Ljubljana (Slovenia), Belgrade (Serbia), Budapest (Hungary), and Durham and Newcastle (United Kingdom). This research then informed the technical aspects of developing a smart phone app. The key innovative element of the app, therefore, is that it takes into account the socio-cultural factors that shape the driving habits. On the basis of qualitative research, it was possible to determine which approaches encouraged sustainable mobility and were the most appropriate for urban centres.



## CASE STUDY PROFILE

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### BACKGROUND

DriveGreen was co-funded by the Slovenian Research Agency ([ARRS](#)), which is an independent public funding organisation performing tasks relating to the National Research and Development Programme. The lead partner in the project was ZRC SAZU, and the principal investigator and project applicant was Dr Dan Podjed, a Research Fellow at ZRC SAZU. The project was approved for funding through a public call at the ARRS. Part of the overall project budget was co-financed by the participating partner organisations due to the applied nature of the project and its industry orientation.

The key questions that led the concept and design of the DriveGreen project were: How do people drive and how do they behave in traffic? How can their driving habits be influenced and changed? How can we enhance environmental responsibility when it comes to mobility? To address these, the project involved interdisciplinary teams of researchers, students, industry, and city representatives while the ethnographic research approach ensured an intense collaboration and co-creation of solutions with the citizens.

## CONTEXT

The initial plan for DriveGreen was to prepare a simple and affordable smartphone app for drivers of passenger cars. It was supposed to operate similarly as Toyota's iPhone app, A Glass of Water, which determines and visually communicates how economical, safe, and environmentally responsible our driving is. The project team was encouraged by research showing that tools like this can actually save up to 10 percent of fuel and reduce a similar proportion of CO<sub>2</sub> emissions caused by traffic.

Less than a year into the three-year project, however, the team realized they needed to change the initiative entirely. Namely, as they began with ethnographic research in five European cities (Ljubljana, Belgrade, Budapest, Newcastle, and Durham) to identify how to customize the user interface to various locations, people's needs, and culture-specific uses of passenger vehicles, they realized they needed to do more than just customize the user interface. They learned immediately that ethnography could have a much more significant role in planning and designing people-friendly and environmentally responsible technology solutions than was initially thought.

The ethnographic research findings showed that the cost of fuel is not extremely important to drivers of passenger cars and that the data on greenhouse gas emissions is not an effective motivation for sustainable mobility either. Research participants were worried about CO<sub>2</sub> emissions, but mainly on a declarative level. Information about the amount of emissions produced while driving was too abstract for them to significantly change their driving style. In addition, there were doubts expressed about the safety of using mobile phones in vehicles. The project team had to start again and this time target people instead of technology in order to figure out what motivates people to change their driving habits and mobility practices. In this, ethnographic field research continued to play a crucial role.

Interestingly, despite their devotion to driving, the people they spoke with described their daily errands and commutes as a source of anxiety and frustration. Instead of trying to change the way people drive, an opportunity presented in attempting to influence their mode of transportation. The DriveGreen team prepared a new concept for a smartphone app that shows how much people move in the city on a daily, weekly, monthly, and annual basis. Driving a car became of secondary importance to the planned output of the project, which instead focused on promoting more sustainable mobility options.

## OBJECTIVES AND MOTIVATIONS

The project aimed to take an interdisciplinary approach to developing a technological solution by bringing together social scientists, engineers, and industry representatives. One of the goals was to utilise anthropological knowledge and methodology as the key driving force to tackle urban challenges (sustainable mobility), which are often addressed with a predominantly technical approach.

Driving is not only an individual habit but also a social practice. Drivers imitate each other, internalize formal and informal traffic rules, accommodate to external circumstances, and communicate with each other. Thus, influencing the development of driving habits. What drivers learn as members of the community becomes part of an individual's internal practices, which are further enhanced through interaction with external environment while maintaining the possibility to change. A key aim of the project was to deepen the understanding of how these habits and practices can be influenced and changed. Using the technological solutions that are customized to peoples' needs, the project aims to encourage sustainable mobility.

## STAKEHOLDERS

- Students and professors of the University of Ljubljana (anthropology and electrical engineering)
- Researchers of the Research Centre of the Slovenian Academy of Sciences and Arts (anthropology and ethnography)
- Industry representatives, IT companies
- City representatives at the City of Ljubljana (municipality)
- Public and private transport companies (LPP in Ljubljana, BKK in Budapest, Northeast Combined Authority in Newcastle)
- Citizens

## PROCESS

### INPUT

Knowledge, skills, and experiences of university professors, researchers and industry representatives

- 7 academic researchers (ZRC SAZU, University of Ljubljana)
- 5 industry representatives and industry researchers (CVS Mobile)

Citizens forming a research sample for ethnography (individuals, relevant NGOs' representatives)

City of Ljubljana (COL) – providing relevant data for research purposes (e.g. data on traffic in Ljubljana, CO<sub>2</sub> emissions), support in carrying out research and promoting project activities

Funding (national research programme, Slovenian Research Agency): 300,000 EUR (overall budget: 400,000).

## ACTIVITIES

### 1. Multi-sited ethnographic research

The DriveGreen project researchers conducted research in five European cities Ljubljana, Belgrade, Budapest, Newcastle, and Durham. The research began in Ljubljana where it was extensively interdisciplinary. Ethnography was combined with engineering. Qualitative analysis (participant observation, interviews, focus group discussion on driving and mobility, traffic observation, etc.) was combined with quantitative studies and data (e.g. measuring physical bodily responses to driving, driving with telematic devices, traffic measurements). Research visits to other EU countries lasted for 3 months each and involved primarily qualitative research techniques. In each country, researchers aimed to involve a number of key stakeholders, including students and higher education and/or research organisations, citizens, relevant civil society organisations (e.g. cycling promotion and other NGOs), and responsible public administration and government organisations (local councils, ministries, or relevant departments dealing with traffic and urban mobility).

### 2. Interdisciplinary and intersectoral R&D cooperation (university, industry and city)

Research and industry partners collaborated in an interdisciplinary team to combine, contrast, and collate qualitative and quantitative analysis of the data. Based on the research findings and close cooperation with relevant civil society and local government organisations, project researchers tweaked their initial development idea, as explained above, and designed an idea for a smartphone app.

Students were involved in the project in the form of focus groups. Focus groups have proven to be a useful research tool for studying traffic and driving habits since they allow researchers to study people in a less structured conversation pattern than what typically occurs in a one-to-one interview. The focus groups were carried out in the formal environment of a university building. However, the setting was relaxed and informal. The main theme of the debate was initially focused on the promotion of sustainable mobility in different cities, especially when Erasmus students from different countries were involved (focus groups in Ljubljana and Durham). The socio-cultural diversity of the participants has proven to be an important advantage in the debate about driving habits, which significantly differ in various places. In fact, the most significant output of the focus groups was a comparison of driving habits in different places. The participants explained how driving habits differ between the place where they had lived in the past and Durham, UK, and verbalized their observations about the differences in driving styles in different locations that they had visited as tourists or researchers.

### 3. Development of ICT solutions based on ethnographic research

Due to the limited duration, scope, and funding, the project team designed a smartphone app called '1, 2, 3 Ljubljana'. The idea behind the project was not to provide a "one size fits all" solution, but something which reflects and responds to specific local contexts (social, cultural, infrastructural, etc.), while having the potential to be adapted to other urban localities.

The app uses sensors in the phone to detect whether the users are walking, running, cycling, using public transport, or driving a car. It visualizes the completed activities on the 'action wheel'. Under it, people can see their personal results and can compare it with the average of all the other users in the city so they can determine whether their day was above or below average. They can also view the total distance and the savings in CO<sub>2</sub> emissions achieved by using environmentally friendly ways of movement. This calculation is a background feature and not a prominent one, which was a choice based on our realization that greenhouse gases are quite abstract and less successful as a motivational factor for most people.

The main innovation of the '1, 2, 3' app is the social dimension that connects people to work together toward a common goal. Since this goal needs to be more clear, accessible, and concrete than emissions data, the project team members have designed the campaigns so that people can compete against another person. For example, against the Mayor of Belgrade, a movie star from Budapest, or the Slovenian President. The challenge for the celebrity is to walk, run, cycle, or use public transport at a rate higher than the city's average while other people in the city work to raise that average. If the celebrity does not beat the city average, she or he has to donate a certain amount of his or her own funds for the reconstruction of infrastructure or the renewal of bike trails in a city park. The project team called this cooperative-competitive principle the 'indirect microdonations' because every walked or cycled kilometre or mile counts, but the app users themselves aren't required to contribute any funds for the improvement of transportation infrastructure.



## OUTCOMES AND IMPACT

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### OUTPUTS

Mobile app: "1, 2, 3 Ljubljana" available for Android users in Ljubljana at the end of the project

Book: Podjed, Dan and Simona Bezjak (2017): *Research on the Road. Methodology and Practice of Studying Traffic, Driving Habits, and Sustainable Mobility*. Založba ZRC: Institute of Slovenian Ethnology. (paperback and [e-book](#))

Other academic outputs: 5 original scientific research articles published during the project financing period

Theses and mentorship: Two members of the project research team concluded their PhD theses during project duration aligned with the topic of the project. Under the mentorship of project researchers, two student MSc/MA theses were completed connected to the topic of the project ("A study of the user experience of an interactive mobile application" and "Exploring the self-monitoring of ecologically-oriented drivers with a mobile app").

Organisation of events, symposia: project researchers participated in a number of scientific and popular events. One of the most visible results, however, was DriveGreen's co-organising of the main European event in the field of applied anthropology; Why the World Needs

Anthropologists. From 2015 to 2017, the event focused on the main DriveGreen project themes, i.e. environmental protection, development of technologies, and energy efficiency. In total, more than a thousand experts from around the world attended these events, which took place in Ljubljana, Tartu, and Durham.

Project reports: required by the funding organisation (ARRS) and reviewed

Other results of the project available at: <http://drivegreen.si/en/publications/>

## IMPACTS

- Changed perception of the “usefulness” and applicability of ethnography/anthropology for technology R&D, and its value in interdisciplinary endeavours. Due to the successful implementation of the DriveGreen project, the project partners (academic and industry) have decided to continue the collaboration and have successfully secured funding for a new applied research project, Invisible Life of Waste (co-funded by ARRS). In this sense, the project initiated and established an ongoing partnership between higher education/research organisations and industry partners. In addition, the approach to people-centred development has been further developed and applied in other international R&D projects, i.e. PEOPLE (Erasmus+, Knowledge Alliances), Mobistyle, and TripleA-reno (Horizon 2020).

- R&D impact: Within the project, the developed beta version of the app was evaluated and tested in a period of two months with 18 volunteers who installed the app on their smartphones and used it in their everyday settings. The survey, carried out with the first users, showed that the app is user-friendly, well designed, easy to use, and compatible with various versions of Android. The testing also showed that the beta version of the app was, at the time, not completely accurate at recognising and measuring different types of movement or transport. Testers reported, however, that the app was not only helping them understand their mobility habits, but also motivating them to use sustainable modes of travelling more often. According to the survey, there is still much potential for improvements and further research, particularly about the social aspects of such “green” smartphone applications. For example, studies that focus on users. This is in line with the project’s argument that green apps may be an important tool for supporting a green lifestyle when approached interdisciplinarily. DriveGreen was in this sense a “proof of concept” project, in which combining ethnography with engineering in a R&D project dealing with urban sustainability challenges and interdisciplinary collaboration were tested. However, due to funding, duration, and scope limitations, additional funding would be needed to finalise, test, promote, and implement the App and its concepts (see also challenges and barriers chapter).

### SUPPORTING MECHANISMS

Financial support from the Slovenian Research Agency (ARRS) enabled smooth implementation of the project. Availability of national funding for applied, interdisciplinary projects in partnership with industry, in addition to “traditional” research funding, is of crucial importance for supporting innovative or even experimental R&D approaches.

Support from the City of Ljubljana (municipality) and their involvement in research & development activities has aided the project team with informed decision making, even though they were not officially involved in the project as partners.

### BARRIERS AND DRIVERS

Key barriers:

- Funding barrier: The project was of limited duration and scope. Due to this, the project outputs, in particular the smartphone app, were limited to beta version as funds were not available (nor intended) for long-term testing or promotion of the product. In addition, funding of applied, interdisciplinary and intersectoral (university – industry) projects on the national level is limited, in particular in the social sciences and humanities fields.

Key drivers:

- Support from the City of Ljubljana (municipality): The City of Ljubljana (COL) provided relevant support during the research process, the promotion of the project, and the project’s outputs. For instance, the DriveGreen project was presented within Point.For.You (Točka.Zate) series of events in front of the Ljubljana Town Hall and was part of COL’s round table on sustainable mobility, along with representatives of key organisations. Likewise, representatives of COL participated at events organised by DriveGreen partner organisations. Their support was offered through informal networks and personal engagement of both the project team and individuals employed by the COL.

- Addressing real life challenges and involving citizens in co-creation of solutions: The dedication of involved researchers to cooperate within an interdisciplinary team led by a social science/humanities discipline (anthropology/ethnology) aided in implementing people-centred development approaches for technological solutions. However, this kind of research is not systematically or strongly supported by higher education systems or funding agencies.



## LESSONS LEARNED

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### CHALLENGES

- Ethnography perceived by some academics as a discipline which should not be misused for industrial research and development (for business interests), initially resulted in a lack of support among fellow academics. However, the approach and collaboration have since been successfully transferred, up-graded, and implemented in a number of new collaborations and projects (see Impact section). This is, in particular, because of the successful cooperation within DriveGreen and the encouraging outcomes of the interdisciplinary research approach.

- The results of the first tests done in Ljubljana indicated that the first version of the '1, 2, 3' app was still rather weak in some of the technical aspects, especially in automatically detecting the mode of transport/mobility (car vs bus etc.). However, the feedback received from the test group of users, derived through a combination of qualitative and quantitative approaches—from eye tracking to the information collected through questionnaires and interviews—was also encouraging. People liked the concept of 'indirect microdonations' and were interested in individual and collective health and wellbeing challenges. It confirmed the fact that a detour on the way to sustainable mobility was the sensible thing to do in order to break up the original development plan and to allow people to take the initiative.

### KEY SUCCESS FACTORS

The DriveGreen project was very well accepted by the public and media. Visibility (national and international) was provided by members of the project group with their numerous scientific and popular publications, presence in the media, presentations at scientific meetings, and, in particular, with the organisation of the main European event in the field of applied anthropology; Why the World Needs Anthropologists (see Outputs section).

Due to the nature of this case study, the duration of the project was limited. However, developed approaches (people-centred development approaches) were taken up and sustained by the participating project researchers and industry partner, who have since successfully implemented these in new projects with similar goals (waste management, energy efficiency) and agendas (involvement of social sciences and humanities in R&D teams, development of people- and environment-friendly solutions through interdisciplinary R&D).



## FURTHER INFORMATION

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### AWARDS AND RECOGNITION

NA

### TRANSFERABILITY

As research was carried out in three other EU cities, besides Ljubljana, the currently existing version of the app has immediate potential transferability to these three cities. The project's approach to developing sustainable mobility solutions, however, is more widely applicable as it provides an opportunity to combine ethnographic approaches in an interdisciplinary research and development process. This provides people-friendly, people-centred, and environment-friendly technological solutions in the field of sustainable urban mobility or other urban challenges.

### PUBLICATIONS

Podjed, Dan and Simona Bezjak (2017): *Research on the Road. Methodology and Practice of Studying Traffic, Driving Habits, and Sustainable Mobility*. Založba ZRC: Institute of Slovenian Ethnology. (paperback and e-book: <https://isn2.zrc-sazu.si/en/publikacije/how-to-study-and-improve-driving-habits-1#v>)

### LINKS

<http://www.drivegreen.si/>

[https://www.epicpeople.org/ethnography-first-promoting-sustainable-lifestyles/?fbclid=IwAR1VqT-SKZhNVAPFps3KHuB1Q\\_xSLrbEg\\_mXA-8C2tO3z2YLPZVy1\\_GC\\_mE](https://www.epicpeople.org/ethnography-first-promoting-sustainable-lifestyles/?fbclid=IwAR1VqT-SKZhNVAPFps3KHuB1Q_xSLrbEg_mXA-8C2tO3z2YLPZVy1_GC_mE)

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