Reviewing Electric Vehicle Policies:
Developing a Method to Review NEVI State Plans

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    - The National Association of State Energy Officials

Abstract

The goal of this project was to develop a method to assist Atlas Public Policy in documenting each state's unique response to proposed NEVI guidelines. We first read through the NEVI guidelines and developed categories and questions based on NEVI's content. Then, as time permitted, we reviewed state plans to document examples of how states addressed and implemented the NEVI guidelines in their plans. Based on our results, our recommendations included actions future teams can take to continue this project, a computer program to facilitate state plan reviewing, how Atlas Public Policy can stay updated on current and future issues, and what policymakers can do to improve state plans and NEVI guidelines.

Reviewing Electric Vehicle Policies:

Developing a Method to Review State NEVI Plans

Executive Summary

December 15, 2022

Introduction

The National Electric Vehicle Infrastructure (NEVI) Formula Program is a five-year federally funded program designed to provide each state with the funds necessary to strategically deploy electric vehicle (EV) charging infrastructure (U.S. Department of Transportation [USDOT], 2022). The goal of the NEVI program is to establish an interconnected EV network to make chargers more accessible, in order to promote a nationwide transportation electrification effort. As of Fall 2022, all 50 states, Puerto Rico, and the District of Colombia submitted plans to the USDOT proposing how they will follow the NEVI guidelines, and all have been approved for funding by the Federal Highway Administration (FHWA).

Each state included different implementation practices and problem-solving strategies to satisfy the NEVI guidelines and to address their unique state-based transportation challenges. Documentation of these unique approaches, solutions, and distinct methods used to satisfy NEVI guidelines enables EV stakeholders to help improve the effectiveness of the nationwide initiative as time progresses.

Goal and Objectives

The goal of this project was to develop a method to document each state plan's unique response to proposed NEVI guidelines. We developed these three objectives to accomplish this goal:

1. Develop a set of categories and questions to facilitate the review of a selected group of state plans.
2. Select and review a set of state plans. This objective has two parts:
    2.1. Select and review state plans using the categories and questions.
    2.2. Use the results of the state plan reviews to document the state responses to NEVI guidelines.
3. As time permits, review additional state plans using the categories and questions.

Background

Anthropogenic global warming, partially caused by the emissions of greenhouse gases (GHGs), has caused an increase in heat-related diseases and is harmful to water sources and crop cultivation (Wang et al, 2022). In the United States, the largest contributing sector to the emissions of GHGs is the transportation sector at 27 percent (EPA, 2022a). As a result, the U.S.

is now focused on the electrification of its transportation sector (U.S Department of Transportation, 2022). This electrification effort is focused on encouraging vehicle owners to transition to EVs since fully electric vehicles emit no direct GHGs compared to internal combustion engine (ICE) vehicles (Koengkan et al., 2022).

However, switching to EVs presents its own challenges which limit their rapid and widespread adoption (Koengkan et al., 2022). For example, a primary concern of EV adoption is an EV's relatively limited range due to battery capacity. Although most EVs have enough battery capacity to cover the average American's daily travel distance of about 50 miles, many EV owners would be challenged to operate their vehicle for trips over 250 miles because of the relative lack of chargers on highways (EPA, 2022b; Noel et al, 2020). In addition, EV chargers are often either difficult to locate, non-functional because of poor maintenance, or unavailable in part because the infrastructure needed for EV chargers is not fully in place (LaChance, 2022).

The NEVI program was established under the Bipartisan Infrastructure Law (BIL), also known as the Infrastructure Investment and Jobs Act (IIJA). The BIL provides $1.2 trillion in federal funding over the next ten years for the improvement of various infrastructures across the nation. The NEVI program is a five-year, $5 billion fund with the goal of establishing an interconnected network of 500,000 EV chargers nationwide by 2030 (The White House, 2021).

Methodology

We used the NEVI guidelines to develop a set of categories and questions by which individual state plans could be reviewed and implementation practices could be discerned. Categories refers to a subject addressed within the NEVI guidelines, and each category includes questions, which aid in discerning state plan implementation practices. As time permitted, we reviewed state plans, using the categories and questions, to document examples of how states responded to and implemented the NEVI guidelines in their plans. Finally, we summarized the data for each state plan into an Excel spreadsheet.

Results

Our team reviewed the NEVI guidelines, documenting information that we noted as relevant or significant. We discovered that most of the content within the guidelines were suggestions, while the number of proposed NEVI requirements was limited. Through our review, we identified six categories and organized our questions accordingly:

1. Equity & Environmental Justice (EJ)
2. Buildout
3. Maintenance & Reliability
4. Evaluation
5. Medium- & Heavy-Duty (MDHD) Vehicles
6. Energy Storage & Renewable Energy

With these categories and their associated questions, we reviewed eight state plans. From reviewing the state plans, we learned that state plan terminology and content organization were inconsistent. The states we reviewed can be found in Figure ES.1.

Massachusetts (MA)	Hawaii (HI)	Wisconsin (WI)	Georgia (GA)
New Jersey (NJ)	Colorado (CO)	Louisiana (LA)	Washington (WA)

Figure ES.1: A table containing state plans the team reviewed. Each is a link to the original state plans.

While reviewing state plans, exceptions to the NEVI guidelines were rarely encountered. These exceptions were often requested to adapt to situations where NEVI compliance was not feasible, either due to physical constraints or due to a lack of sufficient funding.

Feedback

Through the feedback received from stakeholder organizations, we learned of some of the challenges we would encounter when reading through the state plans, such as many states not explicitly detailing their implementation practices, or the NEVI guidelines not being finalized. Due to these uncertainties, we were advised to exercise caution in drawing too many conclusions about state responses.

Keyword Search Program

Due to the difficulty of locating specific state responses to the NEVI guidelines, a team member created a State Plan Keyword Search (SPKS) program. This program was used to aid in the review of state plans by locating instances of key terms and phrases in the state plans and presenting them to the user.

Excel Spreadsheet

After reviewing the eight state plans, we documented state responses to the NEVI guidelines using multiple Excel spreadsheets. When creating the spreadsheets, we realized that some of the questions only led to yes or no answers. We decided it would be more useful for EV stakeholders to know types of engagement methods states used for stakeholder outreach, benefits for disadvantaged communities (DACs), DAC identification, etc. Remaining questions were then refined to align with this realization for the equity, buildout, and maintenance categories.

Below are recommendations for Atlas Public Policy, NEVI policymakers and states, and future project teams to address accessibility to state plan information and the evaluation of state plans.

Recommendations

1. **Use the methods, categories and questions developed for this project to review the remaining state plans.**

We recommend that Atlas Public Policy creates another team, through means such as internships or existing staff members, to continue reviewing remaining state plans as soon as possible. Without having a 7-week time constraint, this team could also ensure all remaining state plans are reviewed and key findings are documented.

2. **Develop a word searching program that can be dynamically configured and used to scan plans for keywords and phrases.**

To facilitate state plan reviews and documentation, we recommend that Atlas Public Policy modify and improve the program submitted along with this report, the State Plan Keyword Search (SPKS) program, to best suit their needs. Alternatively, Atlas can develop their own keyword search program, referencing the SPKS program, for the review of current or future state plans.

3. **Review state updated NEVI funding and expenditures on an annual basis.**

States are required to report expenditures to NEVI for each fiscal year. Those reports should include how the state prioritized their funding, distributed funding to third parties, and matched the cost-share requirement. Fundings and expenditure reviews would help NEVI and other EV stakeholders understand how each state is spending funds and best practices.

4. **Organize an annual workshop to facilitate cooperation between states and the identification of best practices.**

We recommend that NEVI be required to organize an annual workshop for state representatives and require those representatives to provide a summary statement regarding state plan evaluations after each fiscal year of state plan implementation.

5. **Develop methods for EV users to provide feedback on their use of NEVI charging stations.**

Methods could include feedback forms such as QR codes, surveys, and follow-up emails or messages. EV user feedback would enable faster repair and maintenance. Ensuring NEVI chargers are being maintained and repaired, in a timely manner, helps provide a positive user experience and states with assurance that NEVI chargers are being properly maintained.

6. **Require standard terms to be used by all state plans.**

United States Department of Transportation (USDOT) and Federal Highway Administration (FHWA) should develop a list of standard terms to be used by all state plans, by the next fiscal year. State plan terminology is inconsistent when discussing NEVI topics.

Authorship Table

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2.0	All	
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4.0	All	
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Appendix C	Nicholas Borrello	
Appendix D	Daniel Thu	
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Appendix F	All	

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1.0 Introduction

The National Electric Vehicle Infrastructure (NEVI) Formula Program is a five-year federally funded program designed to provide each state with the funds necessary to strategically deploy electric vehicle (EV) charging infrastructure (U.S. Department of Transportation [USDOT], 2022). The goal of the NEVI program is to establish an interconnected EV network to make chargers more accessible, improve charger reliability, facilitate charger user data collection, reduce range anxiety, and promote a nationwide transportation electrification effort. The program seeks to accomplish this goal with proposed guidelines, which all 50 states, Puerto Rico, and the District of Colombia, must follow. Some of these guidelines include establishing a maximum charger-to-charger distance, improving availability of charging stations in disadvantaged communities, and requiring inclusion of maintenance plans (US Department of Energy, 2022). As of Fall 2022, all 50 states, Puerto Rico, and the District of Colombia submitted plans to the USDOT proposing how they will follow the NEVI guidelines, and all have been approved for funding by the Federal Highway Administration (FHWA).

Each state included different implementation practices and problem-solving strategies to satisfy the NEVI guidelines and to address their unique state-based transportation challenges. Each state proposal was influenced by its own geographical region, its climate, or issues that reflected the desires of the state's electorate (personal communications from Atlas Public Policy, Fall 2022). Documentation of these unique approaches, solutions, and distinct methods used to satisfy NEVI guidelines enables EV stakeholders to help improve the effectiveness of the nationwide initiative as time progresses. Organizations such as the Joint Office of Energy and Transportation, the Alliance for Transportation Electrification, EVGrid network, and other non-government organizations (NGOs) would benefit from having this level of detail documented and easily accessible for other states and other EV stakeholders.

The goal of this project was to develop a method to document each state plan's unique response to proposed NEVI guidelines. We developed these three objectives to accomplish this goal:

1. Develop a set of categories and questions to facilitate the review of state plans.
2. Select and review an initial set of eight state plans.
3. As time permits, review additional state plans.

2.0 Background

This section focuses on the role of EVs in addressing greenhouse gas (GHG) induced climate change, the concept of range anxiety (one of the primary challenges preventing widespread EV adoption), and a description of the NEVI program.

2.1 Greenhouse Gases

While fossil fuels have been a historical energy source used to operate factories, heat homes, and power motorized vehicles, the use of fossil fuels and the corresponding GHG emissions have resulted in a rise in the earth's temperature (Mcrae, 2019). Anthropogenic global warming has, in turn, caused an increase in heat-related diseases, and is harmful to water sources and crop cultivation (Wang et al, 2022).

As illustrated in Figure 1, the largest contributing sector to the emissions of GHGs is the transportation sector at 27 percent (EPA, 2022a). More than half of the transportation sector's emissions come from passenger vehicles, mainly due to the number of internal combustion engine (ICE) vehicles currently on the road (Wang et al, 2022; Reynolds, 2021).

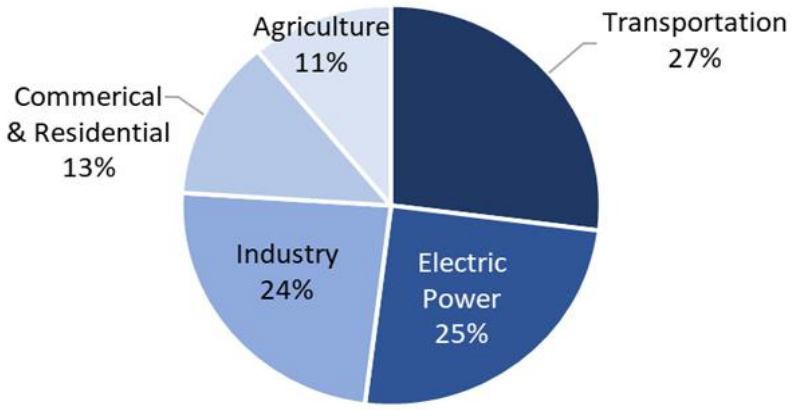

Figure 1: GHG emissions by sector in 2020. This pie chart depicts how the major economic sectors of the U.S. contribute to GHG emissions, with the transportation sector at 27%. (Adapted from EPA, Figure 1. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions)

Carbon dioxide (CO_2) comprises most of the GHGs emitted from the transportation sector due to ICE passenger vehicles' reliance on fuels such as gasoline and diesel. On average, a passenger vehicle produces 4.6 metric tons of CO_2 per year, however, this number varies due to factors such as the model of the vehicle, the type of fuel used, and the vehicle's daily driving conditions (EPA, 2022b). In addition to the operating emissions of ICE vehicles, their manufacturing process, along with the collection, refinement, and redistribution of their fuel sources, all result in additional GHGs emitted (EPA, 2022b).

2.2 Adoption of EVs

As a result of the increasing levels of GHG emissions in the U.S., the U.S. is now focused on the electrification of its transportation sector (U.S Department of Transportation, 2022). This electrification effort is focused on encouraging vehicle owners to transition to EVs since fully electric vehicles emit no direct GHGs compared to ICE vehicles (Koengkan et al., 2022).

However, switching to EVs presents its own challenges which limit their rapid and widespread adoption (Koengkan et al., 2022). For example, a primary concern of EV adoption is an EV's relatively limited range due to battery capacity. Although most EVs have enough battery capacity to cover the average American's daily travel distance of about 50 miles, many EV owners would be challenged to operate their vehicle for trips over 250 miles because of the relative lack of chargers on highways (EPA, 2022b; Noel et al, 2020). In addition, EV chargers are often either difficult to locate, non-functional because of poor maintenance, or unavailable in part because the infrastructure needed for EV chargers is not fully in place (LaChance, 2022).

These limitations may lead to range anxiety, the EV owners' uncertainty about how far they can travel or if the car can reach its destination without being recharged, or even if a charger can be found if needed prior to reaching the desired destination (Green et al, 2014). Some issues with EV chargers that may impact range anxiety include:

- Charger access near residential buildings
  - Buildings, like condos or apartments, may not allow access to EV chargers available in their parking lots to non-building users.
  - Some buildings do not have off-street parking for charger placement (Tuss et al., 2022).
- Charger maintenance
  - Chargers are often damaged due to the weather (Tuss et al., 2022).
  - Some chargers are vandalized (Tuss et al., 2022).
  - At existing charger locations, maintenance personnel may be reluctant to conduct repairs due to a lack of demand for EV chargers (Ichien, 2019).
- Charging level
  - Some chargers cannot provide enough energy to charge an EV in a reasonable amount of time (Birk Jones et al., 2022).

All these factors may contribute to a poor user experience since they increase the inaccessibility of chargers and exasperate the range anxiety of owners.

2.3 NEVI

The NEVI program was established under the Bipartisan Infrastructure Law (BIL), also known as the Infrastructure Investment and Jobs Act (IIJA). The BIL provides $1.2 trillion in

federal funding over the next ten years for the improvement of various infrastructures across the nation. The NEVI program is a five-year, $5 billion fund with the goal of establishing an interconnected network of 500,000 EV chargers nationwide by 2030 (The White House, 2021).

To achieve this goal, the NEVI program created a set of state proposal guidelines, which all 50 states, Puerto Rico, and the District of Columbia are required to follow. Some of the topics addressed within the guidelines include a maximum distance between chargers on the Interstate Highway System (IHS), a charging level standard for all EV chargers nationwide, and the required inclusion of long-term maintenance and equity plans.

Through these guidelines, NEVI ensures that the interconnected network the states are building will improve the accessibility and reliability of chargers nationwide, while also facilitating the collection of EV data, such as charging time and charging station popularity. Subsequently, the United States hopes to reduce owner range anxiety and significantly increase the number of EV owners and users. As of Fall 2022, all 52 plan proposals have been approved, enabling states to work towards building NEVI's interconnected EV network.

3.0 Methodology

The goal of this project was to develop a method to document each state's unique response to proposed NEVI guidelines. To accomplish this goal, we identified three objectives:

1. Develop a set of categories and questions to facilitate the review of a selected group of state plans.
2. Select and review a set of state plans. This objective has two parts:
   - 2.1 Select and review state plans using the categories and questions.
   - 2.2 Use the results of the state plan reviews to document the state responses to NEVI guidelines.
3. As time permits, review additional state plans using the categories and questions.

Below, the methods associated with each objective are detailed.

3.1 Develop Categories and Questions

The focus of Objective 1 was to use the NEVI guidelines to develop a set of categories and questions by which individual state plans could be reviewed.

Categories and Questions

The NEVI state plan review method was based on a system of categories and questions. For this report, the term "category" refers to a subject addressed within the NEVI guidelines, and which includes questions related to that subject which help discern individual implementation practices.

Equity and Environmental Justice

- Does the state engage or make use of Justice40?
- How does the state identify, categorize, and prioritize underserved communities within its state plan?
- …

Figure 2: Example of a category and questions based on the research we conducted with the help of our sponsors.

To develop the questions, we reviewed the NEVI guidelines, and noted three key concepts which comprised the majority of NEVI's proposed requirements. We identified equity, buildout, and maintenance as those key concepts, which we then used as the categories to develop the questions. Figure 2 provides an example of three questions that are part of a key category.

3.2 Evaluate State Plans

An initial set of eight state plans was reviewed to identify unique implementation practices which addressed NEVI guidelines. We used the National Association of State Energy Officials (NASEO) map of regions, which was created to facilitate coordination between states, to choose one or two state plans per region, at random, for review (National Association of State Energy Officials [NASEO], 2022). Finally, more questions were created based on the additional implementation practices identified.

We applied the categories and questions from Objective 1 to eight state plans to identify each state's unique response to the NEVI guidelines. We then documented those responses between the eight state plans by category and question. Finally, we summarized the data for each state plan into multiple Excel spreadsheets, one spreadsheet for each category.

3.3 Apply the Method to Additional State Plans

The method created in Objectives 1 and 2 was applied to additional state plans, as time permitted. New questions were created and then added to the methodology to document implementation practices which were not present in the initial eight state plans reviewed.

4.0 Results and Findings

This section presents the results and findings of the research conducted over the seven weeks of this project.

4.1 Review of the NEVI Guidelines

4.1.1 Identified Categories and Questions

Our team reviewed the NEVI guidelines, documenting information that we noted as relevant or significant. We discovered that most of the content within the guidelines were suggestions, while the number of proposed NEVI requirements was limited. We formed individual questions based on the suggestions and proposed NEVI requirements. Then, we organized the questions based on the topics they addressed and identified the following six categories:

- Equity & Environmental Justice (EJ)
- Buildout
- Maintenance and Reliability
- Evaluation
- Medium- & Heavy-Duty (MDHD) Vehicles
- Energy Storage & Renewable Energy

4.1.2 Feedback from Organizations

After reviewing the NEVI Guidelines, we developed a one-page summary (Appendix A) highlighting the categories and questions we used to facilitate the review of the selected group of state plans. This summary was then sent to the Joint Office of Energy and Transportation, the National Association of State Energy Officials (NASEO), and the American Association of State Highway and Transportation Officials (AASHTO), each of which responded and provided feedback.

Through the feedback received, we learned of some of the challenges we would encounter when reading through the state plans. One significant challenge made apparent by the feedback was that many of the state plans describe their intentions or considerations. However, state plans do not provide detailed implementation statements in their responses because most states are still developing their programs. We also learned that the requirements mentioned within the guidelines are not finalized. Due to these uncertainties, we were advised to exercise caution in drawing too many conclusions about state responses, especially responses that lack details in topics such as charger deployment and maintenance.

4.2 Review of Initial Set of Eight State Plans

4.2.1. Understanding State Plans

Figure 3 depicts each selected state plan chosen from the NASEO regional map. The eight selected states included in our review were the following[1]:

- Massachusetts (MA)
- New Jersey (NJ)
- Hawaii (HI)
- Colorado (CO)
- Wisconsin (WI)
- Georgia (GA)
- Louisiana (LA)

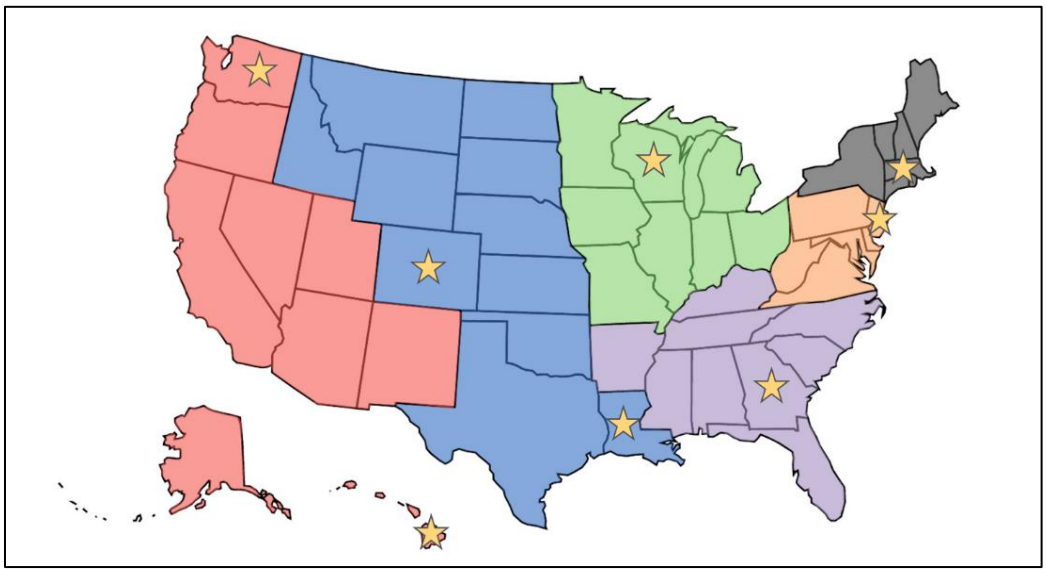

Figure 3: This NASEO regional map depicts which states were selected from each region. (Adapted from NASEO, Figure 3. https://www.naseo.org/naseo-regions)

States followed a recommended template to organize their plan's content into specified sections provided by NEVI, however, states still controlled the organization of their content within each section. Because of states' different content organization, it was difficult to consistently locate and document state implementation practices. For example, some implementation details were repeatedly found throughout a state plan rather than in a specific location; this caused confusion in determining how states responded to NEVI guidelines. In addition, terminology between state plans and NEVI guidelines was inconsistent. This

[1] Each state is hyperlinked to a downloadable version of that state's NEVI proposal.

inconsistent terminology led the team to develop a list of terms (Appendix F) to facilitate the review and documentation of state plans.

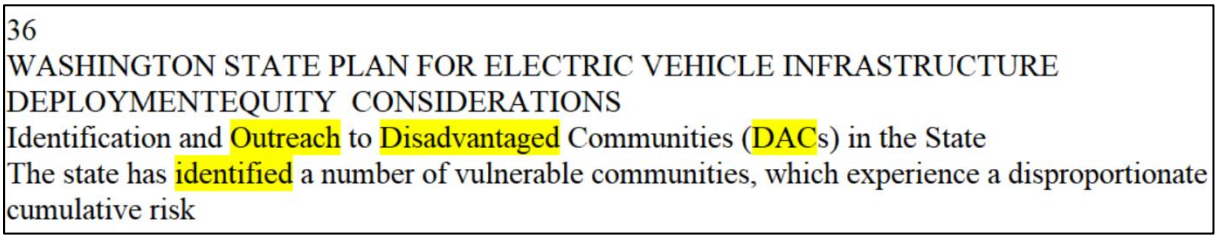
36
WASHINGTON STATE PLAN FOR ELECTRIC VEHICLE INFRASTRUCTURE DEPLOYMENTEQUITY CONSIDERATIONS
Identification and Outreach to Disadvantaged Communities (DACs) in the State
The state has identified a number of vulnerable communities, which experience a disproportionate cumulative risk

Figure 4: Screenshot displaying SPKS program's output of the WA state page number and highlighted key terms relating to identification of disadvantaged communities.

Due to the difficulty of locating specific state responses to the NEVI guidelines, a team member created a STATE PLAN KEYWORD SEARCH (SPKS) program. This program was used to aid in the review of state plans by locating instances of key terms and phrases within the state plans and presenting them to the user. Figure 4 is an output example of the program which includes highlighted key terms for the identification of disadvantaged communities (DACs) in the Washington state plan. (Appendix C)

4.2.2. State Plan Content

Since state proposals were due only a short time after NEVI's request for proposals was published, the state plans generally described their intentions or considerations of NEVI guidelines rather than explaining how a state will implement their plans. As a result, state plans differed to some extent from what was expected. For example, plans for maintenance and buildout were often to be contracted to third party entities, which for those states were not yet established. Consequently, charger deployment and maintenance were to be determined later in the planning process.

4.2.3. Excel Spreadsheets of State Responses to NEVI

After reviewing the eight state plans, we documented state responses to the NEVI guidelines using multiple Excel spreadsheets. Each category was made into its own Excel spreadsheet (Appendix B), each containing tables describing state responses.

When creating the Excel spreadsheets, we realized that some of the questions only led to yes or no answers. We decided it would be more useful for EV stakeholders to know types of engagement methods states used for stakeholder outreach, benefits for DACs, DAC identification, etc. Remaining questions were then refined to align with this realization for the equity, buildout, and maintenance categories.

In addition, some questions and state responses were worth noting due to the uniqueness of state responses regarding a question. We documented state responses that differed from one another rather than those responses that were similar throughout all states.

4.2.4. State Plan Exceptions

State plan exceptions to the NEVI guidelines were rarely encountered while reviewing state plans. These exceptions were often requested to adapt to situations where NEVI compliance was not feasible, either due to physical constraints, such as the fact that charging stations cannot be installed on bridges and in tunnels, or due to a lack of sufficient funding, which limits the number of new charging stations a state can install. Most of the exceptions found focused on increasing the maximum charger-to-charger distance, the charger station-to-intrastate highway (IHS) distance, and the charger power level.

Hawaii was one of the reviewed state plans that listed exceptions. One of the state's more unique exceptions focused on reducing the total power output of a charging station that Hawaii's Department of Transportation (HDOT) intends to install on the island of Moloka'i. In this case, due to the island's small population, its electric grid was inadequate to handle the required 600kW charger output. Since HDOT did not have the funds to improve the grid, asking for an exception was necessary. Figure 5 includes additional information from states which also incorporated exceptions and the reasons for those exceptions.

State	Number of Exceptions	Exception Topics	Reason for Exception
NJ	7	• Charger to IHS Distance	• Grid Capacity • Equity Problems • Geographical Problems • Extraordinary Cost
HI	5	• Charger to Charger Distance • Charger to IHS Distance • Total Charger Output	• Grid Capacity • Extraordinary Cost
CO	1	• Charger to Charger Distance	• Geographical Problems • Extraordinary Cost
GA	2	• Charger to IHS Distance	• Promotion of Unhealthy Competition

Figure 5: A table detailing which states have asked for exceptions, the number of exceptions, the topics they wish to get an exception for, and the reasons why they were asked.

4.3 Review of additional state plans

Due to our time constraint, we reviewed one additional state plan. As a result, Texas was included within the Excel spreadsheet. Figure 6 depicts the addition of Texas within the selected state plans.

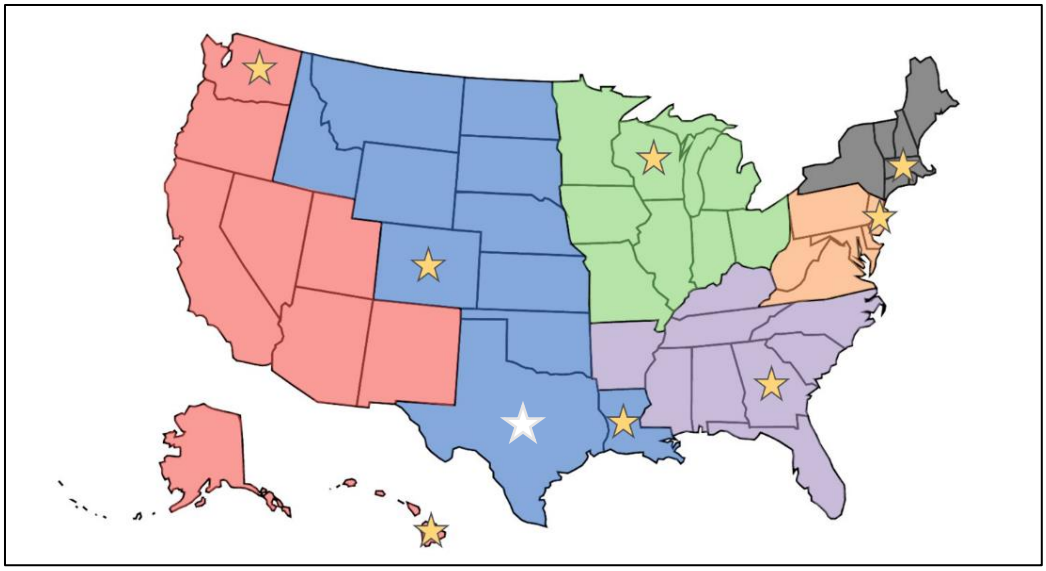

Figure 6: This NASEO regional map depicts which states were selected from each region, with the addition of Texas. (Adapted from NASEO, Figure 6. https://www.naseo.org/naseo-regions)

5.0 Recommendations

Below are recommendations for Atlas Public Policy, NEVI policymakers and states, and future project teams to address accessibility to state plan information and the evaluation of state plans.

5.1 Use the methods, categories and questions developed for this project to review the remaining state plans.

We recommend that Atlas Public Policy creates another team, through means such as internships or existing staff members, to continue reviewing remaining state plans as soon as possible. Without having a 7-week time constraint, this team could also ensure all remaining state plans are completed. At least one person on the team should be a professional data analyst to ensure that the data is formatted correctly.

There are two methods which the team can take into consideration to review the remaining state plans. The first is having each member focus on a specific category, becoming a "category expert" for the remaining state plans. Category experts review state plans based on their assigned category. The second is having each member become a "state expert." Each state expert is responsible for reviewing a specific set of state plans.

5.2 Develop a word searching program that can be dynamically configured and used to scan plans for keywords and phrases.

The review of state plans was a time-consuming process due to each plan's length, inconsistent terminology, and content organization. To facilitate state plan reviews and documentation, we recommend that Atlas Public Policy modify and improve the program submitted with this report, the State Plan Keyword Search (SPKS) program, to best suit their needs. Alternatively, Atlas can develop their own keyword search program, referencing the SPKS program, for the review of current or future state plans.

This program should:

- Allow users to input sets of keywords with the same meaning (e.g., DACs, disadvantaged communities, underserved communities)
- Allow users to input multiple sets of keywords to search simultaneously
- Support multiple search "modes", such as custom searches or preset searches
- Allow for output of all page numbers containing instances of key words

Suggested Improvements

- Make the program compatible with DOCX files as well PDF files to improve overall accuracy and consistency
- Improve the user interface and ease of use

For reviewing state plans, users can input their own keywords, select from a provided list of words, or modify these preset lists to best suit their needs.

5.3 Review updated state NEVI funding and expenditures on an annual basis.

We recommend Atlas Public Policy reviews state NEVI funding and expenditures on an annual basis. States are required to report expenditures to NEVI for each fiscal year. Those reports should include how the state prioritized their funding, distributed funding to third parties, and matched the cost-share requirement. Funding and expenditure reviews would help NEVI and other EV stakeholders understand how each state is spending funds and best practices.

5.4 Organize an annual workshop to facilitate cooperation between states and the identification of best practices.

We recommend that NEVI be required to organize an annual workshop for state representatives and require those representatives to provide a summary statement regarding state plan evaluations after each fiscal year of state plan implementation. An annual workshop and summary statement will allow states to view and discuss significant findings, best practices, and problem-solving strategies identified from other states' plan execution. As a result, states could recognize best practices that each state could incorporate as they move forward in their plan development and implementation.

5.5 Develop methods for EV users to provide feedback on their use of NEVI charging stations.

We recommend states require NEVI charging stations to provide feedback methods which would enable users to report charger damage, user experience, maintenance needs, etc. Methods could include feedback forms such as QR codes, surveys, and follow-up emails or messages. EV user feedback would enable faster repair and maintenance. Ensuring NEVI chargers are being maintained and repaired, in a timely manner, helps provide a positive user experience and states with assurance that NEVI chargers are being properly maintained.

5.6 Require standard terms to be used by all state plans.

We recommend that the United States Department of Transportation (USDOT) and Federal Highway Administration (FHWA) develop a list of required terms for state plans to reference and use, by the next fiscal year. Currently, the terminology used between state plans is inconsistent when discussing NEVI topics, and as a result, reviewing state plans is difficult. Figure 7 displays a table that includes potential terms NEVI should require state plans to use.

Required NEVI Terms	Definitions	Terms used by State Plans
Equity	A subject addressing aspects in the state plan dealing with environmental justice, community advocacy organizations, Justice40, etc.	N/A
Environmental Justice	Implementation practices which deal with fair treatment from environmental impacts, communicating with environmental advocacy groups, etc.	Environmental Equity
Disadvantaged Community (DAC)	An area identified by the state as being at-risk, or that displays the specifications described within Justice40.	Underserved Community, Rural

Figure 7: A table detailing potential terms NEVI should require state plans to use, their definitions, and other terms state plans used which should be replaced by the required terms.

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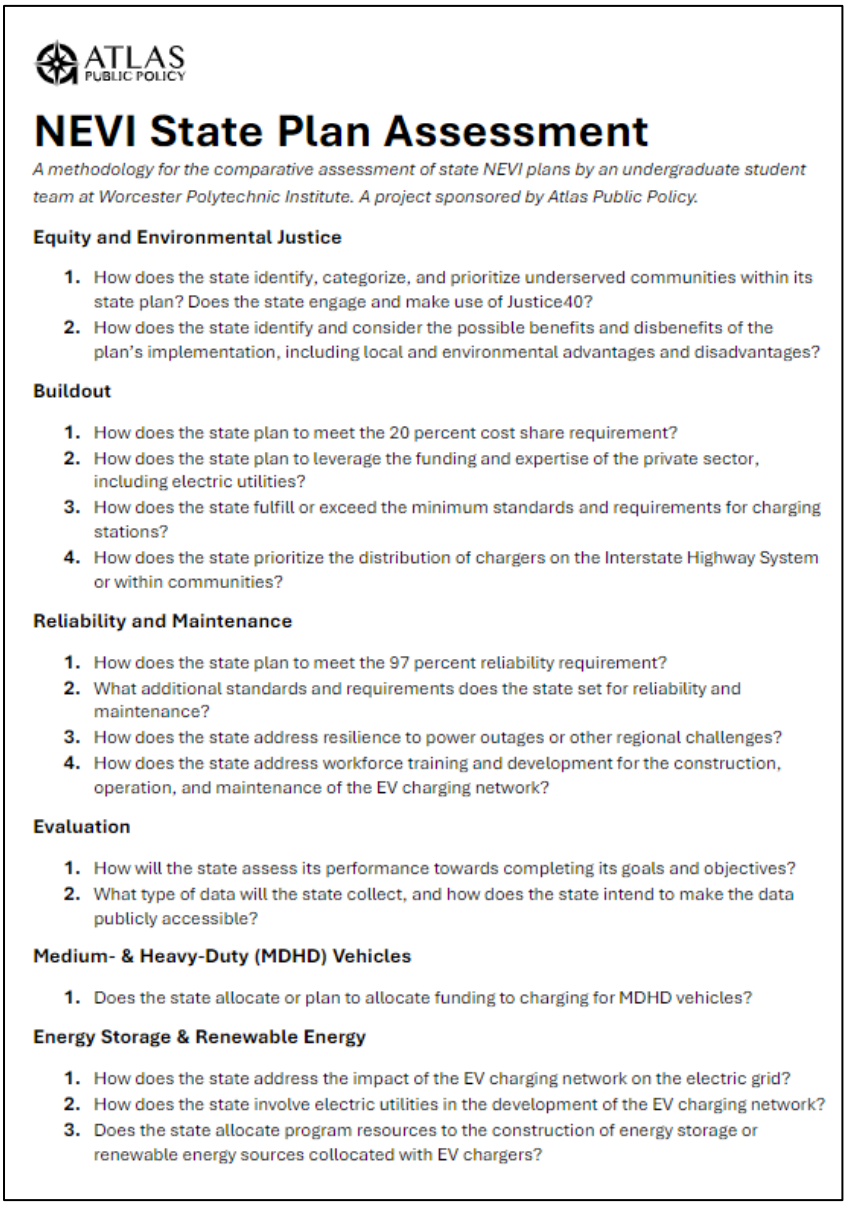
Appendices

Appendix A:
Original Project Summary

This is a one-page summary that formed the basis of our data collection. More information relating to this document and other data collected can be found in the addendum ATLAS STUDENT TEAM DATA which was submitted alongside this project. To gain access, open the addendum directly through the project submission.



ATLAS PUBLIC POLICY

NEVI State Plan Assessment

A methodology for the comparative assessment of state NEVI plans by an undergraduate student team at Worcester Polytechnic Institute. A project sponsored by Atlas Public Policy.

Equity and Environmental Justice

1. How does the state identify, categorize, and prioritize underserved communities within its state plan? Does the state engage and make use of Justice40?
2. How does the state identify and consider the possible benefits and disbenefits of the plan's implementation, including local and environmental advantages and disadvantages?

Buildout

1. How does the state plan to meet the 20 percent cost share requirement?
2. How does the state plan to leverage the funding and expertise of the private sector, including electric utilities?
3. How does the state fulfill or exceed the minimum standards and requirements for charging stations?
4. How does the state prioritize the distribution of chargers on the Interstate Highway System or within communities?

Reliability and Maintenance

1. How does the state plan to meet the 97 percent reliability requirement?
2. What additional standards and requirements does the state set for reliability and maintenance?
3. How does the state address resilience to power outages or other regional challenges?
4. How does the state address workforce training and development for the construction, operation, and maintenance of the EV charging network?

Evaluation

1. How will the state assess its performance towards completing its goals and objectives?
2. What type of data will the state collect, and how does the state intend to make the data publicly accessible?

Medium- & Heavy-Duty (MDHD) Vehicles

1. Does the state allocate or plan to allocate funding to charging for MDHD vehicles?

Energy Storage & Renewable Energy

1. How does the state address the impact of the EV charging network on the electric grid?
2. How does the state involve electric utilities in the development of the EV charging network?
3. Does the state allocate program resources to the construction of energy storage or renewable energy sources collocated with EV chargers?

Appendix B:
Atlas Excel Spreadsheets

After reviewing the eight state plans, we documented each state's responses to the NEVI guidelines using multiple Excel spreadsheets (ATLAS EXCEL SPREADSHEETS) submitted alongside this report. Each category was made into its own Excel spreadsheet, each containing tables describing state responses related to that category.

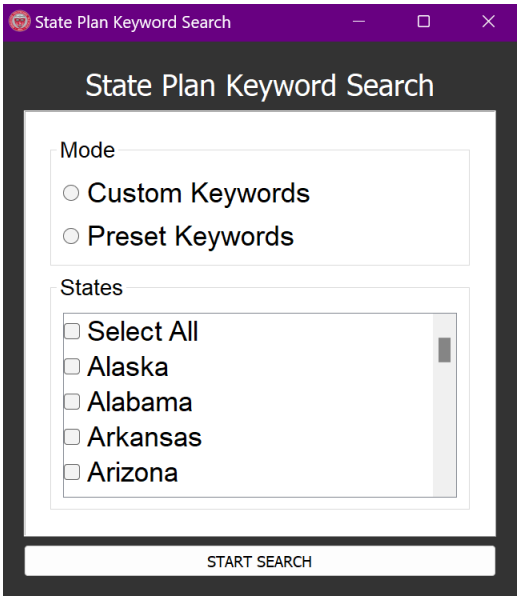
The USER'S GUIDE TO STATE PLAN DATA, submitted with this report, provides an explanation of an example Excel spreadsheet, detailing its topics, qualities, organizational structure, and terms used. This document can be accessed directly through the project submission.

Appendix C:
State Plan Keyword Search (SPKS) Walkthrough

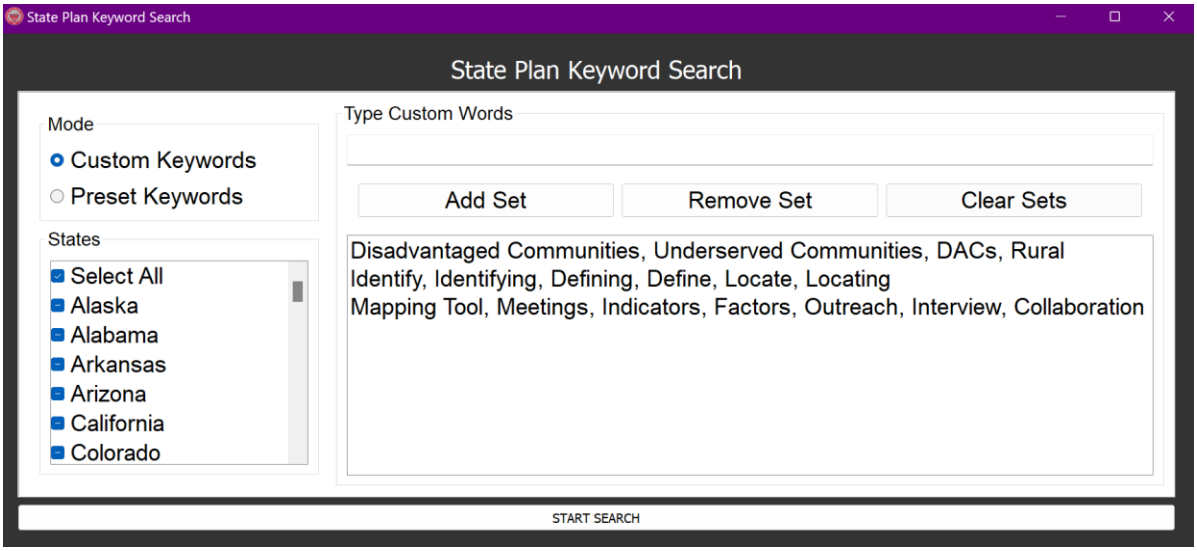
To aid with the state plan reviewing process, one of our team members wrote a program in Python that can search for specific keywords within the plans all at once. This program can be accessed by running the STATE_PLAN_KEYWORD_SEARCH.EXE file submitted along with this report. The files needed to run the program can be accessed here, and, for those interested, the source code can be accessed here. Detailed instructions and examples for accessing the program through GitHub will follow.

To download the files required to run this program from GitHub, open the first link provided above. Select "Code", and then "Download ZIP". Then, extract the files from the ZIP. The extracted folder contains files titled *plans* and *State_Plan_Keyword_Search.exe*. The *plans* folder containing all 52 plans and the *State_Plan_Keyword_Search.exe* file must be in the same folder for this program to function. Finally, in the extracted folder, open STATE_PLAN_KEYTERM_SEARCH.EXE to run the program.

This system was beta tested by another team member on his own computer. Below is a walkthrough for the program.



The program will first ask users to select one of the two modes and to input the state plans they would like to review. The "Custom Keywords" mode will allow the user to input their own sets of keywords, and the "Preset Keywords" mode will provide preset keywords based on different categories and questions.



If the "Custom Keywords" mode is selected, users can input their own sets of keywords to search for. The program will then take these sets and locate pages in the state plans that contain at least one word from each of the sets.

Disadvantaged Communities, Underserved Communities, DACs, Rural
Identify, Identifying, Defining, Define, Locate, Locating
Mapping Tool, Meetings, Indicators, Factors, Outreach, Interview, Collaboration

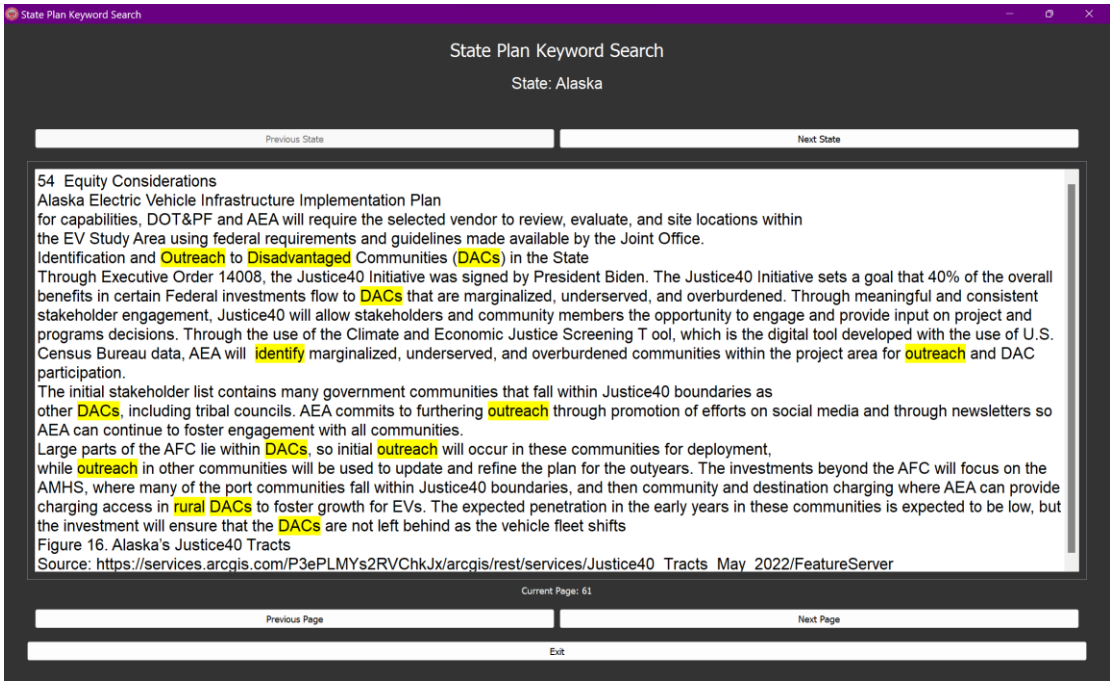
The image above showcases three different sets of keywords. If a page contains the phrase "Disadvantaged Communities" found within the first set, and it also contains the word "Identify" from the second set, but it does not include any of the words in the third set, then the page will not be printed.

Disadvantaged Communities, Underserved Communities, DACs, Rural

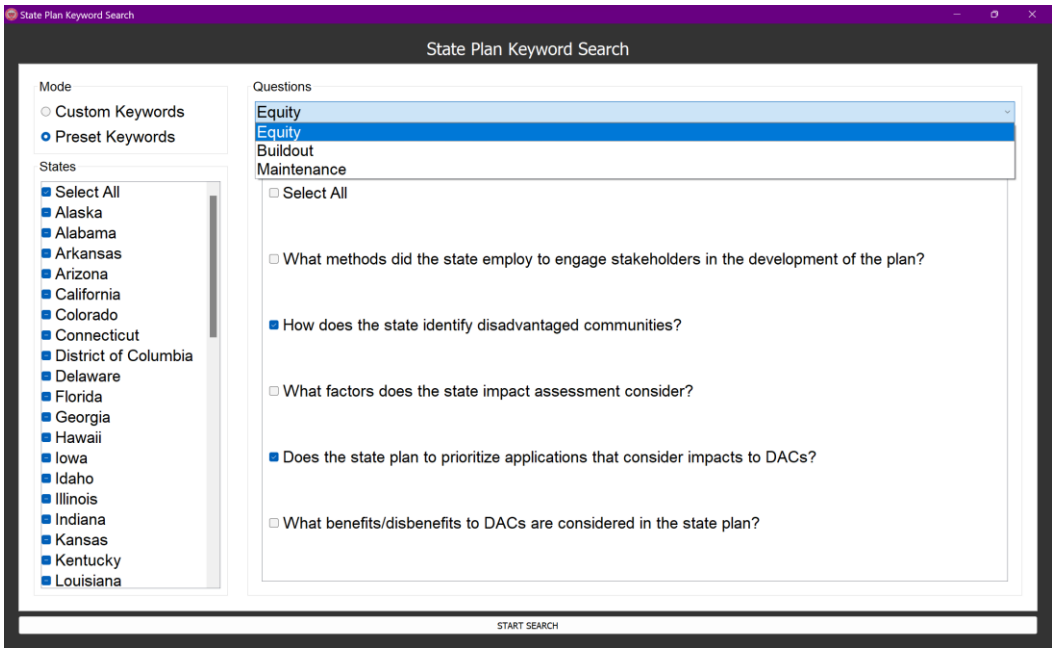
Each set is a comma-separated list of words. These sets can be made up of words with similar or identical definitions. The set above contains the different terminology that state plans use to refer to disadvantaged communities. This allows for the program to avoid issues with inconsistent terminology across state plans by searching for many different terminologies all at once.

Mapping Tool, Meetings, Indicators, Factors, Outreach, Interview, Collaboration

Sets can also contain words that correspond to different implementation practices found in state plans. The set above contains many of the different methods that states were using to identify their disadvantaged communities. Sets such as these can be helpful to locate specific ways that states are responding to different topics within their plans.

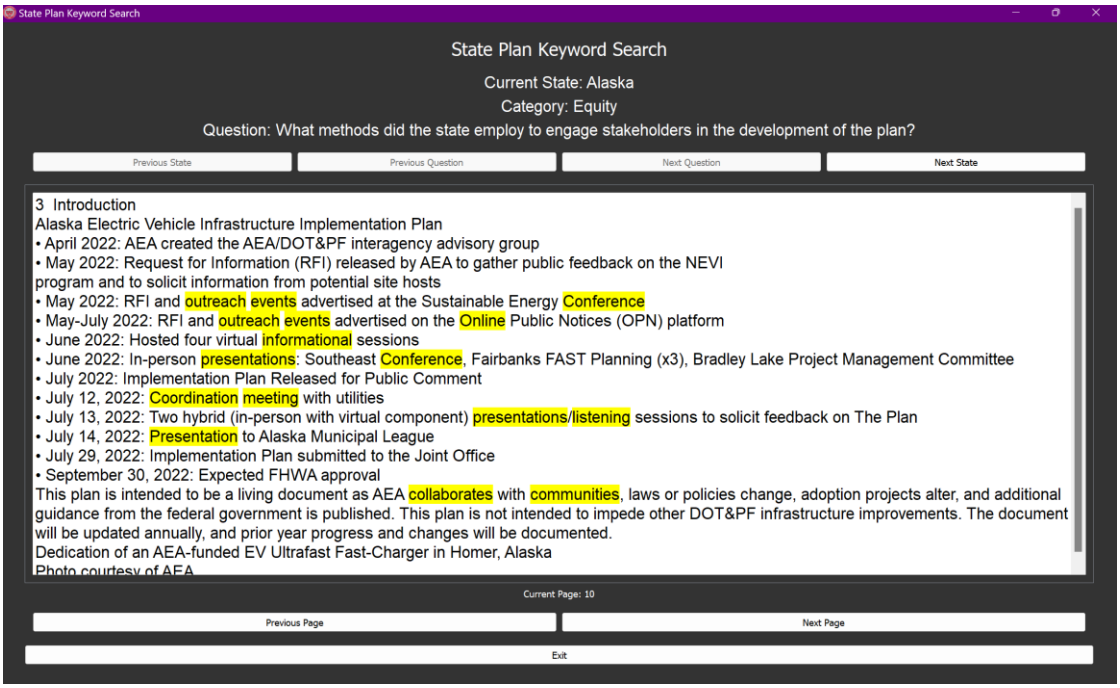


When the user presses the "START SEARCH" button with "Custom Keywords" mode selected, every page that contains at least one keyword from set will be shown with all of the words highlighted in yellow. The current state and sets of keywords will be displayed at the top of the window. Users can navigate through their selected states and the pages using the corresponding "Previous" and "Next" buttons. The "Exit" button can be used to return to the main menu.



If the user selects the "Preset Keywords" mode, they will be presented with three categories to choose from. Based on the category selected, the user will be presented with

corresponding questions, each of which has its own preset keywords designed to guide the user to the states' response to each question. These preset keywords will follow the same format as the custom keywords.



When the user presses the "START SEARCH" button with "Preset Keywords" mode selected, every page that contains at least one keyword from each of the preset sets will be shown with all of the keywords highlighted in yellow. The current state, category, and question will be displayed at the top of the window. Users can navigate through the selected questions, states, and pages using the corresponding "Previous" and "Next" buttons. The "Exit" button can be used to return to the main menu.

Appendix D:
Questions from other Stakeholder Organizations

We received questions from organizations such as the Joint Office of Energy and Transportation and AASHTO asked for clarification on our methods. This section lists those questions, and how we addressed them.

Note: Some of the information in this section is now outdated or irrelevant, but it serves as an example of how the project evolved.

1. *Who is the intended audience for this evaluation? Will it be made public?*

We plan to make it publicly available on Atlas EV Hub and to share directly with state DOTs. Atlas EV Hub is a community of 1,400 EV advocates, policymakers, and industry representatives that is free for public agencies and most non-profits.

2. *What are the intended outcomes/purposes? Is it just to illuminate where the states are at in their planning or is it to make a judgment on the quality of the plans and highlight areas of weakness?*

This project aims to democratize the access of this information through an impartial lens. We plan to be as objective as possible with a focus on highlighting relevant information in a clear and transparent manner. Others may use this data to make judgements, but we aim only to provide the community with easy access to the data.

3. *Will the results of the evaluation be reported on a state-by-state basis or in aggregate with a summary of findings?*

We plan to employ both methods. We will draft a report summarizing our high-level findings and then make the underlying data publicly available.

4. *How are you planning to assess each plan based on these questions? Are you going to assign a value judgement (bucketing, assigning a qualitative score, etc.) on how the state plans addressed these questions or simply just describe what was in the plans?*

Our current plan is to bucket and categorize the state approaches within an objective framework. We are not assigning value judgements, but rather describing what is included in the plans.

Appendix E:
Data Collection Instruction

Upon the completion of this project, only a total of nine state plans were reviewed using the methodology created. To simplify the process of reviewing additional state plans and the documentation of their implementation practices, these steps were created.

Step 1: Choosing State Plans

To begin, start by choosing the state plans you wish to analyze and document. If this is your first attempt, avoid plans like California, Hawaii, and Texas, which are known to be complex due to the states' already established EV laws.

Step 2: Expanding Questions as Needed

Next, the goal here is to adapt the questions our team created through this project to identify any state plan implementation practices you believe are relevant. The questions detailed in the one-page summary, found in Appendix A of the main report, identify many of the general topics discussed within the NEVI guidelines and within state plans. These questions should serve as a foundation, however, expand and modify the questions using your best judgment to target your desired implementation practices.

Examples of some topics we focused on include:

Category: Equity and Environmental Justice (EJ)

- Stakeholder Engagement Methods
- Disadvantage Community Identifications Methods

Category: Buildout

- Charging Station Accessibility Accommodations
- Number of State Exceptions

Category: Maintenance and Reliability

- Charging Station Resilience Considerations
- Data Collection Topics

Two important notes: on the one-page summary, there are six categories in which the questions are organized into. Depending on what information is of interest to you, you may not need to use all categories, or you may have to create new categories. If you would like to reference our expanded categories and questions, you can find those categories and questions in the document NEVI STATE PLAN ASSESSMENTS (INITIAL SET), located in addendum ATLAS STUDENT TEAM DATA.

Step 3: Apply the Questions

Read through your selected state plans and document any information that addresses the questions from the previous step. This process should identify the implementation practices you believed were relevant. Repeat until all questions have been answered for each chosen state plan. Remember to record the page numbers of the pages you found your information from.

Step 4: Organize the Resulting Data

Once you have collected and compiled your identified implementation practices, organize the data, to the best of your abilities and judgment, to best suit your needs. If you would like to reference our data organization, you can review the ATLAS EXCEL SPREADSHEETS document submitted alongside this report.

Appendix F:
NEVI Excel Definitions

Submitted alongside this report is the addendum EXCEL SPREADSHEET DEFINITIONS, which acts as a key for the terms used in both the Excel spreadsheets and USER'S GUIDE TO STATE PLAN DATA referenced in Appendix B. The terms in this document are paired with their respective definitions and organized under Excel spreadsheet name and individual column headings. You can access this document directly through the project submission.