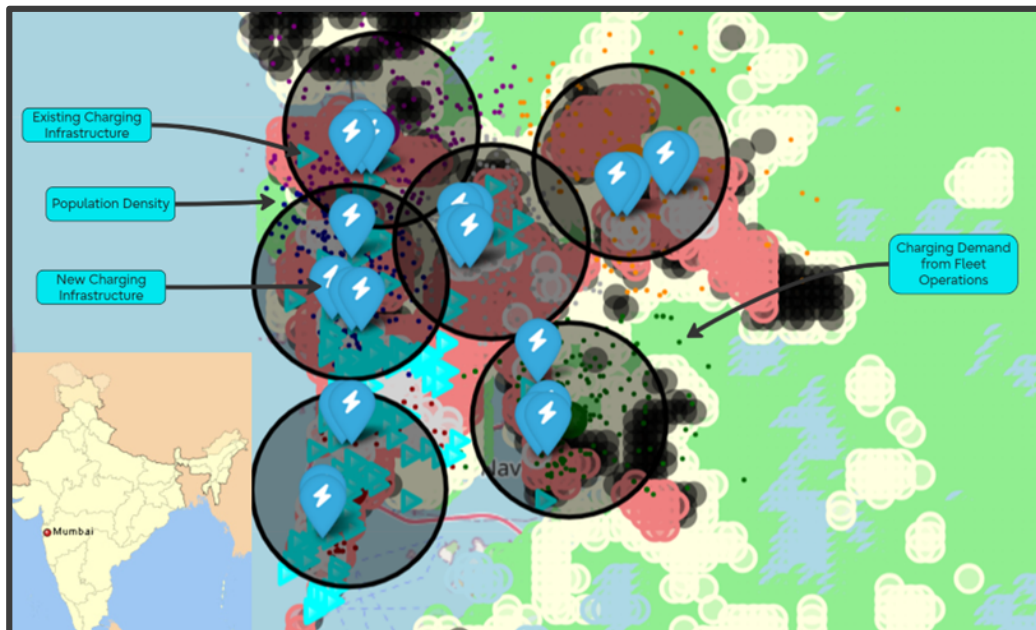
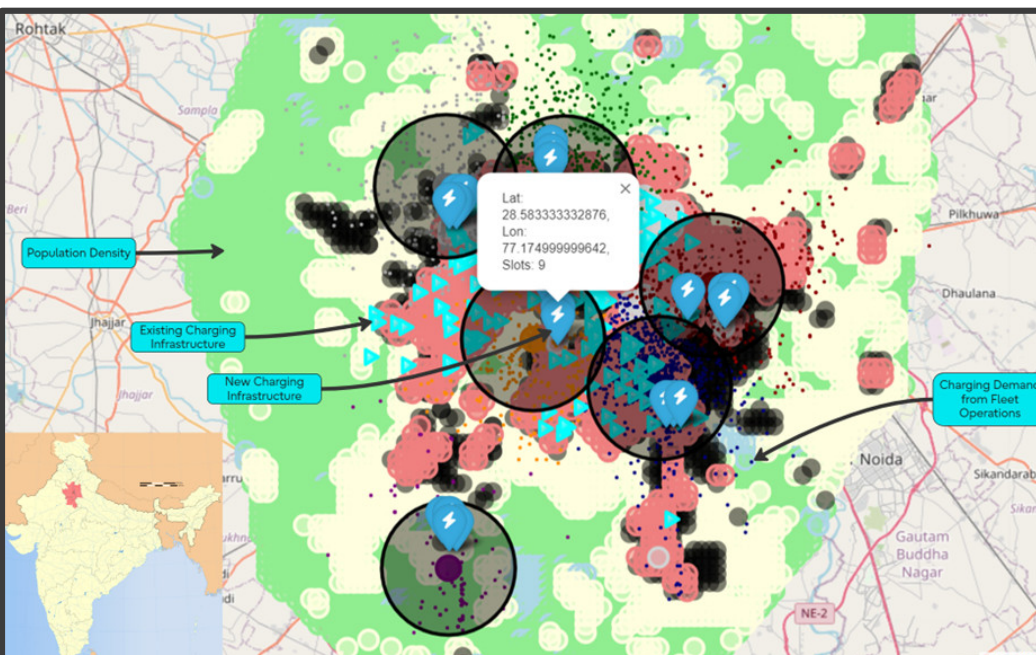


This study addresses the global need for expanded EV charging infrastructure, highlighting the disparity between affluent G20 nations and others. It proposes a spatial modelling approach using open-source and private data, tailored for fleet operators to optimally identify locations and capacities for urban charging stations. The novel software pipeline enables fleet operators to select warehouse locations, enhance infrastructure, and perform scenario analyses. A case study in Mumbai and Delhi demonstrates significant improvements, including a **70% reduction in charger waiting times**, a **20% decrease in travel time to chargers**, and a **70% reduction in charging duration**.

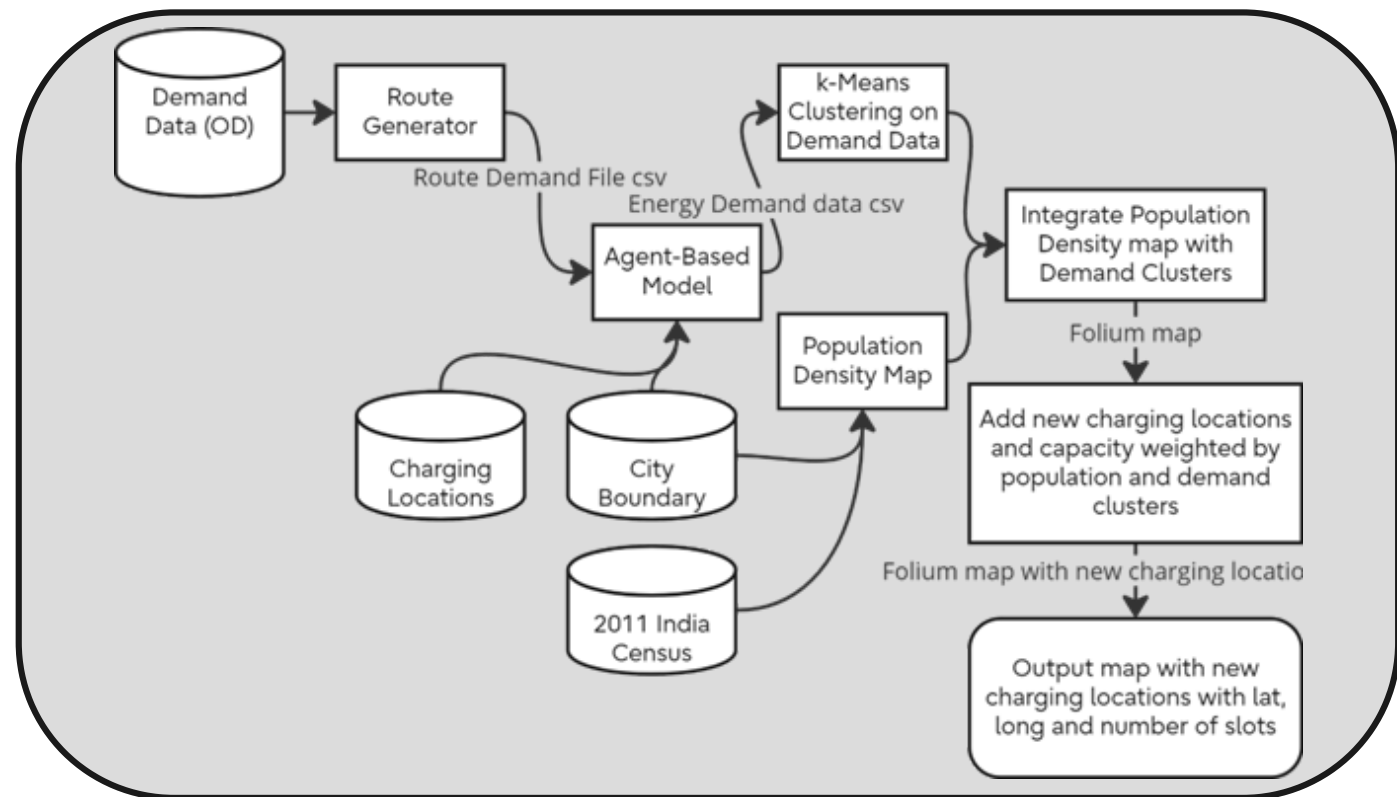
Abstract



Optimal Electric Vehicle Charging Locations in Mumbai



Optimal Electric Vehicle Charging Locations in Delhi



Methodology

KPI		Delhi (pre)	Delhi (post)	Mumbai (pre)	Mumbai (post)
Average charging time per Task [m]		167.19	48.66	261.88	78.03
Average in-route time to charge per task [m]		7.46	5.99	8.50	7.14
Total charging time [m]		715,092.33	214,097.00	393,090.33	114,474.16
Total waiting time to charge [m]		217.16	42.83	87	0.16

Aggregated Key Performance Indicators

Using data from **~250** vehicles over a month, including population density and existing charging locations, the study identified **48** optimal new charging sites. Results showed significant improvements: average charging time per task decreased from **167 to 49 minutes in Delhi** and **from 262 to 78 minutes in Mumbai**; average in-route time to charge per task reduced slightly; total charging time and waiting time to charge also saw substantial reductions. These findings highlight the efficiency gains from the new infrastructure, providing a foundation for future enhancements, including cost savings and carbon emissions metrics.

Results & Highlights