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Overview

Our mission is to strategically expand the electric vehicle (EV) charging infrastructure in the Australian Capital Territory (ACT) to promote the adoption of electric vehicles, reduce greenhouse gas emissions, and create a sustainable, convenient, and reliable charging network. By 2025, our primary goal is to deploy 180 charging stations while collecting essential data on EV usage patterns, user demographics, and charging needs. Our secondary goal is to create an attractive and innovative public charging network app that exemplifies the ACT's commitment to zero-emission transport, and that provides the simplicity while still being incredibly useful, which is an idea that is missing from the infrastructure today.

Goals

Primary Goals


1. To meet the goal of 180 charging stations by 2025, and beyond.
2. Collect data on what kind of cars they have, where they live, and where they go. We can find this out by looking at their car registration, asking them questions, or tracking their cars with GPS. This will help us see which places have the most electric cars, and where they need to charge them.
3. Using current data to obtain more data to understand EV driver habits, and in turn, the best locations to install the different types of charging stations.

Secondary Goals

1. To make EV charging sustainable, convenient, reliable, and affordable for all, and to create an attractive and innovative public charging network that showcases the ACT's commitment to zero-emission transport.

Challenges Hindering the Goals

1. To meet the goal of 180 charging stations by 2025, and beyond, you might face the challenge of finding suitable locations for the charging stations, as well as securing the necessary permits, funding, and partnerships to install and operate them. There may be challenges of ensuring the safety and reliability of the charging stations, as well as maintaining and upgrading them as needed.

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2. To collect data on what kind of cars people have, where they live, and where they go, you might face the challenge of obtaining the consent and cooperation of the EV owners, as well as protecting their privacy and security. Some challenges with this are ensuring the quality and accuracy of the data, as well as storing and managing it effectively.
 3. To use current data to obtain more data to understand EV driver habits, you might face the challenge of finding the appropriate methods and tools to analyse the data and extract meaningful insights. Challenge regarding this are validating and verifying the data and the analysis, as well as communicating and applying them to your decision-making process.
 4. To make EV charging sustainable, convenient, reliable, and affordable for all, you might face the challenge of balancing the supply and demand of electricity for charging stations, as well as ensuring the environmental and economic benefits of EV charging. There are challenges of meeting the diverse needs and preferences of different EV drivers, such as fast or slow chargers, free or paid services, etc.
 5. To create an attractive and innovative public charging network that showcases the ACT's commitment to zero-emission transport, you might face the challenge of designing and implementing features or designs that make the charging stations appealing and user-friendly. Some challenges regards this are promoting and advertising the network to the public and potential EV buyers, as well as creating a positive image and reputation for EV charging.

Problem


1. The evidence to show the lacking number of EV chargers
2. Distribution of where the EV charging stations are gonna be placed and the number of charging ports that will be provided
3. Minimal data to understand EV driver habits. - Expand on what kind of data we are looking for, and that why it is limited

Supporting Problem Statement

- Research have shown by 2030, the ACT will need at least 600 to 1,000 public chargers to support expected numbers of EVs –up from less than 60 in 2021 (Source:The ACT Electric Vehicle Charging Outlook, 2021)

Solution

THE MAP - creating a map with data set overlapping to determine where the next EV charger are needed



THE APP - creating an app that educates the people on the EV cars and chargers and how they can get the best experience out of it. The app will collect data on what most common areas for EVs are, the driver behaviour, the preference, instruction on how to use the app, etc and will add this add to the map and pin point the areas where the EV chargers are needed next.

How we got there?

The solution to strategically expand electric vehicle (EV) charging infrastructure in the Australian Capital Territory (ACT) involves a multifaceted approach that encompasses infrastructure development, data collection and analysis, and user engagement. Here's a step-by-step solution to address the stated problem:

1. Data Collection and Analysis:

- **Data Sources:** Gather data on EV registration, user demographics, and charging habits through multiple sources, including government vehicle registration records, user surveys, and opt-in GPS tracking with user consent.
- **Data Integration:** Centralize and analyze the collected data to gain insights into EV driver behavior, popular routes, and locations with the highest concentration of EVs.

2. Strategic Charging Station Placement:

- **Data-Driven Decisions:** Utilize the insights from the data analysis to inform charging station placement decisions. Identify areas with high EV density, commuter routes, and common destinations.
- **Residential Areas:** Prioritize placing charging stations in residential areas, especially in places with apartment complexes and homes where residents cannot install home chargers.
- **Tourist and High-Traffic Areas:** Install charging stations at popular tourist destinations, shopping malls, and public spaces to cater to visitors and residents alike.



3. Charging Station Types and Features:

- Fast vs. Slow Chargers: Offer a mix of fast and slow chargers to accommodate different user needs. Fast chargers should be available at locations where users have shorter dwell times, while slow chargers can be strategically placed where longer charging times are acceptable.
- Smart Charging: Implement smart charging solutions to optimize charging times, manage peak demand, and offer user-friendly experiences, such as mobile apps for station location and reservations.


4. Sustainability and Reliability:

- Renewable Energy: Explore the use of renewable energy sources, such as solar panels and wind turbines, to power charging stations and reduce their carbon footprint.
- Grid Integration: Ensure grid capacity and stability to support the growing demand for electricity from charging stations. Collaborate with utility providers to upgrade infrastructure as needed.

5. User Incentives and Engagement:

- Affordable Pricing: Establish competitive pricing structures for charging, including options for subscription services and discounts during off-peak hours.
- Educational Campaigns: Conduct public awareness campaigns to educate users about EV benefits, charging options, and the convenience of the expanded charging network.
- Feedback Mechanisms: Implement user feedback mechanisms to gather input on charging station locations, functionality, and overall experience. Use this feedback for continuous improvement.

6. Stakeholder Collaboration:

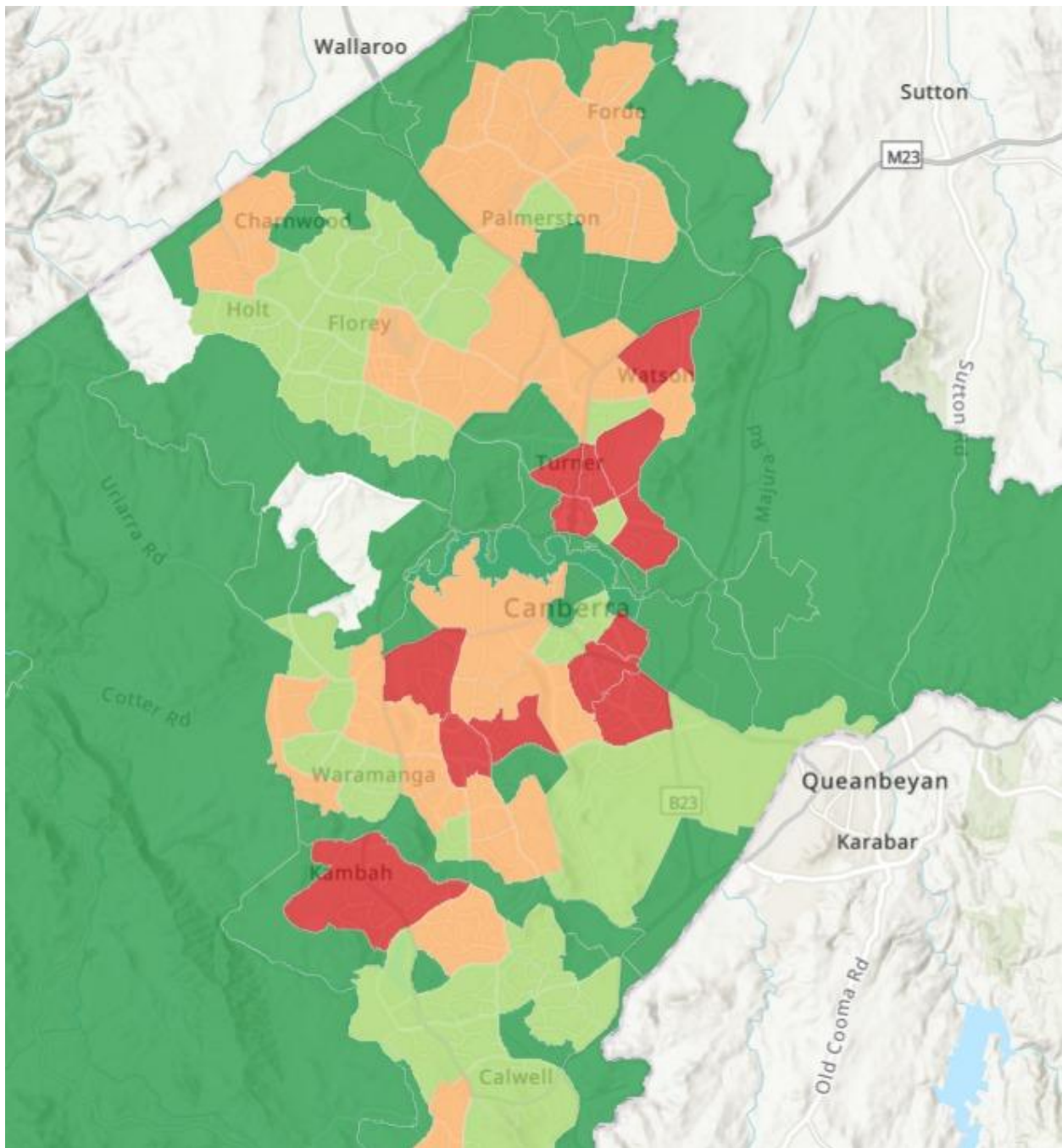
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- Public-Private Partnerships: Collaborate with property managers, local businesses, and private charging networks to expand the charging infrastructure more rapidly and efficiently.
 - Government Support: Work closely with government agencies to streamline permitting processes and secure funding for infrastructure development.

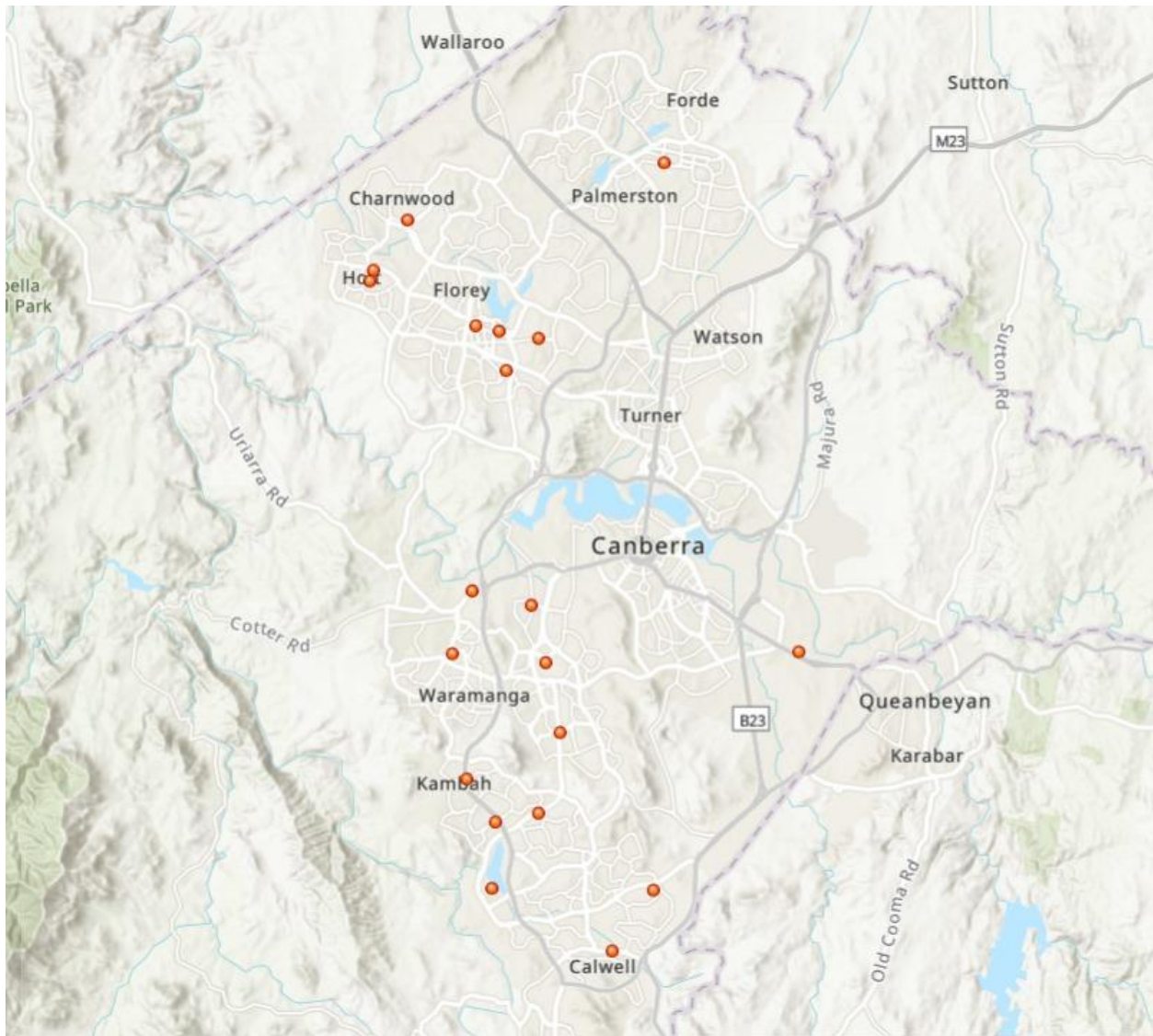
7. Monitoring and Adaptation:

- Continuous Data Monitoring: Regularly monitor charging station usage, user behavior, and grid performance to make data-driven adjustments to the infrastructure and charging network.
- Scalability: Develop a scalable plan to accommodate the increasing adoption of EVs beyond 2025, ensuring the charging network keeps pace with demand.

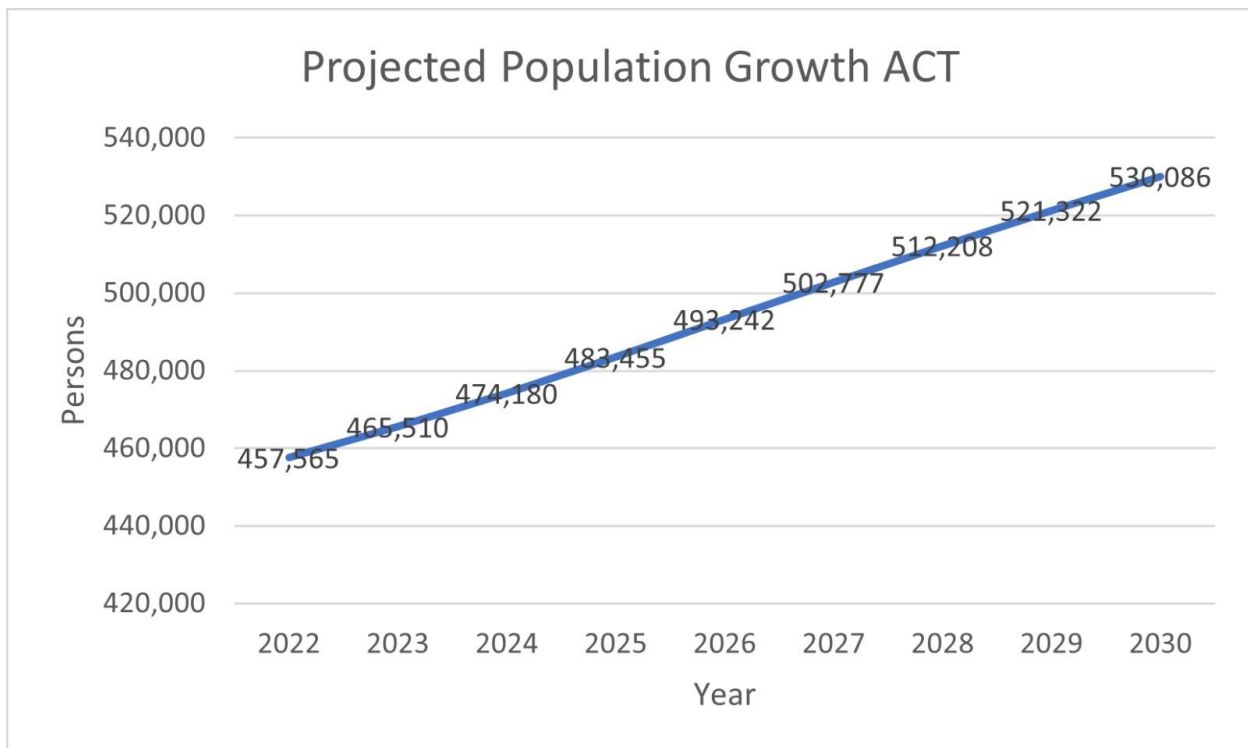
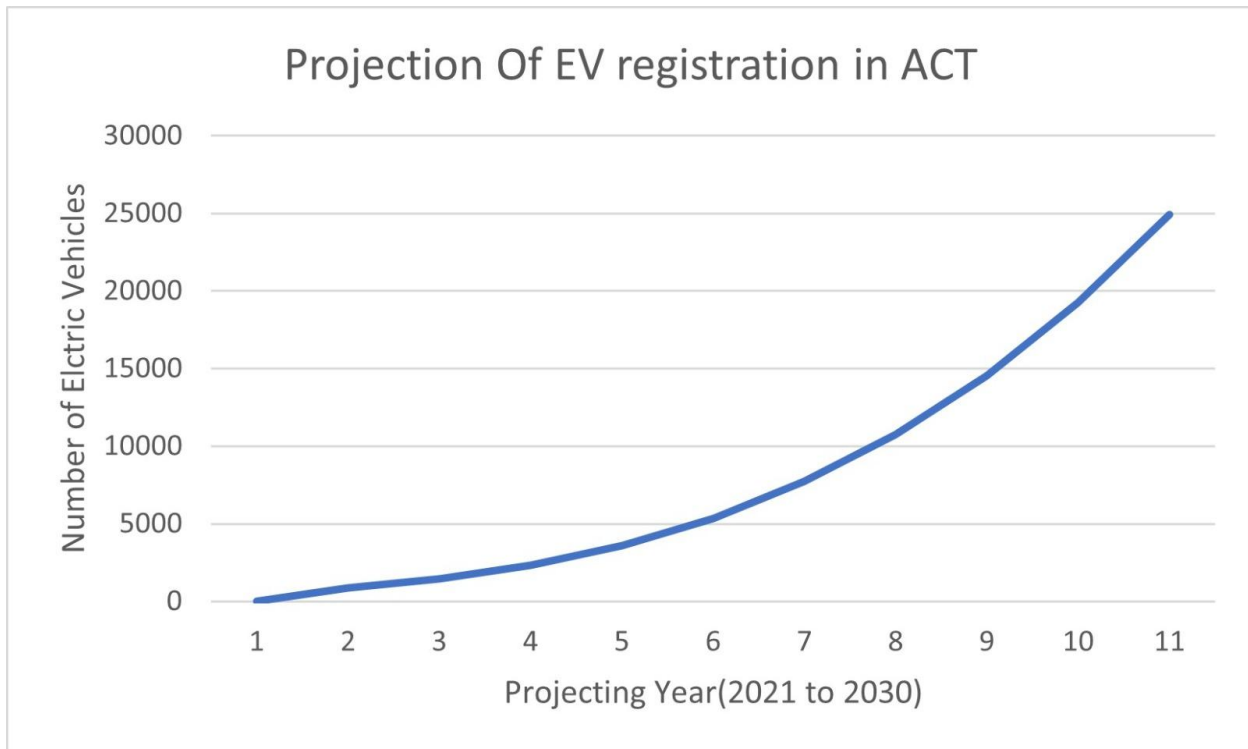
By implementing this comprehensive solution, the ACT can achieve its goal of expanding the charging infrastructure to 180 stations by 2025 and create a sustainable, convenient, reliable, and affordable charging network that supports zero-emission transport while meeting the needs of all residents and visitors.

The Data from the Challenge Interpreted:





SA3	Charing station(FY25)	EV regisrtation (FY25)	EV per charging
Kingston (ACT)	4	188	47
Braddon	6	155	26
Curtin	0	131	N/A
Griffith (ACT)	2	122	61
Kambah	0	115	N/A
Civic	35	114	3
Watson	1	111	111
Narrabundah	1	106	106
Turner	3	103	34





Limitations

Data Collection and Analysis:

- To address the evidence gap regarding the lacking number of EV chargers, you plan to collect data on EV driver habits, car types, and locations through various means such as car registration, surveys, and GPS tracking.
- You also aim to obtain data on EV driver behavior, preferences, and common areas for EVs. This data will help you understand how and where EV drivers use their vehicles and where charging infrastructure is most needed.

Mapping:

- Your proposed "MAP" involves creating a map that overlays different data sets to identify areas with high EV usage and insufficient charging infrastructure.
- By visualizing this data, you can identify patterns and pinpoint locations where the next EV chargers are needed most urgently.

Talk about what data is limited, and how we are solving this problem with the app collecting data


Educational App:

- The development of an app aims to educate people about EVs, their benefits, and how to effectively use charging stations.
- The app will collect data on driver behavior, preferences, and usage patterns. This information will be used to enhance the map and determine charger placement.
- The app could also include instructions for using charging stations and provide real-time updates on station availability, helping drivers make informed decisions.

Sustainability and Convenience:

- To ensure EV charging is sustainable, convenient, reliable, and affordable, you plan to balance electricity supply and demand for charging stations.
- This could involve strategies such as managing peak loads, integrating renewable energy sources, and offering various charging speeds to meet different driver needs.

Design and Promotion:

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- You aim to create an attractive and innovative public charging network that showcases the ACT's commitment to zero-emission transport.
 - This might involve designing charging stations with user-friendly features and aesthetic appeal.
 - Promoting and advertising the charging network will help increase awareness and adoption among the public and potential EV buyers.

Limitations and Challenges:

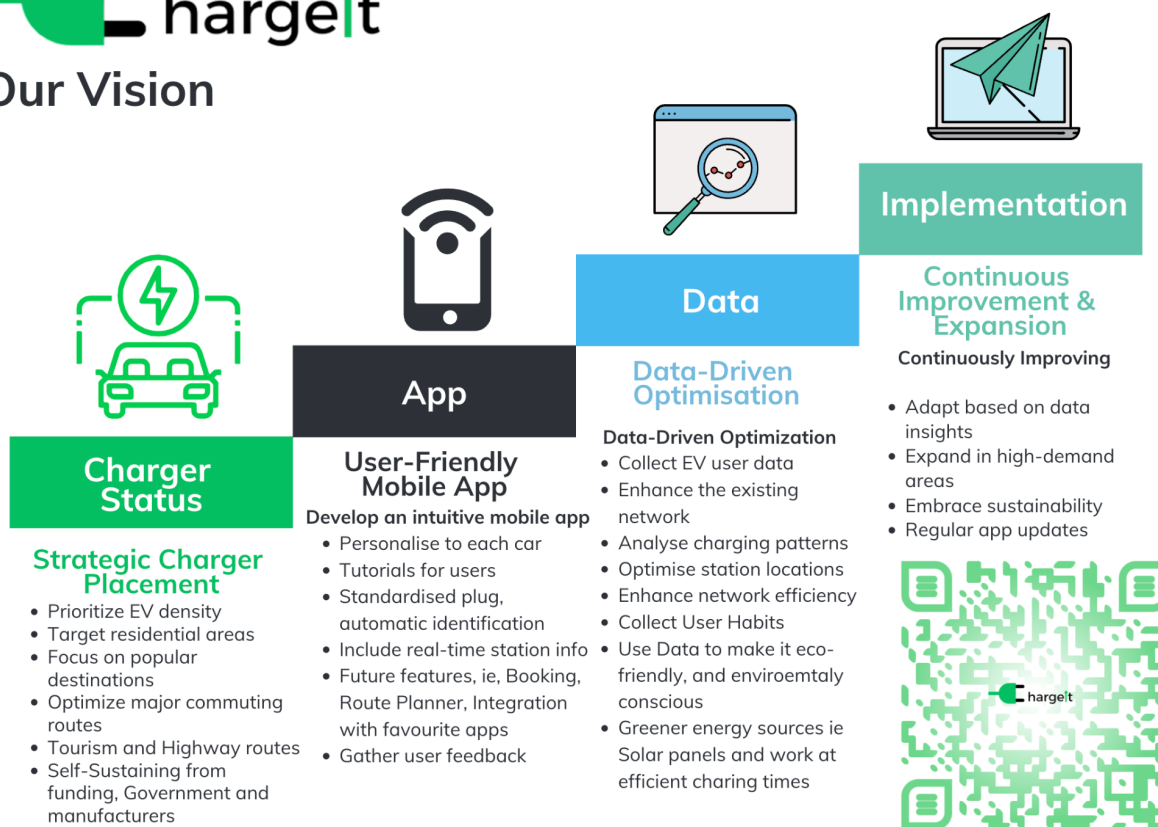
- You acknowledge challenges in obtaining data with proper consent, maintaining data quality and accuracy, and applying meaningful insights to decision-making.
- Challenges related to securing suitable locations, permits, funding, and partnerships for charging stations are also recognized.
- Balancing diverse driver preferences and managing the supply and demand for electricity are additional challenges.

Supporting Problem Statement:

- You mention research indicating the need for a significant increase in public chargers by 2030 to support the growing number of EVs in the ACT.



Our Vision





Appendix

Dhruy

criteria for establishing new chargers

Requirements

ev vehicle growth done

population density

earning capacity per

powergrid network support

interstate travel / Long Distance travel

access to utilities

safer and well lit

current ev chargers density/ network available/ evs per charging station

data from ChargeIT app for ev driver behavior

sustainable power sources (renewable or accessible)

regular maintenance

Data Sets Utilized

1. ACT Government population projections 2022-2060
(<https://www.treasury.act.gov.au/snapshot/demography/act>)
2. Electric Vehicles Registration Number
(<https://actmapi-actgov.opendata.arcgis.com/datasets/ACTGOV::electric-vehicles-registration-number/about>)



3. Electric Vehicles Total Chargers

(<https://actmapi-actgov.opendata.arcgis.com/datasets/ACTGOV::electric-vehicles-total-chargers/about>)

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