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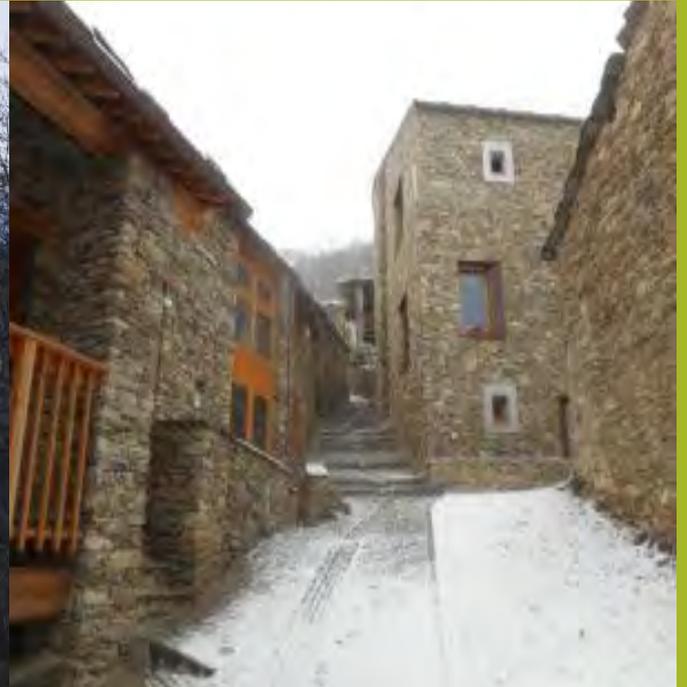
USI  
Master in  
International  
Tourism



Community  
of  
Ostana

# Ostana Mobility Experiment

## A Survey for Implementing Sustainability In Mountain Tourism



2017

**What is a future model of mobility for the community of Ostana?**

**A field experiment, questionnaire survey and design thinking excursion.**

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# 1. Overview



Students of the Masters in Economics and Communication with a major in International Tourism at the University of Lugano, Switzerland, attended the Sustainable Tourism Colloquium course taught by Dr. Tobias Luthe.

The course aimed to deepen knowledge and understanding related to sustainability and international tourism, specifically in the context of resilience and mountain livelihoods. In an introductory seminar, students received an overview on the most recent advances in transdisciplinary sustainability science, and its relation to tourism. Sustainable tourism, permaculture/ agro-forestry, mobility architecture, renewable energy and “alpine urbanism” are examples of specific topics that were introduced. Between the 26<sup>th</sup> and 29<sup>th</sup> of May, students followed a field trip to Ostana, Piedmont, Italy, where they prepared and executed an experiment with tourists including a questionnaire survey regarding transport and mobility concepts for the community.

During their stay, students met members of the community, visited local businesses which recently developed (e.g. the permaculture gardens) and touristic attractions, like the Il Bosco Incantato and the Agriturismo. During this time, students were asked to participate in reflective thinking and to provide creative ideas and solutions. Furthermore, students were engaged in a design thinking workshop using their creativity and innovative spirits to provide ideas concerning realistic or futuristic sustainable mobility concepts for the rural area of Ostana and the Po Valley.

The Sustainable Tourism Colloquium enabled students and local residents to cooperate toward finding sustainable mobility solutions that fit the particular case of the rural Ostana community. Although teaching several concepts in a classroom environment is certainly important, the experience of “learning by doing” and practically applying the attained knowledge in a real case scenario provided students with a very unique and hands-on experience. Therefore, the colloquium is conceived as a win-win situation for the students and the community residents as it fostered learning and development for all participants.

The following pages will provide a description of the community of Ostana, the procedure and results of the field experiment, and the student’s design thinking proposals on possible mobility concepts.

## 2. Introduction



Previously, sustainability was often defined as the way biological systems endure and remain diverse and productive. However, the 21<sup>st</sup>-century multi-faceted concept of sustainability, requires a more comprehensive definition. Today, it refers to the need to develop sustainable models necessary for both the human race and planet earth to survive. Thus, sustainability is a balancing act. The *United Nation's 1987 Report of the World Commission on Environment and Development: Our Common Future* noted that sustainable development meets the needs of the present without compromising the well-being of future generations. The same concept is defined in the *Brundtland Commission (1987)* and the *Earth Summit in Rio de Janeiro (1992)*.

This concept continues to expand in scope. In 2000, the *Earth Charter* broadened the definition of sustainability to include the ideas of a global society “founded on respect for nature, universal human rights, economic justice, and a culture of peace”. Therefore, to achieve these lofty goals, humans will have to re-examine their policies on environmental protection, social responsibility and economic practice. Thus, the term sustainability encompasses two main challenges: first, not a single definition is universally accepted, which contributes the second challenge of misleading use of the word, at times narrowly focused on economic exploitation.

Sustainable development is frequently illustrated as overlapping or concentric circles representing the triple-bottom line equilibrium or incorporation of the environment, the society and the economy (IUCN, 2008). Due to the imperfection of these models, Luthe (2016) developed a quantifiable and comprehensive model that sets the environment (ecosystems and carrying capacity) the foundation, which must not be outbalanced by economic and social well-being, binding cultural values and technological enhancements. It is notable that this model is fostering community empowerment and people's participation.

In order to have successful sustainability, entrepreneurs need to engage in innovative supply and everybody must reflect about sustainable consumption habits. In tourism, this particularly concerns transportation systems. The United Nations declared 2017 as the “International Year of Sustainable Tourism for Development” encouraging long-term views in relation to objectives and adapted strategies. At the same time, it challenged multiple researchers who argue that the globalization of tourism, due to and leading towards increased mobility, can never be sustainable, because a much greater set of resources is needed to fulfil the needs of these additional visitor flows.

### 3. The Community of Ostana



Ostana is an alpine community belonging to the broader territory of the Po Valley in Piedmont, Italy. The community stretches alongside a south facing mountain slope in the Po Valley, in front of the majestic Monte Viso. Ostana is well known and has easy road access with approximately 1.45h from Torino (80 km) and 1.5h from Cuneo (69 km).



The community experienced a substantial crisis when the local population shrank from about 1300 to only 5 inhabitants at the end of the 20<sup>th</sup> century. Since the mid-80s, Ostana decided to build on the quality of architecture and landscape, and on knowledge and traditions as ways to reactivate the town. From the mid-80s onwards the local community has been an important reference point for the restoration and enhancement of alpine architecture.

The architectural structures represent the most evident and recognizable elements of this created landscape, are also an area of conflict in terms of modernization, sustainability, and renovation, since legal regulations prevent construction of new structures and only permit renovation that coincides with traditional techniques. However, some steps have been taken in order to overcome these challenges, such as the creation of poly-functional structures that are able to satisfy a variety of needs for the community.

A recurring element of this territory is without doubt stone, which is the main material of the landscape and for the construction of houses. Stone is used for walls, for covering the roofs, the outdoor and indoor pavements. Stone structures are built by using a highly specialized technique, which is very labor intensive, expensive, and requires a level of expertise. Additionally, sustainability concerns arise in terms of energy efficiency. For example, solar panels do not comply with the aesthetic legal requirements for stone roofs.

At present, the renovation and the improvement of the architectural heritage have created a new identity and recognizability for this little mountain community, and consequently led to an economic and social rebirth. Notably, the smallest community of the Po Valley is at the same time an example for an intelligent architectural innovation and has recently been awarded with the admission to the association of the most beautiful villages of Italy, the “Borghi più belli d’Italia”.

Houses, architecture, cultivated land, terracing, alpine meadows, forests, and canals represent interdependent single elements of a sole integrated system. Therefore, today, a new vibrant community of 40+ permanent residents have been reviving this unique place, while new artists, entrepreneurs, friends and families are collaborating to prototype the future of sustainable living in the mountains. This has transformed Ostana into a pilot region for a new model of Alpine living and brought the town to the forefront of international chronicle, as it became great tourist magnet.

Currently, the main attraction of Ostana is its natural beauty and hiking trails. Popular tourist attractions are shown in Table 1:

TABLE 1: Ostana Tourist Attractions

Agriturismo “A Nostro Mizoun”	restaurant, accommodation, local products, beautiful scenery
Il Bosco Incantato	scenic walks, numerous wellness experiences, yoga, permaculture garden
Rifugio Galaberna	restaurant, social hub, information point for local activities, adventure park
MonViso Institute	hub for research, educational tourism, accommodation, permaculture garden
Polyfunctional Center “Lou Pourton”	cultural event center, co-working place



However, the community faces some challenges. Although the population of Ostana is increasing, attracting new residents remains an important issue, as there is a lack of basic services (i.e. grocery store, pharmacy, shops) and job opportunities.

Another issue is the mobility and transportation options. The lack of well-maintained and safe road infrastructure and transportation means contribute to environmental, social and financial costs, either because residents need to drive to neighboring towns in order to meet basic needs, or because of congestion problems. Especially in the summer and weekends, tourists' and residents' demand for mobility is in conflict. The high influx of vehicles and limited parking places lead to decreasing local and tourist well-being.

Attracting more tourists to the village is another challenge for the community, but at the same time presents an opportunity to develop a sustainable management plan in terms of mobility, tourism, and overall community resilience.

## 4. Ostana Mobility Experiment



## 4.1 Experiment Description

Being a tourist destination, Ostana is facing tourism mobility issues. For example, during high seasons (i.e. summer) and weekdays, there may be up to 300 cars clogging the small roads in the village, leading to environmental, social and financial costs. As a result, there is a need of finding an alternative concept for taking advantage of the interest of tourists in Ostana, while avoiding the negative side effects.

It is no secret that economic growth and energy have come at the cost of environmental ruin, and to face this challenge, sustainability experts are looking at ways in which they can slow or prevent pollution, conserve natural resources and protect remaining environments, in order to support a sustainable, healthy and happy population. From this point of view, an efficient and flexible transport system that offers intelligent and sustainable patterns of mobility is essential for the health, economy and standard of living of the community.

Ostana as a community is actively engaging in sustainable development. Its goal is to optimize the use of materials, energy and information in an intelligent and efficient way so as to minimize the environmental impacts of transport, while satisfying the local and foreign mobility needs of goods and people. Improving the mobility of passengers using means that are sustainable, safe and of high-quality is essential in order to reduce congestion.

To be able to develop sustainable policy plans, the community wants to understand people's perception, both regarding a decrease of the impact of car congestion and a change to more ecological transportation modes to reach Ostana.

The experiment intended to shed light on the preferences and willingness-to-engage of the local people and tourists so as to create a better and higher quality visitor experience. This would help improve the overall sustainability of the community in its development attempting to meet the needs of the present without compromising the well-being of future generations.

What is an alternative concept for taking advantage of the interest of tourists in Ostana, while avoiding the negative side effects? How can the mobility demand of both tourists and residents be reconciled? The aim of the experiment is to shed light on a solution to these concerns.

To achieve the experiment's purpose, the community, the professor and the students collaborated in transdisciplinary research.

For changing undesired processes and enforcing desired processes (transformation knowledge), transdisciplinary research for sustainability investigates problems on a descriptive, normative and operational level. Given that sustainable development involves societal problem-solving based on research, the knowledge held by non-academic actors has an important role to play throughout the process of knowledge production. In turn, it concerns communication with the society involved (Hirsch Hadorn et al, 2003).

A framework for the community, the professor and the students' collaboration is shown on Figure 1:



Figure 1: Experiment Framework

## 4.2 Experiment Methodology

For this experiment, an *applied research* approach was conducted. The study undertaken aimed at answering questions about a specific problem and at providing guidelines on decision-making about particular courses of action or policies through valuable information, since decision-making situations can be classified on a continuum ranging from complete certainty to absolute ambiguity (Zikmund, 2003). The survey technique was used, because it is considered as the most appropriate technique for the collection of factual data.

The choice approach, which is a hypothetical method, was implemented and consisted in asking respondents to make choices based on a hypothetical scenario. Respondents are simultaneously shown two or more different alternatives and their characteristics, and asked to identify the most preferred alternative in the choice. Because it focuses on tradeoffs among scenarios with different characteristics, choice approach is especially suited to policy decisions where a set of possible actions might result in different impacts. However, respondents may find some tradeoffs difficult to evaluate, because they are unfamiliar with them. In this case, 6 scenarios were tested.

Primary data was collected through a questionnaire. The questionnaire was executed through in-person interviews, as they are generally the most effective for complex questions. It is often easier to explain the required background information to respondents in person, and people are more likely to complete a long survey when they are interviewed in person.

The collected data was entered in Microsoft Excel spreadsheet software and for the purpose of this report only descriptive statistics were executed.

## 4.3 Questionnaire Development

Three different questionnaire versions were developed for the experiment: one was designed for local people, whereas the other two were designed for tourists. Questionnaire versions designed for tourists were either highlighting the engagement of the community of Ostana in sustainable development or drawing attention to the community of Ostana being affected by car traffic and congestion. Tourists were given one of the two versions of the questionnaire.

All questionnaire versions were standardized, which means that all respondents were asked a standard list of questions, in standard order, with the same response options. The questionnaires were structured with open and closed-ended questions. Beyond the convenience provided to the respondents, the forming of questions assured the compatibility and the ease of coding and interpreting of the answers.

The questionnaire designed for local people (Refer to Appendix 1: Questionnaire Locals) mainly consisted of attitude statements in order to provide insight on their perspective of mobility in Ostana. It also included demographic questions.

The questionnaires designed for tourists (Refer to Appendix 2: Questionnaire Tourists) consisted of two parts: the first part included demographic questions, questions related to the reason of visiting Ostana, the activities undertaken, and respondents' attitude towards mobility and sustainability. The second part consisted of choice scenarios with variance of levels in the options provided. The respondent was asked to choose one option for each scenario, each having a set of different attributes (i.e. travel or waiting time, parking and travel cost, parking time) and a set of various transportation modes (i.e. car, chair lift, e-bike or shuttle). Offering variance of levels in the options helped in order to understand the importance of each attribute and transportation mode for each tourist. It also allowed to reveal the respondents' perspective towards the use of alternative ecological transport modes and to elaborate a forecasting of behavior.

The questionnaires were developed by the MonViso Institute in collaboration with the Institute of Economic Research (IRE) at the Università della Svizzera italiana in Lugano. All questionnaires were discussed between Dr. Tobias Luthe and the Master students before the experiment implementation. Necessary adjustments were made, and revised questionnaires were then translated from English to Italian language by the Italian speaking students of the class.

## 4.4 Experiment Implementation

The experiment was scheduled to be implemented on Sunday the 28<sup>th</sup> of May. One day before, on Saturday, the experiment was promoted through a public announcement in the local press. The announcement aimed at raising awareness, informing people of the region, raising participation interest and encouraging contribution to the experiment (Refer to Appendix 3: Experiment Announcement).

On the day of the experiment, students engaged with local people and tourists traveling to Ostana. During the entire day students maintained an information booth at a parking spot, the Lou Biviou, at the road entrance of Ostana and talked to visitors. Participants of the experiment were interviewed by the Italian speakers of the class, and were asked to leave their car at the parking area. A shuttle bus, or Navette, was available to transfer participants up to different drop-offs in the village at zero cost.

Advertising panels, handmade by students of the class, were placed on site explaining the purpose of the experiment.



The use of questionnaires can imply some disadvantages that need to be taken into consideration. Indeed, respondents might answer what they think/know the interviewer wants to hear rather than sharing their actual opinion. Although these hidden statements are unavoidable, it is essential to be aware of them. A solution that has been applied in our experiment was to combine questionnaires with observation. The interviewing procedure was supported by the experiment observation, where students were observing the procedure and took notes on different issues (i.e. the number of cars stopping, passengers' synthesis, passengers' attitude, experiment participants' mood). The combination of interview and observation was ideal to offer the possibility to add comments about tourists' attitude towards the questionnaire and to ensure an appropriate interpretation of the experiment's results.

On another note, a small incentive was given to the experiment participants, connecting them to some tourist activities. Each participant was offered a wood coin as a local currency to be exchanged for a free coffee in various establishments of the community. The wood coins were handmade by the students.



The engagement of the community of Ostana was of major importance for the success of the experiment.

## 4.5 Questionnaire Analysis

The questionnaire was coded and analyzed using Microsoft Excel software.

Interviewed participants were separated into two categories: “locals/residents” and “visitors/tourists”. The sample used in the analysis for this experiment was 98 participants (73 tourists and 25 Ostana residents).

Because different versions of questionnaires were executed and depending on which group a participant belonged, two different excel sheets summarized the coded data.

In general, Microsoft Excel was used to count the frequencies of different answers to each questionnaire question. They were then depicted graphically in pie and bar charts where applicable.

The use of pie charts provides many benefits. First, they display relative proportions of multiple classes of data. Secondly, the size of the circle is proportional to the total quantity it represents, and by this way it summarizes large data sets in visual form. In turn, it is visually simpler than other types of graphs, such as a histogram or scatter plot. It requires minimal additional explanations and can be easily understood due to widespread use in business and the media.

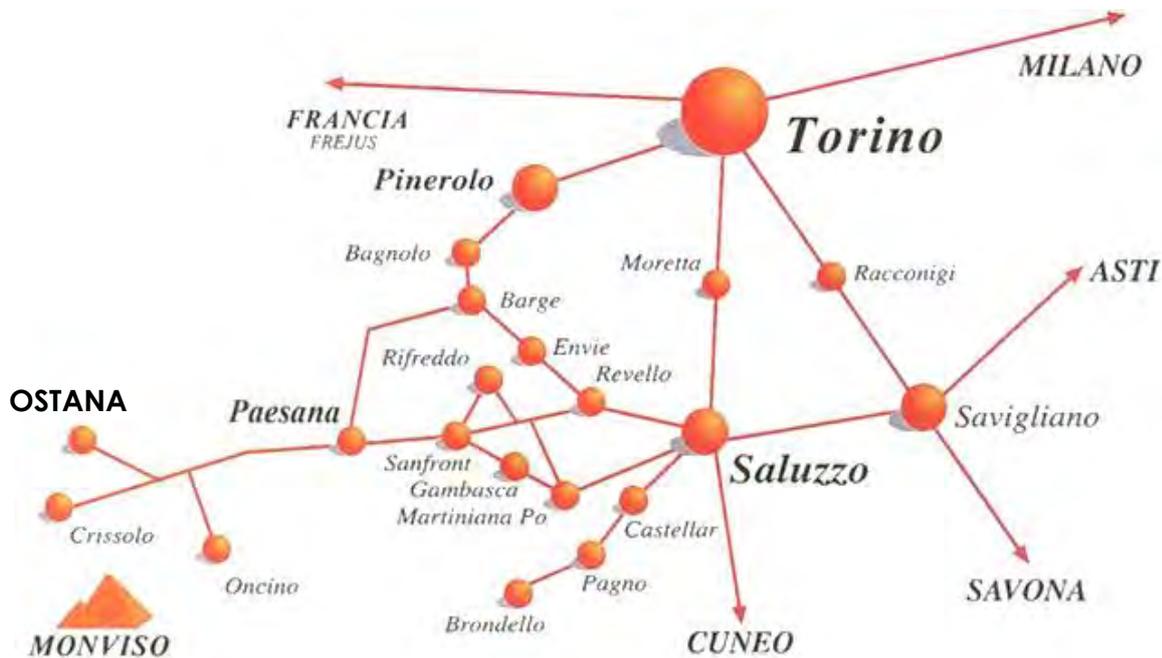
Additionally, Microsoft Excel was used to calculate an average in cases where it was applicable.

## 4.6 Experiment Results

Results are presented separately for the two categories: “visitors/tourists” and “locals/residents”.

### Results: visitors/ tourists

Out of the 73 interviewed tourists, 96% of the sample were Italian nationals. They were traveling to Ostana from the nearby region of Torino. Most frequent starting points were Saluzzo, Savigliano, Cuneo, Sanfront and Crissolo.



Participants were between 19 and 86 years old. 49% of the sample were male, whereas 48% were female.

The questionnaire version “Sustainable Development Experiment” was executed with 60% of the participants, whereas the questionnaire version “Transport Mode Experiment” was used with 40% of the participants.

The majority of participants stayed in Ostana for one day (96%) and were first time visitors to the community (52%).

The most frequent seasons of visitation are winter and fall.

Regarding the traveling group synthesis, the majority of participants specified that they were traveling with adults between 16-30 years old.

The most frequent activities planned during the day in Ostana (Q5/ questionnaire for tourists) were visiting friends and family, dining and hiking (Figure 2).

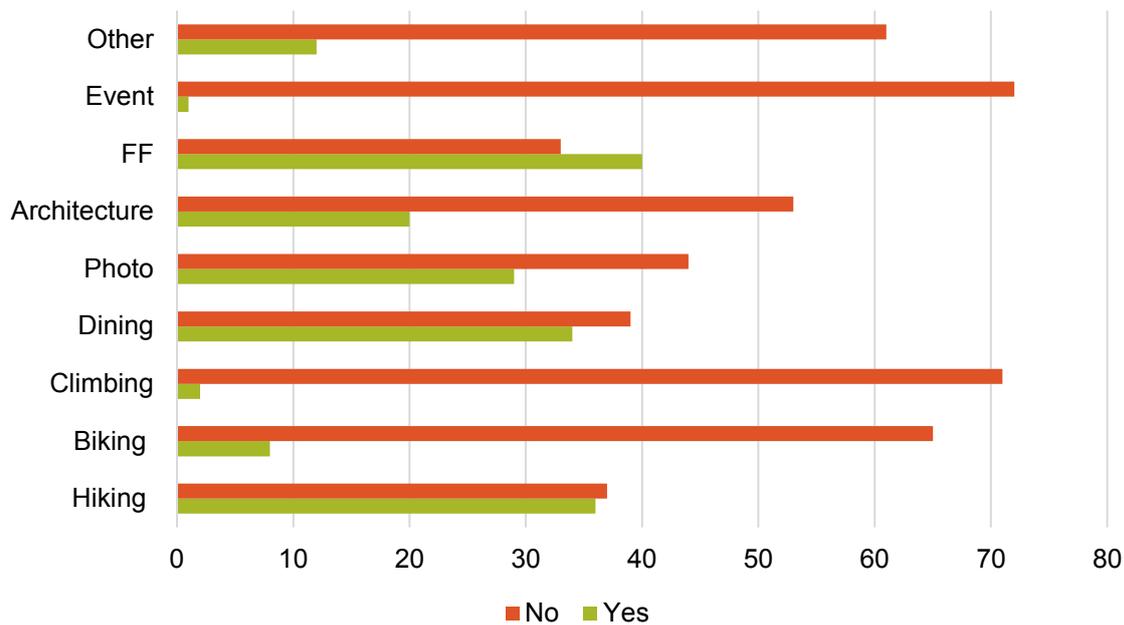


Figure 2: Activities planned in Ostana today / tourists

Participants were asked to provide level of agreement to statements regarding mobility preferences (Q6/ questionnaire for tourists). When in Ostana, the perception of car traffic and congestion as disturbing is relatively scattered. On a scale of 1 (=completely disagree) to 5 (=completely agree) 26% of participants completely disagreed and 13% of participants completely agreed. 24% affirmed lacking knowledge to answer the question, whereas 11% did not answer the particular question (Figure 3).

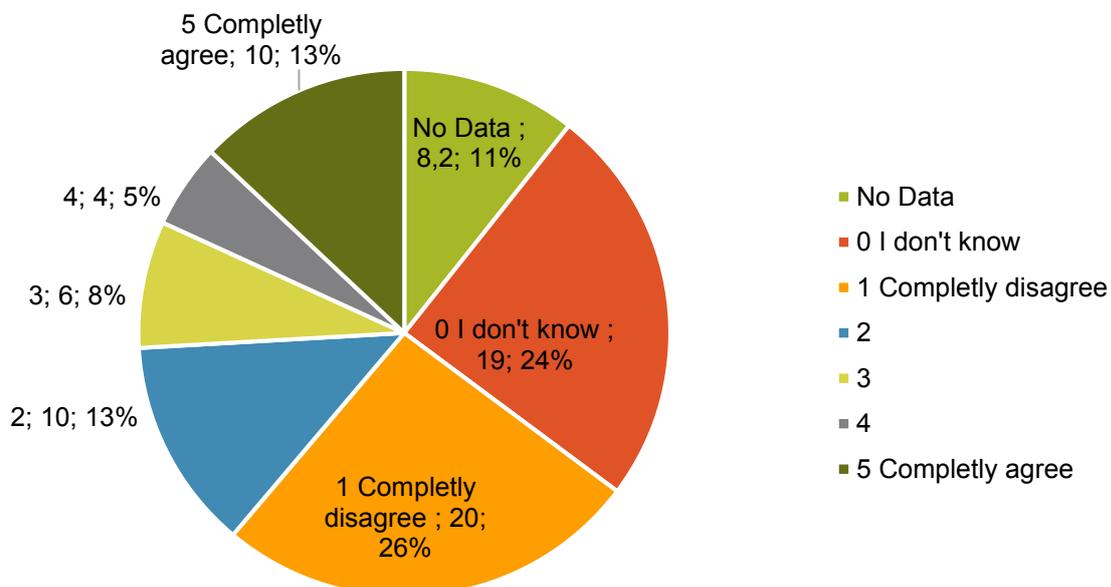


Figure 3: Perception of car traffic and congestion as disturbing (on a scale of 1 to 5) / tourists

When asked about the existence of more ecological alternatives to car arrival to Ostana, the majority of participants (52%) completely agreed to the statement that there should be more ecological alternatives to car arrival to Ostana (Figure 4)

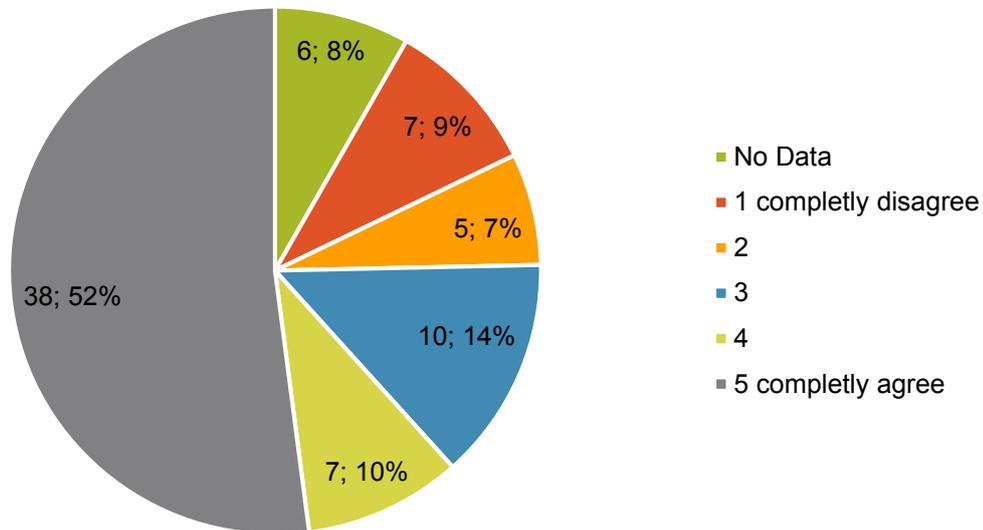


Figure 4: Ecological alternative to car arrival in Ostana (on a scale of 1 to 5) / tourists

When asked if limiting car arrival to Ostana was a good thing, a dominant majority of participants (48%) completely agreed with the statement. Only 11% of participants completely disagreed that it was a good thing (Figure 5).

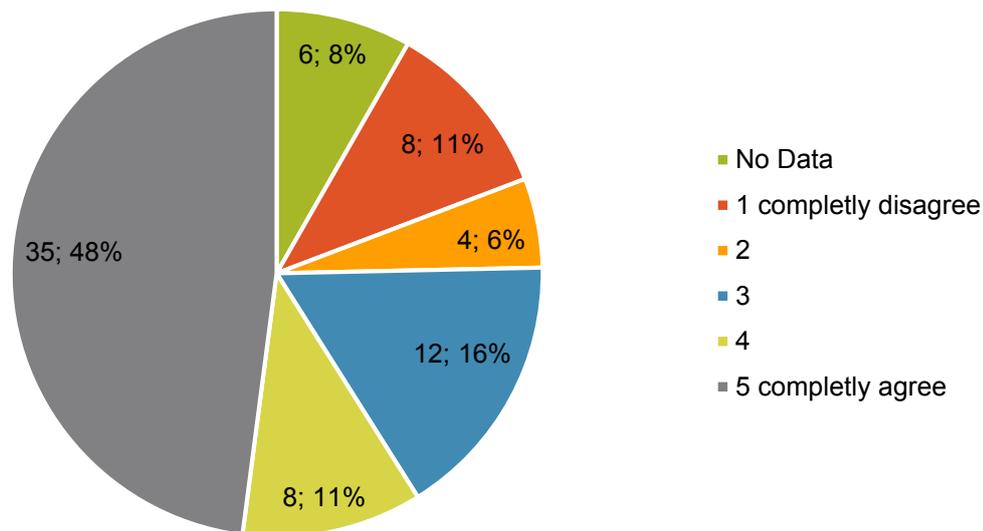


Figure 5: Limiting car arrival to Ostana is a good thing (on a scale of 1 to 5) / tourists

### Results: locals/ residents

Out of the 25 interviewed local residents, on average a resident has been living in Ostana for 29.55 years. The age of participants, born between 1939 and 2007, ranges from 10 to 78 years old. 42% of participants were female, whereas 52% were male.

Participants were asked to provide level of agreement to statements regarding mobility preferences (Q1/ questionnaire for locals). When asked if visitor's car traffic and congestion in Ostana is disturbing, 36% of participants were relatively neutral choosing 3 on a scale of 1 (=completely disagree) to 5 (=completely agree) (Figure 6).

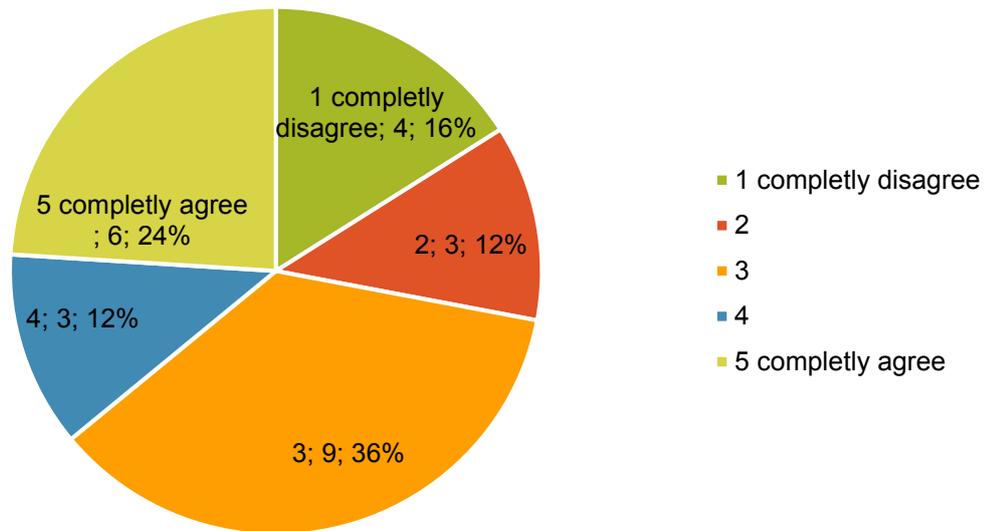


Figure 6: Visitor's car traffic and congestion in Ostana are disturbing (on a scale of 1 to 5) / residents

When asked if there should be a more ecological alternative to car arrival to Ostana, a dominant majority of participants (52%) completely agreed (Figure 7).

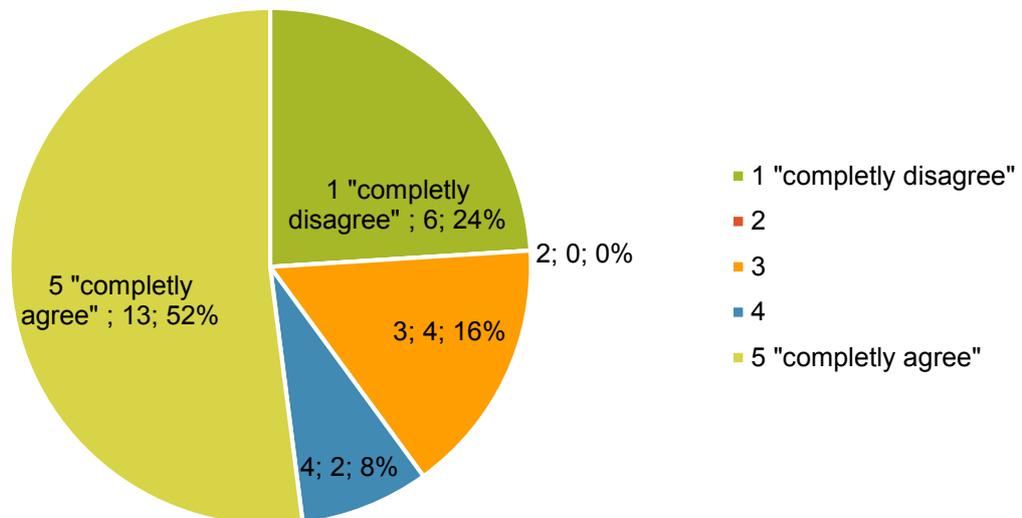


Figure 7: There should be a more ecological alternative to car arrival to Ostana (on a scale of 1 to 5) / residents

When questioned if limiting car arrival to Ostana was a good thing, opinions were more differentiated. About two thirds either completely agreed (33%) or disagreed (30%) (Figure 8).

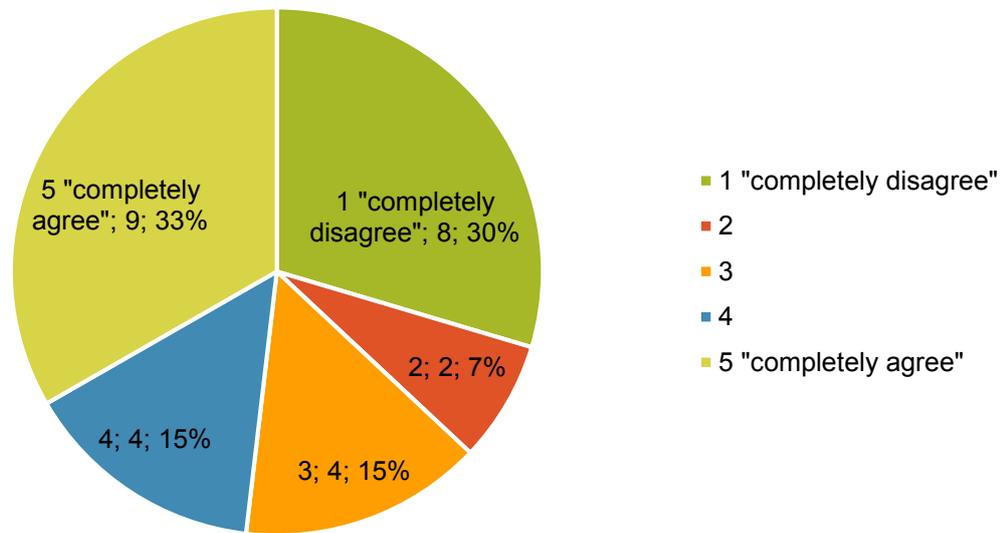


Figure 8: Limiting car arrival to Ostana is a good thing (on a scale of 1 to 5) / residents

In general, the majority of residents (64%) completely agreed that tourism and daily visitors were a good thing for the community of Ostana (Figure 9).

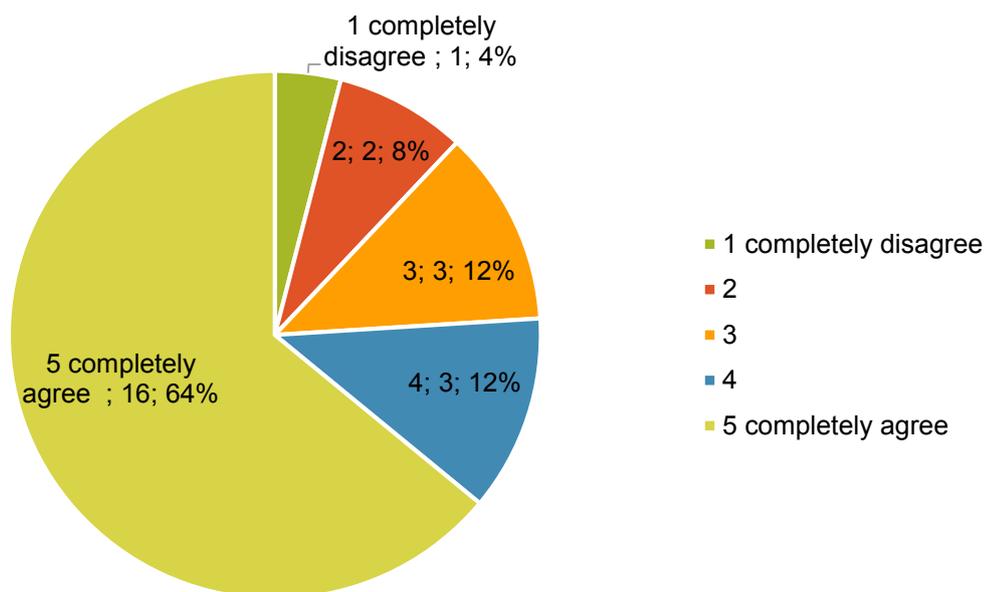


Figure 9: Tourism and daily visitors are good for the community of Ostana (on a scale of 1 to 5) / residents

When asked if visitor's car traffic and congestion in Ostana were too polluting, nearly a third (32%) of participants completely agreed (Figure 10).

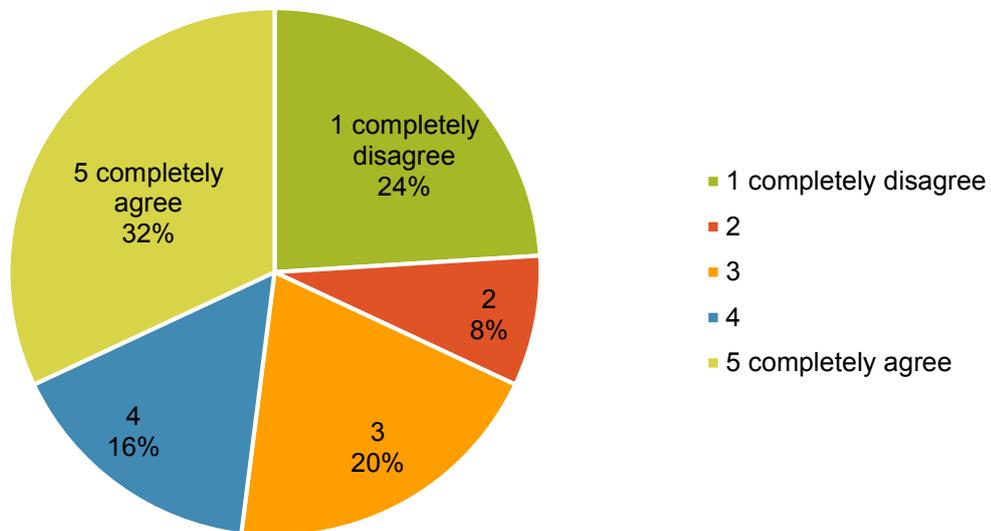


Figure 10: Visitor's car traffic and congestion in Ostana are too polluting (on a scale of 1 to 5) / residents

When asked about transportation alternatives to car for tourists, participants' most favored option was a shuttle service and e-bike, whereas the chairlift seemed to be the least favored alternative (Figure 11).

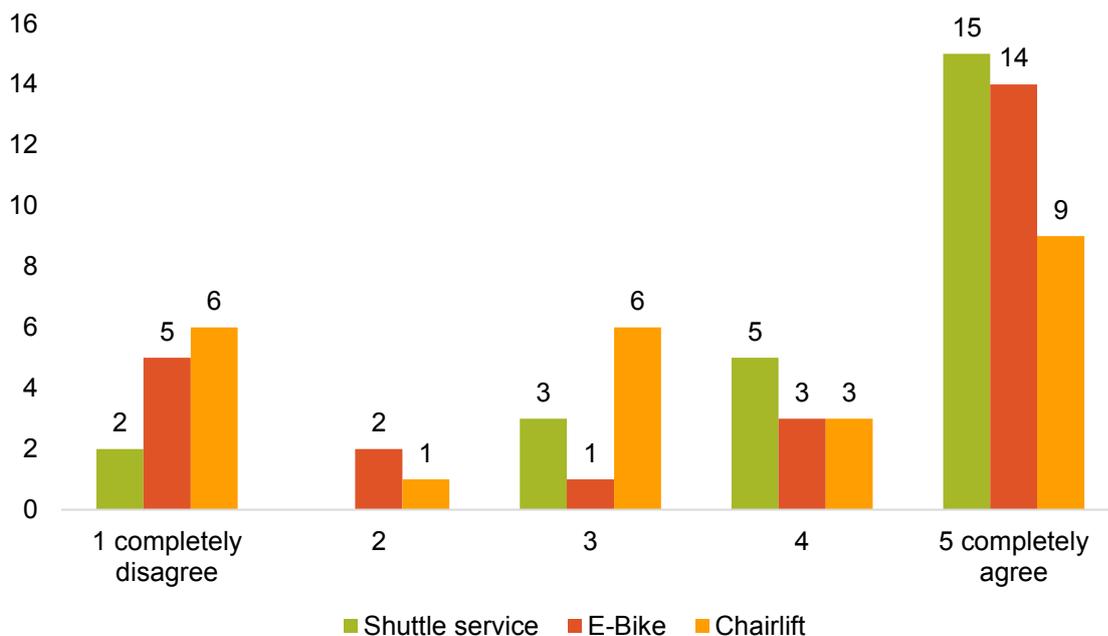


Figure 11: Ranking of transportation alternatives: shuttle service, e-bike, chairlift (on a scale of 1 to 5) / residents

When asked if visitors made traffic in Ostana less safe, the majority of participants (52%) did not answer the question. Only 16% of the participants responded that they completely agreed with the statement (Figure 12).

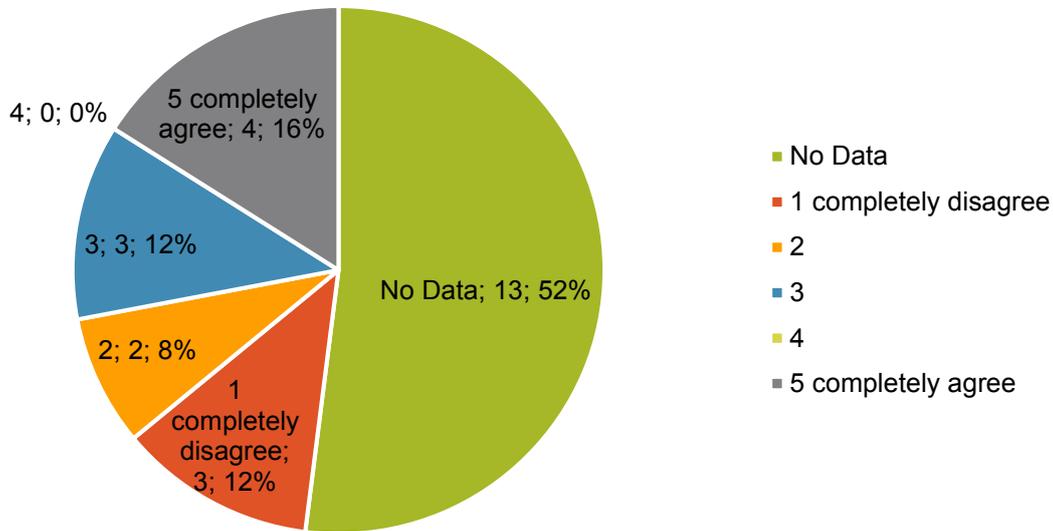


Figure 12: traffic and congestion caused by visitors’ vehicles make driving less secure (on a scale of 1 to 5) / residents

When asked if driving on the road system was rather dangerous, 52% of participants did not answer the question. Yet 32% of the participants completely agreed with the fact that it was indeed dangerous (Figure 13).

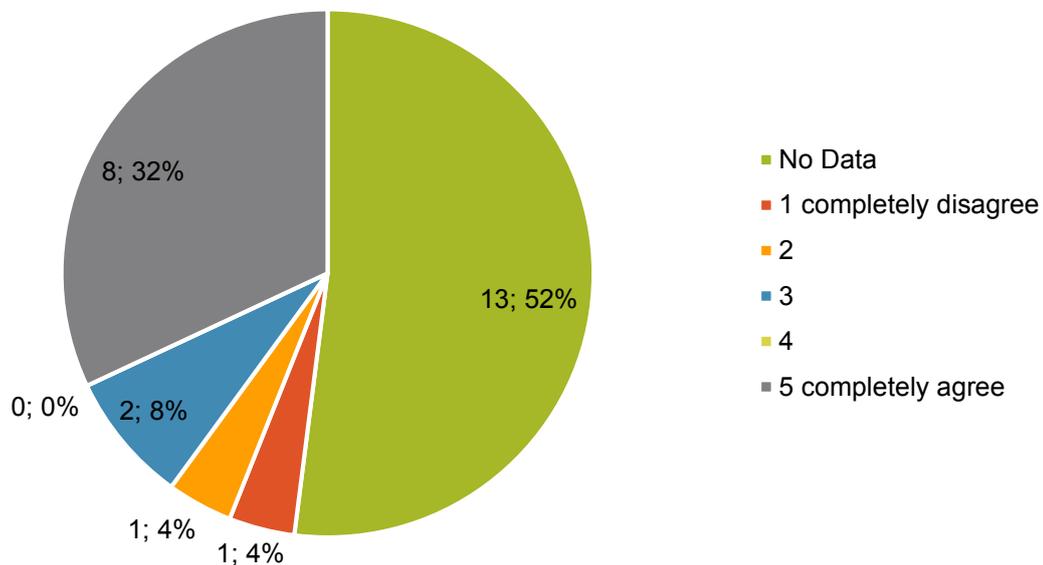


Figure 13: Driving on the Ostana roadway is rather dangerous due to the lack of protection barriers (on a scale of 1 to 5) / residents

For viewing further results for the “visitors/tourists” questionnaire refer to Appendix 4.

For viewing further results for the “locals/residents” questionnaire refer to Appendix 5.

## 4.7 Experiment Observation

During the experiment day, students were observing the procedure and took notes on different issues (i.e. the number of cars stopping, passengers' synthesis, passengers' attitude, experiment participants mood, demographics, and types of transportation means). Experiment observation aimed to identify specific patterns of people's behavior.

The total number of cars observed was 206. The number of passengers in each car varied between one and six, but the most frequent synthesis were couples and families of four people. In some cases, passengers were accompanied by dogs. The total number of motorbikes observed was 8, 9 people were using bicycles and 4 others were traveling on foot.

Most people came from nearby areas of Italy, but had various motivations for travelling to Ostana. Some were local people living in Ostana or owning a holiday house there. Others traveled to Ostana for working reasons or for visiting friends and family. The majority of the people were tourists.

People's reaction towards the project varied. Most people were responsive and willing to help and contribute by answering the questionnaire. Some filled the questionnaire with the help of the interviewers and some preferred to take it with them, fill it during their visit in Ostana and bring it back on their way down the village. Some people were happy to use the shuttle service. However, other people were more reluctant to the project. Although these behaviours were relatively rare, it was observed that some people drove without stopping or refused to participate in the experiment or to take the shuttle. A unique case of angry respondent was observed, however it was perceived that there was a political reason behind the experiment.

Overall, people were enthusiastic towards the experiment and interested in the fact that a group of students from Ticino was there to help the community to develop sustainability plans. Some people reported they were seeing benefits, such as less congestion than a usual Sunday. Others made recommendations, such as the need for the shuttle to have children car seats and necessary equipment to accommodate dogs. The shuttle service was also being seen as the only option for disabled people. A passenger traveling from nearby Crissolo stressed the need of collaboration between the nearby communities regarding transportation.

On another note, the wood coin offered in exchange for filling the questionnaire was greatly appreciated; people either decided to keep it as a souvenir or exchange it for a coffee in various establishments in Ostana.

Some of the participants' most important statements can be viewed in Table 2:

TABLE 2: Participants Statements

"I hope the shuttle service will be implemented the soonest possible"
"I am concern because nearby communities are not collaborating to find a solution for the transportation issue"
"Initiatives like this should be implemented in order to bring and keep people back to the community"
"I find Navette a fantastic idea, but I am concern that if we try to reduce cars, the people will not be willing to come to Ostana anymore"
"We cannot take the shuttle service, because we have dogs with us"
"We would like to take the shuttle service, but we have a baby with us who needs special sitting arrangement"
"I am a local resident and the shuttle service does not concern me"
"I never thought about a chair lift in Ostana, but now you tell me the idea, I might start thinking about it as alternative"
"I am very frustrated, because you are blocking the road access"

In general, through the engagement of the students and participants, the experiment was successful and offered various suggestions for the community to take into consideration.

## 4.8 Suggestions for Future Version of the Experiment

The experiment procedure revealed some limitations and drawbacks. These do not necessarily have a negative influence on the credibility of the conclusions drawn, but they have to be kept in mind, especially when interpreting the results, and secondly, because limitations give ideas for further research that would effectively deal with them.

Referring to the experiment observation, we can conclude that local awareness regarding the experiment and the reasons for being implemented were not sufficient. Some of the local people did not understand or know why the experiment was conducted. When the interviewers explained the purpose to locals, they were unable to see mobility issues as relevant to them because they weren't tourists. For that reason, some did not want to participate in the experiment. In other cases, people decided to deviate to Crissolo, even if their intended destination was Ostana. Seeing so many people standing along the road was perceived as a road block and did not want to drive through.

This caused a reduced number of potential participants to the experiment and a reduced sample size. Collected data could have been more important, if there was a higher experiment participation. Therefore, for the future versions of the experiment we suggest the implementation of a better promotion strategy planned ahead and earlier than the day prior to the experiment. Awareness should concern both local residents and tourists. Furthermore, creative incentives to motivate participation should also be considered (i.e. win an overnight stay in Ostana).

Although in-depth interviews were beneficial, mainly because the researchers guided the participants to give more attention to the survey and sometimes think harder. There were still some drawbacks. In some cases, participants were in a hurry and did not give proper answers or did not answer at all. In some other cases, participants found the questionnaire handed to tourists too long. As a result, there were some questionnaires that were missing data. For the future, improved and more user-friendly versions of the survey questionnaire may incorporate fewer scenarios.

Another issue to be considered for the future is safety. Having in mind that the experiment took in a place where a road turn had to be made, in some cases this caused congestion, drivers' frustration and the risk of accidents.

## 5. Design Thinking



While in Ostana, students were engaged in a Design Thinking Workshop to find alternative mobility solutions for the community.

Design thinking is a methodology used to solve complex problems, and find desirable solutions by proposing and offering new thoughts. It allows to develop suggestions for future trials/experiments through designing a vision and focusing on where we want to be in the future. Backcasting, rather than forecasting, is thus core: it allows to start with the end in mind, move backwards to the present and then move step by step towards the vision. Design thinking can be explained in the Figure 14:

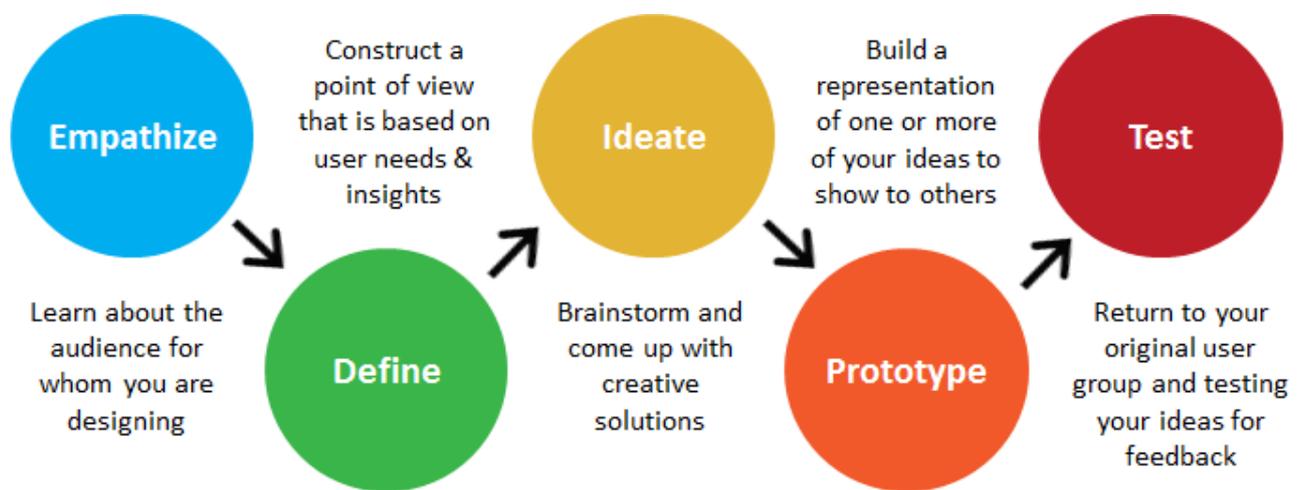


Figure 14: Design thinking procedure (Image credit: irdg.ie)

It is also important to have an adequate framework and consider possible boundaries, such as geographical and topographical boundaries. In the case of Ostana, geographical and topographical boundaries reflect the importance of collaboration between the community and the nearby communities like Crissolo. Various touristic attractions of the community such as the Il Bosco Incantato, the Adventure Park or the Agriturismo, should also be considered. Besides, other system boundaries, like the local culture, traditions and architecture, should also be taken into account. Furthermore, sustainability, social, environmental and economic aspects, should ensure the achievement of current and future needs. Thus, for design thinking to be successful, it is important to include local stakeholders and practitioners and to adopt a holistic approach.

Design thinking proposals conceptualized by students can be viewed in Appendix 6.

## 6. Conclusion



Human use and the tourism economy are often not sustainable on mountain regions. While being situated in fragile environments, mountain regions are also vulnerable to climate change. Broader environmental and socio-economic changes further increase their vulnerability. Human activities, tourism, traffic, agriculture and land destruction need to be balanced well in order to enable resilient and sustainable development in alpine regions. In order to achieve a more sustainable social-ecological system balance in mountain regions, and to know what to change and where to start, sustainability needs to be measured in a comparable and quantitative way.

This report explored issues related to transportation and mobility in rural Ostana.

The survey casted light on the mobility preferences of tourists and the community of Ostana residents. The majority of tourist participants (52%) have completely agreed to the statement that there should be more ecological alternatives to car arrival to Ostana. The percentage for the resident participants is equal for the same statement.

The results also tend to support the use of a shuttle bus service. When asked regarding transportation alternatives to car for tourists, resident participants most favored option is a shuttle service and e-bike, whereas the chairlift seems to be the least favored alternative.

However, parking is an essential part of the transportation system, and proper parking facilities can have significant impact on traffic flow. Inadequate parking can cause unnecessary circulation as drivers search for parking spaces. Furthermore, roadway capacity may be reduced by illegal parking.

Through the Sustainable Tourism Colloquium course, we were taught about the sustainabuild concept (Luthe & Kutzschenbach, 2016), which highlights the need of the development of a common ground for a more understandable, concrete, desirable, and stimulating vision of sustainability. The experiment observation tend to support the use of this concept, as many residents of the community and residents from the nearby communities expressed the opinion of a common vision towards sustainability for the broader area, addressing at the same time the satisfaction of both social and economic needs.

Mobility, or the ability to get from place to place, is important for everyone. Mobility enables people to conduct the activities of daily life, stay socially connected with their world, participate in activities that make life enjoyable, and maintain their quality of life. It is well documented that community mobility services are limited or nonexistent in many rural areas

(Dickerson, et al., 2007). The long distances between rural residences and necessary services create transportation and mobility challenges in rural communities. Furthermore, it is likely that older adults are forced to continue driving longer than they can safely do so. With the increased population of older rural residents, providing adequate mobility options is an especially important issue.

The community of Ostana intends to repeat the experiment in August.

## 7. Appendices



# Appendix 1: Questionnaire Version for Locals

## Sustainable Tourism Mobility - The Case of Ostana, Piedmonte -- Questionnaire for Local Residents

Q1: Please consider your agreement to the following statements:

**"Visitor's car traffic and congestion in Ostana are disturbing."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"There should be a more ecological alternative to car arrival to Ostana."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"Limiting car arrival to Ostana is a good thing."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"Tourism and daily visitors are good for the Ostana community."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"Visitor's car traffic and congestion in Ostana are too polluting"**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"A shuttle bus service up to Ostana would be a good alternative to car for tourists."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"E-Bike services for going up to and around Ostana would be a good alternative to car for tourists."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

**"A chairlift up to Ostana would be a good alternative to car for tourists."**

Completely disagree (1) (2) (3) (4) (5) Completely agree

Q2: What is your gender?

- Male
- Female

Q3: What year were you born? .....

Q4: How long have you been living in Ostana?.....

**Thank you for participating!**

**Turismo e mobilità sostenibile– Il caso di Ostana, Piemonte – Questionario per i residenti locali**

1. Indicare gentilmente in quale misura concorda con le seguenti affermazioni:

**“Il traffico e la congestione causati dai veicoli dei visitatori ad Ostana recano disturbo”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Bisognerebbe introdurre un mezzo di trasporto alternativo, più ecologico dell'automobile, per raggiungere Ostana.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Limitare l'arrivo di automobili ad Ostana apporterebbe benefici alla comunità.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Il turismo e i visitatori giornalieri generano opportunità economiche alla comunità di Ostana.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Il traffico e la congestione causati dai veicoli dei visitatori sono causa di inquinamento ad Ostana”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Un servizio navetta per raggiungere Ostana rappresenterebbe una valida alternativa all'automobile per i turisti.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Un servizio di biciclette elettriche per raggiungere e muoversi ad Ostana rappresenterebbe una valida alternativa all'automobile per i turisti.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Un collegamento tramite seggiovia per raggiungere Ostana rappresenterebbe una valida alternativa all'automobile per i turisti.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Il traffico e la congestione causati dai veicoli dei visitatori rendono la guida ad Ostana meno sicura.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

**“Guidare sul tratto stradale di Ostana è piuttosto pericoloso a causa della mancanza di barriere di protezione.”**

Completamente in disaccordo (1) (2) (3) (4) (5) Completamente d'accordo

2. Indicare il proprio sesso:

- Maschio
- Femmina

3. Indicare l'anno di nascita: .....

4. Indicare da quanto tempo vive ad Ostana: .....

**Grazie per la partecipazione!**

# Appendix 2: Questionnaire Version for Tourists

## Sustainable Tourism Mobility - The Case of Ostana, Piedmonte -- Questionnaire for Tourists

- Q1: From where did you start your trip today?
- Place of Residence (CAP, Municipality, Country)
    - .....
  - Holiday Accommodation (CAP, Municipality, Country)
    - .....
- Q2: Please, specify the group you are travelling with today (including yourself):
- Number of children below 15 years: .....
  - Number of adults, 16-30 years: .....
  - Number of adults, 31-60 years: .....
  - Number of adults, 61+ years: .....
- Q3: How long are you staying here?
- Only today (hours \_\_\_\_\_)                      ■ Overnight guest
- Q4: On average, how often are you coming to Ostana per year?
- First time                      ● 2-5 times                      ● 6-10 times                      ● more than 10 times
- Q4.1: Please, rank in which season you come to Ostana most frequently?  
(from 1=most frequent to 4=least frequent)
- Spring .....
  - Summer .....
  - Fall .....
  - Winter .....
- Q5: What activities do you plan to do today in Ostana? (mark as many as apply)
- Hiking
  - Biking
  - Climbing
  - Dining
  - Taking Photographs
  - Enjoying Architecture
  - Spending quality time with friends and family
  - Attending an event (specify, which:) .....
  - Other (please, specify:) .....
- Q5.1: Did you bring any sport equipment with you today for your activities in Ostana?
- Please, specify which (if any): .....
- Q6: Please consider your agreement to the following statements:
- “When in Ostana, I perceive car traffic and congestion as disturbing.”**  
Completely disagree (1)      (2)      (3)      (4)      (5) Completely agree      (O) don't know
- “There should be a more ecological alternative to car arrival to Ostana.”**  
Completely disagree (1)      (2)      (3)      (4)      (5) Completely agree
- “Limiting car arrival to Ostana is a good thing.”**  
Completely disagree (1)      (2)      (3)      (4)      (5) Completely agree
- Q7: What is your gender?
- Male                      ● Female
- Q8: What year were you born? .....
- Q9: What is your nationality? .....

Q10: **Ostana as a Community is actively engaging in sustainable development.** As a visitor, you are kindly asked to participate in this aim by reducing the impact of car congestion and switch to more ecological transport modes. Which option would you choose to reach Ostana?

<b>Scenario 1</b>	<i>Travel time</i>	<b>Car</b> 15 min.	<b>Shuttle</b> 18 min.	<b>E-bike</b> 35 min.	<b>Chair lift</b> 15 min.
	<i>Parking cost</i>	1.50 €/hour			
	<i>Travel cost (round trip, free for under-15 kids)</i>		2.00 €/pp	1.00 €/pp	4 €/pp
	<i>Parking time</i>	5 min.			
	<i>Waiting time</i>		10 min.		3 min.
	<i>N. of e-bike stations in Ostana</i>			3	
<b>Choice question:</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 2</b>	<i>Travel time</i>	<b>Car</b> 12 min.	<b>Shuttle</b> 15 min.	<b>E-bike</b> 30 min.	<b>Chair lift</b> 18 min.
	<i>Parking cost</i>	2.50 €/hour			
	<i>Travel cost (round trip, free for under-15 kids)</i>		Free	2.00 €/pp	2.00 €/pp
	<i>Parking time</i>	10 min.			
	<i>Waiting time</i>		10 min.		4 min.
	<i>N. of e-bike stations in Ostana</i>			1	
<b>Choice question:</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 3</b>	<i>Travel time</i>	<b>Car</b> 18 min.	<b>Shuttle</b> 12 min.	<b>E-bike</b> 30 min.	<b>Chair lift</b> 12 min.
	<i>Parking cost</i>	2.50 €/hour			
	<i>Travel cost (round trip, free for under-15 kids)</i>		2.00 €/pp	3.00 €/pp	4.00 €/pp
	<i>Parking time</i>	1 min.			
	<i>Waiting time</i>		8 min.		5 min.
	<i>N. of e-bike stations in Ostana</i>			1	
<b>Choice question:</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 4</b>	<i>Travel time</i>	<b>Car</b> 15 min.	<b>Shuttle</b> 18 min.	<b>E-bike</b> 35 min.	<b>Chair lift</b> 15 min.
	<i>Parking cost</i>	3.50 €/hour			
	<i>Travel cost (round trip, free for under-15 kids)</i>		2.00 €/pp	3.00 €/pp	4.00 €/pp
	<i>Parking time</i>	5 min.			
	<i>Waiting time</i>		5 min.		3 min.
	<i>N. of e-bike stations in Ostana</i>			2	
<b>Choice question:</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 5</b>	<i>Travel time</i>	<b>Car</b> 12 min.	<b>Shuttle</b> 12 min.	<b>E-bike</b> 40 min.	<b>Chair lift</b> 18 min.
	<i>Parking cost</i>	3.50 €/hour			
	<i>Travel cost (round trip, free for under-15 kids)</i>		2.00 €/pp	1.00 €/pp	Free
	<i>Parking time</i>	1 min.			
	<i>Waiting time</i>		10 min.		5 min.
	<i>N. of e-bike stations in Ostana</i>			2	
<b>Choice question:</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 6</b>	<i>Travel time</i>	<b>Car</b> 18 min.	<b>Shuttle</b> 12 min.	<b>E-bike</b> 40 min.	<b>Chair lift</b> 18 min.
	<i>Parking cost</i>	1.50 €/hour			
	<i>Travel cost (round trip, free for under-15 kids)</i>		4.00 €/pp	2.00 €/pp	2.00 €/pp
	<i>Parking time</i>	1 min.			
	<i>Waiting time</i>		10 min.		5 min.
	<i>N. of e-bike stations in Ostana</i>			3	
<b>Choice question:</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for participating!



10: La comunità di Ostana è attiva nell'ambito dello sviluppo sostenibile. In quanto visitatore, le viene gentilmente richiesto di partecipare a questo fine, riducendo l'impatto del traffico automobilistico decidendo coscientemente di utilizzare una modalità di trasporto più sostenibile. Quale opzione sceglierebbe per raggiungere Ostana?

<p><b>Scenario 1</b></p> <p><i>Tempo di percorrenza</i>  <i>Costo del parcheggio</i>  <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i>  <i>Tempo per parcheggiare</i>  <i>Tempo d'attesa</i>  <i>Nr. di stazioni e-bike a Ostana</i></p>	<p><b>Macchina</b>  15 min.  1.50 €/ora</p> <p>5 min.</p>	<p><b>Navetta</b>  18 min.</p> <p>2.00 €/pp</p> <p>10 min.</p>	<p><b>E-bike</b>  35 min.</p> <p>1.00 €/pp</p> <p>3</p>	<p><b>Seggiovia</b>  15 min.</p> <p>4 €/pp</p> <p>3 min.</p>
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Scenario 2</b></p> <p><i>Tempo di percorrenza</i>  <i>Costo del parcheggio</i>  <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i>  <i>Tempo per parcheggiare</i>  <i>Tempo d'attesa</i>  <i>Nr. di stazioni e-bike a Ostana</i></p>	<p><b>Macchina</b>  12 min.  2.50 €/ora</p> <p>10 min.</p>	<p><b>Navetta</b>  15 min.</p> <p>Free</p> <p>10 min.</p>	<p><b>E-bike</b>  30 min.</p> <p>2.00 €/pp</p> <p>1</p>	<p><b>Seggiovia</b>  18 min.</p> <p>2.00 €/pp</p> <p>4 min.</p>
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Scenario 3</b></p> <p><i>Tempo di percorrenza</i>  <i>Costo del parcheggio</i>  <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i>  <i>Tempo per parcheggiare</i>  <i>Tempo d'attesa</i>  <i>Nr. di stazioni e-bike a Ostana</i></p>	<p><b>Macchina</b>  18 min.  2.50 €/ora</p> <p>1 min.</p>	<p><b>Navetta</b>  12 min.</p> <p>2.00 €/pp</p> <p>8 min.</p>	<p><b>E-bike</b>  30 min.</p> <p>3.00 €/pp</p> <p>1</p>	<p><b>Seggiovia</b>  12 min.</p> <p>4.00 €/pp</p> <p>5 min.</p>
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Scenario 4</b></p> <p><i>Tempo di percorrenza</i>  <i>Costo del parcheggio</i>  <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i>  <i>Tempo per parcheggiare</i>  <i>Tempo d'attesa</i>  <i>Nr. di stazioni e-bike a Ostana</i></p>	<p><b>Macchina</b>  15 min.  3.50 €/ora</p> <p>5 min.</p>	<p><b>Navetta</b>  18 min.</p> <p>2.00 €/pp</p> <p>5 min.</p>	<p><b>E-bike</b>  35 min.</p> <p>3.00 €/pp</p> <p>2</p>	<p><b>Seggiovia</b>  15 min.</p> <p>4.00 €/pp</p> <p>3 min.</p>
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Scenario 5</b></p> <p><i>Tempo di percorrenza</i>  <i>Costo del parcheggio</i>  <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i>  <i>Tempo per parcheggiare</i>  <i>Tempo d'attesa</i>  <i>Nr. di stazioni e-bike a Ostana</i></p>	<p><b>Macchina</b>  12 min.  3.50 €/ora</p> <p>1 min.</p>	<p><b>Navetta</b>  12 min.</p> <p>2.00 €/pp</p> <p>10 min.</p>	<p><b>E-bike</b>  40 min.</p> <p>1.00 €/pp</p> <p>2</p>	<p><b>Seggiovia</b>  18 min.</p> <p>Free</p> <p>5 min.</p>
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p><b>Scenario 6</b></p> <p><i>Tempo di percorrenza</i>  <i>Costo del parcheggio</i>  <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i>  <i>Tempo per parcheggiare</i>  <i>Tempo d'attesa</i>  <i>Nr. di stazioni e-bike a Ostana</i></p>	<p><b>Macchina</b>  18 min.  1.50 €/ora</p> <p>1 min.</p>	<p><b>Navetta</b>  12 min.</p> <p>4.00 €/pp</p> <p>10 min.</p>	<p><b>E-bike</b>  40 min.</p> <p>2.00 €/pp</p> <p>3</p>	<p><b>Seggiovia</b>  18 min.</p> <p>2.00 €/pp</p> <p>5 min.</p>
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Grazie per aver partecipato!

- 10: Il mezzo di trasporto da Lei scelto, ha un impatto sulla comunità di Ostana. Il traffico causato dai visitatori ha un serio impatto sulla salute dei residenti e sull'ambiente circostante e, in quanto visitatore, le viene chiesto di tenere in considerazione questa problematica. Quale delle seguenti opzioni sceglierebbe per raggiungere Ostana?

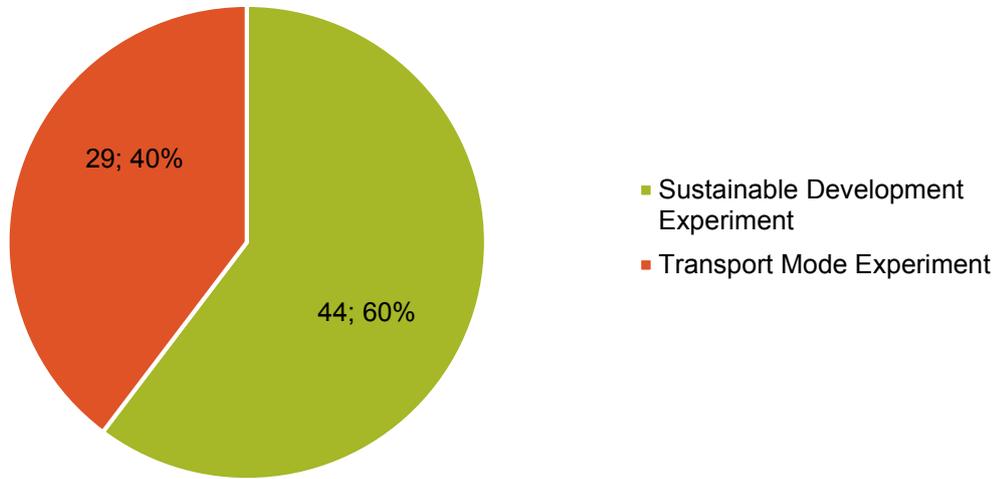
<b>Scenario 1</b> <i>Tempo di percorrenza</i> <i>Costo del parcheggio</i> <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i> <i>Tempo per parcheggiare</i> <i>Tempo d'attesa</i> <i>Nr. di stazioni e-bike a Ostana</i>	<b>Macchina</b> 15 min. 1.50 €/ora  5 min.	<b>Navetta</b> 18 min.  2.00 €/pp  10 min.	<b>E-bike</b> 35 min.  1.00 €/pp  3	<b>Seggiovia</b> 15 min.  4 €/pp  3 min.
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 2</b> <i>Tempo di percorrenza</i> <i>Costo del parcheggio</i> <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i> <i>Tempo per parcheggiare</i> <i>Tempo d'attesa</i> <i>Nr. di stazioni e-bike a Ostana</i>	<b>Macchina</b> 12 min. 2.50 €/ora  10 min.	<b>Navetta</b> 15 min.  Free  10 min.	<b>E-bike</b> 30 min.  2.00 €/pp  1	<b>Seggiovia</b> 18 min.  2.00 €/pp  4 min.
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 3</b> <i>Tempo di percorrenza</i> <i>Costo del parcheggio</i> <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i> <i>Tempo per parcheggiare</i> <i>Tempo d'attesa</i> <i>Nr. di stazioni e-bike a Ostana</i>	<b>Macchina</b> 18 min. 2.50 €/ora  1 min.	<b>Navetta</b> 12 min.  2.00 €/pp  8 min.	<b>E-bike</b> 30 min.  3.00 €/pp  1	<b>Seggiovia</b> 12 min.  4.00 €/pp  5 min.
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 4</b> <i>Tempo di percorrenza</i> <i>Costo del parcheggio</i> <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i> <i>Tempo per parcheggiare</i> <i>Tempo d'attesa</i> <i>Nr. di stazioni e-bike a Ostana</i>	<b>Macchina</b> 15 min. 3.50 €/ora  5 min.	<b>Navetta</b> 18 min.  2.00 €/pp  5 min.	<b>E-bike</b> 35 min.  3.00 €/pp  2	<b>Seggiovia</b> 15 min.  4.00 €/pp  3 min.
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 5</b> <i>Tempo di percorrenza</i> <i>Costo del parcheggio</i> <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i> <i>Tempo per parcheggiare</i> <i>Tempo d'attesa</i> <i>Nr. di stazioni e-bike a Ostana</i>	<b>Macchina</b> 12 min. 3.50 €/ora  1 min.	<b>Navetta</b> 12 min.  2.00 €/pp  10 min.	<b>E-bike</b> 40 min.  1.00 €/pp  2	<b>Seggiovia</b> 18 min.  Free  5 min.
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Scenario 6</b> <i>Tempo di percorrenza</i> <i>Costo del parcheggio</i> <i>Costo del viaggio (A/R, gratuito sotto i 15 anni)</i> <i>Tempo per parcheggiare</i> <i>Tempo d'attesa</i> <i>Nr. di stazioni e-bike a Ostana</i>	<b>Macchina</b> 18 min. 1.50 €/ora  1 min.	<b>Navetta</b> 12 min.  4.00 €/pp  10 min.	<b>E-bike</b> 40 min.  2.00 €/pp  3	<b>Seggiovia</b> 18 min.  2.00 €/pp  5 min.
<b>Scelta:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Grazie per aver partecipato!

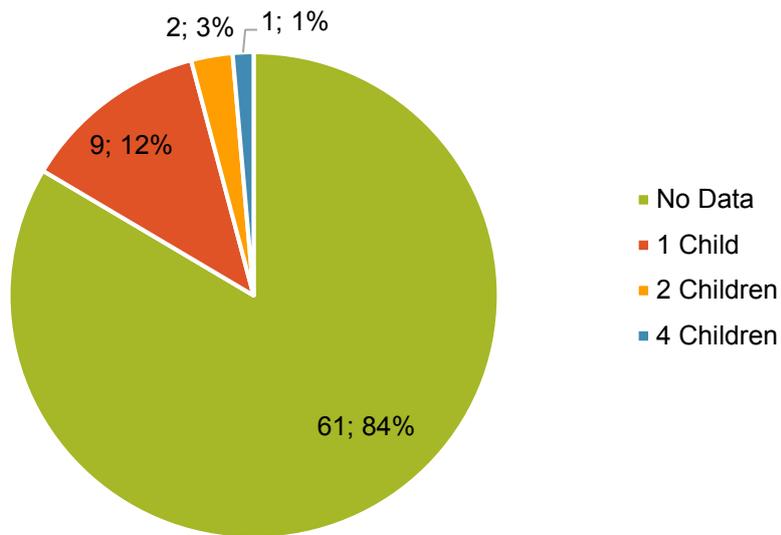


# Appendix 4: Further results for the “visitors/tourists” questionnaire

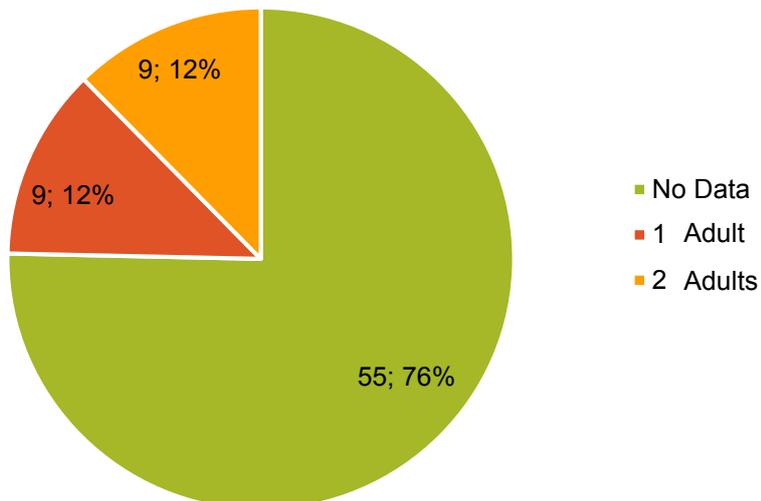
Version of questionnaire



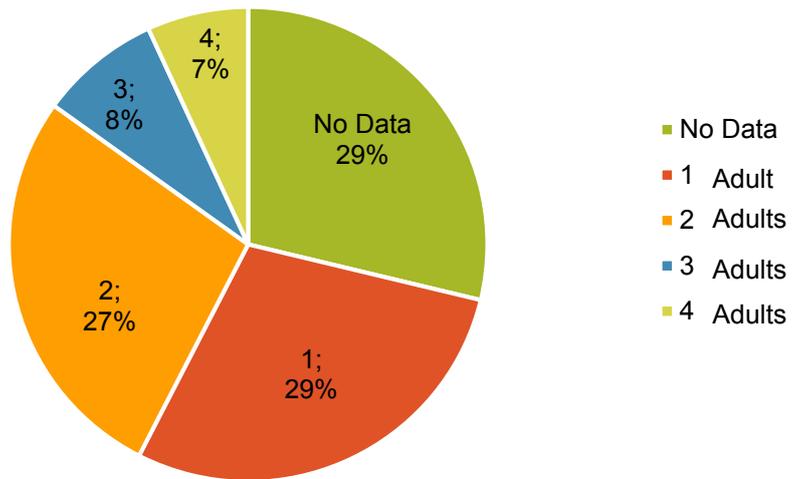
Q1: Group Travel/ No. of children under 15 yrs.



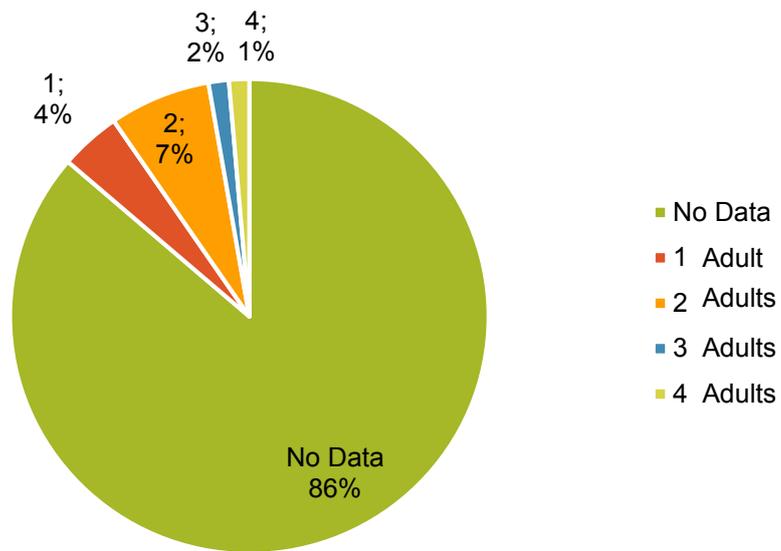
Q1: Group Travel/ No. Of adults (16-30)



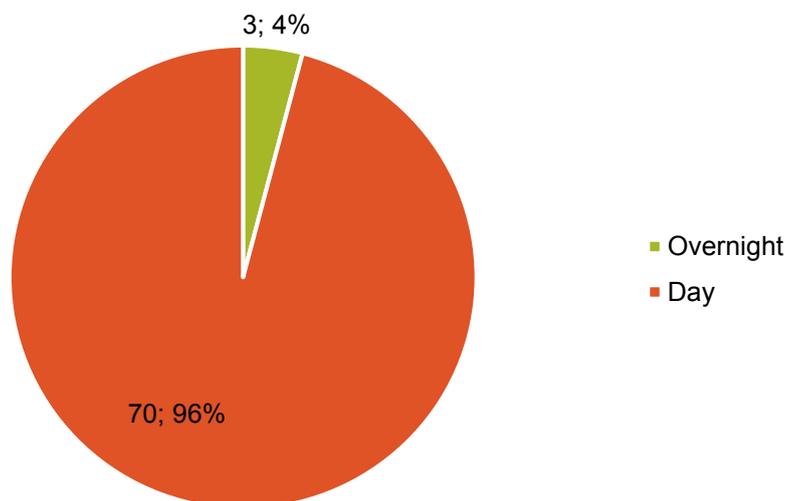
Q1: Group Travel/ No. of adults (31 - 60)



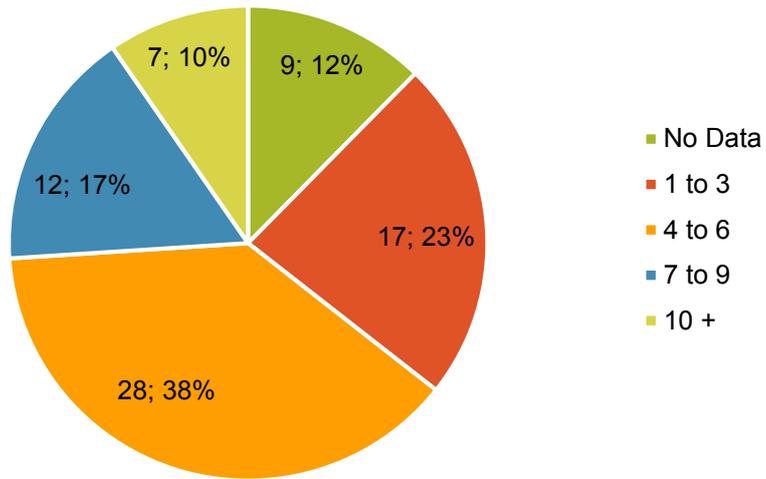
Q1: Group Travel/ No. Of adults (65+)



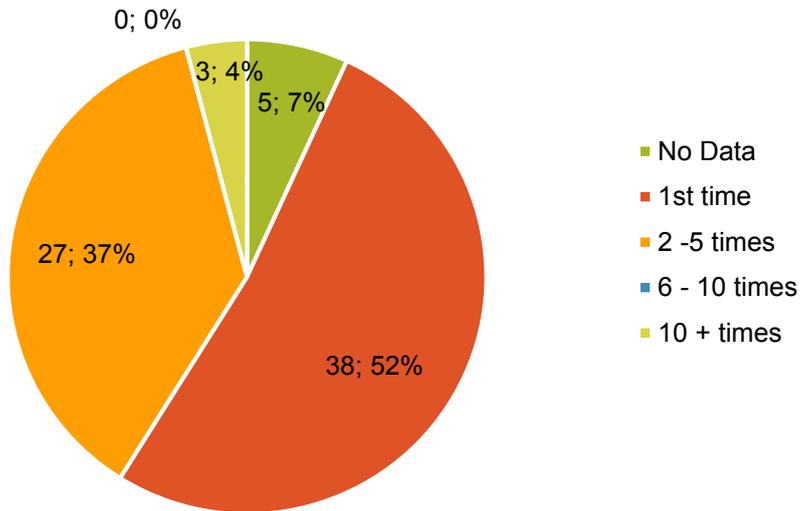
Q3: Duration of Stay



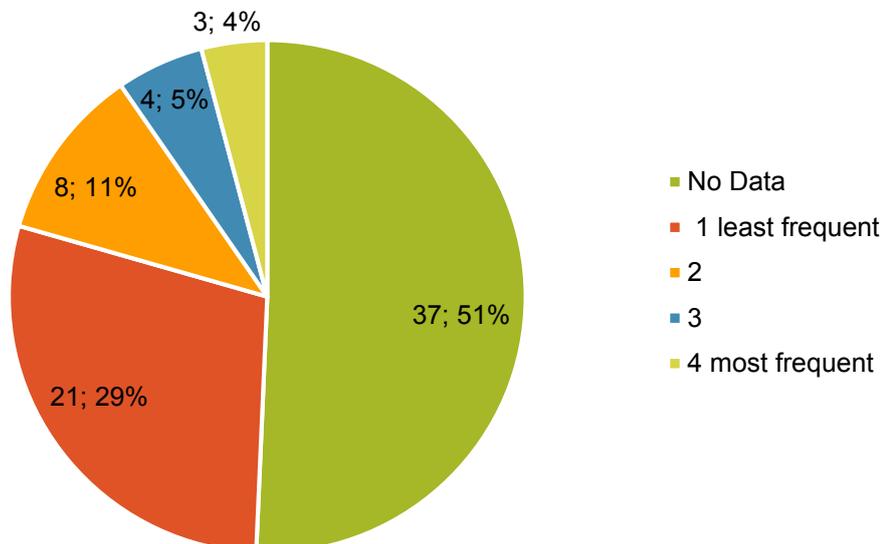
Q3: Duration of stay in hours



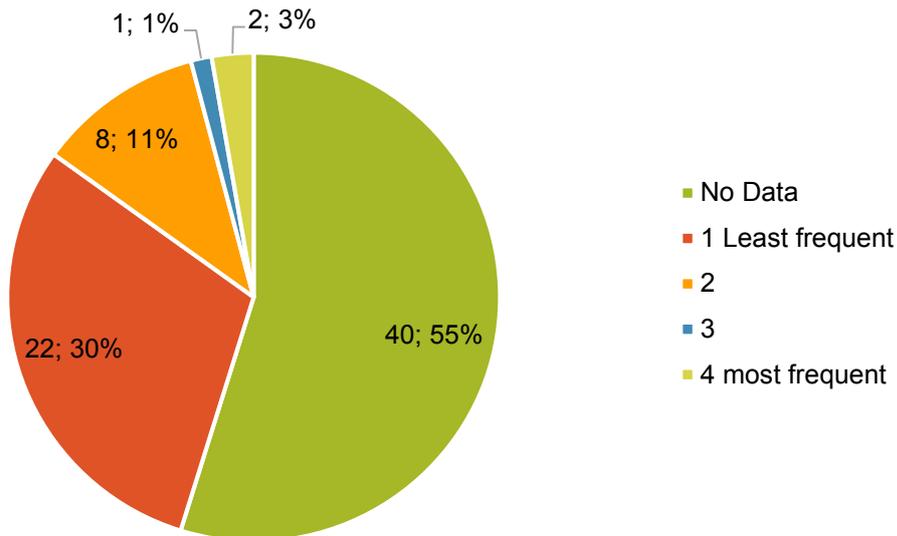
Q4: How often are you coming to Ostana



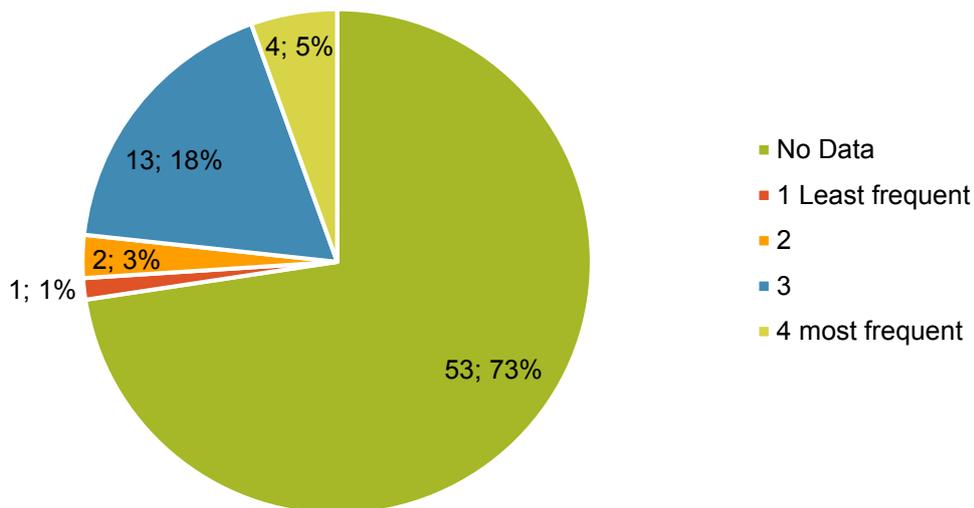
Q4.1: Frequency of visit/ Spring



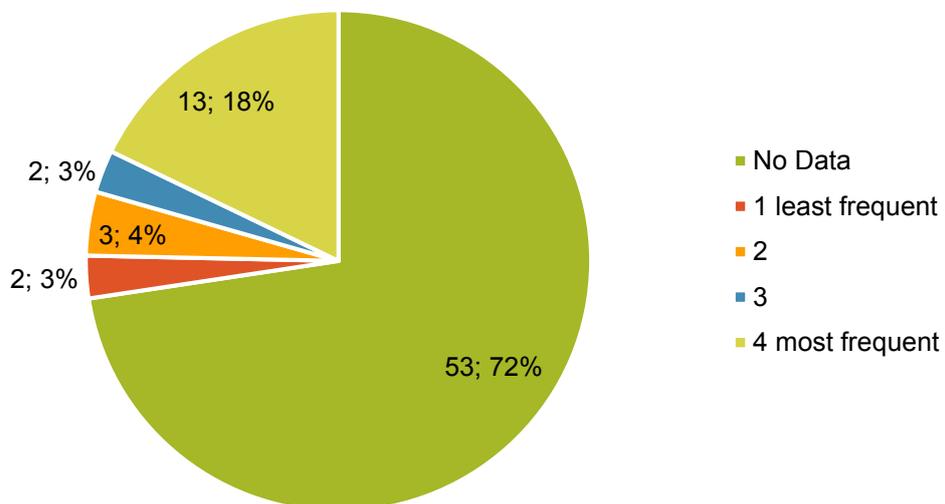
Q4.1: Frequency of visit/ Summer



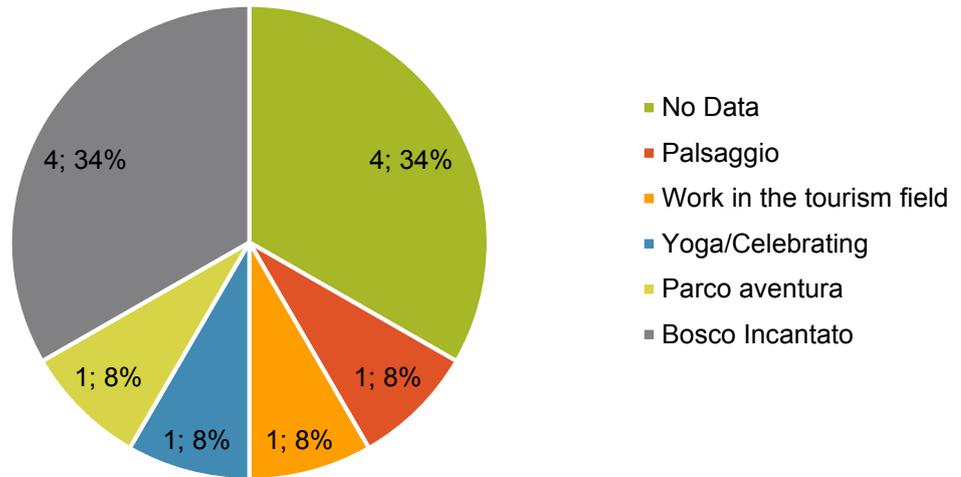
Q4.1: Frequency of visit/ Fall



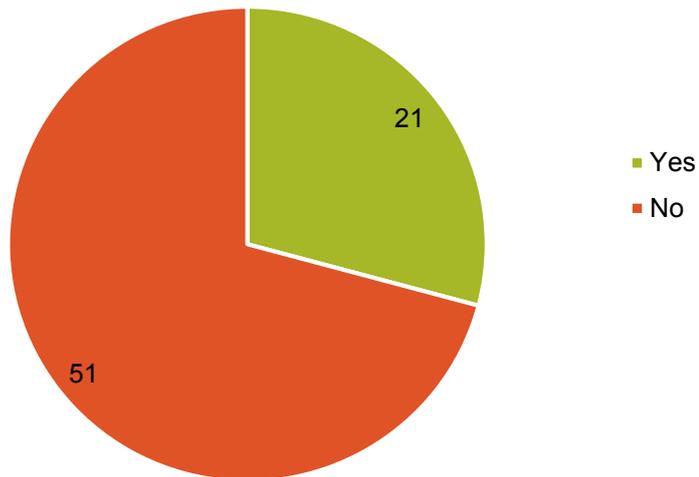
Q4.1: Frequency of visit/ Winter



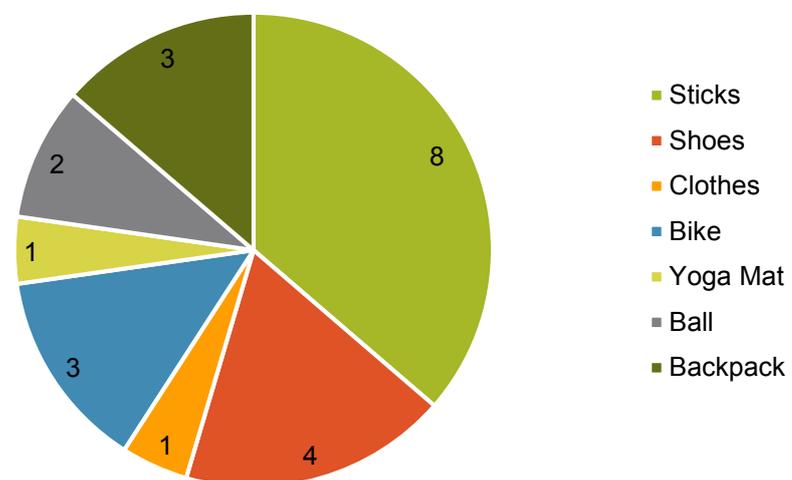
Q5: Other activities people plan to do in Ostana



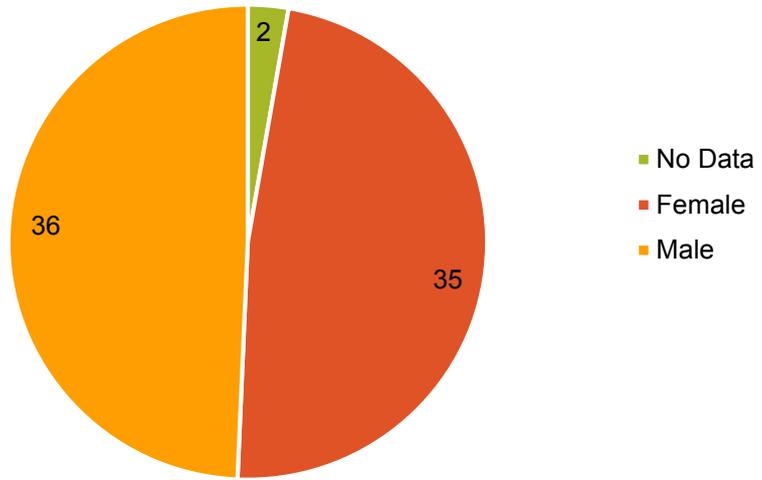
Q5.1: Did you bring sport equipment to Ostana?



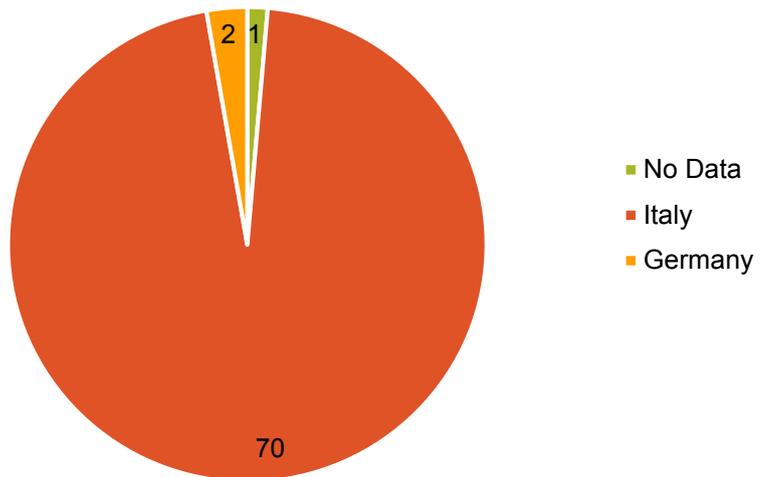
Q5.1: Kind of sports equipment



Q7: Gender

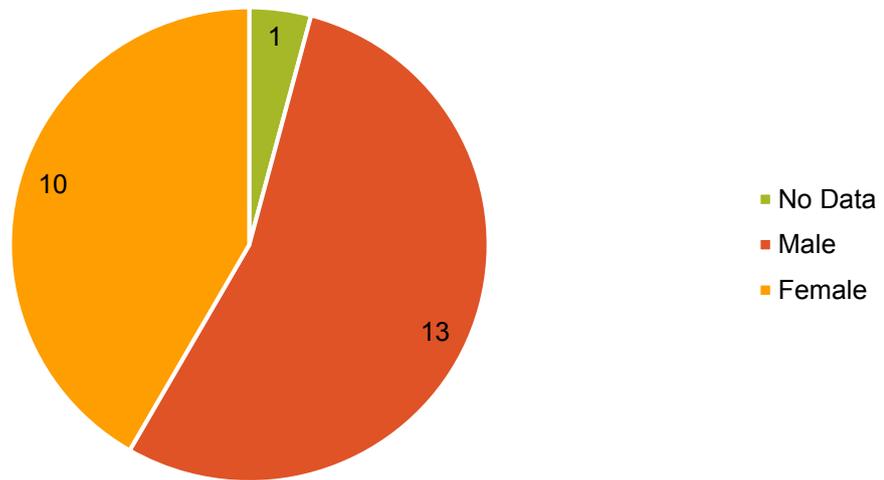


Q9: Nationality

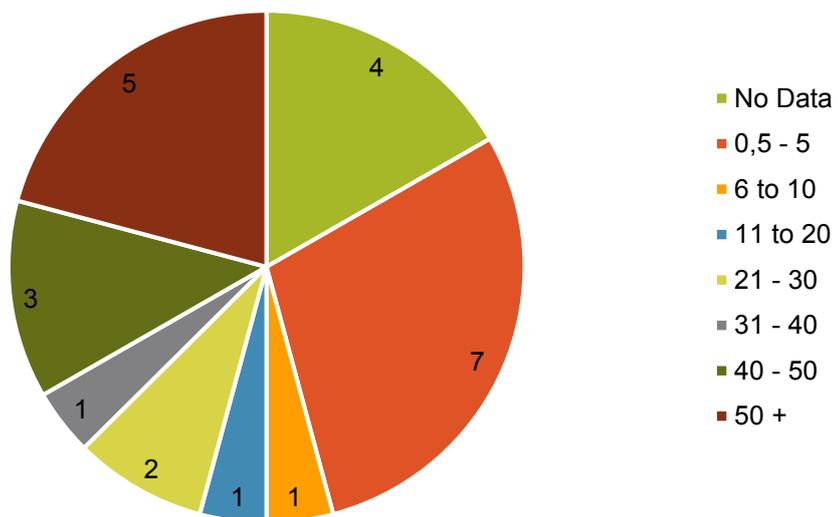


# Appendix 5: Further results for the “locals/residents” questionnaire

Q2: Gender



Q4: Amount of years of residence



## Appendix 6: Students Design Thinking Proposals

### DESIGN THINKING PROPOSAL: Cooperation at the Po Valley

Prepared by: Charlene Minster, Nicole Regazzoni, Laura Tommasina, Martina Zanetta, Benedetta Brambilla, Francesca Bossi, Mariya Germanova

Our vision is centered on the need for the Po Valley area to cooperate.

A main carpark could be available at Paesana, where visitors could be asked to leave their car. All transportation throughout the valley could then be ensured by hybrid shuttles serving different villages such as Ostana and Crissolo.

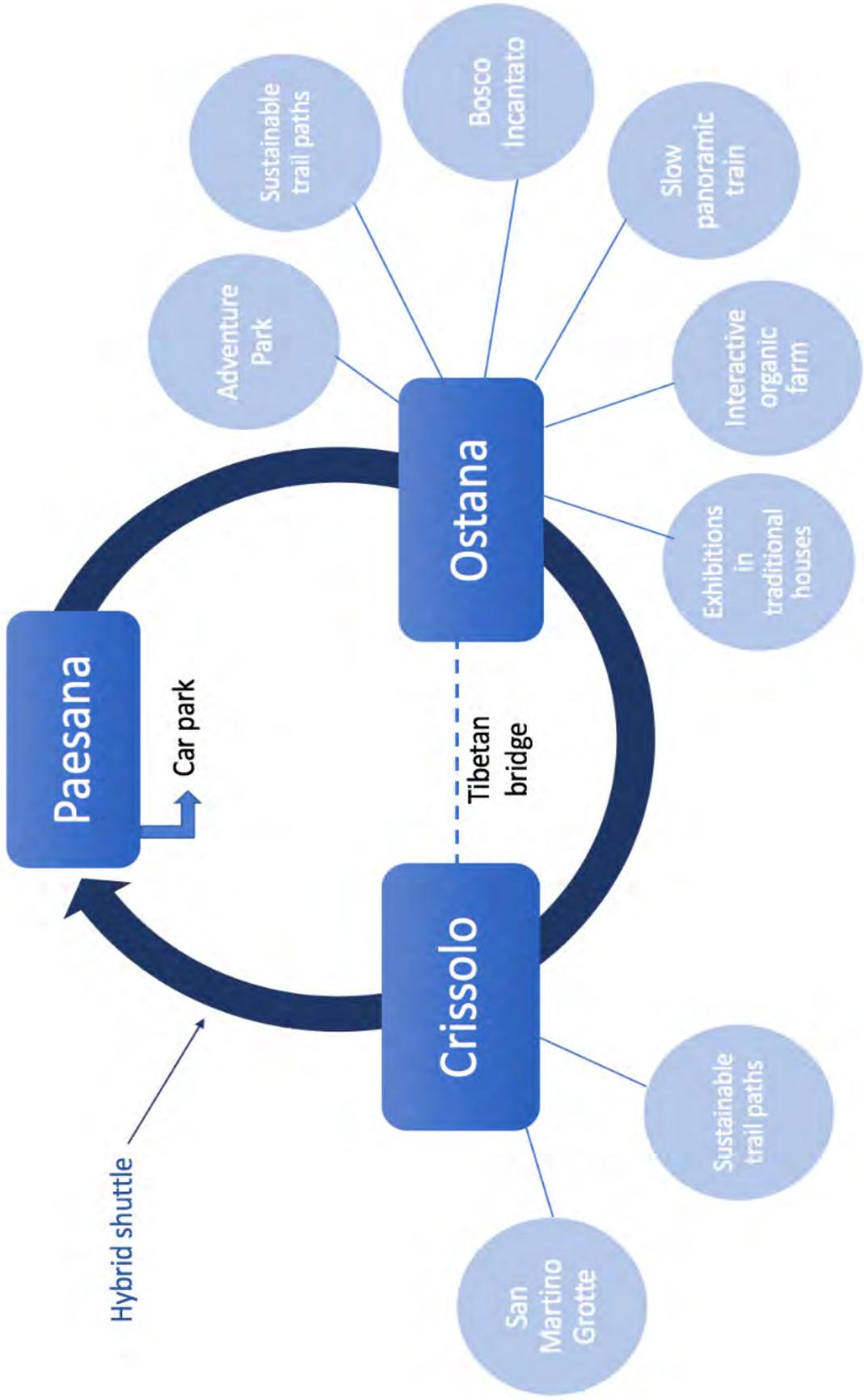
We focused our vision on the development of various sustainable activities in the different villages. In Ostana for example, this implies the creation of a slow panoramic train working thanks to solar panels, an interactive organic farm, exhibitions in traditional houses, as well the already existing Bosco Incantato and the adventure park.

Through the entire valley, we propose the development of sustainable trail paths with different difficulties, offering various activities and information points along the way.

This would allow to combine discovery and amusement, while reinforcing people's knowledge of the region and encouraging tourists to use the most sustainable mobility option.

The different steps towards the achievement of the project include:

1. Stakeholders collaboration & obtain locals / municipality agreement
2. Final concept & executive / technical plan and funding
3. Regulations / permissions for the project
4. Implementation and construction in decided order (set priorities)
5. Market / advertise the region as sustainable destination



## DESIGN THINKING PROPOSAL: Improved Mobility in Ostana

Prepared by: Oriana Hirt, Valentina Muraca, Gleb D’Inverno

Cooperation between the neighboring municipalities:

A shuttle service could be put in place from the municipalities of Paesana to Crissolo, allowing a better mobility between the towns which could in turn allow for better congestion management, thanks to the implementation or even optimization of use of available parking spaces.

Visitors will have the opportunity to park outside any of the towns and use the shuttle to move between them. This would allow to be more respectful of the environment as well. This shuttle service will however solely operate between the towns but will not take visitors directly inside them as other services can be made available.

Planning the implementation of “in town” mobility measures:

To be able to move around more responsibly and respectfully towards locals and the environment a system of electric golf-type carts can be implemented. These small carts will operate on a rent by hour or day basis and will have several small hubs spread along the villages, each municipality having their own carts. They can transport up to 4 people along with some equipment for picnics or hiking. A cart rented at a hub can be left at another one if the visitors only want to climb up the mountain and go down by foot, and vice versa.



To finance such a project, noticeably large funds would be necessary which is why we suggest the following options:

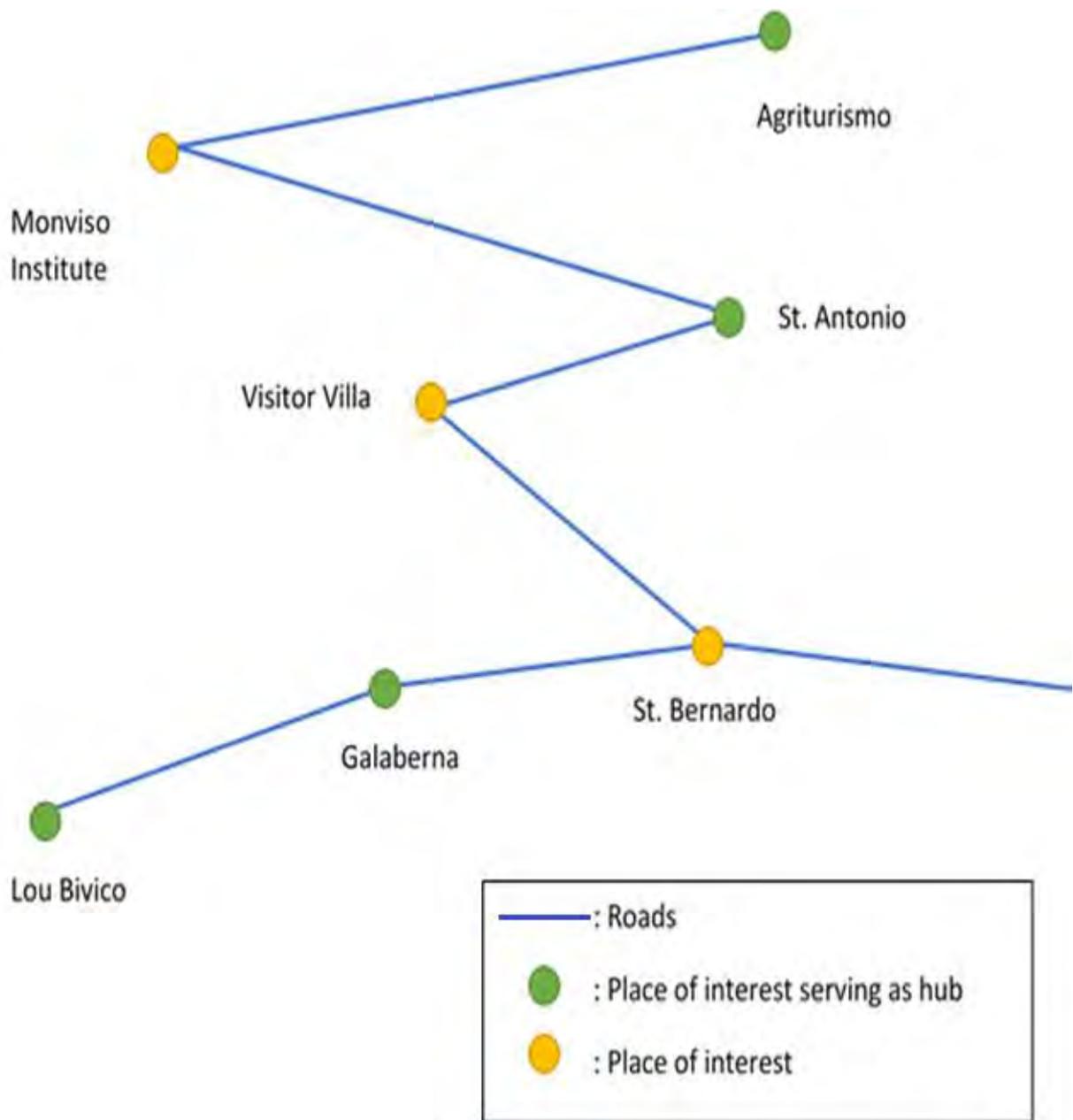
1. Sponsorship: The valley of Piedmont is a place where many people own a vacation home and live elsewhere. These people can be very helpful in the delivery of the cart system as the municipalities can offer a dual-ownership. Thus, the people who own a secondary residence will also partly own one of the mobility-carts, allowing them to for example give them a name, have absolute priority over the use of their own cart when

they arrive in the municipality and will exempt them from having to worry about storage and maintenance as the municipality will take care of these. In return, the mobility carts have to be owned majoritarily by the private party and available to the general public during their absence.

2. Private companies: A privately owned network of mobility-carts could be implemented as well, allowing the municipality to solely worry about regulating the network. However it is a far more challenging concept as private companies will be more interested in the return on investment potential rather than environment friendliness and sustainable development, both of which are our original objectives.

#### Raise awareness:

It is vital for systems such as our proposed shuttle and mobility carts to function to receive proper awareness campaigns. Should the visitors and locals not know of their existence, they will not be used. Therefore many ways exist to raise awareness. First of all, banners and signs in and just outside the municipalities to attract both visitors and locals to use the newly implemented mobility systems. A secondary mean could be to create a section about shuttle and mobility carts in the Piedmont/Ostana websites as many visitors could be looking for information online before coming. Finally, at first it could be a good idea to have some locals use a few of these carts around town to show their presence to visitors (for example on Sundays), it will make it easier to catch attention, based on what the person who invented the shopping cart did by paying actors to use shopping carts to show people what they are for, such a model could work for mobility in Ostana.



## DESIGN THINKING PROPOSAL: Accessible Ostana

Prepared by: Faith Chilombo

For Tourism to be successful in Ostana, it must be easy for the tourists coming from countries with no mountains or terrains like Ostana, to move around from one point to the next and for them to enjoy the village the same way as an average hiker. Ostana's mobility options must be improved.

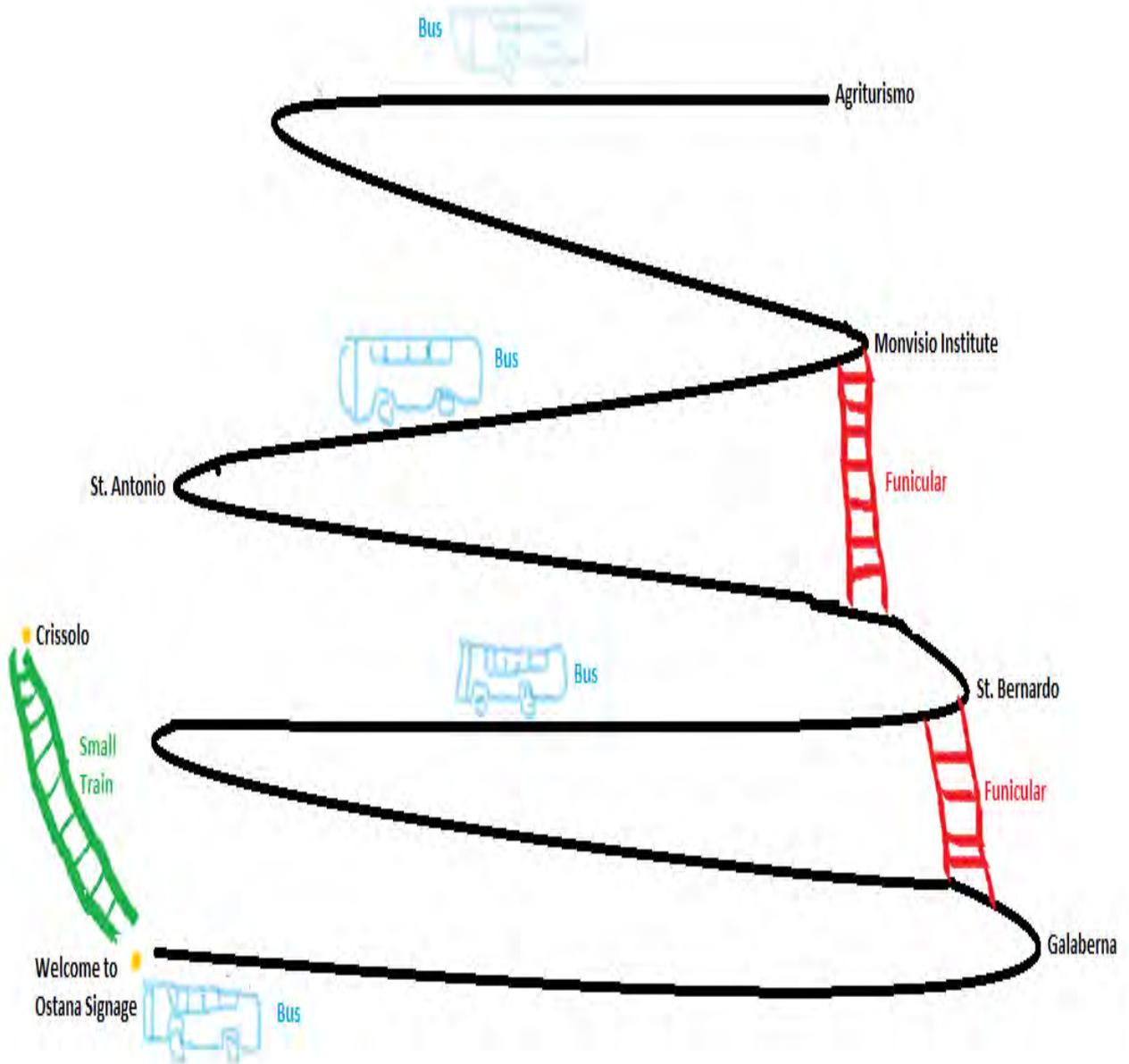
To improve mobility in Ostana, the following are the three options of transportation suggested: plans for two or three 50-seater buses from ...

**Bus:** There should be plans for two or three 50-seater buses from the welcome sign of Ostana all the way up to Agriturismo, with the possibility of stop options along the way, e.g. for places like MonViso Institute, Galaberna and many others.

**Small Train:** This option requires building of more infrastructure and collaboration of the entire Valley of Po, so as to create an easy movement of tourists from one village to the next. Since Ostana is aiming at developing sustainability, this option could be the creation of an electric train. Having connected transport throughout the valley will bring tourism development at the same time to all the surrounding villages. The train can be designed with large windows so the tourists can easily look out and enjoy the view while traveling.

**Funicular:** Electric funicular can be useful for mobility within Ostana. When the bus is not available, the funicular can be used as an alternative option to guaranteed mobility throughout the place. It can also be used in locations that the bus cannot access.

The three transport options suggested must be interconnected to each other for continued mobility and for efficiency. Ostana must be made accessible, going down to Galaberna to have a coffee or going up to Agriturismo to eat dinner should be done within at least a few minutes. Once the basic options are implemented, there is a possibility for continued population growth in Ostana as these options are perceived to greatly benefit the local community.



## DESIGN THINKING PROPOSAL: Increased Connectivity & Transportation as an Attraction

Prepared by: Ashley Thalmann

Ostana needs to increase its overall connectivity within the town and also within the region of the Po Valley. This design thinking proposal suggests that mobility could be increased and congestion decreased if the following steps are taken:

1. A chairlift that will encourage people to leave their cars at the bottom of the hill.
2. Creation of a zipline network linking stops along the chairlift with local businesses and attraction.
3. Improvement and creation of new trails that will help encourage hiking, biking, and skiing as a means of transport.

### **THE CHAIRLIFT**

The chairlift will act as a means of transport as well as an attraction.

As you ride up the chair lift there will be several “treehouse” stop-off points that feature local products and services. The featured goods and services could either be random or thematic. Suggested themes are wellness and gastronomy. In a journey of wellness, the Bosco Incantato could be featured as well as other natural treatments highlighting local elements, such as the laburnum tree (healing enzyme bath with sawdust) or hot stone therapy using Ostana’s special stones.

Another way in which the chairlift could act as a form of entertainment is by featuring art installations/exhibitions on the ground below, which could be viewed during ascent and descent. The artwork will be featured on an exhibition style basis and ideally will come from local artists from the Po Valley and possibly urban centers of Piemonte, such as Torino, as this could be a good opportunity to leverage networks coming from existing hubs (i.e. galleries in cities). The possibilities of artwork are endless ranging from a progressive film as you go up the hill, music, or an exhibition working with the natural elements. The chairlift will also serve as a jumping off point for the zip-line network, to be attached to each of the “tree-houses.” The chairlift seats will be designed to carry bikes for those that do not wish to ride uphill.

## **ZIPLINE NETWORK**

The zipline network will increase connectivity, but further connecting the chairlift stopping points to other points of attraction that are located further away from the main chairlift line. This could include camping areas, businesses, or other natural attractions.

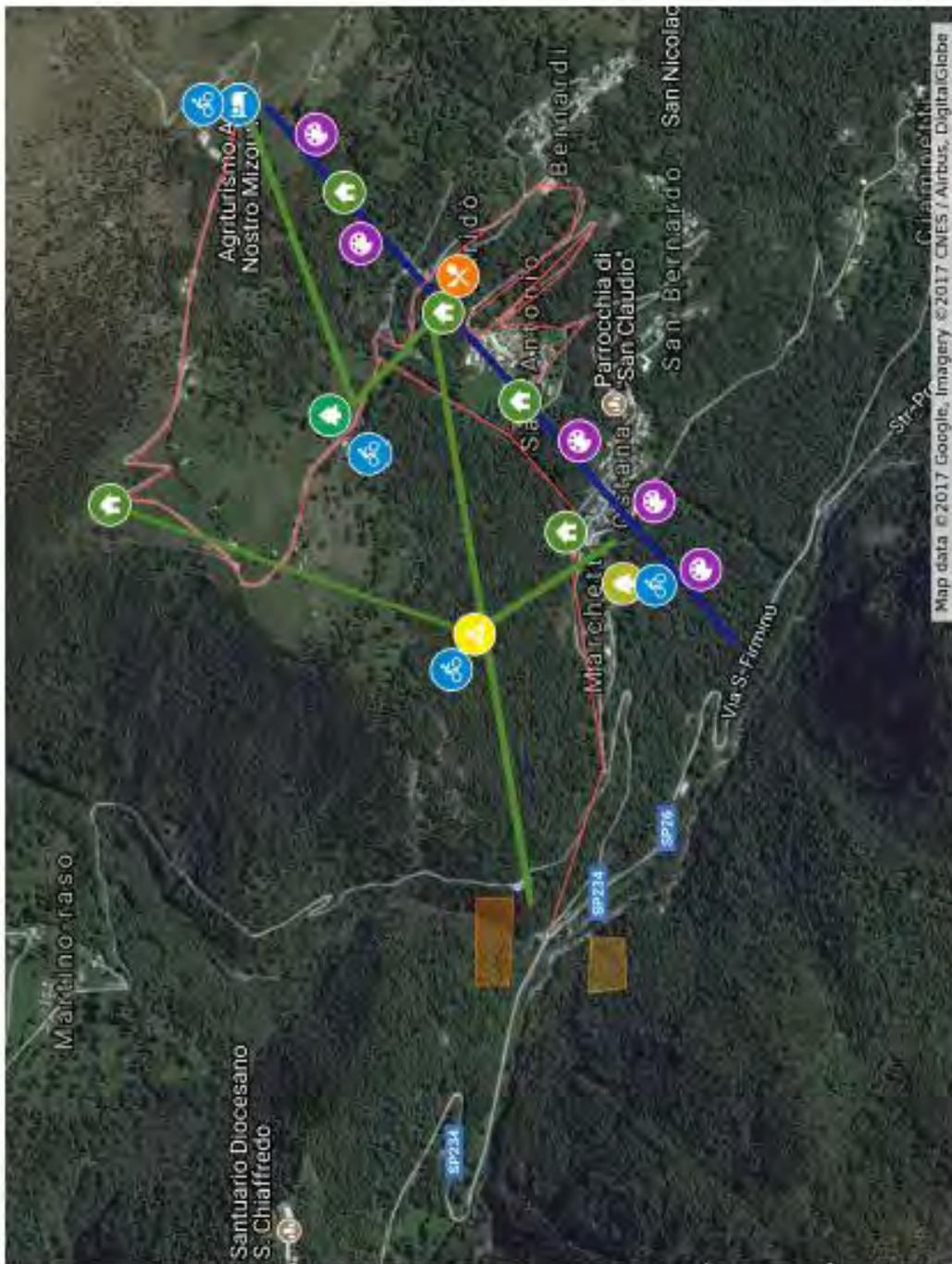
## **THE TRAILS**

The improvement of the trail system will be used to help increase connectivity and reduce traffic in Ostana. Additionally, expansion of the trail network will be used to connect other towns within the region. Bike maintenance stations will be added along the trail, as well as minimalistic and environmentally sustainable accommodation options, possibly consisting of hammocks and composting toilets.

## **STEPS FOR IMPLEMENTATION**

1. Get community support
2. Get local businesses to participate in Ostana and in a larger context in the Po Valley and Piemonte.
3. Get funding
  - a. Trails could be named after investors
  - b. Get government support
  - c. Businesses could pay a 'membership' fee to be featured in treehouses on a rotating basis
4. Start by improving trails that already exist
5. Install chairlift
6. Build treehouses
7. Build zip-lines
8. Find ways to attract SVFs from other larger points of interests, such as Torino and other larger towns in the region (listed as the last step, but this should be ongoing throughout the entire process)

DESIGN THINKING PROPOSAL: Practical Mobility in Ostana



Increased Connectivity and Transportation as an Attraction

- \* Could not find already existing camping areas, so this is just an idea of where one could be
- \*\* Trails shown are not comprehensive, ideally already existing trails should be improved, especially ones linking Ostana to surrounding villages. Some new ones should be created in order to increase overall connectivity

Points of Interest

- Agriturismo
- Il Bosco Incantato
- MonViso Institute
- Rifugio Galabà ma
- Potential Camping \*

Transportation

- Parking
- Parking
- Zipline
- Zipline
- Zipline
- Hike/Bike/Ski \*\*
- Hike/Bike/Ski
- Chair Lift

Treehouses

- All items

Bike Repair Stations

- All items

Art

- All items

Prepared by: Koulla Orthodoxou, Yasaman Behshad, Yu Xin Xu

This design thinking proposal suggests that connectivity within Ostana community should be increased.

The idea was conceptualized from our own experience while staying in Ostana as first-time visitors. We found it complicated to move within the center and the nearby attractions.

For example, being visitors without owning private car, we found it difficult to move from the center to the Agriturismo on foot. The distance is big to cover on foot, the road is uphill, and especially during the night, where there is no lighting. Taking into consideration disabled people or tourists with special needs, a visit to Agriturismo would be impossible for them.

Furthermore, being a mountain destination, the community is vulnerable to unpredictable weather conditions.

We propose the creation of shared bikes, bicycles and electric cars points in strategic places along the community. Energy charging points, sufficient parking spots, and solar lamps will support the overall network.

We have found in several sources that road transport is the largest contributor to global warming through the emission of carbon dioxide, which creates air pollution. Since Ostana is engaging in sustainable development, we believe that recent technologies such as vehicle electrification, efficient energy and materials utilization, connectivity and autonomy, are generating unusual design opportunities, which will benefit the community in social, economic and environmental aspects.

Concepts of micro mobility (flexible mobility), lightweight design, mobility for the elderly, and mobility beyond urbanization characterize our proposal.

On another note, we have seen that there is lack of basic services in the community, like for example pharmacy, health center and shops (i.e. offering local products, wine, vegetables, souvenirs). We propose the creation of these services.

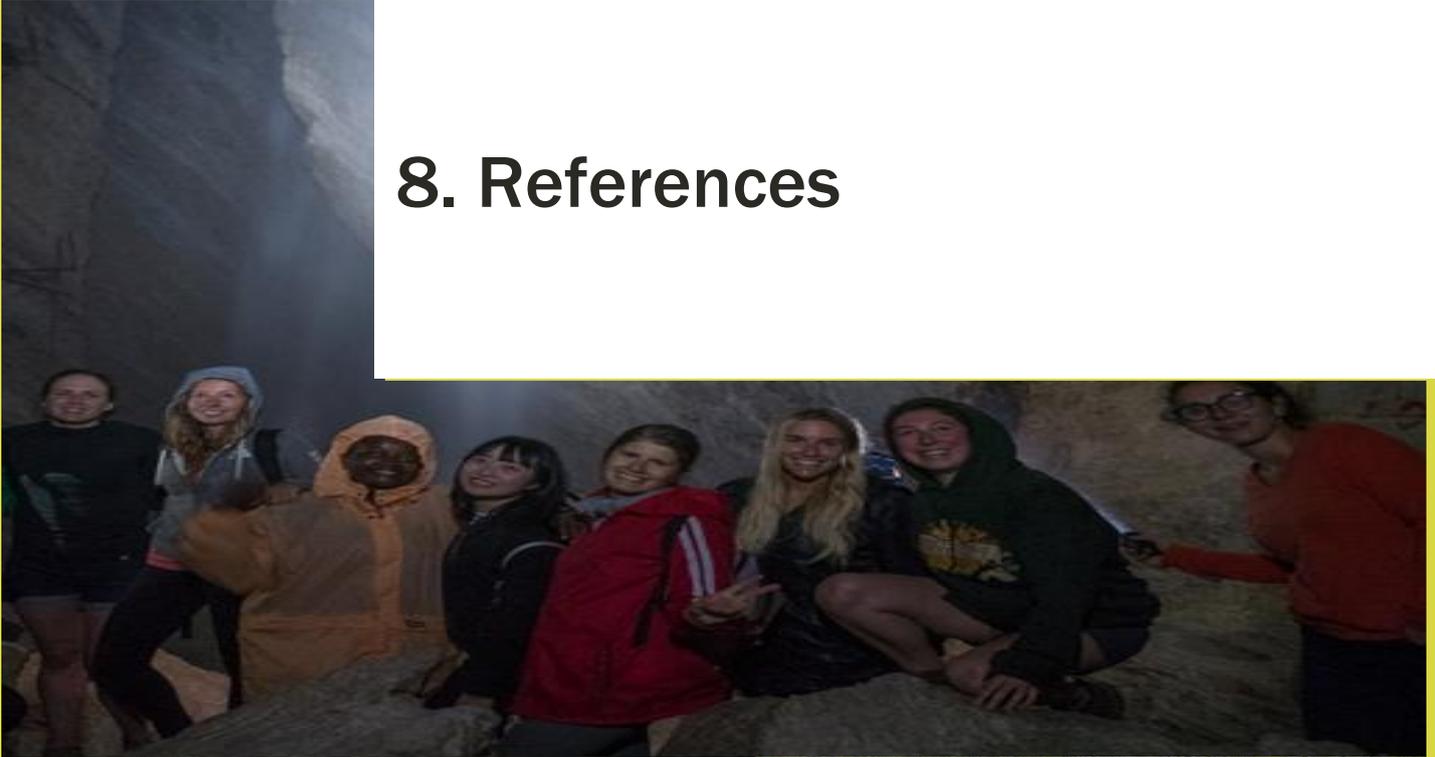
Different steps towards the achievement of this proposal include:

1. Stakeholders collaboration
  2. Concept formalization
  3. Technical, environmental, and feasibility studies
  4. Funding (private and governmental)
  5. Implementation
  6. Promotion
- 

-  Parking
-  Clinic
-  Shop
-  Lamp
-  ELECTRIC VEHICLE CHARGING STATION
-  Sharing point



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