Madison Bavosa, EJ Gasataya, Kristen Libonati, Jessica Malek, Emmanuel Pasteur

Professor Michels & Professor DeGood

MGT/BUS-385 & CSC 315

24 April 2023

Phase IV: Final Submission

Background & Overview:

Sustainability-related issues have been widely discussed and debated in recent years, stirring up discussions surrounding global warming and climate change, pollution, and a wide variety of other problems that pose major threats to the environment and the planet. Particularly, greenhouse gas emissions are a major environmental problem discussed today, especially in relation to gas and diesel-powered vehicles. Greenhouse gases are extremely harmful to the environment, and data suggests that their presence is one of, if not the most, significant influences of global warming today.

Global warming is known to lead to increased temperatures in the atmosphere, rising sea levels, and severe flooding and drought, and research shows that vehicle emissions account for nearly one-fifth of all greenhouse gas emissions in the United States (Car Emissions and Global Warming, 2014). According to the United States Environmental Protection Agency, typical passenger cars emit approximately 4.6 metric tons of carbon dioxide per year. These vehicles also emit a substantial amount of methane and nitrous oxide, which also contribute to global warming (Greenhouse Gas Emissions From a Typical Passenger Vehicle 2018). Clearly, the usage of gas-powered vehicles poses a variety of environmental issues that are putting the future of ecosystems, the climate, and the world itself in danger, which could have major long-term implications if initiatives aren't taken to increase sustainability practices soon. Despite this, the problem continues to persist due to individuals' unwillingness to switch to electric vehicles over traditional gas or diesel-powered vehicles, which subsequently has led to the production of an alarming amount of greenhouse gas emissions from their vehicles as a result.

The issue surrounding greenhouse gas emissions and global warming affects a variety of stakeholders, which is virtually every person on the planet given that greenhouse gas emissions impact the entire world and its population; children, the elderly, the poor, and those with pre-existing health conditions are more vulnerable to negative health effects from climate change issues and therefore have a slightly higher stake in these environmental issues (Herring & Lindsey, 2020). Therefore, based on this information, greenhouse gas emissions certainly have major ethical implications associated with it.

Generally, driving gas-powered cars could be beneficial to large groups from a utilitarian perspective. Although gas-powered cars pose the issue of harming others through their environmental harms, from a self-interest standpoint, many people do not want to deal with being inconvenienced by switching vehicle types, so there can be arguments made for the case that more people would be inconvenienced through the limitations on gas-powered vehicles and would result in a net decrease in overall happiness as a result. Therefore, this poses ethical issues surrounding people putting their own self-interest ahead of the environment's and the entire future population's interest by risking the likelihood of further harms through global warming resulting from increased greenhouse gas emissions from gas-powered vehicles that could be minimized substantially through simply switching to electric or hybrid vehicles. Based on this information, our proposal is to encourage municipalities with relatively lower proportions of electric vehicles and higher numbers of vehicle miles traveled within the municipality to increase overall adoption of electric vehicles in order to work towards the overarching goal of lowering greenhouse gas emissions emitted from vehicles.

How Can Data Help Analyze Sustainability Problems?

Data can deliver substantial value in the context and identification of sustainability issues. Organizations such as Sustainable Jersey offer a variety of different data resources that measure and track energy consumption broken down by municipalities, vehicle type, vehicle miles traveled per municipality, and audits summarizing energy efficiency for different businesses, to name a few of several different data sets available surrounding sustainability initiatives. This data can be further analyzed through comparisons to other

institutions where their energy efficiency and usage can be contrasted and leveraged to promote different incentives to encourage businesses with higher energy usage or emit more greenhouse gasses to adopt programs that will help them be more sustainable. In the context of our proposal surrounding how electric vehicle usage and the number of miles traveled are correlated with greenhouse gas emissions when compared to traditional gas-powered vehicles, data can be extremely valuable in identifying a correlation between all of the different variables and potentially finding evidence to support claims that would encourage more sustainable practices. More specifically, looking at the data from a municipality with high vehicle miles traveled and a high proportion of electric vehicles in that area while simultaneously examining its greenhouse gas emissions emitted from those vehicles can be compared to another municipality with similar miles traveled but a lower proportion of electric vehicles and a higher level of greenhouse gas emissions. This could offer important insights that would help show a correlation between electric vehicles and greenhouse gas emissions as a result of the analysis of this data.

Over time, data could also be useful in showing progress toward sustainability initiatives. For example, in this context, data could be analyzed for greenhouse gas emissions per municipality with lower electric vehicle proportions, which could then be looked at over time after increased adoption of electric vehicles to see if greenhouse gas emissions decreased as a result of an increase in electric vehicles on the road (For example 10-15 years from now). Overall, data surrounding sustainability issues are extremely important to have and can deliver a lot of insight into both identifying and resolving sustainability issues.

What Data Will We Gather?

We will gather data related to the number of electric vehicles in each municipality in New Jersey, as well as the total amount of greenhouse gas (GHG) emissions in each municipality. We will also reference the number of miles traveled for all vehicles, which includes gas-powered as well as electric vehicles in the municipality. The grand total for the emissions in each municipality will ultimately be displayed in the database. Zip codes in conjunction with municipality names will also be displayed in order to uniquely identify

each town while analyzing the emissions/VMT data within the database. This data will be very useful by providing detailed information about which municipalities have which values.

Questions to Explore with Data:

Through the previously described data that we aim to examine this sustainability issue with, there are a variety of questions that could be asked in relation to it. Users of our database could have queries related to whether municipalities with high vehicle miles traveled but low populations of electric vehicles demonstrate a correlation with high greenhouse gas emissions. Additionally, the data can help explore questions related to whether municipalities with a higher proportion of electric vehicles have fewer overall greenhouse gas emissions than those with fewer electric vehicles but with a similar number of vehicle miles traveled. These are just a few of many different questions that could be asked in relation to the data we identified that would offer valuable insight into this sustainability problem.

(Modified 4/26/23) Proposed Use Cases (Modified for Phase IV Submission)

Use Case 1: Specifying Range of GHG Emissions:

The user can enter a range of GHG emissions as a query, and return the municipalities that fall within that range.

1. The system will present the user with two sliders that correspond to the minimum and maximum values for GHG emissions as a query.
2. The sliders already assume that the units for GHG emissions are measured in Metric Tons of carbon dioxide, which is presented in the instructions in the web application.
3. The system validates the range of values from the user.
    a. When the user clicks “Submit GHG data” on the UI, the table will be empty (only showing the table columns) if:
        i. The MAX range is smaller than the MIN range slider
        ii. Both MIN and MAX sliders are at the 0 position (far left), or at the far right.

4. The system will present a list of municipalities (with their corresponding zip codes) with the selected county that falls in the GHG emission range.
5. The query will also present the total number of personal vehicles, the # of EVs, as well as the Ratio of EVs in each NJ municipality.

Use Case 2: Specifying Zip Code to view Specific Municipality and Corresponding County: *The purpose of this use case is to allow the user to query a known ZIP code in order to return the corresponding municipality name and county.* This will aid in the use of identifying which zip codes can be drawn out when the VMT and GHG slider queries are being made. (Use cases 1 and 3).

The system prompts the user to enter a zip code.

1. The user enters a valid zip code. Valid ZIP codes include trailing zip codes (ex. 08610) as well as omitting them (ex. 8610). However additional zeros after the zip code will not be recognized.
    a. If the user types an unknown zip code, the query will present an empty table consisting of just the column headers from which the query was being made.
    b. In this case, the user will go back to Step 1.
2. Since each zip code is unique, the query will contain just one row of the zip code and the

Use Case 3: Specifying Mile (VMT) Ranges: This functionality is going to be similar to how we enter data on GHG emissions data. The user will have the option to also enter the mileage (VMT) range they want (via sliders), which will return the list of municipalities that fall within that range.

1. The system will present the user with two sliders that correspond to the minimum and maximum values for VMT (Vehicle Miles Traveled) as a query.
2. The sliders already assume that the units for VMT are measured in miles (as integers) which is presented in the instructions in the web application.
3. The system validates the range of mileage from the user.

a. When the user clicks “Submit VMT data” on the UI, the table will be empty (only showing the table columns) if:

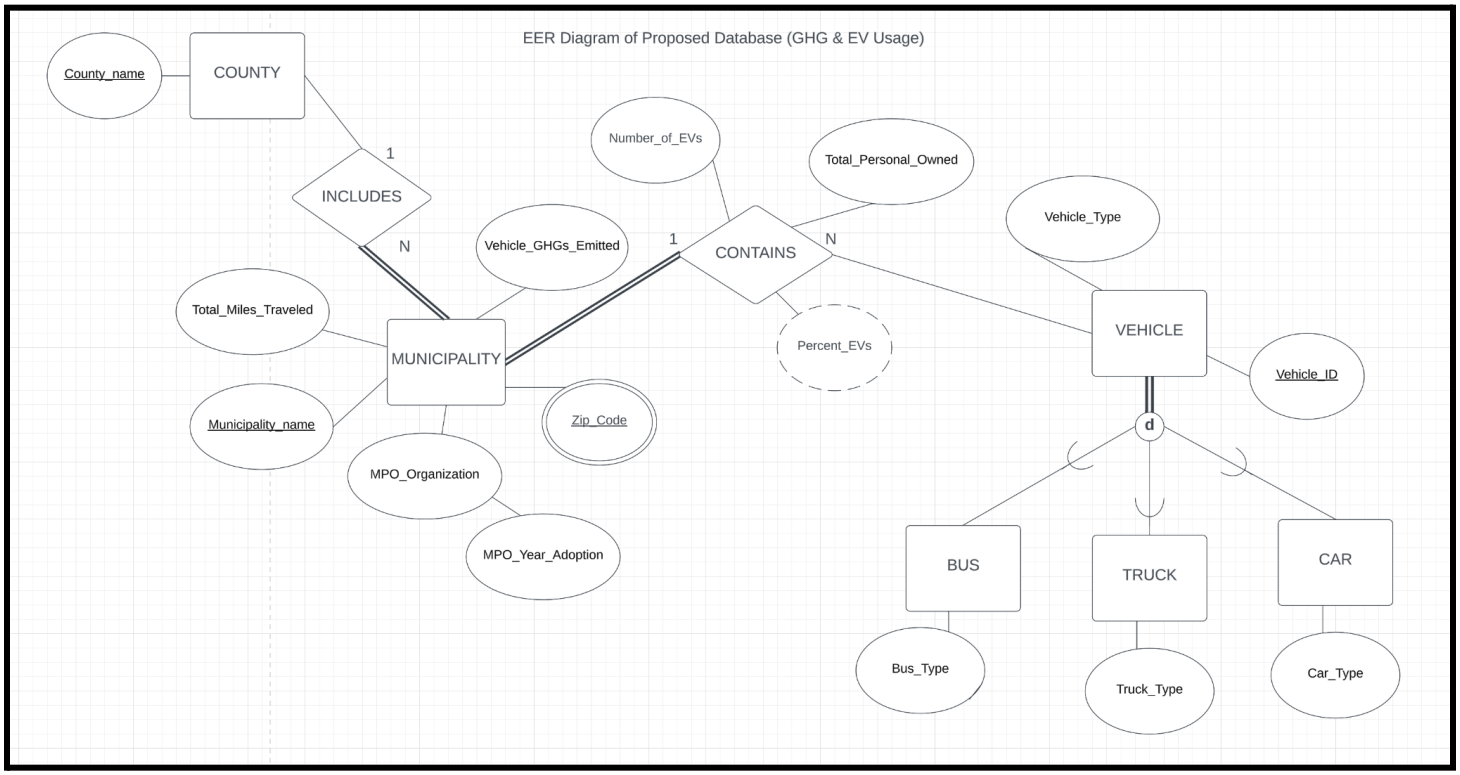
   i. The MAX range is smaller than the MIN range slider

   ii. Both MIN and MAX sliders are at the 0 position (far left), or at the far right.

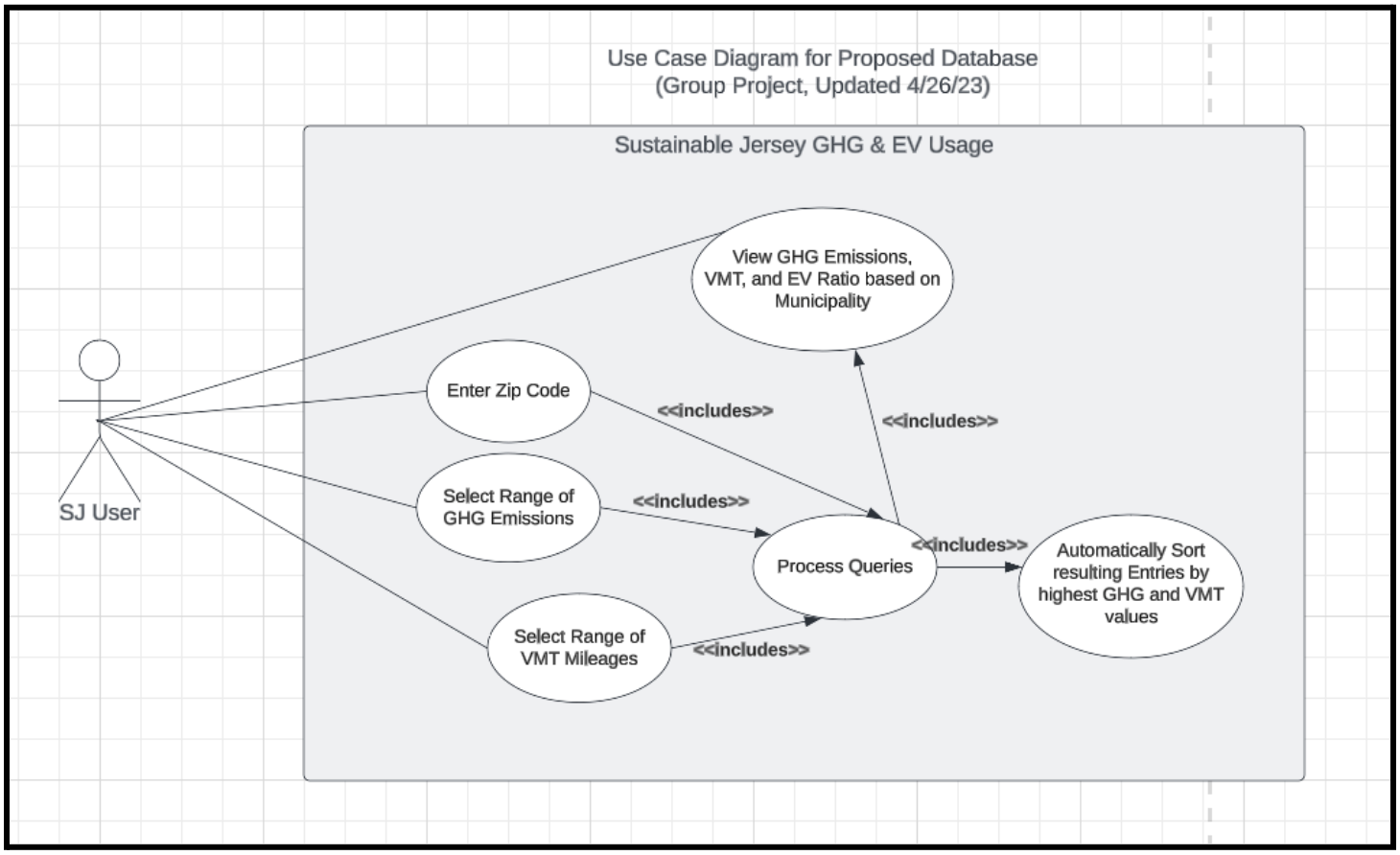
4. The system will present a list of municipalities (with their corresponding zip codes) with the selected county that falls within the specified mileage range.

The Database Model Explained

ER (EER) Diagram



(Modified 4/26/23) UML Use Case Diagram of Proposed User Interaction



(Modified 4/26/23) Summary of the Details of Our System's Users (Actors), Their Interactions with Our System, and the Goals Our System will Help Those Actors Achieve

The User interface (UI) consists of 3 main input forms that the user can use to interact with our database. More specifically, the first input type allows the user to manually enter a zip code, while the second and last inputs use sliders to permit the user to enter the range of numbers that will query the database. The first input allows the user to enter a zip code of a county in New Jersey, and our database will create an output of the name of the county as well as the municipality to which the zip code belongs. Since the database is developed to identify each zip code as a unique key, the query for entering the zip code will contain only one table entry. The second and third inputs contain min and max sliding controls that will allow the user to make a query related to VMT and GHG usage from a range of numbers provided. During the UI implementation of the project, we transitioned from using two text boxes to sliding scales to make user interaction with the

application more intuitive since the user will not need to manually type the minimum and maximum values of the query every time he/she uses the database.

After making a query with the sliders, the page will create an output of a list of municipalities along with their respective zip codes demonstrating their GHG and EV usage. The database will also automatically sort the table entries based on the highest GHG/VMT usage, which can be useful by identifying which municipalities have the highest number of miles traveled but have a low population of EVs, alongside the GHG emissions within the municipality.

Scope of Our System

The scope of the system will heavily depend on which datasets are being used. As previously described, the data is focused on New Jersey datasets collected from 2020-2022, all from Sustainable Jersey. Thus, when information is being presented in the user interface, users must be reminded that the result of the presented queries will be on datasets from NJ, and therefore cannot necessarily be generalized for national or global situations based on similar variables. If *nationwide* GHG emissions and EV percentages are taken into account, the scope of the system will be larger as a result of the increased amount and scope of the data.

(Modified 4/26/23) How Relational Databases Work and Why They Are Valuable

The relational database will store a collection of information that can be represented as “relations”, and the relationships they have with other variables; relations are based on the entities drawn from ER/EER diagrams. Relational databases can be beneficial given that it provides more of an in-depth view of how commonalities across different datasets can be drawn out (i.e. join operations). Also, the type of actions that can be done through relational databases are very flexible yet powerful; the ability to easily update, delete, or add tables and/or relationships during the Data Manipulation Language (DML) and Data Definition Language (DDL) phases allow the database to adapt to datasets that are very complex. Data integrity is another valuable aspect of a relational database; it is important that there is consistency among each instance of the entity in terms of the domain constraints held in each one. The concept of normalization, which ensures that the data

being presented in the database is highly accurate, is also extremely valuable, as accuracy is vital to the integrity of the database as a whole and the deductions that can be made from the data presented.

(Modified 4/26/23) The Elements of Our Diagram and What They Reveal About Our Database Model

Our ER/EER diagram includes five entities. These include “COUNTY”, “MUNICIPALITY”, “VEHICLE”, “BUS”, “TRUCK”, and “CAR”. “COUNTY” represents any one of the 21 counties in New Jersey, and each county is identified by its name.“MUNICIPALITY” represents the different townships in New Jersey, with each municipality identified by its name and corresponding zip code. This entity also includes information such as the total vehicle miles traveled and the municipal planning organization. The “VEHICLE” entity will represent a vehicle, each with three sub-entities according to the “Vehicle_Type” attribute. These “Vehicle-Type” attributes include “BUS”, “TRUCK”, and “CAR”. The database is based on the assumption that a vehicle can only be either a bus, truck, or car (but not a combination of any of those). Each of these entities will have an attribute that specifies the type of bus, truck, or car the item is. For example, the domain for “Truck_type” is combination long-haul, combination short-haul, single unit long-haul, single unit short-haul, refuse, passenger, and light commercial.

The relationship type “CONTAINS” will have attributes describing the participation between each municipality and the number of vehicles. The number of EVs will be drawn out from this relationship as well as the number of total vehicles owned. The “Percent_EVs” attribute demonstrates a derived attribute since it can be calculated based on the ratio between the number of EVs and the total number of personal vehicles owned in each municipality. Additionally, the zip code attribute in the “MUNICIPALITY” entity will be the primary key and will also be multivalued since some municipalities contain different zip codes at the same time. Therefore, having the municipalities as multivalued will ensure that there is no conflict between the differing zip codes for a single municipality.

Reasoning Behind Our Database Given the Goals for the Sustainability Project

The design of our database can be leveraged to deliver our proposed sustainability goal of recognizing which municipalities have the highest number of electric vehicles compared to municipalities that have the lowest number of electric vehicles, comparing that data to total vehicle miles traveled and in turn analyzing the ratio of vehicle emissions to vehicle type (EV vs Non-EV). The database enables users to identify the vehicle miles traveled for each municipality and the proportion of electric and gas-powered vehicles per municipality, as well as the total emissions associated with them respectively.

Proposal Details & Ethical Implications:

Based on the data analyzed throughout the creation of the database, in an effort to improve municipal sustainability in New Jersey, we propose that local governments throughout the state offer incentives to local car dealerships and consumers in order to increase the number of electric vehicles on the road and therefore limit ga-powered vehicles and their carbon emissions as a result. Our proposal ultimately aims to encourage municipalities with relatively lower proportions of electric vehicles and higher numbers of vehicle miles traveled within the municipality to increase overall adoption of electric vehicles in order to work towards the overarching goal of lowering greenhouse gas emissions emitted from vehicles. This could take the form of increased incentives for municipalities with higher proportions of gas-powered vehicles to offer to citizens in its areas for purchasing electric vehicles.

The goal would be to prioritize the promotion of incentives for municipalities that have data demonstrating a high proportion of vehicle miles traveled in the area with lower proportions of electric vehicles, incentivizing residents of those areas to adopt electric vehicles in place of gas vehicles. Similar incentives already exist in the federal government; currently, the government offers tax incentives to consumers who purchase electric vehicles, offering a tax credit of up to $7,500 for new plug-in or fuel cell electric vehicles purchased, or up to a $4,000 credit for pre-owned electric vehicle purchases (Credits for New Clean Vehicles Purchased 2023 or After, 2023). From a business perspective, car dealers can be supplied with

tax incentives or other promotions in order to incentivize them to push purchases of electric vehicles. Local dealerships can partner with the local government to arrange different incentive programs in order to incentivize them to push electric vehicle sales in exchange for bonuses depending on meeting certain quotas.

Our proposal has the potential to improve sustainability initiatives throughout New Jersey, as well as other states and the nation as a whole if the initiative is scaled up. Through the use of tax incentives for consumers in high-emission areas with high vehicle miles traveled as identified by the database, residents and local dealerships may be more inclined to purchase electric vehicles over gas-powered ones, which will in turn help reduce overall carbon emissions from vehicles in the municipalities as a result.

The database is particularly valuable in identifying the best targets for these incentives, as it singles out the municipalities that have high vehicle miles traveled or low vehicle miles traveled. Additionally, the database will also single out the municipalities that have both high and low greenhouse gas emissions. Using the database to identify this information will recognize municipalities that suffer from carbon emissions the most and thus would benefit the most from our proposal involving increasing incentives for electric vehicle purchases in those areas. We hope that local governments will promote the usage of electric vehicles through incentive programs directed towards both residents and/or car dealerships, or possibly even create plans to lessen the amount of driving in general such as providing incentives for carpooling. Overall, reducing emissions in municipalities with the highest concentration of emissions is one step towards making New Jersey a more sustainable place.

How the Solution Would Affect Various Stakeholders:

Our proposal and sustainability initiatives generally involve increasing the ratio of electric vehicles and lowering greenhouse gas emissions affecting a variety of different stakeholders. For one, by identifying which municipalities have relatively high greenhouse gas emissions and high vehicle miles traveled, and by being able to identify within that municipality if its electric vehicle proportion is “acceptable”, we hope that this project can allow one stakeholder, Sustainable Jersey, to develop a rough idea regarding which areas of New Jersey

need to have more EV usage to promote sustainability in their area. Other stakeholders in this proposal include local and other corporate car manufacturers, who will be impacted by being incentivized to offer more electric vehicles in the municipality, and whose sales staff may be pressured more to sell electric vehicles. They could also be more negatively impacted by this proposal if it impacts the sale of gas-powered vehicles to the point where it hurts their financial stability, so local car dealers definitely are major stakeholders in this initiative. Companies must also consider the *cost* of the production of each electric vehicle, which was out of the scope of this project. However, future developers can draw statistical conclusions on the relationship between the cost of each electric vehicle and how that can correlate with the number of electric vehicles present in the municipality to tackle that issue in the future. Finally, the general public, residents of New Jersey, and the environment as a whole are major stakeholders in this proposal; New Jersey residents are impacted by the incentives being offered and may change to electric vehicles as a result of the incentives. Residents and the environment are also stakeholders in this proposal since it aims to increase the presence of electric vehicles in efforts to reduce greenhouse gas emissions, ultimately helping to improve air quality and pollution for residents, but on a larger scale, helping to reduce the impact on global warming.

Unintended Risks or Ethical Concerns Raised by Our Proposal & How to Address Them:

Although this proposal is likely to be very valuable to increasing sustainable practices in municipalities with high vehicle emissions, the proposal certainly has the potential to produce unintended consequences and may have some ethical concerns in relation. One concern relates to the burden of the increased prices of electric vehicles. Electric vehicles may often be more expensive than gas-powered vehicles, and lower-income areas in New Jersey may not have the financial resources to purchase electric vehicles despite high proportions of emissions and vehicle miles traveled in that area. Additionally, another risk associated with this proposal is limited cooperation from local car dealerships to adopt these incentive/quota programs for pushing electric vehicles. Car companies likely make the majority of their revenue from the sale of gas-powered vehicles, so many may be unwilling to cooperate or adopt these programs that would inhibit their sales growth. Both of

these risks should be taken into consideration when analyzing the practicality of the proposal and determining the steps that should be taken to effectively execute it.

In addition to some risks of the proposal, there could also potentially be some ethical concerns in the database itself. In the domain of computing and computer science, how the database was modeled should be taken into consideration. Database attacks such as DoS (Denial of Service), as well as other forms of SQL Injection, are common attacks that can alter the "true" meaning of what the database was meant to be in the first place. By maliciously altering table entries in a database (for example, an attack that will change Edison's GHG value to be lower than usual), this can lead external stakeholders using the application to believe that Edison's GHG usage has decreased dramatically in recent years, but in reality, is still one of the main producers for high GHG emissions. Similarly, if the attacker changes the EV ratio to be extremely high, this will trick car manufacturers into believing that they do not need to produce more EVs in their area, but in reality, that region suffers from having low EVs in the first place.

From the business ethics side, ethical issues can be analyzed through the lens of ethical theories. The applicable ethical theory to this proposal is the utilitarian theory, which may make the argument that such a proposal could be unethical by limiting overall happiness and the greater good of society. Specifically, it could be argued that implementing programs that push for electric vehicle usage could lead to major inconveniences for residents as a result due to a variety of factors (i.e., limited charging stations in the area, added expense of purchasing electric vehicles, etc.). Additionally, a lot of harm can be posed to local car dealerships that rely on the sale of gas-powered vehicles to stay in business, and the loss of revenue could have a domino effect on the community that will now receive less in tax revenue and will therefore have less money going to the town. Therefore, from a utilitarian perspective, it can be argued that this proposal could have a net harm to the overall good of the community from all of these impacts, despite the positive impact it has on the environment, if the impact against local businesses and the inconvenience posed to residents is greater than the positive impact to the environment.

Despite these concerns, there are other ways to look at the proposal through ethical perspectives that counter the earlier ethical concerns. From a utilitarian perspective, it could certainly be argued that the net harm from greenhouse gas emissions is more impactful than the unhappiness and inconvenience of switching to electric vehicles from switching. Since greenhouse gasses are correlated with global warming, which is a major issue in the world currently, it is safe to say that initiatives relating to reducing the likelihood of global warming would likely produce more of a net increase in overall good compared to the among of harm of reducing convenience for residents and adding additional costs for electric vehicles. Additionally, the free market system represented by utilitarianism is being violated by externalities seen from greenhouse gas emissions and pollution, affecting third parties not involved such as the environment, therefore the net harm from vehicle emissions is not being factored into the utilitarian model, so arguments may be void in these circumstances.

Another important ethical theory to consider is the Kantian theory, which essentially states businesses are ethically obligated to “do no harm.” Therefore, in accordance with this theory, our proposal would prevail from an ethical perspective since reducing harm to the environment through these initiatives would trump inconvenience or additional costs posed by reducing greenhouse gas emissions that ultimately harm the environment.

Going back to potential risks regarding database management, there are ways to mitigate this. Addressing database vulnerabilities early on is very important to ensure that the database system is robust and recoverable. Input validation techniques, SQL query sanitization, and “blind SQL variables” are some of the ways to protect databases from external or internal threats. Future iterations of the project should provide means of administrative access to certain parts of the database, in which some portions of each relation (table) in the database can be accessed or written. (Account privileges). The datasets we have provided from Sustainable Jersey do not show any confidential information, to begin with (such as vehicle license plates), so we did not have to hide any information in this project. But if this project were to be expanded to support

different datasets that might contain any sensitive information (such as revenue earned by each car manufacturer), then there should be methods to encrypt such info.

Databases should also be recoverable in the case of an unintended failure or risk associated with it. The recovery process should restore the database to the "most recent consistent state" before the failure has occurred. Thus all information related to querying databases, in general, should be kept in a history log. Another way to back up databases is that the database should be available as "copies" across different hosts (prominent in distributed database management systems) to prevent a single point of failure, such as a server crash. While the server is recovering, the server containing the backed-up database can temporarily run without affecting the end-user experience. In regard to keeping databases updated and backed up regularly, developers need to ensure that the datasets being used are up-to-date as well. At the time of this report, we have used datasets from Sustainable Jersey in the 2020-2022 time period. Values regarding GHG, VMT, and EV data are consistently being updated each year (or even bi-annually), so future implementations of the project should provide means to automatically update the table entries when the time comes.

Why the Proposal is Worth Pursuing Despite These Concerns:

Despite the risks and concerns associated with ethics described above, we strongly support that our proposal can still outweigh the downsides. This is because we must see the long-term effects of the continuous use of greenhouse gas emissions produced by non-electric vehicles. By reducing the carbon footprint produced by each gas-powered vehicle, assets that were once hindered by these emissions, such as farms and local beaches, can now have more room to be more environmentally sustainable when GHG usage is reduced. By showing stakeholders which municipalities in New Jersey have low electric vehicle usage relative to the total number of personal vehicles owned in that area, they can motivate car companies to either initiate new project ideas related to the implementation or/improvement of EVs in the area. Of course, the production for making EVs can be more costly, but these vehicles have been shown to be more environmentally stable and cost-effective in the long run. According to a study from the U.S. Department of Energy's National Renewable

Energy Laboratory and the Idaho National Laboratory, “EV owners can save as much as $14,500 on fuel costs by owning an electric car for 15 years. That’s almost $1,000 in savings for every year of driving.” (Discover How Much Money You Can Save With An Electric Vehicle, 2023). Clearly, based on this information and the ethical theories cited above, our proposal is worth pursuing despite the concerns posed, as it has the potential to deliver significant value to the environment and sustainability initiatives in New Jersey as a whole.

Works Cited

“Car Emissions and Global Warming.” *Union of Concerned Scientists*, 2014, https://www.ucsusa.org/resources/car-emissions-global-warming.

“Credits for New Clean Vehicles Purchased in 2023 or After.” *Internal Revenue Service*, 17 Apr. 2023, https://www.irs.gov/credits-deductions/credits-for-new-clean-vehicles-purchased-in-2023-or-after.

“Discover How Much Money You Can Save With An Electric Vehicle”, 2023, https://www.consumersenergy.com/community/sustainability/our-hometown-stories/save-with-an-electric-vehicle#:~:text=According%20to%20a%20study%20from,for%20every%20year%20of%20driving.

EPA, Environmental Protection Agency, https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle#:~:text=typical%20passenger%20vehicle%3F-,A%20typical%20passenger%20vehicle%20emits%20about%204.6%20metric%20tons%20of,8%2C887%20grams%20of%20CO2.

Lindsey, David Herring, AND Rebecca. “How Will Global Warming Harm Human Health and Well-Being?” *NOAA Climate.gov*, 29 Oct. 2020, https://www.climate.gov/news-features/climate-qa/how-will-global-warming-harm-human-health-and

-well-being#:~:text=The%20most%20vulnerable%20people%E2%80%94children,on%20a%20sweltering%20Wednesday%2C%20Aug.