# Carbon Reduction Strategy

## FINAL REPORT

November 2023

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# List of Acronyms

| | |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ADA | Americans with Disabilities Act |
| ADECA | Alabama Department of Economic and Community Affairs |
| AF | Alternative Fuel |
| ALDOT | Alabama Department of Transportation |
| ASAP | Alabama Service Assistance Patrol |
| CCTV | Closed Circuit Television |
| $CO_2$ | Carbon Dioxide |
| CRP | Carbon Reduction Program |
| CRS | Carbon Reduction Strategy |
| EV | Electric Vehicle |
| FHWA | Federal Highway Administration |
| GHG | Greenhouse Gas |
| HOV | High-Occupancy Vehicle |
| HPMS | Highway Performance Monitoring System |
| IIJA | Infrastructure Investment and Jobs Act |
| ITS | Intelligent Transportation Systems |
| LED | Light-Emitting Diode |
| LRTP | Long Range Transportation Plan |
| MPO | Metropolitan Planning Organization |
| NEVI | National Electric Vehicle Infrastructure |
| NHS | National Highway System |
| RTOP | Regional Traffic Operations Program |
| SOV | Single Occupancy Vehicle |
| TDM | Travel Demand Management |
| TIP | Transportation Improvement |
| TMC | Traffic Management Center |
| TPO | Transportation Planning Organization |
| TSMO | Transportation Systems Management and Operations |

# Executive Summary

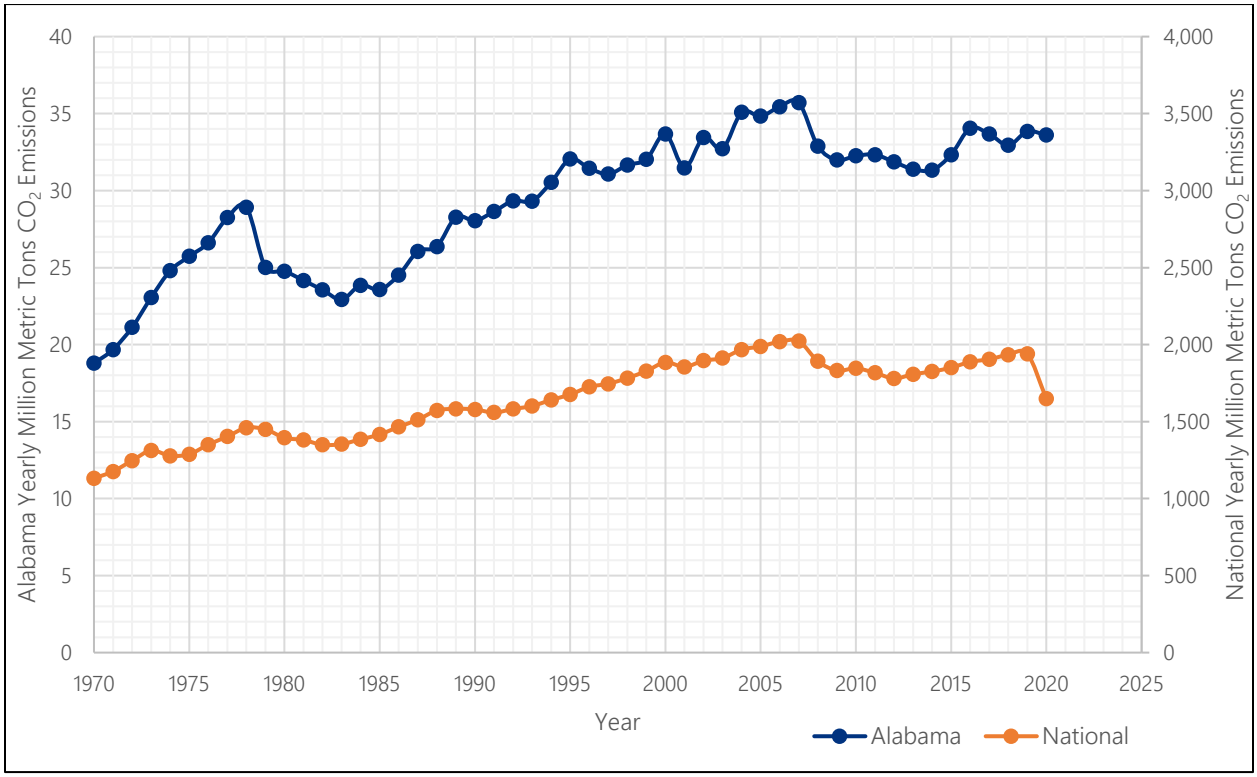
## Introduction

The Infrastructure Investment and Jobs Act (IIJA) requires all states to develop a Carbon Reduction Strategy (CRS) to identify projects and programs to reduce carbon dioxide ($CO_2$) emissions in the transportation sector. The Federal Highway Administration (FHWA) released guidance on April 21, 2022, to outline the CRS requirements. The first CRS is due to FHWA by November 15, 2023, and updates are required every four years.

## Existing Conditions in Alabama

The figure below shows how Alabama's transportation sector $CO_2$ emissions compare to national $CO_2$ emissions over a 50-year period.

**Transportation Sector $CO_2$ Emissions from Fossil Fuel Consumption (1970–2020)**




**Note that the scale for the Alabama $CO_2$ Emissions is on the left axis while the scale for the National $CO_2$ Emissions is on the right axis.*

Source: U.S. Energy Information Administration

Extensive data collection was performed to determine the baseline $CO_2$ emissions in Alabama. This information was entered into the AASHTO Greenhouse Gas (GHG)

Calculator to calculate Alabama's existing transportation $CO_2$ emissions using 2021 as the base year.

**Baseline $CO_2$ Emissions in Alabama (2021)**

| Measure | Baseline (2021) Emissions (metric tons) |
|---|---|
| Total Annual GHG | 30,808,407 |
| NHS Annual GHG | 13,832,728 |

Source: AASHTO GHG Calculator

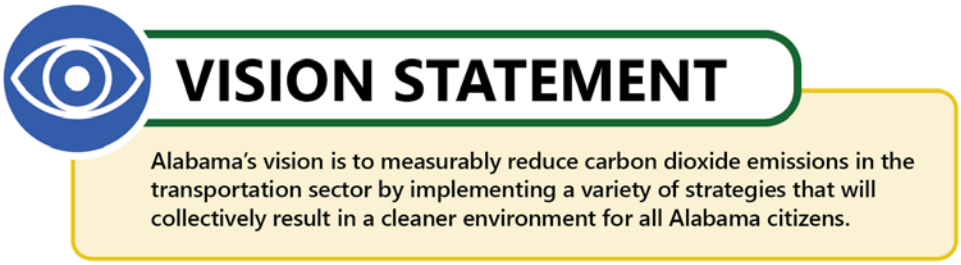
## Alabama's CRS Development Process

The first task that was completed for Alabama's CRS was data collection and analysis. This information was used to calculate the $CO_2$ emissions produced by the transportation sector for baseline year 2021. Statewide plans were reviewed for goals, initiatives, and implementation actions that support the reduction of $CO_2$ emissions.

In consultation with Alabama's 14 Metropolitan Planning Organizations (MPOs), the Alabama Department of Transportation (ALDOT) and their planning team developed a vision statement for the CRS as well as goals and focus areas. Several strategies were developed for each focus area, and implementation actions were identified to support each strategy. The draft CRS was prepared and presented to the MPOs and the public for comment. After all comments were considered, the final CRS was developed and submitted to FHWA.

## Vision Statement & Goals

The following vision statement was developed for the CRS.



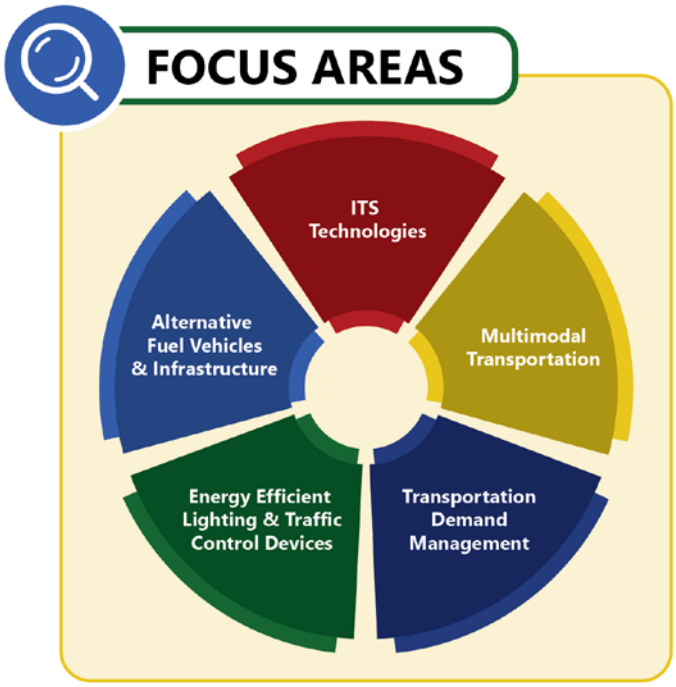

Three goals were identified to guide the CRS development:

- Reduce vehicular carbon dioxide emissions to improve air quality and mitigate climate impacts
- Support and expand multimodal transportation options in urban and rural areas
- Apply transportation management strategies and technologies to improve overall network efficiency

## Focus Areas, Strategies, & Implementation Actions

Five focus areas were identified for Alabama's CRS:

- Intelligent Transportation Systems (ITS) Technologies
- Transportation Demand Management
- Multimodal Transportation
- Energy Efficient Lighting & Traffic Control Devices
- Alternative Fuel Vehicles & Infrastructure




Corresponding strategies and implementation actions that will be considered within the State of Alabama were developed for each focus area.

### Strategies & Implementation Actions for ITS Technologies

| Strategies | Implementation Actions |
|---|---|
| Advanced Corridor Management | Implement Regional Traffic Operations Program (RTOP) |
| Detection/Monitoring | Install/maintain detection devices;<br>Install/upgrade cameras |
| Digital Messaging | Expand use of variable message signs;<br>Provide traveler information |
| Traffic Incident Management | Expand hours & coverage at Traffic Management Centers;<br>Promote & improve ALGO website & app |

## Strategies & Implementation Actions for Transportation Demand Management

| Strategies | Implementation Actions |
|---|---|
| Travel Demand Management | Utilize predictive traveler information;<br>Implement/expand on-demand transit;<br>Promote/expand ridesharing programs |
| Traffic Management | Implement dynamic lane use control & dynamic/variable speed limits;<br>Consider future HOV lanes;<br>Improve intersections;<br>Use incident and queue detection to provide queue warnings;<br>Implement signal timing synchronization / adaptive signal control systems;<br>Improve Traffic Management Centers;<br>Expand ASAP program |
| Parking Management | Utilize dynamic pricing, reservations, & parking capacity;<br>Improve way-finding for parking;<br>Increase truck parking in rural areas;<br>Add more commuter parking lots |

## Strategies & Implementation Actions for Multimodal Transportation

| Strategies | Implementation Actions |
|---|---|
| Pedestrian Facilities | Construct/maintain sidewalks, curb ramps, crosswalks, pedestrian signals, overpasses & multi-use paths/trails |
| Bicycle Facilities | Construct/maintain bike lanes, shared lanes, & multi-use paths/trails |
| Multimodal Access Improvements | Install ramps, bike racks, benches, & shelters;<br>Provide multimodal information & navigational support;<br>Implement transit-oriented development |
| Transit Service | Introduce more alternative fuel transit vehicles;<br>Coordinate rural transit service;<br>Utilize microtransit |
| Shared Mobility / Micromobility Options | Implement/increase car share & bicycle share programs;<br>Improve micromobility options |

### Strategies & Implementation Actions for Energy Efficient Lighting and Traffic Control Devices

| Strategies | Implementation Actions |
|---|---|
| Street Lighting Installations / Upgrades | Upgrade traditional street lights with LED technology;<br>Require LED for all new lighting |
| Traffic Signal Retrofits | Upgrade traffic signals to include LED lighting;<br>Require LED for all new traffic signals |

### Strategies & Implementation Actions for Alternative Fuel Vehicles and Infrastructure

| Strategies | Implementation Actions |
|---|---|
| Designated Alternative Fuel Corridors | Identify/implement alternative fuel corridors |
| EV/AF Charging/Refueling Stations | Install charging/fueling stations along key corridors & at convenient locations |
| Diesel Retrofits | Retrofit truck engines to improve fuel efficiency & reduce emissions |
| Construction Practices | Increase use of zero emission construction equipment & sustainable construction materials |
| EV/AF Incentives | Support rebate programs & incentives for purchasing/operating EVs/AFs |

## Alignment with Federal Requirements & Existing Plans

Alabama's CRS aligns with Federal requirements, statewide plans, and MPO plans.

## Evaluation Process

New projects will be evaluated to determine their expected effectiveness in reducing $CO_2$ emissions. Data collection activities will be performed to measure progress toward meeting carbon reduction goals. The GHG Calculator can be used to update total emissions calculations and determine which types of projects provide the greatest reduction. Equity impacts will also be analyzed for projects identified for carbon reduction funding.

FHWA issued a proposed rule with a request for comments on July 15, 2022, entitled "*National Performance Management Measures; Assessing Performance of the National*

*Highway System, Greenhouse Gas Emissions Measure*". This CRS will be updated to include targets and performance measures after the rule is finalized.

## Conclusion

ALDOT and the Alabama MPOs are committed to supporting and implementing programs and projects that reduce $CO_2$ emissions on the state's transportation network. Programs and projects will be evaluated for carbon reduction and equity impacts and will be adjusted as needed to continue progress toward reduced $CO_2$ emissions and improved air quality for all Alabama residents.

# 1.0 Introduction

## 1.1 Carbon Reduction Program Overview

The Carbon Reduction Program (CRP) is a new program that was introduced in the Infrastructure Investment and Jobs Act (IIJA) to reduce carbon dioxide ($CO_2$) emissions from on-road highway sources. It allocated $6.4 billion over five years for eligible projects. Eligible state funding activities include truck stop electrification, diesel engine retrofits, vehicle-to-infrastructure communications equipment, public transportation, port electrification, and deployment of alternative fuel vehicles, including charging or fueling infrastructure and the purchase or lease of zero emission vehicles.

Alabama will receive $128 million of this funding which can be used for projects in transportation management areas, small urban and rural areas, and statewide. A local match is required for all projects as shown in **Table 1.1** below.

**Table 1.1: Funding by System**

| System | Federal Funding | Local Match |
|---|---|---|
| Interstate | 90% | 10% |
| Not Interstate | 80% | 20% |

Source: FHWA Bipartisan Infrastructure Law Federal Share Fact Sheet

Projects in the following categories can be considered for CRP funding:

- Safety
- Transit Flex
- Transferability between FHWA Programs
- ADA
- Equity
- Climate Change / Sustainability
- Truck Parking
- Labor & Workforce

## 1.2 Carbon Reduction Strategy Overview

The IIJA requires all states to develop a Carbon Reduction Strategy (CRS) to identify projects and programs to reduce $CO_2$ emissions in the transportation sector. The Federal Highway Administration (FHWA) released guidance on April 21, 2022, to outline the CRS requirements. It must align with existing plans and be coordinated with the state's Metropolitan Planning Organizations (MPOs). The first CRS is due to FHWA by November 15, 2023, and updates are required every four years.

According to the FHWA guidance, the CRS must:


- Support efforts to reduce transportation emissions
- Identify projects and strategies to reduce emissions
- Support reduction of transportation emissions of the state
- At the discretion of the State, quantify total carbon emissions from production, transport, and use of materials in the construction of transportation facilities
- Be appropriate to population density and context of State

Eligible projects are as follows:

- Traffic Monitoring or Management
- Public Transportation
- Transportation Alternatives
- Advanced Transportation or Congestion Management
- Infrastructure-based ITS Systems
- Energy Efficient Street Lighting and Traffic Control Devices
- Carbon Reduction Strategy Development
- Travel Demand Management Strategies
- Freight Projects that Improvement Environmental Impacts
- Deployment of Alternative Fuel Vehicles
- Diesel Engine Retrofits
- Traffic Flow Improvements
- Reduction of Transportation Emissions at Ports

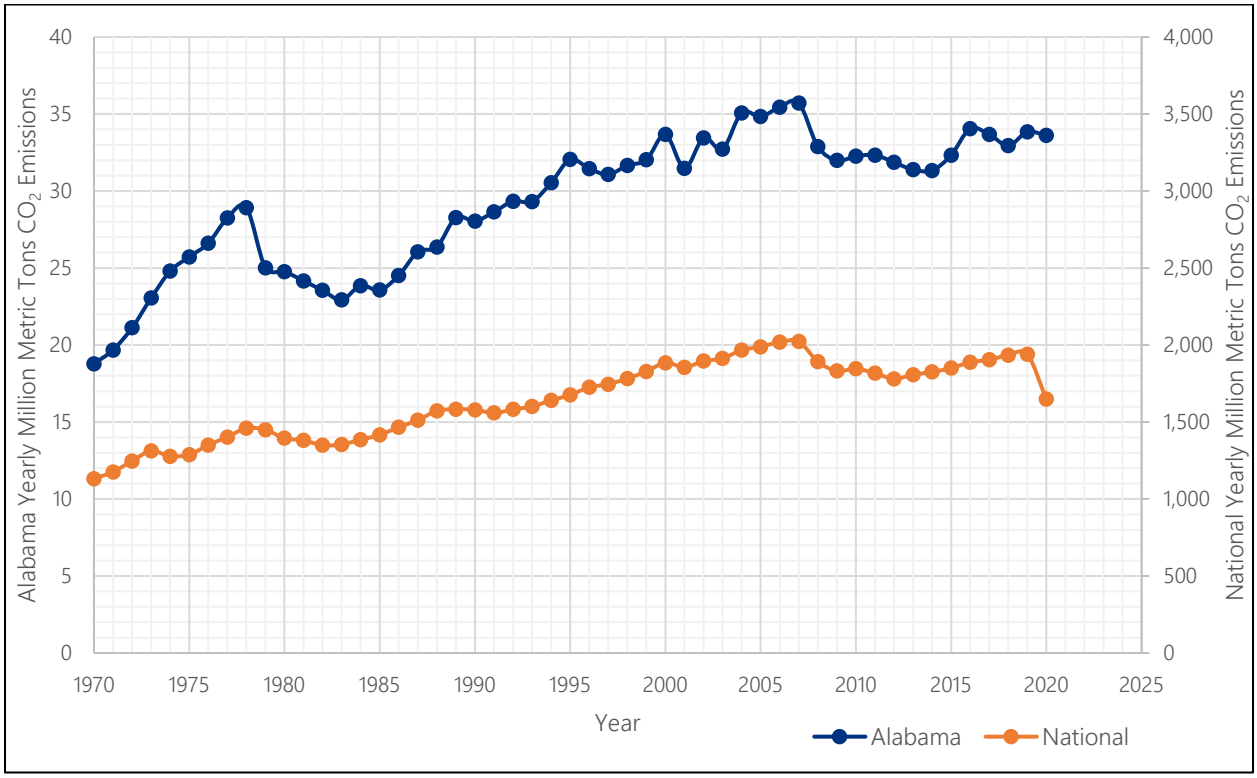
# 2.0 Existing Conditions in Alabama

Extensive data collection was performed to determine the baseline $CO_2$ emissions in Alabama. The following data was collected:

- Freight data
- Historical traffic counts
- HPMS data
- Fuel consumption data
- Vehicle registration data
- Existing and future socioeconomic data
- State emissions data

**Figure 2.1** shows how Alabama's transportation sector $CO_2$ emissions compare to national $CO_2$ emissions over a 50-year period.

**Figure 2.1: Transportation Sector CO2 Emissions from Fossil Fuel Consumption (1970–2020)**




**Note that the scale for the Alabama $CO_2$ Emissions is on the left axis while the scale for the National $CO_2$ Emissions is on the right axis.*

Source: U.S. Energy Information Administration

The AASHTO Greenhouse Gas (GHG) Calculator was used to calculate Alabama's existing transportation $CO_2$ emissions using 2021 as the base year. Alabama's total GHG emissions and the National Highway System (NHS) GHG emissions in Alabama are summarized in **Table 2.1**.

### Table 2.1: Baseline $CO_2$ Emissions in Alabama (2021)

| Measure | Baseline (2021) Emissions (metric tons) |
|---|---|
| Total Annual GHG | 30,808,407 |
| NHS Annual GHG | 13,832,728 |

Source: AASHTO GHG Calculator

The Alabama Department of Transportation (ALDOT) and the MPOs provided lists of projects that are already programmed for CRP funding. These projects were reviewed and considered during the development of CRS goals and focus areas.

Two technical reports were developed during the existing conditions analysis. The *"Existing Conditions Assessment"* is dated August 2023. It offers a thorough discussion of the data collection, the baseline $CO_2$ analysis, and the current strategies and projects that address $CO_2$ emissions. A second technical report explains the GHG Calculator methodology and results. It is titled *"AASHTO GHG Calculator Methodology and Results"* and is dated September 2023.

# 3.0 Alabama's Carbon Reduction Strategy Development Process

## 3.1 Transportation Planning Process

Alabama's statewide transportation plans are developed within the Planning Studies Section which is under the Bureau of Office Engineer at ALDOT. Other statewide plans were referenced during the development of the CRS to ensure plan alignment.

## 3.2 CRS Development Tasks

The first task that was completed for Alabama's CRS was data collection and analysis. This information was used to calculate the $CO_2$ emissions produced by the transportation sector for baseline year 2021. Technical reports titled *"Existing Conditions Assessment"* and *"AASHTO GHG Calculator Methodology and Results"* were developed to thoroughly explain this task.

Statewide plans were reviewed for goals, initiatives, and implementation actions that support the reduction of $CO_2$ emissions. These plans included:

- Alabama Statewide Transportation Plan (2017)
- Alabama Statewide Transportation Improvement Program (2024-2027)
- Alabama Strategic Highway Safety Plan (2022)
- Alabama Statewide Freight Plan (2022)
- ALDOT Statewide TSMO Master Plan (2019)
- Alabama Electric Vehicle Infrastructure Plan (2022)

In consultation with Alabama's 14 MPOs, ALDOT and their planning team developed a vision statement for the CRS as well as goals and focus areas. Several strategies were developed for each focus area, and implementation actions were identified to support each strategy. The draft CRS was prepared and presented to the MPOs and the public for comment. After all comments were considered, the final CRS was developed and submitted to FHWA.

A flowchart showing all project tasks can be seen in **Figure 3.1**.

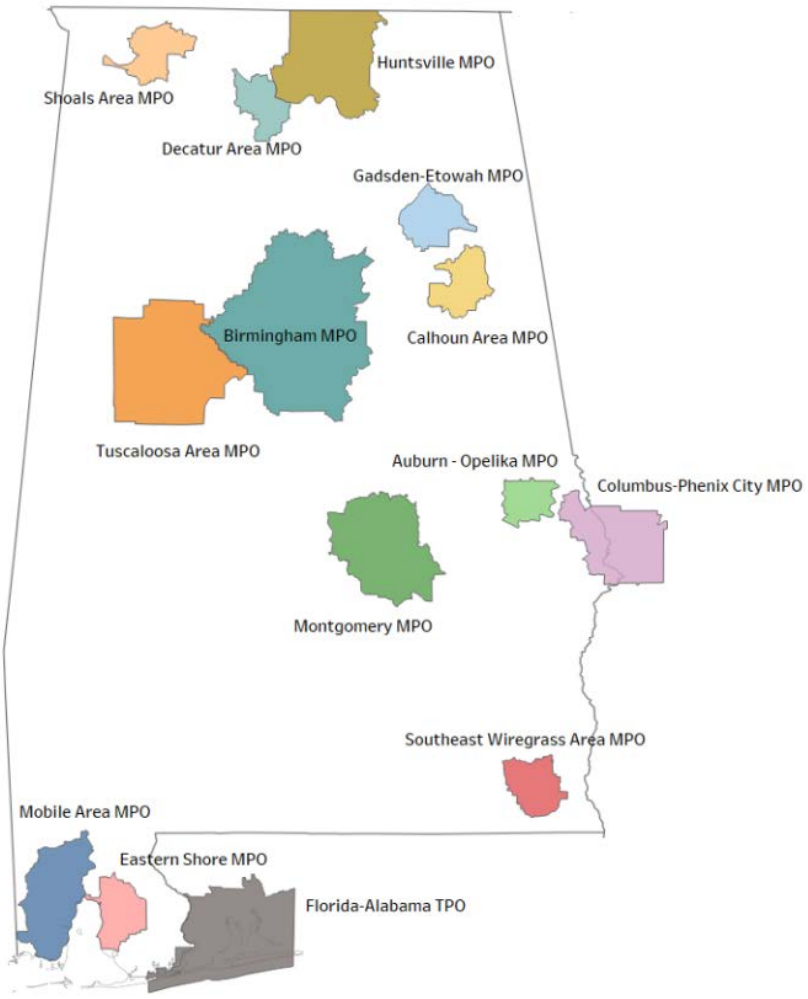
**Figure 3.1: Project Development Tasks**

## 3.3 MPO Consultation

All 14 Alabama MPOs were invited to participate in the development of the CRS through virtual meetings and an online survey. These MPOs are located throughout the state as seen in **Figure 3.2**. Each MPO also submitted their most recent Long Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP) for use in developing CRS goals, initiatives, and implementation actions that align with these plans.

A brief description of each meeting and a discussion of the survey results are included below. The full meeting summaries with attendance rosters and presentation slides can be found in **Appendix A**.

**Figure 3.2: Alabama MPOs**




Source: Alabama Transportation Policy Research Center, The University of Alabama (January 27, 2021)

### Meeting #1

All MPOs were invited to attend a virtual meeting on July 12, 2023. During this meeting, an overview of the CRP was presented as well as information about Alabama's CRS. MPOs were asked to provide their current LRTPs, TIPs, and a list of any carbon reduction strategies that they are currently pursuing. The meeting ended with a brief explanation of the next steps in the project and an invitation to attend MPO Meeting #2.

### Survey

After Meeting #1, all MPOs were sent a link to participate in an online survey. The same survey was sent to the ALDOT Region Engineers for distribution to appropriate personnel. The survey requested feedback on potential goals and strategies and asked respondents to share which strategies would be most beneficial in their part of the state.

The first question asked respondents why it is important to reduce carbon emissions in Alabama. The responses to this question were used to help form the vision statement and goals for the CRS. The most common responses included:

- Protect the environment
- Improve air quality
- Improve/preserve quality of life
- Mitigate climate impacts

The next series of questions asked respondents to rank possible strategies as low priority, medium priority, or high priority. Strategies were grouped into the following five categories: Alternative Fuels / Efficient Energy, Active Modes / Multimodal, Transportation Demand Management / Transportation System Management and Operations (TSMO), Technology Solutions, and Other. Weighted averages were used to identify the top strategies for each category as follows:

- Alternative Fuels / Efficient Energy
    - Freight Emission Reductions
    - Energy Efficient Lighting and Equipment
    - Alternative Fuel Vehicle Adoption and Infrastructure
    - Electric Vehicle Adoption and Charging Infrastructure
- Active Modes / Multimodal
    - Pedestrian Facilities
    - Bicycle Facilities
    - Multimodal Access Improvements
- Transportation Demand Management / TSMO
    - Travel Demand Management / Traffic Incident Management
    - Commute Trip Reduction
    - Land Use Changes
- Technology Solutions
    - Intelligent Transportation Systems (ITS) / Advanced Transportation Technologies
    - Adaptive Signals
    - Traffic Management Facilities
- Other
    - Traffic Flow Improvements

- Rural Internet Connectivity Improvements
- Sustainable Construction / Sustainable Design / Clean Construction / Sustainable Pavements

Survey participants were asked to rank the five strategy categories from 1 to 5 depending on their applicability to the MPO's location. For this ranking, 1 was the highest priority and 5 was the lowest priority. The highest ranking categories were Transportation Demand Management / TSMO, Technology Solutions, and Active Modes / Multimodal.

An open-ended question asked respondents to share other ideas for cardon reduction strategies that were not already mentioned in the survey. This question only generated a few unique responses including emissions testing, use of excess right-of-way for solar/wind power or native vegetation, and improvements in travel efficiency.

Finally, each survey participant was asked what strategy or category of strategies is most likely to reduce carbon emissions in their area. The MPOs ranked Bicycle/ Pedestrian/Transit Infrastructure highest, while ALDOT ranked TSMO Strategies highest.

A copy of the survey and full results for both the MPOs and ALDOT can be found in **Appendix B**.

### Meeting #2

All MPOs were invited to participate in a second virtual meeting on August 22, 2023. During this meeting, a summary of the "*Existing Conditions Assessment"* technical report was presented, and the survey results were shared. Drafts of the vision statement, goals, and focus areas were presented to the MPOs, and a discussion was held for input and concurrence. Draft strategies to support each focus area were also presented and discussed. The meeting concluded with an invitation to attend MPO Meeting #3.

### Meeting #3

All MPOs were invited to attend the third virtual meeting on October 4, 2023. The draft CRS was presented during this meeting, and the MPOs were offered the opportunity to comment on it before it was posted for public comment.

## 3.4 Public Engagement

ALDOT issued a press release on September 22, 2023, to notify the public that the draft CRS would be available for public comment. The draft CRS was posted on the Public Involvement page of ALDOT's website. The webpage content also included an explanation of the CRS requirements, a list of project tasks, and a description of MPO

involvement in the CRS development process. In addition, the vision statement, goals, and focus areas were highlighted on the webpage along with a brief description of the strategies and implementation actions. Links to the "*FHWA CRP Fact Sheet*" and "*CRP Implementation Guidance*" were included as well.

The public was asked to submit comments on the draft CRS by completing an online comment form or by downloading a hard copy comment form from the webpage. Hard copy comment forms were also available at the ALDOT Bureau of Office Engineer. The comment period was open for 3 weeks from October 17th through November 6th.

ALDOT's Media and Community Relations Bureau publicized information about the draft CRS and requested public comments through numerous media outlets including the Cullman Times, Yrt News, News 19, Usa Jaun News, and WVTM 13 News.

A copy of the press release, the webpage content, the public comment form, and media outreach examples can be found in **Appendix C**.

## Summary of Public Comments

Four comments were received during the public comment period. ALDOT responded to each commenter to thank them for their participation and to notify them that their comments would be considered.

Three of the four comments were applicable to the CRS. One comment expressed support for the CRS. The other two applicable comments stated that more emphasis should be placed on land use and alternative transportation. While land use was discussed by ALDOT and the MPOs as a carbon reduction strategy, it is not specifically listed in the CRS since ALDOT and the MPOs do not have jurisdictional authority over land use. However, alternative transportation (i.e., walking, biking, transit usage, etc.) is included as a focus area in this CRS. Appropriate and context-sensitive land use planning is vital to provide people with more choices for getting around their town/city and their region. The final CRS will be shared with the municipalities who make land use decisions.

A table showing all public comments, ALDOT's responses, and notes pertaining to each comment is included in **Appendix C**.

# 4.0 Vision Statement & Goals

The following vision statement was developed for the CRS. It was approved by ALDOT and the MPOs.

## VISION STATEMENT

Alabama's vision is to measurably reduce carbon dioxide emissions in the transportation sector by implementing a variety of strategies that will collectively result in a cleaner environment for all Alabama citizens.

Three goals were identified to guide the development of the CRS toward reducing $CO_2$ emissions. These goals were developed from survey results and fine-tuned through discussions with ALDOT and the Alabama MPOs.

## GOALS

- Reduce vehicular carbon dioxide emissions to improve air quality and mitigate climate impacts
- Support and expand multimodal transportation options in urban and rural areas
- Apply transportation management strategies and technologies to improve overall network efficiency

# 5.0 Focus Areas & Strategies

Focus areas are groups of similar strategies that work together to achieve the goals. The focus areas and strategies for this CRS were identified using survey results, discussion comments from ALDOT and the Alabama MPOs, and carbon reduction efforts that are already in progress throughout the state. The following five focus areas were identified:

- ITS Technologies
- Transportation Demand Management
- Multimodal Transportation
- Energy Efficient Lighting & Traffic Control Devices
- Alternative Fuel Vehicles & Infrastructure

Strategies were assigned to each of the five focus area as shown below.

## ITS Technologies

Intelligent Transportation Systems (ITS) apply technology to improve the quality, safety, and mobility of surface transportation systems. The strategies identified under this focus area are:

- Advanced Corridor Management
- Detection/Monitoring
- Digital Messaging
- Traffic Incident Management

## Transportation Demand Management

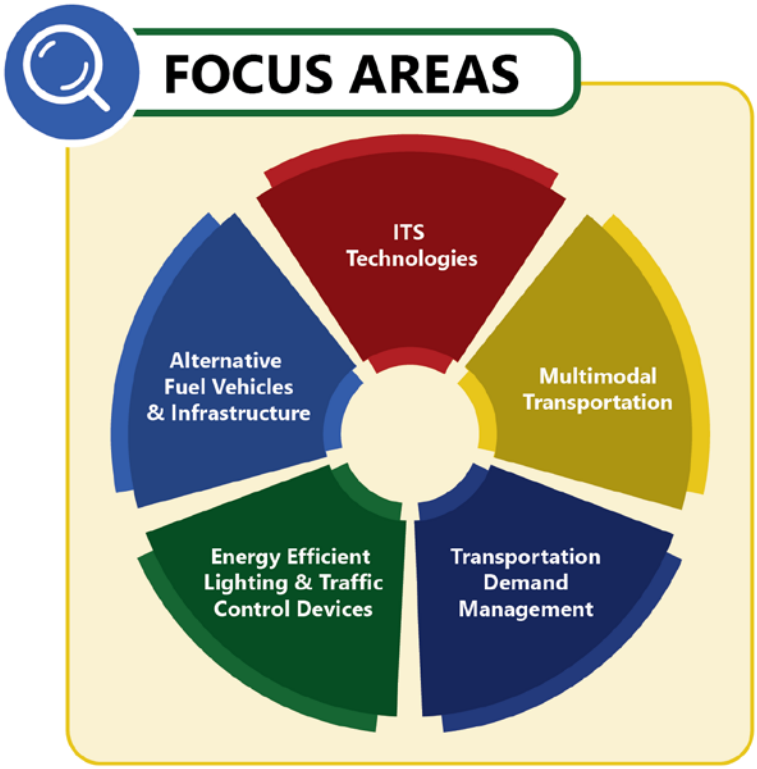
Transportation Demand Management describes programs that increase the efficiency of the transportation system. These programs strive to redistribute the demand on the system by providing options that reduce the need for vehicle trips, shorten trip lengths, and use more efficient transportation modes. The following strategies were identified for this focus area:

- Travel Demand Management
- Traffic Management
- Parking Management

## Multimodal Transportation

Multimodal Transportation describes all mobility modes including walking, biking, vehicles, transit, railroad, airplane, and water vessels. Transportation options can help reduce congestion and optimize the transportation system. The strategies identified under this focus area are:

- Pedestrian Facilities
- Bicycle Facilities
- Multimodal Access Improvements
- Transit Service
- Shared Mobility / Micromobility Options




## Energy Efficient Lighting & Traffic Control Devices

This focus area seeks to improve energy efficiency in street lights and traffic signals. Two strategies were identified:

- Street Lighting Installations/Upgrades
- Traffic Signal Retrofits

## Alternative Fuel Vehicles & Infrastructure

Alternative fuels are a proven way to reduce $CO_2$ emissions in the transportation sector. These fuels can include biodiesel, ethanol, hydrogen, natural gas, propane, renewable diesel, and electricity. The following strategies were identified for this focus area:

- Designated Alternative Fuel Corridors
- EV/AF Charging/Refueling Stations
- Diesel Retrofits
- Construction Practices
- EV/AF Incentives

# 6.0 Implementation Actions

Implementation actions are defined as types of projects or programs that support the carbon reduction strategies. This section discusses the implementation actions that were identified for each of the strategies defined in Section 5.0. These actions will be considered for implementation within the State of Alabama.

## 6.1 ITS Technologies

**Table 6.1** displays the implementation actions associated with the ITS Technology strategies. Detailed descriptions of these actions are included below the table.

**Table 6.1: Implementation Actions for ITS Technologies**

| Strategies | Implementation Actions |
|---|---|
| Advanced Corridor Management | Implement Regional Traffic Operations Program (RTOP) |
| Detection/Monitoring | Install/maintain detection devices;<br>Install/upgrade cameras |
| Digital Messaging | Expand use of variable message signs;<br>Provide traveler information |
| Traffic Incident Management | Expand hours & coverage at Traffic Management Centers;<br>Promote & improve ALGO website & app |

### Advanced Corridor Management

Alabama began implementing the Regional Traffic Operations Program (RTOP) several years ago. This program focuses on modernizing traffic signals and their associated ITS devices on state routes to reduce delay and congestion. Corridor management, particularly through signal timing and coordination, improves the efficiency of vehicle movement on key roadways and results in reduced congestion and fewer emissions from idling vehicles. Alabama's implementation action for advanced corridor management supports ALDOT's plans to continue this effort throughout the state.

### Detection/Monitoring

Many Alabama roadways and intersections already use ITS devices to detect and monitor traffic. These devices include inductive loops, video cameras, radar, thermal sensors, and Bluetooth readers. Alabama's implementation actions for detection/monitoring involve maintaining or upgrading devices already in use and installing new devices in appropriate locations throughout the state.

### Digital Messaging

Variable message signs allow agencies to convey travel information to roadway users in a safe and efficient manner. Digital messaging can be used to inform drivers of slowdowns or unsafe conditions that can be avoided by using alternate routes. Alabama's implementation actions for digital messaging expand the use of variable message signs throughout the state to display traveler information about roadway conditions, incidents, heavy traffic, inclement weather, and other appropriate topics.

### Traffic Incident Management

Traffic incidents, such as vehicle breakdowns and crashes, reduce roadway capacity and generate safety hazards that slow travel and increase congestion and vehicle idling. Traffic incident management focuses on swiftly and safely removing these roadway obstructions to return traffic to normal conditions.

Alabama's Traffic Management Centers (TMCs) aid in incident management by monitoring and reporting live traffic conditions. The ALGO Traffic website and mobile app are used to provide real time updates on Alabama roads including traffic reports, travel times, traffic camera feeds, message sign readouts, incident information, construction updates, and road congestion levels. Push notifications and email alerts are also available to road users. Alabama's implementation actions for traffic incident management expand the operating hours and coverage of the TMCs and promote and improve the ALGO website and mobile app.

## 6.2 Transportation Demand Management

**Table 6.2** displays the implementation actions associated with the Transportation Demand Management strategies. Detailed descriptions of these actions are included below the table.

### Table 6.2: Implementation Actions for Transportation Demand Management

| Strategies | Implementation Actions |
|---|---|
| Travel Demand Management | Utilize predictive traveler information;<br>Implement/expand on-demand transit;<br>Promote/expand ridesharing programs |
| Traffic Management | Implement dynamic lane use control & dynamic/variable speed limits;<br>Consider future HOV lanes;<br>Improve intersections;<br>Use incident and queue detection to provide queue warnings;<br>Implement signal timing synchronization / adaptive signal control systems;<br>Improve Traffic Management Centers;<br>Expand ASAP program |
| Parking Management | Utilize dynamic pricing, reservations, & parking capacity;<br>Improve way-finding for parking;<br>Increase truck parking in rural areas;<br>Add more commuter parking lots |

## Travel Demand Management

Travel Demand Management (TDM) programs are designed to change travel behavior and reduce Single Occupancy Vehicle (SOV) trips to maximize the capacity of the transportation system. When implemented on an area-wide basis with support from government organizations, businesses, universities, and residents, these programs can reduce delay and congestion during peak periods on local roadway networks. Predictive traveler information can be obtained by using past travel trends to determine when and where people will make future trips. This information can help identify locations where TDM programs may be beneficial.

SOV trips can be reduced through on-demand transit which uses shared vehicles to transport multiple passengers who are traveling in the same direction. While this service is offered in some parts of Alabama, many areas do not have access to it. Four metropolitan areas in Alabama (Birmingham, Huntsville, Mobile, and Montgomery) offer a rideshare program called CommuteSmart which provides carpools and vanpools for work commutes. Alabama's implementation actions for travel demand management include promoting and expanding this rideshare program, implementing and expanding on-demand transit, and utilizing predictive traveler information to identify locations where TDM programs should be considered.

## Traffic Management

Traffic management focuses on improving the operations of a roadway system through a variety of methods including dynamic lane use control, dynamic/variable speed limits, High-Occupancy Vehicle (HOV) lanes, intersection improvements, and incident/queue detection. Dynamic lane use control allows individual lanes to be opened or closed as needed. Advance warning of these changes is provided through dynamic lane control signs. Dynamic or variable speed limits are adjusted based on real-time traffic, road, or weather conditions. Alabama does not have any High-Occupancy Vehicle (HOV) lanes but may consider implementing them in the future. Intersection improvements, such as signal timing updates, can help with traffic management by improving traffic flow. Other traffic management tools include incident and queue detection to provide queue warnings to motorists in areas where delays may be longer than expected and signal timing synchronization / adaptive signal control systems to coordinate traffic signals.

Alabama's Traffic Management Centers were designed to help manage traffic by monitoring and reporting live traffic conditions. The Alabama Service Assistance Patrol (ASAP) operates within Alabama's larger municipal areas to assist with traffic incident management, motorist needs, road maintenance, emergency operations, and work zone management.

Alabama's implementation actions for traffic management include using the tools mentioned above to improve roadway operations and reduce congestion.

## Parking Management

Parking management includes managing the limited amount of space available for parked vehicles and reducing the time needed for drivers to locate available parking spaces. Dynamic pricing, parking reservations, and dynamic parking capacity can be used to manage parking. Dynamic pricing adjusts parking rates based on demand. Parking reservations ensure that drivers will have a place to leave their vehicles when they arrive at their destinations. Dynamic parking capacity tracks the number of available spaces in a parking lot or deck and continuously updates signage to share that information with drivers. Another way to manage parking is to add or improve way-finding to available parking through signage or phone apps.

Truck parking and commuter parking are also important. Providing truck parking options in rural areas can reduce the number of trucks parked on the side of the road during driver rest periods. Commuter parking lots encourage carpooling and transit use. Alabama has several commuter parking lots located throughout the state.

Alabama's implementation actions for parking management include utilizing the tools described above, improving way-finding to available parking, increasing truck parking areas, and adding more commuter parking lots throughout the state.

## 6.3 Multimodal Transportation

**Table 6.3** displays the implementation actions associated with the Multimodal Transportation strategies. Detailed descriptions of these actions are included below the table.

### Table 6.3: Implementation Actions for Multimodal Transportation

| Strategies | Implementation Actions |
|---|---|
| Pedestrian Facilities | Construct/maintain sidewalks, curb ramps, crosswalks, pedestrian signals, overpasses & multi-use paths/trails |
| Bicycle Facilities | Construct/maintain bike lanes, shared lanes, & multi-use paths/trails |
| Multimodal Access Improvements | Install ramps, bike racks, benches, & shelters;<br>Provide multimodal information & navigational support;<br>Implement transit-oriented development |
| Transit Service | Introduce more alternative fuel transit vehicles;<br>Coordinate rural transit service;<br>Utilize microtransit |
| Shared Mobility / Micromobility Options | Implement/increase car share & bicycle share programs;<br>Improve micromobility options |

### Pedestrian Facilities

The use of pedestrian facilities provides health and mobility benefits for users without contributing to $CO_2$ emissions. These facilities promote alternative transportation and reduce SOVs. Pedestrian facilities include an expansive and connected network of sidewalks, curb ramps, crosswalks, pedestrian signals, overpasses, and multi-use paths/trails. Alabama's implementation actions for pedestrian facilities include continued construction and maintenance of the pedestrian networks throughout the state.

### Bicycle Facilities

The use of bicycle facilities also provides health and mobility benefits for users without contributing to $CO_2$ emissions. Like pedestrian facilities, bicycle facilities also promote alternative transportation and reduce SOVs. They include an expansive and connected network of bike lanes, shared lanes, and multi-use paths/trails. Alabama's implementation actions for bicycle facilities include continued construction and maintenance of the bicycle network throughout the state.

### Multimodal Access Improvements

Multimodal access links motorized and non-motorized transportation to provide users with multiple travel options. Improving access to multimodal facilities encourages the use of non-motorized transportation and reduces the number of vehicles on the road. Infrastructure improvements such as pedestrian ramps, bike racks, and transit amenities (i.e., benches and shelters at transit stops) make these transportation modes more appealing. Providing user information and navigational support for multimodal facilities also increase their use.

Transit-oriented development is characterized by walkable mixed-use communities centered around public transportation. This design decreases personal vehicle use thus reducing $CO_2$ emissions. Alabama's implementation actions for multimodal access improvements include continuing to install multimodal access amenities, providing multimodal information/navigation information, and implementing transit-oriented development.

### Transit Service

Public transit provides a less expensive travel option for users while reducing the number of vehicles on the roadways. In addition to these benefits, transit vehicles can use alternative fuels to reduce $CO_2$ emissions. To maximize the effectiveness of rural transit services, it is important for rural transit providers to coordinate with urban transit providers to provide connectivity between the services. Microtransit can be a good option for rural areas. It is characterized by on-demand shared transportation with routes that vary based on rider demand. Alabama's implementation actions for transit service include introducing more alternative fuel transit vehicles, coordinating rural transit service, and utilizing more microtransit.

### Shared Mobility / Micromobility Options

Shared mobility involves users sharing transportation resources, such as cars or bicycles, that are owned and maintained by a company or agency that charges users a fee to borrow the resources. Micromobility options include bicycles, scooters, segways, e-bikes, and e-scooters. These individual transportation modes produce little to no $CO_2$ emissions. Alabama's implementation actions for shared mobility / micromobility include implementing or increasing car and bicycle share programs and improving micromobility options throughout the state.

## 6.4 Energy Efficient Lighting & Traffic Control Devices

**Table 6.4** displays the implementation actions associated with the strategies for Energy Efficient Lighting and Traffic Control Devices. Detailed descriptions of these actions are included below the table.

### Table 6.4: Implementation Actions for Energy Efficient Lighting and Traffic Control Devices

| Strategies | Implementation Actions |
|---|---|
| Street Lighting Installations / Upgrades | Upgrade traditional street lights with LED technology;<br>Require LED for all new lighting |
| Traffic Signal Retrofits | Upgrade traffic signals to include LED lighting;<br>Require LED for all new traffic signals |

### Street Lighting Installations/Upgrades

Traditional street lighting can be a significant contributor to $CO_2$ emissions. Light-emitting diode (LED) street lighting uses less electricity, emits less $CO_2$, and requires less maintenance. Alabama's implementation actions for street lighting installations/upgrades include upgrading traditional street lights with LED technology and requiring LED technology for all new street lighting.

### Traffic Signal Retrofits

Alabama has updated many of their traffic signals to include LED lighting. Similar to LED street lights, LED signals use less electricity, emit less $CO_2$, and require less maintenance. Alabama's implementation actions for traffic signal retrofits include continuing to upgrade traditional traffic signals with LED technology and requiring LED technology for all new traffic signals.

## 6.5 Alternative Fuel Vehicles & Infrastructure

**Table 6.5** displays the implementation actions associated with Alternative Fuel Vehicles and Infrastructure strategies. Detailed descriptions of these actions are included below the table.

### Table 6.5: Implementation Actions for Alternative Fuel Vehicles and Infrastructure

| Strategies | Implementation Actions |
|---|---|
| Designated Alternative Fuel Corridors | Identify/implement alternative fuel corridors |
| EV/AF Charging/Refueling Stations | Install charging/fueling stations along key corridors & at convenient locations |
| Diesel Retrofits | Retrofit truck engines to improve fuel efficiency & reduce emissions |

| Strategies | Implementation Actions |
|---|---|
| Construction Practices | Increase use of zero emission construction equipment & sustainable construction materials |
| EV/AF Incentives | Support rebate programs & incentives for purchasing/operating EVs/AFs |

## Designated Alternative Fuel Corridors

Designated Alternative Fuel (AF) corridors help users know where to find alternative fuels for their vehicles and allow for more efficient trip planning. These corridors also promote the use of alternative fuels. Alabama's implementation actions for designated AF corridors are to identify specific corridors throughout the state and install AF fueling infrastructure along them.

## EV/AF Charging/Fueling Stations

Electric Vehicles (EV) require charging stations. Special fueling infrastructure is also needed for AF vehicles. Alabama's implementation action for EV/AF charging/fueling stations is to install charging/fueling stations on key corridors and at convenient locations throughout the state.

## Diesel Retrofits

Trucks are a large contributor to roadway $CO_2$ emissions since they traditionally operate using diesel fuel. Diesel retrofits offer a cost-effective way to reduce $CO_2$ emissions as diesel systems are replaced with more fuel-efficient systems. Alabama's implementation action for this strategy is to establish programs to retrofit truck engines to improve fuel efficiency and reduce emissions.

## Construction Practices

Roadway construction uses many carbon-based materials. Construction equipment also contributes to $CO_2$ emissions. Switching to low or no carbon materials and equipment will reduce these emissions. Alabama's implementation actions for this strategy are to increase the use of zero emissions construction equipment and sustainable construction materials.

## EV/AF Incentives

Rebate programs can encourage the use of electric and alternative fuel vehicles which will result in $CO_2$ emissions reductions. These programs work well when EV charging and AF fueling stations are supported and conveniently located on identified corridors. Incentives for purchasing and operating these vehicles also encourage their use. Alabama's implementation action for this strategy is to support rebate programs and incentives for purchasing and operating EVs and AF vehicles in the state.

# 7.0 Alignment with Federal Requirements & Existing Plans

## 7.1 Federal Requirements

The *"Carbon Reduction Program Implementation Guidance"* memorandum issued by FHWA on April 21, 2022, states that each CRS must be prepared in coordination with MPOs. Documents should support efforts to reduce transportation emissions and should identify projects and strategies to work toward this effort. **Table 7.1** shows how Alabama's CRS fulfills these Federal requirements.

## 7.2 Statewide Plans

The following statewide plans were reviewed for alignment with the CRS:

- Alabama Statewide Transportation Plan (2017)
- Alabama Statewide Transportation Improvement Program (2024 - 2027)
- Alabama Strategic Highway Safety Plan (2022)
- Alabama Statewide Freight Plan (2022)
- ALDOT Statewide TSMO Master Plan (2019)
- Alabama Electric Vehicle Infrastructure Plan (2022)

**Table 7.2** shows how the goals/objectives and projects/strategies in these plans align with this CRS.

## 7.3 MPO Plans

The most recent LRTP and TIP were reviewed for each of the following MPOs:

- Auburn - Opelika MPO
- Birmingham MPO
- Calhoun Area MPO
- Columbus - Phenix City MPO
- Decatur MPO
- Eastern Shore MPO
- Florida - Alabama TPO
- Gadsden - Etowah Area MPO
- Huntsville MPO
- Mobile MPO
- Montgomery MPO
- Shoals Area MPO
- Southeast Wiregrass Area MPO
- Tuscaloosa Area MPO

**Table 7.3** shows how the goals and projects in these plans align with this CRS.

## Table 7.1: CRS Alignment with Federal Requirements

| Requirement | Compliance | Corresponding Section |
|---|---|---|
| Coordinate with MPOs | All Alabama MPOs were invited to participate in three meetings during the CRS development process. They completed a survey to help identify goals and strategies and provided their current plans and project lists. The MPOs also reviewed and provided feedback on the draft CRS. | CRS: Section 3.3, Appendix A, Appendix B |
| Support efforts to reduce transportation emissions | A vision statement and goals were identified to support efforts to reduce transportation emissions. | CRS: Section 4.0 |
| Identify projects and strategies to reduce transportation emissions | Focus areas, along with corresponding strategies and implementation actions, were identified to reduce transportation emissions. | CRS: Section 5.0, Section 6.0 |
| Support the reduction of transportation emissions of the State | The CRS aligns with existing statewide and MPO plans which contain many projects and initiatives to reduce transportation emissions in Alabama. The CRS also supports ALDOT's current list of CRP projects. | CRS: Section 7.2 & Section 7.3<br>Technical Report *"Existing Conditions Analysis"*: Section 4.0 |
| Quantify the total carbon emissions from transportation within the State | Total carbon emissions from transportation fuel consumption were quantified for Alabama. | Technical Report *"Existing Conditions Assessment"*: Section 2.0 & Section 3.0 |
| Be appropriate to the population density and context of the State | Numerous sources of state-specific data were analyzed to prepare a CRS that is appropriate to the population density and context of Alabama. | CRS: Section 2.0<br>Technical Report *"Existing Conditions Assessment"*: Section 2.0 |

## Table 7.2: CRS Alignment with Statewide Plans

| Plan | Applicable Goals/Objectives | Applicable Projects/Strategies |
|---|---|---|
| Alabama Statewide Transportation Plan (2017)<br><br>Statewide Transportation Improvement Program (2024 - 2027) | Accommodate emerging technology<br><br>Understand trends in mode shift | Sidewalk/curb ramp improvements & construction<br>Crosswalk installations<br>Intersection improvements<br>Trail expansion & construction<br>CCTV camera deployment<br>Multi-use path construction<br>Lighting upgrades & installations<br>Bicycle lane striping<br>Traffic signal upgrades<br>Pedestrian bridge construction<br>Advanced corridor management (ITS)<br>Regional Traffic Operations Program<br>Ride share program<br>Regional Transportation Management Centers<br>ITS expansion<br>Segways for police department<br>Feasibility study for sidewalks/multi-use path<br>Carbon Reduction Strategy<br>Electric Vehicle Program<br>Transit improvements<br>Electric buses and charging stations |

| Plan | Applicable Goals/Objectives | Applicable Projects/Strategies |
|---|---|---|
| Alabama Strategic Highway Safety Plan (2022) | No applicable goals | Safety countermeasures to reduce the frequency and severity of intersection conflicts through traffic control devices<br>Safety countermeasures to reduce the frequency and severity of intersection conflicts through geometric improvements, use of emerging technologies and detection devices, and the utilization of intersection control evaluation studies<br>Access to public transportation or other alternative transportation options<br>Infrastructure to support non-motorists |
| Alabama Statewide Freight Plan (2022) | Improve reliability and reduce congestion on the National Multimodal Freight Network within the state.<br>Promote the use of ITS technologies to improve the safety, efficiency, and reliability on the statewide freight network.<br>Promote and enhance both the human and natural environment while enhancing the performance of the statewide freight network. | Congestion reduction<br>Innovative operational improvements<br>Commercial vehicle parking<br>Reduction of environmental impacts |

| Plan | Applicable Goals/Objectives | Applicable Projects/Strategies |
|---|---|---|
| ALDOT Statewide TSMO Master Plan (2019) | Reduce congestion and bottlenecks<br><br>Increase sustainability and minimize environmental impacts<br><br>Integrate TSMO solutions into ALDOT policies, plans, and procedures | Intelligent Transportation Systems & communications<br><br>Advanced traffic signal systems<br><br>Traffic Management Centers<br><br>Real-time traveler information<br><br>Traffic incident management<br><br>Emergency transportation operations<br><br>Road weather management<br><br>Special event management |
| Alabama Electric Vehicle Infrastructure Plan (2022) | No specific goals in plan | Electric vehicle infrastructure<br><br>Electric vehicle corridors |

## Table 7.3: CRS Alignment with MPO Plans

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Auburn-Opelika | 2045 Long Range Transportation Plan<br><br>FY 2024-2027 Transportation Improvement Program | Provide reliable transportation options.<br><br>Improve safety and security.<br><br>Maintain and maximize our system.<br><br>Protect our environment and communities. | Sidewalk construction<br>Intersection improvements<br>Traffic signal upgrades<br>Multi-use path construction<br>Dynamic message signs<br>Transit improvements |
| Birmingham | 2050 Regional Transportation Plan (Draft)<br><br>FY 2024-2027 Transportation Improvement Program (Draft) | Implement strategies that improve operations and address congestion.<br><br>Provide equitable transportation options that enhance opportunities for physical activity, increase access to essential needs, and improve quality of life.<br><br>Support economic growth by ensuring the efficient movement of goods and freight to and from the region.<br><br>Mitigate the challenges of the climate change by incorporating more sustainable transportation choices that promote clean energy, better air and water quality as well as environmental programs that create more resilient communities. | Traffic signal upgrades<br>Intersection improvements<br>Sidewalk/curb ramp upgrades & construction<br>Crosswalk installation<br>Pedestrian bridge construction<br>Bicycle lane construction<br>Multi-use trail construction & upgrades<br>Transit improvements<br>Electric buses and charging stations<br>Lighting upgrades<br>ITS devices for Advanced Corridor Management<br>Regional Transportation Management Center<br>ASAP program |

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Calhoun Area | 2045 Long Range Transportation Plan<br><br>FY 2024-2027 Transportation Improvement Program (Draft) | Achieve a significant reduction in congestion on the National Highway System.<br><br>Improve the efficiency of the surface transportation system.<br><br>Enhance the performance of the transportation system while protecting and enhancing the natural environment. | Multi-use path construction<br>Bicycle lane striping<br>Ride share<br>Sidewalk construction<br>Lighting upgrades<br>Intersection improvements<br>Traffic signal upgrades |
| Columbus-Phenix City | 2045 Metropolitan Transportation Plan<br><br>FY 2021-2024 Transportation Improvement Program | Preserve the quality and capacity of transportation facilities and the street and highway network by using and developing all modes of transportation to their highest and most efficient use.<br><br>Develop and implement appropriate land use controls to help relieve and prevent congestion from occurring to the point that it compromises the functional ability of the primary thoroughfare system.<br><br>Develop and expand present and alternative modes of transportation, such as increased bikeways, walkways, and motorized public transportation.<br><br>Develop and implement policies that enhance and protect the environment. | Trail construction<br>Pedestrian & bicycle facility construction<br>Bicycle parking<br>Transit improvements |

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Decatur | 2045 Long-Range Transportation Plan<br><br>FY 2024-2027 Transportation Improvement Program | Provide a safe and efficient transportation system.<br><br>Improve the accessibility, connectivity, and mobility of the transportation system for the movement of people, goods, and services for all modes in and throughout the planning area.<br><br>Provide a transportation system that will preserve, protect, and enhance the natural and human environment.<br><br>Maintain quality performance of the transportation system through efficient congestion management and operations. | Lighting rehabilitation<br>Intersection improvements<br>Sidewalk construction<br>Advanced Corridor Management<br>Transit improvements |
| Eastern Shore | 2045 Long Range Transportation Plan<br><br>FY 2020-2023 Transportation Improvement Program | Develop effective strategies for maintaining and improving regional mobility for all modes and for freight, within the anticipated funding levels. | Sidewalk construction & improvements<br>Transit improvements<br>Intersection improvements<br>Traffic signal upgrades<br>Trail expansion<br>Street lighting improvements |

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Florida-Alabama TPO | 2045 Long Range Transportation Plan<br><br>FY 2024-2028 Transportation Improvement Program | A transportation system that meets user needs<br><br>A transportation system that is maintained and operated efficiently<br><br>A transportation system that is multimodal, integrated, connected, and innovative<br><br>A transportation system that supports a high quality of life respectful of the environment, public health, and vulnerable users. | Intersection improvements<br>Traffic signal upgrades<br>Mobility management planning<br>Sidewalk construction<br>Bicycle lane striping & sharrows<br>Multi-use path construction<br>Regional Traffic Management Center<br>Advanced traffic management improvements<br>Lighting installation<br>Transit improvements<br>Regional Traffic Operations Program<br>Corridor management planning |
| Gadsden-Etowah Area | 2045 Long Range Transportation Plan<br><br>FY 2020-2023 Transportation Improvement Program | Develop effective strategies for maintaining and improving regional mobility for all modes and for freight, within the anticipated funding levels. | Transit improvements<br>Curb ramp installations |

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Huntsville | Transportation Regionally Innovative Projects 2045<br><br>FY 2024-2027 Transportation Improvement Program (Draft) | Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.<br><br>Increase the accessibility and mobility of people and freight.<br><br>Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.<br><br>Promote efficient system management and operation. | Advanced corridor management<br>Sidewalk construction<br>Intersection improvements<br>Transit improvements<br>Electric buses<br>Pedestrian overpass construction |

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Mobile | Envision 2045<br><br>FY 2024-2027 Transportation Improvement Program | Reduce traffic congestion.<br><br>Improve the efficiency of the surface system.<br><br>Protect the environment. | Shared-use path construction<br>Regional Traffic Operations Program<br>Segways for police department<br>Traffic Management Center upgrades<br>ITS expansions<br>Transit improvements<br>Electric buses<br>Workforce transportation pilot project<br>Intersection improvements<br>Traffic signal upgrades<br>Sidewalk & curb ramp construction<br>Trail extension<br>CCTV camera deployment |
| Montgomery | 2045 Long Range Transportation Plan<br><br>FY 2020-2023 Transportation Improvement Program | Optimize the efficiency, effectiveness, connectivity, safety, and security of the transportation system.<br><br>Provide viable travel choices to improve accessibility and mobility, sustain environmental quality, and preserve community values.<br><br>Develop, maintain, and preserve a balanced multimodal transportation system that provides for safe, integrated, and convenient movement of people and goods. | Sidewalk/multi-use path feasibility study<br>Intersection improvements<br>Curb ramp installation & repairs<br>Sidewalk construction<br>Lighting upgrades<br>Trail construction<br>Intersection improvement study<br>Transit improvements |

| MPO | Documents | Applicable Goals | Applicable Project Types |
|---|---|---|---|
| Shoals Area | 2045 Long Range Transportation Plan<br><br>FY 2020-2023 Transportation Improvement Program | Provide a safe and efficient transportation system.<br><br>Improve the accessibility, connectivity, and mobility of the transportation system for the movement of people, goods, and services for all modes in and throughout the planning area.<br><br>Maintain quality performance of the transportation system through efficient congestion management and operations. | Intersection improvements<br>Transit improvements |
| Southeast Wiregrass Area | 2045 Long Range Transportation Plan<br><br>FY 2020-2023 Transportation Improvement Program | Affordable, convenient, and reliable access to destinations by multiple modes of transportation<br><br>A well-maintained and efficient transportation system<br><br>A transportation system that minimizes detrimental impacts to the natural and historic environment and practices environmental stewardship | Sidewalk construction<br>Curb ramp installations<br>Transit improvements<br>Intersection improvements |
| Tuscaloosa Area | 2045 Long Range Transportation Plan<br><br>FY 2024-2027 Transportation Improvement Program | Achieve a significant reduction in congestion on the National Highway System.<br><br>Improve the efficiency of the surface transportation system.<br><br>Enhance the performance of the transportation system while protecting and enhancing the natural environment. | Intersection improvements<br>Lighting installation<br>Curb ramp installations<br>Sidewalk construction<br>Traffic studies<br>Transit improvements |

# 8.0 Project Evaluation Process & Performance Measures

## 8.1 Project Evaluation Process

### Project Evaluation

New projects will be evaluated to determine their expected effectiveness in reducing $CO_2$ emissions. Projects will be compared against the CRS vision statement, goals, focus areas, and strategies for alignment. Appropriate data collection activities will be identified at the beginning of each project to measure progress toward meeting carbon reduction goals. As the project is implemented, this data will be documented and analyzed to assess continued effectiveness in reducing $CO_2$ emissions.

As projects are implemented, the parameters can be updated in the GHG Calculator to calculate the revised GHG emissions. The Sensitivity Analysis within the GHG Calculator can be used to determine which types of projects will provide the greatest reduction (i.e., reduced SOV trips, increased fuel efficiency, higher percent of EV fleet, etc.).

### Equity Analysis

ALDOT is committed to equity and will strive to implement carbon reduction projects across all areas of the state, including areas with environmental justice populations. The following statewide maps will be used to analyze equity impacts from projects that are identified for carbon reduction funding:

- Persons 65 or Older
- Households Without a Vehicle
- Limited English Proficiency Population
- Minority Population
- Low Income Population
- Persons with Disabilities
- Combined Environmental Justice Population

These maps are included in **Appendix D**.

## 8.2 Targets & Performance Measures

Performance measures provide a way for agencies to evaluate project and program effectiveness to determine if they are successful. FHWA issued a proposed rule with a request for comments on July 15, 2022, entitled "*National Performance Management Measures: Assessing Performance of the National Highway System, Greenhouse Gas Emissions Measure*". When finalized, this rule will require ALDOT and all Alabama MPOs to establish targets to reduce $CO_2$ emissions. Developing methods for measuring performance toward achieving these targets and reporting GHG emissions from the transportation sector will also be required. This CRS will be updated to include targets and performance measures after the rule is finalized.

# 9.0 Conclusion

ALDOT and the Alabama MPOs are committed to supporting and implementing programs and projects that reduce $CO_2$ emissions on the state's transportation network. These programs and projects will focus on ITS technologies, transportation demand management tools, multimodal transportation improvements, energy efficient lighting and traffic control devices, and alternative fuel vehicles and infrastructure. Programs and projects will be evaluated for carbon reduction and equity impacts and will be adjusted as needed to continue progress toward reduced $CO_2$ emissions and improved air quality for all Alabama residents.

# Appendix A: MPO Meeting Summaries

## Meeting #1

The first meeting was held on July 12, 2023, via Microsoft Teams. During the meeting, the Neel-Schaffer project team presented an overview of the Carbon Reduction Program. They also discussed Alabama's Carbon Reduction Strategy and requested that each MPO submit their LRTP, TIP, and any carbon reduction strategies that they are pursuing. The meeting ended with a brief explanation of the next steps in the project and an invitation to attend MPO Meeting #2 on August 22, 2023.

**Attendance**

| Name | Agency |
|---|---|
| Scott Tillman | Birmingham MPO |
| Austin Mount | Florida - Alabama TPO |
| Zane Davis | Tuscaloosa Area MPO |
| Lisa Sandt | Auburn - Opelika MPO |
| Anthony Johnson | Mobile MPO |
| Monica Williamson | Mobile MPO |
| Dewayne Hellums | Decatur MPO |
| Chris Henson | Decatur MPO |
| Dennis Stripling | Tuscaloosa Area MPO |
| Michael Mixen | Columbus - Phenix City MPO |
| Steve Partridge | Gadsden - Etowah Area MPO |
| Lynda Temples | Columbus - Phenix City MPO |
| Casey Lewis | Montgomery MPO |
| Sonya Baker | ALDOT |
| Toni Arrington | ALDOT |
| Sundae Ragland | ALDOT |
| Candy Griffin | ALDOT |
| Barbara Hendricks | ALDOT |
| James Giles | ALDOT |
| Aaron Dawson | FHWA - Alabama Division |
| Becky Rogers | Neel-Schaffer, Inc. |
| Vijay Kunada | Neel-Schaffer, Inc. |
| Chuck LeBoeuf | Neel-Schaffer, Inc. |

Carbon Reduction Strategy

## Carbon Reduction Program Overview

MPO Meeting #1

July 12, 2023

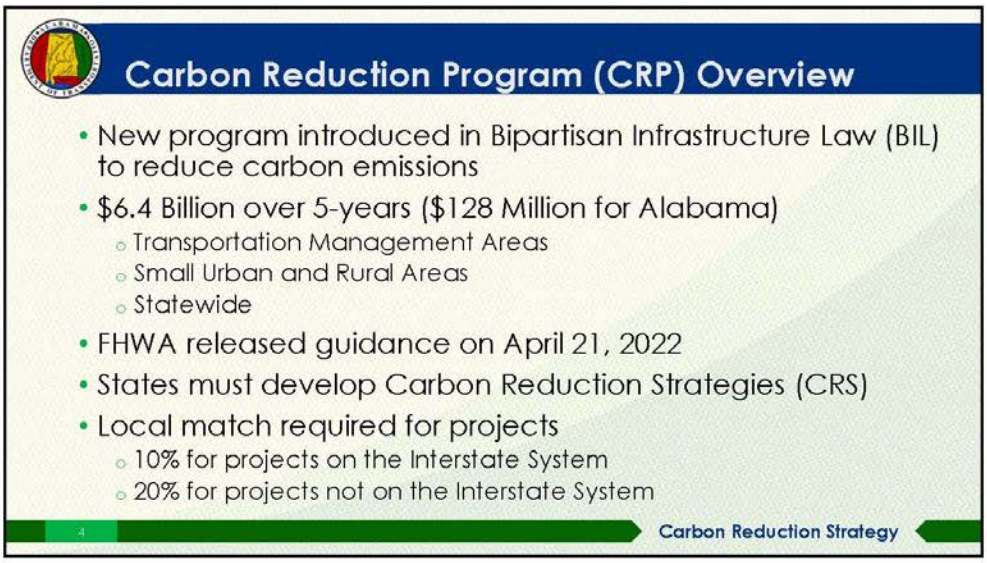
## Agenda

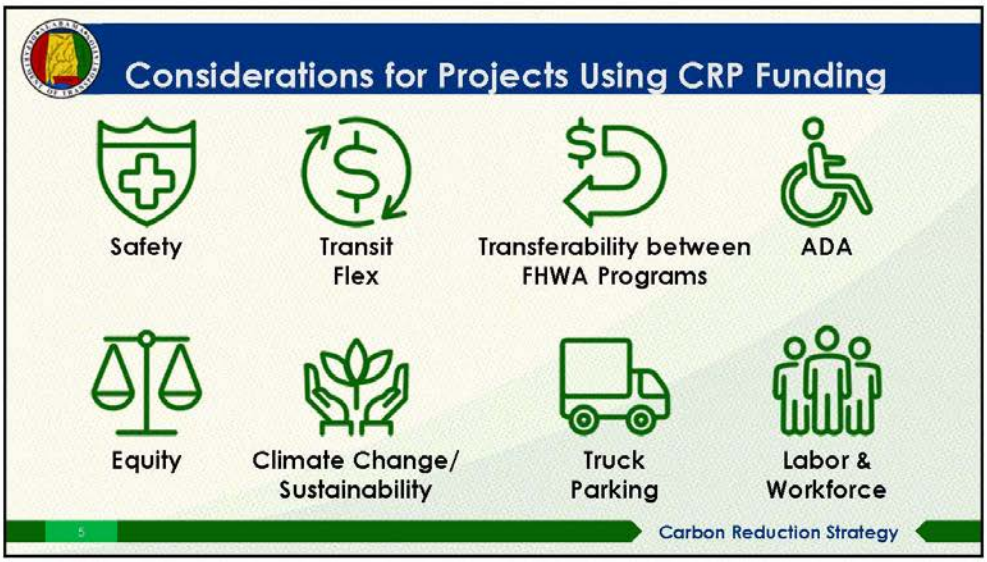
- Introduce Project Team
- Present Carbon Reduction Program (CRP) Overview
- Discuss Alabama's Carbon Reduction Strategy (CRS)
- Request MPO Involvement
- Share Next Steps
- Provide Project Contact Information

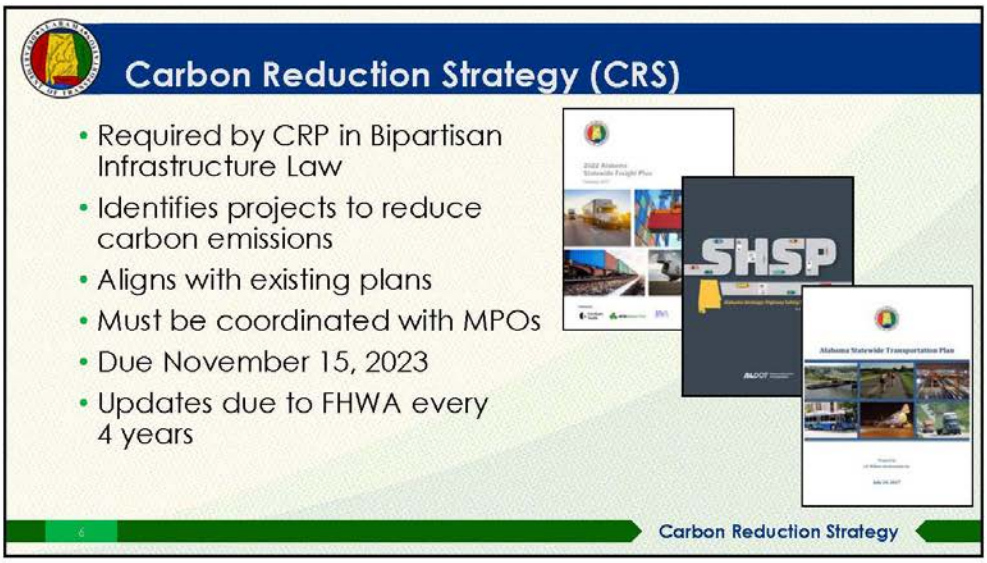

2

Carbon Reduction Strategy


Neel-Schaffer Project Team
NEEL-SCHAFFER
Becky Rogers
Project Manager
Vijay Kunada
QA/QC
Chuck LeBoeuf
Project Engineer
Nick Broussard
Senior Planner
3
Carbon Reduction Strategy

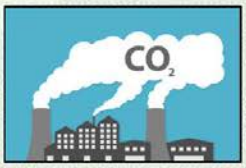

Carbon Reduction Program (CRP) Overview
• New program introduced in Bipartisan Infrastructure Law (BIL) to reduce carbon emissions
• $6.4 Billion over 5-years ($128 Million for Alabama)
o Transportation Management Areas
o Small Urban and Rural Areas
o Statewide
• FHWA released guidance on April 21, 2022
• States must develop Carbon Reduction Strategies (CRS)
• Local match required for projects
o 10% for projects on the Interstate System
o 20% for projects not on the Interstate System
4
Carbon Reduction Strategy


Considerations for Projects Using CRP Funding
Safety
Transit Flex
Transferability between FHWA Programs
ADA
Equity
Climate Change/ Sustainability
Truck Parking
Labor & Workforce
5
Carbon Reduction Strategy


Carbon Reduction Strategy (CRS)
• Required by CRP in Bipartisan Infrastructure Law
• Identifies projects to reduce carbon emissions
• Aligns with existing plans
• Must be coordinated with MPOs
• Due November 15, 2023
• Updates due to FHWA every 4 years
SHSP
6
Carbon Reduction Strategy

## Carbon Reduction Strategy (CRS)

- Support efforts to reduce transportation emissions
- Identify projects and strategies to reduce emissions
- Support reduction of transportation emissions of the State
- Quantify total carbon emissions from production, transport, and use of materials used in construction
- Be appropriate to population density and context of State


7 Carbon Reduction Strategy

## Eligible Projects

- Traffic Monitoring or Management
- Public Transportation
- Transportation Alternatives
- Advanced Transportation or Congestion Management
- Infrastructure-based ITS Systems
- Energy Efficient Street Lighting and Traffic Control Devices
- Carbon Reduction Strategy Development

8 Carbon Reduction Strategy

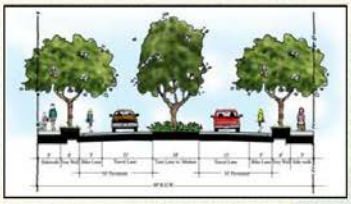
## Eligible Projects (continued)

- Travel Demand Management Strategies
- Freight Projects that Improvement Environmental Impacts
- Deployment of Alternative Fuel Vehicles
- Diesel Engine Retrofits
- Traffic Flow Improvements
- Reduction of Transportation Emissions at Ports

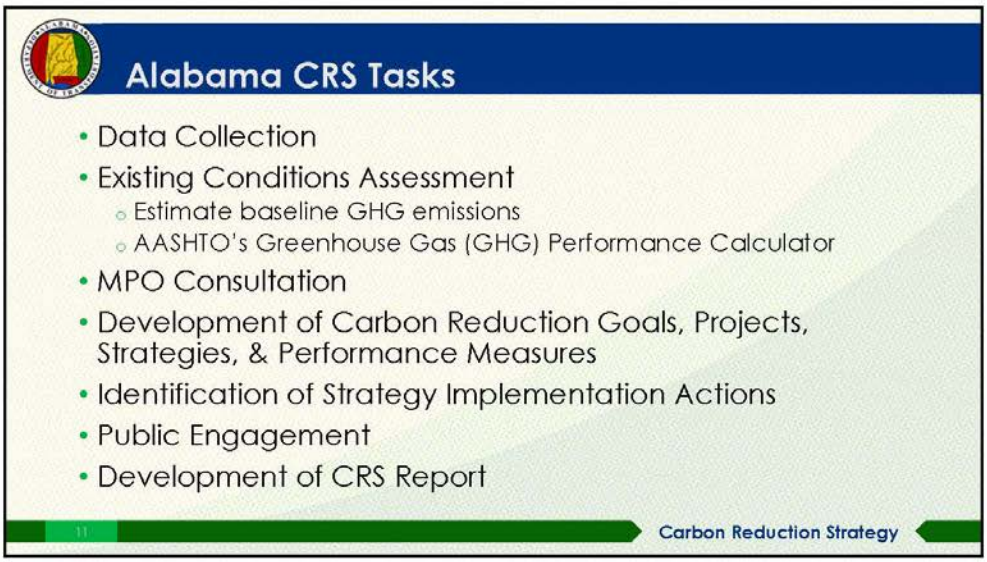
9 Carbon Reduction Strategy

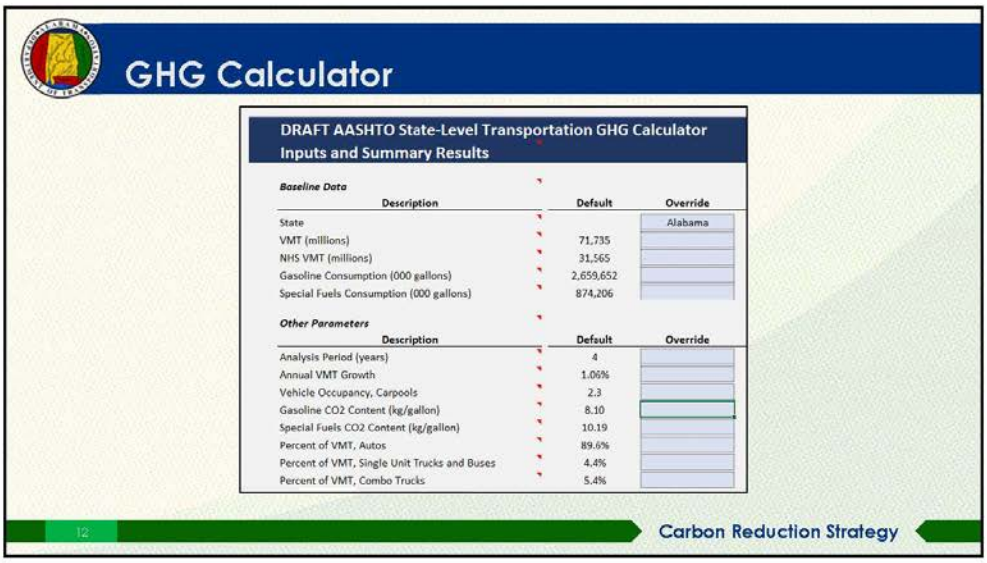
## Examples of Strategies/Projects

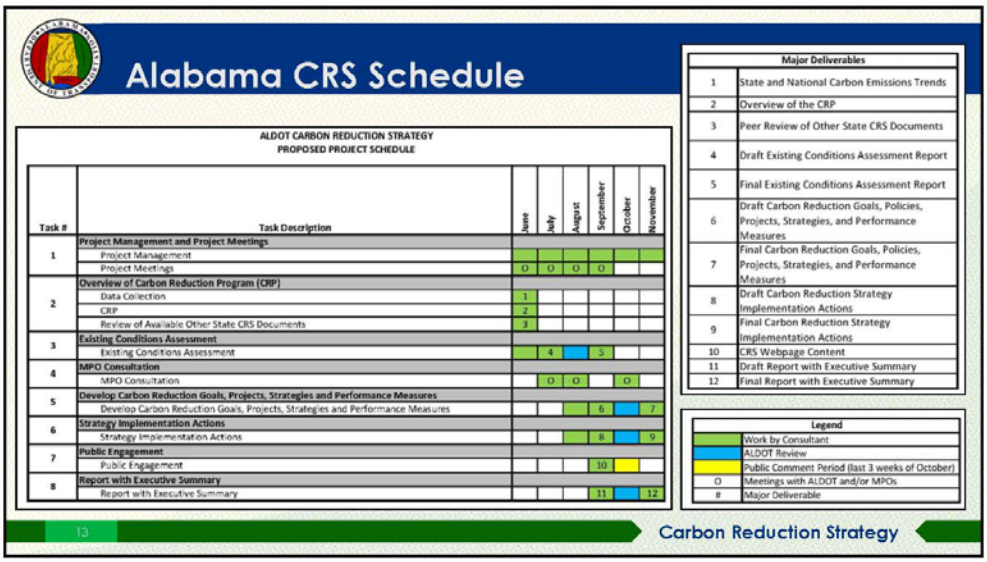
- Reduce traffic congestion
  - Public transportation facilities
  - Pedestrian facilities
  - Bicycle facilities
  - Complete streets
  - Shared vehicle trips
- Promote vehicles/modes with lower emissions
- Improve construction practices to lower emissions




10 Carbon Reduction Strategy


Alabama CRS Tasks
• Data Collection
• Existing Conditions Assessment
◦ Estimate baseline GHG emissions
◦ AASHTO's Greenhouse Gas (GHG) Performance Calculator
• MPO Consultation
• Development of Carbon Reduction Goals, Projects, Strategies, & Performance Measures
• Identification of Strategy Implementation Actions
• Public Engagement
• Development of CRS Report
11
Carbon Reduction Strategy


GHG Calculator
DRAFT AASHTO State-Level Transportation GHG Calculator
Inputs and Summary Results
Baseline Data
Description
Default
Override
State
Alabama
VMT (millions)
71,735
NHS VMT (millions)
31,565
Gasoline Consumption (000 gallons)
2,659,652
Special Fuels Consumption (000 gallons)
874,206
Other Parameters
Description
Default
Override
Analysis Period (years)
4
Annual VMT Growth
1.06%
Vehicle Occupancy, Carpools
2.3
Gasoline CO2 Content (kg/gallon)
8.10
Special Fuels CO2 Content (kg/gallon)
10.19
Percent of VMT, Autos
89.6%
Percent of VMT, Single Unit Trucks and Buses
4.4%
Percent of VMT, Combo Trucks
5.4%
12
Carbon Reduction Strategy



## Alabama CRS Schedule

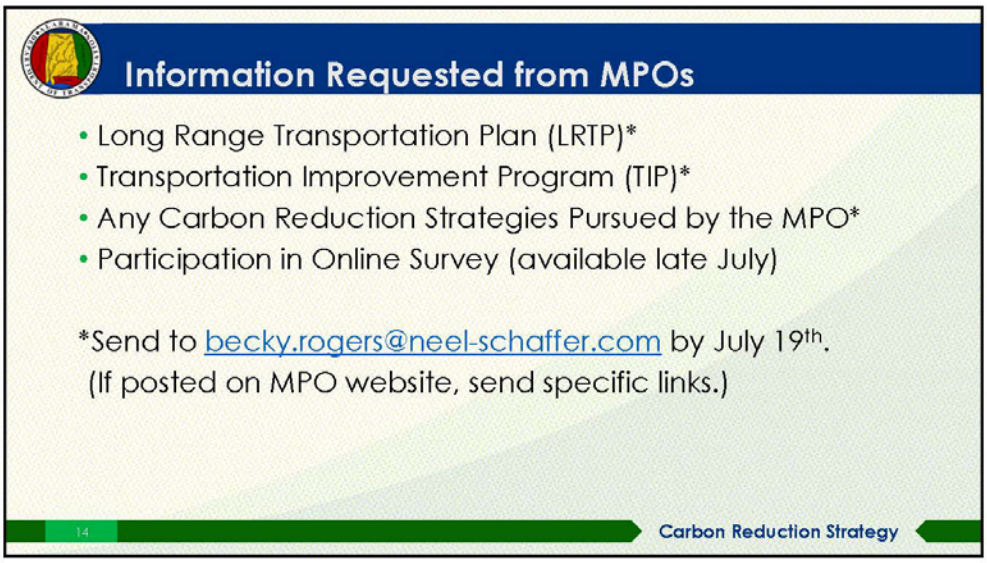
ALDOT CARBON REDUCTION STRATEGY
PROPOSED PROJECT SCHEDULE

| Task # | Task Description | June | July | August | September | October | November |
|---|---|---|---|---|---|---|---|
| 1 | **Project Management and Project Meetings** | | | | | | |
| | Project Management | | | | | | |
| | Project Meetings | O | O | O | O | | |
| 2 | **Overview of Carbon Reduction Program (CRP)** | | | | | | |
| | Data Collection | 1 | | | | | |
| | CRP | 2 | | | | | |
| | Review of Available Other State CRS Documents | 3 | | | | | |
| 3 | **Existing Conditions Assessment** | | | | | | |
| | Existing Conditions Assessment | | 4 | | 5 | | |
| 4 | **MPO Consultation** | | | | | | |
| | MPO Consultation | | O | O | | O | |
| 5 | **Develop Carbon Reduction Goals, Projects, Strategies and Performance Measures** | | | | | | |
| | Develop Carbon Reduction Goals, Projects, Strategies and Performance Measures | | | | 6 | | 7 |
| 6 | **Strategy Implementation Actions** | | | | | | |
| | Strategy Implementation Actions | | | | 8 | | 9 |
| 7 | **Public Engagement** | | | | | | |
| | Public Engagement | | | | 10 | | |
| 8 | **Report with Executive Summary** | | | | | | |
| | Report with Executive Summary | | | | 11 | | 12 |

| | Major Deliverables |
|---|---|
| 1 | State and National Carbon Emissions Trends |
| 2 | Overview of the CRP |
| 3 | Peer Review of Other State CRS Documents |
| 4 | Draft Existing Conditions Assessment Report |
| 5 | Final Existing Conditions Assessment Report |
| 6 | Draft Carbon Reduction Goals, Policies, Projects, Strategies, and Performance Measures |
| 7 | Final Carbon Reduction Goals, Policies, Projects, Strategies, and Performance Measures |
| 8 | Draft Carbon Reduction Strategy Implementation Actions |
| 9 | Final Carbon Reduction Strategy Implementation Actions |
| 10 | CRS Webpage Content |
| 11 | Draft Report with Executive Summary |
| 12 | Final Report with Executive Summary |

| | Legend |
|---|---|
| | Work by Consultant |
| | ALDOT Review |
| | Public Comment Period (last 3 weeks of October) |
| O | Meetings with ALDOT and/or MPOs |
| # | Major Deliverable |

13 Carbon Reduction Strategy

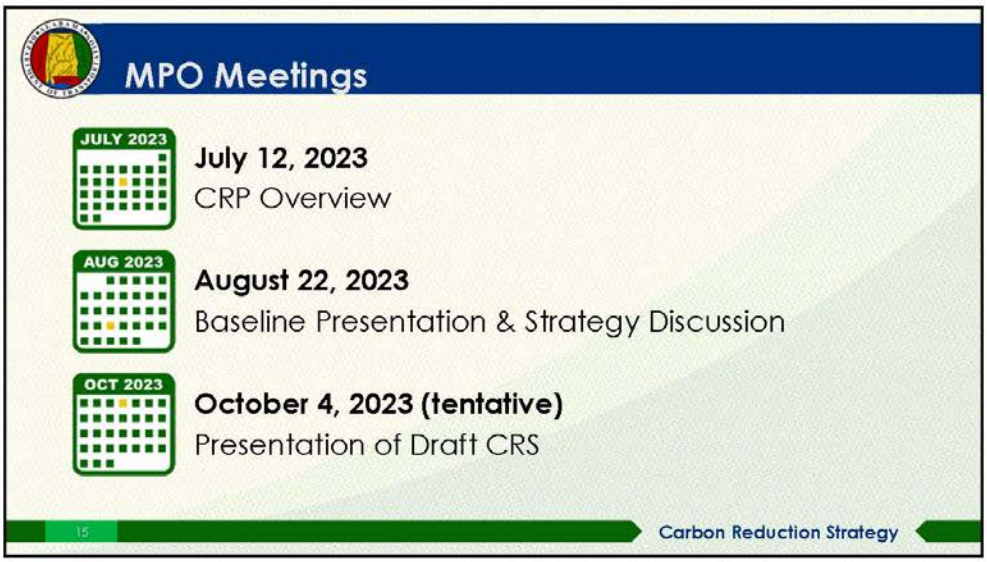


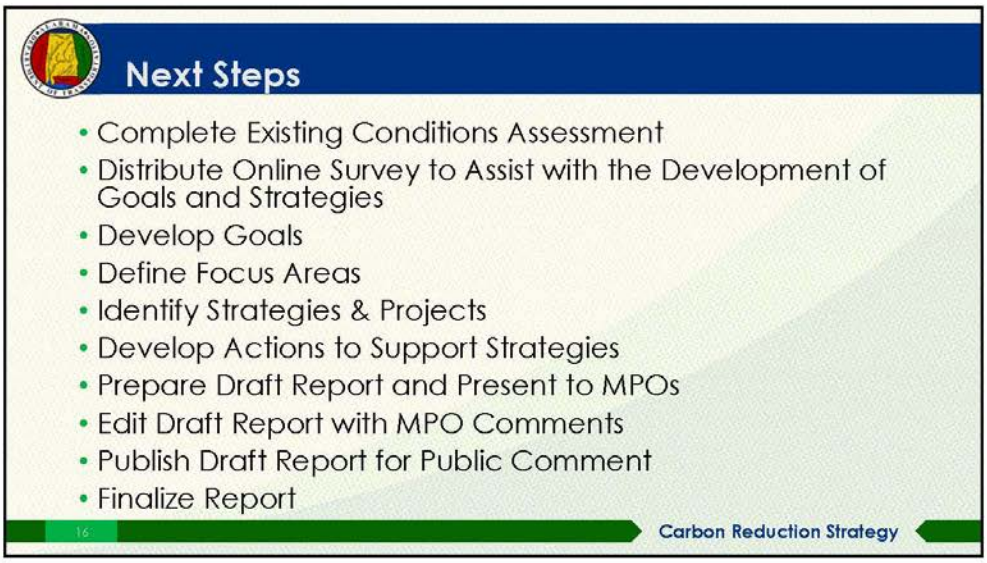
## Information Requested from MPOs

- Long Range Transportation Plan (LRTP)*
- Transportation Improvement Program (TIP)*
- Any Carbon Reduction Strategies Pursued by the MPO*
- Participation in Online Survey (available late July)

*Send to becky.rogers@neel-schaffer.com by July 19th.
(If posted on MPO website, send specific links.)

14 Carbon Reduction Strategy


MPO Meetings
JULY 2023
July 12, 2023
CRP Overview
AUG 2023
August 22, 2023
Baseline Presentation & Strategy Discussion
OCT 2023
October 4, 2023 (tentative)
Presentation of Draft CRS
15
Carbon Reduction Strategy


Next Steps
• Complete Existing Conditions Assessment
• Distribute Online Survey to Assist with the Development of Goals and Strategies
• Develop Goals
• Define Focus Areas
• Identify Strategies & Projects
• Develop Actions to Support Strategies
• Prepare Draft Report and Present to MPOs
• Edit Draft Report with MPO Comments
• Publish Draft Report for Public Comment
• Finalize Report
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Carbon Reduction Strategy


Carbon
Reduction
Strategy
Project Contacts
Becky Rogers
becky.rogers@neel-schaffer.com
Vijay Kunada
vijay.kunada@neel-schaffer.com
NEEL-SCHAFFER

## Meeting #2

The second meeting was held on August 22, 2023, via Microsoft Teams. A summary of the *"Existing Conditions Assessment"* technical report and the results of the MPO/ALDOT surveys were presented during this meeting. Drafts of the vision statement, goals, and focus areas were also shared and discussed with the MPOs for input and concurrence. Input was also requested for strategies to support each focus area. The meeting ended with a brief explanation of the next steps in the project and an invitation to attend MPO Meeting #3 on October 4, 2023.

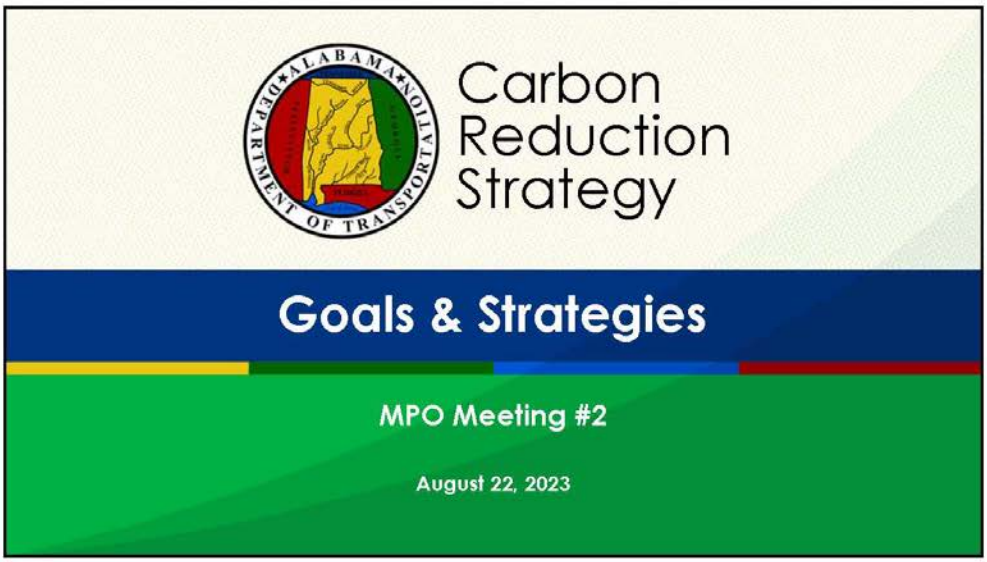
Specific comments from the discussion are recorded below:

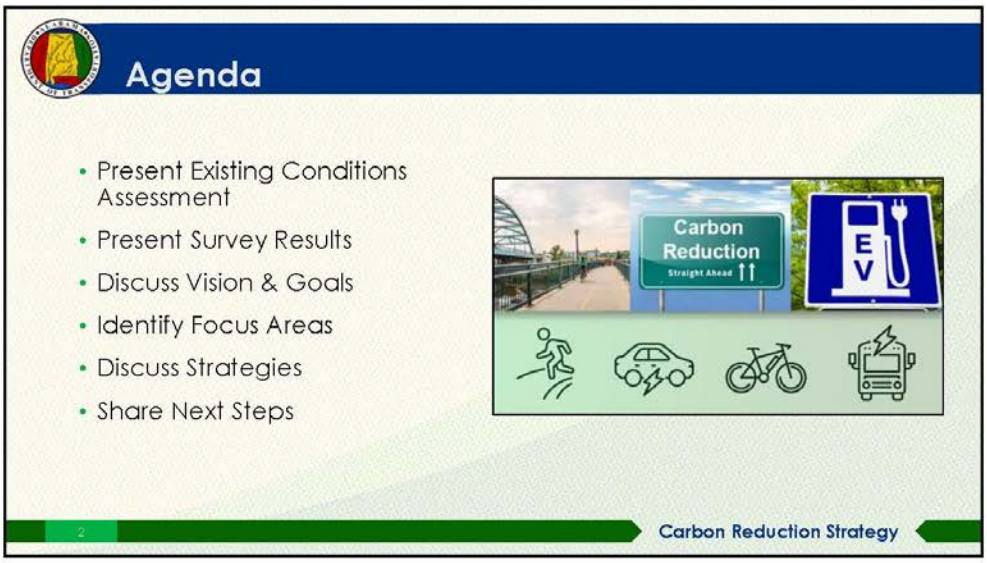
- Sonya Baker (ALDOT), Tom Piper (Mobile MPO), and Robert Smith (Montgomery MPO) offered positive feedback on the proposed vision statement.
- The MPOs did not have any feedback on the goals and indicated approval.
- Tom Piper (Mobile MPO) offered positive feedback on the proposed focus areas. He mentioned that his MPO is focused on ITS implementation.
- Austin Mount (Florida-Alabama TPO) suggested being cautious about showing land use changes as a strategy due to political considerations.
- Sonya Baker (ALDOT) mentioned that ALDOT will partner with ADECA for EV infrastructure implementation.
- Tom Piper (Mobile MPO) mentioned purchasing EV buses for one of their cities.
- Robert Smith (Montgomery MPO) mentioned that they programmed funding in their 2024 budget for an EV charging station infrastructure master plan. He also stated that EV/AF vehicles have been discussed as far back as 2011-2012. They plan to eventually go to all electric transit vehicles.
- Scott Tillman (Birmingham MPO) stated that Birmingham is implementing EV infrastructure and diesel retrofits. Their MPO works with the Alabama Clean Air Initiative. He can provide their annual report.
- Sarah Hart Sislak (Eastern Shore MPO) mentioned that they have plans for charging stations and to expand the charging network in their MPO area.
- Vijay Kunada (Neel-Schaffer) brought up alternative fuel corridor designations and the NEVI funding program.
- Austin Mount (Florida - Alabama TPO) mentioned an ITS multi-prong approach, especially on the Florida portion of their MPO. He also mentioned considering a safety element for ITS, especially for corridors with high fatalities.
- Tom Piper (Mobile MPO) brought up the RTOP initiative in Mobile.

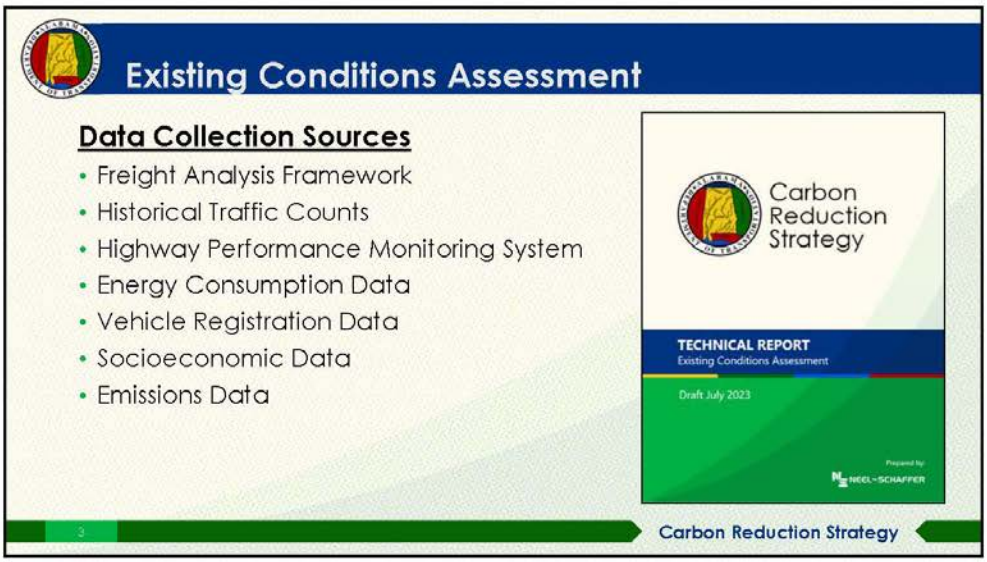
- Scott Tillman (Birmingham MPO) mentioned the CommuteSmart program partnership with the four large cities (Birmingham, Mobile, Montgomery, and Huntsville).
- Tom Piper (Mobile Area MPO) and Scott Tillman (Birmingham MPO) agree that the strategies support the goals.
- Robert Smith (Montgomery MPO) suggested adding $CO_2$ emissions to the first goal.
- Sonya Baker (ALDOT) asked the agencies that are also RPOs to brainstorm any strategies that are applicable to rural areas.

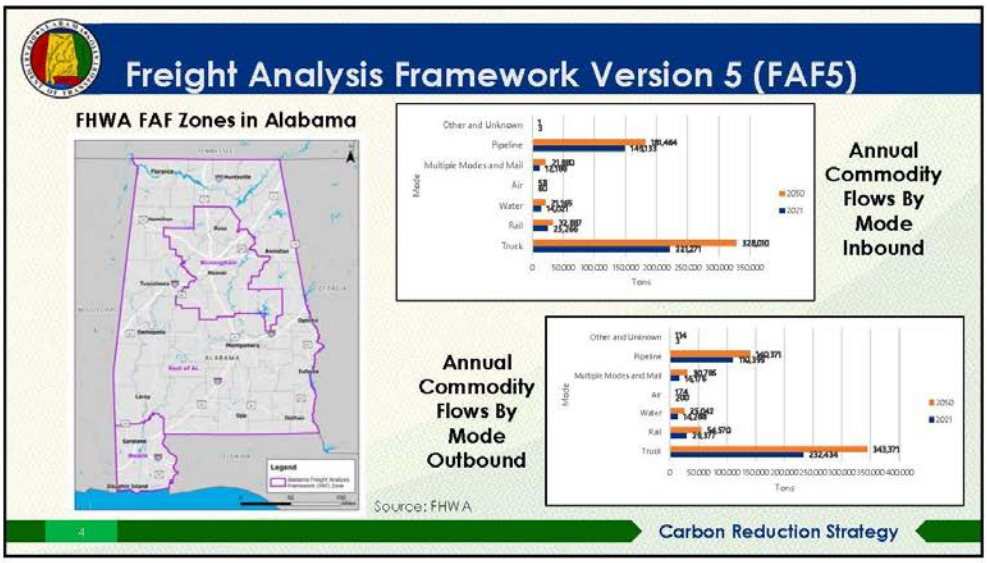
**Attendance**

| Name | Agency |
|---|---|
| Scott Tillman | Birmingham MPO |
| Austin Mount | Florida - Alabama TPO |
| Zane Davis | Tuscaloosa Area MPO |
| Lisa Sandt | Auburn - Opelika MPO |
| Anthony Johnson | Mobile MPO |
| Monica Williamson | Mobile MPO |
| Dewayne Hellums | Decatur MPO |
| Dennis Stripling | Tuscaloosa Area MPO |
| Michael Mixen | Columbus - Phenix City MPO |
| Casey Lewis | Montgomery MPO |
| Tim Dail | Gadsden - Etowah Area MPO |
| Elizabeth Messick | Calhoun Area MPO |
| James Vandiver | Huntsville MPO |
| Sarah Hart Sislak | Eastern Shore MPO |
| Tom Piper | Mobile MPO |
| Jo Beth Gleason | Huntsville MPO |
| Robert Smith | Montgomery MPO |
| Jessica Mayo | Eastern Shore MPO |
| Sonya Baker | ALDOT |
| Toni Arrington | ALDOT |
| Sundae Ragland | ALDOT |
| Robert Dees | ALDOT |
| Aaron Dawson | FHWA - Alabama Division |
| Becky Rogers | Neel-Schaffer, Inc. |
| Vijay Kunada | Neel-Schaffer, Inc. |
| Chuck LeBoeuf | Neel-Schaffer, Inc. |


Carbon
Reduction
Strategy
Goals & Strategies
MPO Meeting #2
August 22, 2023


Agenda
Present Existing Conditions Assessment
Present Survey Results
Discuss Vision & Goals
Identify Focus Areas
Discuss Strategies
Share Next Steps
Carbon Reduction
Straight Ahead
EV
2
Carbon Reduction Strategy


Existing Conditions Assessment
Data Collection Sources
• Freight Analysis Framework
• Historical Traffic Counts
• Highway Performance Monitoring System
• Energy Consumption Data
• Vehicle Registration Data
• Socioeconomic Data
• Emissions Data
Carbon Reduction Strategy
TECHNICAL REPORT
Existing Conditions Assessment
Draft July 2023
Carbon Reduction Strategy


Freight Analysis Framework Version 5 (FAF5)
FHWA FAF Zones in Alabama
Annual Commodity Flows By Mode Inbound
Annual Commodity Flows By Mode Outbound
Source: FHWA
Carbon Reduction Strategy

## Historical Traffic Counts

Existing Roadway Volumes

Volumes (AADT)
- 0 - 25,000
- 25,001 - 50,000
- 50,001 - 75,000
- 75,001 - 100,000
- >100,000

**Interstates with Volumes Exceeding 80,000 AADT**

- I-20/I-59, I-65, and I-459 in Birmingham
- I-65 and I-85 in Montgomery
- I-10 and I-65 in Mobile
- I-565 in Downtown Huntsville

**Non-Interstates with Moderate to High AADT**

- US-280 between Phenix City and Birmingham
- US-231 between Montgomery and the Florida State Line
- US-431 between Huntsville and I-20 and between Phenix City and Dothan
- US-72 between the Mississippi State Line and the Tennessee State Line

Source: ALDOT (Map developed by NSI)

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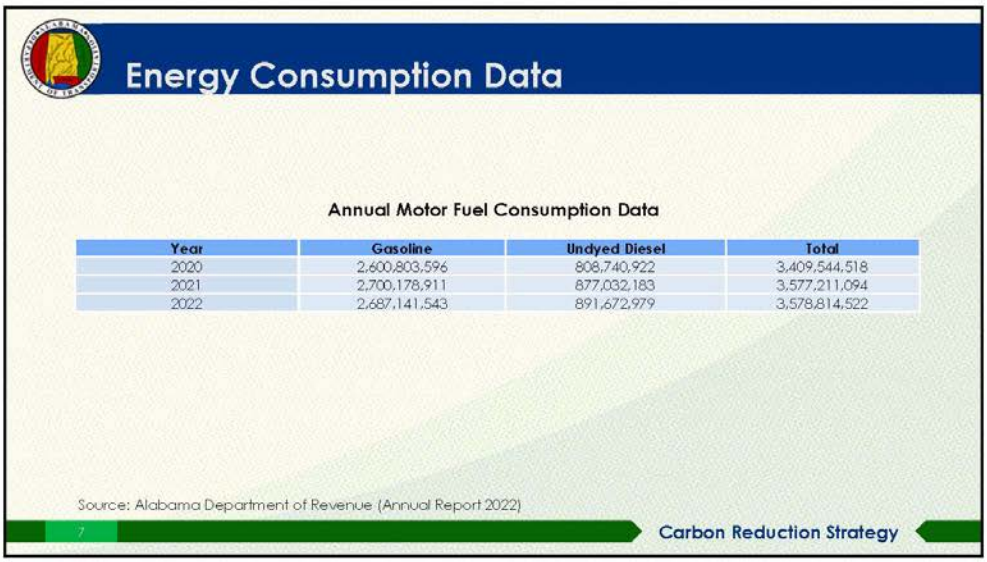
## Highway Performance Monitoring System (HPMS)

HPMS Extent and Travel Summary (2022)

| Functional Classification | Centerline Miles | | Daily Vehicle Miles Traveled | |
|---|---|---|---|---|
| | All | NHS | All | NHS |
| Interstate | 1,005.9 | 1,003.5 | 44,371,636 | 44,226,214 |
| Principal Arterial – Other Freeways and Expressways | 34.4 | 30.6 | 1,449,307 | 1,300,240 |
| Other Principal Arterials | 3,323.4 | 3,133.5 | 41,932,767 | 40,341,214 |
| Minor Arterials | 6,350.1 | 79.0 | 32,301,652 | 643,505 |
| Major Collectors | 15,920.8 | 12.3 | 23,698,615 | 52,984 |
| Minor Collectors | 5,500.4 | 0.0 | 3,821,632 | 0 |
| Local | 66,925.0 | 7.6 | 45,244,444 | 10,510 |
| **Total** | **99,060.0** | **4,266.6** | **192,820,054** | **86,574,666** |

Sources: HPMS, ALDOT

6 Carbon Reduction Strategy



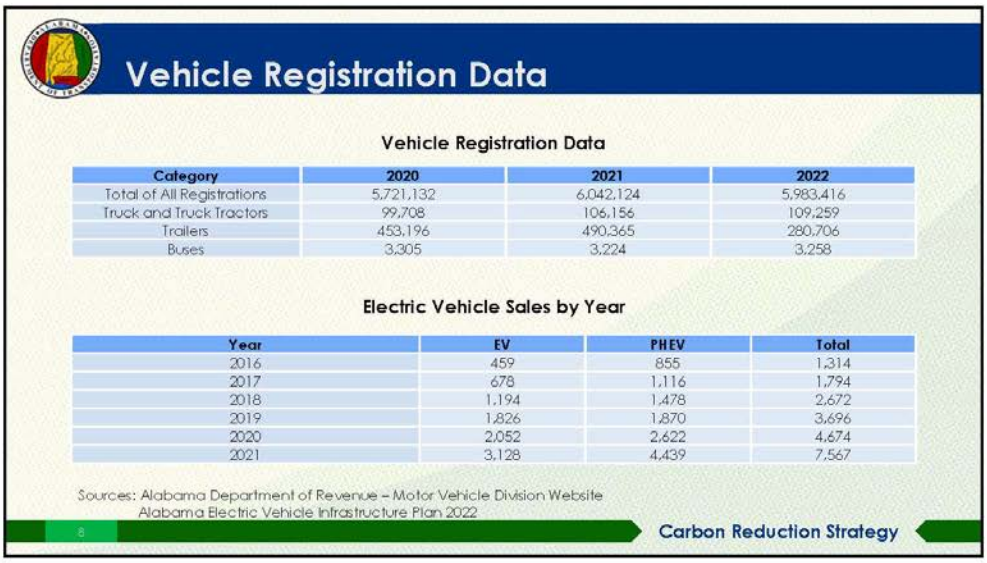
## Energy Consumption Data

**Annual Motor Fuel Consumption Data**

| Year | Gasoline | Undyed Diesel | Total |
|---|---|---|---|
| 2020 | 2,600,803,596 | 808,740,922 | 3,409,544,518 |
| 2021 | 2,700,178,911 | 877,032,183 | 3,577,211,094 |
| 2022 | 2,687,141,543 | 891,672,979 | 3,578,814,522 |

Source: Alabama Department of Revenue (Annual Report 2022)

7 Carbon Reduction Strategy



## Vehicle Registration Data

**Vehicle Registration Data**

| Category | 2020 | 2021 | 2022 |
|---|---|---|---|
| Total of All Registrations | 5,721,132 | 6,042,124 | 5,983,416 |
| Truck and Truck Tractors | 99,708 | 106,156 | 109,259 |
| Trailers | 453,196 | 490,365 | 280,706 |
| Buses | 3,305 | 3,224 | 3,258 |

**Electric Vehicle Sales by Year**

| Year | EV | PHEV | Total |
|---|---|---|---|
| 2016 | 459 | 855 | 1,314 |
| 2017 | 678 | 1,116 | 1,794 |
| 2018 | 1,194 | 1,478 | 2,672 |
| 2019 | 1,826 | 1,870 | 3,696 |
| 2020 | 2,052 | 2,622 | 4,674 |
| 2021 | 3,128 | 4,439 | 7,567 |

Sources: Alabama Department of Revenue – Motor Vehicle Division Website
Alabama Electric Vehicle Infrastructure Plan 2022

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## Socioeconomic Data

**Population Change**

- 2010: 4,779,736
- 2020: 5,024,279
- 5.1% Growth

**Existing Commute Patterns**

- 2010: 78% Used Private Vehicles
- 2021: 72% Used Private Vehicles
- 2010: 7% Used Public Transportation
- 2021: 8% Used Public Transportation

**Population Per Square Mile**

- 2010: 94.4
- 2020: 99.2
- 5.1% Growth

**Top Employment Industries**

- Manufacturing
- Retail Trade
- Healthcare & Social Assistance
- Professional, Scientific, & Technical Services
- Construction

Sources: U.S. Census Decennial Data 2010-2020
American Community Survey 2021

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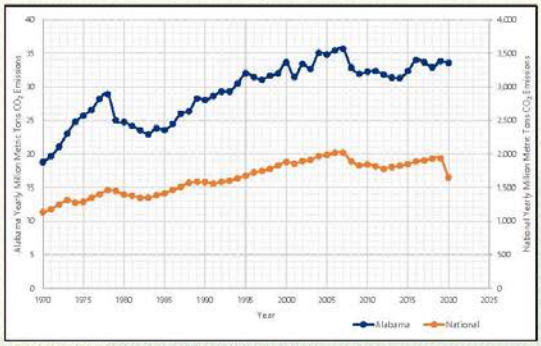
## Emissions Data

**Transportation Sector $CO_2$ Emissions from Fossil Fuel Consumption (1970 – 2020)**




Source: U.S. Energy Information Administration

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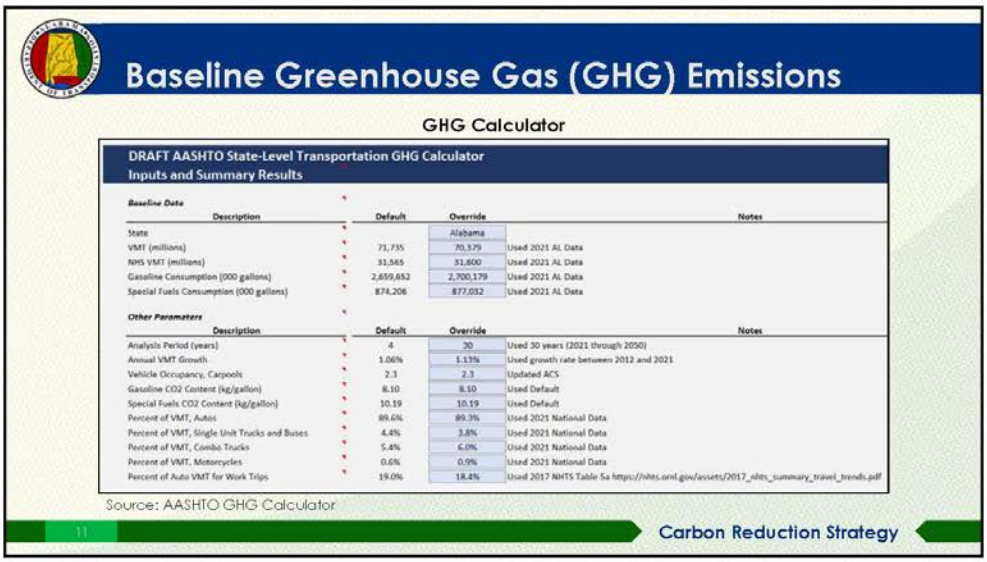
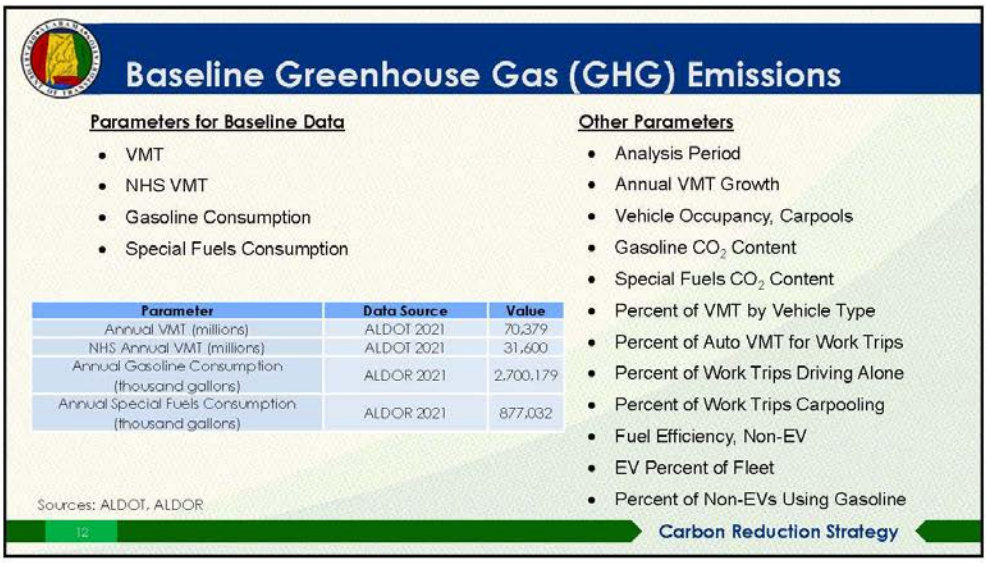

Baseline Greenhouse Gas (GHG) Emissions
GHG Calculator
DRAFT AASHTO State-Level Transportation GHG Calculator
Inputs and Summary Results
Baseline Data
Description | Default | Override | Notes
State | | Alabama |
VMT (millions) | 71,735 | 70,379 | Used 2021 AL Data
NHS VMT (millions) | 31,565 | 31,600 | Used 2021 AL Data
Gasoline Consumption (000 gallons) | 2,659,652 | 2,700,179 | Used 2021 AL Data
Special Fuels Consumption (000 gallons) | 874,206 | 877,032 | Used 2021 AL Data
Other Parameters
Description | Default | Override | Notes
Analysis Period (years) | 4 | 30 | Used 30 years (2021 through 2050)
Annual VMT Growth | 1.06% | 1.13% | Used growth rate between 2012 and 2021
Vehicle Occupancy, Carpools | 2.3 | 2.3 | Updated ACS
Gasoline CO2 Content (kg/gallon) | 8.10 | 8.10 | Used Default
Special Fuels CO2 Content (kg/gallon) | 10.19 | 10.19 | Used Default
Percent of VMT, Autos | 89.6% | 89.3% | Used 2021 National Data
Percent of VMT, Single Unit Trucks and Buses | 4.4% | 3.8% | Used 2021 National Data
Percent of VMT, Combo Trucks | 5.4% | 6.0% | Used 2021 National Data
Percent of VMT, Motorcycles | 0.6% | 0.9% | Used 2021 National Data
Percent of Auto VMT for Work Trips | 19.0% | 18.4% | Used 2017 NHTS Table 5a https://nhts.ornl.gov/assets/2017_nhts_summary_travel_trends.pdf
Source: AASHTO GHG Calculator
11
Carbon Reduction Strategy


Baseline Greenhouse Gas (GHG) Emissions
Parameters for Baseline Data
VMT
NHS VMT
Gasoline Consumption
Special Fuels Consumption
Parameter | Data Source | Value
Annual VMT (millions) | ALDOT 2021 | 70,379
NHS Annual VMT (millions) | ALDOT 2021 | 31,600
Annual Gasoline Consumption (thousand gallons) | ALDOR 2021 | 2,700,179
Annual Special Fuels Consumption (thousand gallons) | ALDOR 2021 | 877,032
Sources: ALDOT, ALDOR
Other Parameters
Analysis Period
Annual VMT Growth
Vehicle Occupancy, Carpools
Gasoline $CO_2$ Content
Special Fuels $CO_2$ Content
Percent of VMT by Vehicle Type
Percent of Auto VMT for Work Trips
Percent of Work Trips Driving Alone
Percent of Work Trips Carpooling
Fuel Efficiency, Non-EV
EV Percent of Fleet
Percent of Non-EVs Using Gasoline
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Carbon Reduction Strategy

## Baseline Greenhouse Gas (GHG) Emissions

**Baseline $CO_2$ Emissions in Alabama (2021)**

| Measure | Baseline (2021) Emissions (metric tons) |
|---|---|
| Total Annual GHG | 30,808,407 |
| NHS Annual GHG | 13,832,728 |

Source: AASHTO GHG Calculator

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## Current Projects

**Funding**

- Over $105 Million obligated to Alabama projects that address $CO_2$ emissions (includes Federal, State, & other contributions)

**Projects**

- Statewide Projects
  - Intelligent Transportation System (ITS) Specifications
  - Pedestrian Facilities Assessment
  - Carbon Reduction Strategy Development
- Areawide Projects
  - Regional Traffic Operations Program (RTOP)
  - Transportation Management Centers

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## Current Strategies/Projects

**Projects (continued)**

- County Projects
  - Sidewalks and/or Curb Ramps
  - Bike Lanes
  - TSMO Projects (i.e., Advanced Corridor Management)
  - New and/or Upgraded Lighting
  - Multi-Purpose Trails / Shared Use Paths
  - ITS Infrastructure
  - Traffic Signal Upgrades
  - ASAP Program
  - RTOP Congestion Management
  - Workforce Transportation Pilot Project


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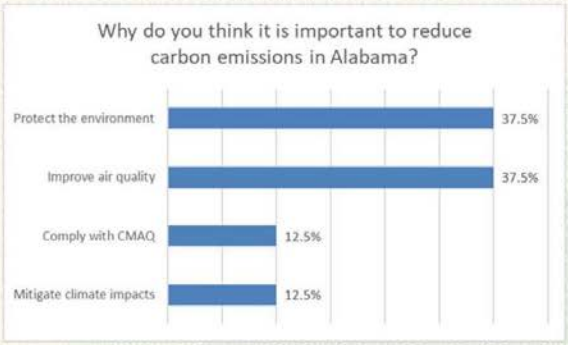
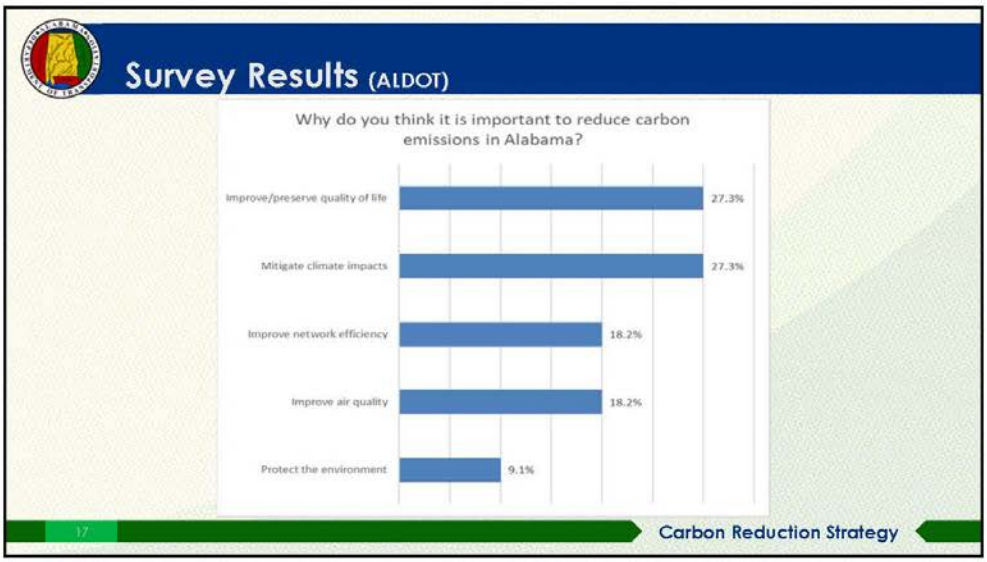
## Survey Results (MPOs)




16 Carbon Reduction Strategy


Survey Results (ALDOT)
Why do you think it is important to reduce carbon emissions in Alabama?
Improve/preserve quality of life
27.3%
Mitigate climate impacts
27.3%
Improve network efficiency
18.2%
Improve air quality
18.2%
Protect the environment
9.1%
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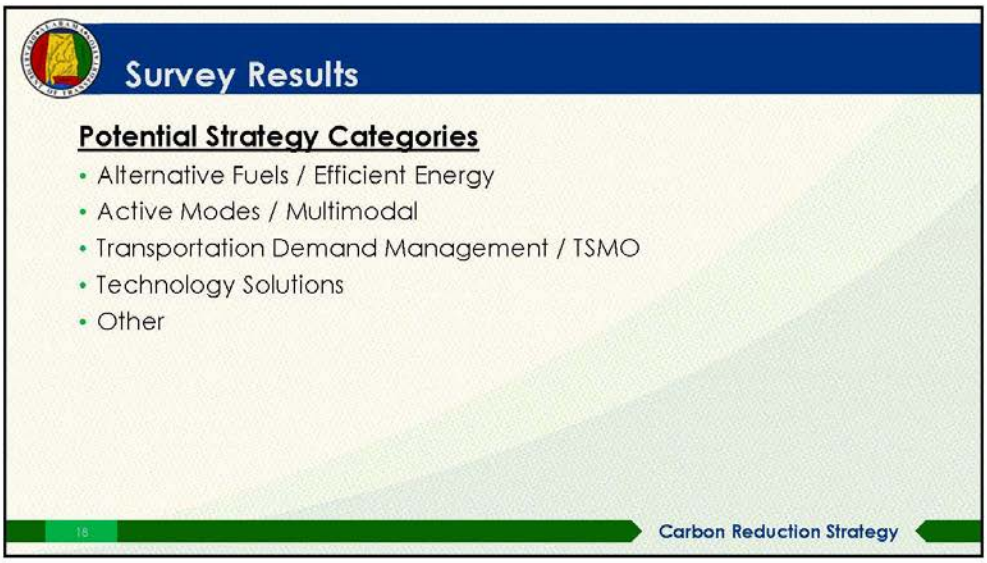
Carbon Reduction Strategy


Survey Results
Potential Strategy Categories
• Alternative Fuels / Efficient Energy
• Active Modes / Multimodal
• Transportation Demand Management / TSMO
• Technology Solutions
• Other
18
Carbon Reduction Strategy

## Survey Results

**Alternative Fuels / Efficient Energy Strategies**

- Electric Vehicle (EV) Adoption and Charging Infrastructure; Heavy Duty Charging
- Alternative Fuel Vehicle (AFV) Adoption and Infrastructure
- Freight Emission Reductions
- Emission Reduction at Port Facilities
- Diesel Engine Retrofits
- Energy Efficient Lighting and Equipment

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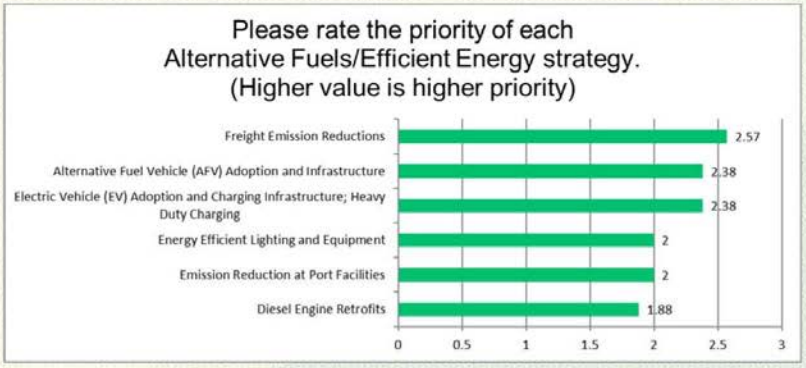
## Survey Results (MPOs)

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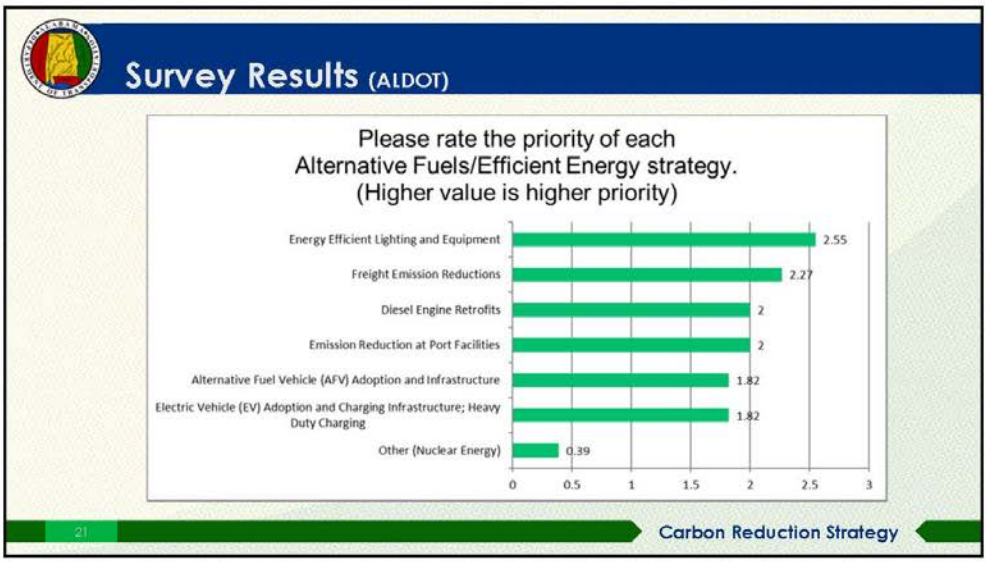
Survey Results (ALDOT)
Please rate the priority of each
Alternative Fuels/Efficient Energy strategy.
(Higher value is higher priority)
Energy Efficient Lighting and Equipment
2.55
Freight Emission Reductions
2.27
Diesel Engine Retrofits
2
Emission Reduction at Port Facilities
2
Alternative Fuel Vehicle (AFV) Adoption and Infrastructure
1.82
Electric Vehicle (EV) Adoption and Charging Infrastructure; Heavy Duty Charging
1.82
Other (Nuclear Energy)
0.39
0
0.5
1
1.5
2
2.5
3
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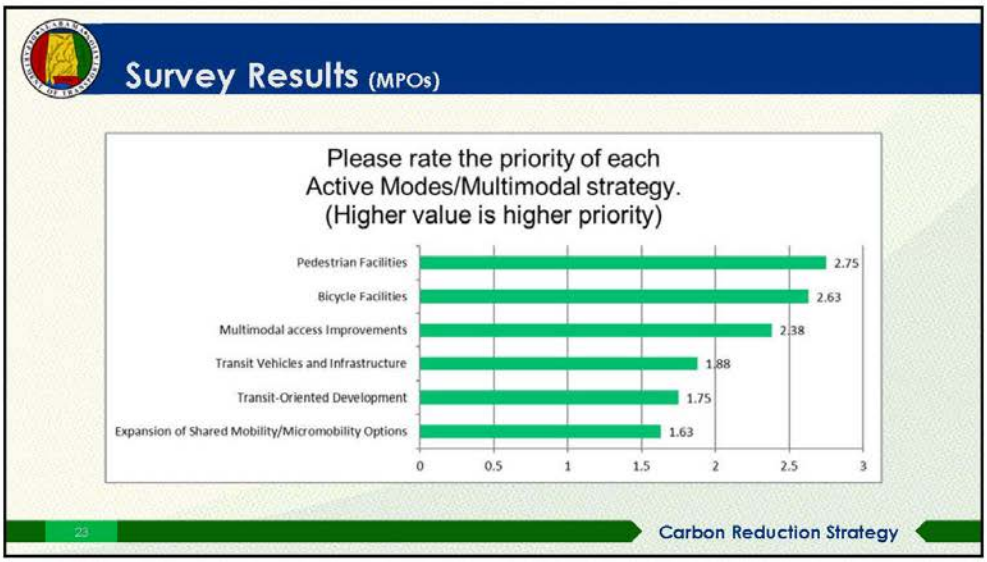
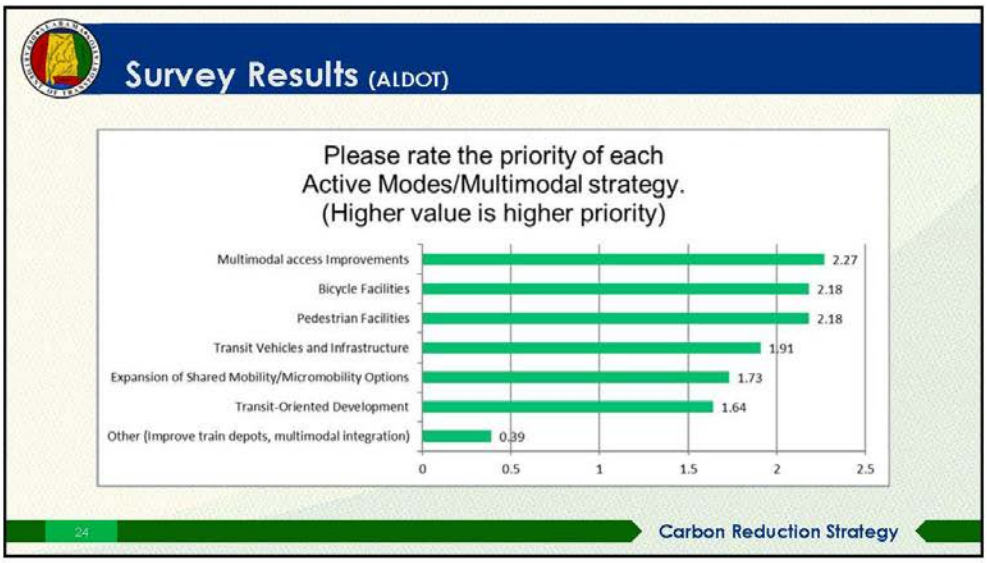
Carbon Reduction Strategy


Survey Results
Active Modes / Multimodal Strategies
• Pedestrian Facilities
• Bicycle Facilities
• Transit Vehicles and Infrastructure
• Expansion of Shared Mobility / Micromobility Options
• Multimodal Access Improvements
• Transit-Oriented Development
22
Carbon Reduction Strategy


Survey Results (MPOs)
Please rate the priority of each Active Modes/Multimodal strategy. (Higher value is higher priority)
Pedestrian Facilities 2.75
Bicycle Facilities 2.63
Multimodal access Improvements 2.38
Transit Vehicles and Infrastructure 1.88
Transit-Oriented Development 1.75
Expansion of Shared Mobility/Micromobility Options 1.63
0 0.5 1 1.5 2 2.5 3
23
Carbon Reduction Strategy


Survey Results (ALDOT)
Please rate the priority of each Active Modes/Multimodal strategy. (Higher value is higher priority)
Multimodal access Improvements 2.27
Bicycle Facilities 2.18
Pedestrian Facilities 2.18
Transit Vehicles and Infrastructure 1.91
Expansion of Shared Mobility/Micromobility Options 1.73
Transit-Oriented Development 1.64
Other (Improve train depots, multimodal integration) 0.39
0 0.5 1 1.5 2 2.5
24
Carbon Reduction Strategy

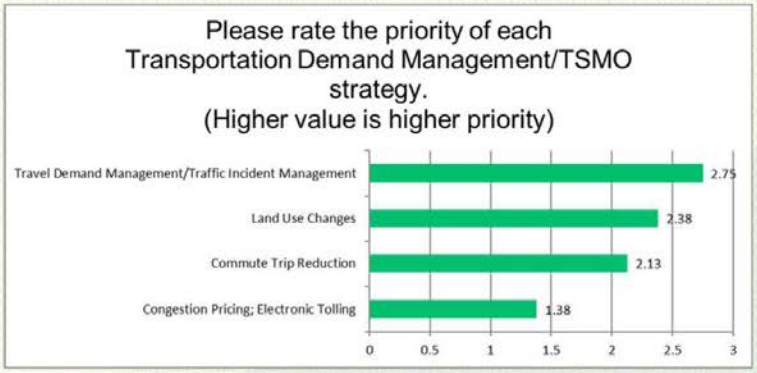
## Survey Results

**Transportation Demand Management / TSMO Strategies**

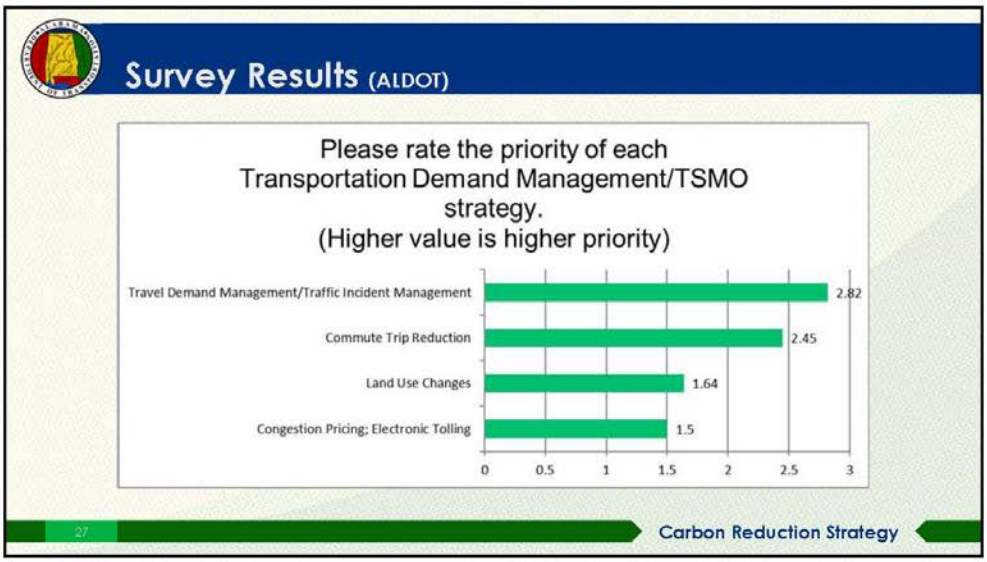
- Congestion Pricing; Electronic Tolling
- Land Use Changes
- Commute Trip Reduction
- Travel Demand Management / Traffic Incident Management

25 Carbon Reduction Strategy

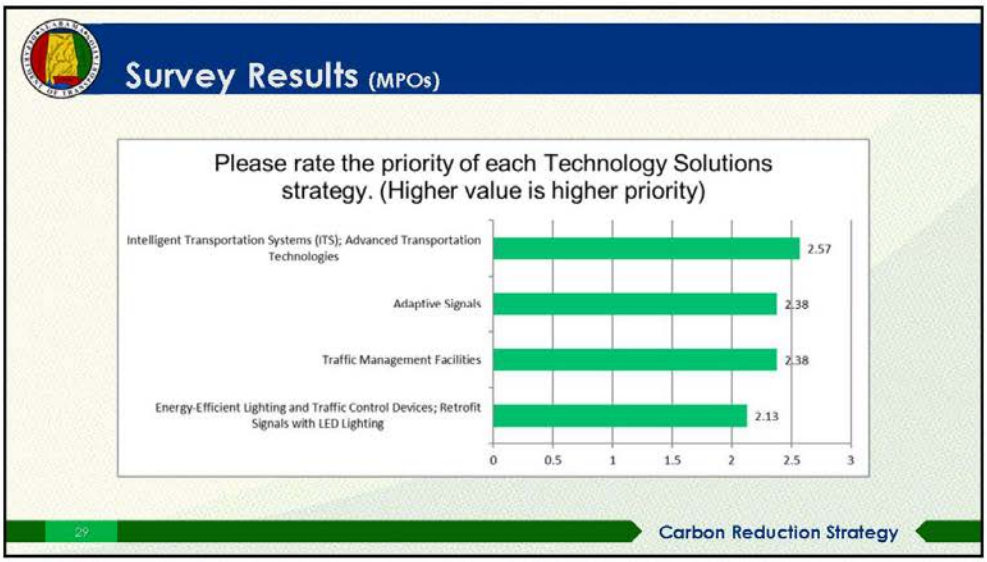
## Survey Results (MPOs)

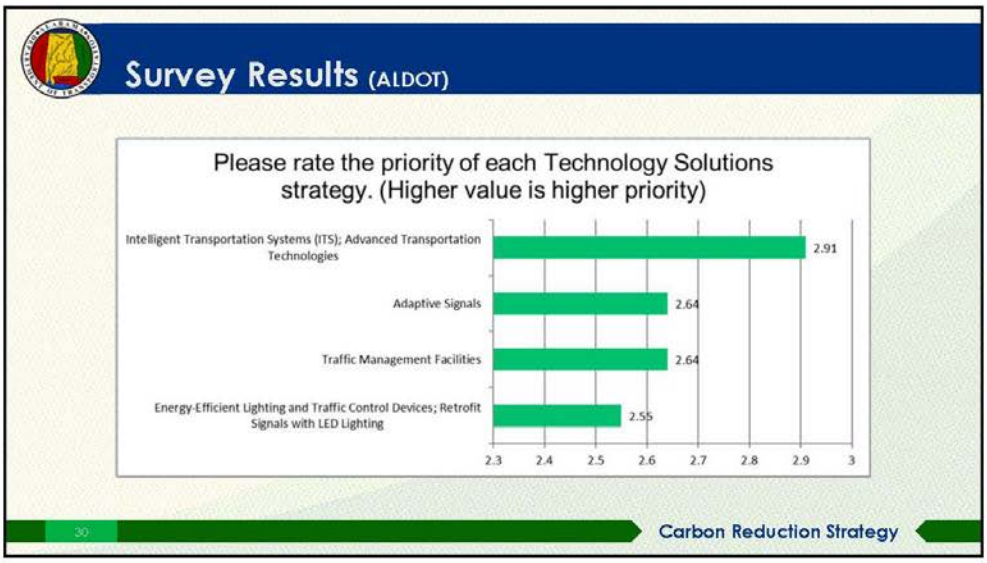



26 Carbon Reduction Strategy


Survey Results (ALDOT)
Please rate the priority of each Transportation Demand Management/TSMO strategy.
(Higher value is higher priority)
Travel Demand Management/Traffic Incident Management
2.82
Commute Trip Reduction
2.45
Land Use Changes
1.64
Congestion Pricing; Electronic Tolling
1.5
0
0.5
1
1.5
2
2.5
3
27
Carbon Reduction Strategy


Survey Results
Technology Solutions
• Traffic Management Facilities
• Adaptive Signals
• Intelligent Transportation Systems (ITS); Advanced Transportation Technologies
• Energy-Efficient Lighting and Traffic Control Devices; Retrofit Signals with LED Lighting
28
Carbon Reduction Strategy


Survey Results (MPOs)
Please rate the priority of each Technology Solutions strategy. (Higher value is higher priority)
Intelligent Transportation Systems (ITS); Advanced Transportation Technologies
2.57
Adaptive Signals
2.38
Traffic Management Facilities
2.38
Energy-Efficient Lighting and Traffic Control Devices; Retrofit Signals with LED Lighting
2.13
0
0.5
1
1.5
2
2.5
3
29
Carbon Reduction Strategy


Survey Results (ALDOT)
Please rate the priority of each Technology Solutions strategy. (Higher value is higher priority)
Intelligent Transportation Systems (ITS); Advanced Transportation Technologies
2.91
Adaptive Signals
2.64
Traffic Management Facilities
2.64
Energy-Efficient Lighting and Traffic Control Devices; Retrofit Signals with LED Lighting
2.55
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3
30
Carbon Reduction Strategy

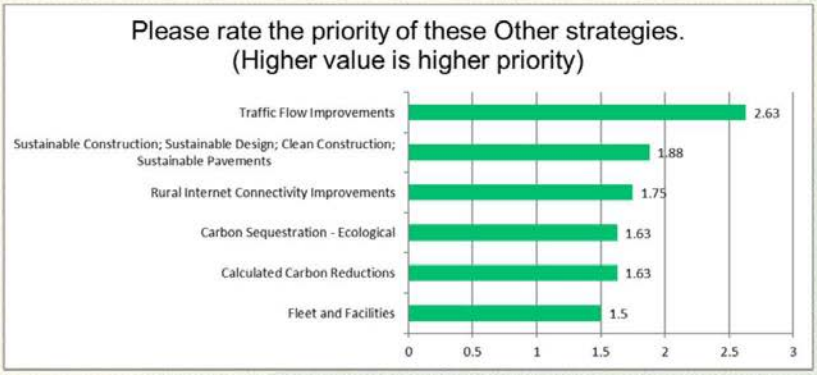
## Survey Results

**Other Strategies**

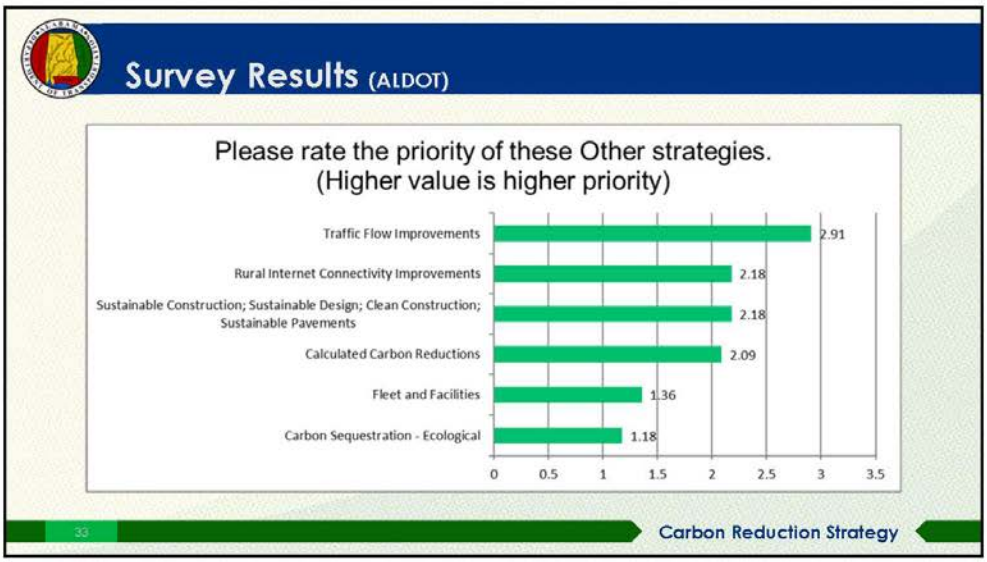
- Traffic Flow Improvements
- Calculated Carbon Reductions
- Sustainable Construction; Sustainable Design; Clean Construction; Sustainable Pavements
- Fleet and Facilities
- Carbon Sequestration - Ecological
- Rural Internet Connectivity Improvements

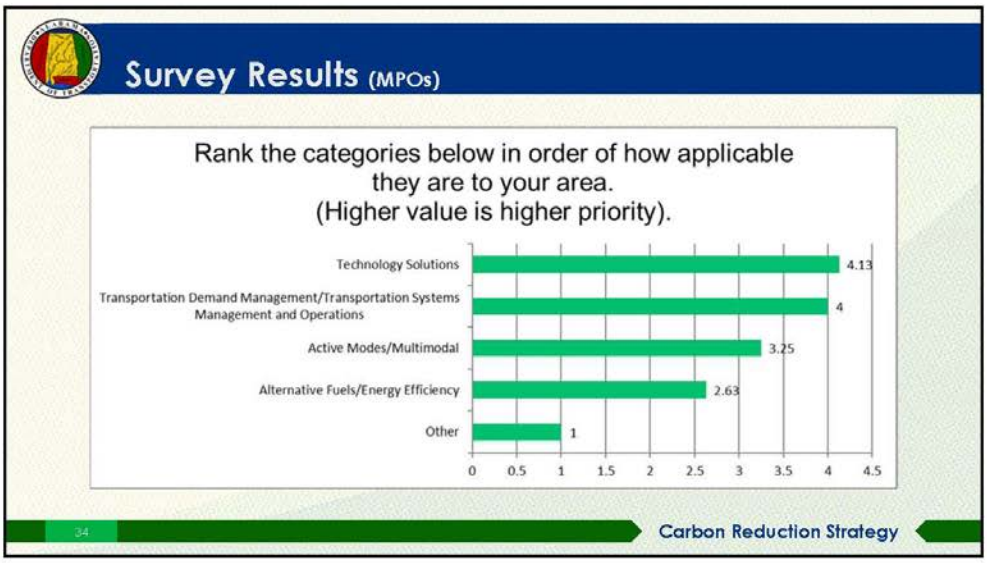
31 Carbon Reduction Strategy

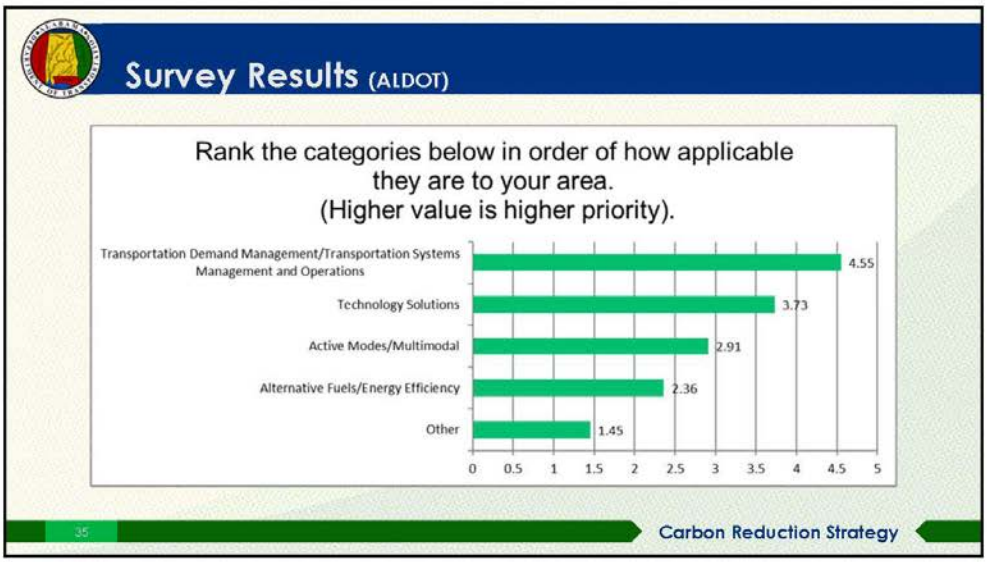
## Survey Results (MPOs)

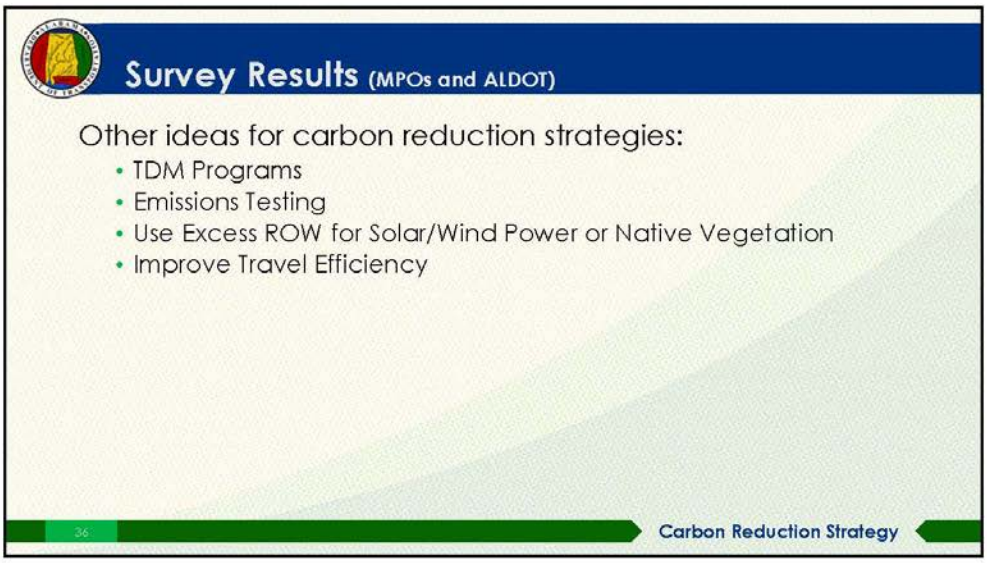


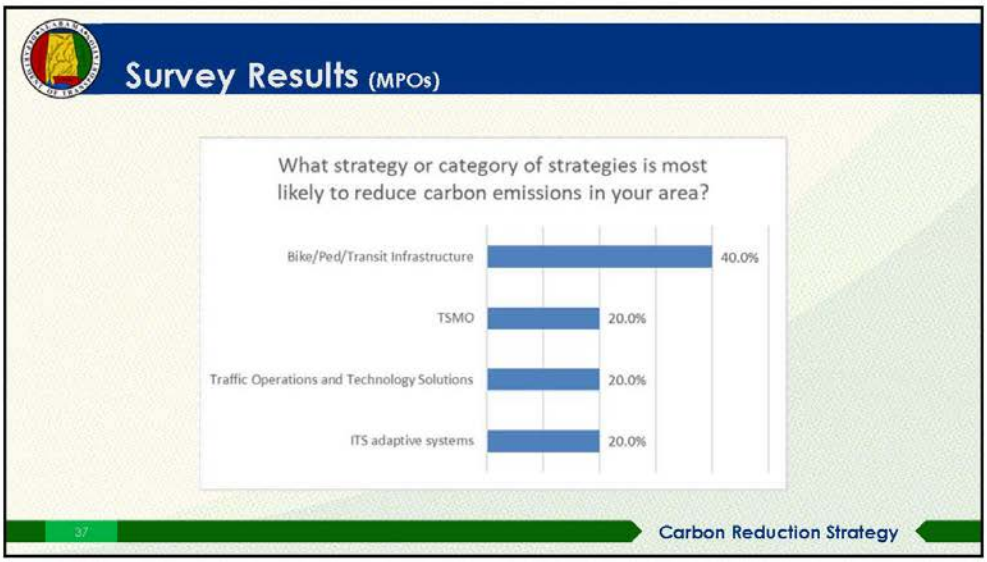

32 Carbon Reduction Strategy

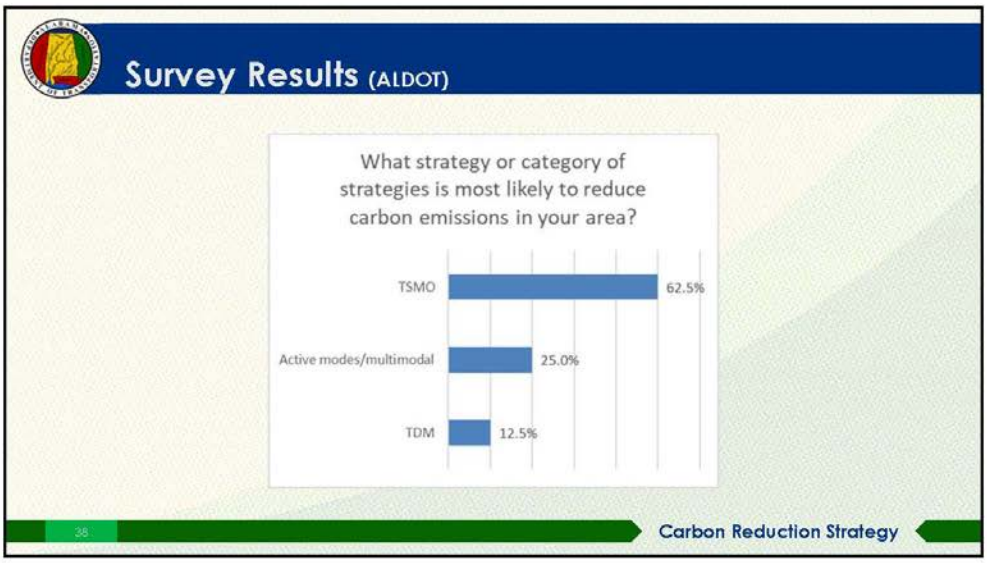

Survey Results (ALDOT)
Please rate the priority of these Other strategies.
(Higher value is higher priority)
Traffic Flow Improvements
2.91
Rural Internet Connectivity Improvements
2.18
Sustainable Construction; Sustainable Design; Clean Construction; Sustainable Pavements
2.18
Calculated Carbon Reductions
2.09
Fleet and Facilities
1.36
Carbon Sequestration - Ecological
1.18
0
0.5
1
1.5
2
2.5
3
3.5
33
Carbon Reduction Strategy

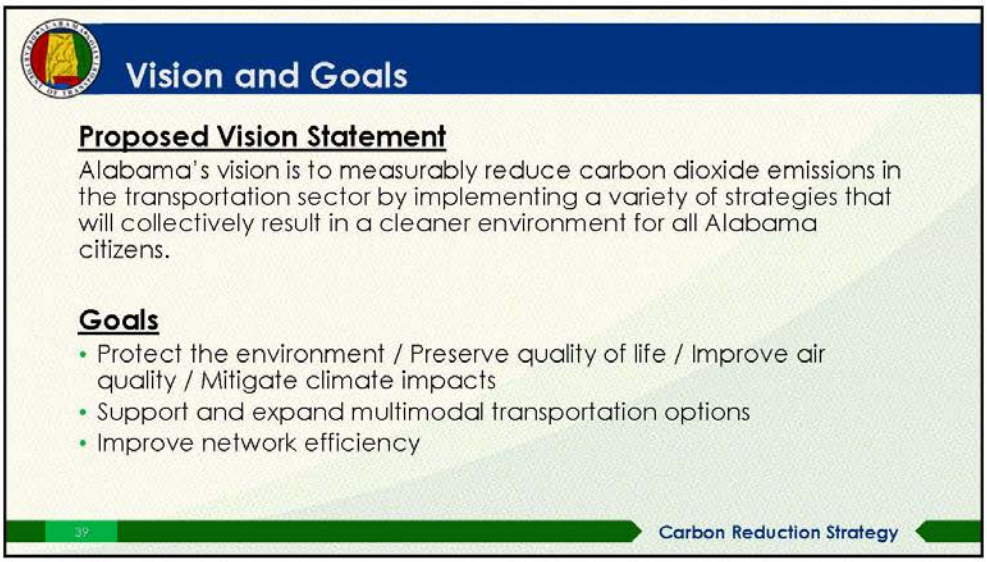

Survey Results (MPOs)
Rank the categories below in order of how applicable they are to your area.
(Higher value is higher priority).
Technology Solutions
4.13
Transportation Demand Management/Transportation Systems Management and Operations
4
Active Modes/Multimodal
3.25
Alternative Fuels/Energy Efficiency
2.63
Other
1
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
34
Carbon Reduction Strategy

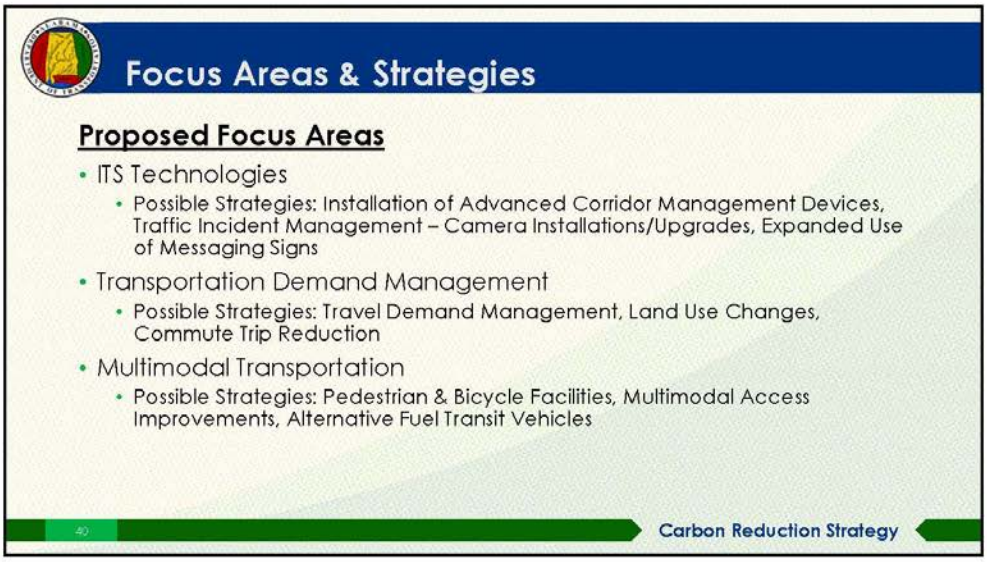

Survey Results (ALDOT)
Rank the categories below in order of how applicable they are to your area.
(Higher value is higher priority).
Transportation Demand Management/Transportation Systems Management and Operations
4.55
Technology Solutions
3.73
Active Modes/Multimodal
2.91
Alternative Fuels/Energy Efficiency
2.36
Other
1.45
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5
35
Carbon Reduction Strategy

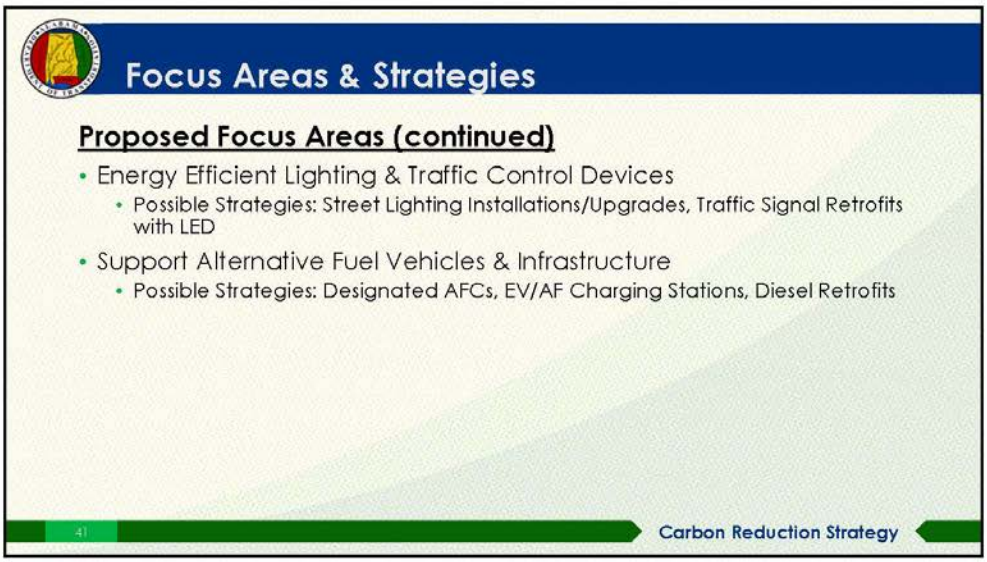

Survey Results (MPOs and ALDOT)
Other ideas for carbon reduction strategies:
• TDM Programs
• Emissions Testing
• Use Excess ROW for Solar/Wind Power or Native Vegetation
• Improve Travel Efficiency
36
Carbon Reduction Strategy


Survey Results (MPOs)
What strategy or category of strategies is most likely to reduce carbon emissions in your area?
Bike/Ped/Transit Infrastructure
40.0%
TSMO
20.0%
Traffic Operations and Technology Solutions
20.0%
ITS adaptive systems
20.0%
37
Carbon Reduction Strategy


Survey Results (ALDOT)
What strategy or category of strategies is most likely to reduce carbon emissions in your area?
TSMO
62.5%
Active modes/multimodal
25.0%
TDM
12.5%
38
Carbon Reduction Strategy


Vision and Goals
Proposed Vision Statement
Alabama's vision is to measurably reduce carbon dioxide emissions in the transportation sector by implementing a variety of strategies that will collectively result in a cleaner environment for all Alabama citizens.
Goals
• Protect the environment / Preserve quality of life / Improve air quality / Mitigate climate impacts
• Support and expand multimodal transportation options
• Improve network efficiency
39
Carbon Reduction Strategy


Focus Areas & Strategies
Proposed Focus Areas
• ITS Technologies
• Possible Strategies: Installation of Advanced Corridor Management Devices, Traffic Incident Management – Camera Installations/Upgrades, Expanded Use of Messaging Signs
• Transportation Demand Management
• Possible Strategies: Travel Demand Management, Land Use Changes, Commute Trip Reduction
• Multimodal Transportation
• Possible Strategies: Pedestrian & Bicycle Facilities, Multimodal Access Improvements, Alternative Fuel Transit Vehicles
40
Carbon Reduction Strategy


Focus Areas & Strategies
Proposed Focus Areas (continued)
Energy Efficient Lighting & Traffic Control Devices
Possible Strategies: Street Lighting Installations/Upgrades, Traffic Signal Retrofits with LED
Support Alternative Fuel Vehicles & Infrastructure
Possible Strategies: Designated AFCs, EV/AF Charging Stations, Diesel Retrofits
41
Carbon Reduction Strategy


Next Steps
Refine Strategies
Identify Types of Projects and Implementation Actions for Each Strategy
Prepare Draft Report and Present to MPOs
Edit Draft Report with MPO Comments
Publish Draft Report for Public Comment
Finalize & Submit Report
Next MPO Meeting
OCT 2023
October 4, 2023
Presentation of Draft CRS
42
Carbon Reduction Strategy


Carbon
Reduction
Strategy
Project Contacts
Becky Rogers
becky.rogers@neel-schaffer.com
Vijay Kunada
vijay.kunada@neel-schaffer.com
NEEL-SCHAFFER
43

## Meeting #3

The third meeting was held on October 4, 2023, via Microsoft Teams. The draft CRS was presented, and the MPOs were offered the opportunity to provide feedback on it prior to the public comment period. Several MPOs provided positive feedback, and no revisions were requested. NSI will send the entire Draft CRS to the MPOs so that they can review and comment on it during the public comment period. It was agreed that if applicable comments are received, another virtual meeting will be scheduled to share and discuss those comments with the MPOs after the public comment period ends.

Specific comments from the discussion are recorded below:

- Robert Smith (Montgomery MPO) mentioned a scooter sharing program in Montgomery and asked if scooters should be included as an implementation action for the Shared Mobility / Micromobility Options strategy. Becky Rogers (Neel-Schaffer) shared that scooters are included in the detailed description of this strategy within the Draft CRS. Based on this information, it was agreed that no changes are needed to the table.
- Dennis Stripling (Tuscaloosa Area MPO) asked if there will be a follow up meeting after the public comments are received. Vijay Kunada (Neel-Schaffer) responded that an additional meeting can be scheduled if needed. It was agreed that if applicable comments are received, a meeting will be scheduled to share and discuss the comments with the MPOs after the public comment period closes.
- No revisions were requested from the MPOs at this time. Scott Tillman (Birmingham MPO) and Robert Smith (Montgomery MPO) both agreed that the Draft CRS is ready for public comment.
- The Draft CRS will be sent to the MPOs for review and comment during the public comment period. Comments can be sent directly to Becky Rogers (Neel-Schaffer) who will share them with ALDOT.

**Attendance**

| Name | Agency |
|---|---|
| Scott Tillman | Birmingham MPO |
| Zane Davis | Tuscaloosa Area MPO |
| Anthony Johnson | Mobile Area MPO |
| Monica Williamson | Mobile Area MPO |
| Dennis Stripling | Tuscaloosa Area MPO |
| Casey Lewis | Montgomery MPO |
| Sarah Hart Sislak | Eastern Shore MPO |
| Tom Piper | Mobile Area MPO |
| Chris Henson | Decatur MPO |
| Lynda Temples | Columbus - Phenix City MPO |
| Robert Smith | Montgomery MPO |
| Toni Arrington | ALDOT |
| Sundae Ragland | ALDOT |
| Candy Griffin | ALDOT |
| James Giles | ALDOT |
| Robert Dees | ALDOT |
| Aaron Dawson | FHWA - Alabama Division |
| Becky Rogers | Neel-Schaffer, Inc. |
| Vijay Kunada | Neel-Schaffer, Inc. |
| Chuck LeBoeuf | Neel-Schaffer, Inc. |

Carbon Reduction Strategy

Draft Report

MPO Meeting #3

October 4, 2023

## Report Sections

- Introduction
- Existing Conditions in Alabama
- Alabama's CRS Development Process
- Vision Statement & Goals
- Focus Areas & Strategies
- Implementation Actions
- Alignment with Federal Requirements & Existing Plans
- Project Evaluation Process & Performance Measures
- Conclusion


2

Carbon Reduction Strategy

## Introduction

- The Carbon Reduction Program (CRP) was introduced in the Infrastructure Investment and Jobs Act (IIJA).
- Alabama will receive $128 million for CRP projects over five years.
- All states must develop a Carbon Reduction Strategy (CRS) to identify projects and programs to reduce carbon dioxide ($CO_2$) emissions in the transportation sector.
- The Federal Highway Administration (FHWA) released guidance on April 21, 2022, to outline the CRS requirements.
- The first CRS is due to FHWA by November 15, 2023.
- CRS updates are required every four years.

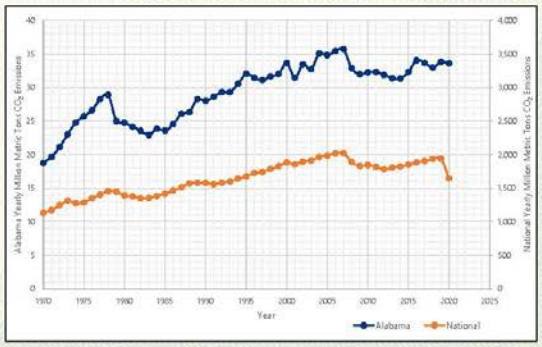

3 Carbon Reduction Strategy

## Existing Conditions in Alabama

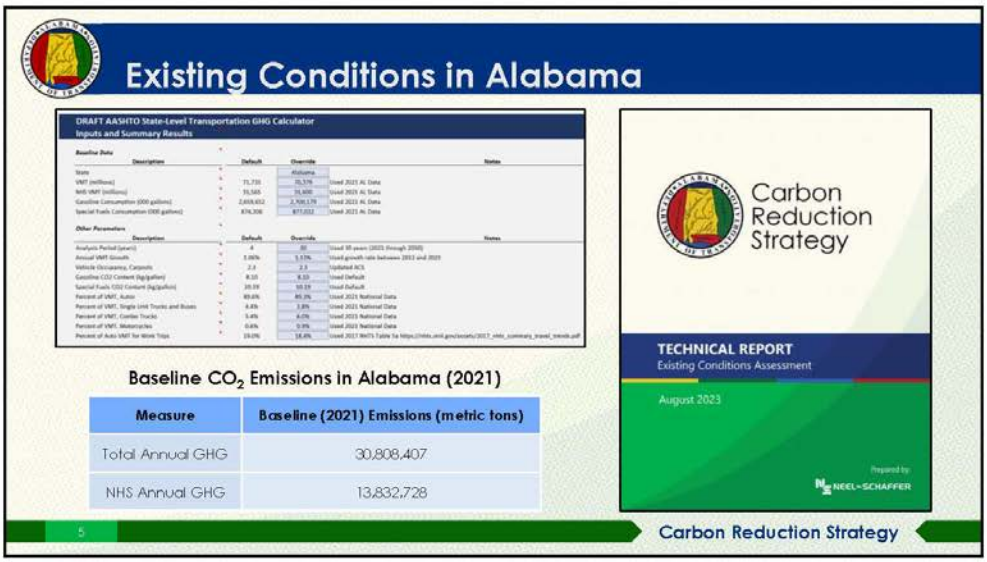
**Data Collection**

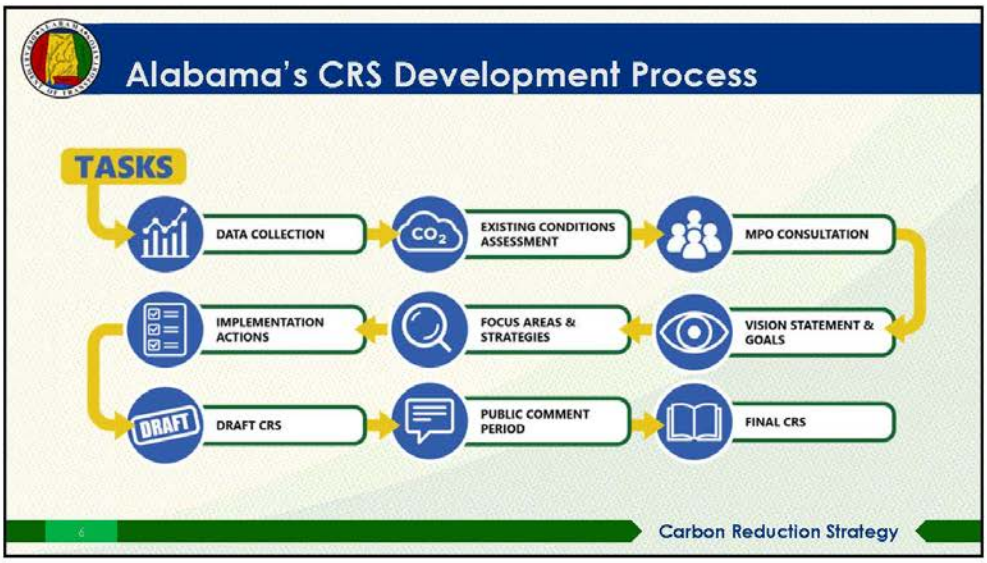
- Freight Data
- Historical Traffic Counts
- Highway Performance Monitoring System data
- Fuel Consumption Data
- Vehicle Registration Data
- Socioeconomic Data
- Emissions Data

Transportation Sector $CO_2$ Emissions from Fossil Fuel Consumption (1970 – 2020)

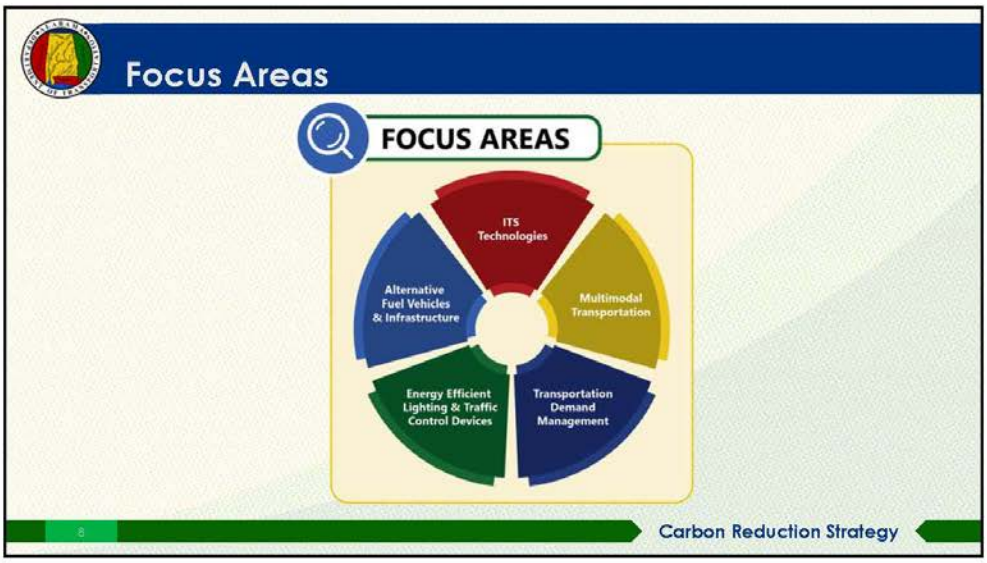


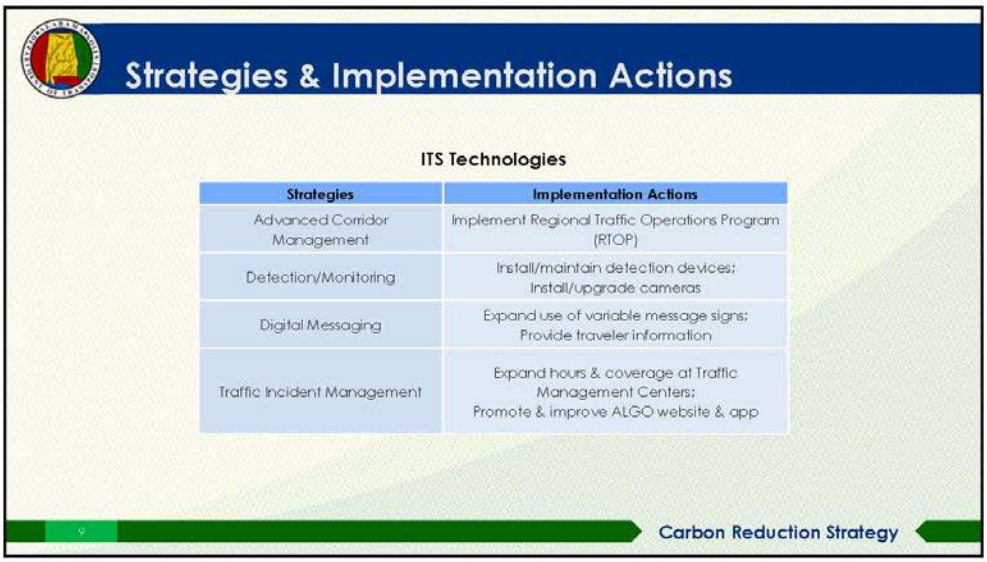

4 Carbon Reduction Strategy

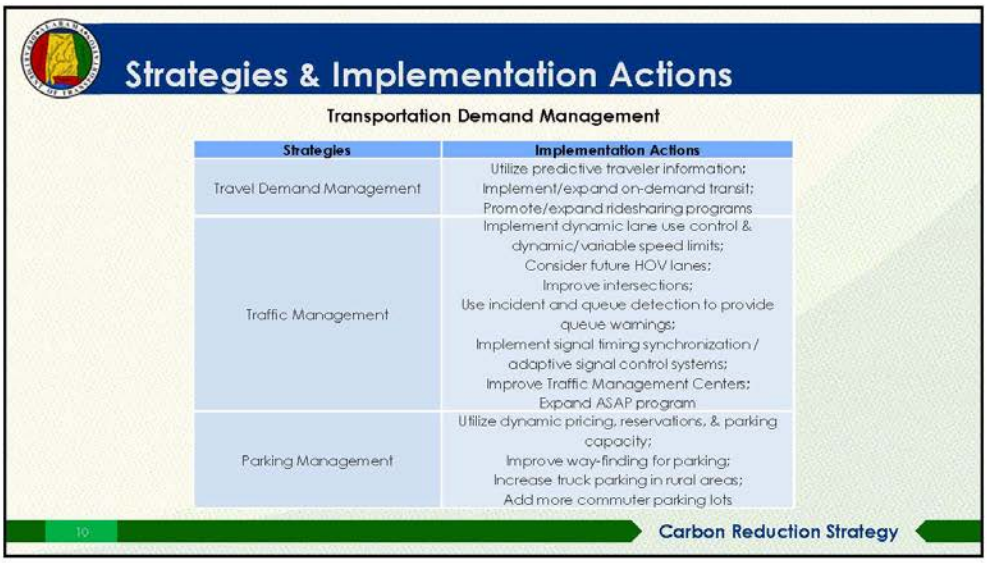

Existing Conditions in Alabama
DRAFT AASHTO State-Level Transportation GHG Calculator
Inputs and Summary Results
Carbon Reduction Strategy
TECHNICAL REPORT
Existing Conditions Assessment
August 2023
Baseline $CO_2$ Emissions in Alabama (2021)
Measure
Baseline (2021) Emissions (metric tons)
Total Annual GHG
30,808,407
NHS Annual GHG
13,832,728
5
Carbon Reduction Strategy

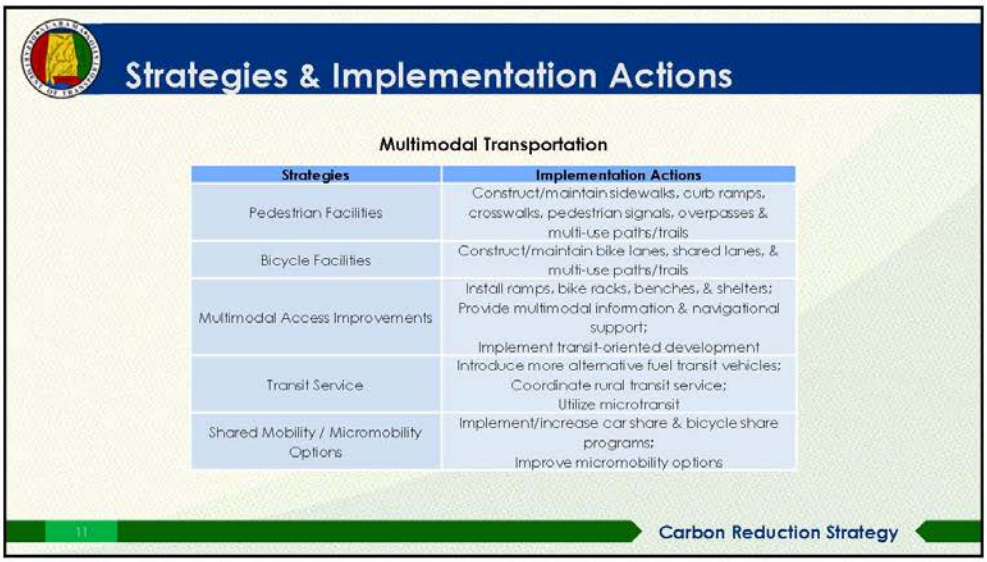

Alabama's CRS Development Process
TASKS
DATA COLLECTION
EXISTING CONDITIONS ASSESSMENT
MPO CONSULTATION
IMPLEMENTATION ACTIONS
FOCUS AREAS & STRATEGIES
VISION STATEMENT & GOALS
DRAFT
DRAFT CRS
PUBLIC COMMENT PERIOD
FINAL CRS
6
Carbon Reduction Strategy

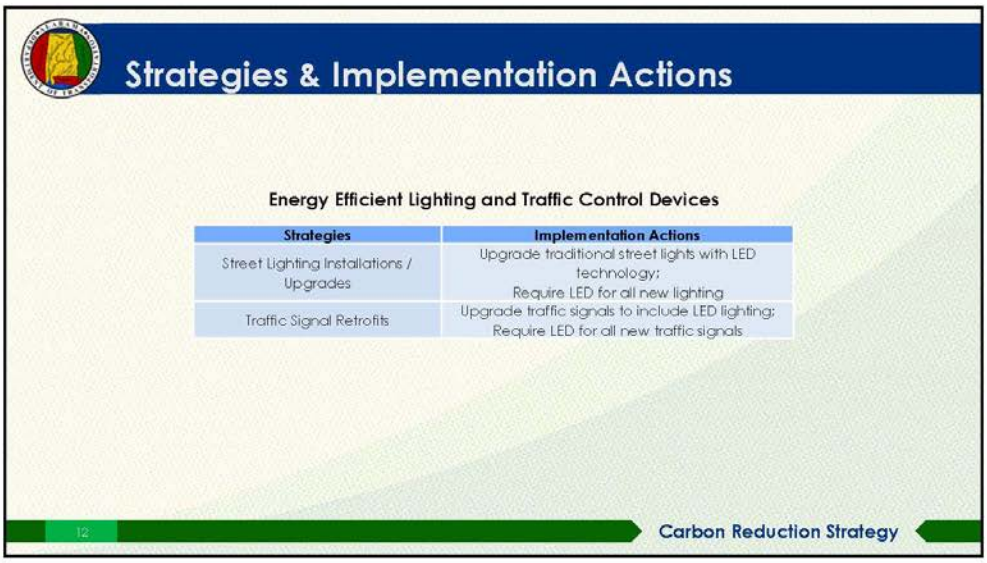

Vision Statement & Goals
VISION STATEMENT
Alabama's vision is to measurably reduce carbon dioxide emissions in the transportation sector by implementing a variety of strategies that will collectively result in a cleaner environment for all Alabama citizens.
GOALS
Reduce vehicular carbon dioxide emissions to improve air quality and mitigate climate impacts
Support and expand multimodal transportation options in urban and rural areas
Apply transportation management strategies and technologies to improve overall network efficiency
7
Carbon Reduction Strategy

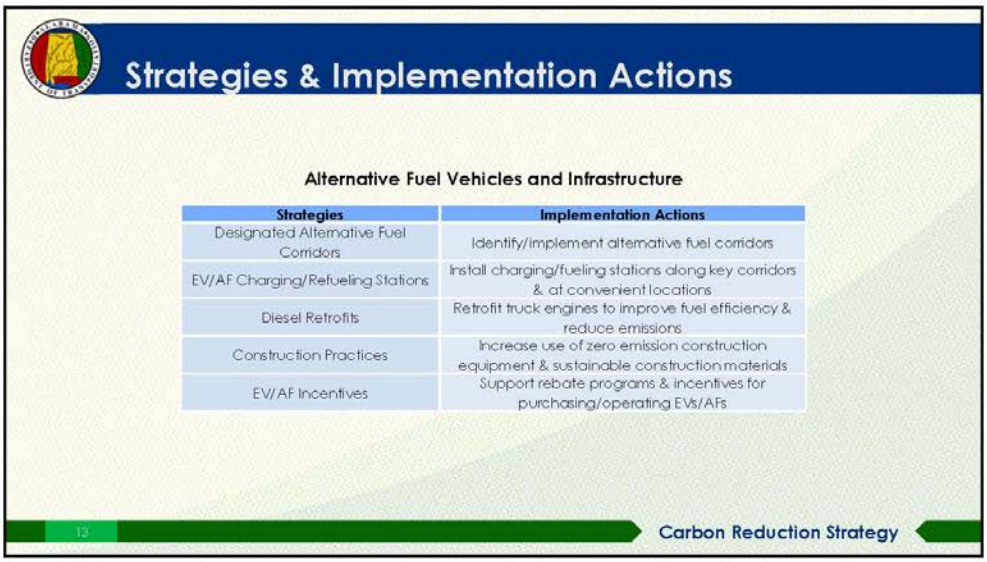

Focus Areas
FOCUS AREAS
ITS Technologies
Multimodal Transportation
Transportation Demand Management
Energy Efficient Lighting & Traffic Control Devices
Alternative Fuel Vehicles & Infrastructure
8
Carbon Reduction Strategy


Strategies & Implementation Actions
ITS Technologies
Strategies
Implementation Actions
Advanced Corridor Management
Implement Regional Traffic Operations Program (RTOP)
Detection/Monitoring
Install/maintain detection devices; Install/upgrade cameras
Digital Messaging
Expand use of variable message signs; Provide traveler information
Traffic Incident Management
Expand hours & coverage at Traffic Management Centers; Promote & improve ALGO website & app
9
Carbon Reduction Strategy


Strategies & Implementation Actions
Transportation Demand Management
Strategies
Implementation Actions
Travel Demand Management
Utilize predictive traveler information; Implement/expand on-demand transit; Promote/expand ridesharing programs
Traffic Management
Implement dynamic lane use control & dynamic/variable speed limits; Consider future HOV lanes; Improve intersections; Use incident and queue detection to provide queue warnings; Implement signal timing synchronization / adaptive signal control systems; Improve Traffic Management Centers; Expand ASAP program
Parking Management
Utilize dynamic pricing, reservations, & parking capacity; Improve way-finding for parking; Increase truck parking in rural areas; Add more commuter parking lots
10
Carbon Reduction Strategy


Strategies & Implementation Actions
Multimodal Transportation
Strategies
Implementation Actions
Pedestrian Facilities
Construct/maintain sidewalks, curb ramps, crosswalks, pedestrian signals, overpasses & multi-use paths/trails
Bicycle Facilities
Construct/maintain bike lanes, shared lanes, & multi-use paths/trails
Multimodal Access Improvements
Install ramps, bike racks, benches, & shelters; Provide multimodal information & navigational support; Implement transit-oriented development
Transit Service
Introduce more alternative fuel transit vehicles; Coordinate rural transit service; Utilize microtransit
Shared Mobility / Micromobility Options
Implement/increase car share & bicycle share programs; Improve micromobility options
11
Carbon Reduction Strategy


Strategies & Implementation Actions
Energy Efficient Lighting and Traffic Control Devices
Strategies
Implementation Actions
Street Lighting Installations / Upgrades
Upgrade traditional street lights with LED technology; Require LED for all new lighting
Traffic Signal Retrofits
Upgrade traffic signals to include LED lighting; Require LED for all new traffic signals
12
Carbon Reduction Strategy



## Strategies & Implementation Actions

**Alternative Fuel Vehicles and Infrastructure**

| Strategies | Implementation Actions |
|---|---|
| Designated Alternative Fuel Corridors | Identify/implement alternative fuel corridors |
| EV/AF Charging/Refueling Stations | Install charging/fueling stations along key corridors & at convenient locations |
| Diesel Retrofits | Retrofit truck engines to improve fuel efficiency & reduce emissions |
| Construction Practices | Increase use of zero emission construction equipment & sustainable construction materials |
| EV/AF Incentives | Support rebate programs & incentives for purchasing/operating EVs/AFs |

13 Carbon Reduction Strategy

## Alignment with Federal Requirements & Existing Plans

**CRS Alignment with Federal Requirements**

| Requirement | Corresponding Section |
|---|---|
| Coordinate with MPOs | CRS: Section 3.3, Appendix A, Appendix B |
| Support efforts to reduce transportation emissions | CRS: Section 4.0 |
| Identify projects and strategies to reduce transportation emissions | CRS: Section 5.0, Section 6.0 |
| Support the reduction of transportation emissions of the State | CRS: Section 7.2 & Section 7.3<br>Technical Report *"Existing Conditions Analysis"*: Section 4.0 |
| Quantify the total carbon emissions from transportation within the State | Technical Report *"Existing Conditions Assessment"*: Section 2.0 & Section 3.0 |
| Be appropriate to the population density and context of the State | CRS: Section 2.0<br>Technical Report *"Existing Conditions Assessment"*: Section 2.0 |

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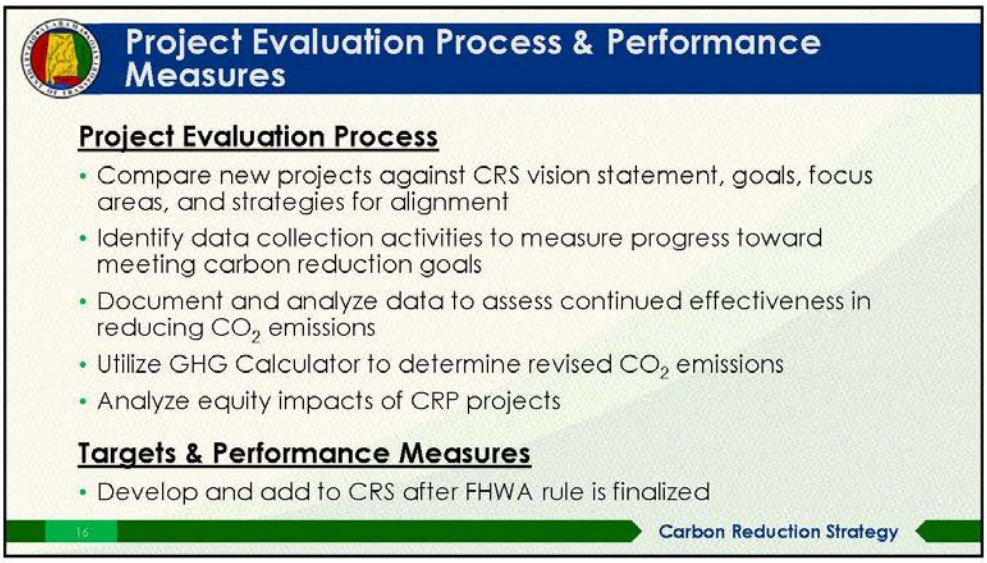
Alignment with Federal Requirements & Existing Plans
Statewide Plans
• Alabama Statewide Transportation Plan (2017)
• Alabama Statewide Transportation Improvement Program (2024 - 2027)
• Alabama Strategic Highway Safety Plan (2022)
• Alabama Statewide Freight Plan (2022)
• ALDOT Statewide TSMO Master Plan (2019)
• Alabama Electric Vehicle Infrastructure Plan (2022)
MPO Plans
• Long Range Transportation Plans
• Transportation Improvement Programs
15
Carbon Reduction Strategy


Project Evaluation Process & Performance Measures
Project Evaluation Process
• Compare new projects against CRS vision statement, goals, focus areas, and strategies for alignment
• Identify data collection activities to measure progress toward meeting carbon reduction goals
• Document and analyze data to assess continued effectiveness in reducing $CO_2$ emissions
• Utilize GHG Calculator to determine revised $CO_2$ emissions
• Analyze equity impacts of CRP projects
Targets & Performance Measures
• Develop and add to CRS after FHWA rule is finalized
16
Carbon Reduction Strategy

## Conclusion

**ALDOT and Alabama MPO Commitment**

- Support and implement programs and projects that reduce $CO_2$ emissions on Alabama's transportation network
- Identify projects that include ITS technologies, transportation demand management tools, multimodal transportation improvements, energy efficient lighting and traffic control devices, and/or alternative fuel vehicles and infrastructure
- Evaluate programs and projects for carbon reduction and equity impacts and adjust as needed to continue progress toward reduced $CO_2$ emissions and improved air quality

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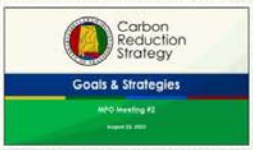
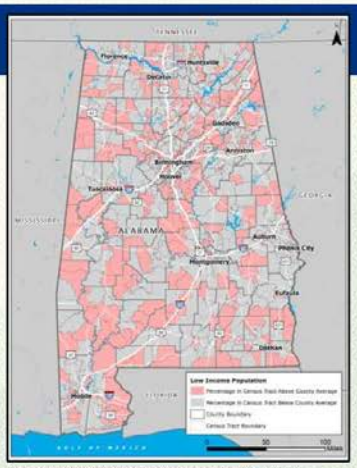
## Appendices

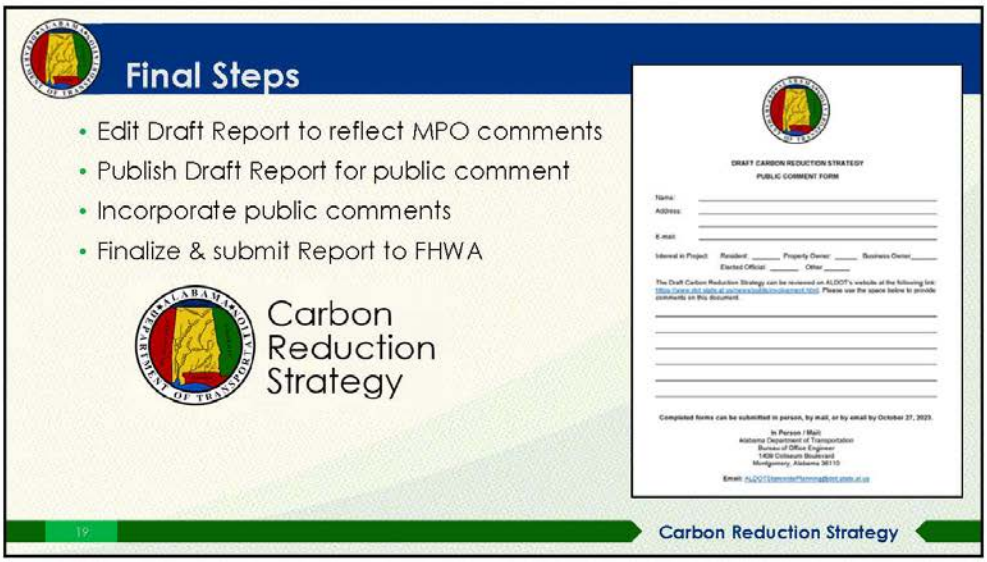
- Appendix A: MPO Meeting Summaries
- Appendix B: Survey & Survey Results
- Appendix C: Public Engagement Summary
- Appendix D: Statewide Environmental Justice Population Maps


Source: American Community Survey 2021

18 Carbon Reduction Strategy


Final Steps
• Edit Draft Report to reflect MPO comments
• Publish Draft Report for public comment
• Incorporate public comments
• Finalize & submit Report to FHWA
Carbon Reduction Strategy
DRAFT CARBON REDUCTION STRATEGY
PUBLIC COMMENT FORM
19
Carbon Reduction Strategy


Carbon Reduction Strategy
Project Contacts
Becky Rogers
becky.rogers@neel-schaffer.com
Vijay Kunada
vijay.kunada@neel-schaffer.com
NEEL-SCHAFFER
20

# Appendix B: Survey & Survey Results

# Survey

## Carbon Reduction Strategy Survey

**Please complete this survey to provide input on the Carbon Reduction Strategy (CRS) for the State of Alabama. Responses to the first question will help form the vision statement and goals for the CRS. The next set of questions will ask for input on CRS strategies grouped into five categories: Alternative Fuels / Efficient Energy, Active Modes / Multimodal, Transportation Demand Management / TSMO, Technology Solutions, and Other. Within each category, please select Low Priority, Medium Priority, or High Priority to indicate how important each strategy is to your area. The remaining questions request additional ideas for reducing carbon emissions in your area.**

**Thank you for participating in this survey. Your feedback is important.**

**1. Why do you think it is important to reduce carbon emissions in Alabama?**

## Carbon Reduction Strategy Survey

**As part of the CRS process, strategy options were identified to reduce carbon emissions.**

**2. Please rate the priority of each Alternative Fuels/Efficient Energy strategy.**

| | Low Priority | Medium Priority | High Priority |
|---|---|---|---|
| Electric Vehicle (EV) Adoption and Charging Infrastructure; Heavy Duty Charging | ○ | ○ | ○ |
| Alternative Fuel Vehicle (AFV) Adoption and Infrastructure | ○ | ○ | ○ |
| Freight Emission Reductions | ○ | ○ | ○ |
| Emission Reduction at Port Facilities | ○ | ○ | ○ |
| Diesel Engine Retrofits | ○ | ○ | ○ |
| Energy Efficient Lighting and Equipment | ○ | ○ | ○ |

Other (please specify)

**3. Please rate the priority of each Active Modes/Multimodal strategy.**

| | Low Priority | Medium Priority | High Priority |
|---|---|---|---|
| Pedestrian Facilities | ◯ | ◯ | ◯ |
| Bicycle Facilities | ◯ | ◯ | ◯ |
| Transit Vehicles and Infrastructure | ◯ | ◯ | ◯ |
| Expansion of Shared Mobility/Micromobility Options (ride sharing, ebikes, etc.) | ◯ | ◯ | ◯ |
| Multimodal access Improvements | ◯ | ◯ | ◯ |
| Transit-Oriented Development (Hudson Yards, New York; Horton Plaza, San Diego; etc.) | ◯ | ◯ | ◯ |

Other (please specify)

**4. Please rate the priority of each Transportation Demand Management/TSMO strategy.**

| | Low Priority | Medium Priority | High Priority |
|---|---|---|---|
| Congestion Pricing; Electronic Tolling | ◯ | ◯ | ◯ |
| Land Use Changes | ◯ | ◯ | ◯ |
| Commute Trip Reduction | ◯ | ◯ | ◯ |
| Travel Demand Management/Traffic Incident Management | ◯ | ◯ | ◯ |

Other (please specify)

**5. Please rate the priority of each Technology Solutions strategy.**

| | Low Priority | Medium Priority | High Priority |
|---|---|---|---|
| Traffic Management Facilities | ◯ | ◯ | ◯ |
| Adaptive Signals | ◯ | ◯ | ◯ |
| Intelligent Transportation Systems (ITS); Advanced Transportation Technologies (adaptive signals, traffic management centers, etc.) | ◯ | ◯ | ◯ |
| Energy-Efficient Lighting and Traffic Control Devices; Retrofit Signals with LED Lighting (LED traffic lights, signs, etc.) | ◯ | ◯ | ◯ |

Other (please specify)

**6. Please rate the priority of these Other strategies.**

| | Low Priority | Medium Priority | High Priority |
|---|---|---|---|
| Traffic Flow Improvements | ○ | ○ | ○ |
| Calculated Carbon Reductions (lifecycle analysis, travel demand models, etc.) | ○ | ○ | ○ |
| Sustainable Construction; Sustainable Design; Clean Construction; Sustainable Pavements | ○ | ○ | ○ |
| Fleet and Facilities (e.g., buildings, off-road equipment, power equipment) | ○ | ○ | ○ |
| Carbon Sequestration - Ecological (carbon capture and storage) | ○ | ○ | ○ |
| Rural Internet Connectivity Improvements | ○ | ○ | ○ |

Other (please specify)

**7. Rank the categories below in order of how applicable they are to your area (1 being highest priority and 5 being lowest priority).**

| | |
|---|---|
| ☰ ☐ | Alternative Fuels/Energy Efficiency |
| ☰ ☐ | Active Modes/Multimodal |
| ☰ ☐ | Transportation Demand Management/Transportation Systems Management and Operations |
| ☰ ☐ | Technology Solutions |
| ☰ ☐ | Other |

**8. Please share other ideas for carbon reduction strategies not listed above.**

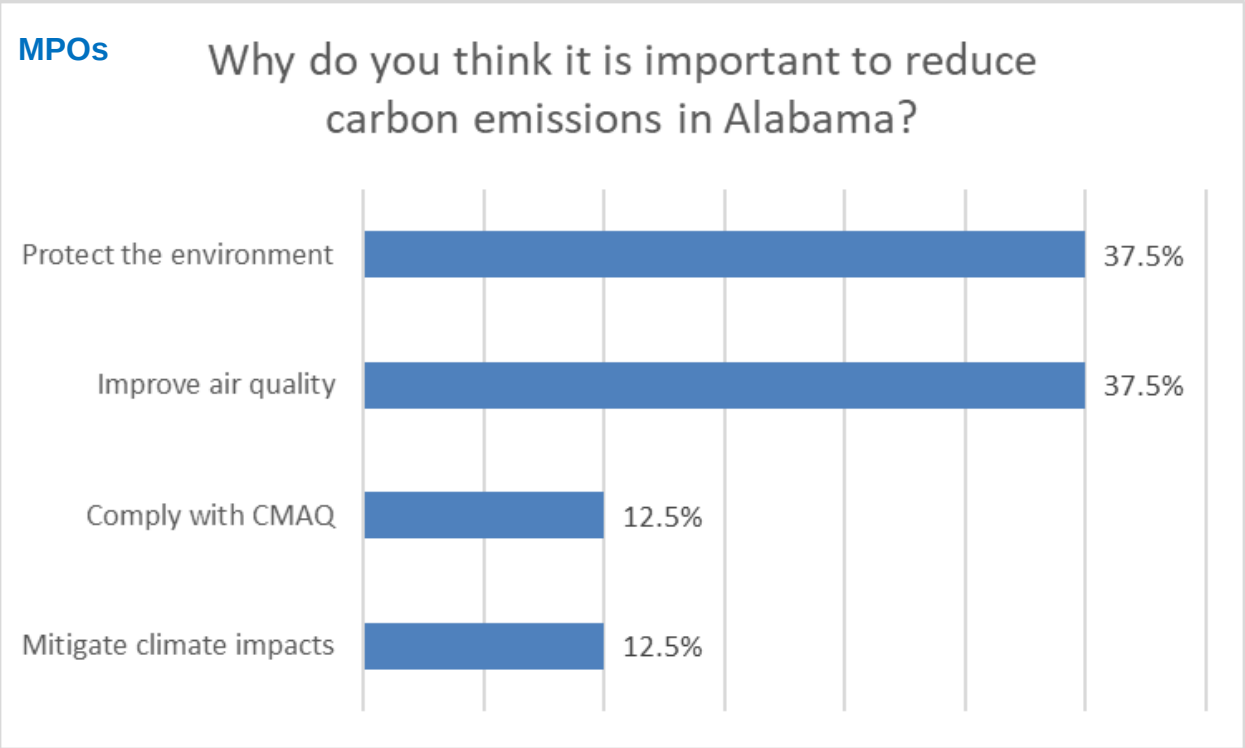
**9. What strategy or category of strategies is most likely to reduce carbon emissions in your area?**

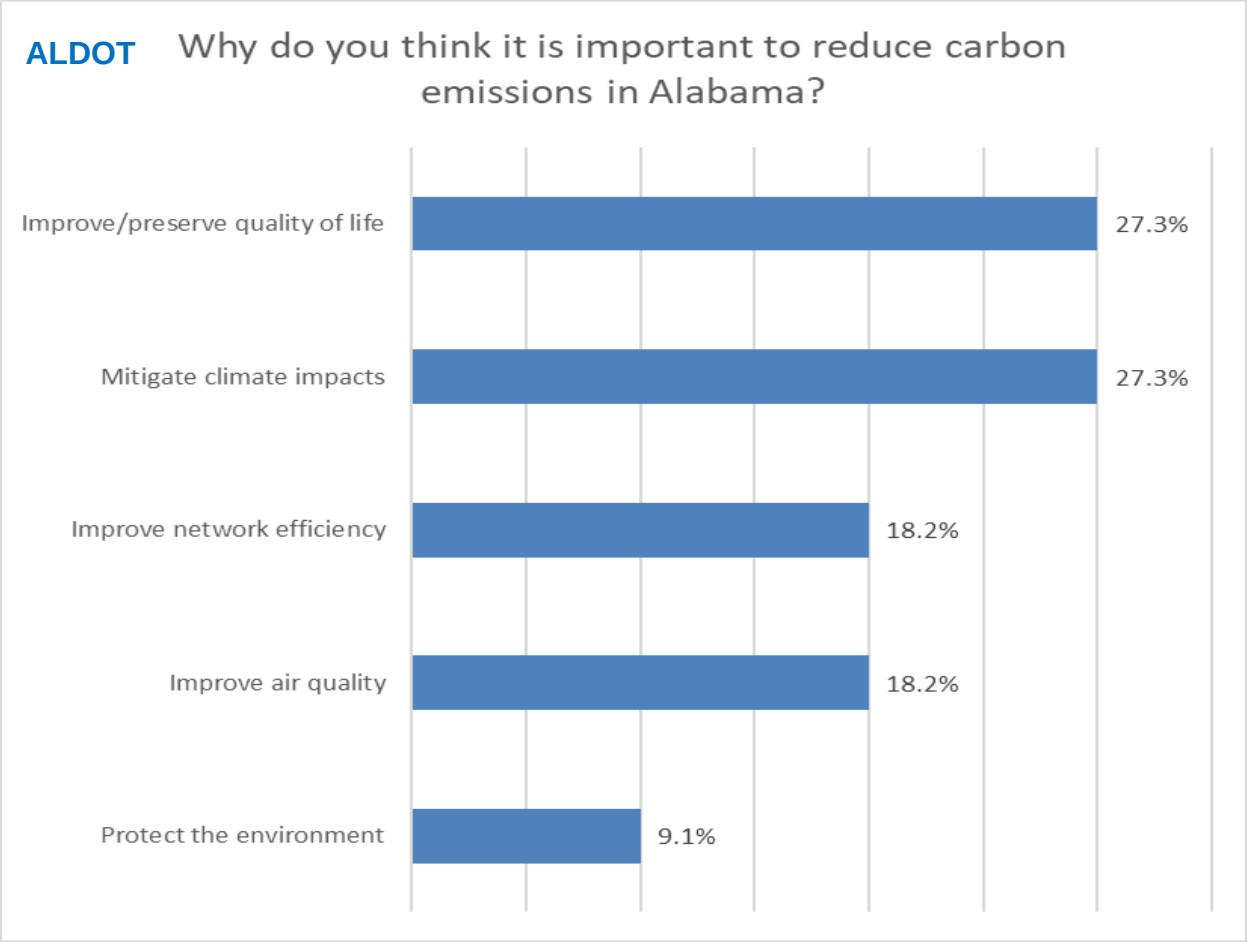
## Carbon Reduction Strategy Survey

**10. What MPO do you represent?**

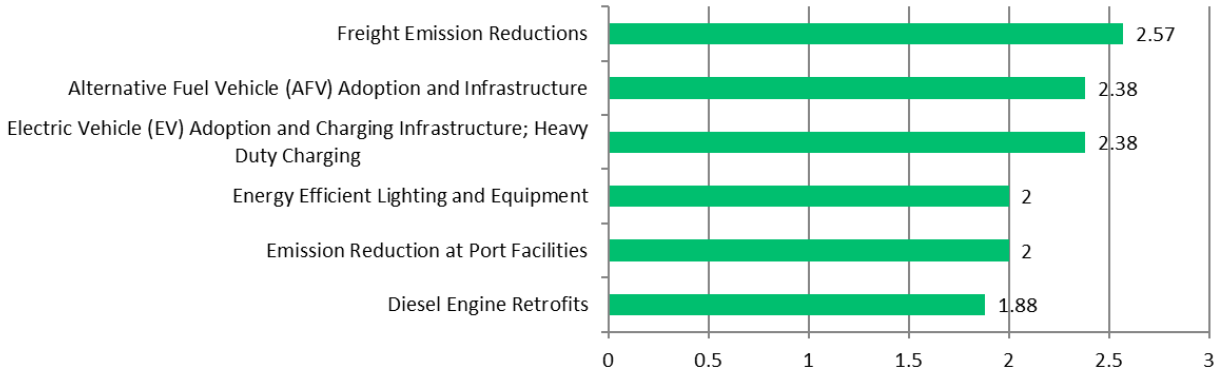
# Survey Results

**MPOs**

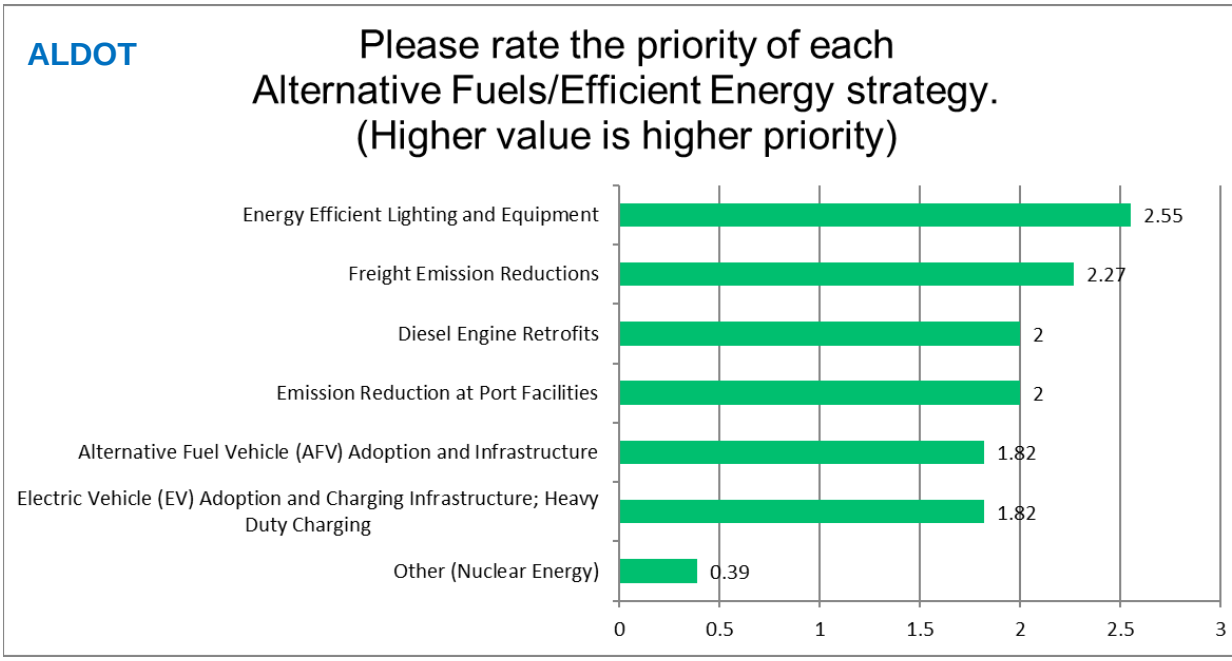



ALDOT
Why do you think it is important to reduce carbon emissions in Alabama?
Improve/preserve quality of life
27.3%
Mitigate climate impacts
27.3%
Improve network efficiency
18.2%
Improve air quality
18.2%
Protect the environment
9.1%

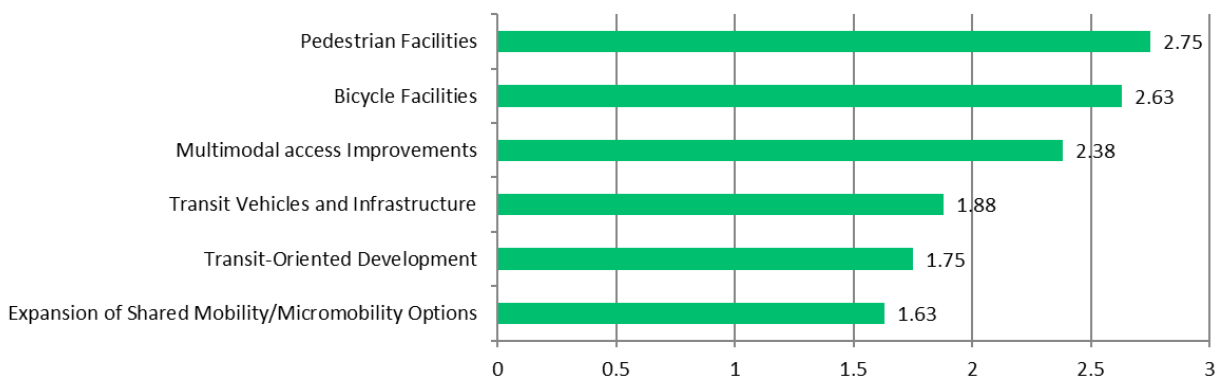
**MPOs**


Please rate the priority of each Alternative Fuels/Efficient Energy strategy. (Higher value is higher priority)
Freight Emission Reductions
2.57
Alternative Fuel Vehicle (AFV) Adoption and Infrastructure
2.38
Electric Vehicle (EV) Adoption and Charging Infrastructure; Heavy Duty Charging
2.38
Energy Efficient Lighting and Equipment
2
Emission Reduction at Port Facilities
2
Diesel Engine Retrofits
1.88
0
0.5
1
1.5
2
2.5
3

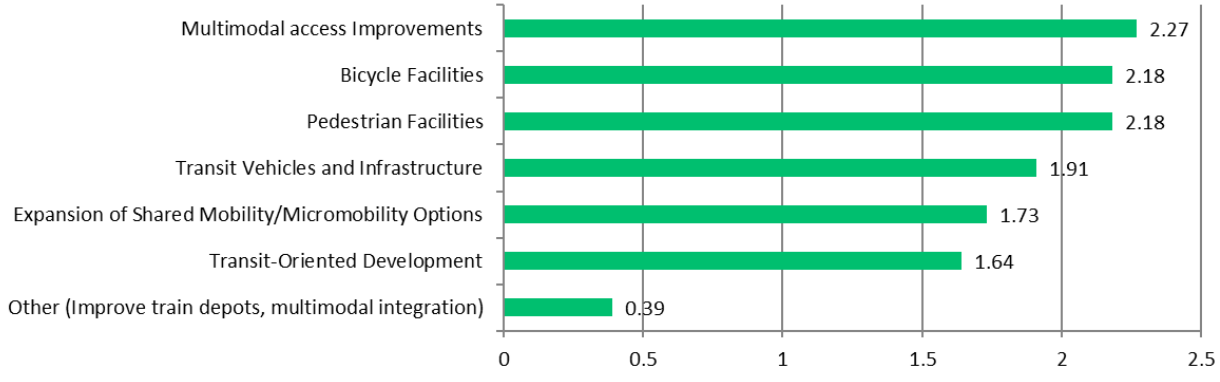
**ALDOT**


Please rate the priority of each Alternative Fuels/Efficient Energy strategy. (Higher value is higher priority)
Energy Efficient Lighting and Equipment
2.55
Freight Emission Reductions
2.27
Diesel Engine Retrofits
2
Emission Reduction at Port Facilities
2
Alternative Fuel Vehicle (AFV) Adoption and Infrastructure
1.82
Electric Vehicle (EV) Adoption and Charging Infrastructure; Heavy Duty Charging
1.82
Other (Nuclear Energy)
0.39
0
0.5
1
1.5
2
2.5
3

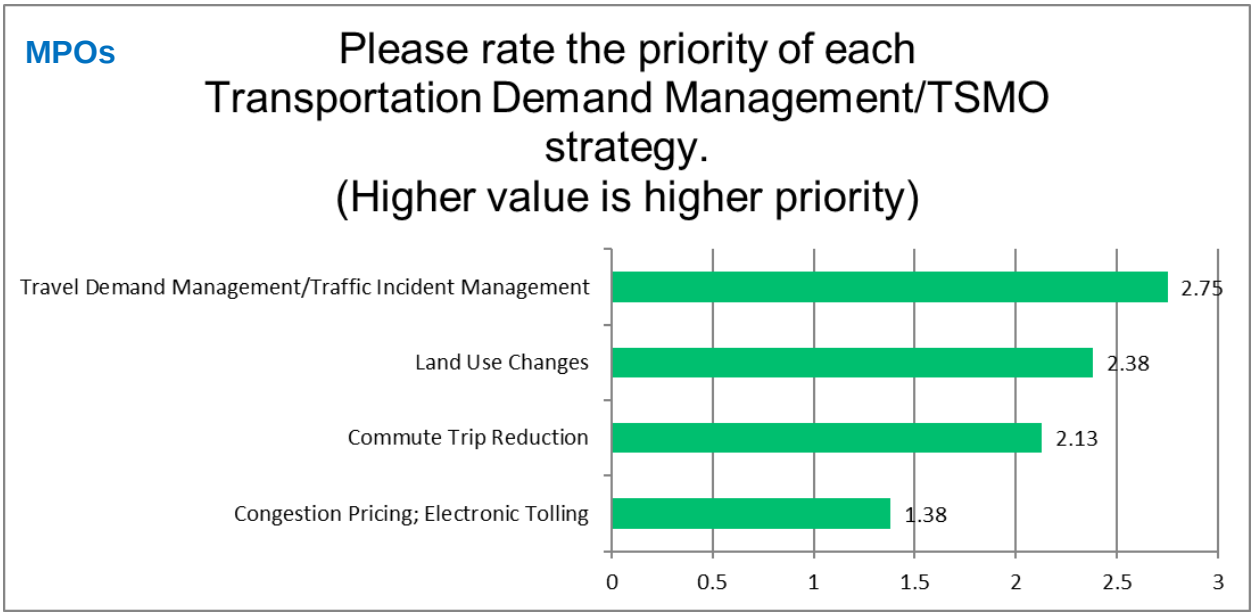
**MPOs**


Please rate the priority of each Active Modes/Multimodal strategy. (Higher value is higher priority)
Pedestrian Facilities
Bicycle Facilities
Multimodal access Improvements
Transit Vehicles and Infrastructure
Transit-Oriented Development
Expansion of Shared Mobility/Micromobility Options
2.75
2.63
2.38
1.88
1.75
1.63
0
0.5
1
1.5
2
2.5
3

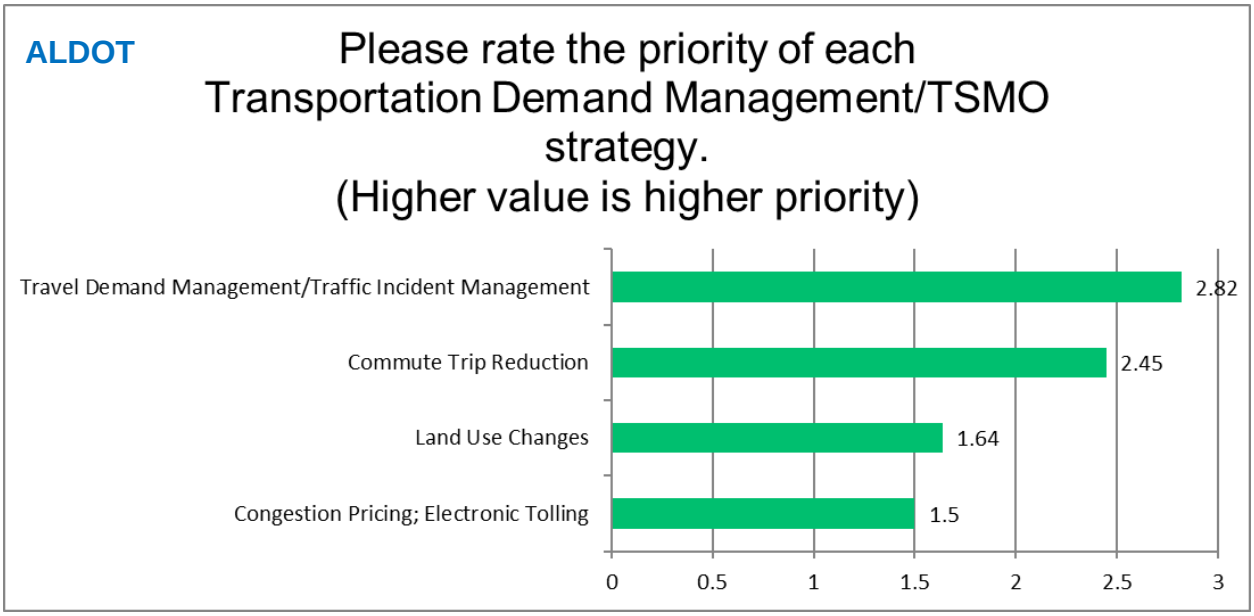
**ALDOT**


Please rate the priority of each Active Modes/Multimodal strategy. (Higher value is higher priority)
Multimodal access Improvements
Bicycle Facilities
Pedestrian Facilities
Transit Vehicles and Infrastructure
Expansion of Shared Mobility/Micromobility Options
Transit-Oriented Development
Other (Improve train depots, multimodal integration)
2.27
2.18
2.18
1.91
1.73
1.64
0.39
0
0.5
1
1.5
2
2.5

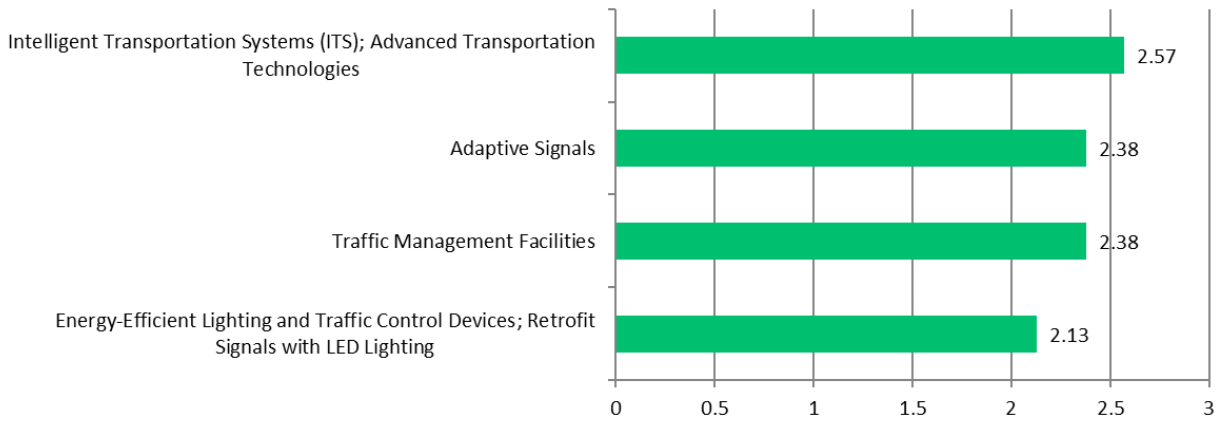
**MPOs**


Please rate the priority of each Transportation Demand Management/TSMO strategy.
(Higher value is higher priority)
Travel Demand Management/Traffic Incident Management
2.75
Land Use Changes
2.38
Commute Trip Reduction
2.13
Congestion Pricing; Electronic Tolling
1.38
0
0.5
1
1.5
2
2.5
3

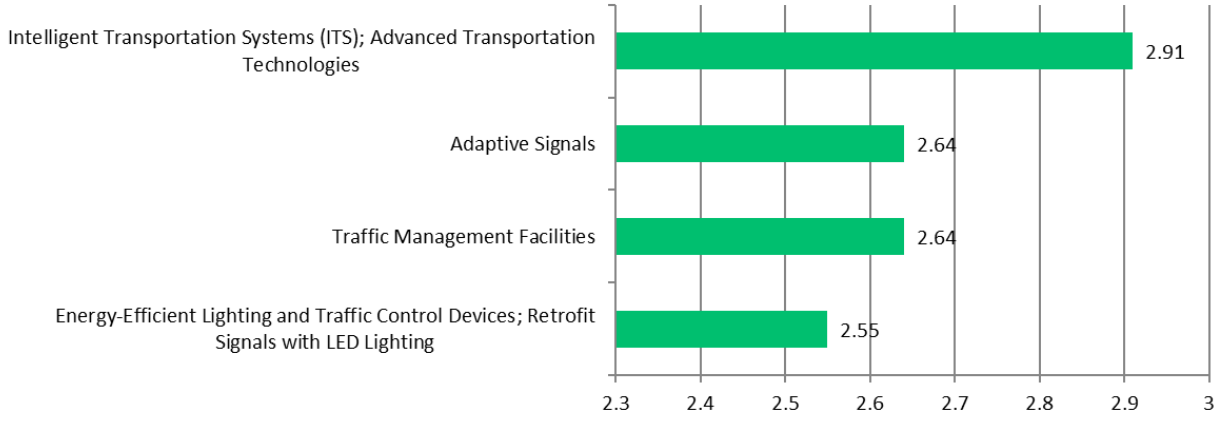
**ALDOT**


Please rate the priority of each Transportation Demand Management/TSMO strategy.
(Higher value is higher priority)
Travel Demand Management/Traffic Incident Management
2.82
Commute Trip Reduction
2.45
Land Use Changes
1.64
Congestion Pricing; Electronic Tolling
1.5
0
0.5
1
1.5
2
2.5
3

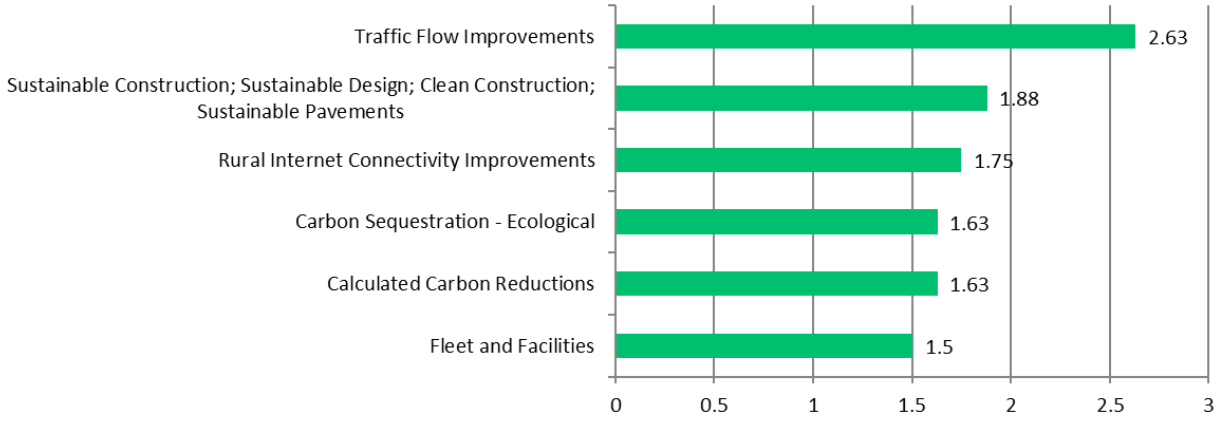
**MPOs**


Please rate the priority of each Technology Solutions strategy. (Higher value is higher priority)
Intelligent Transportation Systems (ITS); Advanced Transportation Technologies
2.57
Adaptive Signals
2.38
Traffic Management Facilities
2.38
Energy-Efficient Lighting and Traffic Control Devices; Retrofit Signals with LED Lighting
2.13
0
0.5
1
1.5
2
2.5
3

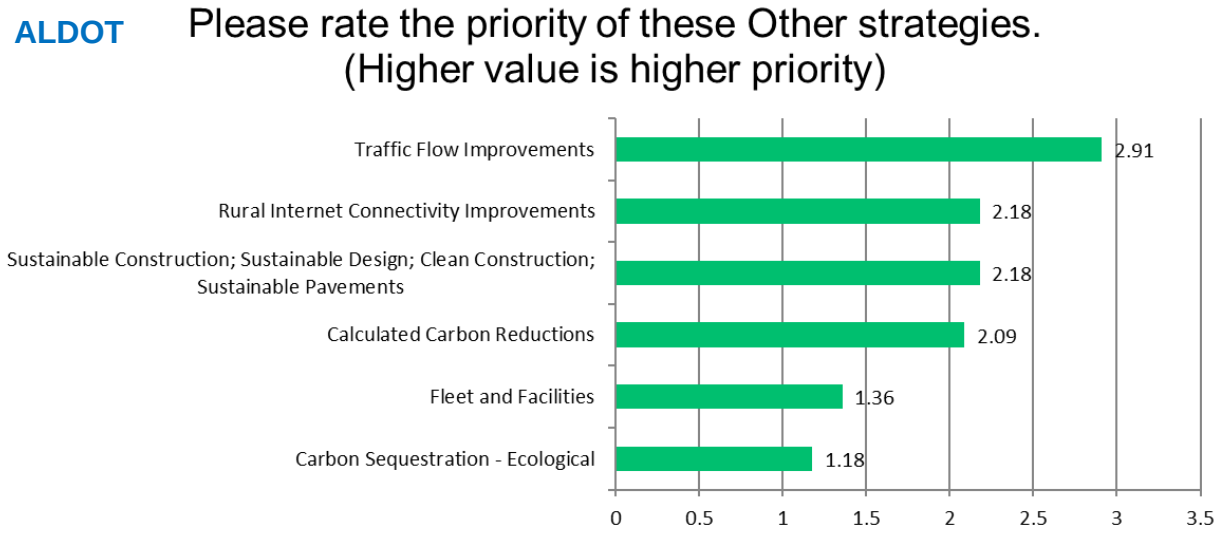
**ALDOT**


Please rate the priority of each Technology Solutions strategy. (Higher value is higher priority)
Intelligent Transportation Systems (ITS); Advanced Transportation Technologies
2.91
Adaptive Signals
2.64
Traffic Management Facilities
2.64
Energy-Efficient Lighting and Traffic Control Devices; Retrofit Signals with LED Lighting
2.55
2.3
2.4
2.5
2.6
2.7
2.8
2.9
3

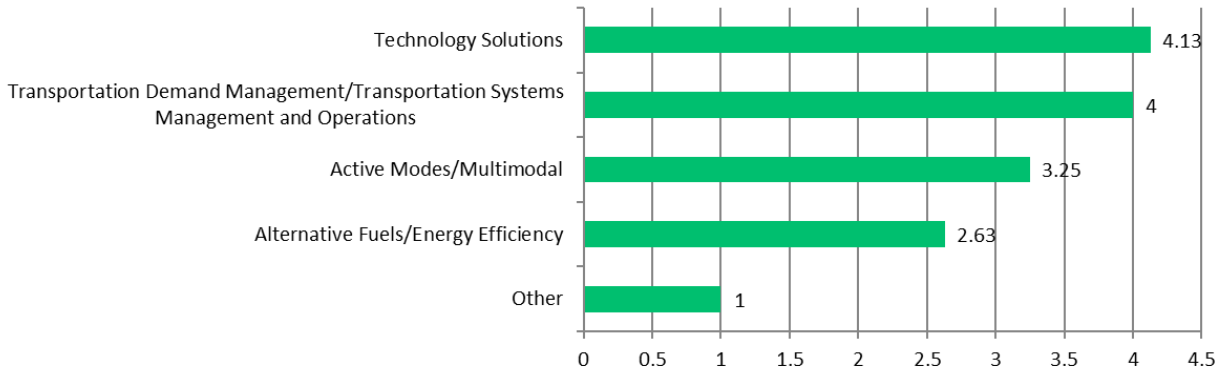
**MPOs**


Please rate the priority of these Other strategies.
(Higher value is higher priority)
Traffic Flow Improvements
2.63
Sustainable Construction; Sustainable Design; Clean Construction; Sustainable Pavements
1.88
Rural Internet Connectivity Improvements
1.75
Carbon Sequestration - Ecological
1.63
Calculated Carbon Reductions
1.63
Fleet and Facilities
1.5
0
0.5
1
1.5
2
2.5
3

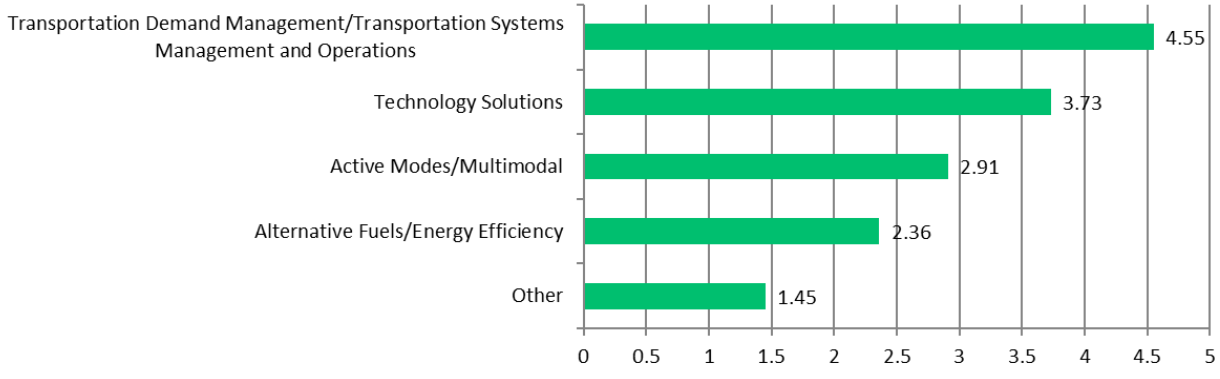
**ALDOT**


Please rate the priority of these Other strategies.
(Higher value is higher priority)
Traffic Flow Improvements
2.91
Rural Internet Connectivity Improvements
2.18
Sustainable Construction; Sustainable Design; Clean Construction; Sustainable Pavements
2.18
Calculated Carbon Reductions
2.09
Fleet and Facilities
1.36
Carbon Sequestration - Ecological
1.18
0
0.5
1
1.5
2
2.5
3
3.5

**MPOs**




**ALDOT**

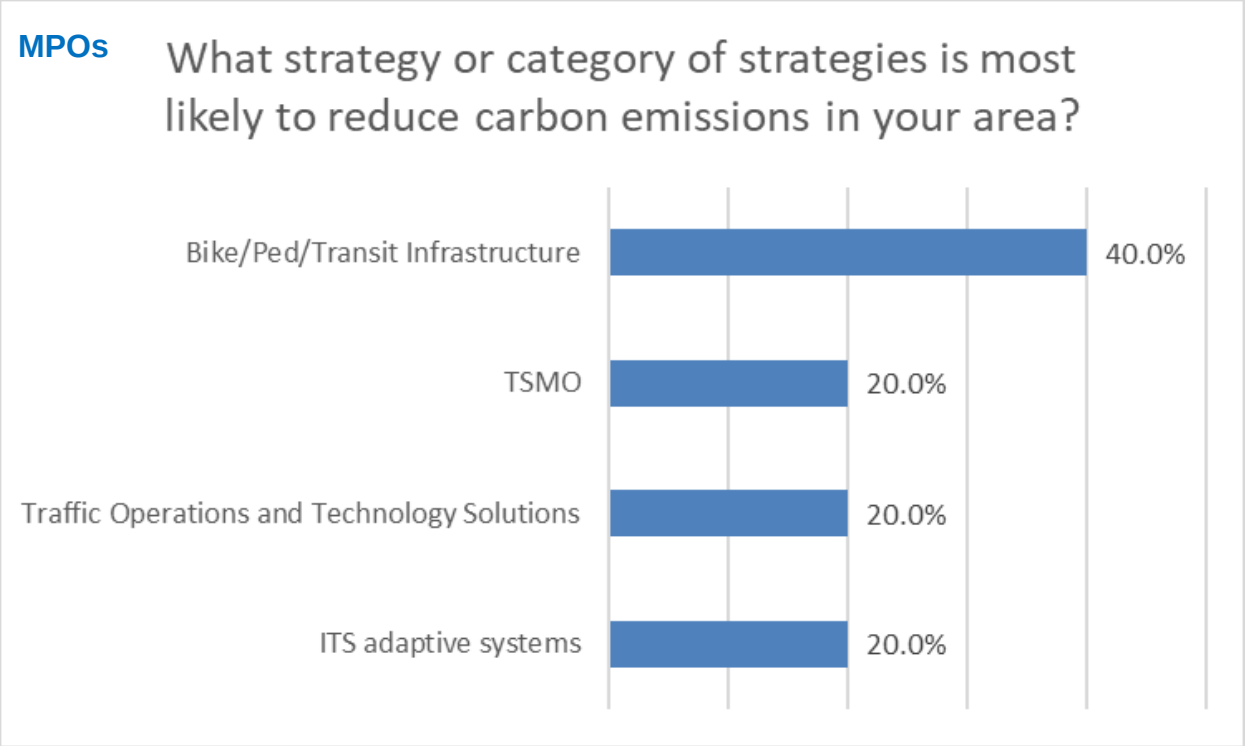



Please share other ideas for carbon reduction strategies not listed above.

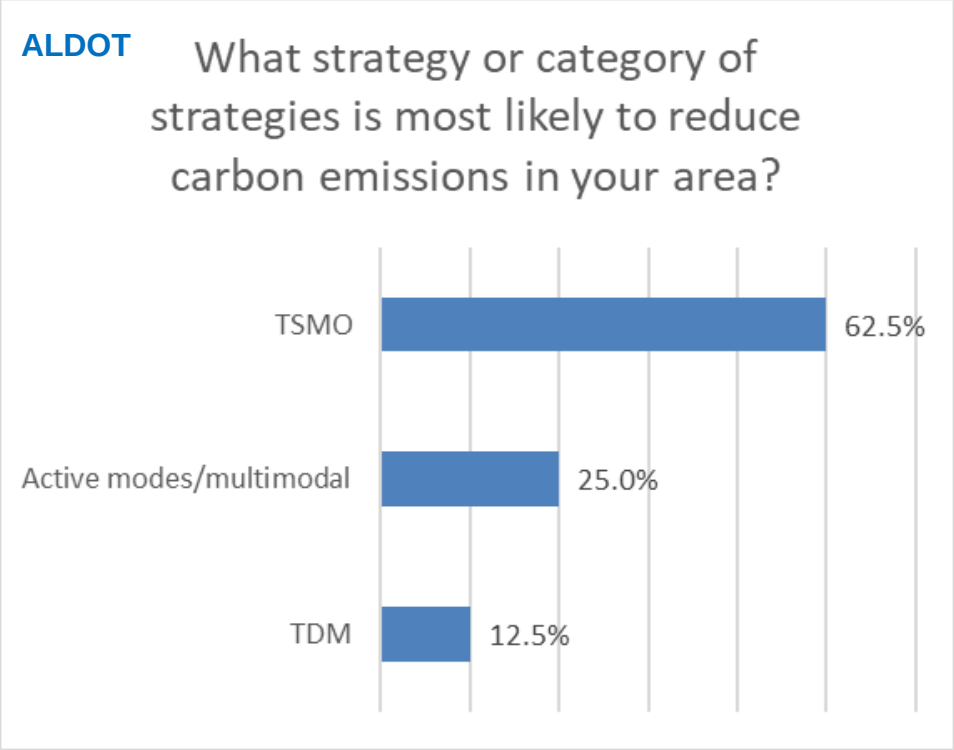
- TDM Programs
- Emissions Testing
- Use Excess ROW for Solar/Wind Power or Native Vegetation
- Improve Travel Efficiency

*(Responses reflect ideas from MPOs and ALDOT.)*

**MPOs**


What strategy or category of strategies is most likely to reduce carbon emissions in your area?
Bike/Ped/Transit Infrastructure
40.0%
TSMO
20.0%
Traffic Operations and Technology Solutions
20.0%
ITS adaptive systems
20.0%

**ALDOT**


What strategy or category of strategies is most likely to reduce carbon emissions in your area?
TSMO
62.5%
Active modes/multimodal
25.0%
TDM
12.5%

# Appendix C: Public Engagement Summary

# Press Release

ALDOT Alabama Department of Transportation

**September 22, 2023**

**FOR IMMEDIATE RELEASE**

**ALDOT Seeks Input on Carbon Reduction Strategy**

**MONTGOMERY. Ala.** – The Alabama Department of Transportation is inviting the public to give input on the draft Carbon Reduction Strategy. The comment period will end on or around October 27, 2023.

It is Alabama's vision to measurably reduce carbon dioxide emissions in the transportation sector by implementing a variety of strategies that will result in a cleaner environment for all Alabama citizens.

Alabama's goals are to reduce vehicular carbon dioxide emissions to improve air quality and mitigate climate impacts, support and expand multimodal transportation options in urban and rural areas and apply transportation management strategies and technologies to improve overall network efficiency.

For more information about the Draft Carbon Reduction Strategy, visit:
https://cpmsapps.dot.state.al.us/OfficeEngineer/Plan/Statewide2

To participate and give feedback on the Draft Carbon Reduction Strategy, visit:
www.aldotinvolved.com.

**MEDIA CONTACT:**
**Amanda Deem**
ALABAMA DEPARTMENT OF TRANSPORTATION
Media & Community Relations Bureau
Montgomery, Alabama
334-242-6963 Office
deema@dot.state.al.us

# Webpage Content

ALDOT
Alabama Department of Transportation

Business | Travel Info | Projects | Programs | Publications | Report a Concern

## Online Public Involvement: DRAFT Alabama Carbon Reduction Strategy (CRS)


Posted on: 10/17/2023

### Opportunity for Public Comments

*Thank you for visiting our site.*

The Alabama Department of Transportation invites the public to provide comments on Alabama's Draft Carbon Reduction Strategy. This document explains Alabama's plan to reduce carbon dioxide emissions in the transportation sector. Please use the online comment form on this page to offer comments. Hard copy comment forms can be printed from the atached PDF located below or obtained from the ALDOT Bureau of Office Engineer.

**Completed comment forms must be received by November 6, 2023.**

Comment Form

## Alabama's Carbon Reduction Strategy

The Alabama Department of Transportation invites the public to provide comments on Alabama's Draft Carbon Reduction Strategy. This document explains Alabama's plan to reduce carbon dioxide emissions in the transportation sector. Please use the online comment form on this page to offer comments. Hard copy comment forms can be printed from the attached PDF located in the Downloads Section below or obtained from the ALDOT Bureau of Office Engineer. **Completed comment forms must be received by November 6, 2023.**

### Background

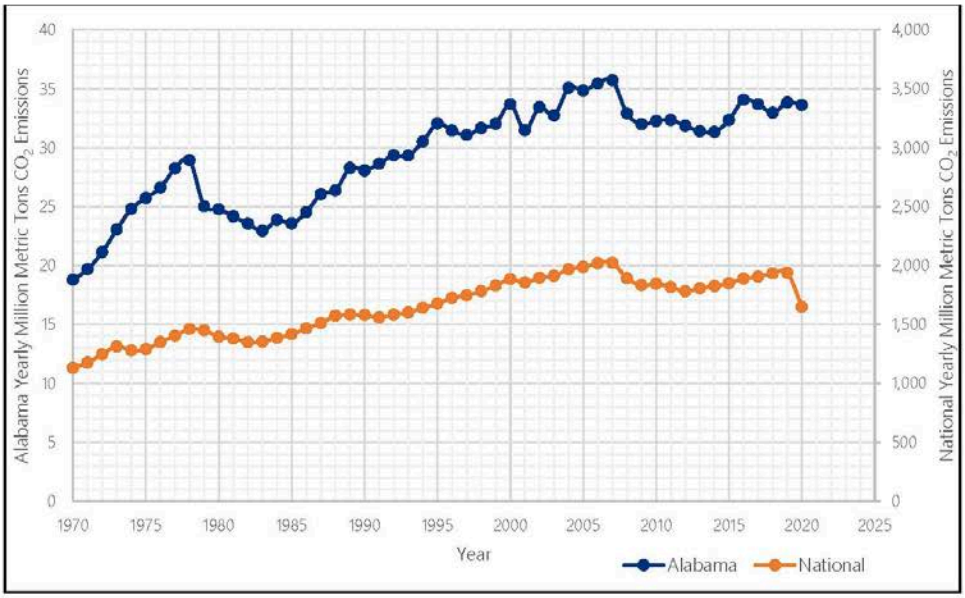
The Infrastructure Investment and Jobs Act was signed into law on November 15, 2021. This act established the Carbon Reduction Program to provide funding (approximately 6.4 billion dollars over a 5-year period) for projects that are designed to reduce carbon dioxide emissions from on-road highway sources. Eligible state funding activities include truck stop electrification, diesel engine retrofits, vehicle-to-infrastructure communications equipment, public transportation, port electrification, and deployment of alternative fuel vehicles, including charging or fueling infrastructure and the purchase or lease of zero emission vehicles. Each state is required to prepare a Carbon Reduction Strategy (CRS) in coordination with their Metropolitan Planning Organizations (MPOs) by November 15, 2023. The CRS should support current efforts to reduce transportation emissions and should identify strategies and implementation actions to continue reducing emissions.

### MPO Involvement

All 14 Alabama MPOs were invited to participate in the CRS development process through a series of meetings and an online survey. An overview of the Carbon Reduction Program was presented to the MPOs during the first meeting, and they were asked to provide information regarding their current plans and projects. Following this meeting, the MPOs received a survey to help develop goals and strategies. The existing conditions assessment and survey results were presented to the MPOs in the second meeting along with drafts of the Vision Statement, Goals, Focus Areas, and Strategies. These drafts were discussed with the MPOs for input and concurrence. The draft CRS was developed using this input and was presented to the MPOs in the third meeting where they were given the opportunity to comment on it.

**Current $CO_2$ Emissions Trends**

Transportation Sector $CO_2$ Emissions from Fossil Fuel Consumption (1970 - 2020)*



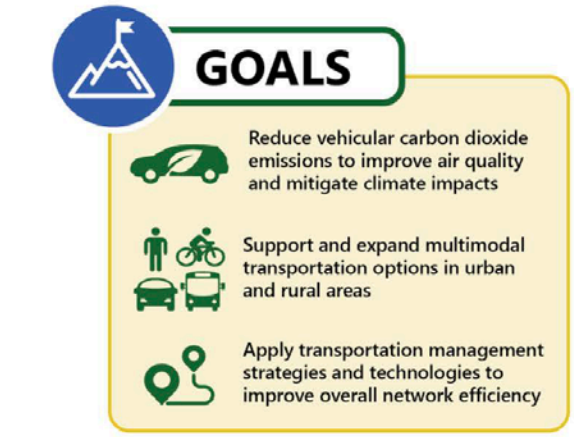

*(Source: U.S. Energy Information Administration)*

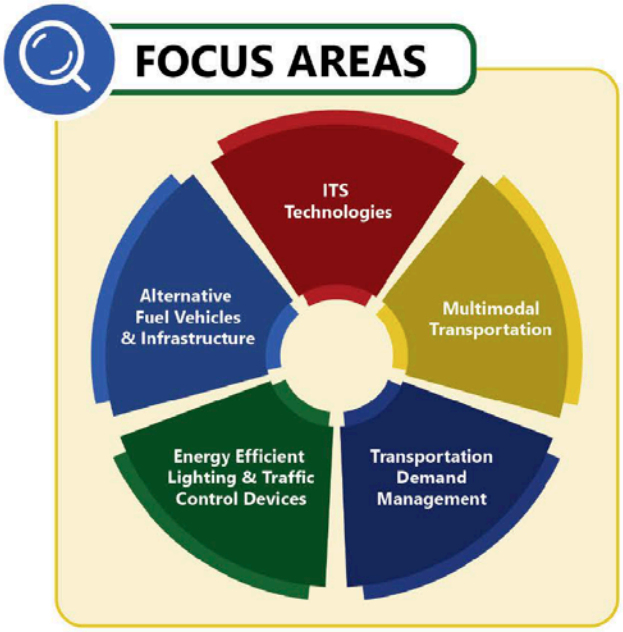
**Note that the scale for the Alabama $CO_2$ Emissions is on the left axis while the scale for the National $CO_2$ Emissions is on the right axis.*

**Vision Statement, Goals, & Focus Areas**

**VISION STATEMENT**

Alabama's vision is to measurably reduce carbon dioxide emissions in the transportation sector by implementing a variety of strategies that will collectively result in a cleaner environment for all Alabama citizens.




**Strategies & Implementation Actions**

Multiple strategies were identified for each focus area. Implementation actions, which include types of projects and programs that support each strategy, were also identified. These strategies and focus areas are summarized in the Carbon Reduction Strategy.

**Links**

- FHWA CRP Fact Sheet
  https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

- CRP Implementation Guidance
  https://www.fhwa.dot.gov/environment/sustainability/energy/policy/crp_guidance.pdf

**Comments**

- Comment using Online Comment Form
- Comment by Email: ALDOTStatewidePlanning@dot.state.al.us

**Downloads**

- Draft Carbon Reduction Strategy
- Public Comment Form

# Public Comment Form

**DRAFT CARBON REDUCTION STRATEGY**

**PUBLIC COMMENT FORM**

Name: _____

Address: _____

_____

E-mail: _____

Interest in Project: Resident: _____ Property Owner: _____ Business Owner_____

Elected Official: _____ Other _____

The Draft Carbon Reduction Strategy can be reviewed on ALDOT's website at the following link: https://www.dot.state.al.us/news/publicinvolvement.html. Please use the space below to provide comments on this document.

_____

_____

_____

_____

_____

_____

**Completed forms can be submitted in person, by mail, or by email by November 6, 2023.**

**In Person / Mail:**
Alabama Department of Transportation
Bureau of Office Engineer
1409 Coliseum Boulevard
Montgomery, Alabama 36110

**Email:** ALDOTStatewidePlanning@dot.state.al.us

# Media Outreach

ALDOT

CARBON REDUCTION STRATEGY DIGEST

from the Media and Community Relations Bureau

1. Cullman Times - ALDOT seeks public input on carbon reduction strategy
    a. Total Readership: 16,322
2. Yrt News - ALDOT seeks feedback on carbon reduction strategy
    a. Total Readership: 942
3. News 19 - ALDOT seeking input on Carbon Reduction Strategy
    a. Total Readership: 628,208
4. Usa Jaun News - ALDOT seeking input on Carbon Reduction Strategy
    a. Total Readership: 11,159
5. WVTM 13 News @ 4pm - Broadcast
    a. Total Viewership: 13,157

https://www.cullmantimes.com/news/aldot-seeks-public-input-on-carbon-reduction-strategy/article_dd80e372-7289-11ee-bd8e-afe1b71a4215.html

FEATURED

# ALDOT seeks public input on carbon reduction strategy

Patrick Camp pcamp@cullmantimes.com
Oct 25, 2023

Philip Steury Photography

The Alabama Department of Transportation is offering the public a chance to weigh in on the department's recently drafted Carbon Reduction Strategy.

The CRS was created as a requirement of the Bipartisan Infrastructure Investment and Jobs Act, which allocated $6.4 billion throughout five years for states to fund projects aimed at reducing carbon emissions when passed in Nov. 2021. Alabama is set to receive $128 million of these allocations, and has created a guide describing how to select and fund eligible projects.

All 14 of Alabama's Metropolitan Planning Organizations met with ALDOT to examine the state's existing carbon conditions and identified five key focus areas which are intended to work in tandem to achieve ALDOT's goals.

"The carbon reduction strategy is required by the Federal Highway Administration with the goal of providing a cleaner environment for all Alabamians," said ALDOT spokesperson Allison Green. "ALDOT consulted with Alabama's 14 Metropolitan Planning Organizations to develop the vision, goals and focus areas for the Carbon Reduction Strategy. ALDOT and the Alabama MPOs are committed to supporting and implementing programs and projects that reduce carbon dioxide emissions on the state's transportation network. The strategies and implementation actions that were identified in the plan focus on five areas where we have significant opportunities to reduce carbon emissions in Alabama. We encourage the public to provide input on the carbon reduction strategy."

These five focus areas are:

- Intelligent Transportation Systems
- Transportation Demand Management
- Multimodal Transportation
- Energy Efficient Lighting and Traffic Control Devices
- Alternative Fuel Vehicles and Infrastructure

ALDOT has also included suggested strategies for each of the focus areas, including offering incentives for electric/alternative fuel vehicles and increasing multimodal transit options for pedestrians and cyclists to reduce congestion. All approved projects will require a local match of 10 percent for interstate projects and 20 percent for non-interstate projects.

The first CRS proposal is due to be submitted to the Federal Highway Administration by Nov. 15 and ALDOT will be accepting public comments trough Nov. 6.

To participate and give feedback on the Draft Carbon Reduction Strategy, visit: www.aldotinvolved.com.

For more information about the Draft Carbon Reduction Strategy, visit: https://www.dot.state.al.us/news/2023/opmStatewideCRS.htm.

Patrick Camp can be reached at 256-734-2131 ext. 238

54° SIGN UP WATCH NOW

ALABAMA NEWS

# ALDOT seeking input on Carbon Reduction Strategy

(Getty Images)
by: Logan Sparkman
Posted: Oct 23, 2023 / 10:36 PM CDT
Updated: Oct 23, 2023 / 10:37 PM CDT

SHARE

ALABAMA (WHNT) — The Alabama Department of Transportation (ALDOT) is asking the public for input on a draft Carbon Reduction Strategy (CRS).

The Bipartisan Infrastructure Law, which was adopted in November 2021, created the Carbon Reduction Program. The program provides funds for states to reduce transportation emissions.

**Gov. Ivey approves West Alabama Corridor Project, ALDOT contracts despite disputes ›**

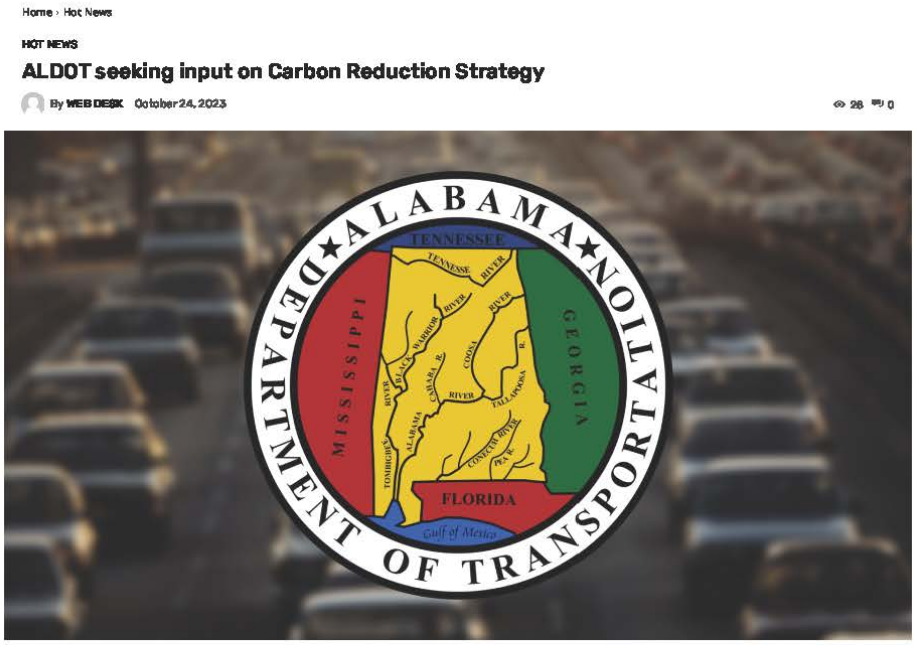
ALDOT is creating a CRS to guide how to select and fund projects to reduce carbon emissions from transportation in Alabama.

"It is Alabama's vision to measurably reduce carbon dioxide emissions in the transportation sector by implementing a variety of strategies that will result in a cleaner environment for all Alabama citizens," ALDOT said.

The state wants to reduce vehicular carbon dioxide emissions to improve air quality and mitigate climate impacts, provide more transportation options in rural and urban areas, and apply transportation management strategies and technologies to improve overall network efficiency.

For more information about the Draft Carbon Reduction Strategy, you can click here.
To participate and give feedback on the Draft Carbon Reduction Strategy, you can visit ALDOT's involvement website here.

Suggest a Correction


Home › Hot News
HOT NEWS
ALDOT seeking input on Carbon Reduction Strategy
By WEB DESK October 24, 2023
ALABAMA DEPARTMENT OF TRANSPORTATION
TENNESSEE
MISSISSIPPI
GEORGIA
FLORIDA
Gulf of Mexico


ALABAMA (WHNT) — The Alabama Department of Transportation (ALDOT) is asking the public for input on a draft Carbon Reduction Strategy (CRS).

The Bipartisan Infrastructure Law, which was adopted in November 2021, created the Carbon Reduction Program. The program provides funds for states to reduce transportation emissions.

Gov. Ivey approves West Alabama Corridor Project, ALDOT contracts despite disputes

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Source link


16:35 WVTM-BIRM (NBC) - WVTM 13 News @ 4pm
Monday, October 23, 2023
VIEW PLAN, GIVE FEEDBACK
THROUGH NOVEMBER 6
ALDOTINVOLVED.COM
PAUSED
16:35:58

# Summary of Public Comments

| Interest in Project | Comment | ALDOT Response to Commenter | Notes |
|---|---|---|---|
| Other | I have reviewed ALDOT's draft Carbon Reduction Strategy and I approve and support the findings and recommendations in the document. | Thank you for your input on the Draft Carbon Reduction Strategy for Transportation Planning. Your input is greatly appreciated. Your comments will be taken into consideration as Alabama Department of Transportation (ALDOT) endeavors to finalize the Plan.<br><br>General comments on transportation issues will be forwarded to the appropriate ALDOT Region personnel for your area. Again, thank you for your participation. | This comment expresses support for the Carbon Reduction Strategy. |

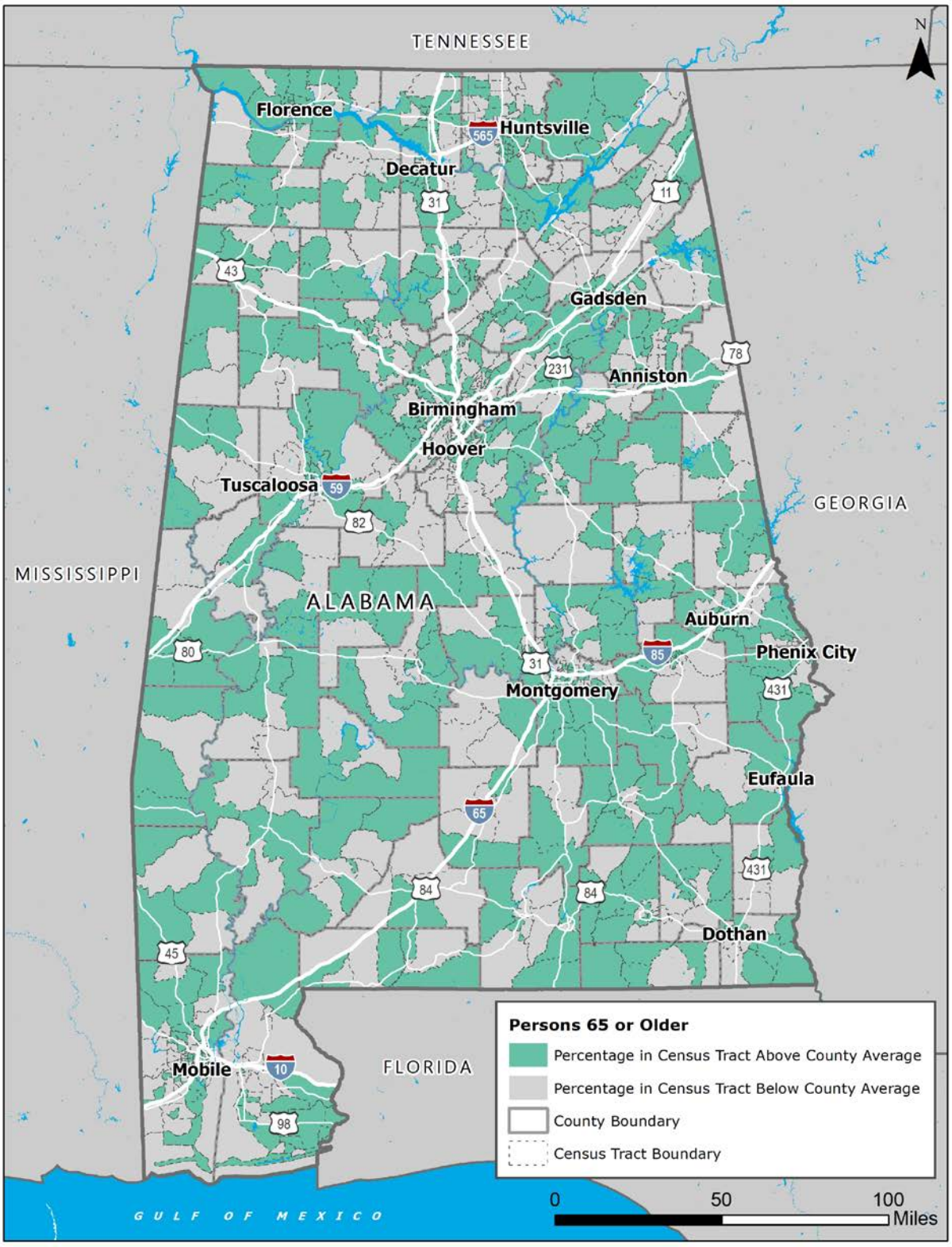
| Interest in Project | Comment | ALDOT Response to Commenter | Notes |
|---|---|---|---|
| Resident | While the ALDOT CRS identifies some important changes to make to reduce carbon emissions, it does not go far enough. Tactics that would significantly lessen overall carbon outputs, like changing land use, are passed over in favor of less impactful changes like improving traffic signals. While all improvements are essential, ALDOT needs to concentrate on land use and expanding alternative transportation, as well as quantifying the state's emissions, to make lasting cuts to the state's carbon emissions. | Thank you for your input on the Draft Carbon Reduction Strategy for Transportation Planning. Your input is greatly appreciated. Your comments will be taken into consideration as Alabama Department of Transportation (ALDOT) endeavors to finalize the Plan.<br><br>General comments on transportation issues will be forwarded to the appropriate ALDOT Region personnel for your area. Again, thank you for your participation. | While land use was discussed by ALDOT and the MPOs as a carbon reduction strategy, it was not specifically listed in the plan since ALDOT and the MPOs do not have jurisdictional authority over land use. These decisions are made at the local level.<br><br>Alternative transportation (i.e., walking, biking, transit usage, etc.) is included as a focus area in this plan. Successful implementation of the strategies within this focus area will depend on appropriate and context-sensitive land use planning at the local level. |

| Interest in Project | Comment | ALDOT Response to Commenter | Notes |
|---|---|---|---|
| Resident | The ALDOT CRS fails to make substantive changes that measurably reduce our state's carbon output in the long term. We more than double the national average in carbon output, yet the best ALDOT & Neel + Schaffer can offer is piecemeal solutions. The cheapest time to swap to sustainable, walkable infrastructure is now, and this plan should place much greater emphasis on land use reform and multimodal transit. | Thank you for your input on the Draft Carbon Reduction Strategy for Transportation Planning. Your input is greatly appreciated. Your comments will be taken into consideration as Alabama Department of Transportation (ALDOT) endeavors to finalize the Plan.<br><br>General comments on transportation issues will be forwarded to the appropriate ALDOT Region personnel for your area. Again, thank you for your participation. | Alabama's carbon output is well below the national average according to Figure 2.1. The scale for Alabama's $CO_2$ emissions is shown on the left axis, while the scale for National $CO_2$ emissions is shown on the right axis.<br><br>While land use was discussed by ALDOT and the MPOs as a carbon reduction strategy, it was not specifically listed in the plan since ALDOT and the MPOs do not have jurisdictional authority over land use. These decisions are made at the local level.<br><br>Walkable infrastructure and multimodal transit are included under the Multimodal Transportation focus area in this plan. Implementing these strategies will depend on appropriate and context-sensitive land use planning at the local level. |

| Interest in Project | Comment | ALDOT Response to Commenter | Notes |
|---|---|---|---|
| Unknown | Please stop the West AL road project. W/O federal support, we cannot afford it. I-65 is choking travel and commerce. Widen I-65. | Thank you for your input on the Draft Carbon Reduction Strategy for Transportation Planning. Your input is greatly appreciated. Your comments will be taken into consideration as Alabama Department of Transportation (ALDOT) endeavors to finalize the Plan.<br><br>General comments on transportation issues will be forwarded to the appropriate ALDOT Region personnel for your area. Again, thank you for your participation. | This comment is not applicable to the Carbon Reduction Strategy. |

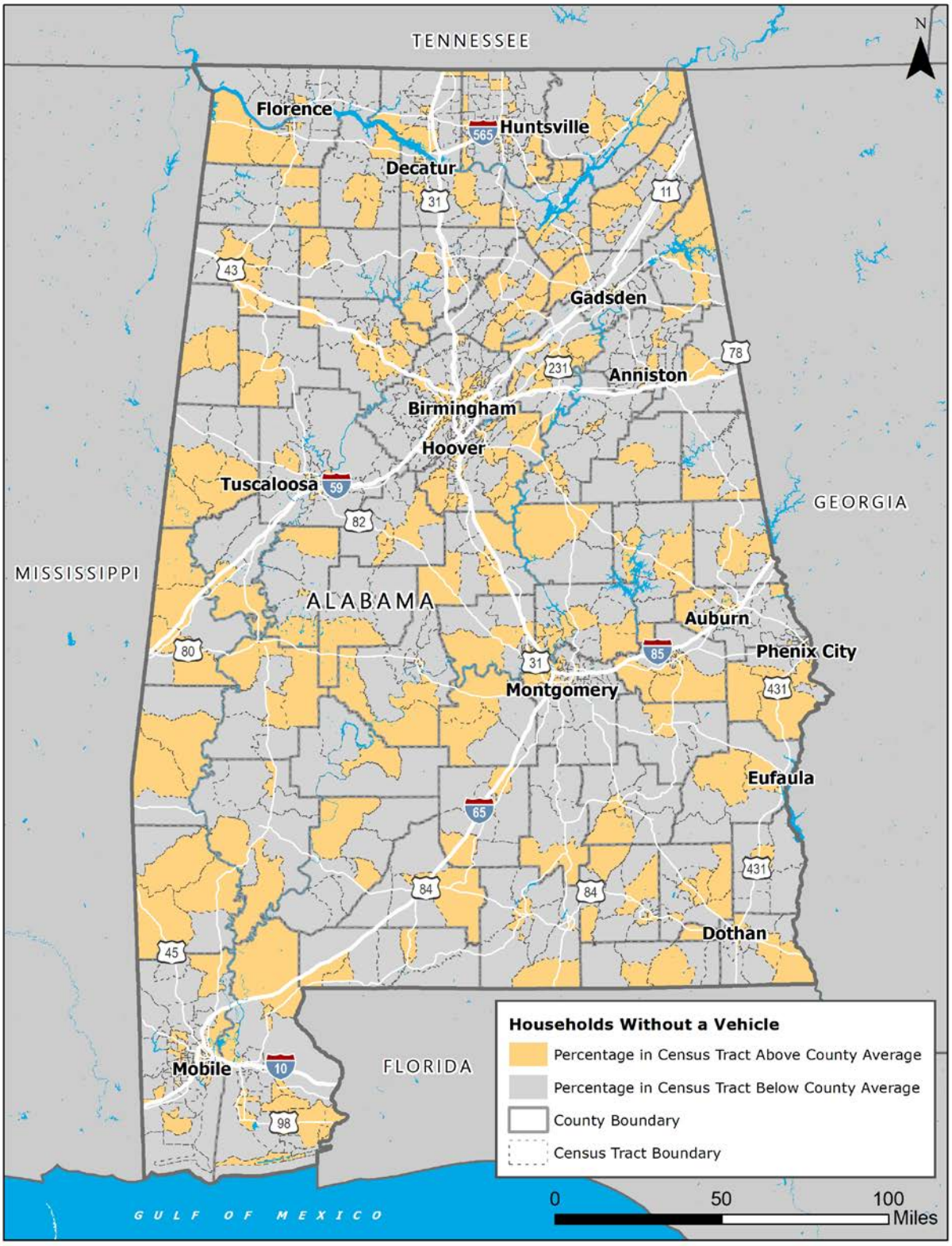
# Appendix D: Statewide Environmental Justice Population Maps

# Persons 65 or Older



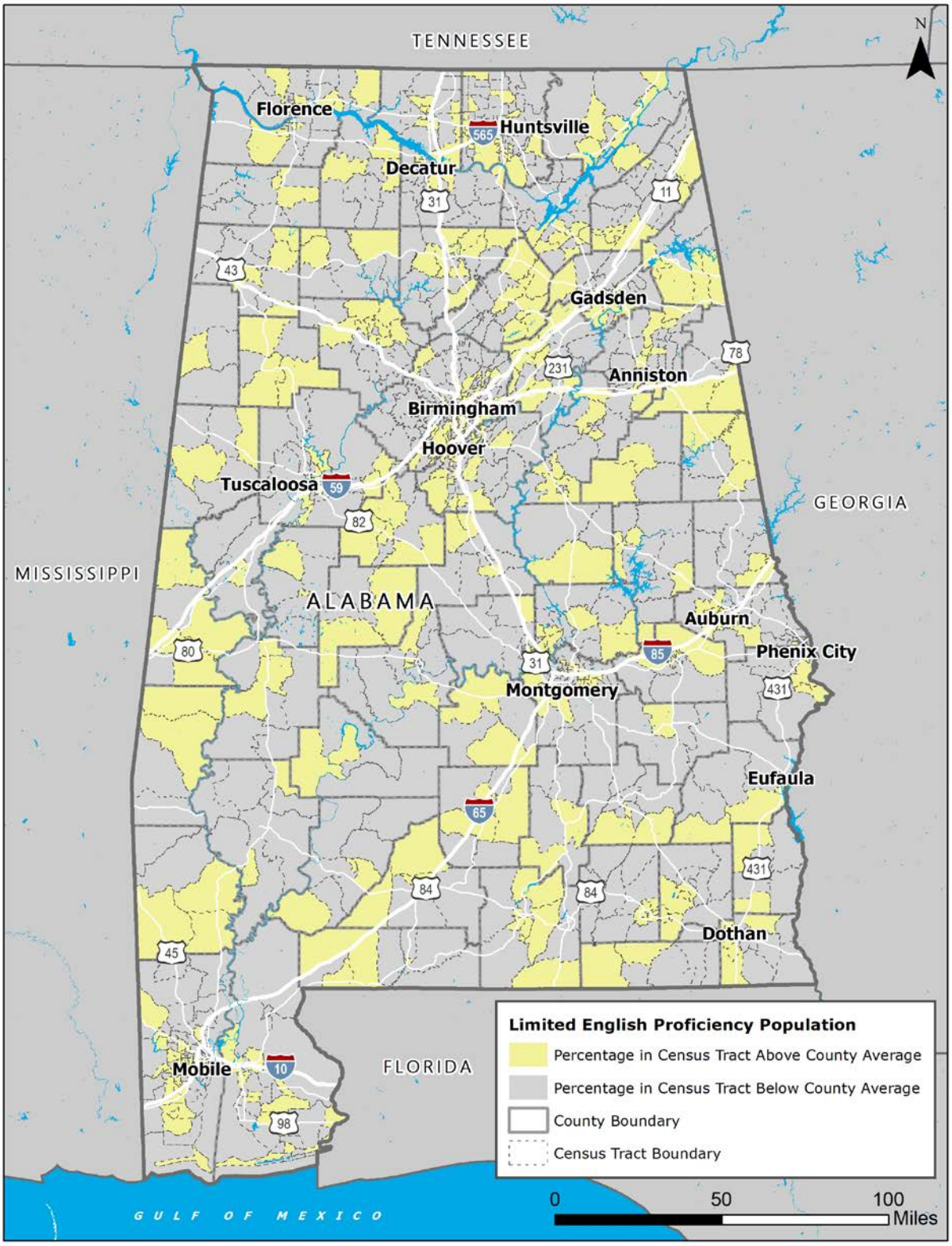

Source: U.S. Census, American Community Survey (2021)

# Households Without a Vehicle



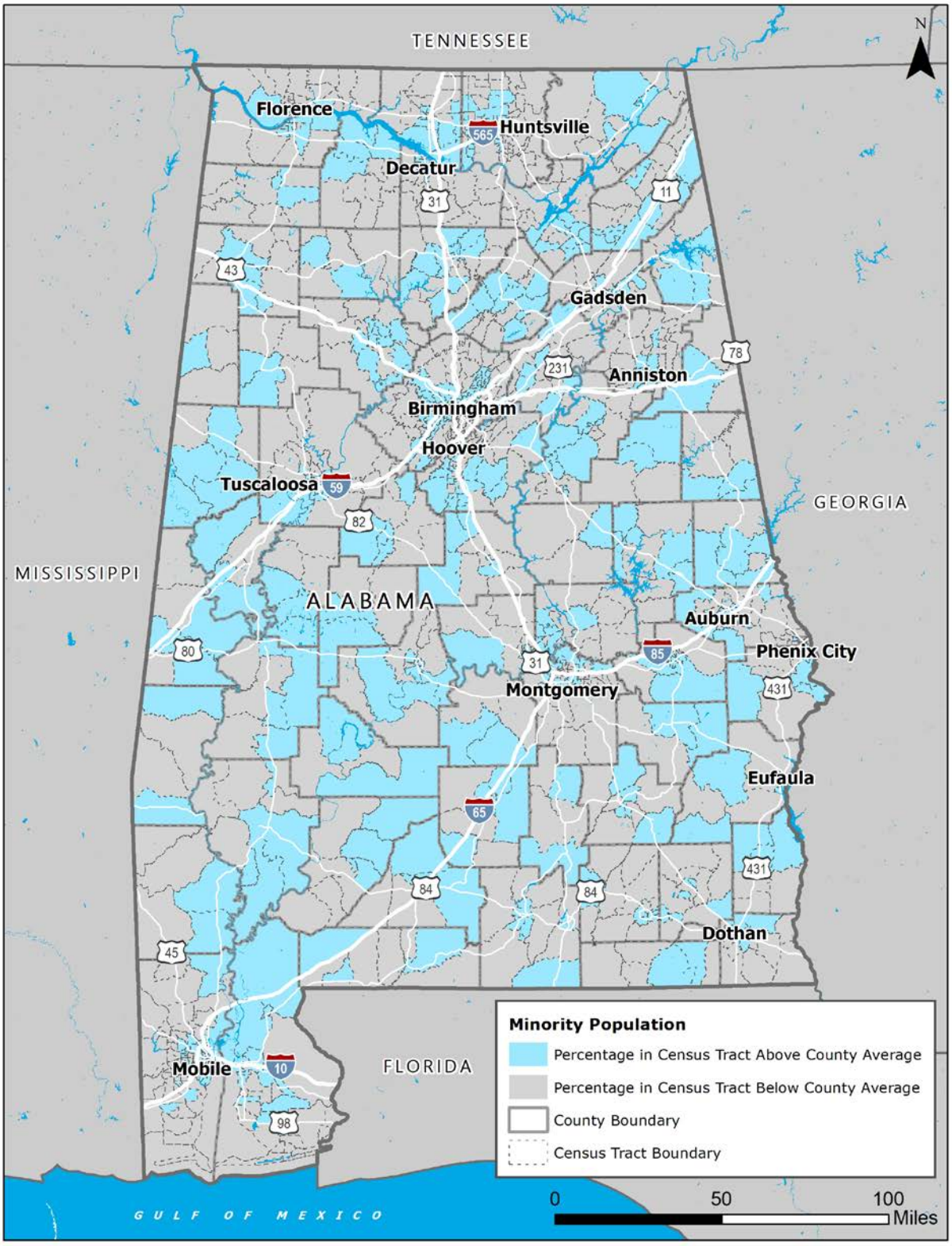

Source: U.S. Census, American Community Survey (2021)

# Limited English Proficiency Population



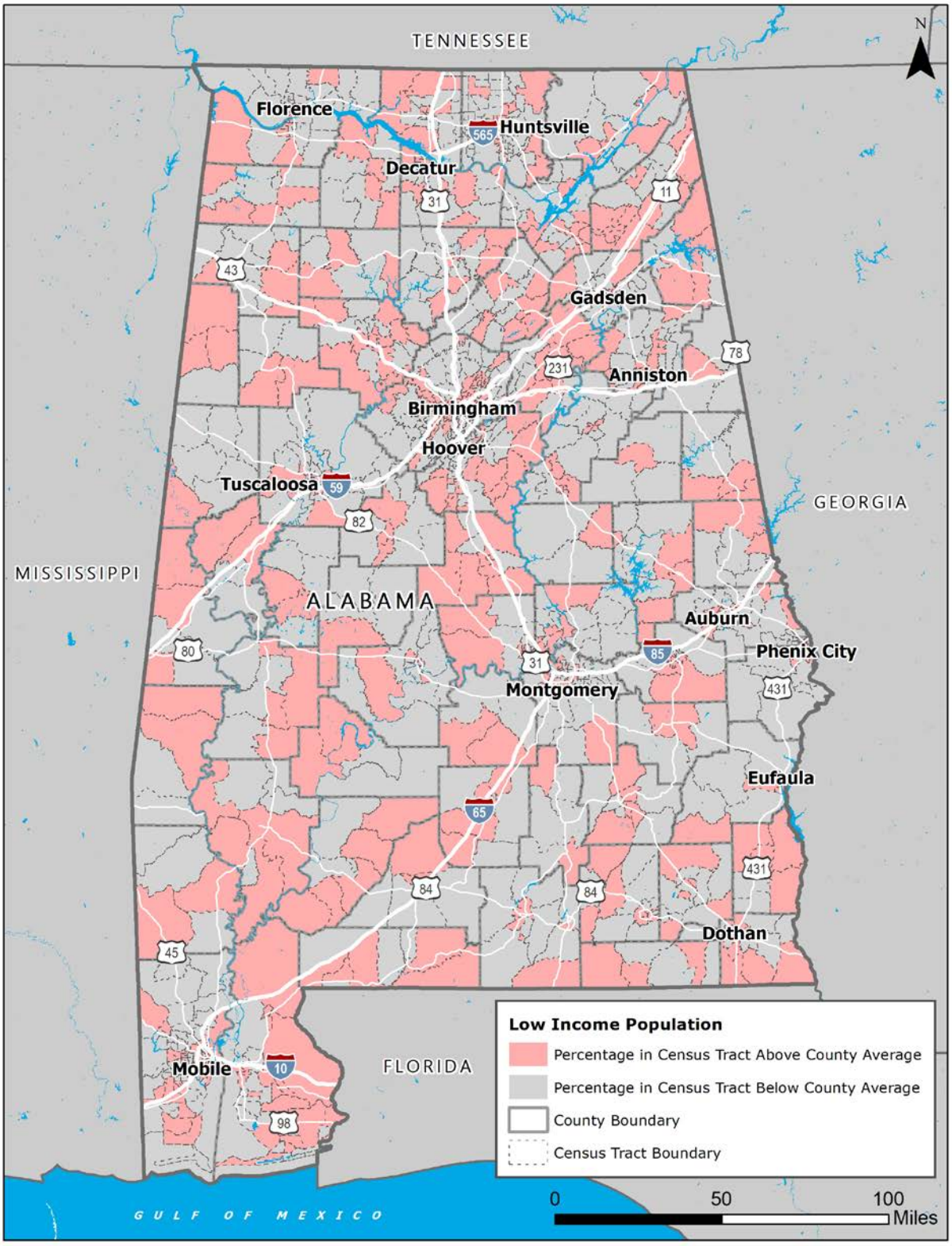

Source: U.S. Census, American Community Survey (2021)

# Minority Population



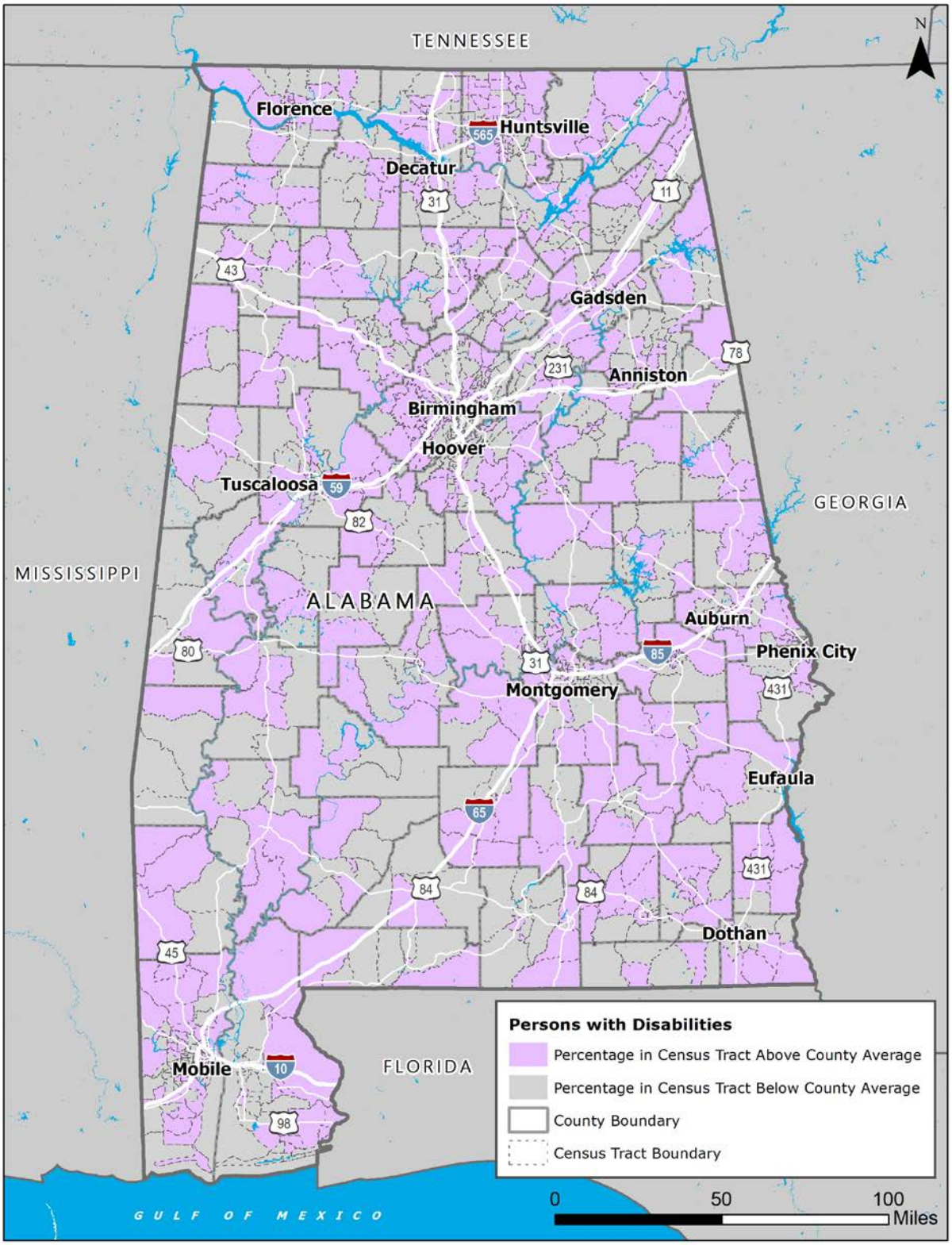

Source: U.S. Census, American Community Survey (2021)

# Low Income Population



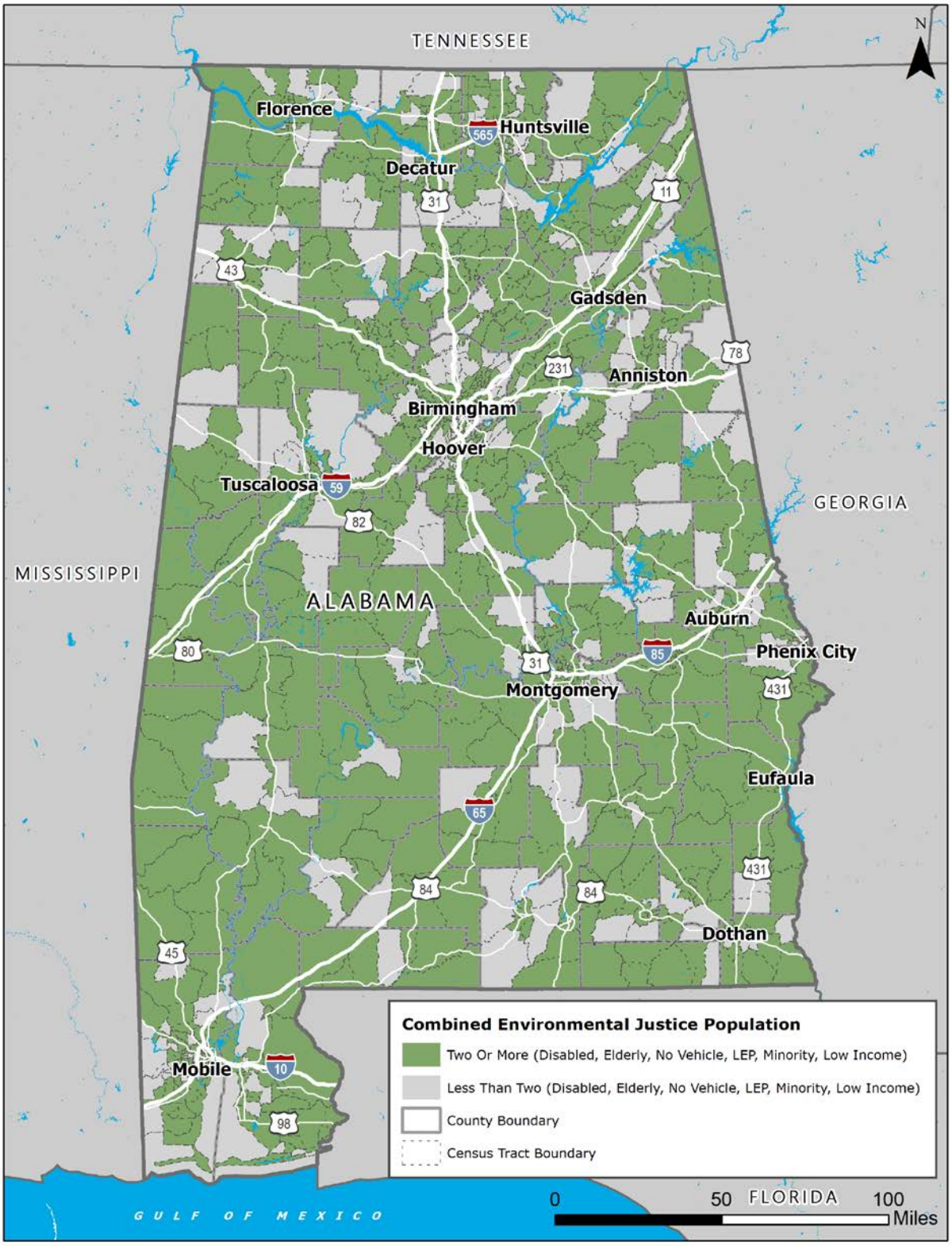

Source: U.S. Census, American Community Survey (2021)

# Persons with Disabilities




Source: U.S. Census, American Community Survey (2021)

# Combined Environmental Justice Population




Source: U.S. Census, American Community Survey (2021)