Scooter sharing system
Project Scootcy in Barcelona

BUSINESS PLAN

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1. Main idea

The main drive of our company is to enhance the existing public modes of transportation. This would have the benefit of both facilitating the trip of current users and attract new ones. Our company would act as an intermediary hence handling the users' commute to and from the public transportation station to their final destination. This would be achieved through the use of electric scooters which would be the main focus of our company in its initial phase. The main objective is to provide a cheap and easy mode of transportation that is readily available. In order to achieve our company's goal, the electric scooters would be strategically placed in areas where there is high demand; areas inaccessible by conventional modes of transportation. So, where the journey ends for buses, metros ...etc. It begins with a scooter. The scooters would be implemented as a first phase near touristic areas and universities where demand is expected to be high. The usage of the scooters would be managed through an app. In order to find a scooter, the user opens the app where a map would be shown with the nearest scooters marked on it. This is enabled through equipping the scooters with a GPS device. Upon finding a scooter, the user would scan a QR code placed on the scooter before starting the trip. The user would be charged an initial fare and subsequently an amount for each minute of usage. The user would be able to leave the scooter anywhere upon completing the trip. The strength of our company lies in the ease of use. This would be due to a user-friendly app that would manage the connection between user and scooter in a seamless manner; but also, this would be due to the scooters themselves which contribute to the comfort of the user due to the fact that they are powered by an electrical motor. This ease of use could be relied on to generate the interest of prospective users.

2. Key aspects to create value for the customer

2.1. Competition

There is another scooter sharing system in Barcelona. It is called ecooltra and the web address is: https://www.ecooltra.com/.

Figure 1 Logo

Ecooltra is established in Barcelona since 2006 and it is running quite well too, which is an indicator for how good the customers using a scooter in Barcelona. It became also a European leader in mobility solutions on two wheels. You can book a scooter over an application and then you can just pick the next free scooter next to you up. After driving to your destination, you can leave the scooter anywhere in the area Barcelona. You pay your ride per minute or you can book a pack in advanced if you want to use it a longer time. But they only offer big scooter for a long distance. With this kind of scooter you lose a lot of time just for picking up the scooter, like put on your helmet. Another main disadvantage of this system is that need a driving licence for using it.

Figure 2 Big scooter

Over all ecooltra is not a direct competitor because the company offers only big scooter and it is focused on the direct transport, for example from home to the destination. It is not a connection between the public transport and final destination.

Another company, which offers a sharing transportation in Barcelona, is Bicing. The website address is https://www.bicing.cat/.

Figure 3 Logo

With Bicing you can rent bicycles in Bicing stations in the city and you can drive to your destination. After booking a season ticket for 47,16 €, you pay also per ride. The first 30 minutes are free after that until 2 hours you have to pay 0,74 €. And if you need the bike more than 2 hours you have to pay 4,49 €/h.
For renting a bike you must apply a NIE. Another problem is that you can not leave it everywhere you want. You have to find a station for leaving the bike. Therefore, you possibly have to walk to your destination because the next Bicing station could be not very close to your place. Therefore, this sharing system is very expensive and inflexible. Moreover, human powers it.

Figure 4 Bicingstation

All in all Bicing is also not a direct competitor. It is also more a direct transport, but not that flexible like the other sharing systems.

Summarizing a company in Barcelona, which offers small scooters for short distances, which connect the public transportation, would be very useful. You can pick up the scooter very easy, go where you want and leave it there. Consequently you safe a lot of time. Another big advantage is that it is very easy to manage and you do not need a driving license for using it. Accordingly, there are some parts in Barcelona, where you cannot drive with a car but with a small scooter it is possible to go.

Furthermore, there is no direct competitor in Barcelona, who offer the same service. Therefore, the pricing is not limited and there is a lot of room for growth.

2.2. Launching strategy and location

The general procedure for implementation the project is, that that the project focus at first only on the area around UPC Campus Nord. Principal it focalize on the way from the Metro and Bus stop to the university. Shown in the Figure 5 Map below are all the public transportation stations in the vicinity of UPC campus Nord. The metro stations are the ones expected to receive the largest in flow of commuters hence a substantial number of scooters would be placed near them compared to other public transportation stations. As for the bus stations, it could be seen that they are combined together in clusters hence each cluster would be serviced by its own number of scooters. The preliminary proposal of the scooter placement is shown also in the Figure 5 Map below.

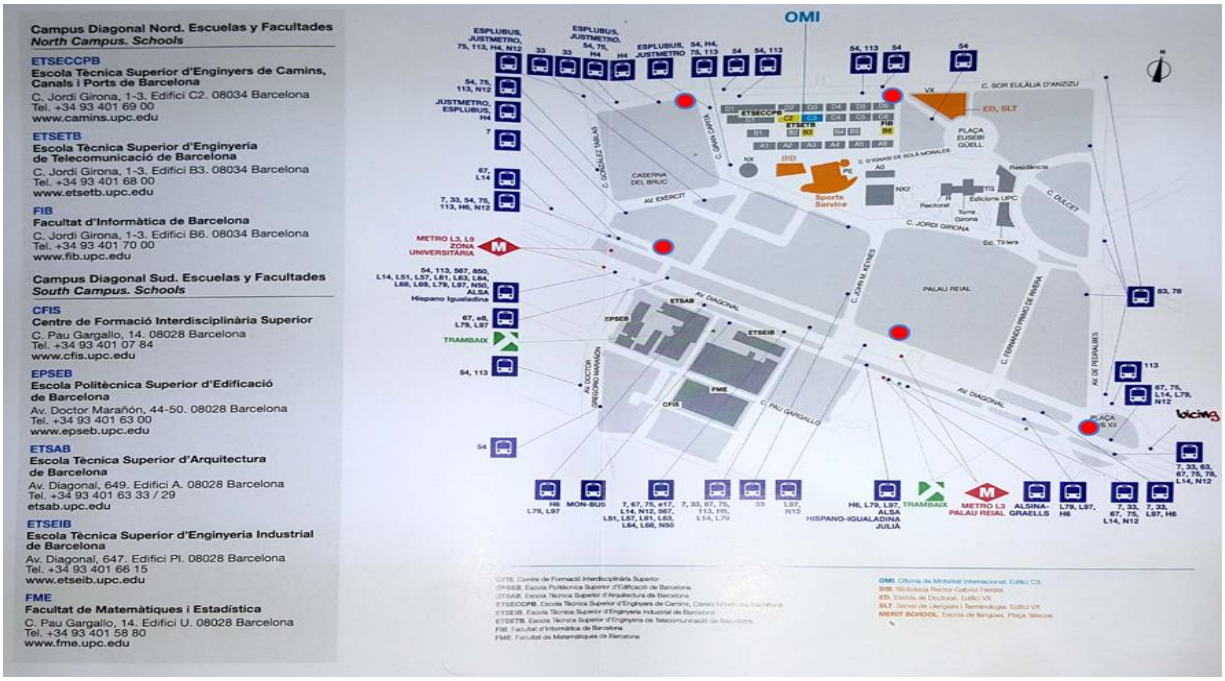

Figure 5 Map

At the very beginning 30 Scooter are offered. This small number is enough because we approximate a use per ride about 10 minutes. Furthermore, students have very different timetables, therefore the need of the scooter is spread over the whole day.

2.3. Expansion strategy

The expansion of our project would be gradual. This would have the benefit of a better management of our company's finances. It would be also a good strategy in order to test the functionality of each element of our company and to polish any the ones that could be problematic. After working on a smaller scale and working out the minor details our company's activities would expand to cover all major districts of the city in focus.

Hence as an initial phase our company will focus its activities on university zones. The nature our company makes it easy to operate in a specific area without losing any of our company's strength. Specific locations would be chosen among these aforementioned areas as preliminary testing grounds. UPC campus Nord would be chosen as the testing grounds for university areas.

After that testing phase, the scooter will be placed around touristic areas. After a longer period, we will analyse the behaviour and the demand of the users. According to this analysis, we will place more scooters in areas with high demands.

Upon completion of this initial phase, a similar approach would be taken for the whole city. Each area would be sub-divided into separate sections. The scooters would be placed near public transportation stops and their numbers would be estimated based on the volume of users' traffic at each station. Hence the number of scooters is dictated based on users' demand. The placement of the scooters would be also a dynamic process as the users dictate where they want to place them. Data would be collected from the GPS fitted on the scooters and typical roots would be deduced. Based on this data the required number of scooters per-region would be calculated and the typical pattern of their commute would be known.

2.4. Customers

It is producing a high number of potential customers. Who are they? And why should they pick our company? At first the company focus on the students of the UPC Campus Nord. And with expending the area these scooters are very interesting for tourists.

The UPC Campus Nord is a bit far from the Metro station and mountainous located. Moreover, not every student has a driving license and therefore every student can use a scooter for less money. After expending the area, it can be very useful for the other main category of customers:

The tourists. They are only for few days in Barcelona. Barcelona has many things to visit and furthermore it is a really large city. There is a lot of traffic in the streets but with a small scooter you are very flexible. You even can drive on the pavement. Furthermore, there are parts in Barcelona where it is not allowed to drive but you can drive in there with a small scooter. So, if you only have a few days in the city for sightseeing and want to do it on your own, you can easily rent a scooter. You can discover many things in Barcelona in a short period of time for a cheap price.

Figure 6 Map Barcelona

This service can also be helpful for the citizens. It can be used as connection between public transportation and for example the location of the workplace. In addition they can rent a scooter for activities where you it is impractical to use a car because of the small streets in Barcelona and the dense traffic. As well for people who do not need that often, it is more rentable than to buy and own one.

3. Product and supplier

3.1. Product (Scooter A101)

In this part we are going to talk about the characteristics of the scooter and the supplier.

Figure 7 Scooter A101

The electric kick scooter is a labor-saving traffic tool with fashion look. No matter where you go, you can ride to office, metro, coffee shop, park without any problem! It is a very convenient and popular traffic tool which can be used instead of walk and cars if short distance. It can be folded, very easy to carry with. Very classical design and fantastic ride feeling.
Boasting a unique folding design, A101 electric scooter has been made from aircraft-grade aluminium alloy and weighs 13.9kg. Further, it adopts advanced E - ABS braking system, kinetic energy recovery system, cruise control system and intelligent BMS system. Smart and practical, as well as beautiful, you will love it!

3.2. Size information

Product size (before folded): approx 1080mm x 430mm x 1140mm
Product size (After folded): approx 1080mm x 430 mm x 490mm

Figure 8 Dimensions of the Scooter

3.3. Smartphone App

Lightweight, clean, super tidy and with great control! While you have no speed visibility indication on the scooter itself, the app gives you full amount of data. Including the expected covered range, various temperature and sensor data. You can even upgrade the firmware from it! And some of the features can be enabled or disabled. App will have the capability to track the scooter to see which is closer to you.

3.4. Brake system

The electric scooter comes with a dual-brake system. The front wheel has E-ABS anti-lock system, while the rear wheel uses mechanical disk brake. The braking distance can be shortened to 4 meters, making your riding much safer.

3.5. Battery life

Powered by 18650 lithium-ion battery pack with a battery capacity of 280Wh and offering an over-long cruising distance of 30km.Charging time 3-4 hours that is very convenient. In addition, it adopts intelligent BMS battery management system. You can know the battery conditions through the APP downloaded in your mobile phone.

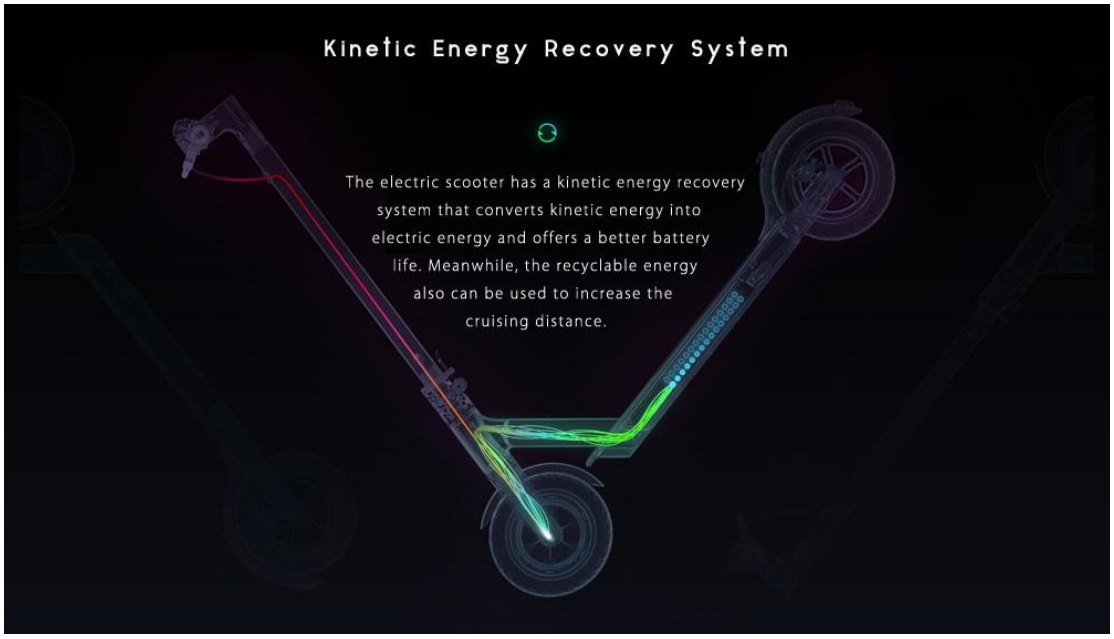

Figure 9 Kinetic Energy Recovery System

3.6. Protection functions

It is very important to point out that it has six protection functions which are short-circuit protection, over-current protection, overcharge protection, over-discharge protection, low-voltage protection, and temperature anomaly protection. All these protection functions make the ride easier and more pleasant because the user has not to worry about anything.

Figure 10 Anti-skid and Shock resistance mechanism

The A101 electric scooter can achieve the speed up to 25km/h in normal mode. In eco it goes as fast as 18 kilometers per hour. The rated motor power is 250W and the maximum motor power is

500W.Also, can go uphill a 14% incline. The max load is 100kg and the standard power consumption is 1.1 kWh per 100km.

The only thing that can be a little annoying at first is that the motor needs run-up process before it starts to work. You should trample on the board and slide the scooter, then activate the accelerator after the sliding speed is in 3 - 5km/h.

Figure 11 On Scooter functions

The cost for 30 pieces is 169 euros and a 12th month warranty is provided.

3.7. Ideal gadget-best value for money decision

This scooter is ideal for traveling in the town as it is very quiet when it is working and can be folded so it is ergonomic and easy to carry in public transports. There is a protective and anti-slip floor and its speed is sufficient to save a lot of time. This scooter from the market research we did is the best in terms of quality-possibilities and price. Moreover, the price we buy it, is much better than other suppliers as for the same scooter the price is up to 220 euros.

3.8. Protection against theft

The scooters are always fitted with a GPS, so the location is always known. The GPS can be fitted at the brain of the scooter. As a result, GPS cannot be removed without destroying the scooter.

3.9. Supplier

Figure 12 Logo

JADI Tech is a diversified OEM/ODM enterprise, which specializes in intelligent sweeper, vacuum cleaner, robotic mop, balance scooter, scooter, swing car and electronic cigarette. In addition, JADI has a professional mold factory belonging to the group. OEM scooters manufacturers have more than 6 years experience in scooters industry.

3.10. Charging system

The charging system will be very simple.
After 23:00 p.m. a registered member will be able to pick up a scooter out of the road and take it to his home to charge it for 3 to 4 hours and release it again the next morning. Chargers will have a map that shows them where to find scooters that need to be charged. These users will get 5-7.5 euros that can use in the app for next rides. This is a very profitable way because the charger gets the next rides for free and the company does not pay practically the charger. As a result, the company does not need to hire employees for the charging process. The chargers will get a message saying to them where to drop the scooters. The scooters must be in their drop-off locations by 7 a.m., so that they are ready for commuters.

4. Marketing

Once we have everything set up, we will have a big gift to people that have downloaded the app and have created an account the first month. They will get 1 hour for free. In addition, every user will have a unique code, that can give to non-users of the app. This is a referral system that will reward those attracting more people to the use of our services. The more people someone has attracted to the app the more meters he will be getting. Costumers also can get some meters for free by following our social network sites and pages. Implementing these ways will boost the popularity in the beginning very much as well as thereafter with the referral system.

5. Financial plan

In this section, the financial aspects of the project are put into consideration. The preliminary components of such analysis are the expenses and the income. The analysis in hand was conducted while taking into consideration the time value of money.

5.1. Expenses

The expenses of the project where primarily estimated and they were divided into two categories: capital cost and running cost.

5.2. Capital cost

The capital cost includes all the expenses that are to be paid at the initial phase of the project. These expenses are paid only once at the present time. The capital cost necessary to our project in shown in Table 1 Capital cost

Table 1 Capital cost

Concept	Amount	Price[euros]	Total[euros]
Scooters	30	770	15400
App development	1	6584	6584
Website development	1	700	700
Office rent deposit	1	6000	6000
1st month rent	1	3000	3000
Computers/phones	5	500	2500
Office equipment	1	1000	1000
Legal aspects	1	4000	4000
Total			**39184**

The capital cost includes the money required for buying the scooters necessary for the launching phase of our project. It also includes the cost of outsourcing the development of the app necessary

for generating the ecosystem of our company. The remainder of the costs are related to the establishment of an office including the legal requirements.

5.3. Running cost

The second category of expenses is the running cost. These are expenses that are to be paid in regular intervals of time (on a monthly basis in our case). The running cost necessary to our project in shown in Table 2 Running costs

Table 2 Running costs

Concept	Amount	Price [euros]	Total [euros]
Rent	1	3000	3000
Insurance	1	300	300
Internet	1	80	80
Cleaning service	8	50	400
Marketing	1	500	500
Electricity	1	100	100
Water	1	60	60
Licenses	1	400	400
Average Salaries	4	1200	4800
Total			**9640**

These expenses included the costs to keep our office running on a monthly basis. They include the cost of the basic amenities. Marketing was also allocated a monthly cost as it is detrimental to the core of our business strategy. Another expense is the salary of employees to be hired. It was agreed upon that in the initial phase only four employees would suffice, in addition to the members of our group. This was in order to compensate some of the missing know-how. One employee would be responsible for the maintenance and improvement of the application. Another

would be responsible for public relations (PR) and marketing. The third employee would be responsible for the maintenance of the scooters on the ground. And the last employee would handle the financial and the accounting responsibilities.

The concept of time value of money was applied to the running cost in order to determine their present value. The present value of annuity equation was used (Equation 1).

$$P\left[\frac{1-(1+r)^{-n}}{r}\right]$$

$$P = Periodic\ Payment$$
$$r = rate\ per\ period$$
$$n = number\ of\ periods$$

Equation 1 Present value of annuity

The number of periods r is 12 months while the interest rate is 10% per year which is 0.833% per month. This yields a present value of 158474.258 euros for the running cost for one year.

5.4. Loan calculation

The required expenses were deemed to high for our team members to finance on their own thus it was concluded that a bank loan is necessary. This would cover the capital cost and the running cost for the first month. This would amount to 48824 euros. This loan would be repaid on a monthly basis with an interest rate of 10%. The calculation of the monthly payments is shown in Table 3 Loan calculation

Table 3 Loan calculation

Month	Starting Balance	Repayment	Interest Paid	Principal Paid	New Balance
1	48,824	4292.405	406.867	3885.538	44,938
2	44,938	4292.405	406.867	3885.538	41,053
3	41,053	4292.405	406.867	3885.538	37,167
4	37,167	4292.405	406.867	3885.538	33,282
5	33,282	4292.405	406.867	3885.538	29,396
6	29,396	4292.405	406.867	3885.538	25,511
7	25,511	4292.405	406.867	3885.538	21,625

8	21,625	4292.405	406.867	3885.538	17,740
9	17,740	4292.405	406.867	3885.538	13,854
10	13,854	4292.405	406.867	3885.538	9,969
11	9,969	4292.405	406.867	3885.538	6,083
12	6,083	4292.405	406.867	3885.538	2,198

5.5. Income

The income of our project is based on the renting process of the scooters. Analysis of the market led to the determination of a tariff that would be suitable for both the costumer and for our business to remain profitable. The income per scooter could be calculated according to the following Equation 2.

$$I = N * (E0 + Emin * Min) – N*(Elec)$$

Equation 2 Income equation

Where:

- I = Income/scooter/day
- N = Number of trips
- E0 = initial fare
- Emin = fare per minute
- Min = minutes used
- Elec = price of electricity

The initial fare was set to be equal to 1 euro. This is the price for initiating the trip. The fare per minute of use was set to be equal to 0.15 euros. The price of electricity was set to be equal to 0.05 euros per trip. These numbers where all based on the estimation that each trip would be 10 minutes on average. Thus, this equation is only function of the number of trips N. The present value of the income takes the form 375.358*N euros.

5.6. Break even analysis

The previous sections all for the conduction of a breakeven analysis. The process would be to combine the cost with the income in one equation in function of the number of trips N. Subsequently, the number of trips N that would render our operations profitable could be determined. The equation takes the following form:

(-Capital Cost-Present value of the running cost + present value of the income * Number of scooters * N + Bank loan)

This yields the following results shown in Figure 13.

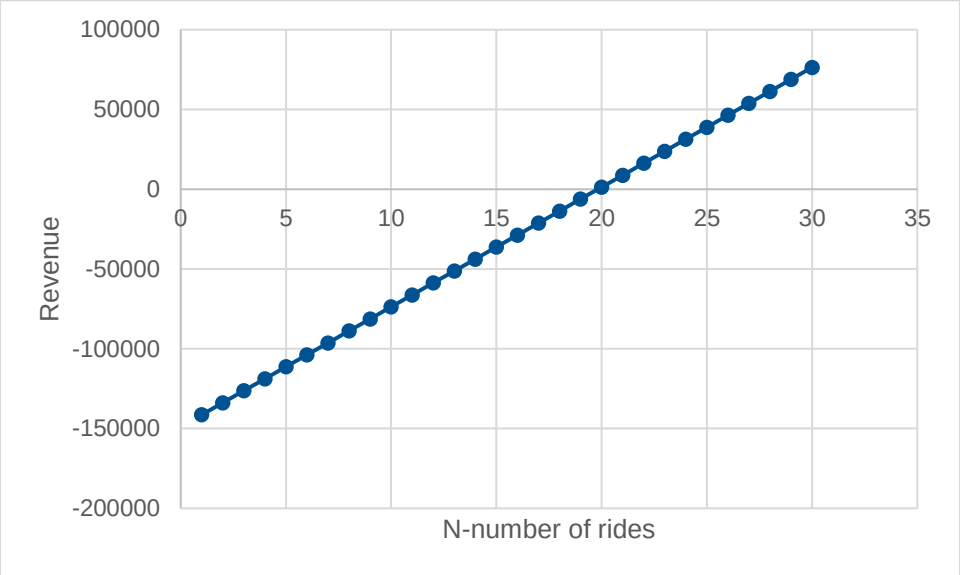

Figure 13 Break-even analysis

The suitable number of trips N that would render our operations profitable while deploying 30 scooters is 20 trips per month per scooter. This number sets the bar and it is the goal to achieve each month. This goal seems reasonable and attainable on a monthly basis. This relatively low number of required rides proves the profitability of our company and the success of our business model.

5.7. Cashflow

The cash flow of the project with the calculated minimum number of trips (N=20) is shown in this section.

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Full Year
Opening balance	0	8907.595	8175.19	7442.785	6710.38	5977.975	5245.57	4513.165	3780.76	3048.355	2315.95	1583.545	0
Incoming													
Sources of finance	48824												48824
Cash sales	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	158400
Total income	62024	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	13200	207224
Outgoing													
Initial investment	39184												39184
Rent	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	36000
Insurance	300	300	300	300	300	300	300	300	300	300	300	300	3600
Average Salaries	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	57600
Internet	80	80	80	80	80	80	80	80	80	80	80	80	960
Water	60	60	60	60	60	60	60	60	60	60	60	60	720
Electricity	100	100	100	100	100	100	100	100	100	100	100	100	1200
Cleaning service	400	400	400	400	400	400	400	400	400	400	400	400	4800
Licenses	400	400	400	400	400	400	400	400	400	400	400	400	4800
Marketing	500	500	500	500	500	500	500	500	500	500	500	500	6000
Loan repayments	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	4292.405	51508.86
Total expenses	**53116.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**13932.405**	**206372.86**
Net cash flow	**8907.59**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**-732.405**	**851.14**
Final Balance:	**8907.6**	**8175.19**	**7442.79**	**6710.38**	**5977.98**	**5245.57**	**4513.17**	**3780.76**	**3048.355**	**2315.95**	**1583.545**	**851.14**	**851.14**

The cash flow for the first year of operations of our project is shown in Figure 14.

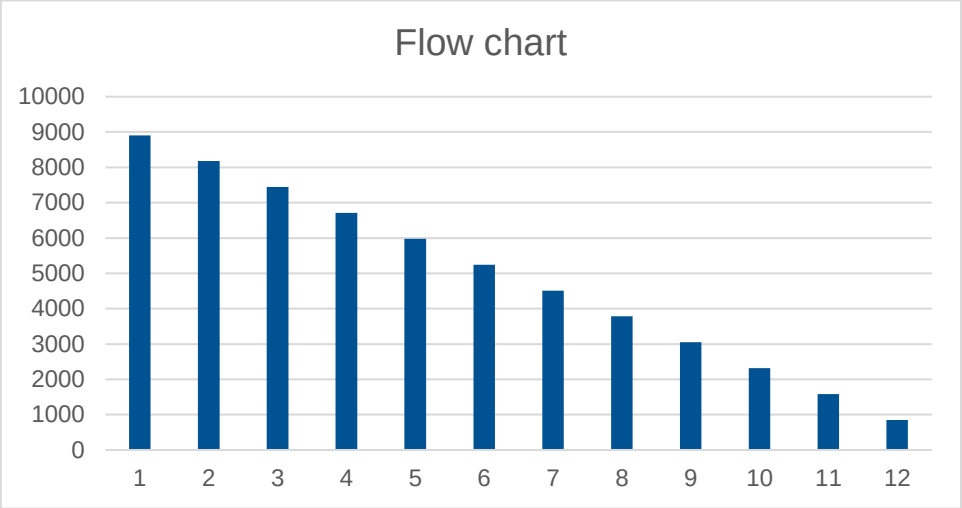

Figure 14 Flow chart for the first year of operations

It could be seen that there is always a positive value of cash in disposal. This is due to the bank loan that was taken in the beginning. This value is reduced over time where the monthly expenses are accumulating. It is worth noting that the monthly income is higher than the monthly expenses (without the loan repayment) which insures the profitability of our project. This is shown by the net positive cash flow at the end of the first year. Again, this analysis was conducted for the minimum number of trips thus any value above this benchmark would render our operations more profitable.

The analysis was limited to one year due to the fact that this was the estimated time that would take to complete the initial phase of our project's development. This phase would be followed by and expansion phase detailed earlier in the report.

6. Legal aspects

To found a company, we will need to carry out the next steps:

- Apply for NIE
- Registration of the company name by notary
- Composing the company statutes
- Open bank account for the company in Spain and payment of the minimum capital (3000 €). This is strictly needed to create a company.
- Application for a tax number (CIF), registration for IAE (commercial tax) and the tax office.
- Register in trade registry (name and location of the company, authorized representatives, legal form as well as stock or share capital)
- Receipt of the final tax code

7. Investment proposal

In order to initiate the operations of our company an initial investment is required. It was concluded from the financial analysis that a total amount of 48824 euros is required for the initial phase. This amount could be rounded up to 50000 euros. It covers the capital cost of the of the project in addition to the running cost of the first month of operations. In order to remain in control of our company and not include an outside investor it was agreed upon that this initial investment would be secured through a bank loan. This bank loan would be repaid on a monthly basis with an interest rate of 10 percent. Detailed calculation of the loan repayment is included in the financial analysis section. By taking into account all the expenses, the loan repayment and the income, it was concluded that the operation of our company would be profitable beyond an attainable number of trips for the scooters; and that the initial investment would be recovered. The proposed investment would only cover the initial phase of the project that was estimated to take one year to complete. An expansion phase would follow if the prior phase was deemed successful and after working out all the minor details and problems. Such an expansion phase, due to its nature, would require a new investment.