Sustainable & Climate Resilient Gurgaon

Pre-feasibility Analysis For Shifting From Diesel To Electric Auto-rickshaws

A Study to Understand the Feasibility of Incorporating Better Fuel Alternatives For Public Transport and their Social Requirement

3rd Highest Per Capita Income

68.82% Population lives in Urban regions

One of the Fastest Growing Cities in India

1. Department of Economic and Statistical Analysis, Haryana, 2010
2. Census 2011

Need for Sustainable Transport

Concrete Jungle With Shrinking Green Spaces

1. Forest Department Haryana, 2013

Increasing Health Issues Due to High Level of Pollution

2. Integrated Mobility Plan for Gurgaon Manesar Urban Complex, Department of Town and Country Planning, 2010

Growing Traffic & Poor Public Infrastructure

3. Ambient Air Quality Reports, Haryana State Pollution Control Board, 2016

High Number of Diesel-run Auto-rickshaws Worsen the Air Quality


Limited Metro Connectivity within Gurgaon

5. Our City, We Care: Action for Cleaner Air (Right To Clean Air Campaign) Report, Centre of Science and Environment, 2014

Objective: To Replace Diesel Autos with Electric Vehicles
Pre-feasibility Analysis For Shifting From Diesel To Electric Auto-Rickshaws

What We Did?

1. Stakeholder Engagement
   - Resident Welfare Associations
     To gauge their interest in contributing to the areas of sustainable transport & renewable energy
   - Auto Union
     To determine their interest & requirement for alternative fuel sourced vehicles
   - Original Equipment Manufacturers
     To ascertain the economic feasibility of bringing about change in the current public transport with environment-friendly options

2. Planning Socio-economic Feasibility Study
   Based on the stakeholder engagement the necessity of a socio-economic feasibility analysis was rationalized

3. Social Feasibility Study
   A perception gauging survey was conducted on online & offline platforms to find out:
   - Passengers’ current transport profile
   - Motivators for moving towards a more sustainable form of transport
   - Perception and acceptance of electric vehicles as a mode of last mile connectivity by the citizens
   - Needs and requirements of travelers frequently using public transport

What We Found?

4. Economic Feasibility Study
   Detailed interviews and focus group discussions with auto-union members and auto drivers were done to know about the current capital investments and operational & maintenance costs. Discussions with Original Equipment Manufacturers were also done to find out about policy requirements and current capital investments.

Mode of Travelling

- 61.3% Travel Within Gurgaon
- 7.3% Travel to Noida
- 65.3% Travel to Delhi
- 3.3% Travel to Faridabad
- 4.7% Other

These percentages are not mutually exclusive.

- 63.3% Private Car
- 35.3% Metro
- 20% Shared 4-Wheeler
- 16.7% Taxi
- 9.3% 2-Wheeler
- 8% Bus
- 18.7% Auto-Rickshaw
- 7.3% Shared Auto
- 2% E-Rickshaw

These percentages are not mutually exclusive.
70% of travelers by private transport would shift to public transport (metro/bus/shuttles) assuming it is environment-friendly (electric/solar).

**Motivation to Shift to Public Transport (metro/bus/shuttles)**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.3%</td>
<td>Better Last Mile Connectivity</td>
</tr>
<tr>
<td>31.3%</td>
<td>Better Safety</td>
</tr>
<tr>
<td>15.3%</td>
<td>Availability of Environment-Friendly Options</td>
</tr>
<tr>
<td>28.7%</td>
<td>Less Congestion in Public Vehicles</td>
</tr>
<tr>
<td>42.7%</td>
<td>Increased Level of Comfort</td>
</tr>
<tr>
<td>19.3%</td>
<td>Already Using Public Transport</td>
</tr>
<tr>
<td>0.7%</td>
<td>Already Using Electric/Solar Transport</td>
</tr>
</tbody>
</table>

These percentages are not mutually exclusive.

**Challenges that would Stop Commuters from Using Electric Buses/Shuttles/Autos**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3%</td>
<td>Higher Fares</td>
</tr>
<tr>
<td>70%</td>
<td>Lack of Good Frequency</td>
</tr>
<tr>
<td>69.3%</td>
<td>Lack of adequate Connectivity</td>
</tr>
<tr>
<td>32.7%</td>
<td>Lack of Facilities like Air Conditioning</td>
</tr>
<tr>
<td>34.7%</td>
<td>Safety</td>
</tr>
<tr>
<td>14.7%</td>
<td>Fuel Reliability</td>
</tr>
<tr>
<td>19.3%</td>
<td>Lack of Recharging Facilities</td>
</tr>
<tr>
<td>8.7%</td>
<td>Other</td>
</tr>
</tbody>
</table>

These percentages are not mutually exclusive.

### Economic Feasibility Study (from service providers’ perspective)

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Diesel Shared Auto-rickshaw</th>
<th>CNG Auto-rickshaw</th>
<th>E-Rickshaw</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Passengers Carried</strong></td>
<td>10-12 (Permit is only for 3)</td>
<td>3-4 (Permit is only for 3)</td>
<td>4-5 (Permit is only for 4)</td>
</tr>
<tr>
<td><strong>Daily Expenditure on Fuel</strong></td>
<td>Rs. 400</td>
<td>Rs. 200-250</td>
<td>Rs. 60</td>
</tr>
<tr>
<td><strong>Earning Per Day</strong></td>
<td>Rs. 700-1000</td>
<td>Rs. 500-700</td>
<td>Rs. 500-700</td>
</tr>
<tr>
<td><strong>Monthly Expenditure on Maintenance</strong></td>
<td>Rs. 1000-2000</td>
<td>Rs. 2000</td>
<td>Rs. 5000</td>
</tr>
<tr>
<td><strong>One Ride Charge</strong></td>
<td>Rs. 100 (Rs. 10 per passenger)</td>
<td>Rs. 40 (Minimum charge)+ per km charge</td>
<td>Rs. 40 (Rs. 10 per passenger)</td>
</tr>
<tr>
<td><strong>Monthly Earning</strong></td>
<td>Rs. 16000</td>
<td>Rs. 12010</td>
<td>Rs. 14200</td>
</tr>
<tr>
<td><strong>Capital Investment</strong></td>
<td>Rs. 2.25 Lakhs</td>
<td>Rs. 1.8-2.2 Lakhs</td>
<td>Rs. 96000-1.45 Lakhs</td>
</tr>
</tbody>
</table>
Pre-feasibility Analysis for Shifting From Diesel to Electric Autos-Rickshaws

Possible Solutions

1. Palam Vihar
2. Gurgaon Bus Stand
3. Rajiv Chowk
4. Manesar
5. Sohna Road
6. Wazirabad
7. Sector 55 & 56
8. Ghaffar/Sector 55 & 56
9. ALT Chowk
10. Bristol Chowk
11. Sector 26
12. Ambience Mall
13. Krishna Chowk

NCR Metro Stations
14. Huda City Centre
15. IFFCO Chowk
16. MG Road
17. Sikanderpur
18. Guru Dronacharya

Rapid MetroRail Stations
19. Sikanderpur
20. DLF Phase 2
21. Belvedere Tower
22. DLF Phase 3
23. Cyber City
24. Moulshahi Avenue

Major Residential Complexes

Major Shared Auto Routes in Gurgaon

Last Mile connectivity between residential and commercial areas to the metro
Reduce the number of diesel autos and bring in Electric public vehicles instead
To bring about change without affecting the current employment status of the auto-rickshaw drivers
Address the demand for high quality transport by bringing in financing options for investors
Consequently, decrease the congestion levels, increase mobility and reduce air pollution in Gurgaon

Financing Options
Money budgeted from national level programs
Since there would be return on investment, private funds would also be feasible
Viability gap funding for service providers can it come from Faster Adoption and Manufacturing of Hybrid and Electric Vehicles in India (FAME)?

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This transport analysis is a part of Preparing Cities To Be Climate Resilient- Prioritizing Actions and Identifying Resources project. The project assesses options for Climate Compatible Development (CCD) in second-tier cities in key developing economies such as India, Philippines and Indonesia. It also aims at understanding the financial needs for the implementation of relevant CCD options. In India, the focus cities are Gurgaon in Haryana and Puri in Odisha.

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