Evaluation of deconsolidation alternatives in zero-emission vehicles for last mile distribution of packages in prioritized areas of Bogotá D.C.

Bogotá, DC
BOGOTÁ: CAPITAL OF COLOMBIA

BOGOTÁ

- 7.4 million inhabitants
- 25% of the GDP
- 47% of logistics companies

BOGOTÁ + CUNDINAMARCA

- + 10 million inhabitants
- 31% of the GDP
- 60% of the country's imports

CARGO SECTOR BOGOTÁ

- 80 thousand daily trips
- 240 thousand ton of merchandise/day
- 19% of jobs related to logistics in the country.

Sources: (DANE, 2020) - (SDA, 2018) - (Steer Daves Gleave, 2015)
PROJECT

IMPLEMENTATION PERIOD

Preparation | Execution and measurement | Evaluation of results

2 MONTHS | 3 MONTHS | 1 MONTH

6 MONTHS
PROPOSED ACTIVITIES

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Execution and measurement</th>
<th>Evaluation of results</th>
</tr>
</thead>
</table>

- Articulation with logistics operation companies.
- Detailed planning of pilot operation.
- Pilot and last mile transport baseline.
- Enlistment and adaptation of spaces and vehicles.
- Socialization with the community and actors of the areas.
PROPOSED ACTIVITIES

**Preparation**

- Pilot assignment
  - (Distribution to customers with different zero emission vehicles)

**Execution and measurement**

- Social strategy implementation.
  - (Information and awareness days, socialization and feedback of the process, linkage to the process of small owners)

- Linking small owners.

**Evaluation of results**

- Information taking.
# Proposed Activities

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<th>Evaluation of results</th>
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- Analysis of pilot results and consolidation of impact indicators
- Socialization of project results with stakeholders
- Development of results toolkit and replicability in organizations
**KEY INDICATORS**

<table>
<thead>
<tr>
<th>Environmental performance</th>
<th>Logistics Performance</th>
<th>Economic indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CO₂eq emissions/month</td>
<td>• Kg delivered/day</td>
<td>• Operational cost/route</td>
</tr>
<tr>
<td>• Particulate matter emissions/month</td>
<td>• Kg transported/km traveled</td>
<td>• Operational cost/delivered</td>
</tr>
<tr>
<td>• CO₂eq emissions/kg transported</td>
<td>• Kg traveled/day</td>
<td>• Operational cost/kilometer traveled</td>
</tr>
<tr>
<td>• Particulate matter emissions/kg transported</td>
<td>• Number of deliveries/day</td>
<td></td>
</tr>
</tbody>
</table>
Positive impact on the community in the implementation areas:

- Mitigation of air pollution and associated diseases.
- GHG emissions reductions
- Better service levels and efficiency in distribution.
- Less traffic jams and road accidents due to the use of smaller vehicles.

According to the preliminary Baseline of emissions presented by ICLEI-Despacio, the last mile distribution on vehicles smaller than 3.5 Ton represents a significant fraction of the freight trips that are made in the city.

- Of the baseline sample analysed
- +150 thousand trips/month of these typologies
- 12% of the total CO₂ emissions
PILOT IMPACT

Each combustion vehicle would stop traveling +900 km/month

12 conventional vehicles would be replaced*

34,000 km avoided in the 3 months of the pilot

320 kg of PM$_{10}$

21,000 kg of CO$_2$

+13 thousand people who will receive packages in designated areas

*Assumed according to conversations with logistic operators
CO-BENEFITS

BENEFITED COMPANIES

+163 companies of the Urban Logistics Network (RLU) that would receive the replicability toolkit with the support of associations such as ANDI and CCB.

VEHICLE SUPPLIERS

Suppliers selected for the pilot will have the opportunity to exploit their products within the framework of their local innovation processes.

SMALL CARRIERS

The linking of small transporters to the project is an opportunity to strengthen relationships through spaces to learning about good ecological practices emerged as a result of the pilot.
SCALING POTENTIAL

Potential to articulate and strengthen other strategies:

- National Electric Mobility Strategy
- Public Policy of Zero and Low Emission Motorized Mobility
- Green districts and zero and low emission zones

<table>
<thead>
<tr>
<th>Scenario 1: 49% of sectors</th>
<th>Scenario 2: 95% of sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 ton PM$_{10}$/year</td>
<td>70 ton PM$_{10}$/year</td>
</tr>
<tr>
<td>23,000 ton CO$_{2}$/year</td>
<td>45,000 ton CO$_{2}$/year</td>
</tr>
<tr>
<td>5% PM$_{10}$</td>
<td>10% PM$_{10}$</td>
</tr>
<tr>
<td>3% CO$_{2}$</td>
<td>7% CO$_{2}$</td>
</tr>
</tbody>
</table>

Net reduction potential

% reduction on cargo emissions
### STAKEHOLDERS

<table>
<thead>
<tr>
<th>LOCAL GOVERNMENT</th>
<th>Secretariats for Mobility, Environment and Economic Development</th>
<th>Support in the management of resources, spaces, areas, communications and permits necessary for the development of the pilot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICLEI</td>
<td>Support consultant selection process and project budget management.</td>
<td></td>
</tr>
<tr>
<td>CONSULTANT</td>
<td>Determined from the selection process. It would perform the project activities contemplated in the preparation, performance and measurement phases, and evaluation of results, in coordination with logistics operators and vehicle suppliers.</td>
<td></td>
</tr>
</tbody>
</table>
## STAKEHOLDERS

### LOGISTICS OPERATORS

<table>
<thead>
<tr>
<th>Package companies with interest to participate in the pilot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interested parties: Logistics Companies</td>
</tr>
</tbody>
</table>

Planning and performance of the last mile logistics operation in the areas of influence. Provision of information and human resources.

### SUPPLIERS

<table>
<thead>
<tr>
<th>Small and large suppliers companies of zero-emission cargo vehicles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some interested suppliers: Bicivan, Ecotriciclos, Lola, Pargal, Renault and Renting Colombia.</td>
</tr>
</tbody>
</table>

Rental of zero-emission cargo vehicles to the consultant and articulation with logistics operators to evaluate different typologies.
## STAKEHOLDERS

### EXTERNAL PARTNERS

Approach with the Bogotá Chamber of Commerce (CCB) and the National Association of Colombian Entrepreneurs (ANDI)

- They provide knowledge, experiences and learning that support the development of the pilot and the measurement of indicators, and with dissemination and articulation with other actors.

### SMALL CARRIERS

The project will include small carriers to accompany the pilot and learn about the performance of new technologies, their benefits/costs and distribution alternatives.
This project is related and contributes with the LCAP-UF that we are formulating for the city of Bogotá contributing to all the axes and objectives proposed as follows:

**AXIS OF THE PLAN**

<table>
<thead>
<tr>
<th>Technological change</th>
<th>Definition of transit and cargo</th>
<th>Infrastructure</th>
<th>Communication, pedagogy and co-responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promoting a cleaner vehicle <strong>fleet through innovation</strong> and <strong>evaluation</strong> of zero-emission vehicles in last mile trips.</td>
<td>Support the consolidation of a logistics vision through the <strong>promotion of more efficient and sustainable logistics processes</strong> and the optimization of the use of resources.</td>
<td>Support the decision for the development of a deconsolidation <strong>centre and a network of distribution nodes</strong> based on existing logistical needs.</td>
<td><strong>Strengthening and generating knowledge through</strong> tools that allow replicability by the private sector in this type of practices.</td>
</tr>
</tbody>
</table>