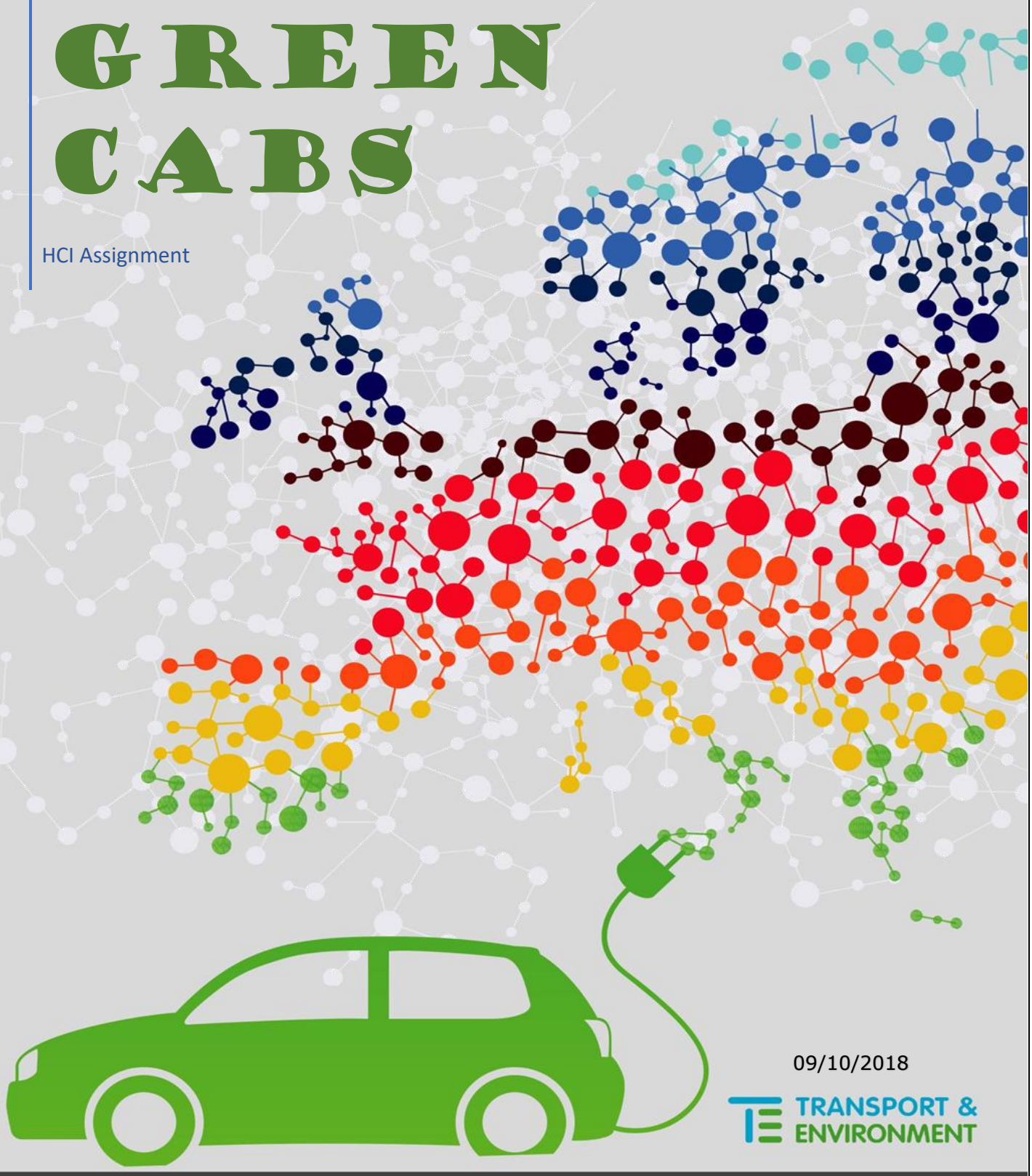
NSBM Green University

GREEN CABS

HCI Assignment



09/10/2018

TRANSPORT & ENVIRONMENT

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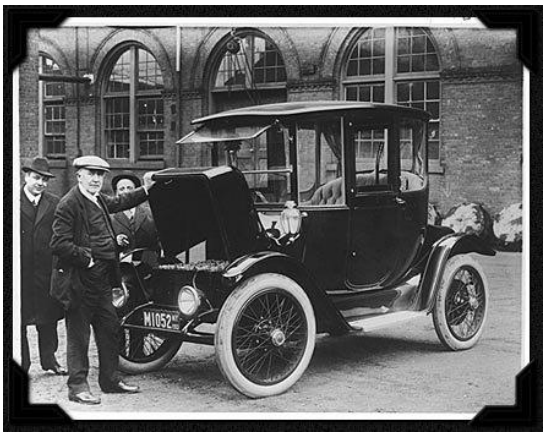
What is an electric vehicle (EV)?

Electric vehicles (EVs) are powered solely by an electric motor and battery. They do not have an internal combustion engine like most cars do, instead relying on a re-chargeable battery for power.

"Electric vehicles are the future both nationally and globally. I hope that Hackney cab drivers will take the opportunity to try out the loan scheme. The vehicles are built locally – and the numbers of charging points are increasing all of the time."

Electric cars aren't new....!!!!!

At the dawn of the US auto industry in the late 1800s, electric vehicles outsold all other types of cars. By 1900, electric autos accounted for one-third of all vehicles on US roadways. Of the 4,192 vehicles produced in the US and tallied in the 1900 census, 1,575 were electric.



Electric vehicle sales remained strong in the following decade and provided a launchpad for fledgling automakers, including Oldsmobile and Porsche, that would go on to become industry titans. Even Henry Ford partnered with Thomas Edison to explore electric vehicle technology. Battery-powered models, considered fast and reliable, sparked a major transportation renaissance.

But the momentum shifted over the first few decades of the 20th century, as the electric starter supplanted hand-cranking to start gas engines. The prices of those models dropped. A network of inter-city roadways enabled drivers to travel farther — more easily done in those days in gas-powered vehicles — and the discovery of domestic crude oil made gasoline cheaper.

The internal combustion engine gained a superiority that would persist for decades.

Nearly 100 years later, a second wave of electric vehicles arrived, driven by California's zero-emissions vehicle policy in the late 1990s. Unfortunately, it faltered. The enthusiasm of electric vehicle owners couldn't overcome the reluctance of cash-flush automakers to invest in alternatives to gas-powered vehicles. Automakers also mounted successful lobbying efforts to weaken the zero-emissions vehicle policy. In 1999, General Motors ended production of its own promising electric vehicle, the EV1, after just three years. The automaker removed all 1,100 models from the roads, despite outcry from their drivers. It blamed its pivot away from electric vehicle technology on the EV1's 100-mile range and the high cost of development compared to sales. Oil giants, still powerful political lobbies, also opposed electric vehicle innovation.

However, the undermining of all-electric cars laid the groundwork for today's innovation. Hybrid electric cars like the Honda Insight and Toyota Prius — with a small battery-powered electric motor assisting the gasoline engine — became the preferred answer to California's modified low-emission program, and sales grew steadily. Other hybrid models followed.

Now, nearly two decades later and 120 years after its introduction, the electric car is making an unmistakable comeback. This time, it's aided by better technology as well as environmentally sensitive consumers and policymakers looking to supplant fossil fuel use with renewable electricity.

Absent smart planning, adding tens of thousands of new electric vehicles to the grid could make grid operations more costly. But electric vehicles also represent a transformational opportunity. By optimizing when vehicles are charged, they can soak up excess nighttime electricity supply or extra renewable energy. Electric car batteries can increase the capacity of local grids to absorb more wind and solar power. They allow for further decentralization of power generation, and of the ownership of that power generation, than ever before.

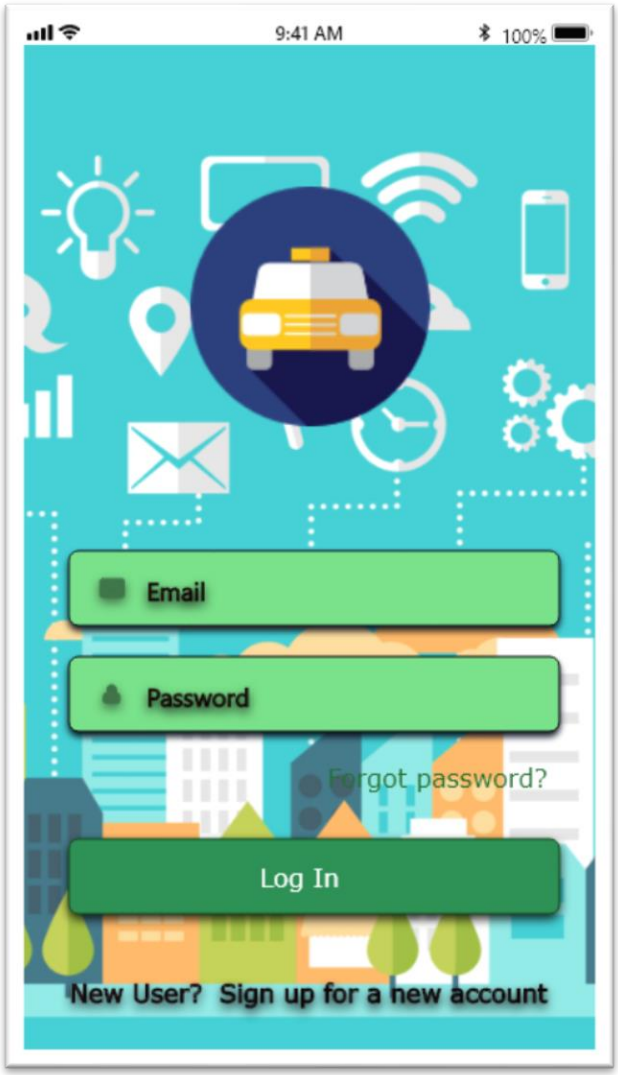
These opportunities can be enhanced by vehicle-to-grid (V2G) technology, which allows electric cars and the grid to exchange energy. This two-way relationship is still under development, but a car with a 30 kilowatt-hour battery — like the 2017 Nissan Leaf — stores as much electricity as the average US household consumes in one day

This report explores how electric vehicles will compete with gasoline-powered cars and the widespread implications beyond transportation. It shows how electric vehicles can stave off an electricity sales slump, bolster renewable generation, and make the grid more efficient and resilient. In addition, this report also explores how electric vehicles can move the U.S. toward energy democracy — decentralizing and distributing local power generation, and the ownership of the energy system.

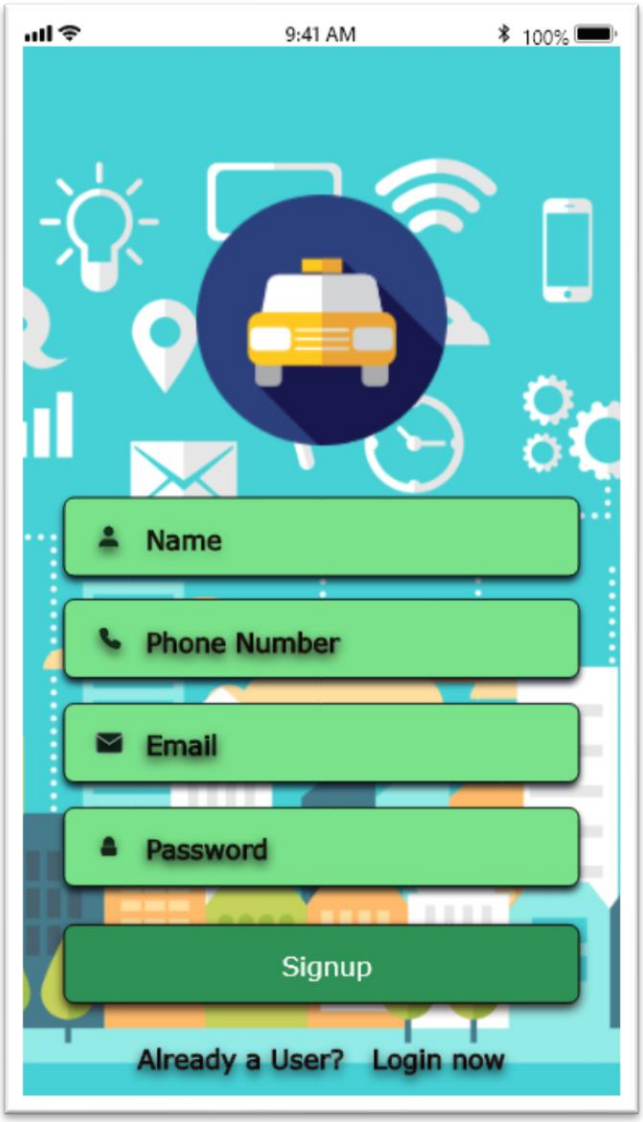
Main Module’s

- Sign up
- Driver And Customer login
- New booking and cancel booking.
- Confirm booking
- Transaction Status

Mobile App UI



User Login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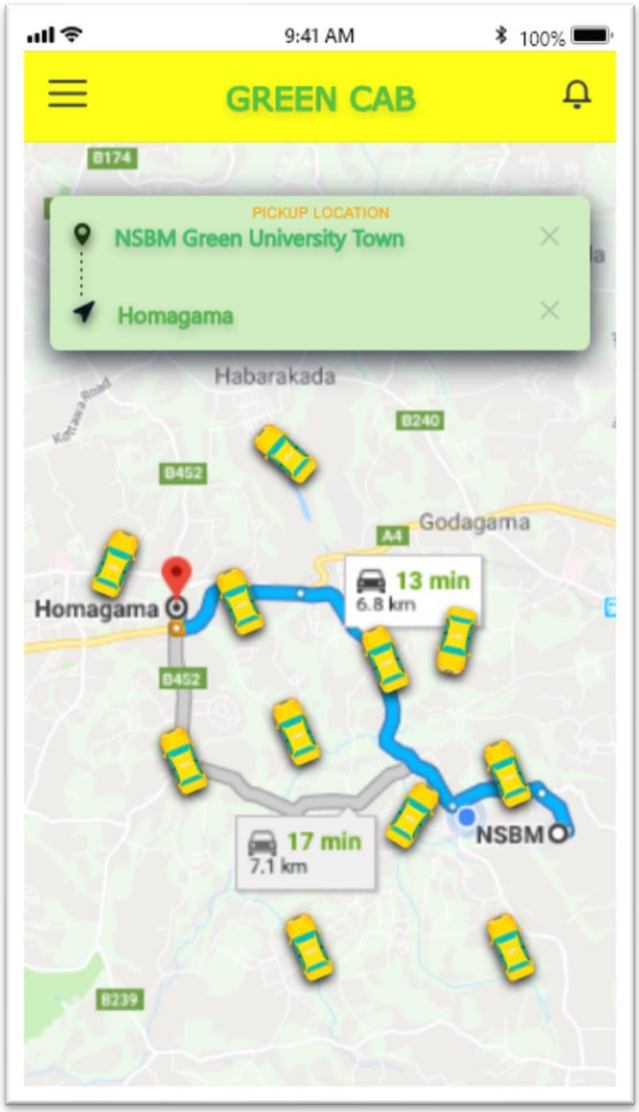
Name
Phone Number
Email
Password
Signup
Already a User? Login now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GREEN CAB
B174
PICKUP LOCATION
NSBM Green University Town
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Godagama
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Homagama
B452
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NSBM
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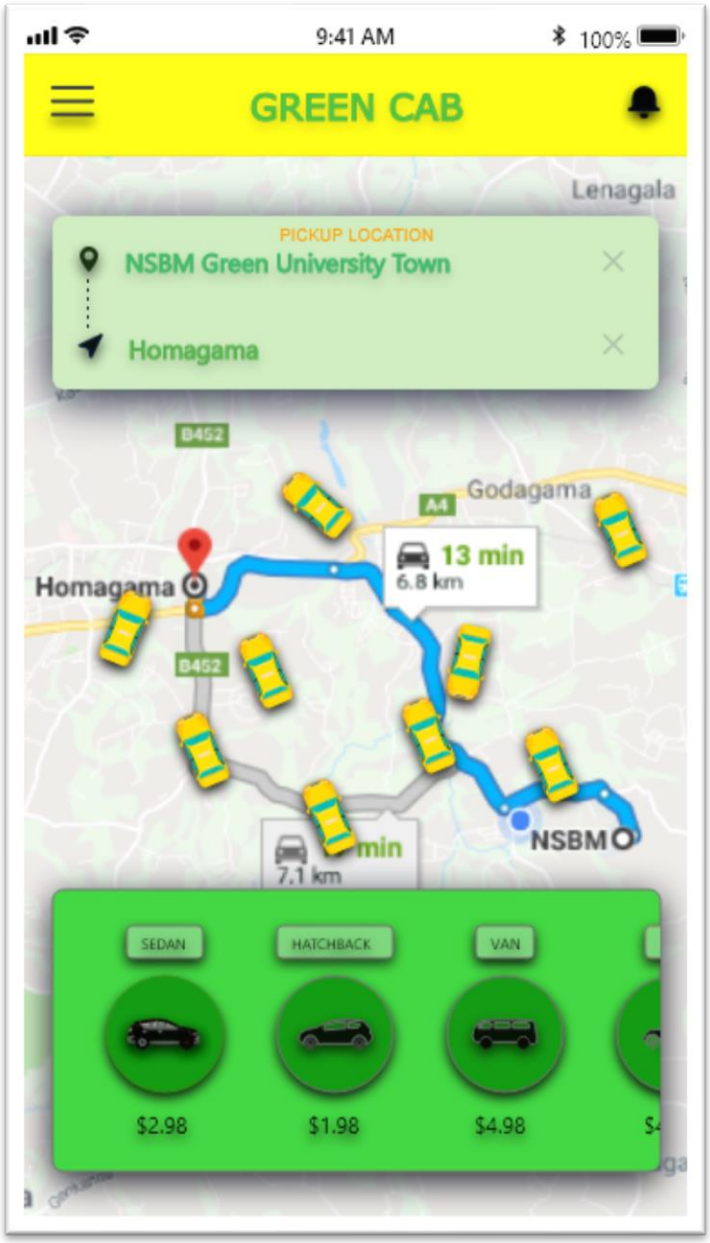
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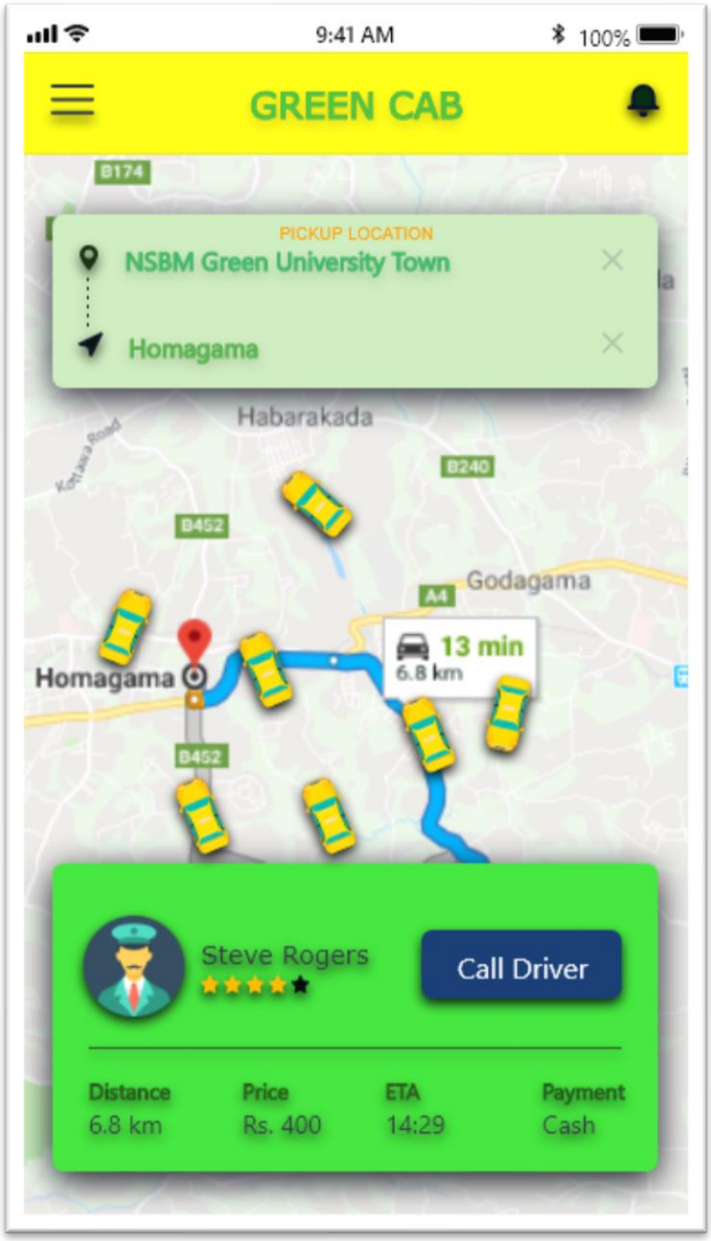
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Steve Rogers
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Distance
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Price
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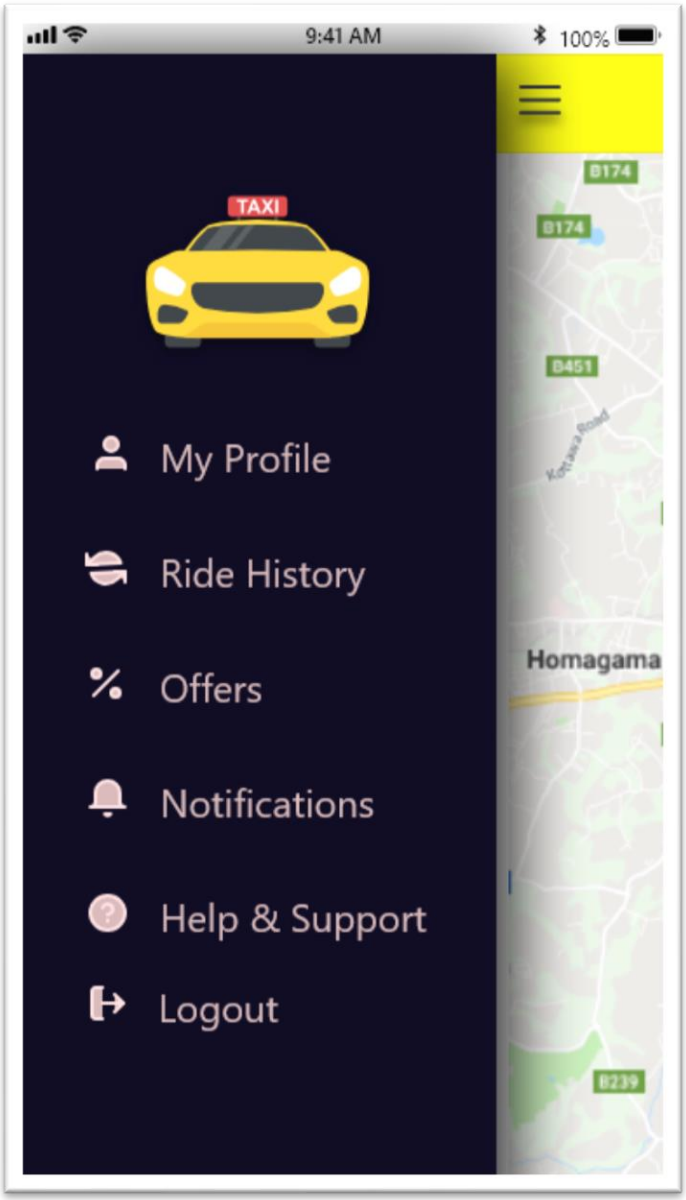
Payment
Cash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RIDE HISTORY
Search
Showing Recent Rides
NSBM Green University Town
01 May 2018
Home
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Phoenix Market City
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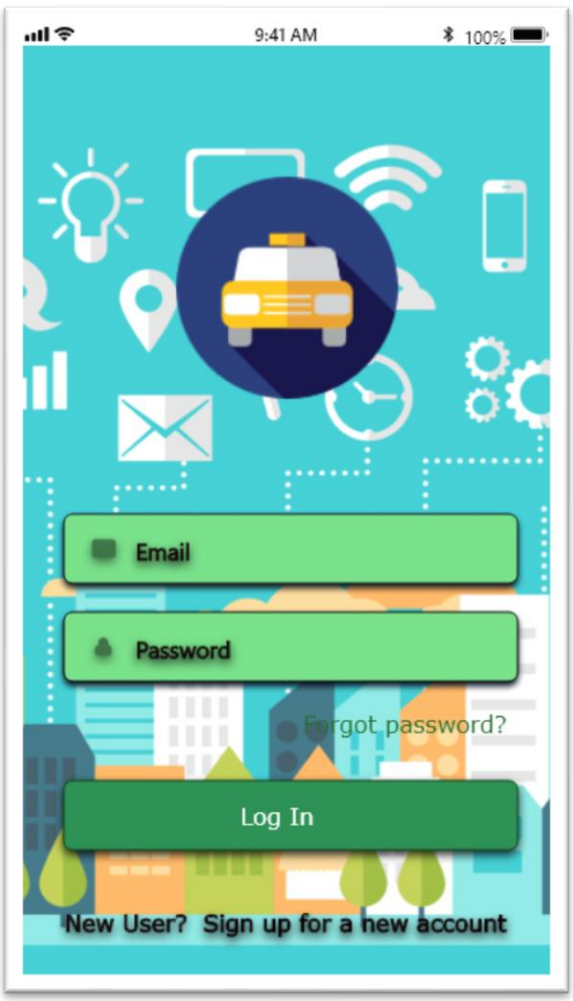
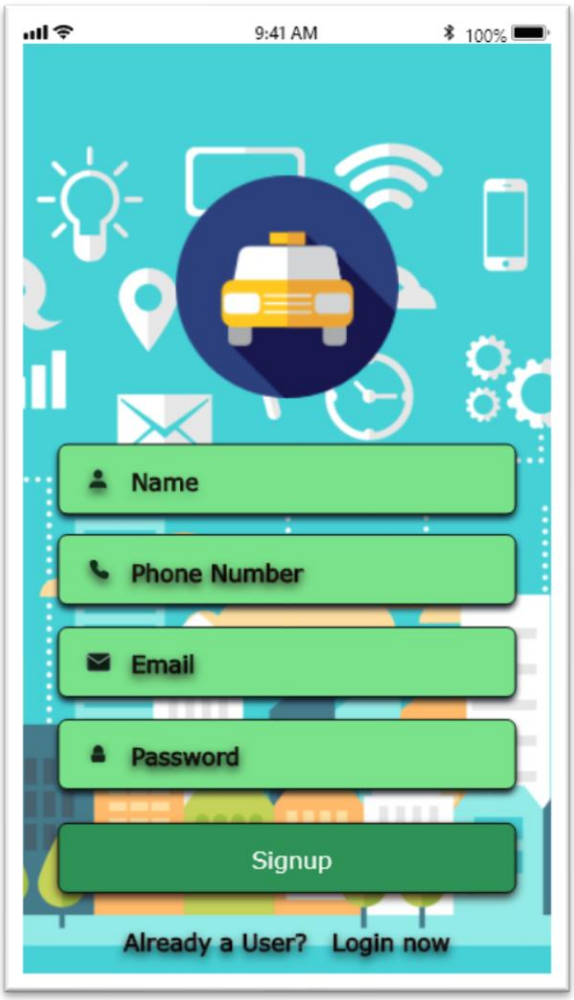
Phoenix Market City
01 May 2018

Sign up:

This is the first step what user to do. In this module, user wants to create an account in database, to call taxi from system. The registration processes are done by any person non-violating the database privacy rules. The registration will be permitted by call taxi system administrator. After the registration process completed user can get the authentication code and machine generated user id, by using this only user can login to the call system.



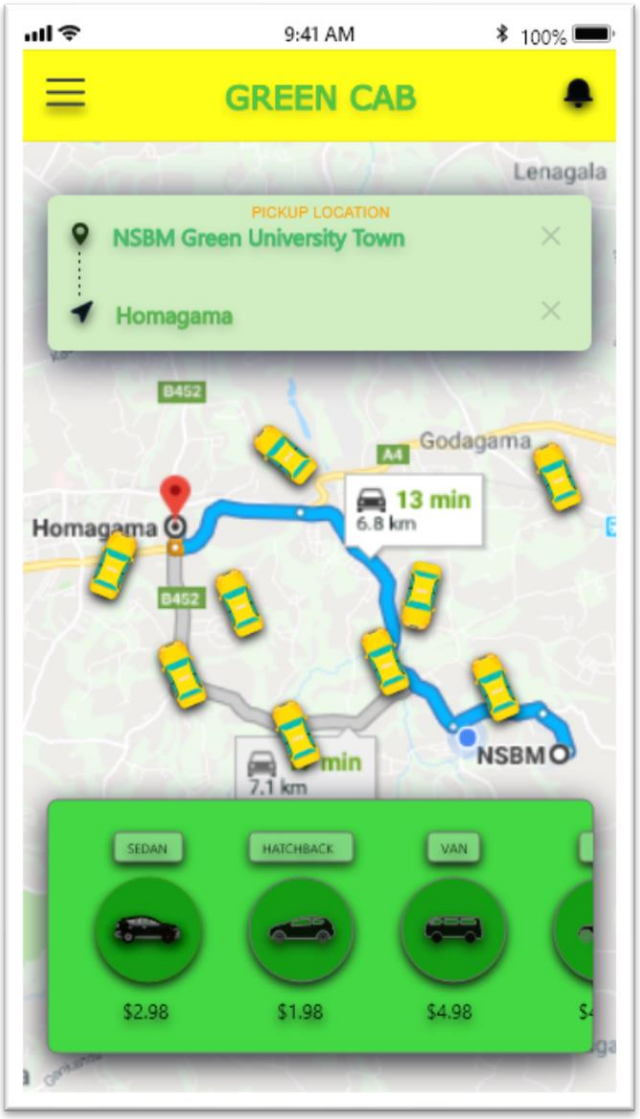


Driver and Customer Login:

In this module user want to register the personal details in the call taxi company database and get the authentication processes to go forward.

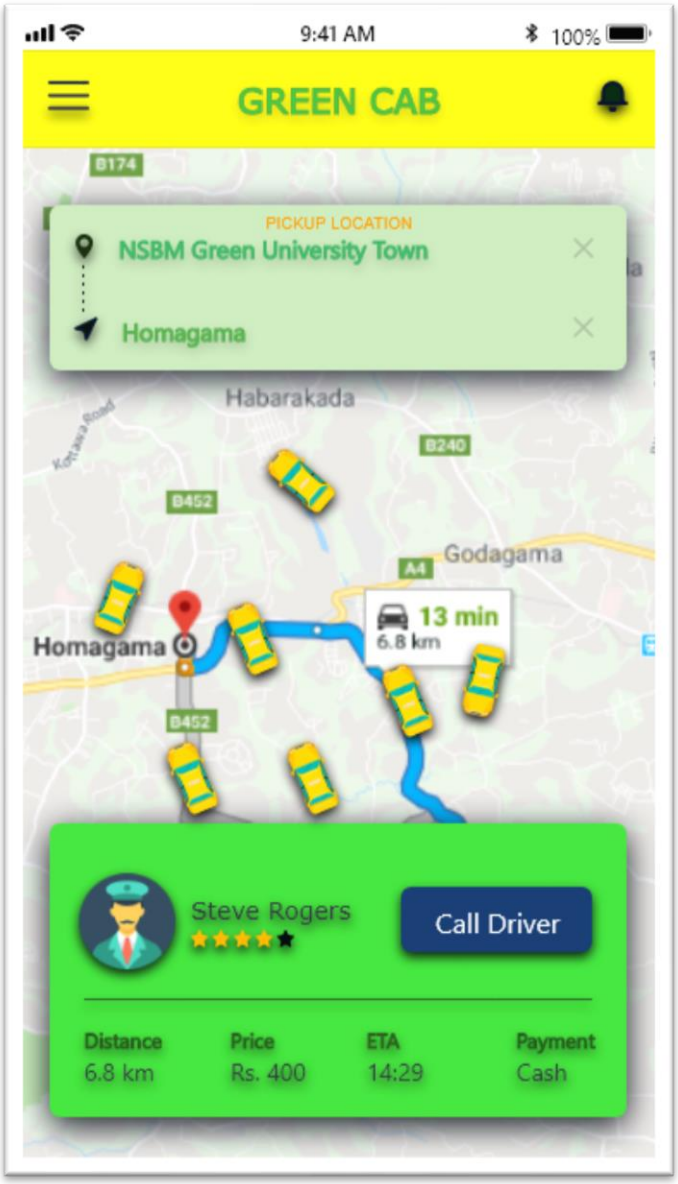
User booking and cancel booking:.

In this module authorized drivers can book a taxi from the call taxi system. Here also shows all the details about the driver who also registered in the system. And the system admin give the personal details to the particular driver only after the matching process is done. Now the matching process is done by the admin. After getting the user details, driver can wait the user confirms the booking.



Confirm booking:

In this process, user will get the information about the distance, time and required fees from the system, then booking can be confirmed or cancelled in the above module.

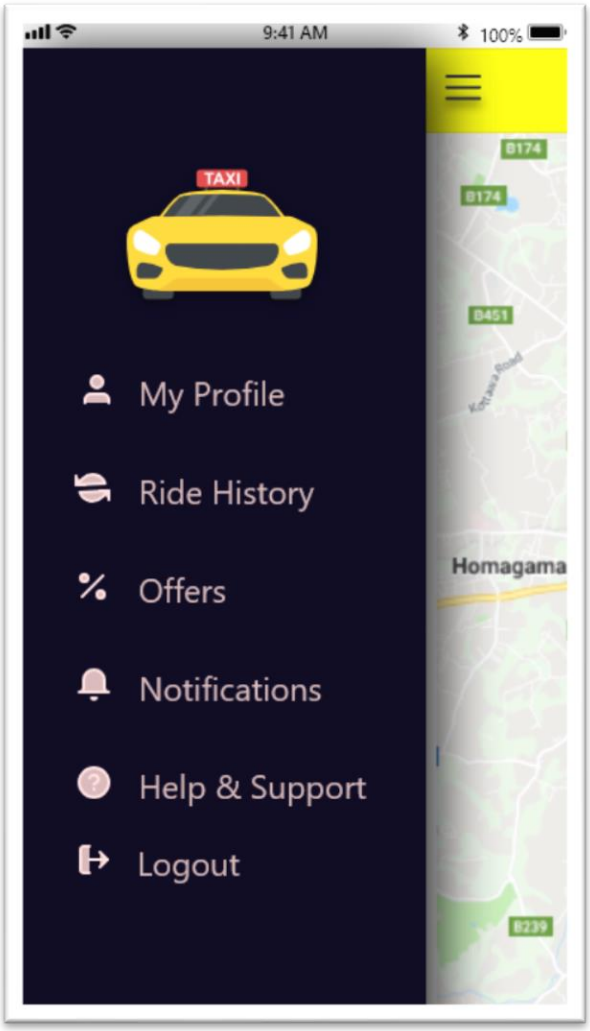


User APP

User-friendly mobile app that helps passengers to book trips, travel and pay anywhere anytime

- **Instant Booking:** It provides fast & convenient taxi booking service to passengers.
- **Push Notification:** Instant notification sent to the users on booking status including driver details.
- **Payment Option:** Hassle-free payment options using wallet, cash or online transactions.

- On-demand booking
- Billing
- Feedback
- Automated e-receipts
- Scheduled bookings
- Edit Profile
- SMS alerts
- Vehicle tracking system (GPS)
- Flexible payment options
- Trip/Cab tracking
- Automatic fare calculation
- Rate Card
- Android & iOS device support
- Multi currency support
- Flexible vehicle options
- See estimated time of taxi arrival
- Notification to passengers
- Dynamic UI rendering
- Address History
- Multi language support
- Email alerts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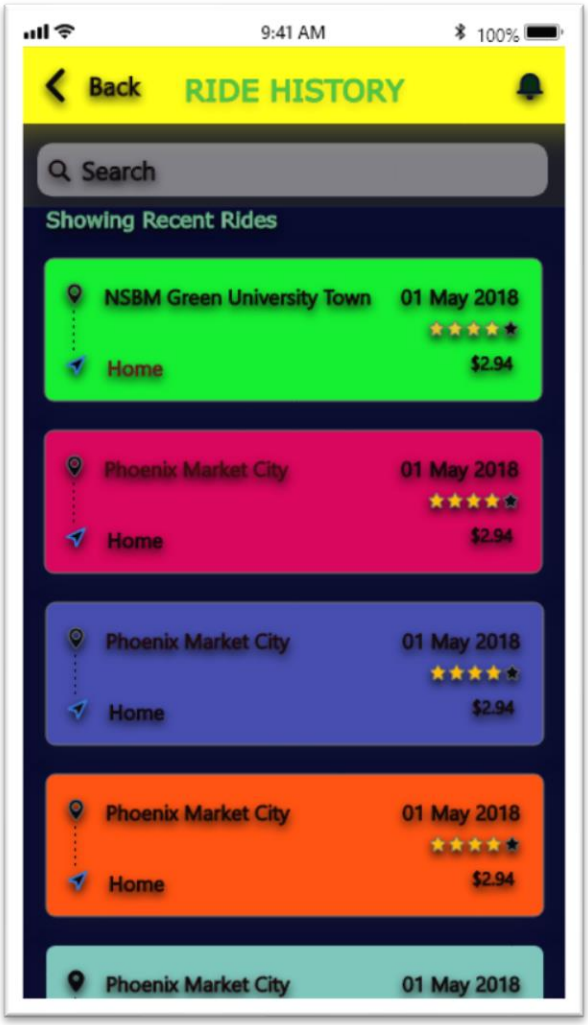
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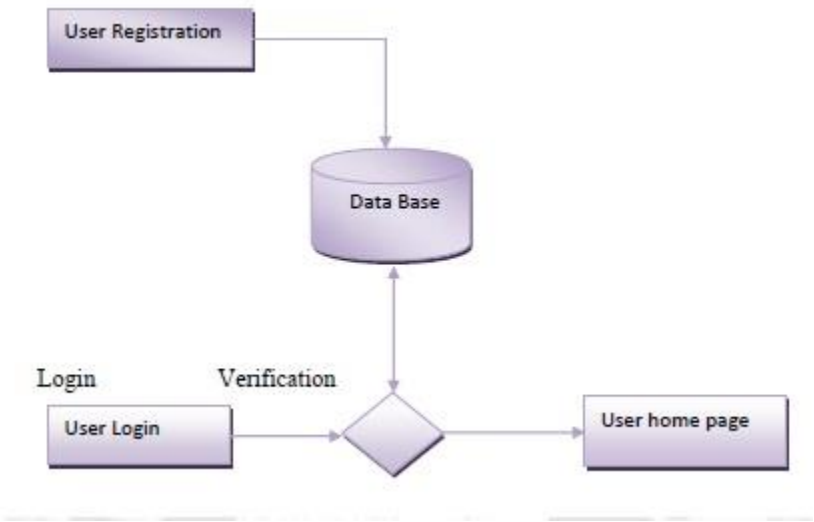
Transaction status:

This is a module in which only admin can access, all registrations got permitted by this module. Booking request by users and drivers' information also can be viewed in this module, such as the admin will arrange available driver to serve the particular request.



Application

Green cab System is used to maintain the user database in the format. It also very easy to retrieve the accurate data from a database, here all the information about the user are maintained securely and also here we achieve the confidentiality for the data's stored in the database. Concerning the actual execution of the database update, once the system has verified that the Booking be safely inserted to the database the data can be easily accessed and be used for further purposes and also the transactions can be done both the ways. Its applied by retrieving information from the database and storing through the android application.

Future Enhancements

- Devising private update techniques to database systems that support notions of anonymity different than k-anonymity.
- Dealing with the case of malicious parties by the introduction of an un-trusted, no colluding third party.
- Implementing a real-world database system.

- Improving the efficiency of an application, in terms of number of transactions exchanged and in terms of their sizes, as well.

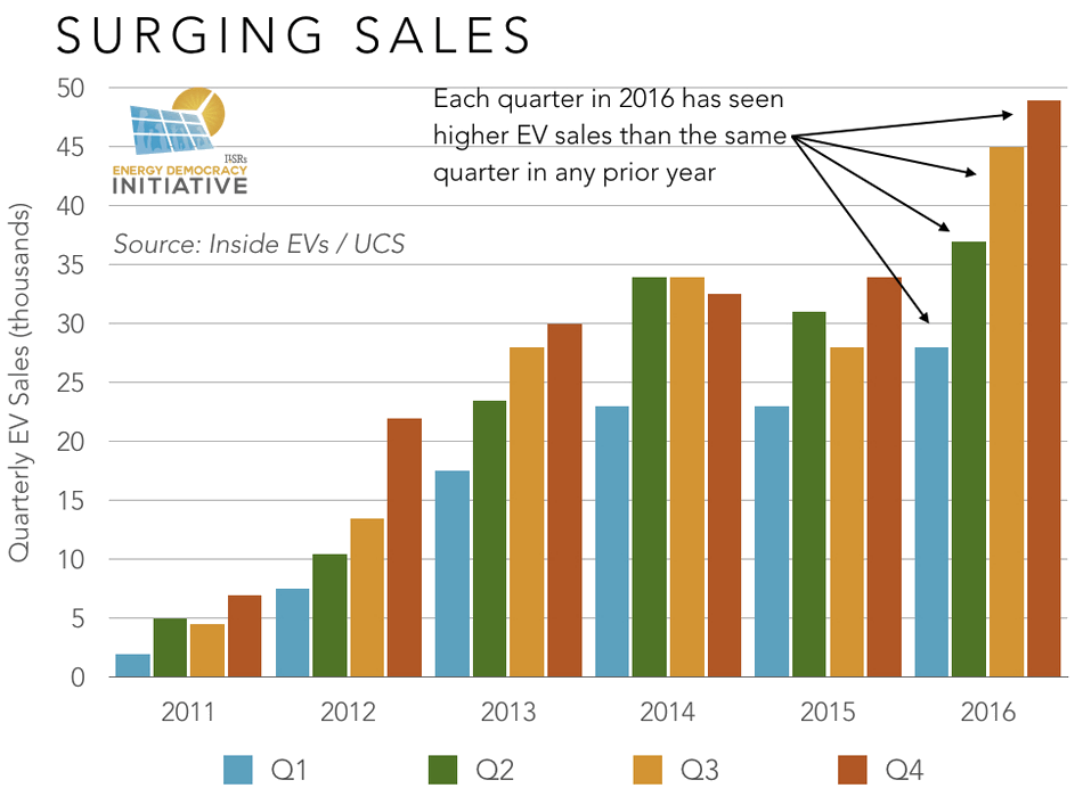
Highlights of the Project

A system which can be used for user to login to connect a database is proposed. The user can just login to the system over internet, and book the taxi from location to location. With the help of the proposed system, user can book taxi without making phone call, which takes time to wait to call in. In the proposed system, checking the data that are entered in the databases does not violate privacy, and performs such verification without seeing any sensitive data of an individual. Under this approach, the entire tuple has to be revealed to the party managing the database server, thus violating the privacy of the user. Another possibility would be to make available the entire database to the user so that the user can verify himself if the insertion of his/her data violates his/her own privacy. This approach however, requires making available the entire database to the user thus violating data confidentiality. Once this anonymized record is stored in the research database, the non anonymized version of the record is removed from the system of the facility. Thus, the research database used by the researchers is anonymous.

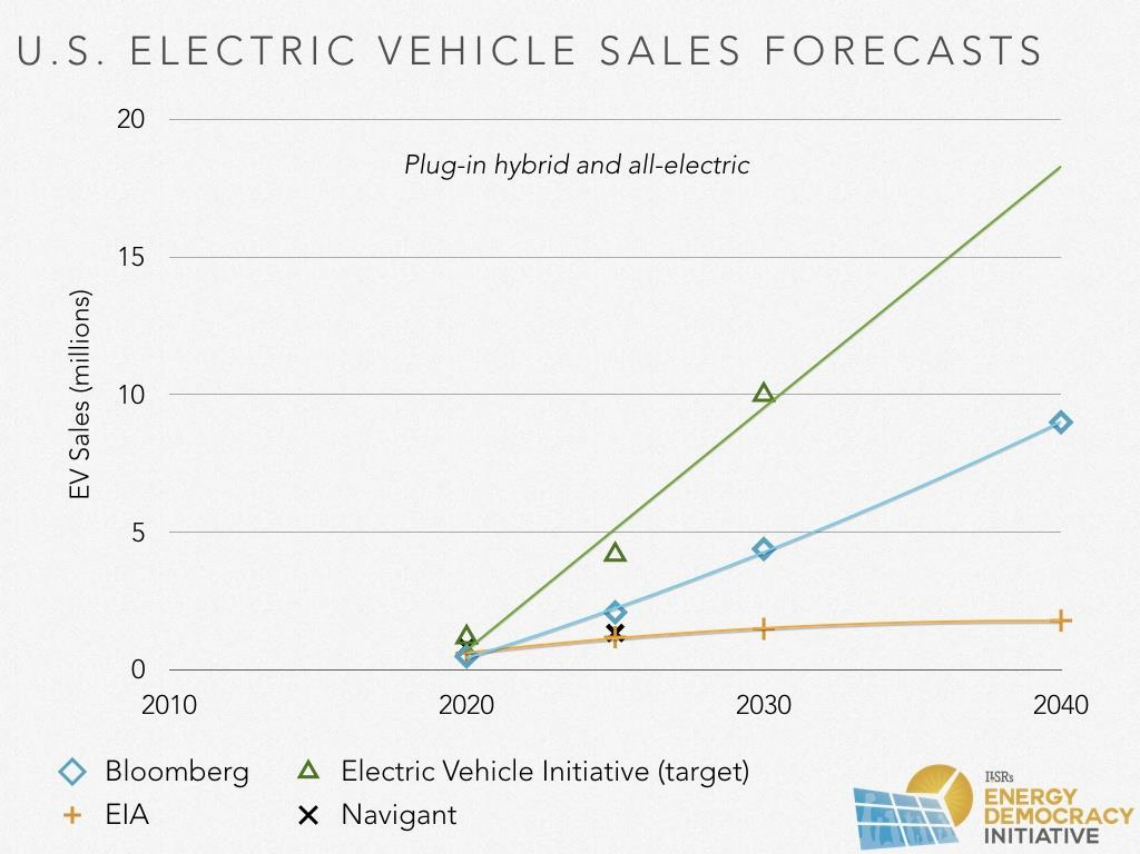
Electric Vehicles Going Mainstream

Sales of electric cars are growing. Technology improvements in the new millennium have solved the shortcomings of earlier models, providing longer ranges, improved battery technology, and competitive pricing. Juiced by favorable federal, state, and local policies as well as the increasingly positive image of electric vehicle ownership, the electric-drive tide is rising.

In just the first quarter of 2011, for example, more electric cars were sold than General Motors leased throughout the entire 1990s. In 2016, US auto dealers recorded 158,000 plug-in vehicle sales — up more than 30% from 2015. The trend shows no signs of stopping, especially as more sophisticated production technology drives down vehicle costs, and even as automakers continue to advertise their non-electric models far more often.



Buoyed by cost-competitiveness, many forecasts show electric vehicle sales ramping up. *Bloomberg New Energy Finance* expects electric vehicles to comprise 35% of global auto sales worldwide by 2040. Other forecasts vary widely. The chart below shows various projections or targets set by four different organizations.



If electric cars penetrate the global marketplace as deeply as *Bloomberg* predicts, they would displace demand for 13 million barrels of crude oil per day (over 13% of worldwide use) while using 2,700 terawatt-hours of electricity — equal to 11% of global electricity demand in 2015.

Bloomberg New Energy Finance expects electric vehicles to comprise 35% of global auto sales worldwide by 2040. If they penetrate the global marketplace that deeply, they would displace demand for 13 million barrels of crude oil per day (over 13% of global use).

An Innovation Hotspot

Despite being the most prominent electric vehicle manufacturer, Tesla is not the only player looking to cash in on electric car technology. A healthy growth outlook for the industry has lured multiple technology companies into the space alongside many traditional auto manufacturers.

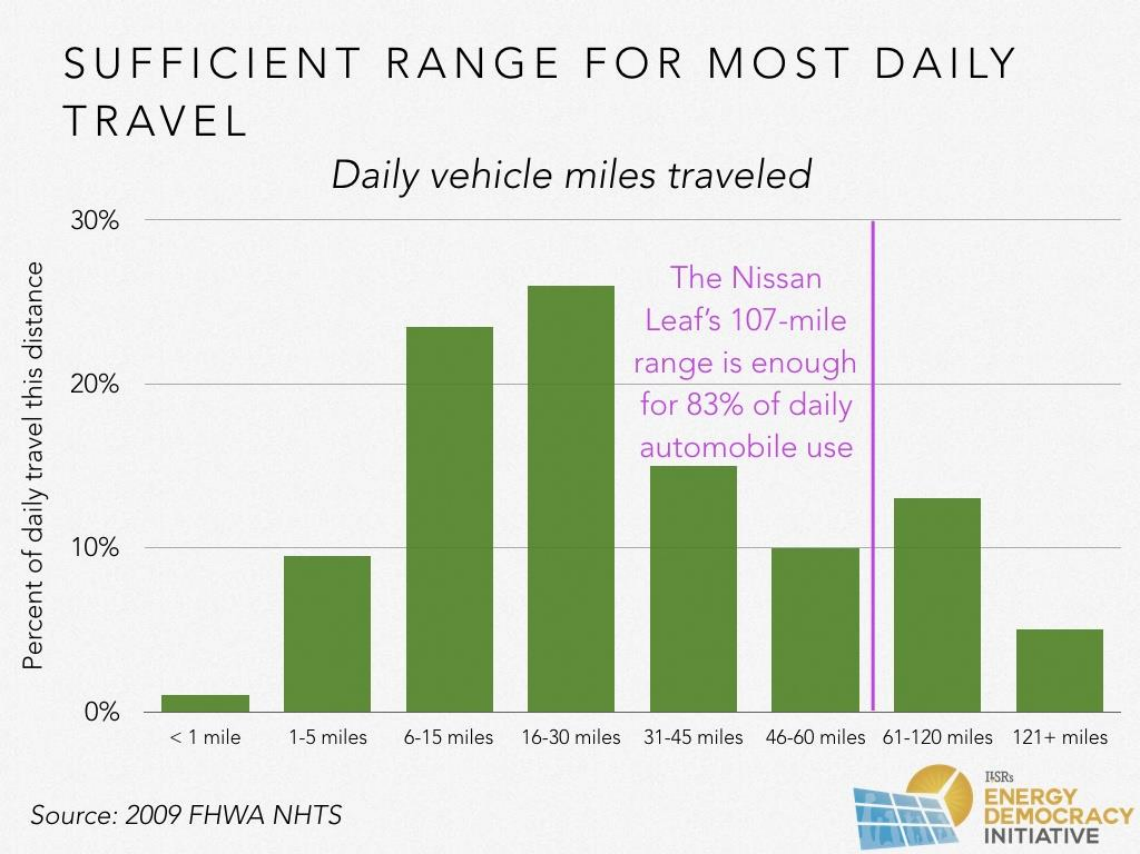
Tech giant Apple spent more on its electric vehicle research and development than all major automakers, according to a May 2016 report by Morgan Stanley analysts. At that time, the company had outspent even Tesla by more than 10 to 1, and invested more in its budding vehicle business than it had on the Apple Watch, iPad, and iPhone combined. Although it has since changed course to focus on vehicle software, the company had planned to release an electric vehicle by 2019.

The following sections illustrate the factors behind the recent and forecast growth in electric vehicles.

Range Concerns Diminishing

Today's electric vehicles would generally need more frequent fueling than gasoline cars if home or workplace charging were not possible. The 2017 Nissan Leaf, a popular battery-powered vehicle, can travel up to 107 miles on a single charge in optimal conditions.

While the Leaf covers much less ground than the 350-400 miles offered by a single tank of gasoline in other vehicles, it already satisfies most drivers' daily needs (Americans cover an average of 29 miles per day and a median of just 10 miles). 83% of Americans' daily auto travel covered less than 60 miles, according to a periodic government survey of driving habits last conducted in 2009.



With today's electric vehicles already able to cover most drivers' daily travel needs, and generally able to refuel completely each night, the extended range of next-generation electric cars will all but eliminate the issue of "range anxiety." A recent test drive of a pre-production Chevy Bolt found it exceeded the EPA-listed range of 238 miles on a drive along the California coast. Cross-country travel may still require fewer stops with a gas-powered car in 2020, but too few Americans routinely travel long distance to sufficiently affect the overall adoption of electric vehicles in the near term.

Falling Cost of Ownership

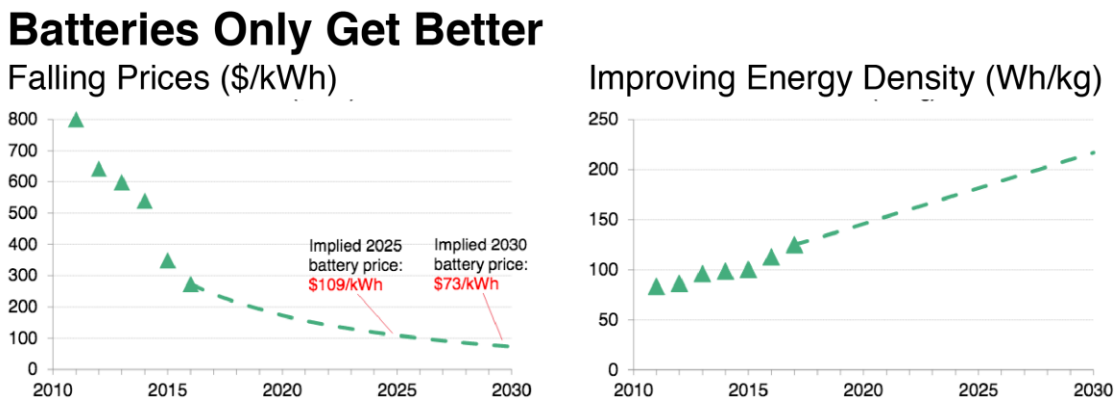
With operational differences diminishing, electric vehicles are also approaching price parity with gasoline cars. The trend is driven by falling component and total vehicle costs, in addition to lower operations and maintenance costs.

Better Battery Prices Make Electric Cars Competitive

The sunny forecast for electric vehicles comes as the cost of their batteries falls. The price of lithium-ion battery packs — typically comprising one-third of a vehicle's cost — dipped an average of 8% each year between 2007 and 2017. Battery prices dropped 35% last year alone, compounding steep reductions logged in the previous years.

Battery prices dropped 35% last year alone.

The trend is slated to continue, with battery packs expected to cost just one-quarter of their 2010 price by 2022, a shift that by itself reduces the price of electric vehicles by about 25%. The following chart shows the forecast steep declines in battery costs, albeit at a slower pace than the previous five years.



The shrinking battery costs lead *Bloomberg* to forecast that electric cars will undercut gasoline cars on price by the mid-2020s.

Sticker Price v. Cost of Ownership

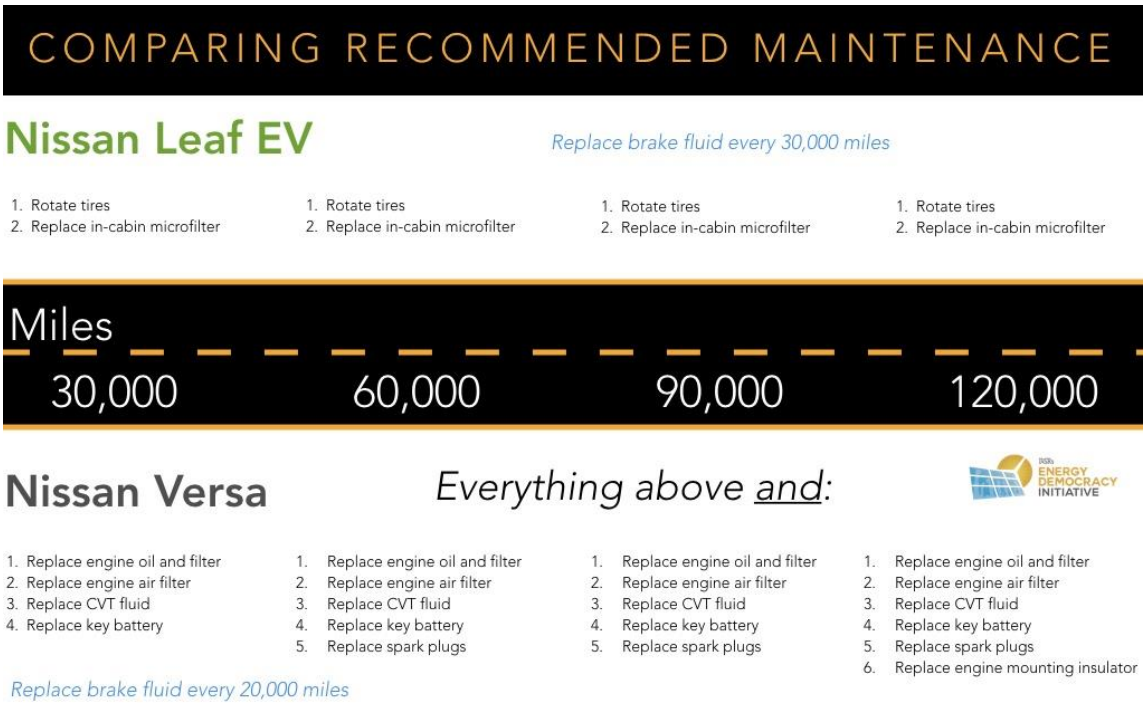
By the 2020s, electric vehicles may be more economical than gasoline or diesel cars in many countries. But the purchasing shift may come even sooner.

A study from the International Energy Agency in 2013 suggested that the ownership cost of an electric vehicle (including fuel and maintenance, not just the sticker price) would break even with ownership expenses for traditional cars when battery cost dropped to $300 per kWh of storage capacity. Top battery manufacturers had already hit that mark by 2016.

Fuel cost savings are a good illustration of the ownership benefits of electric cars. Without any special charging rate, drivers in all 50 states would save a minimum of $740 per year and up to $1,500, a discount ranging from 38% to 80% of the cost of driving 15,000 miles. With special rates for overnight ("off-peak") charging — already available from several utilities for around $0.03 per kilowatt-hour — the average savings of driving electric rise from $1,000 to nearly $1,500 per year. The savings remain significant even when a driver covers only 10,000 miles per year (see Appendix C for more on the calculations).

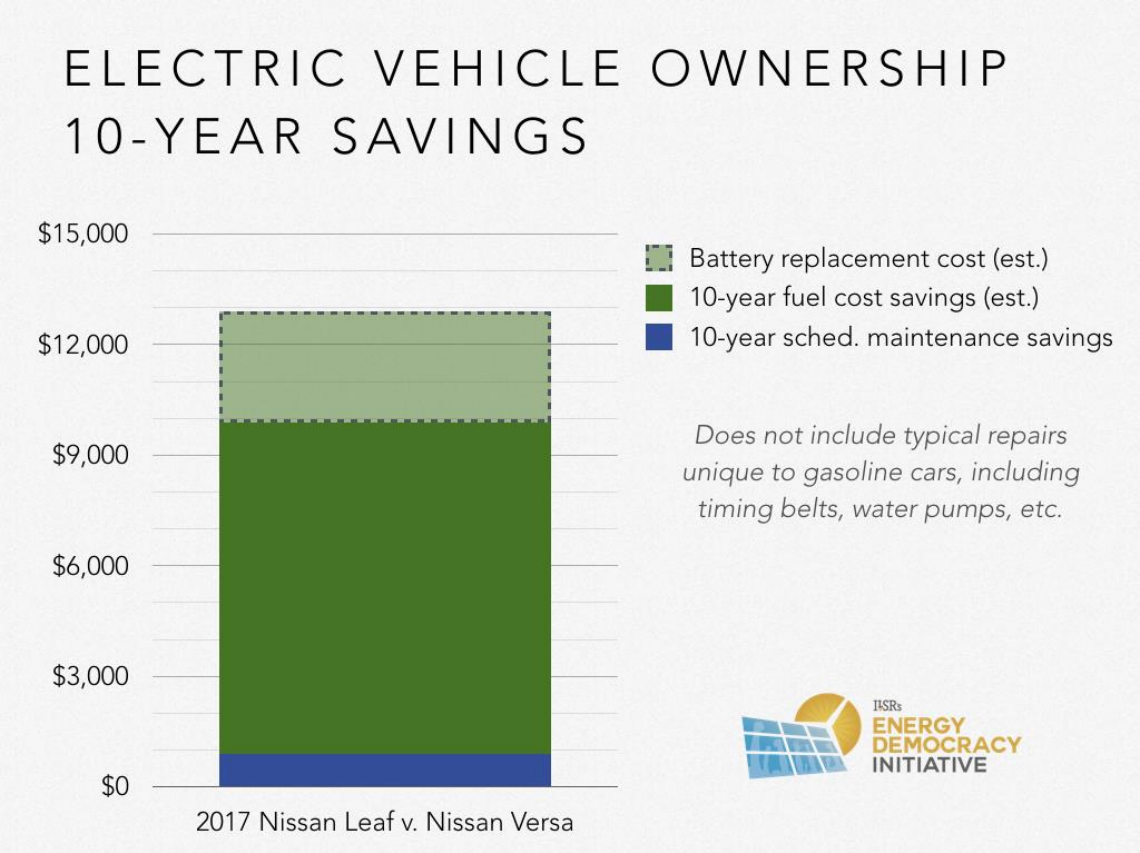
With special rates for overnight ("off-peak") charging — already available from several utilities for around $0.03 per kilowatt-hour — the average savings of driving electric rise from $1,000 to nearly $1,500 per year.

Maintenance costs are also lower for electric vehicles. Clean Disruption author Tony Seba notes that electric vehicles have 100 times fewer moving parts in the drivetrain than cars powered by internal combustion engines. They do not require oil changes, transmission fluid, or timing belt replacements. Electric vehicles' regenerative braking reduces brake wear. Edmunds estimates a 2017 Nissan Leaf will have five-year scheduled maintenance costs of about 15% less than the gasoline-powered Nissan Versa, for example (other sources suggest the advantage lands closer to 25%). The infographic below compares the Nissan maintenance schedules for a Versa with the all-electric Leaf.



Though they require less scheduled maintenance, electric vehicles may need battery replacement. A Nissan Leaf can be expected to lose approximately one-third of its range in the first 10 years of driving (if the car averages 12,500 miles per year). However, the 30-kilowatt-hour battery originally priced near $10,000 in 2016 is likely to cost $3,000 or less to replace in 2026 — less than the accumulated scheduled maintenance savings.

The following chart combines expected fuel and maintenance savings of electric vehicle ownership over 10 years and deducts the expected battery replacement cost. It is likely conservative, as it does not factor in unscheduled or common repairs unique to gasoline-powered cars including belts, pumps, gaskets, or hoses.

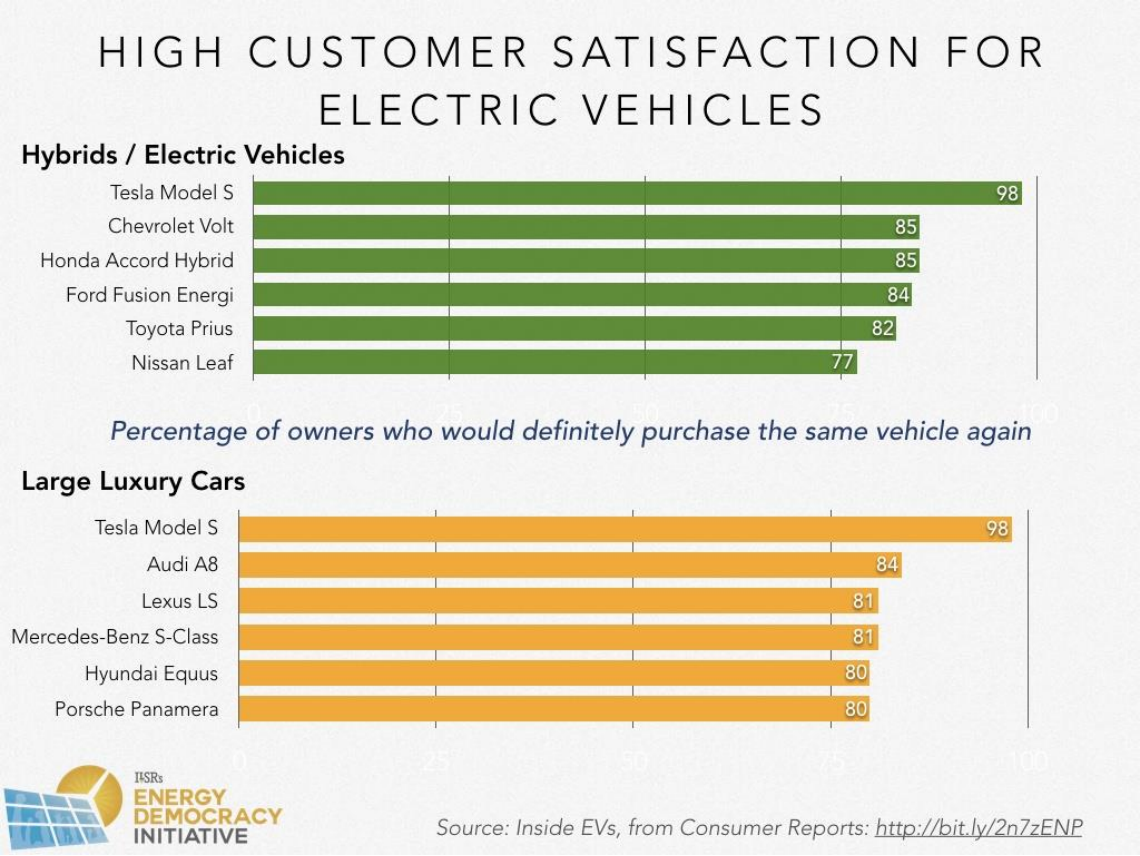

ELECTRIC VEHICLE OWNERSHIP
10-YEAR SAVINGS
$15,000
$12,000
$9,000
$6,000
$3,000
$0
Battery replacement cost (est.)
10-year fuel cost savings (est.)
10-year sched. maintenance savings
Does not include typical repairs unique to gasoline cars, including timing belts, water pumps, etc.
IHSRs
ENERGY DEMOCRACY INITIATIVE
2017 Nissan Leaf v. Nissan Versa

Policy and Pride at Play

Electric vehicles sales are also aided by federal and state policy, and a desire for individuals, governments, and

Some states offer a non-monetary incentive that may be even more attractive than cash. Ten states allow electric vehicle drivers unrestricted access to high-occupancy vehicle (HOV) or carpool lanes. In California, according to surveys, the right to drive in the carpool lane has been a compelling benefit. In a 2013 survey, when vehicle buyers were asked about their primary motivation to buy a plug-in car, 57% of plug-in Toyota Prius, 34% of Chevy Volt and 38% of Nissan Leaf owners singled out free access to carpool lanes. The benefit expires in 2019.

Tesla aside, many other hybrid and electric cars rank as high as luxury cars in customer satisfaction.



In other words, hybrid and all-electric vehicles boast a unique appeal that car shoppers consider alongside performance, cargo space, and other common characteristics.

Electric vehicles reduce stress for drivers, says new brain monitoring study

Electric vehicles already have several advantages over gas-powered cars. From no fuel cost to zero tailpipe emission, but now a new study might confirm another often overlooked advantage of EVs.

The quieter driving environment of an electrically driven vehicle can have significant mental health benefits, according to a new brain monitoring study.

The study was led by acoustics expert Dr. Duncan Williams of the University of York and ordered by LEVC (London EV Company), which makes the electric black cabs operating in London.

What they did is place an electroencephalogram, often referred to as a 'brain cap', on the head of four professional cabbies who all operate in central London and monitor their brain activity as they drove both the electric and diesel black cabs.

They claim that the results indicate that drivers are more focused, calmer, and happier when driving the electric version of the taxi:

More focused than when driving the diesel vehicle

- Higher levels of beta brain wave activity were recorded by drivers in the electric vehicle, which indicates higher levels of active concentration. In short, while driving the electric taxi, drivers were freed up get on with driving
- This was particularly noticeable when vehicles are waiting at traffic lights – a common situation for the London cabbie

Calmer than when driving the diesel vehicle

- Heart rate was consistently less variable in the electric taxi than the diesel taxi, indicating greater mental calmness
- The electric taxi was a less noisy working environment for the drivers with around 5dB less overall amplitude, and an increased dynamic range in comparison to recordings from the diesel taxi.

Happier than when driving the diesel vehicle

- Additional driver survey data showed that the largest improvement over the diesel taxi reported by the drivers was increased happiness
- This was followed by reduced stress and less distraction in the electric taxi

Dr. Williams also commented on the findings of the study:

This study proved hugely interesting. The drivers all reported being calmer, less stressed and happier in the electric taxi than in the old diesel model. Traditionally those feelings would correlate with more Alpha brain waves, which are a good indicator of relaxation. But when we looked at the data, the drivers' showed more Beta brain waves, an indicator of mental activity and attention.

What does this mean? Well, the study suggests that the quieter driving environment allowed cabbies to be in a more concentrated state of mind. In other words, by removing the noisy diesel engine rumble, they are perhaps freed up to get on with driving in a more focused, but calm way. It's a fascinating result and, given the movement towards electric commercial vehicles, shows there are even more benefits of going electric than we might have previously thought.

They say that all the drivers already had driven many miles in the electric TX taxi and were familiar with its controls and driving behavior.

1. It'll run all day – and charges in 25 minutes

The TX has a range of 80 miles before it needs to use its 1.5l 'range extender' petrol engine. Considering the average cabbie drives 80-120 miles a day, that should be more than enough juice to get them through the average shift. After all, it's possible to boost the battery to 80% capacity in an impressive 25 minutes with a 50kw charger, so if the car is running low on battery, it's easy to top it up on a lunch break.

2. It's much greener

It might sound obvious, but the new TX is much greener than its diesel TX4 predecessor. It has to be. From 1 January, all newly registered London cabs must by law have emissions of no more than 50g/km and a minimum zero-emission range of 30 miles. LEVC wanted to significantly outdo this benchmark, so they've built a cab that can do 80 miles emission free, with carbon emissions of only 29g/km when driven on the range extender.

4. You're safer than ever

The old TX4 had very few safety features, but that's all changed with the LEVC TX. The driver has a wheel airbag, thorax airbag and curtain airbag, and passengers have additional curtain airbags to protect them from side impacts. Of course, in a perfect world, you'll never need any these. To help minimize the chance of an incident, LEVC has included additional safety features like emergency autonomous braking, lane departure warnings and forward collision warnings.

5. It's a much smoother ride

Unlike the chuggy diesel engines of the TX4, the ride in the new electric taxi feels incredibly smooth, both for the driver and passengers. Its regenerative braking (which slows the vehicle as soon as you lift your foot off the accelerators) means there's no need for the driver to slam on the brakes when they approach a speed bump, and there's none of the noise or smell that accompanies a diesel engine either.

6. It looks a bit like a Bentley

Okay, so the car doesn't really look like a Bentley (its black chassis and tall roof probably have more in common with a hearse), but the new LEVC logo – as Pat, the cabbie showing me around the car, pointed out – can easily be mistaken for that of a Bentley. Considering the TX costs £55,000, I suppose it doesn't hurt to have a ride that's mistaken for one that costs more than twice the price...

7. You can charge your phone (and laptop)

The new black cab is equipped with 2 USB chargers and a mains plug too, as you'd expect from something that runs off a ruddy massive battery. So if any of your gadgets are running low on power, you can top them up while using the onboard Wi-Fi. Of course, if you don't need to get anywhere in a hurry, it'd still be advisable to go to a cafe rather than riding aimlessly around London until your iPad battery is charged.

The main goal of this project is to develop an accessible and comprehensive Eclipse structure application, can potentially assist individuals to book a taxi from a phone and for the company to maintain a database for booking and sending driver details.

Existing system as Call Taxi Wiki, which is a system exists in the market for one year, the existing system helps user to find the nearest taxi around in a particular city. The system all allows full internet access. However, the number of cities in the whole world is huge; database can't store all the cities names.

Methodologies are the process of analyzing the principles or procedure of a progressive Call taxi system.

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