



faunalert

faunalert

FAUNALERT

Save money, protect life

Road security system to reduce animal
road accidents

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Table of content

1. Executive summary	4
1.1. What is FaunAlert?	5
1.2. The FaunAlert team	5
1.3. Value proposition	6
1.4. FaunAlert business model	6
1.5. Who are FaunAlert clients?	7
1.6. Market size and market penetration strategy	8
1.7. How does FaunAlert work?	8
1.8. Financial expectations and business success keys	9
1.9. Ffuture company strategy	10
2. FaunAlert presentation	11
2.1. Introduction	12
2.2. Mission	12
2.3. Vision	12
2.4. Business keys	12
2.5. Definition of our product	13
2.6. Success factors	14
2.7. FaunAlert's team	14
3. Environmental scanning	16
3.1. Political-legal environment	17
3.2. Cultural environment	18
3.3. Economic environment	18
3.4. Technological environment	19
3.5. Natural environment	19
4. Strategic plan	21
4.1. SWOT analysis	22



4.1.1. Strengths	22
4.1.2. Weaknesses	22
4.1.3. Opportunities	22
4.1.4. Threats	23
4.2. Business model	23
4.2.1. Who is FaunaAlert for?	23
4.2.2. What is our value proposition?	24
4.2.3. What is our market penetration strategy?	24
4.2.4. How do we connect with our customers?	25
4.2.5. Activities, resources and key partners	26
4.2.6. Which are our main incomes and expenses?	27
4.2.7. Strategic objectives	27
5. Marketing plan	29
5.1. Project validation	30
5.1.1. Initial business idea	30
5.1.2. Interviews	30
5.1.3. Conclusions	32
5.2. Marketing mix	33
5.2.1. Description of products and services	33
5.2.2. Pricing policy	34
5.2.3. Distribution channels	35
5.2.4. Communication and promotion plan	35
6. Financial plan	36
6.1. Product/Service costs	37
6.2. Expected sales	37
6.3. Marketing investment	37
6.4. Human resource costs	39
6.5. Funding sources	39



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40

- 6.6. Liquidity
- 6.7. Accounts staiment
- 7. Supplementary material
 - 7.1. CANVAS model
 - 7.2. Empathy map
 - 7.3. SWOT analysis diagram
 - 7.4. Accounts staiment table

Executive summary

1. EXECUTIVE SUMMARY

1.1. What is FaunAlert?

FaunAlert is a start-up that has created a system to alert car users in real-time of the presence of wild animals crossing the road. FaunAlert will prevent animal car accidents through an infrared-based detection system connected to a dynamic signal and mobile app, which will prompt a message whenever an animal is crossing or has recently crossed the road.

Our mission is to make people’s road trips safer while at the same time protecting an irreplaceable value such as the wild fauna.

Our vision is to offer a solution which is currently not available and to become the reference in road security solutions.

We will reach this by implementing an innovative solution which will increase car drivers security, save money to public institutions and road maintenance companies, and protect wild fauna. Our motto is “Safe money, protect life”.

1.2. The FaunAlert team

FaunAlert is formed by a highly qualified multidisciplinary team, well united, and motivated. All team members have university degrees in the fields of engineering or life sciences and are currently finishing their master’s degree at EOI (Escuela de Organización industrial). Together with this, the team has other skills and abilities related to problem solving, data analysis, and financial expertise.

Every team member is responsible for one of the different areas that make up the business model as described in the following diagram:



Eduardo Haro

Product development



Cillian Cunningham

Marketing strategy



Jorge Martínez

Financial plan



Nicolás Martínez

Project management

1.3. Value proposition

FaunAlert was born from the validation of a business, road safety, and conservation problem that currently does not have a practical, effective and scalable solution. Our value proposition is to provide an effective technical solution to warn drivers in advance and in real-time of the presence of wild animals crossing the roads, thus reducing wild animal mortality (**Conservation Dimension**), cleaning, maintenance and legal expenses for licensee companies (**Business Dimension**), and increasing road security (**Social Dimension**).

Business dimension. Public institutions and concession holders responsible for highway maintenance make considerable economic and material efforts every year to clean and recover animal remains from roads. Although in certain accident black spots there is usually some type of signalling, the effectiveness of the current solutions is highly questioned if we take into account that in regions like Catalonia the number of animal car crashes increased by 100% in the past 7 years.

Social/business dimension. Car drivers are the legal responsible for the accident and therefore have to cope with all the expenses, unless they have hired a specific clause with their insurance companies (which is not often the case). Road accidents with medium to large size animals (such as wild boar or roe deer) can seriously put at risk the life of car drivers.

Conservation dimension. Accidents represent a huge environmental loss, quantified in 10 million vertebrates in Spain alone across 2006. These figures will continue to grow given the increased awareness and investment efforts in biodiversity conservation plans. For instance, as Iberian lynx populations have been recovering in the past decade, deaths by car collisions have steadily increased and represents today the main cause of Iberian lynx deaths.

1.4. FaunAlert business model and how are we making money

Our solution is backed up by a business model based on 4 fundamental pillars:

1. **Installation of the detection and signalling system (Det-Sig system)** in those areas with the highest concentration of animal car crashes. The system has been fully designed by the **FaunAlert** team and, therefore, the company has

exclusive rights on the product. In addition, we are about to apply for the patent at national and european level.

2. **Maintenance and relocation of the Det-Sig system** to adapt its location to the seasonality of animal movements and population densities. The relocation will be based on the predictions made by mathematical models that will be fine-tuned with accident data collected from the DGT, as well as with data on the abundance and distribution of relevant species such as wild boar, roe deer, or Iberian lynx.
3. **Monthly subscription fee for users of mobile application** which will alert drivers through voice notifications of the proximity of road sections with high rates of animal crossings, as well as of the imminent presence of animals crossing the roads.
4. **Consultancy and advisory services** offered to public (such as DGT) or private entities (such as insurance or concession holders) with the data collected in our database to optimize road signalling and road construction planning.

Taking into account the structure of our business model, **FaunAlert** is based on both a B2C (Business to Consumer) model for users and a B2B (Business to Business) for public and/or private entities, mainly focusing on road licensee companies.

1.5. Who are FaunAlert clients?

The **FaunAlert** customer segment is divided into the following two groups:

- **Concession holders** responsible for the construction and maintenance of state highways.
- **Regional and/or local public administrations** responsible for the conventional roads (where most of the accidents due to animal collisions occur in Spain).

In addition to these two main customer segments, we have detected two other customer sub-segments

- **Drivers** are unprotected in terms of road safety (no effective signalling systems for animal crossing) and, in most cases, are responsible for all costs associated with vehicle reparations and healthcare.

- **Public entities** such as the DGT or private companies dedicated to the construction of road infrastructure could be interested in our consulting service, which we provide in order to optimize road design.

1.6. What's our market size and what's our market penetration strategy?

In the client segment our main client will be **concession holders**. Since the number of companies dedicated to the construction and maintenance of state roads is rather limited, we intend to contact as many of them as possible in order to arrange formal meetings where we will present our project and its value proposition. We will focus on those companies with a greater volume of concessions and capital such as FCC, Ferrovial, **Acciona**, Sacyr, ACS, and Abertis. In addition, and to publicize **FaunAlert**, we will attend the National Road Safety Congress which is held yearly, as well as other relevant congresses or fairs.

Concerning our other main client segment, **public administrations of regional or local character**. The maintenance of conventional roads is generally outsourced, and therefore regional/local governments are not directly responsible for them. However, in this case, we will directly contact regional/local governments because they are responsible for negotiating the contract terms with the outsourced companies. We will need to hire a negotiator with experience to deal with and attract clients at the beginning of the project.

In order to give more visibility to **FaunAlert** through the press, our initial goal is to focus on applying our system in roads where **Iberian lynx** deaths due to car collisions accumulate. By doing this, we can accelerate market penetration, with an innovative solution that is not offered by any other company at the moment and which tackle a problem which will likely become worse in the near future due to the increase in nature conservation policies. In addition, a **blog and webpage** will be created to raise awareness among the population with news related to the nature of animal movements and project development.

1.7. How does FaunAlert work?

The main product offered by **FaunAlert** is based on an integrated detection and signalling system.



The detection system is composed of an **infrared light** emitting element (i.e. transmitter) and a receiver. It will be installed on the roadsides at those road **black spots** where most animal car accidents occur. The transmitter and receiver will be separated by about 50-100 meters (depending on road morphology, especially the curvature and slope). When the beam of infrared light is **intercepted** by animals crossing the roads, an electric signal will be triggered. In order to detect both medium and large animals, several transmitters and receivers will be arranged horizontally and placed at 10, 30 and 60 centimetres above ground. The signal emitted by the passage of wild fauna will be sent **via radio** to the second system. In conventional roads, the integral system that we propose will be complemented with the application of **pheromones** at strategic locations, in order to direct the passage of fauna through the monitored crossing areas which will be safer. This measure is not required in highways because they are fenced along most of their stretch by law.

The second system consists of a **traffic signal** formed by a **digital panel** that will be updated with warning messages for drivers based on the signals received from the detection system, and it will be placed 500 meters away from the detection system.

To ensure that the product operates on a continuous basis, a pair of **solar panels** will be installed in each of the mentioned sub-systems (detection and signalling), which will provide for the low electrical energy requirements.

1.8. Financial expectations and business success keys

For the first and second year, we estimate an **EBITDA** of 188,915 € and 560,367 €, respectively. We estimate the **Net Profit** at 139,341 € during the first year, and 418,318 € during the second year. We will have a **gross margin** of 71% and 80% for our two products (one for highways, and the second one for conventional roads), which is significantly high due to the lack of solutions of this type in the road security sector. The **ROE** for the first year will be 77.9%, and 70.7% for the second. The **breakeven point** will be 158,262 € with a payback of 9 months.

The keys to **FaunAlert**'s success are:

- A business model based on an **innovative** product, **easy to produce and install**, and **easily scalable**.
- **Integrated solution fully provided by FaunAlert**, from the detection of road black spots to the production of the Det-Sig system (installation and maintenance).

1.9 Future company strategy

FaunAlert will start operating in Spain, but with a clear medium-term goal (1 year) of internationalizing to other countries from the Eurozone (in particular, those countries with the highest animal collision rates, such as Germany, France, Switzerland and Portugal). After 3 years, market penetration in Latin America and North America will be addressed.

FaunAlert presentation

2. FAUNALERT PRESENTATION

2.1. Introduction

FaunAlert is a start-up created in the framework of the Venture Launchpad, whose purpose is to offer the road safety market a detection and signaling system to prevent car accidents against wild animals on highways and conventional roads.

2.2. Mission

To reduce road accidents at critical points of wildlife passage and to mitigate the impact of anthropogenic infrastructures such as roads on wildlife.

2.3. Vision

Our vision is to offer a solution which is currently not available and to become the reference in road security solutions. We will reach this by implementing an innovative solution which will increase car drivers security, save money to public institutions and road maintenance companies, and protect wild fauna. Our motto is “Safe money, protect life”.

2.4. Business keys

FaunAlert relies on the advanced state of technological development of Arduino products, which has allowed us to design a system for the detection of wild animals that is effective, economical, and with a large profit margin.

In addition, **FaunAlert** comes to solve a problem that is currently unresolved within the road safety market (i.e. road accidents caused by animal collisions), and that entails great inconveniences for the different parties involved.

On the one hand, drivers may suffer serious physical damage, and may have to pay a considerable amount of money for mechanical reparations too. In addition, most drivers are unprotected against their insurance companies, since they are the legal responsible and must pay the full amount of mechanical reparations that result from accidents. Besides, the car crashes against medium and large animals can seriously put at risk the lives of the endanger the health and life of the vehicle occupants.

On the other hand, every collision with animals on the roads supposes an important cost of cleaning and road maintenance for concession holders in charge of highways and conventional roads. There are no effective methods for the prevention of this type of

accidents beyond the signals alerting of the risk of animals crossing the road at specific road sections. Nevertheless, road accidents caused by animals continue to increase, which calls into question the effectiveness of the preventive measures currently used.

FaunaAlert will provide the first commercial solution to this road security problem in Spain. In addition, the lack of similar solutions across the rest of the European territory paves the path for a rapid expansion of our business model in the short term.

2.5 Definition of our products

Our solution provides the following products and services:

- **Real-time detection and signaling system** (Det-Sig system) for animal road crossing. The detection system is composed of an infrared light emitting element (i.e. transmitter) and a receiver. It will be installed on the roadsides at road black spots where most animal car crashes concentrate. When the beam of infrared light from the transmitter (which is constantly emitting) to the receiver is intercepted by animals crossing the roads, an electric signal will be triggered. The signal emitted by the passage of wild fauna will be sent via radio to the second system. In conventional roads, the integral system that we propose will be complemented with the application of pheromones at strategic locations, in order to direct the passage of fauna through the sensorized crossing areas.
- **Maintenance and relocation of the Det-Sig system** to adapt its location to the seasonality of animal movements and population densities. The relocation will be based on the predictions made by mathematical models that will be fine-tuned with accident data collected from the DGT, data on the abundance and distribution of relevant species such as wild boar, roe deer, or Iberian lynx, and climate data (every environmental variable which might affect population dynamics).
- **Monthly subscription fee for users of mobile application** which will alert drivers through voice notifications about the proximity of road sections with high rates of animal crossings and about the imminent presence of animals crossing the roads.
- **Consultancy and advisory services** offered to public (such as DGT) or private entities (such as insurance or road-licensee companies) with the data collected in our database to optimize road signalling and construction. This service will only be offered once we have reached a critical amount of clients, data, and experience.

2.6. Success factors

The keys to **FaunAlert**'s success are:

- A business model based on an **innovative** product, **easy to produce and install**, and **easily scalable** to other countries.
- **Integrated solution fully provided by FaunAlert**, from the detection of road black spots to the production of the Det-Sig system (installation and maintenance).
- **Solves a real problem** that will likely worsen, and for which there is no current solutions.

2.7. FaunAlert's team

FaunAlert is formed by a highly qualified multidisciplinary team, well united, and motivated. All team members have university degrees in the fields of engineering or life sciences and are currently finishing their master's degree at EOI (Escuela de Organización industrial). Together with this, the team has other skills and abilities related to problem solving, data analysis, and financial expertise.



LUIS EDUARDO HARO BARCHÍN

He graduated in Biology from the *Universidad Autónoma de Madrid*, and he is a current student of Mathematics at the *Universidad Nacional de Educación a Distancia (UNED)*. He also holds a Master of Science in Systems Ecology and Nature Conservation from the University of Wageningen (The Netherlands), and a Master in Big Data & Business Analytics from the *Escuela de Organización Industrial (EOI, Madrid)*.

He has extensive experience in the field of scientific research, systems ecology, and writing professional reports.

CILLIAN CUNNINGHAM

He studied Environmental Sciences at the *Universidad Autónoma de Madrid*, and he holds a master's degree in Environmental Engineering and Management from the *Escuela de Organización Industrial (EOI, Madrid)*.

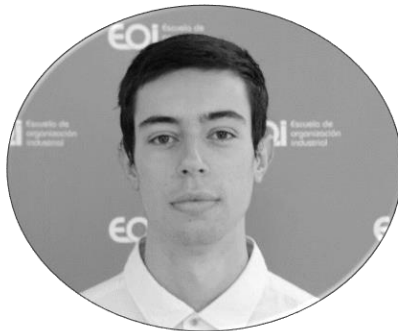
He has extensive experience in the analysis and prevention of environmental risks.



JORGE MARTÍNEZ PEREDA

Mining engineer from the *Universidad de Oviedo*. He also holds a master's degree in Renewable Energy and Energy Market from the *Escuela de Organización Industrial (EOI, Madrid)*.

He has experience in business development, financial reports, and project management. His skills will be useful to **FaunAlert** to attract clients and negotiate contractual terms.



NICOLÁS MARTÍNEZ GARCÍA

Industrial Engineer specialized in Electricity from the *Universidad de Castilla-La Mancha*. He also holds a master's degree in Renewable Energy and Energy Market from the *Escuela de Organización Industrial (EOI, Madrid)*.

He has extensive experience in the design and development of electronic systems. He will also share his experience with the civil construction.



Environmental scanning

3. ENVIRONMENTAL SCANNING

Although our business model can be deployed internationally, we focused the environmental scanning on Spain, since it will be the starting point for the project development.

However, **FaunAlert** objectives include the business expansion to other European countries which are suffering too from the same road security problem that FaunAlert is trying to solve, such as Germany, France, Italy, Switzerland, and England.

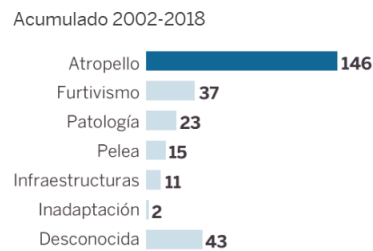
3.1. Political-legal environment

At the political level, we find a Spanish political class considerably more involved with environmental issues such as climate change, global warming and biodiversity conservation than their predecessors two decades ago. As a result of this greater concern, more investments are being made by central and regional governments for the conservation of our natural heritage.

The large investments made in the past two decades for the restoration and conservation of Iberian lynx populations reflect the greater involvement of politicians in environmental matters. In 2002, the LIFE project "Recovery of Iberian lynx populations in Andalusia" was granted with 9,285,714€, of which the EU contributed 42%. In 2006, the LIFE project "Conservation and reintroduction of the Iberian lynx in Andalusia" (LIFE06NAT/E/000209) was granted with 25,971,489€, of which the EU contributed 38%.

Furthermore, companies are increasingly being held responsible for the environmental damages that their productive activities entail, and it is now mandatory for them to provide detailed reports of their environmental impacts, being exposed to potential fines whenever the damages inflicted on the environment are higher than those established by law.

The current political-legal environment, with politicians being increasingly aware of the urgency of protecting our natural heritage, and with new legislation demanding more environmental responsibility from companies, favors the insertion and growth of a company such as **FaunAlert** that, besides increasing drivers' security on roads, offers a solution to reduce the negative impact of road infrastructures on vertebrate populations.



Fuente: Iberlince. EL PAÍS

3.2. Cultural environment

Travelling has become a commodity for most people in developed countries due to the good conditions of road infrastructures and to the greater access to motorized vehicles. This means that the number of journeys with land vehicles has considerably increased in the past decades, together with jams and road accidents.

According to an article published in *Statista* in August 2017, rural tourism has experienced a boom in 2014 reaching 3.6 million tourists in Spain by 2016, of which 818,000 chose Castilla y León as their destination, one of the Spanish regions with higher numbers of car accidents due to animal collisions.

The positive trend in rural tourism, together with the recovery of wild fauna populations, will worsen the problem of road accidents due to animal in the coming years. For instance, in some regions such as Catalonia, the number of this type of accidents has already increased by 100% in the last seven years.

On the other hand, citizens are conscious and involved with environmental causes, and it is partly due to this increase in environmental awareness that has made the political class to devote more time and weight in their political programs to environmental matters. The average citizen is more demanding both with politicians and with companies, and is willing to adapt their consumption behaviours according to the righteousness of companies' activities.

3.3. Economic environment

According to the *Situation Report of the Spanish Economy* published in July 2018, the Spanish economy has experienced four consecutive years of strong economical growth since 2013, with growth rates above 3%, having virtually recovered the pre-crisis previous to the global financial crisis of 2007-2008. Another noteworthy feature of the Spanish economy that may affect the future of FaunAlert is the reported growth in fixed capital investment. This variable experienced an average annual increase of 5% in 2017. Equipment's investment increased 6.1% in 2017 compared to pre-crisis levels, while construction's investment increased by 4.6%.



Finally, a process of financial deleveraging of the private sector is taking place, which reduced its debt by more than 60 GDP points from the peak reached in mid-2010 to the beginning of 2018. The deleveraging of non-financial corporations and households is triggering a high dynamism in credit, registering the capital invested in households and SMEs an increase of 8.7% and 8.2% respectively.

3.4. Technological environment

In recent years, the use of digital devices has greatly increased globally. In Spain, according to a report published by the *National Institute of Statistics* in November 2018, 85% of the Spanish population use Internet regularly, while 80% are regular mobile users.

In the field of digital transformation, according to a study conducted by *Roland Berger* and sponsored by *Siemens*, Spain is below the European average and outside the top 40 worldwide. According to the report, the main barriers are the resistance to change and the initial investment costs, followed by the lack of competition and supply adapted to the market.

3.5. Natural environment

In the field of environmental responsibility, a profound change is taking place at the business, political and citizenship levels. Global phenomena such as climate change and global warming are producing social movements that seek to mitigate the negative effects of these anthropic processes. Citizens are becoming increasingly aware of the environmental problems the planet is facing, and are more willing to apply mitigation practices to their daily routines in order to reduce their environmental impact (e.g. recycling, reduce water and plastic consumption). Although the individual and social images of environmental problems differ markedly from one individual to another, and even from one region to another, we find a greater sensitivity towards environmental causes, such as the conservation of natural ecosystems and the protection of the fauna and flora that enriches them.

Furthermore, citizens are demanding more transparency from the companies whose products they consume, regarding the sustainability of their production processes and the associated environmental impacts. As a consequence, the Spanish ecological market has experienced an increase of 12.55% in 2018 according to a report made by *EcoLogical* at the end of 2018.

FaunaAlert can do a great job at the environmental level, significantly reducing the deaths of wild animals on Spanish roads, amounting to 10 million vertebrates in 2006.

We also want to highlight that applying a solution such as the one offered by **FaunAlert** can be also positive for the brand image of public and private organizations, as it will show greater concern for the road safety of drivers, as well as for our cultural and natural heritage.

Strategic plan

4. STRATEGIC PLAN

4.1. SWOT analysis

4.1.1. Strengths

The use of open-source hardware technology (i.e. Arduino) has allowed us to develop a detection system at very low cost, which will allow us to obtain high profitability from the product.

FaunAlert is offering an integral solution that goes from the detection of critical points of wild fauna crossings in conventional roads and highways, the development, installation and maintenance of the Det-Sig system, as well as the relocation of the system based on the seasonality of migratory flows and the size of animal populations.

It is also an easily scalable solution that can be perfectly applied in other countries, allowing for a rapid international expansion of the business.

4.1.2. Weaknesses

One of the biggest challenges for **FaunAlert** will be giving enough visibility to the project. Given that one of our main customers' segment is a relatively small group of concession holders and regional/local governments, setting up meetings to further explain the project will be one of the key points to address since the beginning.

The hiring process by regional and local governments, probably, will have to go through public bids, so the contract deals that **FaunAlert** may make with public entities will be subject to the budgets that these entities have.

In addition, it should be noted that being a young group and a start-up team, our credibility may be put into question by our potential customers. To address this problem, we will hire the services of qualified staff to help us setting up meetings and during the negotiations of contract terms.

4.1.3. Opportunities

The biggest opportunity comes from the lack of competition in the national road safety market. There are currently no solutions for a problem which will worsen in the coming years.

In addition, and given that we will try to deploy our system in order to reduce the number of Iberian lynx killed after car crashes, we will take advantage of the media to increase our company's visibility.

4.1.3. Threats

One of the main threats would be a decrease in the interest of society and companies for environmental causes.

Another problem could be the arrival of sensorized vehicles with already incorporated fauna detection devices. However, advances in this area seem to be quite slow, and the time margin between the animal detection and alerting the driver is very short and currently a bottleneck for the development of this kind of technology.

4.2. Business model

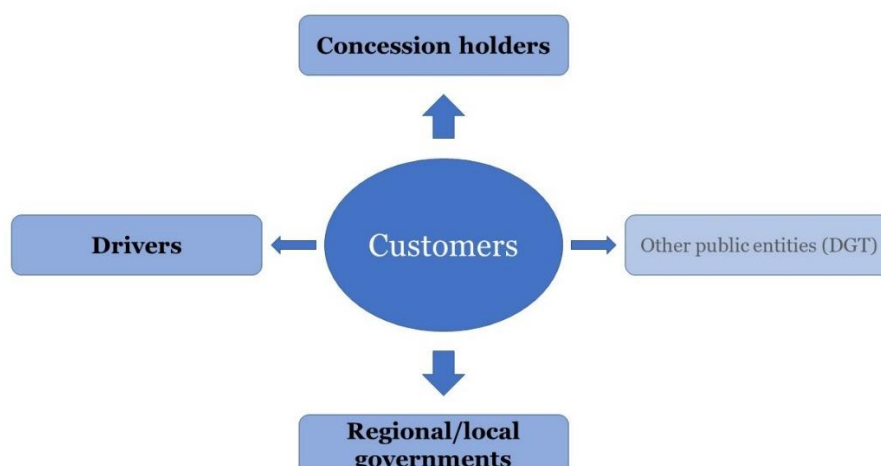
4.2.1. Who is FaunAlert for?

The **FaunAlert** customer segment is divided into the following two groups:

- **Concession holders** responsible for the construction and maintenance of state highways.
- **Regional and/or local public administrations** responsible for the conventional roads (where most of the accidents due to animal collisions occur in Spain).

In addition to these two main customer segments, we have detected two other customer sub-segments:

- **Drivers**, who are unprotected in terms of road safety (no effective signalling systems for animal crossing) and, in most cases, are responsible for all costs associated with vehicle reparations and healthcare.
- **Other public entities such as the DGT or private companies** dedicated to the construction of road infrastructure could be interested in our consulting services, which we will provide in order to optimize road design.



4.2.2. What is the value proposition?

FaunaAlert was born from the validation of a business, road safety, and conservation problem that currently does not have a practical, effective and scalable solution. Our value proposition is to provide an effective technical solution to warn drivers in advance and in real-time of the presence of wild animals crossing the roads, thus reducing wild animal mortality (**Conservation Dimension**), cleaning, maintenance and legal expenses for licensee companies (**Business Dimension**), and increasing road security (**Social Dimension**).

Business dimension. Public institutions and concession holders responsible for highway maintenance make considerable economic and material efforts every year to clean and recover animal remains from roads. Although in certain accident black spots there is usually some type of signalling, the effectiveness of the current solutions is highly questioned if we take into account that in regions like Catalonia the number of animal car crashes increased by 100% in the past 7 years.

Social/business dimension. Car drivers are the legal responsible for the accident and therefore have to cope with all the expenses, unless they have hired a specific clause with their insurance companies (which is not often the case). Road accidents with medium to large size animals (such as wild boar or roe deer) can seriously put at risk the life of car drivers.

Conservation dimension. Accidents represent a huge environmental loss, quantified in 10 million vertebrates in Spain alone across 2006. These figures will continue to grow given the increased awareness and investment efforts in biodiversity conservation plans. For instance, as Iberian lynx populations have been recovering in the past decade, deaths by car collisions have steadily increased and represents today the main cause of Iberian lynx deaths.

4.2.3. What is our market penetration strategy?

In the client segment our main client will be **concession holders**. Since the number of companies dedicated to the construction and maintenance of state roads is rather limited, we intend to contact as many of them as possible in order to arrange formal meetings where we will present our project and its value proposition. We will focus on those companies with a greater volume of concessions and capital such as FCC, Ferrovial, **Acciona**, Sacyr, ACS, and Abertis. In addition, and to publicize **FaunaAlert**, we will

attend the National Road Safety Congress which is held yearly, as well as other relevant congresses or fairs.

Concerning our other main client segment, **public administrations of regional or local character**. The maintenance of conventional roads is generally outsourced, and therefore regional/local governments are not directly responsible for them. However, in this case, we will directly contact regional/local governments because they are responsible for negotiating the contract terms with the outsourced companies. We will need to hire a negotiator with experience to deal with and attract clients at the beginning of the project.

In order to give more visibility to **FaunaAlert** through the press, our initial goal is to focus on applying our system in roads where **Iberian lynx** deaths due to car collisions accumulate. By doing this, we can accelerate market penetration, with an innovative solution that is not offered by any other company at the moment and which tackle a problem which will likely become worse in the near future due to the increase in nature conservation policies. In addition, a **blog and webpage** will be created to raise awareness among the population with news related to the nature of animal movements and project development.

4.2.4. How do we connect with our customers?

As we have seen before, we have differentiated three main customer segments: concession holders, regional/local governments, and drivers (we exclude from the list other public entities such as the DGT, since they will not be part of our market strategy during the first year), each with different needs and therefore with slightly different value propositions. The relationship with customers will therefore vary from one to the other.

The relationship with concession holders and regional/local governments will be carried out in a similar way, through quarterly meetings (or according to the criterion established by the client) and through a phone line, thus enabling a way for any request or suggestion that our clients may require.

The relationship with drivers will be different. Through the application, the webpage, and the phone line that we will put at their disposal, drivers can contact and send us any questions or suggestions. In addition, through the web, posts will be periodically uploaded to inform users about the project development, and about news or any other information related to road safety that may be of interest to drivers.

4.2.5. Which are our activities, resources, and key partners?

Depending on the customer segment, we make the following differentiation:

I. Concession holders and regional/local governments segment

a. Key activities

- Detection of critical points of wildlife crossing on highways and conventional roads using Geographic Information Systems technology (GIS).
- Manufacture of the detection and signalling system (Det-Sig system) for alerting drivers of the presence of animals crossing the roads.
- Installation, maintenance and relocation of the Det-Sig system (in conventional roads, we will apply pheromone mixtures to direct fauna movements towards the sensorized areas).
- Marketing, sale tasks and business development.
- Assistance to congresses and fairs about road safety topics to increase FaunAlert's visibility.
- Business meetings to present and explain the project to potential customers.

b. Resources

- Economic. For acquiring the required material to manufacture the Det-Sig system, and to hire support staff to negotiate contract terms and set up business meetings.
- Customer service via telephone.

c. Key partners

- Local and regional governments
- *Dirección General de Tráfico (DGT)*
- Non-profit organizations dedicated to nature conservation
- *Asociación Europea de Automovilistas (AEA)*

II. Drivers' segment

a. Key activities

- Development and maintenance of the mobile application and web page.
- Writing and publication of articles of potential interest for drivers and app users.

- b. Resources
 - Economic. For hiring servers in the cloud to store data.
- c. Key partners
 - *Asociación Europea de Automovilistas (AEA)*
 - Media

4.2.6. Which are our main incomes and expenses?

Our income will come from three fundamental elements:

1. **Installation of the detection and signalling system (Det-Sig system)** in those areas with the highest concentration of animal car crashes. The system has been fully designed by the **FaunAlert** team and, therefore, the company has exclusive rights on the product. In addition, we are about to apply for the patent at national and european level.
2. **Maintenance and relocation of the Det-Sig system** to adapt its location to the seasonality of animal movements and population densities. The relocation will be based on the predictions made by mathematical models that will be fine-tuned with accident data collected from the DGT, as well as with data on the abundance and distribution of relevant species such as wild boar, roe deer, or Iberian lynx.
3. **Monthly subscription fee for users of mobile application** which will alert drivers through voice notifications of the proximity of road sections with high rates of animal crossings, as well as of the imminent presence of animals crossing the roads.

The expenses will come mainly from:

- Development, installation, maintenance and relocation of the Det-Sig system.
- Sales tasks. At this particular point, large economic efforts will be made, since one of the main weaknesses which can put at risk the whole viability of our business model is to set up business meetings with our potential customers and reaching agreements on the contract terms.

4.2.7. Strategic objectives

FaunAlert will start operating in Spain, but with a clear medium-term goal (1-2 year) of expanding to other European countries (i.e. those countries with the highest animal

collision rates, such as Germany, France, Switzerland, Italy, Portugal and the United Kingdom). After 3 years, market penetration in Latin America and North America will be addressed.

FaunAlert's vision is threefold, since we seek to have an impact at the business, social and environmental levels. Our objective is to reduce the expenses that concession holders have related to cleaning and maintenance tasks of roads after road accidents against animals. In addition, we seek to increase the drivers' safety, who are currently unprotected from this particular type of accident, given that current methods have not proven their effectiveness. Finally, we are a working team deeply concerned with environmental causes, particularly those which have to do with fauna conservation and therefore, another main objective of the company is to reduce the number of dead animals on Spanish roads.

To achieve this, we have set the following strategic landmarks:

- To improve current methods for the detection of critical points of wild fauna crossing.
- To reduce by 90% the number of accidents due to collision with wild animals of medium to large size.
- To reduce by 50% the number of Iberian lynx killed in car crashes.
- To drag all concession holders into incorporating **FaunAlert**'s solution.
- To actively collaborate with the DGT, establishing a two-way communication which will allow us to update and optimize our system.

Marketing plan

5. MARKETING PLAN

5.1. Project validation

5.1.1. Initial business idea

The initial business idea for **FaunaAlert** was to create a detection system, coupled with a road signaling system, to reduce the death rates of Iberian lynx due to car accidents. Following this business model, funds would have come from the main institutions involved in the Life + IBERLINCE project (i.e. Junta de Andalucía, Autonomous Agency for Natural Parks, Junta de Extremadura, Junta de Castilla-La Mancha, and some non-profit organizations). Given this financing model, we encounter significant problems when thinking of how to make our business model viable on the long-term.

Following this problem, we modified our initial business idea. We decided to increase the scope of our initial value proposition, and we opted to apply the system we were planning to design to the overall wild fauna population, and not only to Iberian lynx populations. With this business model, insurance companies would be our main customer segment, since the amount invested annually in economic compensations for this type of accidents was considerably high (41,800,000 € only for mechanical reparations). However, we were advised against starting business initiatives with the insurance sector because of their low maneuverability to finance projects with high-associated risks. Therefore, we decided to explore through the interviews another interesting customer segment, concession holders and regional/local governments, for which our solution could significantly diminish their operation costs.

5.1.2. Interviews performed to validate our business model

First Interview

We started interviewing the **head manager of the road infrastructure department of Acciona** (*Juan Antonio Fernández Matamoros*), to which we presented the idea of applying our solution to secondary roads, where most accidents caused by animals occur.

After this interview, we slightly modified our business idea, and we decided to incorporate our solution also to highway junctions, where the number of accidents due to domestic and wild animals is also high.

Another suggestion made by our interviewee was to add U-shaped fences at intersections as part of our value proposition, in order to reduce to a greater extent the crossing of

animals at these intersections. The interviewee seemed to suggest that this type of solution could be incorporated by Acciona in the future, which led us to think that we were dealing with a problem of interest at least for concession holders.

Along with these suggestions, the interviewee indicated that, in order to obtain more information regarding the exact number of accidents caused by animals, as well as their geolocation, it would be necessary either to make an exhaustive search through the Internet, or to directly contact public organizations such as the DGT.

The main conclusions obtained were:

- To focus on highway intersections.
- To incorporate U-shaped fences along with the Det-Sig system.
- To contact the DGT in order to get data related to accidents caused by animals.

Second Interview

The second interview was conducted with the **director in Spain of the *Asociación Europea de Automovilistas*** (Mario Arnaldo). The main points to highlight from this interview were:

- He provided us with official and confidential information related to accidents caused by animals which occurred between 2012 and 2018. Very detailed data, which indicated the type of road and animal involved in the accident, as well as the exact geographical location.
- He emphasize the urgent need to increase drivers' security on roads. Road signalling currently used is rather ineffective, especially when it comes to alert of the potential crossing of fauna. Animal populations vary seasonally, and therefore the risks of coming across an animal on road varies too. In addition, drivers, unless they have signed a specific clause with their insurance companies, are the legal responsible when accidents caused by animals occur, and have to cope with any expense linked to car reparations or healthcare.

Although we did not draw any big conclusion from this interview that may have modified our business model, we get valuable data that will be useful when deploying our system in field.

Third Interview

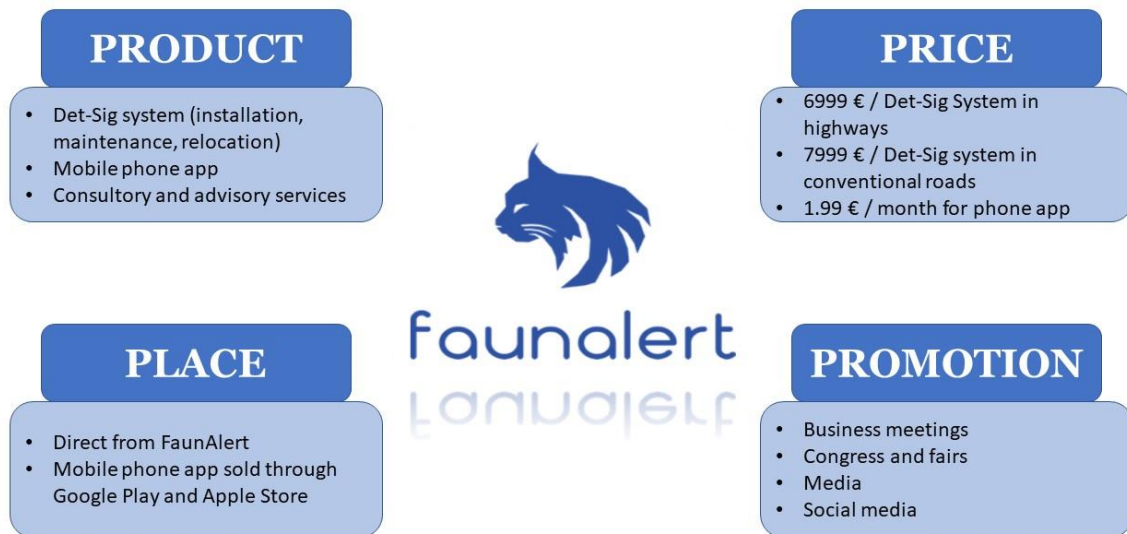
Our last interview was conducted with the director of the association of conservation and exploitation companies of roads in Spain (Pablo Sáez). The key points of the interview were the following:

- He encouraged us to continue with the idea of implementing our system at highway intersections, and he told us about several prototypes that are being tested in other European countries (which have not yet being commercialized).
- In addition, he suggested that we do not incorporate the U-shaped fence, because of the added costs it would entail, and because of the legal difficulties we would have if we close these intersections, since these are often used by special vehicles like ambulances and have to remain open.
- He also encouraged us to install our solution on conventional roads, since most accidents caused by animals occur in these. He suggested the possibility of our system being mobile, so that we could adapt its location to the seasonality of animal populations. In addition, he told us to apply pheromone mixture to direct the crossing of fauna as much as possible towards the sensorized areas.
- Finally, he emphasized that it would be interesting for us to negotiate with companies dedicated to the navigation sector (Tom-Tom, Google Maps, Waze) the possibility of connecting our system with their applications.

5.1.3. Conclusions

The interviews confirmed concession holders as one of our potential clients, since several of the interviewees found it interesting to install our system on highway intersections. However, they also suggested that our business model should incorporate the implementation of the system in conventional roads, so it was clear that regional/local governments would be the other customer segment sustaining our business model. Finally, the lack of protection of drivers was quite worrying, and since our company not only seeks to create economic value but also to have a positive social impact, we decided to incorporate drivers as the third customer segment. We will provide them with a digital product (app + web page) that will alert them of the presence of animals on the roads, and send mail notifications before making a trip regarding the state of wild animal populations and the risk of encountering wildlife along the way.

5.2. Marketing Mix



5.3.1. Description of products and services

Our company will offer the following products and services.

Development and installation of the signaling and detection system Each detection and signaling system will consist of several infrared transmitters and receivers. Separated by a distance that will vary according to the conditions of the road, three transmitters of infrared light will be installed vertically at 10, 30, and 60 cm (and in the same way for the receivers). Along with this, the system will include an interactive traffic signal, which will be connected via radio to the detection system, displaying a message for drivers whenever an animal is crossing the road. The energy required by both systems will be provided by two small-sized solar panels.

Maintenance and relocation of the signaling and detection system

We will offer concession holders and regional/local governments a maintenance service, together with the possibility of relocating the signaling and detection system along the roads, adjusting their position to the critical points that we will have previously detected using our wildlife movement model. Our operators will be in charge of inspecting the systems according to the time period established within the contract terms, and of relocating them according to the seasonality.

Mobile application for drivers

Our phone application will alert drivers through voice notifications of the proximity of road sections with high rates of animal crossings, as well as of the imminent presence of

animals crossing the roads. Besides, we will create a web page which we will update weekly with news regarding road safety topics.

5.3.2. Pricing policy

Our pricing strategy will differ depending on the customer segment to which the service or product is oriented.

In the segment of concession holders and regional/local governments, the main objective is to achieve high penetration and to position ourselves as a reference solution within the market. We do not seek volume, but rather trust on the part of our clients and fidelity. The volume of clients in our case will never be too high, since there are a limited number of relevant concession holders and regional governments to whom we can sell our solution. In the case of the product offered to public entities, which would include the detection system, the dynamic signaling system, and the use of pheromone mixtures, we have set the price at **7,999 €**, while in the case of the product offered to concession holders, the price would be set at **6,999 €** (not including treatment with pheromones). We have estimated the productive cost of both solutions in 2,000 and 1,600 €, respectively, so we would be charging our customers four times the costs of production. While we believe that we can afford this gross profit margin, the price can be adjusted once we have entered into negotiations with customers.

In addition to the fixed cost established for each Det-Sig system, the maintenance and relocation services **FaunAlert** offer will be charged through a variable monthly rate (there will be less activity at certain periods of the year for which the price will be lower), whose price will depend on the number of systems available to the client.

As for our mobile application, the initial idea was to make it available at a cost of 1.99 € per month. However, we are well aware that today there are very few people who are willing to pay for using mobile apps which they have never used before. That is why we will probably offer it for free with the aim of reaching a high volume of users. Once a critical mass of users has been attained, our strategy is to either monetize the application through advertising, or to enter into conversations with entities such as Google, TomTom, and Waze in order to offer them our application as an added functionality for their software.

5.3.3. Distribution channels

Both the design and the production of the Det-Sig systems will be carried out entirely by the FaunAlert team. **FaunAlert** will be in charge of requesting the transmitters and

receivers of infrared light, the electronic circuits, the wiring, the supports for the detection system, as well as the dynamic signals and the solar panels. The assembly of the different components will take place in the offices and workshop of **FaunAlert**, which will be located in a strategic geographical point such as Madrid to facilitate the subsequent distribution of the systems. Once the assembly is completed and the critical points are located on the roads where the systems will be installed, the distribution and installation of the systems in the established points will be carried out. Initially, this work will be performed by the four initial team members, carrying out the entire process from production to installation. As initially the number of systems we hope to sell is rather small, the workload should be affordable for the team. Later on, the hiring of staff specialized in production, transportation, installation and maintenance will be required.

The mobile application that **FaunAlert** will offer to drivers will be available for Android and iOS through the Google Store and the Apple Store.

5.3.4. Promotion and communication plan

The main objective of the communication plan is to bring the mission and vision of **FaunAlert** to our customers. In the case of drivers, we want to instill in them the importance of any action, however small, when it comes to protect the environment. With our mobile application, users will have the opportunity not only to increase their safety when traveling, but also to reduce the negative environmental impact that their trips may cause. In the case of concession holders and regional/local governments, we aim to transmit them the confidence that we have in our system, a system that has already been tested at the academic level, reducing at some locations in 90% the number of accidents caused by animals.

During a first stage of penetration, our efforts will be focused on getting the highest possible number of meetings with the main concession holders of our country, especially those in charge of the roads that registered the highest number of Iberian lynx deaths, as well as with the regional governments involved. As we already mentioned in other sections of this report, our objective is to take advantage of the close attention that the Iberian lynx recovery received from the media to give more visibility to our project and make our system known across the road security market.

In a later stage of market expansion, a greater effort will be made in order to expand to the rest of the national territory. With the aim of acquiring even more visibility, we will attend fairs and congresses to publicize our technology, perform an analysis of the competition, and interact with potential customers that we may have skipped in our first stakeholder analysis.

Financial plan

6. FINANCIAL PLAN

6.1. Products offered by FaunAlert

Our company will offer two main products as had been explained in previous sections, one Det-Sig system to be installed at highway intersections, and another Det-Sig system to be installed at conventional roads, which will also include the application of a mixture of pheromones to direct wildlife movements through the sensorized areas. Based in our estimations, our costs and prices will be the ones shown in the following table. With no direct competition in the road security sector, we expect to be able to afford this high gross margin of 70 to 80 %.

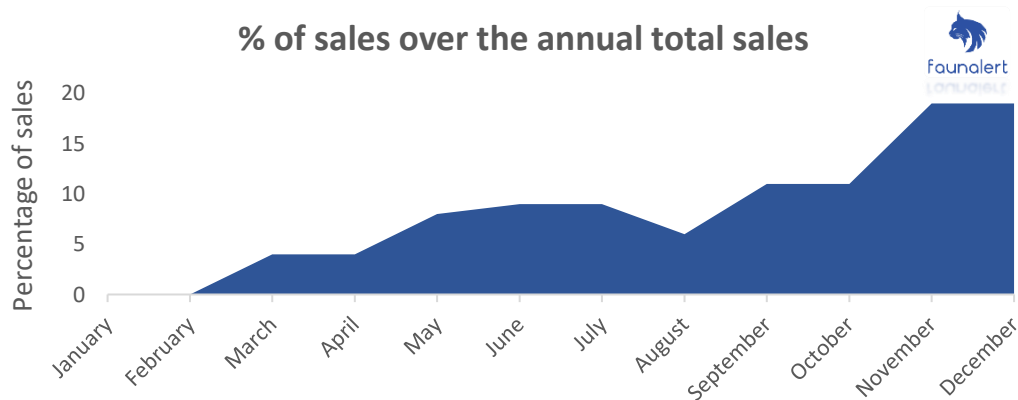


Products offered by FaunAlert

Product offer	Sale price	Production costs	Gross margin (%)
1. Det-Sig system (highways) 2. Det-Sig system (conventional roads)	1. 6999 € / system unit 2. 7999 € / system unit	1. 1600 € / sys. unit 2. 2000 € / sys. unit	1. 80% gross margin 2. 71% grossmargin

6.2. Expected sales

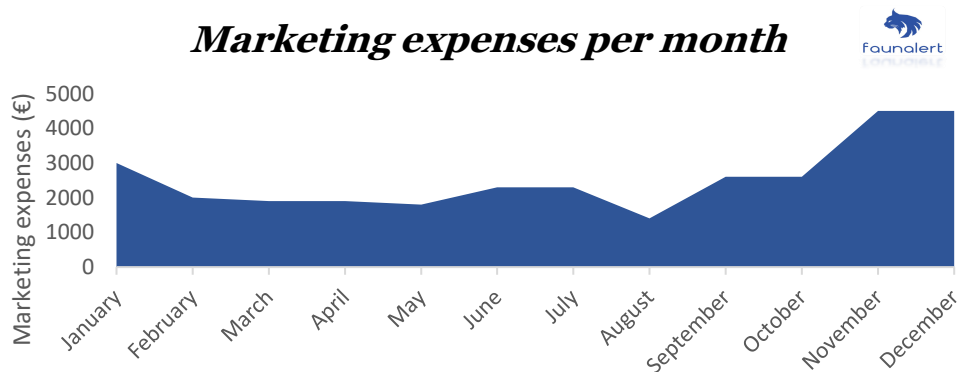
We expect a conservative growing trend, without any sells during the first 2 months without any sells, since during the first two months we will make a contact round with the potential customers and we will be preparing for the business meetings; besides, we expect companies to take some time for the decision making, so we predict that we will not make any sales during this first period of two months. Once the first clients are attracted, we expect to be able to sell a higher number of Det-Sig system during the following months, once the effectiveness of the system have been proved. We expect to sell 30 Det-Sig systems for highways, and 23 for conventional roads during the first year (see annual trends in the following graph).



We assumed that the large companies we are dealing with will pay us in 90 days after we provided the Det-Sig systems. However, we will try to negotiate the payment terms since we will have to pay in cash our suppliers. This is a problem for the cash flows and to solve it, we will need to raise more money to start the company (we will explain this later).

6.3. Marketing investment

The marketing investment will be higher at the beginning of the project, since it is the most crucial moment to attract new clients. Once acquired our product, we are confident that our customers will order more system units in order to keep reducing accidents against animals, so our marketing investment will be focused in the sales percentage. At this point, we will put more money in the offline marketing because our potential customers are not easily reached through social media or the internet. Instead we will focus our marketing economic efforts in assisting to congresses, fairs, and to hire sales staff (see graph showing the marketing expenses by month across the first year).



In the following table, we show the distribution of marketing expenses, where we can perfectly see the difference we mentioned between expenses in digital and off-line marketing.



6.4. Human resources costs

We will be 4 partners earning an equal salary of 25,000 € per year, and with a RETA of 30% (BOE 2019). Our expenses in human resources according to our estimations will be of 70,000 € per year. However, this figures are just estimates since we may have to hire additional staff as the project progresses, to help us with production, transport and installation, as well as with the commercialization of our solution.

6.5. Funding sources

FaunAlert will have three major funding sources:

- Our own equity, which will be of 2,500 € per partner plus 5,000 € coming from one of the partners, who will also provide us with a track to carry out the transportation and installation of the Det-Sig system.
- A participation loan, valued in 30,000 €, which will be payed in five years, with a 5 % interest rate and 12 payments per year. This is needed because of the negative cash flows due to the imbalance in time payments between our customers and our suppliers.
- A subsidy, valued in 10,000 €. We expect this subsidy to be even higher since national and regional governments are trying to promote entrepreneurial initiatives which are willing to innovate within the business tissue.

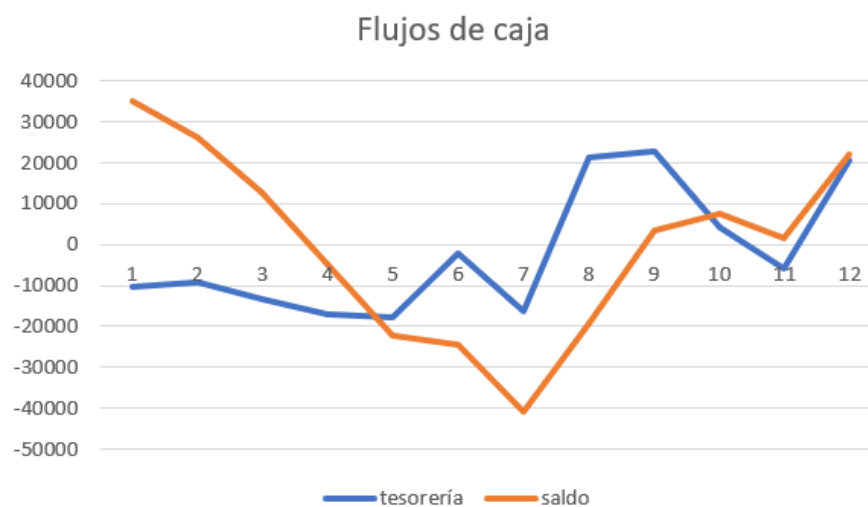


Funding sources and net worth

FaunAlert's net worth	55,000€	FaunAlert's net worth
Money contributed by partners	10,000€	
Goods and rights contributed by partners	5,000€	
Grants and donations	10,000€	
Participative loans	30,000€	

6.6. Liquidity

In this section, like any start-up company, we will have certain difficulties during the first few months, especially due to the mismatch between charges and payments. By charging our customers 90 days after the sale, and by also having to pay our suppliers in cash, negative balances will be created. To compensate for this, it has been necessary to acquire more financing than initially expected through a participative loan of 30,000 €. After three months from the first sale (month five), we expect an slow increase in cash flow due to the charging of the products previously sold to our customers.



6.7. Accounts statement

During the first and second year, we estimate that the EBITDA will be of 188,915 € and 560,367 €, respectively. The net profit will be of 139,341 € during the first year, and of 418,318 € during the second. We will have a gross margin of 71 and 80 % for the Det-Sig system for highways and for the Det-Sig system for conventional roads. The ROE for the first year will be 77.9%, and 70.7% for the second. The breakeven point will be 158,262 € with a payback of 9 months (to see more details, see Excel file attached).

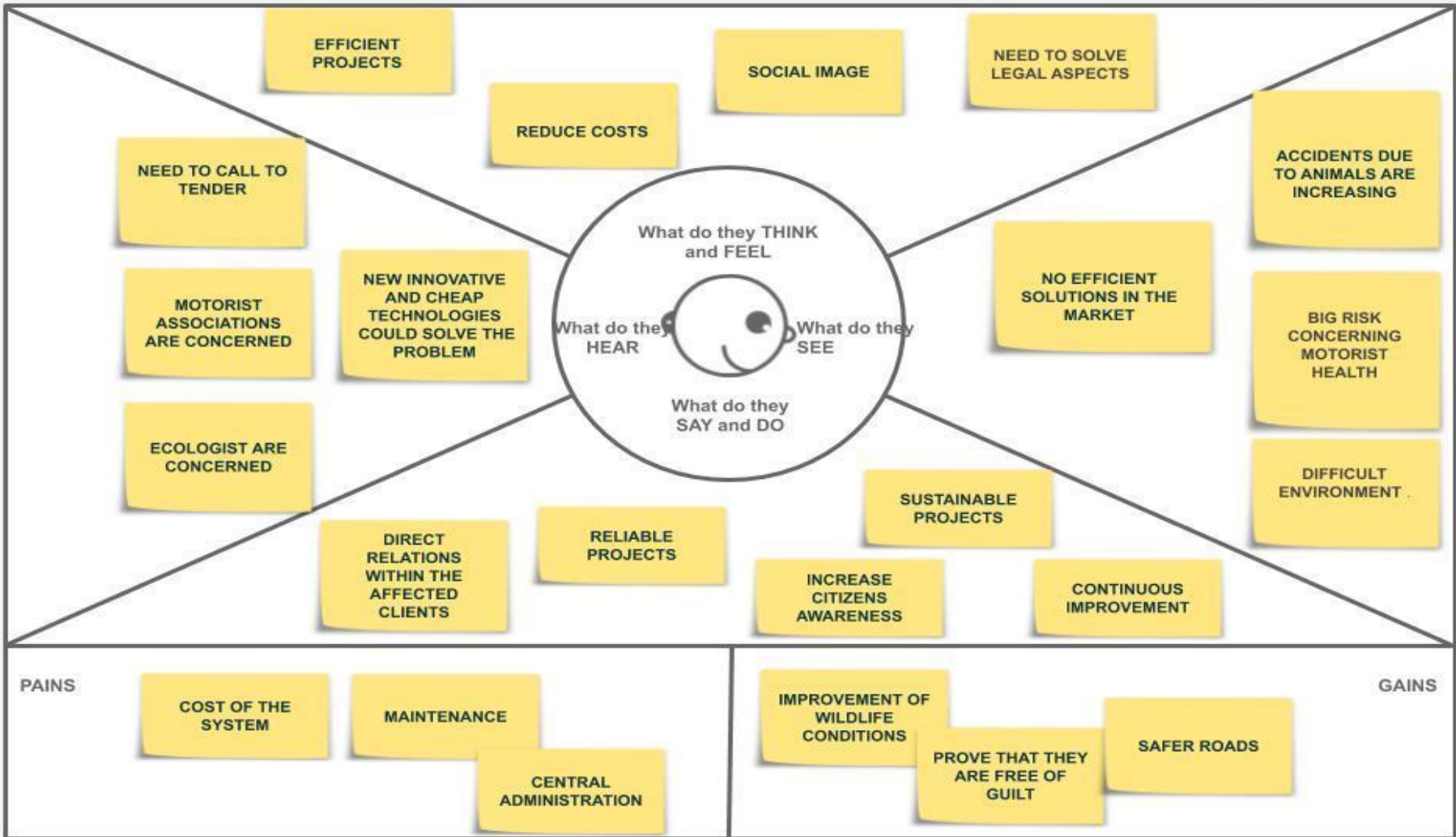
Supplementary material

CANVAS model

<p><u>Key partners</u></p> <p>NGO's</p> <p>Directorate-General of Traffic (DGT)</p> <p>Wild fauna recovery centres</p> <p>Motorists associations</p>	<p><u>Key activities</u></p> <p>Hot spot detection</p> <p>Manufacture Det-Sig sys</p> <p>Installation, maintenance & relocation Det-Sig sys</p> <p>Marketing & sales tasks</p> <p>Meetings, congresses & fairs</p>	<p><u>Value propositions</u></p> <p>Reduce cleaning and maintenance costs</p> <p>Improve drivers' road security</p> <p>Reduce environmental impact of road infrastructures</p>	<p><u>Customer relationships</u></p> <p>Personal assistance (phone, e-mail)</p> <p>Long-term</p>	<p><u>Customer segments</u></p> <p>Concession holders (Acciona, ACS, Ferrovial, FCC, Sacyr)</p> <p>Regional/local governments</p> <p>Drivers</p> <p>Other public and private entities (DGT)</p>
<p><u>Cost structure</u></p> <p>Development, maintenance & relocation of Det-Sig system</p> <p>Sales tasks</p> <p>Staff salary</p>		<p><u>Revenue streams</u></p> <p>Installation of Det-Sig system</p> <p>Maintenance and relocation of Det-Sig system</p> <p>Monthly subscription fee for app users</p>		

Empathy Map

Nombre del Usuario / Cliente: Concession Holders	Designed by: Faunalert	En: dd/mm/aaaa
		Por:



INTERNAL
FACTORS

STRENGTHS (+)

- Innovative technology.
- Chameleon company; able to adapt
- Social work "Society consciousness"
- Lack of real competition in the sector
- Variety of projects

WEAKNESSES (-)

- Young team
- Lack of data
- Costs of technologies

EXTERNAL
FACTORS

OPPORTUNITIES (+)

- Global Projects
- Conservation programmes
- Drivers
- Road owners
- Land owners

THREATS (-)

- New regulations
- Insurance companies
- Central administration
- Poachers

	Cierre 1º Ejerc. 2019		Cierre 2º Ejerc. 2020	
	Euros	%	Euros	%
INGRESOS (Ventas)	400.947,0	100,0%	911.880,0	100,0%
Costes Directos Variables (a)	94.000,0	23,4%	211.200,0	23,2%
Otros Costes Variables (b)	0,0	0,0%	0,0	0,0%
Total COSTES de VENTAS (Costes Variables)	94.000,0	23,4%	211.200,0	23,2%
(1) MARGEN BRUTO S/ VENTAS	306.947,0	76,6%	700.680,0	76,8%
Gastos de Personal (Gastos de Estructura)	70.000,0	17,5%	70.000,0	7,7%
Otros Gastos de Estructura (incluido Mk)	48.031,8	12,0%	70.312,8	7,7%
Total GASTOS de ESTRUCTURA (Costes Fijos)	118.031,8	29,4%	140.312,8	15,4%
(2) EBITDA (Beneficio Antes de Int., Imp., y Amortizaciones)	188.915,2	47,1%	560.367,2	61,5%
Dotación a la Amortización (Contable)	1.750,0	0,4%	1.750,0	0,2%
(3) EBIT (Beneficio Antes de Intereses e Impuestos)	187.165,2	46,7%	558.617,2	61,3%
Gastos Financieros	1.377,0	0,3%	1.099,9	0,1%
RESULTADO FINANCIERO	-1.377,0	-0,3%	-1.099,9	-0,1%
+ Ingresos / -Gastos Excepcionales	0,0	0,0%	0,0	0,0%
(4) EBT (Beneficio Antes de Impuestos)	185.788,2	46,3%	557.517,3	61,1%
Provisión Impuesto s/ Beneficios	46.447,0	11,6%	139.379,3	15,3%
(5) Resultado Neto	139.341,1	34,8%	418.138,0	45,9%
Costes de Marketing	31.056,8	7,7%	54.712,8	6,0%