

## Israel – Ruta N Smart Cities Call For Proposals

### EXPRESSION OF INTEREST

#### 1. Project Participant

Company name: **TRONEX S.A.S**

Website: <http://www.tronex.com/es-es/>

Year established: **2010**

Type of company:  R&D  Research institute  University X Other

Stage:  Seed  R&D  Initial revenues X Revenue growth

Ownership:  Public X Private  Governmental  Other

Number of employees: 541

Number of R&D personnel: 4

Company contact information: Jaime Andres Moreno B

Address: **Cra 67 # 1 Sur – 92, Medellín Antioquia.**

Contact person:

Name: **Jaime Andres Moreno Betancur**

Title: **Manager Division Industrial**

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#### 2. Organization Background

##### General Business Description & Area of Expertise

TRONEX was born from a process of innovation in the world of entertainment and music, seeking the integration of complementary businesses. For this reason, from the first moment the Company contemplated the development and manufacture of a red battery that will work for all the discharges, mainly of lanterns, toys and audio players.

We started with the manufacture of D, C and AA batteries, mainly for portable stereo audio players from the 70's, later new battery production lines were developed. Nowadays, we are the only independent battery factory in Latin America, founded after the Second World War, which continues to operate in the national territory.

In the 80's, alliances were consolidated for the manufacture of Zin Carbón - Manganese batteries and it is the philosophy of the company to position the

TRONEX brand so it lasts over time, as a manufacturer of superior quality batteries.

In the 90's, other alliances were generated in Indonesia for the development of alkaline batteries, with the best suppliers of raw materials from all continents; This is as specialized as the raw materials for food, and therefore its homogeneity and purity are key to the success of our product.

The learning process and the acquired experience of market analysis and the recognition of our products, has facilitated the detection of new opportunities to enter the industrial sector. This is how, in the year 2000, our TRONEX INDUSTRIAL Business Unit was created to serve sectors such as Telecommunications, the Manufacturing Industry, the Financial Sector, Oil, among others.

Later, we ventured into the governmental sector and into applications in alarms, ups, rectifiers, medical equipment and toys. We are currently a leading company and recognized in the Industrial sector for our services, product quality and our mtek battery brand, which manages a complete range of energy storage solutions for different applications, characterized by its safety and reliability thanks to its high performance.

In 2003, as part of the industrial business, TRONEX establishes a distribution agreement with one of the three largest global manufacturers of lead-acid batteries in the United States, and the Motive Power (MP) Business Unit is created, which it would be transformed to the Business Strategic Unit TRONEX LOGISTICS SOLUTIONS, to meet the needs of the Logistics sector and consolidate itself as a leader in the category of industrial batteries of driving force.

Innovation has been a strategic and fundamental part of our Company, promoting the research and development of new models that improve the productivity and efficiency of our products. This is how we obtained a patent in 2008 for an improvement developed in batteries R03 (AAA Zinc carbon) which makes it unique worldwide providing safety features superior to other batteries of the same reference.

In 2010, business and distribution grew, expanding the battery and battery product portfolio and starting to market other types of complementary household products such as light bulbs, lighters, among others.

Subsequently, the Large Format business unit was created, in charge of managing large areas and multiple distribution channels; specialized in the representation and commercialization of self brands of TRONEX S.A.S. Years later, the unit is transformed into a Strategic Business Unit for Mass Consumption, including in its portfolio the exclusive representation of leading brands worldwide, for our country.

Parallel to the Company's continuous growth, a strategy of direct sales to neighborhood stores is being built and consolidated at the national level, under the promise of visiting the seller on the same day and time each month, offering the entire portfolio of products and establishing a unique relationship with these customers.

In 2012, the first online sales project was developed through the E-commerce model, to venture into digital sales through the virtual platform TiendaTronex.com. Then, the ConectAT project is structured, a computer application that allows shopkeepers to make their purchases digitally, to receive their order within 24 hours, also becoming part of our distribution network.

In 2013, it began with a formal innovation process under the leverage of INNpuls Colombia, in order to structure and achieve the Company's maximum potential hand in hand of innovation, offering specialized services and financing strategies.

Nowadays, the work done focuses on an Innovation system and is projected through a model defined with the Innovatio + Ideas con poder program, the company's flagship organizational project that aims to make tangible and add value to our company.

### **Technology Description (Main Products/Services) and IP**

Tronex is a Company specialized in the manufacture, marketing and distribution of superior quality products for different markets of mass consumption, home, industrial and government. It has the only independent battery factory in Latin America, founded in the national territory after the Second World War and the only Battery Laboratory in the country certified under ISO 17025, which serves customers worldwide.

Through its different business units the scope of the company's business is extended as follows:

- Tronex Battery Pack Manufacturing unit:
  - Manufacture of assemblies from standard designs or remanufacturing of battery packs based on samples.
  - Development of lithium-based energy storage systems tailored to the customer.
- Tronex Industrial:
  - Advice for any basic need, installation, repair, maintenance (preventive - corrective), renovations, installations, disassembling, relocations, relocation of equipment and emergency attention 7x24x365 days with coverage nationwide. All the necessary services that ensure proper operation and proper conservation of equipment such as UPS, rectifiers, inverters, substations.
  - Design, formulation, structuring, monitoring -control or installation of renewable or alternative solutions.
  - Calibration and testing of measuring equipment such as multimeters or clamp meters.
- Massive consume:
  - Distribution and commercialization in large and small areas at national level of own and international brands such as batteries, lighters, lighting, electrical supplies for the home, among others.
- Tronex Logistics Solutions:
  - High quality solutions and energy efficiency in the logistics sector.
  - Traction batteries.
  - Industrial Chargers for traction batteries.
  - Equipment for battery charging rooms.
  - Spare parts and accessories.
  - Specialized technical service and advice.

### **Targeted Customers**

Public, private and/or mixed companies related to production, marketing, distribution of:

- Energy sector.
- Alternative Mobility Sector.
- Alternative Energies Sector.

**Sales (over the last 3 years)- if applicable**

Current year: (2017): 64.506.453.000 (Gross Sales).

i-1: (2016) 66.844.017.000 (Gross Sales)

i-2: (2015) 54.834.407.000 (Gross Sales)

**3. General Information**

Project Title: **TRONEX MOBILITY**

Technology Sector:

- Electric Mobility, Autonomous Mobility, Smart Mobility, Vehicle Technology.**
- Digital city**
- Information city
- Cognitive Smart City
- Energy, street lighting, smart buildings, distributed energy resources (DER), data analytics, and smart transportation.
- Environment
- Public safety

**Submission Date:** 30/01/2019

**Summary:**

This model was created to "transport energy" around cities, positioning itself as a system that supports trips on electric bicycles, supporting the pro-Bici law existing in Colombia, reducing CO2 emissions and with a new digital proposal to live the city.

This initiative seeks to prioritize trips on foot and trips on two wheels, linking them to a digital platform that allows us to scale and enhance all the features offered by trips in electric vehicles, combining the generation of non-conventional or alternative energy, with the accumulation of energy and a post-consumer program, becoming a truly sustainable system from its concept to its operation.

It is shown as a public-private model where the private component makes the investment of electric bicycles, "parking bike" stations and street furniture that seek to benefit the general public, the employees of the companies or specific target audiences. On the other hand, the public sector will be responsible for the creation of cycle-routes, to promote road education and provide the spaces and access necessary for its operation. So then, the use of the electric bicycle and the solar parking bike stations, focus the model on the use of renewable energies. In addition, users of this

system will have access to a digital platform or application (APP) to interconnect different transport systems such as mass transport, bicycle stations, street furniture, among others. The APP will provide the necessary information to innovate in sustainable mobility systems with real and accurate data, which will help road decongestion, environmental improvement and people's health.

Each station "parking bike" solar, will give the user access to bicycles, charging points, internet spots, integrated services center and even an assistant drone for location, guide in remote places with the ability to provide first aid and even have with enough technology to carry an emergency defibrillator.

The user APP will be connected to a bicycle security system, through which a GPS will make a history of routes, travel details and kilometers traveled, recognizing the user who is using the service and even keep payment records if the case requires it.

The cycle routes that are linked to the system, will have installed speedometers to educate users about the speeds they have in their journeys and guide to maintain safe speeds. These sensors, accompanied by cameras will be able to provide useful information on the number of bicycles that pass through the area and associate all this information with the mobile application to connect people with: city events, cultural agendas, prevention, road safety education and preference of places.

And finally, the model will generate an algorithm to apply our own environment, to our needs and conditions, which can be scaled to other cities or countries that have similar conditions, such as an exportable and replicable business model.

#### **Main Characteristics of the Model:**

- Private-Public Model for a sustainable mobility system.
- Speed in implementation.
- Management and control via APP (Applications for Cell phones).
- Easily scalable.
- Intuitive for the user.
- Non-conventional or alternative energy attribute.
- Fosters specialized knowledge of sustainable mobility.
- It has an integrated service center for electric bicycles.
- Electric bicycle messaging.
- Use of internal mobility within organizations and / or productive plants.
- "Solar Parking Bike".
- We are in networks such as <http://tronexmobility.com/>

**Project Start Date:** Octubre 2019

**Project End Date:** Octubre 2020

#### **4. Budget:**

**Total Project Budget:** USD 500.000

Requested IIA grant (% of budget): 50%

**Requested Medellin Partner Support:** Support with local, state and national level organizations in charge of mobility, air quality and other topics related with the project scope.

## 5. Project Outline:

### Project Description

TRONEX SAS, since 2013 has been working on the development of the concept of shared mobility through electric bicycles, thanks to its innovation management system of the company and three years later during an ideation session with the employees of the company. Proposes the sustainable mobility line.

The concept has been presented and validated by leading entities in the city of Medellín, such as Ruta N, has received press awards and has received awards from Andesco and Fenalco Solidario for its commitment to corporate social responsibility and sustainability; and has raffled the following stages:

1. Development at the level of idea without conceptual development.
2. Conceptual approach duly supported according to theory (s).
3. Preliminary prototype that works under controlled conditions and allows testing basic attributes.

What is intended in the current project is to materialize the knowledge that has been collected in the previous phases, through which the development has been carried out in a real-scale pilot in the city of Medellín, implementing a network of stations, in order to validate the performance of the system and its interaction with the general public; Evidencing the strategic decision making of TRONEX and of the people through the information provided by the platform and the computer app with which the company will have access to information about users' routes, locations where batteries are most used up, consumptions energetics, usage patterns and user management risk; and users will have knowledge bases to choose the most appropriate displacement option according to their preferences, such as: travel time, decrease of environmental impact, use of sustainable alternatives, as well as knowing the options of modal interconnection of the city, among others; In addition, the provision of the service and the most appropriate model for its operation will be validated.

At the end of the project, with the knowledge obtained in the development of the pilot, the necessary adjustments can be made and in this way have a shared public-private mobility model that provides necessary information for sustainable mobility with real and accurate data that helps road decongestion, environmental and health improvement of people; and TRONEX in the strategic planning of growth and scaling of experience centers.

In this way, users of the shared electric bicycle system and experience centers (stations) will be connected at all times, through the use of digital systems, to the mobility of the cities with which they can schedule their trips and make use of the different multimodal media of the mass transport system, as well as of the stations for bicycles, street furniture to make road breaks, among others.

In the same way, the sensors perform data mining of the number of bicycles that pass through the area, and with a computer platform it is possible to identify patterns of use and thus to know where it is more viable to place charging stations, battery replacement systems, It also connects the user with city events, cultural agenda, prevention, road education and preference of places or space with which they are identified, generating a culture around sustainable mobility.

That is to say, that the entire model will generate an application algorithm for our own environment, needs and conditions, which can be offered to other countries, cities or municipalities that have similar conditions, such as an exportable business model.

## Market Potential and Commercialization Plan

The target market of the electric mobility shared network will be the population present in the cities, for which a first evaluation of the city of Medellín will be carried out, however, the analysis can be replicated for any city.

In the present case, the market which is going to be attended, will be mainly the population that moves from home to work or study and vice versa of the metropolitan area, given mainly during peak hours (6:30 - 8:30 am and 5:00 - 7: 00 pm).

The definition of the market has been obtained by analyzing the destination origin survey, evidencing the place of origin, the place of destination, reason for the trip and means of transport used. To do this, the four cardinal points (north, south, east and west) of the city are going to be analyzed as the point of origin and the place of destination is verified, discriminated by communes.

Of the total of trips made by people, it will be taken as assumption the market capture of these trips as follows: 18% uptake for trips made by car, 20% bus, and 15% for trips made by motorcycle.

Table 1, presents the quantified results of the market, taking as reference the trips made in the morning hours (5:00 a.m. to 8:59 a.m.) by the population that is between 18 and 65 years of age.

Table 1. Trips to be captured by the shared model in the Metropolitan Area

Source: Own development. Data taken from origin-destination survey 2012

| Origin/destination | North |      |            | West |      |            | East |      |            | South |      |            |
|--------------------|-------|------|------------|------|------|------------|------|------|------------|-------|------|------------|
|                    | Car   | Bus  | Motorcycle | Car  | Bus  | Motorcycle | Car  | Bus  | Motorcycle | Car   | Bus  | Motorcycle |
| Candelaria         | 488   | 5683 | 1250       | 263  | 1935 | 382        | 414  | 5602 | 584        | 1180  | 3176 | 737        |
| El Poblado         | 255   | 523  | 598        | 68   | 372  | 299        | 237  | 640  | 245        | 1187  | 1682 | 605        |
| Envigado           | 65    | 105  | 202        | 0    | 0    | 0          | 31   | 139  | 136        | 920   | 905  | 707        |
| Guayabal           | 112   | 372  | 270        | 3    | 280  | 60         | 26   | 416  | 203        | 533   | 661  | 335        |
| Itagüí Comuna 1    | 0     | 0    | 0          | 0    | 0    | 0          | 0    | 0    | 0          | 270   | 740  | 239        |
| Laureles           | 105   | 970  | 364        | 107  | 629  | 239        | 321  | 731  | 319        | 668   | 324  | 175        |
| Sabaneta           | 0     | 0    | 0          | 0    | 0    | 0          | 0    | 0    | 0          | 246   | 578  | 193        |
| Belén              | 47    | 242  | 210        | 37   | 256  | 98         | 75   | 431  | 101        | 515   | 253  | 161        |
| Itagüí Comuna 3    | 0     | 0    | 0          | 0    | 0    | 0          | 0    | 0    | 0          | 275   | 350  | 236        |
| Robledo            | 152   | 1055 | 190        | 81   | 469  | 45         | 22   | 649  | 61         | 258   | 387  | 168        |
| La América         | 0     | 0    | 0          | 46   | 598  | 31         | 13   | 242  | 93         | 0     | 0    | 0          |
| Castilla           | 230   | 851  | 260        | 0    | 209  | 90         | 0    | 0    | 0          | 0     | 0    | 0          |
| Itagüí Comuna 4    | 0     | 0    | 0          | 16   | 204  | 5          | 0    | 0    | 0          | 0     | 0    | 0          |

| Origin/destination | North |     |            | West |     |            | East |     |            | South |     |            |
|--------------------|-------|-----|------------|------|-----|------------|------|-----|------------|-------|-----|------------|
|                    | Car   | Bus | Motorcycle | Car  | Bus | Motorcycle | Car  | Bus | Motorcycle | Car   | Bus | Motorcycle |
| La Estrella        | 0     | 0   | 0          | 9    | 209 | 0          | 0    | 0   | 0          | 0     | 0   | 0          |
| Buenos Aires       | 0     | 0   | 0          | 0    | 0   | 0          | 93   | 189 | 57         | 0     | 0   | 0          |
| Aranjuez           | 119   | 603 | 223        | 0    | 0   | 0          | 24   | 144 | 93         | 0     | 0   | 0          |
| Comuna 31 Bello    | 129   | 826 | 112        | 0    | 0   | 0          | 0    | 0   | 0          | 0     | 0   | 0          |

Finally, travel is obtained through the shared mobility network distributed throughout the Metropolitan Area of the Aburrá Valley, originating in the four cardinal points. It can be seen from Table 2 the number of trips to be captured in one day.

Table 2. Trips planned to be carried out using the shared mobility network.

Source: Own development. Data taken from origin-destination survey 2012

| Destiny/Transport mode | Total         |
|------------------------|---------------|
| Candelaria             | 21.693        |
| El Poblado             | 6.710         |
| Laureles               | 4.953         |
| Robledo                | 3.537         |
| Guayabal               | 3.271         |
| Envigado               | 3.211         |
| Belén                  | 2.426         |
| Castilla               | 1.640         |
| Itagüí Comuna 1        | 1.248         |
| Aranjuez               | 1.206         |
| Comuna 31 Bello        | 1.067         |
| La América             | 1.023         |
| Sabaneta               | 1.017         |
| Itagüí Comuna 3        | 862           |
| Buenos Aires           | 339           |
| Itagüí Comuna 4        | 225           |
| La Estrella            | 217           |
| <b>Total</b>           | <b>54.645</b> |

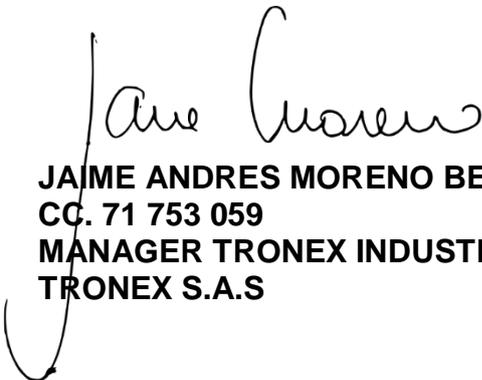
### Expected Outcome of Project

Develop a shared public-private network of electric mobility solutions through the implementation of monitoring systems and their integration with decision systems based on a data analytics model, to provide information to end users in making smart

decisions about mobility , reducing travel times, environmental impacts and guaranteeing the competitiveness of TRONEX SAS in the medium term.

Short Profile of the Key Staff who will be Undertaking the Work

- Jaime Andres Moreno Betancur, Innovation Professional and Manager HIROKI 360 S.A.S
- Natalia Alvarez Uribe, Innovation Professional.
- Gabriel R. Bolaños García, Innovation Professional.
- Faber Jair Jimenez, Innovation Professional.

  
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